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Measuring innovation policy across Europe – Common Indicator Framework

Towards an international alignment of innovation indicators used by TAFTIE agencies

Part of the TAFTIE Task Force on Benchmarking Impact, Effectiveness and Efficiency

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TFBIEE Common Indicator Framework

TAFTIE Task Force on Benchmarking Impact, Effectiveness and Efficiency

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1. Background and Context

1.1 Purpose of this framework

This documents presents a ***list of common indicators*** developed by the TAFTIE Taskforce on Benchmarking Impact, Effectiveness and Efficiency for four innovation policy instruments: R&D Grants, Collaborative R&D Grants, Innovation Vouchers and Competence Centres. One of the goals of this Task Force has been to work towards **a better understanding of the performance of innovation instruments** by gaining valuable insights through **international benchmarking**. However, before a valid international benchmark can take place without comparing apples and oranges, a common understanding of *how to measure performance* of these instruments is required. One of the key steps is the **alignment of indicators** in a voluntary framework that allows for comparison of instrument's basic characteristics and performance, and this is exactly what this document will present.

Innovation Agencies (and other actors) are **encouraged to make use of this framework** in the monitoring and evaluation of their programmes. The usefulness of this framework for international benchmarking in specific instrument evaluations depends on the implementation of these indicators in practice. The rationale is by choosing one or more of these indicators, monitoring and evaluation professionals significantly improve the chance of being able to compare internationally. The more it is used, the more useful it becomes, as the pool of potential comparator instruments grows.

This framework has benefited from the ***Reference Model on Indicators***, which was developed in parallel in the context of this Task Force, and potential users of this framework may find it helpful to use it in the context of this framework and beyond.

1.2 Background and context

TAFTIE (The European Network of Innovation Agencies) is an association with 29 European innovation agencies as its members that is aimed at promoting collaboration on innovation policies. One of the main elements of TAFTIE's strategy is to learn from each other and exchange best practices on the development, implementation and evaluation of innovation instruments. A principal tool in sharing expertise and the joint development of knowledge are the Task Forces, which are focused initiatives of at least six members. In 2013, eleven members decided to initiate a task force on Benchmarking impact, effectiveness and efficiency.

The Task Force, assisted by Technopolis Group, pursued the benchmarking of 40+ innovation instruments across four types:

- Business R&D grants
- Collaborative R&D grants
- Competence centres and clusters
- Innovation Vouchers programmes

One of the main findings of the task force was, that while benchmarking has a large potential for giving valuable insight in an instrument's performance, the current evaluation practices are too divergent to already arrive at a meaningful (quantitative) benchmarking of indicators for effectiveness, efficiency and impacts. In order to address this, the Task Force developed a reference model for evaluations that is aimed at providing practical guidance in bringing evaluations to a comparable 'gold standard'.

1.3 Objectives

Noting the current inconsistency between indicator selection and operationalization between agencies as well as the opportunities offered by potential benchmarking, the TAFTIE Taskforce on Benchmarking Impact, Effectiveness and Efficiency has decided to start a follow-up project to build on the work carried out in 2013 and early 2014.

The objectives of this project were threefold:

1. To develop an addition to the reference model for practical guidance on indicator selection and operationalization, based on international best practices,
2. To develop a list of programme-level 'common indicators' based on logical framework analysis for measuring effectiveness and impacts which improves the opportunities of benchmarking as agencies are more likely to use identical indicators
3. To promote the use and relevance of these products by engaging the entire task force in an integral manner.

The reference model and list of common indicators have been developed for four specific innovation instruments, which were selected based on the fact that they encompass relatively similar and standardised interventions that lend themselves for benchmarking:

- Business R&D grants
- Collaborative R&D grants
- Competence centres
- Innovation Vouchers programmes

As can be seen, this selection is aligned to the previous study, although cluster initiatives have been excluded due to the relatively complex and varying nature of intervention. The reference model and indicator list will be developed with an integral policy cycle in mind, including programme design (ex-ante), monitoring (continuous or mid-term) and ex-post evaluation.

1.4 Approach and methodology common indicator list

The main purpose of this task force work package has been to arrive at an overview of common indicators that are useful for monitoring and evaluation of innovation policies, in particular the four instruments which fall within the scope of this assignment. Note that the framework will have a voluntary character, although participating agencies will be encouraged to use it.

Indicators are tools to measure (proxies of) a societal or economic situation or development. In innovation policy evaluation, indicators are operationalizations of specific concepts related to the intervention, such as outputs, outcomes or impacts.

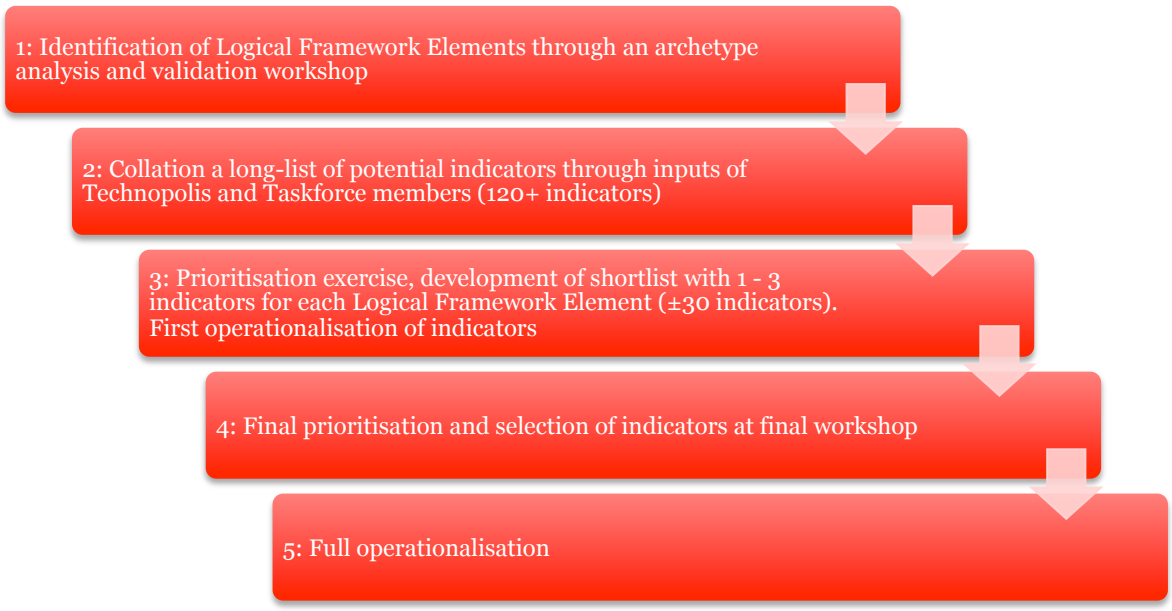
Good indicators are specific and relevant, thereby capturing essential information on the effectiveness and efficiency of a public intervention. A first step to indicator design is to (re)construct the intervention logic of the innovation policy instruments. A logical framework analysis (LFA) is a powerful tool to give insight into the coherence and structure of a public intervention, and thereby facilitates the identification of the objectives (or other aspects of the intervention logic) to be operationalized into key performance indicators (KPIs).

The first step has therefore entailed the development of **four 'archetype' intervention logics**, one for each policy instrument part of the analysis. As we have seen in the TFBIEE benchmark, policy instruments within the four chosen types share similar goals, objectives and activities across the different agencies. Note that for this study the focus will lie on innovation an economic impacts at

companies, not on other type of impacts.[1] The four archetype logical frameworks are available in the appendix.

The four intervention logics have first been developed through analysis of the specific (reconstructed) logical frameworks of specific instruments from TAFTIE members. These draft intervention logics were validated in a workshop during the kick-off meeting.

Subsequently, a long-list of potential indicators was identified by aggregating all current indicators from Task Force Members, which were prioritised into a smaller number of key indicators. A final decision on the selection of the indicators has been taken at the final Task Force meeting in December 2014. An overview of the approach is presented in the figure below.



One of they key challenges in the final choice for indicators has been the **balance between a good coverage of the intervention logic and the alignment with actual instruments** used by innovation agencies on the one hand with a practical indicator list for benchmarking. The latter is by definition a short list, as benchmarking will only be possible when two instrument evaluations chose to use the same common indicator. Of course, accommodating diversity in instruments and covering a variety of outputs, outcomes and impacts is important, but it should not detract from the actual usefulness in the end product. The result has therefore a succinct and focused list of indicators, that aims to **achieve optimal intervention logic validity while resulting in a succinct and focused list.**

[1] Such as environmental impacts, knowledge and scientific impacts, social impacts, etc.

[2] EC DG Regio (2014) Indicative guidelines on monitoring and evaluation http://ec.europa.eu/regional_policy/sources/docoffic/2014/working/wd_2014_en.pdf

Traditional vs. innovative indicators

The methodology above has focused on international comparability as one of the key criteria for inclusion in the common indicator framework. This has resulted – perhaps unsurprisingly – in a rather set of indicators, as any indicator that was not considered immediately relevant or feasible by a substantial number of agencies was almost automatically excluded. Such a process has the result of converging on 'traditional' indicators that come from proven data sources with definitions that are well-established (e.g. based on definitions used by statistical agencies). The quite clear drawback is that this has left out indicators that are more innovative by virtue of their operationalisation (e.g. indicators that focus more on expectations rather than looking back) or by virtue of their innovative data source (social media presence, webometrics etc), even though there could be –in time - a good potential for international comparison. As such, this framework should not discourage agencies from using (or experimenting with) innovative indicators, nor should it be seen as a static list. If new indicators are consistently adopted across several countries, it should definitely be considered to include these in a next version.

1.5 Structure of common indicator framework

After various prioritisation exercises, a decision has been made to work with two different sets of indicators, one for input activities and output indicators, the other for outcomes and impact indicators. The key reason for distinguishing between those two rings is the fact that for aligning outcome and impact indicators for international benchmarking, it is required to also align evaluation and impact assessment methodologies. Whereas input, activity and output indicators are largely collected within the domain of the programme management, whereas outcome and impact indicators are collected outside the agencies direct domain (e.g. through ex-post surveys).

Aligning outcome and impact indicators would therefore require establishing standard methodology sets and preferences for counterfactual impact assessment, whereas the earlier TAFTIE study indicated that there are currently large variations in evaluation and impact assessment strategies, as well as data availability for counterfactual analysis. Since it is not possible to completely align evaluation and impact assessment methodologies and strategies within the scope of this task force, a **two-step approach** has been developed**:**

- An **agreement on common indicators and definitions for input, activity and output indicators**, that will go a long way in improving benchmarking possibility, with the potential for **application within the short term**.
- A number of **suggested indicators** and their operationalization for **the outcome and impact indicators,** with further potential for benchmarking in the medium – and long term. Note that there has already been an agreement on the archetype intervention logics, which will help in aligning the evaluation questions to some extent

Figure 1 Comparison of indicator framework sets

	Benchmark requirements	Intervention logic levels	Data collection moments
Primary indicator set	• Common indicators ✓ • Common definitions ✓	• Input • Activities • Output	• Programme management data – Start of participation – During participation – At end of participation

	Benchmark requirements	Intervention logic levels	Data collection moments
Secondary indicator set	• Common indicators ✓ • Common definitions ✓ • Standardised common evaluation and impact assessment methods ✗	• Outcomes • Impact	• Ex-post data collection (primarily) • Continuous data (for counterfactual purposes)

It should be noted that the indicator sets are based on **archetype logical frameworks**. This means that the indicators are based on an 'archetype instruments', representing the key components that are similar across various agencies' instruments. Naturally, actual instruments of agencies have often a much broader set of activities and goals. In actual instrument evaluations, these objectives will be an integral part of assessing effectiveness, efficiency and impact, but they are less relevant for international comparison. The indicators presented in this framework are only applicable for those objectives for which international comparison is especially relevant..

1.6 Key definitions and operationalization principles

This section presents key definitions as they are used in the indicator framework. Also it presents the source of these definitions where relevant.

Figure 2 Definitions

Term	Definition	Notes
Enterprise	Enterprise: Organisation producing products or services to satisfy market needs in order to reach profit. The legal form of enterprise may be various (self-employed persons, partnerships, etc.).	Based on ERDF Indicator guidelines[2]
Organisation	A public or private legal entity with the potential effective capacity to engage in participation in an public (innovation) instrument	
SME (Small or Medium-sized Enterprise)	' The category of micro, small and medium-sized enterprises (SMEs) is made up of enterprises which employ **fewer than 250 persons** and which have an annual turnover not exceeding 50 million euro, and/or an annual balance sheet total not exceeding 43 million euro.'	EU Definition; Article 2 of the Annex of Recommendation 2003/361/EC
Innovation	A **product innovation** is the market introduction of a new or significantly improved **good or service** with respect to its capabilities, user friendliness, components or sub-systems. (CIS, 2010). In the context of this indicator framework, 'new' is defined as 'new to the firm'[3] A **process innovation** is the implementation of a new or significantly improved production process, distribution method, or supporting activity. An **organisational innovation** is a new organisational method in your enterprise's business practices (including knowledge	See also Community Innovation Survey Form[4]. Based on Oslo Manual.

[2] EC DG Regio (2014) Indicative guidelines on monitoring and evaluation http://ec.europa.eu/regional_policy/sources/docoffic/2014/working/wd_2014_en.pdf

[3] As opposed to 'new to the market' or 'new to the world'.

[4] Community Innovation Survey. Version July 9, 2010

Term	Definition	Notes
	management), workplace organisation or external relations that has not been previously used by your enterprise. – It must be the result of strategic decisions taken by management. – Exclude mergers or acquisitions, even if for the first time. A **marketing innovation** is the implementation of a new marketing concept or strategy that differs significantly from your enterprise's existing marketing methods and which has not been used before. – It requires significant changes in product design or packaging, product placement, product promotion or pricing. – Exclude seasonal, regular and other routine changes in marketing methods	
R&D Expenditure	Research and experimental development (R&D) comprise creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications	Based on OECD Frascati Manual[5]
External R&D	The definitions as described above, but carried out by another public or private organisation	
Co-operation relation	A shared participation in the same project. Each individual unique combination between two consortium partners counts as one relation. In a project with N participants, the number of unique pairs is N! / 2(N-2)!	
Participants / Beneficiaries	Organisations with a *contracted financial stake* in a project funded under the project, either by contributing or receiving or a combination of both.	

Operationalisation principles

- Only those indicators that have the highest potential for benchmarking purposes across agencies have been selected. During the prioritisation process, it has been sought to end up with only one or two indicators for each logical framework element in order to enhance the future potential for comparability.
- The indicators below have been selected in line with the good practise principles defined in the indicator reference model.
- All indicators in the primary set (input, activities and outputs) are collected and aggregated to an annual figure (calendar years).
- For comparative reasons, all amounts are translated into Euro, using the average exchange rate of that particular calendar year if amounts were originally in another currency.
- Attribution to specific years
  - Contracted budgets count towards the year of the contract date.
  - Application success/non-success dates count towards the year of the formal communication of the decision.

[5] OECD (2002) Frascati Manual, 6th edition

2. Common Indicators Tables

2.1 Indicator table: primary set

The next two tables present the key voluntary common indicator framework for the four instruments. As can be seen, various indicators apply to several instruments, thereby also facilitating cross-instrument comparison on key indicators if desired. Note that several indicators are 'derived' indicators as they are based on combinations of other indicators (such as success rate, based on total applications and number of grants). In these cases it is generally wise to also report the underlying values of these indicators, even though they have not been included in this table for reasons of parsimony.

Logical Framework Element	Indicator	Detailed (sub-) Indicators	R&D Grants	R&D Collaborative Grant	Innovation Vouchers	Competence Centres
INPUTS						
Budget	Contracted Budget[6]	• Total amount of funding in euro contracted in year x. – Total – All enterprises – SMEs – Knowledge institutions	✔	✔	✔	✔
ACTIVITIES						
Managing and Operating Grants	Awarded Grants	• Number of *awarded* grants (or reimbursed vouchers) in year x – Total – All enterprises – SMEs – Knowledge institutions	✔	✔	✔	
Managing and Operating Grants	Application success rate	• Application Success rate: successful applications in year x /(successful applications in year x + unsuccessful applications in year x[7])	✔	✔	✔	
Managing and Operating Grants / Vouchers	Number of Beneficiaries	• Number of unique organisations contracted for grants (or vouchers) in year x – Total – All enterprises – SMEs – Knowledge Institutions	✔	✔	✔	
Managing and operating competence centres	Number of Beneficiaries	• Number of unique organisations active in R&D-projects in the competence centres – Total – All enterprises – SMEs				✔

[6] The earlier phases of the TFBIEE showed that comparing gross budgets across agencies is generally fraught with difficulties; agencies use various ways of accounting for overhead, some use annual fixed amounts while others have a rolling budget etc. Contracted Budget is a much more comparable indicator across agencies for measuring agencies' inputs into programmes (even though a full evaluation would require an assessment of efficiency using full information on gross budgets, but this is better to be addressed at the national level – at least for now).

[7] Unsuccessful applications do not include applications that did not meet the exclusion or inclusion criteria (e.g. late submission)

		– Knowledge Institutions				
Managing and operating competence centres	Competence Centres	• Number of competence centres supported in year x				✔
Managing and operating voucher scheme	Voucher reimbursement rate	• Voucher reimbursement rate: Number of reimbursed vouchers[8] of vouchers issued in year x / number of vouchers issued in year x			✔	
OUTPUTS						
(Collaborative) R&D Projects	Private contributions [9]	• Total private contributions in euro contracted in year x.[10]	✔	✔		✔
Specific R&D co-operation relations	Specific R&D co-operation relations	• Number of participation relationships in projects contracted in year x: – number of company – company relationships • number of company – knowledge institute relationships		✔	✔	
Specific Knowledge & technology generation	Technical success of projects	• Number of projects closed in year x, along levels of technical success[11]: – Number of projects which achieved their objectives as planned – Number of projects which yielded results beyond planned objectives – Number of projects which achieved its objectives partially – Number of projects which failed to reach its objectives or were discontinued	✔	✔	✔	

[8] Based on reimbursement rate

[9] This indicator is equivalent to the traditional 'input additionality' indicator.

[10] Total of contributions, both in-cash and in-kind, but only the eligible costs that are covered under the grant/under the competence centres' R&D projects

[11] Assessment of this technical success can either be carried out on the agency's side, could be carried out during a possible project evaluation with the beneficiary, or be organised through a survey (could be integrated with an impact assessment survey)

2.2 Overview table: secondary set

The table below presents an overview of *suggestions* for indicator use that will improve comparability for certain key indicators in the outcome and impact levels even though full comparability cannot be achieved without further alignment of evaluation methods and practises (particularly in the domain of counterfactual analysis). This list therefore does not define the mode of assessing attribution; which could be either using a quantitative counterfactual analysis or by more qualitative self-reporting through surveys.

Note that this table does not present indicators for all logical framework elements part of the archetype logical framework. The indicators which can rely on already relatively standardized data collection methodologies (business data, BERD, CIS) provide the best first step towards international benchmarking of outcome and impact indicators, and have as such been prioritised.

Note that several indicators are 'derived' indicators as they are based on combinations of other indicators (such as success rate, based on total applications and number of grants). In these cases it is generally wise to also report the underlying values of these indicators, even though they have not been included in this table for reasons of parsimony.

Logical Framework Element	Indicator	Detailed (sub-) Indicators	R&D Grants	R&D Collaborative Grant	Innovation Vouchers	Competence Centres
OUTCOMES						
More innovations	Innovations	• Share of enterprises that introduced an innovation (new to the *firm*[12]) within *two years* after the project – Share of firms introducing an innovation[13] – Share of firms introducing a product innovations (either service or good) – Share of firms introducing a process innovations – Share of firms introducing an organisational innovation – Share of firms introducing a marketing innovation Potential Sources: Survey among beneficiaries or CIS survey data	✔	✔	✔	✔
Improved R&D capacities & capabilities[14]	Higher R&D Expenditure	• Increase in R&D Expenditure of beneficiary enterprises: R&D expenditures 1 year after closure of the project – R&D expenditures 1 year before start of the project. • Increase in R&D FTE of beneficiary enterprise: R&D FTE 1 year after closure of the project – R&D FTE 1 year before start of the project. Source: BERD survey or beneficiary survey during ex-post evaluation	✔	✔	✔	✔
Increased co-operation between firm and knowledge institutes	Increased co-operation	• Increase in expenditure on external R&D: external R&D expenditures by beneficiary enterprises 1 year after closure of project – external R&D expenditure by beneficiary enterprises 1		✔	✔	✔

[12] There are also variations of the definition of innovation which use 'new to the market' or even 'new to the world'. In this context, it is best to stick with the more encompassing 'new to the firm', although it may be relevant in specific cases to add additional questions on the level of 'novelty'

[13] Note that the share of firms introducing any innovation (the total) is not necessarily the exact sum of the sub-categories of innovations, as it is possible that a single innovation classifies under multiple headings, or firms may have introduced more than 1 innovation.

[14] This indicator is equivalent to the traditional behavioural additionality indicator

		year before start of the project Source: BERD survey or beneficiary survey				
IMPACTS						
Better economic performance of firms	Turnover increase	• Percentage increase of turnover between 1 year before the start of the project and 3 years after closure of the project. Source: National Business Statistics or beneficiary survey	✔	✔		✔
Structural higher research intensity and rate of innovation in firms	Research intensity of enterprises	• Percentage point increase of share of R&D expenditure in enterprise turnover between 1 year before the start of the project and 3 years after closure of the project. Source: BERD survey or beneficiary survey	✔	✔	✔	✔
More innovative firms	Innovation behaviour	• Percentage point increase of share of turnover related to innovative products[15]. Source: CIS survey or beneficiary survey	✔	✔		✔

[15] Example: if the share of turnover of innovative products (CIS Indicators TURN*) was 10% 1 year before the project and 15% three years after participation, the *percentage point increase* is 5%.

Appendix A Full intervention Logics

This section presents the validated logical frameworks for all four instruments.

Figure 3 Logical Framework R&D Grants

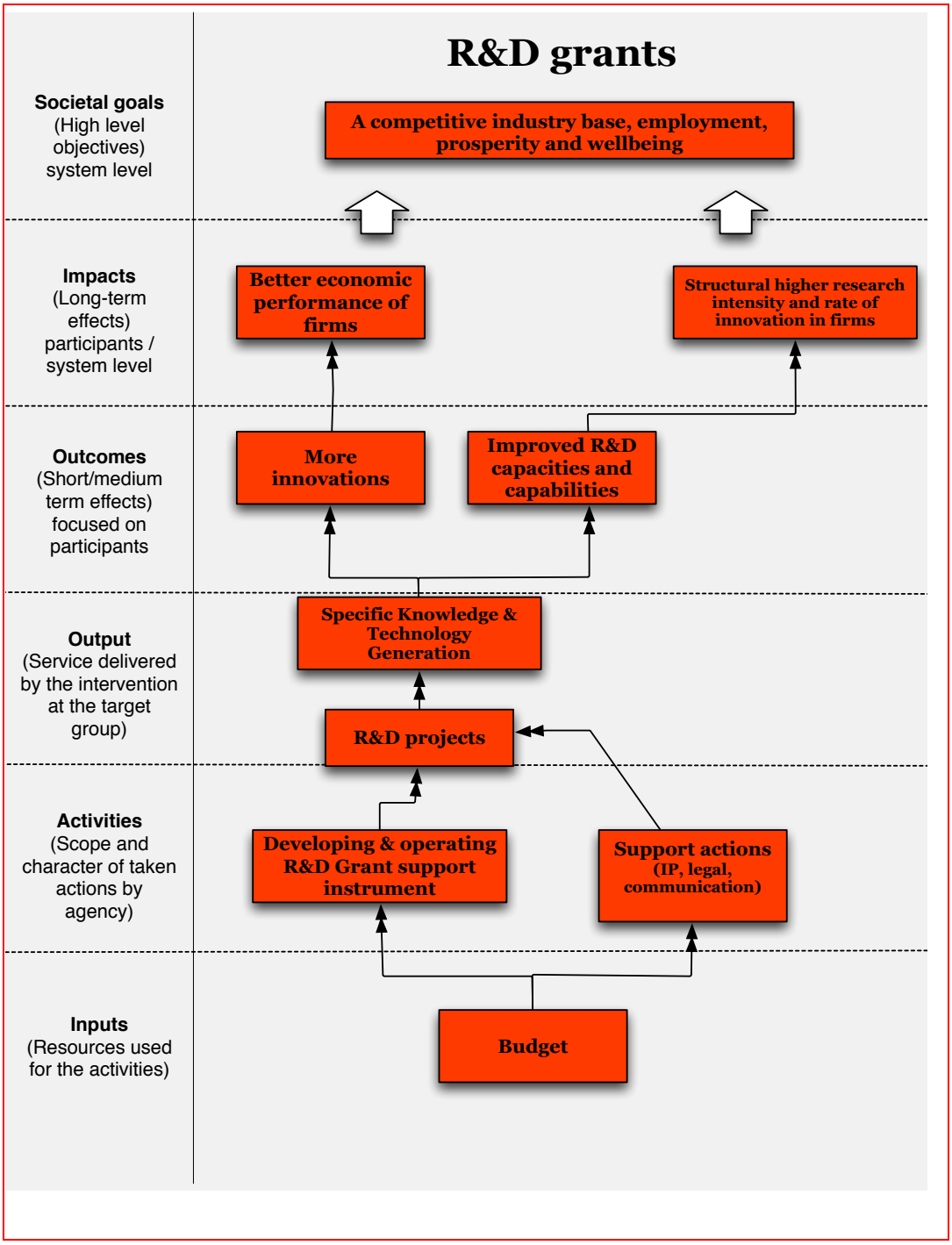


Figure 4 Logical Framework Collaborative R&D Grants

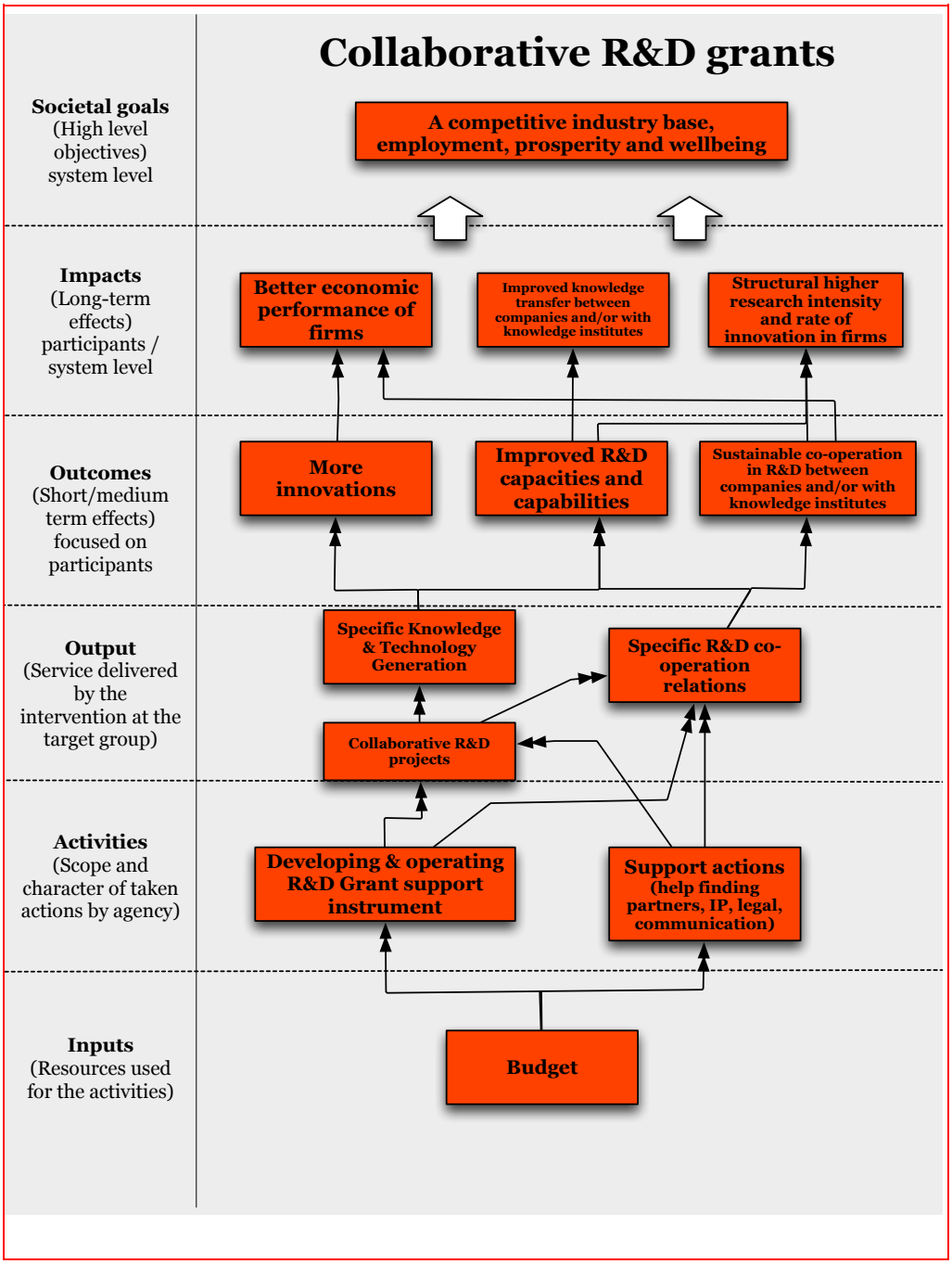


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Figure 5 Intervention logic innovation vouchers

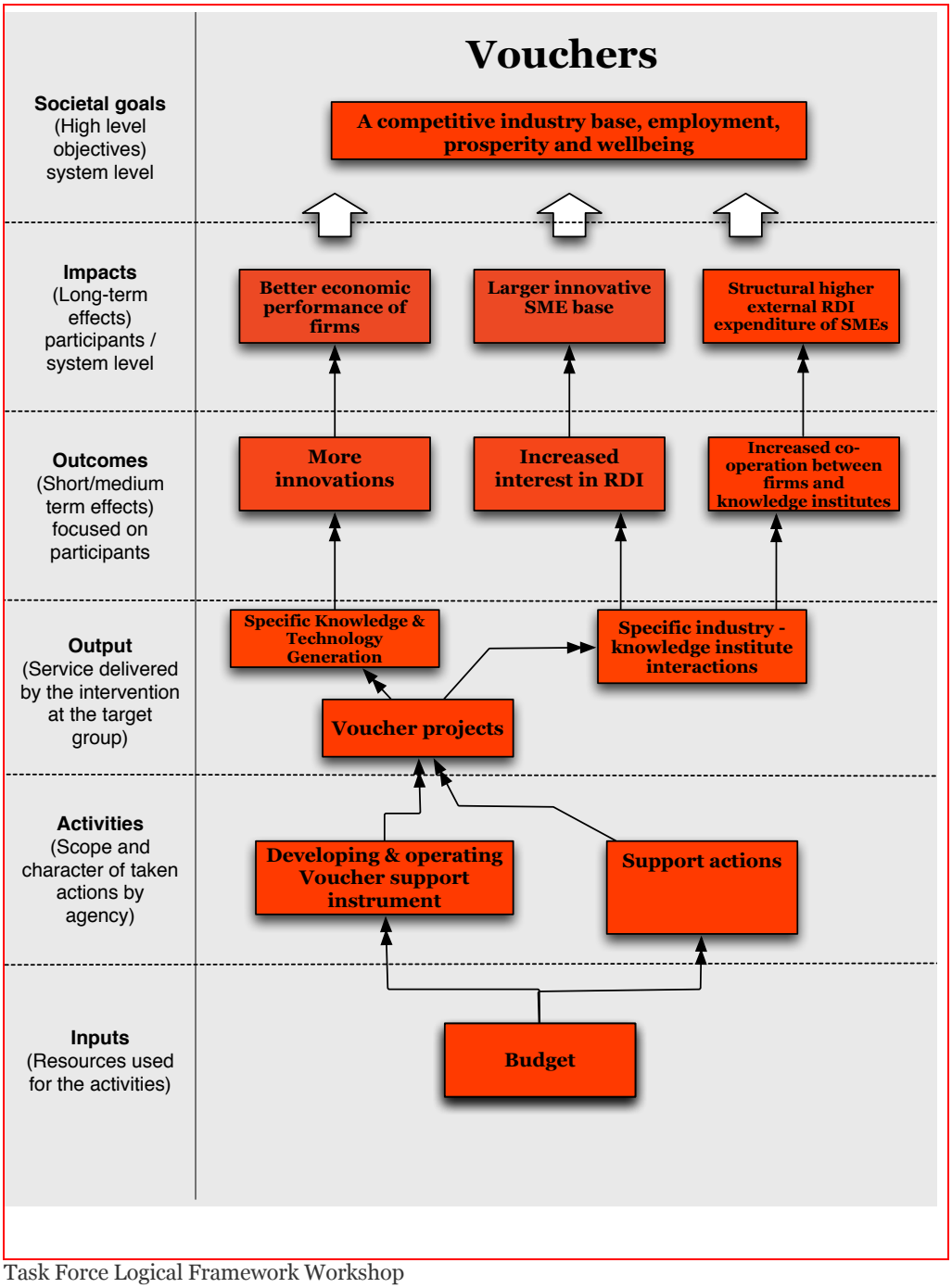

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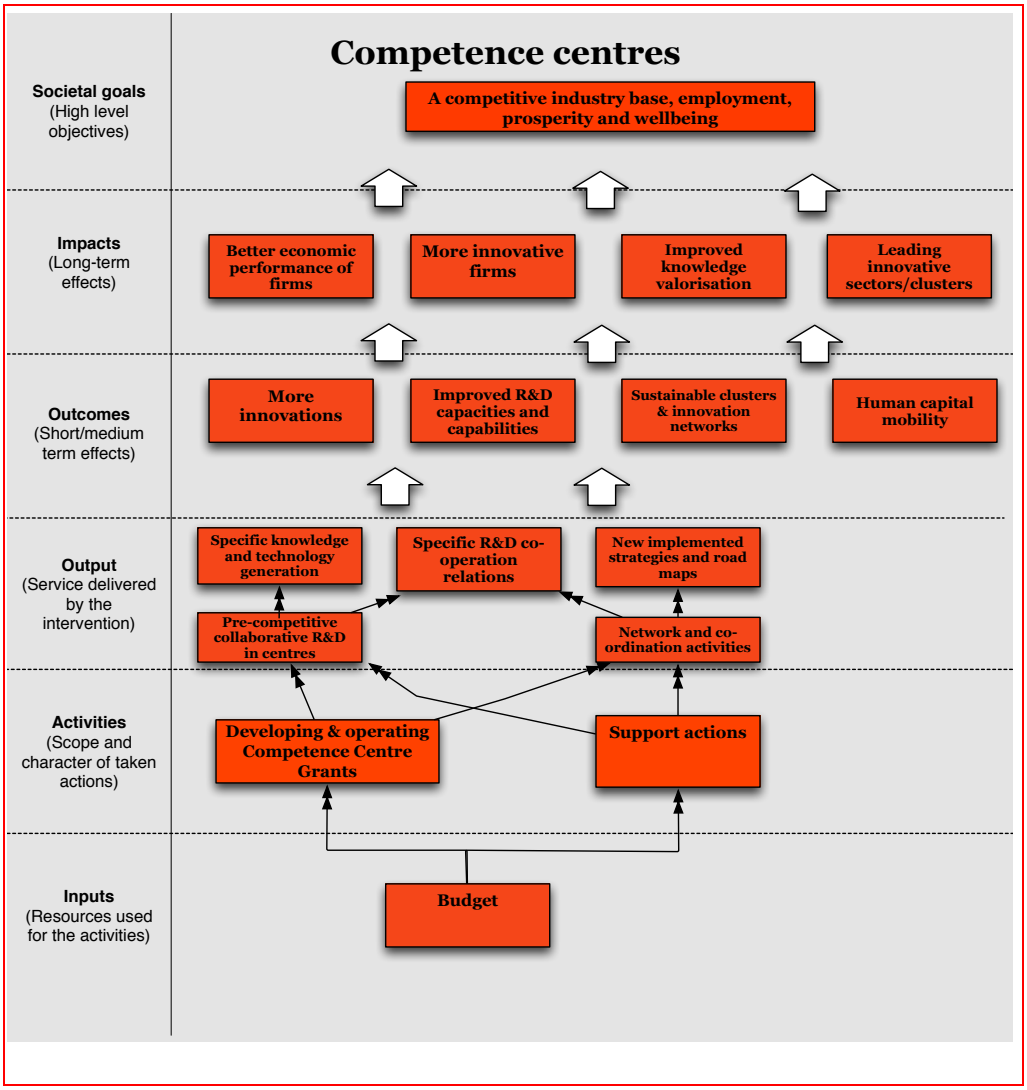
Figure 6 Logical Framework Competence centres



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