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## **D2.1 – Staged gate reviewing process for concerted innovation portfolio coordination**

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*Version 1.0*

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## List of abbreviations

CEDR:	Conference of European Directors of Roads
CEF:	Connecting Europe Facilities
CSA:	Coordination and Support Action
CV:	Cost Variance
EJP:	European Joint Programme
IA:	Innovatio Action
IFA:	Innovation Focus Area
NPV:	Net Present Value
NTIA:	National Transport Infrastructures Authority
PCP:	Pre-Commercial Procurement
PI:	Productivity Index
PPI:	Public Procurement of Innovative Solutions
PSA:	Programme Support Action
RIA:	Research and Innovation Action
SGRP:	Stage Gate Review Process
SV:	Schedule Variance
TRL:	Technology Readiness Level
WP:	Work Package

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# 1 Executive summary

Aim of this document is to provide an effective operational model to manage projects in a rolling portfolio of initiatives based on a shared programme. The model is intended to support the management procedures within the coordination mechanism developed under WP1 of the Infra4Dfuture project.

The proposed model is based on the Stage Gate Review Process (SGRP), a conceptual and operational model for moving a new product project from idea to implementation. The model was developed by Robert G. Cooper to optimize innovation and development processes. The SRGP breaks the innovation process into a predetermined set of manageable, discrete stages, usually 5 stages, followed by as many gates that serve as quality-control checkpoints. After each stage projects are evaluated at gates and the related results are compared at Portfolio Review before making a decision about their continuation. Different types of information (market, technical and operational) are provided to allow senior managers to decide whether to proceed or delete a project (GO/KILL decision). Decisions are made on the basis of a set of criteria and rules that evolve from qualitative to quantitative evaluations as the projects move from one stage to another.

The Stage Gate Model is usually adopted for the development of fairly well defined and predictable projects by the industry, but it can't be applied to Research and Innovation projects as such. This is because usually the different stages of a project are funded by diverse funding programmes, making the whole process rather slow and inefficient. To avoid this problem, the SGRP has been modified in the i4Df project introducing in the mechanism an accelerated path for those projects delivering positive results, be they research, demonstration or implementation projects.

The modified version of the SGRP involves three gates and three dynamically evolving stages, as shown in the Figure 1:

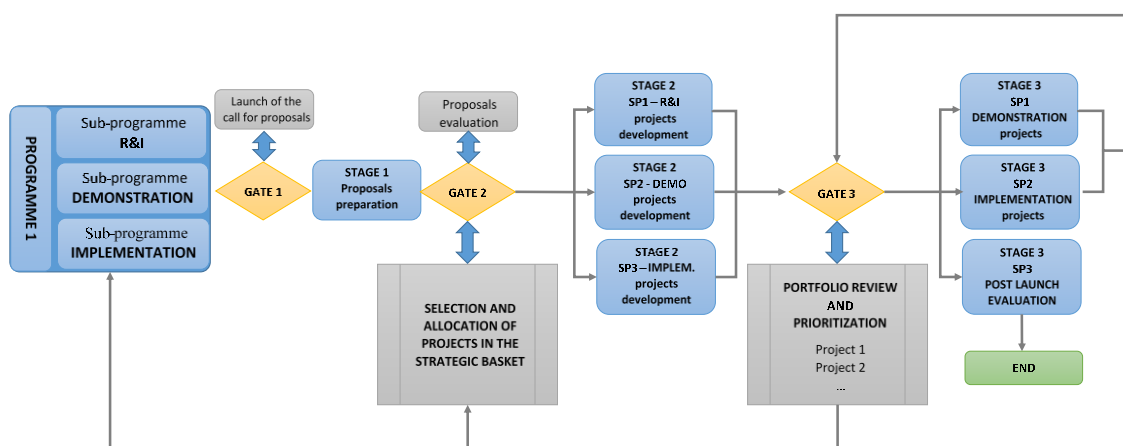


Figure 1 - Flow chart of the SGRP modified version.

- **Stage 0 – Preparation of the programme.** This is a preliminary stage that involves the identification of research themes, topics and priorities. The programme should

account for R&D Projects, Demonstration Projects and Implementation Projects in three separate sub-programmes, in order to allow the development of projects starting from different phases.

- **Gate 1 – Selection of topics for new projects.** At this gate the topics for new project are chosen, taking into account the topics priority, the budget available and the portfolio of national and European funding programmes.
- **Stage 1 – Project proposals preparation.** At this stage project proposals are prepared.
- **Gate 2 – Selection of projects to be funded.** Project proposals are evaluated on the basis of a set of criteria depending on the project type: research and innovation, demonstration and implementation.
- **Stage 2 – Project implementation.** At this stage projects are implemented.
- **Gate 3 – Evaluation of completed projects.** The results of finished projects are evaluated, as well as their plan for future development. Projects passing this gate can move forward to the following stage. At the end of this evaluation a ranking list is prepared and the portfolio of projects is reviewed on the basis of the results achieved. The output of this gate also determines and influences the update of programmes, the right balance of projects, as well as the selection of topics at Gate 1 in an iterative way (rolling approach).

Projects can be funded using a self-funded mechanism (common pot) or by submitting project proposals to national, transnational or European funding programmes.

Ongoing projects are monitored by gatekeepers, who periodically check the progress of the projects and suggest corrective actions if needed. At the end of the projects, gatekeepers proceed with the final evaluation of the projects. Gatekeepers' evaluation form the basis for portfolio reviews.

Portfolio reviews are foreseen at the end of the selection process of new projects (Gate 2) and at the completion of projects stages (Gate 3). Decisions are made on the basis of the evaluations given by gatekeepers and the budget available for each project type and research line.

A part of the portfolio management system is the allocation of projects in the strategic baskets, i.e. the lists of projects belonging to the different sub-programmes (Research and Innovation, Demonstration and Implementation). Once resources are allocated across baskets, projects within each basket are ranked from best to worst until the basket resource limit is reached. This process requires to balance and mix new and ongoing projects for each project type. Balancing the baskets of projects requires to provide a ranking list for each project type or sub-programme, encompassing the list of GO projects from Gate 2 and 3. Baskets and the ranked list of projects within baskets are used at portfolio reviews to help management to prioritize all projects.

In order to support decision makers in the evaluation and selection of projects, a user-friendly application has been developed.

The application consists of two macro processes:

- Projects evaluation;
- Portfolio management.

For projects evaluation, the tool takes into account an opportunely selected mix of qualitative and quantitative criteria as a function of project type. The evaluation process is applied to active projects, i.e. new project proposals submitted at the Gate 2 and completed projects resulting from Gate 3. The evaluation of projects is made using a scorecard model. Based on the scores achieved, the projects are ranked and selected as a function of their cost, Productivity Index and the budget available for the same project type (portfolio management). An optimization algorithm allows to automatically identify the projects that maximize the number of projects with respect to the budget available and the score achieved.

This report includes also three Annexes:

- **Main Funding Programmes Description.** A review of the main funding programmes including basic information, such as a short description of the funding instrument, the TRL and the funding rate.
- **Selection and Award Criteria.** This annex describes the selection and award criteria applied by the main funding programmes. This information was used as a basis to identify the selection and evaluation criteria for the i4Df SGRP.
- **i4Df Tool Manual.** This is a user guide to the developed software application for the evaluation and selection of projects.



## 2 Introduction

### 2.1 Purpose of the document

Aim of this document is to provide an effective operational model to manage projects in a rolling portfolio of initiatives based on a shared programme. The model is intended to support the management procedures within the coordination mechanism developed under WP1 of the Infra4Dfuture project.

The proposed model is based on the Stage Gate Review Process (SGRP), opportunely modified to make it suitable to research projects. Therefore, the document starts with a sketch of the classical SGRP and proceeds with the description of the i4Df customized version, together with a detailed explanation of the process and procedures for its implementation.

The work done follows the lines of activity planned in the i4Df project proposal within WP2, task.2.1 “Design of a structured reviewing process of the innovation activities”.

#### ***2.1.1 Task 2.1 ‘Design of a structured reviewing process of the innovation activities’***

Task 2.1 is described as follows in i4Df’s ‘Description of Action’:

Task 2.1 Design of a structured reviewing process of the innovation activities

Task leader: ANAS

Core partners: RWS, CERTH/HIT, LVC, DRD, TRV, BAST, ANAS

Participants: all consortium partners

The aim of this task is to develop a structured and systematic process for reviewing progress in a portfolio of innovation activities that is based on clear business cases.

Following the identification of the relevant innovation programmes and initiatives in Task 3.1, the action is to analyse the respective programmes and initiatives on eventual existing requirements and procedures that should be taken on board in designing the gate reviewing structure under the infra4Dfuture CSA initiative. In parallel, a short desk study is done on sound practices in gate reviewing structures and procedures that could serve as a template e.g. by adopting from practices in other sectors. Moreover, a draft of the gate reviewing process structure will be presented to the second stakeholder conference (M8; under WP1) in order to capture the notions from the relevant stakeholders. Ultimately the structure will be concluded as part of the coordination mechanism over the following sequence of EU-regional events, workshops and stakeholder conferences. The coordination of the event management will be carried out in WP4.

## 2.2 Delivery process

### 2.2.1 Methodology and work programme

The main objective of this task is to develop a structured and systematic process to review a rolling portfolio of research programmes based on the assessment of pre-defined quantitative and qualitative criteria, with the final aim to support and speed up the implementation of the most promising projects compliant with the infra4Dfuture strategic vision 2030-2040.

The fulfillment of this task was accomplished through the development of the following sub-tasks:

1. State of the art on stage gate reviewing process (SGRP) structures and procedures from literature;
2. Analysis of programmes and initiatives delivered by task 3.1 to identify eventual requirements and procedures to be taken into account in preparing the stage gate reviewing process structure;
3. Definition of the structure of the SGPR, including evaluation criteria and tools to support decision makers (NTIA in consultation with innovation programme owners);
4. Improvement and optimization of the SGRP;
5. Preparation of the final report on SGRP.

#### **1. State of the art on stage gate process structures and procedures from literature**

Review of the main articles available in literature about the stage gate process.

Many versions of the stage gate process are available, thus the solution that suits infra4Dfuture requirements were identified. Currently, the stage gate model is applied to single projects or a portfolio of projects. For the process developed within the infra4Dfuture project, it was necessary to extend the application of the review method to a portfolio of programmes and to find the criteria and tools to be used to make it operative in a simple way. This implied a study on the programmes and initiatives delivered by task 3.1

#### **2. Analysis of programmes and initiatives delivered by task 3.1 to identify eventual requirements and procedures to be taken into account in preparing the stage gate reviewing process structure**

This sub-task involved the study of the research programmes delivered by task 3.1 and the identification of the instruments used for projects funding: RIA, IA, Demonstration project, etc.

A clear picture of the current situation was outlined before proceeding with a first draft of the procedure to coordinate programmes and projects.

In this subtask, programmes or projects overlaps and gaps were identified, in order to harmonize them, avoid projects duplication and promote projects twinning.

**3. *Definition of the structure of the stage gate reviewing process, including tools and information to be provided to decision makers (NTIA in consultation with innovation programme owners)***

In this subtask a first draft of the stage gate review process was identified together with a software tool to support the decision-making process.

**4. *Improvement and optimization of the SGRP***

This subtask includes the definition of the criteria and tools to be used at gates for GO/KILL decisions. Here the stage gate reviewing process was optimized based on suggestions achieved from the EU-regional events, workshop and stakeholder conferences.

**5. *Preparation of the final report on SGRP***

In this subtask the report describing the SGRP was prepared.

### 3 The Stage Gate Review process

The Stage Gate Review Process is a conceptual and operational model for moving a new product project from idea to launch [1][7]. It was developed by [Robert G. Cooper](#) to optimise innovation and development processes.

It was developed for:

- Improving quality and process performance;
- Effective focusing and improved priority setting;
- Parallel and rapid process performance;
- Deployment of an interdepartmental team;
- Explicit inclusion of market orientation and assessment;
- Detailed achievement of information and prognoses at the beginning of a project;
- Creation of products with competitive advantages.

There are a number of advantages to using the stage-gate process for product development, such as its ability to identify problems and assess progress before the project's conclusion. Poor projects can be quickly rejected by disciplined use of the process. When using the stage-gate process on a large project, the process can help reduce complexity of what could be a large and limiting innovation process into a straightforward rule-based approach. When a stage-gate process incorporates cost and fiscal analysis tools such as net present value, the organization can potentially be provided with quantitative information regarding the feasibility of developing potential product ideas. Finally, the process is an opportunity to validate the updated business case by a project's executive sponsors.<sup>1</sup>

Stage-Gate breaks the innovation process into a predetermined set of manageable, discrete stages, usually 5 stages, followed by as many gates, that serve as quality-control checkpoints, where the path forward for the next stage of the process is agreed to.

Each stage is designed to gather information needed to move the project forward. Different types of information (market, technical and operational) are provided to allow senior managers to make a decision on the project continuation or, alternatively, to stop the project.

The general flow chart of the typical Stage-gate system is shown in figure 2.

The process is usually split into 5 stages, namely:

- *Discovery*: pre-work designed to discover and uncover opportunities and general ideas;

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<sup>1</sup> <https://de.wikipedia.org/wiki/Stage-Gate-Modell>, 09 April 2020

- *Scoping*: a quick, preliminary investigation and scoping of the project – largely desk research;
- *Build the business case*: a much more detailed investigation involving primary research, both from market and technical view, leading to a business case, including product and project definition, project justification and a forward plan or action plan;
- *Development*: the actual detailed design and development of the new product, and the design of the operations or production process;
- *Testing and validation*: market tests or trials, technical tests, and operation trials to verify and validate the proposed new product, and its marketing and production/operations;
- *Launch*: commercialization, beginning of full operations or production, marketing and selling.

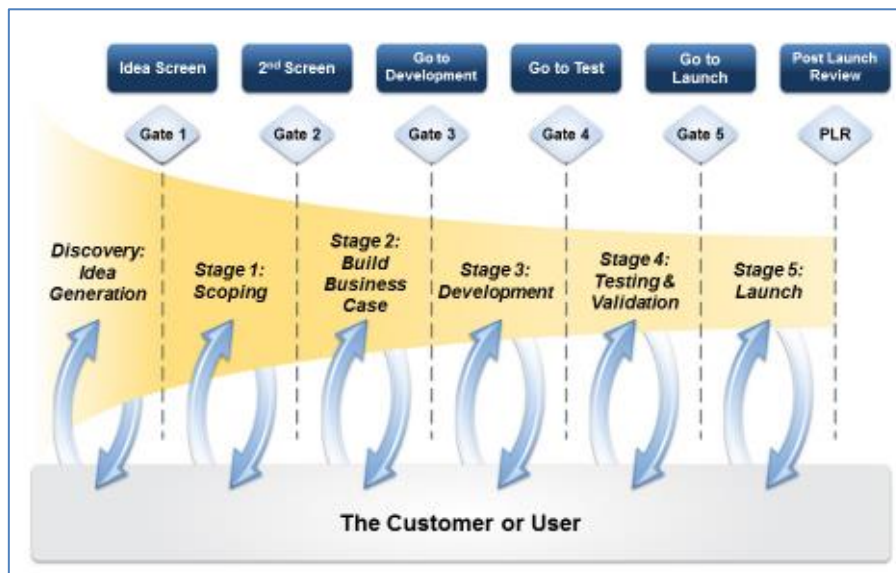


Figure 2 – Typical Stage Gate scheme.

Preceding each stage is a gate. Gates serve as quality-control check points, ensuring that the project is executed properly.

Gates consist of:

- A set of required deliverables: what the project leader and team must bring to the decision point (e.g., the results of a set of completed tasks);
- Gate criteria against which the project is judged. They usually include strategic, technical and financial indicators;
- Defined gate outputs: four possible decisions are foreseen: GO, KILL, HOLD (means that the project passes the gate criteria, but that better projects are available or

resources are not available for it), RECYCLE (means that the project has not delivered what was required; it is a redo or fix some tasks in the previous stage). In case of a GO decision, the action plan for the next stage is approved completely with resource commitment, the timeline and a list of the deliverables for the next stage.

The decisions are made by the so called “Gatekeepers”, i.e. usually senior managers who “own” the resources required for the project to move to the next stage and who make the GO/KILL and prioritization decision.

The GO/KILL decisions update the list of projects included in the programme owner’s portfolio. A killed project is removed, recycled or held from the portfolio of projects, and the ranking list of the projects is updated based on the scores achieved by the assessed projects at the respective gates.

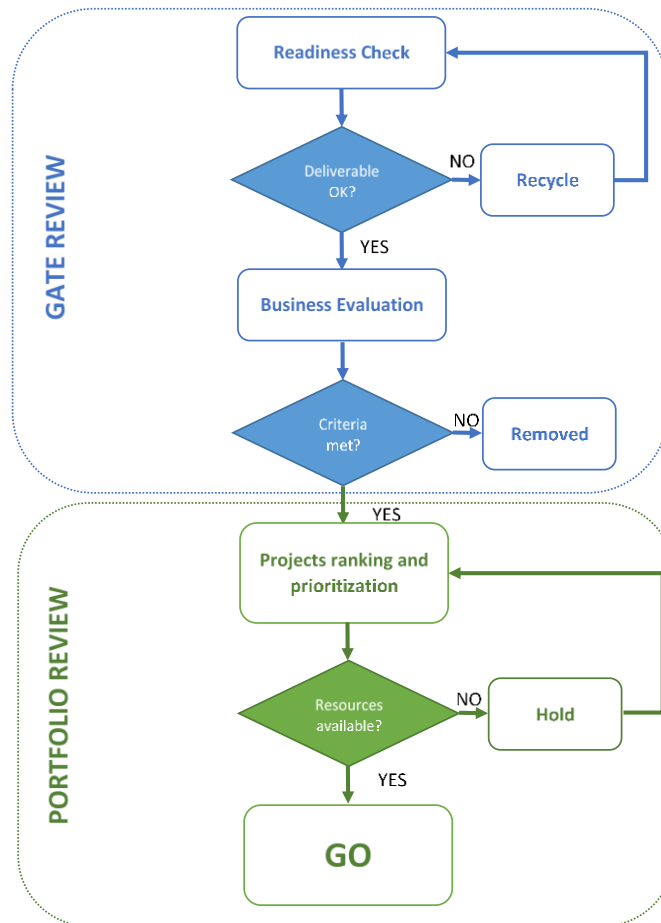


Figure 3 – Flow chart of the Stage Gate Review Process.

The portfolio management system is integrated within the gating process. Portfolio reviews are held periodically, typically two or four times a year, and are more holistic than gates, looking at the entire set of projects. Portfolio reviews deal with issues such as achieving the right mix and balance of projects, project prioritization, and whether the portfolio is aligned with the business strategy.

### **3.1 Applying the Stage Gate Model to research activities**

The Stage Gate Model is usually adopted for the development of fairly well defined and predictable projects by the industry. Variants of the Stage Gate Process are available for research projects [2][6], but further considerations are needed in order to adapt the procedure to a rolling portfolio of projects, as described in chapter 5.

First of all we should consider that research, science and technology development projects are high risk projects by their nature with many unknowns and high technical uncertainties. In general, especially at the beginning of such projects, the likelihood of technical success may be quite low and solutions usually take years before reaching positive outcomes.

Similarly, traditional projects require a full business case and financial analysis before heavy commitments are made, but in research activities the commercial prospects for the new technology are often unclear or cannot be considered appropriately, especially in the early stage of a project when these commitment decisions are required. Market and product analysis can't be applied, as market and products are not defined at that stage.

Furthermore, in order to benefit from National or European funding programmes, the stage gate process should take into account their criteria and selection rules that typically differ from the financial regulations employed in the SGPR and integrate them in the development model. In addition, National or European funding mechanisms rarely cover the entire life-cycle of projects, but they often split the process into a series of phases that are funded by different research programmes, making the application of the Stage Gate approach rather unsuitable.

However, improvements in terms of efficiency are expected from the implementation of the Stage Gate system to research projects, but a custom-designed process is required to fit their technical, administrative and financial requirements, as shown in chapter 5.

## 4 The main funding research programmes

In this chapter a short overview of the main funding programmes for transport research is described [10][11][12][16][19], focussing on the identification and definition of their funding mechanisms and the SGRP stages.

Currently, four main funding research and innovation programmes can be cited, namely:

- HORIZON 2020;
- LIFE;
- CONNECTING EUROPE FACILITIES (CEF);
- CEDR (Conference of European Directors of Roads);

Further research funding programmes identified in Tasks 2.2 and 3.1 of the infra4Dfuture project are also available at national and transnational level. These are:

- BRA - Baltic Road Association (Baltic Countries)
- CoT - City of Things - smart cities and municipalities Flanders Innovation and Entrepreneurship (VLAIO)
- D-A-CH (DE, AT, CH)
- FEREC (FR)
- FFI - Strategic Vehicle Research and Innovation (SE)
- IDRRIM (FR)
- MOTF - Mobility of the Future (AT)
- NordFoU (Nordic Countries)
- SESAR Joint Undertaking (contribution EU under HORIZON 2020, CEF and assigned revenues, Eurocontrol and industry partners)
- Shift2Rail
- Sustainable transportation (CH)
- TakeOff Federal Ministry for Transport, Innovation and Technology (BMVIT)

All these programmes mainly support four types of projects classified according to their Technology Readiness Level (TRL) as defined in figure 4:

- Coordination projects;
- Research and development projects;
- Demonstration and validation projects;



- Implementation projects.



Figure 4 – Technology Readiness Level scale.

More in detail, the different projects deal with a peculiar application field and refer to a specific technology readiness level range, as described in the following sub-paragraphs for the main research funding programmes.

#### 4.1 Coordination projects

Coordination projects primarily deal with accompanying measures such as standardization, dissemination, awareness-raising and communication, networking, coordination or support services, policy dialogues and mutual learning exercises and studies, including design studies for new infrastructure. They may also include complementary activities of strategic planning, networking and coordination between programmes in different countries.

These projects are not linked to a specific TRL and are currently funded by:

- Horizon 2020: Coordination and Support Actions (CSA), ERA-NET Cofund Actions and European Joint Programme (EJP);
- LIFE Programme: Technical assistance projects, Capacity building projects, Preparatory projects and Information, awareness and dissemination projects;
- CEF: Programme Support Actions (PSA).

Details about the different project are available in Annex 1.

#### **4.2 Research and development projects**

These projects primarily consist of activities aiming to establish new knowledge and/or to explore the feasibility of a new or improved technology, product, process, service or solution. For this purpose they may include basic and applied research, technology development and integration, testing and validation on a small-scale prototype in a laboratory or simulated environment.

Projects may contain closely connected but limited demonstration or pilot activities aiming to show technical feasibility in a near to operational environment.

These projects usually have a **TRL ranging from 1 to 5** and are currently funded by:

- Horizon 2020: Research and Innovation Actions (RIA), ERA-NET Cofund Actions, European Joint Programme (EJP) and Pre-Commercial Procurement (PCP);
- CEDR.

Details about the different project are available in Annex 1.

#### **4.3 Demonstration and validation projects**

These projects mainly consist of activities directly aiming at producing plans and arrangements or designs for new, altered or improved products, processes or services. For this purpose they may include prototyping, testing, demonstrating, piloting, large-scale product validation.

A ‘demonstration or pilot’ aims to validate the technical and economic viability of a new or improved technology, product, process, service or solution in an operational (or near to operational) environment, whether industrial or otherwise, involving where appropriate a larger scale prototype or demonstrator.

Projects may include limited research and development activities.

These projects usually have a **TRL ranging from 5 to 8** and are currently funded by:

- Horizon 2020: Innovation Actions (IA), ERA-NET Cofund Actions, European Joint Programme (EJP) and Pre-Commercial Procurements (PCP);
- LIFE Programme: Pilot Projects and Demonstration Projects;
- CEF: Grants;
- CEDR: Demonstration and Best Practice Projects.

Details about the different project are available in Annex 1.

#### **4.4 Implementation projects**

Implementation projects support the first application/deployment in the market of an innovation that has already been demonstrated but not yet applied/deployed in the market due to market failures/barriers to uptake. Implementation projects do not cover multiple applications in the market of an innovation that has already been applied successfully once in the market. ‘First’

means new at least to Europe or new at least to the application sector in question. Often such projects involve a validation of technical and economic performance at system level in real life operating conditions provided by the market.

For these projects a **TRL from 8 to 9** is required and they are currently funded by:

- Horizon 2020: Innovation Actions (IA) and Public Procurement of Innovative Solutions (PPI);
- LIFE Programme: Best Practice Projects Projects, Integrated Projects and NGO Operating Grants;
- CEF: Grants;

Details about the different projects are available in Annex 1.

In Table 1 the different funding instruments vs project types and their funding rate are summarized.

Table 1 – Summary of the main European funding instruments with respects to projects type.

	FUNDING INSTRUMENT	Funding rate	Coordination	Research and development	Demonstration and validation	Implementation
<b>HORIZON 2020</b>	Research and Innovation Actions (RIA)	100%		✓		
	Innovation Actions (IA)	70% - 100%			✓	✓
	Coordination and Support Actions (CSA)	100%	✓			
	ERA-NET Cofund actions	33%	✓	✓	✓	
	European Joint Programme (EJP)	70%	✓	✓	✓	
	Pre-Commercial Procurement (PCP)	30%		✓	✓	
	Public Procurement of Innovative solutions (PPI)	50%				✓
<b>LIFE</b>	Pilot projects	55%-75%			✓	
	Demonstration projects	55%-75%			✓	
	Best Practice projects	55%-75%				✓
	Integrated projects	60%				✓
	Technical assistance projects	60%	✓			
	Capacity building projects	100%	✓			
	Preparatory projects	60%	✓			
	Information, awareness and dissemination projects	55%-75%	✓			
<b>CEF</b>	NGO Operating grants	70%				✓
	Grants	10%-50%			✓	✓
<b>CEDR</b>	Programme Support Actions (PSA)		✓			
	Studies	100%		✓		
	Demonstration projects	100%			✓	
	Best Practice projects	100%			✓	

## 5 Applying the Stage Gate Model to a rolling portfolio of initiatives

As shown in chapter 4, European funding programmes split the life cycle of a project into three main phases (see figure 5):

- Research and Development (TRL $\leq$ 4);
- Demonstration and Validation (5 $\leq$ TRL $\leq$ 7);
- Implementation (8 $\leq$ TRL $\leq$ 9).

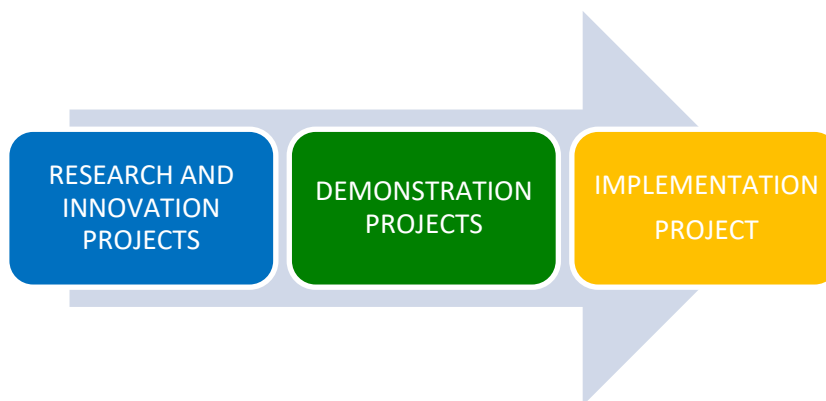


Figure 5 – Splitting the life cycle of a project into three main phases.

For all the funding programmes it is required to submit a project proposal through one or two stages to pass from one phase to another. In the latter case, a light proposal (1<sup>st</sup> stage) should be submitted at first, followed by an evaluation step (a gate) during which the proposal is assessed. Only proposals passing this gate are admitted to submit a full proposal (2<sup>nd</sup> stage). Full proposals must pass a second gate to be awarded and allowed to proceed with the development stage.

Theoretically, to complete the process from idea to implementation, it is necessary to submit a project proposal at least three times. This procedure contributes to slow down the implementation of project results.

Furthermore, this kind of mechanism does not guarantee that a project idea might reach the end of the process, i.e. implementation and launch to the market. Even if successful research and development projects might fit demonstration and then implementation programme requirements after the first phase (and this is not always the case), the research product could access the market only after many years, with the risk to become obsolete and outdated due to the required time period so far. This makes the current supporting mechanism rather slow and complicated.

### 5.1 Applying the Stage Gate Model to research projects

The Stage Gate Model has the potential to speed up the implementation of final results of research projects. This approach allows only valuable projects to proceed in the process through different stages and gates, avoiding to reiterate project proposal submissions to access the following phases. It accelerates and smoothes the passage from one phase to another, thereby reducing the risk of providing outdated products at the end of the process.

Figure 5 shows how the Stage Gate Process can be adapted to the development of research products.

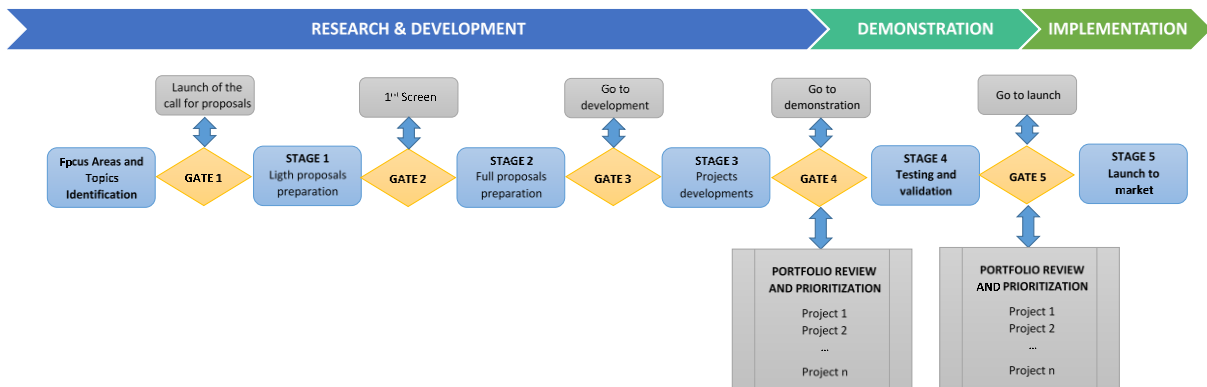


Figure 6 – Adapting the Stage Gate Model to research products.

As shown in figure 6, the projects management scheme is composed of five stages and as many gates that are distributed along the three phases of the life cycle of a project: Research and Development, Demonstration and Implementation.

Each phase is intended to be managed using the stage gate approach in which each project can proceed to the next stage, be discarded or put on hold during its lifetime at gates.

The scheme starts with a preliminary stage that consists in the preparation of the funding programmes and the identification of the main topics. At the first gate the topics to be funded are selected and the selection process ends with the launch of a call for proposal. At the following stage, light proposals are prepared and evaluated at the next gate. Only projects passing this second gate are admitted to the second stage that consists in the preparation of the full proposal. At the third gate the full proposals are evaluated. Solely valuable proposals will pass this gate and proceed to the implementation stage. From gate 1 to gate 3, the assessment is carried out by programme evaluators as usual.

At gate 4, corresponding to the end of the first phase, a portfolio review is foreseen. During portfolio reviews the whole basket of projects is assessed and projects are scored and prioritized. Therefore, only projects passing this gate move forward to the following phase (Demonstration Phase).

At the end of the Demonstration Phase another Portfolio Review is done and projects passing this gate can proceed to the fifth stage that corresponds to the Implementation Phase (Launch to the Market).

Using this scheme, the preparation and submission of new project proposals to pass from one phase to another is not necessary anymore. This results in speeding up the process (from idea to launch to market) and in improving the technological impact of project results, reducing the risk of providing obsolete products in the end.

## 5.2 Integrating the Stage Gate Review Process in Programme Management

In paragraph 5.1 the basic structure of the model has been described, but this scheme doesn't take into account the possibility of including also initiatives starting from a different stage in the

basket of projects, for example project that have already reached the demonstration phase, or to include the possibility of launching a research product directly to the market, if ready.

Based on the basic scheme described in the previous paragraph, a more structured programme management mechanism has been developed. This programme management scheme forms the basis for a wider portfolio management tool (see paragraph 5.3).

As shown in figure 6, in the programme management scheme a funding programme should include three sub-programmes to tackle separately R&D Projects, Demonstration Projects and Implementation Projects. Each project type moves to the development stage through the selection process at gate 2 and results are evaluated at gate 3, during the first portfolio review. Gate 3 allows valuable projects to proceed towards the following phase that is a demonstration phase for projects belonging to the first sub-programme, the implementation phase for projects belonging to the demonstration sub-programme and to a post launch evaluation, for projects belonging to the implementation sub-programme. At the following step, another portfolio review is done and valuable projects can move forward to the following phase. This is an iterative approach that is periodically fed by the introduction of new projects (rolling portfolio of projects) through internal calls (self-funded) or external calls (European or National calls).

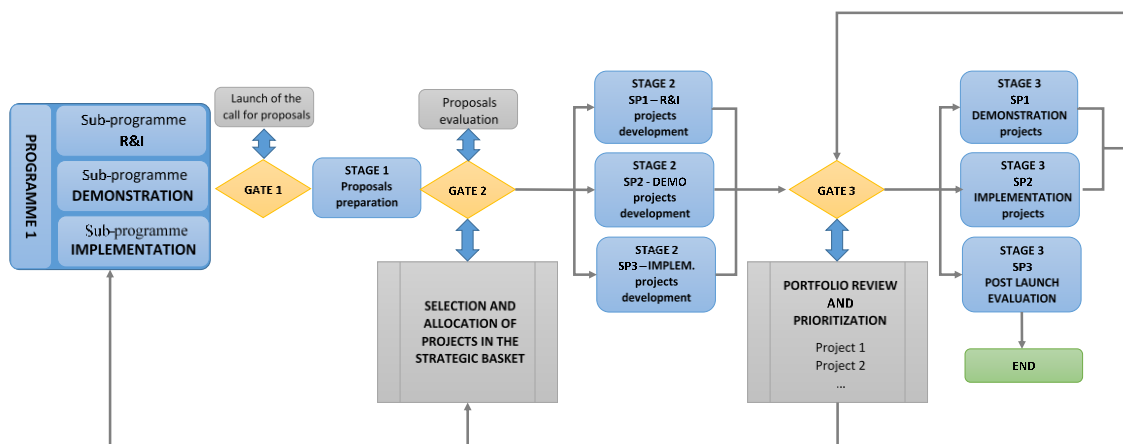


Figure 7 – The programme management mechanism.

### 5.3 Integrating the Stage Gate Review Process in the infra4Dfuture initiative

In Work Package 1 of the infra4Dfuture project [20], three main capabilities have been identified and for each capability a series of Innovation Focus Areas (IFA) have been defined, as follows:

- **Capability 1: Infrastructure optimally meeting end user needs**

*The ability to provide optimal transport infrastructure network capacity in order to accommodate increasing transport needs, and balancing cost, performance, safety and risk to provide infrastructure as a high quality service to end users.*

Innovation Focus Area: Network performance

Innovation Focus Area: Integrated infrastructure network management

Innovation Focus Area: Responsible and innovative procurement and finance

- **Capability 2: Infrastructure meeting environmental and social sustainability needs**

*The ability to embed transport infrastructure networks in their immediate surroundings, optimally balancing interests from economy, society, and environment.*

Innovation Focus Area: Decarbonisation of infrastructure management

Innovation Focus Area: Preserving the environment

Innovation Focus Area: Integrating multi-layer networks and nodes

- **Capability 3: Infrastructure achieving added value from digitalisation**

*The ability to harvest the benefits from digitalisation in internal processes of transport infrastructure management (e.g. planning, design, construction, operation, end-of-life) as well as in the relation between transport infrastructure management and its end user (smart mobility and logistical services, individual end users). Use digitalisation to support the achievement of sustainability targets and provide a better service to infrastructure end users.*

Innovation Focus Area: Smart data and information ecosystem for accommodating automated and connected transport

Innovation Focus Area: Information provision for process optimisation in infrastructure management.

Each IFA is supposed to be managed by an independent management group that is responsible for the corresponding research programme. Therefore, the i4Df management structure encompasses eight collaboration groups as shown in figure 8.



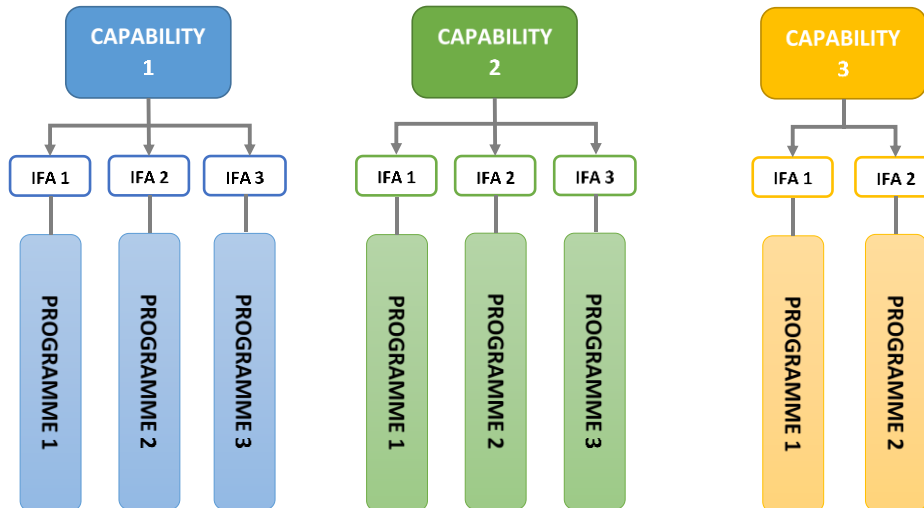


Figure 8 – i4Df Management Structure.

The coordination ecosystem for each IFA is composed of two major entities (see figure 9):

- **the collaboration group**, including NTIAs interested in the corresponding IFA research line from the road, rail and water sectors;
- **the community of experts**, mainly composed of representatives of the academic, industry and research world.

The collaboration group and the community of experts interact with each other to identify and define research needs, periodically review the programme and the portfolio of projects, participate together in external calls.

Collaboration group members and representatives of the community of experts will also act as gatekeepers in the SGRP to evaluate and monitor new and ongoing projects.

For the management structure please refer to the output of deliverable D1.4.



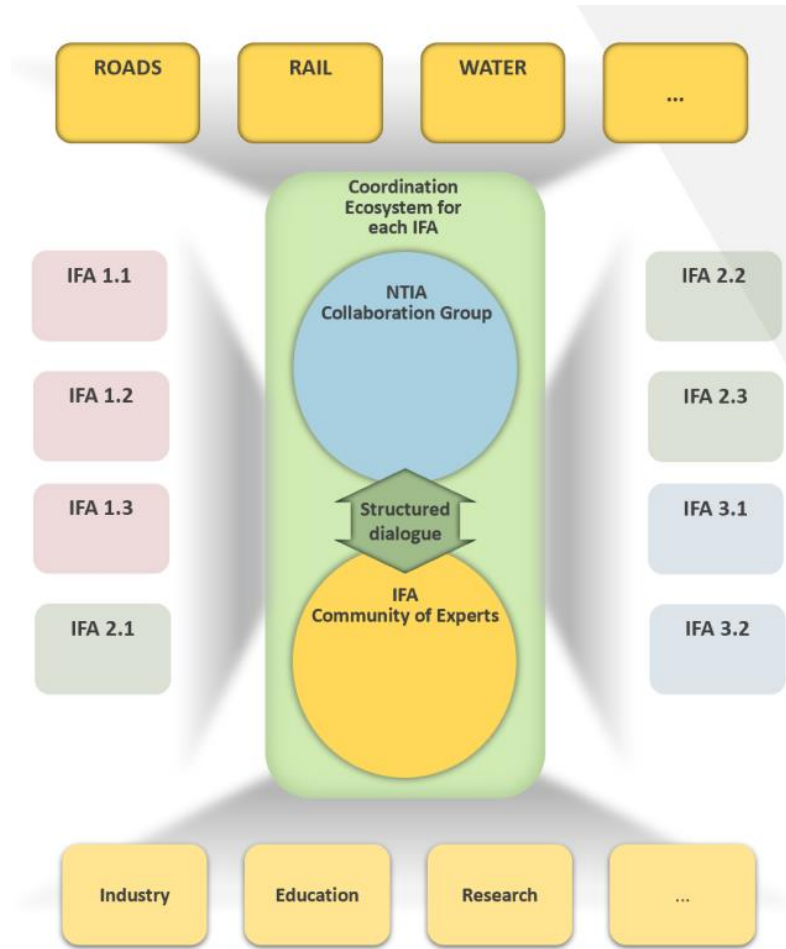


Figure 9 – The coordination ecosystem for each IFA.

## 6 Gate rules and criteria

The stage gate model is based on sharp decisions about the continuation of projects that are made at gate meetings and portfolio reviews. Decisions are made on the basis of a set of criteria and rules that evolve from qualitative to quantitative evaluations as the projects move from research to implementation.

The Infra4Dfuture management scheme involves 3 gates:

- **Gate 1 – Selection of topics for new projects.** At this gate the topics related to the different sub-programmes are chosen for funding, taking into account the IFA group priorities, the budget available, the portfolio of national and European funding programmes. Here the decision also depends on the ranking list resulting from portfolio reviews at gate 3, in order to achieve the right balance of projects.
- **Gate 2 – Selection of projects to be funded.** Project proposals are evaluated on the basis of a set of criteria depending on the project type: research and innovation, demonstration and implementation. In order to ease the selection process and reduce the burden of proposals preparation, a two stages submission of project proposals can be foreseen: a first stage in which a light proposal is prepared and a second stage in which a full proposal is formulated. Applicants are invited to submit full proposals only in case light proposals are admitted to the second stage at gate 2.
- **Gate 3 – Evaluation of completed projects.** The results of finished projects are evaluated, as well as their plan for future development. Projects passing this gate can move forward to the following stage. At the end of this evaluation a ranking list is prepared and the portfolio of projects is reviewed on the basis of the results achieved. The output of this gate also determines and influences the update of IFA programme and sub-programmes, the right balance of projects, as well as the selection of topics at Gate 1 in an iterative way (rolling approach).

### 6.1 Gate 1 – Selection of topics for new projects

The selection of topics for new projects is strictly connected to IFA programme and sub-programmes that are supposed to be yearly updated on the basis of NTIAs research needs and the results achieved from ongoing and closed projects (output from Gate 3). The updating process should also include the identification of the topics priority and project types (Research & Innovation, Demonstration & Validation, Implementation). This step could be carried out by means of the usual survey tools, such as questionnaires, workshops, meetings with interested stakeholders, etc.

Priorities should be reviewed in case national, transnational and European calls for funding are matching IFA topics, so as to make the best use of available financial resources. This could be done by simply adding a weighing coefficient to priority scores.

Topics passing a minimum fixed priority threshold are supposed to be admitted for funding through a self-funded mechanism (common pot) or external funds (national, transnational and European programmes). The final number of topics will be determined by the budget available. Consequently, a cost range for each project type should be defined, in order to make a first estimate of the number of projects to be funded.

Besides, the projects portfolio is intended to encompass and balance Research & Innovation projects, Demonstration & Validation projects and Implementation projects. This aspect should be taken into account when allocating the budget to the different sub-programmes, even though the final projects distribution will be defined at Gate 2, after the new projects assessment and the portfolio review at Gate 3.

## **6.2 Gate 2 – Selection of projects to be funded**

At the end of the first stage, consisting in the preparation of the project proposals, a selection of the most valuable projects is done. As mentioned before, this process can be split into two stages: a first stage in which a light proposal is prepared and a second stage in which a full proposal is formulated. Full proposals can be submitted only in case light proposals are admitted to the second stage.

Whatever approach is used, the selection process requires the identification of a set of appropriate criteria against which the evaluation of the projects is carried out in order to guarantee a transparent and comparable process. The set of criteria depends on the project type. More qualitative criteria are necessary for the assessment of research and innovation projects, a balanced mix of qualitative/quantitative criteria for demonstration projects and mostly quantitative criteria for implementation projects.

The set of criteria includes a subset of qualitative criteria common to all types of projects, as shown in table 2. Additional criteria are formulated for the different project types as reported in the following sub-paragraphs. For each criterion a series of detailed sub-criteria are introduced to ease the analytical evaluation of the proposal. These criteria are the results of an in depth analysis undertaken on the main research funding programmes, as shown in Annex II.

Criteria are gathered into two main sets of macro-criteria that <1> refer to the strategic fit of the proposal and <2> to its feasibility and quality, against which the projects are finally judged.

Projects evaluation are made using a scorecard model and weighing the scores achieved by the sets of criteria and macro-criteria (see paragraph 7.2.1 for details on the scorecard model).

In case of light proposals, the same set of criteria can be reduced or reformulated as a function of the information required by call specifications, as shown as an example in table 3.

The set of criteria reported in table 2 and 3 can be considered a sort of guideline, which can be reviewed as a function of IFA programme/sub-programme requirements.

In the following sub-paragraphs the list of common and peculiar criteria is described for each project type, together with the corresponding suggested weighing factors [13][14][17][18].

Table 2 –Full proposals evaluation criteria common to all project types.

FULL PROPOSAL EVALUATION CRITERIA COMMON TO ALL PROJECT TYPES					
STRATEGIC FIT			FEASIBILITY AND QUALITY		
Relevance	Credibility	Impacts	Technical Feasibility and Quality	Implementation Coherence and Quality	Financial Coherence and Quality
<ul style="list-style-type: none"> <li>• Clarity and pertinence of the proposal to the related capability and IFA objectives;</li> <li>• Contribution of the proposal to the programme priorities.</li> </ul>	<ul style="list-style-type: none"> <li>• Soundness of the concept and credibility of the proposed methodology;</li> <li>• Sponsorship from key stakeholders.</li> </ul>	<ul style="list-style-type: none"> <li>• Coherence of the project outputs with the expected impacts mentioned in the work programme under the relevant topic;</li> <li>• Any substantial impacts not mentioned in the work programme;</li> <li>• Transnational benefits.</li> </ul>	<ul style="list-style-type: none"> <li>• Understanding of technical requirements;</li> <li>• Clear description of the proposal. The proposal must clearly describe how, where, when and by whom each action will be undertaken;</li> <li>• Feasibility of project outputs.</li> </ul>	<ul style="list-style-type: none"> <li>• Appropriateness of the organisational and managerial structures;</li> <li>• Quality and effectiveness of the work plan;</li> <li>• Qualifications and complementarity of partners (extent to which the consortium as whole brings together the necessary expertise);</li> <li>• Appropriateness of the allocation of tasks, ensuring that all participants have a valid role and adequate resources in the project to fulfil that role;</li> <li>• Quality and effectiveness of the communication and dissemination plan;</li> <li>• Project duration.</li> </ul>	<ul style="list-style-type: none"> <li>• Cost of different components of the proposal (staff costs, equipment, etc) and overall cost of the project;</li> <li>• Transparency of the budget, i.e. the cost items should be sufficiently described, coherent and cost-efficient, including for the management of the project;</li> <li>• Added value in relation to transnational benefits.</li> </ul>

Table 3 – Light proposals evaluation criteria common to all project types.

LIGHT PROPOSAL EVALUATION CRITERIA COMMON TO ALL PROJECT TYPES		
Project Type	Strategic Fit	Feasibility and Quality
<b>All projects</b>	<ul style="list-style-type: none"> <li>• The extent to which the outputs of the project would contribute to each of the expected objectives mentioned in the work programme under the relevant topic.</li> <li>• Estimation of the expected impacts with respect to the project objectives.</li> <li>• Transnational benefits.</li> </ul>	<ul style="list-style-type: none"> <li>• Clarity and pertinence of the objectives. This criterion is focused on the clarity of the proposal (including the description of the pre-operational context), its feasibility and indicative value for money.</li> <li>• Soundness of the concept, and credibility of the proposed methodology.</li> <li>• Expertise of partners and composition of the project team.</li> <li>• Experience of the programme objectives and evidence of involvement with similar projects.</li> <li>• Quantification and description of the main actions and expected results. To allow the evaluation of the project feasibility, the light proposal must describe how, where, when and by whom each main action will be undertaken. Indicative means necessary for the implementation of the project should be provided. Expected results should be clearly spelled out.</li> </ul>

### 6.2.1 Research and Innovation projects evaluation criteria

#### Strategic Fit of the Proposal

<b>RELEVANCE</b>	Clarity and pertinence of the proposal to i4Df capabilities and IFA objectives
	Contribution of the proposal to the programme priorities
	Evidence of the innovation potential beyond the state of the art
<b>CREDIBILITY</b>	Soundness of the concept, and credibility of the proposed methodology
	Sponsorship from key stakeholders
<b>IMPACTS</b>	Coherence of the project outputs with the expected impacts mentioned in the work programme under the relevant topic.
	Any substantial impact not mentioned in the work programme
	Transnational benefits

#### Feasibility and Quality of the Proposal

<b>TECHNICAL FEASIBILITY AND QUALITY</b>	Understanding of technical requirements
	Clear description of the proposal. The proposal must clearly describe how, where, when and by whom each action will be undertaken
	Viability of the technical approach
	Feasibility of project outputs
<b>IMPLEMENTATION COHERENCE AND QUALITY</b>	Appropriateness of the organisational and managerial structures
	Quality and effectiveness of the work plan
	Qualification and complementarity of partners (extent to which the consortium as whole brings together the necessary expertise)
	Appropriateness of the allocation of tasks, ensuring that all participants have a valid role and adequate resources in the project to fulfil that role.
	Quality and effectiveness of the communication and dissemination plan
	Risk assessment and management
<b>FINANCIAL COHERENCE AND MARKET PERSPECTIVE</b>	Project duration
	Transparency of the budget: cost of different components of the proposal (staff costs, equipment, etc) and overall cost of the project
	Value for money for customers/user
	Added value in relation to transnational benefits
	Future potential exploitation of the results (including a rough estimate of market size, growth and competition).

Macro-Criteria	Criteria	Single Weighting Factor	Overall Weighting Factor
<b>STRATEGIC FIT</b>	RELEVANCE	50%	35%
	CREDIBILITY	20%	
	IMPACTS	30%	
<b>FEASIBILITY AND QUALITY</b>	TECHNICAL FEASIBILITY AND QUALITY	50%	65%
	IMPLEMENTATION COHERENCE AND QUALITY	25%	
	FINANCIAL COHERENCE AND MARKET PERSPECTIVE	25%	

Single and overall weighting factors are indicative and can be changed at discretion of the IFAs collaboration groups.

## 6.2.2 Demonstration projects evaluation criteria

### Strategic Fit of the Proposal

<b>RELEVANCE</b>	Clarity and pertinence of the proposal to i4Df capabilities and IFA objectives
	Contribution of the proposal to the programme priorities
	Sustainability of the project results in the medium and long term (capacity to maintain them after its implementation, either by continuation, by replication or by transfer <sup>2</sup> ).
<b>CREDIBILITY</b>	Credibility of the proposed methodology and or solution.
	Sponsorship from key stakeholders
<b>IMPACTS</b>	Coherence of the project outputs with the expected impacts mentioned in the work programme under the relevant topic.
	Any substantial impact not mentioned in the work programme
	Transnational benefits

### Feasibility and Quality of the Proposal

<b>TECHNICAL FEASIBILITY AND QUALITY</b>	Understanding of technical requirements.
	Clear description of the proposal. The proposal must clearly describe how, where, when and by whom each action will be undertaken
	Feasibility of the actions proposed for achieving the forecasted project outputs and outcomes.
	Proposal based on promising main research results.
<b>IMPLEMENTATION COHERENCE AND QUALITY</b>	Appropriateness of the organisational and managerial structures
	Quality and effectiveness of the work plan
	Qualification and complementarity of partners (extent to which the consortium as whole brings together the necessary expertise)
	Appropriateness of the allocation of tasks, ensuring that all participants have a valid role and adequate resources in the project to fulfil that role.
	Quality and effectiveness of the communication and dissemination plan
	Realistic time planning and risk assessment.
	Project duration.
<b>FINANCIAL COHERENCE AND MARKET PERSPECTIVE</b>	Transparency of the budget: cost of different components of the proposal (staff costs, equipment, etc) and overall cost of the project
	Added value in relation to transnational benefits
	Cost-effectiveness of the project. Value for money against expected outcomes.
	Future potential exploitation of the results (including a rough estimate of market size, growth and competition).

<sup>2</sup> "Continuation" means the continued use by the entities involved in the project of the solutions implemented during the project after its end. Continuation may also entail further geographical spread. Mere continuation and maintenance of project results will be sufficient for a passing score, while further geographical spread will be judged on its expected scope, which makes it comparable to replication or transfer.

"Replication" means that the solutions applied in the project might be used again in the same way and for the same purposes by other entities/sectors during or after the project end. "Transfer" means that solutions applied in the project are used in a different way or for a different purpose by the same or other entities/sectors during or after the project end.

Successful continuation, replication and/or transfer require a strategy including tasks to multiply the impacts of the projects' solutions and mobilise a wider uptake, reaching a critical mass during the project and/or in a short and medium term perspective after the end of the project. This goes beyond transfer of knowledge and networking, and involves putting the solutions developed and/or applied in the project into practice beyond the project period, elsewhere or for a different purpose. Applicants have to provide a clear and credible description of the strategy and actions foreseen to ensure this.



Macro-Criteria	Criteria	Single Weighting Factor	Overall Weighting Factor
<b>STRATEGIC FIT</b>	RELEVANCE	40%	35%
	CREDIBILITY	20%	
	IMPACTS	40%	
<b>FEASIBILITY AND QUALITY</b>	TECHNICAL FEASIBILITY AND QUALITY	40%	65%
	IMPLEMENTATION COHERENCE AND QUALITY	30%	
	FINANCIAL COHERENCE AND MARKET PERSPECTIVE	30%	

Single and overall weighting factors are indicative and can be changed at discretion of the IFAs collaboration groups.

### 6.2.3 Implementation projects evaluation criteria

#### Strategic Fit of the Proposal

<b>RELEVANCE</b>	Clarity and pertinence of the proposal to i4Df capabilities and IFA objectives
	Contribution of the proposal to the programme priorities
	Contribution of the project to the internal market, the cohesion policy and growth and jobs creation.
<b>CREDIBILITY</b>	Credibility of the project.
	Sponsorship from key stakeholders.
<b>IMPACTS</b>	Coherence of the project outputs with the expected impacts mentioned in the work programme under the relevant topic.
	Any substantial impact not mentioned in the work programme
	Transnational benefits

#### Feasibility and Quality of the Proposal

<b>TECHNICAL FEASIBILITY AND QUALITY</b>	Understanding of technical requirements
	Clear description of the proposal. The proposal must clearly describe how, where, when and by whom each action will be undertaken.
	Readiness/technical maturity of the proposed project.
	State of preparation or implementation at the time of the submission of the application (TRL), dependence on the results of any past or on-going feasibility or technical studies.
	For projects with high technological value, availability of additional information on the foreseen technology and materials.
<b>IMPLEMENTATION COHERENCE AND QUALITY</b>	Appropriateness of the organisational and managerial structures.
	Quality and effectiveness of the work plan.
	Qualification and complementarity of partners (extent to which the consortium as whole brings together the necessary expertise).
	Appropriateness of the allocation of tasks, ensuring that all participants have a valid role and adequate resources in the project to fulfil that role.
	Quality and effectiveness of the communication and dissemination plan.
	Project duration.
	Control procedures and quality management during implementation.
	Risk management methods and procedures.
Ex-post monitoring and audit(s).	
Transparency of the budget: cost of different components of the proposal (staff costs, equipment, etc) and overall cost of the project	



### Feasibility and Quality of the Proposal

<b>FINANCIAL COHERENCE AND MARKET PERSPECTIVE</b>	Added value in relation to transnational benefits.
	Relevance and economic value in terms of costs and benefits.
	Revenues and revenue potential.
	Financial viability.
	Stimulating effect of the financial support on public and private investment and financial leverage.

Macro-Criteria	Criteria	Single Weighting Factor	Overall Weighting Factor
<b>STRATEGIC FIT</b>	RELEVANCE	30%	35%
	CREDIBILITY	20%	
	IMPACTS	50%	
<b>FEASIBILITY AND QUALITY</b>	TECHNICAL FEASIBILITY AND QUALITY	25%	65%
	IMPLEMENTATION COHERENCE AND QUALITY	25%	
	FINANCIAL COHERENCE AND MARKET PERSPECTIVE	50%	

Single and overall weighting factors are indicative and can be changed at discretion of the IFAs collaboration groups.

#### 6.2.4 Projects evaluation model

The evaluation of projects can be made using a scorecard model. A score ranging from 0 to 10 is applied to each sub-criterion. Scores related to sub-criteria are then summed up together and opportunely weighted on the basis of their relevance, as follows:

$$Criterion_{k,j} = w_{f,j} \left( \frac{1}{n} \sum_{i=1}^n S_i \right)$$

where:

- $k$  is the index related to the number of macro-criteria;
- $j$  is the index related to the single criterion;
- $i$  is the index related to the single sub-criterion;
- $w_{f,j}$  is the weighting factor related to each criterion;
- $S_i$  is the score assigned to the each sub-criterion;
- $n$  is the number of sub-criteria.

For each macro-criterion (Strategic Fit and Feasibility and Quality) an overall score is calculated, as shown in the following formula:

$$MCS_k = w_{fk} \sum_{j=1}^3 criterion_{k,j}$$

where:

- $MCS_k$  is the score achieved by each macro- criterion;
- $w_{fk}$  is the weighting factor applied to the  $k^{th}$  macro- criterion.

In order to rank the projects using a scale ranging from 0 to 10, the MSC scores are then normalised to the highest score. In this way, the output of the process can be depicted in a diagram that reports the positions of projects with respect to four areas, corresponding to the four stage-gate options: GO, KILL, HOLD and RECYCLE.

The x-axis of the diagram refers to the “Strategic Fit”, whilst the y-axis refers to the “Feasibility and Quality”, as shown in figure 9. The “GO”, “KILL”, “HOLD” and “RECYCLE” areas can be delimited at discretion of IFAs collaboration groups. A threshold of 5 is proposed as a starting point for “GO”/“KILL” decisions.

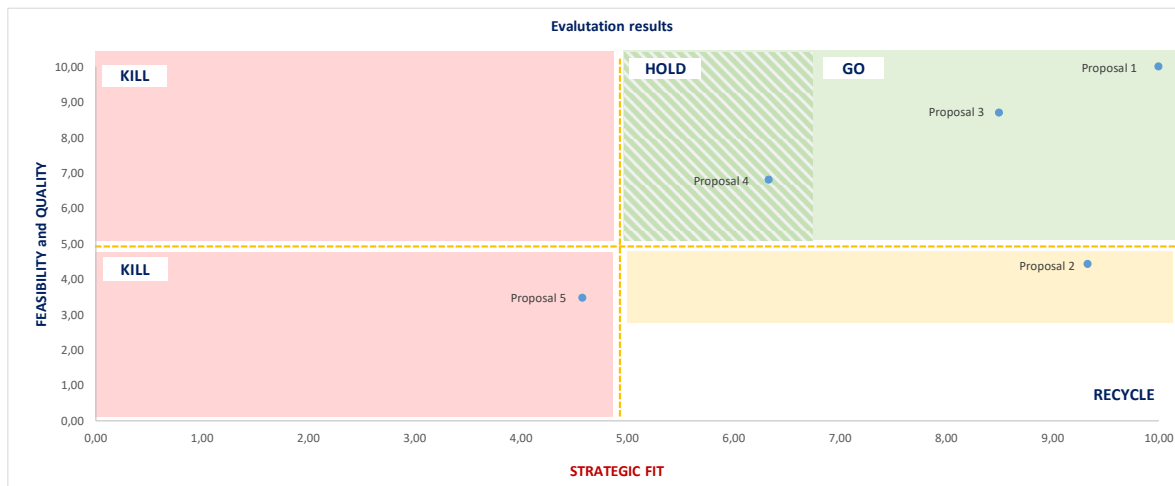


Figure 10 – Diagram depicting the results of the evaluation as a function of two macro-criteria: strategic fit of the proposal vs feasibility and quality of the proposal.

A total score is achieved by weighting and summing up the two macro-criteria at the end of the process, as follows:

$$Total\ Score = w_{f1} \sum_{j=1}^3 criterion_{1,j} + w_{f2} \sum_{j=1}^3 criterion_{2,j}$$

The Total Scores assigned to the different projects are then opportunely normalized to provide a final ranking list, one for each project type (Research and Innovation, Demonstration and Implementation).

### 6.2.5 *Projects award*

Projects are awarded taking into account the total score achieved by new and existing projects and the budget available for each project type (see chapter 7 on portfolio management). The budget distribution is agreed at gate 1, where a first estimate on the number and cost of the different project types is defined.

The “GO Projects” available in the ranking list are awarded until exhaustion of financial resources. In case of savings, Gatekeepers can decide to return unspent funds to the IFA Collaboration Group’s members, save them for future calls in a common pot or use them for other projects, such as “HOLD” or “RECYCLE” projects, even belonging to different project types. As mentioned in chapter 3 a project is put in the HOLD list, when it passes the gate with a lower score and no sufficient resources are available to fund it. Projects are put in the RECYCLE list when they fit the strategic objectives, but they show minor deficiencies in their technical quality and need some redo or fix actions before being admitted to the GO list. HOLD projects should preferably have a higher priority with respect to RECYCLE projects, but the final decision is at discretion of Gatekeepers, who should take into account not only the amount of unspent funds, but also IFAs Collaboration Group’s expectations.

In figure 11 a flow chart of the projects awarding process is shown. The flow chart refers generically to a single project type and must be replicated for all project types. In case of savings, HOLD and recycled projects converge in a unique ranking list and are submitted to an additional selection process.

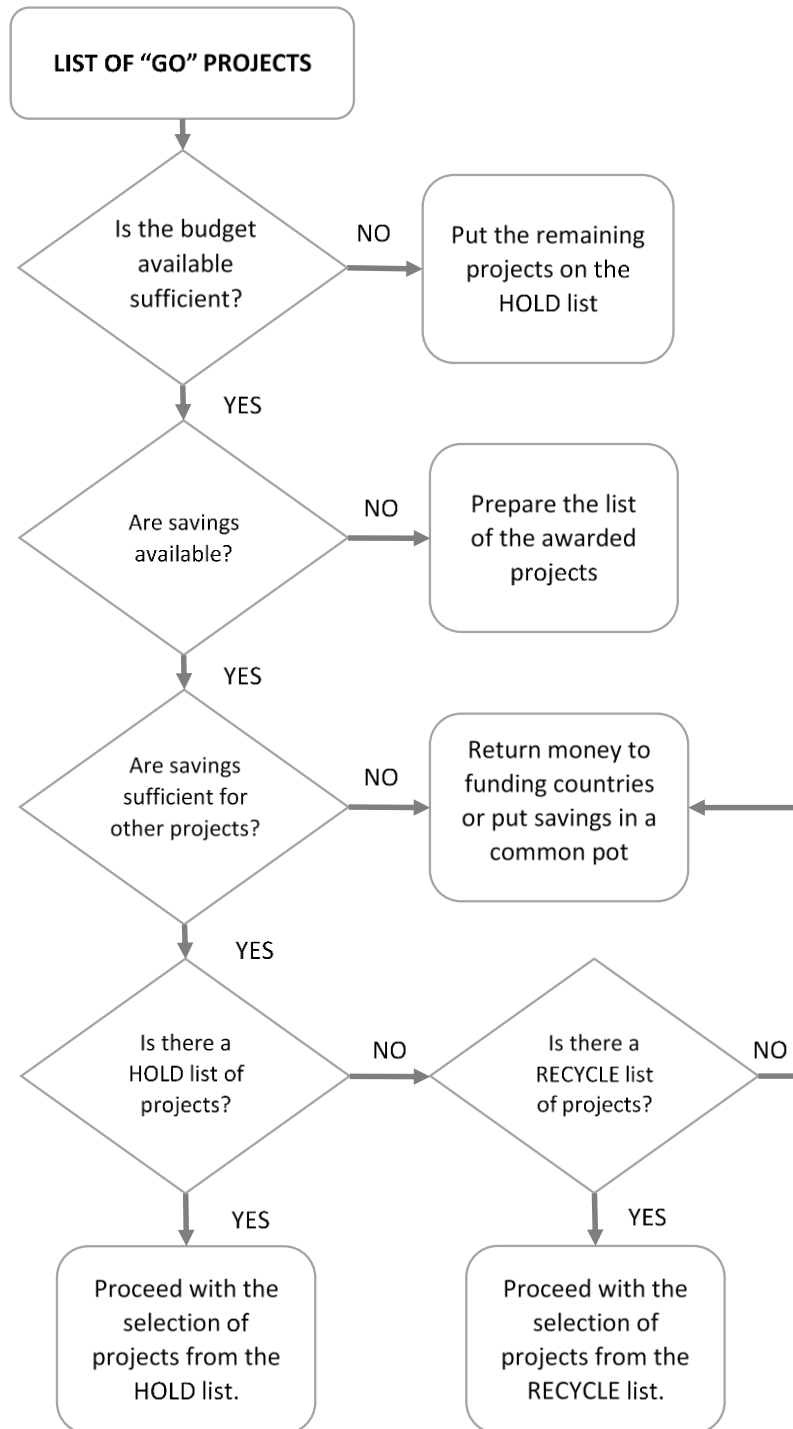


Figure 11 – Flow chart showing the projects awarding process.

### 6.3 Gate 3 – Evaluation of completed projects

At this gate the results of finished projects are evaluated, as well as their plan for future development. The evaluation of finished projects is broken down into two main steps:

1. *Assessment of the work done.* The work done is reviewed and checked by gatekeepers, ensuring that the technical work has been positively completed and that

it meets the initial specifications. If the project fails on this readiness check, the decision could be a KILL decision or a RECYCLE decision, in case some minor actions are required to fully comply with the project specifications. In table 4 a set of criteria suitable to perform this task is suggested.

2. *Assessment of the plan for future development and of market expectations.* Only projects passing the first step are admitted to this evaluation. Here the business plan related to the following stage and market perspectives are analysed and scored [4], according to the selection criteria provided at Gate 2. This is in order to make new and existing projects comparable when balancing the baskets of projects. The plan for future development is intended as a mandatory deliverable for the projects necessary to speed up the transition to the following stage.

Projects passing this gate can move forward to the following phase. At the end of this evaluation a ranking list is prepared and the baskets of projects reviewed taking into account the new projects (Gate 2) as a function of the results achieved (portfolio review). Based on the scores given to closed projects, priorities might shift up and down in the ranking list.

Table 4 - Set of criteria for project performance evaluation.

CRITERION	SCORE RANGE		
	0÷5	6÷8	9÷10
<b>Technical performance: consistency with expected results</b>	Insufficient	Coherent	Better
<b>Quality of the deliverables</b>	Low	Medium	High
<b>Schedule Variance (1-Actual Time/Estimated Time)</b>	SV <-10%	SV = ET±10%	SV>+10%
<b>Cost Variance (1-Actual Costs/Estimated Costs)</b>	CV<-10%	CV= EC±10%	CV>+10%

### 6.3.1 Running Gate 3 meetings

Ongoing projects are monitored by gatekeepers, who periodically check the progress of the projects and suggest corrective actions if needed. Gate meetings should be held at least twice a year, in conjunction with project team meetings, to guarantee corrective actions are undertaken in due time.

One gatekeeper per project can be considered sufficient to perform this task. The gatekeeper can be a representative of the consortium set up to fund the project within the collaboration group.

At the end of the project, the gatekeeper proceeds with the final evaluation of the project, as described in the previous paragraph. Gatekeepers' evaluation form the basis for the following portfolio reviews.

## 7 Portfolio management

Portfolio management is a dynamic decision process, whereby a business’s list of active projects is constantly updated and revised. In this process new projects are evaluated, selected and prioritized. Existing projects may be accelerated, killed or de-prioritized, and resources are allocated and reallocated to active projects. The portfolio decision process is characterized by uncertain and changing information, dynamic opportunities, multiple goals and strategic considerations, interdependence among projects, and multiple decisions-makers and locations. The portfolio decision process encompasses or overlaps a number of decision-making processes, including periodic reviews of the total portfolio of projects (looking at all projects holistically and against each other); making GO/KILL decisions on individual projects and developing strategies, complete with strategic resource allocation decisions [1].

Portfolio management involves two levels of decision making:

- Level 1 - Strategic portfolio management
- Level 2 - Tactical portfolio decisions.

Strategic portfolio management involves decisions related to the allocation of resources across project types and research lines. As one of the objectives of the i4Df initiative is to convey research projects results to implementation, resources allocation should preferably be addressed to demonstration and implementation projects.

Conversely, the budget breakdown could follow a different approach, based on the priorities given to research lines. In this case, for each research line the type of projects that better suits research needs is identified and a total rough cost estimate is carried out. The total cost is finally compared to the budget available and cut are accomplished to research lines with lower priorities.

Tactical portfolio decisions are focused on individual projects, their priorities and costs and follow the decisions made at level 1 about budget breakdown.

Tactical decisions involve two steps:

- decisions that are made at gates;
- decisions that are made at portfolio reviews.

Decisions made at gates are based on an in depth review of individual projects. The output from this gate is summarized by a score and a GO/KILL/RECYCLE decision is made at this gate. This type of action allows the selection of the best projects and their prioritization.

However, a second action is necessary to choose the right mix of projects holistically. The latter is achieved by a second decision process, i.e. the periodic portfolio review.

Portfolio reviews look at the entire set of projects, but in much less detail, and changes on projects priority might occur following strategic decisions. This process should finally converge into the right mix and balance of initiatives and to the maximum portfolio value.

### 7.1 Portfolio reviews

Portfolio reviews are accomplished by collaboration group members with the support of an advisory group from the community of experts, together with gatekeepers, at governing board meetings at least twice a year. Portfolio reviews are foreseen at the end of the selection process of new projects (Gate 2) and at the completion of projects stages (Gate 3). Decisions are made on the basis of the evaluations given by gatekeepers and the budget available for each project type and research line.

As part of the portfolio management system, is the allocation of projects in the strategic baskets [3][1]. This operation allows to assign resources across various dimensions, such as project types or research lines. Once resources are allocated across baskets, projects within each basket are ranked from best to worst until the basket resource limit is reached. This process requires to balance and mix new and ongoing projects for each project type (see figure 12). Balancing the baskets of projects requires to provide a ranking list for each project type or sub-programme, encompassing the list of GO projects from Gate 2 and 3. This could include also the transfer of budget from a sub-programme to another, in case of savings, to recover HOLD projects.

Baskets and the ranked list of projects within baskets, are used at portfolio reviews to help management prioritize all projects.

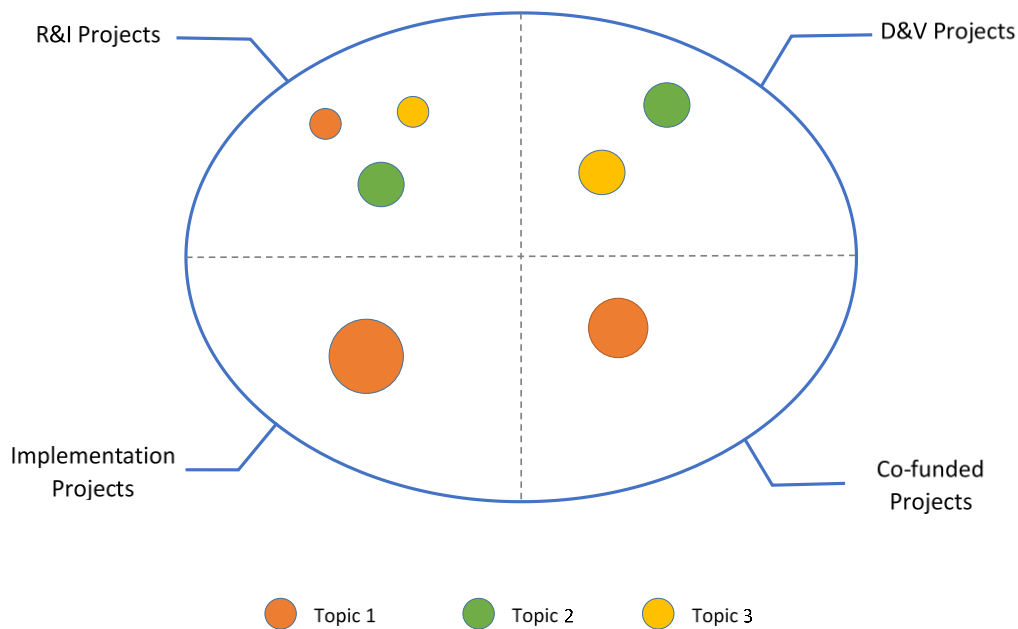


Figure 12 – Baskets of projects.

## 7.2 *Balancing the basket of projects*

Balancing the basket of projects requires to provide an overall ranking list, encompassing the list of “GO” and “RECYCLE” projects, and then to allocate the necessary resources to the best projects until the budget limit is reached.

This operation involves at first to rank the projects using the scorecard model described in paragraph 6.2 and then to proceed with the selection of projects taking into account their probability of success, their costs and the budget available for each project type.

To do so, an additional quantitative parameter can be used to estimate the viability of the projects, such as the “Productivity Index”. The Productivity Index is given by the weighed ratio between the Net Present Value and the budget necessary to perform the project, being the weighing coefficient the probability of success of the developed product:

$$PI_i = \frac{NPV_i}{Budget_i} * P_{ts_i}$$

where:

*PI* = Productivity Index;

*Budget<sub>i</sub>* = budget related to the i-th project;

*NPV* = Net Present Value;

*P<sub>ts</sub>* = Probability of Technical Success.

The Probability of Technical Success is estimated as a percentage of the project's potential for success. Indicatively it can be assumed that:

- a project with low probability of success cannot exceed 35%;
- a project with medium probability of success cannot exceed 70%;
- a project with high probability of success has a value greater than 70%.

The introduction of the productivity index allows to review the ranking of projects on the basis of their cost, their benefits and the probability of success.

Once the ranks are refined, the process proceeds with the allocation of the resources to prioritised projects. To do so, fit for purpose algorithms can be used, such as the Knapsack algorithm, whose goal is to maximize the total value of selected items without exceeding a fixed constraint. In this case the goal is to maximize the total score of the proposals without exceeding the budget limit, as follows:



$$\text{maximize } \sum_{i=1}^n v_i x_i$$

$$\text{subject to } \sum_{i=1}^n w_i x_i \leq W, x_i \in \{0,1\}$$

**where:**

- $x_i$  is a binary variable (1 for GO projects and 0 for killed projects);
- $v_i$  is the score of each proposal;
- $w_i$  is the budget of each proposal;
- $W$  is the maximum budget capacity for the portfolio
- $i = 1..n$

At the end of this process the right mix and balance of projects is analytically achieved, but further adjustments based on strategic evaluations are still possible at discretion of the collaboration group.

### 7.2.1 The Portfolio Review Application

In order to support decision makers in the evaluation and selection of projects, a user-friendly application has been developed.

The application consists of two macro processes:

- Projects evaluation;
- Portfolio management.

For projects evaluation, the tool takes into account a mix of qualitative and quantitative criteria, as described in chapter 6 and 7 (see figure 13).

SCORECARD MODEL FOR FULL PROPOSAL		Evaluation Criteria														
		0	2.5	5	7.5	10										
		Low	Little	Medium	Good	High										
Project Type : Demonstration							GROUP 1 - New project proposals					GROUP 2 - On going projects.				
		Proposal 1	Proposal 2	Proposal 3	Proposal 4	Proposal 5	Proposal 6	Proposal 7	Proposal 8	Proposal 9	Proposal 10					
<b>STRATEGIC FIT</b>																
<b>RELEVANCE</b>	Clarity and pertinence of the proposal to H2020 capabilities and IFA objectives	10	10	10	5	10	10	10	10	10	5	10	5	10		
<b>RELEVANCE</b>	Contribution of the proposal to programme priorities	10	0	10	7.5	0	5	10	2.5	0	5					
<b>RELEVANCE</b>	Sustainability of the project results in the medium and long term (capacity to maintain them after its implementation, either by continuation, by replication or by transfer)	10	10	10	7.5	2.5	5	10	2.5	0	2.5					
<b>CREDIBILITY</b>	Credibility of the proposed methodology and/or solution	10	10	2.5	7.5	10	5	10	2.5	0	10					
<b>CREDIBILITY</b>	Sponsorship from key stakeholders	10	2.5	10	5	2.5	5	10	2.5	0	5					
<b>IMPACTS</b>	Coherence of the project outputs with the expected impacts mentioned in the work programme under the relevant topic.	10	2.5	2.5	7.5	2.5	5	10	7.5	7.5	5					
<b>IMPACTS</b>	Any substantial impact not mentioned in the work programme	10	2.5	10	5	10	10	10	10	5	10					
<b>IMPACTS</b>	Transnational benefits	10	2.5	10	5	0	10	2.5	10	5	0					
<b>FEASIBILITY and QUALITY</b>																
<b>TECHNICAL FEASIBILITY AND QUALITY</b>	Understanding of technical requirements	10	5	7.5	7.5	2.5	10	5	7.5	7.5	2.5					
<b>TECHNICAL FEASIBILITY AND QUALITY</b>	Clear description of the proposal. The proposal must clearly describe how, where, when and by whom each action will be undertaken	10	5	0	5	10	10	5	0	5	5					
<b>TECHNICAL FEASIBILITY AND QUALITY</b>	Feasibility of the actions proposed for achieving the forecasted project outputs and outcomes	10	5	0	10	10	2.5	5	10	10	10					
<b>TECHNICAL FEASIBILITY AND QUALITY</b>	Proposal based on promising main research results	10	10	0	5	2.5	10	5	7.5	0	2.5					
<b>IMPLEMENTATION COHERENCE AND QUALITY</b>	Appropriateness of the organisational and managerial structures	10	10	0	5	2.5	10	2.5	7.5	0	5					
<b>IMPLEMENTATION COHERENCE AND QUALITY</b>	Quality and effectiveness of the work plan	10	10	10	10	2.5	2.5	10	7.5	0	5					
<b>IMPLEMENTATION COHERENCE AND QUALITY</b>	Qualification and complementarity of partners (intent to which the consortium as a whole brings together the necessary expertise)	10	10	0	10	2.5	10	10	7.5	0	5					
<b>IMPLEMENTATION COHERENCE AND QUALITY</b>	Appropriateness of the allocation of tasks, ensuring that all participants have a valid role and adequate resources in the project to fulfil that role.	10	10	10	10	2.5	10	10	7.5	0	5					
<b>IMPLEMENTATION COHERENCE AND QUALITY</b>	Quality and effectiveness of the communication and dissemination plan	10	10	0	5	2.5	10	10	7.5	0	2.5					
<b>IMPLEMENTATION COHERENCE AND QUALITY</b>	Realistic time planning and risk assessment	10	10	0	10	2.5	10	10	0	10	2.5					
<b>IMPLEMENTATION COHERENCE AND QUALITY</b>	Project duration	10	10	2.5	5	10	2.5	5	2.5	5	10					
<b>FINANCIAL COHERENCE AND QUALITY</b>	Transparency of the budget: cost of different components of the proposal (staff costs, equipment, etc) and overall cost of the project	10	10.0	2.5	5	10	2.5	5	2.5	5	10					
<b>FINANCIAL COHERENCE AND QUALITY</b>	Added value in relation to transnational benefits	10	5.0	0	7.5	10	2.5	5	0	7.5	10					
<b>FINANCIAL COHERENCE AND QUALITY</b>	Cost-effectiveness of the project. Value for money against expected outcomes	10	0.0	0	5	2.5	2.5	0	0	5	2.5					
<b>FINANCIAL COHERENCE AND QUALITY</b>	Future potential exploitation of the results (including a rough estimate of market size, growth and competition)	10	5.0	10	5	10	2.5	5	10	5	10					

Figure 13 – List of criteria with related scores assigned to new and existing projects.

The evaluation process is applied to active projects, i.e.:

1. new project proposals submitted at Gate 2;
2. completed projects resulting from Gate 3.

The results of this evaluation is weighed and normalised to a scale ranging from 0 to 10, as described in chapter 6 (see figure 14).

		Proposal 1	Proposal 2	Proposal 3	Proposal 4	Proposal 5	Proposal 6	Proposal 7	Proposal 8	Proposal 9	Proposal 10	
Weighed Score	<b>STRATEGIC FIT</b>	3,5	1,7	2,9	2,2	1,6	2,5	3,2	3,1	1,1	2,0	
	<i>RELEVANCE</i>	1,4	0,9	1,4	0,9	0,6	0,9	1,4	1,3	0,2	0,8	
	<i>CREDIBILITY</i>	0,7	0,4	0,4	0,4	0,4	0,4	0,7	0,5	0,0	0,5	
	<i>IMPACTS</i>	1,4	0,4	1,1	0,8	0,6	1,2	1,1	1,3	0,8	0,7	
	<b>FEASIBILITY and QUALITY</b>	6,3	4,4	1,7	4,6	3,6	4,1	3,5	3,2	2,8	3,6	
	<i>TECHNICAL FEASIBILITY AND QUALITY</i>	2,6	1,6	0,5	1,8	1,6	2,1	1,3	1,6	1,5	1,3	
	<i>IMPLEMENTATION COHERENCE AND QUALITY</i>	2,0	2,0	0,6	1,5	0,7	1,5	1,6	1,1	0,4	1,0	
	<i>FINANCIAL COHERENCE AND QUALITY</i>	1,8	0,9	0,5	1,3	1,3	0,5	0,6	0,5	0,9	1,3	
	Weighed Score (1-10 scale)	<b>STRATEGIC FIT</b>	10,0	4,9	8,3	6,3	4,6	7,0	9,0	8,8	3,0	5,8
		<i>RELEVANCE</i>	10,0	6,7	10,0	6,7	4,2	6,7	10,0	9,2	1,7	5,8
<i>CREDIBILITY</i>		10,0	6,3	6,3	6,3	6,3	5,0	10,0	7,5	0,0	7,5	
<i>IMPACTS</i>		10,0	2,5	7,5	5,8	4,2	8,3	7,5	9,2	5,8	5,0	
<b>FEASIBILITY and QUALITY</b>		9,7	6,8	2,5	7,1	5,6	6,3	5,4	5,0	4,3	5,5	
<i>TECHNICAL FEASIBILITY AND QUALITY</i>		10,0	6,3	1,9	6,9	6,3	8,1	5,0	6,3	5,6	5,0	
<i>IMPLEMENTATION COHERENCE AND QUALITY</i>		10,0	10,0	3,2	7,9	3,6	7,9	8,2	5,7	2,1	5,0	
<i>FINANCIAL COHERENCE AND QUALITY</i>		9,1	4,4	2,8	6,5	6,7	2,4	3,1	2,6	4,7	6,7	

Figure 14 – Weighed and normalized project scores.

Based on the scores achieved, the projects are ranked and depicted in a diagram that reports the positions of projects with respect to three areas, corresponding to as many stage-gate options: GO, KILL and RECYCLE (figure 15).

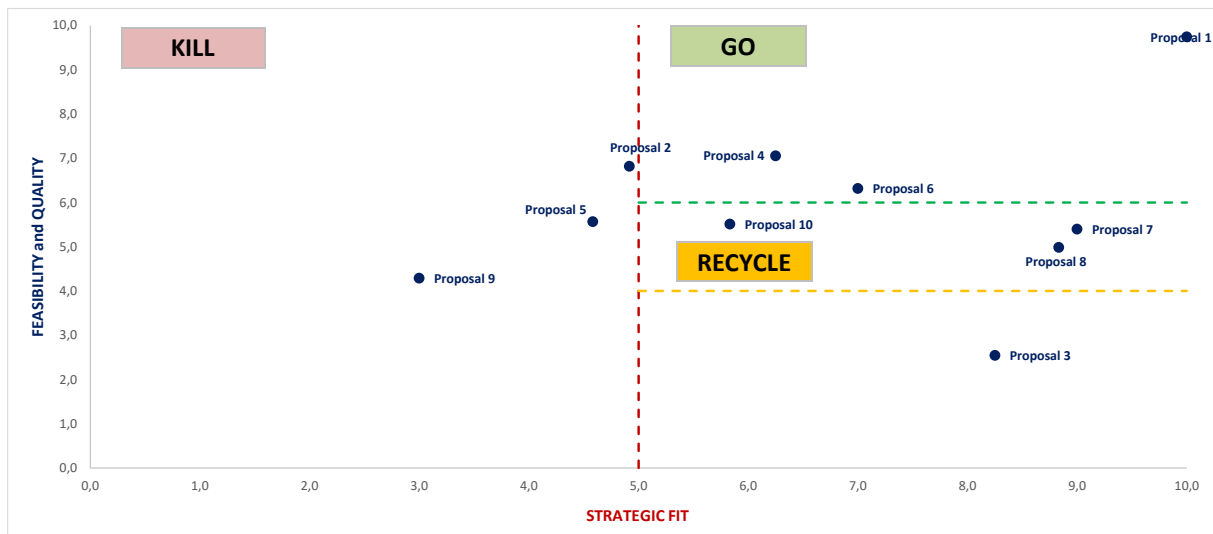


Figure 15 – Diagram reporting the positions of projects with respect to three areas: GO, KILL and RECYCLE.

To clearly show how each evaluation criterion has contributed to the final score, the results are also reported in radar format (figure 16).

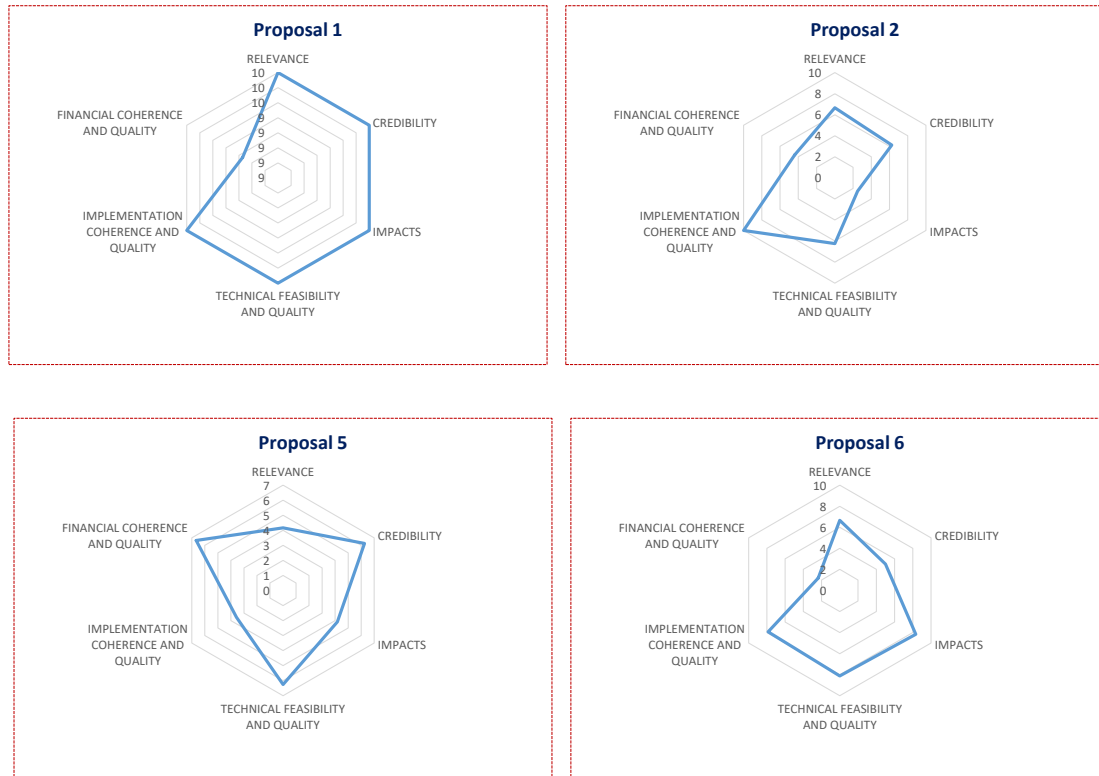


Figure 16 – Evaluation results in radar format.

At the end of this evaluation process, the projects are selected taking into account their cost, their productivity Index and the budget available for the same project type (portfolio management). This last step allows to estimate the optimal combination of GO proposals. In case of savings, the possibility of using the remaining budget to fund RECYCLE projects is also foreseen (Figure 17).

SCENARIO 1 (only GO projects)					SCENARIO 2 (also RECYCLE projects)				
Totale score of proposal taken					Totale score of proposal taken				
Budget limit					Budget limit				
Budget used by the optimal solution					Budget used by the optimal solution				
REMAINING BUDGET					REMAINING BUDGET				
	TOTAL SCORE (min = 0; max =20)	Qualification	Budget (€min)	Evaluation Results		Total Score (min = 0; max =10)	Qualification	Budget (€min)	Evaluation Results
Proposal 1	9,9	GO	0,10	FINANCED	Proposal 7	6,9	RECYCLE	0,25	RECYCLE
Proposal 4	6,8	GO	0,05	FINANCED	Proposal 8	5,6	RECYCLE	0,20	RECYCLE
Proposal 6	6,6	GO	0,20	HOLD	Proposal 10	5,7	RECYCLE	0,05	FINANCED

Figure 17 – Final selection of projects without (Scenario 1) and with (Scenario 2) RECYCLE projects.

More detailed information about this application is available in the related manual (Annex III).

## 8 Conclusions

In this report, a new operational model for moving projects from idea to implementation has been described. The model is based on a revised version of the original Stage Gate Review Process (SGRP) by Robert J. Cooper and it is intended to support the management procedures within the coordination mechanism developed under Work Package 1 (WP1) of the infra4Dfuture project.

In WP 1, three main capabilities and eight Innovation Focus Areas (IFA) have been defined. Each IFA is supposed to be managed by an independent management group (“IFA coordination ecosystem”) that is responsible for the corresponding research programme. Therefore, the i4Df management structure encompasses eight collaboration groups.

The coordination ecosystem for each IFA is composed of two major entities: the collaboration group, including NTIAs interested in the corresponding IFA research line from the road, rail and water sectors, and the community of experts, mainly composed of representatives of the academic, industry and research world. The IFA coordination ecosystem is NTIA-lead.

The collaboration group and the community of experts interact with each other to identify and define research needs, periodically review the programme and the portfolio of projects, fund new call for proposals and participate together in external calls.

Collaboration group members and representatives of the community of experts will also act as gatekeepers in the SGRP to evaluate and monitor new and ongoing projects.

In describing the SGRP we have spoken about gatekeepers in general. But who are they and what they do at the different stages of the coordination mechanism?

These details are not reported at this stage of the project, but to make the i4Df SGRP works, it is necessary to define additional operational details and to identify the management scheme players. It was agreed under WP1 to have a basic description of collaboration and to leave the IFA collaboration groups free to fine tune the operational mechanism as they wish and are accustomed to. Therefore, the recommendation here is to preferably link the i4Df SGRP to well known and consolidated management procedures, such as those developed by the ERA-NET ROAD initiative.

## 9 References

- [1] R.G. Cooper, *Winning at new products*, Basik Books, 2017.
- [2] R.G. Cooper, *Managing technology development projects*, IEEE Engineering Management Review, Vol. 35, No.1, 2007, pp. 67-76.
- [3] R.G. Cooper and S.J. Edgett, *Ten Ways to Make Better Portfolio and Project Selection Decisions*, PDMA Visions Magazine, June 2006.
- [4] Scott J. Edgett, *New Product development – Process benchmarks and performance metrics*, Product Development Institute and APQC, 2011.
- [5] R.G. Cooper, *Where Are All the Breakthrough New Products? Using Portfolio Management to Boost Innovation*, Research-Technology Management, Sept-Oct 2013, pp 25-32.
- [6] R.G. Cooper, *Managing Technology Development Projects – Stage-Gate®-TD*, Research-Technology Management, 49, 6, Nov-Dec 2006, pp 23-31.
- [7] Scott J. Edgett, *The Stage-Gate Model: an overview*, Stage Gate International, [www.stage.gate.com](http://www.stage.gate.com).
- [8] CEDR Transnational Road Research Programme, *Collaboration Agreement*, 2018.
- [9] ERA-NET ROAD II, *Upgraded Toolkit*, Deliverable 1.6, 2011.
- [10] CEDR Transnational Road Research Programme, *Guide for Applicants*, 2018.
- [11] CEF TRANSPORT, *Guide for Applicants*, 2019.
- [12] HORIZON 2020 – WORK PROGRAMME 2018-2020, 2018.
- [13] HORIZON 2020 – WORK PROGRAMME 2018-2020 General Annexes, *Evaluation criteria*, 2018.
- [14] HORIZON 2020 Manual, *Evaluation process and results*, Funding and Tenders Portal, 2019.
- [15] HORIZON 2020 Manual, *Types of Actions*, Funding and Tenders Portal, 2019.
- [16] LIFE Environment and Resource Efficiency, *Guide for Applicants*, 2019.
- [17] LIFE, *Guide for the evaluation of sub-programme Environment LIFE projects proposals 2018*, 2018.
- [18] LIFE, *Guide for the evaluation of LIFE Integrated Project proposals 2018 Environment and Climate Action sub-programmes*, 2018.
- [19] LIFE, *Guidelines for applicants LIFE Integrated Projects 2019 - Environment and Climate Action sub-programmes*, 2019.

[20] R. Smit, J. Jonsson and B. Gyergyay, *Infra4DFuture - Deliverable D1.2 – Joint vision on transport infrastructure innovation until 2040 – Vers 3.0*, 2019.



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Project Acronym: **infra4Dfuture**

Project Title: **Infrastructure for the Future**

Project Number: **824269**

Topic: **MG-2-4-2018 – Coordinating national efforts in modernizing transport infrastructure and provide innovative mobility services**

Type of Action: **Coordination and Support Action (CSA)**

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## **D2.1 – Staged gate reviewing process for concerted innovation portfolio coordination**

### **Annex 1 – Main funding programmes description**

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*Version 1.0*

<b>Deliverable:</b>	D2.1– Staged gate reviewing process for concerted innovation portfolio coordination – Annex 1
<b>Work Package:</b>	WP2: Developing structures enabling effective transnational coordination of existing and future innovation programmes.
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<b>Dissemination level:</b>	<input checked="" type="checkbox"/> PU - Public <input type="checkbox"/> CO - Confidential, only for members of the consortium (including the Commission) <input type="checkbox"/> RE - Restricted to a group specified by the consortium (including the Commission Services)



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## HORIZON 2020

### Funding instruments

#### Research and Innovation Action (RIA)

**Description**

Action primarily consisting of activities aiming to establish new knowledge and/or to explore the feasibility of a new or improved technology, product, process, service or solution. For this purpose they may include basic and applied research, technology development and integration, testing and validation on a small-scale prototype in a laboratory or simulated environment.

Projects may contain closely connected but limited demonstration or pilot activities aiming to show technical feasibility in a near to operational environment.

**TRL**

1-5

**Funding rate**

100%

#### Innovation Action (IA)

**Description**

Action primarily consisting of activities directly aiming at producing plans and arrangements or designs for new, altered or improved products, processes or services. For this purpose they may include **prototyping, testing, demonstrating, piloting, large-scale product validation and market replication.**

A 'demonstration or pilot' aims to validate the technical and economic viability of a new or improved technology, product, process, service or solution in an operational (or near to operational) environment, whether industrial or otherwise, involving where appropriate a larger scale prototype or demonstrator.

A 'market replication' aims to support the first application/deployment in the market of an innovation that has already been demonstrated but not yet applied/deployed in the market due to market failures/barriers to uptake. 'Market replication' does not cover multiple applications in the market of an innovation that has already been applied successfully once in the market. 'First' means new at least to Europe or new at least to the application sector in question. Often such projects involve a validation of technical and economic performance at system level in real life operating conditions provided by the market.

Projects may include limited research and development activities.

**TRL**

6-9

**Funding rate** | 70% (except for non-profit legal entities, where a rate of 100% applies)

### Coordination and support actions (CSA)

**Description** | Actions consisting primarily of accompanying measures such as standardisation, dissemination, awareness-raising and communication, networking, coordination or support services, policy dialogues and mutual learning exercises and studies, including design studies for new infrastructure and may also include complementary activities of strategic planning, networking and coordination between programmes in different countries.

**TRL** | -

**Funding rate** | 100%

### ERA-NET Cofund actions

**Description** | ERA-NET Cofund actions are designed to **support public-public partnerships**, including joint programming initiatives between Member States, in their preparation, establishment of networking structures, design, implementation and coordination of joint activities as well as EU topping-up of a trans-national call for proposals. **It allows for programme collaboration in any part of the entire research-innovation cycle.**

ERA-NET Cofund actions aim at promoting the coordination of national programmes by pooling national resources and contributing to the alignment of national research and innovation policies.

The main and compulsory activity of ERA-NET Cofund actions under Horizon 2020 is the implementation of the co-funded joint call for proposals that leads to the funding of trans-national research and/or innovation projects. The call is normally based on a call for proposals resulting in grants to third parties.

**ERA-NET Cofund actions may also**, depending on the research area and the underlying national programmes and their governing principles, **target governmental research organisations**. The co-funded call for proposals will in these cases be based on in-kind contributions from their institutional funding and the beneficiaries carry out the transnational projects resulting from their call for proposals fully or partially themselves. The in-kind contributions are the resources allocated as direct expenditure in the selected trans-national projects that are not reimbursed by the EU contribution. ERA-NET Cofund actions based on in-kind contributions do not include other joint activities.

TRL

Funding rate

'Sole participants' may be eligible if the above-mentioned specific conditions for eligible ERA-NET Cofund partners are satisfied.

1-9

The EU contribution will be limited to a maximum of 33% of the total eligible costs of the action. The EU contribution to the costs for support to or implementation of trans-national projects is limited to one call per grant agreement.

No costs are eligible for activities related to the preparation, implementation and follow-up of the co-funded call. The consortium may however choose to use part of the EU contribution to support their activities as long as the corresponding costs are not declared as eligible and the EU contribution does not exceed 33% of partners' funding of trans-national projects and unit costs for additional activities. This means in practice that they have to replace any EU contribution that is used to support their activities with additional national contributions to the funding of trans-national projects.

## European Joint Programme (EJP) Cofund actions

Description

The European Joint Programme ('EJP') is a programme cofund action designed to **support coordinated national research and innovation programmes**. The EJP Cofund aims at attracting and pooling a critical mass of national resources on objectives and challenges of Horizon 2020 and at achieving significant economies of scales by adding related Horizon 2020 resources to a joint effort.

The EJP Cofund does not promote types of activities or forms of coordination, but relies on modalities and processes agreed by the coordinated national programmes and related actors.

The minimum number of participants in EJPs is five independent legal entities from different Member States or associated countries. **Participating entities are typically research funders or governmental research organisations participating on the basis of their institutional funding**. Their participation has to be mandated by the "owner" of the programme, the national/regional authorities in charge.

In addition to the minimum conditions, other legal entities may participate if justified by the nature of the action, in particular entities created to coordinate or integrate transnational research efforts, grouping funding from both national and private sources.

'Sole participants' may be eligible if the above-mentioned specific eligibility conditions for EJP Cofund partners are satisfied.

Finally, EJP Cofund actions support coordination and future integration of national research and innovation programmes. It is appropriate that core participation in these actions is limited to entities that can fully participate through their contribution of national and regional programmes.

#### Funded activities

The main activity of the action is the implementation of a joint programme of activities to attain objectives common to Horizon 2020, ranging from research to coordination and networking activities, including training activities, demonstration and dissemination activities, support to third parties etc.

#### Funding rate

The Horizon 2020 contribution will be limited to 70% of the total eligible costs of the action, unless otherwise specified in the call conditions, in line with the objective of achieving a balanced funding of the EJP Cofund from Horizon 2020 and participating public programmes.

### Pre-Commercial Procurement (PCP) actions

#### Description

PCP actions aim to encourage public procurement of research, development and validation of new solutions that can bring significant quality and efficiency improvements in areas of public interest, whilst opening market opportunities for industry and researchers active in Europe. It provides EU funding for a group of procurers ('buyers group') to undertake together one joint PCP procurement, so that there is one joint call for tender, one joint evaluation of offers, and a lead procurer awarding the R&D service contracts in the name and on behalf of the buyers group. Each procurer in the buyers group contributes its individual financial contribution to the total budget necessary to jointly finance the PCP, enabling the procurers to share the costs of procuring R&D services from a number of providers and comparing together the merits of alternative solutions paths from a number of competing providers to address the common challenge. The PCP must address one concrete procurement need that is identified as *a common challenge* in the innovation plans of the procurers in the buyers group that requires new R&D and is described in the common specifications of the joint PCP call for tender.

#### Funded activities

Preparation and implementation of the joint PCP. Eligible costs include the price of the R&D services procured via the joint PCP and the costs of the eligible coordination and networking activities and may include in-kind contributions of third parties linked to grant beneficiaries.

#### Funding rate

The Union contribution will be limited to maximum 70% of the total eligible costs. Eligible costs include the price of the R&D services procured via the joint PCP and the costs of the eligible coordination and networking activities. Eligible costs may include in-kind

contributions of third parties linked to the grant beneficiaries (e.g. corresponding to resources put at the disposal of grant beneficiaries to carry out the project). The requested reimbursement of the estimated eligible costs of coordination and networking activities may not exceed 30% of the requested grant. The consortium may choose to use part of the Union contribution to increase the support to coordination and networking activities as long as the Union contribution does not exceed 70% of the sum of those costs and the price of the PCP call for tender. Indirect eligible costs are calculated as a flat rate of 25% of direct eligible costs, excluding direct eligible costs for subcontracting and the costs of resources made available by third parties which are not used on the premises of the beneficiary.

## Public procurement of Innovative Solutions (PPI) actions

### Description

The objective of PPI actions is to enable groups of procurers to share the risks of acting as early adopters of innovative solutions, whilst opening market opportunities for industry. It provides EU funding for a group of procurers ('buyers group') to undertake together under the coordination of the 'lead procurer'<sup>23</sup> one joint or several coordinated<sup>24</sup> PPI procurements based on common tender specifications that are defined jointly by all procurers in the buyers group. <sup>25</sup> Each PPI focuses on one concrete unmet need that is shared by the participating procurers and requires the deployment of innovative solutions that are to a significant extent similar across countries and are therefore proposed to be procured in collaboration. This means that the innovative solutions procured by all procurers in the buyers group must have the same core functionality and performance characteristics (described in the common specifications for the joint calls for tenders), but may have additional 'local' functionality due to differences in the local context of each individual procurer (if framework contracts/agreements are used, this can be reflected in the specific contracts for procuring specific quantities of goods/services for each procurer).

### Funded activities

Preparation and implementation of the PPI (as described in General Annex E). Eligible costs include the price of the innovative solutions procured via the PPI and the costs of the eligible coordination and networking activities and may include in-kind contributions of third parties linked to grant beneficiaries. Cost for procurement of R&D are not eligible.

### Funding rate

The EU contribution will be governed by the Rules for Participation, unless otherwise specified in the relevant call conditions. The maximum funding rate is 35%.

The eligible costs of coordination and networking activities may not exceed 50% of the total estimated eligible costs set up in the budget of the action at the signature of the grant agreement.

Indirect eligible costs are calculated as a flat rate of 25% of direct eligible costs, excluding direct eligible costs for subcontracting (e.g. the price of the PPI procurement).and the costs of resources made available by third parties (e.g. test equipment) which are not used on the premises of the beneficiary.

FUNDING INSTRUMENT	Funding rate	Coordination	Research and development	Demonstration and validation	Implementation
Research and Innovation Actions (RIA)	100%		✓		
Innovation Actions (IA)	70% - 100%			✓	✓
Coordination and Support Actions (CSA)	100%	✓			
ERA-NET Cofund actions	33%	✓	✓	✓	
European Joint Programme (EJP)	70%	✓	✓	✓	
Pre-Commercial Procurement (PCP)	70%		✓	✓	
Public Procurement of Innovative solutions (PPI)	35%				✓

## REFERENCES

- Horizon 2020, Work programme 2018-2020, *General annexes*;
- Horizon 2020, Online manual.

## LIFE PROGRAMME 2014-2020

### Funding instruments

#### Pilot projects

##### Description

Pilot projects means projects that apply a technique or method that has not been applied or tested before, or elsewhere, and that offer potential environmental or climate advantages compared to current best practice and that can subsequently be applied on a larger scale to similar situations.

Pilot projects must contain actions that lead to substantial and measurable direct effects on the environmental and/or climate action issue(s) targeted.

Projects focused on research or dedicated to the construction of large infrastructure do not fall within the scope of the LIFE programme and are therefore not eligible.

##### TRL

6-9

##### Funding rate

**Nature and Biodiversity:** 60%. The co-financing rate can be up to 75% if at least half of the total estimated project costs are used for actions to improve the conservation status of priority habitats or species listed in the EU's birds and habitats directives.

**Environment and resource efficiency:** 55%

#### Demonstration projects

##### Description

Demonstration projects are projects that, put into practice, test, evaluate and disseminate actions, methodologies or approaches that are new or unknown in the specific context of the project, such as the geographical, ecological, socioeconomic context, and that could be applied elsewhere in similar circumstances.

Demonstration projects must contain actions that lead to substantial and measurable direct effects on the environmental and/or climate action issue(s) targeted.

##### TRL

6-9

##### Funding rate

**Nature and Biodiversity:** 60%. The co-financing rate can be up to 75% if at least half of the total estimated project costs are used for actions to improve the conservation status of priority habitats or species listed in the EU's birds and habitats directives.

**Environment and resource efficiency:** 55%



## Best Practice projects

### Description

Best practice projects are projects that apply appropriate, cost-effective and state-of-the-art techniques, methods and approaches taking into account the specific context of the project.

Best practice projects must contain actions that lead to substantial and measurable direct effects on the environmental and/or climate action issue(s) targeted.

### TRL

9

### Funding rate

**Nature and Biodiversity:** 60%. The co-financing rate can be up to 75% if at least half of the total estimated project costs are used for actions to improve the conservation status of priority habitats or species listed in the EU's birds and habitats directives.

**Environment and resource efficiency:** 55%

## Information, awareness and dissemination projects

### Description

Information, awareness and dissemination projects means projects aimed at supporting communication, dissemination of information and awareness raising in the fields of the sub-programmes for Environment and Climate Action.

These projects must contain actions that lead to substantial and measurable direct effects on the environmental and/or climate action issue(s) targeted.

### TRL

-

### Funding rate

**Nature and Biodiversity:** 60%. The co-financing rate can be up to 75% if at least half of the total estimated project costs are used for actions to improve the conservation status of priority habitats or species listed in the EU's birds and habitats directives.

**Environment and resource efficiency:** 55%

## Integrated projects

### Description

Integrated Projects were introduced to enable statutory authorities in EU Member States to implement environmental and climate legislation to the fullest extent. Integrated Projects provide funding for plans, programmes and strategies developed on the regional, multi-regional or national level. They help Member States comply with key EU legislation in six areas:

- Nature
- Water
- Air
- Waste
- Climate Change Mitigation
- Climate Change Adaptation

The unique thing about Integrated Projects is they allow Member States to make use of other EU funding sources, including agricultural, structural, regional and research funds, as well as national funds and private sector investment.

Integrated projects under the sub-programme for Environment and Climate Action are projects implementing on a large territorial scale (regional, multi-regional, national or trans-national scale) environmental and climate action plans or strategies required by specific Union environmental and climate legislation, developed pursuant to other Union acts or developed by Member States' authorities, primarily in the areas of nature (including Natura 2000 network management), water, waste and air, and climate change and adaptation, while ensuring involvement of stakeholders and promoting the coordination with and mobilisation of at least one other relevant Union, national or private funding source.

Integrated projects (IP) shall aim towards the full implementation of the targeted plan or strategy. This does not mean that the IP will cover all actions foreseen in the plan or that the plan will be fully implemented during the lifetime of the IP. However, the IP shall include strategic actions to catalyse a process and mobilise supplementary commitments and funding that will lead, in due time, to the full implementation of the plan or strategy. The IP should therefore be designed in a way to address this long term objective.

The actual full implementation of the given plan or strategy would then happen through complementary measures or actions financed outside of the IP, using other available funding (Union, national or private). Some of these complementary measures or actions are expected to be linked to the IP implementation, while others might be carried out after its end. It is in general expected that beneficiaries of grants for LIFE IPs – together with other relevant actors in charge of the complementary actions – commit to

implement the targeted plan and in particular that the relevant actors undertake to implement at least those complementary actions that are foreseen in the IP proposal as actions closely linked to the IP itself.

IPs shall promote the coordination with and mobilisation of other relevant Union, national or private funding sources for the implementation of the complementary measures or actions outside of the IP in the framework of the targeted plan or strategy, giving preference to Union funding. Within the IP itself, however, co-funding may not come from other Union funding sources.

IPs are expected to demonstrate effective and well-coordinated implementation of a plan or strategy in a given geographical area to realise Union environmental / climate objectives, and provide examples of how to replicate success in other geographical areas within that Member State or in other Member States.

IPs should include a high quality multi-purpose delivery mechanism (e.g. aiming at environmental and climate benefits and capacity-building) that make it possible to achieve results in other policy areas<sup>3</sup>, to create synergies with these policies and to integrate environmental and climate action objectives into them.

IPs shall ensure that the main stakeholders are actively involved in the design and implementation of the given project. This involvement is expected to be achieved by including them - where possible and reasonable - as associated beneficiaries of the IP, or through their active participation in the implementation of the IP itself and/or of the complementary actions.

The design of IPs and the composition of the project partnership is again expected to facilitate and result in the building up of strategic capacities among the competent authorities and stakeholders to ensure a long term sustainability of project results and actions, and to ensure that they will be able to function as co-deliverers of the targeted plan or strategy after the end of the IP.

**TRL** 9  
**Funding rate** 60%

**Capacity Building projects**

**Description** Capacity Building projects provide financial support for activities that increase the capacity of Member States, including LIFE national or regional contact points, to participate more effectively in the LIFE programme.

**TRL** -  
**Funding rate** 100%

## Preparatory projects

<b>Description</b>	Preparatory projects are funded by the sub-programme for Environment. Such projects address specific needs for developing and implementing EU environmental or climate policy and legislation. Areas are identified by the Commission in cooperation with Member States on an annual basis.
<b>TRL</b>	-
<b>Funding rate</b>	60%

## Technical Assistance projects

<b>Description</b>	Technical Assistance projects provide action grants to help applicants prepare Integrated projects. Such projects aim to ensure that integrated projects comply with the timing, technical and financial requirements of the LIFE programme in coordination with other funds. It is possible to apply for Technical Assistance projects under both the sub-programme for Environment and the sub- programme for Climate Action.
<b>TRL</b>	-
<b>Funding rate</b>	60%

## NGO Operating grants

<b>Description</b>	<p>Operating grants shall support certain operational and administrative costs of non-profit making entities which pursue an aim of general Union interest, are primarily active in the field of environment or climate action and are involved in the development, implementation and enforcement of Union policy and legislation (Article 21 of the Regulation).</p> <p>The LIFE operating grants for NGOs aim to strengthen the participation of civil society in the EU policy dialogue, as well as to support implementation and enforcement of Union environmental and climate objectives by the beneficiaries.</p> <p>The LIFE contribution aims at facilitating the implementation of a work programme of the applicant NGO, which could not otherwise be implemented without the support of the European Union. The financial contribution is based on the co-financing principle. It is only a supplementary financial contribution, additional to local, regional, national and/or private contributions obtained for implementing the work programme of the NGO.</p>
<b>TRL</b>	9
<b>Funding rate</b>	70%

FUNDING INSTRUMENT	Funding rate	Coordination Preparation Dissemination	Research and development	Demonstration and validation	Implementation
Pilot projects	55%-75%			✓	
Demonstration projects	55%-75%			✓	
Best Practice projects	55%-75%				✓
Integrated projects	60%				✓
Technical assistance projects	60%	✓			
Capacity building projects	100%	✓			
Preparatory projects	60%	✓			
Information, awareness and dissemination projects	55%-75%	✓			
NGO Operating grants	70%				✓

## REFERENCES

- Regulation (EU) no 1293/2013 of the European Parliament and of the Council of 11 December 2013 on the establishment of a Programme for the Environment and Climate Action (LIFE) and repealing Regulation (EC) No 614/2007;
- Guidelines for applicants - LIFE Integrated Projects 2019, Environment and Climate Action sub-programmes, April 2019;
- EU programme LIFE for the environment and climate - Call for proposals LIFE-NGO-EASME-2019 - Framework partnership agreements to support Nongovernmental Organisations primarily active in the areas of environment and/or climate action and specific grant agreements, April 2019;
- Guidelines for applicants 2019, LIFE Environment and Resource Efficiency, April 2019;
- <http://ec.europa.eu/environment/archives/life/index.htm>

## CEDR Transnational Road Research PROGRAMME

### Funding instruments

#### Description

The aim of the CEDR Transnational Road Research Programme is to promote cooperation between the various European road administrations in relation to road research activities.

The topics covered by the programme are developed by WG Innovation to fulfil the common interests of the CEDR members. The aim of the CEDR Transnational Road Research Programme is to procure applied research which includes original investigation undertaken to acquire new knowledge. Research activities are funded following the Eranet scheme through annual calls.

The research activities are directed primarily towards specific practical aims and objectives, that are usually defined in the description of research needs (DoRNs) of the annual call for proposals. The maximum duration of the funded projects is 24 months.

#### TRL

Usually 3-8 - TRL depends on the specific research needs of the call. Projects can range from TRL 3 to TRL 5, as well as be focused only on validation and demonstration activities (TRL 6-8)

#### Funding rate

100%

FUNDING INSTRUMENT	Funding rate	Coordination Preparation Dissemination	Research and development	Demonstration and validation	Implementation
Studies	100%		✓		
Demonstration projects	100%			✓	
Best Practice projects	100%			✓	

### REFERENCES

- ERA-NET ROAD – Coordination and Implementation of Road Research in Europe, Deliverable 6.1 Upgraded Toolkit, 2011.

- Guide for Applicants for CEDR Transnational Road Research Programme - Call 2018.
- Goals of the Transnational Programme, ppt presentation, 2017.
- <https://www.cedr.eu/strategic-plan-tasks/research>.

## CONNECTING EUROPE FACILITY (CEF)

### Funding instruments

The **Connecting Europe Facility (CEF) for Transport** is the funding instrument to implement European transport infrastructure policy. It aims at supporting investments in building new transport infrastructure in Europe or rehabilitating and upgrading the existing one.

TEN-T policy objectives foresee:

completion by 2030 of the Core Network, structured around nine multimodal Core Network Corridors;

completion by 2050 of the Comprehensive Network in order to facilitate accessibility to all European regions.

CEF Transport focuses on cross-border projects and projects aiming at removing bottlenecks or bridging missing links in various sections of the Core Network and on the Comprehensive Network (link), as well as for horizontal priorities such as traffic management systems.

CEF Transport also supports innovation in the transport system in order to improve the use of infrastructure, reduce the environmental impact of transport, enhance energy efficiency and increase safety.

The CEF programme contributes to the implementation of the Trans-European Transport Network (TEN-T) by financing key projects to upgrade infrastructure and remove existing bottlenecks whilst also promoting sustainable and innovative mobility solutions. These projects cover all EU Member States and all transport modes (road, rail, maritime, inland waterways, air), as well as support transport co-modality, logistics and innovation.

CEF financial support primarily takes the forms of:

### Grants

#### Description

Grants are non-reimbursable investments from the EU budget which are implemented through the competitive process of 'calls for proposals'.

#### TRL

5-9

#### Funding rate

50% for studies;

- for railway networks: 40% of the eligible costs for actions concerning cross-border sections;
- for road networks in the case of Member States with no railway network established in their territory or in the case of a Member State, or part thereof, with an isolated network without long-distance rail freight transport: 30% of the eligible



- costs for actions addressing bottlenecks and 40 % of the eligible costs for actions concerning cross-border sections;
- for inland waterways: 40% of the eligible costs for actions concerning cross-border sections;
- for connections to and the development of maritime ports: 20% of the eligible costs;
- for actions to support cross-border roads sections: 10% of the eligible costs.

### Programme Support Actions (PSA)

#### Description

Programme Support Actions are support measures that help the administrations of the Member States, or bodies under their authority, to achieve overall TEN-T and CEF objectives, as well as studies and IT support to the EF programme.

In details, programme support actions include all accompanying measures necessary for its implementation and the implementation of the individual sector-specific guidelines, such as services, in particular the provision of technical assistance, including for the use of financial instruments, as well as preparatory, feasibility, coordination, monitoring, stakeholder consultation, control, audit and evaluation activities which are required directly for the management of the CEF and the achievement of its objectives. Programme support actions include, in particular, studies, meetings, infrastructure mapping, information, dissemination, communication and awareness raising actions, expenditure linked to IT tools and networks focusing on exchanges of information about the CEF, together with all other technical and administrative assistance expenditure incurred by the Commission that may be required for the management of the CEF or implementation of the individual sector-specific guidelines. Programme support actions also include activities required in order to facilitate the preparation of projects of common interest, in particular in the Member States, eligible for financing from the Cohesion Fund, with a view to obtaining financing under this Regulation or on the financial market. Programme support actions shall also include, where appropriate, meeting the costs of the Executive Agency entrusted by the Commission with the implementation of specific parts of the CEF ("Executive Agency").

TRL

-

Funding rate

-

## Innovative financial Instruments

### Description

**Loan Guarantee (LGTT)** was specifically designed to encourage and promote private-sector involvement in the financing of the TEN-T projects. The instrument was set up jointly by the EIB and the EC. The guarantee instrument facilitates investment by improving the ability of a borrower to meet senior debt servicing obligations. The most difficult period is normally the early-operational phase of a revenue-generating transportation project, which is why the LGTT provides guarantees for senior bank debt against this demand risk of up to 20% of total senior debt. The LGTT allows the EIB to accept exposure to higher financial risks than under its normal lending operations during the first five, occasionally seven, years of project operations.

The **EU Project Bond Initiative** intends to at least partially close the transport investment financing gap by attracting private sector investment. The aim of this initiative is to make project bonds attractive to a large investor base, including institutional investors such as pension funds. It has been noted that project bonds could be interesting to institutional investors since infrastructure can provide a natural hedge against inflation for investors (user charges generally rise with inflation). Secondly, they need long-term assets to match longterm liabilities (promises to pay future pensions). Finally, they could be used to diversify their portfolio (Jennett, 2011).

The Project Bond Initiative (PBI) intends to broaden the scope of the current LGTT instrument. Whereas the LGTT focused on bank lending, the PBI is shifting the focus to the capital markets in response to the unwillingness/inability of banks to lend large amounts of long-term money due to the crisis. Furthermore, the LGTT instrument finances projects that rely on user revenues, and the current financial crisis has a negative impact on traffic forecasts. Therefore, the Project Bond Initiative intends to also finance projects that rely on government charges.

The **CEF Debt Instrument** was launched in 2015 jointly by the European Commission and the European Investment Bank (EIB), and is currently implemented by the EIB. The goal of the CEF Debt Instrument is to offer an alternative to traditional grant funding by offering competitive financial products for priority investments in transport, energy and telecommunications.

The CEF Debt instrument builds on the portfolios previously developed under the Pilot Phase of the Project Bond Initiative (PBI) and the Loan Guarantee for TEN-Transport (LGTT) instruments, thus offering the possibility of having a single multi-

sector instrument in place which could further strengthen the leverage effect of EU budget funds.

The Instrument provides an extension of the credit enhancement of project bonds provided under the PBI, a new credit enhancement mechanism targeting loan financing by the banking sector (building on the experience of LGTT), as well as loans, guarantees and equity-type debt financing support to corporates.

The **CEF Transport Blending Facility** is an innovative approach to promote the substantial participation of private sector investors and financial institutions in projects contributing to the environmental sustainability and efficiency of the transport sector in Europe. The CEF Transport Blending Facility supports two areas that will deliver on the Commission's agenda for a clean and digital transport system:

Deployment of the European Railway Traffic Management System (ERTMS)

Deployment of Alternative Fuels

It is implemented via a cooperation framework between the European Commission and Implementing Partners to support Blending Operations, i.e. investments combining the use of grants and/or financial instruments from the EU budget and financing from the Implementing Partners (via a loan, debt, equity or any other repayable form of support).

With a budget of €198 million, the grant component of the Blending Operations under the CEF Transport Blending Facility is managed by the Innovation and Networks Executive Agency (INEA). Promoters can apply for the CEF TBF grants only with the support of the EIB or other Implementing Partners.

In the context of the CEF Transport Blending Facility, the European Investment Bank (EIB) is the first Implementing Partner involved. The European Commission is currently negotiating agreements to define the involvement of other potential Implementing Partners. The list of all Implementing Partners of the CEF Transport Blending Facility is published on INEA website.

TRL

8-9

Funding rate

-

FUNDING INSTRUMENT	Funding rate	Coordination Preparation Dissemination	Research and development	Demonstration and validation	Implementation
Grants	10%-50%			✓	✓
Programme Support Actions (PSA)		✓			
Innovative Financial Instruments					✓

## REFERENCES

- Regulation (EU) no 1315/2013 of the European Parliament and of the Council of 11 December 2013 on Union guidelines for the development of the trans-European transport network and repealing Decision No 661/2010/EU.
- Regulation (EU) no 1316/2013 of the European Parliament and of the Council of 11 December 2013 establishing the Connecting Europe Facility, amending Regulation (EU) No 913/2010 and repealing Regulations (EC) No 680/2007 and (EC) No 67/2010.
- Commission implementing Decision on the financing of the Connecting Europe Facility - Transport sector and the adoption of the Annual Work Programme for 2019.
- Directorate General for internal polices – Financing instruments for EU's transport infrastructure – 2012.

# SHIFT2RAIL

## Funding instruments

The Shift2Rail Joint Undertaking is a public-private partnership in the rail sector, providing a platform for cooperation that drives innovation in the years to come. The S2R JU pursues research and innovation (R&I) activities in support of the achievement of the Single European Railway Area and should improve the attractiveness and competitiveness of the European rail system.

The S2R JU contributes to:

- a 50 % reduction of the life-cycle cost of the railway transport system (i.e. costs of building, operating, maintaining and renewing infrastructure and rolling stock);
- a 100 % increase in the capacity of the railway transport system;
- a 50 % increase in the reliability and punctuality of rail services (measured as a 50 % decrease in unreliability and late arrivals).

The S2R JU proposes innovative solutions to be explored, tested and demonstrated in operational environment and/or “zero on site” to achieve market uptake. Beyond that, with the deployment of its innovative solutions the S2R JU will foster connections between people, regions, cities, and businesses, supporting the socioeconomic objectives of the Union.

The S2R JU follows the rules of the European Union’s Horizon 2020 framework programme (Horizon 2020) and in particular the Horizon 2020 Rules for participation which apply, unless specified otherwise, to both calls for proposals addressed to S2R JU members other than the Union and open calls for proposals addressed to non-S2R JU members.

## Research and Innovation Action (RIA)

### Description

Action primarily consisting of activities aiming to establish new knowledge and/or to explore the feasibility of a new or improved technology, product, process, service or solution. For this purpose they may include basic and applied research, technology development and integration, testing and validation on a small-scale prototype in a laboratory or simulated environment.

Projects may contain closely connected but limited demonstration or pilot activities aiming to show technical feasibility in a near to operational environment.

### TRL

1-5

### Funding rate

100%

## Innovation Action (IA)

### Description

Action primarily consisting of activities directly aiming at producing plans and arrangements or designs for new, altered or improved products, processes or services. For this purpose they may include prototyping, testing, demonstrating, piloting, large-scale product validation and market replication.

A 'demonstration or pilot' aims to validate the technical and economic viability of a new or improved technology, product, process, service or solution in an operational (or near to operational) environment, whether industrial or otherwise, involving where appropriate a larger scale prototype or demonstrator.

A 'market replication' aims to support the first application/deployment in the market of an innovation that has already been demonstrated but not yet applied/deployed in the market due to market failures/barriers to uptake. 'Market replication' does not cover multiple applications in the market of an innovation that has already been applied successfully once in the market. 'First' means new at least to Europe or new at least to the application sector in question. Often such projects involve a validation of technical and economic performance at system level in real life operating conditions provided by the market.

Projects may include limited research and development activities.

### TRL

6-9

### Funding rate

70% (except for non-profit legal entities, where a rate of 100% applies)

## Coordination and support actions (CSA)

### Description

Actions consisting primarily of accompanying measures such as standardisation, dissemination, awareness-raising and communication, networking, coordination or support services, policy dialogues and mutual learning exercises and studies, including design studies for new infrastructure and may also include complementary activities of strategic planning, networking and coordination between programmes in different countries.

### TRL

-

### Funding rate

100%

FUNDING INSTRUMENT	Funding rate	Coordination	Research and development	Demonstration and validation	Implementation
Research and Innovation Actions (RIA)	100%		✓		
Innovation Actions (IA)	70% - 100%			✓	✓
Coordination and Support Actions (CSA)	100%	✓			

## REFERENCES

1. Annual work plan and budget 2020 adopted by the S2R GB on 14 November 2019.
2. Shift2Rail Annual Activity Report 2018.
3. <https://shift2rail.org/>

## SESAR Joint Undertaking

### Funding instruments

SESAR aims to transform European air traffic management into a more modular, automated interoperable, flight and flow-centric system that takes advantage of advances in digital and virtualisation technologies. In this new ATM ecosystem, all categories of air vehicles from drones, general aviation, and business aviation to commercial and military aircraft are safely integrated.

As the technological pillar of the Single European Sky, SESAR aims to deliver benefits in several key areas, namely the environment, capacity, cost-efficiency, safety and predictability.

SESAR has created an innovation pipeline through which promising ideas are explored and then moved out of the ‘lab’ into real operations. The pipeline consists of exploratory research and industrial research projects, validations and large-scale demonstrations. The end-products are operational and technical solutions, known as SESAR Solutions, which are delivered ready for industrialization.

SESAR 2020 is co-funded by the EU’s Horizon 2020 programme, publishes both open and closed calls. Calls relating to exploratory research and very large scale demonstrations are open, while only SESAR Joint Undertaking members can apply for industrial research calls.

Types of actions considered are:

Research & innovation actions (RIA),

Innovation actions (IA).

Funding rates depend on the type of action and, for Innovation actions, on the type of entity applying.

### Research and Innovation Action (RIA)

#### Description

Action primarily consisting of activities aiming to establish new knowledge and/or to explore the feasibility of a new or improved technology, product, process, service or solution. For this purpose they may include basic and applied research, technology development and integration, testing and validation on a small-scale prototype in a laboratory or simulated environment.

Projects may contain closely connected but limited demonstration or pilot activities aiming to show technical feasibility in a near to operational environment.

#### TRL

1-5

#### Funding rate

100%



## Innovation Action (IA)

### Description

Action primarily consisting of activities directly aiming at producing plans and arrangements or designs for new, altered or improved products, processes or services. For this purpose they may include prototyping, testing, demonstrating, piloting, large-scale product validation and market replication.

A 'demonstration or pilot' aims to validate the technical and economic viability of a new or improved technology, product, process, service or solution in an operational (or near to operational) environment, whether industrial or otherwise, involving where appropriate a larger scale prototype or demonstrator.

A 'market replication' aims to support the first application/deployment in the market of an innovation that has already been demonstrated but not yet applied/deployed in the market due to market failures/barriers to uptake. 'Market replication' does not cover multiple applications in the market of an innovation that has already been applied successfully once in the market. 'First' means new at least to Europe or new at least to the application sector in question. Often such projects involve a validation of technical and economic performance at system level in real life operating conditions provided by the market.

Projects may include limited research and development activities.

### TRL

6-9

### Funding rate

70%

## Coordination and support actions (CSA)

### Description

Actions consisting primarily of accompanying measures such as standardisation, dissemination, awareness-raising and communication, networking, coordination or support services, policy dialogues and mutual learning exercises and studies, including design studies for new infrastructure and may also include complementary activities of strategic planning, networking and coordination between programmes in different countries.

### TRL

-

### Funding rate

70%

FUNDING INSTRUMENT	Funding rate	Coordination	Research and development	Demonstration and validation	Implementation
Research and Innovation Actions (RIA)	70%-100%		✓		
Innovation Actions (IA)	70%			✓	✓
Coordination and Support Actions (CSA)	70%	✓			

## REFERENCES

1. Sesar Joint Undertaking – Single Programming Document 2020-2022
2. Sesar Joint Undertaking – Single Programming Document 2019-2021
3. HORIZON 2020 - Types of action: specific provisions and funding rates.
4. <https://www.sesarju.eu/>



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*This document reflects only the views of the author(s). Neither the Innovation and Networks Executive Agency (INEA) nor the European Commission is in any way responsible for any use that may be made of the information it contains.*



Project Acronym: **infra4Dfuture**  
Project Title: **Infrastructure for the Future**  
Project Number: **824269**  
Topic: **MG-2-4-2018 – Coordinating national efforts in modernizing transport infrastructure and provide innovative mobility services**  
Type of Action: **Coordination and Support Action (CSA)**

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## **D2.1 – Staged gate reviewing process for concerted innovation portfolio coordination**

### **Annex 2 “Selection and award criteria”**

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*Version 1.0*

<b>Deliverable:</b>	D2.1– Staged gate reviewing process for concerted innovation portfolio coordination – Annex 2 “Selection and award criteria”.
<b>Work Package:</b>	WP2: Developing structures enabling effective transnational coordination of existing and future innovation programmes.
<b>Due Date:</b>	M20
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<b>Reviewer(s):</b>	Ursula Blume (BAST)
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## SELECTION AND AWARD CRITERIA

### Light Proposal/Concept notes

<b>HORIZON 2020</b>			
<b>PROJECT TYPE</b>	<b>AWARD CRITERIA</b>		
	<b>Excellence</b>	<b>Impact</b>	<b>Weighting Factor</b>
<b>All projects</b>	<ul style="list-style-type: none"> <li>• Clarity and pertinence of the objectives;</li> <li>• Soundness of the concept, and credibility of the proposed methodology.</li> </ul>	The extent to which the outputs of the project would contribute to each of the expected impacts mentioned in the work programme under the relevant topic.	
<b>Research and innovation actions (RIA);</b>  <b>Innovation actions (IA)</b>	Extent that the proposed work is beyond the state of the art, and demonstrates innovation potential (e.g. ground-breaking objectives, novel concepts and approaches, new products, services or business and organisational models) Appropriate consideration of interdisciplinary approaches and, where relevant, use of stakeholder knowledge and gender dimension in research and innovation content.		IA= 1.5
<b>Coordination &amp; support actions (CSA)</b>	Quality of the proposed coordination and/or support measures.		
<b>Score<sup>1</sup></b>	0÷5	0÷5	
<b>Threshold</b>	4	4	

**TOTAL ADMITTENCE THRESHOLD= 8÷8.5.**

<b>LIFE PROGRAMME</b>		
<b>PROJECT TYPE</b>	<b>AWARD CRITERIA</b>	
	<b>Overall quality of the proposal</b>	<b>Overall added value</b>
<b>Pilot, demonstration, best practice, and information, awareness, and dissemination projects</b>	<p>This criterion will focus on the clarity of the intervention logic of the proposal (including the description of the pre-operational context), its feasibility and indicative value for money.</p> <p>The pre-operational context must be described, in particular environmental problems and threats need to be clearly identified. There should be a clear, logical link between problems / threats targeted by the project, and its objectives, the proposed actions and their expected results. Main actions and expected results should be sufficiently described and quantified. The concept note must also indicate how the project partnership is constructed.</p> <p>To allow the evaluation of the project feasibility the concept note must describe how, where, when and by whom each main action will be undertaken. Indicative means necessary for the implementation of the project should be provided. Expected results should be clearly spelled out.</p>	<p>This criterion will focus on the project contribution to the LIFE priorities, its expected impact, and the sustainability of the project results.</p> <p>The concept note needs to demonstrate how the project contributes to one or several of the specific objectives of the priority areas of the LIFE sub-programme for Environment. The extent and the quality of this contribution will be evaluated.</p> <p>The project expected impact is understood as the extent and quality of its contribution to the implementation, updating and development of European Union environmental policy and legislation as well its environmental benefits which must be concrete, realistic and quantified.</p> <p>The sustainability of the project results in the medium and long term is understood as the capacity to maintain them after project implementation. Concept note should sufficiently describe how the continuation of necessary project actions and necessary financing after the end of the project will be ensured. Transfer and replication are also considered part of sustainability.</p>
<b>Score<sup>1</sup></b>	<b>5-20</b>	<b>10-30</b>
<b>Threshold</b>	<b>5</b>	<b>10</b>

**TOTAL ADMITTENCE THRESHOLD= 15.**

Concept notes will be ranked by merit, i.e. the points received on the basis of the award criteria ‘Overall quality of the proposal’ and ‘Overall EU added value’.

For concept notes with equal scoring for the award criterion ‘Overall quality of the proposal’, priority will be given to those with a higher score for ‘Overall EU added value’. In case concept notes achieve an equal scoring for both criteria, the final ranking will be decided by the evaluation committee.

The list of applicants invited to submit a full proposal will include the best ranked concept notes, for which the sum of the EU contributions requested represents 2 to 2.5 times the available budget. The long list will include sub-lists for each priority area. In case the demand under one priority area is insufficient, the lists corresponding to the other priority areas may be extended.

Concept notes that did not reach the minimum threshold regarding one or both criteria as well as those that are not longlisted will not be admitted to stage 2.



## Full Proposals

HORIZON 2020				
PROJECT TYPE	AWARD CRITERIA			
	Excellence	Impact	Quality and efficiency of the implementation	Weighting Factor
<b>All projects</b>	<ul style="list-style-type: none"> <li>• Clarity and pertinence of the objectives;</li> <li>• Soundness of the concept, and credibility of the proposed methodology.</li> </ul>	The extent to which the outputs of the project would contribute to each of the expected impacts mentioned in the work programme under the relevant topic.	Quality and effectiveness of the work plan, including extent to which the resources assigned to work packages are in line with their objectives and deliverables; Appropriateness of the management structures and procedures, including risk and innovation management; Complementarity of the participants and extent to which the consortium as whole brings together the necessary expertise; Appropriateness of the allocation of tasks, ensuring that all participants have a valid role and adequate resources in the project to fulfil that role.	
<b>Research and innovation actions (RIA);</b>	Extent that the proposed work is beyond the state of the art, and demonstrates innovation potential (e.g. ground-breaking objectives,	Any substantial impacts not mentioned in the work programme, that would enhance innovation capacity, create new		IA= 1.5

<b>HORIZON 2020</b>				
<b>PROJECT TYPE</b>	<b>AWARD CRITERIA</b>			
	<b>Excellence</b>	<b>Impact</b>	<b>Quality and efficiency of the implementation</b>	<b>Weighting Factor</b>
<b>Innovation actions (IA)</b>	novel concepts and approaches, new products, services or business and organisational models) Appropriate consideration of interdisciplinary approaches and, where relevant, use of stakeholder knowledge and gender dimension in research and innovation content.	market opportunities, strengthen competitiveness and growth of companies, address issues related to climate change or the environment, or bring other important benefits for society; Quality of the proposed measures to: <ul style="list-style-type: none"> <li>• Exploit and disseminate the project results (including management of IPR), and to manage research data where relevant.</li> <li>• Communicate the project activities to different target audiences.</li> </ul>		
<b>Coordination &amp; support actions (CSA)</b>	Quality of the proposed coordination and/or support measures.	Quality of the proposed measures to: <ul style="list-style-type: none"> <li>• Exploit and disseminate the project results (including management of IPR), and to manage research data where relevant.</li> <li>• Communicate the project activities to different target audiences.</li> </ul>		
<b>ERA-NET Cofund actions</b>	Level of ambition in the collaboration and commitment of the participants in the proposed	Contribution to better alignment of national activities and policies.		

<b>HORIZON 2020</b>				
<b>PROJECT TYPE</b>	<b>AWARD CRITERIA</b>			
	<b>Excellence</b>	<b>Impact</b>	<b>Quality and efficiency of the implementation</b>	<b>Weighting Factor</b>
	ERA-NET action to pool national resources in terms of budget, number of partners and participating countries and to coordinate their national/regional research programmes.	Contribution to establishing and strengthening a durable cooperation between the partners and their national/regional research programmes. Quality of the proposed measures to: <ul style="list-style-type: none"> <li>• Exploit and disseminate the project results (including management of IPR), and to manage research data where relevant.</li> <li>• Communicate the project, to activities to different target audiences.</li> </ul>		
<b>Pre-commercial procurement (PCP)/ Public procurement of innovative solutions (PPI) actions</b>	Progress beyond the state of the art in terms of the degree of innovation needed to satisfy the procurement need.	Strengthening the competitiveness and growth of companies by developing innovations meeting the needs of European and global procurement markets. Quality of the proposed measures to <ul style="list-style-type: none"> <li>• Exploit and disseminate the project results (including management of IPR) and to manage research data where relevant.</li> </ul>		

<b>HORIZON 2020</b>				
<b>PROJECT TYPE</b>	<b>AWARD CRITERIA</b>			
	<b>Excellence</b>	<b>Impact</b>	<b>Quality and efficiency of the implementation</b>	<b>Weighting Factor</b>
		<ul style="list-style-type: none"> <li>Communicate the project activities to different target audiences.</li> </ul> More forward-looking concerted procurement approaches that reduce fragmentation of demand for innovative solutions		
<b>EJP Cofund actions</b>	Level of ambition in the collaboration and commitment of the participants in the proposed action to pool national resources in terms of budget, number of partners and participating countries and to coordinate their national/regional research programmes.	Contribution to better alignment of national activities and policies.  Effectiveness of the proposed measures to exploit and disseminate the programme's results and to communicate the programme.		
<b>Score<sup>1</sup></b>	0÷5	0÷5	0÷5	
<b>Threshold</b>	3	3	3	

### TOTAL ADMITTENCE THRESHOLD= 10.

<sup>1</sup>Experts score each **award criterion** on a scale **from 0 to 5** (half point scores may be given):

- 0 – Proposal fails to address the criterion or cannot be assessed due to missing or incomplete information.
- 1 – Poor. The criterion is inadequately addressed or there are serious inherent weaknesses.

- 2 – Fair. The proposal broadly addresses the criterion, but there are significant weaknesses.
- 3 – Good. The proposal addresses the criterion well, but a number of shortcomings are present.
- 4 – Very good. The proposal addresses the criterion very well, but a small number of shortcomings are present.
- 5 – Excellent. The proposal successfully addresses all relevant aspects of the criterion. Any shortcomings are minor.

The maximum overall score is thus 15 (3x5), unless a weighting is applied.

<b>LIFE PROGRAMME</b>		
<b>PROJECT TYPE</b>	<b>AWARD CRITERIA<sup>1</sup></b>	
	<b>Technical and financial coherence and quality</b>	<b>EU added value</b>
<p><b>Pilot, demonstration, best practice, and information, awareness, and dissemination projects</b></p>	<p><b>1. Technical coherence and quality</b>            This criterion will focus on the clarity and feasibility of the actions proposed for achieving the forecasted project outputs and outcomes.            The pre-operational context must be thoroughly described and there should be a clear link in the proposal between the problems and threats, the project objectives, the proposed actions and their expected results. All actions should be properly described and quantified and, if necessary, accompanied by adequate maps. The proposal must clearly describe how, where, when and by whom each action in the proposal will be undertaken.            The proposal must be drafted so as to allow the evaluators to assess to what extent the technical means and expertise of the consortium involved are adequate for implementing the project. The time planning must be realistic and any potential difficulties must have been correctly assessed in the relevant forms.            Any actions that are not directly contributing to the achievement of the project objectives may be considered as ineligible (example: preparatory actions or studies that are not related to the project implementation, any fundamental scientific research, etc.)</p> <p><b>2. Financial coherence and quality (included value for money)</b>            The proposed budget and its consistency with the actions proposed and with the applicable rules as well as the cost-effectiveness of the proposed approach will be evaluated. Value for money of the proposed project against expected outcomes will also be assessed.</p>	<p><b>3. EU added value: extent and quality of the contribution to the specific objectives of the priority areas of the LIFE sub-programme Environment</b>            The extent to which each proposal contributes to one or several of the specific objectives of the priority areas of the LIFE sub-programme and the quality of this contribution will be evaluated.            The assessment of this criterion will cover, in particular the extent and quality of the expected impacts (environmental benefits) at the end of the project. They must be concrete, realistic and quantified as far as possible. It will assess the magnitude of the environmental impacts expected due to the project actions at the end of the project in comparison to the state-of-play estimated or measured at the outset of the project.</p> <p><b>4. EU added value: sustainability (continuation, replication, transfer potential)</b>            The sustainability of the project results in the medium and long term is the capacity to maintain them after its implementation, be it by continuation, by replication or by transfer. Continuation means the continued use by the entities involved in the project of the solutions implemented during the project after its end. Continuation may also entail further spread geographically. Mere continuation and maintenance of project results will be sufficient for a passing score, while further geographical spread will be judged on its</p>

<sup>1</sup> The Award Criteria are adapted as a function of the subprogramme and the type of project.

<b>LIFE PROGRAMME</b>		
<b>PROJECT TYPE</b>	<b>AWARD CRITERIA<sup>1</sup></b>	
	<b>Technical and financial coherence and quality</b>	<b>EU added value</b>
	<p>The financial contributions of the beneficiaries/co-financiers, the proposed budget and the proposed project expenditures must comply with the rules and principles foreseen in the LIFE guidelines for applicants, the LIFE Model Grant Agreement<sup>1</sup> and the LIFE Regulation. The budget must be transparent i.e. the cost items should be sufficiently described, coherent and cost-efficient, including for the management of the project.</p>	<p>expected scope, which makes it comparable to replication or transfer.</p> <p>Replication means, the solutions applied in the project are used again in the same way and for the same purposes by other entities/sectors during or after the project end.</p> <p>Transfer means that solutions applied in the project are used in a different way or for a different environment, climate action or related governance and information purpose by the same or other entities/sectors during or after the project end.</p> <p>Applicants should demonstrate in their proposals that the solutions (i.e. techniques, methods, methodologies, approaches, and/or actions or support activities for communication, dissemination of information and awareness raising) aiming at direct and/or indirect positive effects with regard to the related objectives of the LIFE Regulation have the potential to be continued, replicated and/or transferred.</p> <p>Successful continuation, replication and/or transfer require a strategy including tasks to multiply the impacts of the projects' solutions and mobilise a wider uptake, reaching a critical mass during the project and/or in a short and medium term perspective after the end of the LIFE project. This goes beyond transfer of knowledge and networking, and involves putting the solutions developed and/or applied in the project into practice beyond the project period, elsewhere or for a different purpose. Applicants have to provide a clear and credible description of the strategy and actions foreseen to ensure this.</p>

<b>LIFE PROGRAMME</b>				
<b>PROJECT TYPE</b>	<b>AWARD CRITERIA<sup>1</sup></b>			
	<b>Technical and financial coherence and quality</b>		<b>EU added value</b>	
<b>Score<sup>1</sup></b>	<b>Technical coherence and quality 10-20</b>	<b>Financial coherence and quality 10-20</b>	<b>Extent and quality of the contribution 10-20</b>	<b>Sustainability 8-15</b>
<b>Threshold</b>	10	10	10	8

**TOTAL ADMITTENCE THRESHOLD= 50.**

## **BONUS**

### ***EU added value: contribution to the project topics***

Project proposals clearly falling under the project topics implementing the thematic priorities for the sub-programme will receive additional points: 5 or 10 points, if they the solution(s) (i.e. techniques, methods, actions, methodologies, or approaches) to the environmental issue targeted is (are) new or unknown in the European Union.

Project proposals under the priority area Nature and Biodiversity and under the priority area Environmental Governance and information will receive 10 points, if they fully comply with one of the project topics under this priority area.

There is no minimum pass score for this criterion.

### ***EU added value: synergies and transnationality:***

- *Synergies (including multi-purpose, integration/complementarity, green public procurement, ecolabel, and uptake of EU-funded research results).(max. 11 points)*



Synergies can be reached by multi-purpose approaches and integration in and/or complementarity with other EU policies and funding mechanisms. Proposals will receive bonus points for synergies and complementary actions, depending on their extent and quality.

A multipurpose delivery mechanism means that the proposal does not only plan to achieve the project's specific main environmental objectives, but has foreseen concrete actions aiming at achieving other purposes.

Project proposals that, while focussing on a specific environmental issue, improve integration of these specific environmental objectives in other policy areas and/or achieve complementarity with these, and thus create synergies with the objectives of other Union policies will be favourably assessed. **Up to eight additional points** can be given for multi-purpose mechanisms, integration or complementarity or a combination of any of these.

Synergies can also be reached through green public procurement and the use of eco-labelling scheme as regards the integration of green production and service provision goals, and the uptake of research results under Horizon 2020 or its predecessor programmes. Thus the commitment to apply **green public procurement and/or, the preference of products and/or services of officially recognised eco-labelling schemes** such as the EU Ecolabel<sup>4</sup> through a clear delivery mechanism **merit one bonus point, each**.

The **uptake of the results** of environmental and climate-related research and innovation projects financed by Horizon 2020 or by preceding Framework Programmes will also **lead to an additional bonus point**, if there is sufficient evidence of the added value of this uptake for the project.

- *Transnationality (max. 4 points)*

Proposals shall be favoured, if transnational cooperation among Member States is essential to guarantee the achievement of the project's objectives. On the basis of this criterion, **up to four additional points** may be given to a proposal, if there is sufficient evidence for an added value of the transnational approach.

There is no minimum pass score for this criterion.

***Criterion 5 - EU added value: Extent and quality of the mobilisation of other funds, in particular Union funds:***

The quality of the coordination with other funding mechanism(s) and the level of mobilisation of other funds complementary to the foreseen LIFE contribution (beyond the minimum necessary for eligibility) as well as the likelihood of their actual mobilisation and their functional link to the plan to be implemented will determine, whether an IP receives additional points under this criterion (**max 10 points**) . IPs which are likely to mobilise Union funds with a functional link to the plan to be implemented and which foresee a satisfactory coordination mechanism will receive a higher score. The proposal should not only identify the funds that will be mobilised, but should also provide a summary description of all complementary actions that will be carried out during the project time by using these additional funding sources.

**This criterion is applicable only to integrated projects.**

## CONCLUSION OF THE AWARD PHASE

On the basis of the evaluations each proposal will fall into one of the following situations:

- Any proposal that receives a final score below the pass score for any of the Award criterion for which a minimum pass level is indicated, OR for which the total sum of these same criteria is less than 50 points (minimum passing score), will be declared "rejected in the Award phase" and will not be further evaluated.
- For all proposals not falling into the above situation, the total score (maximum score) to be awarded is calculated by summing up the final synthesis scores for the Award criteria.

<b>CEDR</b>					
<b>PROJECT TYPE</b>	<b>AWARD CRITERIA</b>				
	<b>Extent to which the proposal meets the requirement of the DoRN</b>	<b>Technical quality of proposal</b>	<b>Track record of consortium members</b>	<b>Management of project</b>	<b>Value for money</b>
<b>All projects</b>	<ul style="list-style-type: none"> <li>• Background to the research requirements</li> <li>• Understanding of programme objectives</li> <li>• Understanding of technical requirements</li> <li>• Transnational benefits</li> </ul>	<ul style="list-style-type: none"> <li>• Methodology for reaching the objective of the project</li> <li>• Conditions for implementing expected results</li> <li>• Innovations contained in the proposal</li> <li>• Dissemination activities</li> </ul>	<ul style="list-style-type: none"> <li>• Qualifications of partners</li> <li>• Experience of the programme objectives</li> <li>• Evidence of involvement with similar projects</li> <li>• Composition of project team (appropriate academic/industry mix)</li> </ul>	<ul style="list-style-type: none"> <li>• Role of Project Coordinator and responsibilities of partners</li> <li>• Scheduling of tasks, milestones, deliverables and other project outputs</li> <li>• Financial plan, control of costs, invoice profile</li> <li>• Identification and evaluation of risks</li> <li>• General: project duration, outputs, communication, dissemination, etc</li> </ul>	<ul style="list-style-type: none"> <li>• Overall costs for the project</li> <li>• Cost of different components of the proposal (staff costs, equipment, etc)</li> <li>• Cost in relation to outputs (quality/price ratio)</li> <li>• Potential for exploitation</li> <li>• Added value in relation to transnational benefits</li> </ul>
<b>Weighting Factor</b>	30%	20%	20%	15%	15%
<b>Score<sup>1</sup></b>	0÷10	0÷10	0÷10	0÷10	0÷10
<b>Threshold</b>	3	3	3		

**TOTAL ADMITTENCE THRESHOLD= 7.**

CEF				
PROJECT TYPE	AWARD CRITERIA			
	Relevance	Maturity	Impact	Quality
<b>All projects</b>	<p>Contribution of the proposed Action to the TEN-T policy objectives and EU dimension, priorities of the call for proposals and work programme, as well as the EU added-value of the proposed Action. Statements must be substantiated:</p> <ul style="list-style-type: none"> <li>• Contribution of the proposed Action to TEN-T and CEF priorities.</li> <li>• Contribution of the proposed Action to the objectives of the priority/sub-priority under which it is submitted.</li> <li>• Contribution of the proposed Action to the internal market, the cohesion policy and promoting growth and jobs creation in line with the Europe 2020 strategy.</li> </ul> <p><b>CROSS BORDER SECTION</b></p> <ul style="list-style-type: none"> <li>• Continuity of a project of common interest or of a Core Network Corridor.</li> <li>• Cross-border section agreement between Member States concerned and between Member States and neighbouring/third country(ies) concerned.</li> </ul>	<ul style="list-style-type: none"> <li>• Approval of the proposed Action to commence the planned activities (at government, regional local level, including environmental approvals).</li> <li>• Political commitments to the proposed Action and, if relevant, on the global project, including cross-border commitments where relevant.</li> <li>• Public consultations carried out and the feedback received or consultations foreseen. Information on the plans to involve stakeholders throughout the proposed Action.</li> <li>• Readiness/technical maturity of the proposed Action. State of preparation or implementation at the time of the submission of the application, contribution to the subsequent implementation of a proposal, dependence on the results of any past or on-going feasibility or technical studies. For projects with high technological value additional information on the foreseen technology and materials. Status of implementation in</li> </ul>	<ul style="list-style-type: none"> <li>• Impact of the studies as a decision-making tool and/or in terms of policy-making and developing best practices. Relevance and economic value of the study in terms of costs and benefits.</li> <li>• Demand/traffic forecast analysis.</li> <li>• Alternative options considered to achieve the Action's objectives and feasibility.</li> <li>• Economic and social effects of the proposed Action (congestion, modal split, interoperability, traffic management, safety and security, accessibility, service quality, health, environment and CO2 emissions).</li> <li>• Other considerations (e.g. competition, regional and/or local development, land use and climate resilience).</li> <li>• Revenues and revenue potential.</li> <li>• Financial viability before CEF and other financial obstacles.</li> <li>• Funding gap rate.</li> <li>• Effect of the EU financial support on the financial viability.</li> <li>• Stimulating effect of the EU financial support on public and</li> </ul>	<ul style="list-style-type: none"> <li>• Breakdown of eligible costs per cost category.</li> <li>• Description and justification of the level of resources needed for implementing the Action.</li> <li>• Organisational structure.</li> <li>• Control procedures and quality management during implementation.</li> <li>• Risk management methods and procedures.</li> <li>• Ex-post monitoring and audit(s).</li> <li>• Communication and visibility given to the CEF Transport co-financing.</li> <li>• Risk assessment grid by activities.</li> </ul>

<b>CEF</b>				
<b>PROJECT TYPE</b>	<b>AWARD CRITERIA</b>			
	<b>Relevance</b>	<b>Maturity</b>	<b>Impact</b>	<b>Quality</b>
	<ul style="list-style-type: none"> <li>• Cross-border section joint commitments between Member States concerned and between Member States and neighbouring/third country(ies) concerned.</li> <li>• Bottleneck improvement.</li> </ul>	<ul style="list-style-type: none"> <li>• case of already started projects.</li> <li>• Building permits, procurements, Contracts already awarded and procedure(s) applied, pending legal/administrative/technical issues, financial maturity,</li> </ul>	<ul style="list-style-type: none"> <li>• private investment and financial leverage.</li> <li>• Impact of CEF funding on the commitment of the different stakeholders.</li> </ul>	
<b>Score<sup>1</sup></b>	0÷5	0÷5	0÷5	0÷5
<b>Threshold</b>	3	3	3	3

*5 (Excellent) The proposal successfully addresses all relevant aspects of the criterion. Any shortcomings are minor.*

*4 (Very good) The proposal addresses the criterion very well but a small number of shortcomings are present.*

*3 (Good) The proposal addresses the criterion well, but a number of shortcomings are present.*

*2 (Unsatisfactory) The proposal broadly addresses the criterion but there are significant weaknesses.*

*1 (Poor) The criterion is inadequately addressed or there are serious inherent weaknesses.*

*0 (Insufficient) The proposal fails to address the criterion or cannot be assessed due to missing or incomplete information.*

## **TOTAL ADMITTANCE THRESHOLD= 12.**

### **Internal evaluation**

An internal Committee composed of representatives from the Commission's Directorate General for Mobility and Transport (MOVE) assisted by INEA and including representatives of other Directorates General, will assess the outcome of the technical evaluation and draw up the list of proposals both recommended and not recommended for funding.

During the final selection process, the following aspects will be taken into account, as appropriate:

- The contribution of the proposed Action to the balanced development of the network;
- The complementarity of the proposed Action with other EU funded projects, in view of optimising the impact of investments already made in the region/country/global project;
- The comparative EU added value (high, medium, low) of the proposed Action in relation to other proposed Actions, taking into account the respective Cost-Benefit Analysis where appropriate;
- Any identified/identifiable risks of double-funding from other Union sources;
- Budgetary constraints;

In exceptional and duly justified cases, and on the basis of the above-mentioned aspects, the Commission may recommend for funding a proposal that has obtained less than 3 points in one or more blocks of award criteria. In the same way, it may decide to not recommend for funding a proposal that has obtained at least 3 points for each block of award criteria.



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*This document reflects only the views of the author(s). Neither the Innovation and Networks Executive Agency (INEA) nor the European Commission is in any way responsible for any use that may be made of the information it contains.*



Project Acronym: **infra4Dfuture**  
Project Title: **Infrastructure for the Future**  
Project Number: **824269**  
Topic: **MG-2-4-2018 – Coordinating national efforts in modernizing transport infrastructure and provide innovative mobility services**  
Type of Action: **Coordination and Support Action (CSA)**

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## **D2.1 – Staged gate reviewing process for concerted innovation portfolio coordination**

### **Annex 3 – i4Df Tool Manual**

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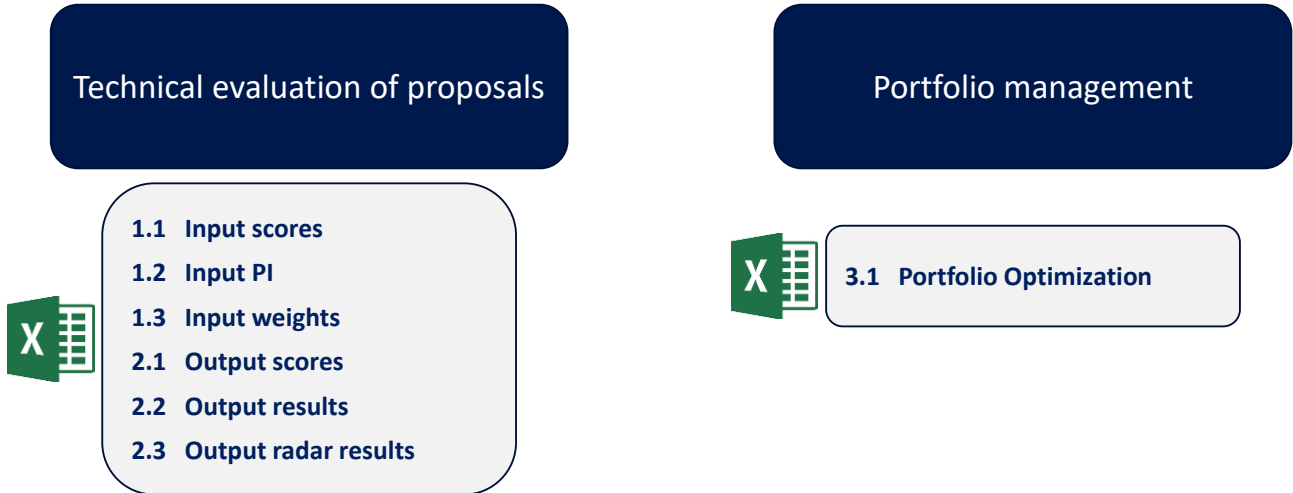
*Version 1.0*

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<b>Nature:</b>	<input checked="" type="checkbox"/> R – Report <input type="checkbox"/> P – Prototype <input type="checkbox"/> D – Demonstrator <input type="checkbox"/> O - Other
<b>Dissemination level:</b>	<input checked="" type="checkbox"/> PU - Public <input type="checkbox"/> CO - Confidential, only for members of the consortium (including the Commission) <input type="checkbox"/> RE - Restricted to a group specified by the consortium (including the Commission Services)



# I4Df TOOL MANUAL

The tool structure consists of two macro processes:



The technical evaluation of the proposal consists of 6 excel sheets. Another sheet is added (sheet 3.1) for portfolio management.

**1.1 Input scores.** In this sheet the scores given to the different criteria are reported for each project. The evaluation matrix consists of:

- ROWS, where macro criteria, criteria and sub criteria are listed and scored from 0 to 10;
- COLUMNS, where the scores are reported for each project.

STRATEGIC FIT	GROUP 1 - new proposals presented at the Gate 2 by new applicants							GROUP 2 - R&I completed projects that aspire to move forward to the next stage		
	Proposal 1	Proposal 2	Proposal 3	Proposal 4	Proposal 5	Proposal 6	Proposal 7	Proposal 8	Proposal 9	Proposal 10
Clarity and pertinence of the proposal to i4Df capabilities and IFA objectives	10	10	10	5	10	10	10	10	5	10
Contribution of the proposal to programme priorities	10	0	10	7.5	0	5	10	10	0	5
Sustainability of the project results in the medium and long term (capacity to maintain them after its implementation, either by continuation, by replication or by transfer)	10	10	10	7.5	2.5	5	10	7.5	0	2.5
Credibility of the proposed methodology and/or solution	10	10	2.5	7.5	10	5	10	7.5	0	10
Sponsorship from key stakeholders	10	2.5	10	5	2.5	5	10	7.5	0	5
Coherence of the project outputs with the expected impacts mentioned in the work programme under the relevant topic.	10	2.5	2.5	7.5	2.5	5	10	7.5	7.5	5
Any substantial impact not mentioned in the work programme	10	2.5	10	5	10	10	10	10	5	10
Transnational benefits	10	2.5	10	5	0	10	2.5	10	5	0
<b>FEASIBILITY and QUALITY</b>										
Understanding of technical requirements	10	5	7.5	7.5	2.5	10	5	7.5	7.5	2.5
Clear description of the proposal. The proposal must clearly describe how, where, when and by whom each action will be undertaken	10	5	0	5	10	10	5	0	5	5
Feasibility of the actions proposed for achieving the forecasted project outputs and outcomes	10	5	0	10	10	2.5	5	10	10	10
Proposal based on promising main research results	10	10	0	5	2.5	10	5	7.5	0	2.5
Appropriateness of the organisational and managerial structures	10	10	0	5	2.5	10	2.5	7.5	0	5
Quality and effectiveness of the work plan	10	10	10	10	2.5	2.5	10	7.5	0	5
Qualification and complementarity of partners (extent to which the consortium as a whole brings together the necessary expertise)	10	10	0	10	2.5	10	10	7.5	0	5
Appropriateness of the allocation of tasks, ensuring that all participants have a valid role and adequate resources in the project to fulfil that role.	10	10	10	10	2.5	10	10	7.5	0	5
Quality and effectiveness of the communication and dissemination plan	10	10	0	5	2.5	10	10	7.5	0	2.5
Realistic time planning and risk assessment	10	10	0	10	2.5	10	10	0	10	2.5
Project duration	10	10	2.5	5	10	2.5	5	2.5	5	10
Transparency of the budget: cost of different components of the proposal (staff costs, equipment, etc) and overall cost of the project	10	10	2.5	5	10	2.5	5	2.5	5	10
Added value in relation to transnational benefits	10	5	0	7.5	10	2.5	5	0	7.5	10
Cost-effectiveness of the project. Value for money against expected outcomes	10	0	0	5	2.5	2.5	0	0	5	2.5

The pipeline of active projects is made of:

1. new proposals submitted at Gate 2 by applicants (blue columns);
2. completed projects resulting from Gate 3 moving to the next stage (orange columns).



**USER ACTION**

1. Insert for each proposal the evaluations related to each sub-criterion;
2. The rating scale that can be used is as follows:

Evaluation Criteria	<b>0</b>	<b>2,5</b>	<b>5</b>	<b>7,5</b>	<b>10</b>
	Low	Little	Medium	Good	High

**1.2 Input PI.** In this sheet the Productivity Index (PI) is calculated for each project. Data, such as budget, Net Present Value (NPV) and Probability of Technical Success (Pts) must be entered in the grey columns

	Budget (€mln)	NPV (€mln)	P <sub>ts</sub> (%)	Productivity Index	Normalized Productivity Index
Proposal 1	0,10	20,0	80%	160,0	5,7
Proposal 2	0,30	30,0	55%	55,0	2,0
Proposal 3	0,08	5,0	60%	37,5	1,3
Proposal 4	0,05	40,0	35%	280,0	10,0
Proposal 5	0,30	7,0	95%	22,2	0,8
Proposal 6	0,20	12,0	85%	51,0	1,8
Proposal 7	0,50	15,0	55%	16,5	0,6
Proposal 8	0,35	9,0	35%	9,0	0,3
Proposal 9	0,20	5,0	85%	21,3	0,8
Proposal 10	0,05	2,0	74%	29,6	1,1

The Probability of Technical Success (P<sub>ts</sub>) is estimated as a percentage of the project's potential for success. Indicatively it can be assumed that:

- a project with low probability of success cannot exceed a P<sub>ts</sub> of 35%;
- a project with medium probability of success cannot exceed a P<sub>ts</sub> of 70%;
- a project with high probability of success has a value greater than a P<sub>ts</sub> 70%.



**USER ACTION**

1. Insert the budget of each proposal (cell c6:c15)
2. Insert the value of Net Present Value of each proposal (cell d6:d15)
3. Insert the value of Probability of Technical Success of each proposal (cell e6:e15)

**1.3 Input weights.** In this sheet the single weighing factors to be applied to each macro criterion and criterion must be entered.

INPUTS				
Criterion	Overall Weighting Factor	Sub Criterion	Single Weighting factor	Total weight
STRATEGIC FIT	35%	RELEVANCE	40%	14,0%
		CREDIBILITY	20%	7,0%
		IMPACTS	40%	14,0%
FEASIBILITY and QUALITY	65%	TECHNICAL FEASIBILITY AND QUALITY	40%	26,0%
		IMPLEMENTATION COHERENCE AND QUALITY	30%	19,5%
		FINANCIAL COHERENCE AND QUALITY	30%	19,5%
TOTAL				100%



**USER ACTION**

- 1. Insert the weight for the two macro criteria:**
  - STRATEGIC FIT (cell C6:C8)
  - FEASIBILITY and QUALITY (cell C10:C12).
- 2. Insert the weight for the six criteria:**
  - RELEVANCE (cell E6)
  - CREDIBILITY (cell E7)
  - IMPACTS (cell E8)
  - TECHNICAL FEASIBILITY AND QUALITY (cell E10)
  - IMPLEMENTATION COHERENCE AND QUALITY (cell E11)
  - FINANCIAL COHERENCE AND QUALITY (cell E12)

**2.1 Output scores** is an automatic sheet that shows the results of the evaluation based on the data inserted by the user in the sheets no. 1.1 to 1.3. In this sheet the score of each proposal is calculated. Weighted and normalized scores are shown in the upper and lower parts of the sheet respectively.

		Proposal 1	Proposal 2	Proposal 3	Proposal 4	Proposal 5	Proposal 6	Proposal 7	Proposal 8	Proposal 9	Proposal 10
Weighted Score	STRATEGIC FIT	3,5	1,7	2,9	2,2	1,6	2,5	3,2	3,1	1,1	2,0
	RELEVANCE	1,4	0,9	1,4	0,9	0,6	0,9	1,4	1,3	0,2	0,8
	CREDIBILITY	0,7	0,4	0,4	0,4	0,4	0,4	0,7	0,5	0,0	0,5
	IMPACTS	1,4	0,4	1,1	0,8	0,6	1,2	1,1	1,3	0,8	0,7
	FEASIBILITY and QUALITY	6,3	4,4	1,7	4,6	3,6	4,1	3,5	3,2	2,8	3,6
	TECHNICAL FEASIBILITY AND QUALITY	2,6	1,6	0,5	1,8	1,6	2,1	1,3	1,6	1,5	1,3
	IMPLEMENTATION COHERENCE AND QUALITY	2,0	2,0	0,6	1,5	0,7	1,5	1,6	1,1	0,4	1,0
FINANCIAL COHERENCE AND QUALITY	1,8	0,9	0,5	1,3	1,3	0,5	0,6	0,5	0,9	1,3	
Normalised Score (1-10 scale)	STRATEGIC FIT	10,0	4,9	8,3	6,3	4,6	7,0	9,0	8,8	3,0	5,8
	RELEVANCE	10,0	6,7	10,0	6,7	4,2	6,7	10,0	9,2	1,7	5,8
	CREDIBILITY	10,0	6,3	6,3	6,3	6,3	5,0	10,0	7,5	0,0	7,5
	IMPACTS	10,0	2,5	7,5	5,8	4,2	8,3	7,5	9,2	5,8	5,0
	FEASIBILITY and QUALITY	9,7	6,8	2,5	7,1	5,6	6,3	5,4	5,0	4,3	5,5
	TECHNICAL FEASIBILITY AND QUALITY	10,0	6,3	1,9	6,9	6,3	8,1	5,0	6,3	5,6	5,0
	IMPLEMENTATION COHERENCE AND QUALITY	10,0	10,0	3,2	7,9	3,6	7,9	8,2	5,7	2,1	5,0
FINANCIAL COHERENCE AND QUALITY	9,1	4,4	2,8	6,5	6,7	2,4	3,1	2,6	4,7	6,7	

Scores related to sub-criteria are summed up together and opportunely weighted on the basis of their relevance, as follows:

$$Criterion_{k,j} = w_{f,j} \left( \frac{1}{n} \sum_{i=1}^n S_i \right)$$

where:

- **k** is the index related to the number of macro-criteria;
- **j** is the index related to the single criterion;
- **i** is the index related to the single sub-criterion;
- **w<sub>f,j</sub>** is the weighting factor related to each criterion;
- **S<sub>i</sub>** is the score assigned to the each sub-criterion;
- **n** is the number of sub-criteria.

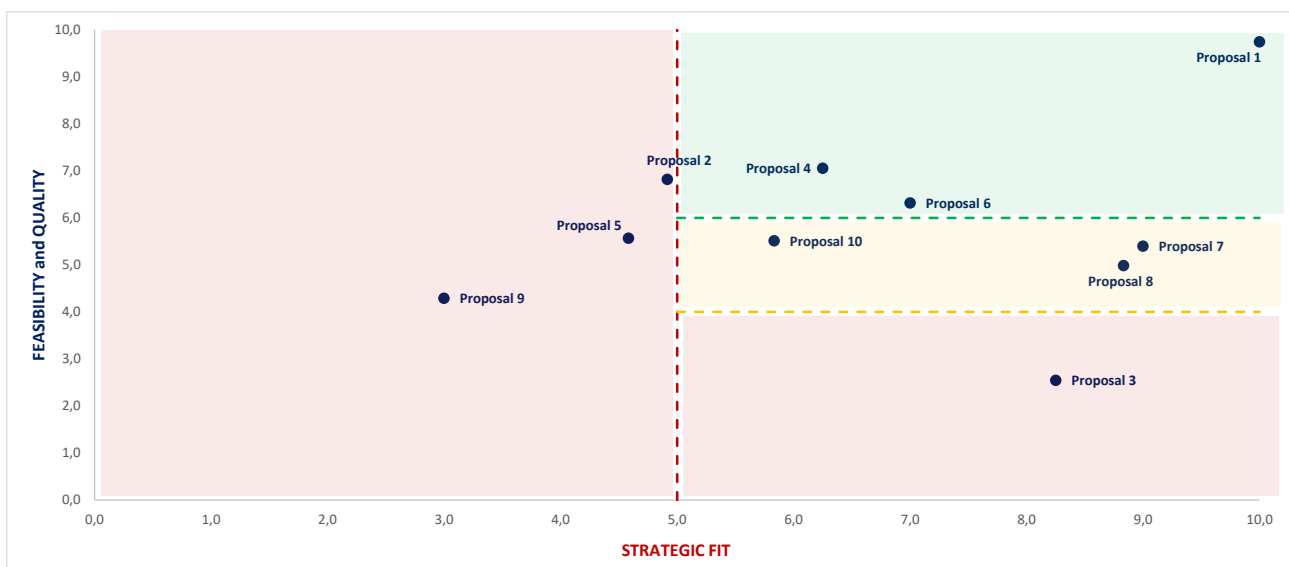
For each macro-criterion (“Strategic Fit” and “Feasibility and Quality”) an overall score is calculated (this calculation is done both for the weighted and for the normalised scores), as shown in the following formula::

$$MCS_k = w_{fk} \sum_{j=1}^3 criterion_{k,j}$$

where:

- **MCS** is the score achieved by each macro- criterion;
- **W<sub>fk</sub>** is the weighting factor applied to the kth macro- criterion.

**2.2 Output result** reports the output of the process. Outcomes are depicted in a diagram that reports the positions of projects with respect to three areas, corresponding to as many stage-gate options: GO, KILL and RECYCLE. The results for each proposal are also shown in a table, positioned on the right side of the diagram.



Evaluation of proposals		
	Total Score (min = 0; max =10)	Qualification
Proposal 1	9,9	GO
Proposal 2	6,3	KILL
Proposal 3	4,6	KILL
Proposal 4	6,8	GO
Proposal 5	5,3	KILL
Proposal 6	6,6	GO
Proposal 7	6,9	RECYCLE
Proposal 8	5,6	RECYCLE
Proposal 9	3,9	KILL
Proposal 10	5,7	RECYCLE



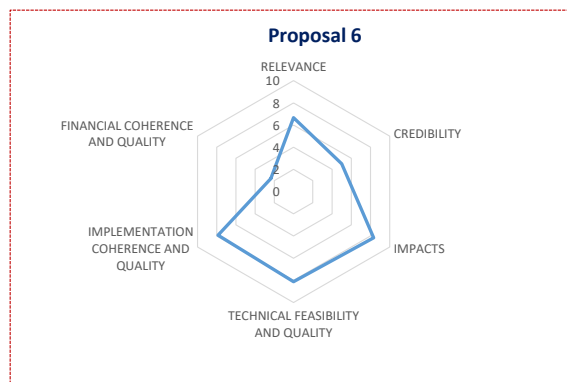
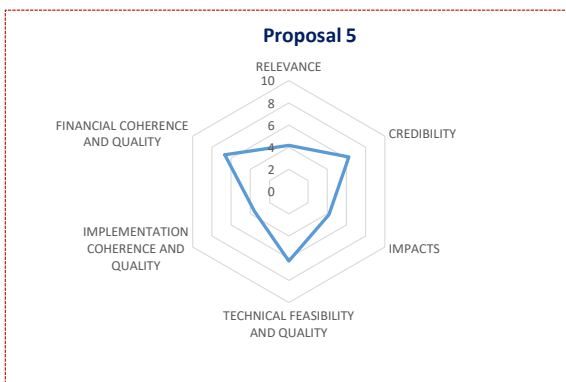
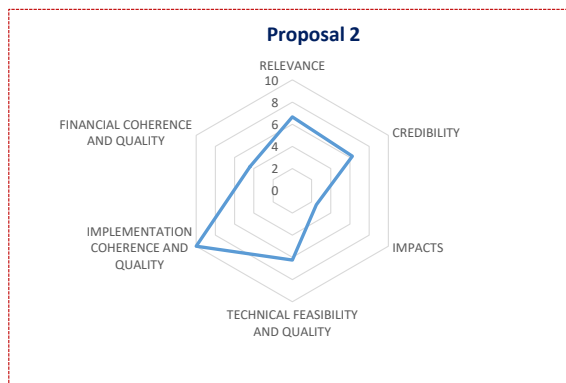
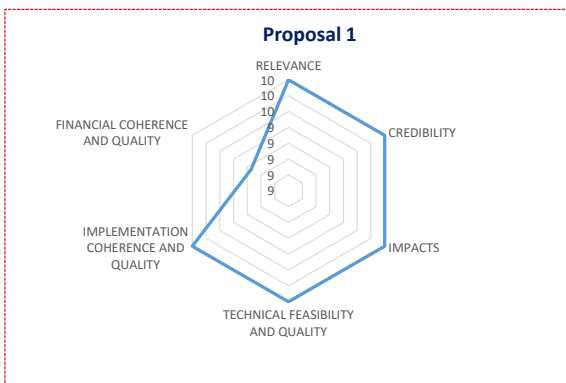
**USER ACTION**

**1. The user has to set two important parameters:**

- STRATEGIC FIT threshold for GO proposal (cell C3)
- FEASIBILITY and QUALITY threshold for GO proposal (cell C5)

*the values of these two parameters will determine the width of the three areas and the positions of their respective separation lines (red, yellow and green) in the graph, as well as the value of the qualification column (GO, KILL, RECYCLE)*

**2.3 In Output radar** the results related to the evaluation of each project are depicted in radar format, to allow a better understanding of the total score achieved (contribution of each criterion to the total score).



**3.1 Portfolio optimization.** In this sheet the optimal combination of GO proposals is calculated. In case of savings, gatekeepers can decide to use the remaining budget for RECYCLE projects.

STEP 1 - Insert the available budget

TOTAL available budget for project type (€mln) **0,40**

STEP 2 - Push the button to order projects

**ORDER PROPOSAL**

	Evaluation Score (min = 0; max =10)	Qualification	Budget (€mln)	Normalized Productivity Index
Proposal 1	9,9	GO	0,10	8,6
Proposal 4	6,8	GO	0,05	10,0
Proposal 6	6,6	GO	0,20	3,6
Proposal 7	6,9	RECYCLE	0,25	6,4
Proposal 10	5,7	RECYCLE	0,05	2,6
Proposal 8	5,6	RECYCLE	0,20	6,3
Proposal 2	6,3	KILL		4,7
Proposal 5	5,3	KILL		1,6
Proposal 3	4,6	KILL		2,7
Proposal 9	3,9	KILL		1,4

STEP 3 - Push the red button to allocate resources

SCENARIO 1 (only GO projects)

**SCENARIO 1**

Totale score of funded projects: 16,72  
 Budget limit: 0,40  
 Budget used by the optimal solution: 0,15  
 REMAINING BUDGET: 0,25

	TOTAL SCORE (min = 0; max =20)	Qualification	Budget (€mln)	Evaluation Results
Proposal 1	9,9	GO	0,10	FINANCED
Proposal 4	6,8	GO	0,05	FINANCED
Proposal 6	6,6	GO	0,20	HOLD

SCENARIO 2 (also RECYCLE projects)

**SCENARIO 2**

Totale score of funded projects: 5,63  
 Budget limit: 0,25  
 Budget used by the optimal solution: 0,20  
 REMAINING BUDGET: 0,05

	Total Score (min = 0; max =10)	Qualification	Budget (€mln)	Evaluation Results
Proposal 7	6,9	RECYCLE	0,25	RECYCLE
Proposal 10	5,7	RECYCLE	0,05	RECYCLE
Proposal 8	5,6	RECYCLE	0,20	FINANCED

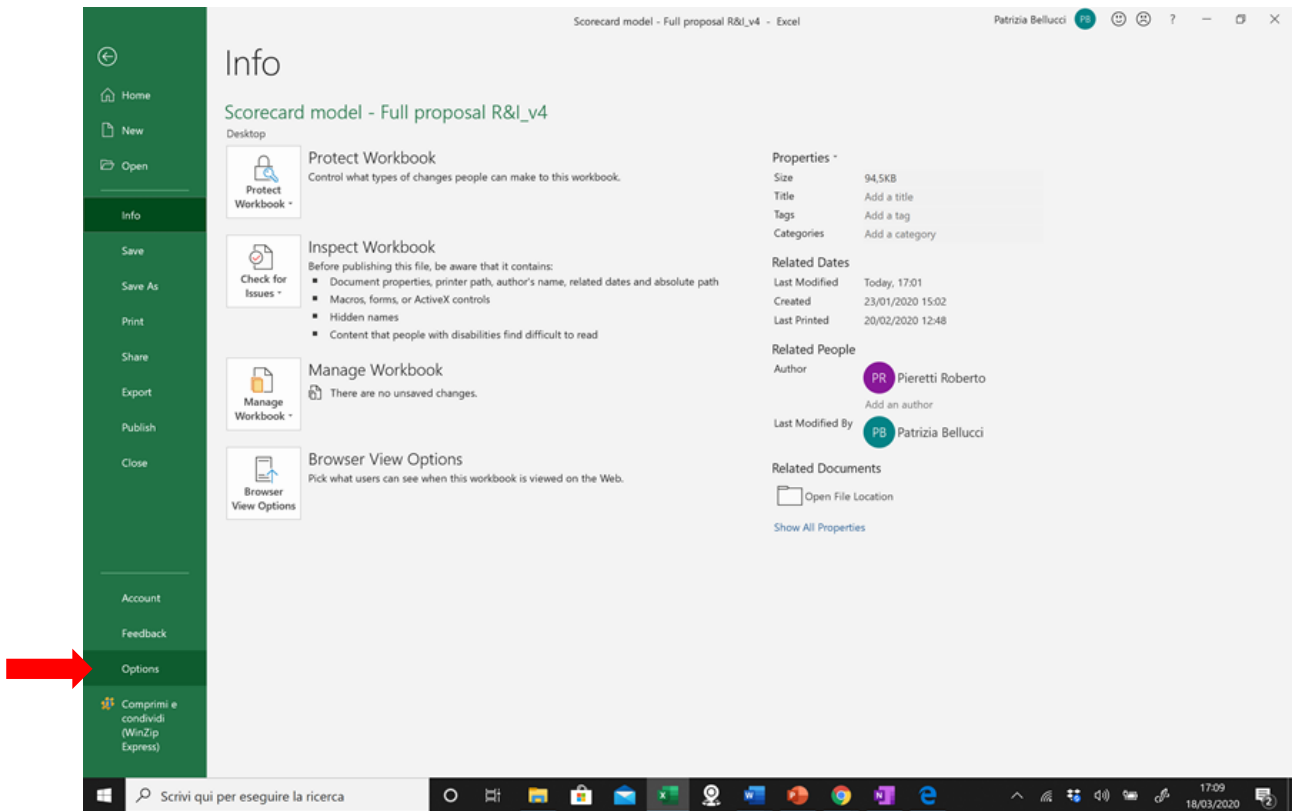


**USER ACTION**

1. Insert the budget available for the portfolio (cell E2);
2. Push the button "ORDER PROPOSAL" to sort the proposals from GO to KILL
3. Insert the budget required for each GO and RECYCLE proposal (column G6 "Budget")
4. Push the red button "Scenario 1" to calculate the optimal combination of GO proposal
5. If there is still budget available (check cell E22) the user can use this budget for RECYCLE proposals. In this case push the button "Scenario 2" to calculate the optimal combination of RECYCLE proposals

**WARNING**

To make the software application work properly, it is necessary to check whether the SOLVER ADD-INN is Active. To do so, click on the **FILE** menu and then go to "Options".



Then **scroll the “Options”** menu and **click on “Add-ins”**. Check whether the **“Solver Add-in”** is present in the list of the “Active Applications Add-in”. If so, you can click OK and quit. Otherwise, you have to select “Solver Add-in” from the “Inactive Applications Add-in” and then click the “GO” button. You can finally press OK and quit. Restart Excel before using the application.

