

Review of the Joint Programming Process

Final Report of the Expert Group

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Executive Summary

Introduction

Within the EU, 88%¹ of all public R&D is programmed, financed, monitored and evaluated at the national level. Various options are available to both the EU Commission and Member States (MS) to engage in Public-Public Partnerships in order to optimise research priorities and research programmes including, for example, ERA-NETs, ERA-NET Plus, Article 185 and more recently, Joint Programming.

Joint Programming (JP) is a process designed to ensure the optimisation of existing and future research effort at the level of Member States. It aims to reinforce cross-border cooperation and the coordination and alignment of national publicly funded research programmes in a limited number of fields, each addressing a specific societal challenge. This process is guided by a High Level Group, the GPC, and Joint Programming Initiatives (JPIs) provide the initial means of implementing the process. In the last four years (since 2009) ten JPIs have been launched.

The Expert Group was invited by the EU Commission to undertake the first formal review (not an evaluation) of the Joint Programming process. The review was conducted between March and October 2012. Its aims are: to review the progress of the Joint Programming process thus far achieved; identify what went well and what not so well, with respect to the original objectives; recommend how to improve the Joint Programming process; assess progress of the ten JPIs; suggest ways for the future, and possible relationship with Horizon 2020; and analyse the participation of less research intensive countries.

Joint Programming is a Member State-led initiative and the report looks at the Council's policy vision for Joint Programming and examines what has been achieved four years after the launch of the first JPI. It comments on Joint Programming from the perspective of stakeholders, and provides the Group's views on the extent to which current JPIs are likely to realise their full potential. It considers the three challenges, political, structural and organisational that may hinder the Joint Programming process from achieving its full potential. The report concludes with the Group's assessment of whether the gap between the original high-level vision and current reality can be bridged, and gives its recommendations.

Since JPIs are at present the principal means of implementing Joint Programming, much of the Expert Group's work has focussed on JPIs and the progress they have made. The conclusions reached therefore are based principally on the establishment and evolutionary trajectories of the JPIs to date and, in that context, the role played by the GPC in identifying the priority Societal Challenges and in preparing the Voluntary Guidelines on Framework Conditions. The Group comments on the role Joint Programming has in furthering the ERA, and other more policy related aspects of this process.

¹ Source: "Draft results of JOREP study on Joint and Open Research Programmes, Commission , 2012.

Achievements so far

The overall conclusion reached by the Expert Group is that the Joint Programming process has got off to a good start, although the process can only reach its full potential if commitment and financial support from national level administrations continues. In some cases participating public authorities are already working to orientate and align their programmes and their funding in order to contribute to the overall implementation of JPIs in a coherent manner. However, the full delivery of “joint programming” as originally envisaged, that is going beyond programme alignment and joint calls, remains uncertain. The Expert Group is concerned that the necessary level of commitment to this ultimate objective at the national level is not yet evident.

Nevertheless, after only four years, the Group regards the degree of progress as very satisfactory believing that sustainable JPIs require time to build up the necessary trust to engage in multi-annual joint programming. In this respect the fact that JPIs are Member State (MS) driven has proved of value. Variable geometry has also proved itself to be a contributory success factor for JPIs. Through these two aspects a level of trust has been built up and MS are (maybe unexpectedly) highly motivated to engage in Joint Programming and to seek to integrate national research activities according to a jointly agreed Strategic Research Agenda (SRA).

Since 2009, 10 JPIs have been launched, six only within the last year. Together they address major societal challenges facing Europe such as neurodegenerative diseases, antimicrobial resistance, and the growing gap between water supply and demand. A wide range of activities have been undertaken so far by the JPIs and the Group has characterised the JPIs according to six main stages of development. The first, already reached by all JPIs is, following wide stakeholder consultation, the development and adoption of formal Visions or SRAs that identify common areas, gaps and priorities that the JPI members will work on. Subsequent stages include requesting Community Support Action funds and enlarging the partnership. Launching and funding research through joint calls has been achieved by the two longest established JPIs, JPND and FACCE, both are now starting to develop plans for multi-annual joint programmes. However no JPI has reached the final stage, that of implementing multi-annual joint programmes and cooperation throughout the policy cycle. By comparing what has been achieved so far with what was set out in the original high-level political vision for joint programming, the Group has reached the following conclusions: significant issues are being addressed that are beyond the scope and resources of individual countries; a wide range of activities are being undertaken by JPIs that will help reduce duplication and effort across Europe; scientific excellence is being promoted through joint calls which follow the Guidelines for Framework Conditions for selection and evaluations; and through their Visions and SRAs, JPIs show evidence that they are coordinating data and expertise.

Joint Programming from the perspective of Stakeholders

From the MS' perspective JPIs are viewed positively as an appropriate tool for tackling grand challenges but MS have yet to fully experience the benefits that can arise. There is still some misconception about what Joint Programming really means – some still perceive it as an extended ERA-NET. In this context the Group considers that the JPIs could better communicate the potential impact of their research and the

Commission could do more to clarify the mutual consistency of ERA instruments. For some MS the positive budgetary effects arising from collaboration do not necessarily outweigh the added transaction costs involved, and there are other constraints. These include budgetary restrictions, limited human resources, insufficient compatibility between national and European rules and procedures, and insufficient administrative staff at the national level to support the process.

Researchers have high expectations for Joint Programming and are supportive of the process. They agree that many research challenges are best tackled at the European level. JPIs offer opportunities to pool resources, promote mobility, and share infrastructure. Researchers do however consider that there needs to be strong political commitment at the national level if Joint Programming is to succeed.

Industry has the potential of playing a bigger role in JPIs. SRAs could for some areas be more effective if their contents, related work programmes and implementation plans reflected the long term interests of industry. The involvement of industry will in the Group's view increase the overall impact of JPIs.

The view expressed by the Commission in their recent Communication on ERA² is that although Joint Programming is gaining momentum and political commitment, the EU needs to act urgently and coherently to achieve the scale of effort and impact needed to address grand challenges. The Expert Group agrees that the measures proposed by the Commission will address many of the operational hurdles facing the full implementation of Joint Programming, including the alignment of national programmes. In the Group's view political will at the national level will also be crucial if JPIs are to move forward to the phase of full joint programming.

Achieving the full potential of Joint Programming

The Group considered the extent to which current initiatives are likely to deliver the policy vision for Joint Programming. The political challenge is for MS to fully understand and appreciate the potential that the process offers. MS need to move away from the idea that Joint Programming is about bringing new funds to address specific research ideas in single joint calls, to a realisation that it is about aligning existing national programmes to tackle major societal challenges and ultimately to engage in a full policy cycle together in order to arrive at true "joint programming". Joint Programming also faces structural and organisational challenges, but JPIs are not the first ERA-related initiative to face these two challenges. The ERA-NET scheme has shown that MS can work together and have found solutions to these challenges.

The Group sought to answer the question "How likely is it that the full potential of Joint Programming will be realised?". It is too early in the process to come to a definitive answer to this question, but the Expert Group is encouraged by what has been achieved so far by the 10 JPIs. Using the longest running JPI (JPND) as an example, the Group has concluded that the political, structural and organisational challenges facing Joint Programming can be met and overcome.

² Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions "A reinforced European Research Area Partnership for Excellence and Growth". COM(2012) 392. 17.7.2012

The Group is therefore optimistic about the future for Joint Programming, particularly given the opportunities that are emerging from Horizon 2020. The more developed JPIs have already established links with ERA-NETs, European Innovation Partnerships (EIPs), and SET-Plan (European Strategic Energy Technology Plan) as well as international initiatives. If this development continues the Group's view is that JPIs could potentially become nodes or hubs for many initiatives.

The Expert Group's Recommendations

The Group has concluded that realising the full potential of Joint Programming will depend on the continuing efforts of Member States, the Commission, the JPIs and the GPC. The Group's recommendations cover actions that need to be taken now in order to help JPIs develop further and actions that need to be taken to ensure the sustainability of the Joint Programming process.

The following recommendations are put forward in order to help JPIs develop further:

1. All those involved in JPIs need to acknowledge that trust is an important component of Joint Programming, and that developing trust takes time. Trust, and therefore time, is needed particularly to engage effectively in Variable Geometry. When the necessary level of trust has been achieved, JPIs should further explore the use of Article 185 and other ERA instruments.
2. JPIs need to maintain the principle of Open Access (open participation). They should in addition help to maintain research capacities in those MS who are at risk, in the current economic climate, by ensuring Open Access, for example through specific common calls open to all European researchers.
3. JPIs should maintain their research focus using trans-disciplinary inputs, including from industry and other societal actors, where appropriate. In the current economic climate, JPIs should ensure that SRAs do not only become aggregations of existing national research programmes, but also include new ideas and approaches.
4. JPIs should start now highlighting and promoting their achievements, particularly to the national and EU level policy makers in order to demonstrate impact.
5. JPIs should be more effective at communicating the SRAs back to all national level organisations in order that the content can be used for the development of national research programmes.
6. In order to provide better access to and make better use of existing research infrastructures, JPIs should produce inventories and map existing key infrastructures, and promote their shared use to MS.
7. JPIs should start preparing to make "smart" use of H2020 instruments to complement MS funded Joint Calls and actions.
8. The GPC should continue to develop its mutual responsibility for and "ownership" of the Joint Programming process. The GPC should consider and prepare a systematic process that can be used for deciding on future Challenges. The process should include the use of monitoring, evaluations and

other forward looking activities including EFFLA (European Forum on Forward Looking Activities). The GPC should revisit the Voluntary Guidelines on Framework Conditions in order to integrate new operational requirements, including those related to Governance.

The following actions need to be taken by MS in order to help develop a new mind-set relating to Joint Programming:

9. MS should increasingly inform and align national strategies and research programmes with the JPI SRAs. MS should also ensure that national administrations, for example programme owners, programme managers and ministries are sufficiently involved in the JPIs.

10. MS need to acknowledge that acting alone cannot solve societal challenges. MS should invest their resources in order to experience and appreciate the benefits arising from Joint Programming. In the current economic climate, reduced research budgets can be used to leverage more impact through JPIs.

11. The impressive commitment of person-months for the establishment of JPIs should be recognised at the national level.

12. MS should consider how many JPIs they can maintain a sustainable commitment to.

13. Those MS not able to be as involved in JPI research as they would wish should pursue related opportunities through H2020 themes and with other EU funding sources. To build or strengthen capacity, MS should use the Smart Specialisation Strategy process (ERDF) to identify, prioritise and engage in JPI-related research and innovation activities.

The following actions need to be taken by the Commission to support Member States in their efforts to sustain the Joint Programming process:

14. The Commission needs to provide greater clarification on the role and focus of each instrument on the ERA landscape, and their respective interdependencies. This will lead to better understanding by MS.

15. Some JPI members resource the JPI Secretariats; the financial independence resulting from CSAs (Coordination and Support Actions) has been important for Secretariats. CSAs support should continue in H2020.

16. Continue the EFFLA work as it could be a supportive partner for the GPC for future priority setting.

17. The Commission should undertake an evaluation of the JPIs at the end of FP7, and at the mid-term point of H2020.

18. Consider the ERA-FRAME option if the renewed political will, called for in the Commission's 2012 ERA Communication, does not materialise.

19. JPIs could give useful inputs to the strategic considerations of a related programme committee. A dialogue between the JPIs and the H2020 Programme Committees responsible for each societal challenge should be established. It is both for the Commission and MS to consider how best to organise such a dialogue between JPIs, the Commission and national delegates.

1. Introduction

1.1 Joint Programming in Brief

Joint Programming is a process designed to ensure the optimisation of existing and future research efforts at the level of the Member States. Optimisation means reinforced cross-border cooperation, improved coordination and better alignment of publicly funded research programmes in Member States in a limited number of fields and, overall, contributing to the structuring of research efforts in the ERA. The initial objective is to develop critical mass to address major societal challenges. The rationale is that by combining national research programmes, which account for approximately 88%³ of the public funding available for research, and which are still programmed, financed, monitored and evaluated at the national level, better use will be made of Europe's limited public resources. Additionally the research effort will be optimally structured.

The High Level Group for Joint Programming (GPC) guides the process and, for now, Joint Programming Initiatives (JPIs) provide the means of implementing the process. To date ten JPIs have been launched, each addressing a specific societal challenge. The expected benefits of Joint Programming are numerous and significant, and include: eliminating wasteful duplication, developing scale and scope, promoting scientific excellence, and pooling data and expertise scattered across Member States.

1.2 Objectives of the Review

The first JPI was launched in December 2009, followed by two waves of initiatives in 2010 and 2011. This is the first independent formal review of the Joint Programming process, although a report by the GPC in 2010⁴ provided detailed information on the progress of JPIs underway at that time.

The Expert Group was asked to undertake the following:

- Review the Joint Programming process experience achieved so far.
- Identify what went well and what not so well, with respect to the original objectives.
- Recommend how to improve the Joint Programming process.
- Assess progress of the ten JPIs, suggest ways for the future, and possible relationship with Horizon 2020.
- Analyse the participation of less research intensive countries.

³ Source: "Draft results of JOREP study on Joint and Open Research Programmes, Commission , 2012.

⁴ Joint Programming in research 2008-2010 and beyond. Report of the High Level Group on Joint Programming to the Council. November 2010

1.3 Conduct of the Review

The review was undertaken between March and October 2012. The Expert Group gathered evidence from four main sources:

- Documentation, including formal Commission documents, published and unpublished analyses of JPIs and joint programming, and databases recording JPI activity.
- A questionnaire, completed by all JPI coordinators, that sought information on a number of criteria including the societal challenge addressed, impact of the JPI on public R&D, and commitment by participating countries (referred to in this report as the JPI Questionnaire). A second questionnaire asked Member States' decision makers to clarify the level, motivation, and constraints of country participation in JPIs (referred to as the ERAC Questionnaire).
- Follow-up discussions with JPI Coordinators at the June 2012 GPC meeting.
- Formal and informal discussions with the Commission, JPI Coordinators, and others involved in JPIs.

1.4 Structure of the Report

The Expert Group's findings are presented in the following five sections:

- Section 2 looks at the EU Council policy vision for Joint Programming and the contribution that Joint Programming Initiatives could make.
- Section 3 considers Joint Programming progress from the perspective of four key stakeholders, Member States, Researchers, Industry and the Commission.
- Section 4 provides the Group's assessment of progress four years after the launch of the first JPI and an assessment of what has been achieved when compared with the expected benefits.
- Section 5 provides the Expert Group's views on the extent to which current initiatives are likely to realise their objectives. It considers the three challenges, political, structural and organisational that may hinder the Joint Programming process from achieving its full potential, and examines the question of sustainability. It also considers the relationship between Joint Programming and Horizon 2020.
- Section 6 provides the Group's recommendations.

Currently JPIs are the principal means of implementing Joint Programming research activities and much of the Expert Group's work has focussed on their progress to date. The conclusions reached are based principally on the establishment and

subsequent development of the 10 JPIs and, in that context, the role played by the GPC in identifying the priority Societal Challenges and in preparing the Voluntary Guidelines on Framework Conditions⁵. The Group also comments on the role Joint Programming has in furthering the ERA, and other more policy related aspects of this process.

⁵ Voluntary guidelines on framework conditions for joint programming in research 2010. European Research Area Committee High Level Group for Joint Programming ERAC_GPC 1309/10

2. Joint Programming – the policy vision

The starting point for this review is to briefly set out where Joint Programming is placed within the European Research Area (ERA) and, regarding the Joint Programming Initiatives, to establish what was planned as their main function (objectives) in the delivery of the ERA.

The European Research Area (ERA) concept was introduced in January 2000 in the Communication “Towards a European Research Area”⁶. This highlighted a number of weaknesses relating to European research including the fragmented nature of research activities across Europe, and an environment that failed to stimulate transnational research. To overcome these and other weaknesses, a restructuring of the European effort was considered necessary, including the reciprocal opening-up of national research programmes.

Following the widespread adoption of the ERA concept the Commission introduced a number of instruments including ERA-NET, ERA-NET Plus and Article 185 Initiatives to help develop the ERA. In 2008 the Commission introduced Joint Programming⁷, an ambitious new approach for making better use of Europe’s public R&D funds through enhanced cooperation.

The Expert Group sees this new concept of Joint Programming as having three distinct phases. There is the current suite of JPis identified and guided by the GPC and approved by the EU Council; a second phase involves the alignment of national research programmes around a common focus or societal challenge. The final phase which involves “true” Joint Programming involves Member States (MS) working together in a systematic and strategic way to identify the next societal challenge (or core research question) and then implementing the full policy cycle (including developing roadmaps, funding research, undertaking ex-post and ex-ante evaluations).

2.1 What defines Joint Programming

Based on the 2008 Commission Communication, the following helps define what Joint Programming is, and its function in delivering the ERA concept.

The main features of Joint Programming are that it is a voluntary partnership between Member States (and associated countries) aimed at tackling major but common European societal challenges by coordinating and integrating national research programmes, and through this make better use of Europe’s limited public R&D resources.

⁶ Communication from the Commission to the Council, the European Parliament, the Economic and Social Committee and the Committee of the Regions. “Towards a European Research Area”. Com(2000) 6 final. Brussels, 18.1.2000

⁷ Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions “Towards Joint Programming in Research”. COM(2008) 468. Brussels, 15.7.2008.

The rationale put forward for Joint Programming is that the majority of public R&D is programmed, financed, monitored and evaluated at national level and generally there is too little collaboration and coordination between national public R&D programmes. The Communication proposed that areas of strategic importance for Europe would particularly benefit from enhanced collaboration which would reduce the fragmentation (i.e. improve structuring) that exists at present and that results in sub-optimal returns.

The concept proposed for Joint Programming is that Member States would engage voluntarily and on a variable-geometry basis in the definition, development and implementation of common strategic research agendas based on a common vision of how to address major societal challenges. Included in this concept is the principle of open access which provides the flexibility for a country to participate at any time. Strategic research agendas are intended to be new, trans-national programmes, which can play a complementary role to existing programmes at EU-level.

The aim is to increase and improve the cross-border collaboration, coordination and integration of publicly funded research programmes in a limited number of strategic areas, and thus help Europe boost the efficiency of its public research funding so as to better address major societal challenges.

The challenge set by Joint Programming is that it requires a new mindset in the Member States. It requires concrete commitments and actions by Member States and a rethinking and reorganisation of the way national research programmes are defined and implemented by refocusing them towards common objectives, agreed by the MS together.

The benefits Joint Programming will bring to Member States, European Research Programme managers and Europe's scientists are as follows:

- Makes it easier to identify and address common challenges together and to develop common solutions.
- Helps optimise research programmes across Europe by reaching the required scale and scope, eliminate wasteful cross-European programme duplication, and increase programme depth.
- Promotes scientific excellence through joint calls.
- Facilitates the pooling of data and expertise, enables the rapid dissemination of research results, promotes cross border mobility and training of human resources.
- Helps strengthen coordination with other related policies.

The criteria for the identification of specific areas for Joint Programming are that they should address a pan-European/global socio-economic or environmental challenge, there is a clear added value in the area and it is sufficiently focussed so that clear realistic objectives can be met.

Currently, the method of making Joint Programming operational in the specific areas identified is through Joint Programming Initiatives (JPIs) guided by the High Level Group for Joint Programming, the GPC.

2.2 Role of GPC – the High Level Group for Joint Programming.

Joint Programming is a process that is led by the Member States. To meet the challenges set by Joint Programming, Member States collaborate through a High Level Group for Joint Programming, the GPC was launched following Council Conclusions in 2008. GPC members are personal appointees of the relevant Minister in each Member State. The first challenge the GPC faced was to identify themes for Joint Programming. Ideally, long-term priority-setting processes would be started in such circumstances but the Council had called for an early start to Joint Programming. A very pragmatic approach was adopted by the GPC in order to get the process going. Member States were invited to consult widely with stakeholders and submit thematic proposals. The GPC evaluated each proposal on the basis of the following criteria:

- Sufficient and effective commitment of the 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.

Although the definition of themes was only partly the result of systematic and evidence-based priority setting, using for example strategic intelligence tools, and themes are in some cases quite wide in scope, the Expert Group observes that the process started quicker than it might otherwise have done if a more rigorous and systematic approach had been adopted.

The Expert Group further acknowledges the work of the GPC who in 2010 issued a set of Voluntary Guidelines on Framework Conditions for Joint Programming⁸. The Framework Conditions set out proposed common approaches to a number of issues thought to be essential for an effective development and implementation of Joint

⁸ Voluntary guidelines on framework conditions for joint programming in research 2010. European Research Area Committee High Level Group for Joint Programming ERAC_GPC 1309/10

Programming, including peer review procedures, foresight activities and evaluation. The guidelines are non-binding but are based on best practices and seek to counter a fragmented landscape that would occur if each initiative applied a completely different set of rules. The Expert Group noted the extent to which the Framework Conditions have been utilised when assessing the progress and future trajectories of the 10 JPIs, and Joint Programming generally.

3. Achievements to date – stakeholders’ perspective

This section considers the Joint Programming process from the perspective of four key groups of stakeholders, Member States, Researchers, Industry and the Commission

3.1 Member States

Based on the responses received to the ERAC Questionnaire (see Annex 2), overall JPIs are viewed positively by Member States as an appropriate tool for tackling the grand societal challenges of today. Despite differences in the state of development, modes of implementation and structure, the JPIs’ overall performance and role is valued positively as an important instrument in structuring the ERA.

From the outset Member States recognised the potential benefits that could arise from a Joint Programming process, including the central objective of aligning national research programmes, coordinating joint actions and setting strategic agendas. This is confirmed by the level of MS participation in the ten JPIs (see Table 1). All MS are engaged in at least one JPI, with many having membership in between five and eight JPIs. EU 15 participation is significantly higher than EU 12 countries.

Through the ERAC Questionnaire, the Expert Group sought views on the rationale for engaging in JPIs, and the obstacles encountered. The Group’s analysis of the 14 replies received is set out below.

Positive aspects:

MS recognise that JPIs offer the opportunity of tackling grand societal challenges through a coordinated, European-wide approach. Common priority setting, on the basis of the Strategic Research Agendas, and the alignment of national programmes are considered crucial factors. MS also acknowledge that JPIs can help research efforts achieve the necessary scale (critical mass) and scope (programme depth) needed to tackle societal challenges. Reducing the duplication of effort and reducing fragmentation in research areas are of major importance, and are also strong reasons for participating in JPIs.

For those MS that are in the process of building a stronger research base, participation in JPIs is driven by a motivation to become better engaged in transnational R&D cooperation, to enhance their networking with European partners and to tap into knowledge outside an individual country’s research system. There is also the possibility for MS that are not members to participate in calls for proposals.

Other drivers identified for joint programming by Member States include sharing experiences and knowledge in programme management, developing joint procedures in the programming cycle and overcoming operational hurdles jointly. JPIs are also perceived by MS as vehicles to influence and strategically position towards the forthcoming Horizon 2020 programme. These are all points that could be taken up in any future revision of the Voluntary Guidelines for Framework.

Challenges/difficulties:

Notwithstanding the motivation and positive expectations that Member States have for JPIs, countries face different limitations and constraints in participating in the joint programming process. The Group's ERAC Questionnaire asked members to evaluate their position with respect to JPIs and specify the main reasons that limit their participation. Their response included reference to seven constraints which are listed in Table 2. The main challenges are as follows:

- The majority of responding countries identified limited budgets for R&D as a major obstacle to their participation in joint programming. Despite the fact that aligning research programmes was one of the drivers for establishing the process, and through this achieving efficiencies, it seems to the Group that thus far convincing most programme owners about such efficiencies has not been successful.
- Of equal importance is the lack of sufficient human resource at the management and policy level to support the coordination and bureaucracy required by JPIs (in addition to other ERA instruments). This aspect is particularly relevant for smaller countries, but was also flagged up by larger countries.
- Despite the ERA-NET experience that has been gained since FP6, administrative and legal hurdles for transnational cooperation through, for example, different funding cycles of national programmes, still pose obstacles to more integrated joint activities. This point has also been highlighted for action in the Commission's 2012 communication on a reinforced ERA⁹.

⁹ Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions "A reinforced European Research Area Partnership for Excellence and Growth". COM(2012) 392. 17.7.2012.

Table 1: MS and other country participation in JPIs. (M Member. C Coordinator. A Associate/Observer/interested partner

	Neurodegenerative diseases (Alzheimer)	Food Security, Agriculture and Climate Change (FACCE)	Cultural Heritage and global change: a new challenge for Europe	Healthy Diet for Healthy Life	The Demographic change (More Years, Better Life)	Antimicrobial resistance - An emerging threat to human health	Connecting Climate Knowledge for Europe (Clik'EU)	Water Challenges for a Changing world	Healthy and Productive Seas and Oceans	Urban Europe - Global Challenges, Local Solutions
AT	M	M	A	M	M		M	A		C
BE	M	M	M	M	A	M	M	A	M	M
BG			A							
CY		M	M	M				M		M
CZ	M	M	M	M		M				
DE	M	M	A	M	C	M	C	M	M	M
DK	M	M	M	M	M	M	M	M	M	M
EE		M	A							A
EL	M		A			M		A		
ES	M	M	M	M	M	M	A	C	M	A
FI	M	M		M	M	M	M	M	M	M
FR	C	C	M	M	M	M	M	M	M	M
HU	M							M		
IE	M	M	M	M	A		M	M	M	M
IT	M	M	C	M	M	M	M	M	M	M
LT			M						M	
LU	M									
LV			A	M						
MT										M
NL	M	M	M	C	M	M	M	M	M	M
PL	M	M	M	M	M	M		A		
PT	M		A					M	M	A
RO		M	M	M		M		M	M	
SE	M	M	M	M	M	C	M	A	M	M
SI	M		M	M			A			
SK	M		M	M						
UK	M	C	M	M	M	M	M	M	M	A

	Neurodegenerative diseases (Alzheimer)	Food Security, Agriculture and Climate Change (FACCE)	Cultural Heritage and global change: a new challenge for Europe	Healthy Diet for Healthy Life	The Demographic change (More Years, Better Life)	Antimicrobial resistance - An emerging threat to human health	Connecting Climate Knowledge for Europe (Clik'EU)	Water Challenges for a Changing world	Healthy and Productive Seas and Oceans	Urban Europe - Global Challenges, Local Solutions
CH	M	M		M	M	M				
HR	M									
IC									M	
NO	M	M	M	M	M	M	M	M	C	M
TR	M	M		M	M	M	A	M	M	M
AL	M									
IL		M	A			M		M		
EC	A	A	A	A	A	A	A	A	A	A

Country Codes

AT Austria. B Belgium. BG Bulgaria. CY Cyprus. CZ Czech Republic. DE Germany. DK Denmark. EE Estonia. EL Greece. ES Spain. FI Finland. FR France. HU Hungary. IE Ireland. IT Italy. LT Lithuania. LU Luxembourg. LV Latvia . MT Malta. NL Netherlands. PL Poland. PT Portugal. RO Romania. SE Sweden. SI Slovenia. SK Slovakia. UK United Kingdom . CH Switzerland. HR Croatia. IC Iceland. NO Norway. TR Turkey. AL Albania. IL Israel.

Table 2: Seven constraints identified by 13 countries regarding their participation in JPIs. (Source: replies to the Expert Group's ERAC Questionnaire).

Country	Budgetary restrictions	Limited human resources	Limited match of national programmes with JPIs	Lack of coordination of national funding agencies towards JPIs	Insufficient compatibility of national and European rules and procedures	Insufficient staff at the administrative level	Multiple parallel European initiatives
Austria	X	X	X				X
Cyprus	X	X					
Czech Republic	X	X		X	X		
France							
Germany							X
Greece	X						
Ireland	X	X					
Italy	X				X		
Netherlands	X			X		X	
Poland	X	X		X			
Portugal	X	X		X			X
Spain	X		X				X
Sweden						X	X
United Kingdom							
	10	6	2	4	2	2	5

3.2 Researchers

To help assess the potential that JPIs offer from the perspective of the research community, the Expert Group analysed the relevant results from two public consultations undertaken by the Commission – the consultation on ERA 2011¹⁰ and the consultation on Common Strategic Framework (CSF)¹¹. Overall the responses received from these two consultations were very positive and the following summarises some of the key supportive points that emerged.

¹⁰ Public Consultation on the Preliminary Report European Research Area Framework . Public Consultation doc to ERA Framework - 2012 - Public - http://ec.europa.eu/research/era/pdf/era-summary-report-2012_en.pdf

¹¹ Analysis of the Public Consultation of Common Strategic Framework (CSF) for EU Research and Innovation Funding http://ec.europa.eu/research/horizon2020/index_en.cfm?pg=h2020-documents

Many research areas and subjects are focusing on multi and interdisciplinary challenges best tackled through cooperation between researchers from different research fields. In order to address these challenges and reach the goals set, international, high-level research co-operation is needed, and in the view of researchers this is facilitated and encouraged through JPIs.

JPIs are seen as having the potential of strengthening relationships and collaboration between researchers. They are larger entities than those at the national level, and provide excellent opportunities to pool different kinds of expertise, encouraging new approaches, and providing new solutions.

JPIs provide opportunities for collaboration between researchers from universities and institutes across Europe, and through this help promote mobility within the research community, between sectors and between countries. The global challenges and international cooperation which are an integral part of JPIs are seen as attractive to young scientists.

The provision of research infrastructure is an important part of the European research environment. Taking into account the high cost involved and limited financing available there are strong drivers to utilise existing infrastructure more efficiently, including sharing facilities across Europe. JPIs offer the potential to utilise European, national and international research infrastructure more efficiently. The JPIs also provide opportunities to increase the visibility of the high-level European research which in turn will help attract talented non-European researchers to work in Europe.

In summary, the Expert Group concurs with many of the views expressed by the research community. Researchers are willing and committed to playing their part in the planning and implementation of JPIs, but there needs to be strong political commitment not just at EU Council level but also at the national level. The Expert Group notes that the recent Communication on a reinforced ERA¹² provides an opportunity for Research Organisations to play a stronger partnership role in developing the ERA.

3.3 Industry

Due to time constraints, the Expert Group was not able to directly assess JPIs from an industry perspective, but responses to the Group's JPI Questionnaire provided some details of what is planned or is already being undertaken by JPIs, to engage with industry. Several JPIs including JPIAMR, Water and HDHL plan to include industry representatives on their Stakeholder Advisory Boards or equivalents which will facilitate the transfer of knowledge.

Much of the strategic research covered by JPIs will be of interest to industry. For example there may be a significant therapeutics market associated with

¹² Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions "A reinforced European Research Area Partnership for Excellence and Growth". COM(2012) 392. 17.7.2012.

neurodegenerative diseases (JPND), and for antimicrobial resistance (JPIAMR) a completely “successful drug” has yet to be developed. The collaborative activities and output from FACCE and JPI Climate will be of direct relevance to agriculture and food processing industries, and the aquaculture industry will wish to be engaged with certain aspects of Oceans.

The GPC report “Joint Programming in research 2008-2010 and beyond”¹³ considered ways of involving industry in JPIs and made a number of recommendations including: that SRAs could in some cases be more effective if their contents, related work programmes and implementation plans reflect the interests of industry; early involvement of industry in the preparation of the vision could result in a greater impact in the long term; European Technology Platforms (ETPs) could bring valuable input to SRAs; demonstration, pilots, and large scale trials could help get the knowledge generated closer to the market. Whilst the Expert Group does not disagree with the need for a greater involvement of industry in order to increase the overall impact of JPIs, it does point out that JPIs have to carefully balance the long-term nature of SRAs against the sometimes shorter-term perspective of industry.

3.4 Commission’s view on progress to 2012

Section 2.1 provides a description of what Joint Programming was seen to encompass by the Commission in 2008. Four years on, in 2012, the Commission’s Communication “A Reinforced European Research Area Partnership for Excellence and Growth”¹⁴ provides an update on this vision for Joint Programming, and a high level commentary on progress so far. The view expressed by the Commission is that although Joint Programming is gaining momentum and political commitment, the EU needs to act urgently and coherently to achieve the scale of effort and impact needed to address grand challenges. Strategic Research Agendas developed under JPIs show Member State commitment to addressing grand challenges. But in the Commission’s view joint programming remains sluggish, implementation falls short, and the level of alignment is presently too low to make a serious impression on big and complex challenges. The reasons given for this lack of progress include the differences between national funding rules and selection processes, as well as a question of political will. Possible solutions suggested by the Commission include:

- For Member States to implement joint research agendas, share information, remove legal and other barriers to cross-border interoperability of national programmes,
- For research stakeholders to agree on common funding principles and pilot the use of synchronised calls

¹³ Joint Programming in research 2008-2010 and beyond. Report of the High Level Group on Joint Programming to the Council. November 2010

¹⁴ Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions “A reinforced European Research Area Partnership for Excellence and Growth”. COM(2012) 392. 17.7.2012.

- For the Commission to map activities in agreed priority areas to identify strengths, weaknesses, gaps and duplications, and support MSs in implementing joint international peer review evaluations and setting common funding standards.

3.5 Conclusions

3.5.1 Member States.

The Group concluded that overall MS have a positive view of JPIs, seeing them as an appropriate tool for tackling grand challenges. Regarding the MS commitment to the Joint Programming process and JPIs, the Expert Group observes that at a high political level (for example Council Conclusions) the commitment is very clear. However, the Group does not believe that all national administrations are equally committed to JPIs and consider that a fundamental, albeit understandable, reluctance to transfer decision making competence to a JPI will continue to limit MS commitment.

The Expert Group concludes that for some MS the positive budgetary effects arising from collaboration do not necessarily seem to outweigh the added (transaction) costs involved, and there are other constraints. These include budgetary restrictions, limited human resources, insufficient compatibility between national and European rules and procedures, and insufficient administrative staff. The Group considers that JPIs need to be seen to offer even more potential at a time of budget constraints when MS can leverage more research by being involved in a joint activity.

MS have yet to fully experience the benefits that can arise. There is still some misconception about what Joint Programming entails – some perceive it as an extended ERA-NET, rather than a process that could eventually lead to the alignment of national programmes. The Expert Group considers that the research agendas of JPIs and the objective to align national programmes should remain the focus of the Joint Programming process and be the primary motivation for MS participation.

3.5.2 Researchers.

The Group concluded that researchers have high expectations for Joint Programming. Researchers are supportive of the process, and accept that many research challenges are best tackled at the European level. JPIs offer opportunities to pool resources, promote mobility, and share infrastructure. Researchers do however consider that there needs to be strong political commitment at the national level if Joint Programming is to succeed, and the Group agrees with this view.

3.5.3 Industry

Industry has the potential of playing a bigger role in JPIs, and the Group endorses the conclusions of the GPC report (Nov 2010) on this aspect. SRAs could for some areas be more effective if their content, related work programmes and implementation plans reflected the interests of industry. The Group has concluded

that a greater involvement of industry will increase the overall impact of JPIs, although a balance needs to be maintained between the sometimes shorter-term perspective of industry and the more strategic nature of SRAs.

3.5.4 Commission

The Expert Group agrees that the measures proposed by the Commission in the 2012 ERA Communication¹⁵ will address many of the operational hurdles facing the implementation of full joint programming, including the alignment of national programmes. However, in the Group's view, political will at the national level is crucial for the sustainability of JPIs and for moving towards the phase of "full" joint programming.

From responses to the ERAC Questionnaire, the Expert Group has concluded that some aspects of Joint Programming remain unclear to MS. The concept of Joint Programming as a means of aligning existing national programmes is not yet fully understood. Joint Programming is still perceived by some as an extended ERA-NET, with the ultimate goal of launching one or two calls. The relationship with Innovation Partnerships, European Strategy Forum on Research Infrastructures (ESFRI) projects and Horizon 2020 remains unclear to many. The consequences of this are that the potential benefits arising from the reduction of unnecessary duplication and a more efficient use of resources are not yet fully evident to MS.

Notwithstanding the Partnering Communication¹⁶, the Expert Group believes the Commission could provide more clarification by describing the complex ERA landscape which involves numerous instruments, tools, processes, and concepts. The Commission needs to explain the inter-relationship of these and which instruments have "research", "innovation" or "human capital development" as a specific focus. The Expert Group appreciates that precise boundaries cannot be fixed. Nevertheless it sees that if for example "innovation" is introduced as an objective for most instruments, then it will be difficult to differentiate a landscape of mutually consistent instruments. It will also be difficult for a broadly-based understanding of joint programming to be developed and for joint programming to be implemented fully.

¹⁵ Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions "A reinforced European Research Area Partnership for Excellence and Growth". COM(2012) 392. 17.7.2012.

¹⁶ "Partnering in Research and Innovation" COM (2011) 572

4. Achievements to date – the Expert Group’s perspective

4.1 Introduction

This section of the report provides the Expert Group’s assessment of the progress made by the 10 JPIs against the expected benefits (Section 2.1). The Group’s remit was not to evaluate individual JPIs, rather to consider progress made throughout the whole Joint Programming process.

4.2 Progress to date

To examine progress the Group gathered Information from a number of sources including data bases held by the Commission and others, participated in one GPC meeting where all JPIs were presented, used JPI websites, and analysed the Group’s JPI Questionnaire (Annex1). This asked the JPI coordinators for information on four areas (scientific excellence, relevance/effectiveness, utility, and sustainability) and six dimensions of the challenge being addressed: strategic research agenda, scale and impact of the research, commitment of participating countries, governance and next steps.

Regarding the progress being made by the 10 JPIs at the time of the review, Table 3 provides the Group’s interpretation of their progress. Its aim is to present an overall impression of the scale and scope of work undertaken by JPIs and progress made, rather than a comprehensive summary of the individual JPIs. The Group noted the wide range of activities undertaken by JPIs and based on this evidence identified six main stages in their development:

- Developing and adopting Strategic Research Agenda
- Submitting a request to the Commission for CSA funding
- Expanding the partnership, building links, influencing and creating impact
-
- Launching joint calls, funded through ‘virtual pot’ approach
- Developing plans for multi-annual joint programmes
- Implementing multi-annual joint programmes and cooperation throughout the policy cycle

The activities involved at each of these stages are presented in Table 2, together with the Group’s observations on progress, and an indication as to how many and which JPIs have reached each stage.

Table 3: Summary of progress by the 10 JPIs, as noted by the Expert Group, July 2012

JPI Title	High Level Summary of Progress
1. Alzheimer's and neurodegenerative diseases (JPND)	Launched by Council Dec. 2009. 25 countries. Governance structure in place. Top-level mapping of national and EU-level research strategies completed. Independent scientific advisory board guided the development of the Strategic Research Agenda (SRA), adopted following stakeholder consultation and now launched. SRA identifies future research needs and encourages networking, collaboration and resource sharing. Also developed European Research Strategy. A €2m EC-funded coordination action JUMPAHEAD awarded and is supporting five work packages including the SRA implementation, dissemination and evaluation. Four proposals funded in the first joint call (€20m) on the clinical use of biomarkers and larger call will be published. Mapping database will be made publicly available for searches. Further calls planned (€20-30m).
2. Agriculture, Food security and Climate Change (FACCE)	Launched Oct. 2010. 21 countries. SRA identifies five core themes, and developed further through mapping current and future research programmes, stakeholder consultation, and interactions with 16 ERA-NETs. Pilot Action launched by 17 countries to mobilise researchers to come together in a "Knowledge Hub" aimed at integrating models of climate change and address uncertainties in climate change scenarios with regard to agriculture (crops, grassland and livestock) and economics and trade. €2m CSA contract awarded, and planning for an ERA-NET+ activity. Pilot joint action (€15m). Bibliographic analysis undertaken of modelling of climate change impacts on agriculture and food security. International call being organised.
3. Cultural Heritage (JPICH)	Launched Oct. 2010. 25 countries. TOR agreed. Governing board and executive board established. Common Framework developed and National Consultation Panels set up, and data gathering templates distributed. Scientific Committee and Stakeholder Board now set up. Mapping of key public and private EU research initiatives completed. CSA started Oct. 2011. Vision describes three Challenges, and national consultation panels are being established in each country to feed into development of the SRA. A 'Heritage Portal' is being developed as part of the communications package.
4. Health, Food and the Prevention of Diet-related Diseases (HDHL)	Launched Oct 2010. 22 countries. Management Board appointed and Scientific Advisory Board selected. Stakeholder Advisory Board will also be appointed. Vision paper adopted, leading to SRA development and adoption. Broad consultation including industry and research community in developing SRA. Management Board mapping available MS resources. CSA awarded. Some members form the core, others are not as actively involved but wish to stay in contact. Task forces will be formed by the MB to work on specific topics e.g. measuring food consumption. Three joint pilot actions launched.

JPI Title	High Level Summary of Progress
5. Water Challenges for a Changing World (JPI Water)	Launched Dec. 2011. 21 countries. A number of governance groups including Scientific Board and Stakeholder Advisory Group established to refine TOR, map current research activities, define a vision and develop strategic research agenda. CSA proposal submitted. Vision document released before official launch. Set of objectives and activities have been designed to be achieved by 2020 including: Strategic Research and Innovation Agenda being developed by Task Forces; Pilot activity possibly including calls; alignment of National and EU programmes.
6. More Years, Better Lives - The Potentials and Challenges of Demographic Change (JPI MYBL)	Launched Sep. 2011. 16 countries. Governance structure comprising a General Assembly, supported by Scientific and Societal Advisory Boards, and Working Groups of scientific representatives in place. Vision document with five main societal themes adopted, in parallel with a “mapping” analysis of relevant national programmes. Strategic Research Agenda under development. CSA under negotiation. JPI participated in pilot activities of European Innovation Partnership (EIP) on Active and Healthy Ageing. No joint activities planned yet. Participating members have contributed joint financing for secretariat.
7. Connecting Climate Change Knowledge for Europe (CliK'EU)	Launched Dec. 2011. 15 countries. Early work included developing and adopting governance structure, a Vision and Strategic Research Agenda which links four main pillars. Also mapping of policies and programmes of member countries. Next phase includes developing an implementation plan and strategy for the SRA on the basis of 16 Fast-Track activities. Working Groups for each of four modules have formed and agreeing actions. Trans-disciplinary Advisory Board in place. Planning for a joint call. CSA under negotiation.
8. Healthy and Productive Seas and Oceans (JPI Oceans)	Launched Dec. 2011. 17 countries. Management Board and Executive Committee established and adopted a Common Vision with goals and objectives and strong links to policy. Strategic Advisory Board in process of being established. CSA under negotiation. Early gap analysis underway. Planning for SRA and Strategic Research and Innovation Agenda underway
9. The microbial challenge – an emerging threat to human health (JPI Antimicrobial Resistance)	Launched Dec. 2011. 18 countries. Governance structure agreed. Management Board, Steering Committee, Scientific Advisory Board, Stakeholders Advisory Board and Secretariat at different stages of development. TOR and Vision with three main research areas adopted. Mapping exercise initiated and results analysed. National Expert Panels appointed in each participating country. CSA under negotiation. SRA Currently under development. Number of enabling actions include database to identify gaps and promote better use of resources and infrastructure, and standard AMR methods.
10. Urban Europe	Launched Dec. 2011. 18 countries. Governance structure in place, with stakeholder engagement through Urban Europe Forum. Management Board has adopted Common Mission and Vision. Strategic Research Framework adopted, and SRA under development. Review of relevant foresight activities undertaken. Cross-thematic joint call launched, second call planned. CSA not awarded at this stage. Pilot phase with 6 action lines, national stakeholder processes and foresight analysis.

Table 4: Expert Group's observations and assessment of progress made at the Six Stages of JPI development

Stage	Activities Involved	Expert Group Observations and Assessment	Number of JPIs at this stage
1. Developing and Adopting Strategic Research Agenda (SRA)	Formal Vision development often a pre-cursor to SRA. Mapping national and EU level research strategies, identify common areas, gaps, priorities. Establishing independent scientific advisory, stakeholders and other groups to help guide development. Wide consultation with stakeholders, ERA-NETs etc. Completed with Formal adoption of SRA.	JPIs are at various stages in developing their SRAs. Completed SRAs have gone through a rigorous process and will help focus the 'Grand Challenge' into a practical work plan. SRAs are critical to future work, identifying areas for common funding and collaboration and JPIs are using their SRAs to good effect. Mapping of strategies and research programmes often published and therefore helping wider science community and national funders in identifying future research needs. SRA encourages networking, collaboration and resource sharing. SRAs show clear evidence of not focussing only on current research, but considering strategic challenges also.	3 at SRA stage (JPND, FACCE and Climate) 7 at Vision stage (CH, HDHL, Water, MYBL, , Oceans, Urban Europe, AMR)
2. Submitting a request to Commission for CSA funding	Preparation and submission of bid for Commission support including defining work packages and deliverables.	Although some JPIs have secured funds through subscription paid by other partners, it is evident that Commission support is key to JPIs making progress in the first years. What happens once CSA funding ends has yet to be tested.	5 CSAs granted (JPND, FACCE, CH, MYBL, HDHL,) 4 under negotiation (Water, AMR, Climate, Oceans) 1 without CSA for the moment (Urban)

3. Expanding the partnership, building links, influencing and creating impact.	Expansion achieved through invitation, communication, stimulating interest. SRAs actively used to mobilise researchers and enhance collaboration and impact.	At outset some JPIs had limited partner numbers, but all have expanded. SRAs are now beginning to influence National research agenda. JPIs actively using SRAs to help collaboration between nationally funded research. Some JPIs are strongly linked to existing ERA-NETs, others less so. Some JPIs have a direct link to policy. Still rather early to measure impact. Generally there is a lack of a clear implementation plan and indices to measure impact and added value resulting from JPIs.	All at different levels
4. Launching joint calls, funded through 'virtual' pot approach.	Similar process to that adopted by ERA-NETs. SRA and earlier mapping activities used to identify call topics.	Framework Conditions Guidelines used in assessing the selection of research proposals for funding.	2 completed (JPND and FACCE. Urban call launched)
5. Developing plans for multi-annual joint programmes	Establish a dedicated working group to consider how to align national programmes.	Several JPIs have identified this as probably the most important and significant stage in the JPI process, and the more advanced JPIs are starting to plan how to achieve effective alignment of national programmes.	JPND and FACCE at this stage
6. Implementing multi-annual joint programmes and cooperation throughout the policy cycle	Alignment of national programmes, Establishment of multi-annual calls. Implementing the full policy cycle including developing roadmaps, and undertaking ex-post and ex-ante evaluations	This stage has yet to be reached by any JPI. It requires funders to agree on research priorities, the practical application of variable geometry.	None

The Group concludes that overall JPIs are making significant progress which can be characterised as follows:

- “Up and Running” JPIs have a large and growing membership. Governance structures are in place. SRAs have been developed through a process of consultation and are beginning to influence national research programmes. Commission funding has been provided for co-ordination and has played an important part in ensuring progress. Calls have been launched and research projects are underway. Collaboration is taking place on a number of fronts including data sharing and networking. Joint programming involving the alignment of national programmes has yet to be achieved, and is recognised as a major challenge. Preparations and plans are underway for this final goal. JPND and FACCE have reached this stage.
- “Starting out” JPIs are involved in a considerable amount of ground work such as developing governance systems, management and scientific boards, terms of reference, websites and communication. Visions are being developed as pre-cursors to SRAs and have involved mapping of strategies and research programmes and consulting stakeholders. CSAs have either been granted or under negotiation. HDHL, CH, MYBL, Climate and AMR have reached this stage. Depending on how much preparation was undertaken prior to launch, early Vision and SRA planning is underway, and maps of strategies and national programmes developing. CSA preparation in hand or submitted. Some have fast tracked certain activities including launching joint calls (Water, Oceans and Urban Europe have reached this stage).

The relatively “advanced” position of JPND and FACCE is not unrelated to their respective histories and the long build-up of trust between the actors. For FACCE, rounds of Foresight (through SCAR¹⁷) ERA-NETs and an ERA-NET Plus in the thematic area provides a very solid basis on which to build a JPI. JPND had a much earlier start than the other JPIs and therefore also has had the time needed to build up the necessary trust.

4.3 .Assessment of impact

Whilst it is clear that a considerable amount of work has been undertaken within the JPIs, and there has been a high level of output including developing SRAs, setting in place governance structures, mapping exercises, and joint calls, the Expert Group wanted to examine what impact there has been so far, and what progress has been made towards the strategic goals set by the JPIs. Two impacts in particular were examined.

¹⁷ SCAR, Standing Committee on Agriculture Research,

4.3.1 Impact on long-term strategic goals of the JPIs.

All JPIs have created visions and set up long-term strategic goals with the time horizon of 2020. These goals and visions include: mobilising in a coordinated way Europe's research resources and capacities (for example JPI Oceans); filling critical knowledge gaps (for example JPI Oceans, Climate); synchronising, aligning and combining research efforts to enhance societal relevance, scientific quality and innovation through cooperation between top researchers from different countries (JPI Climate); and coordinating activities between the JPI, the Commission and stakeholders. The goals also include translating scientific knowledge into policy by bridging knowledge production with knowledge application.

The strategic and long-term goals also include creating platforms for dialogue, knowledge transfer and strategic discussions. These platforms include connecting Member and Associate States, as well as connecting the JPI community with the Commission, other relevant EU and international initiatives and other stakeholders (e.g. policy makers, decision makers or industry).

The Group considers that JPIs have had a very positive impact through the creation of new strategic interactions and platforms between the JPIs and the various stakeholders involved.

4.3.2 Impact on stakeholders.

Several JPIs conclude that there is as yet limited impact on national research communities, while an influence at the policy and stakeholder level (e.g. pointed out by JPND and JPI Oceans) is more apparent. The impact on the research communities is understandably limited (with one example of a MS reporting some national structuring effects) since few common calls have been launched and the ones executed so far have been rather limited in terms of funding. On the level of research funding and programming, there are examples of countries that before joining the JPI did not have a national programme in the challenge area but as a consequence of their membership of a JPI they have started to develop complementary national strategies and programmes.

4.3.3 Summary of impact

From the evidence gathered by the Group it is clear that all JPIs have started to make an impact at different levels. For instance, in their respective areas, the JPIs have raised the awareness of the need to develop scale and scope to address the particular challenge. An indication of this is the increasing participation of countries in the various JPIs, and the commitment in terms of working hours and funding by the participating countries. For example, data from the Commission shows that JPND has had an apparent "coordination" effect on Europe's neurodegenerative disease research. From 2007 to 2011 the total volume of research funding has grown from €100m per annum to €400m, and of that the percentage now coordinated has grown from 10% to some 20%. The increase in funding and coordination can in part be attributed to the JPND calls and the Commission's FP7 calls. Other international initiatives are seeking to link with JPND as it develops a more international profile.

The Expert Group concludes however that the achievement of multi-annual programming and the alignment of national programmes in order to further develop scale and scope remains a significant challenge.

4.4 Assessment of benefits

The Expert Group assessed progress against the following five benefits cited earlier (Section 2.1): addressing common challenges, eliminating wasteful duplication, promoting excellence, reaching the required scale and scope, and facilitating the pooling of data and expertise.

4.4.1 Addressing common challenges and developing common solutions.

A major rationale for developing JPIs is that improved collaboration and coordination between national programmes will enable Europe to be in a better position to tackle major societal challenges. The following three examples extracted from the Group's JPI Questionnaire help illustrate this aspect:

- Over 12 million people in Europe suffer from neurodegenerative diseases, yet treatments are still lacking. JPND has been established specifically to coordinate national efforts by bringing together funding bodies, researchers and other stakeholders to consider existing research evidence, build a common vision, and facilitate sharing of tools, techniques and other resources more efficiently in order to find solutions. Although most Member States have research programmes, the EU is not leading the world, and Europe has never benefited from structured support in this area. JPND will ensure that much greater progress will be made now that efforts can be combined.
- Antimicrobial resistance is a global problem. Currently European research is dispersed and there is little collaboration between Member States. JPIAMR aims to integrate relevant scientific fields across national borders and to create a common research agenda with a shared common vision of sustainable use of antibiotics to treat infectious diseases in Europe. Action is needed on many fronts including new approaches to prevent and treat infections, new drugs and diagnostic tools and models for predicting resistance to antibiotics. To meet these challenges JPIAMR's vision is to build a European Research Area and a global lead in the field of antimicrobial resistance in the next 15 years.
- There is a growing gap between global water demand and water supply. In addition climate change is expected to intensify drought in some European areas and flooding in others. Currently Europe probably holds world leadership in this area of research, and also innovation. JPI Water has been formed to help maintain this lead and address the grand challenge of achieving sustainable water systems for a sustainable economy in Europe and abroad. Addressing this challenge requires a multi-disciplinary approach and JPI Water will enhance this through the coordination of National and Regional RDI policies.

The Group concludes that all JPIs put forward strong cases that they are each addressing significant issues which are beyond the scope and resources of individual countries and together are seeking appropriate solutions.

4.4.2 Eliminating wasteful cross-European programme duplication

There is evidence that JPIs are being effective in helping to realise this benefit. A wide range of activities are being undertaken or planned by JPIs that will help reduce unnecessary duplication of effort across Europe including mapping which helps establish where member states currently are, what they have in common and identify possible overlap and gaps. The drafting and adoption of Vision and SRA documents also contributes to eliminating waste, as does the funding of research through joint calls.

4.4.3 Reaching the Required Scale and Scope.

Apart from the longer established JPIs (JPND and FACCE), the Group does not consider that the required scale and scope has already been achieved. However, the Group does think that some JPIs are on track to achieve the necessary scope and scale. The Group is concerned that in the current economic climate where national research budgets are under pressure a tendency could develop to only aggregate existing national activities into the relevant SRA thereby impacting on the scope of the research undertaken to address the Societal Challenge. Broadly based inputs from stakeholders into the development of SRAs is very important to ensure that societal as well as scientific considerations are taken into account when defining the core challenge and in deciding ways to address it.

SRAs should bring the research into new and potentially rewarding fields (e.g. biomarkers in spinal fluid to detect Alzheimer's which complements existing genetic approaches) and not only reinforcing existing research trajectories.

Notwithstanding the above, the Group found many good examples of JPI activities including for example:

- JPND has mapped National and European-level neurodegenerative disease research in order to identify gaps and opportunities for improved co-ordination.
- FACCE has brought together 65 research groups from 17 countries in its action to develop a Knowledge Hub.
- JPI Climate has completed a comprehensive mapping exercise of research activities, policies and science programmes of all its members.

4.4.4 Promoting excellence through joint calls.

Two JPIs, JPND and FACCE, have completed joint calls and the selection of research proposals for funding have followed the GPC's Voluntary Guidelines for Framework Conditions¹⁸. Broadly these require that the process respects the

¹⁸ Voluntary guidelines on framework conditions for joint programming in research 2010. European Research Area Committee High Level Group for Joint Programming ERAC_GPC 1309/10

principles of equal treatment and transparency. Under the Guidelines the evaluation of proposals is undertaken by independent experts that score the proposals on the basis of their scientific and/or technical excellence, relevance, potential impact and the quality and efficiency of the implementation and management. On this basis the Expert Group concludes that JPIs are encouraging and promoting the principle of excellence in the projects funded through joint calls.

4.4.5 Facilitating pooling of data and expertise.

In developing their Visions and SRAs, JPIs have highlighted the need to pool data and expertise in order to achieve better coordination. For example JPI Climate has highlighted the need to coordinate expertise in developing the next generation of climate models, JPICH has developed a data gathering template, and Oceans, recognising the essential value that long-term datasets play in marine science, will undertake a mapping exercise. The Expert Group endorses this kind of core activity.

4.5 Conclusions

Taking into account the fact that JPIs were launched at different times over the past four years, and that six of the ten JPIs have been operating for less than a year, the Expert Group's overall conclusion is that good progress has been made. Following wide consultation all JPIs have either developed a Vision or a Strategic Research Agenda which identifies common areas, gaps and priorities. All are working on expanding their membership, building links and starting to influence their respective strategic research area. The two longer established JPIs (JPND and FACCE) have launched calls and are funding research through "virtual pots". These two JPIs are now developing plans for multi-annual joint programmes. The final and probably most challenging stage, that of implementing these plans and co-operating throughout the policy cycle, has yet to be achieved by JPIs as a group.

The Expert Group does not view the different modes of implementation or different structures as a negative. A "one size fits all" approach is neither possible nor desirable given the very different nature of the Societal Challenges being addressed. However, many JPIs have reached a point where operational guidelines and templates regarding agreements, IPR etc. are needed and here the GPC can help to avoid needless duplication of effort by preparing these during the next revision of the Voluntary Guidelines on Framework Conditions. The next version of the Voluntary Guidelines needs to also address the question of Governance and should provide clear guidance regarding the composition and integrity of the various Management Boards and Advisory bodies associated with each JPI.

In assessing the overall progress made by the JPIs, the Expert Group looked at two criteria, impact and benefits. JPIs are starting to make an impact on long-term strategic goals, and on stakeholders, and there are plans to widen and increase this impact. On benefits, as set out in the original vision for Joint Programming, the Group concluded the following: significant issues are being addressed that are beyond the scope and resources of individual countries; a wide range of activities are being undertaken by JPIs that will help reduce unnecessary duplication and effort across Europe: scientific excellence is being promoted through joint calls which follow the Framework Conditions; JPIs are on track to achieve the necessary scope and scale;

and through their Visions and SRAs, JPIs show evidence that they are coordinating data and expertise.

As explained earlier the Expert Group sees the Joint Programming process as a spectrum of activity between the GPC, the JPIs, aligning national programmes and full cooperation along the policy cycle. The ten initiatives currently provide the only formal way of implementing Joint Programming and many of the conclusions reached by the Expert Group relate to the progress being made by JPIs. The most significant challenge for Joint Programming remains that of aligning national programmes and implementing multi-annual joint programmes. This challenge is considered in detail in Section 5.

5. Challenges and opportunities facing the Joint Programming process

Quotes taken from the JPI Questionnaire

“Joint programming is a novel and innovative process which requires new ways of working together in Europe”

“Although the participating countries have shown strong commitment to the JPI and the process, the achievement of multi-annual research programming is a long process”

“The challenge remains to achieve multi-annual programming, and not just individual calls”.

The Expert Group has analysed potential challenges facing Joint Programming, grouping these into political, structural and organisational and these are considered below. Additionally, and in line with its terms of reference, the Group has analysed the participation of less research intensive countries in JPIs. The Group has also considered how JPIs relate to Horizon 2020, the future Framework Programme for Research and Innovation (2014-2020)¹⁹.

5.1 The Political Challenge.

The Group considered whether in times of scarce public budget it has proven difficult for Member States' administrations to rapidly redirect national resources into JPIs. Joint programming is primarily about the alignment of existing and planned national research programmes in order to tackle grand challenges more effectively and efficiently. However this concept has yet to be fully adopted and acted on by national programme owners and policy makers. A prevailing concern is the partial transfer of “control” over national resources into cooperation schemes. The political challenge is for the full potential and added value of Joint Programming to be fully appreciated and understood and at the same time moving away from the idea that joint programming is about bringing fresh funding together for one or two calls. As stated previously, JPIs should not be regarded as a variant of ERA-NETs.

The Expert Group's view is that under the current financial and economic pressures, JPIs potentially have a role to play in safeguarding national expertise and capacity. MS currently affected by budgetary cuts for research can leverage “more” from this lower level of funding by financially participating in the Joint Call of a JPI. This could

¹⁹ Communication from the Commission to the Council, the European Parliament, the Economic and Social committee and the Committee of the Regions. Horizon 2020 – The Framework Programme for Research and Innovation. COM(2011) 808. 30.11.2011

also help to mitigate against key expertise and capacity being permanently lost at the national and European level.

5.2. Structural and organisational challenges.

The Group looked at possible structural and organisational constraints that may result in JPIs not achieving their full potential. Structural constraints, which are more difficult to address, include incompatibility between national research and innovation systems which may make Member States hesitant about giving firm commitments to team up with other national programmes into “external” schemes. Organisational constraints include the lack of common principles between MS that are needed to assemble national funding and the design, selection and implementation of cross-border projects and programmes. The ERA Communication²⁰ makes specific recommendations regarding structural and organisational constraints. The Expert Group agrees with these but the Group considers that the main constraint remains the lack of will at the level of national administrations to re-orientate strategies and research programmes significantly in line with the SRAs.

JPIs are not the first ERA- related initiative that has had to face such challenges. For example the ERA-NET scheme has demonstrated very clearly that Member States are able to work effectively together effectively, combining funds through the “virtual” common pot approach, and sharing knowledge, experience and strategies. JPIs are also planning or have already undertaken joint calls, so to a certain extent Member States have already committed funds to “external” schemes, and have therefore found solutions to organisational challenges.

5.3 Sustainability

From the outset it was acknowledged by the Commission and Member States that Joint Programming would be a long-term, strategic process aimed at tackling major economic, social and environmental challenges together. No specific end date was given for Joint Programming to deliver by, but a 10+ year horizon is a reasonable supposition. Given the long timeframe associated with this initiative the Expert Group wished to assess the issue of sustainability, from both a science and a budget provision angle.

5.3.1 Science Sustainability

In response to the Group’s questionnaire, all JPIs provided a convincing case that their areas of science were addressing major societal challenges which will require many years of support. Examples of the science challenges include:

- For JPI Oceans, understand and mitigate the impact of climate change and pressure from human activities on the marine environment, improve

²⁰ Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions “A reinforced European Research Area Partnership for Excellence and Growth”. COM(2012) 392. 17.7.2012.

understanding of marine ecosystems and their processes, develop and sustain infrastructure to support an integrated data and information base.

- For JPI Climate provide integrated climate knowledge and decision support services built around four modules: improved climate projections, climate services, societal transformation, and decision-support tools.
- For HDHL to address three key interacting research areas, determinants of diet and physical activity, diet and food production and diet-related chronic diseases.
- For FACCE the research goals include are to provide new approaches for environmentally sustainable growth and intensification of agriculture, provide an integrated impact assessment of climate change, and contribute to reductions of green house gas emissions.

These are clearly substantial challenges requiring scientific, technological and socio-economic responses and which are likely to remain high on Europe's research agenda for at least 10 years.

5.3.2 Budget Sustainability

There are two budget-related aspects, one associated with the support of the JPI network, the other with the possible constraints of funding availability for new research.

There are high transaction costs associated with collaboration. Running networks, developing strategies, mapping programmes, consulting stakeholder groups, launching joint calls and managing jointly funded research all require resources, and the question is how will this be provided over the longer time frame. Joint Programming does not involve Community funding *a priori* because it is principally about Member States defining common strategies and bringing together national resources. It is after all a MS-led initiative. It is the view of the Expert Group that MS-led means *de facto* MS-funded. This does not rule out the possibility of the JPIs competing for funds that will become available from Horizon 2020.

At the outset some JPIs, for example FACCE, asked countries to pay a small membership fee. Others such as JPI Oceans were supported by a significant start-up budget from a small number of countries which enabled preparatory work to be undertaken. MS have been willing to support the Joint Programming process not only with a considerable amount of 'in kind' support but in some cases with funding from a number of MS. The Expert Group was impressed at the very strong in-kind contribution provided by members to the JP process, with thousands of person-months being committed to delivering Visions and SRAs. However it has to be said that the scale of the funding being committed to Joint Calls is uneven and there is a clear risk of "free riders" in the process.

Once JPIs were considered mature and launched by Council Conclusions, the Commission launched dedicated calls for Community Support Action (CSA), usually at the €2m level over a 3 year period. This has provided an essential injection of

funds into the JPIs Management at an important point in their development and without the CSAs some of what has been achieved so far would not have been realised so quickly.

It is not yet clear how Horizon 2020 may offer help in the future and this is considered further below (Section 5.5). In the interim, since Joint Programming is primarily a Member State-led initiative, it seems appropriate to the Group that MS should bear at least some of the costs associated with collaboration. There is evidence that this is happening, for example through in-kind contribution. Based on the level of CSA support provided so far, start-up costs are perhaps in the region of €700k per annum. This would be expected to fall once the partnership has been fully formed to perhaps €500k per annum, giving an annual subscription per country of €50k (where membership is 10). This is a relatively small amount when compared with the research budgets concerned, and where there is real commitment should not be difficult to reach agreement on. Nevertheless, the Expert Group's view the injection of CSA support as important.

With regards to the funding of new research within the JPIs, this has to be seen against the pressures that are being brought to bear generally on research across Europe. In principle and according to EU Council Conclusions, national programme managers should see advantages in funding research through JPIs where the strategic needs and direction have been carefully mapped out in SRAs, and where leverage of national funds through jointly funded projects will occur (see Section 5.1 above).

Without necessarily investing in new research, added value will arise from aligning national agendas around a common European agenda. These are arguments that still have to be won, and whilst a coordination-bureaucracy burden might be seen to limit the Joint Programming process, the JPIs themselves need to move ahead decisively in order to demonstrate more clearly the advantages of participating if they wish to secure funds for the future. This is a core part of their communication and dissemination task.

5.4. A practical way forward for JPIs

The Group concluded in Section 4 that JPIs have yet to reach the final stage of Joint Programming which involves developing and implementing multi-annual joint programmes, aligning national programmes and engaging in the full policy cycle. So what realistically can be achieved? To help answer this the Group has drawn on the example of the longest-running JPI, JPND, which in the Group's view is developing a practical way forward as described below.

5.4.1 Agreeing a list of candidate topics for joint programming.

JPND's Strategic Research Agenda (SRA) sets out the common vision of the European countries involved in the initiative, and identifies a number of thematic priorities for future neurodegenerative disease. Following adoption of the SRA the next stage has been to develop an Implementation Plan which has involved four main steps:

- Through a survey of funders establish their priorities for international research initiatives. The survey set out key opportunities drawn from the SRA and sought funders views on a number of criteria such as scale, impact, agreed timelines, and added value to national activities.
- Based on the results of this priority assessment, four key themes were identified as being the most appropriate for implementation. These were worked up further by Working Groups into four reports that established a list of implementation opportunities.
- Based on these reports, an analysis was made of the interconnectivities between the identified themes, the degree of EU-wide added value, the level of innovation, and the practicality for implementation through existing mechanisms. This work led to the identification of six topics for Joint Transnational Calls (JTCs) with a potential funding requirement of between €40m and €70m. It also identified one topic for a Coordinated National Call, and five collaboration activities based on Task Forces and Workshops .
- Participating countries were asked to review each of the proposed opportunities that had been identified and to consider their appropriateness with respect to scale, timeliness, ease of implementation and added value for the national agendas. Countries were also asked to identify which JTCs they wished to participate in and what level of investment they would be able to allocate to these calls.

These four steps brought JPND to an important point in making the Implementation Plan a reality - an agreed list of topics to work on, estimates of how much funding would be needed, and identification by each country which specific topics they were interested in and an indication of the level of budget that could be committed. Of the six topics identified for joint transnational calls, one received support from 14 funders (out of a total of 20 that responded), three received support from 7 funders, and the remaining topics received support from 10, four and two funders. The total indicative budget available for all the calls amounted to between €50m and €75m..

5.4.2 Achieving the final goal

How then is JPND taking this forward into the development of actions that could meet all the criteria of a Collaborative Programme? The first hurdle that has arisen is that some countries were not immediately in a position to support full implementation of all the opportunities. Also some countries were more interested in basic research while others were more interested in healthcare and social care research. In the light of these responses the following approach has now been adopted:

- Launch a call covering those topics where countries have indicated that budgets are immediately available
- Given the constraints of national bodies in terms of their ability to commit funds on a multi-annual or long-term basis, adopt a phased approach to the Implementation Plan. Phase 1 will use a staged approach of launching activities annually over a three-year period in order to address the six

research topics already identified. This approach will allow countries the opportunity to plan their annual participation.

- Leading on from Phase 1, Action Groups will be formed to mobilise resources to help progress opportunities that have been identified, including longitudinal cohort studies, models, technologies, education and training. In addition JPND's Executive Board will take the lead in linking and synchronising national plans, strategies and activities and identify areas of synergy and mutual benefit that may lead to transnational initiatives

5.4.3 Assessment of this approach

JPND has set itself an implementation horizon of between 6 and 10 years and it will only be at the end of this period that it will be possible to judge whether full Joint Programming has been achieved in the fields of neurodegenerative disease. Nevertheless the Expert Group considers that JPND provides a clear example of how JPIs can progress to the final stage of developing and implementing multi-annual joint programmes and the alignment of national programmes. The Group considers the following elements are key to JPND's approach to Joint Programming:

- Comprehensive engagement with the national funders of research in deciding the international research priorities identified through a robust SRA process.
- Recognising that national funders do not all share the same priorities, same funding timetables, and budgetary cycles and therefore adopting a so called "à la carte" approach to joint calls which allows flexibility, with not all countries expected to participate in every action. In other words applying the concept of "variable geometry" in a practical and effective way.
- Over the longer-term seeking other ways of collaborating including linking and synchronising national plans, strategies and activities, potentially leading to transnational initiatives.

The Group concludes that, on the basis of what has been achieved by JPND, and the plans already being made for the medium term structural and organisational challenges can be successfully met and difficulties overcome through the JPI process.

5.5 Joint Programming and Horizon 2020.

The Group considered the relationship between Joint Programming and Horizon 2020²¹. Horizon 2020 is the EU's new funding programme for research and innovation and will bring together all existing EU research and innovation funding. It defines research priorities common to all 27 Member States and therefore offers opportunities for each MS to participate in trans-national research and networking activities in thematic areas aligned to their own national interests. The Group looked at two aspects of the JPI/Horizon 2020 relationship.

²¹ Communication from the Commission to the Council, the European Parliament, the Economic and Social Committee and the Committee of the Regions. Horizon 2020 – The Framework Programme for Research and Innovation. COM(2011) 808. 30.11.2011

5. 5.1 How can Horizon 2020 help JPIs

Under Horizon 2020 the Commission has indicated that JPIs could potentially be supported through several means, especially through the new ERA-NET instrument. This could support JPIs in their development, help establish the networking structures, the design and coordination of joint activities, and topping up individual joint calls and actions of a transnational nature. Two JPIs (FACCE and Cultural Heritage) have already requested Commission funding for some of their priorities through an FP7 ERA-NET Plus action and are therefore already providing an example of JPIs making use of EU funding instruments. Article 185, provides an opportunity to fund JPI research (SRA) provided there is a high level of commitment to integration at scientific, management and financial levels by the participating countries.

It can be concluded that Horizon 2020 instruments could potentially be used to support JPIs.

5.5.2 How can JPIs help meet Horizon 2020's Challenges?

Horizon 2020 has identified six societal challenges - health, food security, energy, transport, climate and secure societies. These reflect the policy priorities of the Europe 2020 strategy and address major concerns shared by citizens in Europe. From the Group's questionnaire it is clear that some JPIs already see themselves as able to contribute to one or more of these challenges, and some JPIs (including JPCH and JPI Oceans) have actively engaged in the development of the Horizon 2020 societal challenges themes. For others the link may be less direct at this stage (e.g. JPAMR).

5.5.3 Participation of JPIs in Horizon 2020 Calls.

In principle there are no reasons why JPIs will not actively participate in calls launched under Horizon 2020. An obvious condition is that the call theme is an area identified by the JPI, and not all Horizon 2020 challenges are covered by, or are a priority for, JPIs. The content of Horizon 2020 is proposed by the Commission but it is the Member States, and the Parliament who negotiate the final scope and content. JPI Strategic Research Agendas are generated by the MS and it should be possible to negotiate and accommodate the respective interests within Horizon 2020. MS need to find a way to deal with the coordination-bureaucracy associated with Programme Committees and JPI governance demands. Two JPIs (FACCE and Cultural Heritage) have already in 2013 requested Commission funding for some of their priorities through FP7 ERA-NET Plus actions as there is a coincidence of priorities for both FP7 and the two JPIs.

Where appropriate the SRA can explicitly refer to Horizon 2020 themes, which in turn offers possibilities for the financing of JPI topics. The Group concluded that JPIs can potentially play an important role in addressing some of the Horizon 2020 challenges if they choose to do so, but they are also free to select and work on other priorities. This independence is a positive aspect since it means that potentially the full spectrum of research priorities will be addressed.

5.5.4 Strengthening the role of JPIs in Horizon 2020

JPIs have been established to address grand societal challenges through collaboration and combining and adapting national research programmes. They are cross-Europe partnerships dedicated to mapping and analysing national research activities, and translating this information into strategies at the European, or potentially even at the global level. JPIs have already started to link the different parts of ERA within their specific challenge areas. The more developed JPIs have already established links with ERA-NETs, EIPs, SET-Plans, KICs, as well as with international initiatives.

If this development continues, it is the Group's view that JPIs could potentially become nodes or hubs for many initiatives. To help strengthen the relationship between JPIs and Horizon 2020, individual JPIs could be an integral part of the open and transparent dialogue needed for priority setting in Horizon 2020. The GPC report to Council in 2010²² concluded that the GPC is a unique forum for priority setting in Europe. The JPIs could take on a complementary role, though on a more focused thematic level. If the Commission accepts this development then a link between the JPIs and the programme committees responsible for each societal challenge in H2020 should be established. It is envisaged by the Expert Group that JPIs could act as another stakeholder providing inputs to the strategic considerations of the relevant program committee.

5.6 Participation of less research intensive countries.

The Expert Group was asked to analyse the participation of less research intensive countries in JPIs, and assess whether they participate adequately in the joint programming process, and benefit from it.

The Group first sought to establish what is meant by the term "less research intensive". The Group looked at a number of indicators across the 26 MS including the investment in research as a percentage of GDP, the number of research employees per 1,000 population, and other financial aspects. No single indicator could be used to identify a group of countries as being less or more research intensive. Table 1 lists MS involvement in the ten JPIs, either as full members, or associated /observer/interested members. It confirms the wide participation of MS in JPIs, with many having some involvement in five or more JPIs. The Group concluded that a cautious approach therefore needs to be adopted when assessing participation in JPIs and relating that to a less or more research intensive characterisation.

Of more relevance is to consider how countries that do not necessarily have a significant science capacity in a particular research area could nevertheless participate in a relevant JPI. The Group concluded that members that have a significant interest in a research area, with the necessary funds and research capacity, will almost certainly help form the core of the JPI's membership. Those with an interest in the research area but with reduced capacity, perhaps more at the "project" rather than "programme" level, should nevertheless be able to participate in the JPI activities at a level that suits them. Concurrently, the SRAs need to be better

²² "Joint Programming in research 2008-2010 and beyond. Report of the High Level Group on Joint Programming to the Council" ERAC-GPC 1311/10. Brussels, 12 November 2010.

communicated by the JPIs back to all national level organisations so that the content can be used to inform the development of national research programmes.

Specifically on budgets, a lack of national funding should not automatically exclude a MS from participating. Other sources of funding are available for example Common Strategic Framework Funds (CSF) both to support capacity building in regions that are lagging behind, and excellence, which is a characteristic of leading countries.

5.7 Conclusions

Achieving the Policy Vision for Joint Programming, through JPIs, is a significant challenge. It requires sufficient and sustainable commitment from MS to collaborate on a voluntary basis, and within the principle of “variable geometry”. The themes need to address major societal challenges yet JPIs need to be sufficiently focussed to deliver real results. The Commission’s role is to facilitate the process and provide support, but major, on-going budgetary contributions from the Commission are not assured and as a MS-led initiative to align national programmes, and by implication national budgets, the Expert Group believe that the sustainability of the JPIs depend first and foremost on the MS themselves.

The political challenge is for MS to fully appreciate the potential that the process offers. MS need to move away from the idea that Joint Programming is about bringing new funds to address specific research ideas in single joint calls, and is more about aligning existing national programmes to tackle major societal challenges. Joint Programming faces structural and organisational challenges, but JPIs are not the first ERA-related initiative to face these two challenges. The ERA-NET scheme has shown that MS can work together and have found solutions to these challenges.

It is too early in the process to give a definitive answer as to whether the full potential of Joint Programming will be fully realised, but the Expert Group is encouraged by what has been achieved so far by the 10 JPIs (Section 4). Using the longest running JPI (JPND) as an example the Group has concluded that the political, structural and organisational challenges facing Joint Programming can be met. From the Group’s analysis the successful recipe includes: comprehensive engagement by the national funders in deciding the priorities for collaborative research; applying the concept of “variable geometry” by allowing national funders to adopt an “à la carte” approach to joint calls; and over the longer-term seeking ways of collaborating including linking and synchronising national plans, strategies and activities.

A conclusion reached by the Group is that realising the full potential of Joint Programming will need the combined efforts of Member States, the Commission, researchers, and other stakeholders. Based on what has been achieved so far by JPIs the Group is optimistic about their future, particularly given the opportunities that are arising from Horizon 2020.

On sustainability, the Group has concluded that science sustainability is virtually guaranteed through the Joint Programming process because the rationale for JPIs is that they tackle major societal challenges which will require many years of support and endeavour. The Group considers budget sustainability to be a more uncertain

area, and poses a potential threat to the future success of Joint Programming. The Expert Group was impressed by the very strong in-kind contribution provided by members to the Joint Programming process. The Group also acknowledges that CSA funding has been very important for supporting the development of JPIs. To maintain their effectiveness JPI secretariats need to have secure and stable funding streams over the long term. There is an advantage to secretariats maintaining a degree of financial independence, which suggests that core funding from the Commission may be particularly appropriate. The Expert Group therefore calls for the continued provision of CSA support in the context of Horizon 2020 in order to sustain the coordination activities already started by the JPIs. The JPIs themselves are responsible for securing funds for research collaboration from the MS involved and, as appropriate, through H2020 instruments.

The Joint Programming process was originally initiated and developed primarily with a focus on research. The JPIs can leverage more innovation and contribute to the European Innovation Partnerships by becoming, where possible, the integral research component therein. Where JPIs have strongly maintained the research focus this has allowed for a more natural linkage to the related EIP, e.g. Ageing.

The Expert Group's review points to considerable progress in the establishment of JPIs. Nevertheless, there is no inconsistency when the Expert Group agrees with the Commission's assertion that "*the EU needs to act urgently and **coherently** (Expert Group emphasis) to achieve the scale of effort and impact needed to address grand challenges*". The Group believes that in addition to the steps proposed by the Commission in the Communication more could be done.

Here, the Expert Group refers to the recommendation from a previous ERA Expert Group Report (2008) on the Optimising of Research Programmes and priorities²³. "*The Framework Programme for RTDI and the Article 169 projects have shown that an EU-wide, 'one-size-fits-all' approach can sometimes create high bureaucratic and opportunity costs at the EU-level, and even more at the national and regional levels. From an overall EU macro-economic perspective and, at the end, a true European Research and Innovation Area perspective, this represents a suboptimal allocation of resources. The objective now should be to establish a construct – an ERA-FRAME - wherein EU-decided/third-party types of programmes can be implemented with, from programme-period to programme-period, variable geometry of participation and focus*".

The thinking was that once the decision had been taken, there would be clear rules, procedures, templates and a definitive budget committed thereby obviating the need for sole reliance on the good-will or the influence of individual participants.

Structuring Europe's research efforts in order to address grand societal challenges means that national public funds for research, Horizon 2020 and the Structural Funds have to become more mutually consistent. Responses to the Group's ERAC Questionnaire points to an uneven research and funding capacity across the MS to actively participate in JPIs in particular arising from the current financial climate. A mutual approach between more- and less- research intensive countries would be for the former to fully engage in Joint Programming and align national programmes and

²³ "Optimising research programmes and priorities". Report of the ERA Expert Group. 2008. EUR 23324 EN

funds and for the latter to monitor and assess for themselves what the SRA of each JPI is doing and seek, in the context of developing smart specialisation strategies for regional innovation, through 'related activities' to complement the research with Social and ERDF funded research and innovation initiatives in their own regions. This is already starting to happen. For example, Neurodegenerative diseases have been included as a priority in Slovakia's research policy, which is partly supported by European Structural Funds. This has allowed Slovakia to invest in the JPND pilot call on biomarkers, thus including two Slovak teams in the four projects that were funded.

6. Achieving the full potential of Joint Programming: the Expert Group's recommendations

Earlier sections of this report provide the Expert Group's deliberations and conclusions on the progress of the Joint Programming process to date, the impact JPIs are having, and future sustainability. Whilst no JPI has reached the final stage of aligning national programmes, implementing multi-annual joint programmes and achieving cooperation throughout the full policy cycle, the Group is impressed by what has been achieved so far. Based on the progress made by the longest running JPIs it is the Group's opinion that the political, structural and organisational challenges facing Joint Programming can be overcome.

Whilst the Group considers that JPIs are an effective approach to tackling Societal Challenges, it believes that current success has come because some national funders have engaged comprehensively, applying the concept of "variable geometry" in a practical way, and seeking ways of collaboration by linking and synchronising national plans, strategies and activities.

The Group considers that a sustainable future can only be assured through strong commitment from national-level administrations, including ensuring that the necessary funding is made available. Realising the full potential of Joint Programming will depend on the continuing efforts of Member States and the Commission.

The Group's recommendations on ensuring sustainability are addressed to Member States (6.2) and the Commission (6.3). Actions that need to be taken now (6.1) to ensure continued development are addressed particularly to the JPIs and the GPC.

6.1 Actions that need to be taken now to improve the process

The following recommendations are put forward in order to help JPIs develop further:

1. All those involved in JPIs need to acknowledge that trust is an important component of Joint Programming, and that developing trust takes time. Trust, and therefore time, is needed particularly to engage effectively in Variable Geometry. When the necessary level of trust has been achieved, JPIs should further explore the use of Article 185 and other ERA instruments.
2. JPIs need to maintain the principle of Open Access (open participation). They should in addition help to maintain research capacities in those MS who are at risk, in the current economic climate, by ensuring Open Access, for example through specific common calls open to all European researchers.
3. JPIs should maintain their research focus using trans-disciplinary inputs, including from industry and other societal actors, where appropriate. In the current economic climate, JPIs should ensure that SRAs do not only become aggregations of existing national research programmes, but also include new ideas and approaches.

4. JPIs should start now highlighting and promoting their achievements, particularly to the national and EU level policy makers in order to demonstrate impact.
5. JPIs should be more effective at communicating the SRAs back to all national level organisations in order that the content can be used for the development of national research programmes.
6. In order to provide better access to and make better use of existing research infrastructures, JPIs should produce inventories and map existing key infrastructures, and promote their shared use to MS.
7. JPIs should start preparing to make “smart” use of H2020 instruments to complement MS funded Joint Calls and actions.
8. The GPC should continue to develop its mutual responsibility for and “ownership” of the Joint Programming process. The GPC should consider and prepare a systematic process that can be used for deciding on future Challenges. The process should include the use of monitoring, evaluations and other forward looking activities including EFFLA (European Forum on Forward Looking Activities). The GPC should revisit the Voluntary Guidelines on Framework Conditions in order to integrate new operational requirements, including those related to Governance.

6.2 Ensuring sustainability of Joint Programming: MS-related

The following actions need to be taken by MS in order to help develop a new mind-set relating to Joint Programming.

9. MS should increasingly inform and align national strategies and research programmes with the JPI SRAs. MS should also ensure that national administrations, for example programme owners, programme managers and ministries are sufficiently involved in the JPIs.
10. MS need to acknowledge that acting alone cannot solve societal challenges. MS should invest their resources in order to experience and appreciate the benefits arising from Joint Programming. In current economic climate, reduced research budgets can be used to leverage more impact through JPIs.
11. The impressive commitment of person-months for the establishment of JPIs should be recognised at the national level.
12. MS should consider how many JPIs they can maintain a sustainable commitment to.
13. Those MS that are not able to be as involved in JPI research as they would wish should pursue opportunities associated with H2020 themes and with other EU sources of funding. In order to build or strengthen capacity, MS should use the Smart Specialisation Strategy process (ERDF) to identify, prioritise and engage in JPI-related research and innovation activities.

6.3 Ensuring sustainability of Joint Programming: Commission-related actions.

The following actions need to be taken by the Commission to support Member States in their efforts to sustain the Joint Programming process.

14. The Commission needs to provide greater clarification on the role and focus of each instrument on the ERA landscape, and their respective interdependencies. This will lead to better understanding by MS.

15. Resources are available from JPI members to support the JPI secretariats, but the financial independence resulting from CSAs (Coordination and Support Actions) has been important for JPI Secretariats. Support through CSAs should continue in H2020.

16. Continue the EFFLA work as it could be a supportive partner for the GPC for future priority setting.

17. The Commission should undertake an evaluation of the JPIs at the end of FP7, and at the mid-term point of H2020.

18. Consider the ERA-FRAME option if the renewed political will, called for in the Commission's 2012 ERA Communication, does not materialise.

19. It is envisaged by the Expert Group that JPIs could give useful inputs to the strategic considerations of a related programme committee. A dialogue between the JPIs and the H2020 Programme Committees responsible for each societal challenge should be established. It is both for the Commission and MS to consider how best to organise such a dialogue between JPIs, the Commission and national delegates.

Annex 1. Expert Group's Questionnaire to JPI Coordinators

AREA TRENDS	Questions
1. Scientific Excellence	<i>Describe the main 3 research trends relevant to the JPI challenge(s), indicating in particular if the EU is :</i> <i>1.1 Leading, average or following world research trends (publications, breakthroughs...).</i> <i>1.2 How is the EU competing with other world actors on main industrial actors in the area (Patents, Market Shares, Growth dynamics...).</i> <i>1.3 Leading, average or following world trends on relevant societal research.</i> <i>1.4 Attracting the main researchers and companies in the area or losing them to other countries.</i> <i>Description (please illustrate, and where appropriate justify your responses, with reference to statistics; independent assessments; expert groups; specific examples etc.)</i>
2. Relevance / Effectiveness	<i>Please comment on how research in the EU is addressing current needs resulting from the societal challenge(s) addressed by the JPI:</i> <i>2.1 How is current research in the EU supplying the knowledge needed (i) anticipating future identified needs, (ii) satisfying current needs, (iii) insufficiently, i.e. most of the knowledge originates from outside the EU.</i> <i>2.2 How are current technologies and products being developed in the EU (i) anticipating future identified needs and markets, (ii) satisfying current needs and markets, (iii) insufficiently addressing EU required needs, i.e. most of the technology and products originate from outside the EU.</i> <i>2.3 How is societal research addressing the perceived or identified needs for this societal challenge(s)? (i) Shaping and anticipating future trends and issues, (ii) Reacting to current needs as they emerge from societal issues, (iii) Not addressing EU required needs in some or most EU countries</i> <i>Description (please illustrate, and where appropriate justify your responses, with reference to statistics; independent assessments; expert groups; specific examples etc.)</i>
3. Utility	<i>3.1 Is this JPI the main EU initiative addressing the identified societal challenge(s)?</i> <i>3.2 Which are the main other initiatives outside the EU addressing the same or similar challenge?</i> <i>3.3 Have there recently been research breakthroughs or unexpected failures addressing the challenge your JPI is addressing ?</i> <i>Description (please illustrate, and where appropriate justify your responses, with reference to statistics; independent assessments; expert groups; specific examples etc.)</i>

4. Sustainability	4.1 Do you expect this JPI to have a sustainable impact in addressing your societal challenge? 4.2 Are national research programmes sufficient to address your societal challenge? 4.3 Has the JPI raised awareness, generated programmes or in other way affected research activities in some countries? 4.4 Would you expect the societal challenge to be adequately addressed should the JPI stop its coordination activities ? Description (please illustrate, and where appropriate justify your responses, with reference to statistics; independent assessments; expert groups; specific examples etc.)
Criteria	Comments
1. The Challenge addressed	1.1 Describe the Challenge(s) and the common agreed vision. 1.2 How has the JPI contributed to reduce or improve its impact on EU citizens to date? 1.3 Should the vision be amended, refined for the next reporting period ? 1.4 What is the contribution to other major challenges or national priorities ?
2. The Strategic Research Agenda	2.1 Describe the original SRA and its timetable. 2.2 What have been the major achievements and major drawbacks affecting progress? 2.3 Does this contribute to the EU 2020 objectives? 2.4 Is there a potential link with other EU 2020 initiatives (in particular with Horizon 2020)? 2.5 Other comment?
3. Scale, scope and increased efficiency and impact of public R&D?	3.1 SCOPE - Does the JPI include most (all) relevant programmes, instruments and actions to address the SRA ? IF NOT - Which programmes or instruments are still missing and how could they be included or launched ? 3.2 SCALE - Has it been able to leverage or commit the resources required for completing the SRA to date ? IF NOT - Which resources are still missing and how could they be sourced ? 3.3 Has the JPI increased efficiency and impact of public R&D of this JPI? 3.4 Which were the modalities for actions used and their added value (efficiency, impact) versus pure national / existing instruments? 3.5 How has the above information been generated? Is any mid-term or ex-post impact assessment foreseen, etc.
4. Commitment from participating countries	4.1 Describe how the participating and observers partners (including the EU) have contributed to the JPI. 4.2 Draft specific points on new or small EU Member States, on Associated States and on Third Countries possibly participating in the action. 4.3 Has the JPI made an impact on the national research areas of the involved partners (including the EU) in terms of research programming, research funding or research structure ? 4.4 Do national roadmaps exist supporting such action? (an analysis, country by country, including the EU is necessary) 4.5 What are the links with FP7 funding

5. JPI governance and board management	<i>5.1 Describe the governance structure of the JPI. Comment on its effectiveness and possible improvements in meeting the objectives set by the SRA.</i> <i>5.2 Describe the management rules of its executive bodies. Comment on their effectiveness and possible improvements in meeting the objectives set by the SRA.</i> <i>5.3 ACCOUNTABILITY - Describe reporting requirements to the main partners (including the EU). Is there any accountability to stakeholders other than funding members (e.g. NGOs or patient organisations...)</i>
6. Timetable, next steps	<i>6.1 Illustrate the funding flows and distribution to research actors of the budgets mobilised</i> <i>6.2 Put in evidence the increased "aligning" of the national and EU programmes</i>
<i>Other relevant comments</i>	
<i>Contact Person at the EC: (name, e-mail, tel)</i>	

Annex 2. Expert Group's Questionnaire to ERAC representatives.

Dear ERAC representatives,

The Expert group on the Joint Programming process is reviewing Member State's involvement in the Joint Programming process. Please find enclosed four questions the Group would like you to answer.

1. Describe the level of participation of your country in JPIs.

You should in particular refer to both existing and planned 'in-kind' and actual financial contributions as well as to the situations where your country is present as observer.

2. What is, from the national point of view, the main motivation for participation in JPIs?
3. What are the main reasons that limit your participation in JPIs if that is the case of your country?
4. What systemic changes would be needed at both national and EU level to enhance the engagement by your country with JPIs?

Thanking you in advance for your collaboration, I remain,

Yours sincerely

H. Acheson – Chair of the Expert Group on the Joint Programming process