Development of a system of common indicators for European Regional Development Fund and Cohesion Fund interventions after 2020

Part I – Thematic Objective 1, 3, 4, 5, 6

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Part I – Thematic Objective 1, 3, 4, 5, 6

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FOREWORD

This report is the first part of the study 'Development of a system of common indicators for European Regional Development Fund and Cohesion Fund interventions after 2020'.

The study assesses the possibility of expanding the current list of common output indicators and the feasibility of developing a list of common direct result indicators for post-2020 ERDF (European Regional Development Fund) and CF (Cohesion Fund) interventions, amounting to Euros 350 billion for 355 operational programmes in the 2014-2020 period. This study builds on the current programming period and is based on lessons learned from other programming experiences within and beyond the European Structural and Investment (ESI) Funds framework.

This part of the study proposes a list of candidate common output and direct result indicators on Thematic objective (TO) 1 'Strengthening research, technological development and innovation', TO 3 'Enhancing the competitiveness of SMEs (small and medium-sized enterprises)', TO 4 'Low-Carbon Economy', TO 5 'Climate Change Adaptation and Risk Prevention' and TO 6 'Environment Protection & Resource Efficiency' and the corresponding investment priorities (IPs) according to EU Regulations 1300/2013, 1301/2013 and 1303/2013.

These proposals are based on literature review, analysis of the use of 2014-2020 common and programme-specific output indicators and consultation with administrative bodies and Managing Authorities. These represent a sample of programmes, selected considering the EU allocation for each thematic objective.

ACRONYMS

AIR: Annual Implementation Report

AWU: Annual Working Unit

CF: Cohesion Fund

CF regulation: Regulation (EU) No 1300/2013 of the European Parliament and of the Council[2]

CIS: Community Innovation Survey

COI: Common output indicators as defined in ERDF and CF regulations

COSME: European Union programme for the Competitiveness of Enterprises and Small and Medium-sized Enterprises (SMEs)

CPR: Common Provisions Regulation (Regulation (EU) No 1303/2013 of the European Parliament and of the Council[3])

DG: Directorate General

EAFRD: European Agricultural Fund for Rural Development

EC: European Commission

ECA: European Court of Auditors

ECHO: European Civil Protection and Humanitarian Aid Operations

EEA: European Economic Area

EFSI: European Fund for Strategic Investments

EIB: European Investment Bank

EMFF: European Maritime and Fisheries Fund

EPO: European Patent Office

[2] Regulation (EU) No 1300/2013 of the European Parliament and of the Council of 17 December 2013 on the Cohesion Fund and repealing Council Regulation (EC) No 1084/2006.

[3] Regulation (EU) No 1303/2013 of the European Parliament and of the Council of 17 December 2013 laying down common provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund, the European Agricultural Fund for Rural Development and the European Maritime and Fisheries Fund and laying down general provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund and the European Maritime and Fisheries Fund and repealing Council Regulation (EC) No 1083/2006 (OJ L 347, 20.12.2013, p.320).

ERDF regulation: Regulation (EU) No 1301/2013 of the European Parliament and of the Council[4]

ERDF: European Regional Development Fund

ERTSM: European Railway Traffic Management System

ESF regulation: Regulation (EU) No 1304/2013 of the European Parliament and of the Council[5]

ESF: European Social Fund

ESI Fund: European Structural and Investment Fund

ETC: European Territorial Cooperation

ETC regulation: Regulation (EU) No 1299/2013 of the European Parliament and of the Council[6]

EU: European Union

FTE: Full time equivalent employees

GDP: Gross Domestic Product

GHG: Greenhouse gases

ICT: Information and communication technology

IP: Investment Priority

ITS: Intelligent Transport System

JRC: Joint Research Centre

KPI: Key Performance Indicators

MA: Managing Authority

Mbps: megabits per second

[4] Regulation (EU) No 1301/2013 of the European Parliament and of the Council of 17 December 2013 on the European Regional Development Fund and on specific provisions concerning the Investment for growth and jobs goal and repealing Regulation (EC) No 1080/2006 (OJ L 347, 20.12.2013, p. 289).

[5] Regulation (EU) No 1304/2013 of the European Parliament and of the Council of 17 December 2013 on the on the European Social Fund and repealing Council Regulation (EC) No 1081/2006.

[6] Regulation (EU) No 1299/2013 of the European Parliament and of the Council of 17 December 2013 on specific provisions for the support from the European Regional Development Fund to the European territorial cooperation goal (OJ L 347, 20.12.2013, p. 259).

MS: European Union Member State

MW: Megawatt

OI: Output indicators

OP: Operational programmes

PforR: The World Bank initiative Programme for Results

RACER: It is an acronym used by the Better Regulation Guidelines to identify 'good' indicators. R (relevant), the indicator ensures appropriate thematic coverage and a direct and close link to the objective it is measuring and monitoring; A (accepted) - when it is understood by those in charge of data collection, C (credible) - when it is unambiguous and easy to interpret, E (easy to monitor) - when data collection is feasible in terms of costs and time, R (robust) - when it is clearly defined and not subject to manipulation.

R&I: Research and innovation

R&D: Research and development

SFC: System for Fund Management in the European Union

TO: Thematic Objective

TRL: Technological Readiness Level defined by Horizon 2020 programme

UGC: User generated content

UNESCO: United Nations Educational, Scientific and Cultural Organization

GLOSSARY

Common indicator: an indicator with agreed definition and measurement unit to be used when relevant in Operational Programmes, permitting aggregation to the national and EU level. 2014-2020 CF and ERDF regulations define common output indicators.

Direct result indicator: matches the direct effects (immediate and short-term effects) of the intervention for the direct addressees. Direct results are project results, i.e. the direct benefit and outcome of programme interventions strictly related to (or derived from) the use of project (programme) outputs. These results, for instance, refer to the performance of beneficiaries, investments triggered, increased access to services. Direct result indicators are aggregated at programme level from the project level. There is a baseline value that may or may not be 0.

Intervention field refers to the type of ERDF and CF programme expenditure and is defined according to Annex I of EU (European Union) Commission Implementing Regulation 215/2014. Codes of intervention fields 1-101 apply to ERDF / CF operational programmes, whereas codes 102-120 apply to the ESF. Codes 121-123 relate to technical assistance and are excluded from the study.

Input indicator: measures input, such as financial indicators on EU budget, National budget, and Total budget (the sum of EU and National budgets).

Investment priority: sets out detailed objectives and forms the basis for defining specific objectives within operational programmes based on the needs and characteristics of the programme area. In the 2014-2020 framework, they are defined in Article 4 of CF regulation and Article 5 of ERDF regulation.

Operation: type of action financed by the programme, using programme inputs, to produce outputs contributing to the change (result).

Operational programmes: for this study, these are programmes financed by ERDF and CF.

Output indicator: relates to the specific deliverables of the intervention. It measures what is produced or bought by the programme expenditure and investments through the projects. It is measured at project level and then aggregated at programme level and has no baseline value.

Process indicator: describes a programme implementation process with information on the number and characteristics of beneficiaries, forms of finance, type of support and number of projects.

Programme-specific indicator: an indicator that can be used by Operational Programmes to complement the list of common indicators.

SME: means a micro, small or medium-sized enterprise as defined in Commission Recommendation 2003/361/EC (1).

Specific objective: reflects the desired change that the programme should bring about and relates to the specificities of the programme area. As defined in EU regulation 1303/2013, it *means the result to which an Investment priority or Union priority contributes in a specific national or regional context through actions or measures undertaken within such a priority*. Specific objectives reflect the operational objectives to be supported in the operational programmes.

Thematic objectives: are further detailed in the introduction to this report and indicate the common EU objectives. Within the 2014-2020 regulatory framework they are listed in article 9 of the Common Provision Regulation (CPR). For the scope of this study, ERDF interventions can refer to all TOs, while CF interventions relate to TOs 4, 5, 6, 7 and 11.

INTRODUCTION

In the 2014-2020 programming period, ESI (European Structural and Investment) funds support 11 thematic objectives (TOs):

1. Strengthening research, technological development and innovation;
2. Enhancing access to, and use and quality of information and communication technologies (ICT);
3. Enhancing the competitiveness of small and medium-sized enterprises (SMEs);
4. Supporting the shift towards a low-carbon economy in all sectors;
5. Promoting climate change adaptation, risk prevention and management;
6. Preserving and protecting the environment and promoting resource efficiency;
7. Promoting sustainable transport and removing bottlenecks in key network infrastructures;
8. Promoting sustainable and quality employment and supporting labour mobility;
9. Promoting social inclusion, combating poverty and any discrimination;
10. Investing in education, training and vocational training for skills and lifelong learning;
11. Enhancing institutional capacity of public authorities and stakeholders and efficient public administration.

This report concentrates on five of these thematic objectives (TOs 1, 3, 4, 5 and 6) and is structured as follows:

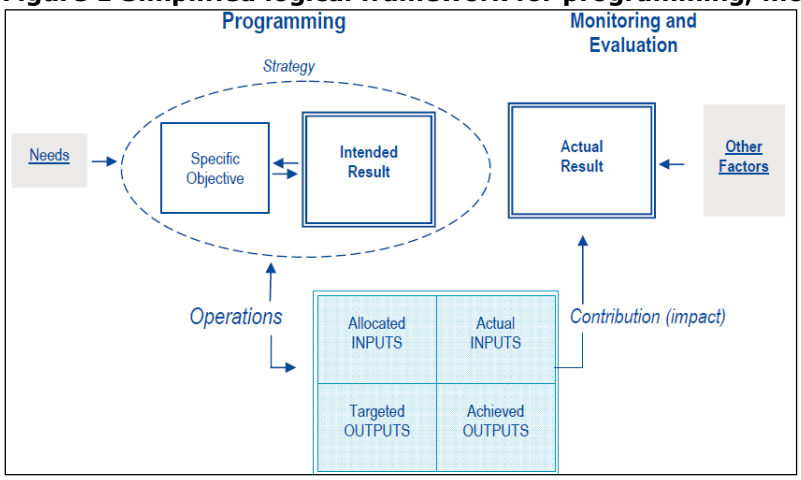
- Section 1 identifies areas of improvement for the 2014-2020 system of ERDF/CF and defines the proposed conceptual framework of the study;
- Section 2 describes the methodological approach for the assessment of indicator quality and the identification of post-2020 proposals;
- Sections 3, 4, 5, 6 and 7 assess the current use of output indicators and propose a set of common input, process, output and direct result indicators for TOs 1, 3, 4, 5 and 6;
- Section 8 contains the annexes.

1. PROPOSED CONCEPTUAL FRAMEWORK

1.1. ERDF and CF 2014-2020 programming framework

ERDF and CF programmes are designed according to the TOs of the CPR (Common Provision Regulation) and IPs of the fund specific regulations[7]. DG Regio guidance on monitoring and evaluation sets out the logical framework for the 2014-2020 period and the role of programming, monitoring and evaluation[8].

Figure 1 Simplified logical framework for programming, monitoring and evaluation



Source: European Commission, 2014a.

In the programming phase, the development challenges of the programme area, the *needs,* are identified to define and underpin the programme strategy and operations. The cornerstone of the strategy is the *specific objective* that reflects the desired change in the programme area. This is reported in the programme section 'results which Member States […] seek to achieve'. This section sets out the programme contribution to the change and the expected capacity to address the development needs, with a focus on specific target groups, beneficiaries, sectors and territories (where relevant). *Operations* are the type of actions financed by the programme, using programme *inputs* (e.g. financial and human resources) to produce *outputs* contributing to the change (*result*). The result depends on the programme contribution of operations and outputs as well as other factors.

The 2014-2020 monitoring system includes three types of indicators: financial, output and result indicators.

Financial indicators relate to expenditure and investments.

Output indicators measure the main deliverables of the projects and key stakeholders involved (e.g. research institutes, firms).

[7] TOs are defined in article 9 of the CPR. IPs are identified in the fund specific regulations, notably: article 5 of EU regulation 1301/2013, the ERDF regulation and article4 of EU regulation 1300/2013, the CF regulation. Additional specifications on IPs are provided in EU regulation 1299/2013, the ETC regulation.

[8] DG Regio is the European Commission, Directorate General for Regional and Urban Policy. For the Guidance 'Concepts and recommendations' see European Commission (2014a).

For the output indicators, Member States (MS) can either use common output indicators included in fund specific regulations and in ETC regulation or introduce programme-specific output indicators[9]. The common output indicators cover:

- Productive investments
- ICT
- Transport
- Environment
- Research and innovation
- Energy and climate change
- Social infrastructure
- Urban development
- European Territorial Cooperation.

The first 9 indicators (CO01 – CO09) cover productive investments and include enterprises supported, type of support, private investments, jobs created and sustainable tourism.

Indicator 10 is the only one on ICT and covers ICT infrastructure.

Transport indicators 11 to 16, regard railways and roads with sub-indicators on TEN-T, as well as urban transport and inland waterways. Indicators on TEN-T are coded as 11a, 12a, 13a, 14a.

Indicators on the environment, from 17 to 23, regard solid waste, water supply, wastewater treatment, risk prevention and management, land rehabilitation, nature and biodiversity.

Research and innovation indicators, from 24 to 29, measure enterprises cooperating with research institutions and introducing innovations, private investments in research and innovation, as well as researchers.

Indicators from 30 to 34 relate to energy and climate change, measuring energy efficiency, consumption and the use of smart grids, as well as GHG (Greenhouse gases) reduction.

Indicators 35 and 36 are about social infrastructure and regard childcare, education and health.

Indicators from 37 to 40 are specific to urban development. Indicators from 41 to 46 relate to ETC.

Despite being classified by theme, 2014-2020 indicators do not have any explicit link with TOs, and, in principle, they might be used for more than one TO.

2014-2020 result indicators are programme-specific, because there is no common list at EU level. Result indicators measure the change sought in the programme area, capturing the contribution of both programme interventions and external factors. They do not measure the direct effects of the interventions but refer to the overall change in the programme area.

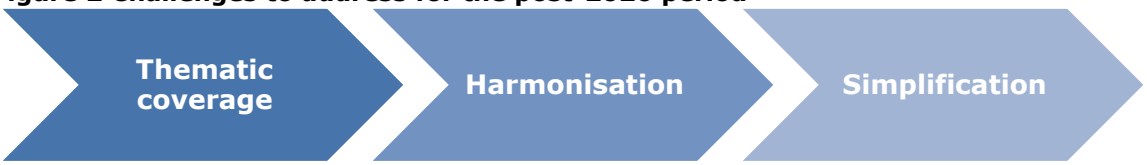
[9] See article 6 of ERDF regulation article 5 of CF regulation; article 16 of ETC regulation.

To reinforce the robustness of the programme indicator system, notably programme result indicators, the CPR introduced general ex-ante conditionality No.7, ensuring a statistical basis to undertake evaluations that assess the effectiveness and impact of the programmes (CPR, Annex XI, Part II).

1.2. Challenges of 2014-2020 indicators

In the 2014-2020 period, common output indicators have been used more in ERDF than ESF programmes[10]. However, three main challenges for the post-2020 period emerge: thematic coverage, harmonisation, and simplification.

Figure 2 Challenges to address for the post-2020 period



Thematic coverage

The use of common output indicators is uneven across TOs, IPs, funds and MS.

TO 1 and TO 3 are the best covered by the common output indicators, while the least covered is TO 11. TO 2 and TO 5 are less covered than other TOs but more than TO 11. This might be due to the type of interventions and to the lack of appropriate indicators in the common list. However, this shows clearly the different thematic coverage of 2014-2020 common output indicators across TOs. Similar differences emerge within TOs between the IPs as illustrated in sections 3, 4, 5, 6, and 7 of this report.

[10] 'The European Court of Auditors Special report No.2 indicates that 'on average, each ERDF OP used 13.2 different programme-specific output indicators and 14.8 common output indicators'. For ESF '13.5 different programme-specific output indicators and 6.2 common output indicators'. For further details see European Court of Auditors (2017a).

Substantial differences emerge between funds (ERDF and CF), policy goals (growth and jobs and ETC)[11] and MS. Overall, common output indicators are:

- 59% of ERDF output indicators (6,216 of 10,606),
- 40% (180 of 445) of CF output indicators,
- 35% of ETC output indicators (557 of 1,588)[12].

This latest finding was already anticipated by Work Package 0 of the Ex-post evaluation of 2007-2013 ERDF/CF which highlighted that common output indicators are usually considered more adapted to Jobs and Growth programmes rather than to ETC programmes[13]. In CF, four countries use more common than programme-specific output indicators: Hungary, Bulgaria, Romania and Portugal. However, Croatia, Czech Republic, Estonia, Slovakia, and Poland have introduced a lot of programme-specific output indicators. In ERDF programmes, Croatia, Czech Republic, Estonia and Slovakia are still using more programme-specific than common output indicators.

Harmonisation

Recently, debate on the omnibus regulation and the European Court of Auditors (ECA) Special Report No. 02/2017 stressed the opportunity and benefits of a more streamlined, simplified and harmonised framework, also for monitoring, reporting and evaluation[14].

The stock taking exercise carried out by ESIF DGs in 2017 identified differences between ESI Funds about the logic of intervention, data collection for monitoring, evaluation and communication, coverage of common indicators, target setting and type of reporting, as well as the level and frequency of reporting on financial implementation[15]. For indicators, the main difference regards the measurement of results. For ERDF / CF, result indicators are not common, because they are not defined at EU level. Result indicators are programme-specific and measure the change occurring in the programme area encompassing the contribution of programme interventions and external factors. On the contrary, other ESI funds have common result indicators and measure the direct (immediate and short-term) effects of

[11] See article 92 of the CPR.

[12] All values are calculated as the ratio between the number of times the common output indicators have been used and the total number of programme output indicators. The ERDF value includes ETC programmes.

[13] European Commission (2015c).

[14] See European Court of Auditors (2017a) and Omnibus regulation refers to the Proposal for a Regulation of the European Parliament and of the Council on the financial rules applicable to the general budget of the Union and amending Regulation (EC) No 2012/2002, Regulations (EU) No 1296/2013, (EU) 1301/2013, (EU) No 1303/2013, EU No 1304/2013, (EU) No 1305/2013, (EU) No 1306/2013, (EU) No 1307/2013, (EU) No 1308/2013, (EU) No 1309/2013, (EU) No 1316/2013, (EU) No 223/2014,(EU) No 283/2014, (EU) No 652/2014 of the European Parliament and of the Council and Decision No 541/2014/EU of the European Parliament and of the Council.

[15] European Commission (2017c), Evaluation Network Meeting, Brussels, September 2017.

programme interventions and not only the change in the programme area[16]. In this respect, it is also important to stress that in the 2007-2013 period, ERDF/CF programmes included result indicators measuring the direct effect, providing information on changes to, for example, the behaviour, capacity or performance of beneficiaries [17].

To reinforce harmonisation across ESI Funds and even with other EC policy tools, the Better Regulation Guidelines could provide a common reference[18]. Better Regulation defines three types of indicators:

- *Output indicators* measure the specific deliverables of the interventions,
- *Result / outcome indicators* match the immediate effects of intervention with reference to direct addressees, and
- *Impact indicators* relate to the intended outcome of the intervention on the wider economy or society beyond those directly affected by the intervention.

Simplification

Experience in the 2014-2020 programming period has highlighted the need for simplification including for definition and calculation methodologies and the use of harmonised standards when possible.

Clarifying definitions and calculation methodologies based on 2014-2020 lessons learned could further simplify the adoption of common output indicators. For some indicators such as CO09, the EC Guidance does not provide any clear instructions for the Managing Authorities to define the indicator 'The Managing Authorities set the methodology for estimating the expected number that can be based on demand analysis'. Therefore, the values of the indicators can be calculated with a different approach across programmes, which reduces comparability and can require substantial effort to define the appropriate methodology. The use of common reporting standards could ensure a simpler framework and more comparable data from indicators. This is not necessarily the case in the 2014-2020 ERDF / CF list, because, for instance in CO08 'Employment increase in supported enterprises', EC Guidance indicates that 'data is collected before the project starts and after it finishes; Managing Authorities are free to specify the exact timing'. A single proposed reference for timing the measurement would clarify the calculation of the indicator and increase comparability.

Overall, improving the coverage of existing common indicators could reduce the use of programme-specific output indicators and the risk of collecting data of limited use.

[16] There are 25 common result/target indicators in EAFRD, 28 in EMFF, 12 in ESF / YEI, immediate results for EAFRD and EMFF and immediate and longer-term results for ESF/YEI. For further details on EMFF see European Commission (2016a).

[17] European Commission (2007).

[18] European Commission (2015b), Commission Staff Working Document, Better Regulation Guidelines, SWD (2015) 111 final, 19.5.2015.

1.3. Conceptual framework of post-2020 indicators

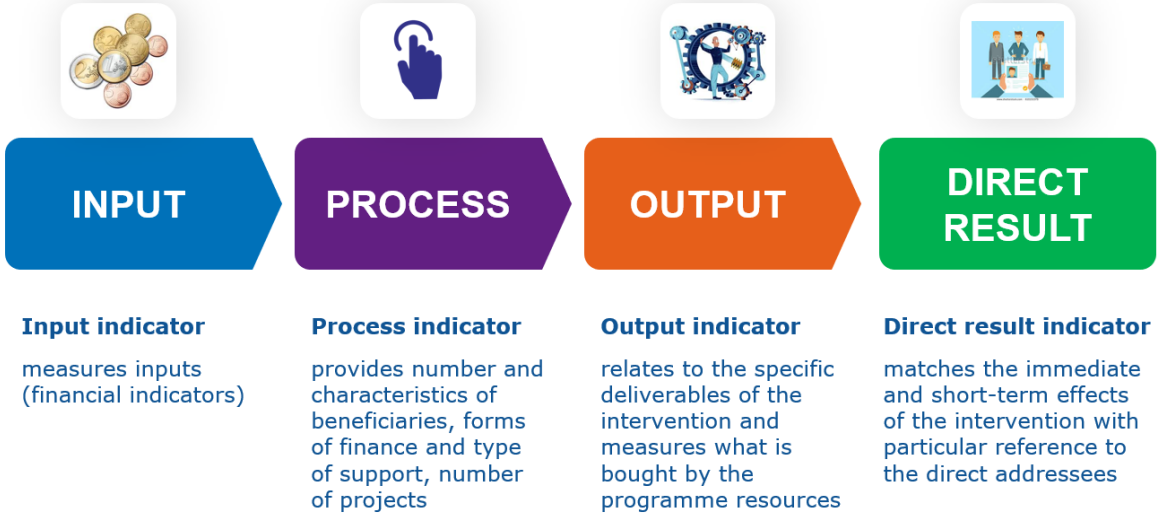
The conceptual framework of post-2020 indicators proposed in the study encompasses ancillary, output and direct result indicators.

Ancillary indicators measure the inputs of interventions and the main features of the implementation process. They are defined respectively as *input and process indicators*.

Output indicators measure specific deliverables to achieve the objectives.

Direct result indicators measure direct effects of intervention with reference to direct addressees. They might refer to the performance of beneficiaries, increased private investments, improved access to services, increased capacities, etc. These indicators might be measured either at project completion or some months after realisation of the outputs depending on their nature. Direct result indicators measuring the (effect of the) use of outputs by a set of addressees requires additional time after realisation of the output, for instance 6, 12 or more months after project completion. This aspect has been considered in the assessment of feasibility for proposed direct result indicators.

Figure 3 Conceptual framework and proposed indicators



Source: Own elaborations.

For instance, if the objective is to increase accessibility of an area, an output indicator can measure the kilometres of roads built, while (direct) result indicators measure the time saved by road users. For an operation supporting research and innovation in SMEs, the new equipment purchased and the collaboration for knowledge and technological transfer between enterprise and research institutions can be examples of the specific deliveries, i.e. outputs. Possible (direct) results / outcomes are the private resources matching public resources and the jobs created as a consequence of the intervention.

The following table summarises the conceptual framework of post-2020 indicators.

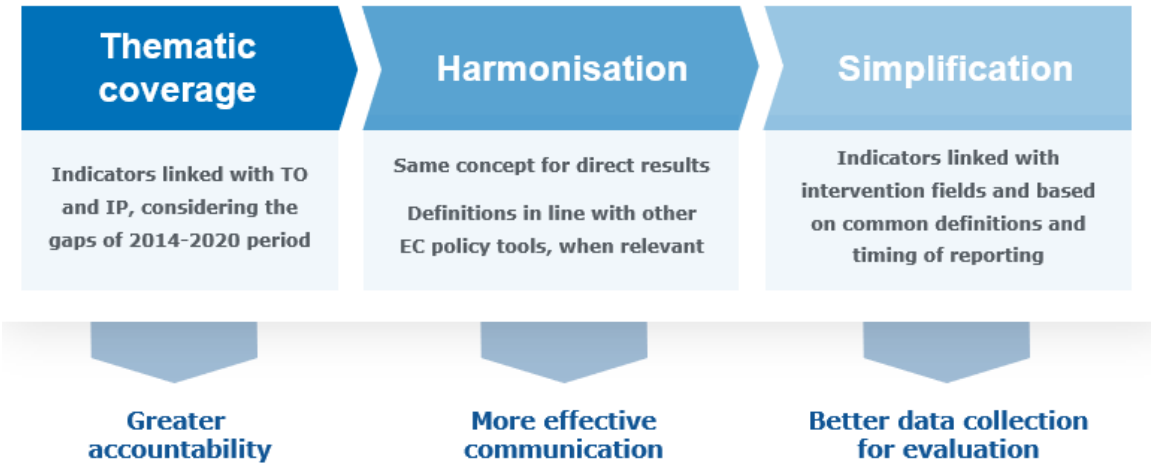
Table 1 Conceptual framework

Type	Definition	Examples	Timing	Level of data collection
Input	Measures financial resources invested in the programmes and is related to the intervention fields.	Financial indicators • EU budget (euro) • National budget (euro) • Total budget (sum of EU and National budgets).	Reported periodically during programme implementation.	Usually monitored and communicated at programme / priority level and based on project expenditure.
Process	Measures the programme implementation process through the number and characteristics of beneficiaries, form of finance, type of support and number of projects.	Type and characteristics of beneficiaries: • Enterprises supported (number) • Micro enterprises supported (number). Form of finance and type of support: • Enterprises supported with grants (number) • Enterprises supported with financial instruments (number). Projects supported (number).	Reported periodically during programme implementation.	Usually communicated at programme level and based on project implementation.
Output	Measures physical and intangible outputs.	Physical output: • Surface of rehabilitated land (square metres). Intangible output (e.g. technology and knowledge transfer from networking) • Enterprises cooperating with research institutions.	Monitored at least annually.	Usually collected at project level and aggregated at programme level, does not have a baseline value.
Direct result	Measures project direct effects with reference to the direct addressees.	• Population benefiting from flood protection measures (people) • Private investment increased (euro).	Monitored at the end of a project or some time later.	Usually monitored through project reporting, administrative registers and ad hoc surveys. Does have a baseline value.

Source: Own elaborations.

The proposed conceptual framework addresses the three main challenges of thematic coverage, harmonisation, and simplification as shown in Figure 4.

Figure 4 Advantages of the proposed conceptual framework for post-2020



Source: Own elaborations.

Proposed output and direct result indicators are associated with one or more TOs and IPs to ensure a wider and clearer **thematic coverage** than in the 2014-2020 period.

To ensure **harmonisation**, indicator definitions are consistent with existing standards from other EC sectoral programmes and Eurostat and build on the same concept for direct results.

The proposed output and direct result indicators contribute to **simplification** of the 2014-2020 list on three levels. First of all, proposed output and direct result indicators are linked with input indicators through intervention fields. Therefore, proposed indicators could be selected in the programming phase at the level of each TO and IP, considering the type of investments (intervention fields). This would enable a sounder monitoring system and simplify the selection of appropriate common indicators and comparison among programmes at EU level.

Secondly, each proposed indicator is fully described in a fiche with definitions, calculation methodology and reporting standards, with proposed rules of aggregation from project to programme and from programme to EC level[19].

Finally, the proposed indicators build on lessons learned. They confirm common indicators or introduce new indicators based on programme-specific indicators as well as on literature review. Most come from programming experiences, so these have already been tested.

Furthermore, introducing direct result indicators should enable stronger ERDF/CF **programme accountability**. The programme intervention logic and data collection about the change would be linked with the supported operations. This would aid the **communication activities** of European Institutions without replacing the impact evaluation.

Finally, introducing direct result indicators could support data collection for **evaluation**, bridging the gap between output indicators (reported at the level of IPs

[19] See Annexes 8.2 and 8.3 on proposed output and direct result indicators.

and based on supported operations) and programme result indicators (referring to programme area). With direct result indicators, the monitoring system could be a cornerstone of evaluation activities, where substantial data collection is needed. Nonetheless, introducing direct result indicators should not interfere with the role and importance of evaluations. Evaluations will collect additional data but could rely on a monitoring system providing information on direct results. Using this, evaluations could assess efficiency, effectiveness and net effects (net results) and investigate reasons for success or failure. This would ensure an independent and external view, the appropriate competences and specialised methods. Monitoring alone will not be sufficient to attribute the change to project implementation, even when measured by direct result, so evaluation is still needed.

2. OVERALL METHODOLOGY FOR THE IDENTIFICATION OF POST-2020 INDICATORS

2.1. Methodological overview

Wide-ranging sources help elaborate the list of candidate common indicators for the post-2020 period including literature review, Managing Authority (MA) consultation and programme review, as well as meetings with EC services. The methodological approach has been structured as illustrated in Table 2. These steps are then reflected in sections 3, 4, 5, 6 and 7, which culminate in a list of candidate common indicators for each TO.

Table 2 Methodological steps

Step	Source	Level of analysis
1. Budget allocation at TO level and illustration of the IPs	ERDF / CF regulations EC Cohesion data	At TO and IP level
2. Gap analysis of the 2014-2020 common indicators	Desk review of use of output indicators (EC data)	IP level
3. Consultation of MAs	Consultation of MAs on 2014-2020 common and programme-specific output indicators and on proposed direct result indicators	At TO and IP level
4. Analysis of the allocation of planned resources	Desk review of planned resources	Intervention fields at TO level
5. Literature review	ECA, EC services, World Bank, evaluations, other sources	TO level

Source: Own elaborations.

The first step, using Cohesion data and Fund specific regulations, describes the budget allocation for TOs and sets out the IPs.

The second step, based on EC data, provides a gap analysis of the 2014-2020 common output indicators at:

- TO level showing the use of common and programme-specific output indicators,
- IP level detailing the most frequently used indicators, classifying them by the type of indicators proposed in the conceptual framework, notably process, output and direct result indicators.

The third, fourth and fifth steps are the constructive part of the work, showing how the analysis has contributed to filling gaps. The third step is an analysis of consultations with a representative sample of MAs on the:

- use of 2014-2020 common output indicators according to RACER[20] and other criteria based on the consultation findings,
- use of programme-specific output indicators at IP level,
- preliminary list of proposed direct result indicators.

[20] See section 2.3.

The fourth step consists of analysing the allocation of planned resources based on the intervention fields at TO level to highlight the main types of investments and possible resulting outputs.

The fifth step is the literature review, where comparing output and result indicator definitions with other international experiences has been useful. ECA Reports were reviewed to identify areas for improvement, and to elaborate the list of candidate common indicators. The ECA performance audit manual was also reviewed to help define the glossary in this study.

The World Bank projects database was examined as a reference for the project results framework, the list of core indicators and the 'Program for Results' (PforR). This initiative helps address a recommendation of the ECA report for a performance budget in the post-2020 period. In this regard, according to the Organisation for Economic Co-operation and Development (OECD), there are two approaches: performance-based budgeting and performance budgets. Performance-based budgeting defines the financial resources along with measurable results and considers future and past performance. A performance budget explicitly links the increase in allocated resources to greater outputs or results[21].

EU programmes under the responsibility of other EC services (e.g. COSME, Horizon 2020) were analysed to identify examples for fine-tuning the list of output and result indicators and to ensure a sound theoretical framework with practical solutions which have already been adopted in sectoral programmes. Moreover, the analysis also considered preliminary ERDF types of interventions elaborated by DG Regio services together with national representatives.

2.2. MA consultation

This is a cornerstone of the activities to define the proposed post-2020 indicators. The consultation used a structured interview template for each programme under analysis. It collected information on the use of common output indicators, programme-specific output indicators and suggestions on the formulation of direct result indicators. The list of template questions is in the annexes[22].

The first round of the consultation was between November 2017 and January 2018 and covered 21 programmes focussing on TO 1 and TO 3, 25 programmes covering TO 4, 5 and 6 and 26 covering at least one of TO 1 or TO 3 and at least one of TO 4, 5 and 6. The second round of consultation started in March 2018 and was finalised in May 2018 on TOs 2, 7, 8, 9, 10 and 11. The selected programmes for each TO cover more than half of the EU contribution and include at least one programme for each country, if available.

[21] See OECD (2015).

[22] Section 8.4 includes the template of MA consultation, section 8.6 shows details of the representativeness of the sample of consulted programmes.

In the first round of consultation, almost all targeted programmes have been consulted successfully. However, three programmes have declined their participation, one of them saying that it is too early in the implementation.

More details are provided in Annex 8.6 of the report. Additional details on the consultation for TOs 2, 7, 8, 9, 10 and 11 are provided in Part II of the study.

Other forms of consultation have been developed. The contractor participated in: two Evaluation Network Meetings in Brussels on 1 December 2017 and 5 March 2018, and two Steering Groups involving Directorate Generals of the European Commission. There was also a consultation of national authorities who have nationally harmonised monitoring systems. The contractor collaborated with the EC to organise and animate a workshop with Managing and National Authorities and EC services to discuss the lessons learned with 2014-2020 indicators. The workshop was on 13 June 2018 in Brussels.

2.3. Indicator quality assessment criteria

The quality assessment criteria were based on key principles of the Better Regulation Toolbox (RACER criteria) and other criteria.

- **R (relevant)** - ensuring appropriate thematic coverage and a direct and close link to the objective it is measuring and monitoring. The study assesses this:
  - by matching the indicators, TO, IP and intervention fields of EU regulation 215/2014 for each task of the study;
  - through the MA consultation with questions 2.1.a and 2.1.b for common output indicators, 3.1.a and 3.1.b for programme-specific output indicators, 4.1 for proposed new direct result indicators.
- **A (accepted)** - when there are no substantial difficulties with data collection. The study assesses the acceptance of common and programme-specific output indicators through MA consultation (questions 2.5.b and 3.5.b) to verify any difficulties with the definition. MA consultation also verifies acceptance of proposed direct result indicators through question 4.4.
- **C (credible)** - when the definition is unambiguous and clear. The study assesses this criterion considering the findings under criteria 'accepted', 'easy to monitor', 'robust' and the answers to questions 2.5.a and 3.5.a.
- **E (easy to monitor)** - when data collection is feasible in terms of costs and time for those in charge of the activity. The study assesses the difficulty and costs of monitoring indicators (questions 2.4 and 3.4). This criterion was considered when formulating new direct result indicators.
- **R (robust)** - when it is clearly defined and not subject to manipulation. The study assesses robustness through MA consultation and desk research:
  - Whether common output indicators have been monitored following common standard methodological definitions and whether programme-specific indicators have used methodological definitions that could be adopted at EU level (questions 2.3 and 3.3 of the MA consultation).
  - To what extent the common or programme-specific output indicators have been monitored through project reporting and whether a more appropriate source of information for the direct result indicators could be project reporting, external registers, surveys, or other sources (questions 2.2.a, 3.2.a, 4.2.a, 4.2.b).
- **CL (clear)**. This criterion is taken from the CREAM matrix assessment that sets out five criteria: clear, relevant, economic and available at reasonable cost, adequate to provide information useful to assess performance and monitorable. An indicator is 'clear' when it provides an unequivocal normative interpretation and direction of change.

- **T (time-bound)**. This criterion is one of five smart assessment criteria: S (specific to the change being measured), M (measurable and unambiguous), A (attainable and sensitive to policy intervention, responsive to policy), R (relevant to the programme as a whole), T (time-bound with term dates for measurement). A time-bound indicator provides dates for measurement over time and monitoring is based on annual reporting or at least takes place at the end of the project. MA consultation on direct result indicators asks programme authorities about the appropriate timing for monitoring the indicator (questions 4.3.a, 4.3.b).
- **D (debatable)**. This criterion was proposed by the High-Level Group of 2011[23]. MA consultation collects information on the use of common output indicators for systematic benchmarking. Question 2.6 of the interview asks MAs whether programmes have decided to use 2014-2020 common indicators to conduct benchmarking analyses or at least intend to use them in future. This is to verify how much comparable information from 2014-2020 common outputs has been fully exploited, since comparability is a major advantage of common indicators.

The following table illustrates how the consultation questions reflect the quality assessment criteria of good indicators. Other questions in the template but not reported in the table provide additional qualitative and quantitative findings which complete the assessment. Further details on the template are in annex 8.4 of this report.

[23] See High level group reflecting on Future Cohesion Policy (2011a,b,c) – Meeting No.8 (15 February 2011).

Table 3 Consultation template questions

Criteria	On 2014-2020 common output indicators	On programme-specific output indicators	On new proposed direct result indicators
Relevant	2.1.a; 2.1.b	3.1.a; 3.1.b	4.1
Accepted	2.5.b	3.5.b	4.4
Credible	See 'accepted', 'easy to monitor' and 'robust' and answer to question 2.5.a, 3.5.a		
Easy to monitor	2.4	3.4	All the questions
Robust	2.2.a; 2.3	3.2.a; 3.3	4.2.a; 4.2.b
Clear	/	/	All the questions
Time-bound	/	/	4.3.a; 4.3.b
Debatable	2.6	/	/

Source: Own elaborations.

All the findings on 'new proposed direct result indicators' have been used to provide a preliminary assessment of the **feasibility of direct result indicators**. The assessment is based on the RACER criteria. Indicators which were not relevant have been excluded from the proposed list. The proposed indicators have been classified as follows.

- Indicators are considered 'fully' *accepted* if they can be monitored based on project reporting. Monitoring direct result indicators can require thematic experts (e.g. experts in the certification of energy performance) and / or external sources (e.g. survey to know how many tourists have visited a cultural heritage site after project completion). The need for thematic expertise and ad hoc external sources can be addressed either at project level or at programme level, with a risk of increasing monitoring costs and reducing feasibility of the direct result indicators.
- Indicators are considered *easy to monitor* if there is a previous experience (e.g. they have been used in the previous programming period). Experience with the same or similar indicators can minimise costs and increase the feasibility of direct result indicators. On the contrary a lack of experience can mean difficult monitoring with a risk of lower feasibility.
- Indicators are ranked as *credible* and *robust* if they are based on existing harmonised standards. On the contrary, if their definition can pose future challenges, this is considered in the assessment as a risk of lower feasibility.

Therefore, three levels of feasibility and corresponding icons are proposed.

- 'High'  . The reporting is based on project reporting at project completion and is 'supported' by project partners. It is usually based on previous similar monitoring experiences.
- 'Medium'  . Reporting is likely to be based on external sources and experts. Previous experience in reporting the indicator may be limited.
- 'Low'  . Reporting is after project closure based on the involvement of project partners and external experts and is likely to be based on project surveys.

For each section on thematic objectives, the proposed direct result indicators are associated with a feasibility assessment, which is summarised in Annex 8.7.

2.4. Template of the indicators

The study proposes a template for candidate indicators (Table 4). This template reflects operational criteria and includes:

- *Identification* – the name, definition and measurement unit of the indicator.
- *Thematic coverage* –reporting TOs, IPs, intervention fields and fund. Intervention fields refer to the intervention fields for ERDF/CF (1-101) derived from the list of categories of interventions in Annex I of EU regulation 215/2014. Intervention fields on technical assistance are excluded from the analysis. Intervention fields are divided into: I - Productive investments, II - Infrastructure providing basic services (energy infrastructure, environmental infrastructure, transport infrastructure, sustainable transport, ICT infrastructure), III – Social, health and education infrastructure and related investments, IV – Development of endogenous potential (research development and innovation, business development, ICT-demand stimulation, applications and services, environment, other). Intervention fields show how the indicator was derived and proposed. Candidate indicators are designed to measure outputs and direct results linked with the intervention fields where resources are concentrated. Intervention fields also link outputs and results with inputs, i.e. with planned, allocated and spent resources. 2014-2020 ERDF and CF common output indicators cover productive investments, ICT, transport, environment, research and innovation, energy and climate change, social infrastructure, urban development.
- *Robustness, methodology source* – indicates if the project / MA is in charge of collecting primary data, the method of calculation (e.g. sum, count), values reported to the Commission, aggregation, source, timing, possible links with other indicators and baseline.
- *Continuity 2014-2020 / simplification* – indicates if the indicator is new / existing / refined compared with the 2014-2020 programming period.
- *Use in other EC services*.

Table 4 Template of output/direct result indicator

Identification	
Name	Name of the indicator
Definition	Definition of the indicator
Measurement unit	Unit used to measure the indicator value
Thematic coverage	
Thematic objectives	As in article 9 of EU regulation 1303/2013.
Investment priorities	Refer, for ERDF to article 5 of EU regulation 1301/2013, for CF to article 4 of EU regulation 1300/2013.
Intervention fields	For ERDF / CF (1-101), of Annex I of EU regulation 215/2014.
Fund	Refers to ERDF, CF or both.
Robustness, methodology source	
Collection of primary data	Whether the project manager or the MA is in charge of data collection.
Method of calculation	At project level.
Indicator values reported to the Commission	The rule of aggregation within programmes, thus from project to programme level.
Aggregation	Explains the rule of data aggregation from programme to EC level. For indicators formulated as 'number of….' the rule is the sum of values from programme level, for those formulated as '%', the rule is explained case by case.
Source	MA monitoring systems / Project reporting / External registers, survey and databases.
Timing	Annually during implementation / At project completion / 1-3 years after project completion. The current reference is the ERDF and CF rule where a fully implemented operation is an operation, in which actions leading to outputs and results have been implemented in full, but for which not necessarily all the related payments have been made.
Links with other indicators	Links with other process, output and direct result indicators.
Baseline necessary	Yes / No.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	Existing / Refined / New. For 'Existing' and 'Refined' indicators the 2014-2020 indicator code is reported in brackets. For a 'New' indicator, the fiches specify whether it is based on programme-specific indicators, literature review or both.
Frequency of use	For 'Existing' / 'Refined' indicators or if it is new but based on programme-specific indicators.
Use in other EC services	
Indicates any service and programme where the indicator is being used.	

Below the fiches additional inputs from the literature review and consultation are provided as appropriate.
The fiches for process, output and direct result indicators are included in Annex 8.1, Annex 8.2 and Annex 8.3.

3. CANDIDATE POST-2020 TO 1 COMMON INDICATORS

3.1. Budget allocation and investment priorities

TO 1 supports innovation in a broad sense[24] . According to EC Cohesion data[25], the total budget planned for TO 1 is around 66 billion euro, of which 94% is covered by ERDF (national and EU contribution) and 6% by EAFRD (national and EU contribution). TO 1 has 22% of the total (national and EU) ERDF budget.

Of the 62.2 billion euro covered by ERDF, 20.6 billion is national and 41.6 billion euro the EU amount, respectively 33% and 67%.

TO 1 is split into two investment priorities, exclusively relevant for ERDF:

- IP 1a enhancing research and innovation (R&I) infrastructure and capacities to develop R&I excellence, and promoting centres of competence, in particular those of European interest;
- IP 1b promoting business investment in R&I, developing links and synergies between enterprises, research and development centres and the higher education sector, in particular promoting investment in product and service development, technology transfer, social innovation, eco-innovation, public service applications, demand stimulation, networking, clusters and open innovation through smart specialisation, and supporting technological and applied research, pilot lines, early product validation actions, advanced manufacturing capabilities and first production, in particular in key enabling technologies and diffusion of general purpose technologies.

[24] For further details on the role of innovation as a development driver and the issues regarding geographical and territorial coverage see OECD (2010, 2017), Gault (2016).

[25] Data downloaded 4 April 2018 from the open cohesion data platform.

3.2. Gap analysis

Use of 2014-2020 common output indicators for TO 1 varies at IP level.

Table 5 Use of output indicators – TO 1 (ETC not included)

IP	Programme-specific	Common	Total	Common %
1a	176	256	432	59%
1b	235	1023	1258	81%
Total	411	1279	1690	76%

Source: DG Regional and Urban Policy, European Commission, SFC 2014-2020[26].

The 2014-2020 common output indicators have been more frequently used to measure interventions under IP 1b rather than IP 1a, for which MAs have introduced programme-specific output indicators. Individual 2014-2020 common output indicators are used to different degrees under Thematic Objective 1.

Table 6 Focus on common output indicators - TO 1 (ETC not included)[27]

Common indicator	IP1a	IP1b	Total	Type of indicator
CO01	10	173	183	Process indicator
CO02	2	108	110	Process indicator
CO03		49	49	Process indicator
CO04	1	48	49	Process indicator
CO05	2	40	42	Process indicator
CO06	2	46	48	Direct result indicator
CO07		13	13	Direct result indicator
CO08	1	52	53	Direct result indicator
CO24	50	50	100	Direct result indicator
CO25	119	11	130	Output indicator
CO26	32	161	193	Output indicator
CO27	33	102	135	Direct result indicator
CO28		86	86	Process indicator
CO29	2	82	84	Process indicator
Total	256	1023	1279	/

Source: DG Regional and Urban Policy, European Commission, SFC 2014-2020.

At TO level, 2014-2020 common indicators focus mainly on procedural aspects (e.g. number of enterprises receiving support) and direct results (e.g. jobs created). However, CO25 and CO26 refer to real outputs, respectively the researchers working in improved research infrastructure facilities and the networks created between enterprises and research institutions enabling technological and knowledge transfer. Further elements on their use at IP level are provided below. The full assessment of 2014-2020 common output indicators is provided in Annex 8.5[28].

[26] Data source refers to October 2017. The data source is the same for all TOs.

[27] CO32 is used one time in IP1a, CO34 one time in IP1a and 2 times in IP1b. They are analysed in detail in section 5.

[28] See section 8.5.

Investment priority 1a

The four most frequently used indicators belong to the cluster of 'Research and innovation' and are: CO24 'Number of new researchers in supported entities', CO25 'Number of researchers working in improved research infrastructure facilities', CO26 'Number of enterprises cooperating with research institutions', CO27 'Private investment matching public support in innovation or R&D projects'.

CO01 is less used. The value of CO01 'Number of enterprises receiving support' is lower than CO26 'Number of enterprises cooperating with research institutions', showing the absence of links between the two. To clarify this type of missing information the post-2020 system could specify the linkage between CO01 and CO26 better and include a process indicator for the number of research institutions supported.

The selected output indicators concentrate on measuring direct results (i.e. jobs created, private investment matching public support) *rather than actual outputs*, except for CO25 and CO26.

Investment priority 1b

A much larger number of common output indicators have been used in IP1b in addition to the four used in IP 1a. There is a strong emphasis on measuring the process-oriented outputs, i.e. number of funded entities. CO02, CO03 and CO04 cover the form of finance (grants, financial instruments and non-financial support), CO01 and CO05 refer to the type of beneficiary. Indicator CO26 'Number of enterprises cooperating with research institutions' measures the networking activity and is a proxy for possible technological transfer and knowledge exchange. IP1b shows the opposite situation to IP 1a for the use of CO01 and CO26. The number of enterprises receiving support is higher than those cooperating with research institutions in research or innovation projects.

On the other hand, indicators such as CO06 and CO27 cover increased private investments. It is also interesting to see that the indicator on private investment with financial instruments CO07 is rather less used than CO06 on grants.

CO28 and CO29 regard innovation, measuring the number of enterprises supported to introduce new-to-firm and new-to-market products. However, CO28 and CO29 do not explicitly measure direct results, but the beneficiaries supported to produce innovative products, and not the innovative products or the enterprises that have already achieved the innovation outcome. Moreover, both CO28 and CO29 do not exclude double counting because innovations might lead to products new both to the market and to the firm. This probably reduces the usefulness of the availability of two different indicators, which has proved to be challenging for the MAs.

CO08 measures the employment increase and can be seen as an output indicator reporting on direct results.

3.3. Consultation findings

2014-2020 common indicators

MA consultation identified potential issues in the current indicators system based on the main assessment criteria (in particular RACER criteria) reported in section 2. For each indicator, the assessment focuses on robustness especially how much the definition is based on EC guidance. Further details on this criterion are in Annex 8.5. Table 7 focuses on 'relevance', 'acceptance', 'credibility', and 'easiness to monitor' and shows the percentage of MAs saying that:

- the indicator covers the main type of intervention (*relevant*),
- the definition has been ambiguous (*not completely credible*),
- data collection has been difficult (*not completely accepted by those involved in monitoring*),
- measurement costs are higher than for other indicators (*not easy to monitor*).

The latest column indicates the number of programmes consulted for each indicator.

Table 7 MA consultation - Interviewees answering 'yes' and OPs consulted [29]

Indicator	Coverage of the type of intervention	Difficult definition	Difficult data collection	Higher measurement costs	No. of OPs consulted
CO24	95%	33%	26%	35%	19
CO25	100%	22%	9%	25%	23
CO26	94%	21%	12%	12%	33
CO27	91%	9%	13%	4%	20

Source: Own elaborations of MA consultation.

Overall CO24, CO25, CO26, CO27 indicators are relevant, ensuring an appropriate thematic coverage.

CO24 is the most challenging for the definition, data collection and measurement costs. The main difficulties regard the use of FTE in R&D organisations where staff mobility is very high, the distinction between support staff and researchers and the attribution of researchers to the specific project because they usually work on more than one.

CO25 counts the number of researchers working in the supported research infrastructure facilities, therefore it seems an appropriate process indicator. It has been used without substantial issues in terms of measurement, definition or data collection.

The main challenges of CO26 relate to use of the indicator. The indicator measures the number of enterprises that cooperate with research institutions in R&D projects, however EC guidance does not specify how the indicator is combined with CO01 and does not provide a definition of what a research institution is. Moreover, the EC guidance indicates that 'Enterprises cooperating in different projects should be added up (provided that all projects receive support); this is not regarded as multiple counting'. The MAs were not clear how to treat double counting with this indicator. *CO27 proves to be the best indicator*, ensuring higher coverage, without posing difficulty with data collection and in terms of costs compared with other indicators. The definition of eligible and private investment is the main challenge. Some MAs have found difficult to collect and verify information on private non-eligible expenditure.

The table below follows the same approach for other indicators.

[29] Questions refer to the answers given by the MAs consulted for the indicators in the table regardless the TO and IP. The table records the 'yes' answers to: the capacity of the indicator to cover the main programme types of intervention; the existence of difficulties with definition and data collection; the presence of higher measurement costs compared with other indicators. The same approach is valid for the following tables on the 2014-2020 common output indicators.

Table 8 MA consultation - Interviewees answering 'yes' and OPs consulted

Indicator	Coverage of the type of intervention	Difficult definition	Difficult data collection	Higher measurement cost	No. of OPs consulted
CO01	91%	10%	27%	15%	56
CO02	92%	3%	24%	16%	47
CO03	91%	5%	16%	11%	35
CO04	85%	17%	40%	39%	31
CO05	94%	26%	29%	15%	33
CO06	93%	28%	24%	20%	35
CO07	94%	30%	15%	18%	17
CO08	89%	21%	41%	53%	40
CO28	88%	20%	12%	23%	24
CO29	80%	21%	15%	26%	26

Source: Own elaborations of MA consultation.

- *All these indicators ensure a high thematic coverage*.
- *CO01 CO02 and CO03 have the lowest costs*. Common indicators 1 to 5 measure the number of enterprises and according to the EC guidance '*multiple counting needs to be eliminated (i.e. an enterprise receiving grants more than once is still only one enterprise receiving grants). Registering a unique identifier for each enterprise to avoid multiple counting is a good practice*'.
  The main challenges in definition and then data collection of CO01 are the following ones. Firstly, the value of CO01 is not always equal to the sum of CO02, CO03, CO04, CO05, because, for instance, enterprises can receive different types of support. Furthermore, one additional challenge mentioned in the consultation is related to the reporting of values in the Annual Implementation Reports. Table 3A of the report shows values at IP level based on actual achievements and forecasts, while table 3B reports values at programme level on actual achievements for CO01, CO02, CO03, CO04, CO5. The values between the tables can be different.
- *CO28 and CO29 are used but do not provide any information on innovation production* which reduces their usefulness in benchmarking. They cover the process (type of projects and beneficiaries). They encounter difficulties in the definition and costs, without avoiding double counting. For instance, defining a new-to-market product might require a deep knowledge of the market, which is not necessarily available for beneficiaries or MAs.
- *CO04 has higher costs*. For CO04, 'non-financial support' is sometimes difficult to distinguish from financial support.
- Difficulties and higher costs are seen with CO08. First, it is difficult to attribute increased employment to the supported operation. Secondly, monitoring the value after the operation is completed might be challenging, both for collecting data and for ensuring the appropriate quality. Thirdly, the indicator is not seen as an output indicator, being a direct result. Some programmes already use job registers to ensure data availability and quality. In addition, counterfactual evaluations could complete the findings of monitoring activities with estimates of the net effects and durability of new jobs.

2014-2020 programme-specific output indicators

Consultation helped assess programme-specific output indicators. The analysis builds on the same sample as the general consultation, so the number of programme-specific indicators reflects the use and features of programmes selected according to the EU contribution. Annex 8.6 provides further details on the number of programme-specific indicators analysed for each IP. Overall, the analysis builds on 20 programmes using IP 1a and 22 IP 1b.

Across all the IPs, about 80% of programme-specific output indicators measure either outputs or results. The others cover the implementation process and context[30]. This shows that the distinction between direct result indicators and output indicators is not entirely new for MAs.

Moreover, *about 70% of programme-specific output indicators have been introduced due to a lack of appropriate common output indicators*, rather than to specific requirements of national harmonisation, simplification, previous experience and use. This is a strong justification for fine-tuning the 2014-2020 common output indicators, especially for TOs, which are less covered.

The analysis of the sample of programme-specific output indicators is based on assessment criteria illustrated in section 2.

Consultation provided additional indications on programme-specific output indicators. Even if officially classified as such, they have been divided into three groups following the conceptual framework of this study: process, output and direct result indicators.

Investment priority 1a

- *Process indicators* – Indicators measuring the number of supported research institutions are the most popular (29% of the programme-specific output indicators analysed and classified as process indicators). This could be introduced as a process indicator. All the other indicators mainly regard the number of projects and enterprises supported.
- *Output indicators* – Supported research infrastructure is covered by more than 80% of the programme-specific output indicators, by number and square meters.
- *Direct result indicators* – The most popular indicators measure the users of improved research facilities. These indicators could map the increased 'attractiveness' of research facilities after being supported. However, it is very difficult to adopt as a common indicator, because it refers to many different types of users (students, researchers, citizens) and use (consultation, research, training). Programme-specific indicators measure results such as publications and new products / services. Indicators on 'publications' can be easily aggregated from project to programme and EU level, use a comparable and objective measurement unit, however publishing a paper is not a smooth process and needs time. They represent 10% of direct result programme-specific output indicators. Indicators on products /services introduced make up 14% of the total. Another interesting indicator is 'supported Horizon 2020 project applications being evaluated over quality threshold'. This can be easily

[30] The distinction between output, direct result and ancillary (input and process) indicators were decided in the experts' review of programme-specific output indicators used in the consulted programmes.

and objectively assessed and aggregated, even if some years after project completion. However, the indicator was mentioned in only one programme.

Investment priority 1b

- *Process indicators* – The number of projects and enterprises are measured by about 90% of the programme-specific output indicators analysed and classified as process indicators.
- *Output indicators* – 2/3 of the programme-specific output indicators are covered by: infrastructure supported (number and square meters), purchased services or goods (number or financial value), or supported partnerships.
- *Direct result indicators* – Programme-specific indicators measure results such as applications to protect intellectual property, performance of supported enterprise and clusters. The indicators are formulated as follows: 'Number of applications to protect intellectual property in industry', 'Companies starting RDI activity with University and research institutions', 'Number of new cluster members'.

Proposed post-2020 direct results indicators

The consultation interviewed MAs also to identify candidate direct result indicators based on a preliminary list. All the proposed indicators are considered by most interviewees as relevant to their interventions, except 'trademark applications'. According to MAs, indicators on gross employment increase can be based on project reporting, measured at project completion and are feasible because the programmes already have experience with them. However, the indicator on EPO patent applications is considered less feasible. Indicators on supported enterprises introducing an innovation can be based on project reporting or a survey between 1 and 3 years after project completion. For indicators on innovation and exports, the Community Innovation Survey (CIS) (Eurostat, 2014) is suggested as a reference. The indicator 'productivity increase' is considered relevant but challenging to measure and could be replaced by an indicator on turnover.

Table 9 MA consultation on a preliminary list of direct result indicators[31]

Direct result indicators	Relevance	Source of monitoring	Time of monitoring	Already monitored	No. of OPs consulted
Gross employment increase in FTEs of supported enterprises[32]	59%	Project reporting (67%)	Project completion (50%)	73%	22
Gross employment increase in FTEs (of which researchers, people directly involved in R&D activities) of supported units (enterprises, research centres, universities)	64%	Project reporting (75%)	Project completion (60%)	87%	22
Increased European Union trademark applications of supported enterprises	41%	Project reporting (67%)	Project completion (56%)	27%	22
Increased patent applications submitted to the EPO of supported enterprises	50%	Project reporting (69%)	Project completion (58%)	36%	22
Productivity increase of supported enterprises after support[33]	64%	External registers (36%)	1 year after completion (71%)	46%	22
Share of supported enterprises introducing an innovation (new services, products, processes)	68%	Project reporting (68%)	Project completion (54%)	57%	22

Source: Own elaborations of MA consultation.

[31] 'Relevance': percent of interviewed programmes who think the indicator covers the result of the programme interventions; 'Source of monitoring': the preferred source of monitoring; 'Time of monitoring': the preferred timing; 'Already monitored': the percent of interviewed programmes who already use this or a similar indicator; No. of OPs consulted: the number of programmes consulted for each indicator. All these notes apply to all the similar tables in the report.

[32] For the indicator 'Gross employment increase of full time equivalents of supported enterprises' 43% of the MAs said that the measurement should be made 1 year after the project completion.

[33] For the indicator 'Productivity increase of supported enterprises after support' the second preferred option regarding timing is 2-3 years (29%) after the end of the project and the second preferred source is project reporting (29%).

In addition to the list, interview partners suggested the following which are also useful for TO 3:

- Partnerships in international R&D programmes,
- Volume of turnover,
- Volume of exports,
- Number of new researchers from abroad,
- Companies that perform technological innovations over the total number of active companies,
- SME access to the financial market, leverage expected.

3.4. Allocation of planned resources

When analysing the potential for improved and/or new output indicators within TO 1, it is worthwhile looking at activities within OPs. The codes of intervention reported in Annex I of Commission Implementing Regulation (EU) regulation 215/2014 have been used to investigate links with TOs. Table 10 shows the intervention fields of TO 1. ETC programmes and priority axes with more than one TO have not been included.

Table 10 Intervention fields of TO 1, ETC not included[34]

Intervention field	Intervention field code	Share of EU amount for TO 1
Research and innovation processes in SMEs (including voucher schemes, process, design, service and social innovation)	064	19%
Research and innovation infrastructure (public)	058	17%
Technology transfer and university-enterprise cooperation primarily benefiting SMEs	062	12.5%
Research and innovation activities in public research centres and centres of competence including networking	060	12%
Research and innovation processes in large enterprises	002	7%
Investment in infrastructure, capacities and equipment in SMEs directly linked to research and innovation activities	056	7%
Research and innovation activities in private research centres including networking	061	5%
Investment in infrastructure, capacities and equipment in large companies directly linked to research and innovation activities	057	4%
Cluster support and business networks primarily benefiting SMEs	063	4%
Total		88%

Source: DG Regional and Urban Policy, European Commission, SFC 2014-2020[35].

- Most of TO 1 resources are concentrated in a small set of intervention fields and contribute to developing the endogenous potential, investing mainly in research and innovation and also in business development.
- The interventions with the highest relative budget share (more than 10% of EU amount) regard research and innovation processes in SMEs, research and innovation public infrastructure, technology transfer and university-enterprise cooperation, and research and innovation activities in public research centres and centres of competence.
- The intervention fields '*Research and innovation processes in large enterprises*', '*Research and innovation activities in private research centres including networking*', '*Investment in infrastructure, capacities and equipment in SMEs directly linked to research and innovation activities*', '*Cluster support and business networks primarily benefiting SMEs*', '*Investment in infrastructure, capacities and equipment in large companies directly linked to research and innovation activities*' each have a budget share between 4% and 7%.

Overall, the investments in research and innovation infrastructure and activities, enterprise research and innovation investments, networking and cluster building produce the main outputs of TO 1 interventions.

[34] The intervention fields '065 Research and innovation processes, technology transfer and cooperation in enterprises focusing on the low carbon economy and to resilience to climate change', '059 Research and innovation infrastructure (private, including science parks)' and '067 SME business development, support to entrepreneurship and incubation (including support to spin offs and spin outs)' have 2% to 4% of the budget.

[35] https://cohesiondata.ec.europa.eu/EU-Level/ESIF-2014-2020-categorisation-ERDF-ESF-CF/9fpg-67a4 . This reference is valid for all the similar tables in the study.

3.5. Literature review

This paragraph describes findings of the literature review to identify common output and direct result indicators as well as the MA consultation on the introduction of direct result indicators.

Other EC services

Key performance indicators of Horizon 2020 programme are useful to identify candidate indicators.

- The Horizon 2020 programme uses the indicator 'Number of national research infrastructures networked (in the sense of being made accessible to all researchers in Europe and beyond through Union support)'. This indicator can be adapted to ERDF and used as an output indicator. Horizon 2020 defines a research infrastructure facility. A broad definition was already provided in the Concepts and Recommendation Guidance for ERDF and CF indicators (European Commission, 2014a). According to Horizon 2020, 'Research infrastructure includes: major scientific equipment (or sets of instruments); knowledge-based resources such as collections, archives or scientific data; e-infrastructures, such as data and computing systems and communication networks; and any other infrastructure of a unique nature essential to achieve excellence in research and innovation'. Such infrastructure may be single-sited, virtual or distributed.
- Horizon 2020 introduces indicators useful for both TO 1 and TO 3 such as: 'The percentage of private companies (and of SMEs) introducing innovations in the total number of project participants validated as private companies (SMEs)'. This indicator is in line with DG Growth indicators elaborated in the Regional Innovation scoreboard and can be used as direct result indicators (European Commission, 2017a). Moreover, the indicator 'Turnover of company' can be used as a direct result indicator, while 'Number of prototypes, testing (feasibility/ demo) activities, clinical trials' can be a reference for direct result indicators. Moreover, Horizon 2020 defines various levels of TRL (Technological Readiness Level), which might be useful to define the types of outputs and results.

Moreover, the guidance for core outcome indicators for EEA (European Economic Area) and Norway Grants 2014-2021 provides the following interesting examples of direct result indicators[36].

- '02' Number of new products / technologies developed. This indicator is interesting even if its applicability could be hindered by broad definitions of 'product' and 'technology'.
- '03' Number of registered applications for intellectual property protection. This indicator is interesting and could be split into two indicators: patents and trademarks.
- '04' Number of articles submitted to peer reviewed publications. This indicator is an interesting reference because it does not refer to a published article, but a single article submitted for publication in a peer-reviewed journal. If submitted to several journals the article is counted only once.

[36] Core indicators 2014-2021 Guidance document for programmes financed under the EEA and Norway grants (EEA and Norway grants, 2017).

European Investment Bank

The methodological guidance 'Key performance indicators (KPI), key monitoring indicators' of the Steering Board of the European Fund for Strategic Investments (EFSI)' sets out KPI 4 'amount of private finance mobilized', confirming the usefulness of indicators such as CO07 'Private investment of supported enterprises with financial instruments (euro)' (European Investment Bank, 2015).

World Bank indicators

Even if the World Bank project results framework is different from the Cohesion policy framework and the size of projects is similar to programmes, the projects and list of core indicators provide inspiring inputs for the definition of direct result indicators. Two lists of World Bank indicators have been examined: Core sectors indicators and World Bank Group corporate scorecards (World Bank, 2013, 2017). The first list provides a set of indicators for each sector, while the second is structured in three tiers. The first is about the long-term trends and the development context, the second regards client results, the third covers performance. Second tier indicators were considered in this literature review.

The following Core sector indicators could be useful for TO 1 and for TO 3.

- Private capital mobilised,
- Value of new private investments in targeted sectors,
- Value of private co-investment generated,
- Sales growth of firms,
- Firms benefiting from infrastructure improvements.

Moreover, from the list of corporate scorecards, the following indicators regarding industry, trade and services and financial sector are interesting:

- Firms benefiting from private sector initiatives,
- Beneficiaries reached with financial services.

3.6. Candidate indicators for the post-2020 period

The proposed candidate indicators encompass input, process, output and direct result indicators. Input indicators are financial indicators measuring EU, national or total (EU + national) contributions in euros, including the total EU resources invested. As in 2014-2020 period, these indicators can be available as allocation (planned amount), decided amount based on project selection and declared expenditure. Intervention fields detail these indicators.

A. Process indicators

Four groups of process indicators are proposed: for the type of beneficiaries, their characteristics, the form of finance and the number of projects.

- *Type of beneficiaries*, these confirm most of the indicators from 2014-2020 and add new indicators monitoring research institutions and public bodies based on programme-specific output indicators. The list also includes the number of NGOs, which is mainly relevant for other TOs related to inclusive growth, but which can be involved as stakeholders in smart specialisation strategies.
- *Characteristics of beneficiaries* encompasses indicators on the size and type of enterprises.
- Form of finance and type of support. Three indicators are proposed, with a similar approach to the current period. Three indicators are proposed on the *form of finance and type of support* confirming CO02, CO03 and CO04. For CO03 the title has been slightly modified to clarify that the indicator refers to financial instruments.

The table also sets out the expected use of process indicators across TOs. All the indicators cover TO 1, 3, 4 and 6, except for P.11 which is relevant for TOs 1 and 4 and P.16 which can be used in all TOs. Indicators on public authorities might be more appropriate for TOs 1, 4, 5 and 6.

Table 11 Proposed process indicators

Type	Process indicator (measurement unit)	Continuity with 2014-2020	TO (mainly)
Type of beneficiaries	P.1 Enterprises receiving support (number)	Refined (CO01)	1, 3, 4, 6
	P.2 NGOs receiving support (number)	New	1, 3, 4, 6
	P.3 New enterprises receiving support (number)	Existing (CO05)	1, 3, 4, 6
	P.4 Research institutions receiving support (number)	New (based on programme-specific indicators, CO26, which implicitly refers to research institutions)	1, 3, 4, 6
	P.5 Local public authorities (number)	New (based on programme-specific indicator, this information is usually available during programme implementation)	1, 4, 5, 6
	P.6 Sub-national public authorities (number)		1, 4, 5, 6
	P.7 National public authorities (number)		1, 4, 5, 6
Characteristics of	P.8 Micro enterprises receiving support (number)	New (based on programme-specific	1, 3, 4, 6

Type	Process indicator (measurement unit)	Continuity with 2014-2020	TO (mainly)
beneficiaries	P.9 Small enterprises receiving support (number)	indicator, this information is usually available during programme implementation)	1, 3, 4, 6
	P.10 Medium enterprises receiving support (number)		1, 3, 4, 6
	P.11 Large enterprises receiving support (number)		1, 4
	P.12 Social enterprises receiving support (number)	New (programme-specific indicator)	1, 3, 4, 6
Form of finance and type of support	P.13 Enterprises supported with grants (number)	Existing (CO02)	1, 3, 4, 6
	P.14 Enterprises supported with financial instruments (number)	Slightly refined in the title based on CO03	1, 3, 4, 6
	P.15 Enterprises receiving non-financial support	Existing (CO04)	1, 3, 4, 6
Projects	P.16 Number of projects with reference to the IP (e.g. P.16.IPx, P.16.Ipy, etc.)	New (this information is usually available for MAs)	1, 3, 4, 5, 6

Overall, the proposed list of candidate process indicators ensures:

- *continuity*, being mainly maintained and refined indicators, plus indicators already implicitly available in programme monitoring systems (e.g. projects, type of enterprise),
- *high level of replicability across TOs*, ensuring simplification and internal harmonisation of monitoring systems,
- *higher coverage* in measuring the type and characteristics of beneficiaries, form of finance and type of support, plus the type of projects.

The analysis has taken into account the possibility of introducing an indicator on 'high-growth enterprises', which is an enterprise with average annualised growth of over 10% or 20% or more per year in a three-year period, based on Eurostat statistics. Growth can be measured by the number of employees or by turnover. However, this indicator has not been included in the final proposal of common indicators, because it would require a lot of monitoring activities to collect information on enterprise performance over time. The indicator is suitable for evaluation activities[37].

[37] See for further details Eurostat at http://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:High-growth_enterprise

B. Output indicators

Gaps identified

- 2014-2020 list contains mainly either process or direct result indicators
- IP 1a is less covered.

Key outputs emerging from the analysis

- Equipped/renewed research infrastructure.
- Equipped/renewed business incubators.
- Purchased enterprise equipment, infrastructure and services.
- Networking and clustering as enablers of technological and knowledge transfer.

Proposed output indicators

- New indicators measuring equipped/renewed research infrastructure and business incubators based on the most frequently used programme-specific output indicators. Indicators measuring square meters report on the size of the intervention, while indicators on the number of facilities / incubators show the number of interventions. This information is useful to map the distribution of resources in the programme area. The indicators on research infrastructure are more appropriate for IP 1a, the others for 1b. Harmonisation is ensured by harmonised definition for both research infrastructure and business incubators[38].
- New indicators measuring purchased equipment, infrastructure and services at enterprise level. They are more appropriate for IP 1b than 1a. These indicators, measured in euros, are very close to input indicators and have been used as programme-specific output indicators in some operational programmes. They could collect information on the value of purchases using programme resources. Process indicators counting the number of projects can be associated with these indicators to distinguish if the interventions are related to research and development (TO 1) or SME competitiveness (TO 3). Using process indicators on enterprises supported is also recommended.
- There are two confirmed indicators. One measures the number of enterprises cooperating with research institutions is a proxy for technological and knowledge transfer. The indicator has been widely used in the 2014-2020 period. The use of process indicators for research institutions and enterprises supported is widely recommended to enrich information collected through the output indicator. The other indicator measures the researchers working in improved research infrastructure facilities.

[38] See European Commission (2010), European Court of Auditors (2014) for the definition of business incubators. The Smart Guide to Innovation Based Incubators (IBI). For the definition of research infrastructure see literature review (section 3.5).

Table 12 Proposed output indicators - TO 1

Output indicators (measurement unit)	Continuity with 2014-2020	Intervention field	IP (mainly)
O.1 Number of enterprises cooperating with research institutions	Existing (CO26)	060, 061, 062, 063	ERDF: 1a, 1b.
O.2 Number of researchers working in improved research infrastructure facilities	Existing (CO25)	058, 059	ERDF: 1a
O.3 Renewed / equipped research infrastructure (number)	New, based on programme-specific indicators and on the Horizon 2020 definition of research infrastructure	058, 059	ERDF: 1a
O.4 Nominal value of purchased enterprise infrastructure (euro)	New, based on programme-specific output indicators	02, 056, 057, 064, 065	ERDF: 1b
O.5 Nominal value of purchased enterprise equipment (euro)	New, based on programme-specific output indicators	02, 056, 057, 064, 065	ERDF: 1b
O.6 Nominal value of purchased services supporting incubation, entrepreneurship and start-up (euro)	New, based on programme-specific output indicators	061, 063	ERDF: 1b
O.7 Renewed / equipped business incubators (number)	New, based on programme-specific output indicators and the definition of business incubators of ECA (2014)	067, 072	ERDF: 1b
O.8 Renewed business incubators (square metres)	New, based on programme-specific output indicators and literature review and the definition of business incubators of ECA (2014)	067, 072	ERDF: 1b

The proposed list of output indicators:

- *Ensures continuity*, where possible with the most frequently used indicators CO25 and CO26;
- *Fills the gap of indicators measuring real outputs*, with candidate indicators on the nominal value of the purchased goods and services and with physical indicators based on programme-specific indicators. This was necessary because 2014-2020 indicators either cover process or direct result indicators for TO 1;
- *Proposes a tighter link between input and output indicators*, ensuring that candidate output indicators cover the main intervention fields of TO 1.

C. Direct result indicators

Gaps identified

- 2014-2020 list contains process indicators on the type of innovation, which could be reformulated as direct results.
- IP 1a is less covered.

Key direct results emerging from the analysis

- Private investments matching public support.
- Performance of beneficiaries in terms of innovation.
- Jobs created.
- Increased research capacity.

Proposed direct result indicators

- Confirmed indicators measuring private investments matching public support have been widely used as common output indicators. Combining with process indicators counting the number of projects shows if the investments are related to research and development (TO 1) or SME competitiveness (TO 3). Using process indicators for the type of beneficiary (e.g. enterprise) and the type of support is also recommended. The indicators are more appropriate for IP 1b and can be combined with any of the common output indicators. These indicators can be measured at project completion and are highly feasible.
- Confirmed indicators on jobs created, measuring employment increase in supported enterprises and new researchers in supported entities can be used for both IPs. Their feasibility is medium. In spite of previous experience, using project reporting as a source and the fact they can be measured at project completion, counting FTEs has not been always easy for MAs.
- Refined and new indicators measuring innovation performance of beneficiaries. These indicators measure the SMEs introducing process and product innovations after the supported operation and patent applications submitted to European Patent Office (EPO). The indicators can be suitable for both IPs. Indicators on innovation introduced can be measured one year after project completion and can be based on external source or project reporting. Their feasibility is medium. Indicators on patent applications at project completion can be based on project reporting. Their feasibility is high because it is based on project reporting and / or European Patent Office standards and applications.
- New indicators measuring improved research capacity are suitable in particular for IP 1a, but also for 1b. They measure prototype testing activities, clinical trials and articles submitted at project completion. Monitoring practices other than ERDF programmes can support MAs as references. Their feasibility is high.

Table 13 Proposed direct result indicators - TO 1

Direct result indicators (measurement unit)	Continuity	Intervention field (mainly)	IP (mainly)	Feasibility
D.1 Private investment matching public support to enterprises (grants) (euro)	Existing (CO06)	02, 056, 057, 064, 065	ERDF: 1a, 1b	High
D.2 Private investment matching public support to enterprises (financial instruments) (euro)	Existing (CO07)	02, 056, 057, 064, 065	ERDF: 1a, 1b	High
D.3 Number of articles submitted to peer-review due to the supported operations (number)	New, based on programme-specific output indicators and literature review (Horizon 2020, EEA and Norway grants (2017))	058, 060, 061,	ERDF: 1a, 1b	High
D.4 Employment increase in supported enterprises (FTEs)	Existing (CO08)	02, 056, 057, 060, 061, 063, 064, 065	ERDF: 1b	Medium
D.5 Number of new researchers in supported entities (FTEs)	Existing (CO24)	058, 060, 061,	ERDF: 1a, 1b	Medium
D.6 SMEs introducing process innovation after the supported operations (number)	Refined CO28 and CO29, based on programme-specific output indicators and literature review (Horizon2020, COSME)	056, 060, 061, 063, 064, 065	ERDF: 1a, 1b	Medium
D.7 SMEs introducing product innovations after the supported operations (number)	Refined CO28 and CO29, based on programme-specific output indicators and literature review (Horizon2020, COSME)	056, 060, 061, 063, 064, 065	ERDF: 1a, 1b	Medium
D.8 Patent applications submitted to EPO by supported large enterprises (number)	New, based on programme-specific output indicators and literature review (COSME, Horizon 2020, EEA and Norway grants (2017)	02, 056, 057, 060, 061, 063, 064, 065	ERDF: 1a, 1b	High
D.9 Patent applications submitted to EPO by supported SMEs (number)		056, 060, 061, 063, 064, 065	ERDF: 1a, 1b	High
D.10 Number of prototypes, testing (feasibility/ demo) activities, clinical trials (number)	New, based on literature review (Horizon 2020, COSME)	02, 056, 057, 060, 061, 063, 064, 065	ERDF: 1a, 1b	High

Note: 'red dots' indicate low feasibility, 'orange dots' medium feasibility, 'green dots' high feasibility

Overall, the proposed list of candidate direct result indicators:

- *Ensures continuity*, where possible with the most frequently used indicators CO06, CO07, CO08, CO24, CO27, clarifying that they are not output indicators. For D.4, it is strongly recommended to use, where possible, job registers to double check project reporting to ensure the appropriate accuracy of data
- *Fills the gap of indicators measuring direct results related to beneficiary performance in innovation*;
- *Refines CO28 and CO29 to measure real achievements* instead of process-related information and to focus on process and product innovation instead of new-to-firm and new-to-market products which might be difficult to establish due to market fluctuations;
- *Is monitored through project reporting* for all the indicators measured at project completion (D.1 – D.5, and D.8-D.10) and *ad hoc surveys* (or additional reporting sources) for D.6 and D.7 on innovation;
- *Ensures a high level of replicability of these indicators in other TOs (notably TO 3),* with potential simplification and internal harmonisation of monitoring systems;
- *Provides indicators measuring the gross results and not the net effect.* Evaluations could disentangle external factors, and, for instance, measure net increased private investments, as well as net jobs created.

Additional indicators on increased trademark applications, users of research infrastructure, turnover, value added, and productivity have been considered. The first has not been included in the final list of common indicators because the MAs considered its relevance limited. The indicator measuring users of improved research infrastructure could help map the increased 'attractiveness' of research infrastructure facilities after being supported. However, it is very difficult to adopt as a common indicator, because it refers to many types of users (students, researchers, citizens) and use (consultation, research, training). Programme-specific indicators could be more appropriate.
The other three have been excluded for low feasibility and difficultly of attributing change to project implementation.

4. CANDIDATE POST-2020 TO 3 COMMON INDICATORS

4.1. Budget allocation and investment priorities

TO 3 supports SME competitiveness. According to EC Cohesion data[39], the budget planned for TO 3 is around 95 billion euro, of which 52% is covered by ERDF (national and EU contributions), 44.2% by EAFRD (national and EU contributions) and 3.8% by EMFF. Of the 49.6 billion euro covered by ERDF programmes, 15.8 billion is national and 33.8 billion euro the EU amount, respectively 32% and 68%. Total (EU and national) ERDF allocated to TO 3 is 18% of the fund budget.

TO 3 Enhancing the competitiveness of SMEs foresees the following investment priorities, exclusively relevant for ERDF:

- IP 3a promoting entrepreneurship, in particular by facilitating the economic exploitation of new ideas and fostering the creation of new firms, including through business incubators;
- IP 3b developing and implementing new business models for SMEs, in particular for internationalisation;
- IP 3c supporting the creation and extension of advanced capacities for product and service development;
- IP 3d supporting the capacity of SMEs to grow in regional, national and international markets, and to engage in innovation processes.

[39] Data downloaded 4 April 2018 from the open cohesion data platform.

4.2. Gap analysis

At IP level 2014-2020 common output indicators are used significantly more than programme-specific indicators for TO 3.

Table 14 Use of output indicators – TO 3 (ETC not included)

IP	Programme-specific	Common	Total	Share common / total
3a	142	664	806	82%
3b	60	241	301	80%
3c	25	385	410	94%
3d	129	622	751	83%
Total	356	1912	2268	84%

Source: DG Regional and Urban Policy, European Commission, SFC 2014-2020.

The 2014-2020 common output indicators are used to measure all IPs. They are 94% of the indicators in IP 3c and at least 80% of the indicators in the other IPs. Programme-specific output indicators are used far less for TO 3 than for TO 1.

Indicators are used to very different degrees at IP level, but similarly across each IP.

Table 15 Focus on common output indicators – TO 3 (ETC not included)

Common output indicator	3a	3b	3c	3d	Total
CO01	139	63	77	136	415
CO02	90	52	69	87	298
CO03	63	12	44	89	208
CO04	68	19	11	63	161
CO05	104	8	13	40	165
CO06	36	33	40	43	152
CO07	40	5	23	56	124
CO08	102	30	50	86	268
CO09	2	1		2	5
CO22		1	1		2
CO26	1				1
CO27	2			2	4
CO28	5	10	22	6	43
CO29	10	7	35	11	63
CO37	2			1	3
Total	664	241	385	622	1912

Source: DG Regional and Urban Policy, European Commission, SFC 2014-2020.

- The use of indicators is even across IPs. The most commonly used indicators measure the number of companies supported (CO01, CO02, CO03, CO04, CO05). Of the eight most commonly used indicators, only two measure a direct result, namely CO06 and CO08.
- CO28 and CO29 measure the number of enterprises supported for innovation.
- The remaining indicators are used to a much lesser extent, and much less often.

Investment priority 3a

- CO01, CO02, CO03, CO04 and CO05 measure the process of implementation and cover types of beneficiaries and forms of finance. CO05 is very used in IP3a, being the IP related to entrepreneurship.
- CO06, CO07, CO08 are common indicators which measure direct results, regarding private investments and employment increase.

Investment priority 3b

- CO01, CO02, CO03, CO04 and CO05 measure the process of implementation and cover types of beneficiaries and forms of finance.
- CO06, CO07, CO08 are common indicators which measure direct results, for private investment and employment increase.
- CO28 relates to innovation implementation.

Investment priority 3c

- CO01, CO02, CO03, CO04 and CO05 measure the process of implementation and cover types of beneficiaries and forms of finance.
- CO06, CO07, CO08 are common indicators which measure direct results for private investment, employment increase and innovation.
- CO28 and CO29 regard innovation implementation.

Investment priority 3d

- CO01, CO02, CO03, CO04 and CO05 measure implementation and cover types of beneficiaries and forms of finance.
- CO06, CO07, CO08 are common indicators which measure direct results for private investment, employment increase and innovation.
- CO28 and CO29 measure innovation implementation.

4.3. Consultation findings

2014-2020 common indicators

Findings from the MA consultation on the challenges of using common output indicators are similar to those for TO 1.

2014-2020 programme-specific output indicators

Consultation provided additional indications on programme-specific output indicators. Even if officially classified as programme-specific output indicators, they have been divided into output and direct result indicators following the conceptual framework in this study. The analysis builds on a sample of 15 programmes using IP 3a, 6 using IP 3b, 6 for IP 3c and 12 for IP 3d. Annex 8.6 contains the number of programme-specific indicators for each IP analysed in the consultation.

Investment priority 3a

- Output indicators - 'Number of business infrastructure facilities supported' is the most popular indicator (30% of programme-specific output indicators), measured either in number or in square meters.
- Direct results – Over 50% of programme-specific indicators regard the improved performance of supported enterprises. Examples include: 'Number of enterprises assisted through SME advisory centres', 'Number of newly created SMEs established by persons from disadvantaged social groups', 'Companies that start new business as a consequence of the support', 'Number of innovations introduced'.

Investment priority 3b

- Output indicators – All the indicators measure the business facilities and platforms supported.
- Direct results – Programme-specific indicators measure results regarding performance of beneficiaries such as 'Expected job creation', 'Expected revenue creation', 'SMEs' net turnover from sales in foreign markets'.

Investment priority 3c

- Output indicators – About half of the indicators measure 'support infrastructure facilities' in square metres and number.
- Direct results – Programme-specific indicators measure results related to enterprise productivity and jobs created (detailing per type of enterprise CO08).

Investment priority 3d

- Output indicators - About half the indicators measure 'support infrastructure facilities' in square metres and number. Programme-specific indicators encompass: 'Number of supported trade and support platforms', 'Applications and information systems realised' 'Assignment of ERDF funds committed to covering a portfolio of New Financial Debt to be implemented by a financial intermediary'.
- Direct results – Programme-specific indicators measure results such as: 'Loans activated', 'Companies in which a significant increase in sales or personnel or exports', 'Jobs created (detailing CO08)'.

Proposed post-2020 direct results indicators submitted for consultation

The main findings were already illustrated in the previous section. In addition to the section on TO 1, consultation assessed two indicators on increased exports and survival rate. Both should be measured at least 1 year after project completion and the survival rate 2-3 years after.

Table 16 MA consultation on a preliminary list of direct result indicators

Direct result indicators	Relevance	Source of monitoring	Time of monitoring	Already monitored	No. of OPs consulted
Share of supported enterprises with increased exports	59%	Survey (33%)	1 year after the end (55%)	67%	22
Survival rate of supported newly born enterprises	59%	External registers (38%)	2-3 years after the end (62%)	46%	22

Source: Own elaboration of MA consultation findings.

4.4. Allocation of planned resources

The table shows the main intervention fields for TO 3 based on the planned EU amount. ETC programmes and priority axes with more than one TO are not included.

Table 17 Intervention fields of TO 3, ETC not included[40]

Intervention field	Intervention field code	TO 3 share of EU amount
Generic productive investment in SMEs	001	39%
SME business development, support for entrepreneurship and incubation (including support for spin offs and spin outs)	067	20%
Advanced support services for SMEs and groups of SMEs (including management, marketing and design services)	066	10%
Investment in infrastructure, capacities and equipment in SMEs directly linked to research and innovation activities	056	6%
Business infrastructure for SMEs (including industrial parks and sites)	072	5%
Total		80%

Source: DG Regional and Urban Policy, European Commission, SFC 2014-2020.

- TO 3 concentrates on a small number of intervention fields. All intervention fields contribute to increasing productive investments and developing endogenous potential, by investing in research and innovation, business development, ICT.
- Most funding (about 70%) focuses on productive investments, business development, entrepreneurship and incubation and advanced support services.

[40] Intervention fields higher than 2% and lower than 4% of the EU amount are not reported in this table. They are: '65-Research and innovation processes, technology transfer and cooperation in enterprises focusing on the low carbon economy and to resilience to climate change', '59-Research and innovation infrastructure (private, including science parks)' and '67-SME business development, support to entrepreneurship and incubation (including support to spin offs and spin outs)'.

- The two intervention fields with less than 10% are 'Investment in infrastructure, capacities and equipment in SMEs directly linked to research and innovation activities' and 'Business infrastructure for SMEs (including industrial parks and sites)'.

4.5. Literature review

Other EC services

Rural development programmes supported by EAFRD use as target indicators 'Jobs created in supported projects' for focus areas 6A and 6B and 'Percentage of rural population benefiting from new or improved services / infrastructure (ICT)' for focus area 6C. The first indicator confirms the validity of CO08 as a potential direct result indicator, while the second indicates the opportunity to include a direct result indicator measuring users or potential users of improved infrastructure even beyond TO 3.

COSME includes performance indicators on business support.

- Process indicator 'Number of start-ups and/or SMEs supported';
- Output indicators 'Number of promotional events organised: networking activities, workshops, match-making activities, events';
- Direct results, such as 'Number of start-ups converted to scale-ups', 'Number of new products/services/solutions developed', 'Number of prototypes/proofs of concept developed'. However, the first is more appropriate for an impact evaluation rather than for monitoring, the second requires a harmonised definition of new product / service / solution and can be a proxy for a direct result indicator. The third replicates the Horizon 2020 indicator. Furthermore, other indicators from COSME[41] can be useful on access to patent protection and cluster internationalisation: 'Number of SMEs that apply for a European Patent with the financial support of this scheme', 'Increase in the percentage of the turnover from international activities, and employment in Europe, of the SMEs having benefited directly and indirectly from the supported actions, compared to a similar group of SMEs not benefiting, as measured through an ex-post survey within two years after the end of the supported action'.

In addition to the section on TO 1, analysis of guidance for core outcome indicators for EEA and Norway Grants 2014-2021 includes an example of direct result indicator '06' measuring the number of beneficiaries of services provided. This indicator has been considered for a direct result indicator measuring users of services provided by business facilities. However, it is not easy to use this as a common indicator because of the broad types of use (information, consultancy, etc.) and users (students, visitors, SMEs etc.).

[41] See GRO/SME/17/B/05, GRO/SME/17/C/12.

ECA Report on business incubators

The 2014 ECA report defines three phases of incubation: pre-incubation, incubation and post-incubation[42]. Pre-incubation services include innovation assessment, business plan preparation and training. Incubation services cover access to finance, coaching, mentoring and training, physical hosting, commercialisation, advanced business planning, etc. Post‑incubation concerns business development, internationalisation, clustering and networking. Networking is defined as a *business activity which involves business people and entrepreneurs establishing personal contacts and arranging business opportunities*. The most frequently used output indicators are 'square metres of office space built' and 'number of printers installed'. Indicators on performance include the number of business plans created with incubator support, the number of start-ups incubated, the number of jobs created. Other indicators measuring the number of tenants seem more appropriate either as process indicators or for TO 8.

Ex-post evaluation of SMEs development

The ex-post evaluation of the Cohesion Policy programmes 'Support to SMEs – Increasing Research and Innovation in SMEs and SME Development', identifies the main types of theory of change, supported operations and results of ERDF programmes in the 2007-2013 period[43].

ERDF programmes have been designed to cover two types of theory of change.

1. To promote the resilience of regional and national development against the economic crisis.
2. To support a selective and ambitious strategy based on a small set of sectors and technological paths.

The definition of the theory of change was formalised in the 2014-2020 period with the smart specialisation strategy. This strategy builds on the principle that *one size does not fit all*, i.e. each region can find and play its own role in global competition[44]. Smart specialisation strategies usually promote at least one of the following processes: transition from an existing industrial specialisation to a new one, technological modernisation of an existing industry, diversification, radical foundation of a new domain[45].

Based on a deep analysis of case studies and expenditure, the ex-post evaluation identified the following types of interventions:

- Support for R&D projects,
- Access and diffusion of ICT, knowledge and technology transfer,
- Business creation and development, creation of innovative companies,
- Internationalisation and visibility,
- Access to business infrastructure and related services,
- Access to enterprise finance,
- Eco-innovation, technological or non-technological innovation,

[42] European Court of Auditors (2014). See also European Commission (2010).

[43] European Commission (2016b, c, d, e).

[44] ESPON (2013).

[45] European Commission (2012).

- Networking and support for improving capacities.

The main types of results can be clustered in four groups.

- Labour market - Creation and safeguard of jobs and improvement in quality of work.
- Capacity building - Increased human capital and managerial organisation, stronger entrepreneurship and equity structure.
- Private investments – Higher fixed capital, R&D and innovation level, ICT.
- Business growth - Higher turnover, exports, profitability and probability of survival in global markets.

World Bank indicators

Similarly to TO 1, the following World Bank indicators could be useful for TO 3.

- Private capital mobilised,
- New private investment in targeted sectors,
- Private co-investment generated,
- Sales growth of beneficiary firms,
- Firms benefiting from infrastructure improvements,
- Firms benefiting from private sector initiatives,
- Beneficiaries reached with financial services.

4.6. Candidate indicators for the post-2020 period

The proposed candidates encompass input, process, output and direct result indicators, with the same input indicators as TO 1.

A. Process indicators

Four groups of process indicators are proposed: for the type of beneficiaries, their characteristics, the form of finance and the number of projects.

Candidate indicators measuring the characteristics of beneficiaries are based on the TO 1 list except for 'Large enterprises receiving support (number)' and indicators on public authorities which are not applicable to TO 3, that exclusively invests in SME development.

Indicators on the *form of finance and type of support* are based on the TO 1 list and four *project-based* indicators are proposed, one for each IP.

The list of candidate process indicators ensures:

- *continuity*, including maintained and refined indicators, and indicators which are already implicitly available in the programme monitoring systems (e.g. projects, type of enterprise),
- *replicates most TO 1 indicators*.

B. Output indicators

Main gap identified: 2014-2020 list contains mainly process or direct result indicators

Key outputs: similar to TO 1 but with a focus on SME competitiveness. This means these indicators can be formulated in the same way but refer to different intervention fields.

Proposed output indicators: These are a sub-group of TO 1 output indicators: O.1, O.4, O.5, O.6, O.7, O.8. The output indicators could be used for monitoring all IPs under TO 3. However, O.6, O.7 and O.8 are specifically relevant for IP 3a.

C. Direct result indicators

Gaps identified

- 2014-2020 list contains process indicators on the type of innovation introduced, which might be reformulated as direct results.

Key direct results

- Private investments matching public support.
- Performance of beneficiaries in terms of innovation.
- Jobs created.
- Survival of supported new firms.

Proposed direct result indicators

- The same indicators as TO 1 are proposed to measure private investments matching public support, employment increase in supported enterprises, product and process innovations.
- A new indicator is proposed specifically for IP 3a, measuring the survival rate of supported new firms. The feasibility is medium, because it is a new indicator using external sources (e.g. registers). It is measured three years after project completion and regards enterprises which did not exist three years before the project. Harmonisation on the definition is ensured by Eurostat standards.

Other indicators on increased exports, in particular for 3b and 3d have been considered and then excluded because they are difficult to directly attribute to the projects and seem more suitable for evaluation rather than for monitoring.

Table 18 Additional proposed direct result indicators – TO 3

Indicator (measurement unit)	Continuity with 2014-2020	Intervention field	IP (mainly)	Feasibility
D.11 Survival rate of supported new firms (%)	New, based on literature review, harmonisation with Eurostat	01, 066, 067	ERDF: 3a	Medium 

Note: the 'orange dot' indicates medium feasibility. The feasibility of the other indicators for TO 3 are illustrated in TO 1 and the fiches.

5. CANDIDATE POST-2020 TO 4 COMMON INDICATORS

5.1. Budget allocation and investment priorities

TO 4 supports transition to a low-carbon economy. This objective is driven first and foremost by the climate agenda, with its aim to limit negative consequences from anthropogenic greenhouse gases. The scope is primarily focused on a shift which requires both technological changes (reduced net emissions from technical infrastructure) and behavioural changes (energy savings, changes in use of mobility services, etc.) supported by new technologies and solutions. In this framework, the Cohesion Fund has a strong focus on investment with environmental benefits, including sustainable development, energy investment, and TEN-T. ERDF has a broader thematic coverage. According to EC Cohesion data[46], the budget planned for TO 4 is around 63.8 billion euro, of which 72.8% is covered by ERDF (national and EU contributions), 15.3% by CF (national and EU contributions), 11.6% by EAFRD (national and EU contributions), and 0.3% by EMFF.

Of the 9.7 billion euro covered by CF programmes, 8 billion is the EU amount and 1.7 billion euro is national, respectively 82% and 18%. The total EU and national amounts allocated to TO 4 are 13% of the CF budget.

The amount of ERDF programmes is 46.4 billion euro, of which 31.9 billion is the EU amount and 14.5 billion euro is national, respectively 69% and 31%. The total EU and national amounts allocated to TO 4 are 17% of the ERDF budget.

TO 4 is split into the following investment priorities of ERDF and CF.

Table 19 ERDF and CF investment priorities – TO 4

ERDF	CF	Investment priorities
IP4a	IP4i	Promoting the production and distribution of energy derived from renewable sources
IP4b	IP4ii	Promoting energy efficiency and renewable energy use in enterprises
IP4c	IP4iii	Supporting energy efficiency, smart energy management and renewable energy use in public infrastructure, including in public buildings, and in the housing sector
IP4d	IP4iv	Developing and implementing smart distribution systems that operate at low and medium voltage levels
IP4e	IP4v	Promoting low-carbon strategies for all types of territories, in particular for urban areas, including the promotion of sustainable multimodal urban mobility and mitigation-relevant adaptation measures
IP4f	/	Promoting research and innovation in, and adoption of, low-carbon technologies
IP4g	IP4vi	Promoting the use of high-efficiency co-generation of heat and power based on useful heat demand

Source: ERDF (EU regulation 1301/2013) and CF regulation (EU regulation 1300/2013).

5.2. Gap analysis

Use of 2014-2020 common output indicators for TO 4 varies significantly at IP level.

[46] Data downloaded 4 April 2018 from the open cohesion data platform.

Table 20 Use of output indicators – TO 4 (ETC not included)

	Common			Programme-specific			Share common / total		
IP	CF	ERDF	CF + ERDF	CF	ERDF	CF+ERDF	CF	ERDF	CF and ERDF
4a		173	173		73	73		70%	
4b		297	297		97	97		75%	
4c		406	406		183	183		69%	
4d		16	16		9	9		64%	
4e		103	103		353	353		23%	
4f		77	77		46	46		63%	
4g		23	23		21	21		52%	
4i	12		12	9		9	57%		
4ii	4		4	4		4	50%		
4iii	20		20	22		22	48%		
4iv	4		4	2		2	67%		
4v	4		4	14		14	22%		
4vi	2		2	5		5	29%		
Total	46	1095	1141	56	782	838	45%	58%	58%

Source: DG Regional and Urban Policy, European Commission, SFC 2014-2020.

- 2014-2020 common output indicators are more frequently used for measuring ERDF than CF interventions.
- IP 4iv, IP 4i, IP 4a and IP 4b are the investment priorities best covered by common output indicators.
- IP 4v and IP 4e covering sustainable urban mobility use common output indicators the least to measure outputs of operations.

Table 21 shows the common output indicators used under TO 4, detailing the CF and ERDF investment priorities. Common output indicators are first described in a general overview and then at the level of each IP.

Table 21 Focus on common output indicators– TO 4 (ETC not included)

Common output indicator	4a	4b	4c	4d	4e	4f	4g	4i	4ii	4iii	4iv	4v	4vi	Total
CO01	17	87	1	1	3	15	7							131
CO02	7	49	1	1	1	9	2							70
CO03	7	27	1			2	1							38
CO04	2	10				5								17
CO05	1	4			1	2								8
CO06	2	12	1	1		6	1							23
CO07	1	2	1			2	1							7
CO08	5	3				3								11
CO11					1									1
CO12					4									4
CO14					2									2
CO15					16							3		19
CO24						3								3
CO26	1					5								6
CO27	1	1				4								6
CO28	1	1				5								7
CO29	3	4				3								10
CO30	66	31	34		1	3	3	6	2	3			1	150
CO31			99		1					5				105
CO32			117		5					5				127
CO33	2	1	1	13							4			21
CO34	56	65	143		55	10	8	6	2	7		1	1	354
CO37	1		6		7									14
CO38					5									5
CO39			1											1
CO40					1									1
Total	173	297	406	16	103	77	23	12	4	20	4	4	2	1141

Source: DG Regional and Urban Policy, European Commission, SFC 2014-2020.

- For ERDF investment priorities, the three most frequently used indicators are: CO30 'Additional capacity of renewable energy production', CO34 'Estimated annual decrease of GHG' and CO01 'Number of enterprises receiving support'. For CF investment priorities, CO30 and CO34 are the two most frequently used.
- Almost all common output indicators measuring CF interventions concern the energy sector and climate change. These include CO30, CO34 as well as CO31 'Number of households with improved energy consumption classification', CO32 'Decrease of annual primary energy consumption of public buildings' and CO33 'Number of additional energy users connected to smart grids'. All these indicators, even if included in the 2014-2020 common output indicators, measure direct results of the interventions. They report on the users, reduced emissions and reduced primary energy consumption. The only indicator not directly related to energy and climate change is a physical output indicator CO15 'Total length of new or improved tram and metro lines'.
- Common output indicators for ERDF interventions are more mixed. Some are used more than ten times including:
  - Process indicators from CO01 to CO04, measuring enterprises and forms of finance;
  - Indicators measuring direct results such as CO06 'Private investment matching public support to enterprises' and CO08 'Employment increase in supported enterprises';
  - Indicators measuring direct results in the energy sector and climate change;
  - Indicators on urban development such as CO37 'Population living in areas with integrated urban development strategies' and CO15.

Investment priority 4a

2014-2020 common output indicators focus on implementation (measuring supported enterprises and the form of finance), results and sometimes outputs.

- CO01, CO02, CO03, CO04 and CO05 measure implementation and cover various type of forms of finance.
- CO26 and CO37 measure outputs.
- CO06, CO07, CO08, CO27, CO28, CO29 cover private investments, employment and innovation. CO30, CO33, CO34 measure results in the energy sector.

Investment priority 4b

2014-2020 common output indicators cover implementation (measuring supported enterprises and the form of finance) and results, without measuring real output.

- CO01, CO02, CO03, CO04 and CO05 measure implementation and cover various forms of finance.
- CO06, CO07, CO08, CO27, CO28, CO29 cover private investments, employment increase and innovation. Other common indicators measure results in the energy sector (CO30, CO33, CO34).

Investment priority 4c

2014-2020 common output indicators focus mainly on results, in a few cases on implementation (measuring supported enterprises and the form of finance) and outputs.

- CO01, CO02, CO03 sometimes measure the process of implementation and cover various forms of finance.

- CO37 and CO39 measure outputs in urban areas.
- CO06 and CO07 cover private investment, while indicators on employment increase and innovation have not been selected. Other common indicators measure results in the energy sector (CO30, CO31, CO32, CO33, CO34).

Investment priority 4d

2014-2020 common output indicators focus exclusively on results and implementation, without measuring outputs.

- CO01, CO02 in a few cases to measure implementation and cover various forms of finance. Financial instruments have not been selected as support under IP4d.
- CO06 covers private investment, and CO33 the energy sector measuring the 'Number of additional energy users connected to smart grids'.

Investment priority 4e

2014-2020 common output indicators focus mainly on outputs and results rather than on implementation (measuring supported enterprises and the form of finance).

- CO01, CO02, and CO05 measure implementation and cover various forms of finance.
- CO11, CO12, CO14, CO15, CO38, CO40 measure outputs. The most frequently used cover urban transport and urban space.
- Indicators for results regard the energy sector without covering private investment, employment increase or innovation (CO30, CO31, CO32, CO34, CO3, CO34). Moreover, CO37 covers the population living in areas with integrated urban development strategies. This is between an output and a result indicator.

Investment priority 4f

This investment priority has many common output indicators covering mainly implementation (measuring supported enterprises and the form of finance) and results.

- CO01, CO02, CO03, CO04 and CO05 measure implementation and cover various forms of finance.
- CO26 measure an output.
- CO06, CO07, CO08, CO24 CO27, CO28, CO29 are common indicators covering private investments, employment increase and innovation. Other common indicators measure results in the energy sector (CO30, CO34).

Investment priority 4g

2014-2020 common output indicators focus on results and implementation (measuring supported enterprises and the form of finance).

- CO01, CO02, CO03 in a few cases to measure implementation and cover various forms of finance.
- CO06 and CO07 regard private investment, while indicators on employment increase and innovation have not been selected. Other common indicators measure results in the energy sector (CO30, CO34).

CF investment priorities

- 2014-2020 common output indicators focus mainly on results and only for 4e on output, without measuring implementation (supported enterprises and the form of finance). This shows the limited capacity of 2014-2020 indicators to cover output from CF interventions.
- Some ERDF indicators are used in CF investment priorities:
    - For investment priorities 4i, 4ii, 4vi, these are CO30, CO34,
    - For investment priority 4iii, CO30, CO31, CO32, CO34,
    - For investment priority 4iv, CO33,
    - The two indicators of investment priority 4v are CO15 measuring a real output and CO33 measuring the users of smart grids.

5.3. Consultation findings

2014-2020 common indicators

As illustrated in section 4, MA consultation helped identify potential issues with current TO 4 indicators. The following table shows the percentage of consulted MAs saying respectively in the columns (from left to right) that:

- the indicator covers the main type of intervention,
- the definition of the indicator has been challenging,
- data collection has been difficult,
- measurement costs are higher than for the other indicators.

Table 22 MA consultation - Interviewees answering 'yes' and OPs consulted[47]

	Coverage of the type of intervention	Difficult definition	Difficult data collection	Higher measurement costs	No. of OPs consulted
CO11	100%	0%	0%	0%	2
CO12	76%	13%	0%	0%	15
CO14	90%	15%	0%	0%	15
CO15	67%	0%	0%	0%	13
CO30	90%	8%	24%	27%	28
CO31	88%	20%	12%	25%	24
CO32	88%	20%	30%	33%	28
CO33	82%	10%	33%	20%	11
CO34	82%	30%	39%	39%	41
CO37	86%	0%	18%	18%	17
CO38	90%	32%	5%	5%	16
CO39	78%	8%	0%	0%	18
CO40	92%	9%	5%	9%	10

Source: Own elaboration of MA consultation.

MA consultation highlighted that:

- All the indicators were relevant for most interviewees.
- The best indicators for definition, data collection and (lower) costs are: CO11, CO12, CO14, CO15, CO37, CO38, CO39 and CO40. Alternative indicators on the additional carrying capacity were suggested instead of CO15. Timing of the measurement is an issue in particular for big investments. All these measure outputs[48].
- All 2014-2020 common indicators measuring a result (CO30, CO31, CO32, CO33, CO34) have been more difficult to measure and have higher costs. The main difficulties were the need for specific expertise and resources for analysis at project level, verifying the data at programme level, as well as methodological and regulatory changes at national level.
  - CO30 requires expert support at project level. It measures installed production capacity, not increased energy production. The indicator could be better specified to clarify it does not refer to production but just to installed capacity. Moreover, the indicator can be disaggregated

[47] Responses from MAs regardless of TO and IP.

[48] CO37 as well as CO38, CO39, CO40 are fully analysed in Part II of the study.

by type of renewable energy. However, measuring production might be problematic, as highlighted by the MA consultation, because it requires a lot of effort and seasonal data normalisation.

- CO31 poses challenges of definition and measurement. One of the problems is with the definition of a household. Counting households can be more complicated than an indicator covering improved energy classification based on apartments. Moreover, CO31 is not harmonised with other ESI funds (EAFRD framework), using a similar indicator for focus area 6.c, which measures the population. An indicator measuring the number of buildings/dwellings with improved energy classification has been suggested in particular for the non-residential sector. Finally, measurement requires an *ad hoc* audit after project completion. Alternatively, the consultation has also suggested the use of Eurostat definition of households to clarify the current definition.
- Measurement of CO32 is challenged by several factors. Firstly, data collection, as energy efficiency certificates and audits should be ensured before the project starts and after completion. Also, the target value of the indicator was often interpreted as the amount of annual primary energy consumption of public buildings after the project rather than the difference as a result of the project. The indicator is more a result than an output indicator. This is also confirmed by the name of the indicator referring to 'decrease / increase'. The consultation suggests removing the reference from the title. Moreover, the meaning of public building needs clarification and MAs should require energy certificates before and after project completion. Consumption depends on the season, which could also lead to a serious weakness in the type of information provided.
- CO33 has not been widely used and refers to a result rather than an output. The definition of the indicator does not specify what a smart grid is and what types of users are measured. This could affect comparability of the indicator across countries.
- For CO34, various weaknesses were highlighted by the consultation. It is not easy to ensure a clear causal relationship with projects. In terms of measurement, aggregating values at programme level and across countries is hindered by different approaches for estimating emissions at project level. Moreover, the indicator seems appropriate more as a (direct) result indicator at project level or programme level rather than an output, because many operations and external factors can contribute to its values[49]. The consultation indicates challenges with high costs, different methodologies across countries and unclear links between the indicator and policy fields of intervention. A common EU methodology would ensure comparable values as well as lower costs and burdens.

[49] The methodological fiches in rural development programmes have been considered. They seem a good reference but with limited application due to the specific development sector (See European Evaluation help desk for rural development and European Commission, 2015, European Court of Auditors, 2017d).

2014-2020 programme-specific output indicators

Programme-specific output indicators are of specific interest in IPs where common output indicators are rarely used such as IP4e and IP4v investing in urban areas, and IP4vi and IP4g on the co-generation of heat and power based on heat demand. Consultation provided additional indications on programme-specific output indicators. Even if officially classified as such, they have been divided in three groups following the conceptual framework of this study as process, output and direct result indicators. Findings of the consultation are summarised for all IPs, with examples of process, output and direct result indicators from programme-specific output indicators. The analysis builds on a sample of 9 programmes using IP 4a, 12 IP 4b, 18 IP 4c, 3 IP 4d, 27 IP 4e, 4 IP 4f,6 IP 4g. For CF IPs, the sample covered 4 programmes using IP 4i, 2 using IP 4ii, 6 with IP 4iii, 2 with IP 4iv, 7 with IP 4v and 1 with IP 4vi. Annex 8.6 contains the number of programme-specific indicators for each IP analysed in the consultation.

Investment priority 4a

- *Process indicators* – An example project-based process indicator is 'Number of innovative interventions on energy distribution, steering and storage'.
- *Output indicators* – These include 'Number of units producing electrical energy from renewable energy sources', 'Machinery/systems of small water power stations', 'Additional capacity for the production and distribution of renewable energy for thermal uses', 'Additional capacity for power transmission between electrical systems or between islands'.
- *Direct results* – Programme-specific indicators measure results regarding energy production such as 'Gross primary energy production from less exploited renewable sources (toe /year)'. Indicators on energy production can be considered proxies of direct result indicators. However, a direct result indicator could also measure an intermediate result such as 'installed additional capacity connected to the network and made operational'.

Investment priority 4b

- *Process indicators* – These are formulated as the number of projects and number of enterprises supported.
- *Output indicators* – Programme-specific indicators include: 'usable surface of buildings which underwent thermo-modernisation' and 'number of units of produced electrical energy from renewable energy sources'.
- *Direct results* – Programme-specific indicators measure results regarding performance of beneficiaries such as 'companies with improved energy consumption', 'reduction of the annual primary energy consumption for enterprises' and 'energy generated from renewable sources'.

Investment priority 4c

- *Process indicators* – These are formulated as 'number of projects' and 'towns/institutions reducing street lighting maintenance and energy costs'.
- *Output indicators* – The main indicator measures 'Light points made efficient', 'Number of buildings modernised for energy', 'Length of rehabilitated / extended thermal network', 'Usable surface of buildings which underwent thermo-modernisation'.

- *Direct results* – Programme-specific indicators measure results related to energy consumption and energy generation, as well as emission reductions, such as 'Reduction of the annual primary energy consumption for residential buildings', 'Energy generated from renewable sources', 'Reduction of emissions (PM10)', 'Decrease of electricity consumption for public lighting'. Moreover, an additional programme-specific indicator can be analysed for post-2020 list 'Number of households with reduced energy consumption without changes in energy classification'. This indicator measures the number of households living in dwellings with reduced energy consumption which did not however improve their energy classification. Therefore, the energy consumption is lower, but without changing the energy classification of the dwelling / building.

Investment priority 4d

- *Output indicators* - Programme-specific indicators encompass: 'Linear extension / coverage of the network' measured in kilometres.
- *Direct results* – Programme-specific indicators measure results on installed capacity and annual electricity consumption, i.e. 'Average annual electricity consumption per household (MWh/ household)'.

Investment priority 4e

- *Process indicators* – These encompass 'Number of institutions' and 'Number of projects'.
- *Output indicators* – These concern urban transport. They cover rolling stock (e.g. 'Number of purchased passenger rolling stock in public municipal transport'), low-emission vehicles (e.g. 'Units of low impact buses'), 'Number of installed intelligent transport systems, 'surface subject to intervention', 'The length of cycle paths'.
- *Direct result indicators* - These refer either to reduced emissions or to users and include 'Reduction in carbon emissions in areas with low carbon strategies', 'Gross passenger kilometres on public transport', 'Number of users that have access to or are covered by Smart Transport services' and 'Number of passengers / year benefited by intermodal transport performance'.

Investment priority 4f

- *Process indicators* – The indicators are formulated as 'number of projects'.
- *Output indicators* – An example is 'Number of new methods and technologies for sustainable green urban development'. However, this indicator has a broad definition and is difficult to use as a common indicator.
- *Direct results* – Programme-specific indicators measure results related to energy consumption, savings and enterprise behaviour changes such as 'Estimated annual decrease in energy consumption (GJ)', 'Energy saved (MWh)', 'Companies that bring into marketplace product or material, either new or significantly developed version from previous versions, to promote low carbon'.

Investment priority 4g

- *Output indicators* - Programme-specific indicators include: 'Number of units of produced thermal and electrical energy through cogeneration'.

- *Direct results* – Programme-specific indicators measure 'Annual primary energy savings achieved through high-efficiency cogeneration (Toe)'.

Investment priority 4i

- *Output indicators* - Programme-specific indicators include: 'Newly built / modernised power grids (km)' and 'Reconstructed heating pipeline networks (km)', 'New equipment for biofuel feedstock mobilisation and for biofuel generation and transportation purchased (number)', 'Additional capacity of energy production (MW)'
- *Direct results* – Programme-specific indicators measure 'Reduction of lost heat energy in reconstructed heating pipeline networks(MWh/year)'

Investment priority 4ii

- *Process indicators* – Indicators are formulated as 'number of supported enterprises'.
- *Direct results* – Programme-specific indicators measure results related to energy savings and decreased energy use such as: 'Energy savings among financial beneficiaries (MWH / year)', 'Decrease in usage of final energy (GJ/year)'.

Investment priority 4iii

- *Process indicators* – These are formulated as 'number of energy renovation projects'.
- *Output indicators* - Programme-specific indicators include: 'Number of street lighting points renovated', 'Modernised / renovated heating / thermal networks (km)', 'Total floor area of reconstructed / renovated buildings (square metres)'.
- *Direct results* – Programme-specific indicators measure energy consumption, use and heat generation capacity 'Annual energy consumption in public sector buildings (GWh)', 'Renovated or new heat generation capacity in district heating (MW)', 'Annual amount of biomethane produced and used in transport as a result of intervention (Ktoe)', 'Thermal energy consumers covered by a more reliable and improved heating supply (persons or households)' and 'Reduction of end use of energy in public buildings (GJ/year)'.

Investment priority 4iv

- *Process indicators* – The indicators are formulated as 'number of enterprises supported'.
- *Output indicators* - Programme-specific indicators encompass: 'Number of new and/or renewed transformer substations and/or distribution stations with at least 3 new technical-functional characteristics of a smart electricity grid'.
- *Direct results* – An example indicator measures 'Share of consumers connected to intelligent metering systems'.

Investment priority 4v

- *Process indicators* – Indicators include 'Number of projects'.
- *Output indicators* – Indicators concern urban transport. They cover rolling stock (e.g. 'Number of purchased passenger rolling stock in public municipal transport'), low-emission vehicles (e.g. 'Units of low impact buses'), and others 'Number of Sustainable Urban Mobility Plans in place', 'Number of electric vehicle charging stations with remote control of the charging process'.

- *Direct result indicators* - These refer either to reduced emissions or to users as in IP 4e.

Investment priority 4vi

- *Process indicators*: The indicators are similar to 'Number of enterprises receiving support'.
- *Output indicators*: The indicators are 'Length of newly built or modernised heating network (Km)', 'Number of built or modernised units of produced electrical and thermal energy through cogeneration'.
- *Direct result indicators* – They refer to additional capacity of production of electrical and thermal energy through cogeneration.

Proposed post-2020 direct results indicators submitted for consultation

The indicator 'Increased renewable energy production with the supported operation', according to the consultation, should either focus on capacity (as CO30) or production. Measuring production could be more difficult and subject to external factors (e.g. seasonality)[50]. This indicator is relevant for 54% of the 25 programmes consulted. The appropriate source is project reporting (71%) and the indicator should be measured after the project completion (57%). Moreover 71% of the programmes had experience in monitoring similar indicators.

Interview partners also suggest the following ideas, potentially useful for TO 4:

- Increase of installed capacity to valorise energy from urban waste,
- Reduced Primary Energy consumption with supported operations,
- Production capacity of advanced biofuels,
- Final energy consumption in industry and diverse uses of biomass,
- Final energy consumption (as contemplated in Article 3 Directive 2012/27/EU) in the industrial sector and in the tertiary sector,
- Electricity production capacity with renewable energy,
- Reduction in particulate emission to atmosphere,
- Reduction of gas pollution to atmosphere (SOx, NOx),
- Share of journeys by non-motorised transport and public transport.

5.4. Allocation of planned resources

When analysing the potential for improved and/or new output indicators within TO 4, it is worth looking at activities within the OPs. Table 23 shows the intervention fields of TO 4 planned by CF and ERDF programmes. ETC programmes and priority axes with more than one TO are not included.

[50] See the literature review for the EAFRD experience.

Table 23 Intervention fields of TO 4, ETC not included[51]

Intervention field	Intervention field code	TO 4 share of the EU amount (ERDF+CF)	TO 4 share of ERDF (EU amount)	TO 4 share of CF (EU amount)
Clean urban transport infrastructure and promotion (including equipment and rolling stock)	043	23%	19%	35%
Energy efficiency renovation of public infrastructure, demonstration projects and supporting measures	013	22%	24%	18%
Energy efficiency renovation of existing housing stock, demonstration projects and supporting measures	014	12%	13%	11%
Renewable energy: biomass	011	5%	4%	7%
Energy efficiency and demonstration projects in SMEs and supporting measures	068	5%	7%	//
High efficiency cogeneration and district heating	016	5%	3%	10%
Other renewable energy (including hydroelectric, geothermal and marine energy) and renewable energy integration (including storage, power to gas and renewable hydrogen infrastructure)	012	4%	4%	3%
Renewable energy: solar	010	3%	4%	1%
Support to environmentally friendly production processes and resource efficiency in SMEs	069	3%	5%	//
Intelligent Energy Distribution Systems at medium and low voltage levels (including smart grids and ICT systems)	015	3%	3%	3%
Cycle tracks and footpaths	090	2%	3%	//
Intelligent transport systems (including the introduction of demand management, tolling systems, IT monitoring control and information systems)	044	2%	2%	2%
Total		89%	91%	90%

Source: DG Regional and Urban Policy, European Commission, SFC 2014-2020[52].

[51] '//' indicates values between 0 and 1%. Percentage values are rounded as in all the following tables.

[52] https://cohesiondata.ec.europa.eu/EU-Level/ESIF-2014-2020-categorisation-ERDF-ESF-CF/9fpg-67a4.

- Interventions with more than 10% of the budget are the same in both ERDF and CF. These are: clean urban transport infrastructure and promotion; energy efficiency renovation of public infrastructure, demonstration projects and supporting measures; energy efficiency renovation of existing housing stock, demonstration projects and supporting measures.
- The intervention fields related to innovation and research processes (65, 68, 69) and to production processes in SMEs are not covered by CF. This is due to the scope of the fund and to the fact that ERDF also includes IP 4f, which does not have any correspondence in the CF framework. The only intervention field regarding enterprises covered under the CF framework is 70 'Promotion of energy efficiency in large enterprises'.

Analysis of the most commonly used interventions shows that the main investments regard urban transport, building and energy sectors[53].These are the basis for fine-tuning the current list of common output indicators.

5.5. Literature review

ECA Reports on renewable energy

The European Court of Auditors has published two reports on rural development, the first with a general focus on programming and indicators, and the second specific to renewable energy[54]. These two reports are very useful to provide inputs on renewable energy indicators for TO 4. Under priority 5 of rural development programmes 'Promoting resource efficiency and supporting the shift towards a low carbon and climate resilient economy in agriculture, food and forestry sectors', focus area 5c 'Supply and use of renewable energy' is associated with two indicators:

- Target indicator T.16 'Total investment in renewable energy production',
- Result indicator R.15 'Renewable energy produced from supported projects'.

Moreover, common indicators are proposed at measure level:

- Total public expenditure,
- Total investments,
- Number of actions / operations supported,
- Number of holdings / beneficiaries supported.

While target and result indicators could be used as a reference for direct result indicators, the others can be either input or output indicators. The result indicator on renewable energy produced can be measured directly by evaluators even with different methods. This is a concrete example of the direct involvement of thematic experts such as evaluators for data collection on result indicators. However, thematic experts (e.g. evaluators) must follow the same methodology to ensure data comparability at EU level.

[53] Investments in infrastructure for energy efficiency encompass: energy distribution, electricity storage and transmission, in intervention fields 5 and 15 and covered by ERDF and CF; energy efficiency of existing housing stock, in intervention field 14 and covered by both ERDF and CF; energy efficiency of public infrastructure, in intervention field 13 and supported by both ERDF and CF.

[54] See in the list of references European Court of Auditors 2017c, 2018.

2007-2013 Ex-post evaluation of data collection and quality assessment

The 'Ex-post Evaluation of the ERDF and CF: Data collection and quality assessment, Work Package 0' identifies good practices in monitoring the Core indicator 30 on greenhouse gas reductions in Austria, Germany and France, and highlights that the indicator was mainly used in energy efficiency and renewable energy interventions, but also sustainable transport and waste management[55].

Two main approaches have been used: programme-based (top-down) and project-based (bottom-up). The first builds on programme financial and/or physical data, sector of interventions (e.g. renewable energy, energy saving, sustainable transport and waste management), technology used, equipment, and relies on parallel studies, estimating the emissions by investment sector. Project-based approach which has been more largely used in 2007-2013 period is estimated at operation level for the measurement of the achievements following some methodological schemes such as the ISO 14064 standard (published in 2006) or the Greenhouse Gas Protocol. While calculation can be precise and accurate, it can be unreliable and of limited comparability due to the lack of harmonised standards and methods. The ex-post evaluation identifies three countries with good practices: France, Germany and Austria.

Table 24 Good practices in monitoring greenhouse gas reduction

Good practice	Approach	Sector of investment
France 2007FR162PO005	Programme-based	Renewable energy and energy efficiency
Germany 2007DE162PO008	Project-based	Renewable energy, energy efficiency
Austria All Austrian 2007-2013 ERDF programmes using the indicator on GHG emissions[56]	Project-based	Renewable energy

Source: Own elaborations of European Commission, 2015c.

The French case is based on ADEME guidance (French Agency for Environment and Energy Management), allowing the calculation of GHG emissions generated by economic activities carried out in a specific area and using Bilan-carbone ® assessment method, transforming physical flows into GHG emissions.

The German experience relies on the support of UBA (Umweltbundesamt, Federal Environmental Agency) and is based on the emission balance for renewable energy sources taking into account all emissions produced during the life cycle of energy generation and transport (generated emission). These are compared to the avoided emissions of substituted fossil fuels.

The Austrian case uses the common guidelines published by the intermediate body KPC (Kommunalkredit Public Consulting) and provided to final recipients. CO2-reductions are estimated for each project ex-ante and ex-post based on a quantification of the demand for energy and the related emissions and the use of standard parameters. However, both values are estimated based on standard parameters and not calculated.

[55] European Commission, 2015c.

[56] 2007AT161PO001, 2007AT162PO001, 2007AT162PO002, 2007AT162PO003, 2007AT162PO004, 2007AT162PO006, 2007AT162PO007, 2007AT162PO008.

The CO2MPARE model

The CO2MPARE (CO2 Model for Operational Programme Assessment in EU Regions) model developed by a study promoted by the European Commission has been defined to support decisions of regional operational programmes in terms of CO2 emissions[57]. It estimates the combined carbon impact of all activities that take place under a programme with a programme-based rather than a project-based approach using financial and technical data from users with the possibility of comparing alternative investment options. The application of the model has been tested, for instance, in some regions in Italy, such as Apulia region[58]. The experience of CO2MPARE model can represent an interesting reference to address the two main issues of feasibility for CO34 emerging from the MA consultation regarding high costs of monitoring and risks of low comparability of values across programmes. As a matter of fact, the CO2MPARE model has been defined at EU level and can potentially ensure a common and comparable measurement of the indicator at EU level. Moreover, being based on simple request of common financial and technical information from project beneficiaries, it can reduce the risks of inconsistency and higher costs and time related to the monitoring activities.

World Bank indicators

This section describes the main findings of the literature review based on World Bank indicators. The following Core sector indicators, which are also included in the World Bank corporate scorecards, could be useful for TO 4, encompassing energy and fuel savings, generation capacity and energy users:

- Projected lifetime energy savings (MWh),
- Projected lifetime fuel savings (MJ),
- Projected generation capacity savings (MW),
- Generation Capacity of Hydropower constructed or rehabilitated under the project (MW),
- Generation Capacity of Renewable Energy (other than hydropower) constructed under the project (MW), Generation Capacity of Renewable Energy (other than hydropower) rehabilitated under the project (MW), Generation Capacity of Conventional Generation constructed under the project (MW).

Furthermore, the World Bank corporate scorecard also proposes an indicator measuring 'people provided with new or improved electricity service', which could be useful and inspiring for TO 4 direct result indicators. The only indicator on transportation 'roads constructed or rehabilitated' could be suitable for TO 7 interventions but may partially conflict with the sustainable urban mobility objective of TO 4.

[57] European Commission (2013b).

[58] See Del Ciello et al (2013) for further details.

5.6. Candidate indicators for the post-2020 period

These include input, process, output and direct result indicators. Input indicators are financial indicators measuring EU, national or total (EU + national) contributions in euros, including the total EU resources invested. These indicators can be the same as for 2014-2020 with allocation (planned amount), decided amount based on project selection and declared expenditure. Intervention fields detail these financial indicators.

A. Process indicators

Four groups of process indicators are proposed covering the type of beneficiaries, their characteristics, the form of finance and the number of projects. The detailed list is provided in section 3.6 of the report. The list of candidate process indicators ensures:

- *continuity*, including mainly maintained and refined indicators, and indicators which are already implicitly available in programme monitoring systems (e.g. projects, type of enterprise),
- *replicates most of the TO 1 indicators*.

B. Output indicators

Gaps identified

- The most frequently used indicators refer to implementation (enterprises receiving support) and direct results, in particular energy and climate change.
- IP 4e and 4v on low-carbon strategies are less covered. However, the only indicators from the 2014-2020 common list measuring physical output cover transport.
- Additional indicators are required for low-carbon mobility (e.g. purchased vehicles, lighting points, urban plans, cycling paths, recharging stations) and for the extension of built / renovated networks (e.g. heating network).

Key outputs emerging from the analysis

- Renovated heating network.
- Equipment and vehicles for sustainable mobility.
- Modernised power grids.
- New, renewed, improved transport lines for sustainable mobility.
- Networking and clustering as enablers of technological and knowledge transfer.

Proposed output indicators

- New indicators are proposed to monitor improved thermal / heating networks based on programme-specific output indicators relevant for various IPs in both ERDF and CF.
- New indicators are proposed to monitor IP 4b, 4c and the corresponding IPs in CF. These measure street lighting points renovated, usable surface of buildings under thermo-modernisation and modernised power grids.
- New indicators measure purchased equipment and vehicles for sustainable mobility, such as public recharging points, cycle tracks and footpaths as well as vehicles. One of the two indicators for vehicles (low-carbon vehicles and railway vehicles) should be combined with the indicator on carrying capacity.
- A new indicator is proposed for IP4c, 4d, 4iii, 4iv.

- Confirmed indicators measure the length of transport infrastructure, but the indicator on roads (CO13) is not included in the proposed list because it may not be suitable for low-carbon mobility.
- The existing indicator for additional energy capacity is confirmed for energy investment priorities.
- Indicator O.1, already proposed for TO 1 and TO 3, is also included in the list with reference to IPs 4a and 4f.

Table 25 Proposed output indicators – TO 4

Indicator (measurement unit)	Continuity with 2014-2020	Intervention field	IP (mainly)
O.1 Number of enterprises cooperating with research institutions	Existing (CO26)	09, 010, 011, 012	ERDF: 4a, 4f
O.9 Total length of new railway lines (km)	Existing (CO11)	043, 083	ERDF:4e CF:4v
O.10 Total length of reconstructed or upgraded railway lines (km)	Existing (CO12)	043,083	ERDF:4e CF:4v
O.11 Total length of new or improved environmentally-friendly (including low-noise) and low-carbon transport lines (km)	Revised (CO15)	043, 044, 083	ERDF:4e CF:4v
O.12 Improved heating / thermal network (km)	New, based on programme-specific output indicators	015, 016	ERDF: 4c, 4d, 4g CF: 4iii, 4iv, 4vi
O.13 Number of street lighting points renovated (number)	New, based on programme-specific output indicators	013	ERDF: 4c CF: 4iii
O.14 Usable surface of buildings which underwent thermo-modernisation (square metres)	New, based on programme-specific output indicators	016	ERDF:4b, 4c CF: 4ii, 4iii
O.15 Modernised power grids (km)	New, based on programme-specific output indicators	015	ERDF: 4c, 4d CF: 4iii, 4iv
O.16 Public recharging points for electric vehicles installed (number)	New, based on programme-specific output indicators	043	ERDF:4e CF:4v
O.17 Low-emission public transport vehicles purchased or refitted (number)	New, based on programme-specific output indicators	043, 083	ERDF:4e CF:4v
O.18 Cycle tracks and footpaths (km)	New, based on programme-specific output indicators	090	ERDF:4e
O.19 Purchased railway vehicles	New, based on programme-specific output indicators	043, 083	ERDF:4e CF:4v
O.26 Carrying capacity of low carbon transport vehicles (total	New, based on programme-	043, 083	ERDF:4e CF:4v

Indicator (measurement unit)	Continuity with 2014-2020	Intervention field	IP (mainly)
passengers)	specific output indicators		
O.35 Additional capacity of renewable energy production	Existing (CO30)	09, 010, 011, 012	ERDF: 4a, 4e, 4g CF: 4i, 4v, 4vi

Additional indicators for parking areas and new renewable transport fuel production have been examined and not included in the proposed list because they have not been widely used by MAs and they could further complicate the list of proposed common output indicators.

The proposed list of candidate output indicators:

- *Ensures continuity*, where possible with the most frequently used indicators;
- *Fills the gap of indicators*, in particular for IP 4e/4v;
- *Proposes a tighter link between input and output indicators*, ensuring the candidate output indicators cover the main intervention fields of TO 4.

C. Direct result indicators

Gaps identified

- IP 4e and 4v on low-carbon strategies are less covered.
- An indicator measuring the installed and used energy production capacity is missing.

Key direct results

- Decreased primary energy consumption.
- Increased use of smart grids.
- Used and installed energy capacity.
- Improved energy classification of buildings.
- Increased use of sustainable mobility.
- Increased private investments supporting resource efficiency.

Proposed direct result indicators

- The list of direct result indicators ensures continuity, where possible with the most frequently used indicators and fills the gap of indicators measuring direct results.
- A new indicator is proposed for sustainable urban mobility based on MA consultation and programme-specific indicators. This would measure additional public transport users in the supported area and is related to all the output indicators on IP 4e/4v. The feasibility of this indicator is medium, because it is new and can be measured through external sources (e.g. survey or registers of the public transport manager), one year after project completion.
- A new indicator on additional capacity of renewable energy production installed and connected to the network is based on a refinement of CO30 and is related to the output indicator on additional renewable energy capacity. The indicator can be measured one year after project completion. Feasibility of the indicator is medium because it is likely to be measured one year after project completion based on external sources (e.g. survey to service provider). An indicator on

renewable energy produced has been considered but has not been proposed because its feasibility could be low. The indicator could require more than one year to be measured, need additional expertise and be more appropriate for evaluation activities than monitoring, following the EARDF experience (see literature review).

- Four existing indicators have been confirmed with some refinements, but they are now intended as direct result indicators. For D.21, a common methodology should be applied to all projects, in particular outside the energy sector to ensure comparable data. A common methodology is a necessary pre-condition for this to be a common indicator, otherwise, there is a risk of high costs and low comparability. This indicator has low feasibility. Measurement of the indicator can be improved by capitalising on experiences described in the literature review. The indicator on energy consumption of supported buildings can be easily measured at project completion and shows high feasibility. Compared with CO32 it can be extended to all buildings and refer to final consumption. The indicator on households in supported buildings with improved energy classification refines CO31 shows high feasibility and can be measured at project completion. The definition provides a common reference for households based on Eurostat and should avoid the difficulties of monitoring households with improved energy classifications (based on energy certificates). D.14 (on energy users of smart grids) can be measured one year after project completion once the smart grid is operational. Feasibility of the indicator is medium.
- Common indicators on private investments (D.1, D.2), job creation (D.4) and innovation (D.6, D.7) from TO 1 and TO 3 can be also used in TO 4 if there is a clear contribution to the low-carbon economy. They can be combined with appropriate project-based process indicators indicating a corresponding investment priority that differs from TO 1 and TO 3.

Table 26 Proposed direct result indicators - TO 4

Direct result indicators (measurement unit)	Continuity with 2014-2020	Intervention field	IP (mainly)	Feasibility
D.12 Public transport users (passengers)	New, based on CO37 and on programme-specific indicators	034, 043, 044, 083, 090	ERDF: 4e CF: 4v	Medium
D.13 Annual energy consumption of supported buildings (kWh/year)	Refined based on existing CO32	013	ERDF: 4c CF: 4iii	High
D.14 Energy users connected to smart grids (users)	Refined based on existing CO33	015	ERDF: 4c CF: 4iii	Medium
D.15 Capacity of renewable energy production installed and connected to the network (MW)	New, based on existing (CO30) and on programme-specific output indicators	09, 010, 011, 012	ERDF: 4a, 4e, 4g CF: 4i, 4v, 4vi	Medium
D.16 Households in supported buildings with improved energy classification (number)	Refined (CO31)	014	ERDF: 4c, but also 4b, 4e CF: 4iii, but also 4ii and 4v.	High
D.21 Estimated GHG emissions (tons of CO2 Equivalent)	Refined based on existing CO34	All, in particular 09, 010, 011, 012, 013, 014, 015, 016, 068	All, in particular those related to the energy sector	Low

Note: 'red dots' indicate low feasibility, 'orange dots' medium feasibility, 'green dots' high feasibility.

6. CANDIDATE POST-2020 TO 5 COMMON INDICATORS

6.1. Budget allocation and investment priorities

The management and reduction of risks relating to natural or technological disasters, as well as adaptation to climate change have several important synergies. Some of these are specific such as protection from floods and forest fires. TO 5 promotes climate change adaptation, risk prevention and management. According to the EC Cohesion data[59], the total ESIF budget amounts to 41 billion euro, of which 76.4% is covered by EAFRD, 13.2% by ERDF and 10.4% by CF.

Of the 4.2 billion euro covered by CF, 3.6 billion is the EU amount and 0.6 billion the national amount, 85% and 15% respectively. The total (EU and national amount) allocated to TO 5 is 6% of the CF budget.

Of the 5.4 billion euro covered by ERDF, 3.9 billion is the EU amount and 1.5 billion the national amount, respectively 72% and 28%. The total (EU and national amount) allocated to TO 5 is 2% of the ERDF budget.

TO 5 promoting climate change adaptation, risk prevention and management, has a mirroring structure in ERDF and CF with two investment priorities:

- IP 5a in ERDF (IP 5i in CF) - Supporting investment for adaptation to climate change, including ecosystem-based approaches;
- IP 5b in ERDF (IP 5ii in CF) - Promoting investment to address specific risks, ensuring disaster resilience and developing disaster management systems.

[59] Data downloaded 4 April 2018 from the open cohesion data platform.

6.2. Gap analysis

2014-2020 common output indicators are used less for TO 5 at IP level than for other TOs.

Table 27 Use of output indicators – TO 5 (ETC not included)

IP	Common output	Programme-specific	Total	Common output share [a /(a+b)]
5a	21	23	44	48%
5b	55	102	157	35%
5i	6	16	22	27%
5ii	5	24	29	17%
Total	87	165	252	21%

Source: DG Regional and Urban Policy, European Commission, SFC 2014-2020.

- As with TO 4, the 2014-2020 common output indicators are used more for ERDF than CF interventions.
- Comparing IPs within each fund, common output indicators are more used for IP 5a (ERDF) and IP 5i (CF) than IP 5b/5ii. This can be at least partially explained by the formulation of IP 5b (ERDF) and IP 5ii (CF) which regard interventions addressing specific risks and disasters. These require specific measurement tools and arrangements which can be defined more easily case by case. Therefore, it is challenging to identify common measurements and indicators.

Common output indicators are used to differing degrees in ERDF / CF programmes under TO 5.

Table 28 Focus on common output indicators - TO 5 (ETC not included)

IP	CO20	CO21	CO22	CO23	CO38
5a	14	4	1	1	1
5b	38	11	5	1	
5i	5		1		
5ii	3	2			
ERDF	52	15	6	2	1
CF	8	2	1	0	0
Total	60	17	7	2	1

Source: DG Regional and Urban Policy, European Commission, SFC 2014-2020.

- The most commonly used indicators for both ERDF and CF OPs measure the population benefiting from improved protection from floods (CO20) and forest fires (CO21), and the total surface area of rehabilitated land (CO22). CO20 and CO21 cover the benefits for the population and direct results of the interventions, while CO22 is a physical output indicator.
- ERDF interventions also use two other output indicators measuring tangible outputs: CO23 'Surface area of habitats supported in order to attain a better conservation status' and CO38 'Open space created or rehabilitated in urban areas'.
- There are no substantial differences in the use of common output indicators across the IPs, except for CO38, which has been used only in IP 5a.

6.3. Consultation findings

2014-2020 common indicators

MA consultation provided the following inputs on CO20, CO21 and CO22, which have also been used in other TOs.

Table 29 MA consultation - Interviewees answering 'yes' and OPs consulted [60]

	Coverage of the type of intervention	Difficult definition	Difficult data collection	Higher measurement costs	No. of OPs consulted
CO20	77%	33%	40%	25%	12
CO21	100%	50%	0%	0%	2
CO22	81%	13%	25%	20%	20

Source: Own elaborations of MA consultation.

CO21 and CO21 are considered as potential direct result indicators. However, they may not cover all possible results of TO 5. The main weakness of CO20 and CO21 is that the target population is not clearly defined. A precise and objective definition of the beneficiary population is needed. The same beneficiary population can be in different projects, so duplication should be eliminated. Moreover, the consultation highlights that the indicator does not make any reference to the type of risk management measures. This means that the population exposed to risks can benefit from 'soft' measures (plans, awareness-raising campaigns) and 'hard' measures (barriers, investments). This is to be considered in the aggregation of values and comparison of 'population' across programmes.

Regarding CO22, the indicator has not been considered difficult. However, it refers to 'remediated or regenerated contaminated or derelict land', without defining what contaminated or derelict means. Moreover, the definition could be improved to specify that it refers to the specific area subject to intervention instead of the whole polluted area.

[60] Responses from MAs for indicators also used in IPs beyond TO 5.

2014-2020 programme-specific output indicators

The analysis builds on a sample of 8 programmes using IP 5a and 10 using IP 5b, while in the CF priorities, 5 use IP 5i and 7 use IP 5ii. Annex 8.6 contains the number of programme-specific indicators for each IP analysed in the consultation.

- A lack of common indicators that can appropriately and specifically measure TO 5 interventions is the main reason for introducing programme-specific output indicators.
- Most programme-specific output indicators could be used in the post-2020 framework, because they measure what has been purchased / produced with programme resources. However, the variety of interventions under TO 5 and the lack of international methodological definition standards could make it difficult to use them as post-2020 common indicators.
- Some programme-specific output indicators could be useful as post-2020 common output indicators. The most used are 'New or renewed environmental air monitoring and early warning, hydrological and meteorological observation stations (number)', 'Flood retention area supported (hectares)', 'Extension of the coastal strip intervened to protect people and property (km)', 'equipped units, monitoring stations', 'Buildings under seismic interventions' (number / square meters).

Investment priority 5a

- *Process indicators* – The programme-specific indicators refer to the number of projects.
- *Output indicators* – The programme-specific indicators measuring real outputs refer to 'rescue equipment', 'warning stations', 'length of reconstructed / renovated state drains (km)', 'Number of IPPC and SEVESO sites at risk of flooding', 'Number of buildings at risk of flooding', 'Number of breakwaters for coastal zone protection'.
- *Direct results* – The indicators on direct results measure the population benefiting from measures to prevent catastrophes and restore damaged areas.

Investment priority 5i

- One programme-specific indicator is 'Annual average economic damage caused by adverse hydrological events (targeted by the program)', measured in Million Euro/year. This programme-specific output indicator can be used as a potential direct result indicator. However, it can only be measured if disasters or hydrological events occur.

Investment priority 5b

- *Output indicators* – Programme-specific indicators measuring real outputs refer to 'Number of new devices and equipment of the Integrated Rescue and Emergency Service units', 'Number of new and modernised buildings/facilities for Integrated Rescue and Emergency Service Units', 'Seismic safety interventions', 'Reinforcement interventions for public emergency facilities', 'Protected or regenerated floor surface'.
- *Direct results* – These indicators measure the 'businesses and properties with reduced flood risk' and 'population benefiting from hydrogeological risk'.

Investment priority 5ii

- *Output indicators* – The programme-specific indicators measuring real outputs refer to 'Rescue and emergency vehicles acquired / equipped', 'Centres for increasing the population preparedness for flood response established, reinforced landslide area (square meters)', 'Number of equipped units for emergency situations', 'Length of water streams dealt with in project (km)', 'Number of studies', 'Monitoring stations', 'Extension of the coastal strip covered by interventions to protect people and property (km)', 'volume of water retention (m3)'
- *Direct result indicators* – Another indicator 'average response time to emergency situations' has been used. This indicator could be monitored at national level and for urban and rural areas.

Proposed post-2020 direct results indicators submitted for consultation

The consultation with MAs proposed an indicator 'Improved protection of biodiversity'. However, only 53% (15) considered this indicator relevant for TO 5 either as an output or a direct result indicator. The appropriate source to monitor the indicators is the project reporting (78%) and it should be measured after project completion (88%). Moreover 80% of MAs consulted have experience in monitoring similar indicators.

6.4. Allocation of planned resources

Table 30 shows the intervention fields of TO 5, which were almost 100% of the total expenditure planned by CF and ERDF programmes. As with TO 4, intervention fields from 121 to 123 in Annex I of EU regulation 215/2014 have been excluded because they relate to technical assistance. In addition, ETC programmes and priority axes with more than one TO have not been included. OP interventions are concentrated in a few intervention fields without substantial differences between CF and ERDF. The intervention field with the most TO 5 budget is 'Adaptation to climate change measures and prevention and management of climate related risks e.g. erosion, fires, flooding, storms and drought, including awareness raising, civil protection and disaster management systems and infrastructures'.

Table 30 Intervention fields of TO 5, ETC not included[61]

Intervention field	Intervention field code	Share of the EU amount (ERDF+CF)	Share of ERDF (EU amount)	Share of CF (EU amount)
Adaptation to climate change measures and prevention and management of climate related risks e.g. erosion, fires, flooding, storms and drought, including awareness raising, civil protection and disaster management systems and infrastructures.	87	89 %	85%	94%
Risk prevention and management of non-climate related natural risks (i.e. earthquakes) and risks linked to human activities (e.g. technological accidents), including awareness raising, civil protection and disaster management systems and infrastructures.	88	8%	11%	6%
Protection and enhancement of biodiversity, nature protection and green infrastructure.	85	1%	2.5%	Close to 0%
Total		98%	99%	100%

Source: DG Regional and Urban Policy, European Commission, SFC 2014-2020.

Analysis of funding allotted to interventions highlights that the output indicator should measure the outputs of investments for risk protection measures, encompassing support for climate change adaptation and related risks and support for measures addressing non-climate change risks, and support for natural protection and rehabilitation of land (mainly ERDF).

6.5. Literature review

Other EC services

DG ECHO (European Civil Protection and Humanitarian Aid Operations) defines two types of key indicators: outcome and result indicators. Outcome indicators measured the context dynamics and regard *inter alia*: mortality rate, food consumption, acute malnutrition recovery rate, fatality rate, secure settlements. Key result indicators have been reviewed for the formulation of direct result indicators[62]. Key result indicators encompass various sectors: shelter and settlements, 'wash' (access to hygienic services), mine actions, education, health, food security and livelihood, nutrition, disaster risk reduction / disaster preparedness. For disaster risk reduction / disaster preparedness, the following key result indicators can be inspiring for TO 5 interventions:

[61] Percentage values are rounded as in all the following tables.

[62] The reference is the DG ECHO 'List of Key Result indicators'.

- Number of people participating in interventions that enhance their capacity to face shocks and stresses,
- Number of people reached through Information, Education and Communication on disaster risk reduction,
- Number of people covered by a functional early warning system,
- Number of people covered by early action/contingency plans,
- Number of community small-scale infrastructures and facilities built or protected,
- Number of people whose livelihoods and assets are protected from shocks and stresses.

An interesting source proposing indicators at local level for climate change plans is the Joint Research Center (JRC) publication (2016) 'Covenant of Mayors: Monitoring Indicators'[63]. The report refers to data from the Covenant of Mayors database of signatories with monitoring reports and harmonisation with data from Eurostat at the local level. This report proposes indicators on plans and policy documents which might be interesting for TO 4 and notably TO 5:

- Number of signatories with a submitted baseline Emission Inventory,
- Population of signatories with a submitted Baseline Emission Inventory, Number of signatories with a submitted Monitoring Emission Inventory,
- Population of signatories with a submitted Monitoring Emission Inventory.

World Bank indicators

Core sector and corporate scorecard indicators do not include specific indicators on risks. Other indicators which can be at least partially relevant for TO 5 have been included in the literature review of the following section on TO 6.

[63] Joint Research Center (2016).

6.6. Candidate indicators for the post-2020 period

The proposed candidate indicators encompass input, process, output and direct result indicators. Input indicators are financial indicators measuring EU, national or total (EU + national) contributions in euro, counting the total EU resources invested. These indicators can be the same as for 2014-2020 in the form of allocation (planned amount), decided amount based on project selection and declared expenditure. Intervention fields detail these financial indicators.

A. Process indicators

Details on the process indicators are provided in section 3.6 of the report. Project-based process indicators are formulated as Number of projects of IP 5a/5i and of 5b/5ii.

B. Output indicators

Gaps identified

- The 2014-2020 list of common indicators covers a relatively small share of the total programme output indicators compared with other TOs.
- The most frequently used indicators regard direct result and climate change related risks (IP 5a/5i) rather than IP 5b/5ii.

Key outputs

- Equipment and monitoring stations for emergency situations.
- Rescue and emergency vehicles.
- Specific outputs regarding specific risks, such as flood, earthquakes.

Proposed output indicators

- New indicators are proposed to monitor new or renewed disaster monitoring and warning stations, extension of flood interventions, purchased / equipped rescue and emergency vehicles and buildings benefiting from seismic adaptation and improvement measures.
- Two existing indicators are confirmed. The first measures the rehabilitated land and the slightly refined second measures the surface area of habitats and green infrastructure supported[64].

[64] The concept of green infrastructure is detailed in the indicator fiche.

Table 31 Proposed output indicators – TO 5

Indicator (measurement unit)	Continuity with 2014-2020	Intervention field	IP (mainly)
O.20 Total surface area of rehabilitated land (hectares)	Existing (CO22)	085,087,088	ERDF: 5a, 5b CF: 5i, 5ii
O.21 Area of habitats and green infrastructure supported (hectares)	Existing and partially refined (CO23)	085	ERDF: 5a, 5b CF: 5i, 5ii
O.22 New or renewed disaster monitoring and warning stations (number)	New, based on programme-specific output indicators	087, 088	ERDF: 5a, 5b CF: 5i, 5ii
O.23 Extension of the coastal strip (and river banks and lakeshores) covered by interventions to protect people and properties (km)	New, based on programme-specific output indicators	087, 088	ERDF: 5a, 5b CF: 5i, 5ii
O.24 Purchased / equipped rescue and emergency vehicles (number)	New, based on programme-specific output indicators	087, 088	ERDF: 5a, 5b CF: 5i, 5ii
O.25 Buildings with seismic adaptation and improvement measures (square meters)	Refined CO39 to address seismic adaptation and improvement measures as suggested in MA consultation	088	ERDF: 5b CF: 5ii

C. Direct result indicators

Gaps identified: results regarding extreme climate change events and earthquakes risks have not been covered.

Key direct results: *regard population benefiting from*

- Flood protection measures,
- Fire protection measures,
- Seismic adaptation and improvement measures.

Proposed direct result indicators:

- Two existing indicators are confirmed based on CO20 and CO21. A clarification is proposed to indicate that they are both calculated on the resident population relevant for the projects. The resident population limits the possibility to assess the effects of interventions on seasonal arrivals (tourists) and commuters, however, it is the only stable and comparable information, which is necessary for a common direct result indicator. This should simplify the calculation of indicators at project level and eventually aggregation at programme level making it possible to reduce the problem of double counting if a specific resident population benefits twice from similar projects. Overall, the level and zoning of risks should be consistent with the existing mapping framework decided at the relevant regional / national level. Moreover, as a general indication, the population benefiting from the implementation and approval of risk plans is not counted in the indicator if it does not benefit from concrete (soft or hard) measures of protection. The feasibility is considered 'high' because the proposed modifications address the challenges from 2014-2020 experience.
- A new indicator measures the population benefiting from measures protecting against climate change extreme-events (e.g. heat waves) and is related to the output indicators on green infrastructure. Another new indicator for IP 5b/5ii measures the number of households in supported buildings with seismic adaptation and improvement measures. It can be measured at project completion. It is related to O.25. The feasibility of both indicators is 'medium' because they are new with a limited previous experience of monitoring. The feasibility of both indicators can increase once a common harmonised definition of the related interventions is agreed.

Table 32 Proposed direct result indicators – TO 5

Indicator (measurement unit)	Continuity with 2014-2020	Intervention field	IP (mainly)	Feasibility
D.17 Households in supported buildings with seismic adaptation and improvement measures (number)	New, based on programme-specific indicators and consultation	088	ERDF: 5b CF: 5ii	Medium
D.18 Population benefiting from flood protection measures (number)	Existing (CO20), considering exclusively resident population	087, 088	ERDF: 5a, 5b CF: 5i, 5ii	High
D.19 Population benefiting from forest fire protection measures (number)	Existing (CO21), considering exclusively resident population	087, 088	ERDF: 5a, 5b CF: 5i, 5ii	High
D.20 Population benefiting from climate extreme-events (heat waves) protection measures (number)	New based on CO21 and programme-specific indicators, it measures the resident population	087, 088	ERDF: 5a CF: 5i	Medium

Note: 'red dots' indicate low feasibility, 'orange dots' medium feasibility, 'green dots' high feasibility

Other indicators have been considered but then excluded because of the feasibility: 'average response time to emergency situations' and 'annual average economic damage caused by adverse climate events (targeted by the intervention'). These refer to the actual occurrence of 'emergency situations' and 'adverse climate events' and not just to increased protection.

7. CANDIDATE POST-2020 TO 6 COMMON INDICATORS

7.1. Budget allocation and investment priorities

The thematic coverage of TO 6 is wide as it covers large scale investments in centralised infrastructure, protection of natural and cultural heritage sites as well as urban regeneration, industrial transformation and innovation.

According to EC Cohesion data[65], the total ESIF budget amounts to 86.9 billion euro, of which 44% is covered by EAFRD, 30% by ERDF, 23% by CF, and 3% by EMFF.

Of the 20 billion euro covered by CF, 17 billion is the EU amount and 3 billion the national amount, respectively 85% and 15%. The total (EU and national amount) allocated to TO 6 is 27% of the total CF budget.

Of the 25.8 billion euro covered by ERDF, 19.1 billion is the EU amount and 6.8 billion the national amount, respectively 74% and 26%. Total (EU and national amount) allocated to TO 6 is 9% of the total ERDF budget.

TO 6 covers preserving and protecting the environment and promoting resource efficiency with the following ERDF and CF investment priorities.

Table 33 ERDF and CF investment priorities – TO 6

ERDF	CF	Investment priorities
IP6a	IP6i	Investing in the waste sector to meet the requirements of the Union's environmental acquis and to address needs, identified by the Member States, for investment that goes beyond those requirements
IP6b	IP6ii	Investing in the water sector to meet the requirements of the Union's environmental acquis and to address needs, identified by the Member States for investment that goes beyond those requirements
IP6c	/	Conserving, protecting, promoting and developing natural and cultural heritage
IP6d	IP6iii	Protecting and restoring biodiversity and soil and promoting ecosystem services, including through Natura 2000, and green infrastructure
IP6e	IP6iv	Taking action to improve the urban environment, to revitalise cities, regenerate and decontaminate brownfield sites (including conversion areas), reduce air pollution and promote noise-reduction measures
IP6f	/	Promoting innovative technologies to improve environmental protection and resource efficiency in the waste sector, water sector and with regard to soil, or to reduce air pollution
IP6g	/	Supporting industrial transition towards a resource efficient economy, promoting green growth, eco-innovation and environmental performance management in the public and private sectors

Source: ERDF and CF regulation

[65] Data downloaded 4 April 2018 from the open cohesion data platform.

7.2. Gap analysis

Table 34 shows the use of common output indicators under TO 6 compared with programme-specific output indicators.

Table 34 Use of output indicators – TO 6 (ETC not included)

	Common			Programme-specific			Share common / total		
IP Cd	CF	ERDF	CF + ERDF	CF	ERDF	CF+ERDF	CF	ERDF	CF / ERDF
6a		32	32		56	56		36%	
6b		85	85		59	59		59%	
6c		101	101		186	186		35%	
6d		83	83		104	104		44%	
6e		119	119		60	60		66%	
6f		15	15		2	2		88%	
6g		18	18		8	8		69%	
6i	12		12	28		28	30%		
6ii	27		27	29		29	48%		
6iii	8		8	14		14	36%		
6iv	6		6	16		16	27%		
Total	53	453	506	87	475	562	38%	49%	47%

Source: DG Regional and Urban Policy, European Commission, SFC 2014-2020.

- ERDF interventions use a wider set of common output indicators than CF. In most cases these either measure a physical output or provide information on the direct results of operations.
- IP 6f and 6g which are only in the ERDF regulation are better covered than the others.
- IP 6iv and IP 6e about urban environments have the least common output indicators to measure operations. This is similar to TO 4 (IP4v / IP4e).

Investment priorities 6a and 6b

- O17 'Additional waste recycling capacity' is used mainly in IP 6a, while CO18 'Additional population served by improved water supply', CO19 'Additional population served by improved wastewater treatment for IP 6b.

Investment priorities 6c and 6d

- For ERDF, the most commonly used indicators are CO09 'Sustainable Tourism: Increase in expected number of visits to supported sites of cultural and natural heritage and attractions' exclusively for IP 6c and CO23 'Surface area of habitats supported to attain a better conservation status' mainly for IP 6d. CO09 measures tourism potential (expected value) of the interventions and therefore is similar to a direct result indicator, even if it does not measure an achievement.

Investment priority 6e

- A peculiar situation is with IP 6e, supporting urban investments. The more frequently used indicators are CO22 and those regarding urban development such as CO37, CO38 and CO39.

Investment priorities 6f and 6g

- For both IP 6f and IP 6g, which do not find any corresponding IP in the CF framework, there are two types of indicators as in TO 1 and TO 3. Inter alia, CO01 and CO02 are process indicators measuring beneficiaries and the form of finance, while CO17 'Additional waste recycling capacity' measures outputs of the intervention.

CF Investment priorities 6i and 6ii, 6iii and 6iv

- For CF, the following indicators have been used: CO17 and CO22 'Total surface area of rehabilitated land' for IP6i; CO18 'Additional population served by improved water supply', CO19 'Additional population served by improved wastewater treatment' and CO22 for IP 6ii; CO23 'Surface area of habitats supported in order to attain a better conservation status' for IP 6iii, CO22 and CO 34 'Estimated annual decrease of GHG' for IP 6iv. All of them either indicate a physical output or report on direct results of interventions.

The table provides further details.

Table 35 Focus on common output indicators – TO 6 (ETC not included)

IP	CO 01	CO 02	CO 04	CO 05	CO 09	CO 17	CO 18	CO 19	CO 20	CO 22	CO 23	CO 29	CO 34	CO 37	CO 38	CO 39	CO 40	Total
6a						31		1										32
6b							39	46										85
6c					96						1			1	1	2		101
6d										7	75				1			83
6e									1	31	1		2	17	41	22	4	119
6f	5	4		1		4						1						15
6g	4	5	2			5							2					18
6i						10				2								12
6ii							13	13		1								27
6iii											8							8
6iv										5			1					6
ERDF	9	9	2	1	96	40	39	47	1	38	77	1	4	18	43	24	4	453
CF						10	13	13		8	8		1					53
Total	9	9	2	1	96	50	52	60	1	46	85	1	5	18	43	24	4	506

Source: DG Regional and Urban Policy, European Commission, SFC 2014-2020.

7.3. Consultation findings

2014-2020 common indicators

The analysis focuses on CO09, CO17, CO18. CO09 and CO18 measure results rather than output or process. As in the previous sections, the following table shows the percentage of MAs saying respectively in the columns (from left to right) that:

- the indicator covers the main type of intervention,
- the definition of the indicator has been challenging,
- data collection has been difficult,
- measurement costs are higher than for the other indicators.

The latest column shows the number of programmes consulted.

Table 36 MA consultation - Interviewees answering 'yes' and OPs consulted[66]

Indicator	Coverage of the type of intervention	Difficult definition	Difficult data collection	Higher measurement costs	No. of OPs consulted
CO09	80%	37%	35%	35%	16
CO17	79%	8%	8%	0%	13
CO18	73%	33%	33%	33%	14
CO19	75%	33%	20%	20%	16
CO23	74%	6%	16%	21%	18

Source: Own elaborations of MA consultation.

MA consultation highlighted that:

- All the indicators are relevant for most interviewees.
- The best indicator for these categories is CO17. However, the consultation highlighted that even for CO17 additional capacity is sometimes calculated by beneficiaries as total capacity which makes the value of the indicator wrong. Due to the various size of projects it is difficult to spot this mistake easily just from the reports. Other indicators can be added to measure the waste collection capacity.
- CO09 and CO18 are both costly and difficult to monitor, also they have been considered as direct result indicators rather than proper output indicators.
- CO18 measures the additional population served by improved water supply. This indicator has been considered challenging for the following reasons.
  - It measures a result rather than an output.
  - It refers to the number of persons who were previously not connected or were served by sub-standard water supply without defining what 'sub-standard' means. In some cases, MA referred to newly signed contracts for water supply, in others to existing contracts benefiting from the interventions. The consultation shows that it would be easier to count the number of buildings and dwellings connected to the network rather than the persons. Counting people is largely affected by demographic trends that are not under the control of the intervention. Additional population is sometimes calculated by beneficiaries (water supply operators) as total population making the indicator irrelevant. Due to projects of various size it is difficult to avoid and correct this mistake easily just from the reports.

[66] Responses from MAs regardless of TO and IP.

  - Moreover, this indicator has been considered only partially relevant in some countries where almost all the population already has access to drinking water and where the main challenges are related to water losses. Programme-specific indicators have been introduced to measure the reduced water losses[67].
- Similar comments were made by MAs about CO19. However, CO19 does not refer to the total population but to the population equivalent.
- CO09 refers to expected increase, which cannot be checked against any external registers. The calculation methodology is very complex, since it must be based on an analysis of demand. It is difficult to measure the number of visitors when no access control is present, and this makes data not comparable. An appropriate direct result indicator should measure the real increase in visits, collected by the beneficiaries and reported one year after project completion.
- CO23 is not a very complicated and costly indicator. The main challenges are related to the exact meaning of 'conservation status' and the need for the monitoring system to avoid double counting of supported areas.

2014-2020 programme-specific output indicators

The analysis builds on a sample of 2 programmes including IP 6a, 4 with IP 6b, 13 with IP 6c, 9 with IP 6d, 9 with IP 6e, 2 with IP 6f and 1 with IP 6g. For CF, the sample includes 8 programmes with IP 6i, 9 with IP 6ii, 6 with IP 6iii and 5 with IP 6iv. Annex 8.6 contains the number of programme-specific indicators for each IP analysed in the consultation.

The analysis of programme-specific output indicators shows:

- Most programme-specific output indicators could be used either as output or direct result indicators in the post-2020 conceptual framework including:
  - 'Total mining surface rehabilitated (hectares)',
  - 'Surface of buildings or places belonging to the cultural heritage, of non-tourist main use, rehabilitated or improved'.
- Those regarding direct results measure, for instance, 'population served by the improvements of the wastewater sanitation system', 'population benefitting from the measures reducing PM10/NOx quantities'.

Investment priority 6a and 6b

- Analysis of programmes for IP 6a identifies an interesting programme-specific indicator which details CO17 'Additional capacity in the thermal treatment, incineration and discharge in the management of urban waste'.
- For 6b, programme-specific indicators measuring outputs encompass: Number of purification plants realised/adequate, Length of the water network object of intervention (km), Water storage facilities improved/reactivated. An indicator measuring results is Volume of water protected and conserved (thousands of m3/year).

[67] See for details European Court of Auditors (2017b).

Investment priority 6c

- Programme-specific indicators measuring outputs encompass: 'Number of supported cultural heritage sites', 'Surface of buildings or places belonging to the cultural heritage, of non-tourist main use, rehabilitated or improved', 'Public environmental awareness-raising measures', 'Natural and cultural heritage sites and territories landscaped and adapted for visiting', 'Length of tracks for bicycles and trails (km)', 'Number of supported visitor infrastructures in national and nature parks contributing to better management of heritage'.
- Programme-specific indicators measuring direct results encompass:' Number of created services in supported cultural and natural heritage objects', 'Number of persons using the facilities receiving support'.

Investment priority 6d

- Programme-specific output indicators measuring results are: 'Number of people impacted by dissemination and environmental awareness actions', 'Habitat types in a favourable or inadequate conservation status (share)', 'Species in a favourable or inadequate conservation status (share)'.
- Programme-specific output indicators measuring outputs encompass: 'Total area of created visitor infrastructure', 'Newly created / rehabilitated areas in supported urban areas Mapped Natura 2000 marine sites'. These indicators use either 'square metres' or 'number' as units of measurement.

Investment priority 6e, 6f, 6g

- Programme-specific output indicators of 6e measuring outputs encompass: 'Historically contaminated sites (number)', 'Length of flood protection facilities (km)'. Both are similar to programme-specific output indicators identified under TO 5.
- For IP6f, programme-specific output indicators measuring outputs encompass: 'Number of water sources subject to interventions' and those measuring results 'Natural resource productivity of enterprises supported based on raw material consumption of construction and non-construction materials, using a GDP index'.
- For IP6g, a programme-specific output indicator is proposed by MAs 'Systems developed to enable companies to better rationalise their resources in the economic activity zone'.

Investment priority 6i

- Programme-specific output indicators are usually formulated in terms of capacity, following CO17. Other programme-specific output indicators are: 'Closed and remediated landfills (hectares)', 'Established and fully operational new waste management centres (number)'.

Investment priority 6ii

- Programme-specific output indicators designed to measure real outputs are: 'Abandoned peat land with a restored water regime (ha)', 'Length of newly built, developed or modernised sanitary sewage systems (km)', 'Length of reconstructed water supply and wastewater collection networks (km)', 'Length of constructed sewage, Upgraded water/sewage network infrastructure', 'Annual production capacity of desalinated water (m^3)'

Investment priority 6iii and 6iv

- In IP6iii, programme-specific output indicators mainly measure real outputs and include: 'Monitoring programmes (areas) carried out according to requirements of directives (number)', 'Area of Sites of Community Importance (number)', Inventoried areas (ha)', 'Number of sites acquired, constructed and reconstructed in connection with protected species or habitats (number)'. In IP6iv, programme-specific output indicators measuring outputs are: 'Total mining surface rehabilitated (ha)', 'Street cleaning equipment purchased (number)', 'No. of appliances and instruments to measure, assess and predict quality of ambient air and relevant meteorological features'.
- In IP6iv, programme-specific output indicators which seem more appropriate for measuring results are: 'Population benefitting from measures to reduce PM10/NOx quantities', 'Share of implemented air quality plans which comply with Directive 2008/50/EC (%)'.

Proposed post-2020 direct results indicators submitted for consultation

The consultation with MAs proposed three indicators 'Improved water treatment access with the supported operation', 'Increased waste recycling capacity, waste incineration and biogas production with the supported operation' and 'Reduced water consumption with the supported operation'. The indicator on increased waste recycling capacity is considered relevant while the other two are less relevant.

Table 37 MA consultation on a preliminary list of direct result indicators

Direct result indicators	Relevance	Source of monitoring	Time of monitoring	Already monitored	No. of OPs consulted
Improved water treatment access with the supported operation	43%	Project reporting (71%)	Project completion (71%)	75%	14
Increased waste recycling capacity, waste incineration and biogas production with the supported operation	57%	Project reporting (74%)	Project completion (74%)	44%	14
Reduced water consumption with the supported operation	43%	Project reporting (43%)	Project completion (43%)	11%	14

Source: Own elaborations of MA consultation.

7.4. Allocation of planned resources

The intervention fields in the table below cover about 97% of total expenditure planned by CF and ERDF programmes[68]. ETC programmes and priority axes with more than one TO have not been included.

Table 38 Intervention fields of TO 6, ETC not included[69]

Intervention field	Intervention field code	Share of the EU amount (ERDF+CF)	Share of ERDF (EU amount)	Share of CF (EU amount)
Waste water treatment	022	33%	19%	44%
Water management and drinking water conservation (including river basin management, water supply, specific climate change adaptation measures, district and consumer metering, charging systems and leak reduction)	021	10%	3%	16%
Protection, development and promotion of public cultural and heritage assets	094	10%	21%	//
Household waste management, (including mechanical biological treatment, thermal treatment, incineration and landfill measures)	018	8%	4%	12%
Protection and enhancement of biodiversity, nature protection and green infrastructure	085	6%	11%	2%
Rehabilitation of industrial sites and contaminated land	089	6%	9%	3%
Household waste management, (including minimisation, sorting, recycling measures)	017	6%	5%	6%
Provision of water for human consumption (extraction, treatment, storage and distribution infrastructure)	020	5%	3%	6%
Air quality measures	083	4%	1%	6%
Protection, restoration and sustainable use of Natura 2000 sites	086	3%	5%	1%
Protection, development and promotion of public tourism assets	092	2%	5%	0.4%
Development and promotion of the tourism potential of natural	091	2%	4%	0.2%

[68] For this TO, a larger share of the total EU amount has been presented compared with the other TOs, to show the variety of interventions and reflect the distinction between CF and ERDF and differences across the IPs.

[69] '//' indicates values between 0 and 1%. Percentage values are rounded.

Intervention field	Intervention field code	Share of the EU amount (ERDF+CF)	Share of ERDF (EU amount)	Share of CF (EU amount)
areas				
Commercial, industrial or hazardous waste management	019	2%	1%	3%
Development and promotion of public cultural and heritage services	095	1%	2%	//
Development and promotion of public tourism services	093	1%	2%	//
Total		99%	95%	100%

Source: DG Regional and Urban Policy, European Commission, SFC 2014-2020.

- The TO 6 budget allocation is more concentrated in CF than ERDF. Three intervention fields (022, 021, 018) regarding waste water treatment, water management and household waste management cover more than 70% of the CF budget. The same intervention fields are also important for ERDF but cover only 50% of the budget for TO 7.
- The intervention fields related to natural and cultural heritage protection and development, notably 094, but also 085, 091, 092 cover an important part of the ERDF allocation and are less important for CF.
- Intervention fields with similar relevance in both CF and ERDF are 017 'Household waste management (including minimisation, sorting, recycling measures)', 020 'Provision of water for human consumption (extraction, treatment, storage and distribution infrastructure)', 089 'Rehabilitation of industrial sites and contaminated land'.
- Compared with ERDF, CF has relatively more investments in air quality measures (083).

The following type of interventions and investments, requiring ad hoc output indicators, emerge:

- Investments in waste treatment and management, that refer to both funds and to intervention fields 017, 018, 019;
- Investments in water treatment and management, that refer to both funds and to intervention fields 020, 021 and 022;
- Support for biodiversity, nature protection and green infrastructure (intervention fields 085 and 086), mainly funded by ERDF but also partially by CF;
- Investments to reduce air and soil pollution that refer to both ERDF and CF and to intervention fields 083 and 089;
- Support for public cultural and heritage assets and services, referring exclusively to ERDF and to intervention fields 094 and 095;
- Support for development of the tourism sector, related to intervention fields 091, 092, 093 and mainly covered by ERDF.

7.5. Literature review

ECA report on tourism (n.06 / 2011)

The sixth report of 2011 of the European Court of Auditors addresses interventions in tourism and identifies:

- output indicators as linear kilometres (pathways and cycle lanes etc.), camping places, mooring places and seats (for theatres and catering facilities).
- jobs created and maintained and increased activity (number of visitors) or capacity(extra beds / rooms)[70].

World Bank indicators

World Bank core indicators cover some topics of interest for TO 6, notably wastewater management and treatment and water supply. The following indicators from the core sector list and corporate scorecards could be useful for TO 6 to measure outputs and results regarding waste management, pollution, wastewater management and treatment under a project:

- People provided with access to improved sanitation services (population),
- People provided with access to improved water sources (population),
- New household sewer connections constructed (households),
- Particulate matter reduction achieved (microgram/m3),
- Nutrient load reduction (nitrogen (N)) achieved (tons/year),
- CO2 pollution load reduction achieved (tons/year),
- Industrial and municipal waste disposal capacity created (tons),
- Industrial or municipal solid waste reduced or recycled (tons/year),
- Contaminated land managed, or dump sites closed (ha),
- Improved community water points constructed or rehabilitated (number),
- New piped household water connections (number),
- Piped household water connections affected (number),
- Water utilities supported (number),
- Other water service providers supported (number).

Moreover, the second tier of the corporate scorecard indicators include other interesting indicators such as: net greenhouse gas emissions, land area under sustainable landscape management practices, cities with improved liveability, sustainability and/or management, people provided with improved urban living conditions.

Finally, the project analysis identified the following indicators for tourism and culture:

- Population in project areas satisfied with the quality of infrastructure financed by the project (Percentage) and tickets sold annually as a measurement of the results,
- Rehabilitated cultural heritage building resistant to an 8.5 magnitude seismic event,
- Effective park management system (qualitative indicator),
- Tourist routes developed and promoted through the supported activities (number),
- Streetscapes upgraded in project target areas (metres),

[70] European Court of Auditors (2011).

- Heritage sites restored, enhanced and open to public (square metres).

7.6. Candidate indicators for the post-2020 period

As with other TOs, the proposed list of post-2020 indicators includes four types: input, process, output and direct result indicators. Input indicators are financial indicators measuring EU, national or total (EU + national) contributions in euros, including the total EU resources invested.

A. Process indicators

Process indicators are the same as in TO 4, with the exception of project-based process indicators which are formulated using the IPs of TO 6.

B. Output indicators

Gaps identified

- Indicators on tourism interventions are missing. However, tourism is not explicitly mentioned in the Fund regulations.
- IP 6iv and IP 6e about urban environment have few common output indicators.

Key outputs identified in the analysis

- Rehabilitated area, with a specific focus in urban areas.
- Better conserved habitats.
- Increased waste recycling capacity.
- Improved water supply networks.
- Improved wastewater collection networks.
- Tourism interventions.
- Installed air pollution and monitoring systems in urban areas.

Proposed output indicators

- For IP 6e/6iv, three existing indicators are confirmed. These measure rehabilitated land, open space created or rehabilitated in urban areas, public or commercial buildings renovated. A new indicator is proposed on air pollution monitoring systems and stations scaling-up programme-specific output indicators.
- Two new indicators are introduced (UNESCO sites and renewed public buildings with cultural and tourism potential) to monitor outputs of the interventions related to tourism and culture.
- Two new indicators are proposed to measure wastewater collection and water supply network.

Table 39 Proposed output indicators – TO 6

Indicator (measurement unit)	Continuity with 2014-2020	Intervention field	IP (mainly)
O.20 Total surface area of rehabilitated land (hectares)	Existing (CO22)	085, 087, 088, 089	ERDF: 6d, 6e CF: 6iv
O.21 Area of habitats and green infrastructure supported (hectares)	Existing and partially refined (CO23)	085	ERDF: 5a, 5b CF:5i, 5ii
O.27 Additional waste recycling capacity (tonnes/year)	Existing (CO17)	017, 018, 019	ERDF: 6a, 6b, 6f, 6g CF: 6i
O.28 Open space created or rehabilitated in urban areas (square metres)	Existing (CO38)	Various	ERDF: 6e CF: 6iv
O.29 Public or commercial buildings newly built or renovated in urban areas (square metres)	Existing (CO39)	Various	ERDF: 6e CF: 6iv
O.30 Length of improved water supply networks (km)	New, but based on programme-specific	020, 021	ERDF: 6b, 6f CF: 6ii
O.31 Length of improved wastewater collection networks (km)	New, but based on programme-specific	022	ERDF: 6a, 6f CF: 6i
O.32 UNESCO cultural and natural heritage sites (number)	New, based in literature review	094, 095	ERDF: 6c
O.33 Renewed public buildings with cultural and touristic potential (square metres)	New, but based on programme-specific indicators	091, 092, 03	ERDF: 6c
O.34 New or renewed air pollution monitoring systems and stations (number)	New, but based on programme-specific indicators	083, 089	ERDF: 6e CF: 6v

C. Direct result indicators

*Gaps identified***:** see the outputs

Key results

- Improved water supply, wastewater treatment and recycling.
- Cleaner urban environment.
- Developed sustainable tourism.

Proposed direct result indicators

- The proposed indicators confirm existing indicators, which measure the immediate and short-term benefits for the population served by water supply facilities and wastewater treatment facilities. A similar new indicator (D.27) has been added for recycling facilities. All these indicators link with the corresponding outputs. The feasibility of these indicators is considered 'medium' because they need the use of additional reporting tools to final project reporting. The effects measured by these indicators are likely to occur after project completion, because they relate to the use of supported

infrastructure. Moreover, the monitoring of similar indicators in 2014-2020, such as CO18 and CO19, has been relatively costly.

- An additional indicator has been introduced to measure recycled waste. Its feasibility is 'medium' because it is a new indicator. However, it can benefit from the existing definition given by Eurostat and it is relatively less costly than the indicator on the population served by supported infrastructure.
- The indicator on GHG emissions can be also used for IP 6e/iv as in 2014-2020.
- For IP 6c, based on the literature review, two new indicators have been proposed to replace CO09. An indicator measures the increase in visitors, the other the heritage attractiveness of supported sites through open data based on the heritage ranking websites. The two proposed indicators should be measured one year after project completion. The feasibility of the indicator on the number of visitors is 'medium', because it is new and requires additional reporting after project completion. The feasibility of the heritage attractiveness index is 'medium', because it depends on the definition of the methodology. After the definition of the methodology, the feasibility would be high because the indicator is supposed to be measured directly at central level without any monitoring / reporting activities at project level. The fiche in the annex already proposes a method of calculation.
- A new indicator is proposed to measure the population benefiting from supported habitats and green infrastructure in relation with O.21. Its feasibility is 'medium' being a new direct result indicator.
- A new indicator on water losses is proposed linked with O.30. The feasibility of the indicator is 'medium' because it is measured after project completion collecting additional information from projects after finalisation.
- Common indicators on private investments (D.1, D.2), job creation (D.4) and innovation (D.6, D.7) from TO 1 and TO 3 can be also used in TO 6 if there is a clear contribution to an IP. They can be combined with appropriate project-based process indicators indicating the IP differing from TO 1 and TO 3.

Table 40 Proposed direct result indicators – TO 6

Indicator (measurement unit)	Continuity with 2014-2020	Intervention field	IP (mainly)	Feasibility
D.22 Water losses (m3/km)	New based on the literature review	020, 021	ERDF: 6b, 6f, 6g CF: 6ii	Medium
D.23 Population benefiting from supported habitats and green infrastructure (number)	New based on the literature review and analysis of programme-specific indicators as well as intervention fields	085, 087, 088, 089	ERDF: 6d, 6e CF: 6iii, 6iv	Medium
D.24 Visitors to supported cultural and natural heritage sites (number)	New based on literature review and programme-specific indicators	091, 092, 093, 094, 095	ERDF: 6c	Medium
D.25 Population connected to supported improved water supply facilities (number)	New based on existing (CO18)	020, 021	ERDF: 6b, 6f, 6g CF: 6ii,	Medium
D.26 Population connected to supported wastewater treatment facilities (number)	New based on existing (CO19)	022	ERDF: 6a, 6f, 6g CF: 6i	Medium
D.27 Population served by supported recycling facilities and smart waste management systems (number)	New based on CO17 and CO18 and programme-specific indicators	017	ERDF: 6a, 6f, 6g CF: 6i	Medium
D.28 Heritage attractiveness index of supported sites	New based on the literature review	091, 092, 093, 094, 095	ERDF: 6c	Medium
D.29 Recycled waste	New based on CO17 and CO18 and literature review	017, 018, 019	ERDF: 6a, 6f, 6g CF: 6i	Medium

Note: 'red dots' indicate low feasibility, 'orange dots' medium feasibility, 'green dots' high feasibility

8. ANNEXES

8.1. Fiches of candidate process indicators

Four groups of process indicators are proposed: the type of beneficiaries, their characteristics, the form of finance and the number of projects.

For each group the confirmed indicators (even with small refinements) are first described, after that, the new ones are proposed.

Table 41 Overview of proposed process indicators

Type	Process indicator (measurement unit)	Continuity with 2014-2020	TO (mainly)
Type of beneficiaries	P.1 Enterprises receiving support (number)	Refined (CO01)	1, 3, 4, 6
	P.2 NGOs receiving support (number)	New	1, 3, 4, 6
	P.3 New enterprises receiving support (number)	Existing (CO05)	1, 3, 4, 6
	P.4 Research institutions receiving support (number)	New (based on programme-specific indicators, CO26, which implicitly refers to research institutions)	1, 3, 4, 6
	P.5 Local public authorities (number)	New (based on programme-specific indicator)	1, 4, 5, 6
	P.6 Sub-national public authorities (number)		1, 4, 5, 6
	P.7 National public authorities (number)		1, 4, 5, 6
Characteristics of beneficiaries	P.8 Micro enterprises receiving support (number)	New (based on programme-specific indicator)	1, 3, 4, 6
	P.9 Small enterprises receiving support (number)		1, 3, 4, 6
	P.10 Medium enterprises receiving support (number)		1, 3, 4, 6
	P.11 Large enterprises receiving support (number)		1, 4
	P.12 Social enterprises receiving support (number)	New (programme-specific indicator)	1, 3, 4, 6
Form of finance and type of support	P.13 Enterprises supported with grants (number)	Existing (CO02)	1, 3, 4, 6
	P.14 Enterprises supported with financial instruments (number)	Slightly refined in the title based on CO03	1, 3, 4, 6
	P.15 Enterprises receiving non-financial support	Existing (CO04)	1, 3, 4, 6
Projects	P.16 Number of projects with reference to IP (e.g. P.16.IPx, P.16.IPy, etc.)	New (this type of information is usually available for MAs)	1, 3, 4, 5, 6

TYPE OF BENEFICIARIES

Existing and refined indicators

P.1 Enterprises receiving support

Identification	
Name	P.1 Enterprises receiving support.
Definition	Counts the number of enterprises receiving support.
Measurement unit	Number of enterprises.
Thematic coverage	
Thematic objectives	TOs 1, 3.
Investment priorities	All.
Intervention field	/
Fund	ERDF.
Robustness, methodology source	
Collection of primary data	MA directly based on the list of beneficiaries.
Method of calculation	Counts the number of enterprises receiving support. It is the sum of micro enterprises, small enterprises, medium enterprises, large enterprises supported. The VAT number should be collected to enable verifications on double counting.
Indicator values reported to the Commission	From project to programme level, considering double counting.
Aggregation	Automatically from the programme value, considering double counting.
Source	MA monitoring system (list of beneficiaries).
Timing	At project completion.
Link with other indicators	P.3, P.8, P.9, P.10, P.11, P.13, P.14, P.15, O.1.
Baseline necessary	No.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	It is the 2014-2020 indicator CO01.
Use in 2014-2020 period	TO 1: IP1a, IP1b TO 3: IP3a, IP3b, IP3c, IP3d TO 4: IP4a, IP4b, IP4c, IP4d, IP4f, IP4g TO 6: IP6f, IP6g.
Use in other EC services	
EAFRD (farms and holdings).	

P.3 New enterprises receiving support

Identification	
Name	P.3 New enterprises receiving support.
Definition	Counts the number of enterprises receiving support, which did not exist three years before the project.
Measurement unit	Number of enterprises.
Thematic coverage	
Thematic objectives	TOs 1, 3, 4, 6.
Investment priorities	All.
Intervention field	/
Fund	ERDF.
Robustness, methodology source	
Collection of primary data	MA directly based on the list of beneficiaries.
Method of calculation	Count the number of new enterprises receiving support.
Indicator values reported to the Commission	The number of enterprises created receiving financial aid or support (consultancy, guidance, etc.) from ERDF or ERDF financed facility. An enterprise will not become new if only its legal form changes.
Aggregation	From project to programme level.
Source	MA monitoring system.
Timing	At project completion.
Link with other indicators	Part of the P.1.
Baseline necessary	No.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	Existing (CO05).
Use in 2014-2020 period	TO 1: IP1a, IP1b TO 3: IP3a, IP3b, IP3c, IP3d TO 4: IP4a, IP4b, IP4e, IP4f TO 6: IP6f.
Use in other EC services	
/	

New indicators

P.2 Non-governmental organisations (NGOs) receiving support

Identification	
Name	P.2 Non-governmental organisations (NGOs) receiving support.
Definition	Counts the number of NGOs receiving support. NGOs are organisations that are not created for personal profit and are voluntary, independent institutions that seek to act on concerns related to the well-being of specific groups of persons or society as a whole (according to COM 2000/0011 final).
Measurement unit	Number of NGOs.
Thematic coverage	
Thematic objectives	Potentially all TOs.
Investment priorities	All.
Intervention field	/
Fund	ERDF/CF.
Robustness, methodology source	
Collection of primary data	MA directly based on the list of beneficiaries.
Method of calculation	Counts the number of NGOs receiving support. The VAT (or other key variable) should be collected to make possible verifications on double counting and because the value to be sent to EC is calculated considering double counting.
Indicator values reported to the Commission	Value derived from project fiches, considering double counting.
Aggregation	Automatic from programme value.
Source	MA monitoring database (list of beneficiaries).
Timing	At project completion.
Link with other indicators	No.
Baseline necessary	No.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New.
Use in other EC services	
COM 2000/0011 final	

P.4 Research institutions receiving support

Identification	
Name	P.4 Research institutions receiving support.
Definition	Counts the number of research institutions receiving support. Following the 2014-2020 ERDF / CF guidance, a research institution is an organisation of which R&D is a primary activity. The research institution is counted if it is a project beneficiary.
Measurement unit	Number of research institutions involved in R&D projects.
Thematic coverage	
Thematic objectives	TOs 1, 4, 6.
Investment priorities	All.
Intervention field	/
Fund	ERDF.
Robustness, methodology source	
Collection of primary data	MA directly based on the list of beneficiaries.
Method of calculation	Counts the number of research institutions involved in the R&D projects of TO 1. The VAT number should be collected to enable verifications on double counting and because the value to be sent to EC considers double counting.
Indicator values reported to the Commission	Value derived from project fiches, considering double counting.
Aggregation	Automatically from the programme value, considering double counting.
Source	MA monitoring system / project reporting.
Timing	At project completion.
Link with other indicators	It is used when relevant with the project-based process indicators of TO 1 and with O.1.
Baseline necessary	No.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New, but based on programme-specific indicators and also mentioned in the monitoring and evaluation guidance of CF and ERDF 2014-2020 programmes.
Use in other EC services	
/	

P.5 Local public authorities

Identification	
Name	P.5 Local public authorities.
Definition	Counts the number of local public authorities supported (e.g. municipalities).
Measurement unit	Number of local authorities supported.
Thematic coverage	
Thematic objectives	TOs 1, 3, 4, 5, 6.
Investment priorities	All.
Intervention field	/
Fund	ERDF.
Robustness, methodology source	
Collection of primary data	MA directly based on the list of beneficiaries.
Method of calculation	Counts the number of local public authorities supported (e.g. municipalities). The VAT number (or other key variable) should be collected to enable verifications on double counting and because the value to be sent to EC is calculated considering double counting.
Indicator values reported to the Commission	Value derived from project fiches, considering double counting.
Aggregation	Automatically from the programme value considering the double counting.
Source	MA monitoring system (list of beneficiaries).
Timing	At project completion.
Link with other indicators	No.
Baseline necessary	No.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New, based on programme-specific output indicators.
Use in other EC services	
/	

P.6 Sub-national public authorities

Identification	
Name	P.6 Sub-national public authorities.
Definition	It counts the number of sub-national public authorities supported (e.g. regions).
Measurement unit	Number.
Thematic coverage	
Thematic objectives	TOs 1, 3, 4, 5, 6.
Investment priorities	All.
Intervention field	/
Fund	ERDF.
Robustness, methodology source	
Collection of primary data	MA directly based on the list of beneficiaries.
Method of calculation	Count the number of local public authorities supported (e.g. regions). The VAT number (or other key variable) should be collected to make possible verifications on double counting and because the value to be sent to EC is calculated considering double counting.
Indicator values reported to the Commission	Value derived from project fiches, considering double counting.
Aggregation	Automatically from the programme value considering the double counting.
Source	MA monitoring system (list of beneficiaries).
Timing	At project completion.
Link with other indicators	No.
Baseline necessary	No.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New, based on programme-specific output indicators.
Use in other EC services	
/	

P.7 National public authorities

Identification	
Name	P.7 National public authorities.
Definition	Counts the number of national public authorities supported.
Measurement unit	Number.
Thematic coverage	
Thematic objectives	TOs 1, 4, 6.
Investment priorities	All.
Intervention field	/
Fund	ERDF.
Robustness, methodology source	
Collection of primary data	MA directly based on the list of beneficiaries.
Method of calculation	Count the number of national public authorities supported. The VAT number (or other key variable) should be collected to make possible verifications on double counting and because the value to be sent to EC is calculated considering double counting.
Indicator values reported to the Commission	Value derived from project fiches, considering double counting.
Aggregation	Automatically from the programme value considering double counting.
Source	MA monitoring system (list of beneficiaries).
Timing	At project completion.
Link with other indicators	No.
Baseline necessary	No.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New, based on programme-specific output indicators.
Use in other EC services	
/	

CHARACTERISTICS OF BENEFICIARIES

New indicators

P.8 Micro enterprises receiving support

Identification	
Name	P.8 Micro enterprises receiving support.
Definition	Counts the number of micro enterprises receiving support. A micro enterprise is an enterprise with less than 10 persons employed, having an annual turnover of up to EUR 10 million, or a balance sheet total of no more than EUR 2 million. The thresholds are applied to the project application form.
Measurement unit	Number of enterprises.
Thematic coverage	
Thematic objectives	TOs 1, 3, 4, 6.
Investment priorities	All.
Intervention field	/
Fund	ERDF.
Robustness, methodology source	
Collection of primary data	MA directly based on the list of beneficiaries.
Method of calculation	Count the number of micro enterprises receiving support.
Indicator values reported to the Commission	From project to programme level, considering double counting.
Aggregation	The number of micro enterprises receiving support considering double counting.
Source	MA monitoring system (list of beneficiaries).
Timing	At project completion.
Link with other indicators	Part of P.1, O.6.
Baseline necessary	No.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New.
Use in other EC services	
EAFRD.	

Providing further details on the type of beneficiaries would ensure harmonisation with other ESI funds (EAFRD for instance), which collect information on the types of beneficiary by size

P.9 Small enterprises receiving support

Identification	
Name	P.9 Small enterprises receiving support.
Definition	Counts the number of small enterprises receiving support. These employ 10-49 persons, having an annual turnover higher than EUR 10 million and up to EUR 50 million, or a balance sheet higher than EUR 2 and up to EUR 10 million. The thresholds are applied to the project application form.
Measurement unit	Number of enterprises.
Thematic coverage	
Thematic objectives	TOs 1, 3, 4, 6.
Investment priorities	All.
Intervention field	/
Fund	ERDF.
Robustness, methodology source	
Collection of primary data	MA directly based on the list of beneficiaries.
Method of calculation	Count the number of small enterprises receiving support.
Indicator values reported to the Commission	From project to programme level.
Aggregation	The number of small enterprises receiving support considering double counting.
Source	MA monitoring system (list of beneficiaries).
Timing	At project completion.
Link with other indicators	Part of P.1.
Baseline necessary	No.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New.
Use in other EC services	
EAFRD.	

Providing further details on the type of beneficiaries would ensure harmonisation with other ESI funds (EAFRD for instance), which collect information on the types of beneficiary by size

P.10 Medium enterprises receiving support

Identification	
Name	P.10 Medium enterprises receiving support.
Definition	Counts the number of medium enterprises receiving support. Medium enterprises refer to an enterprise employing 50-249 persons, having an annual turnover higher than EUR 50 million and up to EUR 250 million, or a balance sheet higher than EUR 10 and up to EUR 43 million. The thresholds are applied to the project application form.
Measurement unit	Number of enterprises.
Thematic coverage	
Thematic objectives	TOs 1, 3, 4, 6.
Investment priorities	All.
Intervention field	/
Fund	ERDF.
Robustness, methodology source	
Collection of primary data	MA directly based on the list of beneficiaries.
Method of calculation	Counts the number of medium enterprises receiving support.
Indicator values reported to the Commission	The number of medium enterprises receiving support, considering double counting.
Aggregation	From project to programme level.
Source	MA monitoring system (list of beneficiaries).
Timing	At project completion.
Link with other indicators	Part of P.1.
Baseline necessary	No.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New.
Use in other EC services	
EAFRD.	

Providing further details on the type of beneficiaries would ensure harmonisation with other ESI funds (EAFRD for instance), which collect information on the types of beneficiary by size.

P.11 Large enterprises receiving support

Identification	
Name	P.11 Large enterprises receiving support.
Definition	Counts the number of large enterprises receiving support. If an enterprise is beneficiary of more than one operation it is counted once. The thresholds are applied to the project application form.
Measurement unit	Number of enterprises.
Thematic coverage	
Thematic objectives	TOs 1, 4, 6.
Investment priorities	All.
Intervention field	/
Fund	ERDF.
Robustness, methodology source	
Collection of primary data	MA directly based on the list of beneficiaries.
Method of calculation	Counts the number of large enterprises receiving support.
Indicator values reported to the Commission	The number of large enterprises receiving support considering double counting.
Aggregation	From project to programme level.
Source	MA monitoring system (list of beneficiaries).
Timing	At project completion.
Link with other indicators	Part of P.1.
Baseline necessary	No.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New.
Use in other EC services	
EAFRD.	

Providing further details on the type of beneficiaries would ensure harmonisation with other ESI funds (EAFRD for instance), which collect information on the types of beneficiary by size.

P.12 Social enterprises receiving support

Identification	
Name	P.12 Social enterprises receiving support.
Definition	Counts the number of social enterprises receiving support. From EC Communication, '*A social enterprise is an operator in the social economy whose main objective is to have a social impact rather than make a profit for their owners or shareholders. It operates by providing goods and services for the market in an entrepreneurial and innovative fashion and uses its profits primarily to achieve social objectives*'.[71]
Measurement unit	Number of enterprises.
Thematic coverage	
Thematic objectives	TOs 1, 3, 4, 6.
Investment priorities	All.
Intervention field	/
Fund	ERDF.
Robustness, methodology source	
Collection of primary data	MA directly based on the list of beneficiaries.
Method of calculation	Counts the number of social enterprises receiving support.
Indicator values reported to the Commission	The number of social enterprises receiving support considering double counting.
Aggregation	Automatic from programme value, considering double counting.
Source	MA monitoring system (list of beneficiaries).
Timing	At project completion.
Link with other indicators	Part of P.1.
Baseline necessary	No.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New.
Use in other EC services	
ESF.	

[71] Under the Social business initiative, the European Commission issued the Communication 'Social Business Initiative: Creating a favourable climate for social enterprises, key stakeholders in the social economy and innovation, 25 October 2011 COM (2011) 682 final' available at http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2011:0682:FIN:EN:PDF

FORM OF FINANCE AND TYPE OF SUPPORT

Existing and slightly refined indicators

P.13 Enterprises supported with grants

Identification	
Name	P.13 Enterprises supported with grants.
Definition	Counts the number of enterprises receiving grants.
Measurement unit	Number of enterprises.
Thematic coverage	
Thematic objectives	TOs 1, 3, 4, 6.
Investment priorities	All.
Intervention field	/
Fund	ERDF.
Robustness, methodology source	
Collection of primary data	MA directly based on the list of beneficiaries.
Method of calculation	Count the number of enterprises receiving grants
Indicator values reported to the Commission	The number of enterprises receiving grants, considering double counting.
Aggregation	From project to programme, considering double counting.
Source	MA monitoring system.
Timing	At project completion.
Link with other indicators	Part of P.1.
Baseline necessary	No.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	It is the 2014-2020 indicator CO02.
Use in 2014-2020 period	TO 1: IP1a, IP1b TO 3: IP3a, IP3b, IP3c, IP3d TO 4: IP4a, IP4b, IP4c, IP4d, IP4e, IP4f, IP4g TO 6: IP6f, IP6g.
Use in other EC services	
/	

P.14 Enterprises supported with financial instruments

Identification	
Name	P.14 Enterprises supported through financial instruments.
Definition	Counts the number of enterprises receiving support through a financial instrument.
Measurement unit	Number of enterprises.
Thematic coverage	
Thematic objectives	TOs 1, 3, 4, 6.
Investment priorities	All.
Intervention field	/
Fund	ERDF.
Robustness, methodology source	
Collection of primary data	MA directly based on the list of beneficiaries.
Method of calculation	Counts the number of enterprises receiving support through a financial instrument.
Indicator values reported to the Commission	The number of enterprises receiving support through a financial instrument, considering double counting.
Aggregation	From project to programme, considering double counting.
Source	MA monitoring system / project reporting (considering the monitoring of body in charge of implementing the financial instrument.
Timing	At project completion.
Link with other indicators	Part of P.1.
Baseline necessary	No.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	Existing (CO03).
Use in 2014-2020 period	TO 1 and TO 3 in particular.
Use in other EC services	
/	

P.15 Enterprises receiving non-financial support

Identification	
Name	P.15 Enterprises receiving a non-financial support.
Definition	Counts the number of enterprises receiving support that does not involve direct financial transfer (guidance, consultancy). Venture capital is considered as financial support.
Measurement unit	Number
Thematic coverage	
Thematic objectives	All TOs.
Investment priorities	All.
Intervention field	/
Fund	ERDF.
Robustness, methodology source	
Collection of primary data	MA directly based on the list of beneficiaries.
Method of calculation	Counts the number of enterprises receiving non-financial support.
Indicator values reported to the Commission	The number of enterprises receiving non-financial support, considering double counting.
Aggregation	From project to programme, considering double counting.
Source	MA monitoring system.
Timing	At project completion.
Link with other indicators	Part of P.1.
Baseline necessary	No.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	Existing (CO04).
Use in 2014-2020 period	TO 1 and TO 3 in particular.
Use in other EC services	
/	

NEW PROJECTS

P.16 Number of projects supported – with reference to the IP

Identification	
Name	P.16 Number of projects – with reference to the IP.
Definition	Counts the number of new projects supported in the single IP.
Measurement unit	Number of projects supported.
Thematic coverage	
Thematic objectives	TOs 1, 3, 4, 5, 6.
Investment priorities	All.
Intervention field	/
Fund	ERDF / CF.
Robustness, methodology source	
Collection of primary data	MA based on the list of projects.
Method of calculation	Count the number of new projects supported.
Indicator values reported to the Commission	The number of new projects supported.
Aggregation	From project to programme.
Source	MA monitoring system.
Timing	At project completion.
Link with other indicators	Linked with all.
Baseline necessary	No.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New, but implicit in the monitoring system.
Use in other EC services	
/	

8.2. Fiches of candidate output indicators

The illustration of the indicators focuses first on the confirmed indicators (even with small refinements) and then on the new ones. The table shows the continuity of the indicator with 2014-2020, the indicative intervention fields and IPs.

Table 42 Overview of proposed common output indicators

Output indicators	Continuity	Intervention field	IP (mainly)
O.1 Number of enterprises cooperating with research institutions	Existing (CO26)	060, 061, 062, 063	ERDF: 1a, 1b, 4a, 4f, all IPs of TO 3, in particular IP 3a
O.2 Number of researchers working in improved research infrastructure facilities	Existing (CO25)	058, 059	ERDF: 1a
O.9 Total length of new railway line (km)	Existing (CO11)	043, 083	ERDF: 4e; CF: 4v
O.10 Total length of reconstructed or upgraded railway lines (km)	Existing (CO12)	043, 083	ERDF: 4e; CF: 4v
O.11 Total length of new or improved environmentally-friendly (including low-noise) and low-carbon transport lines (km)	Existing and partially refined (CO15)	043, 044, 083	ERDF: 4e; CF: 4v
O.20 Total surface area of rehabilitated land (hectares)	Existing (CO22)	072, 085, 087, 088, 089	ERDF: 5a, 5b, 6d, 6e. It can be also used in TO 3 (IP 3b and 3d with intervention field 072); CF: 5i, 5ii, 6iv.
O.21 Area of habitats and green infrastructure supported (hectares)	Existing and partially refined (CO23)	085, 086	ERDF: 5a, 5b, 6c, 6d, 6e; CF: 5i, 5ii, 6iii, 6iv
O.27 Additional waste recycling capacity (tonnes/year)	Existing (CO17)	017, 018, 019	ERDF: 6a, 6b, 6f, 6g; CF: 6i
O.28 Open space created or rehabilitated in urban areas (square metres)	Existing (CO38)	Various	ERDF: 4e, 6e
O.29 Public or commercial buildings newly built or renovated in urban areas (square metres)	Existing (CO39)	Various	ERDF: 6e; CF: 6iv
O.35 Additional capacity of renewable energy	Existing (CO3O)	09, 010, 011, 012	ERDF: 4a, 4e, 4g; CF: 4i, 4v, 4vi

Output indicators	Continuity	Intervention field	IP (mainly)
production			
O.3 Renewed / equipped research infrastructure (number)	New, based on programme-specific indicators and on the Horizon 2020 definition of research infrastructure	058, 059	ERDF: 1a
O.4 Nominal value of purchased enterprise infrastructure (euro)	New, based on programme-specific output indicators	01, 02, 056, 057, 064, 065	ERDF: 1b, 3a, 3b, 3c, 3d
O.5 Nominal value of purchased enterprise equipment (euro)	New, based on programme-specific output indicators	01, 02, 056, 057, 064, 065	ERDF: 1b, 3a, 3b, 3c, 3d
O.6 Nominal value of purchased services supporting incubation, entrepreneurship and start-up (euro)	New, based on programme-specific output indicators	061, 063, 066, 067	ERDF: 1b, TO 3, notably IP 3a
O.7 Renewed / equipped business incubators (number)	New, based on programme-specific output indicators and literature review	067, 072	ERDF: 1b, TO 3, notably IP 3a
O.8 Renewed business incubators (square meters)	New, based on programme-specific output indicators and literature review	067, 072	ERDF: 1b, TO 3, notably IP 3a
O.12 Improved heating / thermal network (km)	New, based on programme-specific output indicators	015, 016	ERDF: 4c, 4d, 4g; CF:4iii, 4iv, 4vi
O.13 Number of street lighting points renovated (number)	New, based on programme-specific output indicators	013	ERDF: 4c; CF: 4iii
O.14 Usable surface of buildings which underwent thermo-modernisation (square metres)	New, based on programme-specific output indicators	016	ERDF: 4b, 4c; CF: 4ii, 4iii
O.15 Modernised power grids (km)	New, based on programme-specific output indicators	015	ERDF: 4c, 4d; CF: 4iii, 4iv
O.16 Public recharging points for electric vehicles installed (number)	New, based on programme-specific output indicators	043	ERDF: 4e; CF: 4v

Output indicators	Continuity	Intervention field	IP (mainly)
O.17 Low-emission public transport vehicles purchased or refitted (number)	New, based on programme-specific output indicators	043, 083	ERDF: 4e; CF: 4v
O.18 Cycle tracks and footpaths (km)	New, based on programme-specific output indicators	090	ERDF: 4e
O.19 Purchased railway vehicles (number)	New, based on programme-specific output indicators	043, 083	ERDF: 4e; CF: 4v
O.22 New or renewed disaster monitoring and warning stations (number)	New, based on programme-specific output indicators	087, 088	ERDF: 5a, 5b; CF: 5i, 5ii
O.23 Extension of the coastal strip (river banks and lakeshores) covered by interventions to protect people and properties (km)	New, based on programme-specific output indicators	087, 088	ERDF: 5a, 5b; CF: 5i, 5ii
O.24 Purchased / equipped rescue and emergency vehicles (number)	New, based on programme-specific output indicators	087, 088	ERDF: 5a, 5b; CF: 5i, 5ii
O.25 Buildings with seismic adaptation and improvement measures (square meters)	Refined CO39 to address seismic adaptation and improvement measures as suggested by the MA consultation	087, 088	ERDF: 5b, CF:5ii
O.26 Carrying capacity of the low-carbon transport vehicles (persons)	New, based on programme-specific output indicators	O43, 083	ERDF: 4e; CF: 4v
O.30 Length of improved water supply networks (km)	New, but based on programme-specific	020, 021	ERDF: 6b, 6f; CF: 6ii
O.31 Length of improved wastewater collection networks (km)	New, but based on programme-specific	022	ERDF: 6a, 6f; CF: 6i
O.32 UNESCO cultural and natural heritage sites (number)	New, based on literature review	094, 095	ERDF: 6c
O.33 Renewed public buildings with cultural and touristic potential (square metres)	New, but based on programme-specific indicators	091, 092, 093	ERDF: 6c
O.34 New or renewed air pollution monitoring systems	New, but based on programme-specific indicators	083, 089	ERDF: 6e; CF:6iv

Output indicators	Continuity	Intervention field	IP (mainly)
and stations (number)			

Existing and refined indicators

O.1 Number of enterprises cooperating with research institutions

Identification	
Name	O.1 Number of enterprises cooperating with research institutions.
Definition	Measures the number of enterprises cooperating with research institutions.
Measurement unit	Number.
Thematic coverage	
Thematic objectives	TO 1, 3.
Investment priorities	ERDF: 1a, 1b, 3a.
Intervention field	060, 061, 062, 063.
Fund	ERDF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Sum.
Indicator values reported to the Commission	From project to programme level.
Aggregation	Automatically calculated from the programme level.
Source	MA monitoring system / project reporting.
Timing	At project completion.
Link with other indicators	P.1 and P.4.
Baseline necessary	No.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	Existing (CO26).
Use in 2014-2020	TO 1: IP1a, IP1b TO 3: 3a TO 4: IP4a, IP4f.
Use in other EC services	
/	

O.2 Number of researchers working in improved research infrastructure facilities (number)

Identification	
Name	O.2 Number of researchers working in improved research infrastructure facilities.
Definition	Existing working positions in research infrastructure facilities that (1) directly perform R&D activities and (2) are directly affected by the project. The posts must be filled (vacant posts are not counted). Support staff for R&D (i.e. jobs not directly involved in R&D activities) is not counted. The facilities may be private or public.
Measurement unit	Number.
Thematic coverage	
Thematic objectives	TO 1.
Investment priorities	ERDF: 1a.
Intervention field	058, 059.
Fund	ERDF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Count the total researchers.
Indicator values reported to the Commission	From project to programme level.
Aggregation	Simple aggregation based on programme values.
Source	MA monitoring system / project reporting.
Timing	At project completion.
Link with other indicators	O.3, D.3, D.8, D.9, D.10.
Baseline necessary	No.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	Existing (CO25).
Use in other EC services	
/	

O.9 Total length of new railway line

Identification	
Name	O.9 Total length of new railway line.
Definition	It refers to the length of new railway constructed, where no railroad existed before.
Measurement unit	Km.
Thematic coverage	
Thematic objectives	TO 4.
Investment priorities	ERDF: 4e; CF: 4v.
Intervention field	043, 083.
Fund	ERDF and CF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Sum.
Indicator values reported to the Commission	From project to programme level.
Aggregation	Automatically given from the programme value.
Source	MA monitoring system / project reporting.
Timing	At project completion.
Link with other indicators	D.12.
Baseline necessary	No.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	Existing (CO11).
Use in 2014-2020	ERDF: 4e / CF: 4v.
Use in other EC services	
/	

O.10 Total length of reconstructed or upgraded railway lines

Identification	
Name	O.10 Total length of reconstructed or upgraded railway lines.
Definition	It refers to the length of reconstructed or upgraded (for quality or capacity) railway line. Signalling systems are excluded as they distort the values.
Measurement unit	Km.
Thematic coverage	
Thematic objectives	TO 4.
Investment priorities	ERDF: 4e; CF: 4v.
Intervention field	043, 083.
Fund	ERDF and CF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Sum.
Indicator values reported to the Commission	From project to programme level.
Aggregation	Automatically calculated from the programme level.
Source	MA monitoring system / project reporting.
Timing	At project completion.
Link with other indicators	D.12.
Baseline necessary	No.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	Existing (CO12).
Use in 2014-2020	ERDF: 4e / CF: 4v.
Use in other EC services	
/	

O.11 Total length of new or improved environmentally-friendly (including low-noise) and low-carbon transport lines

Identification	
Name	O.11 Total length of new or improved environmentally-friendly (including low-noise) and low-carbon transport lines.
Definition	It refers to the length of new or improved tram and metro lines and other networks contributing to strengthening low-carbon and low-noise transport lines.
Measurement unit	Km.
Thematic coverage	
Thematic objectives	TO 4.
Investment priorities	ERDF: 4e; CF: 4v.
Intervention field	043, 044, 083.
Fund	ERDF and CF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Sum. The built/upgraded track is counted once.
Indicator values reported to the Commission	From project to programme level.
Aggregation	Automatically calculated from the programme level.
Source	MA monitoring system / project reporting.
Timing	At project completion.
Link with other indicators	D.12.
Baseline necessary	No.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	Existing and slightly refined (CO15). The indicator has been slightly modified in the title to include low-noise means of public transport lines and other lines than metro and trams.
Use in 2014-2020	ERDF: 4e / CF: 4v.
Use in other EC services	
/	

O.20 Total surface area of rehabilitated land

Identification	
Name	O.20 Total surface area of rehabilitated land.
Definition	Total surface area of rehabilitated land. Non-eligible surface (e.g. agricultural surface and forests) is excluded. The measurements refer to the specific area subject to intervention instead of the whole polluted area.
Measurement unit	Hectares.
Thematic coverage	
Thematic objectives	TO 5, 6 (mainly).
Investment priorities	ERDF: 5a, 5b, 6d, 6e; CF: 5i, 5ii, 6iv.
Intervention field	085,087,088,089.
Fund	ERDF and CF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Sum of hectares reported at project level.
Indicator values reported to the Commission	From project to programme.
Aggregation	Automatically calculated from the programme level.
Source	MA monitoring system / project reporting.
Timing	At project completion.
Link with other indicators	D.23.
Baseline necessary	No.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	Existing (CO22).
Use in 2014-2020	TO 3 – IP3b TO 5 - IP5a, IP5b, IP5i, IP5ii TO 6 - IP6d, IP6i, IP6ii and IP6iv, IP6e.
Use in other EC services	
Similar indicators in European Environmental Agency.	

O.21 Area of habitats and green infrastructure supported

Identification	
Name	O.21 Area of habitats and green infrastructure supported.
Definition	Measure of hectares of restored or created areas aimed to improve the conservation status of threatened species. The operations can be carried out both in or outside of Natura 2000 areas and in green infrastructure capable of improving the conservation status of targeted species, habitats or ecosystems for biodiversity and the provisioning of ecosystem-services. Green infrastructure is defined as 'strategically planned network of natural and semi-natural areas with other environmental features designed and managed to deliver a wide range of ecosystem services' (European Commission, 2013).
Measurement unit	Hectares.
Thematic coverage	
Thematic objectives	TO 5, 6 (mainly).
Investment priorities	ERDF: 5a, 5b, 6d; CF: 5i, 5ii.
Intervention field	085, 086.
Fund	ERDF and CF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Sum.
Indicator values reported to the Commission	Sum of hectares reported at project level. Areas that receive support repeatedly in more than one operation should be counted only once at programme level.
Aggregation	Automatically calculated from the programme level.
Source	MA monitoring system / project reporting.
Timing	At project completion.
Link with other indicators	D.18, D.20, D.23.
Baseline necessary	No.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	Refined (CO23). The new formulation also refers to green infrastructure.
Use in 2014-2020	TO 5 – IP5a, IP5b TO 6 – IP6c, IP6e, IP6iii, IP6d (mainly).
Use in other EC services	
Similar indicators in European Environmental Agency. European Commission (2013).	

O.27 Additional waste recycling capacity

Identification	
Name	O.27 Additional waste recycling capacity.
Definition	Annual waste recycling capacity of the recycling facilities that have been commissioned or renovated via the programme.
Measurement unit	Tonnes/year.
Thematic coverage	
Thematic objectives	TO 6.
Investment priorities	ERDF: 6a, 6f, 6g, CF: 6i.
Intervention field	017, 018, 019.
Fund	ERDF and CF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Sum.
Indicator values reported to the Commission	Sum of recycling capacity reported at project level.
Aggregation	Automatically calculated from the programme level.
Source	MA monitoring system / project reporting.
Timing	At project completion.
Link with other indicators	D.27.
Baseline necessary	No.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	Existing CO17.
Use in other EC services	
/	

O.28 Open space created or rehabilitated in urban areas

Identification	
Name	O.28 Open space created or rehabilitated in urban areas.
Definition	Measure the open space created or rehabilitated in urban areas. It does not include developments covered by the 'standard' common indicators (e.g. roads, rehabilitated land, Natura 2000, schoolyards, other green infrastructure) and does not refer to green infrastructure.
Measurement unit	Square meters.
Thematic coverage	
Thematic objectives	TO 6, TO 4.
Investment priorities	ERDF: 4e, 6e; CF: 6iv.
Intervention field	Various.
Fund	ERDF and CF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Sum.
Indicator values reported to the Commission	Sum of square meters reported at project level.
Aggregation	Automatically calculated from the programme level.
Source	Project reporting / MA monitoring systems.
Timing	At project completion.
Link with other indicators	D.24, D.28.
Baseline necessary	No.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	Existing (CO38).
Use in 2014-2020	ERDF: 4e, 6e, 6d; CF: 5ii.
Use in other EC services	
/	

O.29 Public or commercial buildings newly built or renovated in urban areas

Identification	
Name	O.29 Public or commercial buildings newly built or renovated in urban areas (square metres).
Definition	Measures public or commercial buildings newly built or renovated in urban areas.
Measurement unit	Square meters. It refers to the floor square meters. If in a building there are more floors, all should be counted.
Thematic coverage	
Thematic objectives	TO 6.
Investment priorities	ERDF: 6e; CF: 6iv
Intervention field	Various.
Fund	ERDF and CF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Sum.
Indicator values reported to the Commission	Sum of square meters reported at project level.
Aggregation	Automatically calculated from the programme level.
Source	Project reporting / MA monitoring systems.
Timing	At project completion.
Link with other indicators	/
Baseline necessary	No.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	Existing (CO39).
Use in 2014-2020	ERDF: TO 4 and TO 6
Use in other EC services	
/	

O.35 Additional capacity of renewable energy production

Identification	
Name	O.35 Additional capacity of renewable energy production.
Definition	Measures the additional renewable energy capacity of the equipped / built unit thanks to the project.
Measurement unit	MW.
Thematic coverage	
Thematic objectives	TO 4.
Investment priorities	ERDF: 4a, 4e, 4g; CF: 4i, 4v, 4vi.
Intervention field	09, 010, 011 ,012.
Fund	ERDF and CF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Sum.
Indicator values reported to the Commission	Sum of additional energy production capacity reported at project level.
Aggregation	Automatically calculated from the programme level.
Source	Project reporting / MA monitoring systems.
Timing	At project completion.
Link with other indicators	D.15.
Baseline necessary	No.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	Existing (CO30).
Use in 2014-2020	TO 4.
Use in other EC services	
EU Regulation 2009/28, article 2(a).	

New indicators

O.3 Renewed / equipped research infrastructure

Identification	
Name	O.3 Renewed / equipped research infrastructure (number).
Definition	According to Horizon 2020, research infrastructures include: major scientific equipment (or sets of instruments); knowledge-based resources such as collections, archives or scientific data; e-infrastructures, such as data and computing systems and communication networks; and any other infrastructure of a unique nature essential to achieve excellence in research and innovation'. Such infrastructures may be 'single-sited', 'virtual' or 'distributed'[72]. The indicator measures the number of research infrastructure supported.
Measurement unit	Number
Thematic coverage	
Thematic objectives	TO 1
Investment priorities	ERDF: 1a
Intervention field	058, 059
Fund	ERDF
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Sum the facilities in the projects.
Indicator values reported to the Commission	From project to programme level, avoiding the double counting.
Aggregation	Simple aggregation based on programme values.
Source	MA monitoring system / project reporting.
Timing	At project completion.
Link with other indicators	O.2, D.3, D.5, D.8, D.9, D.10.
Baseline necessary	No.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New, but based on programme-specific indicators.
Use in other EC services	
Horizon 2020.	

This indicator has been introduced because it was one of the most frequently used programme-specific output indicators in IP 1a in the analysed operational programmes.

[72] See https://ec.europa.eu/research/infrastructures/pdf/eric_en.pdf

O.4 Nominal value of purchased enterprise infrastructure

Identification	
Name	O.4 Nominal value of purchased enterprise infrastructure.
Definition	It measures the nominal value of purchased enterprise infrastructure. Enterprise infrastructure is the basic facilities, structures, software upon which the rest of an enterprise is built.
Measurement unit	Euro.
Thematic coverage	
Thematic objectives	TO 1, 3.
Investment priorities	ERDF: 1b, 3a, 3b, 3c, 3d.
Intervention field	1, 2, 56, 57, 64, 65.
Fund	ERDF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Sum of the total costs of purchased and renovated infrastructure.
Indicator values reported to the Commission	From project to programme.
Aggregation	Aggregation based on programme values.
Source	MA monitoring system / project reporting.
Timing	At project completion.
Link with other indicators	D.1, D.2. For the indicators O.4 and O.5 it is recommended the combination with the process indicators counting the number of projects so that it is possible to distinguish if the two indicators are linked with research and development (TO 1) or with SME competitiveness (TO 3).
Baseline necessary	No.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New, based on programme-specific output indicators.
Use in other EC services	
/	

O.5 Nominal value of purchased enterprise equipment

Identification	
Name	O.5 Nominal value of purchased enterprise equipment.
Definition	Measures the nominal value of purchased enterprise equipment. Enterprise equipment encompasses devices, machines, tools, and vehicles purchased for the scope of the project.
Measurement unit	Euro.
Thematic coverage	
Thematic objectives	TO 1, 3.
Investment priorities	ERDF: 1b, 3a, 3b, 3c, 3d.
Intervention field	1, 2, 56, 57, 64, 65.
Fund	ERDF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Sum of the total costs of purchased equipment.
Indicator values reported to the Commission	From project to programme.
Aggregation	Aggregation based on programme values.
Source	MA monitoring system / project reporting.
Timing	At project completion.
Link with other indicators	D.1, D.2. For the indicators O.4 and O.5 it is recommended the combination with the process indicators counting the number of projects so that it is possible to distinguish if the two indicators are linked with research and development (TO 1) or with SME competitiveness (TO 3).
Baseline necessary	No.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New, based on programme-specific output indicators.
Use in other EC services	
/	

O.6 Nominal value of purchased services supporting incubation, entrepreneurship and start-up

Identification	
Name	O.6 Nominal value of purchased services supporting incubation, entrepreneurship and start-up.
Definition	Measures the nominal value of the advanced services. It refers to all the services (management, marketing, design, support for administrative processes, ICT and web-based applications), supporting incubation, entrepreneurship and start-up. Incubation is intended as a process in three stages: pre-incubation, incubation and post-incubation (European Commission, 2010).
Measurement unit	Euro.
Thematic coverage	
Thematic objectives	TO 1,3.
Investment priorities	ERDF: 1b, all IPs in TO 3 notably 3a.
Intervention field	061, 063, 066, 067.
Fund	ERDF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Nominal value of the total costs of the purchase of services.
Indicator values reported to the Commission	From project to programme level.
Aggregation	Simple sum of programme values.
Source	MA monitoring system / project reporting.
Timing	At project completion.
Link with other indicators	P.8. P.9, P.10.
Baseline necessary	No.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New, based on programme-specific output indicators.
Use in other EC services	
/	

The Smart Guide to Innovation-Based Incubators and the special ECA report represent two key references for the definition of incubation and incubators[73].

[73] See European Commission (2010), European Court of Auditors (2014).

O.7 Renewed / equipped business incubators

Identification	
Name	O.7 Renewed / equipped business incubators.
Definition	Counts the number of business incubators under intervention. Incubator is defined as a business infrastructure in charge of three types of services: pre-incubation, incubation and post-incubation[74]. Pre-incubation services include: innovation assessment, business plan preparation, training. Incubation services regard: access to finance, coaching, mentoring and training, physical hosting, commercialisation, advanced business planning, etc. Post-incubation concerns business development, internationalisation, clustering and networking. It measures the number of business incubators equipped and / or renewed.
Measurement unit	Number.
Thematic coverage	
Thematic objectives	TO 1, 3.
Investment priorities	ERDF:1b, all IPs in TO 3 notably 3a.
Intervention field	067, 072.
Fund	ERDF.
Robustness, methodology source	
Collection of primary data	MA.
Method of calculation	Counts the number of incubators receiving support.
Indicator values reported to the Commission	Available at programme level, avoiding the double counting.
Aggregation	Simple and automatic aggregation of programme values.
Source	MA monitoring system / project reporting.
Timing	At project completion.
Link with other indicators	O.8.
Baseline necessary	No.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New, but based on the programme analysis.
Use in other EC services	
/	

Other indicators measuring the tenants hosted in the incubator and the firms receiving support have not been included because they seem more appropriate for TO 8.

[74] European Court of Auditors (2014).

O.8 Renewed business incubators

Identification	
Name	O.8 Renewed business incubators.
Definition	Measures the business incubators supported for renewal, with a focus on the size of the intervention. Incubator is defined for a business infrastructure in charge of three types of services: pre-incubation, incubation and post-incubation[75]. Pre-incubation services include: innovation assessment, business plan preparation, training. Incubation services regard: access to finance, coaching, mentoring and training, physical hosting, commercialisation, advanced business planning, etc. Post-incubation concerns business development, internationalisation, clustering and networking. It measures the size of business incubators renewed.
Measurement unit	Square meters.
Thematic coverage	
Thematic objectives	TO 1, 3.
Investment priorities	ERDF: 1b, all IPs in TO 3 notably 3a.
Intervention field	067, 072.
Fund	ERDF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Counts the square meters of the surface of intervention.
Indicator values reported to the Commission	Available at programme level based on projects.
Aggregation	Simple and automatic aggregation of programme values.
Source	MA monitoring system / project reporting.
Timing	At project completion.
Link with other indicators	O.7.
Baseline necessary	No.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New, but based on the programme analysis.
Use in other EC services	
/	

[75] European Court of Auditors (2014).

O.12 Improved heating / thermal network

Identification	
Name	O.12 Improved heating / thermal network.
Definition	Measures the length of the modernised / renovated / extended heating thermal network. Any improvement is associated with more network efficiency.
Measurement unit	Km.
Thematic coverage	
Thematic objectives	TO 4.
Investment priorities	ERDF: 4c, 4d, 4g; CF:4iii, 4iv, 4vi
Intervention field	015, 016
Fund	ERDF and CF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Sum.
Indicator values reported to the Commission	From project to programme level.
Aggregation	Sum of the programme values.
Source	MA monitoring system / project reporting.
Timing	At project completion.
Link with other indicators	/
Baseline necessary	No.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New. It has been defined following the 2014-2020 programme-specific output indicators.
Use in other EC services	
/	

O.13 Number of street lighting points renovated

Identification	
Name	O.13 Number of street lighting points renovated.
Definition	Measures the number of street lighting points renovated.
Measurement unit	Number.
Thematic coverage	
Thematic objectives	TO 4.
Investment priorities	ERDF: 4c; CF: 4iii.
Intervention field	013.
Fund	ERDF and CF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Number.
Indicator values reported to the Commission	From project to programme level.
Aggregation	Automatic from programme monitoring.
Source	MA monitoring system / project reporting.
Timing	At project completion.
Link with other indicators	/
Baseline necessary	No.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New, based on programme-specific output indicators.
Use in other EC services	
/	

O.14 Usable surface of buildings which underwent thermo-modernisation

Identification	
Name	O.14 Usable surface of buildings which underwent thermo-modernisation.
Definition	Measures the surface of the supported public buildings which have been underwent programme interventions of thermo-modernisation. If in the building, there are more floors they should be counted if the thermo-modernisation covers them.
Measurement unit	Square meters.
Thematic coverage	
Thematic objectives	TO 4.
Investment priorities	ERDF: 4b, 4c; CF: 4ii, 4iii
Intervention field	016.
Fund	ERDF and CF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Sum.
Indicator values reported to the Commission	Sum of square meters supported (from project to programme level).
Aggregation	Sum of the programme values.
Source	MA monitoring system / project reporting.
Timing	At project completion.
Link with other indicators	D.13, D.16, D.21.
Baseline necessary	No.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New. It has been defined following the 2014-2020 programme-specific output indicators.
Use in other EC services	
/	

O.15 Modernised power grids

Identification	
Name	O.15 Modernised power grids.
Definition	It measures the extension of modernised power grids to be used as smart grids. For the definition of smart grid see indicator D.14.
Measurement unit	Km.
Thematic coverage	
Thematic objectives	TO 4.
Investment priorities	ERDF: 4c, 4d; CF: 4iii, 4iv
Intervention field	015
Fund	ERDF and CF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Sum.
Indicator values reported to the Commission	From project to programme level.
Aggregation	Sum of the programme values.
Source	MA monitoring system / project reporting.
Timing	At project completion.
Link with other indicators	D.14 for smart grids.
Baseline necessary	No.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New. It has been defined following the 2014-2020 programme-specific output indicators.
Use in other EC services	
/	

O.16 Public recharging points for electric vehicles installed

Identification	
Name	O.16 Public recharging points for electric vehicles installed.
Definition	Measure of number of public recharging points as defined in EC Directive 2014/94.
Measurement unit	Number.
Thematic coverage	
Thematic objectives	TO 4.
Investment priorities	ERDF: 4e; CF: 4v.
Intervention field	043.
Fund	ERDF and CF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Number of public charging stations for electric vehicles installed.
Indicator values reported to the Commission	From project to programme level.
Aggregation	Automatic aggregation (sum) of the programme values.
Source	MA monitoring system / project reporting.
Timing	At project completion.
Link with other indicators	O.17.
Baseline necessary	No.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New. The indicator has been defined based on programme-specific output indicators.
Use in other EC services	
EC Directive 2014/94.	

O.17 Low-emission public transport vehicles purchased or refitted

Identification	
Name	O.17 Low-emission public transport vehicles purchased or refitted.
Definition	Counts the number of public transport vehicles purchased or refitted. Other programme-specific output indicators can be added to specify the fuel and the type of vehicle.
Measurement unit	Number.
Thematic coverage	
Thematic objectives	TO 4.
Investment priorities	ERDF: 4e; CF: 4v.
Intervention field	043, 083.
Fund	ERDF and CF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Count.
Indicator values reported to the Commission	Sum of vehicles from the projects.
Aggregation	From project to programme level.
Source	MA monitoring system / project reporting.
Timing	At project completion.
Link with other indicators	O.16, O.26 (to indicate the carrying capacity), D.12, and with appropriate process indicator to distinguish from TO 7 interventions.
Baseline necessary	No.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New. It has been proposed in various programmes consulted as programme-specific output indicator.
Use in other EC services	
/	

O.18 Cycle tracks and footpaths

Identification	
Name	O.18 Cycle tracks and footpaths.
Definition	Measures the extension of cycle tracks and footpaths supported.
Measurement unit	Km.
Thematic coverage	
Thematic objectives	TO 4.
Investment priorities	ERDF: 4e.
Intervention field	090.
Fund	ERDF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Sum.
Indicator values reported to the Commission	Sum of km reported at project level.
Aggregation	From project to programme level.
Source	MA monitoring system / project reporting.
Timing	At project completion.
Link with other indicators	/
Baseline necessary	No.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New. In the 2014-2020 programming period, it has been used as programme-specific output indicator.
Use in other EC services	
/	

O.19 Purchased railway vehicles

Identification	
Name	O.19 Purchased railway vehicles.
Definition	Counts the number of purchase passenger rolling stocks for sustainable local transport. Additional programme-specific output indicators might be added to further specify the indicator.
Measurement unit	Number.
Thematic coverage	
Thematic objectives	TO 4.
Investment priorities	ERDF: 4e; CF: 4v.
Intervention field	043, 083.
Fund	ERDF and CF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Sum.
Indicator values reported to the Commission	From project to programme.
Aggregation	Automatic aggregation from programme value.
Source	MA monitoring system / project reporting.
Timing	At project completion.
Link with other indicators	D.12, O.26 (to indicate the carrying capacity) and with appropriate process indicator to distinguish from TO 7 interventions.
Baseline necessary	No.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New, based on programme-specific output indicators.
Use in other EC services	
/	

O.22 New or renewed disaster monitoring and warning stations

Identification	
Name	O.22 New or renewed disaster monitoring and warning stations.
Definition	Counts the new or renewed disaster monitoring and warning stations.
Measurement unit	Number.
Thematic coverage	
Thematic objectives	TO 5.
Investment priorities	ERDF: 5a, 5b; CF: 5i, 5ii.
Intervention field	087, 088.
Fund	ERDF and CF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Sum.
Indicator values reported to the Commission	From project to programme.
Aggregation	Automatic aggregation from programme value.
Source	MA monitoring system / project reporting.
Timing	At project completion.
Link with other indicators	D.18, D.19, D.20.
Baseline necessary	No.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New, based on programme-specific output indicators.
Use in other EC services	
/	

O.23 Extension of the coastal strip (and river banks and lakeshores) covered by interventions to protect people and properties

Identification	
Name	O.23 Extension of the coastal strip (and river banks and lakeshores) covered by interventions to protect people and properties.
Definition	Counts the km of extension of the coastal strip (and river banks and lakeshores) covered by interventions to protect people and properties.
Measurement unit	Km.
Thematic coverage	
Thematic objectives	TO 5.
Investment priorities	ERDF: 5a, 5b; CF: 5i, 5ii.
Intervention field	087, 088.
Fund	ERDF and CF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Sum.
Indicator values reported to the Commission	From project to programme.
Aggregation	Automatic aggregation from programmes.
Source	MA monitoring system / project reporting.
Timing	At project completion.
Link with other indicators	D.18.
Baseline necessary	No.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New, based on programme-specific output indicators.
Use in other EC services	
/	

O.24 Purchased / equipped rescue and emergency vehicles

Identification	
Name	O.24 Purchased / equipped rescue and emergency vehicles.
Definition	Measures the purchased / equipped rescue and emergency vehicles.
Measurement unit	Number.
Thematic coverage	
Thematic objectives	TO 5.
Investment priorities	ERDF: 5a, 5b; CF: 5i, 5ii
Intervention field	087, 088
Fund	ERDF, CF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Count.
Indicator values reported to the Commission	From projects to programme.
Aggregation	Simple aggregation of programme values.
Source	MA monitoring system / project reporting.
Timing	At project completion.
Link with other indicators	D.18, D.19, D20.
Baseline necessary	No.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New, based on programme-specific indicators.
Use in other EC services	
/	

O.25 Buildings with seismic adaptation and improvement measures

Identification	
Name	O.25 Buildings with seismic adaptation and improvement measures.
Definition	It measures the square meters of the buildings supported with seismic adaptation and improvement measures.
Measurement unit	Square meters.
Thematic coverage	
Thematic objectives	TO 5.
Investment priorities	ERDF: 5b; CF: 5i.
Intervention field	043, 083.
Fund	ERDF and CF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Sum.
Indicator values reported to the Commission	Sum of square meters at project level. From project to programme level.
Aggregation	Simple aggregation of programme values.
Source	MA monitoring system / project reporting.
Timing	At project completion.
Link with other indicators	D.17.
Baseline necessary	No.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New, based on the MA consultation.
Use in other EC services	
/	

O.26 Carrying capacity of the low-carbon transport vehicles

Identification	
Name	O.26 Carrying capacity of the low-carbon transport vehicles.
Definition	It measures the number of places (to sit and to stand) for passengers in the purchased vehicles.
Measurement unit	Number.
Thematic coverage	
Thematic objectives	TO 4.
Investment priorities	ERDF: 4e; CF: 4v.
Intervention field	043, 083.
Fund	ERDF and CF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Count.
Indicator values reported to the Commission	From project to programme level.
Aggregation	Simple aggregation of programme values.
Source	MA monitoring system / project reporting.
Timing	At project completion.
Link with other indicators	D.12, O.17, O.19.
Baseline necessary	No.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New, based on programme-specific output indicators.
Use in other EC services	
/	

O.30 Length of improved water supply networks

Identification	
Name	O.30 Length of improved water supply networks.
Definition	It measures the tangible outputs of the networks of water supply reconstructed or ameliorated (more efficient) by programme resources
Measurement unit	Km.
Thematic coverage	
Thematic objectives	TO 6.
Investment priorities	ERDF: 6b, 6f; CF: 6ii.
Intervention field	020, 021.
Fund	ERDF and CF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Sum.
Indicator values reported to the Commission	Sum of programme resources invested and reported at project level.
Aggregation	Simple aggregation of programme values.
Source	MA monitoring system / project reporting.
Timing	At project completion.
Link with other indicators	D.22, D.25.
Baseline necessary	No.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New, based on programme-specific output indicators.
Use in other EC services	
/	

O.31 Length of improved wastewater collection networks

Identification	
Name	O.31 Length of improved wastewater collection networks.
Definition	It measures the tangible outputs of the networks of wastewater collection reconstructed or ameliorated by programme resources.
Measurement unit	Km.
Thematic coverage	
Thematic objectives	TO 6.
Investment priorities	ERDF: 6a, 6f; CF: 6i.
Intervention field	022.
Fund	ERDF and CF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Sum.
Indicator values reported to the Commission	Sum of programme resources invested and reported at project level.
Aggregation	Simple aggregation of programme values.
Source	MA monitoring system / project reporting.
Timing	At project completion.
Link with other indicators	D.26.
Baseline necessary	No.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New, based on programme-specific indicators.
Use in other EC services	
/	

O.32 UNESCO cultural and natural heritage sites

Identification	
Name	O.32 UNESCO cultural and natural heritage sites.
Definition	The UNESCO World heritage sites are either cultural site, or natural site, or both. Therefore, the indicator covers both natural and cultural heritage sites. Similar programme-specific output indicators can be added to further detail.
Measurement unit	Number.
Thematic coverage	
Thematic objectives	TO 6.
Investment priorities	ERDF: 6c.
Intervention field	94, 95.
Fund	ERDF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Sum.
Indicator values reported to the Commission	Sum reported at project level, avoiding the double counting.
Aggregation	Simple aggregation of programme values.
Source	MA monitoring system / project reporting.
Timing	At project completion.
Link with other indicators	O.33, D.4, D.24, D.28.
Baseline necessary	No.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New, based on literature review.
Use in other EC services	
/	

O.33 Renewed public buildings with cultural and touristic potential

Identification	
Name	O.33 Renewed public buildings with cultural and touristic potential.
Definition	Total surface area of the tourism infrastructure facility under support. The potential is ensured by existing studies, categorisation of territories and / or selection criteria.
Measurement unit	Square meters.
Thematic coverage	
Thematic objectives	TO 6.
Investment priorities	ERDF: 6c.
Intervention field	091, 092, 093.
Fund	ERDF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Sum of square meters reported at project level
Indicator values reported to the Commission	From project to programme level.
Aggregation	Sum of all the programme values at EU level.
Source	MA monitoring systems.
Timing	At project completion.
Link with other indicators	O.32, D.4, D.24, D.28.
Baseline necessary	No.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New. It has been defined based on programme-specific output indicators.
Use in other EC services	
/	

O.34 New or renewed air pollution monitoring systems and stations

Identification	
Name	O.34 New or renewed air pollution monitoring systems and stations.
Definition	Measures the number of newly purchased or renewed (with new technologies, devices, equipment) air pollution monitoring systems and stations thanks to programme resources.
Measurement unit	Number.
Thematic coverage	
Thematic objectives	TO 6
Investment priorities	ERDF: 6e; CF: 6iv.
Intervention field	083, 089.
Fund	ERDF and CF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Sum.
Indicator values reported to the Commission	From project to programme level.
Aggregation	Simple aggregation of programme values.
Source	MA monitoring system / project reporting.
Timing	At project completion.
Link with other indicators	No.
Baseline necessary	No.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New. It has been defined based on programme-specific output indicators.
Use in other EC services	
/	

Other indicators not included in the proposed list of indicators

Local plans for risks protection adopted / revised

The indicator has been used, but it has not been included in the list despite being relevant and feasible. There is a risk of low comparability, because plans are usually very different. Moreover, they have their own monitoring system, which cannot be simplified in one single indicator.

Identification	
Name	Local plans for risks protection adopted / revised.
Definition	It counts the number of local emergency plans for non-climate and climate related risks adopted / revised thanks to the programme support.
Measurement unit	Number of plans
Thematic coverage	
Thematic objectives	TO 5.
Investment priorities	ERDF: 5a, 5b; CF: 5i, 5ii.
Intervention field	87, 88.
Fund	ERDF and CF.
Robustness, methodology source	
Collection of primary data	Sum at project level.
Method of calculation	Sum.
Indicator values reported to the Commission	Sum all the projects, avoiding the double counting if a single public authority is beneficiary more than once.
Aggregation	From project to programme level.
Source	MA monitoring systems.
Timing	At project completion.
Link with other indicators	P.5, P.6, P.7, D.18, D.19.
Baseline necessary	No.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New. It is based on programme-specific output indicators.
Use in other EC services	
JRC publication (2016) 'Covenant of Mayors: Monitoring Indicators'.	

An interesting source using similar metrics is the JRC publication (2016) 'Covenant of Mayors: Monitoring Indicators'. The report proposes indicators on plans and policy documents which might be interesting for TO 4 and TO 5.

Risk prevention awareness and information campaigns

The indicator has been used, but it has not been included in the list despite being relevant and feasible. It can be interpreted in various modalities.

Identification	
Name	Risk prevention awareness and information campaigns.
Definition	Number of public awareness campaigns to inform about risk prevention measures.
Measurement unit	Number.
Thematic coverage	
Thematic objectives	TO 5.
Investment priorities	ERDF: 5a, 5b; CF: 5ii, 5ii.
Intervention field	085, 087, 088.
Fund	ERDF and CF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Number.
Indicator values reported to the Commission	Number of campaigns conducted through the project.
Aggregation	From project to programme level.
Source	MA monitoring system.
Timing	At project completion.
Link with other indicators	Population benefiting from risk campaigns.
Baseline necessary	No.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New.
Use in other EC services	
/	

8.3. Fiches of candidate direct result indicators

The table shows the continuity of the indicator with 2014-2020, the indicative intervention fields and IPs, the proposed timing of monitoring of the result.

Table 43 Overview of proposed common direct result indicators

Direct result indicators (measurement unit)	Continuity	Intervention field (mainly)	IP (mainly)	Timing
D.1 Private investment matching public support to enterprises (grants) (euro)	Existing (CO06,CO27)	01, 02, 056, 057, 064, 065	ERDF: 1a, 1b, 3a, 3b, 3c, 3d	Project completion
D.2 Private investment matching public support to enterprises (financial instruments) (euro)	Existing (CO07)	01, 02, 056, 057, 064, 065	ERDF: 1a, 1b, 3a, 3b, 3c, 3d	Project completion
D.4 Employment increase in supported enterprises (FTEs)	Existing (CO08)	Various	ERDF: 1b, 3a, 3b, 3c, 3d, 6c	Project completion
D.5 Number of new researchers in supported entities (FTEs)	Existing (CO24)	058, 060, 061,	ERDF: 1a, 1b	Project completion
D.6 SMEs introducing process innovations after the supported operations (number)	Refined CO28, CO29 based on programme-specific output indicators and literature review (Horizon2020)	056, 060, 061, 063, 064, 065	ERDF: 1a, 1b, 3a, 3b, 3c, 3d	One year after project completion following the model of CIS survey
D.7 SMEs introducing product innovations after the supported operations (number)	Refined CO28, CO29 based on programme-specific output indicators and literature review (Horizon2020)	056, 060, 061, 063, 064, 065	ERDF: 1a, 1b, 3a, 3b, 3c, 3d	One year after project completion following the model of CIS survey
D.13 Annual energy consumption of supported buildings (kWh/year)	Existing (CO32)	013	ERDF: 4c; CF: 4iii	Project completion
D.14 Energy users connected to smart grids (users)	Existing (CO33)	015	ERDF: 4c; CF: 4iii	One year after project completion
D.15 Capacity of renewable energy production installed and connected to the network (MW)	Refined based on existing (CO30)	09, 010, 011, 012	ERDF: 4a, 4e, 4g; CF: 4i, 4v, 4vi	One year after project completion
D.16 Households in supported buildings with improved	Existing (CO31)	014	ERDF: 4c, but also 4b, 4e;	Project completion

Direct result indicators (measurement unit)	Continuity	Intervention field (mainly)	IP (mainly)	Timing
energy classification (number)			CF: 4iii, but also 4ii and 4v	
D.18 Population benefiting from flood protection measures (number)	Refined based on CO20, considering exclusively resident population	087,088	ERDF: 5a, 5b; CF: 5i, 5ii	Project completion
D.19 Population benefiting from forest fire protection measures (number)	Refined based on CO21, considering exclusively resident population	087,088	ERDF: 5a, 5b; CF: 5i, 5ii	Project completion
D.21 Estimated GHG emissions (tons of CO2 Equivalent)	Existing (CO34)	All, in particular 09, 010, 011, 012, 013, 014, 015, 016, 068	TO 4 and TO 6	Even at project completion (it depends on the method used)
D.25 Population connected to supported improved water supply facilities (number)	Existing (CO18)	020, 021	ERDF: 6b, 6f, 6g; CF: 6ii	One year after project completion
D.26 Population connected to supported wastewater treatment facilities (number)	Existing (CO19)	022	ERDF: 6ai, 6f, 6g; CF: 6i	One year after project completion
D.3 Number of articles submitted to peer-reviewed publications due to the supported operations (number)	New, based on programme-specific output indicators and literature review (Horizon 2020, EEA and Norway grants)	058, 060, 061,	ERDF: 1a, 1b	Project completion
D.8 Patent applications submitted to EPO by supported large enterprises (number)	New, based on programme-specific output indicators and literature review (COSME, Horizon 2020, EEA and Norway grants, 2017)	02, 056, 057, 060, 061, 063, 064, 065	ERDF: 1a, 1b	Project completion
D.9 Patent applications	New, based on programme-	056, 060, 061, 063,	ERDF: 1a, 1b	Project completion

Direct result indicators (measurement unit)	Continuity	Intervention field (mainly)	IP (mainly)	Timing
submitted to EPO by supported SMEs (number)	specific output indicators and literature review (COSME, Horizon 2020, EEA and Norway grants (2017)	064, 065		
D.10 Number of prototypes, testing (feasibility/ demo) activities, clinical trials (number)	New, based on literature review (Horizon 2020, COSME)	02, 056, 057, 060, 061, 063, 064, 065	ERDF: 1a, 1b	Project completion
D.11 Survival rate of supported new firms (%)	New, based on literature review, harmonisation with Eurostat	01, 066, 067	ERDF: 3a	Three years after project completion
D.12 Public transport users (passengers)	New, but based on CO37 and based on programme-specific indicators	034, 043, 044, 083, 090	ERDF: 4e / CF: 4v	One year after project completion
D.17 Households in supported buildings with seismic adaptation and improvement measures (number)	New, based on programme-specific indicators and consultation	088	ERDF: 5b, CF: 5ii	Project completion
D.20 Population benefiting from climate extreme-events protection measures (number)	New, based on literature review	087,088	ERDF: 5a, 5b; CF: 5i, 5ii	Project completion
D.22 Water losses (m3/km)	New, based on consultation	020, 021	ERDF: 6b, 6f, 6g; CF: 6ii	One year after project completion
D.23 Population benefiting from supported habitats and green infrastructure (number)	New based on the literature review and analysis of programme-specific indicators as well as intervention fields	085, 087, 088, 089	ERDF: 6d, 6e; CF: 6iii, 6iv	Project completion
D.24 Visitors to supported cultural and natural heritage	New based on literature review and	091, 092, 093, 094, 095	ERDF: 6c	One year after project completion

Direct result indicators (measurement unit)	Continuity	Intervention field (mainly)	IP (mainly)	Timing
sites (number)	programme-specific indicators			
D.27 Population served by supported recycling facilities and smart waste management systems (number)	New based on CO17 and CO18 and programme-specific indicators	017	ERDF: 6a, 6b, 6f, 6g; CF: 6i, 6ii	One year after project completion
D.28 Heritage attractiveness index of supported sites	New based on the literature review	091, 092, 093, 094, 095	ERDF: 6c	One year after project completion
D.29 Recycled waste	New based on the literature review	017, 018, 019	ERDF: 6c	One year after project completion

Existing and refined indicators

D.1 Private investment matching public support to enterprises (grants)

Identification	
Name	D.1 Private investment matching public support to enterprises (grants).
Definition	Measures the total value of private contribution in the supported project (eligible and non-eligible values). The form of support is a grant.
Measurement unit	Euro.
Thematic coverage	
Thematic objectives	TO 1, 3. It could be also used in TO 4 and TO 6.
Investment priorities	ERDF: 1a, 1b, 3a, 3b, 3c, 3d.
Intervention field	01, 02, 056, 057, 064, 065.
Fund	ERDF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	It includes the private contribution to the supported projects matching public support. Private contribution includes non-eligible expenditure.
Indicator values reported to the Commission	From project to programme.
Aggregation	Automatic sum of programme values.
Source	Project reporting.
Timing	At project completion.
Link with other indicators	Appropriate project-based process indicators on the IP, type of beneficiary and appropriate output indicators. For instance, D.1 can be linked with P.4, P.8, P.13 P.16, O.1, O.4 and O.5 to measure the direct result in terms of private investment matching public support given in grants to an operation supporting a micro enterprise and research institution for technological and knowledge transfer.
Baseline necessary	Yes.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	Existing (CO06 and CO27).
Use in other EC services	
See the concept of leverage in the COSME programme. In COSME, with a planned budget of €2.3bn, COSME has a leverage effect able to provide up to €25 bn. For instance, with the Loan Guarantee Facility, COSME programme is expected to release up to 30 euro of financing for SMEs for every euro invested.	

D.2 Private investment matching public support to enterprises (financial instruments)

Identification	
Name	D.2 Private investment matching public support to enterprises (financial instruments).
Definition	Measures the total value of private contribution in the supported project (eligible and non-eligible values). The form of support is a financial instrument.
Measurement unit	Euro.
Thematic coverage	
Thematic objectives	TO 1,3. It could be also used in TO 4 and TO 6.
Investment priorities	ERDF: 1a, 1b, 3a, 3b, 3c, 3d.
Intervention field	01, 02, 056, 057, 064, 065.
Fund	ERDF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	It includes the private contribution to the supported projects matching public support. Private contribution includes non-eligible expenditure.
Indicator values reported to the Commission	From project to programme.
Aggregation	Automatic sum of programme values.
Source	Project reporting.
Timing	At project completion.
Link with other indicators	P.14. See D.1 for an example.
Baseline necessary	Yes.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	Existing (CO07).
Use in other EC services	
See the concept of leverage in the COSME programme.	

D.4 Employment increase in supported enterprises

Identification	
Name	D.4 Employment increase in supported enterprises.
Definition	Sums the gross working positions in FTE in supported enterprises, excluding safeguarded jobs. FTE (Full-time equivalents) are defined according to Eurostat and ILO standards. The jobs created refer to the project. The jobs created with the works of the project shall not be counted.
Measurement unit	Number of full time equivalent (FTEs).
Thematic coverage	
Thematic objectives	TO 1, 3, 6
Investment priorities	ERDF: 1b, 3a, 3b, 3c, 3d; 6c
Intervention field	Various.
Fund	ERDF.
Robustness, methodology source	
Collection of primary data	MA. Managing Authority can use business registers as source (e.g. Chambers of Commerce, Fiscal Agency, Ministry of Finance, European Patent Office). Project reporting.
Method of calculation	Count of gross working positions in FTE in supported enterprises.
Indicator values reported to the Commission	From project to programme level.
Aggregation	Aggregate with sum all the programme values.
Source	Project monitoring / external register. Recommended use of registers at least to check the plausibility of the answers.
Timing	At project completion.
Link with other indicators	See D.1
Baseline necessary	Yes.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	Refined. It is defined based on one of the most frequently used in ERDF / CF programmes common output indicators in the 2014-2020 (CO08).
Use in 2014-2020	It is one of the most frequently used indicators in TO 1 and 3.
Use in other EC services	
It is very similar to the target result indicator of EAFRD in priority 6 and to another indicator in EMFF list of common indicators. ESF indicators are also related to employment. A similar indicator is used in the core indicators 2014-201 of EEA and Norway Grants.	

MA consultation highlighted that is possible to monitor the indicator at project completion.

D.5 Number of new researchers in supported entities

Identification	
Name	D.5 New researchers in supported entities.
Definition	Measures the gross working positions as additional new researchers in supported enterprises, excluding safeguarded jobs. Full-time equivalents are defined according to Eurostat and ILO standards. The new job is a consequence of project implementation or completion, does not include support staff for R&D.
Measurement unit	Number of full time equivalent (FTEs).
Thematic coverage	
Thematic objectives	TO 1.
Investment priorities	All.
Intervention field	058, 060, 061.
Fund	ERDF.
Robustness, methodology source	
Collection of primary data	Project reporting.
Method of calculation	Count the gross working positions in FTE as researchers in supported enterprises, excluding safeguarded jobs.
Indicator values reported to the Commission	Sum of the gross working positions in FTE as researchers in supported enterprises, excluding safeguarded jobs reported at project level.
Aggregation	From project to programme level.
Source	Project reporting.
Timing	Project completion.
Link with other indicators	O.1, O.2, O.3.
Baseline necessary	Yes.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	It is defined based on one of the most frequently used in ERDF / CF programmes common output indicators in the 2014-2020 (CO24).
Use in 2014-2020	Very frequent use in 2014-2020 in TO 1
Use in other EC services	
/	

MA consultation highlighted that is possible to monitor the indicator at project completion.

D.6 SMEs introducing process innovations after the supported operations

Identification	
Name	D.6 SMEs introducing process innovations after the supported operations.
Definition	Sums the SMEs introducing process innovations after the supported operations. The reference to define the type of innovation and the measurability approach is the Eurostat Community Innovation Survey.
Measurement unit	Number.
Thematic coverage	
Thematic objectives	TO 1,3. It can cover TOs 4 and 6.
Investment priorities	ERDF: 1a, 1b, 3a, 3b, 3c, 3d.
Intervention field	056, 060, 061, 063, 064, 065.
Fund	ERDF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Sum.
Indicator values reported to the Commission	From project to programme level.
Aggregation	Sum of programme values.
Source	Project reporting / survey to projects.
Timing	One year after project completion.
Link with other indicators	P.8, P.9, P.10.
Baseline necessary	Yes.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	Refined. The indicator is defined based on the 2014-2020 indicators CO28 and CO29, which are measuring the potential. On the contrary the proposed indicator refers to the actual outcome in terms of innovation and not to the potential.
Use in 2014-2020	Very used in TO 1 and 3, but also in TO 4 and 6.
Use in other EC services	
Similar indicators in COSME, Horizon 2020 programmes, EEA and Norway Grants, and in EMFF framework.	

A reference survey for project reporting could be CIS (Community Innovation Survey), which might be extended to all the beneficiaries of ERDF programmes or used as reference for the questionnaire. The survey and the calculation of the indicator could be performed centrally at EU level as in the experience of DG MARE. The 2014 version of the survey covers product and process innovations in sections 2 to 7, and in section 8 and 9 organisational and marketing innovations. The comparison of the answers over time might be used to simply count how many enterprises have introduced innovations. The survey and the calculation of the indicator could be also performed centrally at EU level as in the experience of DG MARE. The CIS is a reference for this indicator as well as Regional Innovation Scoreboard.

Horizon2020 programme has introduced in the key performance indicators a similar indicator under Industrial Leadership counting the 'percentage of private companies introducing innovations in the total number of project participants validated as private companies'. This indicator is measured through a self-reporting of participating firms based on a common definition of 'innovations new to the company or the market'.

D.7 SMEs introducing product innovations after the supported operations

Identification	
Name	D.7 SMEs introducing product innovations after the supported operations
Definition	Sums the SMEs introducing product innovations after the supported operations. The reference to define the type of innovation and the measurability approach is the Eurostat Community Innovation Survey.
Measurement unit	Number.
Thematic coverage	
Thematic objectives	TO 1,3. It can cover TOs 4 and 6.
Investment priorities	ERDF: 1a, 1b, 3a, 3b, 3c, 3d.
Intervention field	056, 060, 061, 063, 064, 065.
Fund	ERDF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Sum.
Indicator values reported to the Commission	From project to programme level.
Aggregation	Sum of programme values.
Source	Project reporting / survey to projects.
Timing	One year after project completion.
Link with other indicators	P.8, P.9, P.10.
Baseline necessary	Yes.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	Refined. The indicator is defined based on the 2014-2020 indicators CO28 and CO29, which are measuring the potential. On the contrary the proposed indicator refers to the actual outcome in terms of innovation and not to the potential.
Use in 2014-2020	Very used in TO 1 and 3, but also in TO 4 and 6.
Use in other EC services	
Similar indicators in COSME, Horizon 2020 programmes, EEA and Norway Grants, and in EMFF framework.	

For further details see the previous indicator.

D.13 Annual energy consumption of supported buildings

Identification	
Name	D.13 Annual energy consumption of supported buildings (kWh/year).
Definition	Annual energy consumption is calculated based on the energy certificate of buildings (see article12.1. b of Directive 2010/31/EU). In line with the deadlines set in the Directive, the threshold for public buildings is 250 square meters of total useful area.
Measurement unit	kWh/year.
Thematic coverage	
Thematic objectives	TO 4.
Investment priorities	ERDF: 4c; CF: 4iii.
Intervention field	013.
Fund	ERDF and CF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Sum.
Indicator values reported to the Commission	Sum of the values in all the projects.
Aggregation	From project to programme level.
Source	Project reporting.
Timing	At project completion.
Link with other indicators	D.21, O.14.
Baseline necessary	Yes.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	Existing, slightly refined in the title (CO32) to consider that any building can be covered.
Use in other EC services	
Directive 2010/31/EU.	

D.14 Energy users connected to smart grids

Identification	
Name	D.14 Energy users connected to smart grids.
Definition	Counts all the new energy users connected to the smart grids. A smart grid is an upgraded electricity network to which two-way digital communication between suppliers and consumers and intelligent metering and monitoring systems have been added. It ensures an economically efficient and sustainable power system with low losses and high levels of quality, secure and safe power[76].
Measurement unit	Users.
Thematic coverage	
Thematic objectives	TO 4.
Investment priorities	ERDF: 4c; CF: 4iii.
Intervention field	015.
Fund	ERDF and CF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Sum.
Indicator values reported to the Commission	From project to programme level. Sum of the values in all the projects.
Aggregation	Sum of programme values.
Source	Project reporting / survey to projects.
Timing	1 year after project completion.
Link with other indicators	D.21, O.15.
Baseline necessary	Yes.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	Existing (CO33).
Use in other EC services	
DG Energy.	

[76] See https://ec.europa.eu/energy/en/smart-grid-projects-common-interest.

D.15 Capacity of renewable energy production installed and connected to the network

Identification	
Name	D.15 Capacity of renewable energy production installed and connected to the network.
Definition	Measures the renewable energy capacity installed in the project supported unit and connected to the network.
Measurement unit	MW.
Thematic coverage	
Thematic objectives	TO 4.
Investment priorities	ERDF: 4a, 4e, 4g; CF: 4i, 4v, 4vi.
Intervention field	09, 010, 011 ,012.
Fund	ERDF and CF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Sum.
Indicator values reported to the Commission	Sum of additional energy production capacity reported at project level after support, installed and connected to the network.
Aggregation	Sum of programme values.
Source	Project reporting / survey to projects.
Timing	1 year after project completion.
Link with other indicators	O.35, D.21.
Baseline necessary	Yes.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	Refined (CO30). New based on programme-specific output indicators.
Use in 2014-2020	New.
Use in other EC services	
Regulation 2009/28, article 2(a).	

D.16 Households in supported buildings with improved energy classifications

Identification	
Name	D.16 Households in supported buildings with improved energy classifications.
Definition	Refers to the number of households in buildings with improved energy classification resulting from supported energy efficiency measures. In the Eurostat glossary for social statistics, a household is defined as a housekeeping unit or, operationally, as a social unit with common arrangements, sharing household expenses or daily needs and living in a shared common residence. 'A household includes either one person living alone or a group of people, not necessarily related, living at the same address with common housekeeping, i.e. sharing at least one meal per day or sharing a living or sitting room. Collective households or institutional households (as opposed to private households) are, for instance: hospitals, old people's homes, residential homes, prisons, military barracks, religious institutions, boarding houses and workers' hostels'. Therefore, in the case of private households, the reference to dwelling can be a good proxy to measure the indicator. On the other hand, it is possible to have more than one building for collective households or institutional households. Therefore, it is recommended to introduce programme-specific indicators with the number of private households and the number of collective / institutional households.
Measurement unit	Number.
Thematic coverage	
Thematic objectives	TO 4.
Investment priorities	ERDF: 4c but also 4b, 4e; CF: 4iii, but also 4ii and 4v.
Intervention field	014.
Fund	ERDF and CF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Sum.
Indicator values reported to the Commission	Sum of individuals.
Aggregation	From project to programme level.
Source	Project monitoring.
Timing	At project completion.
Link with other indicators	O.14, D.21.
Baseline necessary	Yes.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	Refined (CO31). The refinement is small and regards the explicit reference to dwellings, at least in the definition, because the concept of households has been considered as confusing by users. The reference to actual population would complicate the calculation.
Use in 2014-2020	Frequently used in TO 4.

Use in other EC services
Defined in EC Directive 2010/31. Example of implementation is the Building Energy Rating Certificate (https://www.seai.ie/energy-ratings/building-energy-rating-ber/). The definition of Eurostat of household has been taken as a reference[77].

[77] See http://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Household_-_social_statistics.

D.18 Population benefiting from flood protection measures

Identification	
Name	D.18 Population benefiting from flood protection measures.
Definition	Measures the population living within areas of improved flood protection (resident population). The reference to resident population reduces the potential population but it gives a clear and comparable value. Additional 'populations' might be considered in evaluation activities.
Measurement unit	Individuals.
Thematic coverage	
Thematic objectives	TO 5.
Investment priorities	ERDF: 5a, 5b; CF: 5i, 5ii.
Intervention field	087, 088.
Fund	ERDF and CF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Sum.
Indicator values reported to the Commission	From project to programme level.
Aggregation	Sum of the programme values.
Source	Project reporting.
Timing	At project completion.
Link with other indicators	O.21, O.22, O.23, O.24.
Baseline necessary	Yes.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	Existing (CO20).
Use in other EC services	
/	

D.19 Population benefiting from forest fire protection measures

Identification	
Name	D.19 Population benefiting from forest fire protection measures.
Definition	Measures the population living within areas of improved forest fire protection (resident population). The reference to resident population reduces the potential population but it gives a clear and comparable value. Additional 'populations' might be considered in evaluation activities.
Measurement unit	Individuals.
Thematic coverage	
Thematic objectives	TO 5.
Investment priorities	ERDF: 5a, 5b; CF: 5i, 5ii.
Intervention field	087, 088.
Fund	ERDF and CF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Sum.
Indicator values reported to the Commission	From project to programme level.
Aggregation	Sum of the programme values.
Source	Project reporting.
Timing	At project completion.
Link with other indicators	O.22, O.23, O.24.
Baseline necessary	Yes.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	Existing (CO21).
Use in other EC services	
/	

D.21 Estimated GHG emissions

Identification	
Name	D.21 Estimated GHG emissions.
Definition	The definition proposed is the same as 2014-2020 period for the energy sector. In case of renewable energy production, the estimate is based on the amount of primary energy produced by supported facilities in a given year (either one year following project completion or the calendar year after project completion). Renewable energy is supposed to be GHG neutral and replacing non-renewable energy production. GHG impact of non-renewable energy is estimated through the MS total GHG emission per unit of non-renewable energy production. In case of energy saving measures, the estimate is based on the amount of primary energy saved through in a given year supported operations (either one year following project completion or the calendar year after project completion). Saved energy is supposed to be replacing non-renewable energy production. GHG impact of non-renewable energy is estimated through the MS total GHG emission per unit of non-renewable energy production.
Measurement unit	Tons of CO2 equivalent.
Thematic coverage	
Thematic objectives	TO 4 and TO 6
Investment priorities	All in particular those of energy sector.
Intervention field	All, in particular 09, 010, 011, 012, 013, 014, 015, 016, 068
Fund	ERDF and CF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Sum at project level.
Indicator values reported to the Commission	From project to programme level.
Aggregation	Sum of programme values.
Source	Project reporting / Managing Authority monitoring system / survey / ad hoc study. The choice depends on the approach chosen for measuring the indicator.
Timing	1 year after project completion.
Link with other indicators	All the indicators related to TO 4, in particular the energy sector but also those of TO 6 and O.22, O.24.
Baseline necessary	Yes.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	Existing (CO34).
Use in 2014-2020	Mainly TO 4 and TO 6.
Use in other EC services	
/	

The necessary condition for the adoption of this indicator is that a harmonised definition and method of measurement are used to ensure data comparability. The MA consultation shows that the methods are more similar in the energy sector. However, for all the interventions and also for the energy sector, a unique approach should be promoted in both data collection (involvement of external experts, project partners) and definition of the indicator. See section 5.5 of the report.

D.25 Population connected to supported improved water supply facilities

Identification	
Name	D.25 Population connected to supported improved water supply facilities.
Definition	Programme investments support the improvement of water supply and ensure an increase of population connected to the facilities. The indicator counts the additional population with access to improved water supply facilities.
Measurement unit	Number of individuals.
Thematic coverage	
Thematic objectives	TO 6.
Investment priorities	ERDF: 6b, 6f, 6g, CF: 6ii.
Intervention field	020, 021.
Fund	ERDF and CF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Sum of additional individuals with access to improved water supply through the supported water supply facilities.
Indicator values reported to the Commission	From project to programme level.
Aggregation	Simple sum of programme values.
Source	Project reporting / ad hoc survey.
Timing	One year after project completion.
Link with other indicators	O.30.
Baseline necessary	Yes.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	Existing (CO18).
Use in other EC services	
/	

D.26 Population connected to supported wastewater treatment facilities

Identification	
Name	D.26 Population connected to supported wastewater treatment facilities.
Definition	Counts the population with improved access to waste water treatment.
Measurement unit	Number of individuals.
Thematic coverage	
Thematic objectives	TO 6.
Investment priorities	ERDF: 6ai, 6f, 6g; CF: 6i.
Intervention field	022.
Fund	ERDF and CF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Sum of individuals with access to the supported wastewater treatment facilities.
Indicator values reported to the Commission	From project to programme level.
Aggregation	Sum of programme values.
Source	Project reporting / ad hoc survey.
Timing	One year after project completion.
Link with other indicators	O.31.
Baseline necessary	Yes.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	Existing (CO19).
Use in other EC services	
/	

New indicators

D.3 Number of articles submitted to peer-review due to the supported operations

Identification	
Name	D.3 Number of articles submitted to peer-review due to the supported operations.
Definition	Sums the full articles, after and related to the support, submitted to specific journals which are submitted to peer-review before publication. Articles should be related to the research topics of the project.
Measurement unit	Number of articles submitted.
Thematic coverage	
Thematic objectives	TO 1.
Investment priorities	ERDF: 1a, 1b
Intervention field	058, 060, 061.
Fund	ERDF.
Robustness, methodology source	
Collection of primary data	Project survey / reporting.
Method of calculation	Sum.
Indicator values reported to the Commission	From project to programme level.
Aggregation	Simple sum from programme to EU level.
Source	Project reporting or external database (e.g. SCOPUS).
Timing	At project completion.
Link with other indicators	O.1, O.2, O.3, O.4, O.5, O.6.
Baseline necessary	Yes.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New, but it has been formulated based on literature review and programme-specific indicators. The indicator '04' of the EEA and Norway Grants 'Number of articles submitted to peer reviewed publications' is an interesting reference because it does not refer to a published article, but a single article submitted for publication in a peer-reviewed journal. If submitted to several journals the article is counted only once.
Use in other EC services	
Horizon 2020, 2014-2020 EEA and Norway grants.	

See European Commission (2017d) for further details.

D.8 Patent applications submitted to the EPO by supported large enterprises

Identification	
Name	D.8 Patent applications submitted to the EPO by supported large enterprises.
Definition	Sums the number of patent applications submitted to the EPO by supported large enterprises, as a proxy of the increased capacity of generating new knowledge.
Measurement unit	Number of patent applications.
Thematic coverage	
Thematic objectives	TO 1.
Investment priorities	ERDF:1a, 1b.
Intervention field	02, 056, 057, 060, 061, 063, 064, 065.
Fund	ERDF.
Robustness, methodology source	
Collection of primary data	MA can calculate directly the indicator with an ad hoc project survey and / or by having access to the EPO registers of patent applications. A reference survey could be CIS (Community Innovation Survey), which might be extended to all the beneficiaries of ERDF programmes or used as reference for the questionnaire. The survey and the calculation of the indicator could be performed centrally at EU level as in the experience of DG MARE. In particular, the 2014 questionnaire includes question 11.2 'During the three years 2012 to 2014, did your enterprise apply for a patent / register a trademark? (Yes / No)'. The domain of the patent has to be related to the project.
Method of calculation	Sum of the number of patent applications submitted to the EPO by supported enterprises.
Indicator values reported to the Commission	Sum of the number of patent applications submitted to the EPO by supported enterprises reported at project level.
Aggregation	Sum the programme values.
Source	Project reporting through a simple survey or access to EPO registers.
Timing	At project completion.
Link with other indicators	O.1, O.2, O.3, O.4, O.5, O.6.
Baseline necessary	Yes.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New, based on programme-specific indicators.
Use in other EC services	
A similar indicator (registered applications) is used in the core indicators 2014-201 of EEA and Norway Grants.	

D.9 Patent applications submitted to the EPO by supported SMEs

Identification	
Name	D.9 Patent applications submitted to the EPO by supported SMEs.
Definition	Sums the number of patent applications submitted to the EPO by supported SMEs, as a proxy of the increased capacity of generating new knowledge.
Measurement unit	Number of patent applications.
Thematic coverage	
Thematic objectives	TO 1.
Investment priorities	ERDF: 1a, 1b.
Intervention field	056, 060, 061, 063, 064, 065.
Fund	ERDF.
Robustness, methodology source	
Collection of primary data	MA can calculate directly the indicator with an ad hoc project survey and / or by having access to the EPO registers of patent applications. A reference survey could be CIS (Community Innovation Survey), which might be extended to all the beneficiaries of ERDF programmes or used as reference for the questionnaire. The survey and the calculation of the indicator could be performed centrally at EU level as in the experience of DG MARE. In particular, the 2014 questionnaire includes question 11.2 'During the three years 2012 to 2014, did your enterprise apply for a patent / register a trademark? (Yes / No)'. The domain of the patent has to be related to the project.
Method of calculation	Sum of the number of patent applications submitted to the EPO by supported SMEs from project to programme level.
Indicator values reported to the Commission	Sum of the number of patent applications submitted to the EPO by supported enterprises reported at project level. If the value is calculated directly by the MA through a survey, the VAT code is the key variable to aggregate the values of the supported enterprises and to avoid double counting.
Aggregation	Sum the programme values.
Source	Project reporting through a simple survey or access to EPO registers.
Timing	At project completion.
Link with other indicators	O.1, O.2, O.3, O.4, O.5, O.6.
Baseline necessary	Yes.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New, based on programme-specific indicators.
Use in other EC services	
A similar indicator (registered applications) is used in the core indicators 2014-201 of EEA and Norway Grants.	

D.10 Number of prototypes, testing (feasibility/ demo) activities, clinical trials

Identification	
Name	D.10 Number of prototypes, testing (feasibility/ demo) activities, clinical trials
Definition	Measures the direct result of research and development activities before commercialisation. The supported research activities refer to Technology Readiness Levels (TRL) between 3 and 7 in line with the scale adopted by the Horizon 2020 programme. Therefore, they refer to technology validation operated in lab, industrial environment, demonstration and prototypes.
Measurement unit	Number.
Thematic coverage	
Thematic objectives	TO 1.
Investment priorities	ERDF: 1a, 1b.
Intervention field	Intervention fields are taken from the investments and from networking and clustering type of output: 02, 056, 057, 064, 065, 060, 061, 063.
Fund	ERDF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Sum.
Indicator values reported to the Commission	From project to programme level.
Aggregation	Simple aggregation of programme values.
Source	Project reporting.
Timing	At project completion.
Link with other indicators	O.1, O.2, O.3.
Baseline necessary	Yes.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New, based on literature review.
Use in other EC services	
Horizon 2020 (DG RTD).	

The indicator is based on the definitions adopted by the Horizon 2020 programme. Horizon 2020 programme defines pilot / demonstration projects as expected to realise and test new technological and non-technological solutions.

TRL is defined under Horizon 2020 programme. TRL 4 indicates a technology validated in lab, TRL 5 technology validated in relevant environment, TRL 6 technology demonstrated in relevant environment, TRL 7 system prototype demonstration. Other research activities are excluded from the counting of the indicator if they refer to TRL 1 (basic principles observed), TRL 2 (technology concept formulated), TRL 3 (experimental proof of concept), TRL 8 (system complete and qualified) and TRL 9 (actual system proven in operational environment). In many cases, the programme-specific output indicators refer to research projects. This type of indicator has been excluded because it seems not consistent with the approach of 2014-2020 of avoiding this kind of measurement. Research projects are included in the list of process indicators.

D.11 Survival rate of supported new firms

Identification	
Name	D.11 Survival of supported newly born enterprises.
Definition	Sums the number of supported newly born enterprises. It measures to what extent the allocated resources have been used to ensure the sustainability of the newly born enterprises, in other terms, whether the newly born enterprises have survived after three years. The indicator is defined based on the Eurostat definition of newly born enterprise. Eurostat calculates the survival rate 1, 2, 3, 4, 5 years after the birth date.
Measurement unit	%.
Thematic coverage	
Thematic objectives	TO 3.
Investment priorities	ERDF: 3a.
Intervention field	01, 066, 067.
Fund	ERDF.
Robustness, methodology source	
Collection of primary data	MA can calculate directly the indicator with an ad hoc survey and / or by having access to the business registers.
Method of calculation	Sum of the supported newly born enterprises surviving three years after support.
Indicator values reported to the Commission	From project to programme level. The programme communicates the three values: D.11, numerator and denominator.
Aggregation	The programme sends three types of information: (1) Number of newly born enterprises surviving after three years, (2) Number of new enterprises receiving support (process indicator) (3) D.11 = (1)/(2). The rates are aggregated with an average value.
Source	Project survey / external registers.
Timing	Three years after project completion.
Link with other indicators	P.3.
Baseline necessary	Yes.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New.
Use in other EC services	
A similar aggregation rule is used in EAFRD target indicators.	

D.12 Public transport users

Identification	
Name	D.12 Public transport users.
Definition	It is estimated by the service provider, either using the annual average of tickets sold in the supported area of intervention or other methods.
Measurement unit	Passengers.
Thematic coverage	
Thematic objectives	TO 4.
Investment priorities	ERDF: 4e; CF: 4v
Intervention field	034, 043, 044, 083, 090.
Fund	ERDF and CF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Count the passengers based on the methodology used by the service provider. The same methodology is used for the baseline and achieved value.
Indicator values reported to the Commission	From project to programme.
Aggregation	Sum of programme values.
Source	Project reporting / survey.
Timing	One year after project completion.
Link with other indicators	O.9, O.10, O.17, O.19, O.26.
Baseline necessary	Yes.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New, based on CO37 and on programme-specific output indicators.
Use in other EC services	
See Eurostat for the definition of 'passenger-kilometre, representing the transport of one passenger by a defined mode of transport (road, rail, air, sea, inland waterways etc.) over one kilometre'[78].	

[78] http://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Passenger-kilometre.

D.17 Households in supported buildings with seismic adaptation and improvement measures

Identification	
Name	D.17 Number of dwellings in supported buildings with seismic adaptation and improvement measures.
Definition	It refers to the households in supported buildings which are supported for measures of seismic adaptation and improvement to reduce the risks in case of earthquake. As in the case of D.16 the introduction of programme-specific direct result indicators can be useful to specify the type of household.
Measurement unit	Number.
Thematic coverage	
Thematic objectives	TO 5.
Investment priorities	ERDF: 5b; CF: 5ii.
Intervention field	088.
Fund	ERDF and CF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Sum.
Indicator values reported to the Commission	Sum of individuals.
Aggregation	From project to programme level.
Source	Project reporting.
Timing	At project completion.
Link with other indicators	O.25.
Baseline necessary	Yes.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New and based on programme-specific indicators and consultation.
Use in 2014-2020	New.
Use in other EC services	
/	

D.20 Population benefiting from climate extreme-events (heat waves) protection measures

Identification	
Name	D.20 Population benefiting from climate extreme-events (heat waves) protection measures.
Definition	Population living in areas benefiting from projects investing in climate extreme-events, such as heat waves, protection measures. This indicator mainly refers to the measures to reduce the heat waves.
Measurement unit	Number of individuals.
Thematic coverage	
Thematic objectives	TO 5.
Investment priorities	ERDF: 5a, 5b; CF: 5i, 5ii.
Intervention field	087, 088.
Fund	ERDF and CF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Sum.
Indicator values reported to the Commission	Sum of individuals reported at project level. The resident population is used to avoid the problem of double counting which should be avoided at programme level.
Aggregation	From project to programme level.
Source	Project reporting.
Timing	At project completion.
Link with other indicators	O.21, O.25.
Baseline necessary	Yes.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New, based on a refined CO20 and CO21.
Use in other EC services	
Similar indicators on risks can be consulted at European Commission, 'List of Key Result indicators' of DG ECHO.	

D.22 Water losses

Identification	
Name	D.22 Water losses.
Definition	Programme investments support the improvement of water supply to reduce the water losses. The indicator counts the reduce m3 / km of water losses.
Measurement unit	m3/km.
Thematic coverage	
Thematic objectives	TO 6.
Investment priorities	ERDF: 6b, 6f, 6g, CF: 6ii.
Intervention field	020, 021.
Fund	ERDF and CF.
Robustness, methodology source	
Collection of primary data	Project based on service manager data.
Method of calculation	It is the ratio of (a) total volume of water losses without non-authorised consumptions and measurement errors; (b) kms of the length of the network. It is good practice to refer to the annual average.
Indicator values reported to the Commission	From project to programme level. The average value is calculated at programme level and reported to the EC.
Aggregation	Average of programme values.
Source	Project reporting / survey.
Timing	One year after project completion
Link with other indicators	O.30.
Baseline necessary	Yes.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New based on consultation.
Use in other EC services	
Council Directive 98/83/EC on the quality of water for human consumption.	

D.23 Population benefiting from supported habitats and green infrastructure

Identification	
Name	D.23 Population benefiting from supported habitats and green infrastructure.
Definition	Population living in areas benefiting from projects investing is counted considering the resident population and not the commuters.
Measurement unit	Number of individuals (resident population).
Thematic coverage	
Thematic objectives	TO 6.
Investment priorities	ERDF: 6d, 6e CF: 6iii, 6iv
Intervention field	085, 087, 089, 088.
Fund	ERDF and CF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Sum.
Indicator values reported to the Commission	Sum of individuals reported at project level. The resident population is used to avoid the double counting which should not be reported at programme level.
Aggregation	Sum of programme values.
Source	Project reporting.
Timing	At project completion.
Link with other indicators	O.20, O.21.
Baseline necessary	Yes.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New based on the literature review and analysis of programme-specific indicators as well as intervention fields.
Use in other EC services	
/	

D.24 Visitors to supported cultural and natural heritage sites

Identification	
Name	D.24 Visitors to supported cultural and natural heritage sites.
Definition	Measure of visitors to heritage sites receiving support for protection and development measures.
Measurement unit	Individuals.
Thematic coverage	
Thematic objectives	TO 6.
Investment priorities	ERDF: 6c.
Intervention field	091, 092, 093, 094, 095.
Fund	ERDF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Sum of visitors reported at project level. The same methodology is applied to both the baseline and achieved value.
Indicator values reported to the Commission	From project to programme level.
Aggregation	Sum of programme values.
Source	Project reporting / survey / existing registers.
Timing	One after project completion.
Link with other indicators	O.24, O.28, O.32, O.33.
Baseline necessary	Yes.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	The indicator is new and has been based on the lessons learned on CO09.
Use in 2014-2020	Used in IP 6.c with different methodologies across programmes to measure the visitors' increase.
Use in other EC services	
/	

D.27 Population served by supported recycling facilities and smart waste management system

Identification	
Name	D.27 Population served by supported recycling facilities and smart waste management system.
Definition	Population served by recycling facilities.
Measurement unit	Number of individuals.
Thematic coverage	
Thematic objectives	TO 6.
Investment priorities	ERDF: 6a, 6b, 6f, 6g; CF: 6i, 6ii.
Intervention field	017.
Fund	ERDF and CF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Sum of individuals served by supported recycling facilities.
Indicator values reported to the Commission	From project to programme level.
Aggregation	Sum of programme values.
Source	Project reporting / survey.
Timing	One year after project completion.
Link with other indicators	O.27.
Baseline necessary	Yes.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New. It is similar to CO18, CO19.
Use in other EC services	
/	

D.28 Heritage attractiveness index of supported sites

Identification	
Name	D.28 Heritage attractiveness index of supported sites.
Definition	Measure of perception of visitors to supported sites
Measurement unit	Qualitative score of attractiveness.
Thematic coverage	
Thematic objectives	TO 6.
Investment priorities	ERDF: 6c.
Intervention field	091, 092, 093, 094, 095.
Fund	ERDF and CF.
Robustness, methodology source	
Collection of primary data	Open data.
Method of calculation	Each attraction or heritage sites (project) could access data and information on page views generated by potential visitors without any effort of data collection. After collection, data could be aggregated with an average to derive a score for communication to Programme Authority.
Indicator values reported to the Commission	Average scored reported by visitors in a year.
Aggregation	A first option is the programme average of project averages. A second option is that the value is available at EU level and then manipulated and aggregated to be attributed to programme monitoring.
Source	Heritage ranking websites. Two alternative sources are: Wikipedia (open data: https://wikimedia.org/api/rest_v1/) and TripAdvisor, one of the biggest travel ranking system (+320 million unique visitors/months) opinions and scores freely provided by users could be considered a representative sample of the perception of sites (open data: https://developer-tripadvisor.com/content-api/documentation/)
Timing	One year after project completion.
Link with other indicators	O.28, O.32, O.33.
Baseline necessary	Yes.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New.
Use in other EC services	
Eurostat.	

The availability of online user generated content (UGC) on heritage sites and tourism attractions combined with new information technologies for processing vast datasets could be an innovative approach to detect travellers' perception and level of satisfaction on site visits. This indicator is considered a pilot, for which some limitations could be identified. Some limits in the use of this data could be:

- Private data owners: necessary long-term partnership with data suppliers.
- Discrepancies: data could not be representing the same information of public data providers.
- Coverage bias: distortion for certain categorizations of the units under assessment.

- Objectivity and independence: data supplier could have potential conflict of interest.
- Data skills: advanced specific skills are necessary to use open data.
- Trust: higher citizen trust on public organisation than private.

Nonetheless, it might represent an interesting solution to collect information on direct result in the tourism sector.

D.29 Recycled waste

Identification	
Name	D.29 Recycled waste.
Definition	Measures the tons of recycle waste.
Measurement unit	Tons/year.
Thematic coverage	
Thematic objectives	TO 6.
Investment priorities	ERDF: 6a, 6b, 6f, 6g; CF: 6i, 6ii.
Intervention field	017, 018, 019.
Fund	ERDF and CF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Sum of tons of recycled waste.
Indicator values reported to the Commission	From project to programme level.
Aggregation	Sum of programme values.
Source	Project reporting / survey.
Timing	One year after project completion.
Link with other indicators	D.27.
Baseline necessary	Yes.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New. It is based on CO17, CO18 and CO19. There is a similar indicator. A World Bank indicator is similar to the proposed indicator `Industrial or municipal solid waste reduced or recycled (tons/year).
Use in other EC services	
Eurostat glossary.	

Other indicators not included in the proposed list

Share of supported SMEs increasing turnover after support

This indicator has not been included in the list of proposed indicators, because it should be measured one year after the realisation of the projects and thus it is less feasible than others. Moreover, it is not easy to attribute the increase of the indicator to the supported operation. However, an indicative fiche is provided.

Identification	
Name	Share of supported SMEs increasing turnover after support.
Definition	It calculates the ratio between the SMEs increasing turnover after support and P.1.
Measurement unit	%.
Thematic coverage	
Thematic objectives	TO 1,3.
Investment priorities	ERDF: 1b, 3a, 3b, 3c, 3d.
Intervention field	01, 02, 056, 060, 061, 063, 064, 065.
Fund	ERDF.
Robustness, methodology source	
Collection of primary data	Projects based on Community Innovation Survey. Use of external registers.
Method of calculation	Sum of the number of enterprises with increased turnover. According to CIS, turnover is defined as the market sales of goods and services (Include all taxes except VAT).
Indicator values reported to the Commission	The programme sends three information: (1) P.1 Number of SMEs receiving support (process indicator), (2) Supported SMEs with increased turnover (supporting the direct result indicator), (3) D.8 = (2)/(1): Share of supported SMEs with increased turnover (%) (direct result indicator).
Aggregation	From project to programme level.
Source	Project monitoring or survey.
Timing	One year after project completion.
Link with other indicators	O.1, O.2, O.3, O.4, O.5, O.6.
Baseline necessary	Yes. It is the number of supported enterprises with turnover increase before the intervention.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New.
Use in other EC services	
The indicator is defined based on the Community Innovation Survey approach. A similar approach is followed by EAFRD for target indicators.	

Share of supported SMEs increasing the exports after support

This indicator has not been included in the list of proposed indicators, because it should be measured one year after the realisation of the projects and thus it is less feasible than others. Moreover, it is not easy to attribute the increase of the indicator to the supported operation. However, an indicative fiche is provided.

Identification	
Name	Share of supported SMEs increasing the exports after support.
Definition	It calculates the ratio between the SMEs increasing turnover after support and P.1.
Measurement unit	%.
Thematic coverage	
Thematic objectives	TO 3
Investment priorities	ERDF: 3b, 3d.
Intervention field	01, 056, 060, 061, 063, 064, 065.
Fund	ERDF.
Robustness, methodology source	
Collection of primary data	Projects based on Community Innovation Survey. Use of external registers.
Method of calculation	Sum of the number of enterprises with increased exports.
Indicator values reported to the Commission	Sum of the number of enterprises with increased exports reported at project level. If the value is calculated directly by the MA through a survey, the VAT code is the key variable to aggregate the values of the supported enterprises.
Aggregation	See D.8
Source	Project monitoring or survey.
Timing	One year after project completion.
Baseline necessary	Yes.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New.
Use in other EC services	
COSME programme (DG Growth). Eurostat. The indicator is defined based on the Community Innovation Survey approach.	

Average response time to emergency situations

This indicator has not been included in the list of proposed indicators, because it should be measured one year after the realisation of the projects and thus it is less feasible than others. However, an indicative fiche is provided.

Identification	
Name	Average response time to emergency situations.
Definition	Response time for emergency interventions. Emergency situations can be defined at programme level. The focus of the indicator is on the reduction of response time giving MAs flexibility on the type of emergency situations.
Measurement unit	Minutes.
Thematic coverage	
Thematic objectives	TO 5.
Investment priorities	ERDF: 5a, 5b; CF: 5i, 5ii
Intervention field	087, 088.
Fund	ERDF and CF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Average of project values.
Indicator values reported to the Commission	From project to programme level.
Aggregation	Average of programme values.
Source	MA monitoring systems.
Timing	At project completion.
Link with other indicators	Purchased vehicles and equipment for emergency situations.
Baseline necessary	Yes. The time needed for emergency situations before the project.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New, based on programme-specific output indicators.
Use in other EC services	
/	

Annual average economic damage caused by adverse climate events (targeted by the intervention)

This indicator has not been included in the list of proposed indicators, because it seems very ambitious as direct result indicator and is related to the 'realisation' of adverse climate events. However, an indicative fiche is provided.

Identification	
Name	Annual average economic damage caused by adverse climate events (targeted by the intervention).
Definition	It refers to the annual average economic damage caused by adverse hydrological events (targeted by the programme) for a local or regional authority in charge of the specific interventions.
Measurement unit	Million Euro/year.
Thematic coverage	
Thematic objectives	TO 5.
Investment priorities	ERDF: 5a, 5b; CF: 5i, 5ii
Intervention field	087, 088.
Fund	ERDF and CF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Sum.
Indicator values reported to the Commission	From project to programme.
Aggregation	Sum.
Source	MA monitoring systems.
Timing	At project completion.
Link with other indicators	Purchased vehicles and equipment for emergency situations.
Baseline necessary	Yes.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New, based on programme-specific output indicators.
Use in other EC services	
/	

Population informed on risks

This indicator has not been included in the list of proposed indicators, because it has been considered not relevant. However, an indicative fiche is provided.

Identification	
Name	Population informed on risks.
Definition	Number of individuals being informed through information campaigns.
Measurement unit	Individuals.
Thematic coverage	
Thematic objectives	TO 5.
Investment priorities	ERDF: 5a, 5b; CF: 5i, 5ii
Intervention field	085, 087, 088.
Fund	ERDF and CF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Sum of individuals reported at project level reached by the supported campaign.
Indicator values reported to the Commission	From project to programme level.
Aggregation	Sum of programme values.
Source	MA monitoring systems.
Timing	At project completion.
Link with other indicators	Indicators on campaigns
Baseline necessary	Yes. The baseline value counts the number of individuals informed of risks. The value after the support will count the number of individuals informed before the intervention and the additional units. For instance, immigrants, young children, students might be target population who have been poorly or partially covered in previous campaigns. Additional programme-specific indicators can detail the type of individuals.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New.
Use in other EC services	
ESF regulation uses similar indicators on participants in training activities.	

Awareness index

An indicator on awareness is reported here below. However, it is more suitable for the impact evaluation rather than as a direct result indicator.

Identification	
Name	Increased awareness of risk prevention.
Definition	Number of individuals being more aware of risk prevention measures based on awareness campaigns.
Measurement unit	Awareness index.
Thematic coverage	
Thematic objectives	TO 5.
Investment priorities	ERDF: 5a, 5b; CF: 5i, 5ii.
Intervention field	87, 88.
Fund	ERDF and CF.
Robustness, methodology source	
Collection of primary data	Survey using a standardised tool such as the approach used by Eurobarometer on the public awareness on climate change, risk prevention measures.
Method of calculation	A simple average of the awareness level (percentage of respondents being aware) allows calculate the indicator.
Indicator values reported to the Commission	Percentage of individuals reporting improvement after the campaign.
Aggregation	From survey to programme level. The aggregation is based on a weighted average of resident population.
Source	MA survey. The survey could be even supported by EU or national level to follow the same approach and to ensure harmonised results following the Eurobarometer guidelines.
Timing	Repeated surveys.
Baseline necessary	Yes.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New.
Use in other EC services	
Eurobarometer represents a reference in the field. See Special Eurobarometer 364 (2017) Public Awareness and Acceptance of CO2 capture and storage; Special Eurobarometer 454 on Civil protection (2017); Espon Climate study (2011), using a 2008 Eurobarometer survey.	

Waste to energy capacity of supported facilities

This indicator has not been included in the list of proposed indicators, because it has been considered not very relevant. However, an indicative fiche is provided.

Identification	
Name	Energy capacity of the new or renovated waste to energy facilities.
Definition	Energy capacity of the new or renovated waste to energy facilities, that have been commissioned or renovated via the programme.
Measurement unit	MW.
Thematic coverage	
Thematic objectives	TO 6.
Investment priorities	ERDF: 6a, 6f, 6g CF: 6i.
Intervention field	018.
Fund	ERDF and CF.
Robustness, methodology source	
Collection of primary data	Project.
Method of calculation	Sum.
Indicator values reported to the Commission	Energy production capacity reported at project level after the support. From project to programme level.
Aggregation	Sum of programme values.
Source	Project reporting
Timing	At project completion.
Baseline necessary	Yes. Baseline measures a waste to energy capacity before project implementation.
Continuity 2014-2020/ Simplification	
Relative to 2014-2020	New.
Use in other EC services	
/	

8.4. Template of the MA consultation

This annex illustrates the template used in the MA consultation.

The consultation has involved a representative sample of Managing Authorities, selected based on the total EU allocation of their programmes for each thematic objective. National experts have been provided of a toolkit describing the approach to consultation, the structure of the interview template, a check list, the presentation letter.

The template is structured as an excel file and is divided in four sections.

Section I - Overview

The national expert fills in the section with information about:

- the interview partners, notably *name, position and contact*;
- the date of the interviews (*day, month, year*) if the national expert repeats the interview, because there is other information to collect please add all the dates;
- the name of expert (*name and surname*);
- any qualitative comment and suggestions of *new common output indicators and direct result indicators*.

Section II – Common output indicators

The template provided to the national experts already includes pre-filled information based on DG Regio programme monitoring files:

- Country Code
- CCI
- Priority Axis
- TO Cd (Thematic objective code)
- IP Cd (Investment priority code)
- COI code (Common indicator code)
- COI name (Common indicator name)
- Measurement unit

For all the common output indicators in the template, the national expert fills in the template with information answering the following questions:

- 2.1.a - Does the indicator sufficiently cover the type of intervention of your programme? **(YES / NO).**
- 2.1.b - If needed please specify (for instance if 'no', explain why) **(Write down).**
- 2.2.a - Is the monitoring based on the project reporting? **(YES / NO).**
- 2.2.b - If needed please specify (for instance if 'no', explain why) **(Write down).**
- 2.3 - What is the methodological standard and definition used for the calculation of the indicator (e.g. EC guidance, Eurostat, OECD, World Bank, etc…)? **(Please write down the reference to the standard / method used).**
- 2.4 - Does the monitoring of the indicator cost (in terms of time and resources) more / less / the same than others? **(MORE / LESS / THE SAME).**

- 2.5.a - Have you encountered any specific difficulties with the definition of the indicator? **(YES / NO).**
- 2.5.b - Have you encountered any specific difficulties with the data collection of the indicator? **(YES / NO).**
- 2.5.c - If 'Yes', please specify **(Write down).**
- 2.6 - Do you (or other programme stakeholders) use the indicator to make a systematic benchmarking with other programming experiences? **(YES / NO).**
- 2.7 - Additional qualitative comments **(Write down).**

Section III – Programme specific output indicators

The template provided to the national experts already includes pre-filled information based on DG Regio programme monitoring files:

- Country Code
- CCI
- Priority Axis
- TO Cd (Thematic objective code)
- IP Cd (Investment priority code)
- SOI code (Specific output indicator code)
- SOI name (Specific output indicator name)
- Measurement unit
- Category of Region

For all the programme specific output indicator in the template

The national expert translates:

- The SOI name in English
- The measurement unit in English

And fills in the template based on the interview with MA for the following questions:

- 3.1.a - Why have you chosen the programme specific output indicator (instead of a common one)? **Select one of the options,**
  - There was no common indicator covering the type of interventions of the programme
  - Need of simplification
  - National harmonisation (e.g. the national Partnership Agreement, the national ministry has introduced a common list of indicators)
  - Used in the previous programme
  - Other
- 3.1.b - If needed please specify (for instance if 'other', explain why) **(Write down)**
- 3.2.a - Is the monitoring based on the project reporting? **(YES / NO)**
- 3.2.b - If needed please specify (for instance if 'no', explain why) **(Write down)**
- 3.3 - What is the methodological standard and definition used for the calculation of the indicator (e.g. EC guidance, Eurostat, OECD, World Bank, etc…)? **(Please write down the reference to the standard / method used)**
- 3.4 - Does the monitoring of the indicator cost (in terms of time and resources) more / less / the same than others? **(MORE / LESS / THE SAME).**
- 3.5.a -Have you encountered any specific difficulties with the definition of the indicator? **(YES / NO).**

- 3.5.b - Have you encountered any specific difficulties with the data collection of the indicator? **(YES / NO).**
- 3.5.c - If 'Yes' please specify **(Write down).**
- 3.6 - Additional qualitative comments **(Write down).**

Section IV – Direct result indicators

This section uses a proposed list of direct result indicators with pre-filled information on:

- Indicator code
- Name of the potential candidate direct result indicators
- Definition
- Measurement unit
- Possible source

The national expert answers the following questions for all the indicators:

- 4.1 - Does the indicator sufficiently cover the type of intervention of your programme? **(YES / NO).**
- 4.2.a – What would be the appropriate source to monitor the indicator? **(Project reporting, survey, external registers, others).**
- 4.2.b – If 'Other' please specify and provide suggestions. **(Write down).**
- 4.3.a – What would be the appropriate timing of monitoring the results at project level? **(At the end of the project, 6 months after the end of the project, 12 months after the end of the project, other).**
- 4.3.b – If 'Other' please specify and provide suggestions. **(Write down).**
- 4.4 - Has the programme already monitored similar indicators? **(YES / NO).**
- 4.5 - Additional qualitative comments **(Write down).**

In the case the template is for programmes with TO 4, 5 and 6, the question 5.1, 5.2 and 5.3 have been introduced just for the indicators on emissions. All the other indicators on TO 4, 5, and 6 will be treated following the same questions as the other direct result indicators of TO 1 and TO 3. The specific questions on the indicators on GHG emissions follow:

- 4.6 - Is it feasible and appropriate to introduce an indicator that measures a project's contribution to reducing GHG emissions?? **(Select one of the alternatives).**
  - *Yes. It can be defined as in 2014-2020 COI-34.*
  - *Yes. It should refer to expected effects, but they cannot be measured at the end of the project.*
  - *No. It is too difficult to establish a causal relationship between a project and the reduction of CO2 emissions.*
  - *Other – Provide details in question 4.7*
- 4.7 – Provide further details on 4.6 if you can **(Write down).**
- 4.8 - What do you think should be the appropriate definition of the indicator? Please provide a concrete suggestion **(Write down).**

8.5. Assessment of 2014-2020 common output indicators

INTRODUCTION

The annex illustrates the findings of the consultation with the Managing Authorities on the 2014-2020 common output indicator. The quality assessment was based on the key principles of the Better Regulation Toolbox (RACER criteria).

- **R (relevant)** – The consultation assesses whether there is a ***direct and close link between the indicator and what it is measuring and monitoring***.
- **A (accepted)** - The consultation assesses whether the indicator is understood by those in charge of data collection and there are ***some difficulties with the data collection***.
- **C (credible)** - ***The consultation assesses whether the definition is clear***, i.e. unambiguous and easy to interpret.
- **E (easy to monitor)** - The consultation ***assesses whether the data collection costs more than / less than / the same as other indicators.***
- **R (robust)** - The consultation ***assesses whether common output indicators have been monitored following common standard methodological definitions***.

The findings on each indicator are illustrated by theme in a fiche structured as follows.

Information on the identification are based on EC Guidance Document on Monitoring and Evaluation 'Concepts and Recommendations'. The use of the indicators in thematic objectives, investment priorities and funds is illustrated through the analysis of information provided by SFC 2014-2020. Information on relevance, acceptance, credibility, easiness and robustness builds on the findings and the sample of the consultation.

Identification	
Name	Reports the name
Definition	Describes the definition
Measurement unit	Indicates the measurement unit
Thematic coverage	
Thematic objectives	*TO….*
Investment priorities	*IP*
Fund	*ERDF / CF / or both*
Relevance	*There is a direct and close link with what it is measured*
Robustness, credibility, methodology source	
Acceptance	*There are no substantial difficulties with data collection*
Credibility	*The definition is clear and unambiguous*
Easiness	*The indicator does not cost more than others*
Robustness	*The indicator is measured by using EC common methodological standard*

Findings on common output indicators on 'Productive Investment'

Enterprises

CO01 Number of enterprises receiving support

Identification		Source
Name	Number of enterprises receiving support.	EC Guidance
Definition	Number of enterprises receiving support in any form from ERDF (whether the support represents state aid or not). Enterprise: Organisation producing products or services to satisfy market needs in order to reach profit. The legal form of enterprise may be various (self-employed persons, partnerships, etc.). *Note that indicators 1 to 5 measure the number of the enterprises and multiple counting needs to be eliminated (i.e. an enterprise receiving grants more than once is still only one enterprise receiving grants). Registering a unique identifier for each enterprise to avoid multiple counting is a good practice Note that the sum of indicators 2, 3 and 4 may be higher than indicator 1 if enterprises may receive different types of support or combined support. This indicator should be used together with indicators 28 and 29 for innovation in enterprises. The indicator is also needed when support is given for energy efficiency measures in enterprises.*	EC Guidance
Measurement unit	Number of enterprises.	EC Guidance
Thematic coverage		**Source**
Thematic objectives	TO 1, TO2, TO 3, TO 4, TO 6, TO8, TO9.	SFC 2014-2020
Investment priorities	Number of times the indicator is used: IP 1a (10) IP 1b (173), IP 2a (2), IP 2b (44), IP 2c (1), IP 3a (139), IP 3b (63), IP 3c (77), IP 3d (136), IP 4a (17), IP 4b (87), IP 4c (1), IP 4d (1), IP 4e (3), IP 4f (15), IP 4g (7), IP 6f (5), IP 6g (4),IP 8a (5), IP 8b (12), IP 9a (3), IP 9b (8), IP 9c (81), IP 9d (5).	SFC 2014-2020
Fund	ERDF.	SFC 2014-2020
Relevance	91% of respondents say that the indicator covers sufficiently the type of intervention supported by the programme. Lower relevance for IP 1a, IP 4a, IP 4g.	Consultation
Robustness, methodology source		**Source**
Acceptance *(Data collection)*	73% of respondents do not encounter any specific difficulty with the data collection of the indicator, except some programmes that identified the following issues: • *Timing*: it is not specified in the definition, so it is difficult to choose the	Consultation

	time to measure the indicator. • *Double counting.*	
Credibility *(Definition)*	The 90% of the respondents consider unambiguous the definition of the indicator.	Consultation
Easiness *(Monitoring cost)*	Monitoring the indicator costs more than others for 15% of respondents. For the rest of respondents, the cost of monitoring is the same (52%) or less (33%).	Consultation
Robustness *(Definition)*	EC guidance is largely used as a reference.	Consultation

CO02 Number of enterprises receiving grants

Identification		Source
Name	Number of enterprises receiving grants.	EC Guidance
Definition	Number of enterprises receiving support in forms of non-refundable direct financial support conditional only to completion of project (grants). *Subset of 'Number of enterprises receiving support'.*	EC Guidance
Measurement unit	Number of enterprises.	EC Guidance
Thematic coverage		**Source**
Thematic objectives	TO 1, TO2, TO 3, TO 4, TO 6, TO8, TO9.	SFC 2014-2020
Investment priorities	Number of times the indicator is used: IP 1a (2), IP 1b (108), IP 2a (1), IP 2a (1), IP 2b (28), IP 2c (1), IP 3a (90), IP 3b (52), IP 3c (69), IP 3d (87), IP 4a (7), IP 4b (49), IP 4c (1), IP 4d (1), IP 4e (1), IP 4f (9), IP 4g (2), IP 6f (4), IP 6g (5), IP 8a (1), IP 8b (9), IP 9a (3), IP 9b (4), IP 9c (3), IP 9d (2).	SFC 2014-2020
Fund	ERDF.	SFC 2014-2020
Relevance	92% of respondents say that the indicator covers sufficiently the type of intervention supported by the programme. Lower relevance for IP 3d and IP 9c.	Consultation
Robustness, methodology source		**Source**
Acceptance *(Data collection)*	76% of respondents do not encounter any specific difficulty with the data collection of the indicator, except some programmes that identified the following issues: • *Timing*: it is not specified in the definition, so it is difficult to choose the time to measure the indicator. • *Double counting.*	Consultation
Credibility *(Definition)*	Almost all the respondents (97%) consider unambiguous the definition of the indicator.	Consultation
Easiness *(Monitoring cost)*	Monitoring the indicator costs more than others for 16% of respondents. For the rest of respondents, the cost of monitoring is the same (44%) or less (40%).	Consultation
Robustness *(Definition)*	EC guidance is largely used as a reference.	Consultation

CO03 Number of enterprises receiving financial support other than grants

Identification		Source
Name	Number of enterprises receiving financial support other than grants.	EC Guidance
Definition	Number of enterprises receiving non-grant type financial support, in forms of loan, interest subsidy, credit guarantee, venture capital or other financial instruments. *Subset of 'Number of enterprises receiving support'.*	EC Guidance
Measurement unit	Number of enterprises.	EC Guidance
Thematic coverage		**Source**
Thematic objectives	TO 1, TO2, TO 3, TO 4, TO8, TO9.	SFC 2014-2020
Investment priorities	Number of times the indicator is used: IP 1b (49), IP 2b (8), IP 3a (14), IP 3a (63), IP 3b (12), IP 3c (44), IP 3d (89), IP 4a (7), IP 4b (27), IP 4c (1), IP 4f (2), IP 4g (1), IP 8a (1), IP 8b (1), IP 9b (1), IP9c (1).	SFC 2014-2020
Fund	ERDF.	SFC 2014-2020
Relevance	91% of respondents say that the indicator covers sufficiently the type of intervention supported by the programme. Lower relevance for IP 4f, IP 3c, IP 3d.	Consultation
Robustness, methodology source		**Source**
Acceptance *(Data collection)*	84% of respondents do not encounter any specific difficulty with the data collection of the indicator, except some programmes that identified *double counting* as an issue.	Consultation
Credibility *(Definition)*	Almost all the respondents (95%) consider unambiguous the definition of the indicator.	Consultation
Easiness *(Monitoring cost)*	Monitoring the indicator costs more than others for 11% of respondents. For the rest of respondents, the cost of monitoring is the same (47%) or less (42%).	Consultation
Robustness *(Definition)*	EC guidance is largely used as a reference.	Consultation

CO04 Number of enterprises receiving non-financial support

Identification		Source
Name	Number of enterprises receiving non-financial support.	EC Guidance
Definition	Number of enterprises receiving support that does not involve direct financial transfer (guidance, consultancy, enterprise incubators, etc.). Venture capital is considered as financial support. *Subset of 'Number of enterprises receiving support'*	EC Guidance
Measurement unit	Number of enterprises.	EC Guidance
Thematic coverage		**Source**
Thematic objectives	TO 1, TO2, TO 3, TO 4, TO 6, TO8, TO9.	SFC 2014-2020
Investment priorities	Number of times the indicator is used: IP 1a (1), IP 1b (48), IP 2b (16), IP 2c (1), IP 3a (68), IP 3b (19), IP 3c (11), IP 3d (63), IP 4a (2), IP 4b (10), IP 4f (5), IP 6g (2), IP 8b (5), IP 9d (1).	SFC 2014-2020
Fund	ERDF.	SFC 2014-2020
Relevance	85% of respondents say that the indicator covers sufficiently the type of intervention supported by the programme. Lower relevance for IP 3d, IP 4a.	Consultation
Robustness, methodology source		**Source**
Acceptance *(Data collection)*	60% of respondents do not encounter any specific difficulty with the data collection of the indicator, except some programmes that identified the following issues: • *Timing*: it is not specified in the definition, so it is difficult to choose the time to measure the indicator. • *Double counting*.	Consultation
Credibility *(Definition)*	83% of the respondents consider unambiguous the definition of the indicator, except for some programmes that find difficulties with the definition of 'non-financial support'.	Consultation
Easiness *(Monitoring cost)*	Monitoring the indicator costs more than others for 39% of respondents. For the rest of respondents, the cost of monitoring is the same (39%) or less (22%).	Consultation
Robustness *(Definition)*	EC guidance is largely used as a reference.	Consultation

CO05 Number of new enterprises supported

Identification		Source
Name	Number of new enterprises supported.	EC Guidance
Definition	Number of enterprises created receiving financial aid or support (consultancy, guidance, etc.) from ERDF or ERDF financed facility. The created enterprise did not exist three years before the project started but the Managing Authority or national legislation may set lower the time criterion. An enterprise will not become new if only its legal form changes. *Subset of 'Number of enterprises receiving support'.* *This indicator should be used for both enterprise development and innovation measures if the goal is to create or support new enterprises (e.g. spin-offs, technology start-ups).*	EC Guidance
Measurement unit	Number of enterprises.	EC Guidance
Thematic coverage		**Source**
Thematic objectives	TO 1, TO2, TO 3, TO 4, TO 6, TO8, TO9.	SFC 2014-2020
Investment priorities	Number of times the indicator is used: IP 1a (2), IP 1b (40), IP 2a (1), IP 2b (12), IP 3a (104), IP 3b (8), IP 3c (40), IP 3d (43), IP 4a (1), IP 4b (4), IP 4e (1), IP 4f (2), IP 6f (1), IP 8b (2), IP 9c (6), IP 9d (1).	SFC 2014-2020
Fund	ERDF.	SFC 2014-2020
Relevance	94% of respondents say that the indicator covers sufficiently the type of intervention supported by the programme. Lower relevance for IP 9c.	Consultation
Robustness, methodology source		**Source**
Acceptance *(Data collection)*	71% of respondents do not encounter any specific difficulty with the data collection of the indicator, except some programmes that identified *double counting* as an issue.	Consultation
Credibility *(Definition)*	74% of the respondents consider unambiguous the definition of the indicator, except for some programmes that find difficulties with the definition of 'existing enterprises'.	Consultation
Easiness *(Monitoring cost)*	Monitoring the indicator costs more than others for 15% of respondents. For the rest of respondents, the cost of monitoring is the same (67%) or less (17%).	Consultation
Robustness *(Definition)*	EC guidance is largely used as a reference.	Consultation

CO06 Private investment matching public support to enterprises (grants)

Identification		Source
Name	Private investment matching public support to enterprises (grants).	EC Guidance
Definition	Total value of private contribution in supported project that qualifies as state aid where the form of support is grant (see Common Indicator 2 'Number of enterprises receiving grants'), including non-eligible parts of the project.	EC Guidance
Measurement unit	EUR.	EC Guidance
Thematic coverage		**Source**
Thematic objectives	TO 1, TO2, TO 3, TO 4, TO8, TO9.	SFC 2014-2020
Investment priorities	Number of times the indicator is used: IP 1a (2), IP 1b (46), IP 2a (1), IP 2b (3), IP 3a (36), IP 3b (33), IP 3c (40), IP 3d (43), IP 4a (2), IP 4b (12), IP 4c (1), IP 4d (1), IP 4f (6), IP 4g (1), IP 8b (4), IP 9b (1), IP 9c (1), IP 9d (1).	SFC 2014-2020
Fund	ERDF.	SFC 2014-2020
Relevance	93% of respondents say that the indicator covers sufficiently the type of intervention supported by the programme. Lower relevance for IP 9c.	Consultation
Robustness, methodology source		**Source**
Acceptance *(Data collection)*	76% of respondents do not encounter any specific difficulty with the data collection of the indicator.	Consultation
Credibility *(Definition)*	72% of the respondents consider unambiguous the definition of the indicator.	Consultation
Easiness *(Monitoring cost)*	Monitoring the indicator costs more than others for 20% of respondents. For the rest of respondents, the cost of monitoring is the same (51%) or less (29%).	Consultation
Robustness *(Definition)*	EC guidance is largely used as a reference.	Consultation

CO07 Private investment matching public support to enterprises (non-grants)

Identification		Source
Name	Private investment matching public support to enterprises (non-grants).	EC Guidance
Definition	Total value of private contribution in supported project that qualifies as state aid where the form of support is other than grant (see Common Indicator 3 'Number of enterprises receiving financial support other than grants'), including non-eligible parts of the project, including non-eligible parts of the project.	EC Guidance
Measurement unit	Number of enterprises.	EC Guidance
Thematic coverage		**Source**
Thematic objectives	TO 1, TO2, TO 3, TO 4, TO8, TO9.	SFC 2014-2020
Investment priorities	Number of times the indicator is used: IP 1b (13), IP 2a (1), IP 2b (1), IP 3a (40), IP 3b (5), IP 3c (23), IP 3d (56), IP 4a (1), IP 4b (2), IP 4c (1), IP 4f (2), IP 4g (1), IP 8b (1), IP 9b (1).	SFC 2014-2020
Fund	ERDF.	SFC 2014-2020
Relevance	94% of respondents say that the indicator covers sufficiently the type of intervention supported by the programme. Lower relevance for IP 3d.	Consultation
Robustness, methodology source		**Source**
Acceptance *(Data collection)*	85% of respondents do not encounter any specific difficulty with the data collection of the indicator.	Consultation
Credibility *(Definition)*	70% of the respondents consider unambiguous the definition of the indicator, except for some programmes that find difficulties with the definition of: • *Not eligible cost*: they are not associated with the project. Therefore, it makes the data less relevant'. • *Private investment:* 'unclear definition of what private investment means'.	Consultation
Easiness *(Monitoring cost)*	Monitoring the indicator costs more than others for 18% of respondents. For the rest of respondents, the cost of monitoring is the same (58%) or less (24%).	Consultation
Robustness *(Definition)*	EC guidance is largely used as a reference.	Consultation

CO08 Employment increase in supported enterprises

Identification		Source
Name	Employment increase in supported enterprises.	EC Guidance
Definition	Gross new working positions in supported enterprises in full time equivalents (FTE). Essentially a 'before-after' indicator which captures the part of the employment increase that is direct consequence of project completion (workers employed to implement the project are not counted). The positions need to be filled (vacant posts are not counted) and increase the total number of jobs in the enterprise. If total employment in the enterprise does not increase, the value is zero – it is regarded as realignment, not increase. Safeguarded etc. jobs are not included. Gross: Not counting the origin of the jobholder if it directly contributes to an increase in total jobs at the organisation. The indicator should be used if the employment increase can plausibly be attributed to the support. Full-time equivalent: Jobs can be full time, part time or seasonal. Seasonal and part time jobs are to be converted to FTE using ILO/statistical/other standards. Durability: Jobs are expected to be permanent, i.e. last for a reasonably long period depending on industrial-technological characteristics; seasonal jobs should be recurring. Figures of enterprises that went bankrupt are registered as a zero-employment increase. Timing: Data is collected before the project starts and after it finishes; Managing Authorities are free to specify the exact timing. Using average employment, based on 6 months or a year, is preferred to employment figures on certain dates.	EC Guidance
Measurement unit	Full Time Equivalent (FTE).	EC Guidance
Thematic coverage		**Source**
Thematic objectives	TO 1, TO2, TO 3, TO 4, TO8, TO9.	SFC 2014-2020
Investment priorities	Number of times the indicator is used: IP 1a (1), IP 1b (52), IP 2b (17), IP 3a (102), IP 3b (30), IP 3c (50), IP 3d (86), IP 4a (5), IP 4b (3), IP 4f (3), IP 8a (1), IP 8b (9), IP 9b (2), IP 9c (7), IP 9d (5).	SFC 2014-2020
Fund	ERDF.	SFC 2014-2020
Relevance	89% of respondents say that the indicator covers sufficiently the type of intervention supported by the programme. Lower relevance	Consultation

	for IP 4b, IP 9c.	
Robustness, methodology source		**Source**
Acceptance *(Data collection)*	59% of respondents do not encounter any specific difficulty with the data collection of the indicator, except for some programmes that identify the following issues: • Difficulty with the *calculation of FTE* because there are different methodologies in the MS. • *Timing*: It is not clear when the measurement should be done because the effect if project intervention on employment is not immediate.	Consultation
Credibility *(Definition)*	80% of the respondents consider unambiguous the definition of the indicator, except for some programmes that find difficulties (see above).	Consultation
Easiness *(Monitoring cost)*	Monitoring the indicator costs more than others for 53% of respondents. For the rest of respondents, the cost of monitoring is the same (42%) or less (5%).	Consultation
Robustness *(Definition)*	EC guidance is largely used as a reference.	Consultation

Sustainable tourism

CO09 Increase in expected number of visits to supported sites of cultural or natural heritage and attractions

Identification		Source
Name	Increase in expected number of visits to supported sites of cultural or natural heritage and attractions.	EC Guidance
Definition	The ex-ante estimated increase in number of visits to a site in the year following project completion. Valid for site improvements that aim to attract and accept visitors for sustainable tourism. Includes sites with or without previous tourism activity (e.g. nature parks or buildings converted to museum). One visitor can make multiple visits; a group of visitors count as many visits as many members the group has. The Managing Authorities set the methodology for estimating the expected number that can be based on demand analysis.	EC Guidance
Measurement unit	Visits/year.	EC Guidance
Thematic coverage		**Source**
Thematic objectives	TO 3, TO 6, TO8.	SFC 2014-2020
Investment priorities	Number of times the indicator is used: IP 3a (2), IP 3b (1), IP 3d (1), IP 6c (96), IP 8b (3).	SFC 2014-2020
Fund	ERDF.	SFC 2014-2020
Relevance	80% of respondents say that the indicator covers sufficiently the type of intervention supported by the programme. Lower relevance for IP 8b.	Consultation
Robustness, methodology source		**Source**
Acceptance *(Data collection)*	65% of respondents do not encounter any specific difficulty with the data collection of the indicator, except for some programmes that find some difficulties with the methodology to be used for the calculation of the indicator.	Consultation
Credibility *(Definition)*	63% of the respondents consider unambiguous the definition of the indicator.	Consultation
Easiness *(Monitoring cost)*	Monitoring the indicator costs more than others for 35% of respondents. For the rest of respondents, the cost of monitoring is the same.	Consultation
Robustness *(Definition)*	EC guidance is largely used as a reference, but some programmes used their own methodology	Consultation

Findings on common output indicators on 'ICT infrastructure'

CO10 Additional households with broadband access of at least 30 Mbps

Identification		Source
Name	Additional households with broadband access of at least 30 Mbps.	EC Guidance
Definition	Measures the number of households with internet access with a download speed of at least 30 Mb/sec and who before only had more limited access or did not have access at all. The capacity to access must be a direct consequence of the support. The indicator measures households with the possibility to access, not whether the people living in the households actually choose to be connected or not. 30 Mbps is in line with EU2020, see COM(2010)245 'A digital agenda for Europe'.	EC Guidance
Measurement unit	Households.	EC Guidance
Thematic coverage		**Source**
Thematic objectives	TO 2.	SFC 2014-2020
Investment priorities	IP 2a (58).	SFC 2014-2020
Fund	ERDF, CF.	SFC 2014-2020
Relevance *(Coverage)*	More than 2/3 of the respondents have not experienced any problems, however the following challenges emerge. • ICT is a fast-changing sector and this speed of 30 Mbps is not in accordance with the latest regulations. • The indicator is about households while the OP supports the enterprises connected as well.	Consultation
Robustness, methodology source		**Source**
Acceptance *(Data collection)*	More than 2/3 of the respondents have not experienced any problems, however the following challenges emerge: target setting and definition of what a household is, difficulty of converting addresses into households.	Consultation
Credibility *(Definition)*	About 85% of the respondent are satisfied with the definition, but the main issues are related to the definition of what a household is.	Consultation
Easiness *(Monitoring cost)*	25% of the respondents say that monitoring the indicator costs more than others.	Consultation
Robustness *(Definition)*	EC guidance is largely used as a reference by the respondents, but in a few programmes a specific guidance has been drafted to address the issues mentioned above.	Consultation

Findings on common output indicators on 'Transport'

CO11 Total length of new railway line

Identification		Source
Name	Total length of new railway line.	EC Guidance
Definition	Length of railroads constructed by the project where no railroad existed before.	EC Guidance
Measurement unit	Km.	EC Guidance
Thematic coverage		**Source**
Thematic objectives	TO 4, TO7.	SFC 2014-2020
Investment priorities	Number of times the indicator is used: IP 7a (3), IP 7b (3), IP 7d (2). Limited use for : IP 4e (1), IP 7c (1), IP 7i (1), IP 7ii (1).	SFC 2014-2020
Fund	ERDF, CF.	SFC 2014-2020
Relevance *(Coverage)*	100% of respondents say that the indicator covers sufficiently the type of intervention supported by the programme.	Consultation
Robustness, methodology source		**Source**
Acceptance *(Data collection)*	100% of respondents do not encounter any specific difficulty with the data collection of the indicator.	Consultation
Credibility *(Definition)*	100% of the respondents do not have any difficulty in understanding the definition of the indicator.	Consultation
Easiness *(Monitoring cost)*	Monitoring the indicator does not cost more than others. For 75% of respondents, the cost of monitoring is the same, for 25% lower.	Consultation
Robustness *(Definition)*	EC guidance is largely used as a reference.	Consultation

CO11a Total length of new railway line of which: TEN-T

Identification		Source
Name	Total length of new railway line of which: TEN-T.	EC Guidance
Definition	Total length of new railway line within TEN-T.	EC Guidance
Measurement unit	Km.	EC Guidance
Thematic coverage		**Source**
Thematic objectives	TO7.	SFC 2014-2020
Investment priorities	Number of times the indicator is used: IP 7a (3). Limited use for : IP 7b (1), IP 7c (1), IP 7i (1), IP 7ii (1).	SFC 2014-2020
Fund	ERDF, CF	SFC 2014-2020
Relevance *(Coverage)*	100% of respondents say that the indicator covers sufficiently the type of intervention supported by the programme.	Consultation
Robustness, methodology source		**Source**
Acceptance *(Data collection)*	100% of respondents do not encounter any specific difficulty with the data collection of the indicator.	Consultation
Credibility *(Definition)*	100% of the respondents do not have any difficulty in understanding the definition of the indicator.	Consultation
Easiness *(Monitoring cost)*	Monitoring the indicator does not cost more than others. For 100% of respondents, it costs the same as other indicators.	Consultation
Robustness *(Definition)*	EC guidance is largely used as a reference.	Consultation

CO12 Total length of reconstructed or upgraded railway line

Identification		Source
Name	Total length of reconstructed or upgraded railway line.	EC Guidance
Definition	Length of railroads of which quality or capacity have been improved. This can include electrification, developing single track railroad into double track, increasing the possible speed on the track, or any combination of these, but excludes installation of signalling systems (incl. ensuring ERTMS (European Rail Traffic Management System) compatibility). *The approach chosen here is to exclude signalling systems as they distort the values. Signalling systems should be treated in a separate (programme-specific) indicator.*	EC Guidance
Measurement unit	Km.	EC Guidance
Thematic coverage		**Source**
Thematic objectives	TO 4, TO7.	SFC 2014-2020
Investment priorities	Number of times the indicator is used: IP 4e (4), IP 7a (6), IP 7b (4), IP 7c (3), IP 7d (20), Ip 7i (7), IP 7iii (4). Limited use for IP 7ii (1).	SFC 2014-2020
Fund	ERDF, CF.	SFC 2014-2020
Relevance *(Coverage)*	For 76% of respondents the indicator covers sufficiently the type of intervention. The indicator is more relevant for IP7i than IP7iii.	Consultation
Robustness, methodology source		**Source**
Acceptance *(Data collection)*	100% of respondents do not encounter any specific difficulty with the data collection of the indicator.	Consultation
Credibility *(Definition)*	Almost all the respondents consider unambiguous the definition except for two with the following problems. • Double counting. 'It is not clear how to calculate the value of the indicator, since the same section of the railway can be reconstructed or upgraded several times (with different projects). This problem should be addressed in the future'. • Multiple tracks. 'It is not clear how to measure multiple tracks in the station if they are parallel'.	Consultation
Easiness *(Monitoring cost)*	100% of the respondents say that monitoring the indicator does not cost more than others, for most of them the same as other indicators.	Consultation

Robustness *(Definition)*	EC guidance is largely used as a reference by the respondents. However, some use the definition of Minister of Transport and Communication definition of reconstruction, improvement and renewal of railways (LT), others WEFO guidance (Wales).	Consultation

CO12a Total length of reconstructed or upgraded railway line of which TEN-T

Identification		Source
Name	Total length of reconstructed or upgraded railway line of which TEN-T.	EC Guidance
Definition	Total length of reconstructed or upgraded railway line within TEN-T.	EC Guidance
Measurement unit	Km.	EC Guidance
Thematic coverage		**Source**
Thematic objectives	TO7.	SFC 2014-2020
Investment priorities	Number of times the indicator is used: IP 7a (5), 5, IP 7d (3), IP 7i (7), IP 7iii (4). Limited use for : IP 7c (1), IP 7ii (1).	SFC 2014-2020
Fund	ERDF, CF.	SFC 2014-2020
Relevance *(Coverage)*	93% of respondents indicate that the indicator sufficiently covers the type of intervention of the programme.	Consultation
Robustness, methodology source		**Source**
Acceptance *(Data collection)*	100% of respondents do not encounter any specific difficulty with the data collection of the indicator.	Consultation
Credibility *(Definition)*	Almost all the respondents do not have any specific difficulty with the definition except for two programmes with the same problems as CO12.	Consultation
Easiness *(Monitoring cost)*	100% of the respondents say that monitoring the indicator does not cost more than others, for most of them the same as other indicators.	Consultation
Robustness *(Definition)*	EC guidance is largely used as a reference.	Consultation

CO13 Total length of newly built roads

Identification		Source
Name	Total length of newly built roads.	EC Guidance
Definition	Length of roads (in kilometres) constructed by the project where: • no road existed before, or • as a consequence of project completion, the capacity and quality of the previously existing local/secondary road is significantly improved to reach a higher classification (e.g. national road or equivalent); in this case the road cannot be counted under indicator 'Total length of reconstructed or upgraded roads'.	EC Guidance
Measurement unit	Km.	EC Guidance
Thematic coverage		**Source**
Thematic objectives	TO8, TO7.	SFC 2014-2020
Investment priorities	Number of times the indicator is used: IP 7a (8), 5, IP 7b (38), IP 7i (10). Limited use for : IP 7c (1), IP 8b (1).	SFC 2014-2020
Fund	ERDF, CF.	SFC 2014-2020
Relevance *(Coverage)*	For 82% of respondents, the indicator covers sufficiently the type of intervention supported by the programme. The indicator is more relevant for IP7i than IP7b.	Consultation
Robustness, methodology source		**Source**
Acceptance *(Data collection)*	100% of respondents do not encounter any specific difficulty with the data collection of the indicator.	Consultation
Credibility *(Definition)*	Almost all the respondents do not have any specific difficulty with the definition except for one programme highlighting the following issue 'For instance, could upgrading a local road to a highway be considered as building a new road (since the upgrade quite radically improves the quality of the road and even changes its category)? Therefore, it would be helpful if the future guidance indicates clearly how to interpret the data in ambiguous cases'.	Consultation
Easiness *(Monitoring cost)*	100% of the respondents say that monitoring the indicator does not cost more than others, for most of them the same as other indicators.	Consultation
Robustness *(Definition)*	EC guidance is largely used as a reference by the respondents.	Consultation

CO 13a Total length of newly built roads of which TEN-T

Identification		Source
Name	Total length of newly built roads of which TEN-T.	EC Guidance
Definition	Total length of newly built roads within TEN-T.	EC Guidance
Measurement unit	Km.	EC Guidance
Thematic coverage		**Source**
Thematic objectives	TO 7.	SFC 2014-2020
Investment priorities	Number of times the indicator is used 7a (7), 7i (10).	SFC 2014-2020
Fund	ERDF, CF.	SFC 2014-2020
Relevance *(Coverage)*	100% of respondents indicate the indicator as relevant.	Consultation
Robustness, methodology source		**Source**
Acceptance *(Data collection)*	100% of respondents do not encounter any specific difficulty with the data collection of the indicator.	Consultation
Credibility *(Definition)*	Almost all the respondents do not have any specific difficulty with the definition except for one programme highlighting the following issues: • The difference between upgrading and building a new road as in CO13; • How to count roads leading to TEN-T network or connecting different sections of TEN-T network.	Consultation
Easiness *(Monitoring cost)*	100% of the respondents say that the indicator does not cost more than others, for most of them the same as other indicators.	Consultation
Robustness *(Definition)*	EC guidance is largely used as a reference by the respondents.	Consultation

CO14 Total length of reconstructed or upgraded roads

Identification		Source
Name	Total length of reconstructed or upgraded roads.	EC Guidance
Definition	Length of roads where the capacity or quality of the road (including safety standards) was improved. If the upgrade is significant enough for the road to qualify as new road, it will be counted under 'Total length of newly built roads' and not under this indicator (see above).	EC Guidance
Measurement unit	Km.	EC Guidance
Thematic coverage		**Source**
Thematic objectives	TO 4, TO8, TO7.	SFC 2014-2020
Investment priorities	Number of times the indicator is used: IP 7a (8), IP 7b (51), IP 7i (7), IP 8b (2) Limited use for : IP 7c (1).	SFC 2014-2020
Fund	ERDF, CF.	SFC 2014-2020
Relevance *(Coverage)*	90% of respondents indicate that the indicator covers sufficiently the type of intervention supported by the programme.	Consultation
Robustness, methodology source		**Source**
Acceptance *(Data collection)*	100% of respondents did not encounter any specific difficulty with the data collection of the indicator.	Consultation
Credibility *(Definition)*	Almost all the respondents did not have any specific difficulty with the definition except for the difference between upgrading and building a new road as in CO13.	Consultation
Easiness *(Monitoring cost)*	100% of the respondents say that the indicator does not cost more than others, for most of them the same as other indicators.	Consultation
Robustness *(Definition)*	EC guidance is largely used as a reference by the respondents.	Consultation

CO14a Total length of reconstructed or upgraded roads of which TEN-T

Identification		Source
Name	Total length of reconstructed or upgraded roads of which TEN-T.	EC Guidance
Definition	Total length of reconstructed or upgraded roads within TEN-T.	EC Guidance
Measurement unit	Km.	EC Guidance
Thematic coverage		**Source**
Thematic objectives	TO7.	SFC 2014-2020
Investment priorities	Number of times the indicator is used: IP 7a (7), IP 7i (7). Limited use for : IP 7b (1).	SFC 2014-2020
Fund	ERDF, CF.	SFC 2014-2020
Relevance *(Coverage)*	100% of respondents say that the indicator covers sufficiently the type of intervention supported by the programme.	Consultation
Robustness, methodology source		**Source**
Acceptance *(Data collection)*	100% of respondents do not encounter any specific difficulty with the data collection of the indicator.	Consultation
Credibility *(Definition)*	Almost all the respondents do not have any specific difficulty with the definition except for the difference between upgrading and building a new road as in CO13.	Consultation
Easiness *(Monitoring cost)*	100% of the respondents say that monitoring the indicator does not cost more than others, for most of them the same as other indicators.	Consultation
Robustness *(Definition)*	EC guidance is largely used as a reference by the respondents.	Consultation

CO15 Total length of new or improved tram and metro lines

Identification		Source
Name	Total length of new or improved tram and metro lines.	EC Guidance
Definition	Length of metro, tram or suburban train lines constructed or upgraded. The service along the upgraded lines must significantly improve as a consequence of the project completion. *Double counting for this indicator and indicators 11 and 12 needs to be eliminated (e.g. suburban trains). It is up to the MA for which indicator the built/upgraded track is counted but it must be counted only once.*	EC Guidance
Measurement unit	Km.	EC Guidance
Thematic coverage		**Source**
Thematic objectives	TO 4, TO7.	SFC 2014-2020
Investment priorities	Number of times the indicator is used: IP 4e (16), IP 4v (3), IP 7ii (4). Limited use for : IP 7c (1)	SFC 2014-2020
Fund	ERDF, CF.	SFC 2014-2020
Relevance *(Coverage)*	67% of respondents say that the indicator covers sufficiently the type of interventions supported by the programme. The indicator seems not sufficient to cover some of the programme interventions in particular in IP 4e.	Consultation
Robustness, methodology source		**Source**
Acceptance *(Data collection)*	100% of respondents do not encounter any specific difficulty with the data collection of the indicator.	Consultation
Credibility *(Definition)*	100% of the respondents do not have any specific difficulty with the definition except for two programmes saying that the indicator is more appropriate as a result indicator for IP 4e and its successful measurement depends on other factors. 'The realization of tram and metro lines usually does not consist of the realization of autonomous sectors of infrastructure that are operative as soon as they are completed. It rather consists in the realization of one layer of infrastructure at a time along the whole line under construction, which can be considered operative only when the whole intervention is completed. In this sense it much resembles the characteristics of a result indicator'.	Consultation
Easiness *(Monitoring cost)*	100% of the respondents say that monitoring the indicator does not cost more than others, for most of them the same as other indicators.	Consultation
Robustness *(Definition)*	EC guidance is largely used as a reference by the respondents.	Consultation

CO16 Total length of new or improved inland waterway

Identification		Source
Name	Total length of new or improved inland waterway.	EC Guidance
Definition	Length of inland waterway with new or improved navigation capacity. The improvement may concern improved transport capacity or safety aspects.	EC Guidance
Measurement unit	Km.	EC Guidance
Thematic coverage		**Source**
Thematic objectives	TO7.	SFC 2014-2020
Investment priorities	Number of times the indicator is used: IP 7c (3), IP 7i (3). Limited use for : IP 7b (1)	SFC 2014-2020
Fund	ERDF, CF.	SFC 2014-2020
Relevance *(Coverage)*	For all the respondents, the indicator covers sufficiently the type of interventions supported by the programme.	Consultation
Robustness, methodology source		**Source**
Acceptance *(Data collection)*	100% of respondents do not encounter any specific difficulty with the data collection of the indicator.	SFC 2014-2020
Credibility *(Definition)*	Almost all the respondents do not have any specific difficulty with the definition except for one programme using the national definition of 'inland waterways'.	SFC 2014-2020
Easiness *(Monitoring cost)*	100% of the respondents say that monitoring the indicator does not cost more than others, for most of them the same as other indicators.	SFC 2014-2020
Robustness *(Definition)*	EC guidance is largely used as a reference by the respondents.	Consultation

Findings on common output indicators on 'Environment'

CO17 Additional waste recycling capacity

Identification		Source
Name	Additional waste recycling capacity.	EC Guidance
Definition	Measures the annual capacity of newly built / extended waste recycling facilities.	EC Guidance
Measurement unit	Tonnes/year.	EC Guidance
Thematic coverage		**Source**
Thematic objectives	TO 6.	SFC 2014-2020
Investment priorities	Number of times the indicator is used: IP6a(31), IP6f(4), IP6g(5) and IP6i(10).	SFC 2014-2020
Fund	ERDF, CF.	SFC 2014-2020
Relevance *(Coverage)*	79% of the respondents say that the indicator covers sufficiently the type of interventions supported by the programme.	Consultation
Robustness, methodology source		**Source**
Acceptance *(Data collection)*	Almost all the respondents do not encounter any specific difficulty except for one programme saying that it is difficult to distinguish additional capacity from total capacity in project reporting.	Consultation
Credibility *(Definition)*	Almost all the respondents do not have any specific difficulty with the definition.	Consultation
Easiness *(Monitoring cost)*	100% of the respondents say that monitoring the indicator does not cost more than others, for most of them the same as other indicators.	Consultation
Robustness *(Definition)*	EC guidance is largely used as a reference by the respondents.	Consultation

CO18 Additional population served by improved water supply

Identification		Source
Name	Additional population served by improved water supply.	EC Guidance
Definition	Measures the persons provided with drinking water through drinking water supply network as a consequence of increased drinking water production/transportation capacity built by the project, and who were previously not connected or were served by sub-standard water supply.	EC Guidance
Measurement unit	Persons.	EC Guidance
Thematic coverage		**Source**
Thematic objectives	TO 6, TO9.	SFC 2014-2020
Investment priorities	Number of times the indicator is used: Used in IP6b (39) and IP6ii (13). Limited use in IP 9a (1)	SFC 2014-2020
Fund	ERDF, CF.	SFC 2014-2020
Relevance *(Coverage)*	73% of the respondents say that the indicator covers sufficiently the type of interventions supported by the programme. Higher relevance for IP6ii than IP 6b.	Consultation
Robustness, methodology source		**Source**
Acceptance *(Data collection)*	The measurement of the indicator highlights two issues. • *Result rather than output indicator* – 'This is not an output indicator, but a result indicator. Proper output indicator would be capacity of the infrastructure'. • Importance of demographic trends – 'It would be more appropriate to count number of buildings connected to the network rather than persons. The number of people is largely affected by demographic trends that are not under control of the intervention'.	Consultation
Credibility *(Definition)*	33% of the respondents experience some difficulties with the definition. • Difficulty in identifying households that receive water with below quality standards. • It is considered as a result rather than output indicator. • Beneficiaries sometimes measure the total population instead of additional population and it is not easy to check the data from the reports. • Entities that manage water infrastructures are different from one another in terms of capacity of providing information Infrastructure facilities are built without	Consultation

	guaranteeing connections with homes.	
Easiness *(Monitoring cost)*	33% of the respondents say that monitoring the indicator costs more than others.	Consultation
Robustness *(Definition)*	EC guidance is largely used as a reference by the respondents.	Consultation

CO19 Additional population served by improved wastewater treatment

Identification		Source
Name	Additional population served by improved wastewater treatment.	EC Guidance
Definition	Measures the persons whose wastewater is transported to wastewater treatment plants through wastewater transportation network as a result of increased waste water treatment/transportation capacity built by the project, and who were previously not connected or were served by sub-standard wastewater treatment. It includes improving wastewater treatment level. The indicator covers persons in households with actual (i.e. not potential) connection to the wastewater treatment system.	EC Guidance
Measurement unit	Population equivalent.	EC Guidance
Thematic coverage		**Source**
Thematic objectives	TO 6.	SFC 2014-2020
Investment priorities	Number of times the indicator is used: Used in IP6b (46) and IP6ii (13). Limited use in IP6a (1).	SFC 2014-2020
Fund	ERDF, CF.	SFC 2014-2020
Relevance *(Coverage)*	75% of the respondents say that the indicator covers sufficiently the type of interventions supported by the programme. Higher relevance for IP6ii than IP 6b.	Consultation
Robustness, methodology source		**Source**
Acceptance *(Data collection)*	20% of the respondents experience some difficulties with the definition. • *Result rather than output indicator* – The indicator seems more appropriate as a result rather than output indicator. • *Importance of demographic trends* – 'It would be more appropriate to count the number of buildings connected to the network rather than persons. The number of people is largely affected by demographic trends that are not under control of the intervention'.	Consultation
Credibility *(Definition)*	1/3 of the respondents highlight the following issues. • *Result rather than output indicator* (see acceptance). • It seems difficult to verify the quality of data. • If the indicator is measured in potential terms it is feasible, otherwise it is too ambitious for monitoring activities and should be measured after the end of the projects. • Importance of demographic trends – (see acceptance).	Consultation

Easiness *(Monitoring cost)*	Around 20% of the respondents say that monitoring the indicator costs more than others.	Consultation
Robustness *(Definition)*	EC guidance is largely used as a reference by the respondents, but it is difficult to apply (see credibility and acceptance).	Consultation

CO20 Population benefiting from flood protection measures

Identification		Source
Name	Population benefiting from flood protection measures.	EC Guidance
Definition	Measures the number of people exposed to flood risk where vulnerability decreased as a direct consequence of a supported project.	EC Guidance
Measurement unit	Persons.	EC Guidance
Thematic coverage		**Source**
Thematic objectives	TO 5, TO 6.	SFC 2014-2020
Investment priorities	It has been used in all IPs of TO 5. Limited use in TO 6: IP6e (1).	SFC 2014-2020
Fund	ERDF, CF.	SFC 2014-2020
Relevance *(Coverage)*	77% of the respondents say that the indicator covers sufficiently the type of interventions supported by the programme.	Consultation
Robustness, methodology source		**Source**
Acceptance *(Data collection)*	Almost 40% of the respondents experience some difficulties with the measurement which are related to the definition (see credibility).	Consultation
Credibility *(Definition)*	1/3 of respondents highlight the following issues on the definition. • *Risk level* – The EC guidance does not explain what risk level of flood should be applied. • *Population* – It is not clear whether the indicator refers to resident population. Risks can affect other people (e.g. tourists, commuters). • *Double counting* – Overlaps and double counting should be eliminated.	Consultation
Easiness *(Monitoring cost)*	Around 25% of the respondents say that monitoring the indicator costs more than others.	Consultation
Robustness *(Definition)*	EC guidance is largely used as a reference by the respondents.	Consultation

CO21 Population benefiting from forest fire protection measures

Identification		Source
Name	Population benefiting from forest fire protection measures.	EC Guidance
Definition	Measures the number of people exposed to forest fire risk where vulnerability decreased as a direct consequence of a supported project.	EC Guidance
Measurement unit	Persons.	EC Guidance
Thematic coverage		**Source**
Thematic objectives	TO 5.	SFC 2014-2020
Investment priorities	Number of times the indicator is used: IP5b (11). Limited use: IP5a (4), IP5ii(2).	SFC 2014-2020
Fund	ERDF, CF.	SFC 2014-2020
Relevance *(Coverage)*	100% of the respondents say that the indicator covers sufficiently the type of interventions supported by the programme.	Consultation
Robustness, methodology source		**Source**
Acceptance *(Data collection)*	The respondents do not experience any substantial difficulty with the measurement of the indicator.	Consultation
Credibility *(Definition)*	The main problems on the definition are similar to CO20. In particular, it is not clear what is the right population for the indicator (e.g. resident population or other population).	Consultation
Easiness *(Monitoring cost)*	All the respondents say that monitoring the indicator costs the same as the others.	Consultation
Robustness *(Definition)*	EC guidance is largely used as a reference by the respondents.	Consultation

CO22 Total surface area of rehabilitated land

Identification		Source
Name	Total surface area of rehabilitated land.	EC Guidance
Definition	Measures the surface of remediated or regenerated contaminated or derelict land made available for economic (except non-eligible, e.g. agriculture or forestry) or community activities.	EC Guidance
Measurement unit	Hectares.	EC Guidance
Thematic coverage		**Source**
Thematic objectives	TO 3, TO 5, TO 6, TO8.	SFC 2014-2020
Investment priorities	Number of times the indicator is used: IP5b (11), IP6d (7), IP6e (31). Limited use: IP 3b (1), IP 3c (1), IP5a (1), IP5i (1), IP6i (2), IP6ii (1), IP 8b (2).	SFC 2014-2020
Fund	ERDF, CF.	SFC 2014-2020
Relevance *(Coverage)*	81% of the respondents say that the indicator covers sufficiently the type of interventions supported by the programme. Lower relevance for IP6d and for IP5b.	Consultation
Robustness, methodology source		**Source**
Acceptance *(Data collection)*	Almost 25% of the respondents experience some difficulties with the measurement which are related to the definition (see credibility) and with the need for the monitoring system to dispose of digital cartographic system to determine the exact areas of interventions and avoid double counting.	Consultation
Credibility *(Definition)*	The definition is considered well formulated except for a few programmes highlighting the difficulty of defining the area of intervention. In particular, the size of the area may be larger than the selected area and there could be a problem of double counting while aggregating value from project to programme level.	Consultation
Easiness *(Monitoring cost)*	Around 20% of the respondents say that monitoring the indicator costs more than others.	Consultation
Robustness *(Definition)*	EC guidance is largely used as a reference by the respondents.	Consultation

CO23 Surface area of habitats supported in order to attain a better conservation status

Identification	
Name	Surface area of habitats supported in order to attain a better conservation status .
Definition	Measures the surface of restored or created areas aimed to improve the conservation status of threatened species.
Measurement unit	Hectares.
Thematic coverage	
Thematic objectives	TO 5, TO 6.
Investment priorities	Used in IP 6d (75), IP 6iii (8) Limited use in IP 5a (1), IP 5b (1), IP 6c (1).
Fund	ERDF, CF.
Relevance *(Coverage)*	74% of the respondents say that the indicator covers sufficiently the type of interventions supported by the programme. Lower relevance in IP6d and IP 6iii.
Robustness, methodology source	
Acceptance *(Data collection)*	84% have not experienced any problems with data collection. The main issue relates to the difficulty in identifying the target area.
Credibility *(Definition)*	The 90% of the respondents consider unambiguous the definition of the indicator
Easiness *(Monitoring cost)*	For 21% of the respondents monitoring the indicator costs more than the others, while costing the same for 63%.
Robustness *(Definition)*	EC guidance is largely used as a reference by the respondents, but some programmes used their own methodology.

Findings on common output indicators on 'Research & Innovation'

CO24 Number of new researchers in supported entities

Identification		Source
Name	Number of new researchers in supported entities	EC Guidance
Definition	Gross new working positions (that did not exist before) to directly perform R&D activities, in full time equivalents. The post must be a consequence of project implementation or completion be filled (vacant posts are not counted) and increase the total number of research jobs in the organisation. Support staff for R&D (i.e. jobs not directly involved in R&D activities) is not counted. The indicator focuses on employed personnel; the supported entity may be new or already existing. Gross: Not counting the origin of the jobholder as long as it directly contributes to an increase of total research jobs in the organisation. Full-time equivalent: Jobs can be full time, part time or seasonal. Seasonal and part time jobs are to be converted to FTE using ILO/statistical/other standards. In the field of RTD the duration of jobs tends to be shorter ('project support'). The jobs created for different projects should be added up (provided that all projects receive support); this is not regarded as multiple counting.	EC Guidance
Measurement unit	Full time equivalent (FTE).	EC Guidance
Thematic coverage		**Source**
Thematic objectives	TO 1, TO 4.	SFC 2014-2020
Investment priorities	Number of times the indicator is used: IP 1a (50), IP 1b (50), IP 4f (3).	SFC 2014-2020
Fund	ERDF.	SFC 2014-2020
Relevance	95% of respondents say that the indicator covers sufficiently the type of intervention supported by the programme.	Consultation
Robustness, methodology source		**Source**
Acceptance *(Data collection)*	74% of respondents do not encounter any specific difficulty with the data collection of the indicator, except for some programmes that find some difficulties with the methodology to be used for the calculation of FTE, especially because it is difficult to count new jobs in R&D organisation.	Consultation
Credibility *(Definition)*	67% of the respondents consider unambiguous the definition of the indicator, except for some programmes that find some difficulties in the definition of 'supported entities'.	Consultation

Easiness *(Monitoring cost)*	The indicator cost more than others for 35% of respondents. For the rest of respondents, the cost of monitoring is the same (55%) or less (10%).	Consultation
Robustness *(Definition)*	EC guidance is largely used as a reference, but some programmes used their own methodology	Consultation

CO25 Number of researchers working in improved research infrastructure facilities

Identification		Source
Name	Number of researchers working in improved research infrastructure facilities	EC Guidance
Definition	Existing working positions in research infrastructure facilities that (1) directly perform R&D activities and (2) are directly affected by the project. The posts must be filled (vacant posts are not counted). Support staff for R&D (i.e. jobs not directly involved in R&D activities) is not counted. If more researchers will be employed in the facilities as a consequence of the project, thus the numbers of research jobs increase, the new posts are included (see also 'Number of new researchers in supported entities'). The facilities may be private or public. The project must improve the facilities or quality of equipment, i.e. maintenance or replacement without quality increase is excluded. Full-time equivalent: Jobs can be full time, part time or seasonal. Seasonal and part time jobs are to be converted to FTE using ILO/statistical/other standards. *Research infrastructure is a term used to designate a very heterogeneous group of tangible or intangible assets thus cannot be captured by a limited number of physical indicators. The approach chosen here is to focus on a non-financial dimension of the investment (employment) that is still able to reflect the scale of intervention.*	EC Guidance
Measurement unit	Full time equivalent (FTE).	EC Guidance
Thematic coverage		**Source**
Thematic objectives	TO 1.	SFC 2014-2020
Investment priorities	Number of times the indicator is used: IP 1a (119), IP 1b (11).	SFC 2014-2020
Fund	ERDF.	SFC 2014-2020
Relevance	100% of respondents say that the indicator covers sufficiently the type of intervention supported by the programme.	Consultation
Robustness, methodology source		**Source**
Acceptance *(Data collection)*	91% of respondents do not encounter any specific difficulty with the data collection of the indicator, except for some programmes that find some difficulties with the methodology to be used for the calculation of FTE.	Consultation
Credibility *(Definition)*	78% of the respondents consider unambiguous the definition of the indicator, except for some programmes that find some difficulties in the definition of research infrastructure.	Consultation

Easiness *(Monitoring cost)*	Monitoring the indicator costs more than others for 25% of respondents. For the rest of respondents, the cost of monitoring is the same (67%) or less (8%).	Consultation
Robustness *(Definition)*	EC guidance is largely used as a reference, but some programmes used their own methodology	Consultation

CO26 Number of enterprises cooperating with research institutions

Identification		Source
Name	Number of enterprises cooperating with research institutions.	EC Guidance
Definition	Number of enterprises that cooperate with research institutions in R&D projects. At least one enterprise and one research institution participate in the project. One or more of the cooperating parties (research institution or enterprise) may receive the support but it must be conditional to the cooperation. The cooperation may be new or existing. The cooperation should last at least for the duration of the project. Enterprise: Organisation producing products or services to satisfy market needs in order to reach profit. The origin of the enterprise (inside or outside of the EU) does not matter. In case one enterprise takes the formal lead and others are subcontractors but still interacting with the research institution, all enterprises should be counted. Enterprises cooperating in different projects should be added up (provided that all projects receive support); this is not regarded as multiple counting. Research institution: an organisation of which R&D is a primary activity. *Cooperation can be counted based on either the operations or the participants. This indicator focuses on the enterprises as participants.*	EC Guidance
Measurement unit	Number of enterprises.	EC Guidance
Thematic coverage		**Source**
Thematic objectives	TO 1, TO 3, TO 4, TO 10.	SFC 2014-2020
Investment priorities	Number of times the indicator is used: IP 1a (32), IP 1b (161), IP 3a (1), IP 4a (1), IP 4f (5), IP 10 (1).	SFC 2014-2020
Fund	ERDF.	SFC 2014-2020
Relevance	94% of respondents say that the indicator covers sufficiently the type of intervention supported by the programme.	Consultation
Robustness, methodology source		**Source**
Acceptance *(Data collection)*	88% of respondents do not encounter any specific difficulty with the data collection of the indicator.	Consultation
Credibility *(Definition)*	79% of the respondents consider unambiguous the definition of the indicator, except for some programmes that find some difficulties: • It is unclear what 'collaboration' means • The definition of 'research institutions' is not clear • The definition does not define the conditions for the inclusion of sub-contractor.	Consultation

Easiness *(Monitoring cost)*	Monitoring the indicator costs more than others for 12% of respondents. For the rest of respondents, the cost of monitoring is the same (77%) or less (11%).	Consultation
Robustness *(Definition)*	EC guidance is largely used as a reference.	Consultation

CO27 Private investment matching public support in innovation or R&D projects

Identification		Source
Name	Private investment matching public support in innovation or R&D projects.	EC Guidance
Definition	Total value of private contribution in supported innovation or R&D projects, including noneligible parts of the project.	EC Guidance
Measurement unit	EUR.	EC Guidance
Thematic coverage		**Source**
Thematic objectives	TO 1, TO 3, TO 4.	SFC 2014-2020
Investment priorities	Number of times the indicator is used: IP 1a (33), IP 1b (102), IP 3a (2) IP 3d (2), IP 4a (1), IP 4b (1), IP 4f (4).	SFC 2014-2020
Fund	ERDF.	SFC 2014-2020
Relevance	91% of respondents say that the indicator covers sufficiently the type of intervention supported by the programme. Lower relevance for IP 3d.	Consultation
Robustness, methodology source		**Source**
Acceptance *(Data collection)*	87% of respondents do not encounter any specific difficulty with the data collection of the indicator.	Consultation
Credibility *(Definition)*	91% of the respondents consider unambiguous the definition of the indicator, except for some programmes that find some difficulties with the definition of: • Eligible costs • Private investment.	Consultation
Easiness *(Monitoring cost)*	Monitoring the indicator costs more than others for 4% of respondents. For the rest of respondents, the cost of monitoring is the same (74%) or less (22%).	Consultation
Robustness *(Definition)*	EC guidance is largely used as a reference.	Consultation

CO28 Number of enterprises supported to introduce new to the market products

Identification		Source
Name	Number of enterprises supported to introduce new to the market products.	EC Guidance
Definition	The indicator measures if an enterprise receives support to develop a 'new to the market' product in any of its markets. Includes process innovation as long as the process contributes to the development of the product. Projects without the aim of actually developing a product are excluded. If an enterprise introduces several products or receives support for several projects, it is still counted as one enterprise. In case of cooperation projects, the indicator measures all participating enterprises. A product is new to the market if there is no other product available on a market that offers the same functionality, or the technology that the new product uses is fundamentally different from the technology of already existing products. Products can be tangible or intangible (incl. services). Supported projects that aimed to introduce new to the markets products but did not succeed are still counted. If a product is new both to the market and to the firm, the enterprise should be counted in both relevant indicators (see indicator 29 'Number of enterprises supported to introduce new to the firm products'). The boundaries of the market (either geographical or other) are defined by the Managing Authority based on the business activity of the enterprise receiving support. *Indicator 1 should also be used where this indicator is used. Please note the relation with indicator 29 'Number of enterprises that introduced new to the firm product'. While most classic innovations lead to products new both to the market and to the firm, it is possible that the product is new to the market but not new to the firm, e.g. adapting an existing product to a new market without changing functionality.*	EC Guidance
Measurement unit	Number of enterprises.	EC Guidance
Thematic coverage		**Source**
Thematic objectives	TO 1, TO2, TO 3, TO 4, TO9.	SFC 2014-2020
Investment priorities	Number of times the indicator is used: IP 1b (86), IP 2b (2), IP 3a (5), IP 3b (10), IP 3c (22), IP 3d (6), IP 4a (1), IP 4b (1), IP 4f (4), IP 9a (1), IP 9d (2).	SFC 2014-2020
Fund	ERDF.	SFC 2014-2020
Relevance	88% of respondents say that the indicator covers sufficiently the type of intervention supported by the programme. Lower relevance	Consultation

	for IP 1b.	
Robustness, methodology source		**Source**
Acceptance *(Data collection)*	88% of respondents do not encounter any specific difficulty with the data collection of the indicator.	Consultation
Credibility *(Definition)*	80% of the respondents consider unambiguous the definition of the indicator, except for some programmes that find some difficulties with the meaning of new to the market and new to the firm (CO29).	Consultation
Easiness *(Monitoring cost)*	Monitoring the indicator costs more than others for 23% of respondents. For the rest of respondents, the cost of monitoring is the same (65%) or less (12%).	Consultation
Robustness *(Definition)*	EC guidance is largely used as a reference.	Consultation

CO29 Number of enterprises supported to introduce new to the firm products

Identification		Source
Name	Number of enterprises supported to introduce new to the firm products.	EC Guidance
Definition	The indicator measure if an enterprise is supported to develop a 'new to the firm' product. Includes process innovation as long as the process contributes to the development of the product. Projects without the aim of actually developing a product are excluded. If an enterprise introduces several products or receives support for several projects, it is still counted as one enterprise. In case of cooperation projects, the indicator measures all participating enterprises to which the product is new. A product is new to the firm if the enterprise did not produce a product with the same functionality or the production technology is fundamentally different from the technology of already produced products. Products can be tangible or intangible (incl. services). Supported projects that aimed to introduce new to the firm products but did not succeed are still counted. If a product is new both to the market and to the firm, the enterprise should be counted in both relevant indicators (see indicator 28 'Number of enterprises supported to introduce new to the market products'). *Indicator 1 should also be used where this indicator is used.* *Please note the relation with indicator 28 'Number of enterprises that introduced new to the market product'. While most classic innovations lead to products new both to the market and to the firm, it is possible that the product is new to the firm but not new to the market, e.g. certain technology transfers.*	EC Guidance
Measurement unit	Number of enterprises.	EC Guidance
Thematic coverage		**Source**
Thematic objectives	TO 1, TO2, TO 3, TO 4, TO 6.	SFC 2014-2020
Investment priorities	Number of times the indicator is used: IP 1a (2), IP 1b (82), IP 2b (4), IP 3a (10), IP 3b (7), IP 3c (35), IP 3d (11), IP 4a (3), IP 4b (4), IP 4f (3), IP 6f (1), IP 9d (2).	SFC 2014-2020
Fund	ERDF.	SFC 2014-2020
Relevance	80% of respondents say that the indicator covers sufficiently the type of intervention supported by the programme. Lower relevance for IP 4a, IP 4b.	Consultation
Robustness, methodology source		**Source**

Acceptance *(Data collection)*	85% of respondents do not encounter any specific difficulty with the data collection of the indicator.	Consultation
Credibility *(Definition)*	79% of the respondents consider unambiguous the definition of the indicator, except for some programmes that find some difficulties (See above).	Consultation
Easiness *(Monitoring cost)*	Monitoring the indicator costs more than others for 26% of respondents. For the rest of respondents, the cost of monitoring is the same (59%) or less (15%).	Consultation
Robustness *(Definition)*	EC guidance is largely used as a reference.	Consultation

Findings on common output indicators on 'Energy and Climate Change'

CO30 Additional capacity of renewable energy production

Identification		Source
Name	Additional capacity of renewable energy production.	EC Guidance
Definition	Measures the increase in energy production capacity of facilities using renewable energy resources, built/equipped by the project.	EC Guidance
Measurement unit	MW.	EC Guidance
Thematic coverage		**Source**
Thematic objectives	TO 4.	SFC 2014-2020
Investment priorities	Number of times the indicator is used: one of the mostly used in TO 4 for all IP, except for IP4d, IP4iv, IP4v.	SFC 2014-2020
Fund	ERDF, CF.	SFC 2014-2020
Relevance *(Coverage)*	90% of the respondents say that the indicator covers sufficiently the type of interventions supported by the programme. Lower relevance for IP 4iii.	Consultation
Robustness, methodology source		**Source**
Acceptance *(Data collection)*	The measurement of the indicator highlights two issues. • *Difficulty to consolidate data* due to differences in the measurement unit at project and programme level 'There are difficulties in consolidating the data, since there are differences in between measurement units at project and programme levels'. For instance, some users used the indicator to measure the production and not the capacity. • *Difficulty in the process to obtain information* that implies high additional costs (see easiness).	Consultation
Credibility *(Definition)*	Almost all respondents do not find any difficulties with the definition. However, few say that it is not clear whether it measures results or outputs.	Consultation
Easiness *(Monitoring cost)*	27% of the respondents say that monitoring the indicator costs more than others.	Consultation
Robustness *(Definition)*	EC guidance is largely used as a reference by the respondents.	Consultation

CO31 Number of households with improved energy consumption classification

Identification		Source
Name	Number of households with improved energy consumption classification.	EC Guidance
Definition	Measures the number of households in improved energy class – see Directive 2010/31/EU. Improved class must be the direct consequence of the project completion.	EC Guidance
Measurement unit	Households.	EC Guidance
Thematic coverage		**Source**
Thematic objectives	TO 4.	SFC 2014-2020
Investment priorities	Number of times the indicator is used: Limited use: IP4e (1) and IP4iii (5). Used in IP4c (99).	SFC 2014-2020
Fund	ERDF, CF.	SFC 2014-2020
Relevance *(Coverage)*	88% of the respondents say that the indicator covers sufficiently the type of interventions supported by the programme. Lower relevance for IP 4iii.	Consultation
Robustness, methodology source		**Source**
Acceptance *(Data collection)*	The measurement of the indicator highlights two issues. • *Timing of measurement* - It is difficult to verify the value of output at the payment of the project. 'The value of the outputs, related to Energy efficiency cannot be verified at final payment of the project, but only after one winter season, or after 3 to 6 years subject to a new energy efficiency audit'. • *Difficult measurement* - The process to obtain data and energy certificate is complex and implies additional costs. • *Lack of standard* – 'The issue concerns lack of ranges in characterizing energy efficiency of buildings. Every improvement in energy efficiency is treated as an improvement in energy efficiency class'.	Consultation
Credibility *(Definition)*	Around 20% of the respondents experience some difficulties with the definition. For some of the respondents the definition of household is too general and not easy to understand.	Consultation
Easiness *(Monitoring cost)*	¼ of the respondents say that the indicator costs more than others.	Consultation
Robustness *(Definition)*	EC guidance is largely used as a reference by the respondents.	Consultation

CO32 Decrease of annual primary energy consumption of public buildings

Identification		Source
Name	Decrease of annual primary energy consumption of public buildings.	EC Guidance
Definition	Measures the value calculated from the energy certificates issued before and after the reconstruction. The indicator shows the total decrease of annual consumption, not the total saved consumption.	EC Guidance
Measurement unit	Households.	EC Guidance
Thematic coverage		**Source**
Thematic objectives	TO 1, TO 4, TO 8, TO 9, TO 10.	SFC 2014-2020
Investment priorities	Number of times the indicator is used: Limited use: IP1a (1), IP4e (5) and IP4iii (5), IP 10 (4), IP 9a (2), IP 8b (2). Used in IP4c (117).	SFC 2014-2020
Fund	ERDF, CF.	SFC 2014-2020
Relevance *(Coverage)*	88% of the respondents say that the indicator covers sufficiently the type of interventions supported by the programme. Lower relevance for IP 4c.	Consultation
Robustness, methodology source		**Source**
Acceptance *(Data collection)*	Almost 30% of the respondents experience some difficulties in data collection. The measurement of the indicator highlights two issues. • *Difficulty in data collection and elaboration*, which requires a high level of expertise and implies considerable costs (energy certificates and audits). • Difficulty with definition (see below). • *Results and not output*. It should be intended as result indicator at project level.	Consultation
Credibility *(Definition)*	Around 20% of the respondents experience some difficulties with the definition. The problems with the definition are related to the definition of public buildings.	Consultation
Easiness *(Monitoring cost)*	33% of the respondents say that the indicator costs more than others.	Consultation
Robustness *(Definition)*	EC guidance is largely used as a reference by the respondents.	Consultation

CO33 Number of additional energy users connected to smart grids

Identification		Source
Name	Number of additional energy users connected to smart grids.	EC Guidance
Definition	Measures the users (enterprises and consumers) of smart grids, which are electricity networks that integrate the actions of energy users by exchanging digital information with the network operator or supplier.	EC Guidance
Measurement unit	Users.	EC Guidance
Thematic coverage		**Source**
Thematic objectives	TO 4, TO 7.	SFC 2014-2020
Investment priorities	Number of times the indicator is used: Limited use: IP4a (2), IP4b (1), IP4c (1). Used in IP4d (13), IP4iv (4), IP 7e (4).	SFC 2014-2020
Fund	ERDF, CF.	SFC 2014-2020
Relevance *(Coverage)*	82% of the respondents say that the indicator covers sufficiently the type of interventions supported by the programme. Lower relevance for IP4a.	Consultation
Robustness, methodology source		**Source**
Acceptance *(Data collection)*	More than 30% of the respondents have problems with data collection, mainly due to difficulty of definition what a user is (see below).	Consultation
Credibility *(Definition)*	Most of the respondents (90%) do not have any problem with the definition. The problems with the definition are related to the definition of users.	Consultation
Easiness *(Monitoring cost)*	Around 20% of the respondents say that monitoring the indicator costs more than others.	Consultation
Robustness *(Definition)*	EC guidance is largely used as a reference by the respondents	Consultation

CO34 Estimated annual decrease of GHG

Identification		Source
Name	Estimated annual decrease of GHG.	EC Guidance
Definition	Measures the estimate annual decrease of GHG emissions at project level.	EC Guidance
Measurement unit	tons of CO2 equivalent.	EC Guidance
Thematic coverage		**Source**
Thematic objectives	TO 1, TO 4, TO 6, TO7, TO8, TO9, TO 10.	SFC 2014-2020
Investment priorities	One of the mostly used in TO 4 for all IP, except for IP4d, 4iv Limited use: IP1a (1), IP1b (1), IP6e (2), IP6g (2), IP6iv (1), IP 7e (4), IP 8b (2), IP 9a (2), IP 10 (4).	SFC 2014-2020
Fund	ERDF, CF.	SFC 2014-2020
Relevance *(Coverage)*	82% of the respondents say that the indicator covers sufficiently the type of interventions supported by the programme. Lower relevance for IP4g, IP 6iv, IP 7a, IP 7b.	Consultation
Robustness, methodology source		**Source**
Acceptance *(Data collection)*	Respondents highlight the following issues: • *Difficulty in the methodology* to calculate GHG reductions. Due to the complexity of the measurement a high level of expertise is required and that implies additional costs. • *Result rather than output indicator*. 'It would be more appropriate to be result indicator rather than output indicator' and 'could be measured 12 months after the intervention'. • *Other indicators are needed,* reflecting the reduction in SOx, NOx emissions, etc. • Not clear definition (see below).	Consultation
Credibility *(Definition)*	Almost 30% of the respondents experience some difficulties with the definition. Most of the difficulties are related to the definition provided that is too general and is not always considered clear out of the energy sector. In the case of transport sector (sustainable mobility), the indicator could be measured as 'avoided emissions' instead of 'reduced emissions'. There is an uncertainty about the use of energy certificates instead of actual consumption, whether it is appropriate for EC. The calculation of actual consumption would depend on a season, therefore would be require and would be	Consultation

	weak.	
Easiness *(Monitoring cost)*	39% of the respondents say that monitoring the indicator costs more than others. Energy efficiency certificates are usually considered necessary before and after the project.	Consultation
Robustness *(Definition)*	EC guidance is largely used as a reference by the respondents, but some of the programmes apply their own methodology.	Consultation

Findings on common output indicators on 'Social Infrastructure'

CO35 Capacity of supported childcare or education infrastructure

Identification		Source
Name	Capacity of supported childcare or education infrastructure.	EC Guidance
Definition	Number of users who can use newly built or improved childcare or education facilities. 'Users' in this context mean the children, pupils, or students, not teachers, parents or other persons who may use the facilities too. It includes new or improved buildings, or new equipment provided by the project. It measures nominal capacity (i.e. number of possible users which is usually higher than or equal to the number of actual users).	EC Guidance
Measurement unit	Persons.	EC Guidance
Thematic coverage		**Source**
Thematic objectives	TO9, TO 10.	SFC 2014-2020
Investment priorities	Number of times the indicator is used: IP 9a (22), IP 9b (4), IP 10 (68).	SFC 2014-2020
Fund	ERDF.	SFC 2014-2020
Relevance	91% of respondents say that the indicator covers sufficiently the type of intervention supported by the programme.	Consultation
Robustness, methodology source		**Source**
Acceptance *(Data collection)*	78% of respondents do not encounter any specific difficulty with the data collection of the indicator.	Consultation
Credibility *(Definition)*	Almost all the respondents consider unambiguous the definition of the indicator except for two programmes with the following problems of definition and measurement: • Difficulty in identify who are the users of the infrastructure • Difficulty in measuring the capacity of supported educational infrastructure and not the actual number of children.	Consultation
Easiness *(Monitoring cost)*	Monitoring the indicator costs more than others for 5% of respondents. For 90% of respondents, the cost of monitoring is the same, for 5% lower.	Consultation
Robustness *(Definition)*	EC guidance is largely used as a reference, but some programmes used their own guidance.	Consultation

CO36 Population covered by improved health services

Identification		Source
Name	Population covered by improved health services.	EC Guidance
Definition	Population of a certain area expected to benefit from the health services supported by the project. It includes new or improved buildings, or new equipment for various type of health service (prevention, outpatient or inpatient care, aftercare). The indicator excludes multiple counting even if the intervention benefits more services targeting the same persons: one person still counts as one even if that person will use several services which were supported by Structural Funds. For example, an aftercare facility is developed in a city with a population of 100,000 inhabitants. It will serve half the city's population; thus, the indicator value will increase by 50,000. If later a prevention service is developed in the same city that will serve the whole population, the indicator value will increase by another 50,000.	EC Guidance
Measurement unit	Persons.	EC Guidance
Thematic coverage		**Source**
Thematic objectives	TO2, TO9.	SFC 2014-2020
Investment priorities	Number of times the indicator is used: IP 2c (3), IP 9a (57), IP 9b (1).	SFC 2014-2020
Fund	ERDF.	SFC 2014-2020
Relevance	88% of respondents say that the indicator covers sufficiently the type of intervention supported by the programme.	Consultation
Robustness, methodology source		**Source**
Acceptance *(Data collection)*	73% of respondents do not encounter any specific difficulty with the data collection of the indicator.	Consultation
Credibility *(Definition)*	Almost all the respondents consider unambiguous the definition of the indicator except for some programmes that find difficulties in the definition fo the target value of the indicator.	Consultation
Easiness *(Monitoring cost)*	Monitoring the indicator costs more than others for 33% of respondents. For the rest of respondents, the cost of monitoring is the same.	Consultation
Robustness *(Definition)*	EC guidance is largely used as a reference.	Consultation

Findings on common output indicators on 'Urban Development'

CO37 Population living in areas with integrated urban development strategies

Identification		Source
Name	Population living in areas with integrated urban development strategies.	EC Guidance
Definition	Population living in areas with integrated urban development strategies within the meaning of Article 7 of Regulation 1301 / 2013 (ERDF). Use the indicator only once for each area.	EC Guidance
Measurement unit	Persons.	EC Guidance
Thematic coverage		**Source**
Thematic objectives	TO 3, TO 4, TO 6, TO8, TO9.	SFC 2014-2020
Investment priorities	Number of times the indicator is used: IP 2a (1), IP 2b (1), IP 3a (2), IP 4a (1), IP 4b (6), IP 4e (7), IP 6c (1), IP 6e (17), IP 8b (1), IP 9a (3), IP 9b (28).	SFC 2014-2020
Fund	ERDF.	SFC 2014-2020
Relevance	86% of respondents say that the indicator covers sufficiently the type of intervention supported by the programme. Lower relevance for IP 4e.	Consultation
Robustness, methodology source		**Source**
Acceptance *(Data collection)*	82% of respondents do not encounter any specific difficulty with the data collection of the indicator.	Consultation
Credibility *(Definition)*	100% of the respondents consider unambiguous the definition of the indicator.	Consultation
Easiness *(Monitoring cost)*	Monitoring the indicator costs more than others for 18% of respondents. For the rest of respondents, the cost of monitoring is the same (59%) or less (23%).	Consultation
Robustness *(Definition)*	EC guidance is largely used as a reference, but some programmes used their own methodology.	Consultation

CO38 Open space created or rehabilitated in urban areas

Identification		Source
Name	Open space created or rehabilitated in urban areas.	EC Guidance
Definition	Size of renovated / newly developed publicly accessible open-air areas. It does not include developments covered by the 'standard' common indicators (e.g. roads, rehabilitated land, schoolyards, etc.).	EC Guidance
Measurement unit	Square meters.	EC Guidance
Thematic coverage		**Source**
Thematic objectives	TO 4, TO 5, TO 6, TO8, TO9.	SFC 2014-2020
Investment priorities	Number of times the indicator is used: IP 4e (5), IP 5a (1), IP 6c (1), IP 6d (1), 6e (41), 8b (1), IP 9b (26), IP 9d (3).	SFC 2014-2020
Fund	ERDF.	SFC 2014-2020
Relevance	90% of respondents say that the indicator covers sufficiently the type of intervention supported by the programme. Lower relevance for IP 6d.	Consultation
Robustness, methodology source		**Source**
Acceptance *(Data collection)*	95% of respondents do not encounter any specific difficulty with the data collection of the indicator.	Consultation
Credibility *(Definition)*	68% of the respondents consider unambiguous the definition of the indicator.	Consultation
Easiness *(Monitoring cost)*	Monitoring the indicators cost more than others for 5% of respondents. For the rest of respondents, the cost of monitoring is the same (77%) or less (18%).	Consultation
Robustness *(Definition)*	EC guidance is largely used as a reference.	Consultation

CO39 Public or commercial buildings newly built or renovated in urban areas

Identification		Source
Name	Public or commercial buildings newly built or renovated in urban areas.	EC Guidance
Definition	Measures the size of renovated / newly developed public and commercial areas.	EC Guidance
Measurement unit	Square meters.	EC Guidance
Thematic coverage		**Source**
Thematic objectives	TO 4, TO 6, TO8, TO9, TO 10.	SFC 2014-2020
Investment priorities	Used in IP6e (22), IP9a (7), IP9b (33). Limited use: IP4c (1), IP6c (2), IP8b (3), IP9d (3), IP10 (2).	SFC 2014-2020
Fund	ERDF.	SFC 2014-2020
Relevance *(Coverage)*	78% of the respondents say that the indicator covers sufficiently the type of interventions supported by the programme. Lower relevance for IP 6e, IP 9d.	Consultation
Robustness, methodology source		**Source**
Acceptance *(Data collection)*	Respondents have not encountered any specific difficulty with the data collection.	Consultation
Credibility *(Definition)*	Almost all the respondents have not experienced any difficulties with the definition. However, the two main issues are related to the meaning of 'renovated' and to what 'surface area' should be considered. It should be clarified if the surface area refers to: the building, the sum of all the floors of the building, the surface which can be used.	Consultation
Easiness *(Monitoring cost)*	Monitoring the indicator costs less than or the same as the others.	Consultation
Robustness *(Definition)*	EC guidance is largely used as a reference by the respondents, but some of the programmes apply their own methodology, for instance by specifying that the surface should refer to the usable area of buildings according to the national law.	Consultation

CO40 Rehabilitated housing in urban areas

Identification		Source
Name	Rehabilitated housing in urban areas.	EC Guidance
Definition	Number of renovated / newly developed housing units in residential areas, as part of urban rehabilitation.	EC Guidance
Measurement unit	Housing units.	EC Guidance
Thematic coverage		**Source**
Thematic objectives	TO 4, TO 6, TO9.	SFC 2014-2020
Investment priorities	Number of times the indicator is used: IP 4e (1), IP 6e (4), IP 9a (1), IP 9b (31).	SFC 2014-2020
Fund	ERDF.	SFC 2014-2020
Relevance	92% of respondents say that the indicator covers sufficiently the type of intervention supported by the programme.	Consultation
Robustness, methodology source		**Source**
Acceptance *(Data collection)*	95% of respondents do not encounter any specific difficulty with the data collection of the indicator.	Consultation
Credibility *(Definition)*	91% of the respondents consider unambiguous the definition of the indicator, except one programme that finds some difficulties with the definition of housing units. 'The definition of housing units was unclear as to whether it referred to buildings, flats or households'.	Consultation
Easiness *(Monitoring cost)*	The indicator cost more than others for 9% of respondents. For the rest of respondents, the cost of monitoring is the same (73%) or less (18%).	Consultation
Robustness *(Definition)*	EC guidance is largely used as a reference.	Consultation

8.6. Representativeness and findings of the MA consultation

The tables below illustrate the representativeness of the consulted sample of MA and, for each TO, the share of the total EU amount of each programme, and the success rate of the consultation.

The terms of reference of the study establishes reference thresholds of representativeness of the consulted sample: 63% of the EU amount in TO 1, 62% in TO 3, 71% in TO 4, 76% in TO 5, and 53% in TO 6.

In terms of EU amount, the sample of consulted programmes represents 62% of the EU amount in TO 1 (99% of the target), 63% in TO 3 (102% of the target), 70% in TO 4 (98% of the target), 64% in TO 5 (85% of the target), 57% in TO 6 (108% of the target).

Moreover, the terms of reference of the study establishes reference thresholds of representativeness of the consulted sample in terms of number of programmes: 34 OPs in TO 1, 37 in TO 3, 47 in TO 4, 25 in TO 5, and 28 in TO 6.

The sample of programmes represents 97% of the target TO 1, 95% in TO 3, 96% in TO 4, 92% in TO 5, 96% in TO 6.

Overall, three programmes have refused to participate.

Table 44 MA consultation – EU amount

Programme code	Status of the interview	Country	TO 1	TO 3	TO 4	TO 5	TO 6
2014BG16M1OP002	Conducted	BG	:	:	:	0.008	0.025
2014BG16RFOP001	Conducted	BG	:	:	0.010	:	:
2014BG16RFOP002	Conducted	BG	0.003	0.015	:	:	:
2014RO16M1OP001	Conducted	RO	:	:	0.011	0.061	0.060
2014RO16RFOP001	Conducted	RO	0.019	:	:	:	:
2014RO16RFOP002	Conducted	RO	:	0.019	0.075	:	0.009
2014CZ05M2OP001	Conducted	CZ	0.024	:	:	:	:
2014CZ16M1OP002	Conducted	CZ	:	:	0.013	0.057	0.030
2014CZ16RFOP001	Conducted	CZ	0.033	0.027	0.026	:	:
2014CZ16RFOP002	Conducted	CZ	:	:	0.016	0.019	0.008
2014SK16M1OP002	Conducted	SK	:	:	0.024	0.086	0.037
2014SK16RFOP001	Conducted	SK	0.044	0.012	:	:	:
2014LT16MAOP001	Conducted	LT	0.017	0.016	0.023	0.014	0.014
2014ES16RFOP001	Conducted	ES	0.070	:	:	:	:
2014ES16RFOP002	Conducted	ES	:	:	0.059	:	0.038
2014ES16RFOP003	Conducted	ES	:	0.018	0.009	0.018	0.010

Programme code	Status of the interview	Country	TO 1	TO 3	TO 4	TO 5	TO 6
2014ES16RFOP011	Conducted	ES	0.008	:	:	:	:
2014ES16RFSM001	Conducted	ES	:	0.024	:	:	:
2014PT16CFOP001	Conducted	PT	:	:	0.019	0.051	0.019
2014PT16M2OP001	Conducted	PT	:	0.038	0.009	:	:
2014PT16M2OP002	Conducted	PT	:	0.025	:	:	:
2014PT16M2OP003	Conducted	PT	:	0.011	:	:	:
2014PT16M2OP005	Conducted	PT	:	0.006	:	:	:
2014PT16M3OP001	Conducted	PT	0.034	0.043	:	:	:
2014DK16RFOP001	Conducted	DK	0.001	0.002	0.001	:	:
2014EE16M3OP001	Conducted	EE	0.016	0.009	0.007	0.007	0.005
2014FI16M2OP001	Conducted	FI	0.007	0.008	0.005	:	:
2014SE16RFOP008	Conducted	SE	0.001	0.002	:	:	:
2014SE16RFOP009	Conducted	SE	:	:	0.002	:	:
2014AT16RFOP001	Conducted	AT	0.005	0.005	0.003	:	:
2014MT16M1OP001	Conducted	MT	0.001	0.001	0.001	:	0.004
2014PL16M1OP001	Conducted	PL	:	:	0.104	0.089	0.060
2014PL16M2OP001	Conducted	PL	:	:	0.010	:	:
2014PL16M2OP003	Conducted	PL	:	:	0.010	:	:
2014PL16M2OP006	Conducted	PL	:	:	0.010	:	:
2014PL16M2OP012	Conducted	PL	:	:	0.020	:	:
2014PL16RFOP001	Conducted	PL	0.149	0.066	:	:	:
2014PL16RFOP003	Conducted	PL	:	0.022	0.011	:	:
2014SI16MAOP001	Conducted	SI	0.011	0.016	0.007	0.011	0.008
2014HU16M0OP001	Conducted	HU	0.050	0.061	0.018	:	:
2014HU16M1OP001	Refusal	HU	:	:	0.021	0.113	0.027
2014HU16M2OP001	Conducted	HU	:	:	0.021	:	0.011
2014BE16RFOP002	Conducted	BE	:	:	:	0.001	:
2014CY16M1OP001	Conducted	CY	0.001	0.002	0.001	0.001	0.003
2014DE16M2OP001	Refusal	DE	:	0.006	:	:	:
2014DE16RFOP002	Conducted	DE	:	0.005	:	:	:

Programme code	Status of the interview	Country	TO 1	TO 3	TO 4	TO 5	TO 6
2014DE16RFOP003	Conducted	DE	0.007	:	:	:	:
2014DE16RFOP009	Conducted	DE	0.011	:	0.007	:	0.012
2014DE16RFOP012	Refusal	DE	0.020	0.011	0.013	0.027	:
2014DE16RFOP013	Conducted	DE	:	0.012	0.009	0.015	:
2014DE16RFOP015	Conducted	DE	:	:	:	0.012	:
2014GR16M1OP001	Conducted	GR	:	:	0.031	0.012	0.033
2014GR16M2OP001	Conducted	GR	0.020	0.027	:	:	:
2014LU16RFOP001	Conducted	LU	0.000	:	0.000	:	:
2014NL16RFOP002	Conducted	NL	0.001	:	:	:	:
2014NL16RFOP003	Conducted	NL	:	:	0.001	:	:
2014BE16RFOP003	Conducted	BE	0.002	0.005	0.003	:	0.025
2014FR16M0OP001	Conducted	FR	0.001	:	:	:	:
2014FR16M0OP011	Conducted	FR	:	:	:	0.004	:
2014FR16M0OP012	Conducted	FR	:	:	0.006	:	0.011
2014FR16RFOP007	Conducted	FR	:	0.006	:	:	:
2014HR16M1OP001	Conducted	HR	0.016	0.029	0.013	0.031	0.036
2014IT16M2OP002	Conducted[79]	IT	0.008	0.017	0.005	0.021	0.060
2014IT16M2OP005	Conducted	IT	0.017	:	:	:	:
2014IT16M2OP006	Conducted	IT	:	:	0.009	:	:
2014IT16RFOP003	Conducted	IT	0.013	0.017	0.010	:	:
2014IT16RFOP007	Conducted	IT	:	:	0.012	0.035	0.028
2014IT16RFOP016	Conducted	IT	:	0.015	0.021	0.028	0.013
2014LV16MAOP001	Conducted	LV	0.011	0.009	0.012	0.055	0.003
2014IE16RFOP002	Conducted	IE	0.001	0.001	0.002	:	0.002
2014UK16RFOP001	Conducted	UK	0.019	0.044	0.020	0.009	0.009
2014UK16RFOP005	Conducted	UK	:	:	0.009	:	:
	(A) Sum of the consulted programmes (total EU amount)		0.623	0.634	0.698	0.644	0.575

[79] In the case of this programme, the consultation has been completed in the second round.

Programme code	Status of the interview	Country	TO 1	TO 3	TO 4	TO 5	TO 6
	(B) Target of the EU amount from the terms of reference of the study		Over 0.63	0.62	0.71	0.76	0.53
	Success rate = A / B (in terms of EU amount)		99%	102%	98%	85%	108%

Source: Own elaborations.

The table illustrates the representativeness of the consulted sample of MA in terms of number of programmes.

Table 45 MA consultation – OP

Status of the interview (operational programmes)	TO 1	TO 3	TO 4	TO 5	TO 6
(A) Sum of the consulted programmes (total EU amount)	33	35	45	23	27
(B) Target of the EU amount from the terms of reference of the study	34	37	47	25	28
Success rate = A / B	97%	95%	96%	92%	96%

Source: Own elaborations.

The first two following tables provide the number of programme-specific indicators analysed for each investment priority within the selected programmes. The second two tables illustrate the number of programmes consulted for the analysis of the indicators for each IP. The representativeness is ensured by the rule established of EU amount value at TO level, established by the terms of reference of the study. Overall the analysed programme-specific output indicators represent about 30% of the total universe contained in the SFC file used to launch the consultation.

Table 46 Programme-specific indicators analysed for each IP – TO 1, 3 and 4

	Investment priorities																		
TO	1a	1b	3a	3b	3c	3d	4a	4b	4c	4d	4e	4f	4g	4i	4ii	4iii	4iv	4v	4vi	Total (all TOs)
01	58	57																		115
03			35	11	10	27														83
04							19	18	33	4	77	16	11	8	4	22	2	16	5	235
05																				71
06																				157
Total	**58**	**57**	**35**	**11**	**10**	**27**	**19**	**18**	**33**	**4**	**77**	**16**	**11**	**10**	**4**	**22**	**3**	**19**	**5**	**661**

Source: Own elaborations of consultation findings.

Table 47 Programme-specific indicators analysed for each IP – TO 5 and 6

	Investment priorities														
TO	5a	5b	5i	5ii	6a	6b	6c	6d	6e	6f	6g	6i	6ii	6iii	6iv	Total (all TOs)
01																115
03																83
04																235
05	12	24	11	24												71
06					2	10	26	28	18	2	2	24	26	10	9	157
Total	**12**	**24**	**11**	**24**	**2**	**10**	**26**	**28**	**18**	**2**	**2**	**24**	**26**	**10**	**9**	**661**

Source: Own elaborations of consultation findings.

Table 48 Number of programmes consulted for each IP – TO 1, 3 and 4

	Investment priorities																		
TO	1a	1b	3a	3b	3c	3d	4a	4b	4c	4d	4e	4f	4g	4i	4ii	4iii	4iv	4v	4vi	Total (all TOs)
01	20	22																		42
03			15	6	6	12														39
04							9	12	18	3	27	4	6	4	2	6	2	7	1	101
05																				30
06																				68
Total	**20**	**22**	**15**	**6**	**6**	**12**	**9**	**12**	**18**	**3**	**27**	**4**	**6**	**4**	**2**	**6**	**2**	**7**	**1**	**280**

Source: Own elaborations of consultation findings

Table 49 Number of programmes consulted for each IP – TO 5 and 6

	Investment priorities															
TO	5a	5b	5i	5ii	6a	6b	6c	6d	6e	6f	6g	6i	6ii	6iii	6iv	Total (all TOs)
01																43
03																39
04																101
05	8	10	5	7												30
06					2	4	13	9	9	2	1	8	9	6	5	68
Total	**8**	**10**	**5**	**7**	**2**	**4**	**13**	**9**	**9**	**2**	**1**	**8**	**9**	**6**	**5**	**280**

Source: Own elaborations of consultation findings

8.7. Summary of the feasibility assessment

The annex summarises the assessment of the feasibility of introducing the proposed direct result indicators already discussed in the thematic sections of the report. The assessment has been based on the RACER criteria. However, the following table does not include any assessment on the relevance, because indicators which have been considered not relevant by more than 50% of the consulted Managing Authorities have been excluded from the proposal. The other criteria are presented as follows.

- Indicators are considered accepted if they can be monitored based on project reporting. On the contrary if there are some risks of low acceptance due to use of all the other possible sources (experts' work, survey, registers), the table includes a 'X' for the indicator.
- Indicators are considered easy to monitor if there is a previous experience (e.g. they have been used in the previous programming period). On the contrary if there are some risks of difficult monitoring due to lack of experience, the table includes a 'X' for the indicator.
- Indicators are ranked as credible and robust if their definition is based on some existing harmonised standards. On the contrary, if their definition can pose future challenges, the table includes a 'X' for the indicator.

The table matches each indicator with a 'X' only if there are some challenges in terms of acceptance, easiness to monitor, robustness and credibility:

- Three 'X' make the feasibility 'low',
- One or two 'medium',
- Zero 'high'.

Table 50 Feasibility assessment of proposed direct result indicators

Direct result indicators (measurement unit)	Risk of low acceptance (other sources than project reporting or need of external expertise)	Risk of low easiness to monitor (no previous experience or costly previous experience)	Risk of ambiguous definition (no reference to existing standard)	Feasibility
D.1 Private investment matching public support to enterprises (grants) (euro)				High
D.2 Private investment matching public support to enterprises (financial instruments) (euro) (euro)				High
D.3 Number of articles submitted to peer-reviewed publications due to the supported operations (number)				High
D.4 Employment increase in supported enterprises (number FTE)		X		Medium
D.5 Number of new researchers in supported entities (number FTE)		X		Medium
D.6 SMEs introducing process innovations after the supported operations (number)	X	X		Medium
D.7 SMEs introducing product innovations after the supported operations (number)	X	X		Medium
D.8 Patent applications submitted to EPO by supported large enterprises (number)				High
D.9 Patent applications submitted to EPO by supported SMEs (number)				High
D.10 Number of prototypes, testing (feasibility/ demo) activities, clinical trials (number)				High
D.11 Survival rate of supported new firms (%)	X	X		Medium
D.12 Public transport users (passengers)	X	X		Medium
D.13 Annual energy consumption of supported buildings (kWh/year)	X			High
D.14 Energy users connected to smart grids (users)	X			Medium
D.15 Capacity of renewable energy production installed and connected to the	X			Medium

Direct result indicators (measurement unit)	Risk of low acceptance (other sources than project reporting or need of external expertise)	Risk of low easiness to monitor (no previous experience or costly previous experience)	Risk of ambiguous definition (no reference to existing standard)	Feasibility
network (MW)				
D.16 Households in supported buildings with improved energy classification (number)				High
D.17 Households in supported buildings with seismic adaptation and improvement measures (number)		X	X	Medium
D.18 Population benefiting from flood protection measures (number)				High
D.19 Population benefiting from forest fire protection measures (number)				High
D.20 Population benefiting from climate extreme-events (heat waves) protection measures (number)		X	X	Medium
D.21 Estimated GHG emissions (tons of CO2 Equivalent)	X	X	X	Low
D.22 Water losses (m3 /km)		X	X	Medium
D.23 Population benefiting from supported habitats and green infrastructure (number)		X		Medium
D.24 Visitors to supported cultural and natural heritage sites (number)	X	X		Medium
D.25 Population connected to supported improved water supply facilities (number)	X	X		Medium
D.26 Population connected to supported wastewater treatment facilities (number)	X	X		Medium
D.27 Population served by supported recycling facilities and smart waste management systems (number)	X	X		Medium
D.28 Heritage attractiveness index of supported sites			X	Medium
D.29 Recycled waste	X			Medium

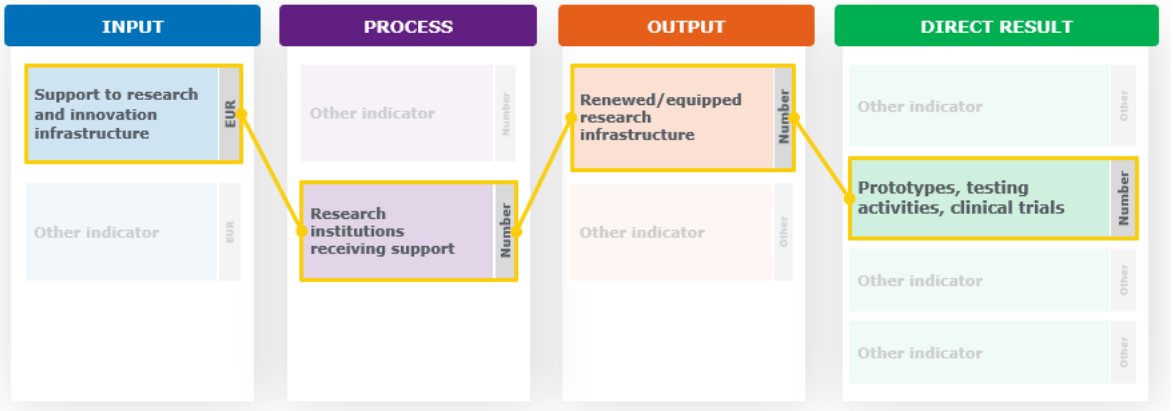
Note: 'red dots' indicate low feasibility, 'orange dots' medium feasibility, 'green dots' high feasibility

8.8. Examples of use of proposed indicators

This annex gives some illustrative examples of possible links between the proposed input, process, output and direct result indicators for the TOs. These examples are not exclusive, because many links between the indicators can be possible; rather they show the possible benefits of linking the different categories of indicators and the specific role of input (linked with intervention fields), process, output and direct result indicators.

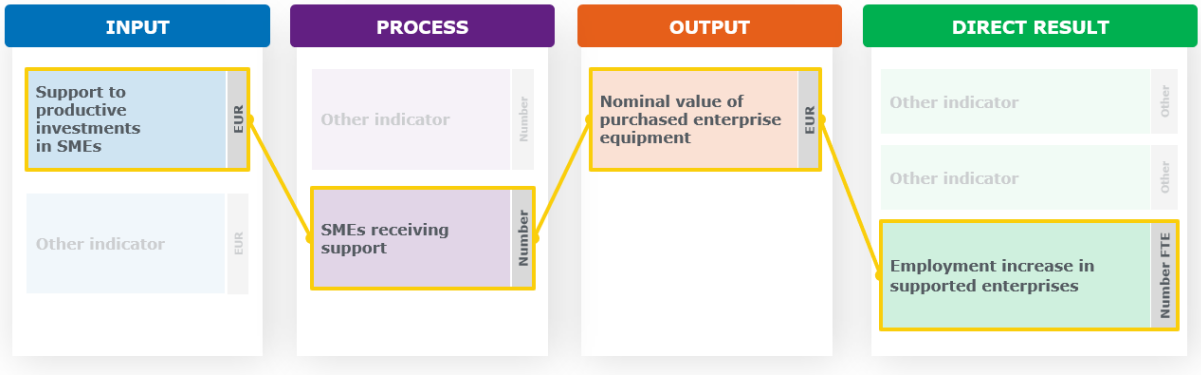
In the case of research and innovation interventions, the support to research and innovation investments is the input indicator, research institutions receiving support the process indicator, while the output can be renewed / equipped research infrastructure, which are going to increase the research capacity producing protypes and testing activities as direct result.

Figure 5 Supporting research and innovation investments – TO 1



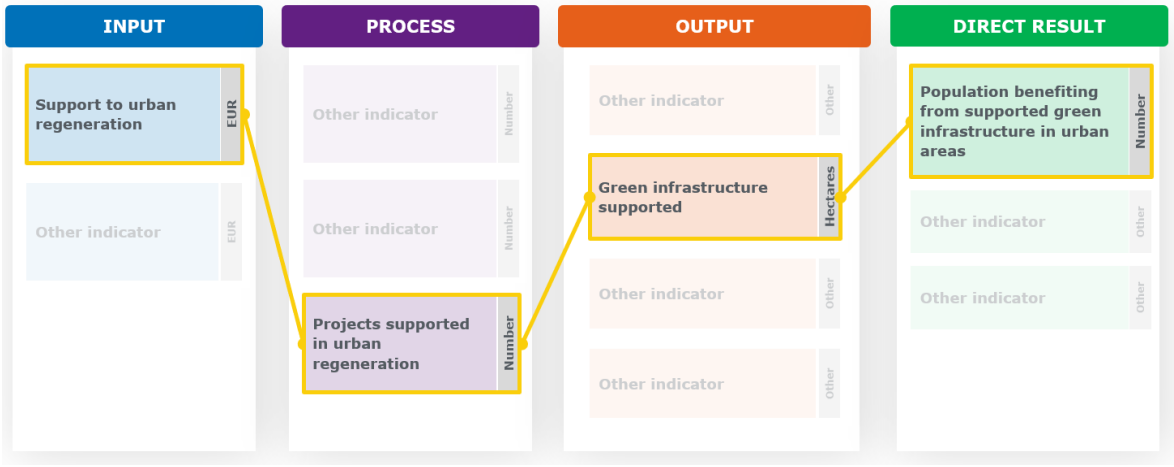
In the case of SMEs competitiveness, productive investments are an example of input indicators, SMEs receiving support process indicator, purchased enterprise equipment is the output and the jobs created to manage and use the new equipment are the direct result of the investment and the outputs.

Figure 6 Supporting SMEs competitiveness – TO 3



In the case of sustainable urban mobility, investments in clean urban transport infrastructure and other promotional activities is the input indicator, the number of projects supported the process indicator. Projects and investments allow increasing the total length of new or improved environmentally-friendly and low-carbon transport lines (e.g. metro, tram and trolley-buses lines) and to purchase new transport vehicles ensuring additional carrying capacity to the local transport systems. As a direct result the interventions are supposed to increase the number of public transport users in the local transport line under the intervention.

Figure 7 Promoting sustainable urban mobility – TO 4



In the case of the energy sector, the financial resources dedicated to investments on renewable energy and energy efficiency are input indicators. Projects in the specific field are process indicators. The typical output of renewable energy interventions is the additional installed capacity and of energy efficiency the usable surface of buildings supported to improve energy performance. In the first case, the direct result is the capacity of renewable energy installed and connected to the network and in the second the reduction of the energy consumption of the buildings and the number of households in supported buildings with improved energy classification.

Figure 8 Renewable energy – TO 4

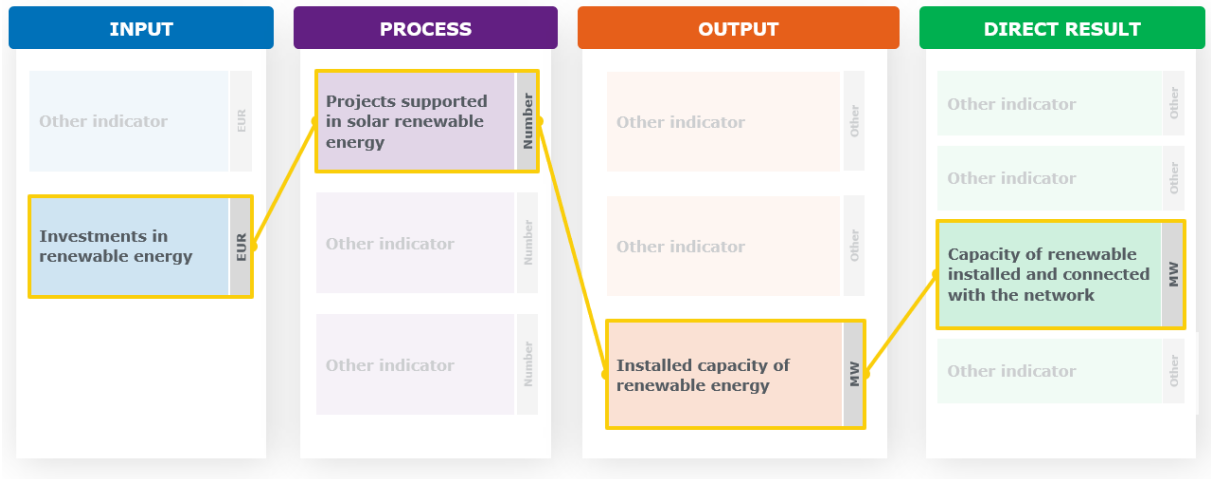
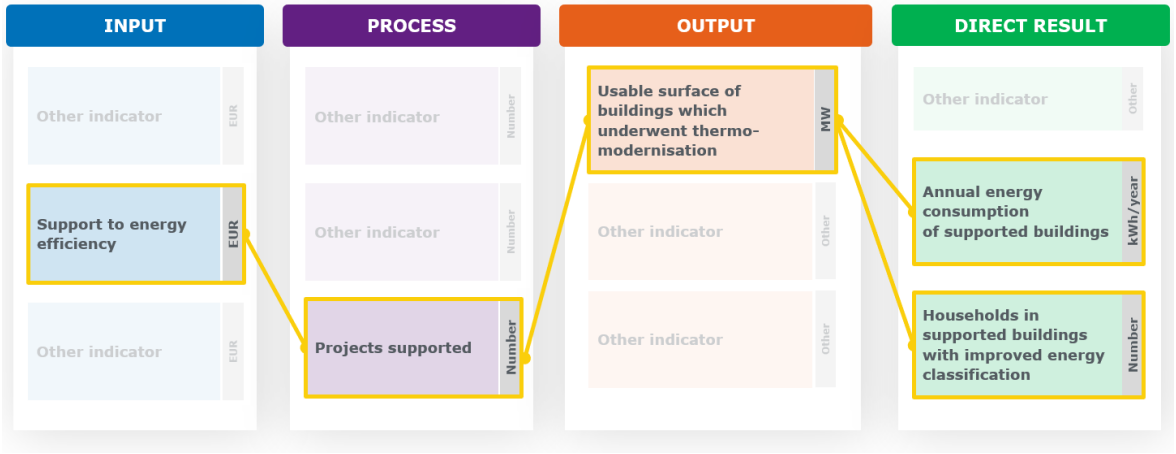
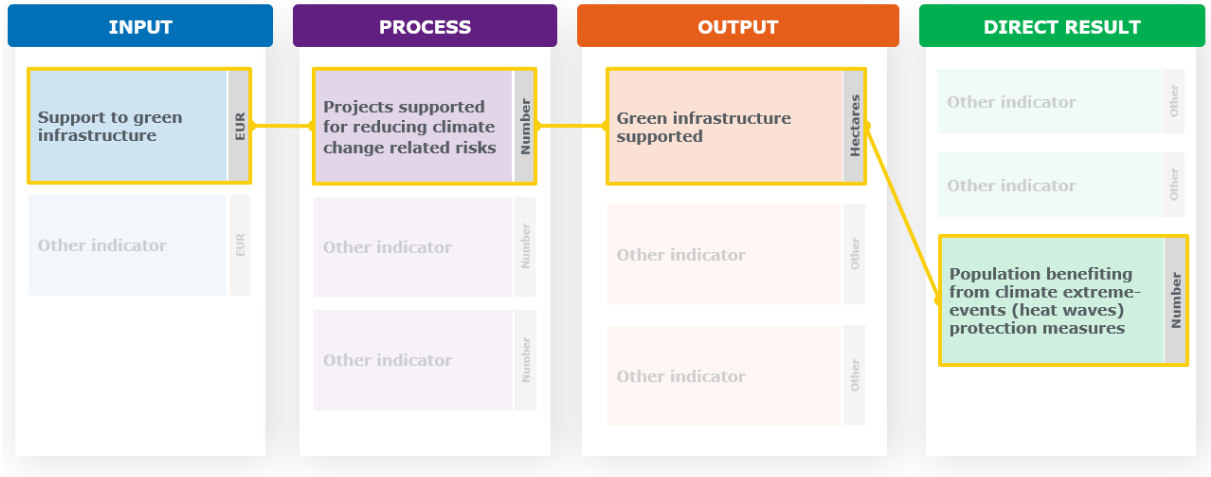


Figure 9 Energy efficiency in buildings – TO 4



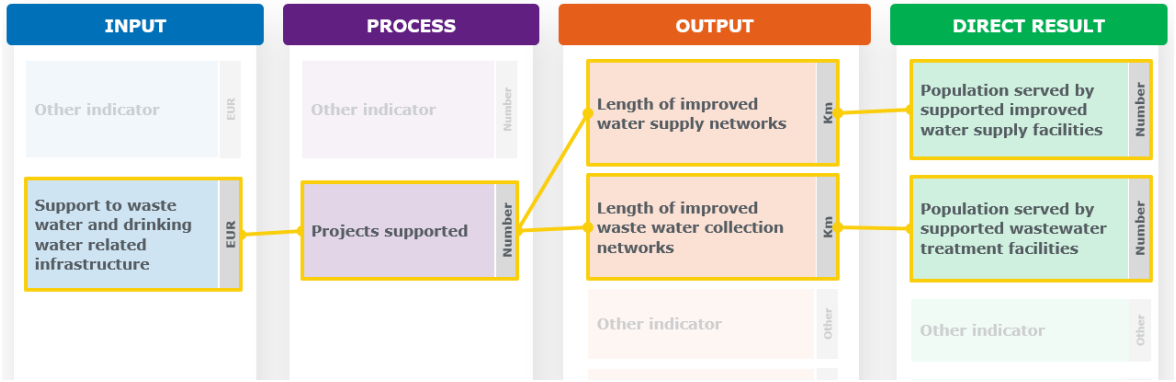
In the case of the climate change related risks, the financial resources dedicated to support green infrastructure can be an input indicator, the number of projects a process indicator, the habitat and green infrastructure supported (hectares) the output which is expected to reduce the climate extreme-events (e.g. heat waves). The resident population in the area concerned by the project is the direct result of the intervention.

Figure 10 Addressing climate change related risks – TO 5



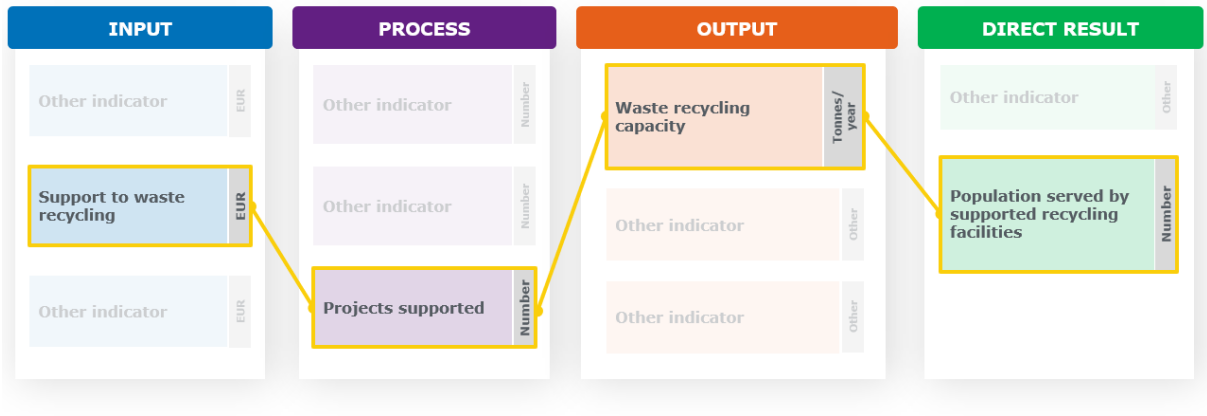
In the case of interventions for waste water and drinking water infrastructure, the financial resources supporting the improvement of infrastructure are the input indicators, the number of projects the process indicator, the length of improved networks examples of output indicators. The direct result is captured by the population served by improved facilities.

Figure 11 Investing in waste water and drinking water infrastructure – TO 6



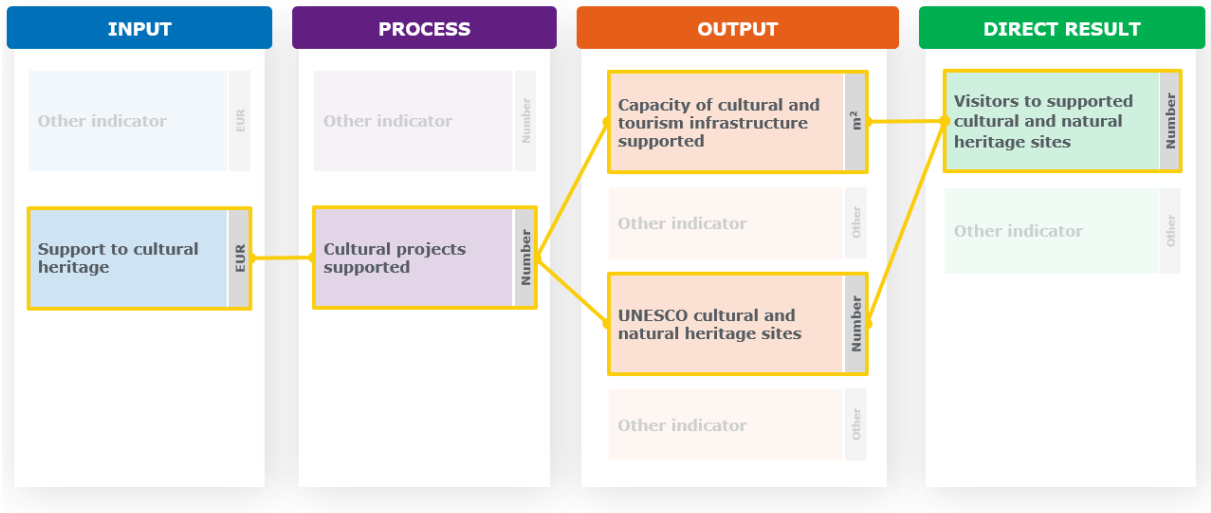
In the case of circular economy, the support to waste recycling is an input indicator, the number of projects supported a process indicator, the additional waste recycling capacity the output indicator, the population served by supported recycling facilities a direct result indicator.

Figure 12 Circular economy (waste recycling) – TO 6



The support to cultural heritage has been provided mainly by TO 6 and has been also addressed by other TOs and IPs. The support to cultural heritage is an input indicator, the number of projects supported the process indicator, the outputs can be 'capacity of cultural and tourism infrastructure supported' and 'UNESCO cultural and heritage sites'. The direct results can be captured by monitoring the visitors to supported cultural heritage sites before and after the intervention.

Figure 13 Support to cultural heritage



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