European Commission

Study on the use of ERDF/CF common indicators by Member States in the 2021-2027 period and possibility of using common indicators in a system of "payments not based on costs"

Second Intermediate Report

September 2025

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EUROPEAN COMMISSION

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2026

EN

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Manuscript completed in September 2025

1st edition

Luxembourg: Publications Office of the European Union, 2026

PDF ISBN 978-92-68-37241-8 doi: 10.2776/5972205 KN-01-26-006-EN-N

Second Interim report

Study on the use of ERDF/CF common indicators by Member States in the 2021-2027 period and possibility of using common indicators in a system of "payments not based on costs"

29 November 2024

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Acronyms

CF: Cohesion Fund
CCT: Conditional Cash Transfer
CIDs: Council Implementing Decisions
CPR: Common Provisions Regulation
COD: Cash-on-delivery aid
DG REGIO: Directorate-General for Regional and Urban Policy
EAFRD: European Agricultural Fund for Rural Development
EC: European Commission
ECA: European Court of Auditors
ERDF: European Regional Development Fund
ESF+: European Social Fund Plus
ESIF: European Structural and Investment Funds
EU: European Union
FNLC: Financing Not Linked to Costs
Impact Bonds: IBS
ICT: Information and Communication Technology
IF: Intervention Field(s)
JTF: Just Transition Fund
LLM: Large Language Models
MCA: Multicriteria analysis
NLP: Natural Language Processing
NRRP: National Recovery and Resilience Plan
OBA: Output-based aid
OBD: Output-based disbursement
PBF: Performance-Based Financing
PFFOR: Programme for result
PO: Policy Objective
PR: Programme
Q&A: Questions and Answers
RBCF: Result-based Climate Financing
RBF: Result-Based Financing
RCO: Common Output Indicator
RCR: Common Result Indicator
RRF: Recovery and Resilience Facility
RSO: see SO
SCO: Simplified Cost Options
SO: Specific Objective(s)
SME: Small- and Medium-sized Enterprise
SWD: Staff Working Document

Introduction

The present document is the first part of the second Interim Report of the 'Study on the use of ERDF/CF common indicators by Member States in the 2021-2027 period and possibility of using common indicators in a system of "payments not based on costs"' (hence after **draft second interim report**). This report constitutes deliverable of the project carried out by the Consortium led by t33 and made up of other 3 partners which are CSIL Scrl, Spatial Foresight GmbH, and EPSEC EUROSTUDIES SP. Z O.O.

A. SCOPE AND OBJECTIVE OF THIS REPORT

The overall study aims to establish whether the ERDF/CF/JTF programme performance framework methodologies 2021-2027, or elements of them, could be used in a future system of "financing not linked to costs". The purpose of the study can be unfolded into two different objectives.

- The first objective of the study is to assess the use of ERDF/Cohesion Fund/JTF common indicators in the 2021-2027 programming period.
- The second objective of the study is to assess whether the abovementioned indicators could be used, partly, as indicators triggering payments within a framework of "financing not linked to costs.

The tasks and sub-tasks of the study to achieve the above objective are as follows:

- Task 1a provides an analysis of the use of common indicators by Member State, by Specific Objective. It implies an assessment of the relevance, frequency, and consistency of the common indicators and to identify possible outliers.
- Task 1b analyses the data, assumptions, methodology and risks identified in setting baselines, milestones, and targets by a selection of programmes in different Member States that shall ensure an appropriate representation of the different parts of the EU and of the different categories of regions.
- Task 2a consists of a comparison between ERDF/CF common indicators with the investment-relevant milestone and target indicators used under the Recovery and Resilience Facility (RRF). There will also be an assessment of whether the ERDF/CF common indicator system could help address some of the critiques made by the European Court of Auditors.
- Task 2b assesses the feasibility of using common indicators in a system of "payment not linked to costs". To do so, for the different indicators their characteristics in terms of availability, timeliness, granularity and reliability must be considered.
- Task 3 comprises a survey of selected programmes and members of the DG REGIO evaluation network to better delineate the advantages and challenges of using the selected common indicators listed under task 1b and assesses which indicators are described as most reliable using the RACER criteria.
- Task 4 regards the elaboration of the interim and final reports.

This second interim report follows up on the draft second interim report finalised in November 2024, which detailed the analysis performed under 1b, 2a and the preliminary findings of task 2b (pilot). In contrast, this report encompasses

- Final result of the task 1b.
- Final result of the task 2a.

- Final result of the task 2b

Therefore, each of the first three sections of the report is dedicated to the respective tasks: Section 1 covers Task 1b, Section 2 addresses Task 2a, and Section 3 focuses on Task 2b.

B. OVERALL METHODOLOGICAL APPROACH

The overall methodological approach is designed to integrate the different tasks effectively. Each sub-task is structured to provide a comprehensive assessment of the indicators, focusing on various attributes:

- **Sub-Task 1a:** evaluates the availability of each indicator.
- **Sub-Task 1b:** concentrates on the reliability of a subset of indicators.
- **Sub-Task 2a** (and partially **Sub-Task 1b**): assesses the granularity and timeliness of the indicators within the context of Financing Not Linked to Costs (FNLC).

Table 1 Definition of Availability, Reliability, Granularity and Timeliness.

Availability	Availability of an indicator refers to the extent to which relevant data can be consistently accessed and utilized over time. This concept encompasses two key aspects: frequency and relevance. Therefore, an available indicator is one that is both widely recognized and used
Reliability	Reliability refers to the stability of an indicator across various programmes in Member States. This entails that the indicator is consistently used for the similar investments (i.e. SO and intervention field) and in homogeneous situations across different regional and national programmes. Additionally, reliability encompasses the indicator's coherence with the methodological guidance issued by DG REGIO, as outlined in their staff working documents.
Granularity	Granularity, in the context of indicators, refers to the degree of specificity or detail that an indicator can provide regarding the underlying investment and Specific Objectives. High granularity means that the indicator can pinpoint and reflect specific aspects of an investment and relate them clearly and distinctly to the intended outcomes or objectives.
Timeliness	Timeliness, in the context of programme indicators, refers to the appropriateness and readiness of an indicator's measurement at a specific stage of the programme's lifecycle. It concerns where in the lifecycle the indicator is most relevant and can be most effectively measured – whether it is during the early phases of preparation, throughout the implementation process, or in the later stages where results and impacts become manifest, after outputs have been produced. Timeliness is about ensuring that indicators are used at the most suitable points in time to accurately reflect the progress and outcomes of the programme, providing meaningful and actionable insights at the right moments.

Sub-Task 2b focuses on evaluating the potential use of individual indicators within the FNLC framework. Here, the findings from each sub-task are used to determine the:

- admissibility: which indicators are most suitable to be used in a FNLC framework
- feasibility: how and when the indicators should be used in a FNLC framework.

This sequential yet integrated approach ensures a thorough assessment of each indicator, addressing all necessary aspects before determining its feasibility in the FNLC context.

Table 2 Contribution from each sub task to the analysis of admissibility and feasibility.

Analysis performed in the earlier tasks	Admissibility			Feasibility		
	Availability	Reliability	Potentiality	Granularity	Timeliness	Practicability
Task 1a – Relevance	X					
Task 1a – Frequency	X					X
Task 1a – Consistency		X				
Task 1b – Coherence with SWD methodology		X				
Task 1b – Homogeneity in target setting and granularity		X		X		X
Task 1b – Insights into the timeliness of using indicators in programme / project life cycle					X	
Task 2a – Comparison ERDF / CF and RRF (thematic overlaps and differences)				X		
Task 2a – Advantages and disadvantages of using ERDF			X		X	

/ CF in payment not linked to costs						

Source: Consortium own elaboration

C. KEY FINDINGS

The draft second interim report has significantly enhanced the knowledge and understanding of indicator usage. Below are the key findings for each task, noting that the results for Tasks 1b and 2a should be considered final

TASK 1B: DETAILED ASSESSMENT OF SELECTED COMMON OUTPUT AND RESULT INDICATORS

Task 1b reviews a sample of 44 methodological documents related to the programme performance framework and focuses on 43 common output and result indicators covering all the POs: 13 for PO 1, 19 for PO 2, 3 for PO 3, 6 for PO 4, 2 for PO 5. This review examines **the coherence** with SWD definitions and assumptions, assesses **homogeneity**, and provides specific insights into **outlier programmes** identified under Task 1a.

COHERENCE WITH THE SWD. The coherence assessment shows that there are no methodological documents that define indicators inconsistently with the SWD guidelines and there are no substantial differences in definitions across specific objectives. With regards to result indicators specifically, while the SWD specifies when output indicators shall be measured, it gives programmes the flexibility to decide when to measure many result indicators, as long as the measurement occurs no later than one year after the completion of the corresponding outputs / intervention. In this regard, the reviewed methodological documents usually do not specify how or when the result indicators will be measured but merely state their consistency with the SWD.

HOMOGENEITY ASSESSMENT. The homogeneity assessment is structured in three steps:

Step 1: Granularity: **It assesses whether the investment actions contributing to each indicator are homogeneous under each specific objective**. To ensure consistency across the programmes under analysis, the study team proposes types of investment actions at the specific objective level contributing to the indicator valorisation. This typology of investment actions is based on the Annex I CPR intervention fields, the correspondence table from the Cohesion data platform[1], textual analysis of the programme actions. There is **high homogeneity** when an indicator is associated with a single type of operation, **medium homogeneity** with two or three types, and **low homogeneity** with four or five types.

[1] https://cohesiondata.ec.europa.eu/2021-2027-Categorisation/Correspondence-21-27-to-14-20-intervention-fields/4s7y-iy43/about_data (last visit 12 September 2024)

- **PO 1 indicators usually exhibit medium to low homogeneity**. This means that typically more than one type of operation contributes to the indicator valorisation. Indicators with high homogeneity of investment actions include SME incubation (RCO15, RCR18) and digital connectivity for dwellings (RCO41, RCR53). Indicators with medium homogeneity measure research infrastructure (RCO06), public sector digitisation (RCO14), SMEs introducing innovations (RCR03). z with low homogeneity are found in PO 1 and cover new enterprises supported (RCO05), job creation (RCR01), new researchers (RCR102), public digital services, products and processes (RCR11) and the survival of new enterprises (RCR17). Homogeneity for RCO02 (SMEs supported with grants) varies across specific objectives.
- **In PO2, PO3 and PO 4**, **homogeneity is typically medium to high**. Indicators often exhibit high homogeneity (a single type of operation is associated with an indicator) for areas such as energy efficiency in dwelling and public buildings (RCO18 and RCO19), flood protection (RCO25, RCR35), public water supply (RCO30, RCR41), waste recycling (RCO34, RCR47), green infrastructure (RCO36), renewable energy (RCO22, RCR31 and RCR32), public transport (RCO57, RCR63), TEN-Trailway infrastructure (RCO47, RCO49, RCR58), childcare infrastructure (RCO66, RCR70), health care facilities (RCO69, RCR73). There is medium homogeneity - two or three types of investment actions under each RSO are associated with an indicator – for Natura 2000 sites (RCO37), access to green infrastructure (RCR95), cycling infrastructure (RCO58, RCR64), education facilities (RCO67, RCR71), annual primary energy consumption (RCR26) and estimated GHG emissions (RCR29).
- **The PO 5 case is very specific**. The analysis shows that reviewed indicators (RCO74, measuring the population covered by projects in the framework of strategies for integrated territorial development, and RCR77, covering visitors of cultural and tourism sites supported) are very often used in combination with others not listed here and, therefore, it is not possible to associate homogenous programme investment actions.

Step 2: Identification of consistent patterns in target setting. The second step of the homogeneity assessment reviews methodological documents to identify consistent patterns in target setting. The analysis covers **timeliness** of output / result delivery and **target setting approaches**, particularly the sources and calculation methods used.

a) **Timeliness.** Output indicators are divided in three groups based on the timing of the expected delivery:
    - Slow: Less than 30% of the reviewed actions are (not?) expected to deliver any outputs by 2024 (e.g. waste management, Natura 2000 sites, railway transport, education and childcare facilities).
    - Medium: 30-50% of the reviewed actions are expected to deliver some outputs by 2024 (e.g. digital connectivity, energy efficiency in housing and public infrastructure, renewable energy capacity, flood protection and health infrastructure).
    - Rapid: At least 50% of the reviewed actions are expected to deliver some outputs by 2024 (e.g. public transport and cycling infrastructure, integrated territorial development projects, water for human consumption in particular for the impact of phased projects, business support, research and innovation).

The analysis of the SWD metadata and methodological documents indicates the following elements on result timeliness:

- Result indicators measuring the population benefiting from the investments are usually measurable at output completion (e.g. RCR35 on flood protection measures and RCR95 on green infrastructure). This is because these indicators essentially provide information on the territorial coverage of the interventions.
- **Job creation indicators can be measured in the short to medium term** (e.g. RCR01 for jobs created in supported entities and RCR102 for new researchers). However, measuring them during project implementation or within one year after project / output completion could refer to different types of changes / benefits: one more directly related to project activities and the other to their medium-term effects.
- Indicators on the use of a new / improved service, facility or infrastructure or implying a behavioural change / innovation require 6 to 12 months to measure the result in terms of a pre-post variation.

b) Target setting approaches. Output indicator target setting is generally based on past experience or ad hoc studies and may vary with:

- The types of investment actions under each specific objective. For instance, the target for RCO02 (enterprises supported with grants) varies across types of investment actions in RSOs 1.1 and 1.3.
- The type of service provided, such as healthcare (RCO69), the type of activities supporting new incubation capacity (RCO15), or the renewable energy source (RCO22).

Result indicator target setting is typically based on past experience, statistical sources, or ad hoc studies, and is defined considering the associated output indicator. As with output indicators, target setting may vary with the types of investment actions.

Step 3: Factors which might affect the achievement of milestones and targets. Factors that typically influence the capacity to meet targets across all POs are **often policy-related**, such as budgetary restrictions, regulatory changes, delays in programme implementation and completion, the capacity of applicants and beneficiaries to prepare proposals and implement projects, competition from other funding sources, and discrepancies between approved projects and pilot projects used to set the targets.

Relevant **socio-economic factors** include the inability to provide anticipated advances or payments to entities with pending justifications, price increases, and potential future crises or supply shortages. **Other factors** identified in methodological documents include the geopolitical crisis, exchange rate risks, long-term effects of the COVID-19 crisis, administrative challenges related to public procurement procedures, contractor selection, and obtaining building permits. Technological advancements that can lower prices and make it easier to achieve programme targets are also important considerations.

LESSONS LEARNED FROM THE ASSESSMENT OF OUTLIERS. Outlier programmes identified in Task 1a are not necessarily adopting incorrect assumptions but may behave differently from the average correlation between indicator targets and invested amounts. The review of methodological documents identifies three key factors that could explain this discrepancy:

- **Programme actions may involve different types of beneficiaries, target groups, focus areas, or delivery modes**. For example, supporting large or micro-enterprises, focusing on energy efficiency in industry or housing, using financial instruments or grants, can affect unit costs and programme delivery, explaining differences between programmes.
- **Different approaches to establishing unit costs**. Some programmes use different approaches or sources to establish unit costs, which could explain why they are outliers.
- **Lack of specification of investment actions** or the use of umbrella investment actions. Some methodological documents do not specify the type of operations supported under each specific objective, while others use broad programme actions covering a wide and flexible set of possible interventions. This can affect the relationship between indicator targets and invested amounts, contributing to the outlier phenomenon.

TASK 2A: ASSESSING THE ROLE OF ERDF/CF COMMON INDICATORS IN A SYSTEM OF "FINANCING NOT LINKED TO COSTS"

An extensive categorisation and mapping has enabled a comparison of ERDF/CF/JTF common indicators with RRF milestones and targets (Sub-task 2.a.1). In an effort to create a common language to make the comparison possible, the study separately focused on three indicator types:

- **Process indicators** describe programme implementation processes with information on the support provided (e.g. number of selected projects, funds allocated), number of enterprises supported.
- **Output indicators** measure what is delivered through the supported intervention (e.g. surface area of energy-renovated buildings, length of new railway lines).
- **Result indicators** measure the direct effects of the supported intervention's outputs (e.g. GHG emission reduction, users of supported infrastructure).

These three indicator types do not reflect RRF or ERDF/CF/JTF definitions – for instance, ERDF/CF/JTF do not have the category of process indicators. Yet, to enable the comparison, it is necessary to apply the same categories to both RRF milestones and targets and ERDF/CF/JTF common indicators.

Most ERDF/CF/JTF common output and result indicators relate to measurable deliverables and do not show a wide set of process indicators similar to those under the RRF. Both in ERDF/CF/JTF and the RRF, some procedural indicators are considered neither measures of deliverables nor effects of the supported interventions. Instead, they represent procedural steps or amounts of financial support and are called process indicators in this study. Under the RRF, process indicators are mostly milestones and can be group into three categories: "Initial steps of the project cycle", "Financial amounts" and "Legislation and strategic, organisational or administrative documents"[2]. The RRF-type process indicators could complement ERDF/CF/JTF common indicators, especially with regard to the category of "Legislation and strategic, organisational or administrative documents", as such indicators capture (and thus incentivise) pre-conditions, or

[2] The analysis is conducted on investment measures.

ancillary features, of a solid public investment system. Steps of the project cycle and financial amounts are already tracked in ERDF/CF/JTF's delivery system instead, and the question related to them is not as much about the potential usefulness of capturing (and incentivising) a certain action. Rather, the RRF's experience points to a potential usefulness of considering transforming such types of information into common indicators, possibly for their use to trigger payments.

Under ERDF/CF/JTF, the fact that common output and result indicators can be used under multiple SOs allows it to capture the same outputs and results in many different contexts. **In addition, this flexibility makes the aggregation of data possible**. The high variability of individual milestones and targets in the RRF leads to a more diverse set of output indicators than under ERDF/CF/JTF. Under result indicators, few items are found in absolute terms under the RRF (in contrast with a relative broad set of result indicators that ERDF/CF/JTF introduced). Ultimately, different elements of the two systems appear to be each instrument's strength: process indicators for the RRF, result indicators for ERDF/CF/JTF.

The analysis identified RRF milestones or targets that do not have a direct correspondence with a ERDF/CF/JTF common indicator. Most of these milestones and targets were classified as output indicators, which is largely due to the lower availability of result indicators under the RRF. For some policy areas supported by the RRF, there is also no correspondence between the RRF milestones or targets and the set of ERDF/CF/JTF common output and result indicators, as ERDF/CF/JTF do not support projects in these areas, which refer primarily to aspects of judicial and fiscal administration and rule of law.

RRF milestones and targets are diverse as they are tailored to the specific measures. This leads to some limitations. Milestones and targets are highly heterogeneous because closely linked to the underlying investments (and because the different RRPs were prepared individually under time pressure). Crucially, the design of the RRF that prioritised the tailoring of indicators aimed to align with the specific needs of Member States and with the project features. At the same time, this heterogeneity significantly hampers the possibility to aggregate values across measures and countries, which in turn is a relevant element to ensure transparency and accountability, but also policy evaluation and learning. Against this background, the ERDF/CF/JTF common indicator system stands out for the higher degree of uniformity it enables.

The assessment of the potential of selected common indicators for payments not linked to costs (carried out under Sub-task 2.a.2) **suggests that the current common indicator system positions ERDF/CF/JTF well for a possible shift to FNLC[3].** 20 out of 22 considered output indicators are rated as having a high potential for FNLC, based on the five criteria considered in the analysis (Linkage to clear intervention logic; Attribution; Time lag; Robustness;

[3] However, further analysis under Task 2b is needed to confirm this intermediate conclusion. The potential of ERDF/CF common output indicators for an FNLC system was investigated by assessing different dimensions of the indicators, drawing on established international practice. In particular the following dimensions were assessed: Linkage to clear intervention logic, Attribution, Time lag, Robustness, Homogeneity (see section. 2.2).

Homogeneity). Result indicators also show potential for FNLC, although relatively lower compared to output indicators. Their lower potential compared to output indicators is mostly due to the dimensions of attribution and time lag. Under the attribution dimension, in particular, 91% of the output indicators are rated as high, against just 5% of result indicators. The lower scores for result indicators serve as a reminder of the challenges ahead if FNLC is chosen as the path forward.

The analysis of the capacity of ERDF/CF/JTF common indicators to address weaknesses identified by the **ECA** (Sub-task 2.a.3) **finds that 90% of the indicators considered can contribute to addressing ECA's remarks**. This provides an insight into the ability of the ERDF/CF/JTF system of indicators to tackle the weaknesses identified by the ECA while also meeting the main requirements of the EU Financial Regulation. More in detail:

- **Enhancing budgetary principles**: The use of ERDF/CF common indicators strengthens the embedding of principles such as transparency and sound financial management, as outlined in Article 6 of the Financial Regulation. Accountability, which is essential for implementing the EU budget (e.g., Article 60), is also reinforced through these indicators.
- **Alignment with performance standards**: These indicators align with the SMART criteria (Specific, Measurable, Achievable, Relevant, Time-bound), facilitating the establishment of clear objectives and effective reporting, as specifically required by the Financial Regulation (Article 33).
- **Essential for evaluation**: Common indicators are crucial for evaluation, providing a useful framework that can contribute to an assessment of the effectiveness and impact of funded actions, as highlighted in Article 34.

TASK 2B: ASSESSMENT OF THE IMPLICATIONS OF FINANCING NOT LINKED TO COST AND THE ROLE OF MILESTONES.

The feasibility of using common indicators and IAMs within an FNLC framework relies on a balanced analysis of strengths and weaknesses. The study demonstrates that common indicators offer reliability, methodological homogeneity, and broad coverage, ensuring ease of implementation and consistency in data collection. Their **extensive use across programming periods, coupled with standardized methodologies, enhances comparability and aggregation across Member States.**

However, **significant challenges** arise from the heterogeneity in their application, complexity of result indicators, and difficulties in maintaining alignment between upper and lower levels in FNLC reimbursement flows. Heterogeneity in indicator use stems from the diversity of intervention types and implementation methods. For example, RCO02 (Enterprises Supported by Grants) can be linked to varied interventions like innovation support or digital transformation, resulting in cost variability. Additionally, result indicators pose complexity in measurement and verification, as they often require post-intervention tracking of intangible outcomes such as behavioral changes or medium-term effects. This necessitates robust monitoring systems and imposes a substantial administrative burden on Managing Authorities and Beneficiaries. Furthermore, challenges emerge when using common indicators across both upper and lower FNLC levels. Process-based indicators,

coverage indicators, and those lacking intermediate deliverables are particularly problematic, requiring adjustments to maintain consistency in financial flows.

The **stakeholder analysis** shows that risk and workload are distributed unevenly across different types of indicators and stakeholders. Process indicators carry the lowest risk and workload for Managing Authorities and Beneficiaries but pose the highest risk to the European Commission and European Parliament due to their limited impact on policy outcomes. In contrast, long-term result indicators impose the highest risk and workload on Managing Authorities and Beneficiaries, while minimizing risk for EU-level actors. This risk distribution highlights the strategic importance of using a combination of process, output, and result indicators to balance administrative efficiency with policy effectiveness. An interesting insight from the analysis is that, despite the variability in risk distribution, the overall risk is almost equally balanced across stakeholders. However, process indicators, while minimizing risk for operational actors, create the highest risk for strategic policymakers, emphasizing the need for result-oriented incentives to achieve public policy goals effectively. This underlines the importance of designing FNLC schemes that integrate a mix of indicators, ensuring alignment between operational efficiency and strategic impact.

To maximize the strengths and address the weaknesses identified, **specific conditions** are recommended. **Combining common indicators** enhances coherence and reliability, effectively representing the lifecycle of interventions and balancing stakeholder risks. **Adjustments to the indicator design** are necessary to better align aggregation rules, data collection timing, and payment mechanisms. **Enhanced verification and adjustment mechanisms** are required to maintain accountability, address external factors, and clarify responsibilities. Additionally, the FNLC design should be approached as a **collaborative and adaptive process, fostering dialogue between the European Commission and Member States** to align objectives, address challenges, and ensure flexibility.

1 Detailed assessment of selected common output and result indicators (Task 1b)

This section presents the analysis conducted under Task 1b, which focuses on the detailed assessment of selected common output and result indicators. Task 1b involves a desk analysis of methodological documents from a sample of programmes to evaluate a specific set of indicators in two key sub-tasks. Sub-Task 1b.1 identifies the indicators and programmes for review, while Sub-Task 1b.2 reviews the programme methodologies for the selected indicators, assessing coherence and homogeneity and analysing outliers. The analysis covers all the POs. The section is structured as follows.

- The first part outlines the methodology.
- The second part explains the process of indicator identification and selection, which follows from Task 1a and provides the basis for Task 2.a.
- The third, fourth, fifth, sixth and seven parts provide a detailed analysis per SO, and finally, per PO.
- The eight part draws general conclusions on task 1b activities.

Detailed analyses for each indicator are presented in Annex 1.

1.1 METHODOLOGY

In this section of the report, the methodology is outlined as a continuation of Task 1a. Here, we delve into how the programme coverage is considered and which criteria have been adopted for the assessment.

1.1.1 Background: from task 1a to task 1b

Task 1a analyses have supported the refining of the primary selection of indicators for the in-depth analysis of Task 1b according to the following criteria: frequency. relevance, consistency (see section 1). The primary purpose of this work is ensuring that the selected indicators exhibit both sufficient frequency and relevance, thereby maintaining a high level of representativeness of the SOs. In addition to relevance and frequency, information about the correlation and outliers in the pairings between allocation and target values derived from the consistency analysis has been considered.
Eventually, the framework used to refine the selection of indicators for analysis in Task 1b consists of three dimensions, each ranked on a high/medium/low scale. The definitions for these scales are outlined in the following table. In principle, indicators ranking “high” for the four dimensions are more suitable to be analysed under task 1b. However, it is important to note that alongside these

dimensions, additional qualitative considerations were also taken into account to determine the final selection of indicators.

Table 3 Framework used to support the selection of indicators for Task 1b

Dimension	High	Medium	Low
Frequency	Indicator is among the top 30% of all indicators by frequency ranking, where the frequency ranking is the average of the following rankings: • Absolute ranking • Ranking by SO • Ranking by MS Note that the rankings by SO and by MS are the averages of the ranking in each of the SOs and MS.	Indicator is between the 30th and the 70th percentile of all indicators sorted by frequency ranking.	Indicator is among the bottom 30% of all indicators by frequency ranking, where the frequency ranking.
Relevance	Indicator is among the top 30% of all indicators by relevance ranking. The relevance ranking is the average of the following rankings: • Ranking based on SOs allocation • Ranking based on IFs allocation, overall • Ranking based on IFs allocation, by SOs • Ranking based on IFs allocation, by MS Note that in the ranking based on SOs allocation financial amounts are allocated to indicators proportionally to their frequency in the SO. In the rankings based on IFs allocation, by SOs and by MS, the same logic applied for frequency by SOs and by MS is used.	Indicator is between the 30th and the 70th percentile of all indicators sorted by relevance ranking.	Indicator is among the bottom 30% of all indicators sorted by relevance ranking.
Correlation	Indicator is among the top 30% of all indicators by correlation ranking. The correlation ranking is the average of the following rankings: • Ranking according to overall correlation • Ranking according to correlation computed only among observations of the indicator related to the SOs	Indicator is between the 30th and the 70th percentile of all indicators sorted by correlation ranking.	Indicator is among the bottom 30% of all indicators sorted by correlation ranking.

	where the indicator is used the most. The correlation is always computed between target value of the indicator (less baseline, if present) and total amount. Note that the rankings are all based on the absolute value of the correlation, so as to correctly rank indicators with negative correlations.		

Source: Authors

Annex 1 presents the matrix prepared based on the outcome of analyses conducted under Task 1a to support the selection of indicators.

Task 1b follows-up task 1a with the aim to review article 17 CPR methodological documents of a sample of programmes on the selected indicators. These methodological documents define how the programme performance framework works. In line with article 16 CPR, the performance framework encompasses all the programme output and result indicators, foresees milestones in 2024 for output indicators and targets for both output and result indicators in 2029. Following article 17 CPR, each programme has defined the methodology to establish the performance framework based on the SWD (2021) 198[4]. The methodological document on the performance framework is key to explain the use and selection of common and programme-specific indicators, to describe the methodology for setting milestones and targets as well as to illustrate the intervention logic showing links between *inputs* (intervention fields), *outputs* (output indicators) and *results* (result indicators). Task 1b assessment focuses exclusively on common output and result indicators, ignoring programme-specific ones. Task 1b:

- **Assesses the coherence** of the programme methodological documents with SWD definitions and assumptions.
- **Focuses on homogeneity**, verifying if the investment actions contributing to each indicator are homogeneous and identifying any consistent patterns in target setting assumptions.
- **Provides explanations on outliers**, providing, in relation to investment allocations, some of the reasons behind variations of the indicator targets as also highlighted in task 1a.

1.1.2 Programme coverage

Initially, a sample of 44 methodological documents and programmes was defined to start the analysis of a selected list of output and result indicators under a defined set of specific objectives. Considering available information from methodological documents, the analysis has focused on 35 programmes as described in the Annex 1.

The task 1b:

[4] SWD (2021)198 on Performance, monitoring and evaluation of the European Regional Development Fund, the Cohesion Fund and the Just Transition Fund in 2021-2027: https://ec.europa.eu/regional_policy/information-sources/publications/evaluations-guidance-documents/2021/performance-monitoring-and-evaluation-of-the-european-regional-development-fund-the-cohesion-fund-and-the-just-transition-fund-in-2021-2027_en

- **Performs an analysis of each common indicator under a selected specific objective** for which the indicator is more relevant, frequent and plays a key role in the intervention logic. This does not mean that the indicator cannot be used or has not been taken up in other specific objectives. However, the proposed approach gives more practical insights into indicator use in a specific intervention logic framework.
- **Reviews at least** 5 (but in many cases more) **methodological documents** for each common indicator.

It is worth noting that while **methodological documents** are expected to be key in providing information on the programme intervention logic and indicators system they **are not standardised**. Their heterogeneity represents a major challenge to task 1b. Despite Annex 2 of Part B of SWD provides an example of such a methodology for the performance framework document, there was no compulsory template.

- **Structure** - A few reviewed methodological documents include several sub-documents, such as those related to these programmes: Romanian Health programme, Free State of Saxony German programme, Luxembourg ERDF programme, Brussels programme, the Polish regional European funds programme for Lodz, Malta programme, Lithuania multifund programme.
- **Type** - Most of the reviewed methodological documents adopt a textual approach, others provide an xls type document, with calculations as in the case of Lithuania, Romanian Health programme, Croatia and Portuguese Centro region. However, while the Croatian programme is much longer, the others are shorter but combine xls information with an additional textual description in a separate document.
- **Size** – The methodological documents providing a single document are usually quite long. Some are shorter as the Northern Western regional programme in Ireland (less than 100 pages), others much longer as the Spanish programmes of Canarias, Andalucia, Pluri-regional programme and the Slovenian multi fund cohesion policy programme (over 200 pages).
- **Content** – Some methodological documents detail information on indicator unit costs per category of region or even at the level of each implementation / intermediate body under each specific objective. In other cases, in particular for the result indicator, information on target setting is not detailed at action level and on unit costs. The use of Annex I CPR intervention fields is not the same across the documents. Some methodologies associate intervention fields with each investment action, others do not.

1.1.3 Criteria of the methodological document review

Task 1b delivers a detailed assessment of a selected set of common output and result indicators according to the following criteria: coherence, homogeneity and outliers' assessment.

Coherence - The coherence assessment contributes to the reliability assessment of task 2b. It reviews methodological documents defining programme performance frameworks according to article 17 CPR. More precisely, the coherence assessment verifies whether the methodological documents are in line with the 'definition and concepts' and 'References' of the SWD metadata and examines whether specific objectives under each programme adopt different definitions and standards for the indicator under assessment.

Homogeneity - The homogeneity assessment contributes to the reliability assessment of task 2b and has three steps.

- *It examines granularity*, showing whether similar/different investment actions contribute to each indicator across programmes under each specific objective. The analysis proposes types of investment actions at specific objective level contributing to the indicator valorisation. This typology of investment actions builds on the Annex I CPR intervention fields, the correspondence table from the Cohesion data platform[5], textual analysis of the programme specific actions as reported in the CPR methodological documents examined. This categorisation is proposed also to ensure consistency across the programmes under analysis and meaningful types of investment actions in line with the RSO intervention logic. Annex 1 contains further details. It is important to clarify that while Task 2a also utilizes type of operations, there might be differences from Task 1b. These differences are explained under each RSO and primarily relate to two main reasons. First, the scope of the analysis differs: Task 1b aims to provide a deeper understanding and investigation of target-setting patterns and the homogeneity in the use of common indicators; Task 2a compares ERDF/CF/JTF common indicators with RRF investment-relevant targets and milestones to assess their potential for payments not linked to costs. Secondly, Task 1b is based on a set of programme methodological documents, while Task 2a relies on the intervention fields outlined in Annex I of the CPR and used by the programmes.
- *It identifies consistent patterns in target setting assumptions* across programmes. Analysis of the assumptions behind target setting covers, whenever possible, indicative unit costs estimated by the study team based on methodological documents, the logic underpinning milestones and targets considering the milestone/target ratio (only for the output indicators), comparison with output indicator targets (for some result indicators), sources and methods for calculating the targets, e.g. previous programming period, statistical data, studies. In this regard, it is worth noting that the approach to indicators has changed from the previous period: while the list of common output indicators has been fine-tuned and extended, the common result indicators have been introduced to cover outcomes from the supported interventions. Therefore, the review of methodological documents also takes into consideration that output indicator target setting assumptions can rely more easily on the past programming period, while this might be unapplicable to common result indicators.
- The last step reviews *factors which might affect the progress and capacity* of the programme to achieve the targets and how these have been taken into account while setting the targets.

Assessment of target setting and outliers – The analysis of the methodological documents helps identify reasons why, in relation to investment allocations, targets for indicator use may vary across programmes and identify potential reasons for outlier values identified in Task 1a. This part of the assessment of outliers will contribute to task 2b whenever relevant.

[5] https://cohesiondata.ec.europa.eu/2021-2027-Categorisation/Correspondence-21-27-to-14-20-intervention-fields/4s7y-iy43/about_data (last visit 12 September 2024)

1.2 LIST OF SELECTED INDICATORS

This section details the selection process of indicators for in-depth analysis in Task 1b. The initial selection was made in the technical offer and confirmed in the study Inception Report. Task 1a activities help fine tune this list. Subsequently, in Sub-task 1b.1, we fine-tune this list by considering the programme coverage and the completeness of the intervention logic. This two-step approach ensures a thorough and relevant set of indicators for further evaluation.

Coverage - This list covers all the POS and includes 43 indicators: 13 for PO 1, 19 for PO 2, 3 for PO 3, 6 for PO 4, 2 for PO 5. The proposed list covers the most financially relevant RSOs under each PO, ensuring a relatively large sample of indicators, providing information on their use and target setting approach and potential challenges in target achievement and providing useful insights into the logic connection between investment actions, outputs and results. In case of PO 5, where there is no common result indicator, the study team proposes RCR77 which is widely used in programme intervention logic. The proposed list of indicators does not cover skills for smart specialisation under RSO 1.4 and digital connectivity for enterprises under RSO 1.5. However, several programmes support enterprise staff upskilling and capacity building in other RSOs and RSO 1.5 has a limited focus on enterprises as shown in task 1b and the common indicators proposed show some methodological inconsistencies.

For PO 2, all the specific objectives are covered apart from RSO 2.3 on smart energy system essentially, in case of PO 4, RSO 4.1 (labour market infrastructure), 4.3, (integration of marginalised communities), 4.4 (integration of third country nationals), 4.6 (culture and sustainable tourism are not considered. The main reasons behind this choice are the feasibility of the assessment in the given time period and the absence of any reference to these themes in the study specifications.

The following table shows the selected output and result indicators and the POs.

Table 4 Indicators selected for in-depth assessment in task 1b

PO	Common output indicators	Common result indicators
1	RCO02 Enterprises supported with grants RCO05 New enterprises supported RCO06 Researchers working in supported research facilities RCO14 Public enterprises supported to digitise their products and services RCO41 additional households with broadband access of very high capacity RCO15 Firms: Capacity of incubation created	RCR01 Jobs created in supported entities RCR03 RTDI: SMEs introducing product or process innovation RCR102 RTDI: New researchers RCR11 Digital: Users of new and upgraded public digital services RCR17 Firms: New enterprises surviving in the market RCR18 Firms: SMEs using incubator services RCR53 Digital: Dwellings with broadband to very high-capacity network
2	RCO18 Energy: Dwellings with improved energy performance RCO19 Energy: Public buildings with improved energy performance RCO22 Energy: Renewable energy capacity RCO25 Climate: Flood protection newly built or consolidated	RCR26 Energy: Annual primary energy consumption RCR29 Climate: Estimated GHG emissions RCR32 Energy: Renewable energy capacity RCR41 Water: Population with improved water supply

PO	Common output indicators	Common result indicators
	RCO30 Water: Length of pipes for public water supply RCO34 Circular: Additional capacity for waste recycling RCO37 Env: Surface of Natura 2000 sites RCO58 Urban Trans: Dedicated cycling infrastructure supported RCO36 Env: Green infrastructure supported for other purposes than adaptation to climate change RCO57 Urban Trans: rolling stock for public transport	RCR63 Urban Trans: Annual users of tram and metro lines RCR64 Urban Trans: Annual users of cycling infrastructure RCR47 Waste recycled RCR95 Env: Pop. with access to green infrastructure RCR35 Population benefiting from flood protection
3	RCO47 Rail: Length of new or upgraded rail - TEN-T RCO49 Rail: Length of rail reconstructed or modernised - TEN-T	RCR58 Rail Annual users railways
4	RCO67 Education: Classroom capacity of education facilities RCO69 Health: Capacity of health care facilities RCO66 Education: Classroom capacity of childcare facilities	RCR71 Education: Annual users of education facilities RCR73 Health: Annual users of health care facilities RCR70 Education: Annual users of childcare facilities
5	RCO74 Population covered in integrated territorial development	RCR77 Visitors of cultural and tourism sites

Source: Consortium own elaboration

Intervention logic completeness - The proposed list ensures at least one output and result indicator, and in some cases more than one, for all the RSOs covered under the study. This ensures granularity to the assessment from investment actions to outputs and results. Annex 1 provides further details on the distribution of indicators per PO and draws lessons learned from methodological document review on the intervention logic.

1.3 POLICY OBJECTIVE 1

This section presents the analysis conducted for the specific objectives under Policy Objective 1 (PO1), focusing on the following Regional Strategic Objectives (RSOs): RSO 1.1 'Enhancing research and innovation', RSO 1.2 'Reaping the benefits of digitisation', RSO 1.3 'Growth and competitiveness of SMEs', and RSO 1.5 'Digital connectivity'. As explained in the inception report and confirmed above, the analysis focuses on the most relevant specific objectives and does not cover RSO 1.4 'Skills for smart specialization, industrial transition, and entrepreneurship'.

Each of the specific objectives is assessed according to the three criteria already outlined in the methodology. First, coherence is evaluated by examining how well the programme methodological documents align with the definitions and assumptions provided in the SWD. Second, homogeneity is analysed by assessing the granularity of the investment actions, identifying patterns in target setting, and determining the factors that may influence the achievement of those targets. Finally, the analysis addresses outliers.

1.3.1 RSO 1.1 – Enhancing research and innovation

Indicators under assessment - The RSO 1.1 indicator assessment covers two common output and two common result indicators.

Common output indicators.

- **RCO02 is a common output indicator measuring enterprises supported with grants**. This indicator was already available in the 2014-2020 list of common indicators. The assessment covers 18 programmes and related documents covering: Italy, Spain, Slovenia, Lithuania, Malta, Austria, Denmark, Germany, Cyprus, Portugal, Croatia, Germany.
- **RCO06 covers the research facilities supported by measuring the number of researchers** (in full time equivalents - FTEs) working there. This indicator has been slightly reformulated from the 2014-2020 list. Task 1b reviews 14 programmes and related methodological documents covering: Belgium, Croatia, Denmark, Germany, Ireland, Italy, Lithuania, Poland, Portugal and Slovenia.
- **SWD definitions indicate that RCO02 and RCO06 cover supported entities**, namely enterprises and research facilities. Therefore, they do not exactly measure a specific deliverable of the intervention as an output indicator should (CPR article 2). However, defining common deliverables for research and innovation interventions is very difficult. Moreover, both output indicators help inform about the size of the supported entities. In particular RCO02 contributes to RCO01 (enterprises supported) and RCO01 will monitor sub-totals for the enterprise size during programme implementation. RCO06 already provides a proxy of the research facility size by counting the FTE researchers employed there.

Common result indicators.

- **RCR03 is a result indicator which measures the enterprises supported and introducing process or product innovation**. It is based on a reclassification of 2014-2020 common indicators CO28 and CO29, which were measuring respectively enterprises supported to introduce new to market products and new to the firm products. However, while these two 2014-2020 indicators referred to the enterprises supported to introduce innovation, RCR03 refers to the enterprises already successful in introducing innovations after the support. The assessment builds on a review of 16 programmes and related methodological documents covering: Belgium, Germany, Spain, Lithuania, Luxembourg, Poland, Portugal, Slovenia, Austria, Romania.
- **RCR102 covers the additional research jobs (in FTEs) created in supported entities**, such as research organisations, enterprises or others. It is based on the reclassified 2014-2020 common indicator CO24. Task 1b covers 12 programmes and methodological documents regarding Cyprus, Germany, Spain, Croatia, Italy, Lithuania, Malta, Portugal, Slovenia, Romania.

Coherence with SWD

- **No methodological document has an indicator definition which is inconsistent with the SWD**. However, most reviewed methodological documents refer to the SWD and / or to common indicators without making explicit reference to SWD definitions, concepts and references. Since the programmes adopt common indicators, they should follow SWD standards and metadata.
- **No remarkable differences in the definition across several specific objectives**. The analysis shows clearly that in case of RCO02 (enterprises supported with grants), RCR03 (SMEs introducing product or process innovation) and RCO06 (researchers working in supported research facilities), the methodological document does not show any differences in the definition across several specific objectives, which implies an implicit coherence within programme documents. RCR102 (new researchers) is mainly and almost exclusively used under RSO 1.1.

Homogeneity (granularity assessment) – The first step of the homogeneity assessment examines granularity with a focus on investment actions reported in methodological documents to set indicator targets. The methodological documents reviewed differ show that **at least a half of them associate more than one single investment action to each indicator, in particular for RCO02**. This means that under a given programme for RSO 1.1, there is more than one action contributing to the valorisation of each of the four indicators under assessment. This shows the complexity of the intervention logic under the RSO for each indicator. Programmes usually have either similar actions replicated for different categories of region, or different types of actions within the same category of regions, or both. Therefore, the study team has defined types of RSO 1.1 investment actions contributing to indicator valorisation in order to ensure consistency across the programmes under analysis and meaningful clusters of investment actions in line with the RSO intervention logic. These types build on Annex I CPR intervention fields, the correspondence

table from the Cohesion data platform[6], textual analysis of programme specific actions as reported in the article 17 CPR methodological documents examined. These types of investment actions are:

- *R&I in enterprises* - Research and innovation investments in micro, small, medium-sized and large enterprises.
- *R&I cooperation and technological transfer* - Research and innovation activities involving business and the research sector, cooperation and technological transfer.
- *Skills, advanced support and incubation* - Capacity building activities for enterprise staff, advanced support and SME incubation needs.
- *R&I research centres* - Investment in research and innovation in research centres[7].

Analysis of the reviewed investment actions shows they contribute differently to the valorisation of the indicators under assessment as presented in the following table.

Table 5 Types of investment actions and contribution to the RSO 1.1 indicators under assessment

	RCO02	**RCR03**	**RCO06**	**RCR102**
Skills, advanced support and incubation	Low	Low	/	/
R&I in enterprises	Medium	Low	/	Medium
R&I cooperation and technological transfer	High	High	Medium	Medium
R&I research centres	/	/	High	Medium

'/' : no contribution to the indicator
Low: less than 20% of the investment actions contribute to the indicator
Medium: between 20% and 40% of the investment actions contribute to the indicator
High: more than 40% of the investment actions contribute to the indicator

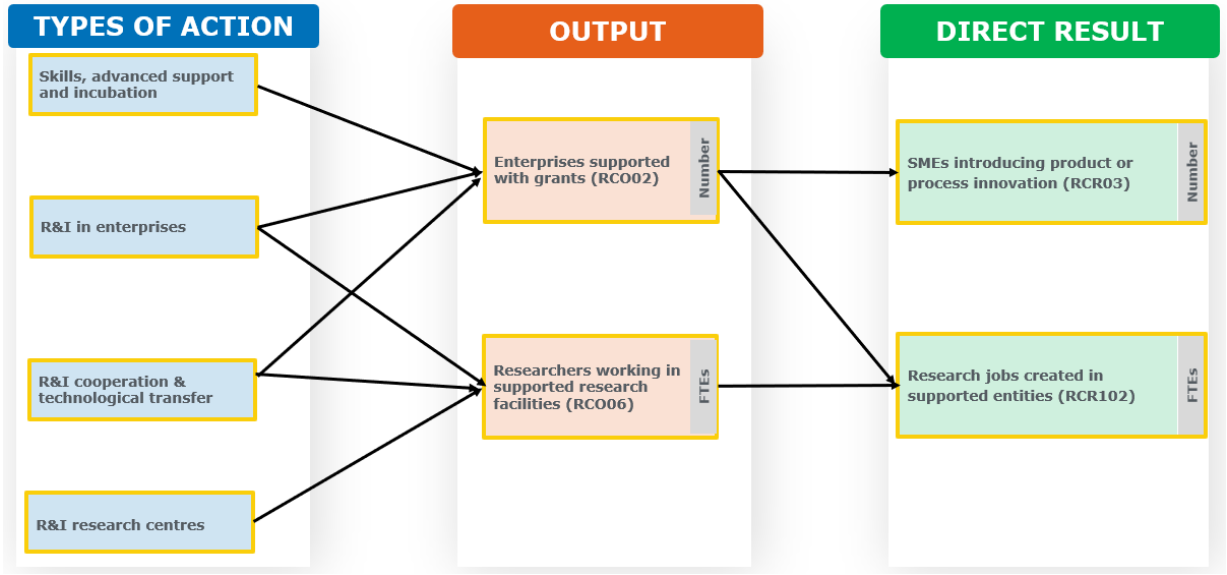
Source: Consortium own elaborations

Methodological document review provides qualitative and descriptive information to explore links between types of actions and outputs and their contribution to the results. These links cannot be necessarily generalised to all investment actions under RSO 1.1 but represent a tentative mapping of the logical chain between type of operations, outputs and results.

[6] https://cohesiondata.ec.europa.eu/2021-2027-Categorisation/Correspondence-21-27-to-14-20-intervention-fields/4s7y-iy43/about_data (last visit 12 September 2024)

[7] The types of investment actions 'R&I in enterprises' and 'R&I research centres' are also used in Task 2a. 'Skills, advanced support and incubation' specifically regards intangible support for enterprise activities related to research and innovation. This category was introduced to provide greater granularity in the analysis with respect to 'R&I in enterprises'. Likewise, 'R&I cooperation and technological transfer' has been introduced as a type of operation that bridges 'R&I in Enterprises' and 'R&I Research Centres'. Information from analysed methodological documents is not sufficient to ensure a granular analysis of the type of operation 'R&I in Low-carbon economy and circular economy', which is used under Task 2a. For that reason, Task 1b does not focus on it.

Figure 1 Type of actions, output indicators and result indicators – RSO 1.1



Source: Consortium own elaborations

Homogeneity (target setting patterns) – The second step of homogeneity assessment identifies consistent patterns in target setting assumptions across programmes.

For RCO02, the analysis shows that *R&I cooperation and technology transfer* investment actions are usually relatively more costly and take more time to deliver their outputs. This seems reasonable since they usually involve several entities, take more time to finalise and require different competences. It is worth noting that the analysis covers enterprises supported in general but does not allow for a more granular approach at enterprise level. Information on the size of supported companies will be available in the monitoring phase, even if it has been usually considered while setting targets.

For RCO06, the analysis highlights that *R&I cooperation and technology transfer* investment actions are set as more costly than *R&I in research centres*. This seems reasonable since they usually involve several entities to finalise and require different competences. With regards the most relevant types of investment action - *R&I cooperation and technology transfer* and *R&I in research centres* have a similar milestone / target ratio. Often this ratio is higher than zero. The main reason behind this finding is that this output indicator can be measured when the project starts. This is remarkable difference from RCO02 on enterprises supported with grant. This indicator is measured at the completion of output financed by the grant support.

Different approaches are used to establish final target of RCR03. However, a key factor which affects target setting decision is related to the definition of the common indicator, which measures SMEs introducing product and process innovations. However, while a product innovation is the market introduction of a new or significantly improved good or service, a process innovation is the implementation of a new or significantly improved production process, distribution method, or supporting activity. This can affect target settings and unit costs. The methodological document review also compares the targets of RCR03 (SMEs introducing product or process innovations) and of RCO02 (SMEs supported with grants), when investment actions simultaneously use both indicators. In general, the final RCR03 target is lower than for RCO02, since the programme assume

that **not all the supported enterprises with grants will be able to deliver process or product innovations** at least by the time of monitoring. In this regard, SWD fiche explains that the result has to be delivered '*at most one year after the completion of output in the supported project*'. Investment actions *R&I enterprises* usually have a higher RCR03 final target / RCO02 final target ratio, showing a relatively higher effectiveness in delivering innovations after the grant support.
For RCR102, for most of the investment actions, methodological documents do not provide clear information on unit costs. Despite information limitations, unit costs associated with RCR102 **vary depending on the category of regions and types of investment actions**. Actions for *R&I in enterprises* tend to have on average higher indicative unit costs. A complementary analysis is conducted to compare the target of RCR102 and of the output indicator RCO06 when simultaneously used. When considering the RCR102 final target / RCO06 final target ratio, values are closer to 0 for *R&I research centres* actions, while are much higher in *R&I cooperation and technological transfer* action type. This result can be explained by two factors. Average costs are lower in R&*I cooperation and technological transfer* than in *R&I research centres* investment actions. A second key factor comes from the definition of RCO06 and RCR102. The output indicator covers exclusively research organisations, the result indicator any supported entities increasing research jobs upon completion of a project. Therefore, for *R&I cooperation and technological transfer* action some programmes use RCR102 but do not include only RCO06 but also other output indicators such as RCO02.
Homogeneity (factors which might affect the capacity to reach targets) - The analysis of homogeneity ends with the review of factors which might affect the progress and capacity of the programme to achieve the targets. The methodological document analysis shows that programmes are fully immersed in their policy context. **Factors which might affect the capacity to reach targets are often policy-related**:

- Budgetary restrictions that force funds to be allocated to other needs.
- Changes in the regulations which are not under the managing authority's responsibility.
- Changes in managing authority powers that modify planned activities, or other circumstances prevent activities planned for each action.
- Later than expected programme implementation and conclusion.
- Complications can arise in specific administrative procedures, such as the execution of an architectural competition, the initiation of audit procedures, or in public procurement processes.
- The participation of research organizations in projects must be coordinated through agreements between the Ministry responsible for environmental matters and the research organizations. Failure to formalize these agreements could jeopardize the involvement of these organizations.
- Differences between the approved projects and the pilot projects used to set the target. In this regard, there could be substantial differences in terms of the size and the type of supported entity. As shown in the previous analysis, indicative unit costs may vary depending on the type of operation.

Other factors can also contribute to slowing down programme implementation and target achievement. These issues **are economic in nature** and include the impossibility of providing

anticipated advances or payments to entities with pending justifications. Moreover, a significant increase in prices or other market conditions might make it impossible to carry out specific investments. Moreover, future crises can reduce the capacity or intention of companies to undertake R&D or innovation and changes in the financial market.

Assessment of target setting and outliers – The analysis of methodological documents helps explore why some programmes are outliers according to the task 1a analysis.
For RCO02 (enterprises supported by grants), the analysis of methodological documents highlights that outlier programmes identified in task 1a focus on similar action types with very different unit costs (Pluriregional Spanish programme) also on very broad thematic focus, in some cases even including sub-actions (Croatian Competitiveness and cohesion programme).
For RCR03 (SMEs introducing product or process innovation), in addition to the findings from RCO02, the analysis of Martinique programme shows that the result indicator is the unique of the specific objective, which is expected to support enterprises and thus to valorise RCO02 (enterprises supported by grants) but also other actions and output indicators. Altogether these different actions contribute to several output indicators but to a single result indicator (RCR03). Moreover, according to the methodological document, this common result indicator counts enterprises as well as public operators which are acting in a competitive context, transport operators and training companies. Therefore, the set of entities qualified as enterprises introducing innovation is also very wide. This can contribute to explaining why this programme can be seen as an outlier in target setting once considered the financial allocation.
For RCO06 (researchers working in supported research facilities), the methodological document review identifies several types of actions with different unit costs contributing to RCO06 (Plurirregional Spanish programme and the Romanian health programme). The variety of types of actions contributing to RCO06 and the result different unit costs might contribute to explaining why this programme behaves as an outlier.
For RCR102 (research jobs created in supported entities), the methodological document of the Romanian health programme confirms the differences with regards the expectations in terms of research job creation from the wide set of projects (e.g. competitive projects are not expected to create job opportunities, while projects on vaccination and cancer treatment are).

1.3.2 RSO 1.2 – Reaping the benefits of digitisation

Indicators under assessment - The RSO 1.2 indicator assessment covers two common output and one common result indicator.

Common output indicators.

- **RCO02 is a common output indicator measuring enterprises supported with grants**. This indicator was already available in the 2014-2020 list. This indicator is also assessed under RSO 1.1 and 1.3. More information on the SWD definition was presented for the RSO 1.1. The assessment covers 13 programmes and related documents from Belgium, Cyprus, Germany, Spain, Croatia, Italy, Lithuania, Malta, Portugal, Slovenia.
- **RCO14 is a common output indicator measuring public institutions supported to develop digital services, products and processes**. The analysis reviews 19 programmes and related documents covering: Belgium, Croatia, Cyprus, Denmark, France, Germany, Italy, Lithuania, Luxembourg, Spain, Poland and Portugal. This indicator was not

included in the 2014-2020 list of common indicators. The SWD does not use any references and provides a broad definition of public institutions, including local public authorities, sub-national authorities, or other types of public authorities and excluding municipal enterprises and public universities or research institutes. The indicator does not collect any information on the size of the supported public institution; therefore, a small municipality counts one as a regional institution.

Common result indicator.

- **RCR11** is a common result indicator measuring the annual number of users of the digital public services, products and processes newly developed or significantly upgraded. The SWD does not use any references and does not require specific information on the type of users. These might be other administration, public institutions and public owned bodies or citizens, companies. This indicator was not included in the 2014-2020 list of common indicators. The assessment covers 18 programmes and related documents from Belgium, Cyprus, Croatia, Denmark, Germany, Lithuania, Poland, Portugal, Slovenia, Spain.

Coherence with SWD

- **No methodological document has an indicator definition which is inconsistent with the SWD**. Most reviewed methodological documents refer to the SWD and / or to common indicators without making explicit reference to SWD definitions, concepts and references. Since the programmes adopt common indicators, they should follow SWD standards and metadata.
- No differences in the definition across several specific objectives for all the indicators.

Homogeneity (granularity assessment) – The first step of the homogeneity assessment examines granularity with a focus on investment actions reported in methodological documents to set indicator targets. The methodological documents reviewed differ. Unlike RSO 1.1, more than a half **of them associate one single investment action to the indicator RCO02**. This means that programme usually adopt a single action type when referring to digitising firms. For RCO14 (public institutions supported to develop digital services, products and processes) and RCR11 (users of new and upgraded public digital services, products and processes) the situation is different because more than a half of methodological documents reviewed link these two indicators to more than one action. This reflects different sectors of public interventions (e.g. health, governance). Considering this methodological document heterogeneity, the study team has defined types of RSO 1.2 investment actions contributing to indicator valorisation in order to ensure consistency across the programmes under analysis and meaningful clusters of investment actions in line with the RSO intervention logic. These types build on Annex I CPR intervention fields, the correspondence table from the Cohesion data platform, textual analysis of programme specific actions as reported in the article 17 CPR methodological documents examined. These types of investment actions are:

- *Digitising firms* - Investments in micro, small, medium-sized and large enterprises including e-commerce, e-business, digital innovation hubs, living labs, ICT start-ups.
- *E-government* – Government ICT solutions, e-services applications.
- *E-inclusion* – IT services and applications for inclusion.

- *E-health* - Investment in e-health services, solutions and applications[8].
- *Digital connectivity* – It is usually supported under RSO 1.5, but some programmes also invest in improving the digital connectivity under RSO 1.2 to open up new opportunities for public services and thus ultimately for citizens and companies.

Analysis of the reviewed investment actions shows they contribute differently to the valorisation of the indicators under assessment as presented in the following table.

[8] The types of investment actions 'e-inclusion' and 'e-health' are considered separately in Task 1b to ensure greater granularity, whereas they are merged into a single one under Task 2a. 'Digital connectivity' has been used to categorise a few programme actions that support the digital transition and telecommunication infrastructure. This type of operation has a similar formulation to the one included in RSO 1.5. This type of operation is not used under Task 2a for RSO 1.2

Table 6 Types of investment actions and contribution to the RSO 1.2 indicators under assessment

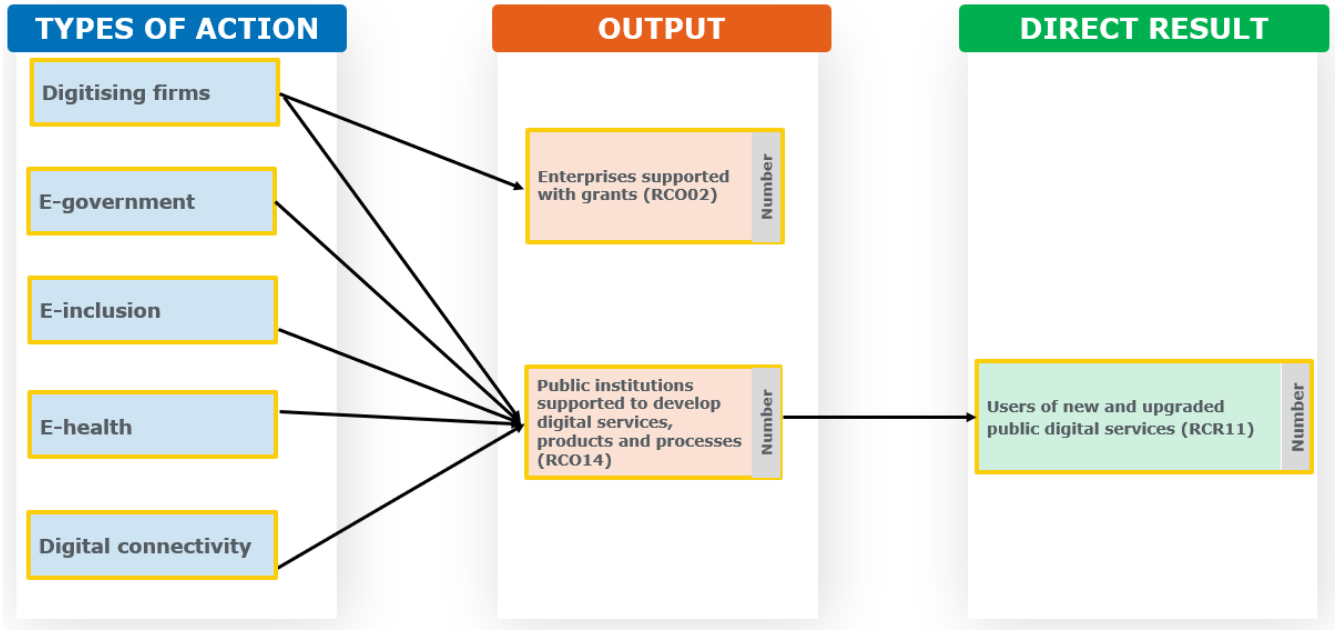
	RCO02	RCO14	RCR11
Digitising firms	High	Low	/
E-government	/	High	High
E-inclusion	/	Medium	Low
E-health	/	Low	Low
Digital connectivity	/	Low	Low

'/' : no contribution to the indicator
Low: less than 20% of the investment actions contribute to the indicator
Medium: between 30% and 40% of the investment actions contribute to the indicator
High: more than 40% of the investment actions contribute to the indicator

Source: Consortium own elaborations

Methodological document review provides qualitative and descriptive information to explore links between types of actions and outputs and their contribution to the results. These links cannot be necessarily generalised to all investment actions under RSO 1.2 but represent a tentative mapping of the logical chain between type of operations, outputs and results.

Figure 2 Type of actions, output indicators and result indicators – RSO 1.2



Source: Consortium own elaborations

Homogeneity (target setting patterns) – **RCO02** (enterprises supported with grants) is used for the type of operation 'Digitising firms'. The milestone / target ratio varies with the categories of regions. About 65% of the actions have a milestone / target ratio greater than zero. In RSO 1.1, about 60% of the actions have a milestone / target ratio equal to zero.

For RCO14, the analysis shows that *e-government* investment actions tend to have higher unit costs than *e-inclusion* and *e-health*. Programmes set a milestone different from zero in *e-government* investment actions more frequently than in the other actions. Other experiences have been used

to setting the targets such as the use of 2014-2020 programme-specific indicators and interventions under the Recovery and Resilience Facility instrument

RCR11 follows a similar patter to RCO14. *E-government* investment actions tend to have higher unit costs; the average final target of users of new and upgraded public digital services for *e-government* investment actions is significantly higher than *e-health* and *e-inclusion* investment actions. Programme target setting methodologies have considered some of the following elements. First, the fiscal identification code has been used to estimating targets once considering the need for eliminating double counting of public institutions for RCO14. Secondly, national statistical institute data represent the reference to estimate the increased number of users and to consider differences between territorial units (metropolitan vs peripheral areas) in the access to digital services.

Homogeneity (factors which might affect the capacity to reach targets) - The methodological document analysis shows that programmes are fully immersed in their policy context. Factors which might affect the capacity to reach targets are often policy-related such as:

- Budgetary restrictions that force funds to be allocated to other needs.
- Awarding procedures take time more than expected.
- Changes in the projects finally selected for financing.
- Fluctuations in the staff of employees of the different public entities that would affect the number of users of the digital products and services improved or launched with the programme, including internal users of the Public Administration.

Other factors can also contribute to slowing implementation and achievements. These are economic and regard inflation which could make investments more costly than expected.

Assessment of target setting and outliers – The analysis of methodological documents highlights the characteristics of some outlier programmes which have been identified from task 1a, in the Spanish Plurirregional ERDF programme. For **RCO02** (enterprise supported by grants), several types of calls and interventions are expected to deliver SMEs digitalisation. Moreover, SME digitalisation actions have a double nature delivering both a financial and non-financial aid. For **RCO14** (Public institutions supported to develop digital services, products and processes), the example of the Plurirregional ERDF programme in Spain indicates that investments digitising public services cover several types of actions. inclusion, e-health and e-government. This implies different unit costs and timing in output delivery (as demonstrated by the milestone / target ratio). Similar findings are also valid for **RCR11** (users of new and upgraded public digital services, products and processes).

1.3.3 RSO 1.3 – Growth and competitiveness of SMEs

Indicators under assessment - The RSO 1.3 indicator assessment covers three common output and three common result indicators.

Common output indicators.

- **RCO02 is a common output indicator measuring enterprises supported with grants**. This indicator was already available in the 2014-2020 list. This indicator is also assessed under RSO 1.1 and 1.2. More information on the SWD definition was presented

for the RSO 1.1. The assessment covers 17 programmes and related documents from Cyprus, Germany, Denmark, Spain, Croatia, Italy, Lithuania, Malta, Poland, Portugal, and Slovenia.

- **RCO05 is a common output indicator measuring new enterprises supported**. This indicator was already available in the 2014-2020 list. The analysis reviews 11 programmes and related documents covering: Belgium, Germany, Spain, Croatia, Ireland, Lithuania, Romania, and Slovenia. This indicator was already in the 2014-2020 list of common indicators.
- **RCO15 is common output indicator measuring the (additional) capacity of incubation created**, i.e. the (additional) number of enterprises that can be served on a yearly basis by a business incubator. The SWD provides the references for the indicator and defines the wide spectrum of enterprise incubation activities. RCO05 is a new indicator in the 2021-2027 list. The assessment covers 6 programmes and related documents from Belgium, Germany, Spain, Croatia, Ireland, Lithuania, Romania and Slovenia.

Common result indicator.

- **RCR01 is a common result indicator measuring the jobs created** (FTEs) in the supported entities. It is based on a reclassification of 2014-2020 common indicator CO08. The SWD does not use any references but provides a detailed description of FTEs calculation. The assessment covers 14 programmes and related documents covering Italy, Spain, Lithuania, Germany, Cyprus, Croatia, Portugal, Belgium and Poland.
- **RCR17 is a common result indicator on the new enterprises surviving in the market**. It is a new indicator in the 2021-2027 list. References are from RCO01 (enterprises supported). This indicator combines perfectly with RCO05. The assessment covers 11 programmes and related documents covering Belgium, Croatia, France, Italy, Lithuania, Malta, Romania, Slovenia and Spain.
- **RCR18 is a common result indicator covering SMEs using incubator services. SWD indicates that** '*this indicator is to be used only for interventions aiming at creating new incubation/ additional capacity (measured by RCO15)*'. The assessment covers 6 programmes and related documents from Croatia, Germany, Ireland, Malta and Romania.

Coherence with SWD

- **No methodological document has an indicator definition which is inconsistent with the SWD**. Most reviewed methodological documents refer to the SWD and / or to common indicators without making explicit reference to SWD definitions, concepts and references. Since the programmes adopt common indicators, they should follow SWD standards and metadata.
- No differences in the definition across several specific objectives for all the indicators.

Homogeneity (granularity assessment) – The first step of the homogeneity assessment examines granularity with a focus on investment actions reported in methodological documents to set indicator targets. The methodological documents reviewed differ showing a wide range of types of actions and high heterogeneity across programmes. Therefore, the study team has proposed types of RSO 1.3 investment actions contributing to indicator valorisation in order to ensure consistency across the programmes under analysis and meaningful clusters of investment actions in line with the RSO intervention logic. These types build on Annex I CPR intervention fields, the correspondence table from the Cohesion data platform, textual analysis of programme specific actions as reported

in the article 17 CPR methodological documents examined. Overall, 74% of the reviewed actions have been categorised in the following types[9]:

- *Business development and support* - Investments in micro, small, medium-sized enterprises for their business development.
- *Circular economy* – Investments in sustainability and more precisely in circular economy.
- *Innovation and cooperation* – Despite RSO 1.1 having a stronger focus on innovation and cooperation, RSO 1.3 also supports these investment actions, covering innovation clusters, cooperation between companies, technology transfer.
- *Enterprise incubation* – Investments in incubation services and infrastructure. These investments are mainly delivered through grants but also include venture capital for incubation.
- *Entrepreneurship and SME survival* – Support for start-ups, spinoffs and entrepreneurship.

Analysis of the reviewed investment actions shows they contribute differently to the valorisation of the indicators under assessment as presented in the following table. *Business development and support* actions contribute mainly to RCO02 (enterprises supported by grants) and RCR01 (jobs created). *Entrepreneurship and SME survival* actions mainly relate to RCO05 (new enterprises supported) and RCR18 (new enterprises surviving in the market). *Enterprise incubation investments* contribute to RCO15 (capacity of incubation created) and RCR18 (SMEs using incubator services). *Circular economy* investment actions have a low contribution mainly to RCO02 and RCR01. *Innovation and cooperation* investment actions have a low contribution to several indicators.

Table 7 Types of investment actions and contribution to the RSO 1.3 indicators under assessment

	RCO02	RCO05	RCO15	RCR01	RCR17	RCR18
Business development and support	High	Low	/	High	/	/
Circular economy	Low	/	/	Low	/	/
Enterprise incubation	/	Low	High	/	Low	High
Innovation and cooperation	Medium	Low	/	Low	Low	/
Entrepreneurship and SME survival	Low	High	/	Low	High	/

'/' : no contribution to the indicator

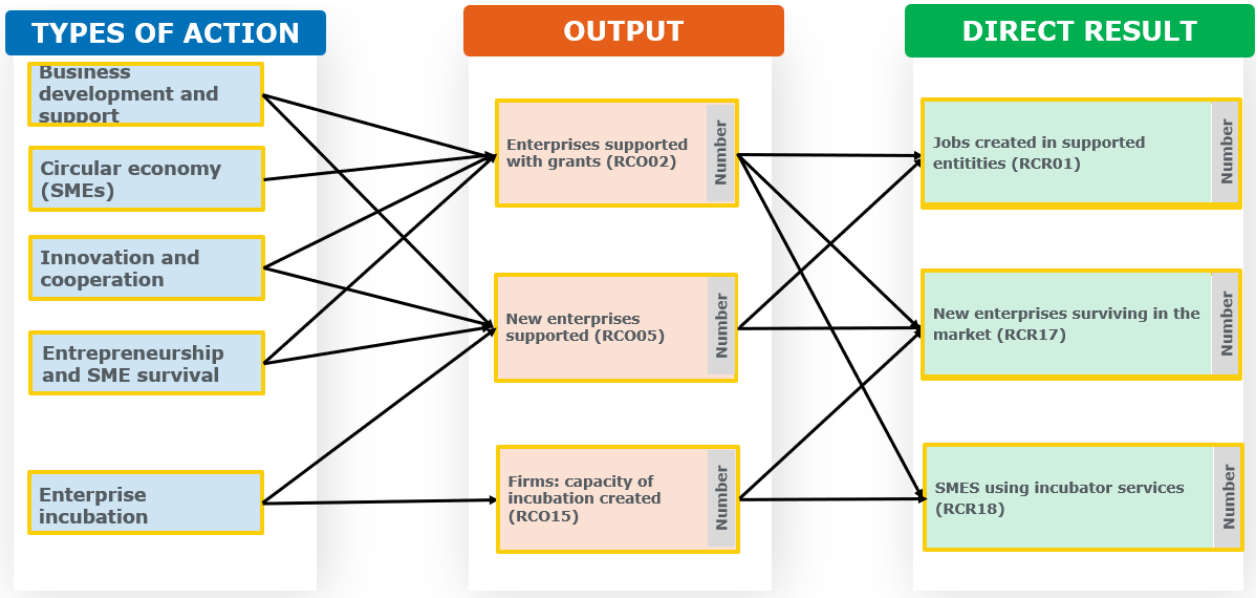
[9] The investment types 'Business development and support' and 'Innovation and cooperation' are also referenced under Task 2a. 'Enterprise incubation' and 'Entrepreneurship and SME survival' used in Task 1b detail the type of operation under RSO 1.4 used in Task 2a. This indicates that enterprise incubation and start-up support are financed not only under RSO 1.4 but also under RSO 1.3. Task 1b does not cover RSO 1.4; however, the analysed methodological documents clearly focus on incubation and new enterprises under RSO 1.3. 'Circular economy' offers a specific thematic focus and details the type 'Business development and support'.

Low: less than 20% of the investment actions contribute to the indicator
Medium: between 20% and 40% of the investment actions contribute to the indicator
High: more than 40% of the investment actions contribute to the indicator

Source: Consortium own elaborations

Methodological document review provides qualitative and descriptive information to explore links between types of actions and outputs and their contribution to the results. These links cannot be necessarily generalised to all investment actions under RSO 1.3 but represent a tentative mapping of the logical chain between type of operations, outputs and results. Compared with other RSOs, this mapping looks more complex.

Figure 3 Type of actions, output indicators and result indicators – RSO 1.3



Source: Consortium own elaborations

Homogeneity (target setting patterns) – **RCO02** (enterprises supported with grants) is mainly used for the type of operation *Business development and support* but also for *innovation and cooperation* and to lower extent for *circular economy* and *entrepreneurship and SME survival*. The milestone / target ratio is usually higher than zero. It is higher than in RSO 1.1 and similar to RSO 1.2.

RCO05 (new enterprises supported) is mainly used for *entrepreneurship and SMEs survival* actions. Its milestone / target ratio is more frequently higher than zero.

RCO15 (capacity of incubation created) is usually associated with *enterprise incubation* type of operations. Its milestone / target ratio is usually set to zero.

For the result indicators, information unit costs are limited and / or difficult to derive from methodological document at single action level. The review of methodological document also highlights that the two most relevant sources justifying the assumptions to target setting are statistical sources and the past programming period.

For **RCR01**, for instance, in the Andalucía programme, to estimate the final target the Agencia IDEA used the projection of historical data from calls made in the previous period 2014-2020. Another approach used was to link target for RCR01 with other output indicator targets. This situation to the Lithuanian programme, to the Italian Region Veneto and to a German programme. The methodological documents link explicitly the target of RCR01 and thus the number of jobs creates with the number of supported companies (RCO01).

The link between output and result indicators target is evident for the other two RSO 1.3 indicators: **RCR17** (new enterprises surviving in the market) and **RCR18** (SMEs using incubator services). In the first case, RCR17 target is usually linked to RCO05 (new enterprises supported), while in the second case, RCR18 target is associated with RCO15 (capacity of incubation created). Linking target of output and corresponding result indicators provides a performance measurement of intervention effectiveness and indicates to what extent new enterprises are surviving in the market and / or additional incubation capacity is used.

Homogeneity (factors which might affect the capacity to reach targets) - Factors which might affect the capacity to reach targets of output indicators are often policy-related such as:

- Budgetary restrictions that force funds to be allocated to other needs.
- Awarding procedures take more time than expected.
- Changes in the projects finally selected for financing.
- Delays in processing times for preparing new regulatory frameworks, issuing calls, and extending deadlines for the granting and justification of subsidy lines.

Economic factors are identified as the most relevant ones which contribute to slowing down programme implementation and hindering programme capacity to achieve the targets of the result indicators. These economic factors regard:

- Shifts in market structure.
- Rising inflation due to escalating global prices, exacerbated by the Ukraine-Russia conflict, that is impacting global supply chains.
- Changes in the socio-economic situation at the time of reference values that can affect target achievement.
- Global uncertainties that can influence investment expectations and potentially affect the uptake of funds, especially by the private sector.

Assessment of target setting and outliers – The analysis of methodological documents explores the characteristics of some outlier programmes identified in task 1a at least for some of the reviewed indicators. First, under a given programme, investment actions might differ substantially between the types proposed in this study. This can have an impact on target setting for RCO02 (enterprises supported by grants) but also on RCR01 (jobs created in supported entities). For RCO15, the programmes have adopted their historical values and then based on this they calculated the target of additional incubation capacity created. This can contribute to partially explaining why there are outlier programmes.

1.3.4 RSO 1.5 – Digital connectivity

Indicators under assessment - The RSO 1.5 indicator assessment covers one common output and one common result indicator.

Common output indicator.

RCO41 is a common output indicator measuring additional dwellings with broadband access of very high capacity. This indicator is similar to the 2014-2020

CO10. The task 1b analysis covers 8 programmes from Spain, France, Lithuania, Portugal, Slovenia.

Common result indicator.

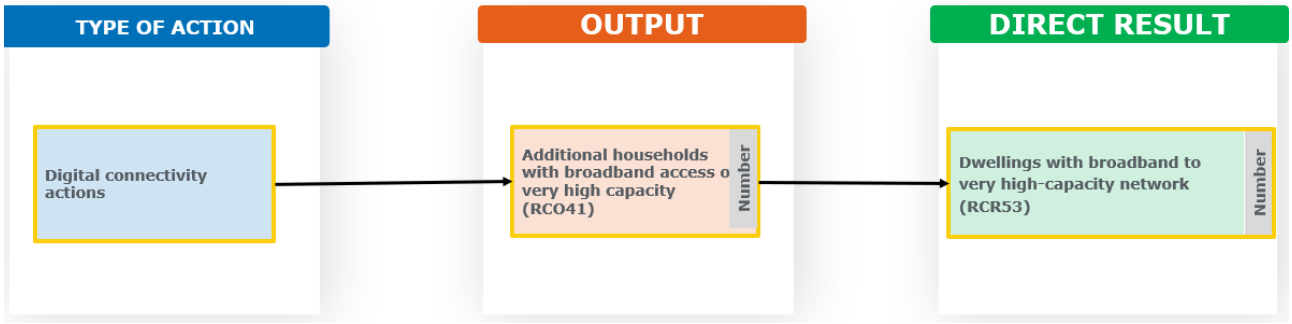
RCR53 covers the additional dwellings with broadband subscriptions to a very high-capacity network as a result of the supported projects. Task 1b covers 8 programmes and several countries: Spain, France, Lithuania, Portugal, Slovenia.

Coherence with SWD

- **No methodological document has an indicator definition which is inconsistent with the SWD**. Most reviewed methodological documents refer to the SWD and / or to common indicators without making explicit reference to SWD definitions, concepts and references. Since the programmes adopt common indicators, they should follow SWD standards and metadata.
- Both indicators are essentially linked with RSO 1.5.

Homogeneity (granularity assessment) – Most of methodological documents reviewed **associate one single investment action to each indicator**[10]. This shows a relatively simple and linear intervention logic under RSO 1.5. Methodological document review provides qualitative and descriptive information to explore links between types of actions and outputs and their contribution to the results. These links cannot be necessarily generalised to all investment actions under RSO 1.5 but represent a tentative mapping of the logical chain between type of operations, outputs and results.

Figure 4 Type of actions, output indicators and result indicators – RSO 1.5



Source: Consortium own elaborations

Homogeneity (target setting patterns) – The review of methodological documents shows that indicative unit costs associated with the RCO41 vary significantly: they are higher in less developed and transition regions than in more developed regions. Investment actions with a milestone / target ratio higher than zero are slightly more than a half. The review of methodological documents also highlights that the two most relevant sources justifying the assumptions to target setting are the past programming period and similar experiences in other contest and 2014-2020 programmes,

[10] The reviewed programme methodological documents refer to a single type of operation, which pertains to digital connectivity. Task 2a proposes a more detailed list of types of digital connectivity investments, focusing on broadband connectivity and other ICT infrastructure. This level of detail was not achievable with the list of indicators in Task 1b (exclusively focusing on households / dwelling connectivity) and information provided by the analysed methodological documents.

financing ICT interventions. For RCR53, considering the information limitations related to unit costs, a comparative analysis between the final target of the result indicator (RCR53) and the output indicator (in this case, RCO41) has been conducted when both are simultaneously used. For almost the totality of actions, the ratio between RCR53 final target / RCO41 final target assumes values higher than 0.5, getting closer to 1 in most cases. This indicates that a portion of the additional dwellings connected to a very high-capacity network will be associated with additional broadband subscriptions.

Homogeneity (factors which might affect the capacity to reach targets) - Factors which might affect the capacity to reach targets are often policy-related such as the use of budgetary restrictions for other needs, the inappropriate planning of the beneficiaries and change in the regulations. Other factors can also contribute to slowing down programme implementation and target achievement. These are of economic nature and regard the rising costs of providing coverage to certain areas, which could make private initiatives unviable, even when incentivized with public resources.

Assessment of target setting and outliers – The analysis of methodological documents provides information on outlier programmes. An interesting example is the French Brittany programme. This programme expects to support investments covering premises for both professional and residential use, contributing to additional dwellings and companies. Therefore, the supported interventions will contribute to the valorisation of four indicators under RSO 1.5. Some regard residential use: RCO41 on additional dwellings with broadband access to the very high-capacity network and RCR53 additional subscriptions. Some regard professional use: RCO42 on additional enterprises with broadband access to the very high-capacity network and RCR54 additional subscriptions. Therefore, considering that investments have this dual nature (professional and residential use of premises), the programme had to estimate the targets based on a large dataset available. This approach contributes, at least partially, to explaining the programme being an outlier as a result from task 1a.

1.3.5 Overall results of the indicator analysis under Policy Objective 1

This section presents the overall results of the above analysis of the indicator related to Policy Objective 1 (PO1), focusing on the criteria detailed in the methodology section. Specifically, it assesses the coherence of the programme's methodological documents with the definitions and assumptions outlined in the SWD. It also examines the homogeneity of the investment actions contributing to each indicator, identifying any consistent patterns in the assumptions used for target setting. Additionally, it provides explanations for any outliers detected.

1.3.5.1 Coherence with SWD

The coherence assessment evaluates the reliability of indicators analyzed under Task 1b. This is achieved through a thorough review of methodological documents that define programme performance frameworks in accordance with Article 17 of the CPR. Specifically, this assessment verifies that these documents align with the 'definitions and concepts' outlined in the SWD metadata. It also examines whether the specific objectives within each programme maintain

consistent definitions and standards for the indicators being assessed. The results of the coherence assessment with the SWD revealed two key findings:

- No methodological document reviewed contains indicator definitions that were inconsistent with the SWD guidelines.
- There were no substantial differences in indicator definitions across the various specific objectives.

These outcomes indicate a high level of alignment and consistency within the methodological frameworks, reinforcing the reliability of the indicators used in programme assessments. However, while this coherence assessment is clear and positive, it covers some parts of the indicator metadata: definitions, concepts and references as well as coherence across specific objectives. The analysis does not cover other aspects such as when (and how) the indicator will be measured. Indeed, while the SWD usually states when output indicators shall be measured, it gives programmes the possibility to decide when to measure result indicators provided that it is not later than one year after the completion of the corresponding outputs. Moreover, methodological documents usually do not specify how the indicators will be measured.

1.3.5.2 Homogeneity assessment

The homogeneity assessment is structured in several steps. First, it involves a granularity assessment, which examines the level of detail and precision of the data. Second, it identifies patterns in target setting, looking for consistent trends across different investment actions. Finally, the analysis seeks to verify the types of reasons identified in the methodological documents that might impact the achievement of the targets.

Homogeneity (granularity assessment) – The first step of the homogeneity assessment focuses on evaluating the granularity of the investment actions as reported in the methodological documents used to set indicator targets. Granularity, in this context, refers to the level of detail and specificity with which the investment actions are linked to the corresponding indicators. Upon reviewing the methodological documents, it becomes evident that there is a significant variation in the level of granularity between different RSO intervention logics. More in details:

- **In RSO 1.1,** there is usually **more than one action** contributing to the valorisation of each of the indicators under assessment. For RSO 1.3, the methodological documents reviewed show a wide range of types of actions and high heterogeneity across programmes.
- **Compared with RSO 1.1, RSO 1.2 situation is different**. More than half of the methodological documents associate one single investment action to the indicator RCO02 (enterprises supported with grants). This means that programme usually adopt a single action type when referring to digitising firms. For RCO14 (public institutions supported to develop digital services, products and processes) and RCR11 (users of new and upgraded public digital services, products and processes) more than a half of methodological documents reviewed link each indicator to more than one action. This reflects different sectors of public interventions (e.g. health, governance).
- In RSO 1.5, most methodological documents reviewed associate one single investment action to each indicator.

The varying relationships between indicators and actions reflect the complexity of interventions under the specific objectives. RSO 1.1 stands out as the most complex, with

multiple actions contributing to the valorisation of each indicator. In contrast, RSO 1.5 is more straightforward, where most indicators are linked to a single investment action. The situation in RSO 1.2 and 1.3 is mixed. For example, while a single action often supports RCO02 (enterprises supported with grants), indicators like RCO14 and RCR11 are linked to multiple actions, reflecting the diverse sectors involved, such as health and governance.

For some of the RSOs under PO 1, the analysis proposes types of investment actions contributing to the indicator valorisation. This also helps create a tentative consistent and relatively homogenous framework supporting the analysis of target setting patterns. Analysis of the reviewed investment actions shows they contribute differently to the valorisation of the indicators under assessment within each specific objective intervention logic. For instance, in RSO 1.1 'Enhancing research and innovation', two types of actions primarily contribute to the RCO02 'Enterprises supported by grants': R&I in enterprises and R&I cooperation and technological transfer. Others, as R&I research centres investment actions do not contribute at all. RSO1.2 'Reaping the benefits of digitisation' contributes to RCO02 exclusively with digitising firms actions, while e-government, e-inclusion and e-health are excluded. In RSO 1.3, several investment actions contribute to RCO02, but mainly business development and support investments.

Homogeneity (target setting patterns) – The second step of the homogeneity assessment identifies consistent patterns in target-setting assumptions across programmes. This analysis explores the assumptions behind the targets, considering various elements where possible. These include indicative unit costs estimated by the study team based on methodological documents, and the logic behind setting milestones and targets, which applies only to output indicators. Additionally, the assessment compares result indicators with corresponding output indicator targets and reviews the sources and methods used to calculate the targets. This comprehensive approach ensures that the target-setting process is transparent and aligned with consistent and justified assumptions across the programmes.

For all indicators, the methodological document review highlights the following findings:

- The two most relevant sources for target setting assumptions are the past programming period and similar experiences.
- **Setting milestones and targets and defining methodological documents** draw lessons from the past and build capacity in the administration as well as project the capacity to spend financial resources and deliver outputs and results.
- **Several programmes adopt prudent approaches compared to past programming periods**, explaining that targets are set by also considering the effects of possible implementation risks and bottlenecks based on the past experience.

In many cases, the **specific objectives and the types of investment actions proposed within each specific objective show different patterns in indicative unit costs** as well as in terms of **milestone / target ratio** for the output indicators. A few examples follow here below.

In RSO 1.1 'Enhancing research and innovation', for RCO02 (enterprises supported by grants):

- The analysis shows that *R&I cooperation and technology transfer* investment actions are usually relatively more costly than others as *R&I in enterprises*.

- On average, RSO 1.1 investment actions usually have a milestone / target ratio higher than zero (in more 60% of the reviewed investment actions). However, this ratio differs between action types. *R&I cooperation and technology transfer* investment actions have a milestone / target ratio higher than zero less frequently than other RSO 1.1 actions *'R&I in enterprises'*.
- This suggests that research and innovation investments in cooperation and for technological transfer are relatively more costly and take more to deliver their outputs than research and innovation in enterprises. This seems reasonable since *R&I cooperation and technology transfer* usually involve several entities, take more time to finalise and require different competences. It is worth noting that the analysis covers enterprises supported in general but does not allow for a more granular approach at enterprise level. Information on the size of supported companies will be available in the monitoring phase, even if it has been usually considered while setting targets.

In RSO1.2 'Reaping the benefits of digitisation', for RCO02 (enterprises supported by grants):

- 'Digitising firms' investment actions are the only contributing to the indicator. About 65% of the RSO 1.2 actions have a milestone / target ratio greater zero. This value is similar to RSO 1.1 and RSO 1.3.

In RSO 1.3 'Growth and competitiveness of SMES', RCO02 (enterprises supported with grants)

- Several actions contribute to the indicator valorisation. It is mainly used for the type of operation *Business development and support* but also for *innovation and cooperation* and to lower extent for *circular economy* and *entrepreneurship and SME survival*. *Business development and support investment* actions tend to have higher average unit costs than the others, in particular much higher than investments in innovation and cooperation and circular economy.
- The milestone / target ratio is usually higher than zero (in more 60% of the reviewed investment actions). It is similar to RSO 1.2 and similar to RSO 1.1. The milestone / target ratio also varies depending on the proposed type of operations. The milestone / target ratio is more frequently higher than zero for *Business development and support* investment actions than the others. This suggests that business development and generic support to SMEs are expected to deliver their outputs earlier than the others in the programme implementation.

For the other indicators it is interesting to see in comparison output and result indicator target setting.

- In RSO 1.1 'Enhancing research and innovation', RCR03 (SMEs introducing product or process innovations) usually has a lower target than RCO02 (enterprises supported by grants), when both indicators are used simultaneously. Therefore, programme assume that **not all the supported enterprises with grants will be able to deliver process or product innovations** at least by the time of monitoring.
- In RSO 1.3' Growth and competitiveness of SMEs', programmes usually establish result indicator targets in relation to output indicators. For RCR01 (jobs created), a few programmes link the number of employment opportunities from project to the enterprises supported. The

RCR17 (new enterprises surviving in the market) target is usually linked to RCO05 (new enterprises supported), and the RCR18 (SMEs using incubator services) target is associated with RCO15 (capacity of incubation created). Linking target of output and corresponding result indicators provides a sort of performance measurement of intervention effectiveness and indicates to what extent new enterprises are surviving in the market and / or additional incubation capacity is actually used.

- In RSO 1.2 'Reaping the benefits of digitisation', the combined analysis of **RCR11** (users of digital services, etc.) **and RCO14** (public institutions supported) shows some similarities with regards the type of operations supported. *E-government* investment actions tend to have higher unit costs for the output and result indicator. Moreover, the average final target of users per action is higher in *e-government* investment actions than *e-health* and *e-inclusion* investment actions.

Homogeneity (factors which might affect the capacity to reach targets) - The analysis of homogeneity ends with the review of factors which might affect the progress and capacity of the programme to achieve the targets. **Factors which might affect the capacity to reach targets are often policy-related**:

- Budgetary restrictions that force funds to be allocated to other needs.
- Changes in the regulations which are not under the managing authority's responsibility.
- Delays in programme implementation and conclusion.
- Discrepancies between the approved projects and the pilot projects used to set the target.

Other factors can also contribute to slowing down programme implementation and target achievement such as: the impossibility of providing anticipated advances or payments to entities with pending justifications, increase in prices and possible future crises.
All in all, the analysis highlights policy-related and external factors affecting target achievement, such as budget constraints, regulatory changes, implementation delays, rising prices, and crises, which can hinder programme progress and capacity.

1.3.5.3 Assessment of target setting and outliers

The analysis of methodological documents highlights a few reasons explaining why some programmes are outliers according to the task 1a analysis. As already explained, Outlier programmes are not to be considered as programmes adopting wrong assumptions but behaving differently from the average correlation between indicator target and invested amount.

- First, **programme actions might be characterized by different** focus, scope, type of beneficiaries / target groups, intervention fields, indicators. This can explain why outlier programmes are different from the others for the relationship between the allocation and target values.
- Secondly, task 1b analysis has used types of investment actions to ensure more granularity to the assessment. This helps ensure a more consistent analytical framework. However, **even under the tentative action types proposed in this study, some programmes support actions with a wide range of unit costs**. This affects the relationship between indicator targets and invested amount.
- Last but not least, some programmes **use umbrella investment actions**, covering a wide and flexible set of possible different interventions (e.g. support for SMEs and new enterprises,

international research and cooperation, collaboration and technological transfer, or new product development).

1.4 POLICY OBJECTIVE 2

This section presents the analysis conducted for the specific objectives under Policy Objective 1 (PO2), focusing on the following Regional Strategic Objectives (RSOs): RSO 2.1 'Energy efficiency', RSO 2.2 'Renewable energy', RSO 2.4 'Climate change adaptation', RSO 2.5 'Sustainable water', RSO 2.6 'Circular economy', RSO 2.7 'Nature protection and biodiversity' and RSO 2.8 'Sustainable urban mobility'. As explained in the inception report and confirmed above, the analysis focuses on the most relevant specific objectives and does not cover RSO 2.3 'Smart energy systems'. Each of the specific objectives is assessed according to the three criteria already outlined in the methodology.

1.4.1 RSO 2.1 – Energy efficiency

Indicators under assessment - The RSO 2.1 indicator assessment covers two common output and two common result indicators.

Common output indicators.

- **RCO18 is a common output indicator measuring dwellings with improved energy performance**. The assessment covers 6 programmes and related documents from Greece, France, Lithuania, Malta and Spain.
- **RCO19 measures the area** (in square meters) **of public buildings with improved energy performance**. Task 1b reviews 8 programmes and related documents covering Austria, Greece, Spain, France, Lithuania, Luxembourg and Portugal.

Common result indicators.

- **RCR29 is a result indicator which measures the total estimated GHG emissions for the entities or processes supported.** It is based on a reclassification of 2014-2020 common indicator CO34. The assessment builds on a review of 8 programmes and related methodological documents covering: Austria, France, Greece, Lithuania, Luxembourg, Malta and Spain.
- **RCR26 covers the annual primary energy consumption**. Task 1b covers 7 programmes and related methodological documents regarding Greece, Lithuania, Luxembourg, Malta, Portugal and Spain.

Coherence with SWD

- **No methodological document has an indicator definition which is inconsistent with the SWD**. Methodological documents do not specify any concrete differences in the definition of the indicators. However, most reviewed methodological documents refer to the SWD and / or to common indicators without making explicit reference to SWD definitions, concepts and references. Since the programmes adopt common indicators, they should follow SWD standards and metadata.
- **No remarkable differences in the definition across several specific objectives**. The analysis shows clearly that the methodological documents do not indicate any differences in the definition across several specific objectives. This is especially relevant for RCR29 which is frequently used under several PO2 specific objectives.

Homogeneity (granularity assessment) – The first step of the homogeneity assessment examines granularity with a focus on investment actions reported in methodological documents. As in other specific objectives, the study team has defined types of RSO 2.1 investment actions contributing to indicator valorisation in order to ensure consistency across the programmes under analysis and meaningful clusters of investment actions in line with the RSO intervention logic. These types build on Annex I CPR intervention fields, the correspondence table from the Cohesion data platform[11], textual analysis of programme specific actions as reported in the article 17 CPR methodological documents examined. These types of investment actions are:

- *Energy efficiency in enterprises* – Investments to improve the energy efficiency of enterprises.
- *Energy efficiency in housing* – Covering energy upgrading of private buildings and improvement of their energy efficiency as well as support for high-performance energy renovation.
- *Energy efficiency in public infrastructure* – Investments to improve the energy efficiency of public buildings.
- *High efficiency / replacement heating systems* – Activities to improve energy efficiency of district heating, cooling and hot water supply systems.

Analysis of the reviewed investment actions shows they contribute differently to the valorisation of the indicators under assessment as presented in the following table.

Table 8 Types of investment actions and contribution to the RSO 2.1 indicators under assessment

	RCO18	**RCO19**	**RCR29**	**RCR26**
Energy efficiency in enterprises	/	/	Low	Low
Energy efficiency in housing	High	/	Medium	Medium
Energy efficiency in public infrastructure	/	High	Medium	Medium
High efficiency / replacement heating systems	/	/	Low	Low

'/' : no contribution to the indicator

Low: less than 20% of the investment actions contribute to the indicator

Medium: between 20% and 40% of the investment actions contribute to the indicator

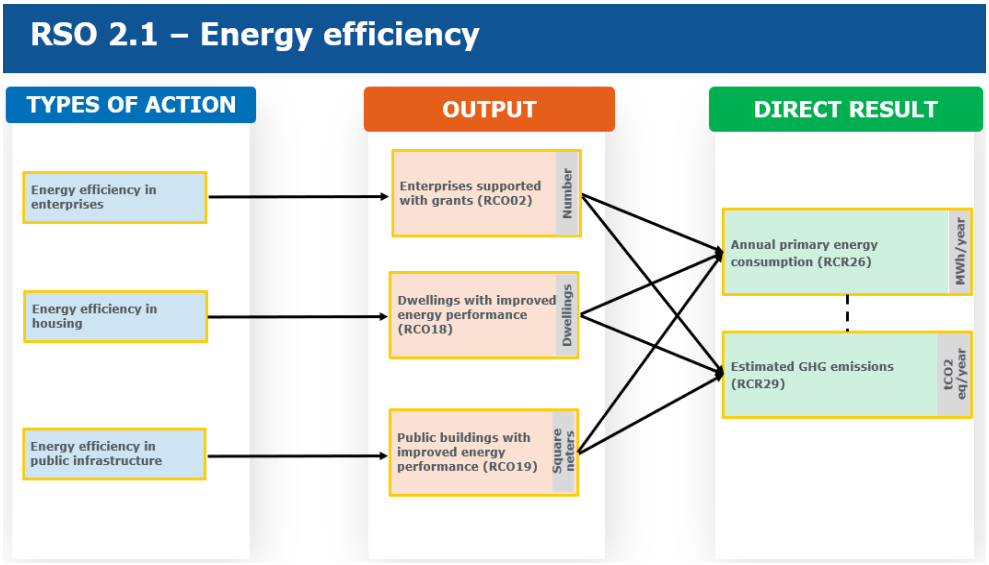
High: more than 40% of the investment actions contribute to the indicator

Source: Consortium own elaborations

Methodological document review provides qualitative and descriptive information to explore links between types of actions and outputs and their contribution to the results. These links cannot be necessarily generalised to all investment actions under RSO 2.1 but represent a tentative mapping of the logical chain between type of operations, outputs and results.

[11] https://cohesiondata.ec.europa.eu/2021-2027-Categorisation/Correspondence-21-27-to-14-20-intervention-fields/4s7y-iy43/about_data (last visit 12 September 2024)

Figure 5 Type of actions, output indicators and result indicators – RSO 2.1



Source: Consortium own elaborations[12]

Homogeneity (target setting patterns) – The second step of homogeneity assessment identifies consistent patterns in target setting assumptions across programmes.

Output indicators

Timeliness - Slightly less than 50% of the reviewed investment actions of both RCO18 and RCO19 expect to deliver some outputs by 2024, being their milestones different from zero.

Unit costs and target setting assumptions- Indicator unit costs vary significantly depending on the category of regions, being on average higher in less developed for both indicators. The methodological document review highlights that target setting usually build on past experiences and other similar programming / planning experiences.

Result indicators

Timeliness – Methodological documents do not necessarily clarify when and how result indicators will be measured but ensure consistency with SWD. In this regard, the SWD refers to the completion of output / intervention and the use of energy performance certificate, energy audit or other relevant technical specification.

Unit costs and target setting assumptions - Despite the fact that methodological documents rarely provide information on unit costs for the result indicators, their review supports a comparative analysis of the selected output and result indicator targets.

- In energy efficiency in housing actions, the greater RCO18 target is usually associated with a higher reduction in emissions (RCR29), which are intertwined with a higher reduction of annual primary energy consumption (RCR26).
- In energy efficiency in public infrastructure actions, the greater RCO19 target usually aligns with a higher reduction in emissions (RCR29) and a higher reduction of annual primary energy consumption (RCR26).

[12] Note that RCO02 has not been analysed in detailed in this section being covered already under PO 1.

- In all type of operations, even in energy efficiency in enterprises, a higher value of reduction of energy consumption (RCR26) aligns with a higher reduction of GHG emissions (RCR29).

Homogeneity (factors which might affect the capacity to reach targets) – The analysis of homogeneity ends with the identification of factors which might affect the target achievement. The methodological document analysis identifies policy and economic factors.

- **Policy-related factors** encompass delays in ERDF programming, possible changes in the schedules of the individual projects, unforeseen budget cuts, risk of competition of other funding sources.
- **Economic factors** include increased prices, supply shortages, economic crisis, rising inflation and increase in the cost of raw materials.

Assessment of target setting and outliers – The analysis of methodological documents helps to explore why some programmes are outliers as identified in the Task 1a analysis.

For RCO 18, the Malta Investment in jobs and development programme is one such outlier included in the Task 1b sample. One reason for this could be that it refers to financial instruments (loans), covering both industry (measured through RCO02) and households (measured through RCO18). This makes the Maltese programme a very specific case.

Some programmes do not specify detailed information on the type of operations supported. For RCO 19, the Luxembourg Smarter and greener Europe programme and the Austrian Investments in employment and growth programme do not specify actions or indicate intervention fields. Both programmes along with the aforementioned Maltese programme are also outliers for RCR29. The above explanations given for RCO18 and RCO19 can be also valid for RCR29.

1.4.2 RSO 2.2 – Renewable energy

Indicators under assessment - The RSO 2.2 indicator assessment covers one common output and three common result indicators.

Common output indicators.

- **RCO22 measures additional production capacity for renewable energy (of which: electricity, thermal) expressed in MW.** The indicator review includes 7 programmes and related documents covering France, Italy, Lithuania, Poland and Spain.

Common result indicators.

- **RCR29 measures estimated GHG emissions (expressed in tonnes CO2 eq/ year) for entities and processes supported.** The indicator review includes 7 programmes and related documents covering France, Italy, Lithuania, Poland and Spain.
- **RCR31 measures total renewable energy produced (of which: electricity thermal) expressed in MWh/year.** The indicator review includes 5 programmes and related documents covering France, Italy, Lithuania, Poland and Spain.
- **RCR3 measures additional operational capacity installed for renewable energy, expressed in MW.** The indicator review includes 5 programmes and related documents covering France, Italy, Lithuania, Poland and Spain.

Coherence with SWD

- Overall, the vast majority of indicator observations under RSO2.2 do not clearly report the same definition and concepts as those in the SWD, however, they refer to it and thus coherence is assumed.
- The SWD does not provide references for any of the reviewed indicators under RSO2.2. Therefore, this aspect of coherence could not be assessed.
- RCO22 and RCR32 have been used only under RSO 2.2 so coherence across specific objectives could not be assessed.
- For RCR31 and RCR29, when they were used across different specific objectives, coherence was not explicitly stated, but methodological documents do not clearly state any substantial differences.

Homogeneity (granularity assessment) – The first step of the homogeneity assessment examines granularity with a focus on investment actions reported in methodological documents to set indicator targets. As in other specific objectives, the study team has defined types of RSO 2.2 investment actions contributing to indicator valorisation in order to ensure consistency across the programmes under analysis and meaningful clusters of investment actions in line with the RSO intervention logic. These types are based on Annex I CPR intervention fields, the correspondence table from the Cohesion data platform[13], textual analysis of programme specific actions as reported in the article 17 CPR methodological documents examined. These types of investment actions are:

[13] https://cohesiondata.ec.europa.eu/2021-2027-Categorisation/Correspondence-21-27-to-14-20-intervention-fields/4s7y-iy43/about_data (last visit 12 September 2024)

- *Renewable energy biomass* – Investments to promote heat generation from renewable energy sources.
- *Renewable energy solar* – Covering electricity production from solar energy.
- *Renewable energy wind* – Investments to promote electricity production from wind energy.
- *Several renewable energies* – Activities related to the development and production of several types of renewable energies at the same time.
- *Other renewable energies (including geothermal energy)* – Activities covering other types of renewable energies, such as hydrogen and geothermal energy.

Analysis of the reviewed investment actions shows they contribute differently to the valorisation of the indicators under assessment as presented in the following table.

Table 9 Types of investment actions and contribution to the RSO 2.2 indicators under assessment

	RCO22	**RCR29**	**RCR31**	**RCR32**
RE biomass	Low	Low	/	/
RE solar	Medium	Low	Low	/
RE wind	Low	Low	/	/
Several ren energy	Medium	Medium	High	High
Other renewable energy (including geothermal energy)	Medium	Medium	/	Medium

'/' : no contribution to the indicator

Low: less than 20% of the investment actions contribute to the indicator

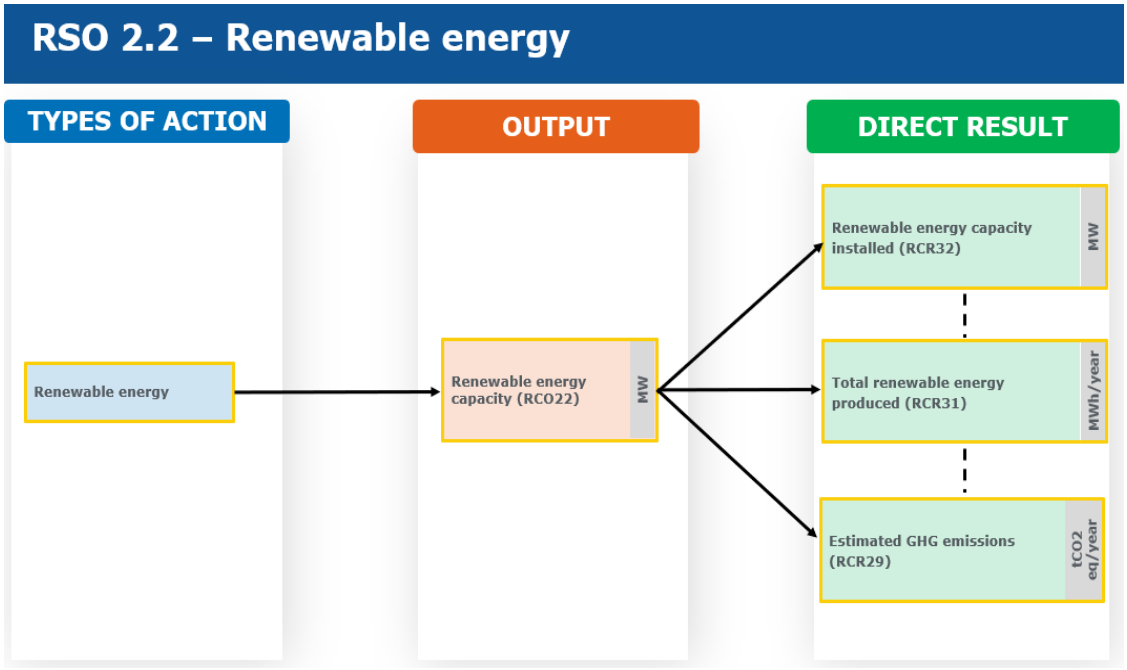
Medium: between 20% and 40% of the investment actions contribute to the indicator

High: more than 40% of the investment actions contribute to the indicator

Source: Consortium own elaborations

Methodological document review provides qualitative and descriptive information to explore links between types of actions and outputs and their contribution to the results. These links cannot be necessarily generalised to all investment actions under RSO 2.2 but represent a tentative mapping of the logical chain between type of operations, outputs and results as illustrated by the following diagram.

Figure 6 Type of actions, output indicators and result indicators – RSO 2.2



Source: Consortium own elaborations

Homogeneity (target setting patterns) – The second step of the homogeneity assessment identifies consistent patterns in target setting assumptions across programmes.

Output indicators

Timeliness – Overall, 50% of the reviewed investment actions of RCO22 are expected to deliver some outputs by 2024, because in these cases their milestones are different from zero. However, considering the different types of renewable energy, programmes supporting actions covering several types of renewable energy are expected to be slower than the average in achieving final targets: only 36% of the reviewed actions in this sub-category indicate a milestone value different from zero.

Unit costs and target setting assumptions- Indicator unit costs vary significantly depending on the category of regions, being on average higher in more developed regions. The methodological document review highlights that most of the programmes built on past experiences and similar experiences to set indicator targets for RCO22.

Result indicators

Timeliness – Methodological documents do not necessarily clarify when and how result indicators will be measured but ensure consistency with SWD. In this regard, the SWD refers to the completion of output / intervention and the use of energy performance certificate, energy audit or other relevant technical specification.

Unit costs and target setting assumptions - Methodological documents rarely provide information on unit costs for the result indicator but do provide information on target setting. Their review supports a comparative analysis of the selected output and result indicator targets.

- The analysis highlights that, in all type of operations, the higher the additional production capacity for renewable energy (RCO22), the lower the estimated greenhouse gas emissions (RCR29).
- In investment actions related to multiple renewable energy types, a higher RCO22 target is usually associated with a higher total renewable energy produced (RCR31), and/or a higher additional operational capacity installed for renewable energy (RCR32).

Homogeneity (factors which might affect the capacity to reach targets) - The analysis of homogeneity concludes with a review of factors which may affect the progress and capacity of the programme to achieve the targets. The analysis of methodological documents identifies both policy and economic factors.

- **Policy-related factors** include potential changes in the entity implementing the project.
- **Economic factors** include increased cost of raw materials, supply shortages, unexpected and unforeseen discovery of archaeological remains during the execution of the works.

Assessment of target setting and outliers – The analysis of methodological documents helps to explore why some programmes are outliers, as identified in the task 1a analysis.

All the mentioned outliers included actions related to the multiple renewable energy sources. Moreover, some programmes used very specific projects or past experience to establish targets. In the case of the Polish programme, target setting and unit costs were estimated based on a single and very specific past experience for both RCR29 and RCR31. Moreover, the Spanish Plurirregional programme calculated its RCR32 target based on a single specific data source (Spanish statistical source 'Red Eléctrica de España').

1.4.3 RSO 2.4 – Climate change adaptation

Indicators under assessment - The RSO 2.4 indicator assessment covers one common output and one common result indicator.

Common output indicator.

- RCO25 is a common output indicator measuring coastal strip, riverbank and lakeshore flood protection newly built or consolidated (expressed in km). The assessment in task 1b refers to 7 programmes and related documents covering France, Italy, Lithuania, Portugal and Spain.

Common result indicator.

- **RCR35 is a result indicator measuring population benefiting from flood protection measures** (measured in persons). The assessment in task 1b uses 7 programmes and related documents covering France, Italy, Lithuania, Portugal and Spain.

Coherence with SWD

- **No methodological document has an indicator definition which is inconsistent with the SWD.** The great majority of methodological documents does not specify any concrete differences in the definition of the indicators.
- The SWD itself does not provide any explicit references for indicators RCO25 and RCR35. Therefore, it is not possible to assess the coherence with these references.
- **Both indicators used under RSO2.4 are used exclusively under this RSO**. Hence, coherence with other specific objectives cannot be assessed.

Homogeneity (granularity assessment)

- The French methodological document does not indicate specific investment actions for the indicator under this specific objective, and thus has limited utility for this analysis.
- For RCO25 four programmes have a single action contributing to this indicator, while two indicate more than one action, and one does not indicate any single action. This shows linearity of the intervention logic under RSO 2.4
- Mapping of actions for result indicator RCR35 is slightly more complex as three programmes have a single action contributing to this indicator and three indicate more than one.

The most relevant type of operation for both RCO25 and RCR35 is '*Climate change adaptation and risk management*' as 18 out of 20 reviewed programme investment actions are reported to fall into this category. The intervention field most relevant for both indicators is "*Flood and landslide (058)*" as shown by the following table.

Table 10 Types of investment actions and contribution to the RSO 2.4 indicators under assessment

	RCO25	RCR35
Climate change prevention and management (060)	Low	Low
Flood and landslide (058)	High	High
Non-climate, human reduced risks: prevention, management (061)	/	Low

'/' : no contribution to the indicator

Low: less than 20% of the investment actions contribute to the indicator

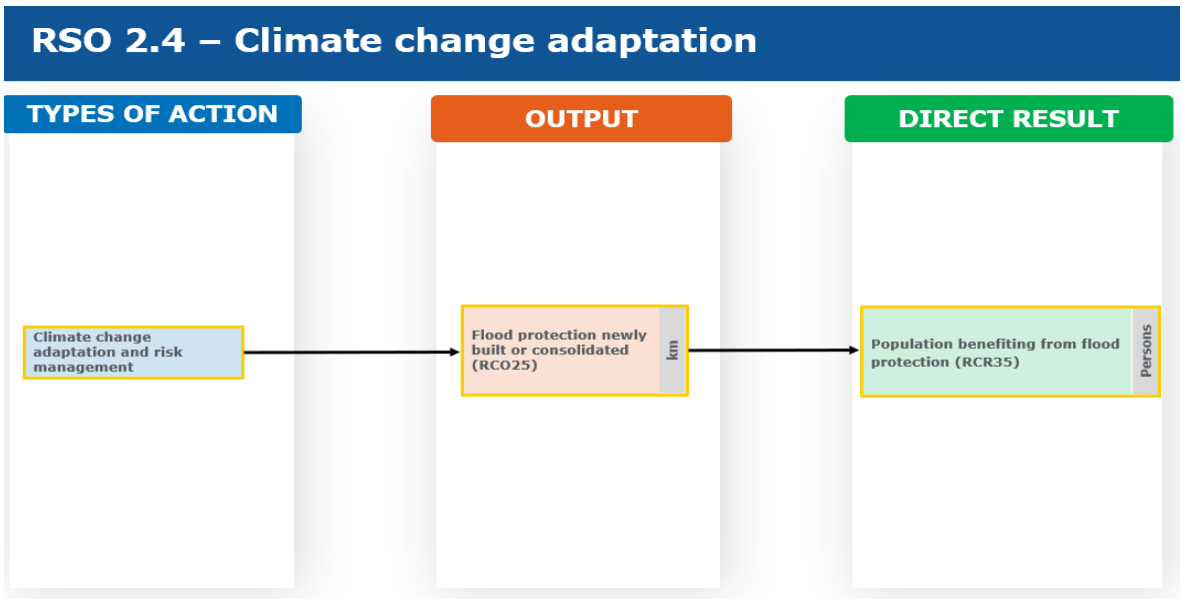
Medium: between 20% and 40% of the investment actions contribute to the indicator

High: more than 40% of the investment actions contribute to the indicator

Source: Consortium own elaborations

The following figure presents a tentative mapping of the logical chain between type of operations, outputs and results under RSO 2.4. The intervention logic appears to be rather linear, which is partly due to the selected indicators, which exclusively focus on flood protection, while RSO 2.4 can also cover other types of climate change related risks.

Figure 7 Type of actions, output indicators and result indicators – RSO 2.4



Source: Consortium own elaborations

Homogeneity (target setting patterns)

Output indicators

Timeliness – 30% of the reviewed actions are expected to deliver some outputs by 2024, with their milestones differing from zero.

Unit costs and target setting assumptions - Analysis of RCO25 has highlighted that unit costs associated under the type of operation *'Flood and landslide*' vary significantly depending on the category of regions. On average, unit costs are higher in more developed regions (over 4 million EUR) than in less developed regions (under 1 million EUR). The review of methodological documents shows that most programmes have based their target setting on similar experiences. For example, the Spanish "Plurirregional" programme cites recent RRF planning while Portuguese "Norte Regional Programme 2021-2027" cites PT2020 (POSEUR) as reference for setting the targets.

Result indicators

Timeliness – Methodological documents do not specify when and how result indicators will be measured. However, their coherence with the SWD ensures that result indicators will be measured by the end of the project or upon output delivery.

Unit costs and target setting assumptions – The analysis of the relationship between RCO25 and RCR35 shows a regularity in target setting across programmes: population covered tends to increase with larger coastal strips, longer riverbanks and greater lakeshore flood protection.

Homogeneity (factors which might affect the capacity to reach targets)

Methodological documents rarely identify factors, **notably policy-related**, that might affect the target achievement.

- For RCO25, the Italian Campania programme refers to the time needed for the completion of the administrative and procedural phases, which are essential for the works.
- For RCR35, the Spanish Plurirregional programme refers to changes in municipal planning that could hinder programme implementation and target achievement.

Assessment of target setting and outliers

The analysis of methodological documents provides some insights into outlier programmes identified under Task 1a. The main reason which seems explaining outliers is the **variation of unit costs**. The Spanish Plurirregional programme builds on RRF planning to determine unit costs and provided significantly lower unit costs than other programmes. On the contrary, while applying a detailed and consistent methodology for RCO25 and RCR35, the Italian Campania programme estimates a significantly higher unit cost which results in fewer kms of intervention but with a relatively high population coverage due to regional high population density.

1.4.4 RSO 2.5 – Sustainable water

Indicators under assessment - The RSO 2.5 indicator assessment covers one common output and one common result indicator.

Common output indicator.

- **RCO30 is a common output indicator measuring the length of pipes for public water supply.** The assessment covers 7 programmes and related documents covering: France, Italy, Lithuania, Poland, Portugal and Spain.

Common result indicator.

- **RCR41 is a result indicator which measures the population connected to improved water supply.** The assessment builds on a review of 7 programmes and related methodological documents covering: France, Italy, Lithuania, Poland, Portugal and Spain.

Coherence with SWD

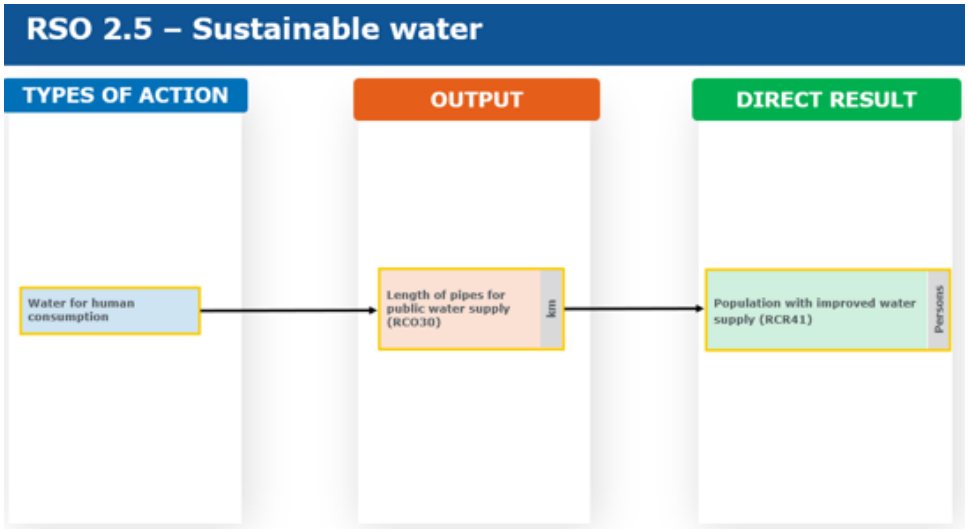
- **No methodological document has an indicator definition which is inconsistent with the SWD**. Methodological documents do not specify any concrete differences in the definition of the indicators. However, most reviewed methodological documents refer to the SWD and / or to common indicators without making explicit reference to SWD definitions, concepts and references. Since the programmes adopt common indicators, they should follow SWD standards and metadata.
- Across the analysed methodological notes, both indicators are used only under this RSO.

Homogeneity (granularity assessment) – The first step of the homogeneity assessment examines granularity focusing on investment actions reported in methodological documents to set indicator targets. As in other specific objectives, the study team has defined one type of RSO 2.5 investment action contributing to indicator valorisation in order to ensure consistency across the programmes under analysis and meaningful clusters of investment actions in line with the RSO intervention logic. This type of operation is defined by using Annex I CPR intervention fields, the correspondence table from the Cohesion data platform[14], textual analysis of programme specific actions as reported in the article 17 CPR methodological documents examined. This type of operation is *Water for human consumption,* covering investments in supply networks, drinking water extraction and treatment facilities.

The review of methodological documents provides qualitative and descriptive information on the links between types of actions and outputs and their contribution to the results. These links cannot necessarily be generalised to all investment actions under RSO 2.5 but they represent a tentative mapping of the logical chain between type of operations, outputs and results. The following chart illustrates this tentative mapping.

[14] https://cohesiondata.ec.europa.eu/2021-2027-Categorisation/Correspondence-21-27-to-14-20-intervention-fields/4s7y-iy43/about_data (last visit 12 September 2024)

Figure 8 Type of actions, output indicators and result indicators – RSO 2.5



Source: Consortium own elaborations

Homogeneity (target setting patterns) – The second step of homogeneity assessment identifies consistent patterns in target setting assumptions across programmes.

Output indicators

Timeliness - 64% of the reviewed actions contributing to RCO30 are expected to deliver some outputs by 2024, with their milestones differing from zero.

Unit costs and target setting assumptions - The unit costs associated under the type of operation 'water for human consumption' (when specified) are on average higher in more developed than in less developed regions. The methodological document review highlights that most of the programmes relied on historical unit costs and updated them by an inflation correction.

Result indicators

Timeliness - Despite the fact that methodological documents rarely provide information on unit costs, their review supports a comparative analysis of the selected output and result indicator targets.

Unit costs and target setting assumptions - When investment actions simultaneously use both RCO30 and RCR41, in general, a greater length of water pipes (higher value of RCO30) is associated with a greater increase in population covered, measured by RCR41 (difference between the final target and the baseline). The main sources of target setting are both data from the past programming period as well as statistical data. More specifically, historical unit costs from projects approved in the context of the previous programming period were used as a basis and updated by an inflation correction. As a difference from the output indicator, programmes (e.g. the Spanish Plurirregional programme and the Portuguese Centro regional programme) also relied on existing statistics of population connected with public water supply as a result of the implemented projects.

Homogeneity (factors which might affect the capacity to reach targets) – The analysis of homogeneity ends with the review of factors which might affect the progress and capacity of the programme to achieve the targets. **The methodological document analysis shows that**

factors which might affect the capacity to reach output indicator targets are often policy related. Organisational and financial difficulties may arise during the implementation of such infrastructure projects, creating issues in the pursuit of intermediate goals and therefore leading to the extension of implementation deadlines. Other economic factors such as increased prices can also slow implementation and achievements. In case of the result indicator, the most cited factors which can affect the capacity to achieve target values are related to those mentioned for the outputs and also to budgetary constraints as well as tensions in construction and civil works sector.

Assessment of target setting and outliers – The analysis of methodological documents helps explore why some programmes, specifically the Italian Campania as well as the Portuguese Centro and Norte regional programmes are outliers as identified by the Task 1a analysis.

For RCO 30, the analysis of methodological documents does not provide sufficient information because such programmes used similar target setting methods to the non-outliers' ones i.e. based on past experiences and considering price fluctuations. Therefore, differences in unit costs might be due to the type of references used and interventions supported.

For RCR41, the target value for the indicator has been calculated using data from a from a Regional Plan for the organization of the integrated water service in Italy, and data from the 2014-2020 CO18 indicator 'Additional population served by water supply improvements' in Portugal. The fact that the current situation may differ and that the specifics of the project may no longer be fully applicable, provides two possible explanations for why the programmes might be seen as outliers. In addition, none of those three programmes indicated using statistical data, which might be an explanation as to why they were identified as outliers.

1.4.5 RSO 2.6 – Circular economy

The RSO 2.6 indicator assessment covers one common output and one common result indicator.

Indicators under assessment

Common output indicator.

- **RCO34 is a common output indicator measuring additional capacity for waste recycling, measured in tonnes/year**. The assessment in task 1b includes 7 programmes and related documents covering Belgium, Germany, Greece, France, Italy, Lithuania and Malta.

Common result indicator.

- **RCR47 is a result indicator measuring waste recycled, measured in tonnes/year**. Similarly to RCO34, the indicator measures only *additional* annual tonnage of waste recycled through supported projects. The assessment in task 1b includes 7 programmes and related documents covering Belgium, Germany, Greece, France, Italy, Lithuania and Malta.

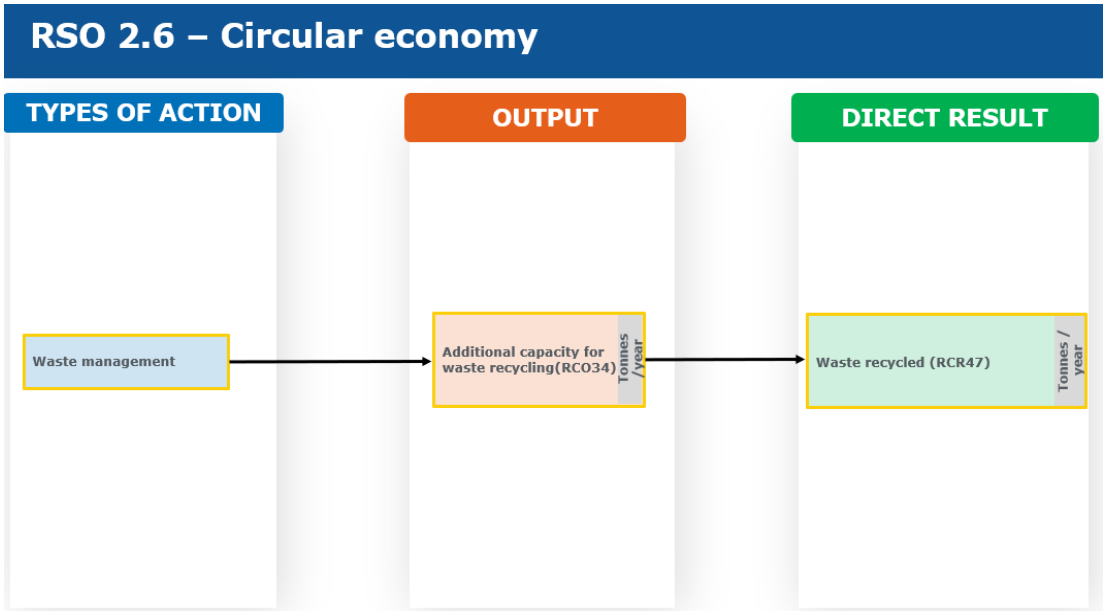
Coherence with SWD

- **No methodological document contains an indicator definition that is inconsistent with the SWD.** For most observations (75%) coherence is assumed, while for the remainder (25%) is clearly stated.
- For both indicators, the reference cited in the SWD is the Directive 2008/98/EC of the European Parliament and of the Council on waste.
- **Both indicators used under RSO2.6 are used exclusively under this RSO**. Hence, coherence with other specific objectives cannot be assessed.

Homogeneity (granularity assessment)

- All analysed actions (for both indicators) under RSO 2.6 fall under the '*Waste management*' type of operation category, making it the only relevant category under this specific objective for the indicators considered.
- Twelve programmes (out of fourteen analysed) detail a single action contributing to the valorisation of the indicators. This demonstrates a high degree of linearity in the intervention logic under RSO 2.6.

Figure 9 Type of actions, output indicators and result indicators – RSO 2.6



Source: Consortium own elaborations

Homogeneity (target setting patterns) - Unit costs associated to the actions are not available disaggregated by category of region in most cases under RCO34. The analysis indicates that the average unit cost ranges between 555 and 700 thousand EUR. However, this analysis should be taken with caution as few programmes indicate unit costs.

When considering RCO34 and RCR47 together, a high correlation is observed between greater additional waste recycling capacity created (RCO34) and the increase in the amount of recycled waste (RCR47). It is important to note the difference between these two indicators: while **RCO34** is delivered upon project completion, **RCR47** is recorded one year after the completion of the output. This means that to ensure the timely measurement of **RCR47**, it will be necessary to set up ad hoc monitoring tools at the infrastructure level, as statistical sources are typically monitored and reported with some delay.

Homogeneity (factors which might affect the capacity to reach targets) - The analysis of the methodological documents reveals that more than half of the analysed programmes (5) identify policy factors as potential obstacles to achieving targets. Similarly, economic factors and the international context are cited by half (4) of the sample of programmes.

For example, the French Auvergne-Rhone-Alpes-ERDF/ESF+/JTF programme cites for RCR47 potential overlaps between EU funds and changes in public spending as potential factor which can affect target achievement. The Maltese programme cites inflation as a potential factor, although it has been already considered for target setting.

Assessment of target setting and outliers

The analysis of methodological documents provides limited information on outlier programmes. In the Italian Sicilian programme, the final targets for **RCR47** are linked to **RCR103** (Circular: Waste collected separately), as it is estimated that approximately 80% of the total amount of additional separate collection created through the funded interventions can enter preparation for recycling. This linkage can likely explain the significantly higher values observed compared to other regions. Similarly, the **French programme** for **Auvergne-Rhône-Alpes** sets the target for **RCR47** based on another indicator (the corresponding output indicator), stating that the operational management estimates this target value at 70% of the value of the output indicator.

1.4.6 RSO 2.7 – Nature protection and biodiversity

Indicators under assessment - The RSO 2.7 indicator assessment covers two common output and one common result indicators.

Common output indicators.

- RCO36 is a common output indicator measuring the green infrastructure supported for other purposes than adaptation to climate change. The assessment considers 10 programmes covering Belgium, France, Greece, Italy, Lithuania, Portugal, Slovenia and Spain.
- **RCO37 measures the surface area** (in hectares) **of Natura 2000 sites covered by protection and restoration measures.** Task 1b reviews 9 programmes and related documents from Belgium, France, Greece, Italy, Lithuania, Portugal, Slovenia and Spain.

Common result indicator.

- **RCR95 is a result indicator which measures the population having access to new or improved green infrastructure**. It is based on the estimated population living within a 2km radius from the public green infrastructure built or upgraded by the projects. The assessment reviews 9 programmes and related methodological documents covering Belgium, Greece, Italy, Lithuania, Portugal, Slovenia and Spain.

Coherence with SWD

- **No methodological document provides an indicator definition which is inconsistent with the SWD**. Although the documents do not specify concrete differences in the indicator definitions, most refer to the SWD and/or to common indicators without explicitly referencing SWD definitions, concepts, or metadata. Since the programmes use common indicators, they are expected to adhere to SWD standards and metadata.
- Both RCO37 and RCR95 indicators are primarily used mainly under this RSO. Anyhow, the analysis shows clearly that the **methodological documents do not indicate any differences in the definition across specific objectives**.

Homogeneity (granularity assessment) – The first step in the homogeneity assessment examines the granularity of investment actions reported in methodological documents to set indicator targets. As in other specific objectives, the study team has defined types of RSO 2.7 investment actions contributing to the valorisation of indicators in order to ensure consistency across the programmes under analysis and meaningful clusters of investment actions in line with the RSO intervention logic. These types are defined based on Annex I CPR intervention fields, the correspondence table from the Cohesion data platform[15], textual analysis of programme specific actions as reported in the article 17 CPR methodological documents examined. These types of investment actions are:

- *Air quality* – Investments in air pollution monitoring and control systems.

[15] https://cohesiondata.ec.europa.eu/2021-2027-Categorisation/Correspondence-21-27-to-14-20-intervention-fields/4s7y-iy43/about_data (last visit 12 September 2024)

- *Natura 2000* – Nature conservation and protection measures targeting Natura 2000 areas, the restoration of species and habitats' conservation status, enhancement of Natura 2000 management models.
- *Nature and biodiversity protection* – Activities aimed at the development and regeneration of green spaces and the promotion of biodiversity.

The analysis of the reviewed investment actions reveals that they contribute differently to the valorisation of the indicators under assessment as presented in the following table.

Table 11 Types of investment actions and contribution to the RSO 2.7 indicators under assessment

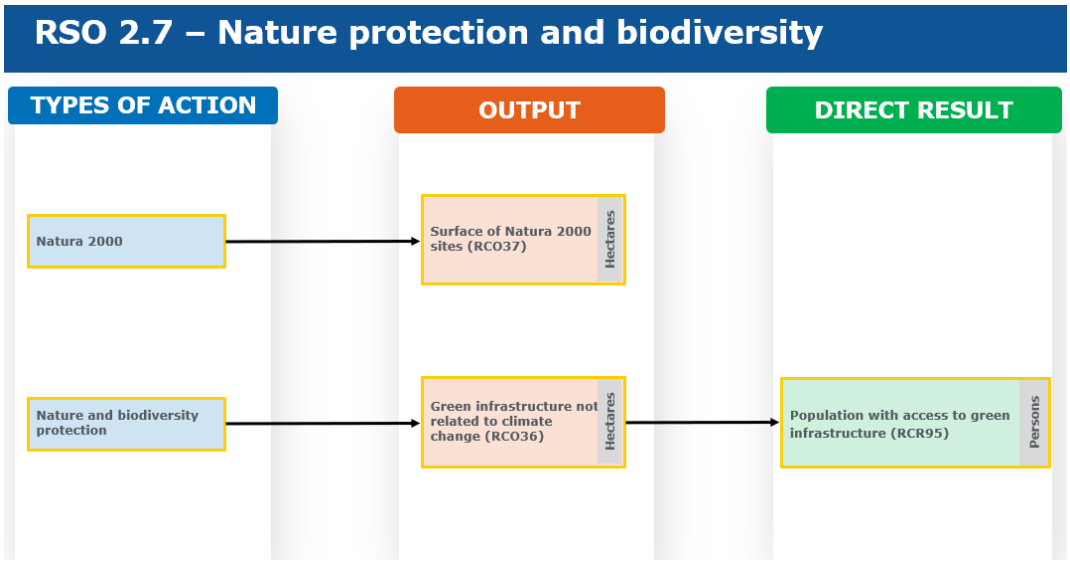
	RCO36	RCO37	RCR95
Air quality	/	/	Low
Natura 2000	/	Medium	Low
Nature and biodiversity protection	High	High	High

'/' : no contribution to the indicator
Low: less than 20% of the investment actions contribute to the indicator
Medium: between 20% and 40% of the investment actions contribute to the indicator
High: more than 40% of the investment actions contribute to the indicator

Source: Consortium own elaborations

The review of methodological documents provides qualitative and descriptive insights into the links between types of actions and outputs and their contribution to the results. Whie these links cannot necessarily be generalised to all investment actions under RSO 2.7, they are summarised in the following chart as a tentative mapping of the logical chain between type of operations, outputs and results.

Figure 10 Type of actions, output indicators and result indicators – RSO 2.7



Source: Consortium own elaborations

Homogeneity (target setting patterns) – The second step of homogeneity assessment identifies consistent patterns in target setting assumptions across programmes.

Output indicators

Timeliness – The analysis shows that *nature and biodiversity protection* investment actions contribute to both output indicators RCO36 and RCO37. For this type of operations, RCO36 is expected to deliver more quickly outputs than RCO37. In contrast, Natura 2000 investment actions also contribute to RCO37, with these actions expected to deliver outputs by 2024 faster than nature and biodiversity protection actions.

Unit costs and target setting assumptions – For both indicators, the unit costs associated under the type of operation 'nature and biodiversity protection' vary significantly depending on the category of regions. Unit costs are on average higher in more developed regions compared to less developed regions.

The methodological document review **for RCO36** highlights the following patterns.

- Most programmes set targets based on past programming periods or similar experiences.
- Inflation adjustments were considered in target setting.
- The type of green infrastructure (e.g., urban revitalization, reforestation, marine restoration) significantly affects unit costs and target values.

For RCO37, the methodological document review shows that:

- Most of the programmes established targets based on the past programming period;
- Almost all programmes considered inflation increase when setting up targets.

Result indicators

Timeliness – While methodological documents rarely specify when and how result indicators will be measured, their alignment with the SWD ensures that measurement occurs immediately after output completion.

Unit costs and target setting assumptions – Although methodological documents provide limited information on unit costs for result indicators, their review allows for a comparative analysis of the selected output and result indicator targets when both are used together.

- RCO36 and RCR95 are inherently linked, as RCR95 is calculated considering the value of RCO36. However, their relationship is not linear, it depends on the population density near the intervention area and the number of areas.
- On the contrary, as expected from the SWD, RCO37 and RCR95 are rarely used together. In many cases, programmes use programme-specific result indicators with RCO37. These programme-specific result indicators usually refer to the number of municipalities or the species / habitats protected.

Homogeneity (factors which might affect the capacity to reach targets) – The analysis of homogeneity concludes with a review of factors that might affect the programme capacity to reach its targets.

These factors are primarily related to policy and economics:

- Potential delays in project schedules, particularly due to issues in the timely approval of documentation, could hinder progress.
- Increased prices, inadequate sea transport infrastructure, and challenges in maintaining up-to-date information systems on forest areas could also slow implementation and target achievement.

- For result indicators, factors such as the length of the construction season during implementation are frequently cited as obstacles.

Assessment of target setting and outliers – The analysis of methodological documents helps explain why some programmes are identified as outliers in Task 1a. A primary reason for these outliers is the different approach to unit cost estimation.

- For RCO 36, the Sicilian regional programme (Italy) as well as the Bretagne regional programmes (France) were identified as outliers in task 1a.
- For RCR 95, the Sicilian regional programme was also identified as an outlier in task 1a but followed a similar approach to other programmes based on the SWD definition and concepts. Despite following a similar approach to other programmes based on the SWD definition, the strong association between the RCR95 target value and the extension of the output indicator likely explains its status as an outlier for the result indicator as well.

1.4.7 RSO 2.8 – Sustainable urban mobility

Indicators under assessment - The RSO 2.8 indicator assessment covers two common output and three common result indicators.

Common output indicators.

- RCO57 is a common output indicator measuring passenger capacity of environmentally friendly rolling stock for collective public transport financed by supported projects. The assessment reviews 9 programmes and related documents covering Croatia, Greece, Italy, Lithuania, Poland, Romania and Spain.
- RCO58 measures the length (in km) of dedicated cycling infrastructure newly built or significantly upgraded by projects supported. Task 1b covers 8 programmes and related documents from Croatia, Italy, Lithuania, Poland, Romania and Spain.

Common result indicators.

- **RCR29 is a result indicator which measures the total estimated GHG emissions for the entities or processes supported**. It is based on a reclassification of 2014-2020 common indicator CO34. The assessment builds on a review of 5 programmes and related methodological documents covering: Croatia, Greece, Lithuania, Romania and Spain.
- **RCR63 covers the annual users of tram and metro lines**. Task 1b covers 6 programmes and related methodological documents regarding Croatia, Italy, Poland, Romania and Spain.
- **RCR64 measures the annual users of supported cycling infrastructure.** Task 1b reviews 8 programmes and related methodological documents covering: Croatia, Italy, Lithuania, Romania, Slovenia and Spain.

Coherence with SWD

- **No methodological document has an indicator definition which is inconsistent with the SWD**. Methodological documents do not specify any concrete differences in the definition of the indicators. However, most reviewed methodological documents refer to the SWD and / or to common indicators without making explicit reference to SWD definitions, concepts and references. Since the programmes adopt common indicators, they should follow SWD standards and metadata.
- **No remarkable differences in the definition across several specific objectives**. The analysis shows clearly that the methodological documents do not indicate any differences in the definition across several specific objectives.

Homogeneity (granularity assessment) – The first step of the homogeneity assessment examines granularity with a focus on investment actions reported in methodological documents to set indicator targets. As in other RSOs, the study team has defined types of RSO 2.8 investment actions contributing to indicator valorisation in order to ensure consistency across the programmes under analysis and meaningful clusters of investment actions in line with the RSO intervention logic. These types build on Annex I CPR intervention fields, the correspondence table from the Cohesion data

platform[16], textual analysis of programme specific actions as reported in the article 17 CPR methodological documents examined. These types of investment actions are:

- *Clean urban transport* – Investments in clean rolling stock, public transport and alternative fuels infrastructure.
- *Cycling infrastructure* – Covering cycling pathways and other infrastructure supporting the use of bikes.
- *Intelligent and digital transport* – Activities for the digitalisation and ICT applications to urban transport.

Analysis of the reviewed investment actions shows they contribute differently to the valorisation of the indicators under assessment as presented in the following table. Moreover, the programmes reviewed do not provide any clear indication on the link between the proposed indicators and the type of operation '*intelligent and digital transport*'. Therefore, the analysis focuses mainly on the two types of investment actions.

Table 12 Types of investment actions and contribution to the RSO 2.8 indicators under assessment

	RCO57	**RCO58**	**RCR29**	**RCR63**	**RCR64**
Clean urban transport	High	Low	High	High	Medium
Cycling infrastructure	/	High	/	/	High

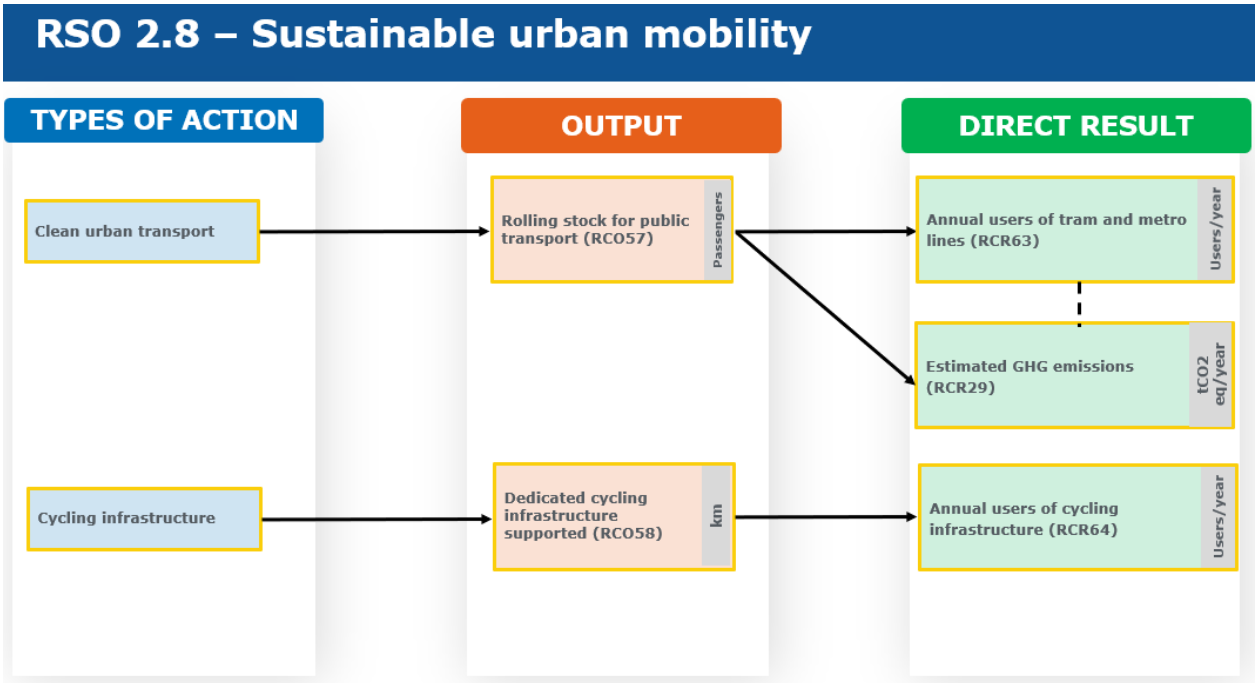
'/' : no contribution to the indicator
Low: less than 20% of the investment actions contribute to the indicator
Medium: between 20% and 40% of the investment actions contribute to the indicator
High: more than 40% of the investment actions contribute to the indicator

Source: Consortium own elaborations

Methodological document review provides qualitative and descriptive information to explore links between types of actions and outputs and their contribution to the results. These links cannot be necessarily generalised to all investment actions under RSO 2.8 but represent a tentative mapping of the logical chain between type of operations, outputs and results.

[16] https://cohesiondata.ec.europa.eu/2021-2027-Categorisation/Correspondence-21-27-to-14-20-intervention-fields/4s7y-iy43/about_data (last visit 12 September 2024)

Figure 11 Type of actions, output indicators and result indicators – RSO 2.8



Source: Consortium own elaborations

Homogeneity (target setting patterns) – The second step of homogeneity assessment identifies consistent patterns in target setting assumptions across programmes.

Output indicators

Timeliness – Methodological documents do not necessarily clarify when and how result indicators will be measured but ensure consistency with SWD, which proposes the JASPERS methodology[17]. In this regard, the SWD indicates that both RCR63 and RCR64 refer to the effects on the use of transport infrastructure one year after the completion of output in the supported project, while RCR29 upon completion of the intervention. This seems strange because the benefits in terms of GHG emission reduction can be achieved only when there is an increase in public transport use for urban mobility.

Unit costs and target setting assumptions - Despite methodological documents rarely provide information on unit costs for the result indicators, their review supports a comparative analysis of the selected output and result indicator targets. This allows to elaborate some reflections on patterns of target setting.

[17] https://ec.europa.eu/regional_policy/sources/policy/evaluations/guidance/2021/transport-indicators/methodl_support_indicators_post_2020_en.pdf. It is interesting to notice that for RCR64, this guidance suggests field surveys, permanent counters of cyclist' passage, online tools. However, these types of methodological sources are not necessarily specified in the methodological documents but might be mentioned in applicants guidance. This might also suggest that programme authorities have not identified yet a standardised approach to data collection of result indicators.

- When investment actions simultaneously use both RCO57 and RCR29, in general, a greater passenger capacity (higher value of RCO57) is associated with a greater expected decrease in RCR29 (difference between the final target and the baseline). The main sources of target setting of RCR29 are the past programming period, the National Climate and Energy Plan (in Lithuania) and other studies.
- Few investment actions use simultaneously RCR63 and RCO57. In these cases, a greater passenger capacity (higher value of RCO57) is associated with a greater increase in number of users, measured by RCR63. Therefore, there is a common logic behind programmes: more investments in clean urban mobility and rolling stock triggers greater annual use. This is also in line with the findings from RCR29. Target setting is based on ad hoc studies, project cost benefit analysis of supported infrastructure and transport models.
- When 'cycling infrastructure' investment actions use both RCO58 and RCR64, there is an interesting correlation between longer cycling paths (greater RCO58 value) and greater annual use of cycling infrastructure (RCR64) in the entire set of analysed programmes.

Homogeneity (factors which might affect the capacity to reach targets) – The analysis of homogeneity also covers factors which might affect the capacity to reach output indicator targets. These factors are usually related to the economy and relates to inflation and price fluctuation and long-term effects of the COVID-19 crisis and recovery on the supply chains. However, methodological documents also refer to technological evolution, which can lower prices. Policy factors which can also slow implementation and achievements are the capacity of the beneficiaries to prepare the technical-financial documentation, unforeseen events during the execution of the works due to adverse weather conditions. In case of result indicators, the most cited factors which can affect the capacity to achieve target values are related to those mentioned for the outputs and also to the local authorities' and transport companies initiatives regarding service provision and organisation as well as tariff policies.

Assessment of target setting and outliers – The analysis of methodological documents helps explore why some programmes, in particular the Polish Infrastructure, Climate, Environment programme and the Croatian Competitiveness and Cohesion programme are outliers according to the task 1a analysis.

Different unit costs - For RCO 57, the use of different unit costs based on historical experience and the type of vehicles can explain why the Polish Infrastructure, Climate, Environment programme may be seen as an outlier. Moreover, this programme adopted a prudent approach which was not explicitly mentioned in other methodological documents. This approach was due to past experience with price fluctuations. Therefore, based on this past experience, all the estimated unit costs were increased by 25% to mitigate the effects on the indicator targets. The use of historical unit costs based on a specific urban project was also the approach of the Polish programme to estimate the RCR63 target. The fact that the current situation may differ and that the specifics of the project may no longer be fully applicable or very different from others, provides two possible explanations for why the programme might be seen as an outlier.

For RCO 58, the Croatian Competitiveness and Cohesion programme adopted a much smaller unit cost based on the past experience, without proposing, at least explicitly in the methodological document, any price adjustments. This can contribute to explaining why this programme is

considered an outlier in task 1a. For RCR 64, the Croatian Competitiveness and Cohesion programme essentially relies on an estimate of the portion of the total population who can potentially use supported cycling infrastructure. However, the fact that this target value does not build on RCO58, neither uses historical data nor follows local sustainable mobility urban plans estimates, as other methodological documents do, might explain why the programme is an outlier.
Lack of specification of investment actions – For RCR63, the Croatian Competitiveness and Cohesion programme estimates the target value to measure the direct effects of several activities (e.g. the reconstruction of the tram line, the purchase of new trams for city transport and the modernization of tram infrastructure). This can contribute to explaining why the programme can be seen as an outlier. The Polish Infrastructure, Climate, Environment programme, on the other hand, relies on expert estimates for a specific urban project and takes into account historical unit costs, allocation, and the effects of the pandemic. The fact that the current situation may differ and that the specifics of the project may no longer be fully applicable, provides two possible explanations for why the programme might be seen as an outlier.

1.4.8 Overall results of the indicator analysis under Policy Objective 2

This section presents the overall findings from the indicator analysis related to Policy Objective 2 (PO2).

1.4.8.1 Coherence with SWD

The coherence assessment examines the alignment of indicators with the definitions and concepts outlined in the SWD metadata. This review ensures that the indicators are reliably defined and applied consistently across the programmes, as required by Article 17 of the CPR.

Key Findings:

1. **Consistency with SWD Guidelines**: All reviewed methodological documents were found to be in line with the SWD guidelines, with no discrepancies in indicator definitions.
2. **No Substantial Differences Across Specific Objectives**: The analysis revealed no significant differences in the definitions of indicators across the various specific objectives in the programmes.

These outcomes underscore the reliability and consistency of the indicators used for monitoring programme performance. However, it is important to note that while the coherence assessment is clear and positive, it primarily covers the definition, concepts, and references related to indicators. It does not address aspects like the timing (when) or the methodology (how) the indicators will be measured. While the SWD specifies when output indicators should be measured, it leaves the timing for result indicators up to the programmes, with the stipulation that measurement must occur no later than one year after the corresponding output is completed.

1.4.8.2 Homogeneity assessment

Homogeneity (granularity assessment) – The first step of involves evaluating the granularity of the investment actions as reported in the methodological documents. Granularity here refers to the level of detail in how investment actions are linked to the indicators.

There are significant differences between specific objectives.

- **RSO 2.1, RSO 2.2 and RSO 2.5** typically involve multiple actions contributing to each indicator, which means a more complex relationship between actions and indicators under assessment.
- **RSO 2.4, 2.6 and 2.8**, however, often associate one single investment action to each indicator, reflecting simpler interventions in these specific objectives.
- **The situation in RSO 2.7 is mixed**. For this latter, while a single action often supports RCO36 (green infrastructure supported for other purposes than adaptation to climate change), indicators like RCO37 and RCR95 are linked to multiple actions.

Homogeneity (target setting patterns) – The second step of the homogeneity assessment looks for consistent patterns in how targets are set across programmes. This involves examining the logic behind setting milestone and target ratios for output indicators, and how these relate to corresponding result indicator targets.

- **Sources for target setting**: The most commonly used sources for setting targets include previous programming periods and similar past experiences. These sources help inform target-setting assumptions for the indicators under review.
- In many cases, **the types of investment actions proposed within each specific objective show different patterns in indicative unit costs** as well as in terms of **milestone / target ratio** for the output indicators. A few examples follow here below.
    a. In RSO 2.1, energy efficiency interventions in housing are typically more costly than energy efficiency in public infrastructure. Moreover, about 43% of the reviewed investment actions for this objective have a milestone/target ratio higher than zero.
    b. **In RSO 2.2,** actions supporting investments in several types of renewable energy are usually more costly than others. Among the different types of renewable energy, investments financing renewable energy biomass actions are on average more costly than actions for wind or solar renewable energy. Overall, 50% of the reviewed investment actions of RCO22 are expected to deliver some outputs by 2024,
    c. RSO 2.4, interventions related to coastal protection investments typically have higher unit costs compared to those focused on water resource management. The milestone / target ratio is higher than zero in 30% of the reviewed investment actions.

Homogeneity (factors which might affect the capacity to reach targets) - **Factors that might impact the capacity to reach targets are often policy-related** such as

- Delays in ERDF programming and in the preparation and approval of technical and financial documentation.
- Changes in project schedules, which can delay implementation.
- Competition with other funding sources, supply shortages, rising prices, or inflation.
- Delays in the delivery of parts, equipment, and materials to construction sites.

1.4.8.3 Assessment of target setting and outliers

The analysis also explores why some programmes were identified as **outliers** in **Task 1a**. Outliers are programmes that exhibit behaviours deviating from the average relationship between indicator targets and the invested amount. The most frequent reasons for outliers are the following.

- **Lack of specification of investment actions** in the methodological documents and in the target setting process.
- **Different unit costs** which can result in target-setting discrepancies.
- **Weak basis for target and unit cost Estimations**: some programmes calculated unit costs based on limited or singular data sources, which could skew target-setting estimations. Similarly, using different data sources for defining targets, compared to other programmes, may lead to inconsistencies.

1.5 POLICY OBJECTIVE 3

1.5.1 RSO 3.1 – Sustainable TEN-T

Indicators under assessment - The RSO 2.5 indicator assessment covers two common output and one common result indicator.

Common output indicator.

- **RCO47 is a common output indicator measuring the length of new or upgraded rail - TEN-T.** The assessment covers 5 programmes and related documents from Bulgaria, Greece, Italy, Romania and Spain.
- **RCO49 is a common output indicator measuring the length of rail reconstructed or modernised - TEN-T.** The assessment includes 7 programmes and related documents covering: Bulgaria, Croatia, Czechia, Greece, Italy, Romania and Spain.

Common result indicator.

- **RCR58 is a result indicator which measures the annual users of newly, built, upgraded, reconstructed or modernised railways.** The assessment builds on a review of 6 programmes and related methodological documents covering: Croatia, Czechia, Greece, Italy, Romania and Spain.

Coherence with SWD

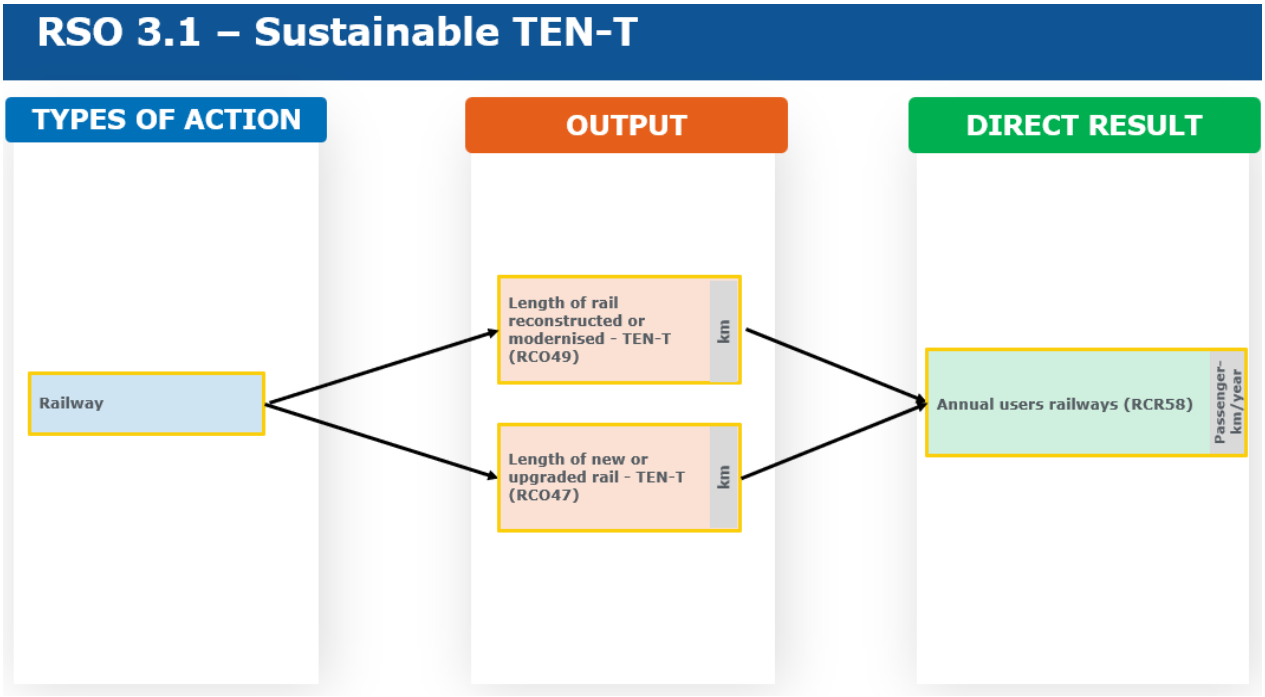
- **No inconsistencies in indicator definitions were found in the reviewed methodological documents**. While the methodological documents generally refer to the **SWD**, many do not explicitly state the SWD definitions and references.
- Across the analysed methodological notes, both RCO47 and RCO49 indicators are used only under this RSO. RCR58, whenever it is used in other RSO, also shows no differences in definition across the reviewed methodological documents.

Homogeneity (granularity assessment) – The first step of the homogeneity assessment examines granularity focusing on investment actions reported in methodological documents to set indicator targets. As in other RSOs, the study team has defined one type of RSO 3.1 investment action contributing to indicator valorisation in order to ensure consistency across the programmes under analysis and meaningful clusters of investment actions in line with the RSO intervention logic. This type is based on Annex I CPR intervention fields, the correspondence table from the Cohesion data platform[18], textual analysis of programme specific actions as reported in the article 17 CPR methodological documents examined. This type of operation is *Railway transport*.

The methodological document review provides qualitative and descriptive information to explore links between types of actions and outputs and their contribution to the results. These links cannot be necessarily generalised to all investment actions under RSO 3.1 but represent a tentative mapping of the logical chain between type of operations, outputs and results.

[18] https://cohesiondata.ec.europa.eu/2021-2027-Categorisation/Correspondence-21-27-to-14-20-intervention-fields/4s7y-iy43/about_data (last visit 12 September 2024)

Figure 12 Type of actions, output indicators and result indicators – RSO 3.1



Source: Consortium own elaborations

Homogeneity (target setting patterns) – The second step of homogeneity assessment identifies consistent patterns in target setting assumptions across programmes.

Output indicators

Timeliness – For RCO47 and RCO 49, respectively 9% and 29% of the reviewed actions are expected to deliver some outputs by 2024, because their milestones are planned as different from zero.

Unit costs and target setting assumptions – Regarding RCO47, the unit costs for the type of operation 'railway transport' are on average higher in transition regions compared to less developed regions. However, the categorisation of regions is not fully applicable because a large of resources is invested in CF regions. For RCO49, such unit costs are on average higher for CF-financed actions than in less developed regions financed by the ERDF. The review of methodological documents highlights that most programmes relied on data from similar experiences as well as ad hoc studies. It is worth noting that despite some similar indicator already existing in the previous programming period (CO11a: Total length of new railway line of which TEN-T and CO12a: Total length of reconstructed of upgraded railway line of which TEN-T[19]), no Programme used past data when calculating the targets.

[19] Output indicators RCO47 'Length of new or upgraded rail - TEN-T' and RCO49 'Length of rail reconstructed or modernised - TEN-T' are derived from 2014-2020 indicators CO11a 'Total length of new railway line, of which: TEN-T' and CO12a 'Total length of reconstructed or upgraded railway line, of which: TEN-T'. It is interesting to note that for the new programming period, indicator CO11a has been updated

Result indicators

Timeliness - Despite the fact that methodological documents rarely provide information on unit costs, their review supports a comparative analysis of the selected output and result indicator targets.

Unit costs and target setting assumptions – In general, a greater length of new or upgraded rail - TEN-T (reflected in a higher value for RCO47) and/or a greater length of rail reconstructed or modernised - TEN-T (reflected in a higher value for RCO49) is associated with a larger increase in the number of annual users, measured by RCR58. The primary sources of target setting are ad hoc studies.

Homogeneity (factors which might affect the capacity to reach targets) – The analysis of homogeneity ends with the review of factors which might affect the progress and capacity of the programme to achieve the targets. **The methodological document analysis shows that factors which might affect the capacity to reach output indicator targets are often policy related**. Administrative difficulties regarding the conduction of public procurement procedures, the selection of a contractor, the obtention of building permits may arise and lead to some delays in the implementation of the planned activities. Other economic factors such as increased in raw materials and energy prices can also slow implementation and achievements. In case of the result indicator, the most cited factors which can affect the capacity to achieve target values are related to those mentioned for the outputs.

Assessment of target setting and outliers – Task 1a identifies very few outlier programmes, which are not covered by the task 1b sample.

and has absorbed part of indicator CO12a, i.e., referring to the upgraded railway lines in order to become RCO47 (which includes both new and upgraded rail). RCO49 derives from CO12a minus the 'upgraded' part, and to which 'modernised rail' has been added. Such updates are the result of the REGIO Evaluation Network Meeting on ERDF and CF common indicators of April 11th, 2019, where it emerged that '*RCO47 should be applied to cases where investments help to achieve compliance with TEN-T standards. All other upgrades (ex: upgrades for a rail which is already TENT) should be included in RCO49*' (inputs from Unit B2, REGIO Evaluation Network Meeting –Minutes for sessions on ERDF and CF common indicators).

1.6 POLICY OBJECTIVE 4

1.6.1 RSO 4.2 – Education and training infrastructure

Indicators under assessment - The RSO 4.2 indicator assessment covers two common output and two common result indicators.

Common output indicators.

- RCO66 is a common output indicator measuring the classroom capacity of new or modernised childcare facilities. The assessment covers 6 programmes and related documents from Italy, Lithuania, Poland, Romania and Spain.
- **RCO67 measures the classroom capacity of new or modernised education facilities**. Task 1b reviews 6 programmes and related documents covering Italy, Lithuania, Poland, Romania and Spain.

Common result indicator.

- **RCR70 is a result indicator which measures the annual users of new or modernised childcare facilities**. The assessment builds on a review of 6 programmes and related methodological documents covering: Italy, Lithuania, Poland, Romania and Spain.
- **RCR71 is a result indicator which measures the annual users of new or modernised education facilities**. The assessment builds on a review of 6 programmes and related methodological documents covering: Italy, Lithuania, Poland, Romania and Spain.

Coherence with SWD

- No methodological document has an indicator definition which is inconsistent with the SWD. While the methodological documents do not specify any concrete differences in the definition of the indicators, they usually refer to the SWD without explicitly citing SWD definitions, concepts and references. Since the programmes adopt common indicators, they are expected to follow SWD standards and metadata.
- Across the analysed methodological notes, all indicators are primarily used only under this RSO. There are no remarkable differences in the definition across specific objectives in the remaining cases.

Homogeneity (granularity assessment) – The first step of the homogeneity assessment examines granularity with a focus on investment actions reported in methodological documents to set indicator targets. As in other specific objectives, the study team has defined types of RSO 4.2 investment actions contributing to indicator valorisation in order to ensure consistency across the programmes under analysis and meaningful clusters of investment actions in line with the RSO intervention logic. These types are based on Annex I CPR intervention fields, the correspondence table from the Cohesion data platform[20], textual analysis of programme specific actions as reported in the article 17 CPR methodological documents examined. These types of investment actions are:

- *Infrastructure for early childhood education* – Investments in pre-school education infrastructure.

[20] https://cohesiondata.ec.europa.eu/2021-2027-Categorisation/Correspondence-21-27-to-14-20-intervention-fields/4s7y-iy43/about_data (last visit 12 September 2024)

- *Infrastructure for primary and secondary education* – Investments in primary and secondary education centres.
- *Infrastructure for tertiary education* – Activities for the improvement of tertiary education systems.
- *Infrastructure for vocational education* – Activities supporting vocational education infrastructure.

Analysis of the reviewed investment actions shows they contribute differently to the valorisation of the indicators under assessment as presented in the following table.

Table 13 Types of investment actions and contribution to the RSO 4.2 indicators under assessment

	RCO66	RCO67	RCR70	RCR71
Infrastructure for early childhood education	High	/	High	/
Infrastructure for primary and secondary education	/	High	/	High
Infrastructure for tertiary education	/	Low	/	Low
Infrastructure for vocational education	/	Low	/	Low

'/' : no contribution to the indicator

Low: less than 20% of the investment actions contribute to the indicator

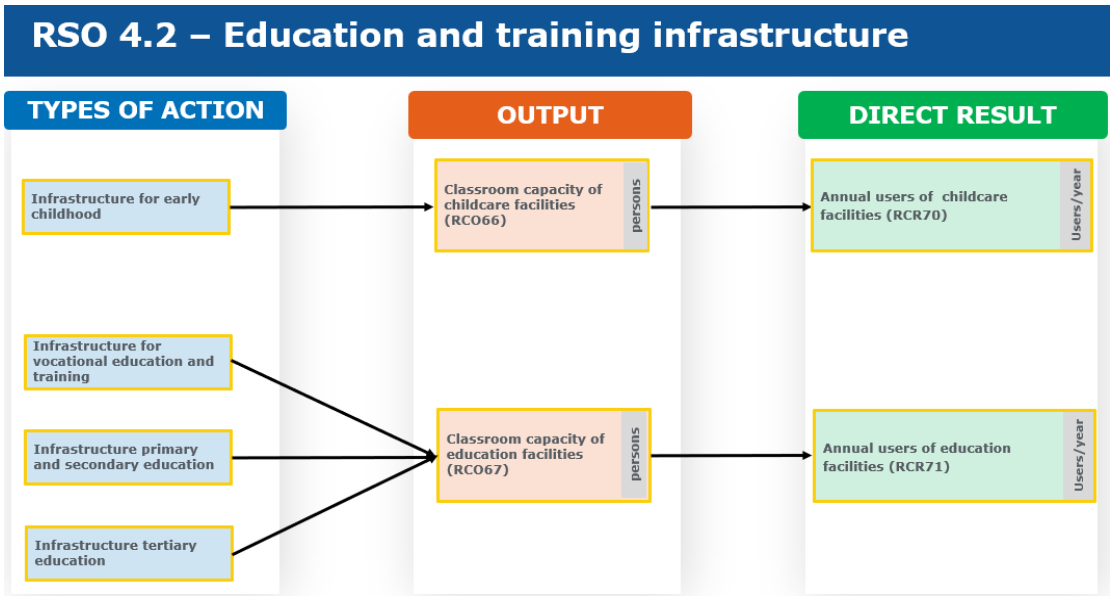
Medium: between 20% and 40% of the investment actions contribute to the indicator

High: more than 40% of the investment actions contribute to the indicator

Source: Consortium own elaborations

The review of methodological documents provides qualitative and descriptive information on the links between types of actions and outputs and their contribution to the results. These links cannot necessarily be generalised to all investment actions under RSO 4.2 but represent a tentative mapping of the logical chain between type of operations, outputs and results as illustrated below.

Figure 13 Type of actions, output indicators and result indicators – RSO 4.2



Source: Consortium own elaborations

Homogeneity (target setting patterns) – The second step of homogeneity assessment identifies consistent patterns in target setting assumptions across programmes.

For RCO66, the analysis shows that '*infrastructure for early childhood*' is the most relevant type of operations. Overall, 29% of the reviewed actions expect to deliver some outputs by 2024, as their milestones are different from zero. The methodological document review highlights that all programmes set targets based on similar experiences from the past programming period. The unit costs associated under the type of operation 'infrastructure for early childhood' are on average higher in less developed than in more developed regions, however, most evidence comes from less developed regions.

For RCO67, the analysis highlights that *'infrastructure for primary and secondary education'* investment actions are the most relevant. Overall, 16% of the reviewed actions expect to deliver some outputs by 2024, with milestones greater than zero. The review of methodological documents highlights that all programmes set targets based on similar experiences from the past programming period. Unit costs appear to be higher in more developed regions. However, the data collected does not cover all the programme investment actions. Among the actions reviewed, infrastructure for primary and secondary education tends to have higher costs compared to others.

The methodological documents provide information to support a comparative analysis of the targets of RCR70 and RCO66 as well as RCR71 and RCO67, when investment actions use them together.

When investment actions use RCO66 and RCR70 indicators, a high correlation is observed between them. However, the net increase of RCR70 (calculated as the target value minus the baseline value) is typically lower than the RCO66 target. The net increase in RCR70 and the RCO66 target are equal when the RCR70 baseline is zero. However, not all cases of RCR70 with a baseline zero (indicating that infrastructure capacity has not yet been utilised) show a net increase equal to the RCO66 target.

Concerning RCO67 and RCR71, almost all reviewed programme actions use both indicators. There is generally a very high correlation between the two, but more often than not the net increase of RCR71 is lower than the RCO67 target. However, there are some exceptions that provide interesting insights into how programmes interpreted and used indicators within their specific intervention logics.

The Andalusia programme supports two actions. One is for provision, updating and/or adaptation of specific and general teaching equipment to the new needs (primary, secondary, baccalaureate, high school, etc). One is for the construction of a new school. This of course affects the use of the output and result indicators.

The North-West Romanian regional programme supports inter alia an action developing education infrastructure in university. This has a target of RCO67 which is equal to the baseline of RCR71; the net increase of RCR71 is much higher than the target of RCO67. This means that the programme supports the existing modernisation / renewal of existing classroom capacity and expects an increased use later. Moreover, The North-West Romanian regional programme includes an action in the field of professional and technical education. RCO67 has a target which is equal to both the baseline and the target values of RCR71. This can be explained by the fact that there is no expected increase in the population of the education facility but rather an improvement of the conditions of the general use.

Homogeneity (factors which might affect the capacity to reach targets) – The analysis of homogeneity concludes with the review of factors which might affect the progress and capacity of the programme to achieve the targets.

The analysis of methodological documents reveals that factors influencing the ability to meet output indicator targets are often linked to potential difficulties in regulatory procedures, the capacity of beneficiaries to prepare technical and financial documentation, as well as changes in policy priorities and regulations. Other factors, such as rising prices or geopolitical crises, like the one on Romania's northern border affecting the North-West programme, can also hinder implementation and target achievement. Additionally, the Polish programme identifies fluctuations in the EUR/PLN exchange rate as a risk.

For result indicators, the most frequently mentioned factors that could affect the capacity to meet target values include those already noted for output indicators, as well as demographic changes. Specifically, a decrease in the number of births or a reduction in the population of the age group that typically uses childcare facilities is seen as a risk factor for the Andalucia regional programme in Spain, potentially leading to a decrease in the number of users of these facilities.

Assessment of target setting and outliers – Task 1a identifies very few outlier programmes, which are not covered by the task 1b sample.

1.6.2 RSO 4.5 – Access to health care

Indicators under assessment The RSO 4.5 assessment covers one common output and one common result indicator.

Common output indicator

- **RCO69 is a common output indicator measuring capacity of new or modernised health care facilities** (persons/year). The analysis of the methodological documents includes 11 programmes and related methodological documents covering: Spain, France, Lithuania, Poland, Romania, Portugal, Malta and Italy.

Common result indicator

- **RCR73 is a common result indicator measuring annual users of new or modernised health care facilities** (users/year). The review for this indicator includes 9 programmes and related methodological documents covering: Spain, France, Lithuania, Poland, Romania, Portugal, Malta and Italy.

Coherence with SWD

- Methodological documents are in line with the SWD and do not specify any concrete differences in the definition of the indicators.
- **The SWD has no references for RCO69 and RCR73.** Hence this aspect of coherence cannot be assessed.
- Across the analysed methodological documents, both indicators are mostly used only under RSO 4.5. Hence coherence across RSOs cannot be assessed either.

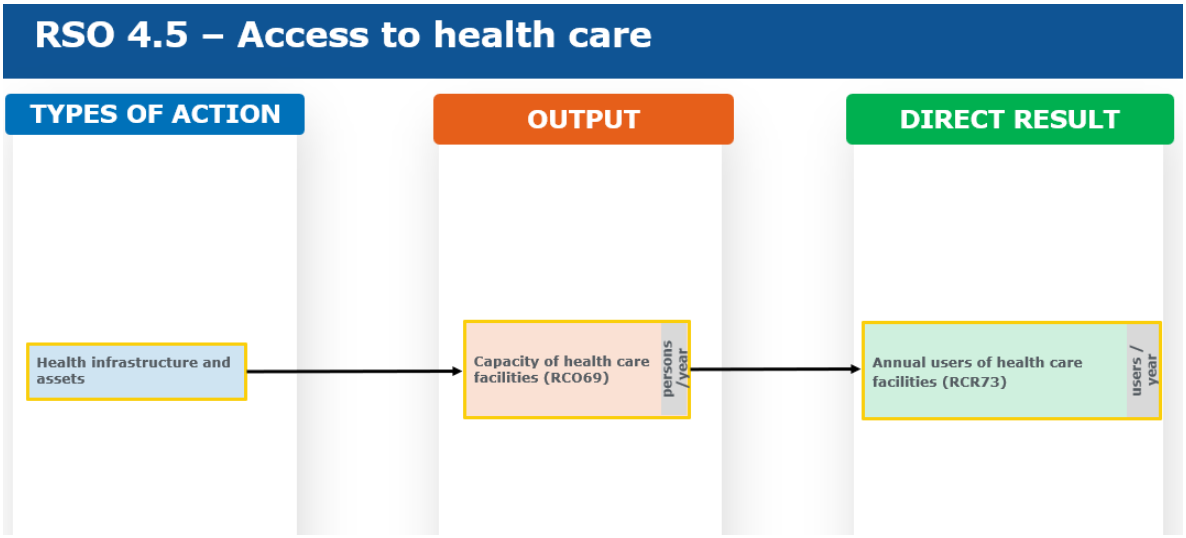
Homogeneity (granularity assessment)

- Most of the analysed actions (for both indicators) under RSO 4.5 are grouped under the '*Health infrastructure and assets*' type of operation, making it the most relevant for this specific objective.
- Six out of the eleven programmes reviewed detail more than one action contributing to the indicators RCO69 and RCR73. This indicates a certain degree of complexity in the intervention logic under RSO 4.5[21].

The following figure maps the links between type of operation, output and result indicators within this specific objective.

[21] The study team, recognizing a pattern in the action fields not linked to any specific investment type, further enhanced the classification by incorporating IF 044 and IF 077 from Annex I of the CPR (Regulation 1060/2021). This classification is primarily based on the Lithuanian methodological note, which employs environmental intervention fields under RSO 4.5. This categorization was then used to identify patterns in unit costs within these types of interventions, which typically involve healthcare infrastructure investments with significant environmental benefits, as outlined in Annex 6.

Figure 14 Type of actions, output indicators and result indicators – RSO 4.5



Source: Consortium own elaborations

Homogeneity (target setting patterns)

Once considering reviewed programme actions categorised under the action type '*Health infrastructure and assets*', there are substantial differences of indicative unit costs across categories of regions. Moreover, under RCO69, 45% of the reviewed actions expect to deliver some outputs by 2024, being their milestones different from zero.

Most programmes use past experiences to set their targets for RCO69. While for RCR73 it is difficult to find a cross-cutting pattern across methodological documents as they justify target setting.

When considering RCO69 and RCR73 together, positive and high correlation can be observed between the net increase of RCR73 (reflecting an increase in annual users of health care facilities) and the target of RCO69. However, there are different patterns and approaches to highlight

Typically, the net increase in RCR73 is lower than the RCO69 target when the RCR73 baseline is equal to zero. This suggests that when the supported or new facility/infrastructure has not yet been utilized, the expected increase in users is much higher. This is the case in Malta, Romania, and the Italian Campania region. In the case of the Plurirregional Spanish programme (for the Melilla hospital), taking into account that an individual can be counted more than once if he/she uses the facilities several times. In other cases, such as the Lithuanian programme and the French Martinique programme, the net increase in RCR73 is very low or close to zero. Greater ratios of RCR73 net increase and RCO69 target can be identified in Poland and Portugal.

Homogeneity (factors which might affect the capacity to reach targets)

The analysis of the methodological documents reveals that for each indicator, more than half of the analysed programmes identify policy and/or economic factors as potential obstacles to the achievement of targets. For example, the Maltese programme (under RCO69) acknowledges that the risk of changes arising from the nature of the intervention is higher in cases where no proxy projects were available, alongside the impact of inflation. Similarly, the Polish programme for Infrastructure, Climate, and Environment cites fluctuations in currency exchange rates as potential risk factors.

Assessment of target setting and outliers

The programmes identified as outliers in Task 1a for indicators RCO69 and RCR73 (and RSO 4.5 overall) are the Polish Infrastructure, Climate and Environment (CF/ERDF) programme and the Romanian Health ERDF/ESF+ programme. The methodological document of the Polish programme explains that its final targets were estimated based on assumptions derived from the health needs map, making the target specifically tailored to local and territorial needs and conditions. Relying on national experience might have led to a unique result.

The Romanian programme, which is entirely focused on health as a thematic programme, finances a broad range of interventions. Specifically, the programme includes priorities 1, 2, 4, and 7, which use RCO69 and RCR73. Priority 1 supports outpatient services, priority 2 invests in recovery, rehabilitation, and palliative care, priority 4 focuses on regional emergency hospitals (carried over from the 2014-2020 programming period), and priority 7 covers oncological transplants. These varied priorities likely explain the uniqueness of the programme targets.

1.6.3 Overall results of the indicator analysis under Policy Objective 4

This section presents the overall results of the above analysis of the indicator related to Policy Objective 4 (PO4).

1.6.3.1 Coherence with SWD

The coherence assessment shows that:

- No methodological document reviewed contains indicator definitions that were inconsistent with the SWD guidelines.
- There were no substantial differences in indicator definitions across the various specific objectives.

These findings highlight the reliability and consistency of the indicators used to monitor programme performance. However, it is important to note that while the coherence assessment is clear and positive, it primarily focuses the definition, concepts, and references related to indicators. It does not address aspects as the timing (when) or the specific methodology (how) the indicators will be measured.

1.6.3.2 Homogeneity assessment

Homogeneity (granularity assessment) – The first step of the homogeneity assessment focuses on evaluating the granularity of the investment actions as reported in the methodological documents used to set indicator targets. Granularity, in this context, refers to the level of detail and specificity with which the investment actions are linked to the corresponding indicators. Upon reviewing the methodological documents, it becomes evident that there is a significant variation in the level of granularity between different RSO intervention logics. More in details:

- **In RSO 4.2, indicators follow two groups of type of operations: childcare and education infrastructure.** For childcare infrastructure, most methodological documents associate one single investment action to each indicator, while indicators of education facilities link with a wide range of types of actions.
- **For RSO 4.5, the division is rather balanced** between programmes having a single action contributing to the concerned indicators and the ones have multiple actions.

Homogeneity (target setting patterns) – The second step of the homogeneity assessment identifies consistent patterns in target-setting assumptions across programmes. For all indicators, the review of methodological documents review highlights the following findings:

- The two most relevant sources for target setting assumptions are the past programming period and ad hoc studies.
- More precisely, all result indicators considered for this analysis are entirely new and rely mainly ad hoc studies and estimates also based on statistical sources, as opposed to the output indicators which are based on experience from the past programming period.

E**ach specific objective shows different patterns in indicative unit costs** as well as in terms of **milestone / target ratio** for the output indicators. A few examples follow here below.
In RSO 4.2 'Education and training infrastructure'

- **The milestone / target ratio is higher than 0 and less than 30% for both RCO66 and RCO67.** This suggests that infrastructural investments in education are expected to deliver their outputs later in the programme implementation compared to other specific objectives.
- The methodological documents provide information to support a comparative analysis of the targets of RCR70 and RCO66 as well as RCR71 and RCO67, when investment actions use them together.
    - When investment actions use RCO66 and RCR70 indicators, a high correlation is observed between them. However, the net increase of RCR70 (calculated as the target value minus the baseline value) is typically lower than the RCO66 target.
    - Concerning RCO67 and RCR71, almost all reviewed programme actions use both indicators. There is generally a very high correlation between the two, but more often than not the net increase of RCR71 is lower than the RCO67 target.

In RSO 4.5 'Access to health care'

- **Regarding RSO 69** (capacity of new or modernised health care facilities), the milestone / target ratio is higher than 0 in almost half of the cases.
- When considering RCO69 and RCR73 together, positive and high correlation can be observed between the net increase of RCR73 (reflecting an increase in annual users of health care facilities) and the target of RCO69. However, there are different patterns and approaches to highlight. Typically, the net increase in RCR73 is lower than the RCO69 target when the RCR73 baseline is equal to zero. This suggests that when the supported or new facility/infrastructure has not yet been utilized, the expected increase in users is much higher. This is the case in Malta, Romania, and the Italian Campania region. In other cases, such as the Lithuanian programme and the French Martinique programme, the net increase in RCR73 is very low or close to zero.

Homogeneity (factors which might affect the capacity to reach targets) - The analysis of homogeneity concludes with the review of factors which might affect the progress and capacity of the programme to achieve the targets. **Factors which might affect the capacity to reach targets are often policy-related**:

- Potential difficulties in regulatory procedures.
- Capacity of the beneficiaries to prepare the technical-financial documentation.
- Changes in policy priorities and regulations.

Other Member State specific factors can also contribute to slowing down programme implementation and target achievement such as: the geopolitical crisis and the risks associated with the fluctuations in the exchange. Additionally, factors that could affect all programmes include issues with the supply of equipment and construction materials.

1.6.3.3 Assessment of target setting and outliers

The analysis of methodological documents highlights a few reasons explaining why some programmes are outliers in RSO 4.5. The methodological document of the Polish programme explains that its final targets were estimated based on assumptions derived from the health needs map, making the target specifically tailored to local and territorial needs and conditions. Relying on national experience might have led to a unique result. The Romanian programme, which is entirely

focused on health as a thematic programme, finances a broad range of interventions. These varied priorities likely explain the uniqueness of the programme targets.

1.7 POLICY OBJECTIVE 5

1.7.1 RSO 5.1 – Integrated development in urban areas

Indicators under assessment - The RSO 5.1 indicator assessment covers one common output and one common result indicator.

Common output indicator.

- RCO74 is a common output indicator measuring the population covered by projects in the framework of strategies for integrated territorial development. The assessment covers 7 programmes and related documents from Croatia, Germany, France, Italy, Poland and Romania.

Common result indicator.

- **RCR77 is a result indicator which measures the number of visitors of cultural and tourism sites.** The assessment builds on a review of 8 programmes and related methodological documents covering: Croatia, Germany, France, Italy, Poland, Romania and Spain.

Coherence with SWD

- **No methodological document has an indicator definition which is inconsistent with the SWD**. Methodological documents do not specify any concrete differences in the definition of the indicators. However, most reviewed methodological documents refer to the SWD and / or to common indicators without making explicit reference to SWD definitions, concepts and references. Since the programmes adopt common indicators, they should follow SWD standards and metadata.
- Across the analysed methodological notes, both RCO74 and RCR77 indicators are used mainly under this RSO. Anyhow, the analysis shows clearly that the methodological documents do not indicate any differences in the definition across several specific objectives.

Homogeneity (granularity assessment) – The first step of the homogeneity assessment examines granularity, focusing on investment actions reported in the methodological documents to set indicator targets. However, no specific action types were identified for this RSO. That said, among the methodological documents that provided data on the indicators at the action level, most (five in total) report a single action contributing to the indicator, while four indicate more than one action. Although the study team did not propose any predefined specific type of operations based on intervention fields, the analysis suggests this is not feasible. Programme actions involving RCO74 and RCR77 typically encompass other indicators or have a broader scope than just tourism attractiveness.

Homogeneity (target setting patterns) – The second step of homogeneity assessment identifies consistent patterns in target setting assumptions across programmes.

Output indicators

Timeliness - 56% of the reviewed actions contributing to RCO74 are expected to deliver some outputs by 2024, because their milestones are different from zero.

Unit costs and target setting assumptions – None of the methodological documents provide information on unit costs, which makes it difficult to establish some statements on this regard. However, the methodological document review highlights that most of the programmes relied on statistical data. As an example, the Romanian programme used statistical data on the urban population at the regional level, while the French and Italian Campania regional ones relied on statistical data on the total population living in areas covered by projects supported. In addition, both the German and Croatian programmes determined the indicator target based on data from the 2014-2020 period, using for instance reports on projects' implementation.

Result indicators

Timeliness - Although methodological documents rarely provide information on unit costs, their review supports a comparative analysis of the selected output and result indicator targets.

Unit costs and target setting assumptions – When RCO74 and RCR77 are used together for the same programme action, programme data suggest that the net increase of visitors (as measured by RCR77) tends to grow with a larger population coverage (reflected in a higher target value of RCO74) for the supported interventions. In other words, the combined analysis of RCO74 target and the net increase of RCR77 suggests that larger territories are more likely to see an increase in visitors compared to smaller ones. However, it should be clarified that RCR77 is usually not the only result indicator under RSO 5.1. Therefore, the relationship between these two indicators may vary depending on the specific type of operation being undertaken. Additionally, it is important to emphasize that RCR77 is focused on attracting visitors from outside the local population not solely from within the territory itself.

The primary sources for target setting for RCR77 are data from the past programming period. For example, the German programme utilized data from the 2014-2020 period. Similarly, the Polish and Spanish Plurirregional programmes relied on unit costs estimated based on data from projects implemented during the 2014-2020 period, while Croatia used reports on the implementation of past projects. In Italy, final targets from the Metro+ and Southern Medium Cities programmes were set based on the types of sites targeted by the intervention (touristic or cultural).

Homogeneity (factors which might affect the capacity to reach targets) – The homogeneity analysis concludes with a review of factors that might affect programme progress and the ability to achieve targets. The methodological document analysis indicates that factors influencing the capacity to meet output indicator targets are often policy-related. These include potential changes in political priorities at both the EU and national levels, delays in the programme's start-up, or the lack of beneficiaries' capacity to prepare the necessary technical and financial documentation. Other factors, such as the geopolitical crisis on Romania's northern border, could also impede implementation and achievements. Additionally, the Polish programme assesses fluctuations in the EUR/PLN exchange rate as a risk factor, which could impact the available allocation size. For the result indicator, most cited factors that might affect the achievement of target values are similar to those mentioned for the output indicators.

Assessment of target setting and outliers – The analysis of methodological documents also sheds light on why certain programmes are identified as outliers according to the Task 1a analysis.

For **RCO74**, the Italian Metro+ and Southern Medium Cities programme was identified as an outlier. This could be explained by the fact that no specific actions are outlined under this indicator

for either less developed or more developed regions, making it difficult to understand the scope of the final targets at the regional level. While the final target is clear for both region types, the lack of detailed actions to achieve these targets may account for its outlier status.

For **RCR77**, both the Italian Metro+ and Southern Medium Cities programmes, as well as the Campania regional programme, were identified as outliers. These programmes did not rely on data from the past programming period, unlike others, which could explain why they were classified as outliers.

1.7.2 RSO 5.2 – Integrated development in rural and coastal areas

Indicators under assessment - The RSO 5.2 indicator assessment covers one common output and one common result indicator.

Common output indicator.

- RCO74 is a common output indicator measuring the population covered by projects in the framework of strategies for integrated territorial development. The assessment covers 6 programmes and related documents covering: Cyprus, France, Italy and Romania.

Common result indicator.

- **RCR77 is a result indicator which measures the number of visitors of cultural and tourism sites.** The assessment builds on a review of 6 programmes and related methodological documents covering: Cyprus, France, Italy and Romania.

Coherence with SWD

- **No methodological document has an indicator definition which is inconsistent with the SWD**. Methodological documents do not specify any concrete differences in the definition of the indicators. However, most reviewed methodological documents refer to the SWD and / or to common indicators without making explicit reference to SWD definitions, concepts and references. Since the programmes adopt common indicators, they should follow SWD standards and metadata.
- Across the analysed methodological notes, both RCO74 and RCR77 indicators are used mainly under this RSO. Anyhow, the analysis shows clearly that the methodological documents do not indicate any differences in the definition across several specific objectives.

Homogeneity (granularity assessment) – The first step of the homogeneity assessment examines granularity with a focus on investment actions reported in methodological documents to set indicator targets. However, no specific action types were identified for this RSO. As said above for RSO 5.1, although the study team did not propose any predefined specific type of operations based on intervention fields, the analysis suggests this is not feasible. Programme actions involving RCO74 and RCO77 under RSO 5.2 typically encompass other indicators or have a broader scope than just tourism attractiveness.

Homogeneity (target setting patterns) – The second step of homogeneity assessment identifies consistent patterns in target setting assumptions across programmes.

Output indicators

Timeliness - 89% of the reviewed actions contributing to RCO74 are expected to deliver some outputs by 2024, because their milestones are set to a value which is different from zero.

Unit costs and target setting assumptions – Only one methodological document provides information on unit costs (the Romanian North-West programme), which makes it difficult to establish some statements on this regard. However, the methodological document review highlights that most of the programmes established targets using data on demography. For instance, the French Centre Val-de-Loire, Auvergne-Rhone-Alpes and Martinique regional programmes as well as the Italian Veneto regional programme all used data on the total population living in areas covered by supported projects. Moreover, the Cyprus programme considered the share of the population from the Integrated Spatial Development Strategy which will be supported by the investments.

Result indicators

Timeliness - Methodological documents rarely provide information on unit costs but can support a comparative analysis of the selected output and result indicator targets.

Unit costs and target setting assumptions - Few programmes use RCO74 and RCR77 together. When RCO74 and RCR77 are used together for the same programme action, programme data suggest that the net increase of visitors (as measured by RCR77) tends to grow with a larger population coverage (reflected in a higher target value of RCO74) for the supported interventions. Similar words of caution and comments to RSO 5.1 apply to RSO 5.2.

The methodological document review highlights that all programmes set their targets based on data and studies related to the number of visitors to the concerned sites. For example, the French Auvergne-Rhône-Alpes regional programme used the results of a 2017 survey that collected data on the number of visitors to the Via-Rhôna biking route, which amounted to 1.1 million visits. This data was used to estimate intermediate goals and target values, accounting for the effects of the post-lockdown period following the COVID-19 crisis. Similarly, the French Martinique regional programme incorporated the effects of the COVID-19 crisis on local cultural and tourism activities when estimating its targets. The Cyprus programme used data from the past five years on annual visitors to cultural sites and monuments, which averaged around 30,000 visits per year per site, to establish its target values. The Romanian programme, on the other hand, relied on data from completed projects during the 2014-2020 period, specifically using the indicator CO09 ('increase in the expected number of visits to cultural and natural heritage sites and attractions benefiting from support'). The unit cost for this indicator was EUR 468, which was then

adjusted using construction cost indices from the European Investment Bank (EIB) to determine the final target.

Homogeneity (factors which might affect the capacity to reach targets) – The analysis of homogeneity concludes with a review of factors that could affect the progress and capacity of the programme to meet its targets. The review of methodological documents reveals that factors influencing the ability to reach output indicator targets are often policy-related. These factors include delayed starts to programming or the risk of competition for available funding. Economic factors, such as a potential economic crisis, rising inflation, or an increase in the cost of raw materials, can also slow down implementation and hinder progress. For result indicators, the factors most commonly cited as affecting target achievement are similar to those for outputs, along with the added risk of overlap due to the coexistence of different crisis response instruments.

Assessment of target setting and outliers – Task 1a identifies very few outlier programmes, which are not covered by the task 1b sample for this RSO.

1.7.3 Overall results of the indicator analysis under Policy Objective 5

This section presents the overall results of the above analysis of the indicator related to Policy Objective 5 (PO5).

1.7.3.1 Coherence with SWD

The results of the coherence assessment with the SWD revealed two key findings:

- No methodological document reviewed contains indicator definitions that were inconsistent with the SWD guidelines.
- There were no substantial differences in indicator definitions across the various specific objectives.

These outcomes indicate a high level of alignment and consistency within the methodological frameworks, reinforcing the reliability of the indicators used in programme assessments.

1.7.3.2 Homogeneity assessment

Homogeneity (granularity assessment) – In both RSO 5.1 and 5.2, the conclusion is rather straightforward, where most indicators are linked to a single investment action. However, there is a remarkable difference with other POs. The analysis shows that it is not feasible to establish a common type of operation across programmes including RCO74 and RCR77. Programme actions involving RCO74 and RCR77 typically encompass other indicators or have a broader scope than just tourism attractiveness.

Homogeneity (target setting patterns) – The second step of the homogeneity assessment identifies consistent patterns in target-setting assumptions across programmes.
For all indicators, the methodological document review highlights the following findings:

- **The most relevant sources for target setting are statistical data** (i.e., on the number of inhabitants as well as the number of visitors of sites). Few programmes relied on experience from the past programming period in order to set up milestones and targets.
- Almost all RSO 5.2 investment actions have a milestone / target ratio higher than zero under RCO74, while it is the case for around half of the RSO 5.1 actions.
- When RCO74 and RCR77 are used together for the same programme action, programme data suggest that the net increase of visitors (as measured by RCR77) tends to grow with a larger population coverage (reflected in a higher target value of RCO74) for the supported interventions. In other words, the combined analysis of RCO74 target and the net increase of RCR77 suggests that larger territories are more likely to see an increase in visitors compared to smaller ones. However, it should be clarified that RCR77 is usually not the only result indicator under RSO 5.1. Additionally, it is important to emphasize that RCR77 is focused on attracting visitors from outside the local population not solely from within the territory itself.

Homogeneity (factors which might affect the capacity to reach targets) - The analysis of homogeneity ends with the review of factors which might affect the progress and capacity of the

programme to achieve the targets. Factors which might affect the capacity to reach targets are often policy-related:

- Possible changes in the political priorities at both EU and national levels.
- Lack of capacity of the beneficiaries to prepare the technical-financial documentation.
- Risk of overlap due to the coexistence of different public funds in response to crises.
- Delays in programme implementation and conclusion.

Other Member State specific factors can also contribute to slowing down programme implementation and target achievement such as: the geopolitical crisis on Romania's northern border, risk the fluctuations in the EUR/PLN exchange rate influencing changes in the size of the available allocation for Polish programmes.

1.7.3.3 Assessment of target setting and outliers

The analysis of methodological documents identifies several reasons that explain why some programmes are outliers, as highlighted in the task 1a analysis. Specifically, for RSO 5.1, the lack of detailed information regarding the specific actions to be implemented in order to achieve the indicator targets may contribute to why some programmes differ significantly from others.

1.8 CONCLUSIONS OF TASK 1B ACTIVITIES

Task 1b focuses exclusively on common output and result indicators under a selected specific objective for which the indicator is more relevant, frequent and plays a key role in the intervention logic. The review covers all the POS and includes 43 indicators: 13 for PO 1, 19 for PO 2, 3 for PO 3, 6 for PO 4, 2 for PO 5. This does not mean that the indicator cannot be used or has not been taken up in other specific objectives. However, the proposed approach gives more practical insights into indicator use in a specific intervention logic framework. Task 1b analysis covers the review of 44 methodological documents of a sample of programmes for a selected list of output and result indicators under a defined set of specific objectives. The sample of programmes covers all the three funds (JTF, ERDF and CF), all the five POs and different categories of regions. The full list of programmes has been defined in the Inception Report and is in Annex 6.

Task 1b reviews at least 5 (but in many cases more) methodological documents for each common indicator:

- **Assesses the coherence** of the programme methodological documents with SWD definitions and assumptions.
- **Focuses on homogeneity**, verifying if the investment actions contributing to each indicator are homogeneous and identifying any consistent patterns in target setting assumptions.
- **Provides explanations on outliers**, providing, in relation to investment allocations, some of the reasons behind variations of the indicator targets as also highlighted in task 1a.

1.8.1 Coherence with the SWD

The results of the coherence assessment with the SWD revealed the following key findings.

- **Coherent definitions** - The analysis revealed that no methodological document contains definitions inconsistent with the SWD guidelines, and there are no substantial differences in definitions across specific objectives. Reviewed methodological documents follow indicator definitions provided by SWD guidelines.
- **Lack of references** – In spite of the lack of references in the SWD metadata, the indicator general description of definition and concepts already clarifies the meaning of the indicators.
- **Limited / no information on how programmes will collect information on result indicators** - While the SWD usually states when output indicators should be measured, it gives programmes the possibility to decide when to measure result indicators provided that it is not later than one year after the completion of the corresponding outputs. Methodological documents usually do not specify when or how the indicators will be measured.

1.8.2 Homogeneity assessment

The homogeneity assessment is structured in several steps:

(1) Granularity assessment,
(2) Identification of consistent patterns in target setting,
(3) Identification of factors that might impact the achievement of the targets.

1.8.2.1 Granularity assessment

This step reviews the list of selected indicators under the given specific objectives. Therefore, it cannot be considered covering all the possible combination of actions, indicators and specific objectives. However, it provides an indicative mapping of the use of selected common output and result indicators under the RSO level based on the proposed types of investment actions. This proposed typology of investment actions at RSO level has been based on the Annex I CPR intervention fields, the correspondence table from the Cohesion data platform, textual analysis of the programme actions. Proposing a typology of investment actions under each specific objective has already substantially reduced the heterogeneity, allowing the analysis to focus on how many different actions contribute to a single indicator. The analysis shows different level of homogeneity.

- **High homogeneity in terms of actions contributing to the indicator**. The following indicators are usually associated with a single type of operation under each RSO.
    - Output indicators relate to enterprises supported with grant for digitalisation (RCO02), incubation capacity (RCO15), energy efficiency in dwellings (RCO18) and public buildings (RCO19), flood protection (RCO25), public water supply pipes (RCO30), additional waste recycling capacity (RCO34), green infrastructure (RCO36), passenger capacity of environmentally friendly rolling stock for collective public transport (RCO57), length of new/upgraded/reconstructed/modernised rail - TEN-T (RCO47, RCO49), childcare infrastructure (RCO66) and capacity of new or modernised health care facilities (RCO69)[22]. In the case of RSO 2.2, RCO22 measures the additional production capacity for renewable energy. It is associated with a single type of operations on renewable energy sources. However, this type of operation covers different renewable sources. In RSO 1.5, the review indicator RCO41 is associated with the type of operation of 'digital connectivity' in the housing sector.
    - Results indicators refer to the use of incubation services (RCR18), flood protection (RCR35), water supply (RCR41), waste recycled (RCR47), dwellings with very high-capacity broadband connection (RCR53), railway users (RCR58), tram and metro users (RCR63), users of childcare (RCR70), health infrastructure users (RCR73). In line with what said on the outputs in the case of RSO 2.2, results indicators on renewable energy sources (RCR31 and RCR32) refer to a single type of operations, which, however, covers different renewable sources. In RSO 1.5, the reviewed result indicator RCR53 is associated with the type of operation of 'digital connectivity' in the housing sector.

[22] Some programme actions under this indicator were not associated to the proposed typology. These were not considered for the granularity assessment here. Therefore, all the actions fall under health infrastructure and assets.

- **Medium homogeneity in terms of actions contributing to the indicator**. The following indicators are usually associated with two or three types of investment actions under each RSO.
    - Output indicators cover enterprises supported with grants under RSO 1.1 and RSO 1.3 (RCO02)[23]; Natura 2000 sites (RCO37) and cycling infrastructure (RCO58); researchers working in supported research infrastructure (RCO06 under RSO 1.1). Output indicators also relate to public sector digitisation and different type of operations such as e-government, e-inclusion / e-health (RCO14). Under RSO 4.2, there is a single output indicator (RCO67) measuring class capacity of education facilities but referring to several types of actions: vocational education and training, primary and secondary education and tertiary education.
    - Result indicators regard SMEs introducing innovations (RCR03), annual primary energy consumption (RCR26)[24], estimated GHG emissions (RCR29) and population with access to green infrastructure (RCR95). For instance, RCR29 is widely used in more than one specific objective and within them in different type of operations (e.g. in RSO 2.1, it covers energy efficiency investments in housing and in public infrastructure). In line with the outputs, under RSO 2.8, the indicator on cycling infrastructure users (RCR64) mainly to cycling infrastructure type of operation but also to clean urban transport. Under RSO 4.2, there is a single result indicator (RCR71) measuring users of education facilities but referring to several types of actions as explained above.

- **Low homogeneity in terms of actions contributing to the indicator**. The following indicators are usually associated with four or five types of investment actions under each RSO.
    - Output indicator measuring new enterprises support (RCO05) is used under RSO 1.3 in several types of investment actions.
    - Result indicators on job creation (RCR01), new researchers (RCR102), public digital services, products and processes (RCR11), survival of new enterprises (RCR17) are widely used across several actions under the specific objectives.

The PO 5 case is very specific. In this case, the analysis has focused on programme actions which were supporting integrated development for enhancing the attractiveness of urban (RSO 5.1) and non-urban areas (RSO 5.2). Therefore, the analysis has focused on the programme actions which were using the two proposed indicators: RCO74, measuring the population covered by projects in the framework of strategies for integrated territorial development, and RCR77, covering visitors of cultural and tourism sites supported. The analysis shows that these two indicators are very often used with others and the programme actions do not only focus on touristic attractiveness.

[23] Under RSO 1.2, RCO02 is also associated to a very limited extent (one programme action) with the type of operation 'digitising firms'.

[24] The analysis of actions covered by RCR26 also includes 9% of actions related to 'high efficiency / replacement heating systems'. However, since such actions are not covered by the output indicators analysed, it has not been taken into consideration when assessing the homogeneity in terms of actions contributing to the indicators.

1.8.2.2 Identification of consistent patterns in target settings

The second step of the homogeneity assessment reviews methodological documents to identify consistent patterns in target setting. The analysis covers timeliness of output / result delivery and target setting approaches, notably based on sources and calculation methods.

1.1.1.1

Timeliness

The analysis of methodological documents focuses on the milestone / target ratio of output indicators at the level of type of operation under each RSO. This type of information can only be derived from the methodological documents. Indicators have been divided in three groups: 'slow' (0-29.9% of the reviewed actions from the methodological documents in task 1b sample have a milestone different from zero, thus expect to deliver an output by 2024), 'medium' (30-50% of the reviewed actions have a milestone different from zero), 'rapid' (more than 50% of the reviewed actions have a milestone different from zero).

The indicators which are expected to have a slow timeliness are:

- RCO14[25] for the type of operations 'e-inclusion' / 'e-health',
- RCO02 (measuring enterprises support with grant for the investment actions on circular economy under RSO 1.3 and the type of operation 'digitising firms' under RSO 1.2),
- RCO15 (capacity of incubation created),
- RCO47 (length of new or upgraded rail - TEN-T) and RCO49 (length of rail reconstructed or modernised),
- RCO66 (classroom capacity of childcare facilities).

The indicators ranking 'medium' are:

- RCO02 (measuring enterprises supported with grant for the investment action on skills, advanced support and incubation under RSO 1.1),
- RCO41 (additional dwellings with broadband access of very high capacity),
- RCO18 (energy efficiency in dwellings) and RCO19 (energy efficiency in public buildings
- RCO22 (renewable energy capacity),
- RCO 25 (Flood protection),
- RCO36 (green infrastructure not related to climate change),
- RCO69 (capacity of new or modernised health care facilities).

The indicators ranking 'rapid' are:

- RCO02 (for the investment actions 'R&I in enterprises' and 'R&I cooperation and technological transfer' under RSO 1.1, for the investment action 'digitising firms' under RSO 1.2, for the investment actions on 'business development and support – SMEs', 'entrepreneurship and SME survival' and 'innovation and cooperation' under RSO 1.3),
- RCO06 (measuring researchers working in supported research infrastructure), for the types of investment actions 'R&I cooperation and technological transfer' and 'R&I research centres' under RSO 1.1,

[25] For RCO14, under RSO 1.2, one single action, corresponding to 2% of the reviewed programme, relates to digitising firms. Considering its limited relevance, it has not been considered here.

- RCO14 for the type of operation 'e-government',
- RCO05 (new enterprises supported), RCO30 (public water supply pipes),
- RCO57 (public transport rolling stock) and RCO58 (cycling infrastructure),
- RCO74 (population covered by projects in the framework of strategies for integrated territorial development).

The absence of a milestone for result indicators prevents a similar analysis. However, it is possible to show whether selected result indicators are expected to be measured by the intervention / output completion or later within one year. Analysis of the SWD metadata and methodological documents indicates the following elements.

- **Result indicators on population covered are usually measurable in the short-term** – While most of the reviewed result indicators will be monitored within one year after intervention / output completion, RCR35 and RCR95 can be measured much earlier. Both indicators measure the population benefiting from the investments, respectively from flood protection measures (RCR35) and new or improved green infrastructure (RCR95). These two indicators essentially provide information on the territorial coverage of the interventions and thus can be measured at the completion of the intervention / output.
- **Indicators on job creation can be measured in the short-medium term** – These indicators can be measured immediately after the project conclusion or even during the project implementation. Measuring these indicators earlier or later might provide different information on the type of result achieved. Jobs created during the project implementation can be measured at the project finalisation or just after that. On the contrary, measuring the jobs created after the project could imply an evaluation of the durability of the jobs created during the project implementation and this could imply efforts going beyond the monitoring functions. For RCR01 (jobs created in supported entities) and RCR102 (new researchers), programme managing authorities will have to decide through which sources measure the indicator such as project reporting, statistical sources, surveys, registers. According to the SWD, RCR01 is to be measured one year after the completion of output of the supported project, therefore, in case of project with more than one output it is necessary to clarify the concrete timing of indicator measurement. Moreover, this should be verified with the availability of information from the selected sources for monitoring. For existing research facilities, upon completion of output of the supported project. A similar approach should be applied to new researchers in newly built research facilities.
- Most of the indicators on the use of a new / improved service, facility or infrastructure or implying a behavioural change / innovation require 6 to 12 months to measure the result in terms of a pre-post variation. The indicators on the use of a service are, for instance, RCR11 (users of new and upgraded public digital services) and RCR70 (annual users of childcare facilities). Indicators on behavioural change / innovation are for instance: RCR03 (SMEs introducing product or process innovation), RCR17 (New enterprises surviving in the market).

The analysis also highlights several points of attention for the measurement.

- RCR26 (energy savings) RCR29 (reduced GHG emission) require an ex-post validation and ad energy performance certifications, audits or technical specifications. The achieved value, according to the SWD, should be calculated based on the achieved level of energy performance during the year after the completion of the intervention.
- The indicator RCR03 refers to SMEs both creating and introducing process or product innovations. Creating and introducing process or product innovations could require some

time at enterprise level and this could not necessarily overlap with project life span. This could complicate the measurement of the result within one year.

- In case of RCR47, which measures the waste recycled, it is important to clarify that supported facilities are not necessarily completely used after their support. This aspect is usually considered by managing authorities in drafting their methodological documents. However, this could delay the result achievement while outputs are completed. Moreover, the use of Eurostat statistics could be not possible, since these usually have some delays. Ad hoc monitoring solutions at infrastructure level are needed.

Table 14 Action type and related output indicators26

	Slow	Medium	Fast
	0-29.9% of reviewed actions in task 1b sample have a milestone different from zero	30-50% of reviewed actions in task 1b sample have a milestone different from zero	>50% of reviewed actions in task 1b sample have a milestone different from zero
RSO 1.1		Skills, advanced support and incubation (RCO02)	R&I cooperation and technological transfer R&I in enterprises (RCO02, RCO06)
RSO 1.2	e-health, e-inclusion (RCO14)		Digitising firms (RCO02), e-government (RCO14)
RSO 1.3	Circular economy (RCO02); Enterprise incubation (RCO15)		Business development and support – SMEs, innovation and cooperation (RCO02); Entrepreneurship and SME survival (RCO02, RCO05)
RSO 1.5		Digital connectivity (RCO41)	
RSO 2.1		Energy efficiency in housing and public infrastructure (RCO18, RCO19)	
RSO 2.2		Renewable energy (RCO22), more types of renewable energy slow down the delivery process of each given action	
RSO 2.4		Flood protection (RCO 25)	
RSO 2.5			Water for human consumption (RCO30), to be seen the impact of phased projects
RSO 2.6	Waste management (RCO34)		

[26] The findings of the analysis have been also validated by comparing the milestone / target ratio available in all the programmes at RSO level based on Cohesion data platform data. It is important to note that the milestone / target ratio at investment action level is not available in programmes and Cohesion data platform. Indeed, the added value of the analysis conducted under task 1b is that it operates at the level of investment actions under each RSO for a sample of programmes. The result of this comparison shows small differences: in case of RSO 2.6 (RCO34), RSO 2.7 (RCO37), RSO 4.2 (RCO66, RCO67) the share of specific objectives with a milestone different from zero is slightly higher than the share of actions in the sample use for Task 1b. In the other cases, differences would not modify the attribution to each timeliness category.

RSO 2.7	Natura 2000 (RCO37)	Nature and biodiversity protection (RCO36)	
RSO 2.8			Public transport (RCO57) and cycling infrastructure (RCO58)
RSO 3.1	Railway infrastructure (RCO47, RCO49)		
RSO 4.2	Infrastructure for early childhood (RCO66); Infrastructure for education infrastructure (RCO67)		
RSO 4.5		Health infrastructure and assets (RCO69)	
RSO 5.1-5.2			Integrated development (RCO74)

Table 15 Timeliness result indicators

Upon output / intervention completion (short term)	**Indicators which can be measured in the short-medium term** (e.g. job creation indicators → the time of measurement can provide different information)	**Medium-long term (within one year)** (e.g. indicators related to the use of improved / new service / infrastructure or behavioural change / innovation)
RSO 2.4 (RCR35) RSO 2.7 (RCR95)	RSO 1.1 (RCR102) RSO 1.3 (RCR01)	RSO 1.1 (RCR03, RCR102) RSO 1.3 (RCR01, RCR17, RCR18) RSO 1.2 (RCR11) RSO 1.5 (RCR53) RSO 2.2 (RCR32, RCR31 as soon as the capacity is operational) RSO 2.5 (RCR41) RSO 2.6 (RCR47) RSO 2.8 (RCR63, RCR64) RSO 3.1 (RCR58) RSO 4.2 (RCR70, RCR71) RSO 4.5 (RCR73) RSO 5.1-5.2 (RCR77) RCR26, RCR29 (based on energy performance certificate, energy audit or other relevant technical specification).

Target setting approaches

The review of methodological documents covers each indicator at RSO level and is organised in two steps.

The first step reviews the sources of target setting such as: past experiences (e.g. past programming period, other planning, specific project documentation and programming experiences as RRF), ad hoc study and evaluations specifically conducted for the indicator or addressing the topic and statistical and public sources (e.g. statistical sources and bulletins, company registers). This first step addresses the following question 'Is there a common information source based on which the indicator target is set?'. Therefore, this step looks for consistency in terms of methodological sources for building the indicators among the reviewed methodological documents. Most of the indicators follow a consistent approach, meaning that the methodological documents follow the same type of source, which is in most cases the past experience.

The second step reviews the approach to target setting, with a focus on differences between types of investment actions and the link between output and result indicators.

All the indicators have either a medium or a high score.

Output indicators

- Target setting approach might vary with the types of investment actions under each RSO as in the following cases: RCO02 (enterprises supported with grant) in RSO 1.1 and 1.3, RCO06 (researchers working in supported research infrastructure), RCO14 (public institutions supported for digital investments).
- Target setting might vary under the type of operation based on the type of service provided, such as in the case of health care (RCO69), the type of activities conducted to support new incubation capacity (RCO15), the renewable energy source (RCO22).
- Usually, output indicators use past experience or ad hoc studies. But in the case of RCO47 and RCO49 under PO 3, methodological documents do not follow a consistent approach to establishing target setting. They usually refer to project documents and other similar interventions.

Result indicators

- Target setting approach might vary with the types of investment actions under each RSO reflecting what stated for the output indicators as in the case of RCR102, RCR11, RCR01.
- It is not possible to establish a clear pattern in establishing targets between output and result indicators considered in RCR63 under RSO 2.8 and for RCR77 under RSO 5.1.
- Usually output indicators use past experience, statistical sources or ad hoc studies. However, in the case of RCO47 and RCO49 on TEN-T railway under PO 3, methodological documents do not follow a consistent approach to establishing target setting. They usually refer to project documents and other similar interventions.

Table 16 Overview of homogeneity assessment on target setting assumptions

RSO	Indicator	Consistency in the information source	Consistent method and approach to target setting at the level of RSO	Overall assessment
RSO 1.1	RCO02 - Firms: Grant aided	Yes (past experience)	No, target setting approach might vary with the types of investment actions under the RSO	Medium
RSO 1.1	RCO06 - RTDI: Researchers with improved infrastructure	Yes (past experience)	No, target setting approach might vary with the types of investment actions under the RSO	Medium
RSO 1.1	RCR03 - RTDI: SMEs introducing product or process innovation	Yes (past experience)	Yes (result indicator target is defined in relation to the output indicator target)	High
RSO 1.1	RCR102 - RTDI: New researchers	Yes (past experience)	No, target setting approach might vary with the related output indicator (e.g. RCO06, RCO02)	Medium
RSO 1.2	RCO02- Firms: Grant aided	Yes (past experience)	Yes (based on the type of operation)	High
RSO 1.2	RCO14 - Digital: Public institutions supported for Digital	Yes (past experience)	No, target setting approach might vary with the types of investment actions under the RSO	Medium
RSO 1.2	RCR11 - Digital: Users of new and upgraded public digital services	Yes (past experience)	No, target setting approach might vary with the types of investment actions under the RSO	Medium
RSO 1.3	RCO02 - - Firms: Grant aided	Yes (past experience)	No, target setting approach might vary with the types of investment actions under the RSO	Medium
RSO 1.3	RCO05 - Firms: New Enterprises	Yes (past experience)	Yes (based on the type of operation)	High
RSO 1.3	RCO15 - Firms: Capacity of incubation created	Yes (past experience)	No, it depends on the type of service / action (new construction, localisation, etc.)	Medium
RSO 1.3	RCR01 - Jobs created in supported entities	Yes (past experience)	No, high variability and difficult to establish an output-result pattern	Medium
RSO 1.3	RCR17 - Firms: New enterprises surviving in the market	Yes (statistics)	Yes (result indicator target is defined in relation to the output indicator target)	High
RSO 1.3	RCR18 - Firms: SMEs using incubator services	Yes (past experience)	Yes (result indicator target is defined in relation to the output indicator target)	High
RSO 1.5	RCO41 - Digital: Add. dwellings with broadband of v high capacity	Yes (past experience)	Yes (based on the type of operation)	High
RSO 1.5	RCR53 - Digital: Dwellings with broadband to vhc network	Yes (past experience)	Yes (result indicator target is defined in relation to the output indicator target)	High

RSO	Indicator	Consistency in the information source	Consistent method and approach to target setting at the level of RSO	Overall assessment
RSO 2.1	RCO18 - Energy: Dwellings with improved energy peformance	Yes (past experience)	Yes (based on the type of operation)	High
RSO 2.1	RCO19 - Energy: Public buildings with improved energy performance	Yes (past experience)	Yes (based on the type of operation)	High
RSO 2.1	RCR29 - Climate: Estimated GHG emissions	Yes (past experience)	Yes (result indicator target is defined in relation to the output indicator target)	High
RSO 2.1	RCR26 - Energy: Annual primary energy consumption	Yes (past experience)	Yes (result indicator target is defined in relation to the output indicator target)	High
RSO 2.2	RCO22 - Energy: Renewable energy capacity	Yes (past experience)	No, there seems to be high variability due to the type of renewable energy sources	Medium
RSO 2.2	RCR29 - Climate: Estimated GHG emissions	Yes (past experience)	Yes (result indicator target is defined in relation to the output indicator target)	High
RSO 2.2	RCR31 - Energy: Total renewable energy produced	Yes (past experience)	Yes (result indicator target is defined in relation to the output indicator target)	High
RSO 2.2	RCR32 - Energy: Renewable energy capacity	Yes (past experience)	Yes (result indicator target is defined in relation to the output indicator target)	High
RSO 2.4	RCO25 - Climate: Flood protection newly built or consolidated	Yes (past experience)	No, differences between coastal defence projects and others might affect target setting	Medium
RSO 2.4	RCR35 - Climate: Population benefiting from flood protection	Yes (past experience)	Yes (result indicator target is defined in relation to the output indicator target)	High
RSO 2.5	RCO30 - Water: Length of pipes for public water supply	Yes (past experience)	Yes (based on the type of operation)	High
RSO 2.5	RCR41 – Water: Population with improved water supply	Yes (past experience)	Yes (result indicator target is defined in relation to the output indicator target)	High
RSO 2.6	RCO34 - Circular: Additional capacity for waste recycling	Yes (past experience)	Yes (based on the type of operation)	High
RSO 2.6	RCR47 - Circular: Waste recycled	No (statistical sources, past experience on the effective use of waste treatment facilities, ad hoc study)	Yes (result indicator target is defined in relation to the output indicator target)	Medium

RSO	Indicator	Consistency in the information source	Consistent method and approach to target setting at the level of RSO	Overall assessment
RSO 2.7	RCO36 - Env: Green infrastructure (not related to climate change)	Yes (past experience)	Yes (based on the type of operation)	High
RSO 2.7	RCO37 - Env: Surface of Natura 2000 sites	Yes (past experience)	No, there are differences between nature and biodiversity protection and Natura 2000 investment actions	Medium
RSO 2.7	RCR95 - Env: Pop. with access to green infrastructure	Yes (past experience)	Yes (result indicator target is defined in relation to the output indicator target)	High
RSO 2.8	RCO57 - Urban Trans: rolling stock for public transport	Yes (ad hoc study)	No, differences of the type of vehicle might affect target setting	Medium
RSO 2.8	RCR29 - Climate: Estimated GHG emissions	No (past experience, ad hoc study)	Yes (result indicator target is defined in relation to the output indicator target – RCO57)	Medium
RSO 2.8	RCR63 - Urban Trans: Annual users of tram and metro lines	Yes (ad hoc study)	No (not clear pattern with the output indicator)	Medium
RSO 2.8	RCO58 - Urban Trans: Dedicated cycling infrastructure supported	Yes (past experience)	No, target setting approach might vary with the types of investment actions under the RSO	Medium
RSO 2.8	RCR64 - Urban Trans: Annual users of cycling infrastructure	Yes (past experience)	Yes (related to the output target)	High
RSO 3.1	RCO47 - Rail: Length of new or upgraded rail - TEN-T	No (project documentation, other interventions)	Yes	Medium
RSO 3.1	RCO49 - Rail: Length of rail reconstructed or modernised - TEN-T	No (project documentation, other interventions)	Yes	Medium
RSO 3.1	RCR58 - Road: Annual users railways	No (project documentation, other interventions)	Yes (result indicator target is defined in relation to the output indicator target)	Medium
RCO 4.2	RCO66 - Education: Classroom capacity of childcare facilities	Yes (past experience)	Yes	High
RCO 4.2	RCO67 - Education: Classroom capacity of education facilities	Yes (past experience)	Yes	High
RCO 4.2	RCR70 - Education: Annual users of childcare facilities	Yes (ad hoc study)	Yes (result indicator target is defined in relation to the output indicator target)	High
RCO 4.2	RCR71 - Education: Annual users of education facilities	Yes (ad hoc study)	Yes (result indicator target is defined in relation to the output indicator target)	High

RSO	Indicator	Consistency in the information source	Consistent method and approach to target setting at the level of RSO	Overall assessment
RCO 4.5	RCO69 - Health: Capacity of health care facilities	Yes (ad hoc study)	No (The value depends on the type of services (e.g. specific type of patients vs general coverage of the population needs) and on the type of operation (new or modernisation and with or without energy efficiency measures))	Medium
RCO 4.5	RCR73 - Health: Annual users of health care facilities	Yes (ad hoc study)		Medium
RSO 5.1	RCO74 - Annual users of new or modernised social care facilities	Yes (statistics and past experience)	Yes (the target simply counts the population concerned)	High
RSO 5.1	RCR77 - Visitors of cultural and tourism sites	Yes (past experience)	No (there is no clear pattern in target setting)	Medium
RSO 5.2	RCO74 - Population covered in integrated territorial development	Yes (statistics and past experience)	Yes (the target simply counts the population concerned)	High
RSO 5.2	RCR77 - Visitors of cultural and tourism sites	Yes (ad hoc study)	No (there is no clear pattern in target setting)	High

Lessons learned on costing assumptions for similar actions

The analysis of methodological documents suggest that consistent patterns can be identified in defining indicator targets. However, heterogeneity in costing assumptions for the same or similar types of investment action is common and can be attributed to several factors: (a) form of support, (b) sector, (c) expected use of intervention deliverables, (d) size of beneficiaries, and (e) specific focus of programme support. It is important to note that methodological documents generally provide more details on costing assumptions for output indicators than for result indicators.

(a) Form of support

The selected list of common indicators does not include RCO03 which is the most commonly used indicator for enterprises supported through financial instruments. As a consequence, most of the programme actions reviewed in this study relate to grants. However, in some cases – such as for RCO18 'Dwelling with improved energy performance' under RSO 2.1 'Energy efficiency' - heterogeneity in costing assumptions relates to the combined use of grants and financial instruments.

(b) Sector

This factor is particularly relevant in energy efficiency, digital connectivity and waste management interventions.

- **Under RSO 2.1 'Energy efficiency'**, for RCO18 'Dwelling with improved energy performance', one programme defines costing assumptions considering that interventions cover both industry and households. For RCO19 'Public buildings with improved energy performance', heterogeneity in costing assumptions arises from the sector, as investment actions cover different types of buildings (e.g., government buildings, education infrastructure). Another relevant factor is the degree of renovation, which is linked to the initial conditions of the supported building or infrastructure and can result in varying cost profiles. Elements highlighted for output indicators RCO18 and RCO19 generally apply to result indicators on GHG emissions (RCR29) and energy consumption (RCR26).
- **For digital connectivity actions**, the main factor contributing to heterogeneity in the costing assumptions of RCO41 'Additional households with broadband access of very high capacity' and RCR53 'Dwellings with broadband subscriptions to a very high-capacity network' is the expected dual nature of the supported building. In one programme, cost definitions had to account for buildings used for both professional and a residential purposes, which affected the overall cost profiles of the intervention.
- In **waste management** under RSO 2.6 'Circular economy', the analysis of methodological documents reveals varying uses of intervention fields for establishing costs and indicator targets for RCO34 'Additional capacity for waste recycling' and RCR47 'waste recycled'. In some cases, programme investment actions focus on **household waste**, while in others, they cover **commercial and industrial waste** and/or circular economy transformation initiatives.
-

(c) Expected use

This factor is critical in particular for indicators covering new or improved services.

- **Education** - For RCO67 'Classroom capacity of new or modernised education facilities' and RCR71 'Annual users of new or modernised education facilities', heterogeneity in costing assumptions

primarily relates to the type of education infrastructure, as costs typically vary between primary, secondary, tertiary, and vocational education facilities.

- **In the health sector**, a slight distinction exists between the output and result indicators. The type of use of intervention deliverables influences target setting and costing assumptions for the result indicator RCR73 'Annual users of new or modernised health care facilities'. Some projects may attract new patients or users, while others simply enhance existing services, with interventions targeting different groups, such as the elderly or children. However, for the output indicator RCO69 'Capacity of new or modernised health care facilities', costing assumptions also vary if projects support health infrastructure (intervention field 128), health equipment (intervention field 129), and energy efficiency measures in buildings (intervention field 044).
- **For digitalisation of public services**, elements of heterogeneity in the costing assumptions for RCO14 ('Public institutions supported to develop digital services, products, and processes') and RCR11 ('Users of new and upgraded public digital services, products, and processes') relate to the expected use. Cost differences typically arise between e-government, e-inclusion, and e-health initiatives. Additionally, costing assumptions are influenced by how 'support' is interpreted in RCO14 valorisation. In some cases, multiple public institutions receive support through significant upgrades or developments, even when the beneficiary is a single organisation. This impacts target estimates and, consequently, unit costs.
- **Under RSO 2.7 'Nature protection and biodiversity'**, heterogeneity in costing assumptions of RCO36 'Green infrastructure supported for other purposes than adaptation to climate change' primarily relates to the type of green infrastructure (e.g., urban revitalization, reforestation, marine restoration) and their expected use. This does not necessarily have an impact on RCR95, which measures the population in the area covered by the intervention.

(d) Size of beneficiaries

The study gathers evidence on the relevance of this factor in contributing to heterogeneity in costing assumptions at least for RSO 1.1 and RSO 1.3, which support enterprises and use the output indicator RCO02 'Enterprises supported with grants'.

- **Under RSO 1.1 'Research and innovation'**, for investment actions such as 'R&I in enterprises' and 'R&I cooperation and technological transfer', the analysis indicates that methodological documents consider the size of the supported entities, which often include companies (such as SMEs and large enterprises), as well as clusters and business networks.
- Similarly, **under RSO 1.3 'Growth and competitiveness of SMEs'**, for the action 'business development and support', the size of beneficiaries influences costing assumptions. This is clearly reflected in the differing approaches outlined in the methodological documents.
-

(e) Specific focus of the programme support

This is the most frequent factor influencing costing assumptions across specific objectives and types of investment actions. The specific focus of each programme intervention logic determines how indicators are applied and, consequently, provides justification for the costing assumptions. A few examples are outlined below.

RSO 1.1 'Research and innovation'

- **R&I cooperation and technological transfer** – In programmes investing in these areas, the analysis of methodological documents shows that the indicator RCO06 'Researchers working in supported research facilities' is widely used across different contexts, as reflected in the use of intervention fields. This, in turn, influences costing assumptions.

- **R&I in enterprises** – For interventions promoting research and innovation in enterprises, the target for RCR03 'SMEs introducing product or process innovation' does not simply mirror RCO02, which measures the number of enterprises supported with grants. When defining the RCR03 target, programmes typically account for the expected time required for an enterprise to introduce an innovation and assume a certain level of market success. These expectations and assumptions vary across programmes, affecting costing profiles.
- **In the case of the result indicator RCR102**, which measures research jobs created after a project's completion, no clear relationship can be established between the size of the supported organisations and the result indicator target. Programmes typically define costing assumptions based on either the number of research entities supported (RCO06) or the number of enterprises supported (RCO02).

RSO 1.2 Reaping the benefits of digitisation

- **SME digitalisation interventions may have a dual nature**. While grants support the implementation of ICT solutions, non-financial support (e.g., advisory services) can help SMEs leverage digital opportunities. This possible dual nature of the SME digitalisation actions can result in varying approaches to costing assumptions for RCO02 as show in some programmes analysed.

RSO 1.3 – Growth and competitiveness of SMEs

Several indicators are used in different policy contexts and under different programme intervention logics. This variation in focus is generally reflected in intervention fields and contributes to heterogeneity in costing assumptions. Notable examples include RCO05 'New enterprises supported', RCR17 'New enterprises surviving in the market', RCO15 'Capacity of incubation created' and RCR18 'SMEs using incubator services after incubation creation' and RCR01 'Jobs created in supported entities'.

PO 2 and PO3

- **Under RSO 2.2 'Renewable energy'**, heterogeneity in costing assumptions is linked to the **different types of renewable energy sources** (as reflected in intervention fields). This is relevant for RCO22 'Additional production capacity for renewable energy' but can also influence the related result indicators RCR31 'Total renewable energy produced' and RCR32 'Additional operational capacity installed for renewable energy'.
- Under **RSO 2.4 'Climate change adaptation'**, costing assumptions of RCO25, measuring flood protection newly built or consolidated, might diverge due to the **specific types of risk addressed and the context situations covered**. This does not necessarily impact RCR35, which measures the population in the area covered by the intervention.
- **Under RSO 2.8 'Sustainable transport',** for RCO 57 measuring rolling stock capacity, heterogeneity in costing assumptions primarily stems from two factors: **the type of vehicle** and whether **the intervention is part of a broader urban transport investment**. The same considerations apply to RCR29 and RCR63 'Annual users of new or modernised tram and metro lines'.
- **In cycling infrastructure actions**, costing approaches for RCO58 'Dedicated cycling infrastructure supported' may differ when the intervention is part of a larger urban transport action. This is reflected in the use of several intervention fields. The same applies to RCR64 'Annual users of dedicated cycling infrastructure'.
- **Heterogeneity in costing assumptions on railway interventions mainly arises from the project focus**, distinguishing between reconstructed / modernised railways (RCO49) or new or upgraded infrastructure (RCO47).

The analysis of methodological documents conducted for this study does not identify substantial factors of heterogeneity in costing assumptions for indicators related to early childhood infrastructure (RCO66 and RCR70), Natura 2000 (RCO37), water supply for human consumption (RCO30 and RCR41). Similarly, for RCO74 ('Population covered by integrated territorial development') and RCR77 ('Visitors of cultural and tourism sites supported') under PO5, programmes usually adopt different approaches but these are related to past programming period experiences.

1.8.2.3 Factors which might affect the achievement of indicator targets

The analysis of homogeneity concludes with a review of factors that might affect the progress and capacity of the programme to achieve its targets. Factors that typically influence the capacity to meet targets for all the Policy Objectives (POs) are often **policy-related** and include:

- Budgetary restrictions that require funds to be redirected to other needs.
- Changes in regulations that fall outside the managing authority's control.
- Delays in programme implementation and completion.
- The capacity of applicants and beneficiaries to prepare the necessary technical and financial documentation, and the timely approval of such documentation.
- The risk of competition from other funding sources.
- Discrepancies between the approved projects and the pilot projects used to set the targets.

Socio-economic factors can also hinder programme implementation and target achievement, such as the inability to provide anticipated advances or payments to entities with pending justifications, price increases and potential future crises or supply shortages. Furthermore, some methodological documents highlight the impact of international factors, such as the geopolitical crisis on the Eastern European borders, exchange rate risks, and the long-term effects of the COVID-19 crisis and recovery.

For infrastructure interventions, especially in PO 2 and PO 3, **administrative challenges** related to public procurement procedures, contractor selection, and obtaining building permits may cause delays in the implementation of planned activities. Additionally, in RSO 2.8, some methodological documents refer to technological advancements that can lower prices and make it easier to achieve programme targets.

1.8.3 Lessons learned from the assessment of outliers

Outlier programmes identified in Task 1a analysis are not to be considered as those adopting wrong assumptions but behaving differently from the average correlation between indicator target and invested amount. The review of methodological documents identifies three reasons which can contribute to explaining this situation.

Programme actions might be characterized by different type of beneficiaries / target groups, **focus** and **delivery mode**. Supporting large or microenterprises, covering energy efficiency in industry and / or housing sector, using financial instruments and / or grants can affect unit costs, the programme delivery and explain differences between programmes.

Different approach to establishing unit costs – Some programmes have used different methodological approaches or sources to establish unit costs. This can explain why they are outliers.

Lack of specification of investment actions or use of umbrella investment actions – Task 1b analysis has proposed types of investment actions to ensure more granularity to the assessment. However, some methodological documents do not specify the type of operations supported under each specific objective. On the contrary, other programmes formulate very broad programme actions covering a wide and flexible set of possible different interventions (e.g. support for SMEs and new enterprises, international research and cooperation, collaboration and technological transfer, or new product development). This affects the relationship between indicator targets and invested amount and this contributes to explaining the outliers.

2 Assessment of the role of common indicators in a system of "financing not linked to costs" (Task 2a)

This section provides an analysis of the potential role of ERDF/CF/JTF common indicators in a system of payments not linked to costs. It presents the results of the analyses conducted under the relevant sub-tasks:

- Sub-Task 2a.1: Comparing ERDF/CF/JTF common indicators with RRF investment-relevant targets and milestones (Section 2.1).
- Sub-Task 2a.2: Assessing the potential of selected common indicators for payments not linked to costs (Section 2.2).
- Sub-Task 2a.3: Evaluating how common indicators address weaknesses identified by the ECA (Section 2.3).

2.1 COMPARISON BETWEEN ERDF/CF/JTF COMMON INDICATORS AND RRF MILESTONES AND TARGETS (SUB-TASK 2A.1)

Based on the approach set out in the methodological section (2.1.1) this section provides a comparison of ERDF/CF/JTF common indicators and RRF milestones and targets, analysing first process indicators (2.1.2) and then output and result indicators (2.1.3).

2.1.1 Methodology

2.1.1.1 General approach

To enable the comparison, ERDF/CF/JTF common indicators and RRF milestones and targets need to be grouped into comparable subsets. Establishing a systematic one-to-one correspondence between individual ERDF/CF/JTF indicators and RRF milestones and targets is not feasible due to the variability across different Recovery and Resilience Plans (RRPs). Indeed, a key novelty of the RRF is that Member States have flexibility in designing the reforms and investments in a way that suits their national conditions, which increases their ownership of the plans but does result in heterogeneity amongst the 27 RRPs. Conversely, a broad, generic comparison may yield limited and superficial insights. Using subsets allows for a more operational and nuanced comparison instead, balancing granularity with comprehensiveness.

To create comparable subsets as a basis for the comparison, the study classifies the milestones and targets and the ERDF/CF/JTF common indicators (output and result indicators) under three dimensions that structure the comparison: **indicator type, policy sector and type of operations**. Under each of these three dimensions, this study's effort is to create a common language between RRF and ERDF/CF/JTF, to enable the comparison.

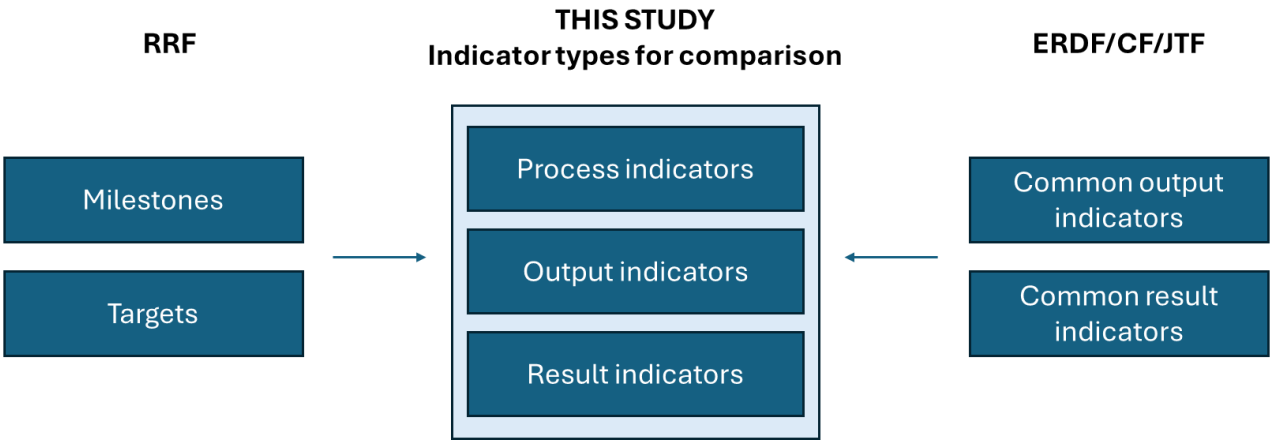
Indicator type

Three indicator types have been assigned: process indicator, output indicator, result indicator. These typologies are aligned with the characterisation of RRF milestones and targets proposed in the tender specifications, as well as with the 2018 study on the development of post-2020 ERDF/CF/JTF common indicators[27]. For the purposes of the present study, the following definitions apply[28]:

- **Process indicators** describe programme implementation processes with information on the support provided (e.g. number of selected projects, funds allocated).
- **Output indicators** measure what is delivered through the supported intervention (e.g. surface area of energy-renovated buildings, length of new railway lines).
- **Result indicators** measure the direct effects of the supported intervention's outputs (e.g. GHG emission reduction).

These three indicator types do not reflect RRF or ERDF/CF/JTF definitions – for instance, ERDF/CF/JTF do not foresee the category of process indicators. Yet, to enable the comparison, it is necessary to apply the same categories to both RRF milestones and targets and ERDF/CF/JTF common indicators.

Figure 15 Terminology of indicator types for comparison



Source: Consortium own elaboration

As part of the preliminary steps of the analysis, 7 ERDF/CF/JTF common output indicators are categorised as process indicators (see below, section 2.1.2). In principle, also common output indicators related to beneficiaries of support (for instance, RCOs 01-05 on firms) could be considered process indicators. However, if for the purposes of this task they were considered process and not output indicators, the comparison of output indicators under some Policy Objectives (especially PO1) would lose a crucial element of the analysis.

[27] European Commission (2018). Development of a system of common indicators for European Regional Development Fund and Cohesion Fund interventions after 2020. To be more precise, this study also includes a fourth indicator type: input indicators, corresponding to the amounts of financial support. In the present study, this category is not deemed relevant.

[28] The definitions are adapted from European Commission (2018). Development of a system of common indicators for European Regional Development Fund and Cohesion Fund interventions after 2020.

Information on the approach adopted to assign RRF milestones and targets to the three indicator types is provided in section 2.1.1.2.

Policy sector

The policy sectors structuring the comparison correspond to the 2021-2027 Specific Objectives (SOs). In particular, the study covers the SOs corresponding to POs 1, 2, 3 and 4. PO5 is left out of this comparison (as Annex 1 to the CPR indicates, in fact, PO5 may use relevant common indicators listed for POs 1 to 4)[29].

Investment type

The comparison is also structured by type of operations, defined as an aggregation of thematically closely related Intervention Fields (IFs). The choice to introduce the concept of type of operation in this comparison in addition to the structure by SO stems from different needs: ensuring a granular analysis; combining the policy/strategic dimension (covered by the SO) with the nature of the supported action (the IF); ensuring consistency throughout the whole study (type of operations will be a building block of Task 2b). Common indicators and milestones and targets are compared for the different type of operations of each SO.

In what follows, Section 2.1.1.2 illustrates the procedures put in place to make the information base on RRF milestones and targets fit for the comparison; Section 2.1.1.3 illustrates the operationalisation of the comparison, structured into the three abovementioned dimensions.

Only investment-related RRF milestones and targets are considered.

2.1.1.2 Structuring the information base on RRF milestones and targets

Unlike ERDF/CF/JTF common indicators, RRF milestones and targets are not standardised at EU level and were never supposed to be, given the strong ownership of Member States in developing their RRPs. From the Commission, the study team received a dataset composed of two sheets containing the lists of Measures (4,671 rows) and M&Ts (7,098 rows). The following steps were taken to structure this information base for the comparison.

[29] The choice to exclude PO5 from the comparison leads also to the exclusion of six common output indicators that, according to the indicative linkage between POs and indicators provided in the ERDF/CF Regulation as well as on the Cohesion Open Data Platform, are mainly linked to PO5 (RCO74 - Population covered by projects in the framework of strategies for integrated territorial development; RCO75 - Strategies for integrated territorial development supported; RCO76 - Integrated projects for territorial development; RCO80 - Community-led local development strategies supported; RCO112 - Stakeholders involved in the preparation and implementation of strategies for integrated territorial development; RCO114 - Open space created or rehabilitated in urban areas).

Merging the two sheets

In RRPs, each measure contains one or more milestones and/or targets. **To prepare a dataset linking the information on the individual milestone or target to its related measure, the study team merged the two sheets** (through the column "Measure Reference" in the sheet Measures, which corresponds to column "Related Measure Reference" in the sheet M&Ts). This merge made it possible to put on a single row in the dataset two types of information:

A. Information on the individual milestone or target (for instance: milestone/target name; milestone/target description; unit of measure; baseline);
B. Information on the related measure (for instance: primary policy area; secondary policy area; cost; Digital Objective Intervention Field; Green Objective Intervention Field).

The merge was performed differently depending on whether a measure had sub-measures or not. The reason for this difference lies in the fact that in the case of measures that are divided into sub-measures, the dataset received provides information on the policy areas, cost and intervention fields at the level of each sub-measure, and not at the level of the "parent" measure. For measures having no sub-measures (2,289), the milestones and targets were merged with the related measure. For measures having sub-measures (579, with a total of 1,803 sub-measures) – since milestones and targets are always related to measures, and not to sub-measures - milestones and targets related to the "parent" measure were replicated for each different sub-measure. The following table is an excerpt from the dataset that provides different examples:

- **Milestones/targets merged with their related measure**. If a measure does not have sub-measures, its milestones and targets are merged with it. Example: Measure DE-C[1.3]-I[1] "Support programme for the development of a climate-friendly timber construction sector", which has one milestone and one target.
- **Milestones/targets merged with all sub-measures of their related measure**. If a measure has sub-measures, and its milestones/targets match with all the sub-measures (based on the information included in the database), all different matches are kept. Example: Measure BE-C[C32]-I[I-311] "Canal Albert and Trilogiport", which has two sub-measures ("Extension of Trilogiport multimodal platform" and "Raising of 3 bridges downstream of Liège to navigate with 4 layers of containers"). This measure has one milestone ("Award of contracts for the works of the bridges over Canal Albert / and a new platform at Trilogiport") and one target ("Completion of the works of the bridges over Canal Albert / and a new platform at Trilogiport"), which both cover the two sub-measures at the same time.
- **Milestones/targets merged with some sub-measures of their related measure**. In this case, the milestones/targets can match with only some of the sub-measures, while the match with other sub-measures appears implausible (based on the information included in the database), therefore – to prevent wrong matches from entering consideration – only the "sure" matches are kept. Example: Measure EL-C[4,6]-I[16293] "Culture as a driver of growth", which has two sub-measures ("Preparation, implementation, monitoring and control" and "Energy efficiency renovations"). This measure has two milestones: the first one (M[280] "Contemporary Greek Culture Brand and Platform") involves the development of a Contemporary Greek Culture Branding, the setup of a Greek Design platform and a Greek music database and the update of a Greek literature translation programme; the second milestone (M[283] "Culture as a driver of

growth"[30] involves the finalisation of different projects, including energy efficiency interventions. Based on the available information, the matches between M[283] and the two sub-measures were kept in the dataset. For M[280], which does not cover any aspects related to energy efficiency, only one match has been kept, i.e. its match with the sub-measure "Preparation, implementation, monitoring and control"; the match with "Energy efficiency renovations" has been excluded from consideration instead, because keeping it would have implied that the progress of energy efficiency renovations is tracked through a milestone that is about cultural branding, distorting the subsequent analysis.

[30] This milestone has the same name as its related measure.

Table 17 Excerpt from dataset

Information on milestone or target		Information on related measure			
Milestone or Target	**Milestone / Target Name**	**Measure Reference**	**Measure level**	**Measure Name**	**Parent Measure Reference**
Milestone	Funding guidelines on the promotion of climate-friendly timber construction	**DE-C[1.3]-I[1]**	Measure	Support programme for the development of a climate-friendly timber construction sector	-
Target	Approval of projects related to the development of climate-friendly timber construction	**DE-C[1.3]-I[1]**	Measure	Support programme for the development of a climate-friendly timber construction sector	-
Milestone	Award of contracts for the works of the bridges over Canal Albert / and a new platform at Trilogiport	**BE-C[C32]-I[I-311.S1]**	Sub-Measure	Canal Albert and Trilogiport - Extension of Trilogiport multimodal platform	BE-C[C32]-I[I-311]
Target	Completion of the works of the bridges over Canal Albert / and a new platform at Trilogiport	**BE-C[C32]-I[I-311.S1]**	Sub-Measure	Canal Albert and Trilogiport - Extension of Trilogiport multimodal platform	BE-C[C32]-I[I-311]
Milestone	Award of contracts for the works of the bridges over Canal Albert / and a new platform at Trilogiport	**BE-C[C32]-I[I-311.S2]**	Sub-Measure	Canal Albert and Trilogiport - Raising of 3 bridges downstream of Liège to navigate with 4 layers of containers	BE-C[C32]-I[I-311]
Target	Completion of the works of the bridges over Canal Albert / and a new platform at Trilogiport	**BE-C[C32]-I[I-311.S2]**	Sub-Measure	Canal Albert and Trilogiport - Raising of 3 bridges downstream of Liège to navigate with 4 layers of containers	BE-C[C32]-I[I-311]
Milestone	Contemporary Greek Culture Brand and Platform	**EL-C[4,6]-I[16293.a]**	Sub-Measure	Culture as a driver of growth - Preparation, implementation, monitoring and control	EL-C[4,6]-I[16293]
Milestone	Culture as a driver of growth	**EL-C[4,6]-I[16293.a]**	Sub-Measure	Culture as a driver of growth - Preparation, implementation, monitoring and control	EL-C[4,6]-I[16293]
Milestone	Culture as a driver of growth	**EL-C[4,6]-I[16293.b]**	Sub-Measure	Culture as a driver of growth - Energy efficiency renovations	EL-C[4,6]-I[16293]

Source: Consortium own elaboration on extraction received from Commission

Assigning each milestone and target to one SO

To assign milestones and targets to one SO, a two-step procedure was established, based first on the use of RRF Intervention Fields (IFs) from the RRF Regulation, and then on policy areas. After the Box below, which presents the main differences between RRF IFs and ERDF/CF/JTF IFs, the procedure is illustrated.

Box 1. RRF Intervention Fields vs. ERDF/CF/JTF Intervention Fields

Under the **RRF**, IFs serve to track the contribution of measures and sub-measures to green and digital objectives. Each RRP must allocate at least 37% of its budget to green objectives and 20% to digital ones, and the RRF Regulation foresees that the contribution of each measure is accounted for by means of a methodology set out in its Annexes VI and VII. Annex VI (Methodology for climate tracking) lists over 140 IFs and for each of them, it indicates two coefficients for the calculation of support to climate objectives and environmental objectives. Among these, not all IFs contribute to climate and environmental objectives (i.e. for some IFs, the coefficients are both 0%). Annex VII (Methodology for digital tagging) lists only IFs that do contribute to digital objectives instead. The list in Annex VII includes some IFs already listed in Annex VI, as well as additional IFs. RRP measures expected to contribute to green objectives are associated with one IF from Annex VI. Measures expected to contribute to digital objectives are associated with one IF from Annex VII. A measure can also be associated with one IF from Annex VI and another IF from Annex VII. In case a measure is divided into sub-measures, IFs are assigned to each sub-measure, not to the "parent" measure.

The **extraction received from the Commission** shows that out of a total of 4,092 measures and sub-measures (2,289 measures having no sub-measures, and 1,803 sub-measures), 51% have at least one IF (2,098), while 49% have none (1,994). Since under the RRF IFs serve to track the contribution to green and digital objectives, the overwhelming majority of measures and sub-measures that have an associated IF relate to these domains. Not all of them, though, because some measures are assigned IFs from Annex VI that do not support green objectives (i.e. their coefficients in Annex VI are both zero). For example, Polish measure PL-C[A]-I[2.4.1] "Investment in the development of research capacities" is associated to IF 003 "Investment in fixed assets, including research infrastructure, in public research centres and higher education directly linked to research and innovation activities", which does not relate to the green and/or digital objectives.

The list of **ERDF/CF/JTF** IFs is very similar to the RRF, but their use differs markedly. The list in the RRF Regulation contains many IFs that have an identical formulation as the 2021-2027 Common Provisions Regulation, but it also introduces a few new IFs (for instance, 011ter "Deployment of the European digital identity scheme for public and private use"). Despite this overall similarity, the use of IFs is much wider under ERDF/CF/JTF, where IFs are employed for different purposes, such as programming, monitoring, reporting, and evaluation, as well as to track the contribution to green objectives (Art. 6 CPR). Under the RRF, IFs are used only to track contributions to green and digital objectives. Also the scope differs: under ERDF/CF/JTF, IFs are specified for each SO with a breakdown of resources (Art. 22 CPR) and at a more granular level, also each project (or project component) is marked with an IF in the monitoring system of Managing Authorities. IFs are therefore a major unit of

analysis for ERDF/CF/JTF, as disaggregating by IF is possible along many different dimensions (for instance, by type of region, SO, achievements, planned/allocated/spent resources, beneficiaries).

Source: Consortium own elaboration

The two-step procedure consisted in:

A. **Using RRF IFs.** The study team first transposed RRF IFs into Cohesion Policy IFs based on the correspondence established by the Commission[31]. When a RRF measure or sub-measure had only one RRF IF, the SO was assigned based on the indicative IF-SO linkage established by the Commission[32]. When a RRF measure or sub-measure had two RRF IFs, the IF corresponding to the primary policy area was considered, if the primary policy area belonged to the green or digital pillar. If the primary policy area did not belong to the green or digital pillar (100 cases), the IF corresponding to the secondary policy area (always Digital) was used. After this, some measures were excluded from the dataset: measures linked to Cohesion Policy IFs between 170 and 182, because they do not have a correspondence with a SO; measures linked to Cohesion Policy IFs that are linked to a SO of the ESF+ (so-called ESOs); measures linked to Cohesion Policy IFs linked to SO5.1 (PO5 is left out of the comparison).
B. **Matching by primary policy area.** For the remaining measures having no RRF IFs (i.e. 1,994 measures or sub-measures for which the extraction received from the Commission provides no associated IF), the attribution of an SO was based on the primary policy area. Out of the 52 RRF policy areas, 24 can be directly attributed to one SO. 9 were considered out of scope and removed from the database, either because not covered by ERDF/CF/JTF (Effectiveness of judicial systems; Tax measures, including measures pertaining to aggressive tax planning; Fiscal policy and fiscal governance; Fraud prevention; Anti-money laundering supervision; Financial sector reforms; Rule of Law reforms; Effectiveness of public administration and national systems, including minimising administrative burden) or because not covered under this study (Transnational cooperation). 19 require a more in-depth approach (typically, they could fall under two or more different SOs): for each of them, a specific approach was established based on the secondary policy area, the measure name, and manual attribution. The table below offers additional details on the mapping of the 52 RRF policy areas and their correspondence with ERDF/CF/JTF SOs, listing the 24 areas directly attributed to one SO, the 9 that are out of scope and the 19 areas requiring a specific approach.

Table 18 Approach to attribution of RRF policy areas to SOs

RRF policy area	Approach
R&D&I In Green Activities (E.G. Climate Change Mitigation, Circular Economy)	Single SO
Research, Development and Innovation	Single SO
(Non-youth) employment support and job creation, including hiring and job transition incentives and support for self-employment	Single SO
Digitalisation of businesses	Single SO

[31] The correspondence table is available on the Cohesion Open Data Platform. Out of the RRF IFs found in the received database, 11 have no correspondence in the correspondence table. Two of them were excluded (01 and ADHOC). For the other nine, the thematically closest Cohesion Policy IF was used.

[32] This information is available on the Cohesion Open Data Platform.

RRF policy area	Approach
Support to SMEs	Single SO
Competitiveness	Single SO
E-government, digital public services (including digitalisation of transport) and local digital ecosystems	Single SO
Business infrastructure	Single SO
Regulatory changes for smart, sustainable and inclusive growth	Single SO
Support to large enterprises	Single SO
Business environment/ Entrepreneurship	Single SO
Connectivity	Single SO
Energy efficiency	Single SO
Climate change adaptation	Single SO
Sustainable use and protection of water and marine resources	Single SO
Industrialisation and reindustrialisation	Single SO
The protection and restoration of biodiversity and ecosystems	Single SO
Pollution prevention and control (such as air, water, noise pollution)	Single SO
Modernisation of labour market institutions, including employment services and forecasting of skills and labour inspectorates; employment protection and organisation; social dialogue and wage setting mechanisms; adaptation of workplaces	Single SO
Transition to a circular economy, waste prevention and recycling	Single SO
Adult learning, including continuous vocational education and training; recognition and validation of skills	Single SO
Early childhood education and care: Accessibility, affordability, quality and inclusiveness, including digitisation and infrastructure	Single SO
Cultural sector	Single SO
Youth Employment Support And Youth Job Creation, Including Hiring And Job Transition Incentives And Support For Self-Employment	Single SO
Transnational cooperation	Out of scope
Effectiveness of judicial systems	Out of scope
Tax measures, including measures pertaining to aggressive tax planning	Out of scope
Fiscal policy and fiscal governance	Out of scope
Fraud prevention	Out of scope
Anti-money laundering supervision	Out of scope
Financial sector reforms	Out of scope
Rule of Law reforms	Out of scope
Effectiveness of public administration and national systems, including minimising administrative burden	Out of scope
Digital-related measures in research, development and innovation	Specific approach
Green skills and jobs	Specific approach
Other Climate Change Mitigation (E.G.. Sustainable Industry)	Specific approach
Human capital in digitalisation	Specific approach
Digital capacities and deployment of advanced technologies	Specific approach
Building renovation and construction	Specific approach
Renewable energy and networks	Specific approach
Sustainable mobility	Specific approach
General, Vocational, And Higher Education: Accessibility, Affordability, Quality And Inclusiveness, Including Digitisation And Infrastructure	Specific approach
Social housing and other social infrastructure	Specific approach
Social protection, including social services and integration of vulnerable groups	Specific approach
Healthcare: resilience, sustainability, adequacy, availability, accessibility and quality, including digitisation and infrastructure	Specific approach
Long-term care: resilience, sustainability, adequacy, availability, accessibility and quality, including digitisation and infrastructure	Specific approach
Territorial infrastructure and services	Specific approach
Development of rural and remote areas (e.g. islands)	Specific approach
Strategic autonomy	Specific approach
Crisis preparedness	Specific approach
Crisis Reaction Capacity	Specific approach
Business and public service continuity (in crisis)	Specific approach

Source: Consortium own elaboration

Assigning each milestone and target to one indicator type.

RRF investment-related milestones were preliminarily classified as process indicators, given their frequent procedural nature. RRF investment-related targets were classified as output indicators as default option, and then – through the use of keywords taken from ERDF/CF indicators, information on their measurement unit, and manual attribution – reclassified as process or result indicators as needed.

Assigning milestones and targets to one type of operation.

After establishing aggregations of IFs (i.e. type of operations, structured by SO – see table below), the assignment of RRF measures and therefore their related milestones and targets to an type of operation relied on their IF (those measures having an IF) or manual attribution. Manual attribution – made necessary by the need to categorise a critical mass of measures into type of operations (so as to ensure a common language between RRF and ERDF/CF/JTF) – was based from a top-down perspective on the available type of operations for each SO (see table) and from a bottom up-perspective on the evidence available in the dataset received from the Commission (information on the measure and its associated policy areas).

Table 19 Investment types and related CP IFs

SO	Investment type	Related CP IFs
1.1	R&I in enterprises	001, 002, 003, 005, 006, 007, 009, 010, 011
1.1	R&I in Low-carbon economy and circular economy	029, 030
1.1	R&I in research centres	004, 008, 012
1.2	Digitising firms	013, 014, 015
1.2	E-government	016, 017
1.2	Inclusion and e-health	018, 019
1.3	Business development (generic support and advanced support services)	021, 022, 024, 031
1.3	Business infrastructure	020
1.3	Innovation and cooperation	026, 027, 028
1.4	Skills for smart specialisation and transition	023
1.4	Incubation and start-up support	025
1.5	Broadband connectivity	032, 033, 034, 035
1.5	Other ICT infrastructure	036, 037
2.1	Energy efficiency in enterprises	038, 039, 040
2.1	Energy efficiency in housing	041, 042
2.1	Energy efficiency in public infrastructure	044, 045
2.1	Other support services/investments for LCE and climate change	046
2.1	High efficiency / replacement heating systems	054, 055, 056
2.1	New energy efficient buildings	043
2.2	RE biomass	049, 050
2.2	RE other	051, 052
2.2	RE solar	048
2.2	RE wind	047
2.3	Natural gas distribution	057
2.3	Smart energy systems	053
2.4	Climate change adaptation and risk management	058, 059, 060, 061, 132
2.5	Integrated water sector	062, 063, 064, 065, 066
2.6	Circular economy	071, 072, 075, 076
2.6	Waste management	067, 068, 069, 070
2.7	Air quality	077
2.7	GHG emission reduction in natural areas	080
2.7	Natura 2000	078
2.7	Nature and biodiversity protection	079
2.7	Rehabilitation of industrial sites	073, 074

SO	Investment type	Related CP IFs
2.8	Clean urban transport	081, 082, 086
2.8	Cycling infrastructure	083
2.8	Intelligent and digital transport	084, 085
3.1&3.2	Airport security, safety and air traffic management	118
3.1&3.2	Digitising transport	119, 120
3.1&3.2	Inland waterways/ports	114, 115, 116, 117
3.1&3.2	Multimodal transport	108, 109
3.1&3.2	Railway transport	096, 097, 098, 099, 100, 101, 102, 103, 104, 105, 106, 107
3.1&3.2	Road transport	087, 088, 089, 090, 091, 092, 093, 094, 095
3.1&3.2	Seaports	110, 111, 112, 113
4.1	Other social infrastructure	127
4.2	Infrastructure for early childhood	121
4.2	Infrastructure primary and secondary education	122
4.2	Infrastructure tertiary education	123
4.2	Infrastructure vocational education and training	124
4.3&4.4	Housing infrastructure	125, 126, 133
4.5	Health infrastructure and assets	128, 129, 130, 131
4.6	Cultural assets and services	166
4.6	Tourism assets and services	165, 167

Source: Consortium own elaboration

As part of the database processing, when type of operations that had been automatically attributed based on the IF appeared incorrect, manual corrections have been made. For example, the Croatian measure "Start-up grant funding" was associated to RRF IF 008 ("Research and innovation activities in small and medium-sized enterprises, including networking"), corresponding to the identically formulated CP IF 010. While the automatic attribution preliminarily assigned this measure to the type of operation "R&I in enterprises", it was manually reattributed to type of operation "Incubation and start-up support". To ensure correctness in the assignment to type of operations, measures (and related milestones and targets) for which the available information was not conducive to a clear assignment have not been attributed to an type of operation (under each type of operation, this is however the case for a minority of measures).

Using Tags to reduce heterogeneity of milestones and targets.

Based on the use of keywords, combined with manual attribution and multiple checks, a Tag was assigned to milestones and targets to reduce their diversity. For example, milestones consisting in new pieces of legislation, or amendments, were all classified under the Tag "Legislation", in order to consider them jointly and thereby enable a more insightful analysis. For this dimension as well, to ensure correctness in the analysis, milestones and targets have not been tagged in case the information deriving from their name, description and unit of measurement did not allow for a clear attribution (under each type of operation, this is however the case for a minority of milestones and targets). Ultimately, the comparison has therefore considered only RRF milestones and targets for which the attribution to the various dimensions has been considered sufficiently solid, in order not to introduce an undue bias to the analysis.

2.1.1.3 Operationalising the comparison

The comparison under each type of operation is performed in table form, listing ERDF/CF/JTF common indicators and RRF milestones and targets, and providing information for each of them on four dimensions.

These dimensions have been chosen for their ability to shed light on differences between ERDF/CF/JTF and the RRF and/or for the chance they offer to map variability and information that is important in the economy of the whole study (especially for Task 2b). They are:

- **Indicator nature.** The use of indicators of either qualitative or quantitative nature is an important element of differentiation.
- **Unit of measurement.** Quantitative indicators can have different units of measurement – a relevant proxy of methodological variability. For common indicators, the unit of measurement is defined in SWD(2021) 198. For RRF targets, it is available in the extraction received from the Commission.
- **Baseline.** Quantitative indicators can have a baseline equal to 0, or a higher one. For common indicators, the baseline is defined in SWD (2021) 1989. For targets, it is available in the extraction received from the Commission. Different approaches to the definition of the baseline can reflect different underlying investments, but also represent an informative element with regard to future steps of the study.
- **Reference to a specific intervention area.** This dimension feeds into Task 2b by providing information about the indicators' thematic coverage. In cohesion policy, common indicators can be used in principle under any SO if relevant; however, SWD (2021) 198 suggests whether each indicator may be used under a specific SO or multiple ones. If an indicator is listed as referring to one SO only, it is marked as specific to an intervention area. In the RRF, the milestones and targets are linked to their measures, thus to a specific type of activities; however, the assigned Tags (which are more general, on purpose: see point 5 under 2.1.1.2 above) can in principle refer to different intervention areas.

Within each type of operation-specific table, output and result indicators are compared separately. Based on the information presented for each of the listed indicators, a type of operation-specific comparison is then put forward. This comparison, presented in table form as well, concerns the abovementioned four dimensions, as well as the differences between the sets of indicators of ERDF/CF/JTF and RRF. The identification of such differences allows to draw findings on whether the indicators cover the same thematic domains and interventions, and whether certain areas remain uncovered under ERDF/CF/JTF.

For **ERDF/CF/JTF common indicators**, the selection under each type of operation is based on the indicators' frequency: for each type of operation (i.e., SO+IFs combination) the common indicators having at least 10 total occurrences in 2021-2027 programmes are considered[33]. Concerning RRF milestones and targets, under each type of operation the most frequent Tags are analysed in the tables. When the

[33] An alternative approach could have consisted in considering each indicator under one SO only, relying on the indicative linkage between SOs and common indicators available in Annex 1 of the ERDF/CF Regulation. The choice to consider common indicators based on their frequence derives from the need to better reflect the reality on the ground, with common indicators being used under multiple SOs. This approach, on the one hand, results in the same common indicators being presented in the comparison tables multiple times (i.e. under each investment type they are frequently used for), but on the other hand offers a more precise overview of the indicators actually used for each investment type, which is a crucial information with regard to the possibility to draw conclusions on possible FNLC schemes and the use of common indicators in them.

numerosity of applicable milestones and target is however very low, which is almost consistently the case for result indicators, also individual milestones and targets are included.

Process indicators[34] are analysed through a general comparison instead (i.e. not specific by type of operation), because, given their largely procedural nature, the differences between thematic areas are not as pronounced as to justify separate comparisons. Eventually, findings and conclusions are drawn based on a horizontal reading of the granular comparisons.

2.1.2 Process indicators

Process indicators serve as proxies for a wide range of observable facts. In the context of investments, they can represent implementation or procedural steps (e.g., calls for proposals, selection rates, finalized procurement contracts) or inputs (e.g., amounts of financial support). Due to their nature and purpose, these indicators are essential for the RRF, as they facilitate the monitoring of ongoing processes and intermediary phases. Conversely, in the ERDF/CF/JTF framework, the focus of the monitoring system is generally on the deliverables of the funded actions rather than the processes involved. As a result, process indicators are not explicitly identified and are less numerous than in the RRF.

Because of their nature, process indicators are treated separately in this section since they are more related to different phases the policy cycle rather than specific policy areas or sectors (e.g., setup or implementation phases). A distinct comparison of process indicators allows for identifying differences between selected ERDF/CF/JTF common indicators and RRF milestones and targets. Furthermore, given their role in the following part of the study (Task 2b), examining these indicators is crucial for drawing lessons on the use of ERDF/CF/JTF indicators in the RRF context.

Under the RRF, process indicators are typically **milestones** (i.e., qualitative indicators), but not exclusively: out of over 5,700 milestones and targets classified as process indicators in the database deriving from the extraction received from the Commission, over 4,600 are milestones (80.4%), compared to over 1,100 targets (19.6%). The main RRF process indicators are presented in the following table under the column Tag (which reflects the core meaning of milestones and targets, irrespective of their individual formulation, and which was introduced in order to cope with the extreme variability of milestones and targets under the RRF – see 2.1.1.2). In turn, Tags are here grouped into three categories to enable a structured analysis, and examples of actual milestones/targets are offered for each Tag.

Table 20 Main RRF process indicators

Category	Tag	Examples of actual milestones/targets

[34] For the purposes of this analysis, seven common output indicators have been considered process indicators: RCO08 RTDI: Value of R+I equipment; RCO13 Digital: Value of digital services, products and processes; RCO24 Climate: Investments in disaster management; RCO27 Climate: Strategies addressing climate change adaptation; RCO96 RTDI: Value of Interregional investment; RCO107 Circular: Investments in separate waste collection; RCO122 Investments in disaster management (non climate).

Initial steps of the project cycle	Publication of tenders/calls	• Public tender launched for additional hydrogen capacity • Launch of calls for Industrial parks • Launch of a call for the selection of the universities performing e-curriculum development
	Selection of projects/award of contracts	• Grant agreements signed for demonstration facilities for innovative green hydrogen technology • Projects selected to promote innovative digital educational solutions • Selection of Industry 4.0 projects
	Projects started/Works started[35]	• At least 66 % of approved projects started • Start of all cycling and walking projects • Commencement of the retrofit works
Financial amounts	Funds allocated/committed	• Budget committed for electric vehicles chargers and hydrogen refuelling points • EUR 8364 million of financial institutions funds signed with final beneficiaries • Funds committed to the entities selected
	Transfer of resources to financial intermediaries	• The Ministry has completed the transfer of funds to CDP Venture Capital SGR • Capital transfer from the Lithuanian Government to INVEGA • Capital transfer of EUR 250 000 000 from the Portuguese Government to BPF and adoption of the investment policy for BPF
	Funds disbursed	• Disbursements made towards VET providers for green upskilling • Disbursement of funds in the form of loans to support the health and aerospace sectors • Disbursement of funds to R&D projects under PERTE Health
Legislation and strategic, organisational or administrative documents	Legislation	• Entry into force of the Digitalisation Fund Act • Legal framework for biogas production • Amendment of Social Services Act concerning inspections and complaints
	Strategy/plan/programme	• Walloon Strategy for deinstitutionalisation (Walloon health policy) • Adoption of a housing affordability strategy • Digitalisation of SMEs Plan 2021-2025

[35] Milestones and targets have been classified as output indicators when they concern completed projects instead, i.e. when the underlying investment has produced its foreseen deliverable.

	Signature of agreement/establishment of financial instrument	• Signature of financing agreement between the European Investment Fund and the Government of Bulgaria • Establishment of financial instrument to support investment by micro, small and medium-sized enterprises • Setup of the Fund
	Administrative steps/Implementing agreements	• Signature of contractual agreements between the Ministry of Agriculture, Fisheries and Food (MAPA) and ENISA • Requirements, design and solutions for the different sub-measures are defined and approved • Conclusion of agreements with local governments on the implementation of projects
	Feasibility studies/Evaluations	• Feasibility studies for the Volkskundemuseum Wien and Prater Ateliers • Assessment of water retention potential and proposal of concrete measures • Evaluation of the support programme

Source: Consortium own elaboration

Among **ERDF/CF/JTF common (output and result) indicators**, there is not a wide set of process indicators similar to those under the RRF listed above**.** Some of the information covered by RRF process indicators, however, is indeed tracked at a granular level in ERDF/CF/JTF: this is the case of financial data (funds planned, selected, disbursed). Other RRF process indicators (especially "Strategy/plan/programme") have similarities with another tool of ERDF/CF/JTF, i.e. enabling conditions.

Seven ERDF/CF/JTF common output indicators have been classified as process indicators for this comparison. Six concern financial amounts and relate to sectoral support to RTDI, digitalisation, climate, circular economy, and disaster management. They are: RCO08 RTDI: Value of R+I equipment; RCO13 Digital: Value of digital services, products and processes; RCO24 Climate: Investments in disaster management; RCO96 RTDI: Value of Interregional investment; RCO107 Circular: Investments in separate waste collection; RCO122 Investments in disaster management (non-climate). The seventh concerns the deployment of a sectoral strategy on climate adaptation (RCO27 Climate: Strategies addressing climate change adaptation). No common result indicator has been classified as process indicator instead. In principle, also common output indicators referred to beneficiaries of support (for instance, RCOs 01-05 on firms) could be considered as process indicators. However, if for the purposes of this task they were considered process and not output indicators, the comparison of output indicators under PO1 (and other POs as well) would lose a crucial element of the analysis.

In what follows, RRF and ERDF/CF/JTF process indicators are assessed under the four dimensions considered for the comparison.

Table 21 RRF process indicators

Category	**Tag**	**Indicator nature**	**Main units of measurement** (targets only)	**Baseline: 0 or not** (targets only)	**Reference to a specific intervention area**
Initial steps of the project cycle	Publication of tenders/calls	Qualitative (milestones)	N/A	N/A	No
	Selection of projects/award of contracts	67% qualitative (milestones), 33% quantitative (targets)	54% number of projects, 25% share of projects, 7% EUR, 13% other.	74% 0, 26% >0 (generally: value of the preceding target under the same measure)	No
	Projects started/Works started[36]	59% qualitative (milestones), 41% quantitative (targets)	92% number of projects, 8% share of projects.	58% 0, 42% >0 (generally: value of the preceding target under the same measure)	No
Financial amounts	Funds allocated/committed	9% qualitative (milestones), 91% quantitative (targets)	47% EUR, 44% share of funds, 9% other.	45% 0, 55% >0 (generally: value of the preceding target under the same measure)	No
	Transfer of resources to financial intermediaries	81% qualitative (milestones), 19% quantitative (targets)	EUR.	0	No
	Funds disbursed	3% qualitative (milestones), 97% quantitative (targets)	81% EUR, 10% share of funds.	0	No
Legislation and strategic, organisational or administrative documents	Legislation	Qualitative (milestones)	N/A	N/A	No
	Strategy/plan/programme	Qualitative (milestones)	N/A	N/A	No
	Signature of agreement/establishment of financial instrument	99% qualitative (milestones), 1% quantitative (targets)	N/A	0	No
	Administrative steps/Implementing agreements	90% qualitative (milestones), 10% quantitative (targets)	71% EUR, 28% number.	0	No

[36] Milestones and targets have been classified as output indicators when they concern completed projects instead, i.e. when the underlying investment has produced its foreseen deliverable.

	Feasibility studies/Evaluations	79% qualitative (milestones), 21% quantitative (targets)	67% number of studies, 33% km2 (area covered by feasibility studies)	0	No

Source: Consortium own elaboration

Table 22 ERDF/CF/JTF process indicators

Common indicator	Indicator nature	Unit of measurement	Baseline: 0 or not	Reference to a specific intervention area
RCO08 RTDI: Value of R+I equipment	Quantitative	EUR	0	Yes (SO1.1)
RCO13 Digital: Value of digital services, products and processes	Quantitative	EUR	0	No
RCO24 Climate: Investments in disaster management	Quantitative	EUR	0	No
RCO96 RTDI: Value of Interregional investment	Quantitative	EUR	0	No
RCO107 Circular: Investments in separate waste collection	Quantitative	EUR	0	Yes (SO2.6)
RCO122 Investments in disaster management (non-climate)	Quantitative	EUR	0	Yes (SO2.4)
RCO27 Climate: Strategies addressing climate change adaptation	Quantitative	Number of strategies	0	No

Source: Consortium own elaboration

In terms of their **nature**, ERDF/CF/JTF common indicators are, by definition, quantitative. Among RRF process indicators, quantitative ones (targets) prevail only in the case of financial amounts allocated and disbursed. Under the other Tags (see tables above), qualitative indicators (milestones) prevail, albeit with varying intensity. The Tags "Publication of tenders/calls", "Legislation" and "Strategy/plan/programme" include only milestones, and this is the case also for 99% of indicators mapped under the Tag "Signature of agreement/establishment of financial instrument". Other Tags have a more balanced composition of indicators of different nature: indicators mapped under "Selection of projects/award of contracts" are for two thirds milestones, for one third targets; under "Projects started/Works started", 59% are milestones, 41% targets.

Units of measurement are univocally defined for ERDF/CF/JTF indicators in SWD (2021) 198. For the process indicators concerning financial amounts, the values are expressed in monetary terms (i.e. the unit of measurement is Euro), while in the case of RCO27, the unit is the number of strategies. Under RRF targets[37], variability is observed in terms of unit of measurement. More than half of the targets under the Tag "Selection of projects/award of contracts" are expressed in terms of number of projects, but other units of measurement are repeatedly used as well under this Tag, including the share of projects (for instance, the share of projects of total projects foreseen under a single measure) or monetary terms (for instance, the amount of the selected projects/contracts awarded). The number of projects is the most common unit of measurement also under the Tag "Projects started/Works started". Under the category of financial amounts, monetary values are the most common unit of measurement, but targets are also expressed in terms of share of funds (for instance, the share of funds disbursed over the total funds allocated). Under the Tag "Administrative steps/Implementing agreements", monetary values are used to express the budget covered under agreements reached between different bodies for the implementation of investments.

The **baseline** is defined as 0 for all seven ERDF/CF/JTF common output indicators that are considered process indicators under this task. In the case of RRF targets[38], 0 is also the most common baseline, except for cases where the baseline is the value of the preceding target under the same measure.

The **reference to specific intervention area**, for ERDF/CF/JTF, has been proxied using information from the SWD (2021) 198 on the use of each indicator under one or multiple SOs. Out of the seven indicators considered, four can be used under all SOs (RCO13 "Digital: Value of digital services, products and processes", RCO24 "Climate: Investments in disaster management", RCO96 "RTDI: Value of Interregional investment", RCO27 "Climate: Strategies addressing climate change adaptation"). As such, they are not referred to a specific intervention area. The other three are linked to one specific SO instead. RCO08 "RTDI: Value of R+I equipment" is linked to SO1.1, RCO107 "Circular: Investments in separate waste collection" is linked to SO2.6, RCO122 "Investments in disaster management (non-climate)" is linked to SO2.4. In the RRF, the milestones and targets are by definition closely linked to the individual intervention; however, considering the Tags, all main process indicators considered can refer to multiple intervention areas.

[37] Milestones do not have units of measurement.

[38] Milestones do not have baselines.

Ultimately, as regards the **differences between the sets of process indicators** of ERDF/CF/JTF and RRF, it is possible to note that all seven ERDF/CF/JTF indicators are in principle present under the RRF, in terms of financial amounts (this category would cover RCO08, RCO13, RCO24, RCO96, RCO107 and RCO122) and strategies (RCO27). Vice versa, not all RRF process indicators find an equivalent under ERDF/CF/JTF:

- For the RRF process indicators under the category "Initial steps of the project cycle" (see tables above), no correspondence is found in the list of ERDF/CF/JTF common indicators. In fact, the publication of calls, the selection of projects and the start of projects represent usual steps of the implementation of cohesion policy (as such, they are already tracked by Managing Authorities at the level of individual operation), but they do not translate into common indicators.
- Similarly, financial amounts are already tracked by Managing Authorities as well at operation level, as they represent cornerstones of programme monitoring systems.
- No process indicators under the category of "Legislation and strategic, organisational or administrative documents" have equivalents under ERDF/CF/JTF common indicators, with the exception of RCO27 "Climate: Strategies addressing climate change adaptation[39].

Process indicators under the category of "Legislation and strategic, organisational or administrative documents" reflect the idea that, for the effective delivery of investments, **a conducive regulatory, strategic and administrative framework is necessary**. ERDF/CF/JTF encompass this theme under enabling conditions, but not through indicators. In this regard, the RRF's process indicators can be a stimulus for reflection especially with regard to indicators. In fact, the inclusion of common indicators covering the aspects under this category, and especially "Legislation", could be explored as an opportunity to capture (and thus incentivise) pre-conditions, or ancillary features, of a solid public investment system.

Data and information on the **steps of the project cycle and financial amounts** are already collected as part of the delivery of ERDF/CF/JTF instead. The question related to them is therefore not as much about the potential usefulness of capturing (and incentivising) a certain action. Rather, the RRF's use of such data as steps of payment schemes points to the potential usefulness of considering whether to transform such types of information into common indicators, in view of a possible expansion of the use of FNLC schemes. ERDF/CF/JTF, given their advanced approach to monitoring, would in fact be already well positioned to transform steps of the project cycle and financial amounts into common indicators, and possibly into elements of future FNLC schemes.

[39] Other common indicators referred to strategies are RCO75 "Strategies for integrated territorial development supported" and RCO 80 "Community-led local development strategies supported", which have however been excluded from the scope of the comparison because referred to PO5, as mentioned in the methodological section (4.1.1). RCR 79 "Joint strategies and action plans taken up by organisations" is also out of scope for this study, since it is referred to Interreg.

2.1.3 Output and result indicators

Annex 2 presents the results of the comparison by type of operation between ERDF/CF/JTF common indicators and RRF investment-related milestones and targets, considering output and result indicators. The comparison covers the most frequent indicators under each type of operation[40].

Only a granular analysis by type of operation allows to grasp similarities and differences between the two frameworks. For this reason, the following table presents the main findings of the comparison under each type of operation, drawing from the additional information provided in the Annex. The column "Difference between sets of indicators" contains information on the different use and thematic coverage of indicators. After the table, general findings are discussed.

[40] As mentioned in the methodological section (2.1.1), for each investment type (i.e., SO+IFs combination) the common indicators having at least 10 total occurrences in 2021-2027 programmes are included. Concerning RRF milestones and targets, under each investment type the most frequent Tags are analysed in the comparison tables in the Annex. When the numerosity of applicable milestones and target is however very low, which is especially the case for result indicators, also individual milestones and targets are included.

Table 23 Main findings of the comparison under each type of operation

SO	Investment type	Difference between sets of indicators
1.1	R&I in enterprises (IFs 001, 002, 003, 005, 006, 007, 009, 010, 011)	**Output indicators**: Both ERDF/CF/JTF and the RRF rely strongly on indicators concerning enterprises supported. The ERDF/CF/JTF also frequently use sector-specific indicators on the number of researchers with improved infrastructure and of firms cooperating with ROs, while the RRF uses the indicator of projects completed. **Result indicators:** RRF's indicators focus on the number of innovations, while ERDF/CF/JTF ones refer to enterprises introducing innovations, private investments, FTEs, and patent applications.
1.1	R&I in Low-carbon economy and circular economy" (IFs 029, 030)	**Output indicators**: Both the ERDF/CF/JTF and the RRF rely strongly on indicators concerning enterprises supported. ERDF/CF/JTF also frequently use indicators on the number of ROs in joint research, while the RRF uses the indicator of projects completed and public-private partnerships established. **Result indicators:** Both the RRF and the ERDF/CF/JTF rely on indicators related to the publications of research results, innovations introduced and new researchers/R&D personnel. In addition, the ERDF/CF/JTF rely on indicators related to jobs created and trademarks or design applications.
1.1	R&I in research centres" (IFs 004, 008, 012)	**Output indicators**: The two frameworks use different indicators. Under the ERDF/CF/JTF, indicators relate to the researchers benefitting from improved infrastructures, ROs in joint research and firms cooperating with Ros. In contrast, under the RRF the only indicator used concerns the number of new/ enhanced research infrastructures. **Result indicators:** Both the RRF and the ERDF/CF/JTF rely on indicators related to the private investments attracted and the number of new researchers/R&D personnel. In addition, the ERDF/CF/JTF rely on indicators related to publication, patents submitted, product/process innovations introduced, jobs created and trademarks or design applications. Instead, the RRF relies on a result indicator on the services provided by the supported research infrastructures.
1.2	Digitising firms (IFs 013, 014, 015	**Output indicators**: Both the ERDF/CF/JTF and the RRF rely strongly on indicators concerning enterprises supported. The RRF also uses the indicator of projects completed. **Result indicators:** Both the ERDF/CF/JTF and the RRF rely on a result indicator measuring the number of entities with improved digital maturity/intensity. The set of ERDF/CF/JTF result indicators is larger, encompassing indicators on private investments, users of digital services created by enterprises and product/process or marketing/organisation innovations introduced.
1.2	E-government (IFs 016, 017)	**Output indicators**: Both ERDF/CF/JTF and the RRF rely on indicators concerning public administrations supported. The RRF also uses the indicators of projects completed, digital innovation introduced in public administration and Public servants benefitting from digital skills training. **Result indicators:** Both the ERDF/CF/JTF and the RRF rely on a result indicator measuring the number of users of new and upgraded public digital services. The set of ERDF/CF/JTF result indicators is larger, encompassing indicators on enterprises reaching high digital intensity, users of digital services by enterprises, private investment.
1.2	Inclusion and e-health (IFs 018, 019)	**Output indicators**: ERDF/CF/JTF and the RRF rely on different indicators. ERDF/CF/JTF use the number of supported firms or public administrations. Under the RRF, the indicators used refer to projects completed, and digital innovation introduced. **Result indicators:** ERDF/CF/JTF use result indicators referred to users of digital services, private investments, enterprises reaching high digital intensity and SMEs introducing innovations. Under the RRF, not much use is made of result indicators under this type of operation and the only example found refers to users of digital health services.
1.3	Business development (generic support and advanced support services)" (IFs 021, 022, 024, 031)	**Output indicators**: Both the ERDF/CF/JTF and the RRF rely strongly on indicators concerning enterprises supported. The RRF also uses the indicator of projects completed and equity investments made. **Result indicators:** Only the ERDF/CF/JTF rely on result indicators under this investment area.
1.3	Business infrastructure (IF 020)	**Output indicators**: The two frameworks use different output indicators. The ERDF/CF/JTF strongly rely on indicators concerning enterprises supported and includes an indicator on the capacity of incubation created. In contrast, the RRF includes an indicator of the number of built/upgraded business infrastructures.

		Result indicators: Under the RRF, the use of result indicators is very limited, with only one example being the indicator for new jobs created in industrial parks or zones. In contrast, the ERDF/CF/JTF feature a broader set of indicators, including new jobs created, private investments, and various other indicators of specific results achieved by enterprises (e.g., innovations introduced, survival rates).
1.3	Innovation and cooperation (IFs 026, 027, 028)	**Output indicators**: Both the ERDF/CF/JTF and the RRF rely strongly on indicators concerning enterprises supported. **Result indicators:** Both the RRF and the ERDF/CF/JTF rely on indicators related to the innovations introduced. In addition, the ERDF/CF/JTF rely on indicators related to jobs created and private investments, while the RRF focuses on new R&D personnel.
1.4	Skills for smart specialisation and transition (IF 023)	**Output indicators**: The two frameworks use different indicators. Under the ERDF/CF/JTF, the focus is on indicators related to the number of SMEs investing in new skills and the number of firms benefitting from support. Under the RRF, the focus is on the trainings developed to develop innovation, digital and green skills, created/renovated training centres and projects completed. **Result indicators:** Both the ERDF/CF/JTF and the RRF rely on indicators of the number of persons completing trainings and the apprenticeships supported. In addition, the ERDF/CF/JTF use indicators of private investments. In contrast, the RRF relies on an indicator of individuals benefitting from job search assistance.
1.4	Incubation and start-up support (IF 025)	**Output indicators**: The two frameworks use different indicators. Under the ERDF/CF/JTF, the focus is on an indicator of the capacity of incubation created. In contrast, the RRF centres on an indicator for projects completed. **Result indicators:** The two frameworks use different indicators. Under the ERDF/CF/JTF, the focus is on an indicator of the number of SMEs using incubator services. In contrast, the RRF centres on an indicator of the number of start-ups supported.
1.5	Broadband connectivity (IFs 032, 033, 034, 035)	**Output indicators**: Both the ERDF/CF/JTF and the RRF rely on indicators concerning the number of dwellings with broadband access. The ERDF/CF/JTF also frequently use an indicator of the number of enterprises with broadband access, while the RRF includes indicators on public infrastructures with broadband access and territories covered by 5G technologies. **Result indicators:** Only the ERDF/CF/JTF rely on result indicators under this investment area.
1.5	Other ICT infrastructure" (IFs 036, 037)	**Output indicators**: The two frameworks use different indicators. Under the ERDF/CF/JTF, the focus is on an indicator quantifying the number of public institutions supported for Digital. In contrast, the RRF centres on indicators related to the number of data centres created or of services migrated to digital infrastructure. **Result indicators:** Both ERDF/CF/JTF and the RRF use result indicators concerning the number of users. ERDF/CF/JTF's set of result indicators is however wider.
2.1	Energy efficiency in enterprises (IFs 038, 039, 040)	**Output indicators**: Both ERDF/CF/JTF and RRF rely strongly on indicators concerning enterprises supported. Under the RRF, the set of indicators also includes projects completed and renovated private non-residential buildings. **Result indicators:** Both the ERDF/CF/JTF and the RRF strongly use indicators quantifying energy savings and avoided GHG emissions. Unlike the RRF, result indicators under the ERDF/CF/JTF also refer to results achieved by the enterprises supported (additional private investments, jobs created, or product/process innovation). The RRF also includes a result indicator related to the additional renewable energy production.
2.1	Energy efficiency in housing" (IFs 041, 042	**Output indicators**: Both ERDF/CF/JTF and RRF rely strongly on indicators concerning the number of dwellings renovated. Under the RRF, the set of indicators also includes projects completed, while under the ERDF/CF/JTF there is an indicator related to district heating and cooling network lines. **Result indicators:** Both the ERDF/CF/JTF and the RRF strongly use indicators quantifying energy savings and avoided GHG emissions. The RRF also includes a result indicator related to the additional renewable energy production.
2.1	Energy efficiency in public infrastructure (IFs 044, 045)	**Output indicators**: Both the ERDF/CF/JTF and the RRF rely strongly on indicators concerning the number of public buildings renovated. Under the RRF, the set of indicators also includes projects completed and an indicator referring to both new energy-efficient buildings constructed and renovated buildings, while under the ERDF/CF/JTF, there is an indicator related to district heating and cooling network lines. **Result indicators:** Both the ERDF/CF/JTF and the RRF strongly use indicators quantifying energy savings and avoided GHG emissions. The RRF also includes a result indicator related to additional renewable energy production.

2.1	Other support services/investments for LCE and climate change (IF 046)	**Output indicators**: Both the ERDF/CF/JTF and the RRF rely strongly on indicators concerning the number of enterprises supported. Under the RRF, the set of indicators also includes LCE products/solutions developed and projects completed. **Result indicators:** Different result indicators are used under the ERDF/CF/JTF and the RRF. The use of result indicators under the RRF is very limited (only a few examples are available).
2.1	High efficiency / replacement heating systems" (IFs 054, 055, 056)	**Output indicators**: Both the ERDF/CF/JTF and the RRF rely on indicators related to the district heating network and co-generation. The RRF also includes indicators related to dwellings and buildings' heating systems and quantifying the number of projects completed. **Result indicators:** Both the ERDF/CF/JTF and the RRF rely on an indicator of energy savings. The ERDF/CF/JTF also use an indicator related to GHG emissions, while the RRF uses an indicator on the additional renewable energy capacity of district heating systems. However, the use of result indicators under the RRF is very limited (only a few examples are available).
2.1	New energy efficient buildings" (IF 043)	**Output indicators**: Different indicators are used under the two frameworks: the ERDF/CF/JTF rely on indicators related to the number of enterprises supported, while the RRF relies on indicators related to the number of new energy-efficient buildings constructed. **Result indicators:** Only the ERDF/CF/JTF rely on result indicators under this investment area.
2.2	RE biomass" (IFs 049, 050)	**Output indicators**: The ERDF/CF/JTF rely on indicators related to renewable energy capacity and the number of energy communities supported, while the RRF only measures the number of projects completed. **Result indicators:** Both the ERDF/CF/JTF and the RRF heavily rely on indicators that measure additional energy capacity generated from renewable sources. While both frameworks also use indicators related to avoided GHG emissions, these are used more extensively under the ERDF/CF/JTF.
2.2	RE other (IFs 051, 052	**Output indicators**: Both the ERDF/CF/JTF and the RRF rely strongly on indicators concerning enterprises supported. The ERDF/CF/JTF also rely on indicators related to renewable energy capacity and the number of energy communities supported, while the RRF also includes indicators quantifying the number of projects completed and of geothermal explorations conducted. **Result indicators:** Both the ERDF/CF/JTF and the RRF place strong emphasis on indicators that measure additional renewable energy capacity. The ERDF/CF/JTF also include a specific indicator for GHG emissions, as well as one for private investments. In contrast, the RRF combines GHG emissions reduction with energy savings in a single indicator.
2.2	RE solar (IF 048)	**Output indicators**: Very different types of output indicators are used. The ERDF/CF/JTF rely strongly on indicators concerning the renewable energy capacity and the enterprises supported. Under the RRF, output indicators related to the number of installed photovoltaic systems, dwellings equipped with photovoltaic panels and the number of projects completed. **Result indicators:** Both the ERDF/CF/JTF and the RRF place strong emphasis on indicators that measure additional renewable energy capacity. The ERDF/CF/JTF also include a specific indicator for GHG emissions.
2.2	RE wind (IF 047)	**Output indicators**: Very different types of output indicators are used. The ERDF/CF/JTF rely strongly on indicators concerning the renewable energy capacity and the number of energy communities supported. Under the RRF, only one output indicator is used, and it is related to the number of projects completed. **Result indicators:** Only under the ERDF/CF/JTF framework, result indicators are used.
2.3	Natural gas distribution (IF 057)	**Output indicators**: Both the ERDF/CF/JTF and the RRF rely on an indicator related to the gas transmission and distribution network. **Result indicators:** Only under the RRF framework, a result indicator is used (Increased gasification capacity).

2.3	Smart energy systems (IF 053)	**Output indicators**: Under both frameworks, output indicators relate to the digitalisation of the electric distribution system. The RRF also includes indicators quantifying the number of projects completed, while the ERDF/CF/JTF also include indicators related to the number of enterprises supported. **Result indicators:** Different result indicators are used under the two frameworks: the ERDF/CF/JTF primarily focus on the number of users, estimated GHG emissions, and private investments. In contrast, the RRF emphasises result indicators related to electricity storage and cross-border transmission capacity, as well as the amount of renewable energy integrated into the electrical grid.
2.4	Climate change adaptation and risk management (IFs 058, 059, 060, 061, 132)	**Output indicators**: Different types of output indicators are used under the two frameworks. **Result indicators:** The two frameworks use a similar result indicator (Population covered by improved flood defence lines), but the set of indicators used under the ERDF/CF/JTF is also wider.
2.5	Integrated water sector" (IFs 062, 063, 064, 065, 066)	**Output indicators**: Both the ERDF/CF/JTF and the RRF rely on output indicators measuring the length of the renovated/expanded water supply and wastewater treatment network. The ERDF/CF/JTF also include an indicator of the wastewater network's capacity, while the RRF includes indicators of the number of projects completed, monitoring devices installed, and rehabilitated dams. **Result indicators:** Both the ERDF/CF/JTF and the RRF rely on result indicators measuring the number of persons with improved access to the water supply and wastewater networks. In addition, the ERDF/CF/JTF measure the losses in public water supply distribution, while the RRF includes result indicators quantifying the irrigated/agricultural areas with improved water retention, the amount of water supplied from alternative sources than groundwater and the additional capacity of the expanded water supply network.
2.6	Circular economy (IFs 071, 072, 075, 076)	**Output indicators**: Both the ERDF/CF/JTF and the RRF rely strongly on indicators concerning enterprises supported. ERDF/CF/JTF also frequently use indicators on the capacity for recycling and the investments made in separate waste collection, while the RRF uses the indicator of projects completed, number of clusters supported, and hotels certified as circular. **Result indicators:** The use and types of result indicators differ across the two frameworks: under the RRF, the use of these indicators is relatively limited, and the focus is on avoided CO2 emissions and plastic materials avoided. The ERDF/CF/JTF instead focus on waste used as raw materials, recycled waste, waste collected separately, and indicators related to product/process innovations and firms' investments.
2.6	Waste management (IFs 067, 068, 069, 070)	**Output indicators**: Both the ERDF/CF/JTF and the RRF rely on indicators concerning waste collection capacity. The ERDF/CF/JTF also frequently use indicators on the investments made in separate waste collection, the amount of waste prepared for re-use and recycled or used as raw materials. Instead, the RRF uses more indicators related to the number of waste collection, recycling and sorting facilities and includes an indicator on the number of projects completed. **Result indicators:** Result indicators have only been identified under the RRF (including Recycling rate, Separate collection rate).
2.7	Air quality (IF 077)	**Output indicators**: Different types of output indicators are used under the two frameworks. The ERDF/CF/JTF rely on an output indicator related to the areas covered by systems for monitoring air pollution, while the RRF relies on indicators related to the number of projects and project activities completed. Only in one specific case, indicators such as the number of air quality monitoring devices installed and the number of terminated pig farms are used. **Result indicators:** The use and types of result indicators differ across the two frameworks: under the RRF, the use of these indicators is relatively limited, and the focus is on avoided GHG emissions. The ERDF/CF/JTF instead focus on indicators related to the number of persons accessing green infrastructure or benefitting from measures for air quality.
2.7	Natura 2000 (IF 078)	**Output indicators**: Both the ERDF/CF/JTF and the RRF rely on an indicator related to the surface of Natura 2000 sites restored and/or protected. In some specific and limited cases, the RRF also uses indicators related to the number of projects completed or the number of Natura 2000 sites having developed site-specific conservation objectives and measures.

		Result indicators: The use of result indicators under the RRF is very limited (only one example is available, related to Achieved good ecological status). Under ERDF/CF/JTF, result indicators refer to size of population benefitting from green infrastructure or measures for air quality.
2.7	Nature and biodiversity protection (IF 079)	**Output indicators**: Both the ERDF/CF/JTF and the RRF rely on an indicator related to the surface of restored and/or environmentally protected green infrastructure. The ERDF/CF/JTF also rely on indicators related to Natura 2000 sites and rehabilitated land, while the RRF includes indicators quantifying the number of projects completed, trees planted, restoration and protection actions implemented, or protected natural areas with updated management plans. **Result indicators:** Only under the ERDF/CF/JTF framework, result indicators are used.
2.7	Rehabilitation of industrial sites (IFs 073, 074)	**Output indicators**: Both the ERDF/CF/JTF and the RRF rely on an indicator related to rehabilitated land and brownfields. The RRF also includes indicators quantifying the number of projects completed and rehabilitated mining sites. **Result indicators:** Only the ERDF/CF/JTF rely on result indicators under this investment area.
2.8	Clean urban transport (IFs 081, 082, 086)	**Output indicators**: The ERDF/CF/JTF and the RRF rely on a similar set of indicators, although the one used by the RRF is wider. Both frameworks include indicators related to alternative fuel infrastructures and the length of the expanded public transport network. In addition, the RRF includes indicators related to the number of projects completed, zero-emission vehicles purchased, scrapped high-emission vehicles, or high-emission vehicles equipped with zero-emission technologies. **Result indicators:** Only the ERDF/CF/JTF rely on result indicators under this type of operation, with indicators related to the number of users, GHG emissions and population benefiting from measures for air quality.
2.8	Cycling infrastructure (IF 083)	**Output indicators**: Both the ERDF/CF/JTF and the RRF rely on an indicator related to the cycling infrastructure supported. **Result indicators:** Only the ERDF/CF/JTF rely on result indicators under this type of operation (Annual users of cycling infrastructure and GHG emissions).
2.8	Intelligent and digital transport (IFs 084, 085)	**Output indicators**: Both the ERDF/CF/JTF and the RRF use an indicator based on the number of administrative units benefiting from digitised transport systems. Additionally, the ERDF/CF/JTF include an indicator for the number of new or modernised railway stations and stops, while the RRF incorporates indicators for the number of intelligent digital transport solutions deployed, datasets developed, and projects completed. **Result indicators:** Only the ERDF/CF/JTF rely on result indicators under this investment area.
3.1 & 3.2	Airport security, safety and air traffic management (IF 118)	A comparison is not possible because no common output or result indicators are used under the ERDF/CF/JTF for this investment area.
3.1 & 3.2	Digitising transport (IFs 119, 120)	**Output indicators**: The two frameworks employ different types of indicators. Under the ERDF/CF/JTF, only one indicator is used focusing on the number of new or modernised intermodal connections. In contrast, the RRF uses a broader range of indicators, including the number of digital tools introduced and digital modernisation works completed, the number of digitised port authorities, and the number of staff trained in new digital technologies. **Result indicators:** The two frameworks use different types of indicators. Under the ERDF/CF/JTF, result indicators measure aspects of freight transport. In contrast, the RRF focuses on the digital readiness of the logistics and transport sector. However, this indicator is only applied to one specific measure under the RRF.

3.1 & 3.2	Inland waterways/ports (IFs 114, 115, 116, 117)	**Output indicators**: The use of output indicators is very limited under the RRF, as only under one measure an indicator related to the number of project activities completed is used. Under the ERDF/CF/JTF, an indicator related to the length on inland waterways is instead generally used. **Result indicators:** Only the ERDF/CF/JTF rely on result indicators under this type of operation (Freight transport on inland waterways).
3.1 & 3.2	Multimodal transport (IFs 108, 109)	**Output indicators**: Both the ERDF/CF/JTF and the RRF rely on an indicator quantifying the number of new or modernised intermodal connections. in addition, the ERDF/CF/JTF use indicators related to the length of new or upgraded railways and roads. **Result indicators:** Only the ERDF/CF/JTF rely on result indicators under this investment area, adopting a set of indicators referred in particular to the road and rail sectors.
3.1 & 3.2	Railway transport (IFs 096, 097, 098, 099, 100, 101, 102, 103, 104, 105, 106, 107)	**Output indicators**: Both the ERDF/CF/JTF and the RRF rely on an indicator quantifying the length of new/retrofitted railway lines and the number of new or modernised railway stations or stops. The RRF also uses additional indicators, such as the number of new/retrofitted railways rolling stocks and locomotives and the number of projects completed. It should be noted that under the ERDF/CF/JTF, different indicators are used for TEN-T and non-TEN-T infrastructures. The RRF also sometimes distinguishes between different types of railway lines (e.g., local/short-distance vs. inter-regional, TEN-T vs. non-TEN-T, high-speed), demand components (e.g., freight vs. passenger), as well as types of investments (e.g., electrification, digital components or platforms). **Result indicators:** Only the ERDF/CF/JTF rely on result indicators under this investment area, with indicators related to number of users, freight transport, time savings and GHG emissions.
3.1 & 3.2	Road transport (IFs 087, 088, 089, 090, 091, 092, 093, 094, 095)	**Output indicators**: Both the ERDF/CF/JTF and the RRF rely on an indicator quantifying the length of new or upgraded roads. The RRF also uses additional indicators, such as the number of new/modernised roadside stations, reduced black/hotspots or the number of projects completed. It should be noted that under the ERDF/CF/JTF, different indicators are used for TEN-T and non-TEN-T infrastructures. The RRF also sometimes distinguishes between different types of road networks (i.e., TEN-T vs. non-TEN-T) as well as demand components (e.g., freight vs. passenger). **Result indicators:** Only the ERDF/CF/JTF rely on result indicators under this investment area, with indicators related to number of users, time savings and GHG emissions.
3.1 & 3.2	Seaports (IFs 110, 111, 112, 113)	**Output indicators**: Only the RRF relies on output indicators under this investment area. **Result indicators:** Only the ERDF/CF/JTF rely on result indicators under this investment area.
4.1	Other social infrastructure (IF 127)	**Output indicators**: The two frameworks use different indicators. Under the ERDF/CF/JTF, the focus is primarily on indicators monitoring new or upgraded facilities for employment services and the number of actions aimed at the inclusion of marginalised populations. In contrast, the RRF centres on indicators related to new or upgraded care facilities, such as those for children and elderly people. **Result indicators:** Only the ERDF/CF/JTF rely on result indicators under this investment area.
4.2	Infrastructure for early childhood (IF 121)	**Output indicators**: Both the ERDF/CF/JTF and the RRF include indicators related to the capacity of early childhood infrastructures. In addition, the RRF also relies on an indicator quantifying the number of new or modernised childcare places. **Result indicators:** Both the ERDF/CF/JTF and the RRF include indicators related to the number of children enrolled in new or modernised infrastructures. In addition, the RRF also relies on an indicator for childcare rate.

4.2	Infrastructure primary and secondary education (IF 122)	**Output indicators**: Slightly different indicators are used. The ERDF/CF/JTF rely on indicators related to the capacity of education facilities, while the RRF relies on an indicator quantifying the number of new or modernised education facilities. **Result indicators:** Both the ERDF/CF/JTF and the RRF include indicators related to the number of students enrolled in new or modernised infrastructures. In addition, the RRF also relies on an indicator for reduced drop-out rates.
4.2	Infrastructure tertiary education (IF 123)	**Output indicators**: Slightly different indicators are used. The ERDF/CF/JTF rely on indicators related to the capacity of education facilities, while the RRF relies on an indicator quantifying the number of new or modernised education facilities. **Result indicators:** Both the ERDF/CF/JTF and the RRF include indicators related to the number of students enrolled in new or modernised infrastructures.
4.2	Infrastructure vocational education and training (IF 124)	**Output indicators**: Both the ERDF/CF/JTF and the RRF include indicators related to the capacity of new/ modernised education infrastructures. In addition, the RRF also relies on an indicator quantifying the number of new or modernised vocational training institutions and classrooms. **Result indicators:** Both the ERDF/CF/JTF and the RRF include indicators related to the number of students enrolled in new or modernised infrastructures. In addition, the RRF also relies on an indicator of the number of apprenticeships signed.
4.3 & 4.4	Housing infrastructure (IFs 125, 126, 133)	**Output indicators**: The two frameworks use different indicators. Under the ERDF/CF/JTF, the focus is primarily on indicators monitoring the capacity of new or upgraded housing infrastructure. In contrast, the RRF centres on an indicator related to the number of new or upgraded housing units. In addition, the targeted social group of housing units (e.g., elderly, children) is also specified under the RRF. **Result indicators:** Only the RRF relies on result indicators under this investment area.
4.5	Health infrastructure and assets (IFs 125, 126, 133)	**Output indicators**: Both the ERDF/CF/JTF and the RRF rely on indicators monitoring the capacity of new or upgraded healthcare facilities. However, the RRF relies on a larger set of output indicators, ranging from the number of new/modernised healthcare facilities, the number of new healthcare services introduced, healthcare personnel hired or trained. **Result indicators:** Both the ERDF/CF/JTF and the RRF rely on indicators monitoring the number of users (patients) of the new or modernised healthcare facilities. Additionally, the RRF includes more detailed indicators, such as the number of visits delivered due to the new or updated services or facilities, as well as the number of communities served by healthcare services.
4.6	Cultural assets and services" (IF 166)	**Output indicators**: Both the ERDF/CF/JTF and the RRF rely on indicators quantifying the number of new or renovated cultural/touristic sites. In addition, the RRF includes other indicators, such as the number of enterprises supported, cultural services digitised or cultural initiatives introduced. **Result indicators:** The types of result indicators used under the two frameworks differ. The ERDF/CF/JTF rely on the number of visitors and jobs created, while the RRF relies on an indicator quantifying the number of localities with improved access to culture.
4.6	Tourism assets and services (IF 166)	**Output indicators**: Both the ERDF/CF/JTF and the RRF rely on indicators quantifying the number of new or renovated cultural/touristic sites. The RRF also includes other indicators, such as the number of enterprises supported. **Result indicators:** Only the ERDF/CF/JTF rely on result indicators under this investment area (Visitors of cultural and tourism sites).

Source: Consortium own elaboration

In terms of **indicator nature**, ERDF/CF/JTF only rely on quantitative ones. Under the RRF, although targets prevail, a not negligible presence of milestones is found, particularly under output indicators. Out of a total of over 3,800 investment-related milestones and targets classified as either output or result indicators in the database deriving from the extraction received from the Commission, 12.5% are milestones. This share increases to 13.1% considering output indicators only, and equals 6% for result indicators instead. The use of milestones under the RRF as output or result indicators is not limited to specific type of operations but is rather spread across different thematic areas.

Differences in the **units of measurement** adopted are typically a consequence of the different sets of indicators used by the ERDF/CF/JTF and the RRF. Under the ERDF/CF/JTF, the unit of measurement tends to be more standardised across different indicators and type of operations. Examples include the number of enterprises supported or persons benefitting from an intervention, full-time equivalents (FTEs) for indicators related to employment, kilometres of infrastructures developed, or energy savings in megawatt-hours (MWh). In contrast, ERDF/CF/JTF common indicators show more diversity in the units of measurement. While the units of measurement used under the ERDF/CF/JTF common indicators are also often used under the RRF, milestone and targets include additional or alternative measurement units under the same Tag and type of operation. For instance, different units of measurement are used under the RRF to track the number of residential dwellings (e.g., number, square metres) and energy savings (e.g., MWh/year, terajoules/year) related to energy efficiency interventions (SO 2.1).

The **baselines** of milestones and targets related to result indicators under the RRF are generally 0, or correspond to the value of the preceding target under the same measure. This practice of using the preceding target's value is a unique feature of the RRF, distinguishing it from the ERDF/CF/JTF. It reflects the use of indicators to track cumulative/incremental progress, which is a defining feature of RRF delivery.

The analysis demonstrates that under ERDF/CF/JTF, the fact that common indicators can be **used under multiple SOs** allows them to capture the same outputs and results in many different contexts. In addition, this flexibility makes the aggregation of data possible.

The high variability of individual milestones and targets in the RRF leads to a more diverse set of output indicators than under ERDF/CF/JTF, even though when considering Tags instead of individual milestones and targets, this higher diversity appears more limited. As far as result indicators are concerned, few milestones and targets are found in absolute terms under the RRF, i.e. few milestones and targets have been classified as result indicators. For some SOs and type of operations, however, the list of all indicators used under the RRF (even once) shows that the set of possible indicators is larger. This is, for example, the case of SOs 1.4, 2.4, 2.5, 4.2, 4.3, 4.4, 4.5 and 4.6.

For some type of operations, ERDF/CF/JTF make available a **relatively wide set of common output and result indicators**. For example, this is the case of type of operations "R&I in Low-carbon economy and circular economy" or "Climate change adaptation and risk management". This availability of various indicators for the same type of operation grants Managing Authorities with a good toolbox of different indicators able to capture different outputs and effects, among which to select the ones that most appropriately relate to the projects at hand. Ultimately, the availability of different output and result indicators under the same type of operation allows ERDF/CF/JTF to embrace the diversity of possible

interventions under each type of operation. Moreover, the availability of a relatively broad set of common output and especially result indicators is an important feature in case a shift towards performance-oriented payment schemes is in the policy's future. In limited cases, however, the number of common indicators that fit an type of operation is low, such as for the type of operation "Digitising transport".

Finally, the differences between the sets of indicators of ERDF/CF/JTF and the RRF (mentioned in the third column of the table above, and emerging in more detail from the information included in the Annex 2) allow to shed light on the extent to which ERDF/CF/JTF common indicators would be able to cover the same aspects that RRF milestones and targets cover, i.e. to what extent the **thematic coverage** of the two sets of indicators is similar to each other. Different considerations can be put forward in this regard.

- As part of the preparation of the RRF database (see methodological section under 2.1.1), nine RRF policy areas were excluded due to the fact that no comparison with ERDF/CF/JTF indicators was possible on them. These are Transnational cooperation; Effectiveness of judicial systems; Tax measures, including measures pertaining to aggressive tax planning; Fiscal policy and fiscal governance; Fraud prevention; Anti-money laundering supervision; Financial sector reforms; Rule of Law reforms; Effectiveness of public administration and national systems, including minimising administrative burden. On these areas, therefore, no comparison of thematic coverage is possible.
- RRF milestones or targets (in terms of Tags) marked as **output indicators that do not have a direct correspondence among the most frequently used ERDF/CF/JTF common indicators** refer to all the four POs considered. More specifically, they refer to
    - 4 SOs under PO1 (out of 5),
    - 7 SOs under PO2 (out of 8), both SOs under PO3, and
    - 4 SOs under PO4 (out of 6).
    - They are the following ones: Projects completed (SO1.1, SO1.2, SO1.3, SO1.4, SO2.1, SO2.2, SO2.3, SO2.5, SO2.6, SO2.7, SO2.8, SO3.1&3.2), Public-private partnership supported, New/enhanced research infrastructures, (SO1.1), Digital innovation introduced in public administration, Public servants benefitting from digital skills training (SO1.2), Built/upgraded business infrastructures (SO1.3), Public infrastructures with broadband access, Territories covered by 5G technologies, Data centres created, Services migrated to digital infrastructure (SO1.5), Renovated private non-residential buildings, Additional renewable energy production, LCE products/solutions developed, New energy-efficient buildings constructed (SO2.1), Geothermal explorations conducted, Number of installed photovoltaic systems, Dwellings equipped with photovoltaic panels (SO2.2), Monitoring devices installed, Rehabilitated dams (SO2.5), Clusters supported, Hotels certified as circular, New/upgraded recycling/sorting facilities (SO2.6), Trees planted, Restoration and protection actions implemented, Protected natural areas with updated management plans, Rehabilitated mining sites (SO2.7), Zero-emission vehicles purchased, Scrapped high-emission vehicles, High-emission vehicles equipped with zero-emission technologies, Intelligent digital transport solutions deployed, Datasets developed (SO2.8), Digital tools introduced, Digital modernisation works completed, Digitised port authorities, Staff trained in new digital technologies, New/retrofitted railways rolling stocks and locomotives, New/modernised roadside stations, Reduced black/hotspots, New/modernised seaports (SO3.1&3.2), New or upgraded care facilities (SO4.1), New or modernised childcare facilities (SO4.1), New or modernised education facilities, Number of students enrolled in

new or modernised infrastructures, New or modernised vocational training institutions and classrooms (SO4.2), New/modernised healthcare facilities, New healthcare services introduced, Healthcare personnel hired or trained (SO4.5), Digitised cultural services, Introduced cultural initiatives (SO4.6).

- RRF milestones or target (in terms of Tags) marked as **result indicators that do not have a direct correspondence among the most frequently used ERDF/CF/JTF common indicators** refer to PO1, PO2 and PO4. More specifically, they refer to 1 SO under PO1 (out of 5), 3 SOs under PO2 (out of 8), and 4 SOs under PO4 (out of 6). They are the following ones: New industrial solutions/prototypes deployed, Services provided by the supported research infrastructures (SO1.1), Increased gasification capacity, Integration of renewable energy into the grid, Electricity storage capacity, Cross-border transmission capacity (SO2.3), Irrigated/agricultural areas with improved water retention, Amount of water supplied from alternative sources than groundwater, Additional capacity of the expanded water supply network (SO2.5), Recycling rate, Separate collection rate (SO2.6), Rate of childcare, Education drop-out rate (SO4.2), Disadvantaged people receiving housing services (SO4.3), Visits delivered due to the new or updated services or facilities, Communities served by healthcare services (SO4.5), Localities with improved access to culture (SO4.6).

2.1.4 Conclusions

This sub-task has been based on an extensive categorisation and mapping exercise that has enabled a comparison of ERDF/CF/JTF common indicators and RRF milestones and targets (formulated as Tag in order to cope with their high variability). This comparison has been structured by type of operations in order to ensure consistency in the approach foreseen in the future parts of the study (task 2b) and has included the mapping of information expected to be useful for that purpose.

Most ERDF/CF/JTF common output and result indicators relate to measurable deliverables and do not show a wide set of process indicators similar to those under the RRF. Both in ERDF/CF/JTF and the RRF, some indicators are considered neither measures of deliverables nor effects of the supported interventions. Instead, they represent procedural steps or amounts of financial support, and are termed process indicators in this study. Under the RRF, process indicators are mostly milestones and can be group into three categories: "Initial steps of the project cycle", "Financial amounts" and "Legislation and strategic, organisational or administrative documents". The RRF's process indicators can be a stimulus for reflection for ERDF/CF/JTF especially with regard to the category of "Legislation and strategic, organisational or administrative documents", as such indicators capture (and thus incentivise) pre-conditions, or ancillary features, of a solid public investment system. Steps of the project cycle and financial amounts are already tracked in ERDF/CF/JTF instead, and the question related to them is not as much about the potential usefulness of capturing (and incentivising) a certain action. Rather, the RRF's experience points to a potential usefulness of considering transforming such types of information into common indicators, possibly for their use to trigger payments.

Under ERDF/CF/JTF, the fact that common output and result indicators can be used under multiple SOs allows it to capture the same outputs and results in many different contexts. In addition, this flexibility makes the aggregation of data possible. The high variability of individual milestones

and targets in the RRF leads to a more diverse set of output indicators than under ERDF/CF/JTF. Under result indicators, few items are found in absolute terms under the RRF (in contrast with a relative broad set of result indicators that ERDF/CF/JTF introduced). Ultimately, different elements of the two systems appear to be each instrument's strength: process indicators for the RRF, result indicators for ERDF/CF/JTF.

The analysis identified RRF milestones or targets that do not have a direct correspondence with a ERDF/CF/JTF common indicator. Most of these milestones and targets were classified as output indicators, which is largely due to the lower availability of result indicators under the RRF. For some policy areas supported by the RRF, there is also no correspondence between the RRF milestones or targets and the set of ERDF/CF/JTF common output and result indicators, as ERDF/CF/JTF do not support projects in these areas, which refer primarily to aspects of judicial and fiscal administration and rule of law.

RRF milestones and targets are diverse as they are tailored to the specific measures. This leads to some limitations. Milestones and targets are highly heterogeneous because closely linked to the underlying investments (and because the different RRPs were prepared individually under time pressure). Crucially, the design of the RRF that prioritised the tailoring of indicators aimed to align with the specific needs of Member States and with the project features. At the same time, this heterogeneity significantly hampers the possibility to aggregate values across measures and countries, which in turn is a relevant element to ensure transparency and accountability, but also policy evaluation and learning. Against this background, the ERDF/CF/JTF common indicator system stands out for the higher degree of uniformity it enables.

2.2 ASSESSMENT OF THE POTENTIAL OF SELECTED COMMON INDICATORS FOR PAYMENTS NOT LINKED TO COSTS (SUB-TASK 2A.2)

Based on the five criteria defined in the methodology section (2.2.1) — Linkage to clear intervention logic, Attribution, Time lag, Robustness, Homogeneity — an assessment is then provided on the selected indicators' potential for FNLC (2.2.2 on output and 2.2.3 on result indicators). Annex 2 provides the overview of the assessment for each of the selected indicators. The assessment on each selected indicator's potential for FNLC is however to be regarded as an intermediate step only, not as a final judgment, since an ultimate assessment of the feasibility of using common indicators in a system of payments not linked to costs is provided in Task 2b.

2.2.1 Methodology

Sub-task 2a.2 assesses the potential of using selected ERDF/CF/JTF common indicators in a system of payments not linked to costs. Selected indicators are those identified under Task 1b.

In order to identify the potential for using ERDF/CF/JTF common indicators in a system of payments not linked to costs, the study investigates different dimensions with regard to each indicator selected in Task 1b. The dimensions, listed in what follows, have been identified drawing on established international

practice, taking into account literature on performance-based payment systems[41] and the specificity of the exercise in the context of this assignment. For example, according to the literature, indicators enable such focus if they have a clear link with the benefit/change the investment intends to bring about; if they can be reasonably attributed to the investment, if there is not a significant time lag between the intervention and the envisioned benefit/change[42]. If these conditions are respected, an indicator allows to focus on whether an investment is delivering compared to a set goal. Altogether, these dimensions provide a detailed assessment of whether an indicator is suitable to be used in a system of payments not linked to costs.

- **Linkage to clear intervention logic**. Can the indicator be linked to a clear intervention logic?
- **Attribution.** Can the indicator's progress/achievement be reasonably attributed to the investment, and not be influenced by external events?
- **Time lag.** To which extent is a time lag expected between the intervention and the change measured by the indicator?
- **Robustness**. To which extent is there the possibility that due to the source for data collection the indicator value is precise/certain?
- **Homogeneity.** To which extent are the assumptions and calculation methods homogeneous among performance frameworks of ERDF/CF/JTF programmes?

The last two dimensions are aligned with concepts that are part of international frameworks for quality indicators: the fourth dimension reflects the concept of "Robust" in the RACER framework; the fifth dimension reflects the concept of "Clear" in the CREAM framework.

To ensure a nuanced and consistent analysis of the selected indicators, definitions are provided for each dimension outlining what constitutes high, medium, or low potential for an indicator's use in a FNLC system. The following table, which represents the framework for the analysis, presents these definitions. The five dimensions are assessed in the present report.

The synthetic judgment on each selected indicator's potential for FNLC is to be regarded as an intermediate step only, since an ultimate assessment of the feasibility of using common indicators in a system of payments not linked to costs is provided in Task 2b.

[41] In addition to ECA reports, relevant bibliography includes, among others: ICF (2015). Payment by Results: Learning from the Literature. A review prepared for the National Audit Office; National Audit Office (2015). Outcome-based payment schemes: government's use of payment by results; National Audit Office (2015). Payment by results: analytical framework for decision-makers; OECD (2023). Linking results frameworks and financing. 15th workshop of the OECD Development Assistance Committee (DAC)'s Results Community; Robinson, M. and Last, D. (2009). A Basic Model of Performance-Based Budgeting. International Monetary Fund; Webster, R. (2016). Payment by results: Lessons from the Literature; European Commission (2021). Roadmaps for administrative capacity building – Practical toolkit; European Commission (2021).

[42] See European Commission (2018). Feasibility study for a potential use of Budget Support to deliver ESI Funds.

Table 24 Definitions of high, medium and low potential of indicators to be used in a FNLC system, under the different dimensions of the analysis

	Linkage to clear intervention logic	Attribution	Time lag	Robustness	Homogeneity	Synthetic judgment
Definition of low potential	LOW POTENTIAL: There is no causal link between the investment and the indicator's deliverable (an implementation mechanism / an output / a result).	LOW POTENTIAL: It is highly possible that external events contribute to the indicator's progress. Therefore, the indicator's deliverable cannot be attributed to the underlying investment.	LOW POTENTIAL: The change measured by the indicator is expected to occur in the long term after the investment (more than one year).	LOW POTENTIAL: The source for data collection includes surveys; therefore, it is very likely that the indicator value is not precise/certain.	LOW POTENTIAL: There is no consistency in the information source for target setting across programmes and no consistent approach to target setting.	Two or more of the dimensions considered are rated as low.
Definition of medium potential	MEDIUM POTENTIAL: There is a causal link between the investment and the indicator's deliverable (an implementation mechanism / an output / a result). However, the indicator is not linked to a specific type of operation or policy area (proxied as Specific Objective).	MEDIUM POTENTIAL: It is possible that external events contribute to the indicator's progress. Therefore, the indicator's deliverable can be attributed to the underlying investment partially.	MEDIUM POTENTIAL: The change measured by the indicator is expected to occur in the short term after the investment (within one year).	MEDIUM POTENTIAL: The source for data collection is project promoter(s); therefore, there is the possibility that the indicator value is not precise/certain.	MEDIUM POTENTIAL: There is consistency in the information source for target setting across programmes, but the approach to target setting varies (or vice versa, no consistent source but a consistent approach).	Only one of the dimensions considered is rated as low.
Definition of high potential	HIGH POTENTIAL: There is a causal link between the investment and the indicator's deliverable (an implementation mechanism / an output / a result). Moreover, the indicator is linked to a specific type of operation or policy area (proxied as Specific Objective).	HIGH POTENTIAL: It is not possible that external events cause the indicator to progress. Therefore, the indicator's deliverable can be attributed only to the underlying investment.	HIGH POTENTIAL: The change measured by the indicator is expected to occur immediately after the investment.	HIGH POTENTIAL: The source for data collection is the MA's monitoring system; therefore, it is likely that the indicator value is precise/certain.	HIGH POTENTIAL: There is consistency in the information source for target setting across programmes, as well as in the approach to target setting.	None of the dimensions considered is rated as low and one or more are rated as high.
Source for compilation	*As far as the link to a specific type of operation or policy area is concerned, the compilation was based on whether the indicator is linked to one specific SO vs. more than one SO in column 9 of the "2021-27 ERDF-CF-JTF common indicator metadata", available on the*	*Compilation based on expert judgment.*	*Compilation based on column 12 of the "2021-27 ERDF-CF-JTF common indicator metadata", available on the Cohesion Open Data Platform.*	*Compilation based on column 11 of the "2021-27 ERDF-CF-JTF common indicator metadata", available on the Cohesion Open Data Platform.*	*Compilation based on Task 1b (second part of Homogeneity assessment under 1b).*	*Compilation based on cross-reading of the five dimensions.*

	Cohesion Open Data Platform, reflecting SWD (2021) 198[43].					

Source: Consortium own elaboration

The following table offers examples for each definition.

Table 25 Examples of indicators falling under each of the definitions of high, medium and low potential

	Linkage to clear intervention logic	Attribution	Time lag	Robustness	Homogeneity	Synthetic judgment
Low potential	In the case of RCO06 (Researchers working in supported research facilities), there is no causal link between the support provided to the research centre and the number of researchers employed at that facility. The indicator offers partial information about the dimensions of the supported site but does not indicate whether the intervention has increased or at least maintained the number of researchers on site. For instance, the intervention might involve constructing new rooms, refurbishing existing ones, or equipping the facility, none of which directly correlates to an increase in researcher number.	Concerning RCR01 (Jobs created in supported entities), it is highly possible that the number of jobs created could increase or decrease regardless of the support provided. Even though the indicator refers to the difference between the value before the start of the project and the one after project completion, other external factors may have influenced the increase or decrease in the number of annual FTEs, such as for instance broader economic conditions.	In the case of RCR03 (Small and medium-sized enterprises (SMEs) introducing product or process innovation), innovation does not occur in the short term but must be developed over time. The impact of investments on innovation may not be immediate given that developing and bringing new products or processes to market can take time, meaning the benefits of investments might not be observed right away.	For RCR53 (Dwellings with broadband subscriptions to a very high-capacity network), it is highly likely that the indicator value may not be fully precise, as its data collection can be based on surveys of dwellings in areas covered by the intervention. Surveys can for instance be affected by non-completion rates or unprecise replies.	No indicator falls under this category.	[Based on assessment of the five dimensions]

[43] An alternative approach could have consisted in relying not on a pre-determined linkage between indicators and SOs, but on the actual use of indicators in practice. However, for the purpose of this assessment, the pre-determined linkage is a good proxy of whether an indicator has a strong relationship to an intervention logic, or whether it can be applied to multiple ones.

Medium potential	For RCO22 (Additional production capacity for renewable energy (of which: electricity, thermal) there is a direct causal link between the investment and the indicator's deliverable (the increase in capacity). However, the indicator is linked to multiple intervention areas (proxied as Specific Objectives).	In the case of RCR11 (Users of new and upgraded public digital services, products and processes) it is possible that external events contribute to the indicator's progress. Therefore, the indicator's deliverable can be attributed to the underlying investment partially.	Concerning RCO05 (New enterprises supported) the change measured by the indicator is expected to occur in the short term after the investment (within one year).	In the case of RCR102 (Research jobs created in supported entities) the source for data collection is project promoter(s); therefore, there is the possibility that the indicator value is not precise/certain.	For RCR11 (Users of new and upgraded public digital services, products and processes), the information source for target setting is consistently past experience. Yet, the target setting approach varies with different type of operations.	[Based on assessment of the five dimensions]
High potential	For RCO18 (Dwellings with improved energy performance), there is a direct causal link between the investment and the indicator's deliverable. Moreover, the indicator is linked to one specific SO (RSO2.1).	In the case of RCO30 (Length of new or upgraded pipes for the distribution systems of public water supply) it is not possible that external events cause the indicator to progress. Therefore, the indicator's deliverable can be attributed only to the underlying investment.	For RCO34 (Additional capacity for waste recycling) the change measured by the indicator is expected to occur immediately after the investment.	Concerning RCO02 (Enterprises supported by grants) the source for data collection is the MA's monitoring system; therefore, it is likely that the indicator value is precise/certain.	For RCR17 (Firms: New enterprises surviving in the market), the information source for target setting is consistently official statistics. In addition, he targets setting approach is consistent (the target is defined in relation to the output target).	[Based on assessment of the five dimensions]

Source: Consortium own elaboration

It is important to note that the synthetic judgment was based on our assessment. The logic described in the table below was applied.

Table 26 Logic used for the assessment of the synthetic judgment

	Synthetic judgment
Low	Two or more of the dimensions considered are rated as low.
Medium	Only one of the dimensions considered is rated as low.
High	None of the dimensions considered is rated as low and one or more are rated as high.

Source: Consortium own elaboration

The choice to base the synthetic judgments on the number of "low" ratings of the four dimensions stems from the recognition that any dimension assessed as low jeopardises the potential of the indicator to be used for FNLC schemes.

An analysis of the potential of all selected common indicators for payments not linked to costs, based on the five identified criteria, is provided in the report (2.3).

2.2.2 Common output indicators

The linkage to a clear intervention logic is assessed as high for 13 out of the 22 output indicators considered (60%). For these 13 indicators, there is a clear causal link between the investment and the indicator's deliverable, such as for example in the case of RCO19 "Public buildings with improved energy performance". Additionally, these indicators are tied to a single SO. Among these, none is directly linked to PO1, while several indicators are linked by the ERDF/CF Regulation specifically to PO2, PO3, and PO4, such as RCO18 "Energy: Dwellings with improved energy performance", RCO47 "Rail: Length of new or upgraded rail (TEN-T)", and RCO66 "Education: Classroom capacity of childcare facilities". Only for two output indicators — RCO06 "RTDI: Researchers with improved infrastructure" and RCO74 "Population covered by integrated territorial development" — is the linkage to a clear intervention logic assessed as low. In these cases, there is no causal link between the investment and the indicator's deliverable. In the case of RCO06, there is no direct causal link between the support provided to the research infrastructure and the number of researchers employed at that facility, as the number of researchers working in the supported research infrastructure does not directly depend on the support provided[44]. Regarding RCO74, there is no causal link between the projects funded and the population covered, as funding might be directed towards a specific project or initiative that does not directly translate into measurable increases in population covered by integrated territorial development. For the remaining seven indicators, the linkage to a clear intervention logic is assessed as medium. In these instances, while a causal link exists between the investment and the indicator's deliverable, the indicator is tied to multiple SOs according to Annex 1 of the ERDF/CF Regulation, not to a single SO. This is for example the case of RCO22 "Additional production capacity for renewable energy (of which: electricity, thermal)": the supported interventions do have a clear causal link with additional energy production capacity, but the indicator can be used under all SOs.

The attribution criterion is assessed as high for most output indicators considered (91%, or 20 out of 22). For these 20 indicators, it is unlikely that external events caused the indicator to progress, so the deliverable can be attributed solely to the underlying investment, as in the case of RCO15 "Capacity of incubation created". These indicators are distributed across PO1, PO2, PO3, and PO4. Only two output indicators—RCO06 "RTDI: Researchers with improved infrastructure" and RCO74 "Population covered in integrated territorial development"—have a low attribution assessment. In these cases, external events likely contribute to the indicator's progress, so the deliverable cannot be attributed to the underlying investment. Regarding RCO06, the number of researchers working in a supported research infrastructure might increase or decrease regardless of the support provided to the research infrastructure itself, being also subject to external events. The measurement of this indicator might be influenced by other factors such as administrative decisions, research priorities, or facility management practices. In the case of RCO74, the indicator may reflect the overall impact of multiple interventions, making it challenging to attribute

[44] For instance, the intervention might involve constructing new rooms, refurbishing existing ones, or equipping the facility, none of which directly correlates to an increase in researcher number.

changes in population coverage to a specific investment. The investment could be part of a broader strategy, with its direct contribution to the indicator difficult to isolate. Additionally, external factors may also influence the population increase or decrease in a particular geographical area. No output indicators have a medium attribution assessment.

In line with their nature, **the time lag** criterion is assessed as high for most output indicators considered (86%, or 19 out of 22). For these 19 indicators, the change measured by the indicator is expected to occur immediately after the investment, as in the case of RCO49 "Length of rail reconstructed or modernised - TEN-T". These indicators are distributed across PO1, PO2, PO3, and PO4. Only three output indicators—RCO05 "Firms: New Enterprises," RCO06 "RTDI: Researchers with improved infrastructure," and RCO69 "Health: Capacity of health care facilities"—have a medium assessment. In these cases, the change measured by the indicator is expected to occur in the short term after the investment (within one year). No output indicators have a low time lag assessment, which aligns with the nature of output indicators.

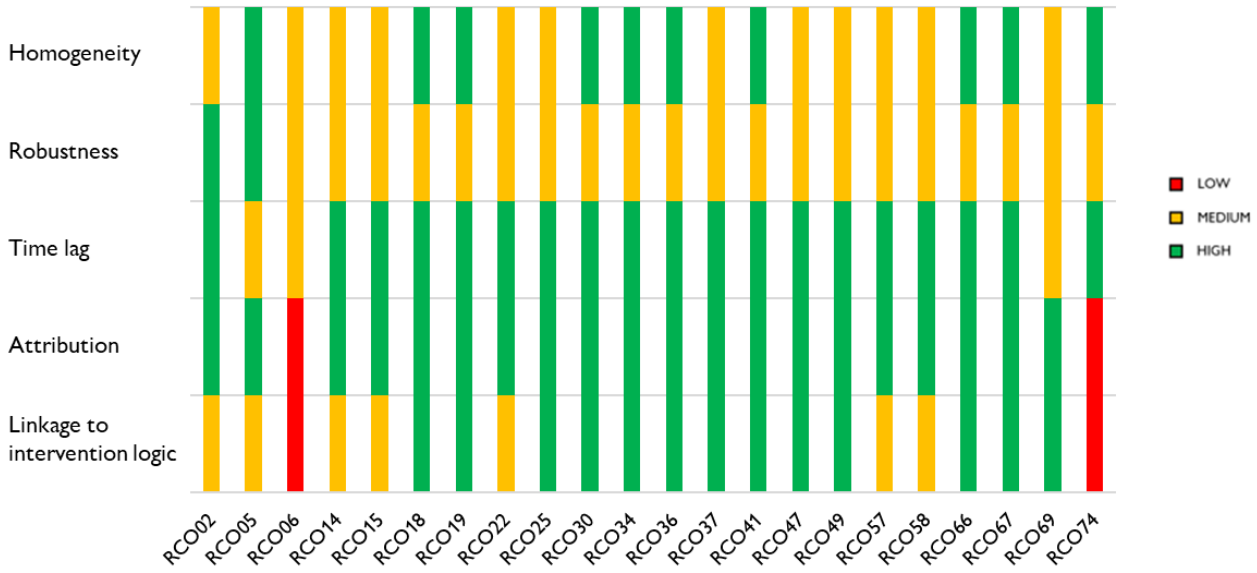
The **robustness** criterion is assessed as medium for most of the output indicators considered (91%, or 20 out of 22). For these 20 indicators, the data collection source is the project promoter(s), which means there is a possibility that the indicator values may not be precise or certain, as seen in the case of RCO14 "Public institutions supported to develop digital services, products and processes". Only two output indicators —RCO02 "Firms: Grant aided" and RCO05 "Firms: New Enterprises"—are assessed as having a high potential for FNLC under the uncertainty criterion. In these cases, the data collection source is the MA's monitoring system, suggesting that the indicator values are likely to be precise and certain. No output indicators are assessed as having a low potential in terms of uncertainty.

The fifth criterion, **homogeneity**, has been assessed based on the analysis performed in Task 1b. Homogeneity (related to the target setting) is assessed as medium for 12 of the 22 output indicators considered. For ten of these 12 indicators, the type of information source used to develop assumptions for the target setting is consistent across programmes (it is mostly evidence from 2014-2020 ERDF/CF implementation related to the same indicator or similar indicators, or implementation of other funds) but the target approach (i.e. the logic used to develop the target) varies depending on the type of operation. This is for instance the case of RCO14 (Public institutions supported to develop digital services, products and processes), for which programmes use the 2014-2020 period as a source of information, but introducing different reductions to either minimise implementation risks or to take into consideration a changed context. The other two indicators assessed as having a medium homogeneity have no consistent information source for target setting, but a consistent approach. It is the case of RCO47 (Length of new or upgraded rail - TEN-T) and RCO49 (Length of rail reconstructed or modernised - TEN-T), which despite a consistent approach rely – in terms of information source - on either project documentation or experience from other interventions. Ten output indicators are assessed as high: both the information source and the approach for target setting are consistent across programmes. This is for instance the case of RCO05 (New enterprises supported) and RCO41 (Additional dwellings with broadband access of very high capacity).

Overall, most of the output indicators considered are assessed as having a high potential for FNLC (91%, or 20 out of 22), as none of the dimensions considered is rated as low and one or more are rated as high. This group includes indicators linked by the ERDF/CF Regulation to PO1, PO2, PO3, and PO4. All of them score high on attribution, and all but two are assessed as high for the time lag, meaning

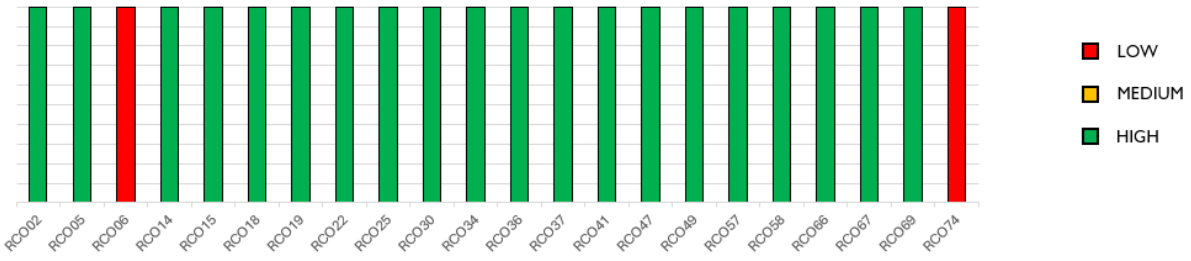
the change measured by the indicator is expected to occur immediately after the investment. The linkage to a clear intervention logic and the robustness criterion are assessed as either high or medium, depending on the indicator. This group of indicators with high potential for FNLC includes several that refer to number of supported entities or capacity aspects.

Figure 16 The five dimensions of the analysis for each indicator



Source: Consortium own elaboration

Figure 17 Synthetic judgment for each output indicator



Source: Consortium own elaboration

Two output indicators are assessed as having a low potential for FNLC. The first one is RCO06 "RTDI: Researchers with improved infrastructure", which falls under PO1 according to Annex 1 of the ERDF/CF Regulation. This indicator has a low score for linkage to a clear intervention logic and attribution criteria and a medium score for the other three criteria considered. This indicator captures the "*Number of researchers using directly, in their line of activity, the research facility or the equipment for which the support is awarded. The indicator is measured in terms of annual full-time equivalents (FTEs), calculated according to the methodology provided in the OECD Frascati Manual 2015*." The indicator is not directly linked to the number of supported projects, the capacity provided by the investment, or the additional number of researchers resulting from supported projects. The second one is RCO74 "Population covered in integrated territorial

development". Although this indicator scores high for the time lag and homogeneity criteria and medium for the robustness criterion, it has a low score for its linkage to a clear intervention logic and attribution criteria. This indicator measures the number of persons covered by projects supported by the ERDF/CF within the framework of strategies for integrated territorial development. As it can be associated with many different types of interventions, establishing a clear causal link between the investment and the indicator's progress or achievement is difficult. Furthermore, its progress can reasonably be influenced by external events, as the unit of measurement is the number of persons covered by projects. Yet, it is important to note that **indicators having a low potential for FNLC might still be useful in the absence of plausible alternatives**.

2.2.3 Common result indicators

The linkage to a clear intervention logic is assessed as high for 11 out of the 22 result indicators considered (50%). Among these, several indicators are specifically recommended by the ERDF/CF Regulation for PO2, PO3, and PO4, such as RCR26 "Energy: Annual primary energy consumption", RCR58 "Rail: Annual users railways", and RCR70 "Education: Annual users of childcare facilities". Unlike the output indicators, among the result indicators with a high linkage to a clear intervention logic, there is also one belonging to PO1: RCR53 "Digital: Dwellings with broadband to VHC network". For the remaining 11 result indicators, the linkage to clear intervention logic is assessed as medium. For example, in the case of RCR17 "New enterprises surviving in the market", it is possible to draw a causal link between the investment (support to a new enterprise) and the indicator's deliverable (new enterprises still active in the market one year after completion of the project). However, the indicator is linked to multiple intervention areas, as it can be used under all SOs. For none of the result indicators is the linkage to clear intervention logic assessed as low.

The attribution criterion is assessed as high for only one out of the 22 result indicators considered: RCR32 "Energy: Renewable energy capacity," which is recommended for RSO2.2 (Renewable energy) according to Annex 1 of the ERDF/CF Regulation. In contrast to output indicators, the majority of result indicators (59%, or 13 out of 22) are assessed as having low potential for FNLC under the attribution criterion, because external events contribute to the indicators' progress. RCR77 "Visitors of cultural and tourism sites", for instance, has a low attribution assessment, due to the fact that many factors contribute to the number of visitors to a cultural or touristic site, and isolating the impact of one investment from other support mechanisms and external influences can be challenging. In another example, RCR73 "Health: Annual users of health care facilities", it can be noted that external factors affect the number of users of a modernised health care facility, such as spikes in certain diseases, closure of nearby healthcare facilities, changes in healthcare accessibility. Therefore, the indicator's deliverable cannot be clearly attributed to the underlying investment. Similarly, in the case of RCR70 "Annual users of new or modernised childcare facilities" factors such as policy changes (e.g., subsidized childcare programs), population growth, or changes in employment patterns also influence the demand for childcare services, complicating the attribution of user numbers to specific investments. For the remaining 8 indicators, attribution is assessed as medium, meaning that external events may contribute to the indicator's progress, as in the case of RCR41 "Population connected to improved public water supply". In this case, it is possible that external events contribute to the indicator's progress: for example, an intervention may focus on a segment of the water supply network, but ultimately the volume or quality of water being delivered may be influenced by

deteriorations of the network in other segments, or by other interventions. Therefore, the deliverable can be partially attributed to the underlying investment.

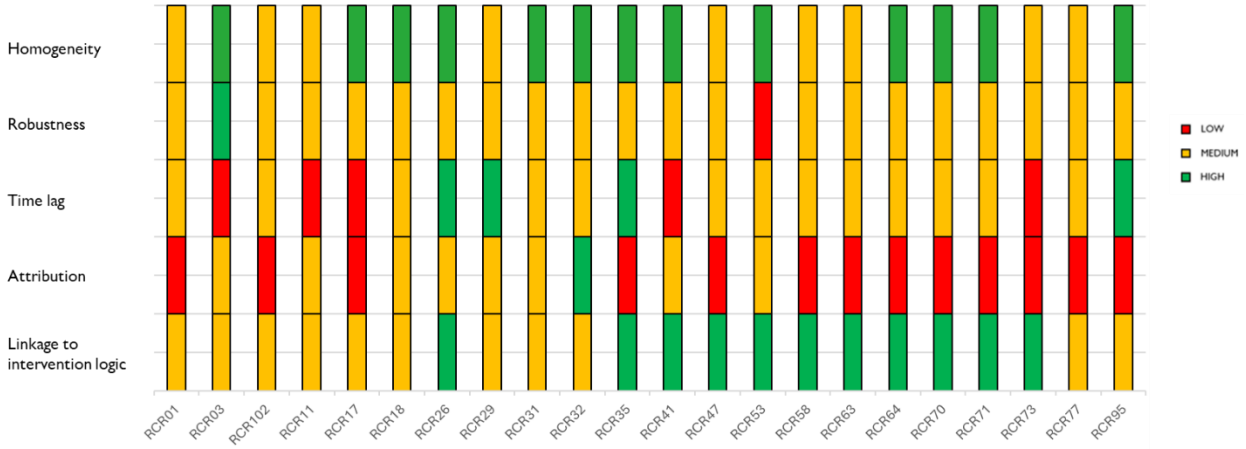
The time lag criterion is assessed as high for only four out of the 22 result indicators considered (18%): RCR26 "Energy: Annual primary energy consumption," RCR29 "Climate: Estimated GHG emissions," RCR35 "Climate: Population benefiting from flood protection," and RCR95 "Env: Population with access to green infrastructure." All four are related to PO2. Despite being result indicators, these are expected to lead to changes occurring immediately after the investment. Consistently with their nature as result indicators, the majority (13 out of 22) are assessed as medium for the time lag criterion, as in the case of RCR01 "Jobs created in supported entities": the value of the indicator is measured one year after the investment. The remaining five indicators are assessed as low, meaning that the change measured by these indicators is expected to occur in the long term (more than one year) after the investment. These include indicators under PO1, PO2, and PO4. For example, in the case of RCR73 "Health: Annual users of health care facilities", the indicator is measured one year after the new or modernised health care facility becomes operational, which can mean that the time lag can frequently be higher than one year.

As with output indicators, the **robustness** criterion is assessed as medium for most of the result indicators considered (91%, or 20 out of 22). For these 20 indicators, the data collection source is the project promoter(s), which means there is a possibility that the indicator values may not be precise or certain, as in the case of RCR35 "Population benefiting from flood protection measures". Only one of the considered result indicators—RCR03 "RTDI: SMEs introducing product or process innovation"—is assessed as having high potential for FNLC under the uncertainty criterion, because in this case the data collection source is the MA's monitoring system, suggesting that the indicator values are likely to be precise and certain. Finally, one of the considered result indicators—RCR53 "Digital: Dwellings with broadband to VHC network"—is assessed as having low potential in terms of uncertainty, as the data collection can rely on surveys, which can be biased due to missing responses or incorrect ones. This is the only indicator for which the data collection source includes surveys.

The fifth criterion, **homogeneity**, has been assessed based on the analysis performed in Task 1b. Homogeneity (related to the target setting) is assessed as high for 13 of the 22 result indicators considered. For these 13 indicators, the type of information source used for target setting is consistent across programmes (it is mostly evidence from 2014-2020 ERDF/CF implementation related to the same indicator or similar indicators, or implementation of other funds) and the approach for target setting (i.e. the logic used to calculate the target) is consistent as well. This is for instance the case of RCR64 "Annual users of dedicated cycling infrastructure" (whose targets are related to the output target). The other nine result indicators considered are assessed as medium. For six of these nine indicators, the information source is consistent across programmes, but the target approach varies depending on the type of operation. This is for instance the case of RCR102 "Research jobs created in supported entities". The other three indicators assessed as having a medium homogeneity have no consistent information source for target setting across programmes, but a consistent approach. It is the case for instance of RCR29 "Estimated greenhouse emissions", which despite a consistent approach rely – in terms of information source – on either project documentation or experience from other interventions.

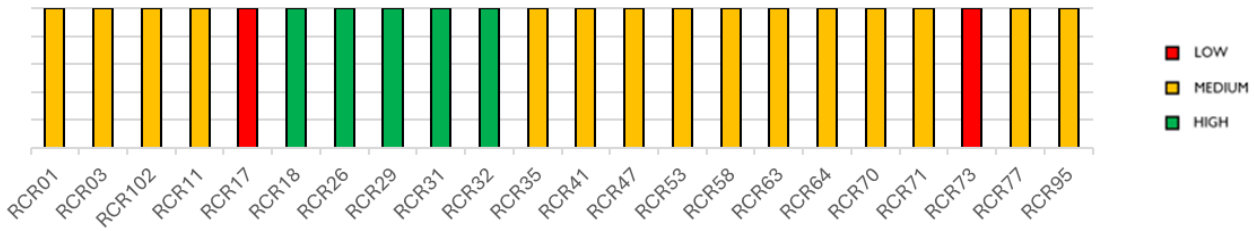
Eventually, in terms of preliminary synthetic judgment, most of the result indicators considered are assessed as having a medium potential for FNLC (68%, or 15 out of 22), as one of the four criteria considered was rated as low. This group includes indicators linked by the ERDF/CF Regulation to PO1, PO2, PO3, and PO4. A common feature of these indicators assessed as having medium potential for FNLC is that most (11) score low on attribution. Additionally, a relatively large number (9) of these indicators score high for their linkage to a clear intervention logic, as their use is tied to a single SO according to Annex 1 of the ERDF/CF Regulation. However, this high score is offset by scores in the other criteria. The only two indicators assessed as having a low potential for FNLC (in terms of synthetic judgment) are RCR17 "Firms: New enterprises surviving in the market" and RCR73 "Health: Annual users of health care facilities". The first one refers to RSO1.3 "Growth and competitiveness of SMEs," according to Annex 1 of the ERDF/CF regulation, and measures the number of new enterprises supported that remain active in the market at least one year after completion of the output. The fact that an enterprise is active in the market can be determined, for example, based on the enterprise's declared turnover for the fiscal year following the year when the output was completed. As a result, the indicator scores low on the time lag criterion. The attribution criterion is also assessed as low because it is highly likely that external events contribute to the indicator's progress. The second one, RCR73, refers to RSO4.5 and measures the number of patients served by the new or modernised health care facility during the year after the completion of the intervention (starting with the time when the new or modernised health care facility becomes operational). The indicator scores low on the attribution and the time lag criteria, determining a synthetic judgment of low potential.

Figure 18 The five dimensions of the analysis for each result indicator



Source: Consortium own elaboration

Figure 19 Synthetic judgment for each result indicator



Source: Consortium own elaboration

Five of the considered result indicators are assessed as having a high potential for FNLC (i.e. none of the dimensions considered is rated as low and one or more are rated as high). These are RCR18 "SMEs using incubator services after incubator creation", RCR26 "Energy: Annual primary energy consumption", RCR29 "Climate: Estimated GHG emissions", RCR31 "Total renewable energy produced" and RCR32 "Energy: Renewable energy capacity". The first one refers to investments in RSO1.3 "Enhancing sustainable growth and competitiveness of SMEs and job creation in SMEs, including by productive investments" and despite having a "medium" assessment under four of the five criteria, scores "high" in terms of homogeneity. RCR26 and RCR 29 refer to investments in RSO2.1 "Energy Efficiency" and unlike most of the other result indicators considered, they score high on the time lag criterion, meaning that, although they are result indicators, the change they measure is expected to occur immediately after the investment. The fourth and fifth one, RCR31 and RCR32, refer to RSO2.2 "Renewable energy" instead. RCR32 is the only result indicator having a high potential under the attribution criterion.

2.2.4 Conclusions

Based on this assessment, ERDF/CF common output indicators show potential for a FNLC system. However, the synthetic judgment on each selected indicator's potential for FNLC is to be regarded as intermediate in view of the performance of task 2.b. 20 out of 22 considered output indicators are rated as having a high potential for FNLC. Among these, 13 have three dimensions rated as high and one as medium. The other seven have two dimensions rated as high and none as low. This group of indicators with high potential for being used in a FNLC system includes indicators linked by the ERDF/CF Regulation to PO1, PO2, PO3, and PO4, and many of them refer to supported entities or capacity aspects.

Result indicators appear to show relatively lower potential for FNLC compared to output indicators. Their lower potential compared to output indicators is mostly due to the dimensions of attribution and time lag. In fact, under the attribution dimension, 91% of the output indicators are rated as high, against just 5% of result indicators. Under the time lag dimension, these shares are 86% and 18%. Under the dimensions of linkage to the intervention logic, robustness and homogeneity, differences are less strong. Under the intervention logic dimension, 59% of the output indicators are rated as high, against 50% of result indicators; in terms of robustness, these shares are 9% and 5%; in terms of homogeneity, they are 45% and 59%. This result confirms that compared to output indicators, as expected, result indicators are more susceptible to external factors and that the change measured by them is expected to occur over a longer term. However, it is worth noting that, for many result indicators, a medium synthetic judgment prevails (i.e. they were rated as having a low potential under one dimension). This suggests there is potential for many result indicators to be suitable for an FNLC system. Furthermore, five of the result indicators considered—RCR18 "SMEs using incubator services after incubator creation", RCR26 "Energy: Annual primary energy consumption", RCR29 "Climate: Estimated GHG emissions", RCR31 "Total renewable energy produced" and RCR32 "Energy: Renewable energy capacity"—are assessed as having a high potential for FNLC. The lower scores for result indicators serve as a reminder of the difficulties ahead if FNLC is chosen as the path forward.

Overall, the assessment suggests that the current common indicator system positions ERDF/CF/JTF well for a possible shift to FNLC. However, further analysis under task 2.b is needed to confirm this initial conclusion. While analysing individual indicators provides insight into their FNLC potential, it is equally important to examine how these indicators interact within the logic of FNLC schemes (as will be explored under Task 2b). In fact, to fully assess the suitability of a performance framework for a system not linked to costs, it is particularly useful to consider indicators in combination—i.e., looking at those that could trigger preliminary payments (milestones) alongside those that could trigger additional payments when the output or result is achieved (targets, in RRF terminology).

2.3 ASSESSMENT OF HOW COMMON INDICATORS ADDRESS WEAKNESSES IDENTIFIED BY ECA (SUB-TASK 2A.3)

Based on the four weaknesses defined in the methodology section (2.3.1) — Main focus on inputs and outputs; Poor coherence and robustness; Inability to capture completion of a measure; Unclear link with financial values— an assessment on how common indicators address criticisms by ECA is provided in this chapter. This assessment benefits from the analysis conducted under task 1b, sub-tasks 2a.1 and 2a.2.

2.3.1 Methodology

ECA reports[45] contain different criticisms of the RRF's performance monitoring framework and in general assessed it as not sufficient to capture all dimensions of performance. Milestones and targets and the RRF common indicators, while complementing one another, do not allow to fully understand how the measures contribute to the RRF's general objectives, according to ECA. **The Commission, in its replies to ECA reports, however expressed disagreement with ECA's conclusions.** The following table more specifically illustrates the weaknesses ECA identified in RRF milestones and targets, and summarises the Commission's position on each criticism.

[45] European Court of Auditors (2022). The Commission's assessment of national recovery and resilience plans; European Court of Auditors (2023). EU financing through cohesion policy and the Recovery and Resilience Facility; European Court of Auditors (2023). Design of the Commission's control system for the RRF; European Court of Auditors (2023). Special report 26/2023.

Table 27 Weaknesses of milestones and targets according to ECA, and Commission replies

Issue	ECA's position	European Commission's position
Focus on inputs, outputs and results	Milestones and targets focus on inputs and especially on outputs, rather than results.	This conclusion goes beyond the definition of milestones and targets set out in the RRF Regulation (they are clearly meant to monitor progress, and not final results of measures) and does not take into account the very nature of the RRF, which links payments to performance. It is not possible to link the disbursement of over EUR 600 billion to final results in a timeframe of 6 years.
Coherence and robustness	Even though milestones and targets are generally suited to measuring implementation progress, their design and level of ambition varies, with some of them being more demanding than others[46]. Even in cases where the same cross-border project is supported under multiple RRPs, milestones and targets co-differ. Moreover, ECA argues that some milestones and targets are not described in a clear way: this poses risks in terms of difficult assessment.	The RRF Regulation does not expect milestones and targets to be comparable, nor to have the same level of ambition. To the contrary, milestones and targets are meant to be customised to capture the differences among 27 Member States and address their specificities.
Capture of the completion of a measure	5% of measures analysed in depth by ECA do not foresee a final milestones or target that will allow to indicate the completion of that measure. As such, it will not be possible to assess whether the measure has been finalised based on the final milestone or target alone.	The Commission, in its replies to ECA's Special report 26/2023, observed that only in very rare instances the last milestone or target does not indicate completion. In addition, it noted "that there is no requirement in the RRF Regulation for milestones and targets to measure completion of reforms and investments. The inclusion of completion milestones and targets for all type of measures is not always relevant or possible and would have created disproportionate burden for both national authorities and the Commission, with little

[46] ECA provides examples illustrating a large diversity in final targets of measures related to the following domains: training initiatives; industry decarbonisation; energy efficiency; sustainable transport. Source: ECA (2023). Special report 26/2023.

Issue	ECA's position	European Commission's position
		impact on the final results". Source: European Commission (2023). Replies of the European Commission to the European Court of Auditors' Special report 26/2023.
Link with financial values	To report on the disbursement of RRF grants and loans (as Delegated Reg. (EU) 2021/2106 requires), the Commission follows a two-step approach: first, it calculates the value of each milestone and target (unit value) by dividing the total allocation of an RRP by the number of milestones and targets. Second, it multiplies this unit value by the number of milestones and targets included in the payments made. This is used as a basis to calculate the share of disbursement per pillar. The main limitation of such methodology is that the same cost is attributed to each milestone and target, reflecting neither their actual nor their estimated cost (and irrespective of whether they relate to a reform or an investment)[47]	In its replies, the Commission wrote that "reporting on disbursements by policy pillars cannot be based on actual costs, due to the very nature of the RRF […]. Considering the performance-based nature of the RRF, the importance of both reforms and investments […] and the lack of information on actual costs, the Commission considers that the methodology that it uses to report on disbursement by pillar provides a good approximation to capture the contribution to the six pillars of the disbursements paid under the RRF". It also added that the RRF Regulation "clearly lays out the RRF as a performance-based instrument where incurred costs are not taken into account, in line with the rules on simplification relating to financing not linked to costs laid down in Article 125(1) of the Financial Regulation 2018/1046. More precisely, the Regulation explicitly provides in Article 29(3) that specific reporting on expenditure must be based on the break-down of the estimated expenditure of the Recovery and Resilience Plans. Therefore, there is no legal ground for the Commission to otherwise collect, or disclose or report on any such data for performance reporting purposes" and that "the Commission does not agree that reporting on actual expenditure by six pillars is essential to assess the efficient use of resources […]. From an EU budget perspective,

[47] See ECA (2023). Special report 26/2023, paragraphs 78-80. On a similar note, the unclear link with financial values also created issues in establishing financial reductions in payment requests when necessary.

Issue	ECA's position	European Commission's position
		measuring efficiency corresponds to comparing how much is paid by the EU budget with actual results achieved on the ground, which in the RRF context are measured through the satisfactory fulfilment of milestones and targets".

Source: Consortium own elaboration based on ECA reports and Commission replies.

Building on the identification of such weaknesses, ECA reports recommended to establish comprehensive performance monitoring systems in the future design of instruments not linked to costs. In particular, according to ECA, an instrument based on FNLC should have a performance monitoring system that allows to have evidence of the instrument's effects, including results, and that feeds into the policy evaluation framework.
It is important to note that the Commission was not in a position to accept all of ECA's recommendations. In particular, the ECA's recommendation to report on the actual expenditure financed might be difficult to reconcile for instruments whose financing is purposefully *not* linked to costs[48].

This sub-task assesses whether the ERDF/CF/JTF common indicator system could address the abovementioned weaknesses. In what follows, assessment criteria for each weakness are spelled out, with the related source of information.

Table 28 Assessment criteria under Sub-task 2.a.3

Weakness	Assessment criteria	Sources of information
W1. Main focus on inputs and outputs, less on results	Does the system of common indicators enable a focus on results?	Sub-task 2.a.1
W2. Poor coherence and robustness	[Assessment only on indicators selected under task 1.b] Are definitions of common indicators consistent across programmes and OPs? Are assumptions and calculation methods of common indicators homogenous? Are common indicators robust, in terms of precision/certainty of the indicator values?	Coherence: 1.b Robustness: 2.a.2 (both at individual indicator level)
W3. Inability to capture completion of a measure	Does the system of common indicators allow to capture the completion of a project?	Sub-task 2.a.1; expert judgment
W4. Unclear link with financial values	Is it possible to attribute a financial value to common indicators that enables a clear reporting on disbursement progress?	Expert judgment

Source: Consortium own elaboration

Building on the analysis of how the common indicator system addresses the four weaknesses, the report draws general conclusions on whether the common indicator system is conducive to a comprehensive performance monitoring that allows to have evidence on effects, including results, which in turn can well feed into the evaluation framework.

[48] See the Replies of the European Commission to the European Court of Auditors' Special Report 26/2023, available at: https://www.eca.europa.eu/Lists/ECAReplies/COM-Replies-SR-2023-26/COM-Replies-SR-2023-26_EN.pdf.

2.3.2 Main focus on inputs and outputs, less on results

Considering the issue related to **focus on input and outputs**, the question that arises is whether the system of common indicators enables also the measurement of projects' results. The introduction of ERDF/CF/JTF common result indicators is a crucial step in this direction. More importantly, in the 2021-2027 programming period, the common results have been designed to allow for the observation of direct outcomes from the actions supported during implementation, rather than only at the end of the implementation period[49].

However, three issues come to the forefront in this regard:

1 not all common result indicators may really represent results.
2 not all of them are directly attributable to the supported intervention.
3 not always do common output indicators have a corresponding common result indicator.

These three issues are discussed in what follows for the different POs.

2.3.2.1 PO1

- Among the 20 common result indicators that the Annex 1 to the ERDF/CF Regulation assigns to PO1, there are two for which it is questionable whether they truly represent results, i.e. direct effects of the supported intervention's outputs. One of them refers to a financial amount: RCR02 "Private investments matching public support". While the attraction of private investments is crucial to public intervention, this indicator does not represent an effect of the supported intervention. The second one refers to the number of persons taking part to trainings: RCR98 "SMEs staff completing training for skills for smart specialisation, for industrial transition and entrepreneurship". This indicator does not reveal effects of the supported intervention (for instance, increased competences after the training).
- Among the 20 common result indicators associated to PO1, seven have been assessed in sub-task 2.a.2. Out of these seven, three were rated as having a low attribution. These three indicators are RCR01 "Jobs created in supported entities", RCR102 "Research jobs created in supported entities" and RCR17 "New enterprises surviving in the market". In these cases, it is highly possible that external events contribute to the indicator's progress. Therefore, the indicator's deliverable cannot be directly attributed to the underlying investment. The other four indicators were assessed as medium in terms of attribution criterion. These are RCR03 "Small and medium-sized enterprises (SMEs) introducing product or process innovation", RCR11 "Users of new and upgraded public digital services, products and processes", RCR18 "SMEs using incubator services after incubator creation" and RCR53 "Dwellings with broadband subscriptions to a very high-capacity network". In these cases, it is possible that external events contribute to the indicator's progress. Therefore, the indicator's deliverable can be partially attributed to the underlying investment.

[49] Ref: SWD (2021) 198, p.8

- For eight of the 20 common result indicators associated to PO1, a clearly corresponding common output indicator is found. For the other twelve, there is no clear correspondence. The eight correspondences found are:
    - RCO01 "Enterprises supported (of which: micro, small, medium, large)" is related to RCR01 "Jobs created in supported entities".
    - RCO13 "Value of digital services, products and processes developed for enterprises" is related to RCR13 "Enterprises reaching high digital intensity".
    - RCO14 "Public institutions supported to develop digital services, products and processes" is related to RCR11 "Users of new and upgraded public digital services, products and processes".
    - RCO15 "Capacity of incubation created" is related to RCR17 "New enterprises surviving in the market".
    - RCO15 "Capacity of incubation created" is related to RCR18 "SMEs using incubator services after incubator creation".
    - RCO101 "SMEs investing in skills for smart specialisation, for industrial transition and entrepreneurship" is related to RCR98 - SMEs staff completing training for skills for smart specialisation, for industrial transition and entrepreneurship (by type of skill: technical, management, entrepreneurship, green, other).
    - RCO41 "Additional dwellings with broadband access of very high capacity" is related to RCR53 "Dwellings with broadband subscriptions to a very high-capacity network".
    - RCO42 "Additional enterprises with broadband access of very high capacity" is related to RCR54 "Enterprises with broadband subscriptions to a very high-capacity network".

2.3.2.2 PO2

- Among the 23 common result indicators that Annex 1 to the ERDF/CF Regulation assigns to PO2, there is one for which it is questionable whether it truly represents a result, i.e. a direct effect of the supported intervention's outputs. It is RCR34 "Roll-out of projects for smart energy systems". This indicator does not reveal effects of the supported intervention, but reflects a process element (the number of projects).
- Among the 23 common result indicators associated to PO2, ten have been assessed in sub-task 2.a.2. Of these ten, five were rated as having a low attribution. These five indicators are: RCR35 "Climate: Population benefiting from flood protection"; RCR47 "Circular: Waste recycled"; RCR63 "Urban Transport: Annual users of tram and metro lines"; RCR64 "Urban Transport: Annual users of cycling infrastructure"; RCR95 "Environment: Pop. with access to green infrastructure". In these cases, it is highly possible that external events contribute to the indicator's progress. Therefore, the indicator's deliverable cannot be directly attributed to the underlying investment. Four other indicators were assessed as medium in terms of attribution criterion. These are RCR26 "Energy: Annual primary energy consumption", RCR29 "Climate: Estimated GHG emissions", RCR31 "Total renewable energy produced" and RCR35 "Climate: Population benefiting from flood protection". In these cases, it is possible that external events contribute to the indicator's progress. Therefore, the indicator's deliverable can be partially attributed to the underlying investment. In one case, RCR32 "Energy: Renewable energy capacity", attribution is high. It is unlikely that external events cause the indicator to progress, so the deliverable can be attributed solely to the underlying investment.

- Considering the 23 common result indicators associated to PO2, a clearly corresponding common output indicator is found in the following 12 cases:
    - RCO123 "Dwellings benefitting from natural gas-fired boilers and heating systems replacing solid fossil fuels based installations" is related to RCR105 "Estimated greenhouse emissions by boilers and heating systems converted from solid fossil fuels to gas".
    - RCO22 "Additional production capacity for renewable energy (of which: electricity, thermal)" is related to RCR 31 "Total renewable energy produced (of which: electricity, thermal)".
    - RCO23 "Digital management systems for smart energy systems" is related to RCR33 "Users connected to smart energy systems".
    - RCO24 "Investments in new or upgraded disaster monitoring, preparedness, warning and response systems against natural disasters" is related to three result indicators (cumulatively): RCR35 "Population benefiting from flood protection measures", RCR36 "Population benefiting from wildfire protection measures" and RCR37 "Population benefiting from protection measures against climate related natural disasters (other than floods or wildfire)".
    - RCO122 "Investments in new or upgraded disaster monitoring, preparedness, warning and response systems against non-climate related natural risks and risks related to human activities" is related to RCR96 "Population benefiting from protection measures against non-climate related natural risks and risks related to human activities".
    - RCO28 "Area covered by protection measures against wildfires" is related to RCR36 "Population benefiting from wildfire protection measures".
    - RCO121 "Area covered by protection measures against climate related natural disasters (other than floods and wildfire)" is related to RCR37 "Population benefiting from protection measures against climate related natural disasters (other than floods or wildfire)".
    - RCO30 "Length of new or upgraded pipes for the distribution systems of public water supply" is related to RCR41 "Population connected to improved public water supply".
    - RCO119 "Waste prepared for re-use" is related to RCR48 "Waste used as raw materials".
    - RCO39 "Area covered by systems for monitoring air pollution installed" is related to RCR50 "Population benefiting from measures for air quality".
    - RCO55 "Length of new tram and metro lines" and RCO56 "Length of reconstructed or modernised tram and metro lines" are related (cumulatively) to RCR63 "Annual users of new or modernised tram and metro lines".
    - RCO58 "Dedicated cycling infrastructure supported" is related to RCR64 "Annual users of dedicated cycling infrastructure".

2.3.2.3 PO3

- Among the six common result indicators that Annex 1 to the ERDF/CF Regulation assigns to PO3, all represent results. In fact, indicators about the number of users (RCR55 and RCR58) as well as the levels of freight transport (RCR59 and RCR60) may reflect not only the direct effects of the intervention's outputs, but if causality chains can be established, they are indeed result indicators.
- Among the six common result indicators associated to PO3, one has been assessed in sub-task 2.a.2, RCR58 "Annual users of newly, built, upgraded, reconstructed or modernised railways". It was rated as having a low attribution. It is highly possible that external events contribute to the indicator's

progress. Therefore, the indicator's deliverable cannot be directly attributed to the underlying investment.

- For all the six common result indicators associated to PO3, clearly corresponding common output indicators were found. The six correspondences are as follows:
    - Six common output indicators are related cumulatively to RCR55 "Annual users of newly built, reconstructed, upgraded or modernised roads". The output indicators are: RCO43 "Length of new or upgraded roads - TEN-T", RCO45 "Length of roads reconstructed or modernised - TEN-T", RCO108 "Length of roads with new or modernised traffic management systems - TEN-T", RCO44 "Length of new or upgraded roads - non-TEN-T", RCO46 "Length of roads reconstructed or modernised - non-TEN-T" and RCO110 "Length of roads with new or modernised traffic management systems - non-TEN-T".
    - Six common output indicators are related cumulatively to RCR56 "Time savings due to improved road infrastructure". The output indicators are: RCO43 "Length of new or upgraded roads - TEN-T", RCO45 "Length of roads reconstructed or modernised - TEN-T", RCO108 "Length of roads with new or modernised traffic management systems - TEN-T", RCO44 "Length of new or upgraded roads -non-TEN-T", RCO46 "Length of roads reconstructed or modernised - non-TEN-T", RCO110 "Length of roads with new or modernised traffic management systems - non-TEN-T".
    - Five common output indicators are related cumulatively to RCR101 "Time savings due to improved rail infrastructure". The output indicators are: RCO47 "Length of new or upgraded rail - TEN-T", RCO49 "Length of rail reconstructed or modernised - TEN-T", RCO48 "Length of new or upgraded rail - non-TEN-T", RCO50 "Length of rail reconstructed or modernised - non-TEN-T", RCO111 "Length of European Rail Traffic Management System equipped railways in operation - non-TEN-T".
    - Five common output indicators are related cumulatively to RCR58 - Annual users of newly built, upgraded, reconstructed or modernised railways. The output indicators are: RCO47 "Length of new or upgraded rail - TEN-T", RCO49 "Length of rail reconstructed or modernised - TEN-T", RCO48 "Length of new or upgraded rail - non-TEN-T", RCO50 "Length of rail reconstructed or modernised - non-TEN-T", RCO111 "Length of European Rail Traffic Management System equipped railways in operation - non-TEN-T".
    - Five common output indicators are related cumulatively to RCR59 "Freight transport on rail". The output indicators are: RCO47 "Length of new or upgraded rail - TEN-T", RCO49 "Length of rail reconstructed or modernised - TEN-T", RCO48 "Length of new or upgraded rail - non-TEN-T", RCO50 "Length of rail reconstructed or modernised - non-TEN-T", RCO111 "Length of European Rail Traffic Management System equipped railways in operation - non-TEN-T".
    - Two common output indicators are related cumulatively to RCR60 - Freight transport on inland waterways. The output indicators are: RCO51 "Length of new, upgraded or modernised inland waterways - TEN-T", RCO52 "Length of new, upgraded or modernised inland waterways -non-TEN-T".

2.3.2.4 PO4

- The nine common result indicators that Annex 1 to the ERDF/CF Regulation assigns to PO4, represent results. They all cover aspects related to the number of users or visitors.
- Among the nine common result indicators associated to PO2, four have been assessed in sub-task 2.a.2. All of these four were rated as having a low attribution. These indicators are: RCR70 "Education: Annual users of childcare facilities", RCR71 "Education: Annual users of education facilities", RCR73 "Health: Annual users of health care facilities", RCR77 "Visitors of cultural and tourism sites". In these cases, it is highly possible that external events contribute to the indicator's progress. Therefore, the indicator's deliverable cannot be directly attributed to the underlying investment.
- For eight of the nine common result indicators associated to PO1, a clearly corresponding common output indicator is found. For the other one (RCR 72 "Annual users of new or modernised e-healthcare services"), there is no clear correspondence. The eight correspondences found are:
    - RCO61 "Surface of new or modernised facilities for employment services" is related to RCR65 "Annual users of new or modernised facilities for employment services".
    - RCO66 "Classroom capacity of new or modernised childcare facilities" is related to RCR70 "Annual users of new or modernised childcare facilities".
    - RCO67 "Classroom capacity of new or modernised education facilities" is related to RCR71 "Annual users of new or modernised education facilities".
    - RCO65 "Capacity of new or modernised social housing" is related to RCR67 "Annual users of new or modernised social housing".
    - RCO63 "Capacity of new or modernised temporary reception facilities" is related to RCR66 "Annual users of new or modernised temporary reception facilities".
    - RCO69 "Capacity of new or modernised health care facilities" is related to RCR73 "Annual users of new or modernised health care facilities".
    - RCO70 "Capacity of new or modernised social care facilities (other than housing)" is related to RCR74 "Annual users of new or modernised social care facilities".
    - RCO77 "Number of cultural and tourism sites supported" is related to RCR77 "Visitors of cultural and tourism sites supported".

2.3.2.5 PO5

- Annex 1 to the ERDF/CF Regulation assigns no common result indicator to PO5.

2.3.3 Poor coherence and robustness

The common indicator system should in principle ensure **coherence** across programmes in terms of key features of each indicator, i.e. definition, measurement unit and the baseline. Indeed, the "definition and concepts" and "references" provided in the SWD (2021)198 should allow for such a coherence. Similarly, **robustness** in terms of precision/certainty of the indicator values is in principle expected thanks to this uniformity and the identification in the SWD of a data collection approach for each common indicator. Analyses performed as part of the other sub-tasks, however, reveal a more nuanced picture.

Coherence and robustness are discussed in what follows for the different POs. As regards coherence, the analysis of Task 1b, which is restricted to a sub-set of indicators, verified the extent to which methodological

documents that define programme performance frameworks align with the 'definitions and concepts' outlined in the SWD metadata and whether the specific objectives within each programme maintain consistent definitions and standards for the indicators. As regards robustness, sub-task 2.a.2 (restricted to the same sub-set of indicators) assessed to which extent there is the possibility that due to the source for data collection the indicator value is precise/certain.

1.1.2.1 PO1

- The results of Task 1.b's coherence assessment against the SWD revealed that all the reviewed methodological documents contained definitions of PO1 indicators that were consistent with the SWD guidelines. Also, no substantial differences in indicator definitions across the various SOs were found.
- As part of sub-task 2.a.2, robustness has been assessed for 13 common indicators that the Annex 1 of the ERDF/CF Regulation assigns to PO1 (6 output and 7 result indicators). For 3 of them, robustness was rated as high. These are RCO02 "Enterprises supported by grants", RCO05 "New enterprises supported" and RCR03 "Small and medium-sized enterprises (SMEs) introducing product or process innovation". In these cases, the source for data collection according to the SWD is the MA's monitoring system; therefore, it is likely that the indicator value is precise/certain. For 9 of them, robustness was rated as medium. These are RCO06 "Researchers working in supported research facilities", RCO14 "Public institutions supported to develop digital services, products and processes", RCO15 "Capacity of incubation created", RCO41 "Additional dwellings with broadband access of very high capacity", RCR01 "Jobs created in supported entities", RCR102 "Research jobs created in supported entities", RCR11 "Users of new and upgraded public digital services, products and processes", RCR17 "New enterprises surviving in the market", RCR18 "SMEs using incubator services after incubator creation". For them, the source for data collection is project promoter(s); therefore, there is the possibility that the indicator value is not precise/certain. Finally, RCR53 "Digital: Dwellings with broadband to very high-capacity network" was assessed as having low robustness as its source for data collection includes surveys; therefore, it is likely that the indicator value is not fully precise/certain.

2.3.3.1 PO2

- All the reviewed methodological documents contained definitions of PO2 indicators that were consistent with the SWD guidelines. Consistency with the SWD is either clearly stated in the documents or implied. No substantial differences in indicator definitions across various SOs were found (also because most indicators are largely used under a single SO).
- As part of sub-task 2.a.2, robustness has been assessed for 20 common indicators that the Annex 1 of the ERDF/CF Regulation assigns to PO2 (10 output and 10 result indicators). For all of them, robustness was rated as medium, because the source for data collection is the project promoter(s); therefore, there is the possibility that the indicator value is not precise/certain.

2.3.3.2 PO3

- No methodological document has an indicator definition which is inconsistent with the SWD. The only indicator (RCR58) used under more than one SO does not show differences in its definitions across the different SOs.

- As part of sub-task 2.a.2, robustness has been assessed for 3 common indicators that the Annex 1 of the ERDF/CF Regulation assigns to PO3 (2 output and 1 result indicators). For all of them, robustness was rated as medium, because the source for data collection is the project promoter(s); therefore, there is the possibility that the indicator value is not precise/certain.

2.3.3.3 PO4

- No methodological document has an indicator definition which is inconsistent with the SWD. Most documents, however, do not make explicit reference to SWD definitions, concepts and references. No significant differences in indicator definitions across various SOs were found.
- As part of sub-task 2.a.2, robustness has been assessed for 7 common indicators that the Annex 1 of the ERDF/CF Regulation assigns to PO4 (3 output and 4 result indicators). For all of them, robustness was rated as medium, because the source for data collection is the project promoter(s); therefore, there is the possibility that the indicator value is not precise/certain.

2.3.3.4 PO5

- No methodological document has an indicator definition which is inconsistent with the SWD. Most documents, however, do not make explicit reference to SWD definitions, concepts and references. No substantial differences in indicator definitions across various SOs were found (also because most indicators are largely used under a single SO).
- As part of sub-task 2.a.2, robustness has been assessed for one common output indicator that the Annex 1 of the ERDF/CF Regulation assigns to PO5. Robustness was rated as medium, because the source for data collection is the project promoter(s); therefore, there is the possibility that the indicator value is not precise/certain.

2.3.4 Inability to capture completion of a measure

The **inability to capture completion of a measure** is discussed in what follows for each PO.

1.1.2.1 PO1

While most common output indicators refer to completed achievements, several common output[50] indicators that the Annex 1 of the ERDF/CF Regulation assigns to PO1 refer to the number of supported entities. This is for instance the case of RCOs 01-05 on the number of supported firms, or RCO14 "Digital: Public institutions supported for Digital". These indicators are not strictly deliverables of a supported intervention. While it can be debated whether the number of supported enterprises in business support interventions constitutes an output or not, it is clearer that in other sectors (for instance, support for energy efficiency improvements) supported enterprises simply represent the number of beneficiaries. As such, RCOs 01-05 cover more a process element than an output. In this regard, they do not enable to capture the completion of a measure. In other words, output indicators, if referred to the number of supported entities only, do not necessarily suffice to

[50] The analysis refers here to common output indicators. Common result indicators' ability to reflect completion of a measure is implicitly included under the first assessment provided in section 2.4.1.

capture the finalisation of an action, as it would be necessary to cover actual deliverables brought about thanks to the support received (such as new machinery). However, through the combined use of output and result indicators, the common indicator system allows, in principle, to capture the completion of a project.
There are however cases of type of operations (such as under SO1.2 the type of operation "E-government" – IFs 016, 017) in which no common output indicators are used beyond one referred to the number of supported entities (RCO14 Digital: Public institutions supported for Digital). Again, in such cases, the simultaneous use of output and result indicators within the scope of the same action (such as the introduction of a new digital service or a digitized procedure) provides complementary information and enhances the ability to effectively capture completion.

2.3.4.1 PO2

While most common output indicators refer to completed achievements, several common output indicators that the Annex 1 of the ERDF/CF Regulation assigns to PO2 refer to the financial amount of investments. This is the case of RCO24 "Investments in new or upgraded disaster monitoring, preparedness, warning and response systems against natural disaster" and RCO122 "Investments in new or upgraded disaster monitoring, preparedness, warning and response systems against non-climate related natural risks and risks related to human activities". These indicators are not strictly deliverables of a supported intervention. They represent an input rather than an output. As such, they do not enable to capture the completion of a measure. However, through the combined use of output and result indicators, the common indicator system does allow, in principle, to capture the completion of a project.

2.3.4.2 PO3

All common output indicators that the Annex 1 of the ERDF/CF Regulation assigns to PO3 refer to completed achievements. As such, they do enable to capture the completion of a measure.

2.3.4.3 PO4

All common output indicators that the Annex 1 to the ERDF/CF Regulation assigns to PO3 refer to completed achievements. As such, they do enable to capture the completion of a measure.

2.3.4.4 PO5

Four out of six common output indicators that the Annex 1 of the ERDF/CF Regulation assigns to PO5 do not refer to completed achievements. Two of them (RCO75 and RCO80) refer to the number of strategies supported. RCO76 refers to the number of integrated projects for territorial development, and RCO112 to the number of stakeholders involved in the strategies. These four indicators reflect more input or process elements, rather than outputs. As such, if taken individually, they do not enable to capture the completion of a measure. Yet, through the combined use of output and result indicators, the common indicator system does allow, in principle, to capture the completion of a project.

2.3.5 Unclear link with financial values

When it comes to the criticism concerning the **link with financial values**, the question is whether common indicators can be linked with a financial amount that would enable a clear reporting on disbursement progress. In this regard, financial values can in principle be linked to common indicators through the use of unit costs. For

instance, under SO1.1, in the case of type of operation "R&I in enterprises" (IFs 001, 002, 003, 005, 006, 007, 009, 010, 011) financial values could be attributed to result indicators based on the calculation of a unit value attributable to RCR102 "RTDI: New researchers", or based on a proportion to private investments attracted (RCR02 "Firms: Private investments"). Preceding output indicators could be linked to a financial value that represents a fraction of the total, so as to enable a clear reporting on disbursement progress.

The analysis of Task 1b, which is restricted to a sub-set of indicators, verified the extent to which assumptions behind target setting across programmes are homogeneous and, whenever possible, the indicative unit costs[51] associated to indicators.

The results of the analysis on the different POs revealed that the unit costs associated with the analysed indicators tend to vary significantly depending on the type of operations and category of regions.

2.3.6 Conclusions on common indicators addressing ECA-identified weaknesses and consistency with Financial Regulation

To provide a synthetic preliminary judgment for each ERDF/CF/JTF common indicator regarding its capability to address ECA remarks, a synoptic analysis has been performed (see table below). By aggregating the four different assessments, we identify 3 subsets:

1) Subset of indicators that are suitable for addressing the main relevant ECA remarks;
2) Subset capable of fulfilling partially them;
3) Indicators that are not fit for this purpose.

The first subset of common indicators is very well-positioned to contribute to a comprehensive performance monitoring system, addressing all but one the weaknesses identified by the ECA (marked in green in the table). These indicators are unaffected by any of the ECA's weakness except for the difficulty in attributing a financial value (unit cost) to the common indicator, which, however, as mentioned earlier, is a cross-cutting issue. This set of indicators includes:

- **PO1**: RCO15 Firms: Capacity of incubation created; RCO41 Digital: Additional dwellings with broadband of very high capacity; RCR11 Digital: Users of new and upgraded public digital services; RCR18 Firms: SMEs using incubator services.
- **PO2**: RCO22 Energy: Renewable energy capacity; RCO30 Water: Length of pipes for public water supply; RCO58 Urban Trans: Dedicated cycling infrastructure supported; RCR31 Energy: Total renewable energy produced; RCR41 Water: Population with improved water supply.
- **PO3:** RCO47 Rail: Length of new or upgraded rail - TEN-T; RCO49 Rail: Length of rail reconstructed or modernised - TEN-T.
- **PO4:** RCO66 Education: Classroom capacity of childcare facilities; RCO67 Education: Classroom capacity of education facilities; RCO69 Health: Capacity of health care facilities.
- **PO5:** None.

Additionally, there is a second subset of common indicators (marked in yellow in the table) that, despite scoring negatively for another dimension (besides the one related to the financial value linkage), can still be considered

[51] Estimated by the study team based on methodological documents.

almost suitable to contribute to a comprehensive performance monitoring system that addresses the ECA's weaknesses. This subset includes:

- **PO1:** RCO02 Firms: Grant aided; RCO05 Firms: New Enterprises; RCO14 Digital: Public institutions supported for Digital; RCR01 Jobs created in supported entities; RCR03 RTDI: SMEs introducing product or process innovation; RCR17 Firms: New enterprises surviving in the market; RCR53 Digital: Dwellings with broadband to very high-capacity network.
- **PO2:** RCO18 Energy: Dwellings with improved energy performance; RCO19 Energy: Public buildings with improved energy performance; RCO25 Climate: Flood protection newly built or consolidated; RCO34 Circular: Additional capacity for waste recycling; RCO36 Env: Green infrastructure (not related to climate change); RCO37 Env: Surface of Natura 2000 sites; RCO57 Urban Trans: rolling stock for public transport; RCR26 Energy: Annual primary energy consumption; RCR29 Climate: Estimated GHG emissions; RCR32 Energy: Renewable energy capacity; RCR35 Climate: Population benefiting from flood protection; RCR63 Urban Trans: Annual users of tram and metro lines; RCR64 Urban Trans: Annual users of cycling infrastructure.
- **PO3:** RCR58 Rail Annual users railways.
- **PO4:** RCR70 Education: Annual users of childcare facilities; RCR71 Education: Annual users of education facilities; RCR73 Health: Annual users of health care facilities; RCR77 Visitors of cultural and tourism sites.
- **PO5:** RCO74 Population covered in integrated territorial development.

Among the indicators for which a full assessment is available, few cases score low (red in the table). These are indicators assessed as least suitable to contribute to a comprehensive performance monitoring system in line with ECA's recommendations.

- **PO1:** RCO06 RTDI: Researchers with improved infrastructure and RCR102 RTDI: New researchers.
- **PO2:** RCR47 Circular: Waste recycled; RCR95 Env: Pop. with access to green infrastructure.
- **PO3, PO4, PO5:** None.

It is worth noting that some indicators were not included in the set of suitable indicators because an in-depth assessment was not conducted for certain criteria used to assess their ability to address the ECA's weaknesses (i.e., they were not analysed under Task 1.b). This is the case, for example, of RCO42 Digital: Additional enterprises with broadband of VHC, which is very similar to RCO41 Digital: Additional dwellings with broadband of very high capacity, and therefore could potentially fall in the subset of very well-positioned indicators to contribute to a comprehensive performance monitoring system in line with ECA's recommendations.

Table 29 Level of suitability of selected common indicators

PO	Indicator code and short name	Level of suitability
PO1	RCO02 Firms: Grant aided	Medium
PO1	RCO05 Firms: New Enterprises	Medium
PO1	RCO06 RTDI: Researchers with improved infrastructure	Low
PO1	RCO14 Digital: Public institutions supported for Digital	Medium
PO1	RCO15 Firms: Capacity of incubation created	High
PO1	RCO41 Digital: Add. dwellings with broadband of v high capacity	High

PO1	RCR01 Jobs created in supported entities	Medium
PO1	RCR03 RTDI: SMEs introducing product or process innovation	Medium
PO1	RCR102 RTDI: New researchers	Low
PO1	RCR11 Digital: Users of new and upgraded public digital services	High
PO1	RCR17 Firms: New enterprises surviving in the market	Medium
PO1	RCR18 Firms: SMEs using incubator services	High
PO1	RCR53 Digital: Dwellings with broadband to vhc network	Medium
PO2	RCO18 Energy: Dwellings with improved energy peformance	Medium
PO2	RCO19 Energy: Public buildings with improved energy performance	Medium
PO2	RCO22 Energy: Renewable energy capacity	High
PO2	RCO25 Climate: Flood protection newly built or consolidated	Medium
PO2	RCO30 Water: Length of pipes for public water supply	High
PO2	RCO34 Circular: Additional capacity for waste recycling	Medium
PO2	RCO36 Env: Green infrastructure (not related to climate change)	Medium
PO2	RCO37 Env: Surface of Natura 2000 sites	Medium
PO2	RCO57 Urban Trans: rolling stock for public transport	Medium
PO2	RCO58 Urban Trans: Dedicated cycling infrastructure supported	High
PO2	RCR26 Energy: Annual primary energy consumption	Medium
PO2	RCR29 Climate: Estimated GHG emissions	Medium
PO2	RCR31 Energy: Total renewable energy produced	High
PO2	RCR32 Energy: Renewable energy capacity	Medium
PO2	RCR35 Climate: Population benefiting from flood protection	Medium
PO2	RCR41 Water: Population with improved water supply	High
PO2	RCR47 Circular: Waste recycled	Low
PO2	RCR63 Urban Trans: Annual users of tram and metro lines	Medium
PO2	RCR64 Urban Trans: Annual users of cycling infrastructure	Medium
PO2	RCR95 Env: Pop. with access to green infrastructure	Low
PO3	RCO47 Rail: Length of new or upgraded rail - TEN-T	High
PO3	RCO49 Rail: Length of rail reconstructed or modernised - TEN-T	High
PO3	RCR58 Rail Annual users railways	Medium
PO4	RCO66 Education: Classroom capacity of childcare facilities	High
PO4	RCO67 Education: Classroom capacity of education facilities	High
PO4	RCO69 Health: Capacity of health care facilities	High
PO4	RCR70 Education: Annual users of childcare facilities	Medium
PO4	RCR71 Education: Annual users of education facilities	Medium
PO4	RCR73 Health: Annual users of health care facilities	Medium
PO4	RCR77 Visitors of cultural and tourism sites	Medium
PO5	RCO74 Population covered in integrated territorial development	Medium

Source: Consortium own elaboration

Overall, 90.9% of the indicators considered can contribute to addressing the ECA remarks. This provides an insight into the extent to which the ERDF/CF/JTF system of indicators can not only address the weaknesses identified by the ECA but also meet the main requirements of EU financial regulation. Indeed, common indicators can enhance the integration of both general principles and those specifically linked to performance within the Financial Regulation.

Regarding the **general budgetary principles**[52] informing the Financial Regulation, the most relevant ones concerning indicators are sound management and transparency. Other principles explicitly mentioned in the regulation include unity, budgetary accuracy, annuality, equilibrium, unit of account, universality, and specification. These principles are more closely related to the specifics of financial management. In contrast, sound management and transparency are influenced by the monitoring system, particularly through the use of indicators. More in details:

- **Sound Financial Management**[53]: By providing clear and measurable indicators, the system enables effective tracking of fund allocation and utilization. This facilitates assessment of whether resources are used efficiently and effectively in achieving specific objectives.
- **Transparency**[54]: Common indicators enhance transparency by standardizing the information required for reporting. Stakeholders can easily access and understand performance data, contributing to greater trust in the management of EU funds.

Even though not explicitly mentioned among the principles in Article 6, **accountability**[55] is one of the most relevant principles affecting how the budget is implemented, whether directly, indirectly, or through shared management. With clearly defined indicators, it becomes easier to establish accountability among managing authorities. Each authority can be held responsible for achieving the expected outcomes linked to the indicators, ensuring that they are answerable for their use of funds.

More specifically, Article 33 of the EU Financial Regulation underscores the critical role of **performance indicators** in ensuring that appropriations are used effectively and efficiently. It emphasizes the importance of performance-focused appropriations, which includes several key components:

- **Establishment of Objectives**: The regulation mandates that objectives for programs and activities be set ex ante. Common ERDF indicators are instrumental in this process, as they are closely aligned with Specific Objectives (SOs), ensuring adherence to a consolidated strategic framework.
- Furthermore, the regulation highlights the need for indicators that are **relevant, accepted, credible, easy to use, and robust (RACER)**. Common ERDF/CF indicators meet these criteria by:
  - Relevance: Indicators are designed to align closely with the objectives of the ESF, ensuring that they measure what matters most in terms of social impact.
  - Acceptance: By employing commonly agreed-upon indicators, managing authorities can foster stakeholder buy-in and ensure that all parties have a shared understanding of performance metrics.
  - Credibility: Well-defined indicators enhance the credibility of the monitoring and evaluation process, providing reliable data that stakeholders can trust.

[52] Ref. art. 6 of Regulation (EU, Euratom) 2018/1046 of the European Parliament and of the Council of 18 July 2018 on the financial rules applicable to the general budget of the Union, amending Regulations (EU) No 1296/2013, (EU) No 1301/2013, (EU) No 1303/2013, (EU) No 1304/2013, (EU) No 1309/2013, (EU) No 1316/2013, (EU) No 223/2014, (EU) No 283/2014, and Decision No 541/2014/EU and repealing Regulation (EU, Euratom) No 966/2012

[53] Ref. art. 33-36 ibidem

[54] Ref. art. 37, 47, 63, 130 ibidem

[55] Ref. art, 60.

- Ease of Use: Common indicators simplify data collection and reporting processes, making it easier for managing authorities to track performance and demonstrate compliance with regulatory requirements.
- Robustness: Finally, robust indicators can withstand scrutiny and provide valuable insights into strategic decision-making.
- Monitoring Progress: The regulation specifies that progress toward achieving these objectives must be monitored using performance indicators. Common ERDF/CF indicators enable systematic tracking of outcomes and outputs, allowing authorities to assess progress over time. This monitoring is essential for identifying areas where adjustments may be needed and for ensuring that interventions remain relevant and effective.

- **Reporting Requirements**: Article 33 also outlines the need to report progress and challenges to the European Parliament and the Council. Common indicators facilitate this reporting by providing standardized metrics that can be easily communicated. This transparency enhances accountability and allows stakeholders to evaluate the impact of ERDF/CF/JTF funding.

Furthermore, indicators are explicitly mentioned in relation to **Evaluation** (Article 34). It is important to recall that the ERDF/CF common indicators have been designed within a performance framework that includes evaluation activities. They have been widely used for this purpose by managing authorities and independent evaluators for over 30 years. Additionally, the indicators are also referenced concerning the form of support, specifically in relation to financing not linked to costs (i.e., the achievement of results measured by reference to previously set milestones or through performance indicators). This aspect has already been analyzed in the previous chapter related to Sub-Task 2.a.2.

More in general ERDF/ CF common indicators can significantly increase the focus on compliance and monitoring as requested by the financial regulation through the following ways:

- **Standardized Data Collection**: The ERDF /CF indicators promote standardized data collection methods, which ensures that data is comparable across different programmes and regions[56].
- **Regular Assessment**: in the Cohesion experience, managing authorities are encouraged to conduct regular assessments of their performance against defined targets.
- **Feedback Mechanisms**: The analysis of indicator performance can inform feedback mechanisms, enabling adjustments to be made in real time.

[56] Ref. art. 36 ibidem

3 Assessment of the implications of financing not linked to cost and the role of milestones (Task 2b)

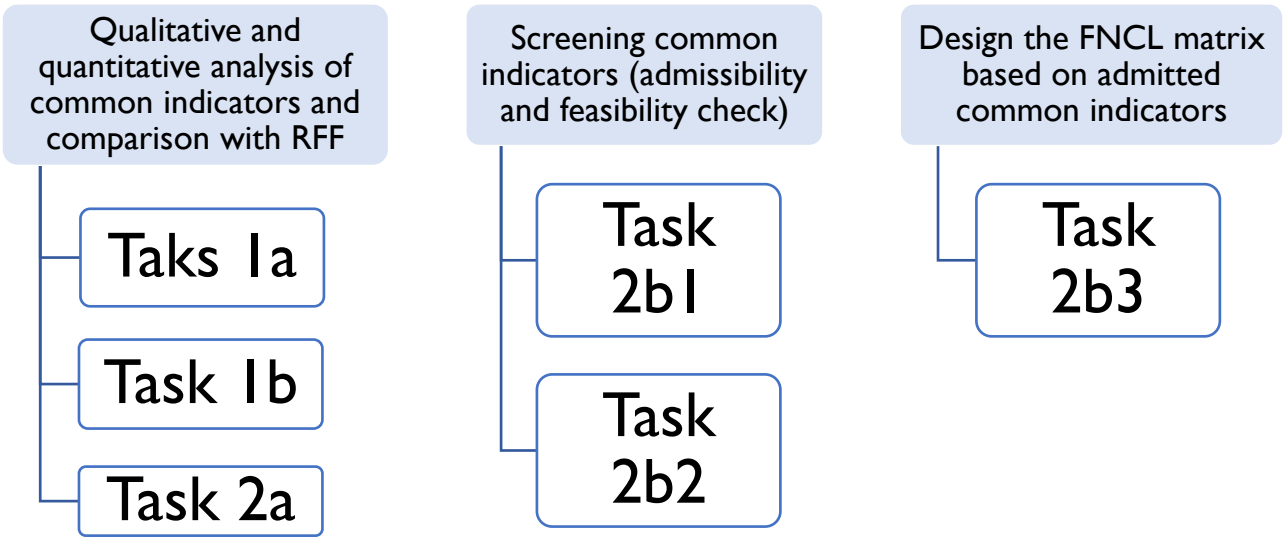
This section assesses the feasibility of using common indicators in a "payment not linked to costs" system. Following a methodological overview (Section 3.1), it presents the results of the analyses conducted under the relevant sub-tasks for a sample of indicators analysed under task 1b, (Sections 4.2 and 4.3) and concludes with lessons learned from this pilot exercise. The Task 2b is divided in the following sub-tasks:

- Sub-Task 2b.1: Analysis of output indicators
- Sub-Task 2b.2: Analysis of result indicators
- Sub-Task 2b.3: Design of intervention action matrices as basis for the development of performance-based delivery model with FNLC.
- Sub-Task 2b.4: SWOT analysis per stakeholder.

3.1 METHODOLOGY

This section of the report outlines the methodology for assessing the implications of financing not linked to cost and the role of milestones (Task 2b). The analysis builds on the results of the analyses conducted in the previous tasks: Task 1a, Task 1b and Task 2a. The analysis is divided in two main parts: assessing the common indicators (sub-task 2b2 and 2b2) and design the FNLC matrix (subtask 2b3).

Figure 20 Methodological process of task 2b



Source: Consortium own elaboration

More in details under tasks 2b1 and 2b2, the **admissibility** and **feasibility** checks were carried out for each output (in Sub-Task 2b.1) and result indicator (in Sub-Task 2b.2) selected in Task 1b to assess:

- whether the indicators listed under Task 1b are suitable for a context of payments not linked to costs (admissibility)
- how and when the indicator might be used in a FNLC scheme (feasibility).

The following sections outline the methodologies, criteria, and data used to carry out the aforementioned checks. The table below provides an overview of the multi-criteria analyses conducted to assess the indicators and of the sources of information.

Table 30 Admissibility and feasibility assessments

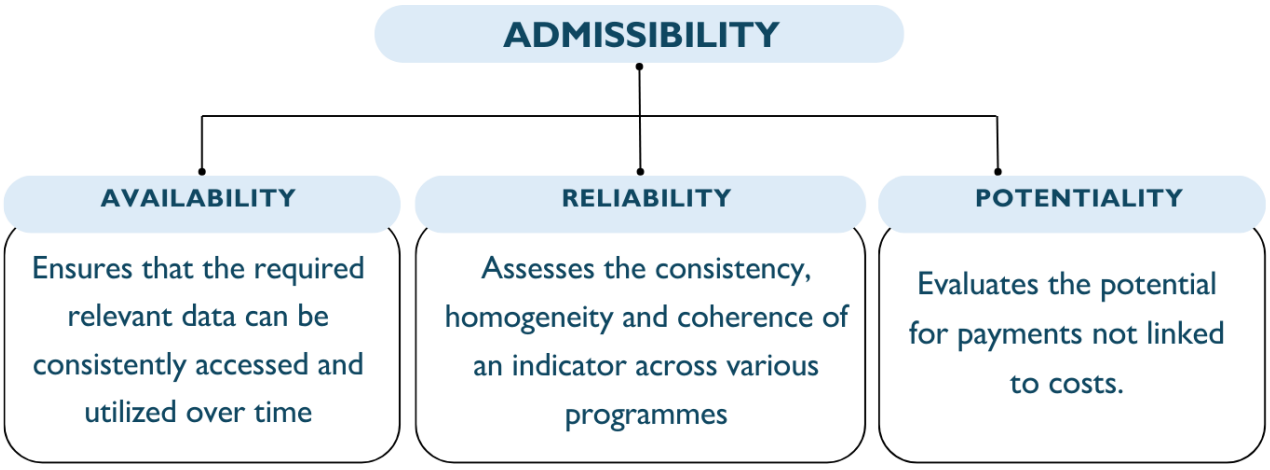
Criteria		Source	
Admissibility	*Availability*	*Frequency*	*Task 1a*
		Relevance	*Task 1a*
	Reliability	*Coherence*	*Task 1b*
		Consistency	*Task 1a*
		Homogeneity	*Task 1b*
Potentiality			*Task 2a*
Feasibility	*Granularity*		*Task 1b*
	Timeliness		*Task 1b*
	Practicability	*Credibility*	*Task 2b*
		Easiness	*Task 1a and 1b*

Source: Consortium own elaboration

3.1.1 Admissibility analysis

The analysis of admissibility aimed to identify the common indicators selected under Task 1b that are the most suitable for a context of payment not linked to cost. The admissibility of each indicator was assessed through a multi-criteria analysis considering three different criteria: **availability**, **reliability** and **potentiality** (see Figure 21).

Figure 21 Admissibility assessment criteria

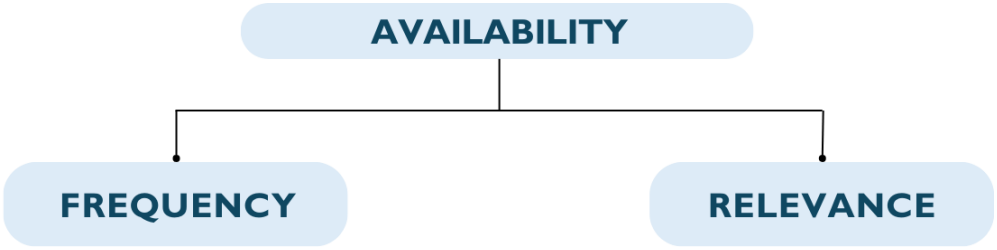


Source: Consortium own elaboration

For the first two main criteria—**availability** and **reliability**—detailed evaluations were conducted based on specific factors:

- **Availability** refers to the extent to which relevant data can be consistently accessed and utilized over time. This criterion was assessed by analysing the *frequency* and *relevance* of each result indicator, leveraging the findings from the analysis conducted under Task 1a (Figure 22).

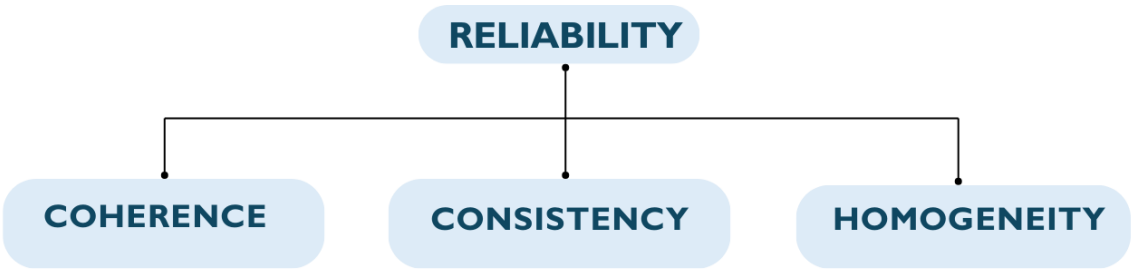
Figure 22 Availability assessment criteria



Source: Consortium own elaboration

- **Reliability,** entails that the indicator is consistently used for the similar investments (i.e. SO and intervention field) and in homogeneous situations across different regional and national programmes, encompassing also the indicators coherence with the methodological guidance issued by DG REGIO (i.e., staff working documents). This criterion was assessed by examining the *consistency* of the indicators, based on the results obtained from Task 1a, as well as their *homogeneity* and *coherence*, as detailed in Task 1b.

Figure 23 Reliability assessment criteria



Source: Consortium own elaboration

- Finally, **potentiality** assesses the potential of using selected ERDF/CF/JTF common indicators in a system of payments not linked to costs. The analysis was carried out under Task 2a, and the scores provided are based on a synthetic judgment calculated using different criteria: linkage to clear intervention logic, attribution, time lag, robustness, and homogeneity.

All the information / judgment collected for these indicators from the previous analysis were translated into a score of 0, 1, and 2, where 0 represents the lowest score and 2 the highest.

These criteria were then aggregated to produce an overall score for each indicator, determining its admissibility trough a multicriteria analysis. The overall score was calculated as the average value of the criteria, with a minimum admissibility threshold set at 1.5.

Table 31 Admissibility assessment matrix

Admissibility	AVERAGE SCORE

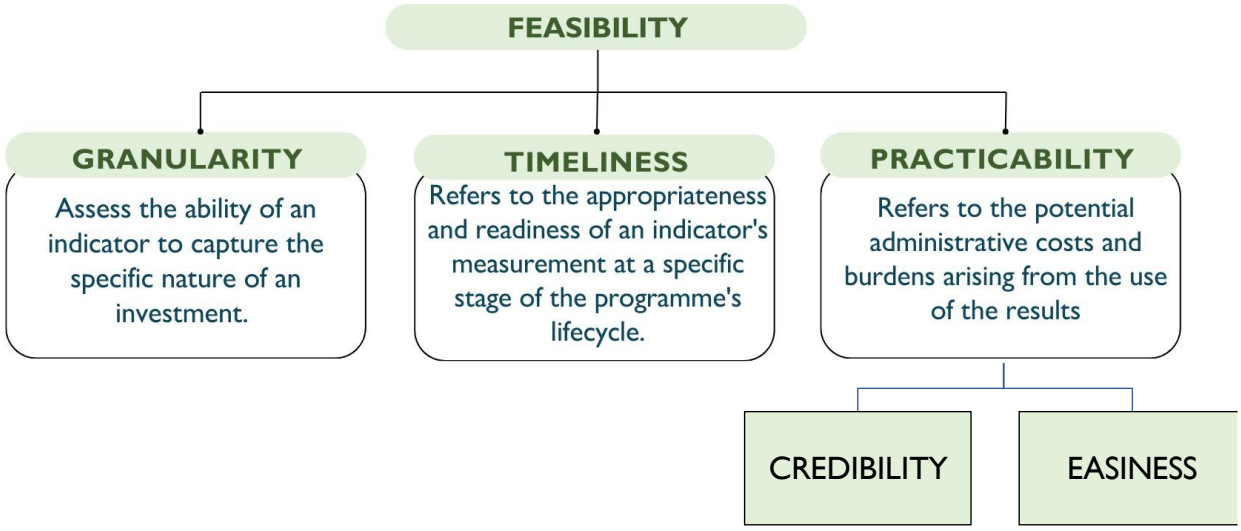
Availability		Reliability			P	
Frequency (Task 1a)	Relevance (Task 1a)	Coherence (Task 1b)	Consistency (Task 1a)	Homogeneity (Task 1b)	Potential for payments not linked to costs (Task 2a2)	

Source: Consortium own elaboration

3.1.2 Feasibility assessment

The feasibility assessment has the goal to assess how and when the indicators could be used in a FNLC scheme. This assessment is not used for selecting indicators but rather serves as guidance for their use in the FNLC shcemes, providing additional insights derived from the analysis of previous tasks. In this phase, three criteria were assessed: granularity, timeliness and practicability.

Figure 24 Feasibility assessment criteria



Source: Consortium own elaboration

Granularity refers to the degree of specificity or detail an indicator provides about the underlying investment and SO. It assesses the extent to which a specific indicator can be linked to a particular typology of actions. In other words, the granularity criterion provides users with information on how extensively the indicator is used for a specific type of operation. It indicates how familiar different stakeholders are with it and how much information can be retrieved about its use in that specific context. The granularity analysis for each indicator drew on the results of the assessment conducted in Task 1b, which examined, for each

SO, the type of operations under which the indicators were used. Finally, for each indicator under these investment actions, the frequency of usage was calculated. These frequencies were then transformed into scores: High = 2, Medium = 1, Low = 0.

Timeliness refers to the suitability and readiness of an indicator's measurement at a specific stage of the programme's lifecycle. It focuses on identifying the point in the lifecycle when the indicator is most relevant and can be effectively measured, whether during the early preparation phases, throughout implementation, or in the later stages when results and impacts become evident after outputs have been achieved. Timeliness provides insights into the application of indicators at the most appropriate moments to accurately reflect the programme's progress and outcomes, ensuring that meaningful and actionable information is available when it is most needed Timeliness has been assessed under Task 1b by analysing methodological documents, with a focus on the milestone-to-target ratio of output indicators at the level of each type of operation under each RSO. Each of the indicators used under each of the investment action was scored as: fast, medium, slow.

An additional criterion related to the feasibility assessment is **practicability**, which refers to the potential administrative costs and burdens arising from the use of the indicator. To comment on this aspect, we used evidence from the study "Development of a system of common indicators for European Regional Development Fund and Cohesion Fund interventions after 2020", where a feasibility assessment was carried out for each ERDF/CF common indicator. In the practicability assessment, two factors were considered:

- Credibility assesses whether the indicator is unambiguous, adopts clear definitions and is also accessible to non-experts. Indicators are ranked as credible if their definition is based on some existing harmonised standards.
- Easiness **evaluates whether an indicator is feasible in terms of monitoring efforts, data collection costs, and organizational settings.** To determine how easy an indicator is to monitor, data from Task 1a and Task 1b were analysed. Specifically, the frequency of use of each indicator in the current programming period, as examined in Task 1a, and information on the utilization of the same indicator in other circumstances, such as in the previous programming period or similar past initiatives, as outlined in Task 1b, were considered. These two pieces of evidence were then combined to generate a score for the easiness criterion. If an indicator satisfies at least one of the two factors, it was classified as easy.

Regarding practicability score, the indicator was scored as "High" if it was considered both credible and easy, "Medium" if it was considered either credible or easy, and "Low" if it was considered neither credible nor easy.

Table 32 Feasibility assessment matrix.

Feasibility Analysis			
Granularity	**Timeliness**	**Practicability**	
Type of intervention in ERDF/CF/JTF	*Timeliness in ERDF/CF/JTF*	Credible	Easy

Source: Consortium own elaboration

It should be noted that in the assessment grid summarising all the **admissibility score** each record corresponds to a combination of the indicator and specific objective. On the other hand, for what concern the **feasibility scores**, each record corresponds to a combination of the indicator, specific objective, and intervention action. This means that if, for example, an indicator such as RCO02 which is used under eight different intervention actions across three specific objectives (1.1, 1.2, and 1.3), it will appear eight times in the grid. This repetition occurs because the granularity score, which reflects the frequency of use under a specific type of operation, and the timeliness score are both linked to the specific use of the indicator under each investment action.

3.1.3 Design of intervention action matrices as basis for the development of performance-based delivery model with FNLC

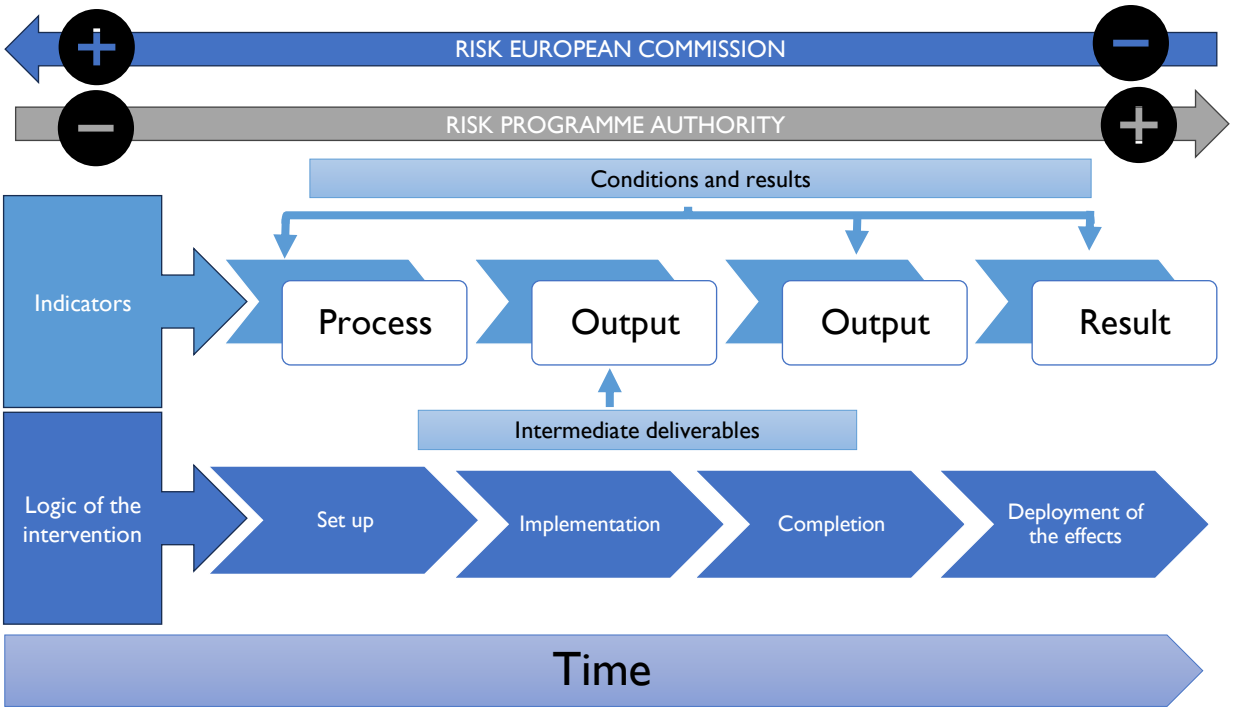
The setting up of the **intervention action matrices** (IAM) builds on the results of subtasks 2b1 and 2b2 and aims to provide a starting model to be further developed into potential FNLC schemes for each SO and each relevant intervention action. IAM are presented in section 3.4 and illustrate the possible combinations of indicators (i.e., process indicators, common output indicators, and common result indicators) that capture the intervention logic of each type of operation. The integration of indicators within each IAM is informed by the findings from the previous tasks, ensuring alignment with the identified intervention logic and strategic objectives.

The overall logic of the IAM is based on the following criteria:

a) **Balanced risk allocation**: There must be a balance between the risks borne by the principal (Commission) and the agent (Member States). To achieve this, conditions and results should be distributed throughout the entire intervention cycle, from inception to the display of results. This proportional allocation of risk ensures fairness and accountability across all levels of implementation.
b) **Comprehensive lifecycle coverage:** Conditions and results spanning the entire operation lifecycle support a regular financial flow and act as an effective monitoring system, providing early warnings in case of difficulties. Concentrating conditions and results predominantly at the end of the cycle would hinder timely financial disbursements and fail to prevent potential major failures in the intervention.
c) **Distinct conditions and results:** Conditions and results should represent different stages of the operation to avoid overlap. This separation ensures proportional risk allocation and supports both financial stability and timely monitoring, as described in points (a) and (b).
d) **Focus on results:** Indicators must relate to results, addressing the main concerns of the ECA and justifying the adoption of the FNLC system. If results are not adequately addressed, alternative delivery mechanisms (e.g., real costs or SCOs) may be more efficient.
e) **Avoiding excessive information burden:** To reduce administrative complexity, the design incorporates three indicators for four stages of the intervention: the intermediate deliverable and the third result/condition share the same output indicator. At any stage requiring payment, only one condition/result and its corresponding indicator are used, minimizing information requests and reducing ambiguity or uncertainty.

The IAMs were cross-checked with the outcomes of Work Package 2 from the ex-post evaluation. The analysis revealed significant overlap between the IAMs and the clusters of operations commonly used in the previous programming period. This alignment confirms the relevance and applicability of the IAMs, ensuring they are grounded in historical implementation patterns and effectively address continuity and consistency in programme design and delivery.

Figure 25. Overall logic underpinning the intervention action matrices



There are three types of IAMs:

- **Fully Admitted Indicators**: These matrices use indicators that have been thoroughly evaluated and validated through the analyses conducted in sub-tasks 2a1 and 2a2. These indicators are considered both "available" and "reliable," making them a solid foundation for developing FNLC schemes.
- **Partially Admitted Indicators**: These matrices include indicators not fully admitted in the previous assessments. Although the selected indicator shows some weaknesses, the matrix still offers valuable insights for FNLC schemes.
- **Exploratory Indicators**: These matrices use indicators outside the scope of those analyzed in the study. Although unvalidated, they provide useful information and potential inspiration for innovative FNLC approaches.

Each IAM includes:

- **a process indicator**, as its achievement is linked to an administrative, procedural, or institutional accomplishment. Since the 2021–2027 period does not explicitly define process indicators, we draw on the experience of the RRF and the 2014–2020 ESIF programming period. A process indicator is a specific type of metric that measures the extent, quality, or efficiency of activities performed during the programme. It focuses on the actions taken or processes implemented to deliver the intervention action, rather than the final outputs or results. Process indicators are instrumental in tracking progress during the implementation phase, offering insights into the effectiveness and efficiency of

the project or programme's execution. For the purpose of the first result/ condition, the indicators should signal that the administrative process of delivery has commenced, which might be related to the selection process or the completion of a specific procedural stage (e.g., approval of preliminary planning, publication of public procurement calls). They are not part of the common indicator set, but to provide a robust framework for FNLC, they are important and practical: They are widely used in cohesion policy and thus well-known. They are systematically utilized in the NRRP as initial milestones;

- **an output indicator** (as a proxy of intermediate delivery), as they are tied to the delivery of the operation and its outputs
- A **result indicator**, acting as a proxy for the operation's goal. This ensures alignment with the intervention's intended outcomes.

It should be noted that when selecting the process indicator for the first condition, it was observed that this can vary even for the same intervention action and for very similar operations, depending on the implementation modality chosen by the programmes. This variation can occur through four distinct modalities, depending on the nature of the operation, which, in some cases, may also affect other indicators. These modalities are described in the box below.

Box 2: Categorization of Result/Condition for Initiating Operation Implementation

For Financial/Non-Financial Support:

1. **Demand-driven:** The operation directly supports beneficiaries through grants, for example, to enhance competitiveness or innovation.
    - **Condition/Result:** Launch of the selection procedure (e.g., public announcement of the call for proposals).
2. **Supply-driven:** An entity (e.g., incubator, business cluster, or service center) is funded to deliver non-financial support.
    - **Condition/Result:** Selection of the non-financial support provider, finalized through a contract or agreement.

For Infrastructure Delivery/Assistance:

3. **Direct management:** The Programme Authority directly implements the action (e.g., a region conducts the procurement process for construction).
    - **Condition/Result:** Finalization of the procurement process (e.g., awarding of the contract).
4. **Delegated management (indirect management):** The Programme Authority entrusts implementation to a third party (e.g., a municipality or province through a funding agreement).
    - **Condition/Result:** Identification of the third implementing entity (e.g., signing of the service contract or funding agreement).

Rationale:

These modalities are inspired by the concepts of *juridical and economic commitment* previously operational in Structural Funds. They ensure that the "principal" (e.g., the Programme Authority) has taken definitive steps to initiate the implementation process.

To enhance accountability, this condition/result can also be tied to a percentage of the total budget planned for the operation. For example, the procedural act (e.g., call for proposals or tender finalization)

must correspond to a significant portion of the resources allocated to the operation, ensuring a meaningful commitment.

The first indicator linked to these modalities is recurring among the different intervention actions, namely:

- When is demand-driven: publication of the call for proposals to deliver the grant or service scheme;
- When is supply-driven: signature of contracts or agreements with the entity providing the services.
- When is direct management: awarding of the contract
- When is indirect management: signature of the service contract or funding agreement

For clarity purpose, the IAMs presented in section 3.4 of the report include only the indicators for intervention actions implemented as "**demand-driven**" and "**direct management**." On the other hand, Annex 3 provides further information on each of the indicator matrices, exploring all possible options.

Furthermore, in some cases, **multiple IAMs** are provided for the same intervention action because different combinations of indicators can be considered. The best solutions for each intervention action, including indicators that achieved the highest scores in the admissibility assessment and were found to be the most suitable in the feasibility tests carried out under Tasks 2b1 and 2b2, are presented as the **first-choice option**. However, a series of **second-choice options** are also included, featuring alternative indicators.

These **alternative indicators** were found to be less suitable for use in a performance-based system. However, they remain relevant due to:

- Certain dynamics of the scoring system developed by the study team, which may prevent some considerations from being fully accounted for when assessing an indicator. These will be explained in the following sections.
- The necessity of covering specific types of alternative outputs or indicators, depending on the policy objectives of different programmes.

Finally, each IAM has been further developed by incorporating additional information, including a description of potential intervention actions covered and the relevant conditions to be measured through the identified indicators. These elements were sourced from existing EU-adopted regulations. This enhanced detail supports the further development of the matrices into FNLC schemes. Additionally, this step has been crucial in analysing and testing the implications of using common output indicators within a performance-based delivery model, ensuring greater relevance and applicability in practical contexts.
Therefore for each IAM have been identified:

1. **Type of operation and description**: Details the purpose, target, and most relevant activities. To better frame the type of operation, in this section also will be reported the most relevant intervention codes.
2. **Related Specific Objective**: Links the operation to the relevant specific objective.
3. **Conditions or results**: Specifies the conditions or results to be fulfilled, based on the logic explained earlier and the identified indicators.
4. **Intermediate deliverables** (if applicable) triggering reimbursement by the Commission.

These enriched IAM are provided in Annex 3.

3.1.4 Analysis per stakeholder

This analysis aims to evaluate the role of various stakeholders in the implementation, monitoring, and evaluation of FNLC based on common indicators by assessing their level of risk and workload. In other words, by classifying stakeholders based on their degree of effort and accountability, this exercise helps to identify who bears the highest burden and responsibility while adopting the FNLC system in relation to specific set of common indicators.

3.1.4.1 Introduction: Purpose and Scope of the Exercise

The assessment is conducted across **four key types of indicators**:

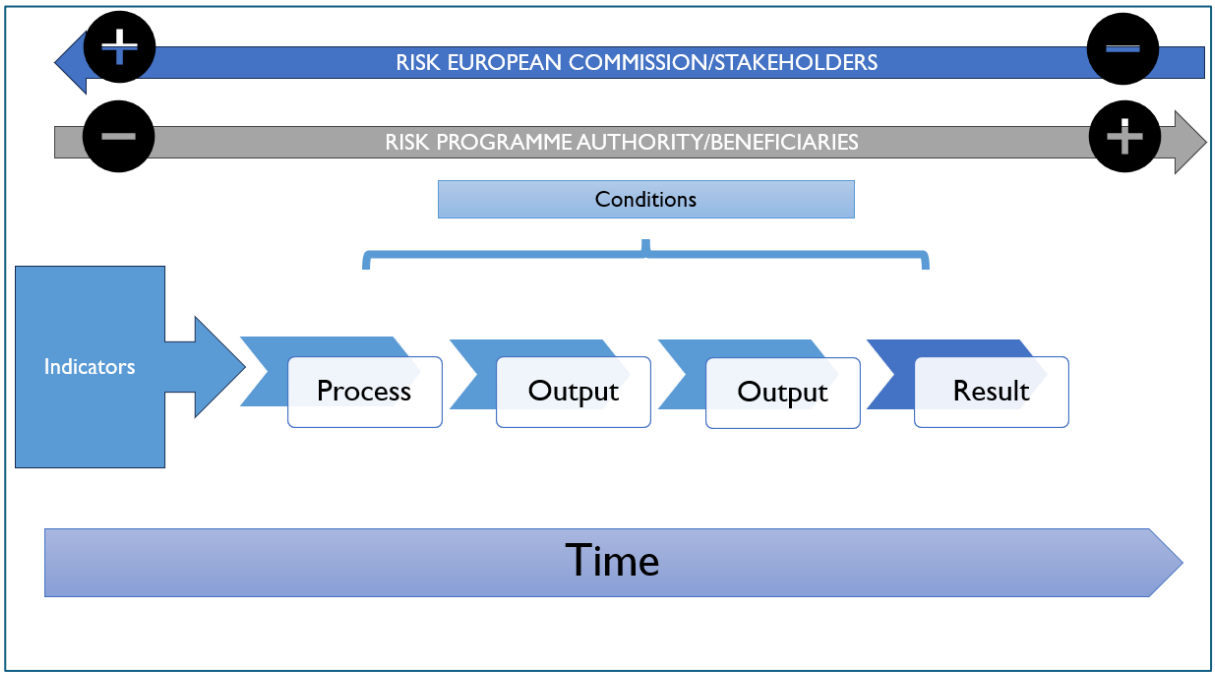
1. **Process Indicators** – Measure procedural steps.
2. **Physical Output Indicators** – Assess tangible deliverables (e.g., kilometers of roads built, number of energy-efficient buildings renovated).
3. **Short-Term Results Indicators** – Capture the immediate effects of implemented programs (e.g., reduction in unemployment, energy savings).
4. **Long-Term Results Indicators** – Evaluate the sustained impact of projects over time (e.g., long-term economic growth, reduction in carbon emissions).

This structured approach provides a qualitative evaluation of stakeholders' responsibilities and their exposure to financial, administrative, and reputational risks. Based on a literature review and experiences from international contexts, the assessment logic suggests that the more the agents (in this case, the European Commission, European Parliament, and, to some extent, national decision-makers) base resource transfers on results—especially long-term results—the more they minimize their risk by aligning their goals with those of the principal (managing authority).

Conversely, the principal actors (beneficiaries and programme authorities) maximize their utility in terms of risk reduction and workload efficiency when payments are linked to process indicators. Process indicators are more directly within their control and are easier to collect and manage compared to result indicators.

The graphic below illustrates this assessment logic, showing how risk and workload are distributed across different types of indicators (Process, Output, Short-term Results, and Long-term Results) for various stakeholders involved in programme implementation and monitoring. It visually represents the balance of responsibilities and highlights potential challenges that may arise throughout the funding

Figure 26: logic of stakeholder assessment



Source: Consortium

3.1.4.2 Methodology Employed

To systematically evaluate **stakeholder involvement**, we use a **dual-dimensional framework**:

- **Risk:** The extent to which a stakeholder faces consequences (financial, regulatory, reputational) if an indicator is not met.
- **Workload):** The level of effort, (administrative costs and burdens) required to meet the indicator requirements.

The **classification system** follows a **traffic light scheme**, ensuring clear differentiation between levels of responsibility and engagement:

Figure 27: work load/ risk assessment scale

Colour Code	Interpretation
Red	**High Risk/High Workload** – Directly responsible for program success and execution.
Yellow	**Moderate Risk/Workload** – Bears moderate workload and risk.
Green	**Low Risk/Workload** – Limited involvement, minimal burden, limited risk.
NA	**Not Applicable** – No direct engagement in implementation

Source: consortium

3. Stakeholder Identification and Categorization

To ensure clarity, stakeholders are divided into **two macro categories** based on their role in the program lifecycle:

A. Stakeholders Directly Involved in Implementation
These stakeholders are responsible for **managing funds, ensuring compliance, and delivering program outputs**. They bear the highest **risk and workload** since they handle day-to-day operations.

- **Managing Authorities** – Governmental bodies overseeing funding allocation and project execution.
- **Beneficiaries** – Public sector organizations, private companies, and municipalities receiving and implementing EU funds.
- **European Commission (EC)** – Monitors program compliance, sets performance targets, and ensures alignment with EU-wide strategies.
- **Auditing/Control Authorities** – Oversight bodies such as the **European Court of Auditors (ECA)**, national audit offices, and internal program evaluators ensuring regulatory compliance.

B. Stakeholders Indirectly Affected by Results
The following **do not take part in the implementation process** but influence policies, public opinion, and long-term impact assessments. Their **concern lies in the results rather than their execution**.

- **Policymakers (National/Regional Governments)** – Shape funding priorities but are not involved in project implementation.
- **Social Stakeholders (Civil Society, Trade Unions, Advocacy Groups)** – Monitor social impacts, such as employment and equality.
- **Environmental Stakeholders (NGOs, Climate Advocacy Groups)** – Assess whether funded projects align with sustainability goals.
- **Research & Innovation Sector (Universities, Think Tanks, R&D Institutions)** – Evaluate knowledge creation and technological advancements linked to EU funding.
- **Economic Stakeholders (Business Associations, Trade Organizations, Private Sector)** – Rely on project outputs for economic benefits but do not manage implementation.
- **European Parliament (EP)** – Ensures political accountability, evaluates program effectiveness, and influences future funding decisions.

3.2 ANALYSIS OF OUTPUT INDICATORS (SUB-TASK 2B.1)

The following section presents the results of the admissibility and feasibility assessments conducted on output indicators. It will first present the findings from the admissibility assessment of output indicators selected in Task 1b, including an overview of the output indicators that were deemed not admissible. This will be followed by a focus on the feasibility assessment.

3.2.1 Admissibility

The following section outline the results of the admissibility assessment. The table below provide an overview of the output indicators that were analysed and the respective scores for each of the criteria.

Table 33 Admissibility assessment for output indicators

Code	Indicator short name	PO	SO	Admissibility						ADMITTED (Y/N)
				Availability		Reliability			Potentiality	
				Frequency (Task 1a)	*Relevance (Task 1a)*	*Coherence (Task 1b)*	*Consistency (Task 1a)*	*Homogeneity (1b)*	*Potential for payments not linked to costs (Task 2a2)*	
RCO02	RCO02 – Firms: Grant aided	1	1.1	2	2	2	2	1	2	yes
RCO06	RCO06 – RTDI: Researchers with improved infrastructure	1	1.1	2	2	2	1	1	0	no
RCO02	RCO02 – Firms: Grant aided	1	1.2	2	2	2	2	2	2	yes
RCO14	RCO14 – Digital: Public institutions supported for Digital	1	1.2	2	2	2	1	1	2	yes
RCO02	RCO02 – Firms: Grant aided	1	1.3	2	2	2	2	1	2	yes
RCO05	RCO05 – Firms: New Enterprises	1	1.3	2	2	2	1	2	2	yes
RCO15	RCO15 – Firms: Capacity of incubation created	1	1.3	1	2	2	0	1	2	no
RCO41	RCO41 – Digital: Add. dwellings with broadband of v high capacity	1	1.5	1	1	2	2	2	2	yes
RCO18	RCO18 – Energy: Dwellings with improved energy peformance	2	2.1	2	2	2	2	2	2	yes
RCO19	RCO19 – Energy: Public buildings with improved energy performance	2	2.1	2	2	2	2	2	2	yes
RCO22	RCO22 – Energy: Renewable energy capacity	2	2.2	2	2	2	1	1	2	yes
RCO25	RCO25 – Climate: Flood protection newly built or consolidated	2	2.4	1	1	2	1	1	2	no
RCO30	RCO30 – Water: Length of pipes for public water supply	2	2.5	2	1	2	1	2	2	yes
RCO34	RCO34 – Circular: Additional capacity for waste recycling	2	2.6	2	1	2	2	2	2	yes
RCO36	RCO36 – Env: Green infrastructure (not related to climate change)	2	2.7	2	1	2	0	2	2	yes
RCO37	RCO37 – Env: Surface of Natura 2000 sites	2	2.7	1	1	2	0	1	2	no
RCO57	RCO57 – Urban Trans: rolling stock for public transport	2	2.8	2	2	2	1	1	2	yes
RCO58	RCO58 – Urban Trans: Dedicated cycling infrastructure supported	2	2.8	2	2	2	1	1	2	yes
RCO47	RCO47 – Rail: Length of new or upgraded rail - TEN-T	3	3.1	0	1	2	1	1	2	no
RCO49	RCO49 – Rail: Length of rail reconstructed or modernised - TEN-T	3	3.1	1	2	2	2	1	2	yes
RCO66	RCO66 – Education: Classroom capacity of childcare facilities	4	4.2	1	1	2	2	2	2	yes
RCO67	RCO67 – Education: Classroom capacity of education facilities	4	4.2	2	2	2	2	2	2	yes
RCO69	RCO69 – Health: Capacity of health care facilities	4	4.5	2	2	2	1	1	2	yes
RCO74	RCO74 – The population covered by projects in the framework of strategies for integrated territorial development	5	5.1	2	2	2	1	2	0	yes
RCO74	RCO74 – Population covered in integrated territorial development	5	5.2	2	2	2	1	2	0	yes

Source: Consortium own elaboration

The indicators were considered admissible when the average score was greater than or equal to 75% of the maximum possible score. The admissibility assessment revealed that all indicators are considered admissible, except for

- RCO06 – RTDI: Researchers working in supported research facilities (SO 1.1) which was deemed not admissible due to its low score on potential for payments not linked to costs.
- RCO15 – Firms: Capacity of incubation created (SO 1.3): this was excluded due to its low score under consistency.
- RCO25 - Climate: flood protection newly built or consolidated (SO 2.4): RCO25 was rated as "medium" under various criteria, including frequency, relevance, consistency, and homogeneity.

- RCO37 - Environment: Surface of Natura 2000 sites (SO 2.7): This indicator received a low score under consistency.
- RCO47 - Rail: Length of new or upgraded rail - TEN-T (SO 3.1): RCO47 received a low score under frequency. It describes the output of interventions involving the construction of large, cost-intensive infrastructure, which is difficult to fund with Cohesion policy. For this reason number of operations funded monitored using this indicator is very low.

3.2.2 Feasibility

The following section outline the results of the feasibility assessment. The tables below provide an overview of the output indicators that were analysed and the respective scores/ judgement for each of the criteria.
In the **granularity analysis** (table below), we evaluate how frequently the indicator is used for a particular type of operation. The score (0–2) reflects the extent to which a specific indicator is used for a particular type of operation within a specific objective. As expected, the table demonstrates that the same indicator's usage varies significantly depending on the type of operation.
For instance, the indicator RCO02, "Supported enterprises," is widely used across several types of operations, but its frequency differs. This variation highlights how the strategic purpose of a type of operation can shift under different specific objectives (SOs). A clear example is the operation type "digital connectivity," which employs different indicators under SO 1.5 and SO 1.2, reflecting their distinct strategic goals.

It should be noted that for SO 5.1 and 5.2, it was not possible to identify specific types of actions implemented; therefore, it was not possible to calculate the granularity score.

Table 34 Granularity assessment for output indicators

Code	Indicator short name	PO	SO	Faesibility Analysis	
				Granularity	
				Type of intervention in ERDF/CF/JTF	*Score*
RCO02	RCO02 – Firms: Grant aided	1	1.1	Skills, advanced support and incubation	0
RCO02	RCO02 – Firms: Grant aided	1	1.1	R&I in enterprises	1
RCO02	RCO02 – Firms: Grant aided	1	1.1	R&I cooperation and technological transfer	2
RCO06	RCO06 – RTDI: Researchers with improved infrastructure	1	1.1	R&I cooperation and technological transfer	1
RCO06	RCO06 – RTDI: Researchers with improved infrastructure	1	1.1	R&I research centres	2
RCO02	RCO02 – Firms: Grant aided	1	1.2	Digitising firms	2
RCO14	RCO14 – Digital: Public institutions supported for Digital	1	1.2	Digitising firms	0
RCO14	RCO14 – Digital: Public institutions supported for Digital	1	1.2	E-government	2
RCO14	RCO14 – Digital: Public institutions supported for Digital	1	1.2	E-inclusion	1
RCO14	RCO14 – Digital: Public institutions supported for Digital	1	1.2	E-health	0
RCO14	RCO14 – Digital: Public institutions supported for Digital	1	1.2	Digital connectivity	0
RCO02	RCO02 – Firms: Grant aided	1	1.3	Business development and support	2
RCO02	RCO02 – Firms: Grant aided	1	1.3	Circular economy	0
RCO02	RCO02 – Firms: Grant aided	1	1.3	Innovation and cooperation	1
RCO02	RCO02 – Firms: Grant aided	1	1.3	Entrepreneurship and SME survival	0
RCO05	RCO05 – Firms: New Enterprises	1	1.3	Business development and support	0
RCO05	RCO05 – Firms: New Enterprises	1	1.3	Enterprise incubation	0
RCO05	RCO05 – Firms: New Enterprises	1	1.3	Innovation and cooperation	0
RCO05	RCO05 – Firms: New Enterprises	1	1.3	Entrepreneurship and SME survival	2
RCO15	RCO15 – Firms: Capacity of incubation created	1	1.3	Enterprise incubation	2
RCO41	RCO41 – Digital: Add. dwellings with broadband of v high capacity	1	1.5	Digital connectivity	2
RCO18	RCO18 – Energy: Dwellings with improved energy peformance	2	2.1	Energy efficiency in housing	2
RCO19	RCO19 – Energy: Public buildings with improved energy performance	2	2.1	Energy efficiency in public infrastructure	2
RCO22	RCO22 – Energy: Renewable energy capacity	2	2.2	RE biomass	0
RCO22	RCO22 – Energy: Renewable energy capacity	2	2.2	RE solar	1
RCO22	RCO22 – Energy: Renewable energy capacity	2	2.2	RE wind	0
RCO22	RCO22 – Energy: Renewable energy capacity	2	2.2	Several ren energy	1
RCO22	RCO22 – Energy: Renewable energy capacity	2	2.2	Other renewable energy (including geothermal energy)	1
RCO25	RCO25 – Climate: Flood protection newly built or consolidated	2	2.4	Climate change prevention and management (060)	0
RCO25	RCO25 – Climate: Flood protection newly built or consolidated	2	2.4	Flood and landslide (058)	2
RCO30	RCO30 – Water: Length of pipes for public water supply	2	2.5	Water for human consumption	2
RCO34	RCO34 – Circular: Additional capacity for waste recycling	2	2.6	Waste Management	2
RCO36	RCO36 – Env: Green infrastructure (not related to climate change)	2	2.7	Nature and biodiversity protection	2
RCO37	RCO37 – Env: Surface of Natura 2000 sites	2	2.7	Natura 2000	1
RCO37	RCO37 – Env: Surface of Natura 2000 sites	2	2.7	Nature and biodiversity protection	2
RCO57	RCO57 – Urban Trans: rolling stock for public transport	2	2.8	Clean urban transport	2
RCO58	RCO58 – Urban Trans: Dedicated cycling infrastructure supported	2	2.8	Clean urban transport	0
RCO58	RCO58 – Urban Trans: Dedicated cycling infrastructure supported	2	2.8	Cycling infrastructure	2
RCO47	RCO47 – Rail: Length of new or upgraded rail - TEN-T	3	3.1	Railway	2
RCO49	RCO49 – Rail: Length of rail reconstructed or modernised - TEN-T	3	3.1	Railway	2
RCO66	RCO66 – Education: Classroom capacity of childcare facilities	4	4.2	Infrastructure for early childhood education	2
RCO67	RCO67 – Education: Classroom capacity of education facilities	4	4.2	Infrastructure for primary and secondary education	2
RCO67	RCO67 – Education: Classroom capacity of education facilities	4	4.2	Infrastructure for tertiary education	0
RCO67	RCO67 – Education: Classroom capacity of education facilities	4	4.2	Infrastructure for vocational education	0
RCO69	RCO69 – Health: Capacity of health care facilities	4	4.5	Health Infrustructure and Assets	2
RCO74	RCO74 – The population covered by projects in the framework of strategies for integrated territorial development	5	5.1	No specific action types were identified for this RSO	N/A
RCO74	RCO74 – Population covered in integrated territorial development	5	5.2	No specific action types were identified for this RSO	N/A

Source: Consortium own elaboration

For indicators deemed relevant for the selected measures, was conducted a **timeliness assessment**. (see Table 36). It is also noteworthy that timeliness varies for the same indicator depending on the SO and type of operation, with different judgments assigned to its deployment (e.g., slow, medium, fast). This variation is expected and reflects the differing contexts and dynamics of each SO and operation type. It should be noted

that timeliness, which was assessed under Task 1b, was not evaluated for all common output indicators in relation to all intervention actions. In some cases, where the indicator was used very few times in relation to the intervention action, the assessment did not produce usable or informative results.

Table 35 Timeliness assessment for output indicators

Code	Indicator short name	PO	SO	Faesibility Analysis	
				Timeliness (1b)	
				Type of intervention in ERDF/CF/JTF	*Timeliness in ERDF/CF/JTF*
RCO02	RCO02 – Firms: Grant aided	1	1.1	Skills, advanced support and incubation	MEDIUM
RCO02	RCO02 – Firms: Grant aided	1	1.1	R&I in enterprises	FAST
RCO02	RCO02 – Firms: Grant aided	1	1.1	R&I cooperation and technological transfer	FAST
RCO06	RCO06 – RTDI: Researchers with improved infrastructure	1	1.1	R&I cooperation and technological transfer	FAST
RCO06	RCO06 – RTDI: Researchers with improved infrastructure	1	1.1	R&I research centres	N/A
RCO02	RCO02 – Firms: Grant aided	1	1.2	Digitising firms	FAST
RCO14	RCO14 – Digital: Public institutions supported for Digital	1	1.2	Digitising firms	N/A
RCO14	RCO14 – Digital: Public institutions supported for Digital	1	1.2	E-government	FAST
RCO14	RCO14 – Digital: Public institutions supported for Digital	1	1.2	E-inclusion	SLOW
RCO14	RCO14 – Digital: Public institutions supported for Digital	1	1.2	E-health	SLOW
RCO14	RCO14 – Digital: Public institutions supported for Digital	1	1.2	Digital connectivity	N/A
RCO02	RCO02 – Firms: Grant aided	1	1.3	Business development and support	FAST
RCO02	RCO02 – Firms: Grant aided	1	1.3	Circular economy	SLOW
RCO02	RCO02 – Firms: Grant aided	1	1.3	Innovation and cooperation	FAST
RCO02	RCO02 – Firms: Grant aided	1	1.3	Entrepreneurship and SME survival	FAST
RCO05	RCO05 – Firms: New Enterprises	1	1.3	Business development and support	N/A
RCO05	RCO05 – Firms: New Enterprises	1	1.3	Enterprise incubation	N/A
RCO05	RCO05 – Firms: New Enterprises	1	1.3	Innovation and cooperation	N/A
RCO05	RCO05 – Firms: New Enterprises	1	1.3	Entrepreneurship and SME survival	FAST
RCO15	RCO15 – Firms: Capacity of incubation created	1	1.3	Enterprise incubation	SLOW
RCO41	RCO41 – Digital: Add. dwellings with broadband of v high capacity	1	1.5	Digital connectivity	MEDIUM
RCO18	RCO18 – Energy: Dwellings with improved energy peformance	2	2.1	Energy efficiency in housing	MEDIUM
RCO19	RCO19 – Energy: Public buildings with improved energy performance	2	2.1	Energy efficiency in public infrastructure	MEDIUM
RCO22	RCO22 – Energy: Renewable energy capacity	2	2.2	RE biomass	MEDIUM
RCO22	RCO22 – Energy: Renewable energy capacity	2	2.2	RE solar	MEDIUM
RCO22	RCO22 – Energy: Renewable energy capacity	2	2.2	RE wind	MEDIUM
RCO22	RCO22 – Energy: Renewable energy capacity	2	2.2	Several ren energy	MEDIUM
RCO22	RCO22 – Energy: Renewable energy capacity	2	2.2	Other renewable energy (including geothermal energy)	MEDIUM
RCO25	RCO25 – Climate: Flood protection newly built or consolidated	2	2.4	Climate change prevention and management (060)	N/A
RCO25	RCO25 – Climate: Flood protection newly built or consolidated	2	2.4	Flood and landslide (058)	MEDIUM
RCO30	RCO30 – Water: Length of pipes for public water supply	2	2.5	Water for human consumption	FAST
RCO34	RCO34 – Circular: Additional capacity for waste recycling	2	2.6	Waste Management	SLOW
RCO36	RCO36 – Env: Green infrastructure (not related to climate change)	2	2.7	Nature and biodiversity protection	MEDIUM
RCO37	RCO37 – Env: Surface of Natura 2000 sites	2	2.7	Natura 2000	SLOW
RCO37	RCO37 – Env: Surface of Natura 2000 sites	2	2.7	Nature and biodiversity protection	N/A
RCO57	RCO57 – Urban Trans: rolling stock for public transport	2	2.8	Clean urban transport	FAST
RCO58	RCO58 – Urban Trans: Dedicated cycling infrastructure supported	2	2.8	Clean urban transport	N/A
RCO58	RCO58 – Urban Trans: Dedicated cycling infrastructure supported	2	2.8	Cycling infrastructure	FAST
RCO47	RCO47 – Rail: Length of new or upgraded rail - TEN-T	3	3.1	Railway	SLOW
RCO49	RCO49 – Rail: Length of rail reconstructed or modernised - TEN-T	3	3.1	Railway	SLOW
RCO66	RCO66 – Education: Classroom capacity of childcare facilities	4	4.2	Infrastructure for early childhood education	SLOW
RCO67	RCO67 – Education: Classroom capacity of education facilities	4	4.2	Infrastructure for primary and secondary education	SLOW
RCO67	RCO67 – Education: Classroom capacity of education facilities	4	4.2	Infrastructure for tertiary education	SLOW
RCO67	RCO67 – Education: Classroom capacity of education facilities	4	4.2	Infrastructure for vocational education	SLOW
RCO69	RCO69 – Health: Capacity of health care facilities	4	4.5	Health Infrustructure and Assets	MEDIUM
RCO74	RCO74 – The population covered by projects in the framework of strategies for integrated territorial development	5	5.1	No specific action types were identified for this RSO	FAST
RCO74	RCO74 – Population covered in integrated territorial development	5	5.2	No specific action types were identified for this RSO	FAST

Source: Consortium own elaboration

Based on how the indicator performs concerning a specific intervention action or type of operation, it is possible to predict when it can trigger a payment and, in some cases, determine its appropriate position within the FNLC matrix. For instance, if an indicator is classified as "fast," it can reasonably be expected to enable quicker payments. Conversely, if it is classified as "slow," caution is required, as linking the achievement of the objective to payment may result in delays. For example, RCO02, "Enterprises supported with grants," is expected to be "fast" in the case of the "R&I in enterprises" type of operation, as it is likely to occur shortly after the grant selection process. Conversely, when used in the "Skills, advanced support, and incubation" type

of operation, a delay is more probable, as there may be a period during which the enterprise is in the incubation phase before it can be considered as "supported."

The **practicability** assessment provides insights into the types of interventions for which an indicator is most appropriate, based on the experiences of the analysed programmes. As explained above, practicality provides insights into how "clear" an indicator is—meaning it is unlikely to be misinterpreted or subject to varying interpretations—and how frequently it has been used in the past. This ensures that future users can easily gather information and data based on its previous application in programmes. The analysis below shows that all indicators are assessed as either highly practical or moderately practical.

Table 36 Practicability assessment for output indicators

Code	Indicator short name	PO	SO	Faesibility Analysis			
				Practicability			
				Type of intervention in ERDF/CF/JTF	*Credible*	*Easy*	*Synthetic judgment*
RCO02	RCO02 – Firms: Grant aided	1	1.1	Skills, advanced support and incubation	yes	yes	HIGH
RCO02	RCO02 – Firms: Grant aided	1	1.1	R&I in enterprises	yes	yes	HIGH
RCO02	RCO02 – Firms: Grant aided	1	1.1	R&I cooperation and technological transfer	yes	yes	HIGH
RCO06	RCO06 – RTDI: Researchers with improved infrastructure	1	1.1	R&I cooperation and technological transfer	yes	yes	HIGH
RCO06	RCO06 – RTDI: Researchers with improved infrastructure	1	1.1	R&I research centres	yes	yes	HIGH
RCO02	RCO02 – Firms: Grant aided	1	1.2	Digitising firms	yes	yes	HIGH
RCO14	RCO14 – Digital: Public institutions supported for Digital	1	1.2	Digitising firms	no	yes	MEDIUM
RCO14	RCO14 – Digital: Public institutions supported for Digital	1	1.2	E-government	no	yes	MEDIUM
RCO14	RCO14 – Digital: Public institutions supported for Digital	1	1.2	E-inclusion	no	yes	MEDIUM
RCO14	RCO14 – Digital: Public institutions supported for Digital	1	1.2	E-health	no	yes	MEDIUM
RCO14	RCO14 – Digital: Public institutions supported for Digital	1	1.2	Digital connectivity	no	yes	MEDIUM
RCO02	RCO02 – Firms: Grant aided	1	1.3	Business development and support	yes	yes	HIGH
RCO02	RCO02 – Firms: Grant aided	1	1.3	Circular economy	yes	yes	HIGH
RCO02	RCO02 – Firms: Grant aided	1	1.3	Innovation and cooperation	yes	yes	HIGH
RCO02	RCO02 – Firms: Grant aided	1	1.3	Entrepreneurship and SME survival	yes	yes	HIGH
RCO05	RCO05 – Firms: New Enterprises	1	1.3	Business development and support	no	yes	MEDIUM
RCO05	RCO05 – Firms: New Enterprises	1	1.3	Enterprise incubation	no	yes	MEDIUM
RCO05	RCO05 – Firms: New Enterprises	1	1.3	Innovation and cooperation	no	yes	MEDIUM
RCO05	RCO05 – Firms: New Enterprises	1	1.3	Entrepreneurship and SME survival	no	yes	MEDIUM
RCO15	RCO15 – Firms: Capacity of incubation created	1	1.3	Enterprise incubation	yes	no	MEDIUM
RCO41	RCO41 – Digital: Add. dwellings with broadband of v high capacity	1	1.5	Digital connectivity	yes	yes	HIGH
RCO18	RCO18 – Energy: Dwellings with improved energy peformance	2	2.1	Energy efficiency in housing	yes	yes	HIGH
RCO19	RCO19 – Energy: Public buildings with improved energy performance	2	2.1	Energy efficiency in public infrastructure	yes	yes	HIGH
RCO22	RCO22 – Energy: Renewable energy capacity	2	2.2	RE biomass	yes	yes	HIGH
RCO22	RCO22 – Energy: Renewable energy capacity	2	2.2	RE solar	yes	yes	HIGH
RCO22	RCO22 – Energy: Renewable energy capacity	2	2.2	RE wind	yes	yes	HIGH
RCO22	RCO22 – Energy: Renewable energy capacity	2	2.2	Several ren energy	yes	yes	HIGH
RCO22	RCO22 – Energy: Renewable energy capacity	2	2.2	Other renewable energy (including geothermal energy)	yes	yes	HIGH
RCO25	RCO25 – Climate: Flood protection newly built or consolidated	2	2.4	Climate change prevention and management (060)	yes	yes	HIGH
RCO25	RCO25 – Climate: Flood protection newly built or consolidated	2	2.4	Flood and landslide (058)	yes	yes	HIGH
RCO30	RCO30 – Water: Length of pipes for public water supply	2	2.5	Water for human consumption	no	yes	MEDIUM
RCO34	RCO34 – Circular: Additional capacity for waste recycling	2	2.6	Waste Management	yes	yes	HIGH
RCO36	RCO36 – Env: Green infrastructure (not related to climate change)	2	2.7	Nature and biodiversity protection	yes	yes	HIGH
RCO37	RCO37 – Env: Surface of Natura 2000 sites	2	2.7	Natura 2000	yes	yes	HIGH
RCO37	RCO37 – Env: Surface of Natura 2000 sites	2	2.7	Nature and biodiversity protection	yes	yes	HIGH
RCO57	RCO57 – Urban Trans: rolling stock for public transport	2	2.8	Clean urban transport	no	yes	MEDIUM
RCO58	RCO58 – Urban Trans: Dedicated cycling infrastructure supported	2	2.8	Clean urban transport	no	yes	MEDIUM
RCO58	RCO58 – Urban Trans: Dedicated cycling infrastructure supported	2	2.8	Cycling infrastructure	no	yes	MEDIUM
RCO47	RCO47 – Rail: Length of new or upgraded rail - TEN-T	3	3.1	Railway	yes	no	MEDIUM
RCO49	RCO49 – Rail: Length of rail reconstructed or modernised - TEN-T	3	3.1	Railway	yes	no	MEDIUM
RCO66	RCO66 – Education: Classroom capacity of childcare facilities	4	4.2	Infrastructure for early childhood education	no	yes	MEDIUM
RCO67	RCO67 – Education: Classroom capacity of education facilities	4	4.2	Infrastructure for primary and secondary education	no	yes	MEDIUM
RCO67	RCO67 – Education: Classroom capacity of education facilities	4	4.2	Infrastructure for tertiary education	no	yes	MEDIUM
RCO67	RCO67 – Education: Classroom capacity of education facilities	4	4.2	Infrastructure for vocational education	no	yes	MEDIUM
RCO69	RCO69 – Health: Capacity of health care facilities	4	4.5	Health Infrustructure and Assets	no	yes	MEDIUM
RCO74	RCO74 – The population covered by projects in the framework of strategies for integrated territorial development	5	5.1	No specific action types were identified for this RSO	no	yes	MEDIUM
RCO74	RCO74 – Population covered in integrated territorial development	5	5.2	No specific action types were identified for this RSO	no	yes	MEDIUM

Source: Consortium own elaboration

3.3 ANALYSIS OF RESULT INDICATORS (SUB-TASK 2B.2)

The following section mirrors the previous one and explores the results of the admissibility and feasibility assessments conducted of result indicators selected in Task 1b. It begins with the findings from the admissibility assessment, providing an overview of the result indicators that were excluded. This is followed by a detailed focus on the feasibility assessment.

3.3.1 Admissibility

The following section outline the results of the admissibility assessment. The table below provide an overview of the result indicators that were analysed and the respective scores for each of the criteria.

Table 37 Admissibility assessment for result indicators

Code	Indicator	PO	SO	Admissibility						ADMITTED (Y/N)
				Availability		Reliability			Potentiality	
				Frequency (Task 1a)	*Relevance (Task 1a)*	*Coherence (Task 1b)*	*Consistency (Task 1a)*	*Homogeneity (Task 1b)*	*Potential for payments not linked to costs (Task 2a2)*	
RCR03	RCR03 – RTDI: SMEs introducing product or process innovation	1	1.1	2	2	2	1	2	1	yes
RCR102	RCR102 – RTDI: New researchers	1	1.1	2	2	2	1	1	1	yes
RCR11	RCR11 – Digital: Users of new and upgraded public digital services	1	1.2	2	2	2	1	1	1	yes
RCR01	RCR01 – Jobs created in supported entities	1	1.3	2	2	2	1	1	1	yes
RCR17	RCR17 – Firms: New enterprises surviving in the market	1	1.3	1	1	2	0	2	0	no
RCR18	RCR18 – Firms: SMEs using incubator services	1	1.3	1	1	2	0	2	2	no
RCR53	RCR53 – Digital: Dwellings with broadband to vhc network	1	1.5	1	0	2	2	2	2	yes
RCR29	RCR29 – Climate: Estimated GHG emissions	2	2.1	2	2	2	1	2	2	yes
RCR26	RCR26 – Energy: Annual primary energy consumption	2	2.1	2	2	2	1	2	2	yes
RCR29	RCR29 – Climate: Estimated GHG emissions	2	2.2	2	2	2	1	2	2	yes
RCR31	RCR31 – Energy: Total renewable energy produced	2	2.2	2	1	2	1	2	2	yes
RCR32	RCR32 – Energy: Renewable energy capacity	2	2.2	2	1	2	2	2	2	yes
RCR35	RCR35 – Climate: Population benefiting from flood protection	2	2.4	2	2	2	0	2	1	yes
RCR41	RCR41 – Water: Population with improved water supply	2	2.5	1	1	2	1	2	1	no
RCR47	RCR47 – Circular: Waste recycled	2	2.6	1	1	2	2	1	1	no
RCR95	RCR95 – Env: Pop. with access to green infrastructure	2	2.7	2	2	2	1	2	1	yes
RCR29	RCR29 – Climate: Estimated GHG emissions	2	2.8	2	2	2	1	1	2	yes
RCR63	RCR63 – Urban Trans: Annual users of tram and metro lines	2	2.8	1	1	2	2	1	1	no
RCR64	RCR64 – Urban Trans: Annual users of cycling infrastructure	2	2.8	2	1	2	2	2	1	yes
RCR58	RCR58 – Road: Annual users railways	3	3.1	1	2	2	0	1	1	no
RCR70	RCR70 – Education: Annual users of childcare facilities	4	4.2	1	0	2	1	2	1	no
RCR71	RCR71 – Education: Annual users of education facilities	4	4.2	2	1	2	2	2	1	yes
RCR73	RCR73 – Health: Annual users of health care facilities	4	4.5	2	2	2	0	1	0	no
RCR77	RCR77 – Visitors of cultural and tourism sites	5	5.1	2	2	2	0	1	1	no
RCR77	RCR77 – Visitors of cultural and tourism sites	5	5.2	2	2	2	0	2	1	yes

Source: Consortium own elaboration

As for the output indicators, a result indicator was considered admissible when the average score was greater than or equal to 75% of the maximum possible score. The admissibility assessment revealed that the following indicators are the lest suitable of the indicator sample analysed under 1b to be used in payment-based-on-results system::

- RCR17 - Firms: New enterprises surviving in the market (SO 1.3)
- RCR18 - Firms: SMEs using incubator services (SO 1.3)
- RCR41 – Water: Population with improved water supply (SO 2.5)

- RCR47 - Circular: Waste recycled (SO 2.6)
- RCR63 - Urban Trans: Annual users of tram and metro lines (SO 2.8)
- RCR58 - Road: Annual users railways (SO 3.1)
- RCR70 - Education: Annual users of childcare facilities (SO 4.2)
- RCR73- Health: Annual users of health care facilities (SO 4.5)
- RCR77 – Visitors of cultural and tourism sites (SO 5.1)

3.3.2 Feasibility

In the analysis of **granularity**, we incorporated the results of the homogeneity assessment to evaluate how frequently the indicator is used for a particular action, which provided a score (see below). The table below reveals that common result indicators are more problematic in terms of granularity compared to output indicators, which is not surprising. In half of the cases, the indicators are closely linked to the type of operation, while for the remaining cases, this connection is less evident due to their specificity.

Table 38 Granularity assessment for result indicators

Code	Indicator	PO	SO	Fesibility Analysis	
				Granularity	
				Type of intervention in ERDF/CF/JTF	*Score*
RCR03	RCR03 – RTDI: SMEs introducing product or process innovation	1	1.1	Skills, advanced support and incubation	0
RCR03	RCR03 – RTDI: SMEs introducing product or process innovation	1	1.1	R&I in enterprises	0
RCR03	RCR03 – RTDI: SMEs introducing product or process innovation	1	1.1	R&I cooperation and technological transfer	2
RCR102	RCR102 – RTDI: New researchers	1	1.1	R&I in enterprises	1
RCR102	RCR102 – RTDI: New researchers	1	1.1	R&I cooperation and technological transfer	1
RCR102	RCR102 – RTDI: New researchers	1	1.1	R&I research centres	1
RCR11	RCR11 – Digital: Users of new and upgraded public digital services	1	1.2	E-government	2
RCR11	RCR11 – Digital: Users of new and upgraded public digital services	1	1.2	E-inclusion	0
RCR11	RCR11 – Digital: Users of new and upgraded public digital services	1	1.2	E-health	0
RCR11	RCR11 – Digital: Users of new and upgraded public digital services	1	1.2	Digital connectivity	0
RCR01	RCR01 – Jobs created in supported entities	1	1.3	Business development and support	2
RCR01	RCR01 – Jobs created in supported entities	1	1.3	Circular economy	0
RCR01	RCR01 – Jobs created in supported entities	1	1.3	Innovation and cooperation	0
RCR01	RCR01 – Jobs created in supported entities	1	1.3	Entrepreneurship and SME survival	0
RCR17	RCR17 – Firms: New enterprises surviving in the market	1	1.3	Enterprise incubation	0
RCR17	RCR17 – Firms: New enterprises surviving in the market	1	1.3	Innovation and cooperation	0
RCR17	RCR17 – Firms: New enterprises surviving in the market	1	1.3	Entrepreneurship and SME survival	2
RCR18	RCR18 – Firms: SMEs using incubator services	1	1.3	Enterprise incubation	2
RCR53	RCR53 – Digital: Dwellings with broadband to vhc network	1	1.5	Digital connectivity	2
RCR29	RCR29 – Climate: Estimated GHG emissions	2	2.1	Energy efficiency in enterprises	0
RCR29	RCR29 – Climate: Estimated GHG emissions	2	2.1	Energy efficiency in housing	1
RCR29	RCR29 – Climate: Estimated GHG emissions	2	2.1	Energy efficiency in public infrastructure	1
RCR29	RCR29 – Climate: Estimated GHG emissions	2	2.1	High efficiency / replacement heating systems	0
RCR26	RCR26 – Energy: Annual primary energy consumption	2	2.1	Energy efficiency in enterprises	0
RCR26	RCR26 – Energy: Annual primary energy consumption	2	2.1	Energy efficiency in housing	1
RCR26	RCR26 – Energy: Annual primary energy consumption	2	2.1	Energy efficiency in public infrastructure	1
RCR26	RCR26 – Energy: Annual primary energy consumption	2	2.1	High efficiency / replacement heating systems	0
RCR29	RCR29 – Climate: Estimated GHG emissions	2	2.2	RE biomass	0
RCR29	RCR29 – Climate: Estimated GHG emissions	2	2.2	RE solar	0
RCR29	RCR29 – Climate: Estimated GHG emissions	2	2.2	RE wind	0
RCR29	RCR29 – Climate: Estimated GHG emissions	2	2.2	Several ren energy	1
RCR29	RCR29 – Climate: Estimated GHG emissions	2	2.2	Other renewable energy (including geothermal energy)	1
RCR31	RCR31 – Energy: Total renewable energy produced	2	2.2	RE solar	0
RCR31	RCR31 – Energy: Total renewable energy produced	2	2.2	Several ren energy	2
RCR32	RCR32 – Energy: Renewable energy capacity	2	2.2	Several ren energy	2
RCR32	RCR32 – Energy: Renewable energy capacity	2	2.2	Other renewable energy (including geothermal energy)	1
RCR35	RCR35 – Climate: Population benefiting from flood protection	2	2.4	Climate change prevention and management (060)	0
RCR35	RCR35 – Climate: Population benefiting from flood protection	2	2.4	Flood and landslide (058)	2
RCR35	RCR35 – Climate: Population benefiting from flood protection	2	2.4	Non-climate, human reduced risks: prevention, management (061)	0
RCR41	RCR41 – Water: Population with improved water supply	2	2.5	Water for human consumption	2
RCR47	RCR47 – Circular: Waste recycled	2	2.6	Waste Management	2
RCR95	RCR95 – Env: Pop. with access to green infrastructure	2	2.7	Air quality	0
RCR95	RCR95 – Env: Pop. with access to green infrastructure	2	2.7	Natura 2000	0
RCR95	RCR95 – Env: Pop. with access to green infrastructure	2	2.7	Nature and biodiversity protection	2
RCR29	RCR29 – Climate: Estimated GHG emissions	2	2.8	Clean urban transport	2
RCR63	RCR63 – Urban Trans: Annual users of tram and metro lines	2	2.8	Clean urban transport	2
RCR64	RCR64 – Urban Trans: Annual users of cycling infrastructure	2	2.8	Clean urban transport	1
RCR64	RCR64 – Urban Trans: Annual users of cycling infrastructure	2	2.8	Cycling infrastructure	2
RCR58	RCR58 – Road: Annual users railways	3	3.1	Railway	2
RCR70	RCR70 – Education: Annual users of childcare facilities	4	4.2	Infrastructure for early childhood education	2
RCR71	RCR71 – Education: Annual users of education facilities	4	4.2	Infrastructure for primary and secondary education	2
RCR71	RCR71 – Education: Annual users of education facilities	4	4.2	Infrastructure for tertiary education	0
RCR71	RCR71 – Education: Annual users of education facilities	4	4.2	Infrastructure for vocational education	0
RCR73	RCR73 – Health: Annual users of health care facilities	4	4.5	Health Infrustructure and Assests	2
RCR77	RCR77 – Visitors of cultural and tourism sites	5	5.1	No specific action types were identified for this RSO	N/A
RCR77	RCR77 – Visitors of cultural and tourism sites	5	5.2	No specific action types were identified for this RSO	N/A

Source: Consortium own elaboration

To the **timeliness assessment**, based on the analysis provided in Task 1b, we define:

- "Fast" indicators: These measure the population benefiting from the investments and are typically measurable upon completion of the intervention or delivery of outputs.
- "Medium" indicators: These can be assessed in the short to medium term, requiring some time post-completion for data collection.
- "Slow" indicators: These capture the use of new or improved services, facilities, or infrastructure, or involve behavioural changes or innovations. They generally require 6 to 12 months to measure the results, often relying on pre- and post-intervention comparisons.

Based on how the indicator performs concerning a specific intervention action or type of operation, it is possible to predict when it can trigger a payment. For instance, if an indicator is classified as "fast," it can reasonably be expected to enable quicker payments. Conversely, if it is classified as "slow," caution is required, as linking the achievement of the objective to payment may result in delays. For example, in the case of RCR102, measuring the indicator earlier or later might provide different information on the type of result achieved. As with the output indicators, it is noteworthy that timeliness varies for the same indicator depending on the SO and type of operation, resulting in different judgments assigned to its deployment (e.g., slow, medium, fast). This variation reflects the differing contexts and dynamics of each SO and operation type

It is important to note that, unlike the analysis of output indicators, the majority of common result indicators are classified as "slow" and are typically measurable only in the medium term. This distinction highlights a key difference in the timeliness assessment between output and result indicators. Output indicators are often measurable during or immediately after the completion of an operation. In contrast, result indicators generally require the operation to be fully completed, and in many cases, a natural time lapse is necessary to observe and measure their intended effects.

The table demonstrates that most result indicators are "medium/slow," requiring measurement more than six months after the operation's completion. This has potential implications for payments in an FNLC context, where delayed measurement could impact financial flows.

Table 39 Timeliness assessment for result indicators

Code	Indicator	PO	SO	Fesibility Analysis	
				Timeliness	
				Type of intervention in ERDF/CF/JTF	*Timeliness in ERDF/CF/JTF*
RCR03	RCR03 – RTDI: SMEs introducing product or process innovation	1	1.1	Skills, advanced support and incubation	MEDIUM/SLOW
RCR03	RCR03 – RTDI: SMEs introducing product or process innovation	1	1.1	R&I in enterprises	MEDIUM/SLOW
RCR03	RCR03 – RTDI: SMEs introducing product or process innovation	1	1.1	R&I cooperation and technological transfer	MEDIUM/SLOW
RCR102	RCR102 – RTDI: New researchers	1	1.1	R&I in enterprises	FAST/MEDIUM
RCR102	RCR102 – RTDI: New researchers	1	1.1	R&I cooperation and technological transfer	FAST/MEDIUM
RCR102	RCR102 – RTDI: New researchers	1	1.1	R&I research centres	FAST/MEDIUM
RCR11	RCR11 – Digital: Users of new and upgraded public digital services	1	1.2	E-government	MEDIUM/SLOW
RCR11	RCR11 – Digital: Users of new and upgraded public digital services	1	1.2	E-inclusion	MEDIUM/SLOW
RCR11	RCR11 – Digital: Users of new and upgraded public digital services	1	1.2	E-health	MEDIUM/SLOW
RCR11	RCR11 – Digital: Users of new and upgraded public digital services	1	1.2	Digital connectivity	MEDIUM/SLOW
RCR01	RCR01 – Jobs created in supported entities	1	1.3	Business development and support	FAST/MEDIUM
RCR01	RCR01 – Jobs created in supported entities	1	1.3	Circular economy	FAST/MEDIUM
RCR01	RCR01 – Jobs created in supported entities	1	1.3	Innovation and cooperation	FAST/MEDIUM
RCR01	RCR01 – Jobs created in supported entities	1	1.3	Entrepreneurship and SME survival	FAST/MEDIUM
RCR17	RCR17 – Firms: New enterprises surviving in the market	1	1.3	Enterprise incubation	MEDIUM/SLOW
RCR17	RCR17 – Firms: New enterprises surviving in the market	1	1.3	Innovation and cooperation	MEDIUM/SLOW
RCR17	RCR17 – Firms: New enterprises surviving in the market	1	1.3	Entrepreneurship and SME survival	MEDIUM/SLOW
RCR18	RCR18 – Firms: SMEs using incubator services	1	1.3	Enterprise incubation	MEDIUM/SLOW
RCR53	RCR53 – Digital: Dwellings with broadband to vhc network	1	1.5	Digital connectivity	MEDIUM/SLOW
RCR29	RCR29 – Climate: Estimated GHG emissions	2	2.1	Energy efficiency in enterprises	MEDIUM/SLOW
RCR29	RCR29 – Climate: Estimated GHG emissions	2	2.1	Energy efficiency in housing	MEDIUM/SLOW
RCR29	RCR29 – Climate: Estimated GHG emissions	2	2.1	Energy efficiency in public infrastructure	MEDIUM/SLOW
RCR29	RCR29 – Climate: Estimated GHG emissions	2	2.1	High efficiency / replacement heating systems	MEDIUM/SLOW
RCR26	RCR26 – Energy: Annual primary energy consumption	2	2.1	Energy efficiency in enterprises	MEDIUM/SLOW
RCR26	RCR26 – Energy: Annual primary energy consumption	2	2.1	Energy efficiency in housing	MEDIUM/SLOW
RCR26	RCR26 – Energy: Annual primary energy consumption	2	2.1	Energy efficiency in public infrastructure	MEDIUM/SLOW
RCR26	RCR26 – Energy: Annual primary energy consumption	2	2.1	High efficiency / replacement heating systems	MEDIUM/SLOW
RCR29	RCR29 – Climate: Estimated GHG emissions	2	2.2	RE biomass	MEDIUM/SLOW
RCR29	RCR29 – Climate: Estimated GHG emissions	2	2.2	RE solar	MEDIUM/SLOW
RCR29	RCR29 – Climate: Estimated GHG emissions	2	2.2	RE wind	MEDIUM/SLOW
RCR29	RCR29 – Climate: Estimated GHG emissions	2	2.2	Several ren energy	MEDIUM/SLOW
RCR29	RCR29 – Climate: Estimated GHG emissions	2	2.2	Other renewable energy (including geothermal energy)	MEDIUM/SLOW
RCR31	RCR31 – Energy: Total renewable energy produced	2	2.2	RE solar	MEDIUM/SLOW
RCR31	RCR31 – Energy: Total renewable energy produced	2	2.2	Several ren energy	MEDIUM/SLOW
RCR32	RCR32 – Energy: Renewable energy capacity	2	2.2	Several ren energy	MEDIUM/SLOW
RCR32	RCR32 – Energy: Renewable energy capacity	2	2.2	Other renewable energy (including geothermal energy)	MEDIUM/SLOW
RCR35	RCR35 – Climate: Population benefiting from flood protection	2	2.4	Climate change prevention and management (060)	FAST
RCR35	RCR35 – Climate: Population benefiting from flood protection	2	2.4	Flood and landslide (058)	FAST
RCR35	RCR35 – Climate: Population benefiting from flood protection	2	2.4	Non-climate, human reduced risks: prevention, management (061)	FAST
RCR41	RCR41 – Water: Population with improved water supply	2	2.5	Water for human consumption	MEDIUM/SLOW
RCR47	RCR47 – Circular: Waste recycled	2	2.6	Waste Management	MEDIUM/SLOW
RCR95	RCR95 – Env: Pop. with access to green infrastructure	2	2.7	Air quality	FAST
RCR95	RCR95 – Env: Pop. with access to green infrastructure	2	2.7	Natura 2000	FAST
RCR95	RCR95 – Env: Pop. with access to green infrastructure	2	2.7	Nature and biodiversity protection	FAST
RCR29	RCR29 – Climate: Estimated GHG emissions	2	2.8	Clean urban transport	MEDIUM/SLOW
RCR63	RCR63 – Urban Trans: Annual users of tram and metro lines	2	2.8	Clean urban transport	MEDIUM/SLOW
RCR64	RCR64 – Urban Trans: Annual users of cycling infrastructure	2	2.8	Clean urban transport	MEDIUM/SLOW
RCR64	RCR64 – Urban Trans: Annual users of cycling infrastructure	2	2.8	Cycling infrastructure	MEDIUM/SLOW
RCR58	RCR58 – Road: Annual users railways	3	3.1	Railway	MEDIUM/SLOW
RCR70	RCR70 – Education: Annual users of childcare facilities	4	4.2	Infrastructure for early childhood education	MEDIUM/SLOW
RCR71	RCR71 – Education: Annual users of education facilities	4	4.2	Infrastructure for primary and secondary education	MEDIUM/SLOW
RCR71	RCR71 – Education: Annual users of education facilities	4	4.2	Infrastructure for tertiary education	MEDIUM/SLOW
RCR71	RCR71 – Education: Annual users of education facilities	4	4.2	Infrastructure for vocational education	MEDIUM/SLOW
RCR73	RCR73 – Health: Annual users of health care facilities	4	4.5	Health Infrustructure and Assests	MEDIUM/SLOW
RCR77	RCR77 – Visitors of cultural and tourism sites	5	5.1	No specific action types were identified for this RSO	MEDIUM/SLOW
RCR77	RCR77 – Visitors of cultural and tourism sites	5	5.2	No specific action types were identified for this RSO	MEDIUM/SLOW

Source: Consortium own elaboration

Based on how the indicator performs concerning a specific intervention action or type of operation, it is possible to predict when it can trigger a payment. For instance, if an indicator is classified as "fast," it can reasonably be expected to enable quicker payments. Conversely, if it is classified as "slow," caution is required, as linking the achievement of the objective to payment may result in delays. For example, in the case of RCR102, measuring the indicator earlier or later might provide different information on the type of result achieved. Refer to Task 1b for further details.

The practicability assessment offers insights into the types of interventions for which an indicator is most suitable, drawing from the experiences of the analysed programmes. It determines how credible and easy an indicator is, based on whether the possibility of misinterpretation is unlikely, and the data collection methods already consolidated in the past. The feasibility assessment provides insights into the types of interventions for which an indicator is most appropriate, based on the experiences of the analysed programmes.
For all the indicators practicability was deemed high or medium, with the exception of RCR17, as the indicator was not evaluated as credible or easy, due to the lack of a solid data collection method and references in the SWD.

Table 40 Practicability assessment for result indicators

Code	Indicator	PO	SO	Fesibility Analysis			
				Praticability			
				Type of intervention in ERDF/CF/JTF	Credible	Easy	Synthetic Judgment
RCR03	RCR03 – RTDI: SMEs introducing product or process innovation	1	1.1	Skills, advanced support and incubation	yes	yes	HIGH
RCR03	RCR03 – RTDI: SMEs introducing product or process innovation	1	1.1	R&I in enterprises	yes	yes	HIGH
RCR03	RCR03 – RTDI: SMEs introducing product or process innovation	1	1.1	R&I cooperation and technological transfer	yes	yes	HIGH
RCR102	RCR102 – RTDI: New researchers	1	1.1	R&I in enterprises	yes	yes	HIGH
RCR102	RCR102 – RTDI: New researchers	1	1.1	R&I cooperation and technological transfer	yes	yes	HIGH
RCR102	RCR102 – RTDI: New researchers	1	1.1	R&I research centres	yes	yes	HIGH
RCR11	RCR11 – Digital: Users of new and upgraded public digital services	1	1.2	E-government	no	yes	MEDIUM
RCR11	RCR11 – Digital: Users of new and upgraded public digital services	1	1.2	E-inclusion	no	yes	MEDIUM
RCR11	RCR11 – Digital: Users of new and upgraded public digital services	1	1.2	E-health	no	yes	MEDIUM
RCR11	RCR11 – Digital: Users of new and upgraded public digital services	1	1.2	Digital connectivity	no	yes	MEDIUM
RCR01	RCR01 – Jobs created in supported entities	1	1.3	Business development and support	no	yes	MEDIUM
RCR01	RCR01 – Jobs created in supported entities	1	1.3	Circular economy	no	yes	MEDIUM
RCR01	RCR01 – Jobs created in supported entities	1	1.3	Innovation and cooperation	no	yes	MEDIUM
RCR01	RCR01 – Jobs created in supported entities	1	1.3	Entrepreneurship and SME survival	no	yes	MEDIUM
RCR17	RCR17 – Firms: New enterprises surviving in the market	1	1.3	Enterprise incubation	no	no	LOW
RCR17	RCR17 – Firms: New enterprises surviving in the market	1	1.3	Innovation and cooperation	no	no	LOW
RCR17	RCR17 – Firms: New enterprises surviving in the market	1	1.3	Entrepreneurship and SME survival	no	no	LOW
RCR18	RCR18 – Firms: SMEs using incubator services	1	1.3	Enterprise incubation	yes	no	MEDIUM
RCR53	RCR53 – Digital: Dwellings with broadband to vhc network	1	1.5	Digital connectivity	yes	yes	HIGH
RCR29	RCR29 – Climate: Estimated GHG emissions	2	2.1	Energy efficiency in enterprises	no	yes	MEDIUM
RCR29	RCR29 – Climate: Estimated GHG emissions	2	2.1	Energy efficiency in housing	no	yes	MEDIUM
RCR29	RCR29 – Climate: Estimated GHG emissions	2	2.1	Energy efficiency in public infrastructure	no	yes	MEDIUM
RCR29	RCR29 – Climate: Estimated GHG emissions	2	2.1	High efficiency / replacement heating systems	no	yes	MEDIUM
RCR26	RCR26 – Energy: Annual primary energy consumption	2	2.1	Energy efficiency in enterprises	yes	yes	HIGH
RCR26	RCR26 – Energy: Annual primary energy consumption	2	2.1	Energy efficiency in housing	yes	yes	HIGH
RCR26	RCR26 – Energy: Annual primary energy consumption	2	2.1	Energy efficiency in public infrastructure	yes	yes	HIGH
RCR26	RCR26 – Energy: Annual primary energy consumption	2	2.1	High efficiency / replacement heating systems	yes	yes	HIGH
RCR29	RCR29 – Climate: Estimated GHG emissions	2	2.2	RE biomass	no	yes	MEDIUM
RCR29	RCR29 – Climate: Estimated GHG emissions	2	2.2	RE solar	no	yes	MEDIUM
RCR29	RCR29 – Climate: Estimated GHG emissions	2	2.2	RE wind	no	yes	MEDIUM
RCR29	RCR29 – Climate: Estimated GHG emissions	2	2.2	Several ren energy	no	yes	MEDIUM
RCR29	RCR29 – Climate: Estimated GHG emissions	2	2.2	Other renewable energy (including geothermal energy)	no	yes	MEDIUM
RCR31	RCR31 – Energy: Total renewable energy produced	2	2.2	RE solar	no	yes	MEDIUM
RCR31	RCR31 – Energy: Total renewable energy produced	2	2.2	Several ren energy	no	yes	MEDIUM
RCR32	RCR32 – Energy: Renewable energy capacity	2	2.2	Several ren energy	no	yes	MEDIUM
RCR32	RCR32 – Energy: Renewable energy capacity	2	2.2	Other renewable energy (including geothermal energy)	no	yes	MEDIUM
RCR35	RCR35 – Climate: Population benefiting from flood protection	2	2.4	Climate change prevention and management (060)	no	yes	MEDIUM
RCR35	RCR35 – Climate: Population benefiting from flood protection	2	2.4	Flood and landslide (058)	no	yes	MEDIUM
RCR35	RCR35 – Climate: Population benefiting from flood protection	2	2.4	Non-climate, human reduced risks: prevention, management (061)	no	yes	MEDIUM
RCR41	RCR41 – Water: Population with improved water supply	2	2.5	Water for human consumption	yes	no	MEDIUM
RCR47	RCR47 – Circular: Waste recycled	2	2.6	Waste Management	yes	no	MEDIUM
RCR95	RCR95 – Env: Pop. with access to green infrastructure	2	2.7	Air quality	yes	yes	HIGH
RCR95	RCR95 – Env: Pop. with access to green infrastructure	2	2.7	Natura 2000	yes	yes	HIGH
RCR95	RCR95 – Env: Pop. with access to green infrastructure	2	2.7	Nature and biodiversity protection	yes	yes	HIGH
RCR29	RCR29 – Climate: Estimated GHG emissions	2	2.8	Clean urban transport	no	no	LOW
RCR63	RCR63 – Urban Trans: Annual users of tram and metro lines	2	2.8	Clean urban transport	yes	yes	HIGH
RCR64	RCR64 – Urban Trans: Annual users of cycling infrastructure	2	2.8	Clean urban transport	no	yes	MEDIUM
RCR64	RCR64 – Urban Trans: Annual users of cycling infrastructure	2	2.8	Cycling infrastructure	no	yes	MEDIUM
RCR58	RCR58 – Road: Annual users railways	3	3.1	Railway	no	no	LOW
RCR70	RCR70 – Education: Annual users of childcare facilities	4	4.2	Infrastructure for early childhood education	no	no	LOW
RCR71	RCR71 – Education: Annual users of education facilities	4	4.2	Infrastructure for primary and secondary education	no	yes	MEDIUM
RCR71	RCR71 – Education: Annual users of education facilities	4	4.2	Infrastructure for tertiary education	no	yes	MEDIUM
RCR71	RCR71 – Education: Annual users of education facilities	4	4.2	Infrastructure for vocational education	no	yes	MEDIUM
RCR73	RCR73 – Health: Annual users of health care facilities	4	4.5	Health Infrustructure and Assests	no	yes	MEDIUM
RCR77	RCR77 – Visitors of cultural and tourism sites	5	5.1	No specific action types were identified for this RSO	yes	yes	HIGH
RCR77	RCR77 – Visitors of cultural and tourism sites	5	5.2	No specific action types were identified for this RSO	yes	yes	HIGH

Source: Consortium own elaboration

For all the indicators practicability was deemed high or medium, with the exception of RCR17 (Enterprise incubation, innovation and cooperation, Entrepreneurship and SME survival), RCR29 (Clean urban transport),RCR58 (Railway), RCR70 (Infrastructure for early childhood education) as the indicators were not evaluated as credible or easy, due to the lack of a solid data collection method and references in the SWD. The scores from the feasibility assessment provide insights into the types of interventions for which an indicator is most appropriate, based on the experiences of the analysed programmes.

All in all, common result indicators are less feasible than output indicators due to their narrower applicability to specific types of operations and their longer timeliness. However, they remain valid for use in the FNLC context as a measurement of results and a basis for triggering payments.

3.4 DESIGN OF THE INTERVENTION ACTION MATRIX (SUB-TASK 2B.3)

This section introduces the IAM developed under Task 2b3. The IAM will be presented per PO, and for each PO, three different matrices will be displayed in the following order: (i) The Fully Admitted Indicators IAM (ii) the Partially Admitted Indicators IAM and (iii) the Exploratory Indicators IAM

3.4.1 PO 1

For what concern **PO 1,** for most of the intervention actions was possible to develop first choice and second-choice options using fully admitted IAM.

In particular, second options using fully admitted IAM were proposed for 3 of these intervention actions:

- **R&I cooperation and technological transfer**: the indicator RCR03 used in the first-choice option was selected taking into account the assessment carried out under sub-task 2b2, where it resulted to be the most used result indicator under this typology of action (see granularity score in section 3.3). However, a valid alternative indicator could be: "RCR102 - Research jobs created in supported entities," which passed the admissibility test applicable to all operations aiming to improve research capacity in companies through the introduction of new personnel and where the target group is broader than SMEs (e.g., large enterprises, micro-enterprises).
- **R&I in enterprises:** the indicator RCR102 used in the first-choice option was selected taking into account the assessment carried out under sub-task 2b2, where it resulted to be the most used result indicator under this typology of action (see granularity score in section 3.3). However, a valid alternative indicator could be: "RCR03 - RTDI: SMEs introducing product or process innovation," applicable to all operations aiming to introduce new processes or products in SMEs (therefore targeting a narrower scope).
- **Business development and support:** The indicator RCO02 used in the first-choice option was selected based on the assessment carried out under sub-task 2b1, where it was identified as the most commonly used output indicator for this type of action and received a high practicability score (see granularity and practicability score in section 3.3). However, a valid alternative could be RCO05 - Firms: New Enterprises, which - even if it received lower scores under the feasibility assessment - is more suitable if the programme aims to focus support on newly created enterprises established within the previous three years.

Table 41 The Fully Admitted Indicators IAM PO 1

Intervention Action	Related SO	Indicator 1 (input/process indicator)	Indicator 2 (Common output indicator)	Indicator 3 (Common result indicator)	Option
Skills, advanced support and incubation	1.1	Publication of the call for proposals to deliver the grant or service scheme	**RCO02** - Firms: Grant aided	**RCR03** - RTDI: SMEs introducing product or process innovation	**First-choice option**
R&I cooperation and technological transfer	1.1	Publication of the call for proposals to deliver the grant or service scheme	**RCO02** - Firms: Grant aided	**RCR03** - RTDI: SMEs introducing product or process innovation	**First-choice option**
R&I cooperation and technological transfer	1.1	Publication of the call for proposals to deliver the grant or service scheme	**RCO02** - Firms: Grant aided	**RCR102** - RTDI: New researchers	**Second-choice option**

R&I in enterprises	1.1	Publication of the call for proposals to deliver the grant or service scheme	**RCO02** - Firms: Grant aided	**RCR102** - RTDI: New researchers	**First-choice option**
R&I in enterprises	1.1	Publication of the call for proposals to deliver the grant or service scheme	**RCO02** - Firms: Grant aided	**RCR03** - RTDI: SMEs introducing product or process innovation	**Second-choice option**
E-government	1.2	Awarding of the public procurement contract	**RCO14** - Digital: Public institutions supported for Digital	**RCR11** - Digital: users of new and upgraded public digital services	**First-choice option**
E-inclusion	1.2	Awarding of the public procurement contract	**RCO14** - Digital: Public institutions supported for Digital	**RCR11** - Digital: users of new and upgraded public digital services	**First-choice option**
E-health	1.2	Awarding of the public procurement contract	**RCO14** - Digital: Public institutions supported for Digital	**RCR11** - Digital: users of new and upgraded public digital services	**First-choice option**
Digital connectivity	1.2	Awarding of the public procurement contract	**RCO14** - Digital: Public institutions supported for Digital	**RCR11** - Digital: users of new and upgraded public digital services	**First-choice option**
Business development and support	1.3	Publication of the call for proposals to deliver the grant or service scheme	**RCO02** - Firms: Grant aided	**RCR01** - Jobs created in supported entities	**First-choice option**
Business development and support	1.3	Publication of the call for proposals to deliver the grant or service scheme	**RCO05** - Firms: New Enterprises	**RCR01** - Jobs created in supported entities	**Second-choice option**
Circular economy	1.3	Publication of the call for proposals to deliver the grant or service scheme	**RCO02** - Firms: Grant aided	**RCR01** - Jobs created in supported entities	**First-choice option**
Innovation and cooperation	1.3	Publication of the call for proposals to deliver the grant or service scheme	**RCO02** - Firms: Grant aided	**RCR01** - Jobs created in supported entities	**First-choice option**
Entrepreneurship and SME survival	1.3	Publication of the call for proposals to deliver the grant or service scheme	**RCO02** - Firms: Grant aided	**RCR01 -** Jobs created in supported entities	**First-choice option**
Digital connectivity	1.5	Awarding of the public procurement contract	**RCO 41** - Digital: Add. dwellings with broadband of v high capacity	**RCR 53** - Digital: Dwellings with broadband to vhc network	**First-choice option**

For two intervention actions, it was not possible to develop IAM using fully admitted indicators because the only available options did not pass the admissibility test. Specifically:

- For what concern **R&I research centres** and **Enterprise incubation** the indicator **RCO06 - RTDI: Researchers with improved infrastructure** it was not admitted because of the low score received in relation to its potential for payments not linked to costs. Similar to RCO02, it does not precisely measure a specific deliverable of the intervention, as an output indicator should (CPR Article 2). Furthermore, as highlighted under Task 1b, this indicator can be measured at the start of the project—unlike RCO02—making it less suitable for directly supporting payments based on an achieved output. However, given the complexity of defining common deliverables for research and innovation interventions, it may be a potential option to be used in a FNLC scheme.

- For **Entrepreneurship and SME survival**, it was decided to present the second option with an increased focus on new enterprises compared to the option presented in the table above (i.e., RCO02 and RCR01). This option includes **RCR17 - Firms: new enterprises surviving in the market**, which did not pass the admissibility assessment due to its low score in consistency (e.g., similar targets are established indicators with comparable financial allocations). This is probably due to the fact that the indicator is linked to multiple intervention areas, as it can be used under all SOs and is therefore applied to monitor different types of enterprise investments. As a matter of fact, the budget allocated to an operation covered by this indicator can be influenced by various factors, depending on the nature of the beneficiary—whether it is an individual entrepreneur, a completely new enterprise to be stabilised, or an already operating business—the sector in which the targeted enterprises/entrepreneurs operate, and the type of initial investment needed, as well as the type of support provided (e.g., consultancy services or financial support for the acquisition of equipment).

  Under 2b2, it the indicator also received a low score in potential for payments not linked to costs (i.e., scoring low under the 2a analysis for attribution and time lag). External events likely contribute to the indicator's progress, making it difficult to attribute the deliverable solely to the underlying investment.

  However, in cases where operations focus on newly established enterprises (RCO05), it is possible to draw a causal link between the investment (support to a new enterprise) and the indicator's deliverable (new enterprises still active in the market one year after project completion). In this case, the indicator is still deemed to be a potential solution.

Table 42 The Partially Admitted Indicators IAM PO 1

Intervention Action	Related SO	Indicator 1 (input/process indicator)	Indicator 2 (Common output indicator)	Indicator 3 (Common result indicator)	Option
R&I research centres	1.1	Awarding of the public procurement contract	**RCO06** - RTDI: Researchers with improved infrastructure	**RCR102** - RTDI: New researchers	**First-choice option**
Enterprise incubation	1.3	Publication of the call for proposals to deliver the grant or service scheme	**RCO05** - Firms: New Enterprises	**RCR17** - Firms: new enterprises surviving in the market	**First-choice option**
Entrepreneurship and SME survival	1.3	Publication of the call for proposals to deliver the grant or service scheme	**RCO05** - Firms: New Enterprises	**RCR17** - Firms: new enterprises surviving in the market	**Second-choice option**

Regarding the intervention action **Digitising Firms** under SO 1.2, none of the common result output indicators analysed in Task 1b were used to measure the final condition of the potential FNLC scheme. However, under Task 2a **RCR13 - Digital: enterprises reaching high digital Intensity** is mentioned as a relevant indicator for the "Digitising Firms" intervention action. Furthermore, the analysis in Task 2a highlights that similar indicators are also present in the RRF for covering comparable interventions. Both Cohesion policy and RRF indicators rely on measuring the number of entities with improved digital maturity or intensity, demonstrating their relevance in capturing advancements in digital capabilities. This makes RCR13 a suitable option to be considered in the development of a potential FNLC scheme.

Table 43 The Exploratory Indicators IAM PO 1

Intervention Action	Related SO	Indicator 1 (input/process indicator)	Indicator 2 (Common output indicator)	Indicator 3 (Common result indicator)	Option
Digitising firms	1.2	Publication of the call for proposals to deliver the grant or service scheme	**RCO02** - Firms: Grant aided	**RCR13** - Digital: Enterprises reaching high digital intensity.	**First-choice option**

3.4.2 PO 2

It should be noted that, regarding PO2, an IAM was not developed for all intervention actions identified under Task 1b. In particular, the following intervention actions were excluded:

- **Air quality:** For this type of intervention, the analysis in Task 1b connected only a result indicator, **RCR95 - Environment: population with access to green infrastructure**. When analysing possible output indicators to cover the second condition to be achieved, the classification of common indicators made under Task 2a suggested RCO39 - Environment: area covered by systems for monitoring air pollution. However, this indicator does not align with the proposed result. Given the different typologies of outputs that could have been produced under this type of intervention and the difficulty in identifying suitable output indicators for air quality in relation to green infrastructure, it was decided to exclude this intervention action.
- **Natura 2000,** for which a specific output indicator was provided (RCO37 - Env: Surface of Natura 2000 sites), was not admissible. It was not possible to identify a consistent result indicator used in combination to describe the intervention logic.
- Under **SO 2.4**, Task 1b identified indicators for three types of actions: **climate change prevention and management**, **flood and landslide**, and **non-climate, human-induced risk prevention and management**. It should be noted that the same combination of indicators (RCO25 and RCO35) was found to be used under all three intervention actions except non-climate, human-induced risk prevention and management, for which only RCR35 was proposed. However, the proposed indicators were specific to flood-related risks. Even though these indicators could have been applicable to the other two intervention actions, it was deemed more accurate to provide the IAM exclusively for flood and landslide prevention and management, as it specifically corresponds to the intervention logic described by the indicator.

As for PO1, also for PO2, for most intervention actions, it was possible to develop both first-choice and second-choice options using fully admitted IAMs. In particular, second-choice options using fully admitted IAMs were proposed for:

- Energy efficiency in enterprises,
- Energy efficiency in housing, and
- Energy efficiency in public infrastructure.

For these intervention actions**, RCR26 – Energy: annual Primary Energy Consumption** was adopted as the result indicator. This selection was based on the feasibility analysis carried out under sub-task 2b2, which highlighted RCR26 as the most suitable result indicator to be potentially used in a FNLC scheme in this type of operation. However, a valid alternative indicator could be **RCR29 - Estimated GHG Emissions**, which passed the admissibility test and which is applicable to all energy efficiency operations (i.e., RCR29 received a lower practicability score compared to RCR26 for this reason is proposed as a second-choice option).

Regarding SO 2.2, the analysis under Task 1b distinguished different types of intervention actions (i.e., **RE biomass, RE solar, RE wind, several renewable energy sources, and other renewable energy sources, including geothermal energy**). For all these types of interventions, the common output indicator proposed by Task 1b was **RCO22 - Energy: renewable energy capacity**, while different options were considered for result indicators:

- **RCR29 - Climate: Estimated GHG Emissions**, used under all the intervention actions identified under SO 2.2
- **RCR31 - Total Renewable Energy Produced, used under RE solar and several renewable energy sources.**
- **RCR32 - Energy: Renewable Energy Capacity,** used for other renewable energy sources (including geothermal energy) and several renewable energy sources.

However, a single solution covering all renewable energy sources was proposed using **RCR29**, as it was common to all interventions under SO2.2. Additionally, RCR29 is the indicator adopted in the Austrian FNLC scheme under the ERDF for energy efficiency and greenhouse gas emission reduction in large enterprises, SMEs, and local authorities, which was the first ERDF FNLC scheme adopted providing further evidence of its suitability for use in an FNLC scheme.

Table 44 The Fully Admitted Indicators IAM PO 2

Intervention Action	Related SO	Indicator 1 (input/process indicator)	Indicator 2 (Common output indicator)	Indicator 3 (Common result indicator)	Option
Energy efficiency in enterprises	2.1	Publication of the call for proposals to deliver the grant or service scheme	**RCO02** - Firms: Grant aided	**RCR26** - Energy: Annual primary energy consumption	**First-choice option**
Energy efficiency in enterprises	2.1	Publication of the call for proposals to deliver the grant or service scheme	**RCO02** - Firms: Grant aided	**RCR29** - Climate: Estimated GHG emissions	**Second-choice option**
Energy efficiency in housing	2.1	Awarding of the public procurement contract	**RCO18** - Energy: Dwellings with improved energy performance	**RCR26** - Energy: Annual primary energy consumption	**First-choice option**
Energy efficiency in housing	2.1	Awarding of the public procurement contract	**RCO18** - Energy: Dwellings with improved energy performance	**RCR29** - Climate: Estimated GHG emissions	**Second-choice option**
Energy efficiency in public infrastructure	2.1	Awarding of the public procurement contract	**RCO19** - Energy: Public buildings with improved energy performance	**RCR26** - Energy: Annual primary energy consumption	**First-choice option**

Energy efficiency in public infrastructure	2.1	Awarding of the public procurement contract	**RCO19** - Energy: Public buildings with improved energy performance	**RCR29** - Climate: Estimated GHG emissions	**Second-choice option**
Renewable energy (solar, wind biomass, other)	2.2	Publication of the call for proposals to deliver the grant or service scheme / Awarding of the public procurement contract	**RCO22** - Renewable Energy Capacity	**RCR29** - Estimated GHG Emission	**First-choice option**
Nature and biodiversity protection	2.7	Awarding of the public procurement contract	**RCO36** - Env: Green infrastructure (not related to climate change)	**RCR95** - Env: Pop. with access to green infrastructure	**First-choice option**
Clean urban Transport	2.8	Awarding of the public procurement contract	**RCO57 -** Urban Trans: rolling stock for public transport	**RCR29** - Climate: Estimated GHG emissions	**First-choice option**

For **Floods and landslides**, **Water for human consumption** and **Waste management**, , all the identified IAMs included one non-admissible indicator. It should be noted that even if they did not pass the admissibility test, all the relevant indicators were scored as "medium" under different criteria but did not receive any "low" scores. In particular, RCO25, RCR41, and RCR47 refer to investments that are not frequently implemented but are long-lasting and, in many cases, they involve large-budget infrastructural works that are rarely undertaken under Cohesion policy. These could have affected the scoring of the indicators.

Regarding **Clean Urban Transport**, the fully admitted IAM proposed using RCR29 (Climate: Estimated GHG emissions) with all admissible indicators. However, an alternative IAM using RCR63 (Urban Transport: Annual users of tram and metro lines) was also considered, despite RCR63 not passing the admissibility test. This second IAM remained relevant as it focused on improving metro services and increasing usage, whereas the first option (RCR29) targeted environmental benefits. This illustrates how different objectives can be pursued within the programme through the same type of intervention.

Table 45 The Partially Admitted Indicators IAM PO 2

Intervention Action	Related SO	Indicator 1 (input/process indicator)	Indicator 2 (Common output indicator)	Indicator 3 (Common result indicator)	Option
Flood and landslide	2.4	Awarding of the public procurement contract	**RCO25** - Climate: Flood protection newly built or consolidated	**RCR35** - Climate: Population benefiting from flood protection	**First-choice option**
Water for human consumption	2.5	Awarding of the public procurement contract	**RCO30** -Water: Length of pipes for public water supply	**RCR41** - Water: Population with improved water supply	**First-choice option**

Waste management	2.6	Awarding of the public procurement contract	**RCO34 -** Circular: Additional capacity for waste recycling	**RCR47 -** Circular: Waste recycled	**First-choice option**
Natura 2000	2.7	Awarding of the public procurement contract	**RCO37** - Env: Surface of Natura 2000 sites	**RCR95** - Env: Pop. with access to green infrastructure	**First-choice option**
Clean urban Transport	2.8	Awarding of the public procurement contract	**RCO57 -** Urban Trans: rolling stock for public transport	**RCR63** - Urban Trans: Annual users of tram and metro lines	**Second-choice option**

Although the 1b analysis did not provide any output indicators related to **High-efficiency/replacement heating systems**, an analysis of the indicators classified under this intervention action in Task 2a suggested that **RCO18** is a potential option to consider for these intervention actions. In addition to aligning with the intervention action and the proposed common result indicators, RCO18 has a more generic nature compared to the other indicators listed under Task 2a (RCO20 - Energy: District heating and cooling network lines; RCO19 - Energy: Public buildings with improved energy performance; RCO104 - Energy: Number of high-efficiency co-generation units). This broader scope allows for wider coverage of operations including operations producing different typologies of output and targeting different categories of beneficiaries (i.e.,

Furthermore, while RCO18 was not found to be used under High-efficiency/replacement heating systems in the programmes analysed in Task 1b, it was selected as part of the 1b sample and passed the admissibility test, making it suitable for use in a potential FNLC scheme.

Table 46 The Exploratory Indicators IAM PO 2

Intervention Action	Related SO	Indicator 1 (input/process indicator)	Indicator 2 (Common output indicator)	Indicator 3 (Common result indicator)	Option
High efficiency / replacement heating systems	2.1	Publication of the call for proposals to deliver the grant or service scheme /A Awarding of the public procurement contract	**RCO18** - Energy: Dwellings with improved energy performance	**RCR26** - Annual primary energy consumption	**First-choice option**
High efficiency / replacement heating systems	2.1	Publication of the call for proposals to deliver the grant or service scheme /A Awarding of the public procurement contract	**RCO18** - Energy: Dwellings with improved energy performance	**RCR29** - Estimated GHG Emission	**Second-choice option**

3.4.3 PO 3

For PO3, only one intervention action was identified under Task 1b: **railway**. For this IAM, we presented two options with different output indicators, each describing a different type of railway investment:

- First-choice option: using RCO49, which refers to the reconstruction or modernisation of railway sections to improve performance.
- Second-choice option: using RCO47, which refers to the construction of new railway sections or the upgrade of existing ones.

RCO49 was suggested as the first choice because it received a higher admissibility score, while RCO47 did noy pass the admissibility test due to its "low" score under frequency.

It should be noted that both options are part of the Partially Admitted Indicators IAM because RCR58 did not pass the admissibility test. This indicator was penalised by the consistency score, as investment in rail infrastructure is only partially dependent on the number of users. As a result, there may be no clear link between the allocated budget and the established target. Key factors influencing the budget include the type of infrastructure, the nature of the work (i.e., new construction or renovation), and the location where the infrastructure is situated or needs to be built. Additionally, as with indicators RCO25, RCR41, and RCR47, this indicator monitors operation which involve large-budget infrastructural works that are rarely undertaken under Cohesion policy, which affected the frequency score of the indicator.

Table 47 The Partially Admitted Indicators IAM PO 3

Intervention Action	Related SO	Indicator 1 (input/process indicator)	Indicator 2 (Common output indicator)	Indicator 3 (Common result indicator)	Option
Railway	3.1	Awarding of the public procurement contract	**RCO49** - Rail: Length of rail reconstructed or modernised - TEN-T	**RCR58** - Road: Annual users railways	**First-choice option**
Railway	3.1	Publication of the call for proposals to deliver the grant or service scheme	**RCO47** - Rail: Length of new or upgraded rail - TEN-T	**RCR58** - Road: Annual users railways	**Second-choice option**

3.4.4 PO 4

Regarding PO3, for the majority of intervention actions, it was possible to develop a first-choice option using a fully admitted IAM. For this PO, no second-choice options are proposed for any of the intervention actions.

Table 48 The Fully Admitted Indicators IAM PO 2

Intervention Action	Related SO	Indicator 1 (input/process indicator)	Indicator 2 (Common output indicator)	Indicator 3 (Common result indicator)	Option
Infrastructure for primary and secondary education	4.2	Awarding of the public procurement contract	**RCO67** - Education: Classroom capacity of education facilities	**RCR71** - Education: Annual users of education facilities	**First-choice option**
Infrastructure for tertiary education	4.2	Awarding of the public procurement contract	**RCO67** - Education: Classroom capacity of education facilities	**RCR71** - Education: Annual users of education facilities	**First-choice option**
Infrastructure for vocational education	4.2	Awarding of the public procurement contract	**RCO67** - Education: Classroom capacity of education facilities	**RCR71** - Education: Annual users of education facilities	**First-choice option**

However, for **Infrastructure for early childhood education** and **Health infrastructure and assets**, a Partially Admitted Indicators IAM had to be provided because RCO66 and RCR70 did not pass the admissibility test. Regarding **RCR73**, its admissibility was also penalised by the consistency score, likely due to the bias associated with 'users' or 'population' indicators. This issue was previously explained in relation to RCR58 - Road: Annual users of railways, which is used to monitor railway investments. In such cases, the budget allocated to the operation is often not correlated with service capacity in terms of users but rather with other factors (e.g., type of infrastructure built, reconstruction or modernisation work), which can lead to significant cost variations.

RCR70, on the other hand, was penalised due to its low frequency of use. Although not commonly applied as an indicator, it is the only one that specifically describes this type of intervention action.

Table 49 The Partially Admitted Indicators IAM PO 3

Intervention Action	Related SO	Indicator 1 (input/process indicator)	Indicator 2 (Common output indicator)	Indicator 3 (Common result indicator)	Option
Infrastructure for early childhood education	3.1	Awarding of the public procurement contract	**RCO66** - Education: Classroom capacity of childcare facilities	**RCR70** - Education: Annual users of childcare facilities	**First-choice option**
Health Infrastructure and assets	3.1	Awarding of the public procurement contract	**RCO69** - Health: Capacity of health care facilities	**RCR73** - Health: Annual users of health care facilities	**First-choice option**

3.4.5 PO 5

No specific action types were identified for this PO. The study team did not propose any predefined specific type of operations based on intervention fields as the analysis carried out under Task1b suggests this is not feasible. Programme actions involving RCO74 and RCO77 under RSO 5.1 and RSO 5.2 typically encompass other indicators or have a broader scope than just tourism attractiveness

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3.5 ANALYSIS PER STAKEHOLDER (SUB-TASK 2B4)

Based on the methodology outlined in the previous section (3.1.4), the stakeholder analysis aims to evaluate the roles and responsibilities of different stakeholders engaged in the implementation, monitoring, and evaluation of FNLC schemes using common indicators. It specifically examines their levels of risk and workload to identify which stakeholders carry the most significant burden and accountability when adopting the FNLC system for a particular set of common indicators.

This assessment provides insights into how responsibilities and challenges are distributed across stakeholders, supporting strategic decision-making in the FNLC implementation process

The analysis takes into account two macro categories based on their role in the program lifecycle:

A. Stakeholders Directly Involved in Implementation:

- Managing Authorities
- Beneficiaries
- European Commission (EC)
- Auditing/Control Authorities

B. Stakeholders Indirectly Affected by Results:

- Policymakers (National/Regional Governments)
- Social Stakeholders (Civil Society, Trade Unions, Advocacy Groups)
- Environmental Stakeholders (NGOs, Climate Advocacy Groups)
- Research & Innovation Sector (Universities, Think Tanks, R&D Institutions)
- Economic Stakeholders (Business Associations, Trade Organizations, Private Sector) – Rely on project outputs for economic benefits but do not manage implementation
- European Parliament (EP)

The matrix below presents the analysis of risk and workload for each stakeholder across the four types of indicators mentioned above. It provides a comprehensive view of how responsibilities and challenges are distributed, helping to identify which stakeholders are most impacted by the implementation of FNLC schemes.
The following pages provide a detailed explanation of the assessment rationale for each of the four types of indicators. The assessment will be refined during the workshop, where participants will be invited to discuss the matrix and its results.

Figure 28: Stakeholder assessment scale

Stakeholder Analyses								
	Process Indicator		**Output (Physical) indicator**		**Stort term results indicator**		**Long term results indicator**	
Actors	Risk	Workload	Risk	workload	Risk	Workload	Risk	Workload
Managing Authority								
Beneficiaries								
EC								
Auditing / Control Authorities								
Policymakers (regional/national)								
Social								
Environmental								
Research & Innovation								
Economic								
European Parliament								

3.5.1 Process Indicators

Concerning **process indicators**, the implications for each indicator and actors are described in the table below:

	Risk (Level and Reasoning)	Workload (Assessment and Rationale)
Managing Authorities (MAs)	Low (1) - Direct control over administrative processes.	Low (1) - Routine tasks with established procedures.
Beneficiaries	Low (1) - Minimal accountability; compliance-focused.	Low (1) - Reporting and compliance with predefined rules.
European Commission (EC)	High (3) - Strategic risk in ensuring alignment with EU goals.	Low (1) - Oversight role without operational involvement.
Auditing and Control Authorities	Moderate (2) - Responsible for compliance and fraud checks.	Low (1) - Standard compliance checks; minimal additional work.
Policymakers (Regional/National)	Moderate (2) - Policy design influence without operational control.	N/A - No involvement in operational processes.
Research & Innovation Stakeholders	Moderate (2) - Dependent on policy alignment for strategic goals.	N/A - Indirect involvement with no operational tasks.
Economic Stakeholders	Moderate (2) - Impacted by program success without direct role.	N/A - No operational involvement.

An **example** of a process indicator is RCO02 (Number of Enterprises Supported by Grants), which tracks the number of grant disbursements managed directly by the Managing Authority (MA) or an intermediate body. This indicator focuses on the administrative process rather than the performance or impact of the supported enterprises. As a result, it does not require detailed performance data from beneficiaries, making it a straightforward and low-risk process indicator.

For Managing Authorities (MAs), the risk is low because they are only responsible for administrative compliance, such as eligibility checks and accurate fund disbursement. There is no risk associated with the performance outcomes of the enterprises supported. The workload is also low as it mainly involves processing applications, verifying eligibility, and managing disbursements, without needing to collect or analyze performance data.

For the European Commission (EC), the risk is high because it is accountable for ensuring that grants are aligned with EU policy goals and are effectively contributing to economic growth and innovation. The potential for political and reputational damage is significant if funds are found to be mismanaged or ineffective. However,

the workload is low as the EC relies on aggregated reports from Managing Authorities and is not directly involved in the grant disbursement or monitoring process.

Auditing and Control Authorities face moderate risk as they are responsible for verifying administrative compliance and preventing fraud or misuse of funds. The workload is moderate as they need to conduct compliance checks, financial audits, and risk assessments to ensure transparency and accountability.

3.5.2 Output (Physical) Indicators

Output indicators measure tangible results delivered through the supported interventions. Then for each stakeholder:

Stakeholder	Risk (Level and Reasoning)	Workload (Assessment and Rationale)
Managing Authorities (MAs)	Moderate (2) - Accountability for delivering physical outputs.	Moderate (2) - Tracking and reporting on physical deliverables.
Beneficiaries	Low (1) - Defined deliverables minimize performance risk.	Moderate (2) - Data collection and reporting responsibilities.
European Commission (EC)	Moderate (2) - Oversight of output effectiveness.	Moderate (2) - Monitoring and strategic evaluation.
Auditing and Control Authorities	Moderate (2) - Verification of physical outputs.	Moderate (2) - Detailed auditing and compliance verification.
Policymakers (Regional/National)	Low (1) - Indirect impact on policy without operational role.	N/A - No involvement in physical output tracking.
Research & Innovation Stakeholders	Moderate (2) - Strategic goals depend on successful outputs.	N/A - Indirect interest without operational tasks.
Economic Stakeholders	Moderate (2) - Success of outputs impacts economic goals.	N/A - No direct operational involvement.

An **example** of an output (physical) indicator is RCO22 – Renewable Energy Capacity Installed, which measures the actual deployment of renewable energy systems, such as solar panels or wind turbines. This indicator provides tangible evidence of physical outputs achieved, making it straightforward to verify and quantify.

For Managing Authorities (MAs), the risk is moderate because they are accountable for ensuring that the installed capacity meets the planned targets. They must also verify that installations comply with technical standards and environmental regulations. The workload is moderate as it involves overseeing project implementation, validating technical specifications, and collecting evidence of installed capacity.

Beneficiaries face moderate risk because they are responsible for delivering the physical output, which includes the installation and operationalization of renewable energy systems. They must ensure compliance with technical requirements and safety standards, which could lead to financial consequences if not met. The workload is moderate as beneficiaries need to manage procurement, installation, and technical documentation to prove capacity installation.

For the European Commission (EC), the risk is moderate because it must ensure that the deployed renewable energy capacity contributes to broader EU climate and energy targets. The EC's accountability lies in verifying that funds are used effectively and contribute to policy goals. The workload is low as it mainly involves reviewing aggregated reports submitted by MAs.

Auditing and Control Authorities encounter moderate risk and workload because they are responsible for verifying the technical specifications and physical evidence of installed capacity. They must ensure compliance with financial and regulatory requirements, including environmental standards. This involves conducting on-site inspections, technical audits, and validating installation records, making the verification process moderately resource-intensive.

3.5.3 Short-Term Results Indicators

These indicators measure immediate effects of interventions, such as utilization rates or short-term behavior changes.

Stakeholder	Risk (Level and Reasoning)	Workload (Assessment and Rationale)
Managing Authorities (MAs)	High (3) - High accountability for immediate performance.	Moderate (2) - Monitoring and evaluation of short-term outcomes.
Beneficiaries	High (3) - Direct performance-related accountability.	Moderate (2) - Data collection and performance reporting.
European Commission (EC)	Low (1) - Delegated accountability to MAs and beneficiaries.	Moderate (2) - Strategic evaluation of program effectiveness.
Auditing and Control Authorities	Moderate (2) - Required to validate short-term results.	Moderate (2) - Compliance checks and performance audits.
Policymakers (Regional/National)	Moderate (2) - Policy impacts influence decision-making.	N/A - No direct role in short-term result tracking.
Research & Innovation Stakeholders	Low (1) - Low risk since economic outcomes are closely monitored by Managing Authorities, ensuring alignment with policy objectives.	N/A - Indirect monitoring role without operational involvement.
Economic Stakeholders	Low (1) - Low risk since economic outcomes are closely monitored by Managing Authorities, ensuring alignment with policy objectives.	N/A - High strategic interest but no operational role.

An **example** of a short-term result indicator is RCR29 – Estimated GHG Emission, which measures the reduction in greenhouse gas emissions resulting from implemented interventions, such as improved energy

efficiency in buildings or increased renewable energy production. This indicator reflects the immediate environmental impact achieved shortly after the project's completion.

For Managing Authorities (MAs), the risk is high because they are accountable for ensuring that the reported emission reductions are accurate and consistent with the objectives of the funded projects. They face significant uncertainty due to external factors that can alter the results, such as changes in energy consumption patterns, weather variations, or technological efficiency differences. If these external variables impact the achieved GHG reductions, MAs may face challenges in justifying the outcomes and linking them directly to the funded interventions. The workload is moderate as it involves collecting, verifying, and aggregating emission data from multiple beneficiaries, as well as validating the methodologies used to estimate GHG reductions.

Beneficiaries also face high risk because they are directly responsible for calculating and reporting the GHG emission reductions achieved by their projects. External factors, such as market fluctuations, user behavior changes, or energy price shifts, may influence the actual emission savings, leading to discrepancies between projected and achieved results. These uncertainties could impact funding eligibility and financial disbursements. The workload is moderate, as beneficiaries must rigorously monitor energy usage, collect emission data, and provide comprehensive documentation to support their claims.

For the European Commission (EC), the risk is low because its role is to review the aggregated emission reduction reports submitted by MAs and ensure they align with EU climate targets. The workload is moderate, as the EC must assess the consistency of methodologies across Member States and verify the contribution to EU-wide GHG reduction goals.

Auditing and Control Authorities encounter moderate risk and moderate workload because they must verify the accuracy of reported GHG emission reductions and the validity of calculation methodologies. This involves reviewing technical reports, conducting spot checks, and ensuring that the reported reductions are consistent with project activities. The workload is moderate due to the need for specialized knowledge in GHG accounting and environmental auditing practices.

3.5.4 Long-Term Results Indicators

Stakeholder	Risk (Level and Reasoning)	Workload (Assessment and Rationale)
Managing Authorities (MAs)	High (3) - Long-term accountability for sustained outcomes.	High (3) - Continuous monitoring and impact evaluation.
Beneficiaries	High (3) - Accountability linked to long-term performance.	High (3) - Long-term tracking and reporting of sustained impacts.
European Commission (EC)	Low (1) - Strategic oversight with shared accountability.	Moderate (2) - Strategic oversight and policy alignment.
Auditing and Control Authorities	High (3) - Complex auditing and validation of long-term impacts.	High (3) - Detailed validation and compliance audits.

Policymakers (Regional/National)	Moderate (2) - Long-term outcomes influence policy effectiveness.	N/A - Indirect strategic implications without operational role.
Research & Innovation Stakeholders	Moderate (2) - Depend on sustained innovation and economic growth.	N/A - High strategic interest but no operational tasks.
Economic Stakeholders	Moderate (2) - Long-term impacts influence policy and strategy.	N/A - Strategic interest in economic growth outcomes.

An example of a long-term result indicator is RCR58 – Annual Users of Railways, which tracks the number of people using newly built, upgraded, or modernized railway infrastructure. This indicator measures the sustained impact of transport interventions on mobility patterns and public transportation usage over an extended period.

For Managing Authorities (MAs), the risk is high because they are accountable for the long-term success and relevance of the railway projects. External factors such as changes in population dynamics, economic shifts, or alternative transport developments (e.g., growth in electric vehicle usage or ride-sharing platforms) can significantly influence railway usage. Additionally, societal behavior changes or economic downturns can impact passenger numbers, leading to discrepancies between projected and actual users. The workload is high due to the need for continuous data collection, monitoring trends, and validating the sustained impact of the investment.

Beneficiaries (e.g., railway operators or infrastructure managers) also face high risk because they are responsible for achieving the expected user numbers. Their financial sustainability and operational efficiency depend on reaching the projected ridership levels. If external factors reduce the demand for railway services, beneficiaries may struggle to justify the initial investment and operational costs. The workload is high, as they must maintain extensive user tracking systems, conduct passenger surveys, and report usage statistics consistently over time.

For the European Commission (EC), the risk is low because its primary role is to assess aggregated data on railway usage and ensure that infrastructure investments contribute to EU transport and sustainability objectives. However, the workload is moderate, as the EC must evaluate the data consistency and analyze the long-term impact on mobility, emissions reduction, and urban congestion.

Auditing and Control Authorities encounter high risk and high workload because they must verify the accuracy of user data and ensure compliance with reporting standards. They also need to assess whether the projected economic and environmental benefits are being realized, necessitating longitudinal studies and comprehensive impact assessments.

For Research & Innovation, Economic, Environmental, and Social Stakeholders, the risk is low because they benefit from the infrastructure improvements indirectly. Their interests are served if the railway contributes to economic growth, environmental sustainability, and social mobility. The workload is minimal, as they do not engage in direct implementation but may use the data for advocacy, policy analysis, or strategic planning.

3.5.5 Conclusion

The overall analysis of risk and workload associated with FNLC mechanisms based on common indicators demonstrates a predictable pattern: as the focus shifts from output indicators to long-term result indicators, the risk and workload increase for Managing Authorities (MAs) and Beneficiaries while they decrease for European-level actors such as the European Commission (EC) and the European Parliament.

This pattern is primarily driven by the nature of result indicators, particularly long-term results, which require ongoing monitoring, complex data collection, and an ability to account for external factors influencing outcomes. For MAs and Beneficiaries, this entails heightened accountability and a more significant administrative burden, as they must track and report on long-term impacts, such as behavioral changes, societal shifts, or environmental benefits. Additionally, they bear the risk of external variables—such as economic downturns, demographic changes, or technological advancements—that can alter projected outcomes and affect the achievement of targets.

Conversely, for the EC and other European-level stakeholders, the risk decreases as they benefit from a results-oriented approach that shifts accountability and operational complexity to the implementing actors (MAs and Beneficiaries). By focusing on long-term outcomes, EU actors enhance strategic oversight and policy alignment while reducing their involvement in administrative processes and short-term deliverables. As a result, they can allocate resources more efficiently, concentrating on evaluating the broader impact on EU policy goals rather than managing individual project-level outputs.

This asymmetric distribution of risk and workload highlights a key characteristic of FNLC mechanisms: they effectively shift operational responsibility downward while enhancing strategic governance at the European level. This dynamic underscores the importance of robust monitoring systems and capacity-building initiatives to support MAs and Beneficiaries in managing the increased complexity and risk associated with long-term result indicators.

An interesting reflection emerges when assigning speculative scores to the different levels of risk associated (see chart below) with each type of indicator: the overall quantity of risk is almost equally distributed across all stakeholders. However, the distribution of risk is not uniform across the different types of indicators. In fact, process indicators—those focused on procedural steps rather than tangible results—carry the highest aggregate risk.

While process indicators minimize risk for Beneficiaries and Managing Authorities by keeping accountability limited to administrative tasks, they maximize risk for the European Commission (EC), European Parliament (EP), and other stakeholders. This is because they provide little assurance of real policy impact, undermining the strategic goals tied to long-term societal changes, innovation, and economic growth.

In other words, this exercise seems to demonstrates that relying solely on process indicators, which lack any incentive structure for achieving meaningful results, represents the least effective option for the majority of stakeholders and for the public interest at large. The absence of performance-based incentives diminishes

accountability and strategic alignment, posing a substantial risk to the credibility and effectiveness of public interventions.

This underscores the necessity of incorporating at least some result-oriented indicators within FNLC mechanisms to better align individual incentives with broader policy objectives. Doing so not only distributes risk more equitably but also enhances overall policy effectiveness, ensuring that public resources contribute to tangible societal impacts.

Figure 29: aggregate values on risk for different type of indicator in a FNLC system

Source: consortium

3.6 CONCLUSIONS

This section presents the approach used to draw conclusions on the feasibility of using common indicators and IAMs within a FNLC framework. These conclusions are based on a comprehensive analysis of strengths and weaknesses identified throughout the study tasks. The study evaluates the conditions under which FNLC can effectively utilize a selected set of common indicators and IAMs, providing strategic insights for potential implementation.

Table 50 Strengths and weaknesses of using common indicators and IAMs within a FNLC framework

Strengths	Weaknesses
1. Reliability of the common indicator system 2. Methodological homogeneity and comparability among common indicators 3. Coverage and flexibility of the common indicator system	1. Heterogeneity in indicator use 2. Complexity of result indicators 3. FNLC reimbursement flow

Weaknesses identified. There are three main weaknesses concerning the use of common indicators in the FNLC framework: 1) Heterogeneity in use 2), complexity of result indicators and 3) Challenges in application at Upper and Lower Levels**.**

1) **Heterogeneity in use** - Despite programme methodological documents adopting a coherent approach based on SWD definitions and methodological references, they show high heterogeneity in indicator use, usually providing limited / no information **on how programmes will collect information on result indicators** and not specifying when or how the indicators will be measured. This may represent a main weakness for adopting the common indicators for a FNLC approach but also shows the wealth and variety of programme intervention logic under a common and robust general framework. Common indicators are applied across different frameworks and policy areas, which leads to inconsistent associations with specific types of operations. This has significant implications for cost variability. For example, the same output indicator, RCO02 measuring enteprises supported with grants, can be applied to different types of interventions, such as innovation support or digital transformation, resulting in vastly different cost structures. This heterogeneity arises not only from the diversity of intervention type - captured by specific objectives and intervention fields - but also from the different implementation methods used by programme authorities in their specific context.

2) A second challenge is particularly related to **result indicators**. Compared to output indicators, result indicators are generally more complex to measure and verify. They require ex-post tracking and robust monitoring systems, which can be resource-intensive and administratively burdensome. This necessitates the consideration of specific requirements and resource allocations at multiple levels (Commission, Programme Authority, Intermediate Bodies, and Beneficiaries) to effectively collect and verify the necessary data. More critically, result indicators often measure intangible aspects and / or difficult to measure variables. For instance, indicators that assess behavioral changes or medium-term effects (e.g., RCR03 "SMEs introducing product or process innovation") require post-intervention monitoring,

complicating their quantification and valuation, and / or access to other data sources, implying additional costs and also, at least in some cases, assumptions on the attribution of pre-post result variation to the supported interventions. The inherent complexity of measuring such intangible outcomes presents challenges not only in data collection but also in assigning financial value to the portion of results.

3) One of the challenges is related to using common indicators for **FNLC Reimbursement Flow**

Table 51: Use of FNLC lower/ upper Level in the CPR

One of the key issues relates to using common indicators to cover the entire reimbursement flow.

FNLC (Art. 95 CPR) can be applied at two levels:

- **Upper level**: Reimbursement of the Union contribution by the Commission to the Member States' programmes (Article 51(a) CPR).
- **Lower level**: Reimbursement of grants provided by the Member States to beneficiaries (Article 53(f) CPR).

It should be noted that FNLC can only be used to reimburse beneficiaries (lower level) if it is also applied for the same type of operation at the upper level. On the other hand, when FNLC is used only at the upper level, Member States have the flexibility to reimburse beneficiaries for the same type of operations using different forms of reimbursement, i.e., Simplified Cost Options (SCOs) or reimbursement of eligible costs actually incurred by beneficiaries.

However, as highlighted in the ESF Transnational Network **Recommendation Paper on Financing Not Linked to Costs** (European Commission – DG EMPL G.1, 2022), to fully benefit from the FNLC advantages (e.g., enhanced focus on policy objectives and results, simplification of some administrative procedures), it is recommended that FNLC is applied at both levels.

The analysis revealed that certain types of indicators are not suitable for use at the lower level: Process-based common output indicators, Indicators that do not allow for intermediate deliverables at the lower level, coverage indicators. More details:

Process-based Common Output Indicators**.** Some indicators do not specifically measure a final output but rather a step in the process for achieving it (e.g., within the set of indicators analysed in this study RCO02 'Firms: Grant aided', RCO05 'Firms: New Enterprises', RCO14 'Digital: Public institutions supported for Digital'). These are not directly suitable for reimbursement at the lower level. In particular, two main issues need to be considered:

- Difficulty in identifying the output triggering payment: These indicators are not clearly linked to the production of a tangible output, making it difficult to determine when they should be measured and the condition is achieved. At the upper level, reimbursement can occur when the grant is disbursed to beneficiaries. However, at the lower level, this approach does not work. To be used at the lower level, these indicators should be accompanied by an additional output indicator to clearly define the output to be achieved (e.g., hours of consultancy for business development or number of training

hours delivered to employees, new equipment purchased, etc.). This requirement introduces additional complexity and might increase the workload for beneficiaries[57].

- Issues in financial flow alignment at both levels: To take full advantage of the benefits produced, and to ensure the manageability of the FNCL schemes, the conditions and the portion of reimbursement triggered by each condition should be the same at both levels (i.e. lower and upper level). However, if the FNLC scheme is applied at both levels with the same payment percentages linked to different conditions, inconsistencies may arise. For example, if at the upper level, 60% of the reimbursement is provided when 50% of enterprises are supported (achievement of the intermediate deliverable of Condition 2, see table below), then at the lower level, the beneficiaries making up that 50% would need to receive 100% of their grants to be counted under indicators RCO02, RCO05, and RCO14. In this case, using the same indicators at both levels does not allow payments to be properly aligned between the programme (upper level) and beneficiaries (lower level).

Table 52 Example of FNLC scheme covering the reimbursement (programmes) as provided in Annex 3 'Skills, advanced support and incubation '

	Condition	Indicator	Payment %[58]
Condition/Result 1	Publication of the call for proposals to deliver the grant or service scheme	Publication of the call for proposals to deliver the grant or service scheme	10% of the total amount
Intermediate deliverable (Condition/Result 2)	At least 50% of target number of enterprises has been supported by month 5	RCO02 - Firms: Grant aided	60% of the total amount
Condition/Result 3	Reaching a target number of enterprises to be supported.	RCO02 - Firms: Grant aided	90% of the total amount
Condition/Result 4	Reaching a target number of SMEs introducing product or process innovation as a result of supported projects	RCR03 - RTDI: SMEs introducing product or process innovation	100% of the total amount

Indicators that do not allow for intermediate deliverables at the lower level. Certain indicators, particularly those measuring additional capacity created by a project, such as incubation, energy production, waste management, broadband access, and energy storage (e.g., RCO15, RCO22, RCO34, RCO66, RCO67, RCO69)—as well as process-based common output indicators (RCO02, RCO05, RCO14), are not suitable for defining intermediate deliverables as conditions for reimbursement under the FNLC scheme. At the upper level (between the Commission and the programmes), these indicators can measure progress at the programme level. Since they aggregate values from multiple operations, which may be implemented and completed at different times, it is possible to set intermediate objectives that trigger partial payments. On the

[57] It is worth noting that, even in the 2021-2027 programming period, programme authorities are already required to determine when an output indicator can be valorised. This involves deciding whether to attribute an output indicator (e.g., equipment purchased and operational) or a process indicator (e.g., all project activities are completed except for the final project work package or activities related to reporting and communication).

[58] The percentages of payments linked to each condition were not included in the FNLC matrix developed under Task 2b and are provided here only as examples.

contrary, at the lower level (between the programme and the beneficiaries), these indicators function differently because each indicator is tied to a single operation. Unlike at the upper level, where progress can be built up from multiple operations, a single operation could not contribute partial achievements in relation to 'additional capacity created' and 'number of enterprises supported by grant'—it is either fully completed or not completed at all[59]. This potential binary nature makes it impossible to introduce intermediate deliverables as a condition for reimbursement. This is an important feature to consider, as intermediate deliverables help reduce financial risks for beneficiaries. To address this issue, it is necessary to either:

- Associate a different indicator or
- (in some case) define a qualitative intermediate deliverable that does not depend on the numerical measurement of the main indicator, such as 'completing foundation work' or 'finishing essential infrastructure (e.g., walls, roofing, utilities).'

However, this approach might require beneficiaries to produce additional documentation, increasing their workload.

Coverage indicators often relying on statistical data. It was observed that the monitoring of some indicators measuring the population covered by the funded operation sometimes relies on statistical data rather than project reporting. This implies that programmes may assess the achievement of these indicators only at an aggregate level rather than tracking them at the level of individual operations. While programmes are expected to monitor performance at the project level due to regulatory requirements, in practice, this is not always feasible, and reporting is typically conducted at the level of the **SO**. This issue is particularly relevant for common result indicators that measure population potential impact (e.g., RCO074). For interventions where service uptake or infrastructure usage is measured post-implementation

These additional requirements could lead to administrative burden and costs for both managing authorities and beneficiaries, which cannot be ignored.

Therefore, some of the indicators proposed in **IAMs** belong to the above three categories (i.e., process-based, not allowing deliverables at the lower level, and population-based indicators). These indicators are not suitable for use at the lower level and require adjustments at different levels to cover the entire reimbursement flow effectively.

As a result of these complexities, particularly at the initial stages of implementation, there is likely to be an **increase in administrative costs**. This is due to the dual flow of information and resource management required by FNLC: one at the Upper Level (between the Programme Authority and the Commission) and another at the Lower Level (from Beneficiaries to the Programme Authority).

Many indicators are suitable for FNLC at the upper level but present challenges when applied at the lower level, leading to potential inconsistencies in financial flows and limiting the scope for administrative simplification.

[59] It is worth noting that operations can be divided into individual lots or work packages, allowing for intermediate steps. However, aligning these intermediate steps with the upper level becomes challenging when a programme involves multiple operations. Coordinating the completion of different lots across various operations is complex and makes synchronization difficult.

Strengths Identified

The strengths identified in using common indicators within a FNLC framework are:

1) **Reliability.** The common indicators are widely used in programming and are well-known among Managing Authorities, ensuring ease of implementation and administrative familiarity. Specifically, the indicators used in IAMs are among the most frequently utilized, making them familiar to Managing Authorities both in their application and definition (see also below points).
2) **Methodological homogeneity and comparability.** These indicators exhibit a certain degree of methodological homogeneity in the way they are designed and understood, enhancing comparability and facilitating aggregation across Member States. In other words, their consistent use and well-defined methodologies enable reliable data collection and reporting.
3) **Coverage and flexibility.** Admitted common indicators are relevant and cover a wide range of intervention actions, ensuring comprehensive programme monitoring. Cross-checking conducted through ex-post evaluations confirms that these indicators effectively cover most of the identified clusters of operations and policy areas, demonstrating their adaptability and broad applicability.

Conditions for Effective Use

Taking into account the weaknesses and strengths mentioned above, certain conditions can maximize the opportunities offered by using common indicators in an FNLC context while also addressing specific deficiencies. These conditions relate to:

1) **Using common indicators in combination**. Common indicators, when used in isolation, are often insufficient to provide comprehensive information or to effectively express the intervention logic. The proposed **IAMs** offer a structured approach to combining multiple indicators, thereby enhancing the coherence and reliability of the intervention logic. This ensures a more comprehensive performance measurement framework. IAMs are specifically designed to represent the entire lifecycle of an intervention, from inception to completion, thereby balancing the different risks associated with each stakeholder involved. This approach leverages the flexibility and broad coverage of common indicators while mitigating issues related to heterogeneity. A key feature of IAMs is their foundation on systematic integration of process, output, and result indicators. This integration provides a clear narrative from inputs to impacts, ensuring that the intervention logic is transparent and traceable. By using IAMs, it becomes possible to maximize the potential of common indicators while addressing the limitations that arise when they are used in isolation.
2) **Adjusting the common indicator design for FNLC compatibility.** The common indicator systems for the ERDF, CF, and JTF, as detailed in the Commission Staff Working Document (SWD 2021/198), were initially developed for programming and monitoring purposes, rather than for facilitating payments under FNLC schemes. While the SWD provides metadata on the characteristics and intended use of the indicators, it does not always fully align with the requirements of FNLC schemes. This misalignment presents several challenges, particularly concerning their application in financial flows. Specifically, the analysis identified the following limitations:
    - **Aggregation issues.** Indicators such as RCO02, RCO04, RCO05, RCR03, RCO14, and RCR17 present aggregation challenges due to existing methodological rules. According to the guidance 'double counting is removed at the level of the specific objective,' which means a

beneficiary is counted only once, regardless of multiple supports received under the same specific objective. However, under FNLC, payments must reflect each instance of support. For example, under RCO02 (Enterprises supported with grants), each grant awarded to a beneficiary under the same specific objective should be counted separately to support payment. This discrepancy between aggregation rules and payment requirements necessitates adjustments in the existing indicator framework for better alignment with FNLC mechanisms. The risk of **double counting** also emerges when using multiple indicators in combination, especially if they are linked to the same intervention logic but measured at different stages or levels (e.g., output and result indicators).

- **Timing of data Collection.** The SWD does not always consistently specify when data should be collected for certain indicators, particularly result indicators. This requires Managing Authorities to determine the exact timing of indicator measurement within the timeframe indicated in the SWD. This needs to be considered in order to align payment timelines with performance achievements under FNLC schemes. For example, it is not always clear whether data should be collected within one year of completing an output, upon intervention completion, or at another stage. This issue is particularly relevant for indicators under SO 2.1, such as the output indicators RCO18 (Dwellings with improved energy performance), RCO19 (Public buildings with improved energy performance), and the result indicator RCR26 (Annual primary energy consumption), all of which measure achievements "upon completion of output and issuance of the energy performance certificate". However, it is worth noting that SWD metadata for RCR26 indicates that '*the baseline refers to the annual primary energy consumption before the intervention, and the achieved value refers to the annual primary energy consumption for the year after the intervention*'. This implies that if used together in an FNLC scheme, the output and result of a given operation can potentially be based on the same type documentation (i.e., the energy performance certificate). Therefore, when developing the conditions of the FNLC scheme, further clarification regarding the timing of achievement should be provided, without relying entirely on the indicator specifications.
- **Challenges with specific indicators combination.** Under Task 2b, for skills development and R&I actions, combining RCO02 (Enterprises supported with grants) and RCR03 (SMEs introducing product or process innovation) was suggested. However, RCO02 covers all enterprises, while RCR03 is limited to SMEs, leading to potential inconsistencies in data aggregation and interpretation. To effectively use these indicators in FNLC schemes, it is necessary to ensure that the scope and definitions are harmonized, and adjustments are made to reflect the correct beneficiary categories.

Therefore, for common indicators' FNLC application, it is recommended:

- The existing indicator framework should be adjusted to better align with FNLC payment mechanisms, particularly concerning aggregation rules and double counting.
- The timing of data collection and the issuance of supporting documentation should be explicitly defined, especially for energy efficiency and renewable energy indicators.
- When using multiple indicators in combination, clear guidelines should be established to prevent double counting and to maintain consistency in financial flows.

- Consideration should be given to developing additional qualitative intermediate deliverables to bridge the gap between output completion and final result achievement, ensuring smoother financial flows in FNLC schemes.

3) **Considering monitoring of indicators as an additional (eligible) cost.** The monitoring of indicators under the ERDF/CF and JTF, especially result indicators, poses certain challenges. In the context of FNLC schemes, these challenges can impact payments and should therefore be carefully addressed. In particular, with the adoption of FNLC, monitoring activities will be intensified and extended to a broader range of staff within managing authorities and beneficiaries, who are not accustomed to carrying out these tasks, as they were traditionally confined to the realm of evaluation. One of the main difficulties for managing authorities in tracking the progress and achievement of indicators is obtaining responses from beneficiaries, as they may no longer be actively engaged with the programme or may not prioritise providing the requested information. In the case of FNLC, while the fact that payment is linked to the achievement of predefined conditions under FNLC schemes can encourage engagement, challenges may still arise. Beneficiaries may not have systems in place for effective monitoring, and the process requires dedicated resources and expertise, adding further complexity. Unlike output indicators, which can be measured immediately upon project completion, result indicators typically require tracking changes over time, making the process even more demanding. In some cases, specialised expertise may be necessary to ensure accurate. data monitoring and reporting. These requirements place an additional burden on beneficiaries, who may not be accustomed to conducting post-implementation monitoring. In some cases, meeting these obligations may even necessitate further investments. For instance, tracking the achievement of 'RCR64 – Annual users of cycling infrastructure' would require installing user-counting devices once the infrastructure is completed or using existing ones. Given these constraints, considering the costs related to indicator monitoring as eligible expenditures within FNLC schemes could help ensure data quality, reduce the pressure on beneficiaries, and support effective data collection for programmes

4) **Enhanced verification and adjustment mechanisms.** Using common indicators for FNLC schemes requires refined monitoring, reporting and control processes. This necessitates robust verification methods on both sides—the Commission and Member States—and involves a significant shift not only in control techniques but also in the auditors' mindset. Verifying results is fundamentally different from auditing certified expenditures. To ensure accountability and robustness within the FNLC framework, solid adjustment mechanisms must be established. These mechanisms should:
   - Account for external factors: timely consideration of external factors that may impact costs and performance.
   - Clarify responsibilities and roles: clearly define the responsibilities and roles throughout the project lifecycle, ensuring transparency and accountability at all stages.

   This involves two critical technical aspects:
   - Objective verification of indicator performance: The factors influencing the performance of common indicators must be clearly identified and verified using objective criteria. This includes both internal and, more importantly, external factors that can significantly influence indicator outcomes.

- Enhanced programming capacity: Identifying and verifying these influencing factors require advanced programming capacity, which may not be fully developed within all Programme Authorities. Similarly, the capacity to assess these factors within the European Commission's services may require additional investment in capacity building and guidance.

5) **Designing FNLC through common indicators as a collaborative and adaptive programming approach.** The design of FNLC through common indicators should be approached as a comprehensive programming exercise, where the Programme Authority carefully crafts the intervention logic with a clear focus on specific intervention types and policy objectives. This approach necessitates explicit articulation of the intended outcomes and anticipated challenges. This design process serves as a structured dialogue between the principal (European Commission) and the agent (Member States), fostering a transparent exchange of reciprocal objectives, strategies for achieving them, and the recognition of potential challenges or external factors that may impact target achievement. Rather than being perceived as a rigid contractual obligation or merely a means of administrative simplification, FNLC should be viewed as a flexible, incremental, and learning-oriented process aimed at achieving results. It encourages a dynamic partnership where both the Commission and Member States are actively engaged in pursuing shared cohesion policy goals.

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4 Task 3: Survey and workshop

Under this Task, the consortium will realise a **survey** targeting programme authorities for the selected programmes under Task 1b, and members of the DG REGIO Evaluation Network of national experts, with the objective of collecting further information on the use of common indicators selected under Task 1b.

Additionally, the contractor intends to hold an **in-person workshop** to further discuss and validate the choice of common indicators for FNLC schemes: the workshop themes will be built on the outcomes of the Task 2b.

The delivery of Task 3 will then be divided into two sub-Tasks:

- **Sub-Task 3.1 - Elaboration and dissemination of the survey** toward programme authorities and DG REGIO Evaluation Network of national experts;
- **Sub-Task 3.2 - Organisation and facilitation of the workshop** to present the main finding and preliminary results emerged from analysis and assessment of Task 2b

4.1 Elaboration and dissemination of the survey (Sub-task 3.1)

Regarding the survey targeting Programme Authorities, the study team proposes to focus exclusively on managing authorities that were selected in the sample for Task 1b. Additionally, the survey will also target national experts from the DG REGIO Evaluation Network.

Two separate questionnaires will be developed to cater to the different target groups: one for managing authorities and another for the DG REGIO Evaluation Network.

To maximize the response rate, the survey invitation will be accompanied by an introductory letter from DG REGIO. Follow-up reminders will be sent to non-respondents after 10 and 15 working days to encourage participation.

4.1.1 Questionnaire for managing authority

The study team proposes a questionnaire consisting of a **limited number of questions** (maximum 3) to be answered by each managing authority for each of the common result indicators adopted included under task 1b sample and the 5 output indicators which did not pass the admissibility test performed under task 2b1 and RCO02 which is the most used indicator by programmes (see table below):

Result indicators

1) RCR01 Jobs created in supported entities
2) RCR03 RTDI: SMEs introducing product or process innovation
3) RCR102 RTDI: New researchers
4) RCR11 Digital: Users of new and upgraded public digital services

Output indicators

1) RCO02 - Firms: Grant aided
2) RCO06 – RTDI: Researchers with improved infrastructure
3) RCO15 – Firms: Capacity of incubation created
4) RCO25 – Climate: Flood protection newly built or consolidated

5) RCR17 Firms: New enterprises surviving in the market
6) RCR18 Firms: SMEs using incubator services
7) RCR53 Digital: Dwellings with broadband to very high-capacity network
8) RCR26 Energy: Annual primary energy consumption
9) RCR29 Climate: Estimated GHG emissions
10) RCR32 Energy: Renewable energy capacity
11) RCR41 Water: Population with improved water supply
12) RCR63 Urban Trans: Annual users of tram and metro lines
13) RCR64 Urban Trans: Annual users of cycling infrastructure
14) RCR47 Waste recycled
15) RCR95 Env: Pop. with access to green infrastructure
16) RCR35 - Population benefiting from flood protection
17) RCR58 Rail Annual users railways
18) RCR71 Education: Annual users of education facilities
19) RCR73 Health: Annual users of health care facilities
20) RCR70 Education: Annual users of childcare facilities
21) RCR77 Visitors of cultural and tourism sites

5) RCO37 – Env: Surface of Natura 2000 sites
6) RCO47 – Rail: Length of new or upgraded rail - TEN-T

The questions will be **closed-ended**, with an option to provide additional details where necessary. This approach will ensure greater data comparability and a reduced workload for the respondents.

The questionnaire will concentrate on aspects related to **data collection practices** for monitoring the indicators. This focus stems from two key observations:

- The staff working document provides limited information on data collection processes.
- The analysis of methodological documents conducted under Task 1b did not provide sufficient information on these procedures.

It is important to note that managing authorities may adopt different data collection procedures for result indicators, potentially affecting the feasibility of using these indicators within FNLC schemes.

The decision to cover exclusively the common result indicators in the survey is based on the assessment of the workload for managing authorities, which was conducted for the two scenarios:

- Including all common output and result indicators: managing authorities would need to respond to 3 questions for an average of 18 indicators (approximately 54 questions). Some programmes, such as

2021ES16RFPR001, 2021ES16RFPR002, 2021HR16FFPR001, 2021IT16RFPR005, and 2021LT16FFPR001, have adopted over 30 indicators, requiring responses to more than 90 questions.

- Focusing only on common result indicators and the most critical common output indicators: this approach would significantly reduce the workload, making the exercise more manageable for managing authorities while still providing valuable insights, as result indicators resulted to be the most critical.

Below it is presented the questionnaire to be circulated to managing authorities.

INTRODUCTION

Thank you for taking part in the study of the European Commission (Directorate-General for Regional and Urban Policy) on the use of ERDF/CF common indicators by Member States in the 2021-2027 period and possibility of using common indicators in a system of "payments not based on costs".

The study aims to establish whether the ERDF/CF/JTF programme performance framework methodologies 2021-2027, or elements of them, could be used in a future system of "financing not linked to costs". The purpose of the study can be unfolded into two different objectives.

- The first objective of the study is to assess the use of ERDF/Cohesion Fund/JTF common indicators in the 2021-2027 programming period.
- The second objective of the study is to assess whether the abovementioned indicators could be used, partly, as indicators triggering payments within a framework of "financing not linked to costs.

The survey covers exclusively a selection of common result indicators. The questionnaire requires you to provide information on the data collection procedures for monitoring these selected indicators.

If you have any questions or require further clarification, please do not hesitate to email us at _____

PART 1

Email address: _____

Programme name: _____

CCI: _____

1. **A. What is your opinion on the extended list of common indicators for 2021-2027, compared with previous programming periods?**
    - Very negative /
    - Negative /
    - Slightly negative /
    - Slightly positive /
    - Positive /
    - Very positive)

B. Comment box:

Please provide details. PART 2 – QUESTIONS SPECIFIC FOR EACH INDICATOR

1. **Who is in charge of the data collection for the output/result indicator?**
    a. *Beneficiary, directly providing the data to the programme authority (monitoring costs are not eligible)*
    b. *Beneficiary, directly providing the data to the programme authority (monitoring costs are eligible)*
    c. *External sources (e.g., statistical offices, enterprise registers)*
    d. *Programme authority, through an ad hoc data collection activity (e.g., survey)*
    e. *Other (please specify)*
2. **When is the data collected to measure the achievement of the output/result indicator?**
    a. *Upon completion of the intervention output*
    b. *Within 6 months after the completion of the intervention output*
    c. *Between 6 and 12 months after the completion of the intervention output*
    d. *More than 12 months after the completion of the intervention output*
    e. *Other (Please specify)*
3. **What type of evidence supports the data provided?**
    a. *Self-declaration from the beneficiary*
    b. *Certificate issued by an external entity other than programme authorities*
    c. *Programme authorities ex-post sample/random checks*
    d. *Programme authorities ex-post checks on all the operations*

4.1.2 Questionnaire for DG REGIO Evaluation Network

The questionnaire for the national experts of the DG REGIO Evaluation Network will not focus solely on the common result indicators from the 1b sample and data collection procedures but will aim to gather insights on the entire 2021–2027 common indicator system.

The questions will be general, covering all common indicators, rather than requiring specific answers for each individual indicator. This approach will provide a broader overview of various aspects of the monitoring system.

It will explore differences compared to the previous programming period and assess whether improvements have been observed. Furthermore, questions regarding the choice of using programme-specific indicators over common indicators will be included.

As in previous cases, most of the questions will be closed-ended to enhance the comparability of data.

Below it is presented the questionnaire to be circulated to the experts of the DG REGIO Evaluation Network.

1. **A. What is your opinion on the extended list of common indicators for 2021-2027, compared with previous programming periods?**
   - **(**Very negative /
   - Negative /
   - Slightly negative /
   - Slightly positive /
   - Positive /
   - Very positive)

   B. Comment box:

2. **Compared to the past, how has the workload of indicator monitoring evolved?**
   a. *It has remained similar*
   b. *It has increased*
   c. *It has decreased*

   If the costs for monitoring have increased, this can be attributed to:
   a. *Higher number of indicators used*
   b. *Requirement of monitoring direct result indicators*
   c. *Requirement of more frequent communication of information to EC / SFC*
   d. *Requirement of more detailed communication of information to EC / SFC*
   e. *Other (please specify)*

   If the costs for monitoring have decreased, this can be attributed to:
   a. *Clearer methodological indications*
   b. *Easier procedures for measuring indicators*
   c. *Fewer requirements for measuring indicators*
   d. *Reduced use of programme-specific indicators*
   e. *Other (please specify)*

3. **Do you think that the availability of the EC Staff Working Document (2021) 198 (SWD) has improved the clarity of the indicator definitions?**

    a. *No, it has remained the same*

    b. *Yes*

    c. *No, it has decreased*

    If clarity has increased, possible reasons include:

    a. *SWD definitions are clearer than in the past*

    b. *Other (please specify)*

    If clarity has decreased, possible reasons include:

    a. *SWD definitions are very detailed and difficult to understand*

    b. *Lack of concrete examples*

    c. *SWD definitions do not cover all possible situations and exceptions, requiring MAs to do additional work to customise data collection*

    d. *Other (please specify)*

4. **From your perspective, what are the main reasons why programme authorities use programme-specific indicators instead of common indicators, despite the wider list of common indicators provided by the Regulation?**

    a. *There is no appropriate indicator from the common list*

    b. *The definition of programme-specific indicator is easier to interpret and understand*

    c. *Monitoring procedures are easier to apply compared to common indicators*

    d. *The use of programme-specific indicators is more feasible in terms of costs and timing*

    e. *Programme-specific indicators are based on more robust methodologies*

    f. *Other (please specify)*

5. **What challenges have the programmes faced in implementing the novelties introduced in the 2021–2027 monitoring system? (More that 1 answer allowed? 2-3 answers? Rated 1 most difficult, 2 next most ??**

    a. *Unclear or uncertain timing of measurement*

    b. *Double counting removal*

    c. *Difficulties in collecting data from beneficiaries*

    d. *Lack of capacity (i.e., expertise and/or available human resources)*

    e. *Other (please specify)*

6. **Could you please indicate the 5 most challenging common result indicators for definition used by your member state/programme**

Indicator shortlist	Issues related to the definition of the indicator
1.	
2.	
3.	
4.	
5.	

7. **Could you please indicate the 5 most challenging common result indicators for data collection procedures used by your member state/programme**

Indicator shortlist	Issues related to the data collection procedures
1.	
2.	
3.	
4.	
5.	

8. **Do you think there are other relevant indicators that should be added to the shortlist of common indicators covered by the study?**
    a. *Yes , please specify which indicators should be added and explain why*
    b. *No*

4.2 Organization and facilitation of the workshop (Sub-task 3.2)

An in-person or online workshop will be organised to discuss the findings from Task 2b. The study team will coordinate with DG REGIO services to define its key features, as outlined below.

The workshop will focus on **assessing the practical implications of implementing the FNLC models developed under Task 2b**. Unlike the survey, which aims to collect additional data on indicators for a more detailed analysis, the workshop will validate the findings from Task 2b and gather feedbacks from experienced stakeholders on the feasibility of using common indicators for FNLC implementation. It will also explore potential challenges and caveats to be considered for the new programming period.

Key discussion points will include:

- Collecting information on the FNLC models already developed (e.g., verification methods, expected outputs from different types of interventions, and relevant stakeholders) to provide more context in which the common indicators should be used.
- Highlighting implementation challenges and identifying potential solutions, overall regarding the control and audit mechanism.
- Assessing potential weaknesses in the indicators that were not detected in the analysis and could impact their ability to support payments.

- Evaluating workload implications for programme stakeholders concerning administrative burdens and financial flow.
- Analysing risks associated with the adoption of developed FNLC model based on common indicators and possible mitigation measures.

The workshop will be instrumental in refining the schemes and determining necessary adjustments for effective implementation. In particular, it will also allow to make more detailed considerations on the possibility of using FNLC models at both levels of reimbursement:

- Between the European Commission and the programmes (Article 51 CPR).
- Between the programmes and the beneficiaries (Article 53 CPR)

Features

The features presented below refer to the in-person workshop. However, if due to the tight timing of the study it becomes necessary to hold it online, the agenda and facilitation will be revised to suit the online format**.**

- **Limited number of participants** (8 to 12) to allow for more in-depth discussions. The proposal, to be agreed upon, is to involve members of the DG REGIO Transnational Network on Simplification, as they have experience with FNLC implementation and can provide valuable insights.
- **Venue:** the contractor will identify and cover the cost of the venue. However, if members of the DG REGIO Transnational Network on Simplification are involved, it should be considered whether to align the workshop with TN meeting venues and schedules. If the workshop is held in Brussels for a limited number of participants, DG REGIO may host the meeting. Otherwise, the study team will be responsible for securing an alternative venue.
- **Travel and accommodation**: The study team will organise and cover travel and accommodation expenses.
- **Facilitation.** The study team will moderate and facilitate the meeting. The workshop will be conducted in plenary and parallel sessions with the use of facilitation techniques: the working sessions will be centered on group of selected indicators e.g. divided per PO.
- The workshop will require **active participation** from the attendees, with multiple discussion sessions and exercises (a draft of the agenda is provided below). The **agenda and background documents** will be circulated at least one week before the meeting, allowing participants time to review the materials.
- Background documents will include key findings from all tasks of the study, with a particular focus on Task 2b. This will include the FNLC matrices and the results of the stakeholder SWOT analysis.

Table 53 - Workshop possible agenda

Agenda	
9:30 – 10:00	Registration and welcome coffee
10:00 – 10:05	Overall presentation of a FNCL framework and introduction to the key issues

10:05 – 11:10	Discussion - which is participant' experience of using (common) indicators not only related to FNLC but also to SCO?
10:40 – 11:00	Coffee break
11:00 – 12:30	Discussion -Which are the specific difficulties in using result indicators linked to payment?
12:30 – 13:30	Lunch break
13.30 – 14:30	Discussion - Which are the possible adjustment method? Controls and verification of the results, how can they happen? What to do next?
14:30: 15:45	Discussion – which are the risks and challenges for the different Cohesion Policy Stakeholders?
15:45 – 16:45	What to do next?

5 Annexes

This intermediate report includes the following three annexes in separate documents.

Annex I related to Task 1b that presents the selected programmes for the analysis, the breakdown of the proposed indicators per RSO and then the findings of the assessment for all the indicators under each RSO.

Annex II related to Task 2a that presents the type of operation-specific tables, structured by SO, comparing ERDF/CF/JTF common indicators with RRF investment-related milestones and targets.

Annex III related to Task2b that presents the Indicator Matrix and the FNLC Matrix

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KN-01-26-006-EN-N

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