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EUROPEAN RESEARCH AREA  
AND INNOVATION COMMITTEE  
High Level Group for  
Joint Programming  

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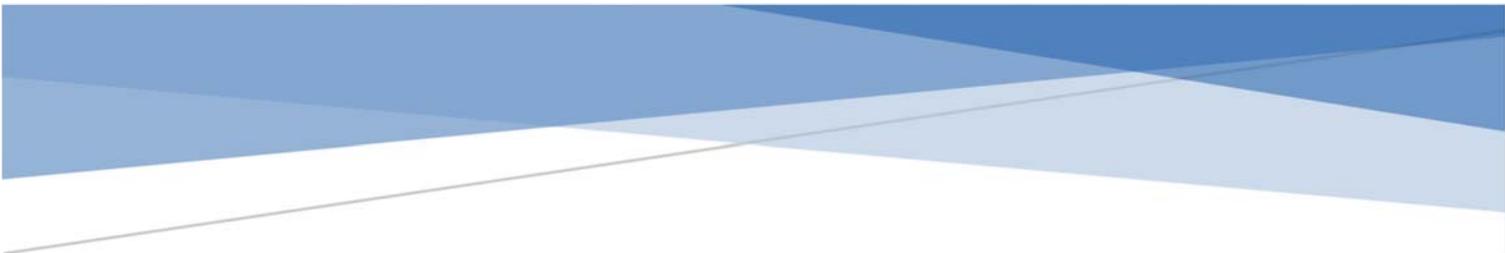
**NOTE**

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Subject: Report of the GPC Implementation Group 3 "Monitoring and evaluating JPIs"

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Delegations will find in the annex Report of the GPC Implementation Group 3 "Monitoring and evaluating JPIs", for adoption by the GPC in written procedure with deadline 9 June 2016.



# Implementation Group 3: MONITORING & EVALUATING JPIs

## FINAL REPORT

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31 May 2016

***Acknowledgments:***

***This report is the result of the joint work and efforts of the members of the ERAO GPC JG3. Without their active help and cooperative spirit this report would not have existed in its current depth of reflections and wealth of details. I want to thank them sincerely for their suggestions, graphics, corrections and insights. In particular, the important contribution of the Portuguese expert, Maria João Sequeira who relentlessly delivered input and comments, stands out and hence deserves a special mention: thank you very much Maria !***

***Peter (rapporteur)***



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## 1 Executive Summary

The Implementation Group 3 (IG3) has mainly focused its work on the development of minimum conditions for the assessment of new and existing JPIs. In order to assess new and existing JPIs, the IG3 developed a multi-dimensional set of criteria on which the JPIs have to provide sufficient information to the GPC to compose an informed advice to the Competitiveness Council on whether to start a new JPI or maintain an existing JPI. The criteria and minimum conditions are arranged in assessment process differentiating between new and existing JPIs. In the former case, the GPC *assesses the quality of the information* contained in the proposal for a new JPI. In the latter case, the framework of criteria functions as the “*reference*” for a dedicated GPC working group that is supposed to reflect on *the long term strategy and operations of the existing JPIs and the Joint Programming Process, in particular regarding the relationship with the next framework programme*. By using the same reference frame, a consistent quality of the information provided by the various JPIs regarding their long term plans should be achieved. A distinction is made between new and existing JPIs as a new JPI mostly carries a “promise” on impact while existing JPIs should be able to demonstrate concrete forms of societal impact. A focus moving from input to impact, from research to innovation as well as the existence of a capacity and ability to adapt itself to the societal context changing over time are logical considerations when assessing existing JPIs.

It is also the strong conviction of the IG3 that the activity of assessing and monitoring JPIs is not to be carried out by the IG3 nor the GPC, but by knowledgeable and objective experts. Nevertheless, by providing criteria and minimum conditions, the IG3 contributes to enhancing the quality of the overall political decision making process on JPIs: instead of basing decisions on vaguely expressed ideas, essential elements have to be sufficiently elaborated on and presented to the GPC beforehand and in a formal way. The IG3 considers that the acceptance or continuation of a JPI stands for the attribution of a “quality mark” that should not be given all too lightly. The IG3 suggests that the JPI mark of quality should translate into some form of longer term support by the next framework programme for (parts of) a JPI’s SRA or SRIA.

For the future, the IG3 is eager to see its work (criteria, assessment process, quality control check, scoring mechanism, minimum conditions) pass the test of reality. GPC opinions on “upcoming” JPIs on the one hand and the elaboration of the next framework programme on the other are a most suited opportunity. In the former case, the incremental procedure can be put to the test quite rapidly. In the latter case, with the advent of the preparation for the next framework programme, the existing JPIs can apply the set of criteria to frame their long term strategy and future operations.

With its work and report, the IG3 hopes to have delivered yet another modest but meaningful contribution to the JPP and the GPC activities.

## 2 Introduction

The Implementation Group 3 (IG3) has received a **three-fold goal** with the adoption of its mandate by the GPC:

1. Contribute to the preparation of the assessment on the success of all JPIs and their development
2. Propose how to measure the performance and impact of JPIs and the JPP
3. Develop minimum conditions for the assessment of JPIs

This assignment is highly challenging, both time-wise and intellectually. Luckily, the IG3 was able to draw on the work of other working groups and/or expert groups to “align” its activities. The first goal was addressed by what we call the “Hunter & Hernani Expert Group” while the second task was taken up by the ERA LEARN 2020 ERA-net project (deliverable D3.2). Consequently, the IG3 didn’t address these two topics directly but examined their outcomes and took relevant items into account in its own work.

The third goal, to develop minimum conditions for the assessment of JPIs, has been fully taken up by the IG3. After some discussion, its members decided that:

- |   |
|---|
| <ol style="list-style-type: none"><li>1) a multidimensional and flexible framework was needed</li><li>2) that should be based on some basic, strategic principles</li><li>3) and integrated in a simple process</li><li>4) whereby a distinction is to be made between proposals for new JPIs and existing JPIs</li></ol> |
|---|

During its first meetings the IG3 debated about its goals and how to reach them (cf. above). Members gathered and circulated relevant background information for further study. As the reports by the “Hunter & Hernani Expert Group” and the ERA Learn 2020 project were not yet available, the IG3 started to work on WP3 first while trying to stay abreast with the activities of the expert group<sup>1</sup> and the ERA Learn 2020 project<sup>2</sup>.

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<sup>1</sup> The IG3 Chair was invited as an expert for the Hunter & Hernani group.

<sup>2</sup> Although it was initially foreseen that an ERA Learn 2020 project member would occasionally participate in IG3 meetings, in practice only a short meeting before the ERA LEARN 2020 Joint Programming Conference took place..

Specifically for WP3, IG3 members first defined some strategic principles (cf. below). In a few open discussions, IG3 members suggested several potential criteria to assess JPIs considering various perspectives, critical to a more intertwined and consistent approach, and allowing for a further analytical insight. These were organised and extended after several iterations into a multi-layered framework of axes, dimensions and cross-cutting facets, in order to capture the state of the art (existing JPIs) or the potential (new JPIs), in all its multiplicity, nodal points, leveraging factors, capabilities and shortcomings. Later on, a procedure has been added to apply the entire framework in practice, with the definition of four steps, the identification of minimum conditions and the addition of a meta-question. The last IG3 meetings were mainly practical sessions to reformulate the phrasings (both of the text and the criteria) and to validate the content of the report.

In the meantime, the report grew considerably with correspondence tables linking the IG3 work to the work of the Hunter & Hernani expert group and the ERA Learn 2020 deliverable D3.2, mainly stressing the overall convergence of these independent processes and bridging not fully coincident features.

At a final stage, some additional and complementary criteria (based on the work of both groups mentioned) have been integrated in the IG3 framework. Some adaptations of the description of a criterion have been done to stress certain aspects contained in the Council Conclusions of 2008, the ERA Learn 2020 report and the Hunter & Hernani expert group report but till then only implicitly addressed by IG3 criteria.

The strategic principles agreed upon are the following ones:

- The framework to be set up is to function as a quality control tool for the decision process by the GPC;
- A proposal for a new JPI has to clearly prove its “future worth” before the GPC can draft an advice for a Council decision;
- The qualification ‘JPI’ is to be considered as an overall label of quality, importance and scale and, hence, not to be awarded or maintained too easily;
- With the extending lifespan of a JPI, the assessment focus should be moving from scientific results and input in an early stage to solutions, innovative applications or societal benefits and impact in subsequent stages;
- The assessment of existing JPIs is not to be performed by IG3 nor GPC members but by independent and/or domestic experts;
- The European Commission has an important role to fulfill in assessing as well as “supporting” well performing JPIs.

The IG3 came up with a framework of four axes, eight dimensions, eighteen facets resulting in 49 different assessment criteria for new JPIs and 32 for existing JPIs. The “impact” dimension additionally has a triple differentiation into short, medium and long term impacts. 17 of the 49 criteria for new JPIs and 15 of the 32 criteria for existing JPIs are considered as minimum conditions, i.e. a criterion on which a JPI simply cannot fail. The criteria for new JPIs have been distributed over a two-step procedure during which the quality of the information addressing the criteria is assessed, while the criteria for existing JPIs have to serve as a reference for a future reflection on their long term strategy and operations.

For the future, the IG3 is eager to see its work (criteria, minimum conditions, assessment process) pass the test of reality. GPC opinions on “upcoming” JPIs on the one hand and the elaboration of a new framework programme on the other are a most suited opportunity. In the former case, it seems that the incremental procedure can be put to the test quite rapidly with the upcoming proposal for a JPI on Migration and Integration. In the latter case, JPIs could evolve by getting a more strategic role in the next framework programme and by receiving a long term support by the European Commission (EC) in the appropriate parts of the next framework work programmes. Reflections on the evolving nature of the JPP in general and the long term strategy and future mode of operating for existing JPIs should be framed in terms of the IG3 criteria.

The remainder of this report is organised as follows. The subsequent chapter (chapter 3) provides an overview and introduction (section 3.1) to **the main concepts of joint programming and the joint programming process in general**. It also sketches the various stages in the process so far (section 3.2) that should result in a more proactive attitude by the European Member States and Associated Countries to tackle together important global societal challenges.

As the IG3 has been given a specific mandate and tasks, in a nutshell to develop a framework to assess JPIs, chapter 4 **discusses first related and previous work in that domain** (section 4.1) as well as the mandate and three tasks of the IG3 itself (section 4.2). The content of each IG3 task (work package) is compared to work and reports presented in the previous section. The IG3 studied the relevance of the related work, and included in this report those parts that it considered relevant given its mandate. It is important to note that most of the work by the various groups has been done independently so that the various commonalities in their respective reports are mutually strengthening the various results.

The core of the report concerns the framework proposed by the IG3 (chapter 5), namely **a list of conditions organised as a multidimensional set of criteria** (section 5.3) integrated in a procedure (section 5.2). This framework is supposed to act as a quality control tool for the GPC to draft its advice to the Council regarding the adoption of new JPIs and the continuation of existing JPIs. The framework is based on a limited number of clear strategic principles (section 5.1) that have guided the development of the framework. The details on the various elements and perspectives included in the framework are presented (sections 5.3.1, 5.3.2 and 5.3.3), with a more in-depth discussion on difference in impact grouped in section 5.3.4.

The conclusion (chapter 6) to this report consists of a concise **overview of the results and some recommendations** by the IG3 for a further refinement of the procedure and criteria. The fact that a proposal for a new JPI is imminent provides an excellent opportunity to test in practice how robust and effective the new IG3 framework is.

The annexes (chapter 7) group some general information about the IG3 (sections 7.1 and 7.2), some background reading (sections 7.3, 7.4, 7.8 and 7.9), some tables (section 7.5) with the basic material concerning the impact discussion of section 5.3.4, but more importantly the **complete list of assessment criteria** (the multidimensional set of conditions) for new (section 7.6) and existing (section 7.7) JPIs.

### 3 Overview

**Joint Programming (JP)** has to be approached in a broad context, namely in the remit of European Research Area (ERA)<sup>3</sup> and of one of its most structuring axes - the Europe 2020 Strategy and one of its flagship initiatives, the Innovation Union. JP is expected to play a major role and become one of the building blocks of the Innovation Union, together with other policy instruments. Therefore this section provides an overview and introduction to the most important concepts regarding the Joint Programming (section 3.1) as well as the different stages of its recent developments (section 3.2).

#### 3.1 Joint Programming: main concepts

As mentioned in several documents, **Joint Programming (JP)**<sup>4</sup> embraces the idea of Member States (MS) and Associated Countries (AC)<sup>5</sup> engaging voluntarily and on a variable-geometry basis<sup>6</sup> in the definition, development and implementation of common strategic research and innovation agendas based on a **common vision of how to address major societal challenges** and achieve tangible societal impact. It may involve strategic collaboration between existing national/regional programmes and projects or jointly planning and setting up entirely new ones. It entails placing resources together, selecting or developing the most appropriate instrument(s), implementing, and collectively monitoring and reviewing progress. It aims to increase and improve cross-border collaboration, coordination and integration of participating countries publicly funded research programmes and projects in a limited number of strategic areas. It requires a new mindset in the participating countries, and above all, tangible commitments and actions by participating countries and a rethinking and reorganisation of the way national/regional research programmes are defined and implemented.

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<sup>3</sup> A short history on the concept of the European Research Area can be found here: :

[http://www.europarl.europa.eu/RegData/etudes/IDAN/2016/579097/EPRS\\_IDA%282016%29579097\\_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/IDAN/2016/579097/EPRS_IDA%282016%29579097_EN.pdf)

<sup>4</sup> Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions of 15 July 2008: "Towards Joint Programming in Research: Working together to tackle common challenges more effectively" [COM(2008) 468 final.

<sup>5</sup> From this point on, we refer to MS and AC by the term 'participating country'.

<sup>6</sup> Cf. [http://eur-lex.europa.eu/summary/glossary/variable\\_geometry\\_europe.html](http://eur-lex.europa.eu/summary/glossary/variable_geometry_europe.html) for a general definition. In the context of the GPC, the notions has acquired a more specific meaning: "participation of Member States in each initiative is 'à la carte', based on voluntary commitments leading to partnerships composed of variable groups of countries" (cf. [http://ec.europa.eu/research/era/how-does-it-work\\_en.html](http://ec.europa.eu/research/era/how-does-it-work_en.html)).

The general concept of “process” is commonly defined as “a systematic series of actions directed to some end, continuous action, operation, or series of changes taking place in a definite manner”. Thereby, the **Joint Programming Process (JPP)** consists of the overall **enabling environment**, and comprises the whole set of **mechanisms, relationships and interactions** driven by participating countries.

Figure 1 emphasises the dynamics of the process: the turning movement of the cogwheels leading to several alignment points. The political level of decision (involving the European Commission (EC), the European Council, and national and regional governments) and the level of programming (European, national, regional, other) are part of JPP given their interactions. Nevertheless, as many R&I initiatives/instruments still remain national/regional not all interactions belong to the JP realm.

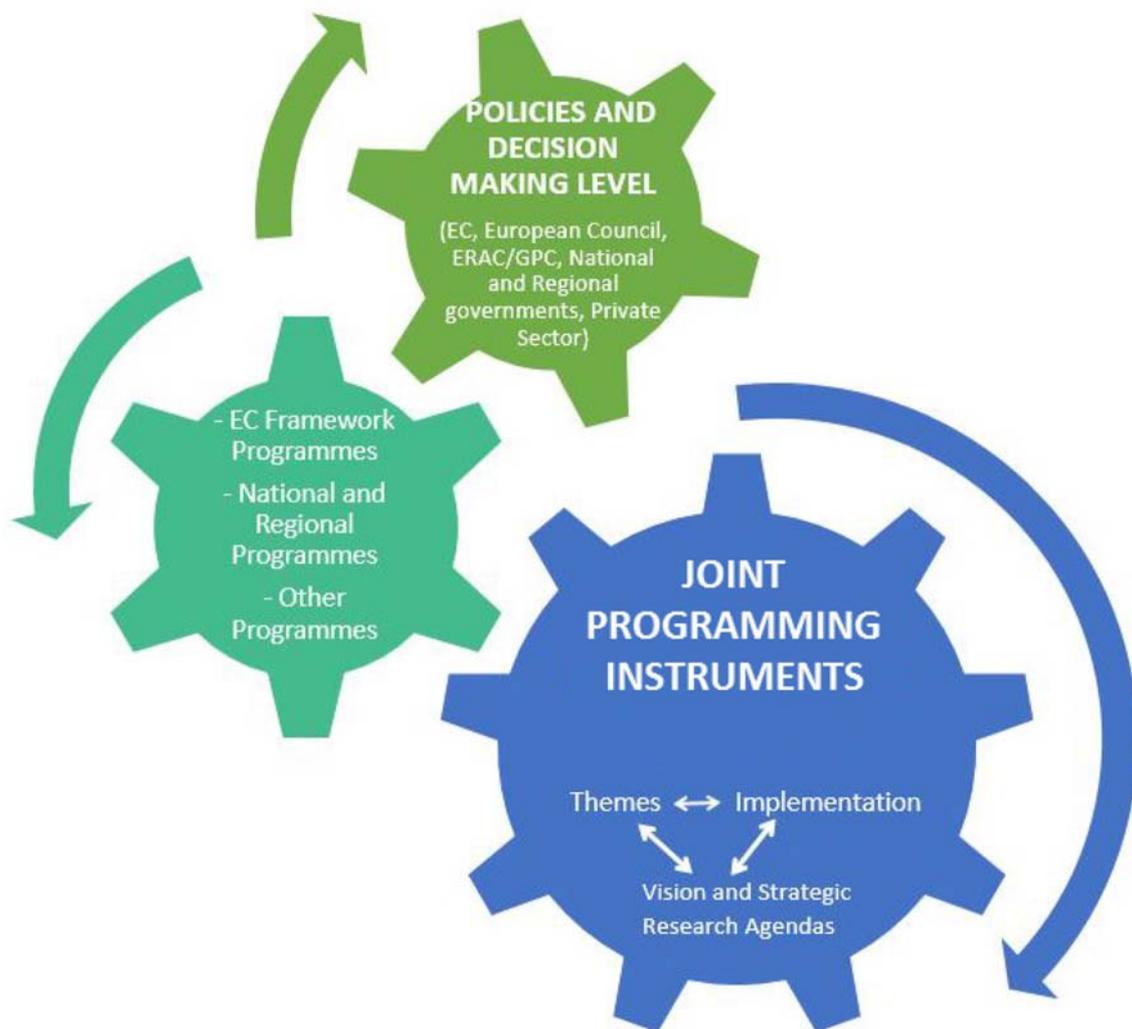


Figure 1: the joint programming approach

Policy design refers to the process of making choices, including the identification of different alternatives such as programmes or priorities (cf. Figure 2). Policies can be understood as political, management, financial, and administrative mechanisms arranged to reach explicit goals.

Ideally, the political level is deeply concerned with strong high level **commitment** by participating countries, involving dynamic, intense and sustainable interactions, and entailing a significant mobilisation of national/regional resources around a given theme. Thus, the political level would be a **key driver** to the JPP, triggering and being part of the whole process of joint programming, given the triangulations that can be observed between different actors and layers.

**The High Level Group for Joint Programming (GPC), a**

dedicated configuration of the European Research Area and Innovation Committee (ERAC) - was established in 2008 with a view to identifying a limited number of **Joint Programming Initiative (JPI) themes**<sup>7</sup> and to substantiating the **Joint Programming Process (JPP)** as a process driven by participating countries. The GPC is composed of high-level representatives of the EU member states, the associated countries, and the Commission. The GPC is assisted by the Council Secretariat. By its mandate, GPC functions as a key **forum** or body for the participating countries to discuss and implement the JPP.

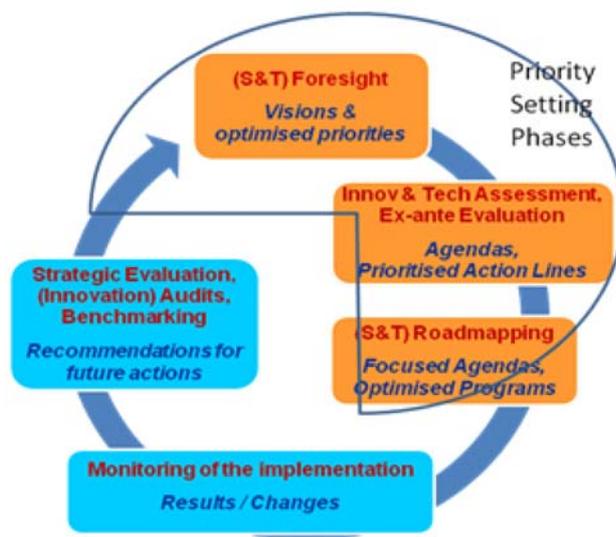


Figure 2: the policy cycle

<sup>7</sup> Following the Green Paper on the European Research Area (2007), The Communication of the Commission to the Council of 15 July 2008 “Towards Joint Programming in Research: Working together to tackle common challenges more effectively” proposed an ambitious new approach for making better use of Europe's limited public R&D investments through enhanced cooperation to tackle common societal challenges; The Council Conclusions on Joint Programming of 2 December 2008 welcomed the concept and objectives as formulated in the Commission Communication and launched Joint Programming as a MS-driven process, and to get into concrete joint programming.

JPIs are initiatives in specific areas or themes identified as priorities by the GPC members, through joint foresight exercises, and aim at addressing particular societal challenges. Countries can freely participate on a variable geometry basis and commit to mobilise resources (human and financial) to jointly achieve critical mass. Agreeing on a common vision and establishing a common Strategy Research (and Innovation) Agenda (SRA, SRIA) are very important steps in the life cycle of a JPI. Other stages regard implementation, monitoring and evaluation. They concern aligning the national/regional research and innovation strategies with Joint (European) priorities as expressed in the SRA or SRIA, improving interoperability of national/regional instruments, and impacting on the national and European R&D&I systems and societal challenges. The JPIs stand out as instruments of Joint Programming, and consequently they should fit together with several other P2P (public to public) initiatives already in place. There is room to develop synergies with other policy initiatives with a view to a continued streamlining. While some of the Commission's financial instruments, such as ERA-NETs (Plus and CoFund) and CSAs have been supportive to JPIs, a need remains for better coordination between JPIs and other initiatives, such as Joint Technology Initiatives, Article 185 initiatives and European Technology Platforms. There is also scope for more synergies between JPIs and ESFRI - and other infrastructures. And additionally with the COST and EUREKA programmes, and perhaps with initiatives such as EIPs and ETPs, that are other forms of Joint Programming.

**Alignment**<sup>8</sup> is at the core of the JPP: it is present in the setting of the themes, and of the agendas and in the triangulations. *Alignment is a strategic approach taken by participating countries to modify their national programmes, priorities or activities as a consequence of the adoption of joint research priorities in the context of Joint Programming with a view to implementing changes to improve efficiency of investment in research at the level of participating countries and ERA.* Aligning is seen as a **continuous process**, calling for monitoring the entire programming cycle including (cf. Figure 3):

- implicating key stakeholders;
- joint foresight;
- strategic process of translating an identified grand challenge into joint activities;
- development of strategic research agendas;
- developing SMART objectives;
- coherence with Horizon 2020, in the perspective of ERA and governance;
- joint processes of research practices;

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<sup>8</sup> Cf. Also the ERA-Learn 2020 deliverable 4.1- Report on the Definition and Typology of Alignment

- funding;
- implementation;
- ex-post evaluation;

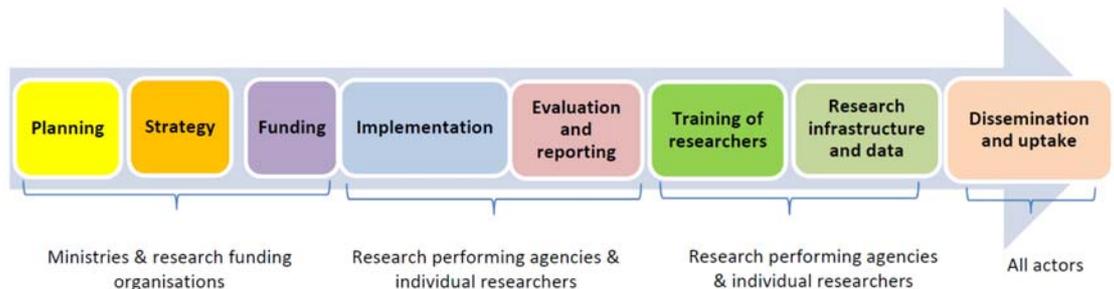


Figure 3: Alignment actions across the entire research programming cycle (source ERA Learn 2020 Del. 4.1 p. 7)

### 3.2 The Joint Programming Approach: main phases

As already mentioned, the Council Conclusions endorsed the concept of Joint Programming as a Member State-driven process in December 2008. The GPC (High Level Group for Joint Programming) identified themes for joint programming according to a continuous process and made a selection of them following broad consultation of the different regional, national and European scientific communities as well as other public and private stakeholders. Some criteria were defined to identify themes for joint programming (cf. box 1):

*box 1: Council conclusions concerning joint programming of research in Europe in response to major societal challenge*

Considers that the following criteria should help identify joint programming themes:

- there is a sufficient and effective commitment of Member States concerned,
- the theme addresses a European or global challenge and is sufficiently focused so that clear and realistic objectives can be laid down and followed up,
- it brings a clear added value to overall current research financed from national and Community public funds, as regards both economies of scale and better thematic coverage,
- relevant regional, national and European stakeholders, including where appropriate the private sector besides scientific communities and funding agencies, have been involved in developing the theme,
- a joint programming approach has the potential of translating the output of good public research into benefits for European citizens and European competitiveness and of increasing the efficiency and impact of public R & D financing by involving the key public initiatives in the area;

A comparison with the IG3 criteria (cf. section 5.3) showed that all but one of the Council criteria are covered (sometimes explicitly, sometimes implicitly) by the IG3 criteria (although they were defined without considering the Council Conclusions text). In order to better include the original criteria by the Council, the description of some criteria has been adapted. The dimension of “sustainability” has been added (as part of the governance and engagement axes – cf. section 5.3.2).

Four different periods in the JPP can be distinguished (cf. Figure 3).

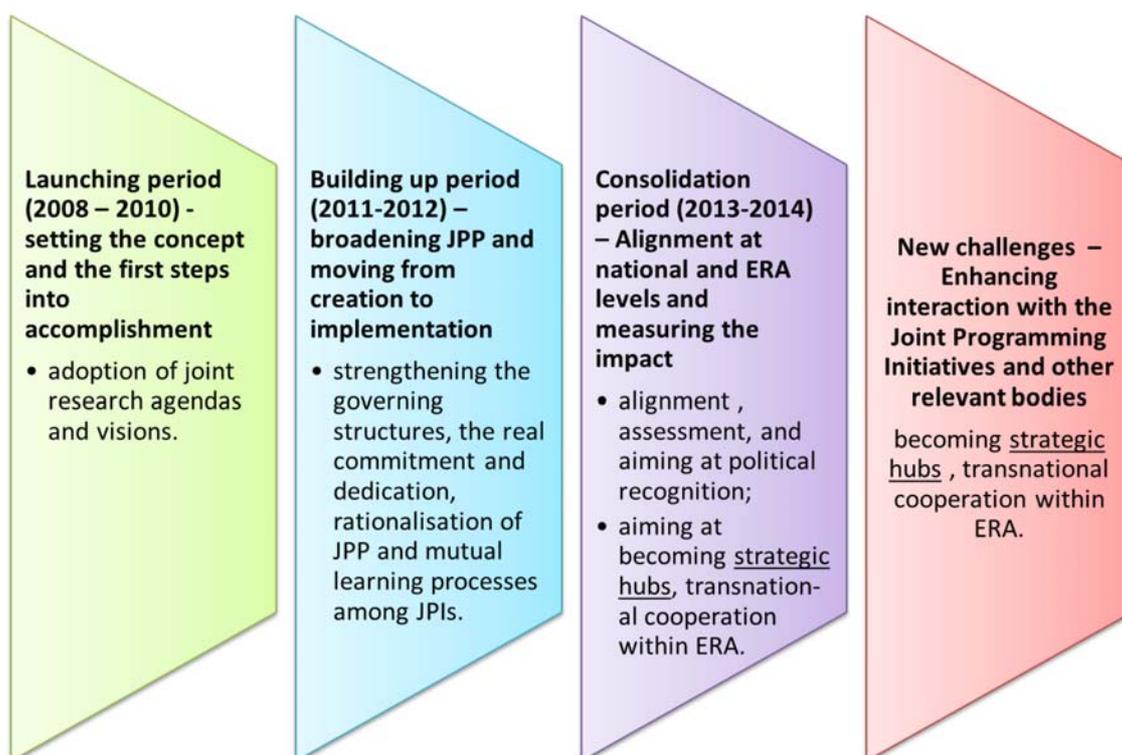


Figure 4: Joint Programming Process: maturation stages

For detailed information on the policy landmarks paving the way for joint programming, we refer the reader to section 7.3.

### 3.2.1 Launching period

The Council launched a first wave of four JPIs on the advice of the GPC:

- Alzheimer and other Neurodegenerative Diseases – JPND (2009)
- Agriculture, Food Security and Climate Change- FACCE (2010)
- Food and Health: Healthy Diet for a Healthy Life – JPI HDHL (2010)
- Cultural Heritage and Global Change: a New Challenge for Europe – JPI CH (2010)

The GPC also developed guidelines on Framework Conditions for Joint Programming, setting some elements crucial to the full development of the JPP: (i) commitment of participating countries, (ii) adoption of joint research agendas and visions, (iii) assigning to the JPIs the role of strategic hub or platform for research and innovation. Interoperability of procedures, alignment of national research activities, application of effective methods, and usage of parameters and indicators for measuring the impact of the JPIs on their respective societal challenge and the JPP were also considered important criteria.

### 3.2.2 Building up period

The launch of a second wave of six JPIs marked the second phase of the JPP:

- More Years Better Lives – The Potential and Challenges of Demographic Change – JPI MYBL (2011)
- Anti Microbial Resistance - The Microbial Challenge – an Emerging Threat to Human Health – JPI AMR (2011)
- Water Challenges for a Changing World – Water JPI (2011)
- Healthy Oceans – Healthy and Productive Seas and Oceans – JPI Oceans (2011)
- Connecting Climate Knowledge for Europe (Clik´EU) – JPI Climate (2011)
- Urban Europe – Global Urban Challenges, Joint European Solutions – JPI UE (2011)

The focus moved from the development of strategic research agendas, visions and initial activities to the **strengthening of governing structures, the real commitment and dedication, the rationalisation of the JPP and mutual learning processes among JPIs**. In 2012 an evaluation report (called the “Acheson report” – cf. section 4.1.1) was released by the independent Expert Group set up by the Commission. Also in 2012, the “JPIs ToCoWork” project was launched, aiming at supporting the approved JPIs.

*box 2: JPIs ToCoWork*

The main objective of JPIs To Co-Work has been to provide Joint Programming Initiatives (JPI), as transnational research programmes, with elements to better implement specific functions known as “Framework Conditions” (FC) (as defined in the document “Voluntary Guidelines on Framework Conditions for Joint Programming in Research 2010”: they include peer review, forward looking activities, evaluation of joint programmes, funding, dissemination and use of findings, and intellectual property rights). In a broader sense, they intended to promote the best contribution of JPIs to the priorities of the European Research Area within the strategy Europe 2020.

The work plan of JPIs TO CO-WORK is based on the following Work Packages (WP):

- WP1: Management structure, based on a direct project management approach to be implemented by the Project Coordinator (PC), the Project Manager (PM), the Project Steering Committee (PSC), and the Advisory Board of JPIs (ABJ).
- WP2: Foresight and ex-ante evaluation;
- WP3: Evaluation, including monitoring and ex-post evaluation, along with Governance issues;
- WP4: Peer Review and funding and management issues related to the Calls, both related to the implementation of the JPIs at operational level
- WP5: Dissemination, Intellectual Property and Innovation, all related to the transfer of research results to final users or beneficiaries.

### 3.2.3 Consolidation period

In this phase the creation of stronger ties, both vertical and horizontal, between the GPC, JPIs and the EC, became an important issue - translating into a continued JPP and a greater focus on the **governance and management** of JPIs, including **assessment, political recognition** and an enlarged concept of **alignment**<sup>9</sup>, as introduced by former commissioner Máire Geoghegan-Quinn. The GPC highlighted that “The state of alignment for a particular JPI is changing and developing over time”.

National strategies and research programmes should be aligned with the Strategic Research Agendas of the JPIs and with European Strategies and vice versa, contributing to the ERA Roadmap as an expression of the most salient priorities to complete the ERA. The JPP became in its quintessence a learning process, both for the policy makers and for research funding and research performing organisations.

Following the Dublin Conference on Joint Programming “Agenda for the Future & Achievements to Date”, under the Irish Presidency of the EU in 2013, the GPC started a reflection on the main actions to take forward the JPP. Along with these actions, four **Working Groups** were established by the GPC (September 2013 to September 2014):

1. Relations between the GPC and JPIs;
2. Alignment
3. Framework Conditions;
4. Measuring JPIs’ Progress and Impact.

By the nature of its process, the “maturity” of the JPP implied a need to measure its progress, and to assess the impact of the JPIs. Nine of the ten JPIs undertook a self-evaluation<sup>10</sup> (see box 4 on page 22) taking their initial vision as a reference frame using a framework developed by the GPC working group 4 on “measuring JPIs’ progress and impact” (cf. section 4.1.2).

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<sup>9</sup> The working group built on the work of the Co-Work” CSA, consulted additional experts, followed the conclusions from the session on Evaluation of JPIs in the 2013 Presidency Conference on Joint Programming.

<sup>10</sup> Evaluation of Joint Programming to Address Grand Societal Challenges (final report of the expert group), 2016, European Commission, p.18

### 3.2.4 New Challenges

One of the major challenges to be addressed in the coming years, after the basic conceptual issues were settled (relevance, scope and meaning of alignment), is improving the **interaction** between the JPIs and other relevant bodies acting in this area. The GPC's task of acting as **a strategic hub** or platform for participating countries, where trust must be built and evidence provided for political decision making, comes out as a fundamental target. By acting as an **intermediary** between politics, policies and practice, the GPC should contribute to **reducing unnecessary fragmentation and duplication of research initiatives and improving connections between initiatives**.

Another assignment of the GPC is to ensure that the implementation of the ERA is taken into account when developing national strategies to facilitate transnational cooperation, enabling a favorable environment for multilateral cooperation and contributing to the further implementation of the ERA - in accordance with the ERA-related groups, in particular the SFIC, and the "open to the world" policy of the Commission.

To cope with additional societal challenges in the future, specific processes are needed to adopt and set up **new JPIs** and detect potentially "obsolete" themes of **existing JPIs**. Inevitably existing JPIs could be "re-qualified" as the status of their corresponding societal challenge changes over time. A transparent and continuous monitoring process needs to be developed in a systematic way, including a broad consultation among the different public and private stakeholders and guaranteeing sufficient political support (cf. the policy cycle of Figure 2).

With the purpose of advising the GPC on the implementation of the ad-hoc Working Group's (WG) recommendations, three non-permanent Implementation Groups (IGs) were created for a maximum period of 1 year, starting in February 2015<sup>11</sup>:

1. IG1- Fostering and Mentoring JPI's;
2. IG2- Alignment and Improving Interoperability;
3. IG3- Monitoring and Evaluating JPIs.

By creating IG3<sup>12</sup>, the GPC initiated a process to develop criteria and minimum conditions for maintaining, creating and decommissioning JPIs (standardised as well as tailored approaches, with a considerable degree of flexibility).

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<sup>11</sup> Extendable for an equal period upon approval of the GPC Plenary

<sup>12</sup> We refer the reader to section 7.4 for details on the mandates of IG1 and IG2.

The **Lund 2015 declaration** highlights **alignment** as a key challenge according to which the European scientific eco-system should be based on “strategies” where various stakeholders, from researchers to society, cooperate and contribute to jointly find solutions to global societal challenges and to implement and apply them. The Lund 2015 declaration additionally includes other key challenges, such as **global mobility**, a necessary element in the European scientific eco-system, the need for a robust scientific eco-system based on **frontier research** and finally the demand for **real impact in implementation**, as prosperity and competitiveness are dependent on the ability to secure socio-economic impact from investments in research and innovation.

## 4 Monitoring and Evaluating JPIs

Assessing JPIs is not to be “invented” from scratch. Earlier groups have shed their light on the matter and have compiled reports with recommendations for future improvements (section 4.1). Although each expert group or working group had its specific perspective, their outcomes are worth study by the IG3, were compared to its line of thinking and were taken into account (sometimes in a modified form) in the IG3 framework. Three reports have been examined and are summarised:

- 1) The Acheson Expert Group Report (section 4.1.1)
- 2) The GPC Working Group on Measuring JPIs’ Progress and Impact (section 4.1.2)
- 3) The Hunter & Hernani expert Group Report (section 4.1.3)

In section 4.2, the mandate of the IG3 is discussed in detail. Its three work packages are described and a comparison with the earlier work (cf. section 4.1) is given. The three work packages are:

- 1) JPI Assessment (section 4.2.1)
- 2) Evaluation of performance and impact of JPIs and the JPP (section 4.2.2)
- 3) Development of Minimum Conditions for JPIs (section 4.2.3)

The relationships discussed in section 4.2.2 between the related work and the IG3 framework already gives a preview of the IG3 framework, although the in-depth presentation of the IG3 framework is given in chapter 5.

### 4.1 Previous steps

#### 4.1.1 The “Acheson” expert group

In 2012, the European Commission invited an Expert Group chaired by Helena Acheson to undertake **the first formal review of the JPP** and suggested ways for improvement (cf. section 3.2.2).

As stated in the Acheson Report “Review of the Joint Programming Process”<sup>13</sup> (cf. box 3), the overall conclusions reached by the Expert Group stressed that, in spite of the good start, the process can only reach its full potential with continued commitment and financial support by participating countries. Sustainable JPIS require time to build up the necessary trust to engage in multi-annual joint programming activities and to integrate national/regional research activities according to their SR(I)As. A wide range of activities (stakeholder consultation, development and adoption of SRAs, launching joint calls etc.) had been undertaken so far by the JPIS. However, the Expert Group was still concerned with the level of national/regional commitment to the ultimate objectives at stake, since no JPI had reached the stage of implementing multi-annual joint programmes and cooperation throughout the policy cycle.

*box 3: “Acheson report” recommendations*

The “Acheson Expert Group” recommendations were grouped as follows:

The 10 JPIS should:

- enhance trust between the participants - when the necessary level of trust has been achieved, JPIS should further explore the use of Article 185 and other ERA instruments,
- maintain the principle of open participation for participating countries and use trans-disciplinary inputs, including from industry and other societal actors, where appropriate,
- promote their achievements, particularly to the national and EU level policy makers in order to demonstrate impact and be more effective at communicating the SRAs back to all national levels, and
- promote shared use of existing key infrastructures and make “smart” use of H2020 instruments.

*The participating countries should:*

- increasingly inform and align national strategies and programmes with the JPI SRAs,
- acknowledge that acting alone cannot solve societal challenges and invest their resources in order to experience the benefits arising from Joint Programming,
- consider how many JPIS they can maintain a sustainable commitment to and ensure that national administrations are sufficiently involved, and
- use the Smart Specialisation Strategy process to identify, prioritise and engage in JPI - related research and innovation activities.

*The European Commission should:*

- provide greater clarification on the role and focus of each instrument on the ERA landscape, and their respective interdependencies,
- continue to support the JPIS with CSAs in H2020 and the EFFLA work as it could be a supportive partner for the GPC for future priority setting,
- undertake an evaluation of the JPIS at the end of FP7 and at the mid-term point of H2020,
- consider the ERA-FRAME option if the renewed political will, called for in the Commission’s 2012 ERA Communication, does not materialize, and
- open a dialogue between the JPIS and the H2020 Programme Committees

<sup>13</sup> [http://ec.europa.eu/research/era/pdf/jp-expert-group-22102012-report\\_en.pdf](http://ec.europa.eu/research/era/pdf/jp-expert-group-22102012-report_en.pdf)

Regarding the evaluation of the JPP and JPIs, this report addressed concisely the issues of impact assessment and benefit assessment, keeping in mind that JPIs were still very young back in 2012.

On the *impact assessment*, the Expert Group considered at that time that “all JPIs have created visions and set up long-term strategic goals”. Moreover, the Expert Group already identified impact on some stakeholders, at the policy and funding levels, with the development of some national programmes following the launch of JPIs.

On the *benefit assessment*, the Experts Group examined five items with the following conclusions:

- 1) Addressing common challenges: the 10 JPIs indeed address issues that cannot be tackled by a single country.
- 2) Eliminating wasteful duplication: various initiatives such as mapping, adoption of SRIA or joint calls help for this purpose.
- 3) Reaching the required scale: it was still work in progress.
- 4) Promoting excellence: this was encouraged through joint calls.
- 5) Facilitating pooling: JPIs were indeed working toward pooling of data and expertise.

#### 4.1.2 GPC Working Group on “Measuring JPIs’ Progress and Impact”

As mentioned earlier, one of the four GPC WGs launched in 2012 dealt with the assessment of the JPIs. The mandate of the **WG5 “Measuring JPIs’ Progress and Impact”** was to give suggestions for measuring JPIs progress and assessing JPIs impact, as well as to contribute to the Terms of Reference of an eventual evaluation of the JPI foreseen by the Commission. Measuring and demonstrating progress and impact of the JPIs is necessary to make the JPP more attractive in Europe and at the international level as additional commitment, increased participation and more support of more countries is targeted. The WG5 focused its work on the development of a set of criteria and a questionnaire for the **self-assessment of the JPIs** (cf. box 4).

##### *box 4: Self-Assessment of JPIs*

Following the recommendation of the WG ‘Measuring JPIs’ Progress and Impact’ the GPC asked the JPIs to provide a Self-Assessment, using the questionnaire designed by the WG. The main lessons from the JPI Self-Assessments were:

- Eight of the 10 JPIs had adopted a SRA/SRIA and two were planning to define their agendas later in 2015.
- By the end of 2014, the 10 JPIs together will have launched 25 Joint Calls, investing about €200 million.
- Most of the JPIs are interacting with third countries and multilateral organisations. Canada is the most active third country – all continents are currently associated to at least one JPI.
- Researchers and stakeholders have been involved in the definition of the JPIs’ SRIAs, thus ensuring that the programming of the research reflects the views of both communities. The involvement of key decision makers and key partners was more challenging.
- All JPIs have been using the six Framework Conditions identified in 2010, whilst not striving to specifically identify which of the practices suggested by the Guidelines each JPI has used. One condition that is less developed is the exploitation of results.
- Alignment of national research has been the focus of most JPIs since 2013, but it was proving particularly difficult for JPIs addressing complex challenges. Many JPIs recognise the need to mobilise institutional funding programmes.
- Only three JPIs (JNPD, FACCE and WATER) had estimated the data related to the total investment in research programmes, addressing their Societal Challenge.

As a template for the assessment of JPIs, the WG5 developed a “Canvas” based on a 3x3 matrix. Three dimensions were considered for JPIs: governing policy making, research performance and definition of societal needs. For each dimension, three elements were considered: structure, process and outcome. As a result, a total of 27 criteria were set up for this Canvas.

Based on this Canvas and also on the work done by the Horizon 2020 CSA project “JPI to CoWork”, the WG5 set up a questionnaire for JPI self-assessment (called the “Selfie”) and analysed the selfies of the JPIs. As a result the WG5 compiled the following main recommendations:

- The evaluation is not a ranking of JPIs but an assessment against the respective visions developed by each JPI
- JPIs should develop SMART<sup>14</sup> objectives for their impact on the major societal challenge they are addressing
- A good proxy for measuring societal impact is the implication of key stakeholders in the definition and the governance of a JPI.

WG5 acknowledged the fact that measuring the societal impact of Research and Innovation actions takes time.

#### 4.1.3 The “Hunter & Hernani” Expert Group

The expert group identified in its report (which we conveniently call the Hunter & Hernani” report to distinguish it from the “Acheson report”) two sets of four indicators to assess the performance of the JPIs: one regarding the progress towards impact on the societal challenge (1-4) and one on the mobilisation of co-investment and alignment actions (5-8).

1. Positioning within the European societal challenge landscape
2. International research leadership
3. Driving demand for innovative new solutions
4. Variety of joint actions and instruments (used or developed by the JPI)
5. Investment in joint research and innovation projects
6. Share of total national investment in the subject of the JPI
7. Degree of national alignment
8. Sustainability of the JPI infrastructure

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<sup>14</sup> Specific, Measurable, Adequate/Achievable, Realistic/Relevant and Time-related (Peter Drucker, "Management Tasks, Responsibilities, Practices", Harper & Row, 1973)

The Hunter & Hernani expert group investigated for each JPI (and additionally for some other joint programming projects) how well they scored on each indicator, and combined their scores (as well as an average) in various spider diagrams.

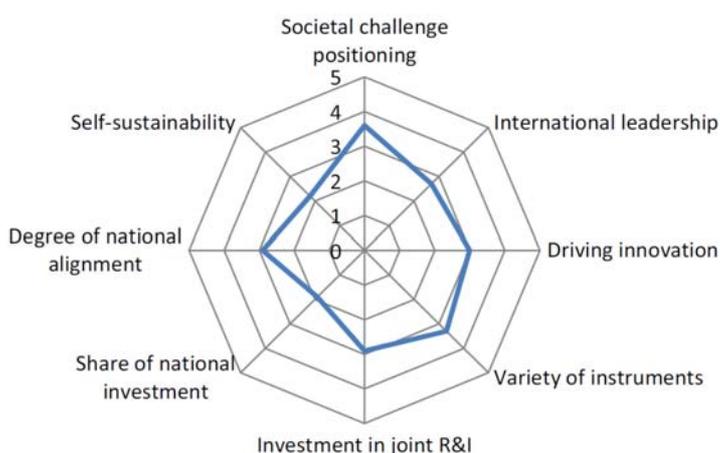


Figure 5: average JPI performance

Comparing the spider diagrams gives a quite

clear overview of the strengths and weaknesses of the JPIs at that point in time. From the spider diagram representing the average JPI performance (cf. Figure 5), it is very clear that the share of national investment is a very critical point. However, some care must be taken when drawing conclusions as the diagrams do not represent the fact that the JPIs have a different life time (and hence, that some are already more mature than others).

Moreover, the expert group identified a series of success factors that can also be considered for our work on evaluation and assessment:

- Quality of Strategic Research and Innovation Agendas
- Supportive national structures (“mirror groups” for instance)
- Strategic use of EU instruments
- Visionary leadership (including involvement of stakeholders, interdisciplinary research, international visibility)
- Executive team (human and financial resources)
- Collaboration between JPIs (synergies e.g., for joint calls)
- Use of experts (such as ERA-LEARN 2020)
- Supportive Commission Directorate (DG RTD)

The expert group also identified several more problematic issues that need to be further addressed:

- Ambition and national commitment
- Alignment (including national coordination)
- Budget and sustainability
- More actions toward innovation

## 4.2 IG3 Mandate

The Mandate of the GPC IG3 is building a monitoring process to measure the impact of each JPI, the GPC and the JPP as a whole on the relevant challenges. In practice, some consideration will be given to the (unevenly) growing maturity of most JPIs, in full operation for a period of already 3 to 5 years. This process was meant to be developed under the following work packages:

- WP1: JPI Assessment;
- WP2: Evaluation for performance and impact of JPIs and JPP;
- WP 3: Development of minimum conditions for JPIs

### 4.2.1 WP1: JPI Assessment

The (self-)assessment and evaluation of JPIs is to be focused on the success of all JPIs and their development in respect to their visions as presented to the GPC, on their strategies and on the Council Conclusions that launched them.

For this purpose, the already mentioned EC expert group was commissioned with the following tasks:

- Evaluate progress by member states (participating countries) on Joint Programming (and identify remaining challenges);
- Assess the current commitment by participating countries (including the progress of alignment);
- Define success criteria and entry/exit criteria;
- Consider some priorities for participating countries (recommendations for the future).

The EC decided on a qualitative evaluation and therefore to combine a desk study of already available material with new interviews with JPI stakeholders, GPC chair and vice-chair, GPC members, national representatives in the JPIs' management boards, funding agencies, etc. The Chair of IG3 was invited to be a member of the Hunter & Hernani expert group that conducted the qualitative evaluation.

The Hunter & Hernani expert group developed a broad approach far beyond a mere qualitative assessment – mostly embracing the whole JPP scope - and identified, with particular relevance to this report, a twofold set of factors – what they call the key *success factors* (cf. Table 1) and the key *bottlenecks* (cf. Table 2) – fostering or hindering the development of the JPIs (and the JPP). These factors, together with the already mentioned set of eight indicators (cf. section 4.1.3) to assess the progress of an individual JPI to an increasingly influential role in its societal challenge, provide an important framework for the evaluation and monitoring of the JPP and JPIs. These activities of the Hunter & Hernani expert group seemed to completely match with the IG3 WP1 description on assessing JPIs on their goals and on giving relevant insight into both strategic and more operational driving factors.

As previously mentioned, the JP, the JPP and the JPIs, although liable to specific conceptual definitions, are inextricable realities, interacting by nature. In this sense, the Hunter & Hernani expert group report also developed *specific issues* regarding the several pertinent *stakeholders* (national stakeholders, GPC, JPIs and European Commission), important as they are in their multiple triangulations, most of which will also be taken into account in this report, although some in a rather implicit way.

Table 1: Hunter & Hernani Success Factors mapped to the IG3 criteria

<b>Hunter &amp; Hernani Expert Group Report</b>	<b>IG3</b>
<i>Success Factors</i>	<i>Axis: Dimensions&gt;Facets</i>
<b>SRA/SRIAS</b>	
<i>Mutual learning benefit, building trust and joint ownership, communication tool, political awareness, engagement with international peer research funding bodies, innovation dimension</i>	<i>Governance: Maturity &gt; Strategic Vision Governance: Robustness &gt; Openness</i>
<b>Supportive national structures</b>	
<i>Alignment of national structures, as mirror groups</i>	<i>Complementary</i>
<b>Strategic use of EU instruments</b>	
<i>Development of JPIs own instruments for collaboration (knowledge hubs) and full advantage of EU funding instruments to leverage impact</i>	<i>Complementary Engagement: Critical mass &gt; Resources</i>
<b>Visionary leadership</b>	
<i>Pioneering role in transforming traditional research structures towards cross-cutting and interdisciplinary research (involving societal and industrial stakeholders, providing better scientific input to policy</i>	<i>Governance: Robustness &gt; Openness Results: Value Added &gt; R&amp;D&amp;I Results: Maturity &gt; Leadership</i>
<b>Executive team:</b>	
<i>Well resourced executive team who really understand the domain of the JPI</i>	<i>Governance: Maturity &gt; Leadership Governance: Robustness &gt; Sustainability</i>
<b>Collaboration between JPIs</b>	
<i>Synergies between JPI and engaging in joint actions where there is overlapping priorities and common stakeholders</i>	<i>Complementary</i>
<b>Use of experts</b>	
<i>Relevant experts can add considerable value to the work of JPIs (ERA LEARN 2020 example)</i>	<i>Complementary</i>
<b>Supportive Comission Directorate</b>	
<i>2nd round of CSA funding and inclusion of opportunities for ERA-NET CoFund actions in the work programmes, in spite of the concerns about JPIs dependency</i>	<i>Complementary</i>

Given the Hunter & Hernani expert group's mandate, the role of IG3 was narrowed down to commenting and studying the expert's group report that was published in March 2016.<sup>15</sup> The IG3 developed in the present report some recommendations on criteria for the assessment of existing JPIs as well as for the selection/adoption of new ones (cf. also section 2).

<sup>15</sup> We recall that the IG3 Chair became member of the expert group.

Table 2: Hunter & Hernani Bottlenecks mapped to the IG3 criteria

<b>Hunter &amp; Hernani Expert Group Report</b>	<b>IG3</b>
<i>Bottlenecks</i>	<i>Axis:Dimensions &gt; Facets</i>
<b>Ambition</b>	
<i>Political structures often don't succeed in involving many societal actors as this becomes an obstacle for the European cooperation arena, assuming JPIs were properly selected,</i>	<i>Governance: Robustness &gt; Openness Engagement: Robustness &gt; Quality of Actors Engagement: Critical mass &gt; Quality of Actors</i>
<b>Commitment</b>	
<i>Lack of sufficient national support (volume and share of national budget), need to raise political awareness and integration of the JPI structures in the national funding system</i>	<i>Engagement: Critical mass &gt; Commitment Engagement: Critical mass &gt; Resources</i>
<b>National alignment</b>	
<i>JPIs as enablers of strategic alignment, countries adjusting their national activities to the SRA/SRIAs and implementation plans and to other countries activities</i>	<i>Governance: Value Added &gt; Alignment Results: Efficiency &gt; Fragmentation Results: Structuring Effect &gt; Alignment</i>
<b>National structures for coordination, funding and management of JPIs</b>	
<i>Need to adapt research and innovation systems based on traditional scientific disciplines to a more effective response to societal challenges and/or enhance the necessary inter-disciplinary working, coordination/organization of overall national management of JPI portfolio (MLE, Policy Support Facility)</i>	<i>Complementary</i>
<b>Role of the Commission</b>	
<i>The role of the Commission as facilitators in the launching of JPIs, but MS cannot effectively implement joint programming without the Commission. JPIs should play a role in the planning process of next FP, solving issues and increasing the political commitment</i>	<i>Complementary</i>
<b>Operational bureaucracy</b>	
<i>Barriers to the co-funding of a permanent executive resource, hampering a sustainable and efficient operational structure to effectively implement the SRA/SRIA Need for strong and influential JPI leadership to overcome the operational barriers and secure the necessary political commitment and resources to achieve their full potential.</i>	<i>Governance: Focus &gt; Leadership Governance: Maturity &gt; Leadership Governance: Robustness &gt; Sustainability Governance: Robustness &gt; Strategic Vision</i>

In Table 1 and Table 2, a mapping is made between the success factors and the problematic issues and the IG3 criteria (cf. section 5 for a detailed discussion on the IG3 criteria) to show that the IG3 criteria are compatible to a large extent with the work of the Hunter & Hernani expert group. Some issues (e.g., “role of the Commission”, “use of experts”) are not really (or are less) relevant from the perspective of the IG3’s third task (design criteria to assess JPIs), and thus are not integrated in the IG3 framework. These are indicated by the label ‘complementary’.

Important similarities and complementarities were detected between the work of the Hunter & Hernani expert group and the IG3 (cf. Table 1 & Table 2). In particular, the set of assessment indicators and the list of success factors and bottlenecks cover many aspects that also occur in the framework developed by the IG3. Some differences however must be highlighted:

- The IG3 criteria are more focused on evaluating the performance of each JPI, in order to allow them to be launched or to proceed, and not on the broader concept of JP or JPP. In this sense, for instance, “Collaboration and Synergies between JPIs” seem to partially fall out of the scope of the IG3 criteria spectrum, in spite of its relevance;
- The IG3 criteria comply with the bottlenecks and success factors, but mainly on their strategic level rather than on an operational one (as strategic they might be). Factors such as “Supportive Commission Directorate”, “Executive Team”, and “Use of Experts” are also not explicitly approached). On the contrary, “Alignment”, “Commitment”, “Involvement of Stakeholders” beyond the research community and “Leadership” stand out as important criteria, present in several IG3 dimensions;
- The IG3 criteria are very much concerned with the evaluation of results, outcomes and impacts (expected in the case of the new JPIs, effective for mature JPIs) in terms of societal challenges and R&D&I systems and not only the factors driving the impact;
- The common criteria/factors do not exactly address the same underlying questions, reflecting the multitude of aspects to be considered and the different perspectives at stake. Hence, it is appropriate to maintain the complementarity between the two approaches;

All in all, it is positive that both the IG3 and Hunter & Hernani expert group independently reached a high degree of common understanding.

#### 4.2.2 WP2: Evaluation of performance and impact of JPIs and the JPP

The aims of this work package are to propose to the GPC a form to measure the performance and impact of JPIs and the JPP, and to set up the evaluation of performance together with the EC. For these purposes, the IG3 was expected to work together with the ERA-LEARN 2020 project, in particular with its consortium members the University of Manchester and OPTIMAT. The ERA LEARN 2020 project carried out amongst others the following tasks:

- Annual monitoring of the networks (JPIs, ERA-Nets, art.185)
- Building ERA LEARN tool + co-work results
- Impact assessment of networks
- Impact assessment of EU cofounded projects
- Guidance material for impact assessment for P2P networks

A deeper examination of the ERA-LEARN 2020 project (its WP3 to be precise) and methodologies showed considerable overlap, but also a very reliable consistency and expertise on their side. The ERA LEARN 2020 project not only covered the JPIs, but rather the most important instruments or initiatives by the EC supporting joint programming activities (all public-to-public networks including JPIs, ERA-Nets and articles 185). Given the content of the ERA Learn 2020 WP3, it seemed only necessary for the IG3 to consider the relevant deliverable(s) (intermediary and final <sup>16</sup> versions).

The ERA LEARN 2020 project consortium published in October 2015 a document entitled “Policy Brief on impact assessment of networks” (deliverable D

3.2). This deliverable provides first insights on the impact of JPIs based on interviews of JPI members. Seven categories of impact were identified implying different timescales (cf. Figure 6).

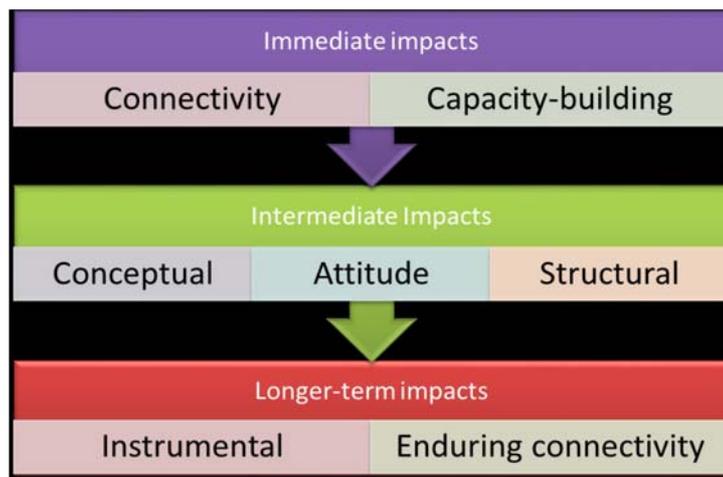


Figure 6: seven categories of impact implying different timescales by the ERA LEARN 2020 project

<sup>16</sup> Expected at the end of 2016.

- 1) As immediate impacts, JPIs have enhanced **connectivity** and **capacity building**: new areas of transnational collaboration, increasing quality of research projects in transnational contexts, promotion of multidisciplinary, reduction of national duplication.
- 2) As intermediate impacts, there have already been :
  - a. **Conceptual impacts** : increase of political awareness, influence on H2020 programming, influence of international agendas
  - b. **Attitudes/Cultural change**: the culture of interdisciplinarity and the increase of investment in specific topics
  - c. **Structural impacts**: national coordination, reduction of fragmentation of the research system, development of national strategies or consideration of European priorities
- 3) In a longer term perspective, JPIs have already impacted the “**enduring connectivity**” which is the connectivity that will continue (increase of international cooperation, networking). The ultimate step is the **instrumental impact**, which means the concrete impact on policy and practice decisions that we expect as the ultimate goal of JPIs but which obviously needs more years to appear.

The ERA LEARN 2020 team also identified some important obstacles that need to be addressed to reach the full potential of joint programming: financial sustainability, interoperability, lack of national coordination, and multidisciplinary.

More generally, barriers to the success of JPIs fall into four categories:

- the process of alignment and interoperability
- the lack of political support and commitment
- the low visibility of JPIs
- the poor availability of human and financial resources.

Based on an analysis of current ways of working by all JPIs, some good practices were recognised to help to overcome the above mentioned barriers:

- coordination at national level (such as mirror groups);
- financial sustainability (transition fees between CSAs);
- important role of the Secretariat and the Management Board;
- monitoring and evaluation frameworks;
- joint activities other than joint calls.

The IG3 concluded that the ERA LEARN 2020 deliverables mention both good examples and barriers to lower, meaning that JPIs and the JPP can be seen as a half-empty or half-full glass. Whatever the choice of the perspective, the IG3's task is to help the "glass to be filled" by delivering an integrated, flexible assessment/evaluation framework and procedure building on all those reflections.

A closer analysis of the ERA LEARN 2020 report induces some additional comments on the connections with the IG3 conceptual framework of criteria. Again a positive convergence can be identified between these two approaches developed independently.

Recommendations about Good Practices (cf. Table 3) and Obstacles (cf. Table 4) are, at least partially or implicitly, included in the broad formulation of the IG3 criteria. Exceptions regarding more operational issues, such as the role of the "Secretariat and Governing Boards" are not considered by the IG3 criteria. However, the ability of a JPI to take care of its "Financial Sustainability" has been added to the IG3 criteria (cf. Table 12 & Table 18), as well as a sustainability of its governance (cf. Table 14 & Table 19). Also concerns about "sustainable networking across other joint programming instruments" and "synergies and communication within the scientific community and other JPIs" seem to be at best considered indirectly and implicitly in IG3 criteria, despite their relevance for the overall JPP.

Another interesting perspective lies on the conceptual framework for impacts (cf. Table 5). The ERA LEARN 2020 project classified as 'Immediate Impacts' the ones stemming from *Connectivity and New Capacity Building* drivers, mostly encompassing the criteria on *Engagement* and *Governance*. We consider these as recommended enabling structures and processes or as means but not ends. IG3 criteria such as Alignment, Inclusiveness, Quality of Actors, Openness and Commitment are in the scope of those categories.

Likewise, ERA LEARN 2020 project considered as Intermediate Impacts the categories of Cultural (political awareness), Conceptual (culture of interdisciplinarity) and Structural (coordination, de-fragmentation). They comprehend IG3 criteria like Alignment – a process in permanent renewal along the JPP – Strategic Vision, Leadership. Other criteria, such as Agenda Setting (under Leadership/Maturity/Results), R&D System Innovation and Support to Policy Making are also included under 'Intermediate Impacts', although they could also be considered as long term effects, associated with the full potential of JPIs, according to the IG3 perspective.

Table 3: ERA LEARN 2020 report “good practices” mapped to IG3 criteria

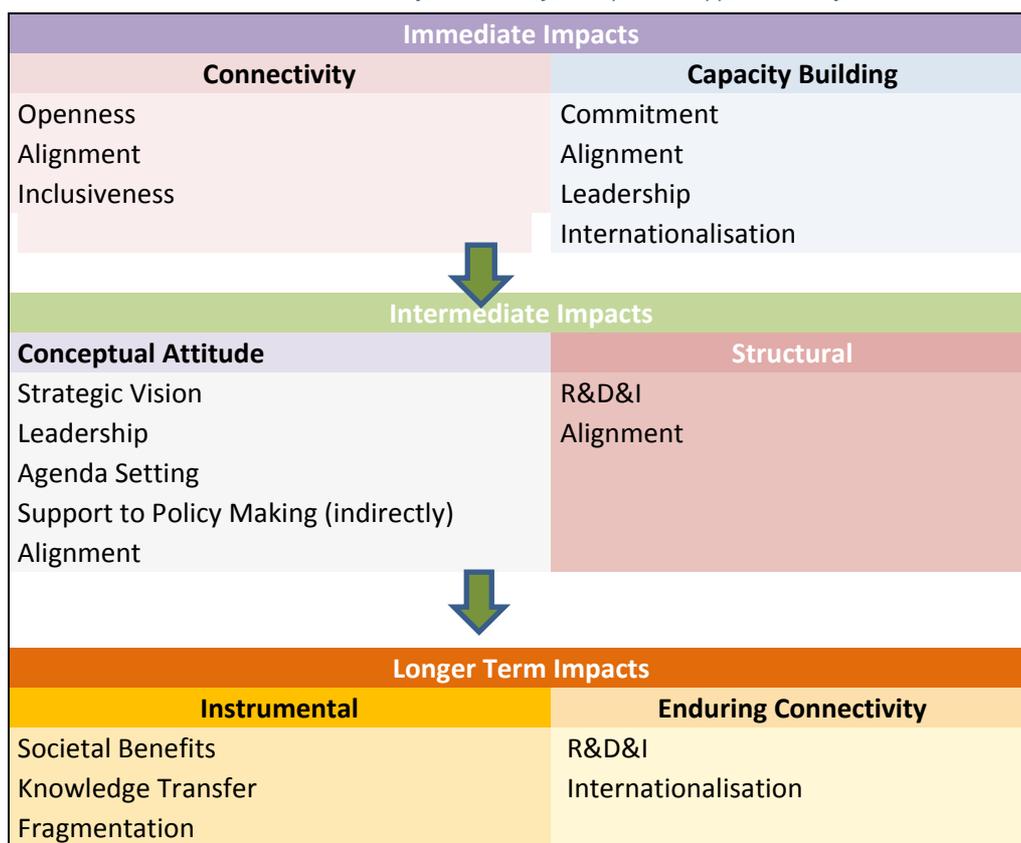
ERA LEARN 2020 report	IG3 Report
Good Practices	Axis: Dimensions > Facets
<b>Coordination at national level to facilitate alignment at international level</b>	
Coordinate policies at the international level by pursuing <i>jointly agreed objectives</i> , enabled by <i>effective coordination</i> in the research area at the national level	Governance: Value Added > Alignment Governance: Maturity > Strategic Vision
<b>Development of the Strategic Research and Innovation Agendas</b>	
Development of the SRIAs should encompass <i>inclusiveness</i> , taking account of wide range of inputs. A series of ‘pilot actions’ was also suggested as <i>test-beds for JPI-type collaborations</i> , while or even before the full strategic SRIA is being developed	Governance: Maturity > Strategic Vision
<b>Financial sustainability</b>	
A key challenge for all JPIs. While the ability to ensure financial support through various <i>FP or H2020 instruments like CSAs or ERA-NET</i> projects has been appreciated, the delays that may exist between one funding cycle and another as well as the <i>administrative burden</i> are still a problem	Engagement: Critical mass > Commitment Engagement: Critical mass > Sustainability
<b>The role of the Secretariat and the Governing Boards</b>	
<i>Crucial role of the JPI secretariat</i> was highlighted as ensuring the constructive and fruitful <i>cooperation of the JPI members</i> in the organisation of the joint calls and activities and helping foster <i>effective coordination</i> throughout the JPI life. It can also foster <i>trust building</i> through <i>transparency of processes, effective communication</i> and <i>consensus building</i> among the participating countries paying particular attention to communication and outreach	Governance: Focus > Leadership Governance: Maturity > Leadership Governance: Robustness > Sustainability
<b>Monitoring and evaluation</b>	
Peer review processes and two-stage evaluation of proposals are considered good practice as well as using an international panel for evaluation of proposals; monitoring and evaluation framework is particularly relevant in this regard	Governance: Maturity > Commitment
<b>Joint activities other than joint calls</b>	
The implementation of <i>additional joint activities</i> such as <i>knowledge hubs, competence centres</i> , etc. would further strengthen the <i>alignment</i> potential. <i>Shared use of infrastructure</i> also proved to be a beneficial experience for the participating countries	Governance: Value Added > Alignment Results: Efficiency > Fragmentation
<b>Communication and synergies</b>	
<i>Communication to the research community</i> of the existence, scope and opportunities offered by the JPIs needs to be strengthened. <i>Linking up with other scientific networks and other JPIs</i> is also <i>significant</i>	Results: Efficiency > Knowledge Transfer

Table 4: ERA LEARN 2020 report “obstacles” mapped to IG3 criteria

ERA LEARN 2020 report	IG3 report
<i>Obstacles</i>	<i>Axis: Dimension &gt; Facet</i>
<b>Commitment and financial sustainability</b>	
<i>Long-term commitment as basic pre-requisite to ensure financial viability, level not yet achieved without the support of the EC. The financial situation in the participating countries is another obstacle especially in those countries still in economic recession; Low levels of human resources in research are another bottleneck. For some countries with small research communities absorption of the national contribution may be difficult;</i>	<i>Engagement: Critical Mass &gt; Commitment Engagement: Critical Mass &gt; Resources Engagement: Critical Mass &gt; Quality of actors</i>
<b>Programme interoperability (or operational alignment)</b>	
<i>The differences and incompatibilities in the rules and procedures that exist in the various Member States concerning timing, funding and participation in research activities is another major obstacle. Establishing rules similar to FP or now H2020 would avoid major confusion for researchers and would allow a large degree of alignment at the operational level</i>	<i>Governance: Value Added &gt; Alignment Results: Structuring Effects &gt; Alignment</i>
<b>Lack of coordination at national level and across P2Ps</b>	
<i>Lack of coordination between organisations and agencies at the national level is a significant obstacle to the smooth operation of the JPI. Related to this are also obstacles due to internal rules of funding agencies; Another element related to governance refers to the external environment of the JPI and its relations to other relevant P2P initiatives (like ERA-NETs or Art 185s). mentality of collaboration may be lacking within and across the national and transnational levels;</i>	<i>Complementary</i>
<b>Multidisciplinarity</b>	
<i>Applying a multidisciplinary approach in research is an on-going challenge for several JPIs. One obstacle is developing a common language. People are from different backgrounds, applied, basic research, social science, technology etc. all bring different perspectives to the JPI. Bringing all these people to work together is a challenge on its own. In addition, multidisciplinarity is not reflected in the mandates and foci of the funding agencies or research institutions.</i>	<i>Governance: Maturity &gt; Leadership Engagement: Robustness &gt; Quality of Actors Complementary -</i>

Finally, there is a perfect match between the Long Term Impact category set by the ERA LEARN 2020 approach and the one under the IG3 criteria, mostly translated into direct impacts on societal challenges, on broader internationalization, on de-fragmentation, change in collective behaviour, support to policy making and knowledge transfer.

Table 5: ERA LEARN 2020 framework of JPI impacts <sup>17</sup> applied to IG3 facets



Given the main purpose of the IG3 criteria – providing a quality control framework and procedure for an educated advice to the Council on existing and new JPIs, a modulated approach on long term impacts was given special attention (see also section 5.3.4).

#### 4.2.3 WP3: Development of Minimum Conditions for JPIs

The WG on Framework Conditions recommended the establishment of minimum conditions for JPIs to be used both for possible new JPIs, as well as for the assessment of existing ones. The aim of IG3’s WP3 is to propose a set of assessment criteria and minimum conditions to the GPC.

The discussion took the Voluntary Guidelines as a starting point and elaborated a first proposal for criteria and minimum conditions. Some general principles came out very early during the discussion as strategic choices:

<sup>17</sup> This is an extended version of Figure 1 (cf. Figure 6) in the ERA LEARN 2020 Report “Policy Brief on Impact Assessment of Networks, Deliverable D.3.2, 2015

- A new JPI can no longer be accepted only on the basis of some vaguely expressed idea, but should be described beforehand according to a fixed format. Although the suggestion for a new JPI should not be as detailed as a project proposal, some essential elements have to be presented and sufficiently elaborated on. E.g., which challenge(s) the new JPI addresses, how the new JPI will address this challenge, which participating countries are committing which amount of already available resources, how the JPI will assess its progress in tackling the challenge(s), etc. It is expected that it could take some reiterations before a suggestion for a new JPI is mature enough for a decision by the Council;
- A JPI should be seen as an overall label of quality, importance and scale and, hence, not be awarded easily.
- The longer a JPI exists, the more the focus should shift from input and building up of critical mass to outcomes and impact (including knowledge transfer and societal and socio-economic benefits) and to the ability of a JPI to adapt (through foresight or other strategic intelligence tools) its goals and work plan to the changed situation of the challenge addressed. Also the stage of a JPI in its lifecycle changes the focus of the assessment: in an early stage scientific results are the primary aim while at a subsequent stage innovative applications or societal benefits are more important (as the overall aim of a JPI is to address a global societal challenge)

## 5 The IG3 Assessment Framework

In this chapter, the overall IG3 framework is presented. It starts with some general considerations (section 5.1), followed by an explanation of the proposed assessment process for new and existing JPIs (section 5.2). The section 5.3 is the core of this report as it describes the various vantage points that are combined in various criteria. We distinguish four axes (section 5.3.1), eight dimensions (section 5.3.2), eighteen facets (section 5.3.3) resulting in 49 different assessment criteria for new JPIs and 32 for existing JPIs. The “impact” dimension additionally has a triple differentiation into short, medium and long term impacts (section 5.3.4). Of the 49 or 32 criteria, 17 or 15 respectively criteria are considered as minimum conditions, i.e. a criterion on which a JPI simply cannot fail.

### 5.1 Overall rationale

The IG3 want to stress first that, if two or more countries want to set up a cooperation programme by aligning their programmes, organising joint calls or setting up other joint activities such as foresight exercises, such an initiative is, in general to be encouraged. However, by its mere definition, a JPI implies an important concentration of resources, a convergence of many activities and actions as well as the ability to (drastically) impact upon society. In short, size matters. Therefore, the qualification of “JPI” should only be attributed to those initiatives that are able to actually achieve an appropriate level of ambition and critical mass.

Neither the IG3, nor the GPC by extension, can act as an evaluation committee for a JPI as its members simply don’t have the required expertise, time and resources to do so. The IG3 sees it however as its task to define a framework within which designated experts can perform such an evaluation. In particular for existing JPIs, the IG3 set of criteria will serve as the terms of reference to be used by a new GPC working group.

An incremental procedure to “requalify” existing JPIs seems more difficult to organise. The IG3 considers it more practical to have existing JPIs providing all the information at once, and subsequently have the GPC debate to recommend their continuation (or requalification if applicable) to the Council. The relevant IG3 criteria are “modulated” towards existing JPIs (cf. the general principle of a shift from critical mass/input to impact/outcomes).

The task of the GPC delegations is to decide, after discussion and reflection within their national/regional administrations and consultation based on the information provided, whether or not the criteria and minimum conditions are adequately addressed by a proposal for a *new* JPI. This decision is executed as a formal vote on allowing (or not) a new JPI to take its proposal to the next step with or without requests for additional information. Eventually, the GPC decides on the nature of its advice to the Council regarding the new JPI. For *existing* JPIs, the suggestion to the GPC is to set up a new working group to address the long term strategy and future mode of operating of an existing JPI and the JPP in general. The IG3 criteria serve as a reference framework according to which the JPIs have to demonstrate their achievements. The new working group should prepare the basis for a GPC opinion on the future of the JPP and the existing JPIs, in particular in relationship to the next framework programme.

The framework, the criteria, minimum conditions and the assessment process are to function as a quality control instrument for the GPC to draft a well-informed advice for the Competitiveness Council. Every national delegation is supposed to perform some sort of domestic assessment, minimally with the information required by the “IG3 process”, and to assist “at home” his/her minister to decide whether or not to support the JPI concerned and at the same time determine his/her position for the Council decision.

It is also highly important that the EC presents its opinion to the GPC and Council concerning the new or existing JPI under scrutiny. Usually the EC can perform a more in-depth investigation than the GPC delegations individually. In particular, the EC can provide more details on potential links/overlap/synergies with the framework programme or other existing R&D&I initiatives in the field. The EC can also provide a more global perspective on the validity of the overall targets of a JPI.

A point of concern to the IG3 is that the various Director-Generals (DG) of the EC responsible content-wise for a societal challenge can decide quite autonomously whether or not a JPI will be supported through the appropriate framework programme line. A more coordinated approach between all EC DGs, might prove more fruitful in the future. Aligning strategies and budgets could also be beneficial here! Council Conclusions based on a general assessment regarding the EC support for JPIs favour objectivity and a common way of proceeding by the various DGs.

## 5.2 Assessment process

### 5.2.1 Process constituents

Unlike the previously established JPIs following the Council Conclusions of December 2008, many more elements are taken into account as basic requirements in addition to the commitment of participating countries, such as whether the theme addresses a European or global challenge, and whether the JP approach has the potential of translating the output of excellent public research into benefits for European citizens and increasing the European competitiveness. In addition, the criteria constitute the basic building blocks of a *quality control check* that is embedded in an *overall assessment process*, with underlying loops and interactions. Decision makers organise as they wish their domestic *decision procedure* to support (or not) a JPI based on the information that has been “certified” as adequate by the GPC delegates applying the assessment process.

The heart of the IG3 **quality control check** by the GPC consists of the following elements:

- The set of IG3 *criteria* – cf. sections 7.6 (for new JPIs) and section 7.7 (for existing JPIs) and section 5.3 for a more detailed presentation;
- A *meta-question* that is applied iteratively over all the criteria to which every GPC delegation has answer with ‘yes’ or ‘no’;
- A *scoring mechanism* based on a simple count of the number of positive vs. negative answers for each criterion, and calculating a grand total by counting the positive vs. negative scores for the entire JPI;
- An additional check whether or not all *minimum conditions* have received a positive score.

The **meta-question** addresses the quality control element: “*do you consider that the information provided by the JPI sufficiently addresses the criterion in question for decision makers/domestic experts to form a well-founded and substantiated opinion ?*”. For each and every criterion, each GPC delegation has to assess whether the information is made available (at hand and possibly added during GPC discussions) and if it sufficiently addresses the description/definition of the criterion and marks it with ‘yes’ or ‘no’. The content itself is not assessed yet, only the fact if there is enough content for a thorough future assessment.

During a GPC meeting, all delegations are asked to submit their quality assessment score for each criterion. These scores (by simple majority of scores according to the GPC rules of procedure) of 'yes' vs. 'no' determine the overall positive vs. negative score on that criterion. A grand total is calculated by counting the overall positive vs. negative criterion scores (by simple majority of scores according to the GPC rules of procedure). If the grand total has received a majority of positive votes, the quality of the information is assessed as globally positive.

A core set of criteria were considered as "vital" and essential (hence **minimum condition**), which resulted in an additional check. No JPI (new nor existing) can fail on delivering adequate information on even a single one of these minimum conditions. The assessment process cannot proceed to the next step unless the information for all minimum conditions is considered to be adequate, even if the grand total of the overall criterion scores is positive.

### 5.2.2 An incremental process for new JPIs

To have a proposal for a new JPI positively adopted, the IG3 recommends a four-step assessment process:

- 1) Expression of the idea
- 2) Expression of the commitment
- 3) Opinion by the GPC
- 4) Decision by the Competitiveness Council (COMPET)

The first two steps (expression of idea and commitment) are cumulative. This mirrors the build-up process of a new JPI that does not happen overnight but takes considerable time and effort in convincing potential partnering countries and developing the initial ideas into full shape. It implies that the information provided in the first step is to be complemented and/or extended with new information in the second step for the same or other criteria. Some criteria are more "demanding" in the second step. Other criteria do not reappear in the second step.

A negative decision by the GPC does not mean that the new JPI cannot start its activities, but that it cannot benefit yet from some advantages of a JPI (cf. section 5.1). Other joint programming instruments could constitute a more adequate means to foster the activities proposed, and later on a reworked proposal can be submitted.

## **1. Expression of an idea (by initiating countries)**

- 1.1. introduce the point to the agenda of the GPC according the standard GPC rules
  - 1.1.1. notify the chair and secretariat of the new point for the agenda
  - 1.1.2. send the necessary information according to the required criteria – cf. Table 9, Table 11, Table 13, and Table 15 – on time to the GPC Secretariat (at least 20 days before the first subsequent GPC plenary meeting) \*
  - 1.1.3. all GPC delegates receive the information (together with the announcement of the item on the agenda) (at least 10 days before the meeting)
- 1.2. during the first subsequent GPC plenary meeting [= meeting 1]
  - 1.2.1. present the idea and relevant supporting information (according to the required criteria)
  - 1.2.2. reply to initial questions, remarks, observations etc. by other GPC delegations
  - 1.2.3. GPC applies the quality control check to determine whether or not the proposal can proceed to the next step (if not, the proposal can be resubmitted whenever the submitting delegations feel it is sufficiently amended → start again at step 1.1)

## **2. Expression of commitment (by engaged countries)**

- 2.1. introduce the point to the agenda of the GPC according the standard GPC rules
  - 2.1.1. notify the chair and secretariat of the extra point for the agenda
  - 2.1.2. send the necessary information according to the required criteria – see Table 10, Table 12, Table 14, and Table 16 – on time to the GPC Secretariat (at least 45 days before the first subsequent GPC plenary meeting) \*
  - 2.1.3. all GPC delegates receive the information (together with the announcement of the item on the agenda) at least 30 days before the plenary GPC meeting)
- 2.2. during the first subsequent GPC plenary meeting [= meeting 2]
  - 2.2.1. present full proposal with the supporting information (according to the required criteria), in particular the actual engagements secured by the committed delegations
  - 2.2.2. reply to detailed questions, remarks, observations etc. by other GPC delegations

- 2.2.3. the EC is asked to express its assessment on the full proposal
- 2.2.4. GPC applies the quality control check to determine whether the proposal can proceed (or not) to the next step (if not → restart at step 2.1.

*\*The GPC chair and vice-chair can decide not to include the proposal on the agenda if they consider that information is lacking in at least one of the minimum conditions.*

### **3. Expression of opinion (by GPC)**

- 3.1. introduce the point to the agenda of the GPC according the standard GPC rules
  - 3.1.1. notify the chair and secretariat of the *decision point* for the agenda
  - 3.1.2. all GPC delegates receive the information, which might contain updates, (with the announcement of the decision point on the agenda) at least 30 days before the plenary GPC meeting)
- 3.2. during the first subsequent GPC plenary meeting [= meeting 3]
  - 3.2.1. if deemed needed, reply to additional questions by other GPC delegations
  - 3.2.2. the plenary GPC decides by its regular voting procedure on the nature of its advice to the Council:
    - i. positive → positive opinion on adoption of new JPI is drafted
    - ii. negative → the new JPI is not proposed to the Council by the GPC

### **4. Decision by the Competitiveness Council**

According to the proper rules of procedure, the GPC recommendation is delivered to the Council.

### 5.2.3 A frame for a long term strategy and mode of operating of existing JPIs

For existing JPIs with already vested interests, specific expertise on the science and innovation European instruments and on the scientific thematic landscape, on one hand, and full knowledge of each JPI's set of activities, on the other, seem to be requirements for a balanced screening and good recommendations. In addition, the IG3 criteria are to be interpreted in a different way. The most obvious example is the "outcomes, result, impact" axis: one cannot expect a proposal for a new JPI to be assessed in the same manner as existing JPIs on its results and impact. A new JPI basically holds a promise on certain results, while an existing JPI should be able to demonstrate effective impact – albeit according to its "age". In that sense, existing JPIs can be viewed from a short term, medium term or long term perspective (cf. section 5.3.4). In general, an assessment of an existing JPI inevitably has to be "customised" as each JPI addresses different topics with different goals in a different manner with different actors.

Therefore, it seems more appropriate to establish a new working group including GPC members, EC collaborators and JPI representatives to work on the longer term strategy and future mode of operating regarding the JPP and JPIs, in particular the relationship with the next framework programme. The working group helps the JPIs with advice to frame their achievements and plans using the set of IG3 criteria as a consistent quality control tool. At a point in time, the GPC drafts an advice to the Council (and EC) regarding the evolving JPP and the desired nature of the relationships of the JPIs with the next framework programme.

## 5.3 Assessment Criteria

The criteria intend to be a framework for a qualitative/quantitative assessment of JPIs. They consist of main guiding lines, stressed upon a rationale with both an operational and an analytical purpose. They were built upon four axes – the Topic, the Engagement, the Governance and the Results, Outcomes and Impacts – that seem to shape and comprehend the main angles of performance.

In order to allow for a more analytical approach, the IG3 framework combines 8 dimensions (cf. section 5.3.2) with 18 facets (cf. section 5.3.3) into 49 criteria for new JPIs (cf. section 7.6) of which 17 are considered as minimum conditions (cf. section 5.3.5). For existing JPIs the dimensions and facets lead to 32 criteria (cf. section 7.7), of which 15 are minimum conditions. These are all distributed over the four axes (cf. section 5.3.1) already mentioned.

### 5.3.1 Axes

*The Topic* is the real touchstone of the Joint Programming - all the activities and commitment converging to its approach, solution or upgrading - and its relevance and resilience overtime have to be monitored and consensually accepted. Features such as the degree of internationalisation, implicit industrial challenges and pre alignment on the topic are also important dimensions.

*The Engagement* stands for the indispensable critical mass when tackling global challenges, considering its large spectrum. The degree of commitment and the “embodiment” of common efforts by the participating countries (either in funding terms or in other forms of resources sharing), and the expressed interest of a balanced and increasing number of participating countries – and their sustainability in the long run – are attributes of *The Engagement*. Track record and the quality of actors account for an accumulated joint experience and a desirable complementarity of profiles and assets.

*The Governance* is based upon the organisation capacity of the JPI’s structures, beyond the participants themselves, to reach its goals on efficient terms. It entails the capacity of leadership, to build or redress a vision, to create or update SRAs/SRIAs, the capacity to involve relevant stakeholders in the whole cycle of joint programming, namely industry and civil society stakeholders, and, in some sense, also alignment, allowing for complementarity between bottom-up and top-down decision making. Broader participation of the quadruple helix stakeholders in the governance process and transparent and sustainable managerial structures will build on faster dissemination of knowledge and stimulate more innovation-led solutions, bridging existing gaps.

The *Results, Outcomes and Impacts* seem to close the cycle up to *the Topic* (while the two other axes are more “intermediate” or functional in their substance, or more structure and process led, to use the terminology of the ERA LEARN 2020 Report). Evaluating the impacts, whether at national, international or transnational levels is, even if rather complex, an utmost important condition for effectiveness and efficiency of policy making. Two main levels of impacts are comprehended in this axis: impacts on societal challenges (Topics), the ultimate purpose and *raison d’être* of JPIs, and impacts on R&D&I systems as a whole, including the excellence (not only scientifically), improved internationalisation as a very important driver of the systems scale, and de-fragmentation. Impacts may translate into effective support to policy making, into new technological paradigms and induce structural improvements in collective behavior. Strong leadership will be an enabling condition and an outcome in terms of setting the international agenda and pushing JPIs as real world-class leaders.

Alignment is seen as an intrinsic feature of JPP, transversal to all axes, mostly as a prerequisite to a consolidated Topic, as value added regarding Governance and as a structuring effect upon defragmentation and unnecessary duplication, driven by the commitment in the sense of the willingness by the participants to redefine national programmes.

### 5.3.2 Dimensions

In their substance, the dimensions concern the main “domains of performance” implicit in each of the axis, being *subject /actor / agent* of this performance. Critical Mass, Robustness, Coverage, and Maturity account again for process and structure levels – or to connectivity and capacity building (cf. Table 5, page 34) - and allow for assessing JPIs in its core definition: “a JPI implies an important concentration of resources, a convergence of many activities and actions as well as the ability to (drastically) impact upon society. In short, size matters. Focus, Efficiency, Structuring Effects and Value Added, mainly address Outcomes/Results/Impacts and also the Topic, the primordial delineation of the challenge.

A multiple variety of perspectives, influences, and interactions underlie these eight dimensions, mainly expressed at the facets level which further “refine” their meaning. The transversal nature of the dimensions is highlighted above, where they are ranked by axis:

- the *Focus : accuracy and pertinence*
  - Topic related- where Focus is also determined by factors such as the pattern of international distribution of knowledge or the stakeholders agenda, namely industry, and the resilience of the solutions
  - Governance related – where factors as Strategic Vision and Leadership are instrumental to achieve Focus
  - and Results related- potential participation of third countries attracted by the centrality of the topic
- the *Critical Mass: scale*
  - Engagement related- where the Number of Countries, the Quality of Actors, the Track Record and the Commitment/Resources - and respective Sustainability - clearly show the “weight” and quality of the new initiative

- the *Robustness: stakeholders soundness*
  - Related to the two “intermediate” or functional axes, Engagement and Governance: streamlining mostly Track Record and Quality of Actors (Engagement related) and in some sense Strategic Vision, Openness and Sustainability, propelled by an adequate managerial structure (Governance related)
- the *Coverage: regional soundness*
  - *Engagement related*, this dimension is mostly driven by Inclusiveness and Openness (even distribution of actors and full circulation of knowledge and assets)
  - *Topic related*, in terms of a possible regional bias on the themes
- the *Maturity: full development*
  - Governance related, this dimension is associated with factors as Leadership, Strategic Vision and Commitment (to the voluntary guidelines)
  - Results related, mainly in terms of Leadership in international terms
- the *Efficiency: quality of the process*
  - Results related, this dimension translates into De-Fragmentation and Knowledge Transfer (knowledge circulation/exploitation and IPR)
- the *Structuring Effects: systems gains*
  - Results related, this dimension encompasses Alignment between participating countries and Internationalisation, related to effective attraction on third countries
  - Topic related, in terms of pre-alignment of stakeholders on the theme
- the *Value Added: overall gains (to be) achieved by the JPI*
  - Cross axis and cross dimensions, such as Relevance, Alignment, Internationalisation, R&D&I, Societal Benefits, Policy Support

### 5.3.3 Facets

This cross-cutting facets directly qualify the core questions contained in each criteria, capturing the underlying key ideas and logic of preceding “domains of performance”/dimensions. Facets provide a clearer insight into the analytical framework.<sup>18</sup> Both dimensions and facets cut across axes, are combined in different manners, and have peculiar contents accordingly. Beyond the several axes and dimensions, this diversity in the content also reflects the specificities of each step of the incremental procedure for the submission of new JPIs as well as the existing JPIs process.

At this level, such are the main cross-cutting facets taken into account:

- Focus/Topic
  - *Internationalisation*: distribution of global expertise
  - *R&D&I*: interest by industry
  - *Resilience*: alternative solutions
- Focus/Governance
  - *Leadership*: clear managerial structure
  - *Strategic Vision*: clear objectives and plans on how to achieve them
- Focus/Results:
  - *Internationalisation*: centrality of the topic for third countries
- Critical Mass/Engagement
  - *Commitment*: specific funding support (effective/targeted)
  - *Number of countries*: minimum threshold
  - *Track Record*: individual past experience on the theme
  - *Quality of Actors*: relevance in a quadruple helix perspective
  - *Resources*: effective support (qualitative and quantitative) – existing JPI
  - *Sustainability*: stable and guaranteed commitment in the long run
- Robustness/Engagement
  - *Relevance*: joint past experience on the theme
  - *Track Record* : present/past other joint relevant initiatives (worldwide)
  - *Quality of Actors*: complementary/interchangeable actors
- Robustness/Governance
  - *Openness*: effective involvement of stakeholders in decision making
  - *Strategic Vision*: contingency plans (creation and implementation)
  - *Sustainability*: clear and consolidated structure

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<sup>18</sup> Alternatively, one could start from the level of the facets, which are “molded” into the specific perspective expressed by a dimension.

- Coverage/Topic
  - *Inclusiveness*: potential regional bias (North/South; old vs. new participating countries)
- Coverage/Engagement:
  - *Inclusiveness*: distribution of actors across Europe
  - *Openness*: barriers to the circulation of knowledge
- Maturity/Governance
  - *Leadership*: appropriate distribution of the various roles of the actors in the consortium ? appropriateness of the role (in particular concerning leading roles) fulfilled by every actor ?
  - *Strategic Vision*: capacity to build (and redress) a Vision and a SR(I)A
  - *Commitment*: compliance to the GPC Voluntary Guidelines
- Maturity/Results
  - *Leadership*: capacity to become a world class leader
- Efficiency/Results:
  - *Fragmentation*: systemic gains in terms of unnecessary duplication
  - *Knowledge Transfer*: potential in terms of knowledge dissemination and technology transfer
- Structuring Effects/Topic:
  - *Alignment*: current degree of pre-alignment within the challenge
- Structuring Effects/Results
  - *Alignment*: new opportunities for alignment for the committing countries
  - *Internationalisation*: "external" countries interest in committing
- Value Added/Topic
  - *Relevance*: importance of the challenge to EU and committing countries and reasons for the choice of a JPI
  - *Internationalisation*: importance of the challenge to the world
  - *Track Record*: effective addressing of the challenge
  - *Societal Benefits*: effective/foreseen changes in the challenge stemming from the solution in the EU and for the committing Countries
- Value Added/Governance
  - *Alignment*: Mechanisms to foster alignment
- Value Added/Results
  - *Societal benefits*: impacts on the challenge and contributions (R&D, policy advice) to tackle the overall challenge
  - *R&D&I*: expected/observed impacts in the entire R&D&I system

A few features could be further highlighted:

- *Commitment* – concerning both funding targets and compliance to the framework conditions themselves - and *alignment* - mostly regarded as a structuring effect or *an European value added* - stand out as crucial conditions to be observed either by participants (*Engagement*) and *Governance*. Alongside, the *strategic vision* is an important attribute of *governance*, adding up to its *robustness* by means of a capacity building on cyclical adjustment of strategies.
- *Inclusiveness* (regarding *participants* - *Engagement* and the inclusion of new members) and *openness* (regarding *Governance* and further inclusion of *stakeholders* in decision making) are two faces of the same coin, translating inclusiveness into broader *robustness*: by means of increasing critical mass and regional balance and by means of broadening participation in the strategic decision process, and easing dissemination.
- *Track record* of the participants and *topic focus* play a stronger role as framework conditions for *new JPI*, while *Impacts and Outcomes* become more stressing in *existing JPIs*.

More horizontal/broader criteria, such as the ones depending upon outcome, results and impacts, should translate into potential advice for policy making, effective change in collective behavior and real absorption of technology by stakeholders, thus gradually impacting on societal challenges and on the international (political) agenda setting. Alignment of national R&D strategies and structuring impacts on R&D systems should be regarded both as outcomes and as instrumental ways to improve efficiency and avoid unnecessary segmentation, building on increased scale and excellence leveraging.

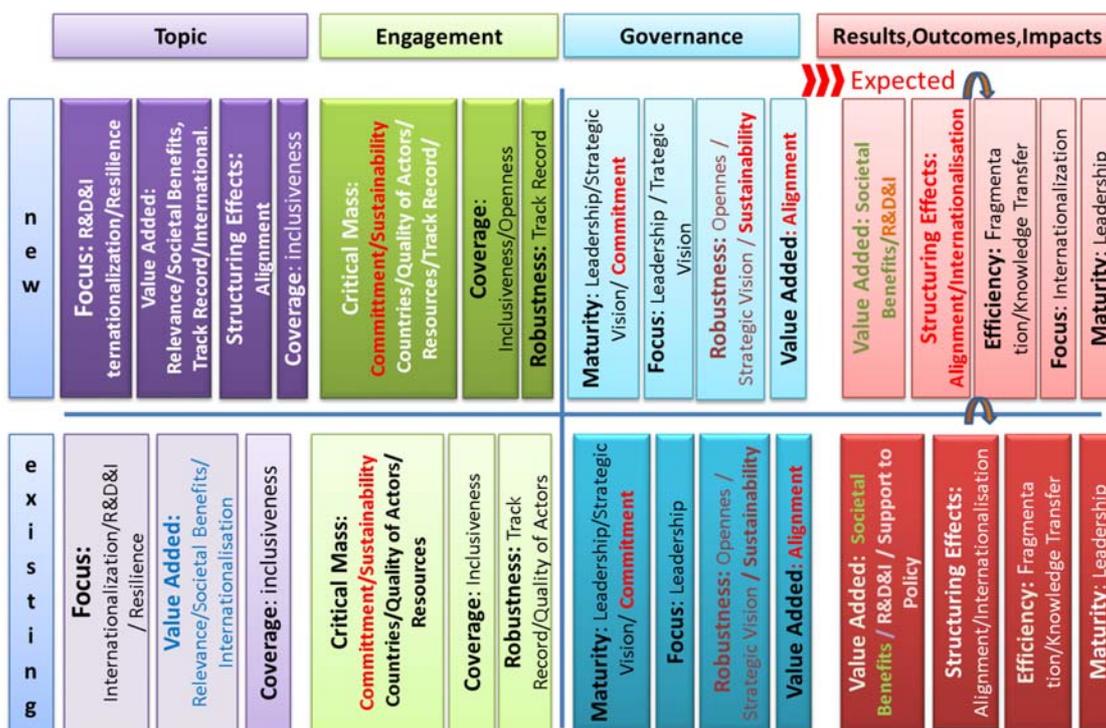


Figure 7: overview of criteria per axis (new and existing JPIs)

In Figure 7, colours account for the relevance of all the criteria spectrum in both new and existing JPIs, although with a nuanced importance, intensity or focus: new JPIs tend to be more intensive in Topic and Engagement (and Governance), and existing JPIs in Governance and Results

### 5.3.4 Additional reflections on the criteria regarding Results, Outcome and Impact

The Expert Group conveyed the general message that "it is too early to judge the impacts of JPIs on their societal challenges, and that it seems more appropriate to consider some intermediate indicators showing they are making progress in the right direction".

The IG3 elaborated a framework of criteria in order to have an available and structured instrument, to be gradually/incrementally implemented in the next period of time. It is likely that a few JPIs may reach maturity in the meantime. From this perspective, the results, outcomes and impacts criteria are in the very core of evaluation and couldn't be ignored or down sized.

Given the very diverse landscape of JPIs showing different stages of maturity, hindering their levels of impacts, on one side; and given the diverse nature of the expected impacts themselves, demanding differentiated levels of time and maturity, on the other, the IG3 considered a breakdown in short, medium and long term impacts and outcomes in the scope of the conceptual framework of criteria.

In general, the *long term impacts* are associated to the full potential of JPIs and are of a broad spectrum, like the ultimate impacts on societal challenges or on R&D systems. Also *knowledge transfer* corresponds to the closure of the cycle starting with fundamental research and assumes a step forward in JPIs landscape concerning innovation and in close involvement of industry stakeholders. Supporting the policy making, inducing new technology absorption and molding collective behaviour is very much in the heart of the final impacts, even if these impacts may have earlier iterations.

Internationalisation and de-fragmentation can be seen as medium to long term impacts: *internationalisation* stems from the very establishment of cross country networks, assigned to cross cutting facets as *inclusiveness* and *openness*, and from the use of several *EU instruments* behind the JPIs - and consist of criteria to improve *critical mass*. *De-fragmentation* is a medium to long term effect of *alignment*, one of the milestones (but not necessarily an end in itself) of JPP, and derive from the structuring effects on R&D systems while implementing the SR(I)As.

*Impacts on R&D excellence* may occur also in the short term – better referenced as the *promise of excellence* based on the *track record* of the participants- while the *proof* of excellence is a later fruit, embodied in citations and publications (Fundamental Research) as well as in patents (Applied Research and Applications).

That said, the IG3 developed a process (cf. section 5.2) for the implementation of the framework of criteria that takes into account the arguments above, allowing for a more tailored core of criteria that better fit the particular moment of JPIs as a whole. We refer the reader to the sections 7.6 and 7.7 of the annex for all the details concerning criteria and to the following section for details on the minimum conditions.

### 5.3.5 Minimum Conditions

A few general arguments can still be added on the minimum condition (MC) rationale:

- the main MC are focused on a few criteria considered as critical drivers of the overall quality of JPIs (including many criteria of the 2008 Council Conclusions – cf. section 3.2):
  - relevance and societal benefits induce higher value added of the Topic;
  - number of countries, quality of actors, commitment, relevance and openness (and resources for existing JPIs) lead to critical mass, robustness and coverage of the Engagement;
  - strategic vision, commitment and leadership (and openness for existing JPIs) nourish maturity and focus of the Governance; and
  - societal benefits, fragmentation and leadership (and knowledge transfer for existing JPIs) generate value added, efficiency and maturity in terms of Results, Outcomes, and Impacts ;

Figure 8: overview of the axes, dimensions, facets and minimum conditions (in bold red)

Topic		Engagement		Governance		Results	
dimensions	facets	dimensions	facets	dimensions	facets	dimensions	facets
Value Added	<b>Relevance</b>	Critical Mass	<b>Number of Countries</b>	Value Added	Alignment	Value Added	<b>Societal Benefits</b>
	<b>Societal Benefits</b>		<b>Quality of Actors</b>	Focus	<b>Leadership</b>		R&D&I
	Internationalisation		Track Record		<b>Strategic Vision</b>	Focus	Internationalisation
	Track Record		<b>Commitment</b>	Maturity	Leadership	Maturity	<b>Leadership</b>
Focus	Resources	<b>Strategic Vision</b>	Efficiency		<b>Knowledge Transfer</b>		
	Internationalisation	<b>Sustainability</b>			<b>Commitment</b>	<b>Fragmentation</b>	
	<b>R&amp;D&amp;I</b>	Relevance			<b>Sustainability</b>	Structuring Effect	Internationalisation
Resilience	Track Record	<b>Openness</b>	Alignment				
Structuring Effect	Inclusiveness	Coverage	Quality of Actors	Robustness	Strategic Vision	Structuring Effect	Alignment
Coverage	Alignment		Inclusiveness				

- as for the two steps in the incremental procedure for new JPIs:
  - the focus is zooming from broader international relevance of the topic to the narrower aspect of committing countries;

- or broadening from a more restrictive initial concept of critical mass, to a more comprehensive one (in terms of the number of committing countries and involved actors);
  - and move from general country level to the concrete actors, taking into account their quality;
- the requirements in the two steps are cumulative - meaning that many of the MCs of the first step still hold for the second step as well. In some cases, the MCs are defined in a more demanding and/or restrictive manner;
- the Governance axis is a building block in both MC approaches (new and existing JPIs), based on the same range of core MC;
- the Results, Outcomes and Impacts are just lightly mentioned in the procedure for new JPIs, and substantiated in expected impacts on fragmentation, while they are another core building block (5 MCs) for existing JPIs.

## 6 Conclusions and recommendations

Evaluating impacts, whether at national, international or transnational levels is, albeit rather complex, an utmost important condition for the effectiveness and efficiency of policy making.

In the future new global societal challenges will call for proposals for new JPIs and the evolution in society will allow us to cope with currently existing challenges, so a transparent and systematic monitoring and evaluation process of the JPP and JPIs must be put in place (cf. chapter 3). At regular instances, a “state of the JPIs and the JPP” is to be made potentially resulting in creating new and/or “decommissioning” or continuing existing JPIs. Each time the GPC has to give an advice to the Council in this matter. Consequently, every GPC delegation has to secure domestic political support for a decision in either sense.

To facilitate this process, the GPC took several initiatives; the most prominent ones being the creation of Working Groups and Implementation Groups, and the request to the JPIs to perform a self-evaluation (cf. section 4.1.2). The European Commission hired several expert groups to assess the JPP and the JPIs, and, through FP7 and Horizon 2020, funds the ERA LEARN 2020 project (cf. sections 4.1.1 & 4.1.3).

The GPC Implementation Group 3 (IG3) took on three tasks spread over three work packages: WP1: JPI Assessment (cf. section 4.2.1), WP2: Evaluation for performance and impact of JPIs and JPP (cf. section 4.2.2), and WP 3: Development of minimum conditions for JPIs (cf. section 4.2.3). Thanks to previous and related work by other groups covering its first two tasks, the IG3 was able to focus on its third task (cf. chapter 5).

### 6.1 WP1 & WP2

The IG3 framework is more oriented to the performance evaluation of an individual JPI rather than of the JPP, to strategic factors rather than operational ones, and on evaluating the outcomes/impacts in parallel with their underlying drivers. In addition to the clear complementarities between the main conclusions of the Hunter & Hernani Report on Success Factors and Bottlenecks and the conclusions on Good Practices and Obstacles of the ERA LEARN 2020 Report, a positive convergence is clearly identified between these two approaches and the IG3 framework. The fact that the three groups worked in a largely independent manner adds to the value of their common ideas and conclusions.

Most of the concerns expressed by the two other reports were accommodated in the IG3 criteria for the evaluation of new and existent JPIs. E.g., the conceptual classification of impacts by ERA LEARN 2020 (immediate, intermediate and long term) have been integrated in the IG3 framework.

## 6.2 WP3

The third task of the IG3, to develop minimum conditions for the assessment of JPIs, has been **operationalised** as follows:

- 1) a multidimensional and flexible framework must be designed
- 2) that should be based on some basic, strategic principles
- 3) and integrated in a simple process
- 4) whereby a distinction is to be made between proposals for new JPIs and existing JPIs

A reflection by the IG3 led to the formulation of some **strategic principles** that should “guide” the design of the IG3 proposal (cf. section 5.1):

- The framework to be set up is to function as a quality control tool for the decision process by the Council;
- A proposal for a new JPI has to clearly prove its “worth” before the GPC can draft an advice for a Council decision;
- A JPI is to be considered an overall label of quality, importance and scale and, hence, not to be awarded or maintained easily;
- With the extending lifespan of a JPI, the assessment focus should be moving from scientific results in an early stage to innovative applications or societal benefits in subsequent stages;
- The assessment is not to be performed by IG3 nor GPC members but by independent and/or domestic experts;
- Also the European Commission has an important role to fulfill in assessing as well as “rewarding” successful JPIs.

The IG3 proposes a simple and transparent **process** for assessing JPIs. The relevant IG3 criteria are “modulated” towards existing JPIs under the above mentioned general principle of a shift from critical mass/input to impact/outcomes.

- For a *new* JPI to be positively adopted, the IG3 recommends a four-step procedure (cf. section 5.2.1): expression of the idea, expression of the commitment, opinion by the GPC and Decision by the Competitiveness Council. These steps require the submission of detailed and tailored information in two phases (expression of idea and expression of commitment).
- The IG3 framework is intended to function as a quality ensuring reference frame for a dedicated GPC working group on the longer term strategy and future mode of operating of the JPP in general and the existing JPIs, in particular in their relationship with the next framework programme. Eventually the GPC drafts its advice based on the recommendations of this working group. (cf. section 5.2.3).

The IG3 came up with a framework of four axes (cf. section 5.3.1), eight dimensions (cf. section 5.3.2), eighteen facets (cf. section 5.3.3) resulting in 49 different assessment criteria for new JPIs and 32 for existing JPIs. The “impact” dimension additionally has a triple differentiation into short, medium and long term impacts (cf. section 5.3.4). Of the 49 or 32 criteria, 17 or 15 criteria respectively are considered as minimum conditions. These are mandatory for this *ex-ante* evaluation. A proposal for a new JPI cannot fail on a single one of these mandatory conditions if it is to proceed. Otherwise, the process stops. But all the criteria are relevant as a whole. The GPC can decide that the proposal fails on too many criteria in total, which also stops the process.

The IG3 criteria are generally more focused on topic, engagement and governance for new JPIs, while for existing JPIs the focus shifts mainly to governance and results, outcomes, impacts.

Because of the different maturity, topics, scope and life time of existing JPIs, expectations regarding their outcomes and impacts (short, medium and long term) might have to be adapted accordingly when assessing the achievements.

The set of IG3 criteria should function as a consistent quality control framework (or guideline) according to which the JPIs governing boards (and national governments and ministries) can collect and organise information and perform an internal evaluation themselves.

For the future, the IG3 is eager to see its work (criteria, assessment process, quality control check, scoring mechanism, minimum conditions) pass the reality test. GPC opinions on “upcoming” JPIs on the one hand and the elaboration of a new framework programme on the other are a most suited opportunity. In the former case, the incremental procedure can be put to the test quite rapidly with the upcoming proposal for a JPI on Migration and Integration. In the latter case, upcoming reflections on the new framework programme regarding the integration of (parts of) the SRAs/SRIAs of a JPI in the future work programmes urge for the use of a broader “canvas” to frame the discussions spanning different JPIs in a consistent manner.

The IG3 hopes to have delivered a modest but meaningful contribution to this larger endeavour.

## 7 Annexes

### 7.1 IG3 Members

- Leonidas Antoniou, lanto@research.org.cy, Chair, Cyprus
- Peter Spyns, Peter.Spyns@ewi.vlaanderen.be, Rapporteur, Belgium
- Maria Sequeira, mjoao.Sequeira@fct.pt, Portugal
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- Ann Miller, Ann.Miller@bis.gsi.gov.uk, United Kingdom
- Lutz Gros, Lutz.Gros@bmbf.bund.de, Germany [till March 2016]
- László Szilágyi, laszlo.szilagyi@mfa.gov.hu, Hungary [till end 2015]

### 7.2 IG3 Meetings

IG3 meetings started after the approval of IG mandates in the GPC meeting on the 26<sup>th</sup> of January 2015, and took place at the following dates mostly associated with GPC Plenary Meetings:

- 1st meeting: 20 February 2015: the launching of IG3, with the presence of only Leonidas Antoniou (CY) and Peter Spyns (BE);
- 2<sup>nd</sup> meeting: 11 March 2015: presence of all the members of the group, except for the UK that joined later;
- 3<sup>rd</sup> meeting: 3 June 2015, all members present
- 4<sup>th</sup> meeting: 30 September 2015 (short, informal meeting)
- 5<sup>th</sup> meeting: 11<sup>th</sup> December 2015
- 6<sup>th</sup> meeting: 14<sup>th</sup> of January 2016 [Hungary dropped out]
- 7<sup>th</sup> meeting: 12<sup>th</sup> of February 2016
- 8<sup>th</sup> meeting: 23<sup>rd</sup> March 2016 (Paris) [Germany dropped out]
- 9<sup>th</sup> meeting: 28<sup>th</sup> April 2016

### 7.3 Annex I: Policy Landmarks on Joint Programming

Joint Programming marked a change in European research and innovation cooperation and, arguably, has the potential to become a mechanism as important as the Framework Programmes in the European research landscape, and to actually change the way in which research is regarded.

A most plentiful set of policy initiatives was taken overtime since the early nineties, paving the way towards deeper maturity on this concept, and reflecting the concrete need for scale and critical mass in international bodies in order to tackle societal challenges<sup>19</sup>. box 5 and box 6 highlight some of the resolutions, conclusions, recommendations, reports and working groups that step by step built on joint programming:

*box 5: Landmarks before the creation of the GPC*

- **the Resolution on CREST**, tasked to "promote the coordination by the Community and the M S of their R&D activities in order to ensure mutual consistency between the national policies and Community policy" (28 September 1995);
- **the Resolution on the creation of the European area of research and innovation** (15 June 2000) and on the building of the European Research Area: orientations for EU action in the field of research (2002 - 2006) (16 November 2000);
- **the Conclusions on progress accomplished in the development of the European Research Area and on providing a new momentum** (26 November 2002);
- **the Conclusions on the future of science and technology in Europe** (23 November 2007);
- the **Commission Green Paper "The European Research Area: New Perspectives"** (2007)
- **the Conclusions on the Commission communication "The European Strategic Energy Technology Plan (SET Plan) - Towards a low-carbon future"**, (28 February 2008);
- **the Conclusions on the launch of the "Ljubljana process"** – building of the European Research Area (30 May 2008);
- **the Conclusions concerning "A common commitment by the MS to combat neurodegenerative diseases, particularly Alzheimer's"** (26 September 2008);
- **the Key Issues Paper (KIP) for 2008: Contribution of the Competitiveness Council to the Spring European Council** encouraging MS and the Commission to continue developing initiatives for joint programming of research (25 February 2008),
- **the Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee of the Regions towards Joint Programming in Research: Working together to tackle common challenges more effectively** (SEC (2008)2281; SEC (2008) 2282) setting a new approach for better use of Europe's limited public R&D funds through enhanced cooperation (15 July 2008).;
- **the Council Conclusions on Joint Programming of 2 December 2008**, welcoming the concept and objectives as formulated in the Commission Communication and the launching Joint Programming as a MS-driven process;

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<sup>19</sup> For further information, see the Conclusions concerning joint programming of research in Europe in response to the major societal challenges 2891st COMPETITIVE\_ESS (I\_TER\_AL MARKET, I\_DUSTRY and RESEARCH) Council meeting Brussels, 2 December 2008

*box 6: Landmarks after the creation of the GPC*

- **the establishment of GPC, the High Level Group for Joint Programming**, a dedicated configuration of the European Research Area Committee (ERAC) with a view to identifying and substantiating a limited number of Joint Programming Initiative (JPI) themes, 2008;
- **the Commission communication ‘Europe 2020 — A strategy for smart, sustainable and inclusive growth**, reiterating and reinforcing the importance of jointly addressing global challenges (3 March 2010);
- **the first Biennial Report** (ERAC-GPC 1311/10), covering 2009 and 2010, and describing the main achievements ;
- **the Council of the EU, in its Conclusions of 29 November 2010, welcoming the Voluntary Guidelines (VG) for Framework Conditions on Joint Programming;**
- **the “JPIs ToCoWork”** project, aiming to supporting the approved JPIs in applying the Framework Conditions (in 2012);
- **the Dublin Conference**, under the Irish Presidency of the EU, in collaboration with the EC. Title “Agenda for the Future & Achievements to Date”, aiming to further develop and speed up the JPP (spring 2013);
- the GPC adoption of an opinion on its functioning and working methods (on 6 September 2013) (ERAC-GPC 1304/13).
- **the second Biennial Report** (ERAC-GPC 1301/13) describing the developments of the building-up phase in the years 2011 and 2012
- the GPC **reflection on actions that would take forward the JPP**, on the basis of the conclusions and recommendations of the Biennial Report, the Dublin Joint Programming Conference, and the findings of the independent Expert Group on the Joint Programming process (at its 23<sup>rd</sup> meeting, held on 21 March 2013).
- the GPC decision to establish four **Working Groups (WGs): Relations between the GPC and JPIs; Alignment; Framework Conditions; Measuring JPIs’ Progress and Impact** (September 2013 to September 2014);
- **the “JPIs to Co-Work” CSA**, additional experts consulted by the Working Group, as the conclusions from the session on Evaluation of JPIs in the 2013 Presidency Conference on Joint Programming, suggested **further implication of key stakeholders** in the definition and in the **governance** of the JPI;
- **the Council adoption of a resolution on the advisory work for the European Research Area (doc. 10331/13)** agreeing to review the ERA-related groups established by ERA; on 30 May 2013
- **the Council Conclusions** on the development of the ERA Roadmap that should take into account alignment of national strategies and research programmes with the Strategic Research Agendas of the JPIs – and the contribution of the JPIs to the completion of the ERA, on 20 and 21 February 2014;
- the GPC at its plenary meeting of 19 May 2014 decided to undertake a **self-assessment exercise of its activities in order to contribute to the review** (On 18 September 2014, the GPC adopted a report on the self-assessment);
- **the Conclusions of the Competitiveness Council** that called on MS, in close cooperation with the Commission, to take the implementation of ERA fully into account when developing national strategies, and to facilitate transnational cooperation, **on 21 Feb. 2014**

## 7.4 Annex II: Mandates of IG1 and IG2

IG1: Fostering and Mentoring JPIs: building on the key recommendations of the WG on “Framework Conditions” and “GPC and JPIs”, and focusing on the cooperation between the different stakeholders, on the implementation of the framework conditions, and on supporting the JPI implementing the full Joint Programming Cycle as part of the overall Joint Programming Process. The following Work Packages (WP) were set up:

- WP1: Implementation of WG Recommendations;
- WP2: Establishing a forum for exchange of information/and coordination between JPIs and between JPIs/GPC/European stakeholders
- WP3: Advancement of implementation of Framework Conditions

IG2: Alignment and Improving Interoperability: building on the key recommendations of the WGs “Alignment” and “Framework Conditions”, and focusing on the progress of alignment in the context of Joint Programming and in interoperability of national and European programmes and activities, reflected on the following WP:

- WP1: Advancement of Alignment in the context of Joint Programming
- WP2: Improving the interoperability of national and European programmes and activities

## 7.5 Annex III.: ERA LEARN 2020 Impacts

Table 6: ERA LEARN 2020 report (immediate impacts) vs. IG3 (short to medium term impacts)

ERA LEARN Report	IG3	IG3 comments
<b>Connectivity</b>	Axis: Dimension > Facet	
Communication between the relevant actors and ministries, funding agencies, programme managers as well as the beneficiaries of JPI activities, i.e. the research community, business and society. <i>Increased international collaboration; design of novel means of bringing people together to work; establishing a well-connected network of influential actors from Member States,</i>	Governance: Robustness > Openness; [partially]  Engagement: Coverage > Inclusiveness  Results: Efficiency > Knowledge Transfer	Short term impact  Short to medium term impact  Medium to long term impact
<b>New capacity-building</b>	Axis: Dimension > Facet	
<i>Development of capabilities and skills in subject areas where previously transnational collaboration amongst Member States was poor or non-existent; knowledge of funding agencies in some countries is enhanced in relation to project/programme management, evaluation and monitoring along with the project experience of researchers; effective international collaborations; impact is in terms of multidisciplinary; reduced national duplication; identify the appropriate level to address priorities</i>	Results: Value Added > R&D&I  Results: Structuring Effects > Internationalisation  Results: Structuring Effects > Alignment	Short to medium term impact  Short to medium term impact  Establishment of cross country networks, assigned to <i>inclusiveness</i> and <i>openness</i> , and from the use of several <i>EU instruments</i> behind the JPIs

Table 7: ERA LEARN 2020 report (intermediate term impacts) vs. IG3 (medium to long term impacts)

ERA LEARN Report	IG3	IG3 comments
<b>Attitude / Cultural impacts</b>	Axis: Dimension > Facet	
Knowledge exchange including <i>improved reciprocal understanding and willingness to work together</i> . This is relevant for JPIs both at the level of ministries and agencies as well as the research and business communities and society multidisciplinary and interdisciplinary approaches being adopted; <i>greater investments in specific topics</i>	Governance: Robustness > Openness;  Governance: Maturity > Strategic Vision;  Results: Efficiency > Knowledge Transfer	Short to medium term impact  Short to medium term impact  Long term impact
<b>Conceptual impacts</b>	Axis: Dimension > Facet	
Impact on the <i>knowledge, understanding and attitudes of policy-makers; changes in the thinking amongst policy makers, influences on policy issues and increased awareness in the policy world; increased awareness amongst national governments to specific issues and topics; shaping H2020 investment; influencing international agendas; knowledge creation and diffusion within JPIs</i>	Results: Maturity > Leadership  Results: Value Added > Societal Benefits  Results: Efficiency > Knowledge Transfer	Short to medium term impact  Long term impact associated to full potential  Long term impact
<b>Structural impacts</b>	Axis: Dimension > Facet	
Changes in institutions and structures in national or European research landscape <i>due to changed thinking amongst policy makers and influences on policy issues stemming from the acquired knowledge; changes to government organisation; new forms or structures have been created responding to the need to coordinate national participation in P2Ps; increased national coordination; as mirror group; less fragmented national research system; development of a national strategy in the specific area; consideration of the SRIA in the national strategies in the respective areas or research</i>	Results: Value Added: R&D&I  Results: Efficiency > Fragmentation  Results: Structuring Effect > Alignment	Proof of Fundamental and applied R&D excellence (citations, publications, patents) Short to medium term impact to long term impact

Table 8: ERA LEARN 2020 report (longer term impacts) vs. IG3 (long term impacts)

ERA LEARN Report	IG3	IG3 comments
<b>Instrumental impacts</b>	Axis: Dimension > Facet	
Direct impact on policy and practice decisions in areas as environmental improvement, risk mitigation, service improvement, societal benefits and productivity improvements. In the case of the JPIs this type of impacts relates to the actual solutions that are sought to deal with the societal challenges addressed by the JPIs	<p>Results: Value Added &gt; Societal Benefits</p> <p>Results: Maturity &gt; Leadership</p> <p>Results: Efficiency &gt; Fragmentation</p> <p>Results: Efficiency &gt; Knowledge Transfer</p>	<p>Long term impact associated to full potential</p> <p><i>De-fragmentation</i> is a medium to long term effect of <i>alignment</i>, one of the milestones of JP, and derives from the structuring effects on R&amp;D systems while implementing the SR(!)As.</p> <p>Long term impact associated to full potential</p>
<b>Enduring Connectivity</b>	Axis: Dimension > Facet	
Communication between the relevant actors and to the follow-up collaborations that continue after the initial activity has been completed: the JPI partners, i.e. Ministries, funding agencies, programme managers as well as the beneficiaries of JPI activities, i.e. the research community, business and society. Increased international collaboration; design of novel means of bringing people together to work; establishing a well-connected network of influential actors from Member States	<p>Results: Structuring Effect &gt; Internationalisation</p> <p>Results: Maturity &gt; Leadership</p> <p>Governance: Robustness &gt; Sustainability</p> <p>Governance: Robustness &gt; Openness</p>	<p>Proof of Fundamental and applied R&amp;D excellence (citations, publications, patents)</p> <p>Short to medium term impact, encompassing all the stakeholders in the national and international ecosystems</p>

## 7.6 Annex IV.: Criteria for new JPIs

Table 9: axis: **Topic**; step 1 (expression of idea) for new JPIs

MC	dimension	facet	description
Y	Value added	Relevance	<b><i>Is a global challenge being tackled and how important is it to the EU ?</i></b>
Y	Value added	Relevance	<b><i>Why precisely a JPI (vs. other instruments as art.185, ERA-net, COST, EUREKA, ...) ?</i></b>
N	Value added	Societal benefits	What will the solution to the challenge change in the EU?
N	Value added	Internationalisation	How would the international R&D&I landscape and cooperation benefit of the initiative?
Y	Value added	Track record	<b><i>How is the challenge being addressed till now (if at all) ?</i></b>
N	Focus	Internationalisation	Describe the distribution of global expertise needed to tackle challenge
N	Focus	R&D&I	(How) does the challenge affect important public and industrial agendas and/or initiatives
N	Focus	Resilience	Describe potential alternative “solutions” to the challenge
N	Structuring effect	Alignment	What is the current degree of “pre-alignment” within the identified challenge?
N	Coverage	Inclusiveness	To which extent is the challenge affecting more specific countries in Europe (e.g. North vs? South, “old” MS/AC vs “new”, .... ?

Table 10: axis: **Topic**; step 2 (expression of commitment) for new JPIs

MC	dimension	facet	description
Y	Value added	Relevance	<b><i>How important is the global challenge for the committing countries ? Why do they support it currently and in future ?</i></b>
Y	Value added	Societal benefits	<b><i>What will the solution to the challenge change for the committing countries ?</i></b>
N	Value added	Internationalisation	Which relevant “international” links do the committed countries have ?
Y	Focus	R&D&I	<b><i>(How) does the challenge affect important public and industrial agendas and/or initiatives within the committed countries ?</i></b>
N	Focus	Resilience	Describe potential alternative “solutions” within the reach of the committing countries
N	Structuring effect	Alignment	Describe current degree of “pre-alignment” within the interested countries

Table 11: axis: **Engagement**; step 1 (expression of idea) for new JPIs

MC	dimension	facet	description
N	Critical mass	Number of countries	At least 5 interested countries (excluding observers) participate in proposing the new JPI
N	Critical mass	Quality of actors	Who are the most relevant actors to address the challenge (quadruple helix) ?

Table 12: axis: **Engagement**; step 2 (expression of commitment) for new JPIs

MC	dimension	facet	description
Y	Critical mass	Number of countries	<b>At least 15 interested countries (excluding observers) commit themselves to the new JPI</b>
Y	Critical mass	Quality of actors	<b>Are the most relevant actors engaged in the proposal (representing the quadruple helix insofar as relevant) ?</b>
N	Critical mass	Track record	How is the challenge being addressed till now by the supporting countries individually ?
Y	Critical mass	Commitment	<b>What specific support do the committed countries promise to provide to the new JPI (qualitatively and quantitatively)?</b>
Y	Critical mass	Sustainability	<b>Does the promised commitment look sustainable (effective and sufficient) in the long run ?</b>
N	Robustness	Relevance	How have the committed countries already cooperated around the challenge (or related topics) in the recent past (bilateral, multilateral) ?
N	Robustness	Track record	In which other, related relevant initiatives are the committed countries involved (not only limited to Europe) ?
N	Robustness	Quality of actors	Are actors interchangeable or completely complementary ? how is the required knowledge and expertise distributed over the engaged actors and committed countries ?
N	Coverage	Inclusiveness	How are the (type of) engaged actors distributed across Europe ?
N	Coverage	Openness	Which are the potentially legal or other barriers that would hinder the circulation of knowledge or assets or would prevent third countries from participation ?

Table 13: axis: **Governance**; step 1 (expression of idea) for new JPIs

MC	dimension	facet	description
Y	Focus	Strategic vision	<b>(outline of) intervention logic: can clear objectives be laid down and attained ?</b>

Table 14: axis: **Governance**; step 2 (expression of commitment) for new JPIs

MC	dimension	facet	description
N	Value added	Alignment	Which mechanisms for fostering alignment are foreseen ?
N	Focus	Leadership	Is the lead partner overall well recognised and respected ?
N	Maturity	Leadership	Is the distribution of roles (R&D&I) well defined and appropriate ?
Y	Maturity	Strategic vision	<b>Does the consortium have the capacity to build an effective SR(I)A ?</b>
Y	Maturity	Commitment	<b>Does the consortium comply with the voluntary guidelines ?</b>
N	Robustness	Sustainability	Is there a clear managerial structure that will be organised in a sustainable manner ?
Y	Robustness	Openness	<b>Is an effective stakeholder involvement foreseen ?</b>
N	Robustness	Strategic vision	Are contingency plans foreseen ?

Table 15: axis: **Expected Results** ; step 1 (expression of idea) for new JPIs

MC	dimension	facet	description
Y	(expected) Value Added	Societal benefits	<b>Which kind of specific (partial) results or contributions (in terms of R&amp;D, policy advice, ...) the JPI intends to deliver to (various) target or stakeholder groups related to the overall challenge ?</b>
N	(expected) Value Added	R&D&I	Which are the expected effects in specific (which ?) areas or R&D domains the JPI intends to achieve ?
N	Focus	Internationalisation	Which (potential participants of) third countries (and why) are prime candidates for joining the JPI ?
N	(expected) Efficiency	Fragmentation	In which ways will the JPI exploit economies of scale (use of resources) and better thematic coverage ?
N	(expected) Efficiency	Knowledge transfer	How does the JPI ensure the knowledge transfer (dissemination, tech transfer, IPR, ....) ?
N	(expected) Structuring Effect	Alignment	Which opportunities for alignment (on the various levels) the JPI could offer ?

Table 16: axis: **Expected Results** ; step 2 (expression of commitment) for new JPIs

MC	dimension	facet	description
Y	(expected) Value Added	Societal benefits	<b>Which specific (partial) results or contributions (in terms of R&amp;D, policy advice, ...) the JPI intends to deliver to (various) target or stakeholder groups related to the overall challenge ?</b>
N	(expected) Value Added	R&D&I	which are the expected effects in specific (which ?) areas or R&D domains the countries committing to the JPI intend to achieve ?
N	Maturity	Leadership	Capacity to become a world class leader
Y	(expected) Efficiency	Fragmentation	<b>Which are the potential “gains” (e.g., economies of scale, better thematic coverage, ...) that the committing countries plan to achieve ?</b>
N	(expected) Structuring Effect	Internationalisation	Which “external”, third countries are already willing to commit to this new JPI ?
N	(expected) Structuring Effect	Alignment	which opportunities for alignment (on the various levels) will become available for the committing countries ?

## 7.7 Annex V.: Criteria for existing JPIs

Table 17: axis: **Topic**; for existing JPIs

MC	dimension	facet	description
Y	Value added	Relevance	<b>Is the challenge tackled still global and relevant to the EU (and in which way)?</b>
Y	Value added	Relevance	<b>Why is a JPI still the most appropriate way ?</b>
N	Value added	Societal benefits	What will the (additional) solution to the remaining challenge change in the EU?
N	Value added	Internationalisation	Is the (remaining part of the) challenge still important to the international R&D&I landscape and cooperation (and how) ?
N	Focus	Internationalisation	Is new global expertise needed (if so located where ?) to tackle the (remaining part of the) challenge
Y	Focus	R&D&I	<b>(How) does the (remaining part of the) challenge affect important public and industrial agendas and/or initiatives</b>
N	Focus	Resilience	Describe new potential alternative “solutions” to the (remaining part of the) challenge
N	Coverage	Inclusiveness	Is the (remaining part of the) challenge able to interest additional MS/AC or third countries ?

Table 18: axis: **Engagement**; for existing JPIs

MC	dimension	facet	description
Y	Critical mass	Number of countries	<b>Are still at least 15 countries continuing to participate (excluding observers) in the JPI ? Are new countries committing to participate ?</b>
Y	Critical mass	Quality of actors	<b>Are the most relevant actors continuing to participate (representing the quadruple helix insofar as relevant) ?</b>
Y	Critical mass	Commitment	<b>What specific support will the participating countries continue to provide to the JPI (qualitatively and quantitatively) ?</b>
N	Critical mass	Resources	Did the participating countries provide/mobilise the support as initially promised to the JPI (qualitatively and quantitatively; in absolute and relative numbers) ?
N	Critical mass	Resources	Which resources were acquired from other sources (third countries, EU-funding, ...)
Y	Critical mass	Sustainability	<b>Is the commitment sustainable (effective and sufficient) in the long run ?</b>
N	Robustness	Track record	Are the participating actors at the forefront of research worldwide, in Europe, in their country ?
N	Robustness	Quality of actors	Are participating actors interchangeable or completely complementary ? how is the required knowledge and expertise distributed over the participating actors and countries ?
N	Coverage	Inclusiveness	How are the (type of) participating actors distributed across Europe ?

Table 19: axis: **Governance**; for existing JPIs

MC	dimension	facet	description
N	Value added	Alignment	Have mechanisms for fostering alignment been functioning appropriately ?
N	Focus	Leadership	Is the lead partner overall well recognised and respected ?
N	Maturity	Leadership	Has the distribution of roles and responsibilities (R&D&I) been functioning appropriately ?
Y	Maturity	Strategic vision	<b>Have effective SR(I)As been built ?</b>
Y	Maturity	Commitment	<b>Have the GPC voluntary guidelines and Framework Conditions been adopted in practice ?</b>
Y	Robustness	Sustainability	<b>Is there a clear, well-functioning managerial structure that is organised in a sustainable manner ?</b>
Y	Robustness	Openness	<b>Have stakeholders effectively been involved in knowledge circulation and decision making ?</b>
N	Robustness	Strategic vision	Have contingency plans been needed and/or adapted ?

Table 20: axis: **Results, Outcomes, Impacts** (including time span); for existing JPIs

MC	dimension	facet	description
Y	Value Added	Societal benefits LT	<b><i>Which kind of specific (partial) results or contributions (in terms of R&amp;D, policy advice, ...) the JPI has delivered to (various) target or stakeholder groups related to the overall challenge compared to the original plans ?</i></b>
N	Value Added	R&D&I MT-LT	Which are the (systemic) effects the JPI has achieved in specific (which ?) areas or R&D&I domains of the participating countries ?
Y	Maturity	Leadership ST-MT	<b><i>Has the JPI become a leader (and in which domains and/or sectors) in delivering research results, technology and/or agenda setting on the national, European and/or global levels?</i></b>
Y	Efficiency	Knowledge transfer MT-LT	<b><i>Was the JPI able, in any sense, to effectively induce behavioural change, technology absorption, ... by means of adequate knowledge transfer strategies (in function of the various targets and target groups) ?</i></b>
Y	Efficiency	Fragmentation LT	<b><i>Which are the potential "gains" (e.g., economies of scale, better thematic coverage, ...) that the participating countries have achieved (in terms of pooled funding, efforts, ...) – if possible with counterfactual data ?</i></b>
N	Structuring Effect	Internationalisation ST-MT-LT	Which (type of) international cooperation has been induced by the JPI ?
N	Structuring Effect	Alignment ST-MT-LT	Which forms for alignment (on the various levels) have been achieved by the participating actors?

## 7.8 Bibliography

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## 7.9 Glossary (Abbreviations)

IG	Implementation Group
JPP	Joint Programming Process
JPI	Joint Programming Initiatives
JP	Joint Programming
GPC	High Level Group on Joint Programming
WP	Work Package
MS	Member States
ERAC	The European Research Area and Innovation Committee
AC	Associated Country
EC	European Commission
CSA	Coordination and Support Action
CREST	Scientific and Technical Research Committee of COMPET
COMPET	Competitiveness Council

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