

Mutual Learning Exercise (MLE)

Widening participation and
strengthening synergies

Synthetic Synergies Paper



Mutual Learning Exercise (MLE) - Widening participation and strengthening synergies: Synthetic Synergies Paper

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Widening participation and
strengthening synergies

Synthetic Synergies Paper

Prepared by the independent expert: Lena Tsipouri

LIST OF ABBREVIATIONS

ADAPT	Ireland's global centre of excellence for digital content
aICP	absolute Intracranial Pressure
AMBER	Advanced Materials and Bio-engineering Research (Ireland)
BBI JU	Bio-Based Industries Joint Undertaking
BMVIT	Bundesministerium für Verkehr, Innovation und Technologie (Federal Ministry for Transport, Innovation and Technology)
BMFWF	Bundesministerium für Wissenschaft, Forschung und Wirtschaft (Federal Ministry for Science, Research and Economy)
CDTI	Centre for the Development of Industrial Technology (Spain)
CE	Centre of Excellence
CERIC-ERIC	Central European Research Infrastructure Consortium
CERN	Conseil Européen pour la Recherche Nucléaire (European Organization for Nuclear Research)
CLCs	co-location centres
CONNECT	Science Foundation Ireland Research Centre for Future Networks and Communications
COSME	EU programme for the Competitiveness of Enterprises and Small and Medium-sized Enterprises
CPMR	Conference of Peripheral Maritime Regions
CPR	Common Provisions Regulation
CS2	CleanSky2
CSA	Coordination and Support Actions
DG	Directorate-General
DG COMP	Directorate-General for Competition
DG JRC	Directorate-General Joint Research Centre
DG REGIO	Directorate-General Regional and Urban Policy
DG RTD	Directorate-General Research and Innovation
EAFRD	European Agricultural Fund for Rural Development
ECSEL	Electronic Components and Systems for European Leadership
EEN	Enterprise Europe Network
EFSI	European Fund for Strategic Investment
EFSI FI	European Fund for Strategic Investment Financial Instrument
EIB	European Investment Bank
EIF	European Investment Fund
EIT	European Institute of Innovation & Technology
EIT RIS	EIT Regional Innovation Scheme
ELI	Extreme Light Infrastructure
ELI NP	Extreme Light Infrastructure - Nuclear Physics
ERA	European Research Area
ERA-NET	EU support instrument supporting public-public partnerships
ERC	European Research Council
ERDF	European Regional Development Fund
ERIC	European Research Infrastructure Consortium
ERRIN	European Regions Research and Innovation Network
ESF	European Social Fund
ESFRI	European Strategy Forum on Research Infrastructures
ESI	European Structural and Investment
ESIF	European Structural and Investment Funds
ESS	European Spallation Source
ESTAT/ESIF/H2020	R&I Regional Viewer
ETAg	Eesti Teadusagentuur (Estonian Research Council)

EU13	13 Member States which joined in the 21st century
EU28	28 Member States, all Member States
EUSALP	Macro-Regional Strategies for the Alpine regions
EUSALP AG1	Macro-Regional Strategies for the Alpine regions Action Group 1
EU TS3P	EU strategic Thematic S3 Partnerships
FFG	Forschungsförderungsgesellschaft (Austrian Research Promotion Agency)
FI	Financial Instrument
FP	Framework Programme
GBER	General Block Exemption Regulation
GDP	Gross Domestic Product
GERD	Gross Expenditure of Research and Development
H2020	Horizon 2020
HEI	Higher Education Institutions
ICT	Information and Communications Technologies
IDC	Inter-Departmental Committee
IICT	Institute of Information and Communication Technologies
IIT	Intelligent Information Technologies
INL	International Iberian Nanotechnology Laboratory
INP	Leibniz Institute for Plasma Science and Technology
INTERREG	European Interregional Cooperation Programme
JPIs	Joint Programming Initiatives
JRC	Joint Research Centre
JTIs	Joint Technology Initiatives
Jus	Joint Undertakings
KAVA	Knowledge Innovation Communities Added Value Activities
KCA	Knowledge Innovation Communities Complementary Activities
KICs	Knowledge Innovation Communities
LEIT	Leadership in Enabling and Industrial Technologies
Mas	Management Authorities
MGA	Management Grant Agreements
MLE	Mutual Learning Exercise
MRS	Macro-Regional Strategies
MS	Member States
MSCA	Marie Skłodowska-Curie actions
MSCA EF	Marie Skłodowska-Curie actions European Fellowships
NCPs	National Contact Points
NSRF	National Strategic Reference Framework
OP	Operational Programme
PI	Partnership Instruments
PROs	Public Research Organisations
PRTL	Programme of Research in Third Level Institutions
PSF	Policy Support Facility
R&D	Research and development
R&D&I/RDI	Research, Development and Innovation
R&I	Research and Innovation
RCL	Research Council of Lithuania
RI	Research Infrastructures
RIA	Research and Innovation Action
RISS	National Research and Innovation Strategy of Slovenia

RITA	Sihtasutus Eesti Teadusagentuur (Estonian Support Programme for strategic R&D activities and knowledge-based policy formulation)
RTD	Research and Technological Development
RTDI	Research, Technology Development and Innovation
RTOs	Research and Technology Organisations
S&T	Science & Technology
S2E	Stairway to Excellence
SA	State Aid
SCREEN	Synergic Circular Economy across European regions
SF	Structural Funds
SFI	Science Foundation Ireland
SME	Small and medium-sized enterprises
SoE	Seal of Excellence
SoMoPro	South Moravian Programme for Distinguished Researchers
SRA	Slovenian Research Agency
SSS or S3 or RIS3	Smart Specialisation Strategies
STEMM	Science, Technology, Engineering, Maths and Medicine
STI	Science, Technology and Innovation
TFEU	Treaty on the Functioning of the European Union
TIGER	Transit via innovative gateway concepts solving European intermodal rail needs
TR3S	Towards Regional Specialisation for Smart Growth Spirit
TRI fund	Third Industrial Revolution fund
VI	Vanguard Initiative
VINNOVA	Swedish Innovation Agency
VLAIO	Agency for Innovation and Entrepreneurship (Flanders)
WPSS	Widening Participation and Strengthening Synergies

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FOREWORD

This document has been prepared under the auspices of the Policy Support Facility (PSF) set up by DG Research and Innovation under H2020 to support countries in reforming their research and innovation (R&I) systems. It is one of a series of reports drafted as part of a Mutual Learning Exercise (MLE) on 'Widening Participation and Strengthening Synergies' (WPSS).

Widening participation in the Framework Programme (FP) can help countries tap into their unexploited R&I potential and improve overall R&I system performance.

Ensuring and strengthening synergies between activities supported by the FP and those supported by European Structural and Investment Funds (ESIF) can improve the overall efficiency and effectiveness of public funding for R&I and enhance the performance of R&I activities.

Twelve countries (Belgium, Bulgaria, Cyprus, Croatia, Hungary, Latvia, Poland, Portugal, Slovenia, Sweden, Spain and Turkey) are actively participating in the MLE, with Germany participating as an Observer.

The schedule for the MLE called for Challenge Papers covering different aspects of 'Widening' and 'Synergies' to feed into discussions at a series of four workshops, prior to the production of Topic Reports based on these discussions and relevant material contributed by participating countries.

This Topic Report covers all aspects of 'Synergies' covered in the workshops.

1 INTRODUCTION

In the Programming Period 2014-2020 Horizon 2020¹ (the European Union Research and Innovation funding mechanism) and the European Structural and Investment Funds (ESIF) are two instruments that share a common vision and objective (smart, sustainable and inclusive growth). ESIF address territorial cohesion and one of their domains of intervention is Research and Innovation as a driver of jobs and growth. The FPs address excellence. But while their primary goals may differ, in the context of R&I policies they both aim to maximise the quantity and quality of R&I investment and their impact (European Commission, 2017b). They also address the same final beneficiaries/recipients (higher education, research centres and businesses). Developing and putting in practice synergies between FP and the ESIF (which provide substantial funding for R&I under the current programming period 2014-2020) is a mechanism for stepping R&I performance by pulling together resources for the efficient implementation of R&I activities (European Commission, 2017c). Synergies should involve meaningful, complementary, mutually reinforcing interactions between the investment strategies and interventions under the Framework Programmes (FP) for Research and Innovation (R&I)/Horizon 2020 and the ESIF. The overall aim is to have significant impacts on the economy by combining the innovation investments of ESIF (currently under the smart specialisation priorities for each country/region) with excellent, world-class research and innovation initiatives supported by H2020.

The need for synergies and complementarities between EU funds for R&I has been increasingly highlighted at political level.² While synergies in the past were always mentioned as a way to improve the effectiveness of both types of EU intervention (ESIF and H2020), since the 2014-20 programming period the Commission has turned to active involvement for harnessing and facilitating synergies. Both Horizon 2020 and the Common Provisions Regulation of ESIF include for the first time a legal mandate to maximise synergies.³ In parallel, the development of synergies is a key priority in the mandates of the Commissioners for R&I and Regional Development, as well as featuring regularly in Council conclusions, in the resolution of the European Parliament⁴ adopted in July 2016 and, more recently, in the Commission's Communication addressing EU regions and smart specialisation⁵. A full list of EU documents aiming at informing on the rationale and practice of synergies is listed in the References, which include publications until 25/6/2018.

These efforts have underpinned a theoretical agreement and forged a political commitment that synergies should be enhanced. But in the real world several legal, communication and behavioural barriers still exist that discourage actors, when it comes to implementation. *Some of these barriers would need legal amendments to be eliminated, while others are perceived barriers and can be overcome through better regulatory interpretations, experimentation and learning.* By now, a large number of good practices are reported that can help "systematise synergies" rather than invest in R&I and "expect synergies to happen". Policy makers in each country need to not only learn about the many existing good practices but gain an understanding of the challenges they face and the type of benefits they can expect. A large number of good practices were collected.

The rest of this report is structured as follows: We first present the scope of the topics covered, namely the basic objectives and rules of each of the two instruments covered

¹ H2020 is the 8th European Research and Innovation Framework Programme (FP)

² Synergies are relevant in all EU funds; this paper addresses only the ESIF-H2020 synergies, which are part of the broader ecosystem

³ Regulation (EU) No 1303/2013: Articles 65(11), 70(2), 96(3)d and Common Strategic Framework, Annex 1; Regulation (EU) No 1290/2013, Article 37

⁴ Resolution on 'Synergies between structural funds and Horizon 2020', adopted by the European Parliament Plenary on 4 July 2016 following the presentation of a Statement on the issue by Commissioner Moedas representing also Commissioner Crețu

⁵ COM(2017)376 & SWD(2017)264 adopted in July 2017

(H2020 and ESIF) as well as their interaction. In the context of the scope we proceed with the presentation of the general provisions, rules and practices affecting the design and implementation of ESIF and H2020, which occasionally constitute barriers discouraging initiatives. After setting the scene the landscape of good practices is explicitly described, including both general ideas and concrete cases. In a concluding section we then summarise findings and respond to questions we consider as most relevant for policy makers, namely:

1. Which countries can one learn best from? Real synergies not incidental success cases but the result of a longer-term endeavour. Countries that break silos and adopt systematic cooperation patterns, as well as countries with policies designed especially to embark in a strategic effort for synergies are the really good practices to learn from.
2. Which are specific (real or perceived) barriers and how can they be better regulated or overcome in the future? In some case it is policy makers that pave the way to overcome barriers whereas in others one can learn from individual actors.

2 SCOPE

The Scope Chapter is about setting the scene. Its aim is to outline the main policy practices, rules and procedures that are likely to have an influence on the attainment of synergies and how, in practice, the combination of all of these exerts either positive or negative influences. It is composed of two parts, the first describing the rules of ESIF and H2020 themselves, while the second will refer to the generic EU rules that affect the way Member States implement national policies and hence influence the potential of synergies.

2.1 Outline of main policy practices, rules and procedures

2.1.1 Description of the rules and procedures governing the award and use of ESIF (including the ex-ante conditionality of RIS3)

ESIF have a place-based approach targeting socio-economic development with the ultimate aim of European cohesion. The funds originate from the EU budget and are co-funded by national resources. Their sectoral/regional distribution is co-decided and monitored through a shared EU/Member State partnership and Operational Programmes are implemented in all Member States/regions by specially appointed Management Authorities (MAs). Depending on the agreements, targets and institutional arrangements the MAs are Central (coordinating Operational Programmes for the whole country) and/or Regional (managing Operational Programmes at regional level) and/or Sectoral (managing Sectoral Operational Programmes). The promotion of innovation has become a central feature in the Cohesion Policy programmes: Research and Innovation in the 2014-2020 programming period has a budget of € 66 bn (of which € 43.7 bn EU contribution) leveraging € 10 bn private funds and € 10 bn financial instruments. Smart specialisation strategies are adopted to mobilise the innovation potential of all EU regions⁶ and guide Operational Programmes.

MAs follow the EU ESIF regulations issued each programming period. Because of the funding origin, goals and rules, they are accountable both to the EU and national authorities for the design, implementation and support (awareness raising and advising) for all activities funded with ESIF. In this role they have to intensely interact with ministries, agencies and beneficiaries/final users internally, at the national, sectoral or regional level and ultimately prove that they comply with the EU Regulations and Guidelines. EU funds flow to the Member States upon presentation of expenses controlled by systematic, often multiple, audits to ensure compliance with EU, national and occasionally even regional accounting rules. In this process MAs, intermediaries distributing ESIF and final recipients are all undergoing the necessary audits. MAs are accountable to the European Commission.

ESIF resources need to be spent at the Member State or region for which they are earmarked.⁷ The only exception to this rule at this stage is Interreg, which supports transnational and trans-regional cooperation with direct funding from the European Commission.

2.1.2 Description of the rules and procedures of R&I Framework Programmes (FP) and H2020 awards and the way national policies support national actors to compete for/succeed in H2020

The selection of proposals for FP-funding (including H2020) is excellence based and (with minor exceptions in the case of "Widening") independent of territorial considerations. Funds are distributed by competitive calls and awarded directly to the final beneficiaries: either research and innovation teams joining forces in research consortia or in few cases

⁶ <https://cohesiondata.ec.europa.eu/themes/1> and

http://www.ncpacademy.eu/wp-content/uploads/2018/01/Synergies_FRAESIF_C.Dearle.pdf

⁷ This is expected to be changed in the future amendment of the Omnibus regulation

excellent applicants who undertake research without transnational cooperation (ERC and SME instrument) benefitting individually. H2020 has a budget of € 80 bn, which is higher than the corresponding ESIF figure for R&I but it covers a wider range of regions; core regions are major beneficiaries of H2020 but are hardly eligible under ESIF.

FPs are directly managed by the European Commission, so the way Member States (regions) react and organise their institutional set up to support applications of their national (regional) teams is not uniform. Originally the applicants were self-organised: strong research teams were applying for funding responding to EU calls for proposals. Over the years, national and regional authorities realised that success in the competitive EU R&I funding contributed to R&I capabilities and competitiveness. This meant that they had every interest to support their research teams to increase their FP participation. Public authorities, funding agencies and even large individual research organisations started to inform and support applicants to improve their success rates. This was seconded by the EU, which encouraged the creation of National Contact Points⁸ (NCPs) while Ministries of R&I, of Industry, of Education, of Economic Development etc. offered information, advice and occasionally matching funds. Depending on the national system, funding agencies (Research Councils, Secretariats, Executive Agencies) and public-private institutions (Chambers, Rectors Associations etc.) started playing an active role in increasing FP success rates through ad hoc and/or systematic initiatives. In regions eligible ESIF are often used to fund these instruments facilitating access to the FP.

Since beneficiaries are directly funded by the European Commission they are also directly accountable for their spending. Under the pressure for simplification by researchers, FP funding and auditing rules have evolved. Flat rates, standard scales of unit costs, lump sums (fixed amount paid when the pre-defined activities and/or output are completed; this removes obligations on cost reporting and hence ex post audits) and prizes were introduced and this new cost-funding model is considered as "radically simplified". The former are used in Horizon 2020 for a considerable part of the budget, while entitlement schemes like prizes and lump-sum project funding cover only a minor part. A significant part of Horizon 2020 is still based on the reimbursement of incurred costs (European Court of Auditors, 2018).

2.1.3 The need and potential for synergies between ESIF and H2020

ESIF R&I funding and H2020 have a common goal: increase jobs and growth. Having a common goal means that they can be combined to attain synergies, but in order to achieve this they need to comply with the rules and institutional set up of both sources of funding. The historical evolution has produced a structured governance scheme for the ESIFs, common to all Member States; however, at Member State level, the efforts to attract FP funds and increase FP participations shows a more anarchic set of partly overlapping efforts and organisations with different mandates, primary goals and accountabilities.

Although each Member State has its own eco-system, there are some common elements that demonstrate how actors are organised for the design and implementation of either Fund. In a rough outline this is presented on Table 1 below:

⁸ NCPs are national structures established and financed by governments of the 28 EU member states and the states associated to the framework programme. NCPs give personalised support on the spot and in applicants' own languages. The NCP systems can vary from one country to another from highly centralised to decentralised networks, and a number of very different actors, from ministries to universities, research centres and special agencies to private consulting companies.

Table 1: Stylised facts of ESIF and FPs

	ESIF	FPs
Mission	Convergence (geographical budget distribution)	Excellence-based budget distribution
EU Budget appropriations €	44.1 bn ⁹	80 bn
Distribution mechanisms	Major role by MAs (in partnership with the Commission and cooperation with national institutions)	Major role Commission services
Implementation	MAs and intermediaries	European Commission
Support activities, facilitators (information, awareness raising etc.)	MAs and intermediaries	NCPs, ERA support mechanisms, ministries, agencies, intermediaries
Final recipients	Research and innovation teams (direct beneficiaries or following competitive calls)	Research and Innovation teams following competitive calls
Accounting rules	ESIF plus national rules	FP plus national rules

While the table above indicates differences, MAs can neither design nor implement policies without interaction with line ministries, nor can line ministries design and implement national policies without taking into consideration what are the funding possibilities, priorities and constraints available through ESIF funding. In the past synergies between them were considered as “nice to have” but the primary goals and differences of national organisations prevailed over the difficulties to coordinate their different missions and path-dependencies. It was not until the current programming period that formal policy papers and legal documents addressed the need for synergies. **In 2014 the Common Provisions Regulation of ESIF included for the first time a legal mandate to maximise synergies** (not only for R&I). In this new spirit primary and secondary goals needed to be combined, as their complementarity and benefits from synergies were not voluntary anymore.

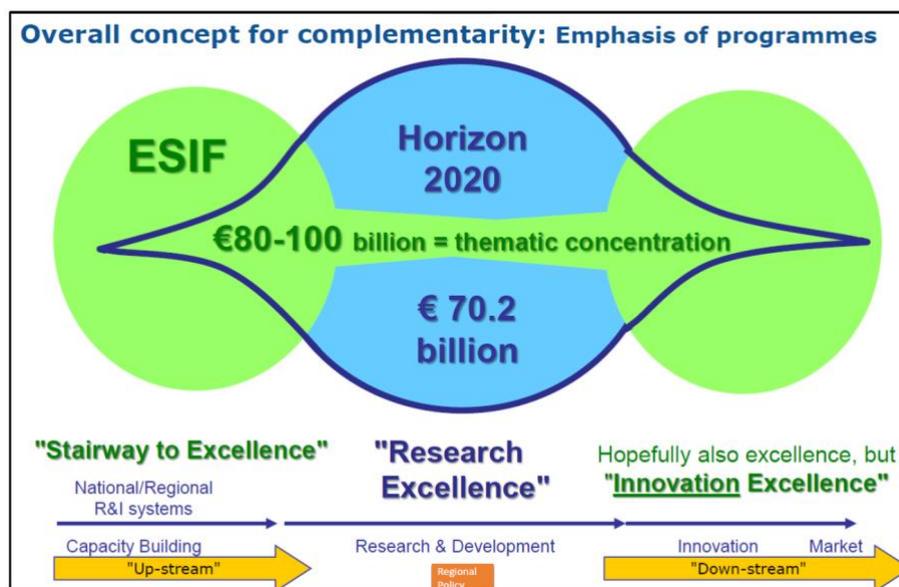
H2020 and ESIF are obviously not the only funding sources. The national/regional funds dedicated to R&I are combined with EU sources and are spent both combined with ESIF (as matching funds) or independently; they are dedicated both to block funding (inelastic expenditure) and competitive calls. As a rule in the frontier countries national funding is significantly higher than the combined FP/ESIF, whereas in the cohesion countries ESIF often contributes considerably, in particular to competitive funding. The intelligent distribution of national funds can act as a catalyser for leveraging synergies between H2020 and ESIF.

Several classifications have been suggested in the past to better understand and address synergies:

The most common way to interact and envisage synergies is by providing funds from both sources to support the same actors/beneficiaries to become excellent and contribute to local growth. The same individual research teams/organisations can benefit from national and EU calls for proposals magnifying their resources. The following Figure 1 is indicative of the potential of co-funding:

⁹ <https://cohesiondata.ec.europa.eu/themes/1>

Figure 1: Relation between H2020 and ESIF



Source: European Parliament, 2016, p. 41

A more refined taxonomy used in most Community documents uses the timing and complementarity of funding sources to classify synergies, namely:

- *Sequential funding* from ESIF/H2020 (or FP) sources:
 - *Upstream sequential combination*: ESIF investment that enables Horizon 2020 participation, i.e. funding actions that build research and innovation capacities of actors who aim (or can at a later stage aim) at participating in the Framework Programme/Horizon 2020.
 - *Downstream sequential combination*: Horizon 2020 or FP project results are used or further developed with subsequent ESIF investments, i.e. funding actions that capitalise on already implemented Framework Programme/Horizon 2020 research and innovation actions aiming at market up-take.
- *Parallel funding*: ESIF and Horizon 2020 (FP) funding are supporting separate projects, which are running in parallel and are mutually supportive or complement each other.
- *Simultaneous/cumulative funding* that brings together Horizon 2020 and ESIF funds in the same project aiming at achieving greater impact and efficiency (i.e. ESIF used for costs non-eligible under Horizon 2020. This new combination is possible under the new regulation of Horizon 2020 (Art. 37 Rules for Participation) provided that the grants do not cover the same cost items (that could be a single action or a group of coordinated actions/operations can only be done provided that there is no double funding of the same expenditure item (non-cumulative principle).
- *Alternative funding* (through ESIF): It is now foreseen to provide funding from alternative sources for positively evaluated and shortlisted Horizon 2020 proposals but not funded due to budget limitation in the call for which they were evaluated. This is the Seals of Excellence novelty in H2020, tested in ERC and SME instrument pilots, whereby funding is provided under the conditions that:
 - The participant in H2020 is eligible under the national agency's rules.
 - The activities not funded by H2020 form a complete and coherent project (not just loose activities).
 - These activities relate to the objectives and priorities of the applicable ESIF Operational Programme and Smart Specialisation.

- There are enough ESIF resources in the region where the activities are performed.¹⁰

Another taxonomy used in the EU documents (European Commission, 2017c) addresses the level of synergies, namely

- At the institutional level (cooperation and coordination of key actors) how to enable an effective and structured dialogue between national Managing Authorities of the Structural Funds and the Framework Programme R&D authorities ('breaking silos').
- Synergies at policy and strategy level: How to ensure synergies at a policy level between mandatory and voluntary strategies, including S3, JPIs, JTI/JU's, macro-regional strategies, etc.
- Synergies at operational level: formulation and implementation of synergies on the ground, on their scope and limitations.

Sequential funding (whether upstream or downstream) may have an element of serendipity. All R&I funding strengthens (or at least is expected to strengthen) capabilities and hence increase the likelihood of further funding. Achieving synergies through systematic efforts is more challenging.

2.2 General provisions, rules and practices affecting the design and implementation of ESIF and H2020

Beneficiaries in the Member States tend to complain about the difficulties of implementation that discourage planning for synergies. Often these difficulties are stemming more from the reluctance to deal with complexity and a risk-averse behaviour rather than from real barriers. They may also be a result of national rules and interpretations rather than EU provisions. We briefly discuss the generic rules here to show what the real barriers are. All others are perceived barriers, which can be dealt with, as demonstrated by Good Practices in the Landscape Section.

2.2.1 State Aide rules: general principles and how ESIF use can be affected

State Aid rules are mandatory rules deriving from the Treaty on the Functioning of the European Union (TFEU) and applied to all EU policies. State Aid needs to comply with the main rationale of the EU competition rules and hence be notified to the European Commission to ensure this compatibility. However, recognising the specificities of individual policies DG Competition has adopted specific Frameworks for areas influenced by positive and negative externalities. R&I is one of them, presenting features of market and systemic failures because of positive externalities, serendipity and appropriability. The most recent Framework, adopted in 2014,¹¹ specifies the State Aid rules for R&D&I. Over the years the R&I rules tend to become more flexible facilitating R&I support through the introduction of the De Minimis provision¹² and the adoption of the General Block Exemption Regulation (GBER),¹³ increasingly diminishing administrative burdens in the case of R&I.¹⁴ The latter presents a long list of R&I incentives, which are compatible with State Aid rules. They both contributed to diminishing bureaucracy and speeding up the implementation process of ESIF spending at national and regional level. Large, potentially competition distorting R&I

¹⁰ Report Workshop Systematising synergies

¹¹ COMMUNICATION FROM THE COMMISSION, Framework for State aid for research and development and innovation [http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52014XC0627\(01\)&from=EN](http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52014XC0627(01)&from=EN)

¹² Allowing for business support up to a specific ceiling (currently 200000 Euros within any 3-year period) without notification or screening

¹³ <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014R0651&from=EN>

¹⁴ For instance "following the GBER revision in 2017, Member States no longer need to verify whether support granted under start-up aid schemes - implemented in line with Article 22 of the GBER - is granted to a company in difficulty, because companies in difficulty are not anymore excluded from start-up aid schemes.

incentives, remain subject to notification to the European Commission and agreement on how to ensure their compatibility with the *acquis communautaire*. There are complaints referring to the GBER, in particular the maximum level of aid intensity (Kadastik, 2017), which policy designers and research actors believe should be further relaxed. This is, however, not a barrier to synergies but a barrier to higher support rates. Only **one real barrier** seems to be appropriately associated with State Aid rules, then: Large individual or cumulative ESIF R&I support that overcomes the € 200000 threshold of the De minimis rule hampers indeed the possibility to co-fund certain activities.

In particular State Aid rules create difficulties for the Seal of Excellence (SoE) of the SME Instrument. Theoretically the SoE would be expected to be applied directly and without any delays in the Member States once awarded by the EU project selection process. However, the process is less automatic than initially hoped/conceived: For proposals where individual research teams are selected in one country State Aid rules constitute a barrier: when successful applicants are funded by the EU (e.g. SME Instrument) there is no issue of State Aid, since applicants from all Member States are treated in the same way. When the results of the same selection procedure are applied by national/regional authorities to local companies, the funding takes place at sub-European level and is thus State Aid. One can circumvent the problem, when the amount is small (e.g. SME Instrument Phase 1) using De Minimis, as long as the selected company has not reached the threshold foreseen by the State Aid Regulation. If the amount is larger the funding rules (type of activity supported and intensities) applied have to be those of the State Regulation and not the original budget as declared by the applicant and selected based on the peer review evaluation. In this case Funding Organisations have to use an additional evaluation procedure (to assess a new type of application) and applicants, even if successful, may have to amend the content and budget of their proposal; this process practically annuls the original EU evaluation. As an illustrative example: SME Instrument Phase II may fund up to 100%, while national funds are bound to intensities prescribed in the GBER).

Perceived barriers are of two kinds:

- Complaints associated with *economic activities of public research organisations and HEI labs*. On the one hand academic and empirical research have confirmed that academic-business cooperation impacts competitiveness and economic growth. On the other, State Aid rules foresee that public funding of publicly-owned research organisations cooperating with the business community may trigger distorting effects, if their invoicing leads to supporting national companies at the expense of their EU competitors. This occurs mostly in “the case for funding for clusters, science parks etc., where State Aid rules can come in to play” (European Parliament, 2014). To overcome this difficulty, systematic invoicing and reporting rules are necessary. While this increases complexity many examples of Good Practices demonstrate that it is feasible and beneficial to ESIF support research-business cooperation.
- *The GBER’s unintended effects*: In order to avoid delays and complexity MAs tend to virtually copy the examples given in the GBER, even if they are not the most appropriate components of their own policy mix, instead of experimenting and going through a screening process for more innovative actions. The rationale behind this de facto “precautionary principle” avoiding any “innovative use” is partly a conservative attitude (experimentation is not promoted by policy makers) and partly the justified perception that in the real world even the clearest rules are subject to interpretation. Regulatory uncertainties emerge from the treatment of different categories of research aid, depending on how remote the research is from the market. As there are many levels of interaction before an incentive is decided, there are also many layers of interpretation:
 - The ministry or agency responsible for designing funding schemes.
 - The MA; in case of disagreement the MA usually blocks any suggested incentive it considers as non-complying (MAs have internal legal departments).

- In case of disagreement at lower level and if policy designers disagree, any unclear rules are discussed with DG COMP in a written procedure; policy makers have a strong tendency to avoid written procedures which delay their schedule.
- Interpretation by the auditors; this is the last screening all actors are fearing may generate ex post complications, hence the precautions.

While there is no systematic survey evidence on this “precautionary principle” approach the statistics of “total new GBER cases as % of total new cases with reported expenditure amounting to 90%” and the corresponding “total GBER cases as % of total cases with reported expenditure” rising from 50% in 2010 to 80% in 2016 (Kekelekis, 2018) indicates that policy makers are reluctant to venture outside the GBER. One may of course argue that the GBER has developed to encompass almost all needs of the Member States, but it is highly unlikely that there are no new desires and experimentation potential.

As expected, researchers and operating authorities are in favour of a broad interpretation, while legal departments both at the national and the EU level tend to adopt narrow interpretations. Good practices, however, confirm that in most cases R&I incentives are compatible with State Aid rules even though occasionally they may trigger delays. But the State Aid rules themselves are often more of a perceived than a real barrier.

2.2.2 Difficulties arising from Funding Rules

Funding rules need to comply with the general rules of the EU as well as the specific rules of ESIF and FPs. In their conception the rules have to follow a **few reasonable and simple principles**:

- *The non-cumulative principle* foresees that a combination of grants in the same project for the same cost item is not possible. But there are Terminology problems: For example: In the Financial Regulation applicable to the general budget of the Union and its rules of application (July 2017): Article 129 (Principle of non-cumulative award) stipulates: “Each action may give rise to the award of only one grant from the budget to any one beneficiary, except where otherwise authorised in the relevant basic acts. A beneficiary may be awarded only one operating grant from the budget per financial year. The applicant shall immediately inform the authorising officers of any multiple applications and multiple grants relating to the same action or to the same work programme. In no circumstances shall the same costs be financed twice by the budget.”, while in the H2020 Rules for Participation: Article 37 (Cumulative funding) stipulates: “An action for which a grant from the Union budget has been awarded may also give rise to the award of a grant on the basis of Regulation (EU) No 1291/2013, provided that the grants do not cover the same cost items.”. In this case, ‘not funding the same costs’ and ‘not funding the same cost items’ are NOT equivalent in meaning. This lack of clarity triggers doubt and prevents stakeholders from implementing some possible models of synergies.
- *Non-substitution* of national or regional or private co-funding to centrally funded EU projects or programmes by ESIF money (this means that in case ESIF funding is used instead of national/regional funds as foreseen by the rules of e.g. Art. 185 EU cannot top them up, nor can ESIF be used for participation fees as in the case of KICs; in a 70% funded Innovation Action, the 30% must not come from ESIF, but entirely from the partner in question). This is connected to the *Additionality Principle*, driving the workings of the European Structural and Investment Funds, stipulating that contributions from the Funds must not replace public or equivalent structural expenditure by a Member State in the regions concerned. In other words, the financial allocations from the Structural and Investment Funds may not result in a reduction of

national structural expenditure in those regions, but should be in addition to national public spending.¹⁵

The rules are clear and reasonable, but researchers and policy makers alike complain about more obstacles, which may constitute ***surmountable barriers*** but overcoming those acts as a deterrent to embark into synergy-seeking policies:

- *The differences in the accounting and audit rules* of ESIF and H2020. Solutions have been partially implemented, as described in Section 2.1 but still often in the case of simultaneous or parallel projects beneficiaries need to prepare for two different systems and duplicate administrative resources. In this spirit beneficiaries would wish the same projects funded from different sources to follow one (the same) set of rules (Kadastik, 2017).
- *Uncoordinated timing of potentially linked calls*: Timing of the calls in ESIF and H2020 that may create important synergies are not currently coordinated in any way. ESIF MAs plan their calls either at national or regional level only within their own OP with no link to the calls planned under H2020 programme. On the other hand, information regarding the plan for particular calls under H2020 is also limited and so the MAs do not always have enough information to effectively coordinate the timing of their particular calls. It is also difficult to align, because MAs wish to launch calls when they are mature and not wait for alignment.
- The frequently cited complexity by both MAs and beneficiaries is not only an issue of different rules but also of occasional *legal uncertainty*¹⁶ as identified by the Court of Auditors.¹⁷
- One should keep in mind that much of the complexity may be due to the inability to deal with *goldplating*: National audits and additional rules imposed to EU regulations because of the need to comply with Member State procedures. For implementing organisations the co-funding rules from the organisation itself (own contribution) create also administrative problems (different accounting in time-sheets of permanent researchers in public organisations).
- *Difficulties of cross-border cooperation*: In general ESIF are expected to be spent in the territory for which they are earmarked. To allow for cross border cooperation now more ESIF can be spent outside an Operational Programme's territory (e.g. to pool funding for technology parks, clusters, research infrastructures abroad etc.) if for the benefit of the programme area: Article 70(2) CPR (also contract research is possible outside OP territory irrespective of Art 70(2)!). There is also a stronger obligation to work with innovation actors in other regions & Member States beyond "INTERREG": Art 96(3) d CPR.

¹⁵ http://ec.europa.eu/regional_policy/en/policy/what/glossary/a/additionality/

¹⁶ This is a different legal uncertainty than in the case of the State Aid rules, it refers to the interpretation of funding rules not distortion of competition rules

¹⁷ The main concerns raised by beneficiaries, as reported by the recent report of the Court of Auditors (CoA, 2018) are the following: when guidelines are too broadly defined, the use of examples by the Commission could be considered by some auditors as the only acceptable practice; when assessing compliance, auditors at multiple levels of the control chain need to interpret the context and the purpose of the same rules, which could be influenced by the availability of information; -when beneficiaries use simplified cost options such as lump sum and flat rates, they expect that the auditors also adjust their approach; -the European Commission has changed some articles of the Horizon 2020 Management Grant Agreements (MGA) with retrospective application to prior projects; -various regulations (concerning Horizon 2020, the European Institute of Innovation and Technology (EIT)) do not always use the same definitions and principles.

2.2.3 Institutional rigidities (silos¹⁸) can inhibit synergies

Unlike State Aid rules and funding rules the organisational set up and coordination is subject to national governance. The lines separating the boxes on Table 1 are not the same in every country. Their relevance and permeability depend on each national research and innovation system. Organisations build their realms and defend their turf constructing boundaries, by design or by accident. Lack of communication or silos are, of course, never justified as need for independence and lack of willingness to cooperate. Their existence stems from different sources, reflects different dimensions and is justified by the need of autonomy and flexibility leading to higher efficiency and effectiveness. Sometimes silos are created because the jargon used is different. In these cases it is essential, in order to break down these silos, that identical messages and same or similar wordings are used across different legal texts when they relate to the same item (e.g. across the Financial Regulation applicable to the general budget of the Union and its rules of application, the R&I Framework Programme regulation and rules for participation, ERDF and ESF regulations for example). There should be a clear alignment and harmonisation across various legal texts when relevant.

There are indeed two opposed forces:

- Autonomy and flexibility as sources of good governance.
- Coordination leading to synergy effects.

The challenge then is to establish a dialogue leading to synergies without leading to over-coordination, which hampers speed and flexibility and may create resistance. A first task then, is to understand what creates anti-synergy forces, because only if one can identify their origin one can decide on the best policy approaches to fight against them:

1. *Legal obligations*: ESIF in particular but also in certain cases FPs have certain rules that are binding for the national/regional authorities. Audits are necessary to ensure compliance and authorities may become over-sensitive to compliance. Legal obligations can be over-stressed generating intended or unintended consequences, leading national interpretations to become stricter than the EU requirements (goldplating). The EU has clarified legal obligations in the current programming period. However, ambiguities remain occurring from the risk of misinterpretation, national and regional policy makers wish to avoid at all costs.
2. *Origin of silos*: effective dialogue is hampered when “boundaries” are strong and difficulties to overcome them depend on whether these boundaries were created by accident, unintentionally to respond to needs and guidelines (hammered over time leading to path dependencies) or intentionally, by design (organisations believing in their own superior capabilities, unwilling to share their turf). Breaking silos by design needs legal actions, while breaking unintended lack of coordination can be addressed by soft interventions.
3. *Age of silos*: Over time authorities use internal guidelines and crystallise their behaviour, routines and interactions, so their autonomy becomes inherent to their existence and silos become more difficult to break.
4. *Governance Structure*: In some systems authorities may be directorates under the same ministry (e.g. design and implementation of R&I incentives under an R&I Ministry; national development policy and MAs under the same ministry as

¹⁸ Breaking silos was also the inaugural message of the new Director General of DG R&I, <https://sciencebusiness.net/framework-programmes/news/tear-down-silos-vows-new-commission-research-chief>

competitiveness and innovation policy etc.). Being under the same authority it is a matter of internal reorganisation to enhance synergies.

5. *Types of intervention*: The larger the indivisibilities and the closer the ESIF support to H2020 priorities the higher the synergies. On one extreme, Research Infrastructure projects under the ESFRI Roadmap had to be coordinated with ESIF to ensure synergies, on the other start-up support from ESIF was in general independent of the corresponding H2020 schemes.
6. *Share of EU funding to total R&I interventions*: The relative importance of MAs compared to R&I Authorities is determined by the share of National R&I funding, ESIF and H2020 in the overall Gross Expenditure of Research and Development (GERD) in a Member State. MA in countries, where the majority of R&I public incentives are co-funded by ESIF, have a much higher relevance, status and potential to set the rules than in countries where ESIF play only a marginal role.
7. Last but not least *the overall governance efficiency* in a Member State determines the interaction between the authorities involved. In countries with well-established rules of inter-ministerial or inter-agency cooperation and consultation processes, ESIF and H2020 authorities are generally more likely to cooperate than in countries where the administration has not fully adopted modern management principles. In countries where regions have more autonomy the differences in governance efficiency can become a very relevant issue.

3. LANDSCAPE

3.1 *Effective and structured dialogue (breaking silos)*

The institutional rigidities, explained above, are the main barriers for effective long-term synergies to be planned and implemented at national/regional level. Synergetic effects are hampered by non-communication, different lines of responsibility and accountability, different sets of rules that discourage the interaction between independent public bodies or with other stakeholders. To fully understand the benefits and barriers of synergies one needs to understand the basic difference between organisations and institutions: Organisations are agents that have preferences and objectives. Institutions are formal and informal social constraints (rules, habits, laws, conventions). "Conceptually, what must be clearly differentiated are the rules from the players" (North, 1990). It is thus of paramount importance to understand, when trying to design an effective synergies strategy, that what matters are not the individual agents but established trust based on transparency and interaction. A rudimentary way of information and communication is the discussion in the Monitoring Committee Meetings chaired by the corresponding MAs: they constitute a forum and an opportunity for all R&I actors to express their views, needs and requests. However, Monitoring Committees have by nature a very wide participation and agendas and they meet seldom. This is not sufficient to establish a structured dialogue.

Synergies ideally start at the national/regional level through in-depth, systematic coordination when preparing the Partnership Agreement and are accompanied throughout the programming period to adapt and redesign national and regional (ESIF co-funded) schemes. The main barriers derive from time pressure, occasionally inherent tendency to defend turfs as well as inertia. Few Member States have succeeded in ensuring a constant pursuit of synergies through systematic coordination, while some more are in the process of organising a systematic coordination. We call the former *Achieved Dynamic Synergies* and the latter *Dynamic Synergies in process*. The examples mentioned below demonstrate that breaking silos and achieving dynamic synergies is feasible, even if it takes time and needs persistence, occasionally also an external impetus. It is suggested that, as we are now close to starting preparing for the next programming period national and regional policy makers need to embark into ambitious efforts to achieve dynamic synergies without underestimating the importance of strategic and operational synergies.

3.1.1 *Achieved Dynamic Synergies (silos broken)*

Only few countries or regions have, as yet, gone beyond the formal consultation process and have adopted a systematic, long-term approach. These cases have proven that design, time and individual commitment matter and pay off. Two national cases seem to have succeeded in systematically institutionalising breaking silos and achieve really dynamic synergies, i.e. synergies that apply both at strategic and operational level, include all relevant stakeholders and most importantly evolve over time into responding to new challenges and opportunities:

Ireland is the most striking example of a country that improved its GDP and research performance making it to the top tier of the EU. Since the end of the 20th century it has heavily invested in supporting research capabilities and continues to do so.¹⁹ The interesting story of Ireland is that all started with an exogenous incentive, the Chuck Feeney – Atlantic Philanthropies, who challenged the Irish Government to get their act together regarding third level research and infrastructure. The condition for matching Ireland's public funds in the case of the *Programme of Research in Third Level Institutions (PRTLTI)* was to ensure focus and cooperation. PRTLTI, which started in 1998 through a charity grant, aimed at facilitating Irish institutions to produce world class research in areas such as science, technology, humanities and the social sciences through a combination of

¹⁹ COMMISSION STAFF WORKING DOCUMENT Country Report Ireland 2018 Including an In-Depth Review on the prevention and correction of macroeconomic imbalances, SWD(2018) 206 final

capital funding for infrastructure and recurrent funding for the development of human capital, including graduate programmes for the training of increased numbers of PhDs. Selection criteria obliged HEIs to focus on few areas, promote excellence in research by institutions rather than by specific faculties or individuals and ensure multi-actor cooperation. There have been five cycles of awards under PRTLTI with a strong emphasis on knowledge transfer and innovation will support key areas of economic development such as medical technologies, food and drink, pharma/biopharma, ICT, energy and environment, engineering, social sciences and humanities, physics and chemistry.

PRTLTI was funded with € 3.5 mn national funds and € 3.5 mn Structural Funds until 2013. It has been essential to the transformation of Ireland to an innovation driven economy supporting world class research in the country and building up capacity with both Irish and international researchers. Evaluations indicators show a threefold increase in the research base, 50 business projects with commercial impact € 754 mn. One of the most important lessons from the Irish PRTLTI success is "Seek to integrate various features into a single funding scheme including an emphasis on research investments, the creation of a more competitive critical mass of research effort and strengthening linkages between teaching and research" and "Clearly elaborate expected commercial and economic impacts at the point of funding and continuously monitor throughout each stage of the research process".

The political agenda is motivated by a concern of Public Sector Innovation and New Public Management policy based on openness and communication with the vision to create a coherent ecosystem, where the various actors "talk to each other". In FP7 Ireland secured more than 150% of its original target and three times the FP6 drawdown. The Irish FP7 evaluation explicitly recognizes the strong synergies between the national and FP7 indicating that "national programmes provide a valuable underpinning for subsequent success within the European RTD Framework Programme" (Technopolis Group, 2016, p.4) Synergies were addressed early on by the Inter-Departmental Committee on Science and Technology (IDC). This has been long time in operation, seeking to develop a particular open, communicative, co-ordinated culture and there are certainly trickle down effects through their own organisational structures and to their subsidiary agencies. Some early (1990s) quite significant disconnects between Government Departments who had a functional responsibility for sectoral R&D (e.g. Health, Marine, Agriculture, Energy, Environment, Telecommunications) and those Departments who funded research in Universities for education & training and industrial application purposes (Education and Enterprise Development²⁰ respectively) resulted in the establishment of an IDC for S&T. Motivated and chaired by the Enterprise Development Department, the role of the Committee is to ensure that each Government Department will be aware, informed and consulted about all plans and investment decisions of all other Departments (with an RTDI budgetary function). Importantly, the Finance Department is also a member of the IDC – responsible for the allocation of all Department RTDI budgets and with overall policy responsibility for the Structural Funds and primary responsibility for ERDF. Other functions, apart from communication, consultation and co-ordination, of the IDC inter alia include: The development of a national position with regard to Ireland's position and priorities for EU Framework Programmes; The development of national STI Strategies (e.g. Innovation 2020 in Dec.2015) and Priority Setting exercises (e.g. RIS3); Recommendations to Government regarding Ireland's membership of international organisations (e.g. CERN). Specific examples of success include the downstream and upstream funding mentioned below. The lesson from Ireland is that all these good practices emerge from the overall common understanding and coordination of ministries and independent agencies, all following the same strategy.

In **Germany** a national-regional dialogue for synergies between Horizon 2020 and the European Structural and Investment (ESI) Funds was launched in 2014, piloting a tailor-made multi-level governance model across policies, programmes and projects spanning

²⁰ After each General Election in Ireland the Department responsible for industrial development invariably undergoes a name change so the name Enterprise Development is used here as a generic term

different research fields, economic sectors and societal challenges. It is a long-term exercise entrusted to the DLR (German Aerospace Centre) for implementation aiming at pursuing a long-term exercise with authorities, proposers, advisory services, experts and stakeholders for a National Dialogue on Synergies Horizon 2020 and the ESIF, establishing a triple agenda: Information – Dialogue and Learning. It aspires to drive “entrepreneurial discovery” by better managing information flows; supporting the strategic use of EU funds; and adapting applicant support services (e.g. towards integrated counselling formats). Led by the Federal Ministry of Education and Research, the dialogue aims to involve all federal and regional (Länder) authorities responsible for Cohesion Policy and R&I. It provides a communication space for Managing Authorities, H2020 Programme Committees and NCPs, advice services including the Enterprise Europe Network (EEN), key stakeholders and potential applicants. Results of the dialogue are fed back into the national policy arenas to kick-start new activities and maximise the impact of activities. This structured and open dialogue fosters the commitment of key actors by concretely addressing societal challenges, specific instruments like public procurement for innovation, or key target groups such as higher education institutions. Thus, the German synergies dialogue has the potential of carrying forward R&I topics of common political interest in Germany at national and Länder level. The endeavour is too recent to assess and its success depends on the readiness of all actors to take new paths (Edwards and Hegyi, 2016, p.20). Important projects have, however, already emerged. Indicative individual success cases include the setup of the secretariat ‘Synergies Dialogue’, which manages a web portal¹⁰ on synergies between ESIF and Horizon 2020, organises thematic workshops and publishes regular overviews of Horizon 2020 calls that are related to smart specialisation and ESIF. Other interesting outcomes include the “Bridgebuilding NRW”²¹ dedicated to competence matching, “a new Boost through Innovation Procurement” (DLR, 2016) and a “Meta” Work Programme on Synergies. The systematic dialogue has produced also a number of applications in selected Länder or fields²² and is expected to proliferate into a dynamic synergies model. One needs to keep in mind that trust building and synergies in larger countries with a high number of actors makes such encompassing efforts more complex.

The case of **Austria** constitutes also an interesting example of a top-down governance system that promotes coordination and synergies. A policy steering group ‘Alignment’ was created with joint ownership of two ministries (Federal Ministry for Transport, Innovation and Technology (BMVIT) and Federal Ministry for Science, Research and Economy (BWF) and members composed of a funding agency and a public consulting/research organization (Austrian Research Promotion Agency (FFG) JOANNEUM RESEARCH POLICIES to provide scientific advice and support to the coordination of the process). The role of the policy steering group was to:

- Develop a national understanding of alignment.
- Develop the framework for the qualitative analysis.
- Discuss quantitative findings.
- Synthesis of core hypothesis from the process.

The rationale for the establishment of *Alignment* was the Promotion of transnationally coordinated R&D as key logic of H2020 and the need to strategically decide upon the participation in several types of bi- and multilateral initiatives, as well as the definition of

²¹ <http://www.brueckenbildung-nrw.de/>

²² <http://www.eubuero.de/regionen-themenworkshops.htm>
http://www.eubuero.de/media/content/Synergien/Ergebnisbericht_PCPPPI_Workshop_BF.pdf
<http://brueckenbildung-nrw.de/>

grand challenges and implementation of related Joint Programming Initiatives. The main lessons from this initiative were:

Alignment is not limited to public-public partnerships. Also industry driven initiatives such as JTIs, especially with member states' participation have to be anticipated as important drivers of alignment. The orientation of national actors towards the EU Framework Programme and the participation in respective project consortia is also seen as an important component of alignment. Therefore 'institutional alignment', i.e. the participation of universities and PROs in bi- and multilateral initiatives and the related strategic orientation of research agendas towards common defined objectives are key for alignment (Bundesministerium für Verkehr, Innovation und Technologie, 2017).

3.1.2 Dynamic Synergies in progress (eroding silos before breaking them)

European Commission papers give advice to Member States on the institutionalisation of synergies. Such examples include "to implement programmes in a synergies-friendly manner in terms of raising awareness, providing information, engaging in communication campaigns, and connecting National Contact Points (NCP) as much as possible to national and regional ESIF policy makers and managing authorities" (European Commission, 2014) or concrete suggestions like install a "Horizon 2020 watch", i.e. consult regularly Horizon 2020 Work Programmes and calls to identify forth-coming calls and initiatives. It could be organised via the relevant NCPs that would digest and send the information to the relevant Managing Authorities (European Commission, 2014). As an example Flanders' VLAIO carries responsibility both for H2020 and acts as an ERDF Managing Authority. It demonstrates that silos are reduced when NCPs are upgraded to front-end offices.

Smaller-scale examples of coordination can also be found and suggest interventions that pave the way to synergies, even if they do not encompass the whole range of interventions and stakeholders or are less systematic. In a sense these are ways of *eroding silos before breaking them*. Ways to do that include shared OP responsibility, co-location and systematic networking. Silos are then easier to break.

- **Estonia** is among the countries that has designed its OPs in a synergetic way: RDI Strategy 2014-2020 "Knowledge-based Estonia" envisaged to "Reinforce, with the help of European Union Structural Funds and activities financed from the state budget, the capacity of Estonian research institutions to participate in forms of cooperation based on quality competition, including in the programme "Horizon 2020". In addition the Estonian OP for Cohesion Policy 2014-2020 foresaw that "R&D-related activities will support the institutional reforms of universities and R&D institutions, high level research, international cooperation (incl. synergy with the EU 'Horizon 2020' Research and Innovation Framework Programme), the mobility of students, university teachers and researchers, and the emergence of their next generation" (Kadastik, E., 2017). Also in Estonia the RITA programme²³, supported by the European Regional Development Fund, aims to increase the role of the state in the strategic managing of research and the capabilities of R&D institutions in carrying out socially relevant research. In this framework Ministries and Funding Agencies can hire science advisers, who can meet and discuss how to best help the system develop. There is now a person in every ministry responsible for research. These science advisers are constantly trained and meet regularly in order to help them to understand possibilities in H2020. This network of advisers being part of their respective ministries but also belonging to the group of advisers help interaction between all actors involved in.
- In the **Slovak Republic** the Operational Programme Research & Innovation is a joint programme of the Ministry of Education, Science, Research and Sports and the Ministry of Economy of the Slovak Republic for granting the support of € 2.2 bn from ERDF during the programming period 2014–2020. The programme aims to create a stable and

²³ <http://www.etag.ee/en/funding/programmes/rita/>

innovation-friendly environment for all relevant entities and to promote the efficiency and performance of the Slovak research, development and innovation system as a basic pillar for reinforcing the competitiveness, sustainable economic growth and employment of the country. The specific actions of the programme focus, inter alia, on supporting the participation of the Slovak performers in the actions of the European Research Area whether they are Horizon 2020 projects or other specific European activities or initiatives.²⁴

- *Grouping responsibilities and competences* in one regional body – like Acció in **Catalonia** – is another road to follow.²⁵ The main purpose of such a strategy should be to boost the competitiveness of regional SMEs (by fostering their innovativeness through guidance, training, connection and technical and financial boost). Leading sectors need to be identified and schemes developed to guide RTOs and SMEs towards the international/global approach access-to-innovation services provided.²⁶
- *Co-location of H202 and ESIF responsibilities* is another way to enhance synergies: In **Sweden**, the main mission of NCPs is to support and stimulate participation in H2020, but they also encourage synergies between H2020 and ESIF. The NCP structure is centralised, with the vast majority of NCPs based at Vinnova. There are no regional NCPs, but good contacts with the regions are maintained via close relationships between NCPs and universities and other stakeholders. In terms of giving advice to stakeholders, the centralised model is said to increase the quality, continuity and coordination of competences. It also facilitates the provision of guidance on broad societal challenges and cross-cutting themes in Horizon 2020, since this necessitates a broad combination of expertise. The Agency for Economic and Regional Growth is the coordinator in Sweden for the Enterprise Europe Network (EEN). This network also provides guidance on both ESIF and H2020. Moreover, the Regional National Dialogue Network (with representatives from Vinnova, the Swedish Agency for Economic and Regional Growth and the regions) meets regularly to discuss common priorities, similarities, differences between programmes, smart specialisation strategies etc. and how the programmes work in relation to universities and research institutes. This helps create an environment in which synergies can be nurtured.
- A common approach was used by the **Czech Republic**, where both the OP Enterprise and Innovation for Competitiveness and OP Research, Development and Education, took into account the opportunities for synergies with Horizon 2020 during the programming process. Representatives from Horizon 2020 authorities were involved and consulted with during the programming process. The OP Research, Development and Education also notes the value of participation from EC representatives from DG REGIO and DG RTD. As a result the OP Research, Development and Education will allow co-financing of projects under Horizon 2020 (complying with the ban on double financing of the same budget items and also adhering to the principle of not replacing national co-financing of a part of the Horizon 2020 projects with ESIF funding). The aim is to increase the still low participation of Czech research teams in framework programmes. Two Priorities are given particular emphasis. Priority 1 focuses on reinforcing the capacity of research organisations. Priority 2 focuses on improving the quality of human resources in science and research by means of attracting and developing promising researchers. This includes activities involving research teams in international research projects implemented under existing EU initiatives (mainly activities under Horizon 2020). Here there is scope for complementary financing to projects (in line with RIS3 priorities) approved under Horizon 2020 and other initiatives (Ferry et al., 2016).

²⁴ ibid

²⁵ Report Workshop on Synergies H2020 ESIF

²⁶ ibid

- Similarly, ESIF authorities in **Wales** actively considered synergies between ESIF and Horizon 2020 in the programme planning process. From a very early stage there was an awareness of the opportunities to share information and to find linkages between the two sources as part of the scoping process for 2014-20. The opportunity then arose to create a specific team in 2013 which could dedicate time to developing synergies through the programmes (Ferry et al., 2016).
- The **Spanish** 'Red de Políticas de I+D+I' is a thematic network for public policies in the areas of RTDI, established in November 2010 under the Spanish NSRF 2007-13 and funded with Technical Assistance. The network is a tool to generate synergies between public R&D&I policies at regional and national levels, Cohesion Policy and Europe 2020, with a focus on FP7. In 2014-20, the network's role has been formally included in the Partnership Agreement as well as in national and regional OPs. Although the emphasis is on Thematic Objective 1 (RTDI), the network also covers TO 3 (SMEs), thereby connecting ESIF to both Horizon 2020 and COSME. The Spanish Smart Growth OP notes that the network will assist with: Cooperation in project selection (aligning the cost models of ESIF programmes, where feasible, with Horizon 2020, COSME etc.); synchronising the funding decisions of ESIF and other directly-managed EU instruments; and synergies with regards to support to SMEs' innovation and competitiveness through the EEN, with respect to COSME in particular. Similarly, the 5th work plan of the network from 2015 notes its role in the coordination of actions supported under TO 1 of Spanish ERDF programmes and of ESIF with other EU instruments related to RTDI such as Horizon 2020 and COSME. In addition, the plan proposes the creation of a thematic working group 'to study possible complementarities with instruments of the European Union'. The working group is to have a double objective: to promote a 'common environment' between the different actors involved in the competence scope of the network and to seek potential complementarities and synergies between instruments (Ferry et al., 2016).
- In **Slovenia** synergies between national, ESIF and FP funds are firmly embedded in the Slovenian research and innovation system. National Research and Innovation Strategy of Slovenia (RISS) 2011-2020, adopted by the Slovenian National Assembly in 2011 states that these funds should be used in synergy and mandated the Government to prepare a document detailing 'synergic use of diverse sources for strengthening of research and development system' (RISS, action 25). Following this policy orientation the Decree on the use of European Cohesion Policy funds in the Republic of Slovenia in the 2014-2020 Programming Period for the "Investment for Growth and Jobs", article 27, provides the basis for the implementation of a synergy between FP and ESIF. According to it, if a project is selected at the EU level, and it allows the complementation funding at the state level, the managing authority shall treat this operation as a matter of priority and treat the operation as if the decision to support it had already been issued. While this was prepared specifically with the Seal of excellence in mind, the State Aid rules in the case of SME instrument projects required that new applications are prepared and submitted for approval. In addition to the co-funding of the Seal of excellence projects (from ESIF) Slovenia also decided to approach the synergies on a systemic level. To this end, the Government of Slovenia established a working group with the EIT Climate KIC in order to elaborate and implement a systemic synergy between EIT - KIC horizontal mechanisms and the regional and national ones. The mandate of the working group is to explore options and possibilities of synergies between Slovenian instruments, mostly financed through ESIF and KIC Climate ones, and the ones by EIT KIC and to prepare proposals on how to integrate the activities of both parties in order to foster a better functioning of the national and transnational research and innovation ecosystem.
- In **Sweden**, a consequence of the MLE itself was that an informal network of stakeholders, that were identified when the Government Offices asked research funding organizations and agencies for good national examples and practices, was formed which promoted these examples and enabled further contacts and mutual learning nationally.

3.1.3 Ideas for the future

A proposal from the **Region of Värmland**²⁷ is to empower NCPs: In the future structure of the implementation of the framework programme, much more could be done to promote the framework programme, disseminating project results to increase impact and stimulating collaboration between quadruple helix stakeholders and end-users in the regions. In the Partnership Agreement between Sweden and the European Commission, there are clear differences in the wording on the co-ordination between the different ESI-funds and on the wording on synergies with the centrally managed programmes. Concerning the ESI-funds there are concrete descriptions on the establishment of working groups and structures at national and regional level with representation from the different funds (and levels). However, concerning the co-ordination with Horizon 2020 the wording is more general on ambitions and overarching visions, but no concrete actions. One interesting proposal to remedy the discrepancy could be the proposal from ERRIN (European Regions Research and Innovation Network) gave in their position paper on FP9 on establishing and giving a stronger mandate to Regional Contact Points, with the same purpose as the National Contact Point. This could be one action to create synergies and achieving greater impact of the framework programme. A closer cooperation between NCPs and MAs on both strategic and administrative links between the programs would also be welcome. Another idea, coming from the Lulea University of Technology in order to improve the ability to develop synergies between framework program and structural funds is that more focus should be put on the universities and their experience as the universities, i.e. in the region of Norrbotten and Västerbotten, are actively participating in both programmes simultaneously.

One good practice on the role of universities as actors helping to break silos (as a catalyser) comes from the **Region of Norrbotten**, where:

- The university have a bilateral agreement with the Region of Norrbotten for discussion how best to develop the region with joint forces.
- Regional representatives, some of the managing authorities and the universities in Norrbotten and Västerbotten meet through the dialog meetings arranged by North Sweden European Office. This is a forum for North Sweden European office to create a link between the region and the EU in relation to research and innovation as well as the EU cohesion policy.
- Europaforum Northern Sweden bring together regional representatives and municipality representatives in the four northernmost countries of Sweden to join forces in positioning this part of Europe in the political arena. One of the outputs from this collaboration is the position papers that are developed and which carries the joint message of the regional priorities of the regions.

3.2 Synergies through strategy and policy

The strategic initiatives, increasingly adopted by the FPs and DG REGIO, offer an opportunity to focus resources and eliminate barriers on information and coordination. Their current use by the Member States and region varies.

3.2.1 Smart Specialisation Strategies (SSS or S3 or RIS3), EU strategic Thematic S3 Partnerships (EU TS3P) and the Stairway to Excellence (S2E)

Smart Specialisation Strategy was an innovative approach for the 2014-2020 period that aims to boost growth and jobs in Europe, by enabling each region to identify and develop its own competitive advantages. Through this partnership and bottom-up approach, smart specialisation brings together local authorities, academia, business spheres and the civil

²⁷ Cases presented during the MLE by Sweden

society, working for the implementation of long-term growth strategies supported by EU funds. By making RIS3 an ex-ante conditionality for spending ESIF, the European Commission is harnessing regional development towards research excellence, hence indirectly increasing the likelihood of H2020 success. Active participation to the RIS3 platform²⁸ operated by the Join Research Centre may offer synergy lessons and ideas to interested MAs and R&I policy designers. However, it seems that the platform is underused (MLE discussions) and RIS3 works best in countries that are already experienced with synergy-seeking strategies. As support is evolving the recent launching of S3 interregional partnerships also aim to tackle funding (and synergies between funding) aspects.²⁹

A good practice example taking advantage of the RIS3 for synergies at a systemic level are the **European S3 Thematic Platforms** launched in 2016, during the Smart Regions conference, the European Commission has launched two Smart Specialisation Platforms: for Industrial Modernisation and Agri-Food, in addition to the existing S3 Platform for Energy. These initiatives are to offer hands-on support to regions to foster interregional cooperation based on matching smart specialisation priorities related to these three areas - such as Key Enabling Technologies, service innovation or resource efficiency. The aim of this initiative is to create a common investment pipeline of mature projects in new growth areas across the EU, by providing tailored advice and helping regions establish links with the business and research communities. The platform helps regions to develop or share infrastructure such as testing facilities, pilot plants, data centres, and Fab-Labs.

The EU S3 Platforms are formed based on the model of Vanguard Initiative (VI). VI is a public-public partnership of diverse EU regions, forming through membership a financial common pot, delivered through collaborative use and demo cases. It is driven by a common political commitment made by regions to use their smart specialisation strategy to boost new growth through bottom-up entrepreneurial innovation and industrial renewal in European priority areas. Such partnerships and clusters form eco-systems that are the catalyst for fast-growing innovative SMEs. Vanguard regions want to build the synergies and complementarities in smart specialisation strategies to boost world-class clusters and cluster networks, in particular through pilots and large-scale demonstrators.

A good practice taking advantage of the RIS3 for synergies at operational level is the **Leibniz-Institute for Plasma Science and Technology** – INP Greifswald and the way it succeeded in the strategic advancement of its capabilities through coherent investment. It benefitted from the RIS3 Action areas in Mecklenburg-Vorpommern and could systematically build up through successive ESIF and H2020 programmes the building blocks necessary to pursue its vision.³⁰

At the same time the "Stairway to Excellence" (S2E)³¹ project is a European Parliament Pilot Project executed by DG-JRC together with DG-REGIO centred on the provision of assistance to the 13 Member States (EU13) who joined the European Union in 2004 and subsequent years with the aim of closing the innovation gap and promoting excellence in Europe. S2E organises national policy events to raise awareness of the actions needed to enable synergies between different EU funding programmes for research and innovation. It also shares experiences in combining funding from Structural Funds and Framework Programme to improve excellence in R&I systems. Good Practices reported in the S2E are used in different places in this report.

The S2E activities have been broadened recently (S2EIII), both geographically targeting appropriate regions in all EU28 as well as in focus of the work. Whereas S2E I and S2E II focused more on the analytical side of synergies, S2E III moved towards action and put a

²⁸ <http://s3platform.jrc.ec.europa.eu>

²⁹ Based on the contribution of the JRC in the MLE

³⁰ Leibniz-Institute for Plasma Science and Technology (INP), Greifswald

³¹ <https://ec.europa.eu/jrc/en/research-topic/stairway-excellence-s2e>

greater focus on capacity building and providing assistance to regions. S2E III (lasting from 1/4/2017 to 30/06/2018) was a transition phase in which modes of collaboration in synergies are being tested, which could be scaled up in the next phase of S2E. Examples of collaboration scenarios that are tested include collaboration between (national and regional) Managing Authorities and Joint Undertakings through dedicated Memoranda of Understanding, as well as collaboration between (less developed) regions and the EIT Innovation Communities under the Regional Innovation Strategies outreach scheme. The **R&I Regional Viewer** (ESTAT/ ESIF/ H2020 data), a tool allowing to visualize and compare Research & Innovation investments under different funding channels and EU programmes across EU Regions, i.e. economic indicators from Eurostat, planned R&I-related investments under ESIF, and Horizon 2020 funding captured by stakeholders. The presentation of the regional funding indicators in parallel with the economic indicators is aimed at supporting the combination of funding and enhancing their complementarities at regional and national levels. Under S2E III new and updated indicators including ESIF funding absorption information combined with H2020 performance indicators at regional level were being included.³²

3.2.2 Partnership Instruments

Partnership Instruments (PI) have been introduced into the European R&D and innovation landscape and more specifically in the Framework programme context after 2000 alongside the Lisbon strategy and the aim to develop the European Research Area. The partnership instruments have been developed over time and each one of them reflects the specific policy priorities and context in which they were designed and launched. Partnerships include Public-to-Public Partnerships developed to implement one of the European Research Area and implement the principle of reciprocal opening of national programmes (ERA-NETs, the European Joint Programme Cofund Actions, Art. 185 Initiatives, European Innovation Partnerships) and Public-Private-Partnerships (European Technology Platforms, Joint Technology Initiatives/Joint Undertakings and Contractual Public-Private-Partnerships). As the underlying philosophy of the PI is the integration of the R&I systems of the Member States their activities should in principle be funded by national (not ESIF) resources. FP/H2020 top up their funding as an incentive to integrate national systems. PI adopt their own research agendas and award funding mainly on the basis of open calls for proposals but the modes of collaboration differ between PI.

H2020 offers two advantages for European Partnerships: Coordination and co-funding (topping up national contributions) under conditions. National policy makers and stakeholders are mainly interested in the latter, but in this case there are specific rules to be respected (European Commission, 2014):

- ESIF can be used for ERA-NET Cofund but no ESIF contribution can be taken into account to calculate the Horizon 2020 contribution (33%). The total budget of the joint call or additional joint calls may include ESIF, provided that they are not declared as eligible costs and are not used for calculating the topping-up by Horizon 2020 grants. ESIF will be used in parallel to the ERA-NET. When considering ERA-NETs in Horizon 2020, Member States will usually contribute with their own budgets to the Joint Call (that is the central element of the ERA-NET) and the costs of additional coordination activities. These budgets will be complemented by additional amounts from Horizon 2020 (in the case of a successful evaluation of this proposal) that will depend on the overall amount of budgets involved: Horizon 2020 reimburses up to 33% of the total of the national budgets involved in the call, and costs for additional activities on the basis of a unit cost. In order to avoid the risk of any potential double funding, no ESIF money should be used to cover these national budgets (and costs for additional coordination activities) as these form the basis for calculating the Horizon 2020 contribution. However, projects generated from a Call can later on use additional national funds to which corresponding

³² Based on the contribution from the JRC participation in the MLE

additional matching ESIF funds could be added. This would require however a very rigorous follow-up and accounting system from the MS involved.

- Use of ESIF in Joint Programming Initiatives (JPI) is allowed with no limitation to use ESIF for joint calls in the framework of a JPI, provided that respondents to Joint Calls observe the rules for ESIF funding and that an ESIF programme foresees such competitive award of research grants. The only exception is when the Strategic Research Agenda (SRA) of a JPI (or part of it) is implemented via ERA-NET or Article 185 initiative. In those cases, the conditions to combine Horizon 2020 and ESIF applicable for ERA-NET and Article 185 initiatives must be met.
- Projects financed through grants under a JTI/JU, can enjoy combined funding, provided that double funding is avoided (different cost items funded by different grants). Simultaneous funding (JTI2 ECSEL example) and parallel funding are foreseen. In this case timing is important: if no decision on the ESIF financing of Part B can be taken in time, the viability of Part A as a stand-alone project needs to be assessed.
- Regarding Art. 185: as one main objective of Art. 185 initiatives is to integrate national public research funding, matching contributions from the Participating States to the programme may not come from other EU funding sources such as ESIF. This means in practice that for the calculation of the Horizon 2020 contribution (50% in general, possibly only 25% or 33% for Eurostars-2) only the national contribution per country is counted.

As PI are important for strategic synergies Member States have adopted some good practices allowing them to make use of FP/H2020 and ESIF:

European Joint Programme Cofund (EJP Cofund)³³ under Horizon 2020 is a co-fund action designed to support coordinated national research and innovation programmes. The EJP Cofund aims at attracting and pooling a critical mass of national resources on objectives and challenges of Horizon 2020 and at achieving significant economies of scales by adding related Horizon 2020 resources to a joint effort. Structural funds are compatible with ERA-NET funds. According to the H2020 Rules for Participation, H2020 funding can be cumulated with any grant from the Union budget, provided that the grant does not cover the same cost items. The total budget of the joint call may include additional call contributions including ESIF funds (outside the grant agreement), however caution is required to ensure that they are not declared as eligible costs and are not topped-up by H2020 grants (this allows MS to fund additional projects/beneficiaries in the call).³⁴

The Flanders of the Bio Base Europe Pilot Plant³⁵ demonstrates a good practice in the case of the Bio-Based Industries Joint Undertaking as long as a region (or country) takes a medium to long-term view dedicating public resources to large flagship projects leverage private, ESIF and H2020 funding. With systematic policy efforts it was made possible to overcome all perceived barriers and fund both parallel (complementing each other) and successive projects (building on each other). The region helped create a multi-purpose pilot facility in the Port of Ghent (B) for Bio-Based products & processes employing 70 people as an independent not-for-profit SME. A combination of ESIF (Interreg, ERDF, H2020 -BBI-JU, RIAs, a CSA, LEITs and more) is a case of multi-synergies.³⁶ The success elements include the availability of public and private funding and will at regional level as well as the inspiring nature of the project being unique and having the opportunity to act as an important part of the BBI JU.

³³ <https://www.era-learn.eu/public-to-public-partnerships/european-joint-programme-cofund-ejp-cofund>

³⁴ http://ec.europa.eu/research/participants/docs/h2020-funding-guide/cross-cutting-issues/era-net_en.htm

³⁵ <http://www.bbeu.org/pilotplant/>

³⁶ Based on contributions from Flanders to the MLE

CleanSky2 Czech Republic (Prihodova, M., 2017): The Ministry of Industry and Trade of the Czech Republic decided to open a special complementary CS2 call. The main reason for implementation of synergies and complementarities between ESIF and framework programmes is to stimulate enterprises towards higher participation in programmes such as Clean Sky 2. This goal could be achieved through the opportunity to utilize similar version of projects in both types of funding titles. As a result, enterprises should have a wider range of options and it should hopefully reduce the pressure on some particular ESIF programmes for research and innovation support where the demand for funding highly exceeds the budget allocated for opened calls. The special complementary call under PA1 OPEIC programme Aplikace was launched on 1 December. The allocation of funds for projects under this call amounts to CZK (Czech crown) 400 mn (€16 mn). Only consortia meeting the conditions for effective cooperation can submit an application for support. The range of support per one project CZK 1 –50 mn (€ 40000 – € 2 mn). Maximum aid intensity is up to 70 % of eligible costs. Eligible costs of the partner cannot account for more than 50 % of the total amount per one project.

An Art. 185 good practice that succeeded in obtaining synergies is **BONUS**,³⁷ a joint Baltic Sea research and development programme with a total budget of €100 mn, which started by the BONUS Member States (Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland and Sweden) and the European Commission. It was officially founded in September 2010 by a co-decision of the European Parliament and the European Council as an initiative under the Article 185 of the Treaty on the Functioning of the European Union and full implementation commenced in October 2012. It is a cross-cutting and interdisciplinary programme that integrates the research programmes of the Baltic Sea states with focuses on the marine sector and the environmental challenges facing the Baltic Sea. These include overcoming large blooms of toxic cyanobacteria and ensuring sustainable development of the Baltic Sea. BONUS supports ecosystem-based management of the sea and is closely aligned with many of the objectives and horizontal actions of the EU Strategy for the Baltic Sea Region, in particular its objective to 'Save the Sea'. In a similar way to FPs, BONUS issues calls for proposals and supports a variety of collaborative research and innovation projects of high excellence and relevance aimed at producing knowledge, scientific evidence and innovative solutions for policy-makers and other actors in the Baltic Sea region. BONUS has established synergies with the INTERREG Baltic Sea Region programme and there may be wider opportunities for establishing greater synergies with ESIF to ensure the coordination of activities in the Baltic Sea region from both a marine bio-economy as well as research and innovation perspective.

In a nutshell European Partnerships offer an important opportunity for synergies in terms of coordinating research agendas and internationalising networking. Financial synergies between H2020 and ESIF is only possible in parallel, simultaneous or linear co-funding but not in using ESIF as national participation. The highest synergies seem to emerge when there are individual project champions interested to pursue coordination.

3.2.3 The European Institute of Innovation and Technology (EIT)

The EIT constitutes another opportunity to create synergies. The Institute addresses R&I by supporting the development of dynamic pan-European partnerships, called Knowledge Innovation Communities (known also as KICs) integrating partners from higher education, research and innovation to perform so-called, Knowledge Triangle Integration. Each KIC works through co-location centres (CLCs) and these are the operational units which bring together people, regional and local clusters and nodes of excellence (EIT, 2013).³⁸

³⁷http://europa.eu/rapid/press-release_IP-09-1648_en.htm?locale=en and https://ec.europa.eu/research/evaluations/pdf/final_bonus_report.pdf

³⁸ https://eit.europa.eu/sites/default/files/Analysis_of_Synergies.pdf

The Institute has established the EIT Regional Innovation Scheme (EIT RIS) designed to share good practices and experience emerging from the EIT Community's activities, as well as to widen participation in KIC activities. Its aim is to help disseminate the knowledge and know-how of the EIT Community and widen participation in the KICs across Europe. The EIT RIS focuses on countries with limited or no participation in the EIT Community's activities. In this context KICs are expected to promote synergies with the Smart Specialisation Strategies and their implementation mechanisms. The KICs, in cooperation with EIT Hubs or through CLCs, are encouraged to provide their expertise in their specific fields and KTI approach, both during the design as well as the implementation and monitoring processes of the S3. In addition, KICs are recommended to interact with local actors to assist with S3 implementation mechanisms (such as cooperating with ESIF funded project implementers in designing and implementing these projects with a view to integrating KIC best KTI practise and approaches) (EIT 2017).

KIC Complementary Activities (KCA) are typical cases using both H2020 and ESIF. The majority of funds has so far originated from FP7 (53%) and H2020-ERC (26% in total). This is not surprising, as the idea behind the KIC Added Value Activities (KAVA)-KCA (or 25%-75%) concept was that EIT Innovation Community Partners would bring their existing research activities and results to the Innovation Communities where the partnership would utilise those results together (e.g. by developing and launching on the market successful products, services and new technologies). The share of the Structural Funds was only 10%. An example is the "Panke Optimization" project the water quality of an urban river in Berlin will be enhanced to turn it usable for animal and man. In another one the results of the project "Dezentrale Reinigung von Straßenabflüssen" will be used to gain insights into a possible decentralisation of water management in cities across Europe, a goal of the EIT Climate-KIC project Blue Green Dream (EIT Interview).

ESIF rules in the current programming period do not allow for the funding of participation fees to the EIT's Innovation Communities or any other similar instrument/ partners to ensure additionality.

For countries that use national funds to join KICs and CLCs synergies are obtained through the exploitation of the EIT/KICs and CLCs knowledge, share information and best practice, help better understand the local ecosystems, mentoring, access to venture capital etc. Financial synergies can be obtained when KIC partners succeed in mobilising ESIF for downstream activities.

A good practices for ESIF mobilisation is the Climate Knowledge and Innovation Community (Climate-KIC) **"Pioneer Cities" & "Transition Cities"** Projects, where the cities that benefitted from the initial EIT support simultaneously agreed to ERDF-fund a sequential project. Climate-KIC has established Regional Centres in six regions across Europe including one in the Lower Silesia region in Poland. Most Lower Silesia partners in this KIC, and in particular the WROCLAW RESEARCH CENTRE EIT+, the University of Environmental and Life Sciences and the Wrocław University, have received since 2007 from ERDF over € 210 mn for projects. This enabled the Lower Silesia region to join the Climate-KIC. The Climate-KIC's Regional Centre in Lower Silesia is working with 14 public and private entities in the region on the transition towards a low-carbon economy. It collaborates with businesses, academia and the public sector to develop new innovation schemes, professional education programmes and entrepreneurship. Almost 100 Polish 'agents of change' have been trained as part of the on-going 'Pioneers into Practice' programme. The strategy focuses on enhancing the good practices and policies of business, academia and public institutions. The Lower Silesia region is proposing to spend more than € 600 mn of its ESIF to support regional low-carbon economy developments over the next seven years. The Climate-KIC's Regional Centre in Lower Silesia recently organised with a great success a 'Climathon - climate change event' which is a global 24-hour hackathon-style occasion

in Walbrzych. The Regional Centre is also now formally collaborating with Estonia to share approaches and develop joint programmes and activities to boost low-carbon innovation.³⁹

Synergies can also be obtained for research teams that have not yet joined the EIT but are interested to do so in the future. In Estonia the government offers support (€ 30000 per year) to interested research units for networking through keeping contact with KICs (travelling, salaries) and participate in the process not as full partners but as associate partners. In this case no participation fee is requested. This contact enabling has helped Estonian groups who are paying fees to fully participate in the KIC activities. This proved beneficial as those that are members receive more support from KICs than they pay in fees. The success of the first project has led to more similar projects in the pipeline.

The **Government of Slovenia** established a **working group with the EIT Climate KIC** in order to elaborate and implement a systemic synergy between EIT - KIC horizontal mechanisms and the regional national ones. The mandate of the working group is to explore options and possibilities of synergies between Slovenian instruments, mostly financed through ESIF and KIC Climate ones, and the ones by EIT KIC and to prepare proposals on how to integrate the activities of both parties in order to foster a better functioning of the national and transnational research and innovation ecosystem (as described in Section 3.1.2 above).

3.2.4 Macro-regional strategies

The EU macro-regional strategies (MRS) were launched as a political and governance experiment in 2009. The rather general description of both the characteristics of a macro-region as well as an MRS, as well as the initial statement that there would be no new EU funding nor new institutions and legislation, did not stand in the way of a broad interest in the concept and considerable political enthusiasm for the promises of better coordination it entailed. The four MRS adopted to date now cover a considerable part of the EU territory and its neighbours and partly overlap each other, and what has begun as an experiment is entering maturity (Rafaelsen et al., 2017). While synergies with DG RTD are mentioned as a target for MRS there is room for improvement on the systematic efforts identified.

The MAs in the Baltic Sea region established a network of MAs that sought to synchronise calls to enable joint projects based on regional ERDF co-funding in the respective programming area. The work of the MA-network was complemented by the **regional network CPMR** that sought to seek out interesting cases or projects among the involved regions. Some pilot actions are ongoing. This approach could well facilitate synergies between ERDF and H2020. It would for example provide a funding opportunity for potential multi-beneficiary "Seal-of-excellence"-proposals.⁴⁰

For example, in the context of the **MRS for the Alpine regions (EUSALP)**, Action group 1 endorsed the task to develop an effective research and innovation ecosystem, drafting a clear and adequate framework in order to merge the MRS goals of strategic alignment with the usage of the operational instruments such as territorial cohesion funds, capitalising and aligning also all other R&I funding sources and initiatives, in order to foster a EUSALP AG1 mission.

Another case of interest is the **Danube:Future**,⁴¹ which is a joint contribution of the Danube Rectors' Conference and the Alps-Adriatic Rectors' Conference, thus integrating the largest pool of institutionalised knowledge in the Danube River Basin. The project contributes to the EU Macro-regional Strategy for the Danube Region by developing interdisciplinary research and education in the Danube River Basin, in particular

³⁹ http://s3platform.jrc.ec.europa.eu/documents/20182/142587/S2E_INT_Climate+KIC.pdf/4232cbe3-0da2-44ef-acc8-ca990ea8b47d

⁴⁰ Case reported by Sweden during the MLE

⁴¹ <http://www.danubefuture.eu/> and <https://ec.europa.eu/research/pdf/publications/ki-01-16-339-en-n.pdf>

strengthening a long-term humanities’ perspective. Danube:Future contributes to solutions for pressing environmental issues and works towards a sustainable future of the region. The project funds its activities from multiple sources including Horizon 2020 and ESIF and aims to have a lasting effect on research and teaching in the humanities in the region, bringing young scholars to the forefront of international research and hence developing the strengths of higher education in the region in internationally competitive contexts. It is also of particular importance for those Danube River Basin regions which base the core of their smart specialisation strategy on sustainability of the economy and ‘green jobs’. Danube:Future carries out trainings in cultural and natural heritage, institutional capacity building for green jobs, and strengthens regional and supra-national networks alike.

3.2.5 Research Infrastructures (RI)

European science needs a coherent and sustainable research infrastructure ecosystem to take excellence to the next level. Under Framework Programme 7, the EU spent € 1.7 bn on research infrastructures and has invested € 2.4 bn to date under Horizon 2020. This was complemented by a further € 18.2 bn from regional development funds.⁴² For the RI to be sustainable (both those in the national roadmaps and those opening up in ESFRI) funding for their investments and operations is critical. However, funding rules are often too restrictive.⁴³ Cautious planning of synergies between FPs, ESIF and national funding, each funding whatever it is allowed to, can lead to the creation of successful and sustainable RI.

A good practice contributed by Slovenia is the **case of CERIC-ERIC (2014/392/EU)**, a pan European research infrastructure in the field of material characterisation in which Slovenia is a member. The ordinary activities are supported by the member countries, which should contribute in kind by operating, making available and continuously upgrading one Partner Facility for a total investment value exceeding € 100 mn and a total annual operation cost exceeding € 10 mn. While capital investments and operational costs are covered by the member countries, using national funds, the H2020 project ACCELERATE, funded by the European Commission, supports CERIC’s long-term sustainability through the development of policies and legal and administrative tools for a more effective management and operation of RIs. In addition to the national and H2020 funds, research and innovation is also co-funded by ESIF, on national level as well as through the Interreg programme. Research infrastructure such as CERIC-ERIC can thus be funded from various sources, be it national, ESIF or H2020, depending on the characteristics of the funds. The table below gives an overview of potential effective combinations of sources of funding by activity, as viewed by CERIC-ERIC:

Activity	Funding
Development of infrastructure	ESIF, National
Open access	National, H2020 (mainly for pilot activities)
Training of scientific and technical personnel	National, H2020, ESIF
Strategy and policy development	H2020, ESIF
Coordination of activities, including promotion, outreach and marketing activities, other operational costs	National
Joint RD activities	H2020, ESIF, National (in-kind and central)

⁴²<https://sciencebusiness.net/framework-programmes/news/european-research-infrastructures-call-smoother-interplay-between-funding>

⁴³ FPs only fund the use of RI for specific projects (allowing for amortisation and project-related costs) and occasional costs for opening up in ESFRI (preparatory phase and limited top-up for implementing long-term sustainability) whereas ESIF are not funding operational costs.

Their mix, based on the properties of a particular funding source are important for the long-term sustainability of RIs.⁴⁴

A published “semi-bad” practice was explained by the Romanian ELI-NP, a large research infrastructure using structural funds. This was reported as both a blessing and a curse in a public interview by the director of ELI-NP⁴⁵. All projects financed from ESIF must comply with strict public procurement laws, which may be in appropriate for large research infrastructures. For example, there are certain parts of an experimental system that cannot be bought off-the-shelf but have to be custom built. For some parts, there is no company that can deliver them. ELI-NP was in contact with research groups at the universities of York, Warsaw and Cologne which were interested in building custom parts for experimental equipment, but they gave up because public procurement rules made writing the application more expensive than the value of the contract. The lesson learned is that equipment needed for research infrastructures should not fall under the same public procurement requirements as other projects funded through structural funds. The rules make hiring research staff difficult also. Research infrastructures have to advertise job openings in ‘national circulation’ newspapers for at least 30 days before the position can be filled. To comply with this rule, ELI-NP has job advertisements all year round in Romania’s top newspapers. It took two years for the ELI-NP team to prepare the application for funding and to submit it in 2011. The paperwork was split in three different components: construction, research, and training. A single application covering all components would have made things much easier.

3.3 Synergies at operational level

3.3.1 Seal of Excellence

The idea of creating a ‘Seal of Excellence Certificate’ is to ensure funding of high quality proposals. The SoE Certificate is awarded to the H2020 proposals rated high quality (above pre-agreed threshold), which the Commission cannot fund because of budget constraints. The Seal of Excellence Certificate holder can approach alternative regional, national, private or public funding sources. For their part, interested funding agencies willing to invest in promising proposals (including national & regional authorities through European Structural & Investment Funds) can identify promising projects more easily. The Seal of Excellence is tested currently with Certificates issues to above-quality threshold, unfunded proposals for two H2020 schemes: the SME Instrument and Marie Skłodowska-Curie actions (MSCA)⁴⁶. A Teaming proposal under the Horizon 2020 programme is also reported to have benefited from a SoE.⁴⁷

The advantage for national or regional authorities applying SoE is that they benefit from the Horizon 2020's evaluation system, thus saving time and resources and keeping the process simple by not re-evaluating the content. Funders just limit the checks to the minimum required by internal rules and offer different types of support (e.g. grants, loans, guarantees, coaching) or combinations. Authorities wishing to use ESIF can either launch targeted calls for the Seal of Excellence, or use existing schemes with bonus points, including the SoE Certificate in the selection criteria of an existing scheme. The barriers are State Aid rules for the SME instrument Phase 2 as well as the psychological reluctance to lose control of the evaluation procedure.

The *SoE for the SME Instrument* is used by many Member States. Supporting projects while complying with State Aid rules is possible. This is done more easily for Phase 1 (using the de minimis threshold) but also for Phase 2 provided the GBER applies to the scheme.

⁴⁴ Contribution from the Slovenian participation in the MLE

⁴⁵ <https://sciencebusiness.net/news/how-build-research-infrastructures-regional-funds>

⁴⁶ https://ec.europa.eu/research/soe/index.cfm?pg=opportunities_msca

⁴⁷ <https://ec.europa.eu/research/soe/index.cfm?pg=what>

Detailed explanations and examples are issued by the European Commission to facilitate the SME Instrument SoE in the Member States⁴⁸ and a Community of Practice is established to help interested policy makers learn from peers.⁴⁹ The European Commission has launched an explanatory note on the application of State Aid Rules for schemes that offer alternative support to SME Instrument with a H2020 'Seal of Excellence'.⁵⁰

Good practices for the SME SoE include:

For the phase 1, a number of countries and regions have already been able to launch at national or regional level⁵¹ support mechanism for the SoE phase 1 holders, mainly channelled through the "de minimis" regime.⁵² In fact, within the knowledge already available in the Seal of Excellence Community of Practice set up by the Commission in November 2015, any region at European level would be able to implement a support mechanism to use the Seal of Excellence for the SME instrument phase 1.⁵³

Fast support using de minimis: VINNOVA established the 'Runner up Programme'⁵⁴ funded by national resources. When the results of each phase 1 of the Horizon 2020 SME Instrument are available, VINNOVA invites the companies that have scored 13 or above to submit an application under a Call for Proposals. The applicants receive a link to a simplified application form, requiring a summary of the project and a budget, supplemented with the original Horizon 2020 SME Instrument application and its Evaluation Summary Report as well as a statement that the applicant is not above the "de minimis" threshold. VINNOVA will not carry out a qualitative evaluation of the applications for the second time, but instead, accepts the outcome of the Horizon 2020 evaluation. After the proposal has been granted funding, the project will follow the same rules and reporting as all the other projects supported by VINNOVA. VINNOVA regards this programme as an economical way to synergize with Horizon 2020. The agency has been able to fund good projects recognised at European level with a very low indirect cost, and has shown that it can be done very quickly. From the Swedish tax-payer viewpoint, the cost is minimal but the added value for Europe is maximised.

The Slovenian Ministry of economic development and technology established a **SoE synergy co-funding model between SME instrument and ESIF at the national level**. A specific call for such proposals was designed and a simplified application form for the applicants was prepared; the eligibility procedure requires an additional merit check on alignment with regional S3 and SA rules.

Trying to go beyond in an effort to exchange learning experiences for Phase 2 three agencies (CDTI in Spain, Enterprise Ireland and Tekes in Finland)⁵⁵ developed a **mind-map to design SoE based support programmes at national or regional level**, not only considering direct funding alternatives but also service provisions that could enable SMEs to become stronger business cases. The result is a guide on how to position the different types and needs of companies disposing of a SoE, suggesting ways to better

⁴⁸https://ec.europa.eu/research/soe/pdf/swd2017-11_application_of_state_aid_rules_to_funding_schemes.pdf#view=fit&pagemode=none

⁴⁹ https://ec.europa.eu/research/soe/index.cfm?pg=who_can

⁵⁰ https://ec.europa.eu/research/soe/pdf/swd2017-11_application_of_state_aid_rules_to_funding_schemes.pdf#view=fit&pagemode=none

⁵¹ http://ec.europa.eu/research/regions/index.cfm?pg=soe_cases

⁵² http://ec.europa.eu/competition/state_aid/legislation/de_minimis_regulation_en.pdf

⁵³ SME-Sealing project. ref H2020-730826, Design Option Paper for the use of the SoE at national level (MLE provided)

⁵⁴ https://ec.europa.eu/research/soe/index.cfm?pg=opportunities_sme

⁵⁵ Tekes is now "Business Finland"

frame with evaluations, alternative routes within the State Aid regime (concrete GBER articles) and the possibility to offer service-based valorisation routes.⁵⁶

Good practices for the MSCA SoE include i.a:⁵⁷.

Lithuania: Drawing on funds from the European Social Fund, the Research Council of Lithuania (RCL) launched a call to fund recipients of the MSCA Seal of excellence and indeed any applicant to the IF calls 2016 and 2017 who scored above threshold (70%). It will provide funding of up to 36 months. Applicants need to adapt the financial part of their MSCA application to take account of ESF funding rules.

Italy: The University of Padova has foreseen funding for recipients of the Seal of Excellence who had applied to be hosted at the university. The Politecnico di Milano will fund the best 10 MSCA recipients of the Seal from the H2020-MSCA-IF-2018 (European Fellowship) call who applied to be hosted at the Politecnico. They will be offered a postdoc position for two years with € 40.000/year (gross amount) as salary and € 20.000 for startup fund for research activities, training and networking. The Politecnico also launched a pilot Master Class for potential applicants to the MSCA.

Sweden: The Strategy Group for EU-Coordination in Sweden has prepared a call "MSCA EF Seal of Excellence". The aim is to provide funding for recipients of the Seal of Excellence to EF projects to be hosted by Swedish organisations that were positively evaluated and on the reserve list but could not be financed through the Horizon 2020 budget. Funding will be provided via Vinnova.

3.3.2 ERC

National/regional policy makers are highly interested in embarking to support their research teams to increase their success rates in the ERC. Most ESIF and national incentives for increasing the likelihood of ERC grants are upstream actions with schemes funding basic research or excellence in the hope that the supported researchers will improve their performance and become eligible for ERC grants. While there are no barriers associated to this preparatory potential synergy funding, it suffers from the element of serendipity: knowing that there is potential for synergies but no direct links, due to the low ERC success rates.

A scheme which applies the SoE mentality for the ERC is used by **Estonia's Mobilitas Pluss** programme⁵⁸ (international cooperation of Estonian Researchers). In this case there is no real SoE but the knowledge of a Phase 1 success in ERC selection. Mobilitas Pluss uses ESIF to reinforce Estonian researchers to succeed in attracting ERC grants. Estonia is relatively successful in H2020, less so in its ERC. Support is offered to Estonian Researchers who have applied for ERC and have reached the second stage of evaluation but have not received affirmative funding decisions from the European Research Council. These researchers are provided with the opportunity of continuing their research in Estonia and to submit a new ERC grant application from an Estonian research or development institution during the next call for proposals. The scheme reimburses research costs related to an ERC grant and the costs of the preparation of a new ERC grant application, including travel to R&D institutions in foreign countries where there are successful holders of ERC grants. During the project researchers can make study visits to ERC grant holders for three to six months. If necessary, ETAg provides help in finding of ERC grant holders. The objective is to support 20 ERC grant applicants.

⁵⁶ SME-Sealing project. ref H2020-730826, Design Option Paper for the use of the SoE at national level (MLE provided)

⁵⁷ https://ec.europa.eu/research/soe/index.cfm?pg=opportunities_msca

⁵⁸ <http://www.etag.ee/en/funding/research-funding/grant-for-applying-for-an-erc-grant/>

A small but very effective instrument includes:

- 100% cost coverage for interview trainings for all researchers who have made it to the interview (first person sent received an ERC grant)
- One week study visits to ERC grantees. Feedback from this scheme is very good, but ERC want to extend it for study visits 3-6 months, whereas Estonia short term (different logic, reinforce grantee teams)

Slovenian Research Agency co-finances the so-called Complementary Scheme for applicants from Slovenian research organisations who were positively assessed by ERC, but not approved for funding. The Agency would co-finance projects, which will be carried out mainly in Slovenia, taking into account budgetary resources. The so-called adjusted projects are limited in scope and duration, but on the other hand, they enhance the opportunities for those researchers otherwise not approved for co-financing. The Agency provides between 25% and 50% of the budget requested in the original ERC application, depending on the type of ERC programme (ERC Starting Grant, Consolidator Grant or Advanced Grant) and results of the ERC evaluation. Altogether 34 projects were funded so far, with 10 projects supported in the year of 2015 and one additional project beginning this year.

3.3.3 Cumulative funding (simultaneous or parallel) and cost models

The short-term interest of public authorities in the Member States focuses more on the potential of using ESIF for leveraging more funds via H2020 than for strategic or policy synergies. In an effort to help national and regional administrations to improve synergies, the regulations⁵⁹ see as key mechanisms for achieving synergies the clarification of rules for combined funding⁶⁰ of ESIF programmes and Horizon 2020: The rules are clear on the conditions for funding the same project, parallel projects or successive (upstream or downstream) projects (European Commission, 2014). Despite confusions that may arise from lack of clarity, difficulties to combine cost models and comply with different audits often remain discouraging. In the current Programming Period the Council has already adopted Regulations that facilitate synergies and help overcome barriers through simplification and specific provisions, while both the European Commission (DG Research and Innovation, DG JRC and DG Regional Development) and the European Parliament have produced or commissioned a series of reports, which facilitate policy makers to enhance synergies through explanations, theoretical examples, recommendations and good practices. These EU documents, while recognising the barriers and that “*more work needs to be done in better coordination and achievements of synergies of national, transnational and EU programmes*”,⁶¹ stress that the direction is that *national and EU programmes should better align their research priorities using appropriate tools and incentives* (High Level Expert Group, 2015). The High Level Expert Group on monitoring simplification for beneficiaries of ESI post 2020 Funds emphasised that it is time to break down the “*practical difficulties limiting synergies with Horizon 2020*”. At the same time the ESIF regulations foresee that “*it is of utmost importance to ensure optimal synergies between the funds to face the ever increasing competitive pressure from global markets and maximise impact and efficiency of public funding*”.

⁵⁹ REGULATION (EU) No 1303/2013 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 17 December 2013 laying down common provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund, the European Agricultural Fund for Rural Development and the European Maritime and Fisheries Fund and laying down general provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund and the European Maritime and Fisheries Fund and repealing Council Regulation (EC) No 1083/2006

⁶⁰ Horizon 2020 and ESIF funding shall not cover the same cost / expenditure item. The right to combine ESIF and Horizon 2020 does not waive the obligation for the beneficiaries to provide national/regional/private co-funding, if required by the grant agreement.

⁶¹ FP7 Evaluation Expert Panel

Cumulative funding is the most frequent case of synergies. It is the possibility to use different public funding sources, including EU funding sources, within a programme, project or a group of projects (Art. 129 Financial Regulation prohibits giving 2 EU grants to the same beneficiary for the same project, however Art 65(11) CPR and Art 37 Rules of participation Horizon give a derogation of the non-cumulative principle, which allows for Cumulative Funding: An Action for which a grant from the Union budget has been awarded may also give rise to the award of a grant on the basis of regulation Horizon 2020 provided that the grants do not cover the same cost items. Regulatory reforms introduced for 2014-20 have addressed the issue of synergies (e.g. increased scope cumulating grants or pooling funding from different EU instruments or the potential to align cost models = scale of unit costs, lump sums and flat rates (Ferry et al., 2016, p.39)). Alignment of similar cost options for easier combining of funds: lump sums, flat rates, standard scales of unit costs under ESIF may use the Horizon 2020 rules applicable for similar types of operations and beneficiaries (Art 67 §5b, 68 CPR). ESIF could fund costs non-eligible under Horizon 2020 (but possible under ESIF) or eligible costs NOT submitted under the Horizon 2020 project, e.g. equipment (European Commission, 2014).

Parallel funding refers to projects that are running with parallel use of ESIF and Horizon 2020 funds in separate projects, which are mutually supportive. An example is: A project proposal on geo-monitoring based soil analysis receives a Horizon 2020 grant. A partner in the project in a rural region obtains EAFRD support to develop more drought/bacteria resistant crops analysing their reactions to specific soil compositions. While the two projects are legally separate, synergies are developed through the targeted, parallel use of funds (European Commission, 2014). ERA-NET Cofund and MSCA COFUND are typical parallel funding cases. Parallel funding can also be used for European Partnerships to enlarge the potential of research projects in other (parallel) projects. ESIF could be used to up-grade a research infrastructure (if this supports the socio-economic development of the host region and is in line with the RIS3 and relevant ESIF programme), while Horizon 2020 funds the research activities (European Commission, 2014).

There are several theoretical examples of cumulative and parallel projects in the EU guide. Individual institutes have applied these combined funding options, as examples from the JRC:⁶²

- A good practice of systematic efforts: ***The Institute of Information and Communication Technologies (IICT) at the Bulgarian Academy of Sciences*** participates successfully in national, Structural Funds (SF) and EU level research initiatives (mainly FP and Horizon 2020). This case study is particularly informative because it demonstrates the positive developments in the Institute stemming from three different projects, chosen as running largely in parallel and allowing for synergies between the different funding sources. It illustrates the benefits of combining funding from different sources, and synergistically implementing a wide set of research activities, which transformed the Institute into a recognized institution providing excellent research and training possibilities.
- A good practice of an ad hoc support: Combining video images: The case study considers the case of synergies achieved by a local SME, ***Ateknea Solutions Malta Ltd***, through participation in two projects, one funded through a local ERDF R&D Grant scheme and the other funded through the Framework Programme 7 (FP7) Programme. The level of synergy is not very high, and did not come about as a result of policy actions designed to promote synergy.
- ***ESIF support leading to and co-existing with H2020***: The Centre of Excellence (CE) in nanotechnologies, financed through Structural Funds (SF) in the period 2008-2013, the Centre of Excellence in wood chain INNORENEW cofinanced form ESIF and H2020 funds, FP7 project Trajectory European Research Council (ERC) Grant and the

⁶² <http://s3platform.jrc.ec.europa.eu/synergies-examples>

Slovenian Research Agency (SRA) national financing provided for the research group. The latter was available to the research team through the entire period, since the research group financing was available to the research team prior of obtaining the grant for the establishment of the Centre of Excellence. The grant from the ERC was won successfully in part also due to the high level of research infrastructure, which was developed with the SF grant to Centre of Excellence and thus enabled the research team to get engaged in very demanding basic research. Thus the combination of financing from different sources resulted in synergy and allowed for the world class research to be conducted in the Nanotechnology Centre/Nanocenter. The work of the Centre of Excellence Nanocenter spreads however much wider and is in different intensity involved in more than 30 projects, financed from various national and European funds in total value of above € 20 mn annually.

The simultaneous and parallel funding cases are at the moment addressed on purpose mainly by individual institutes, in particular those exploiting RIS3 strategies (as the case of the Leibnitz Institute mentioned above) or with ambitious research agendas. They constitute mostly cases of strong research teams with solid accounting systems willing to take the burden of multiple rules and audits. There are two possibilities to significantly enhance combined funding options under the current rules in the future:

- get national authorities to streamline timing and/or
- make success of certain calls conditional to H2020.

A change of rules imposing common rules and common audits agreed between the EU programmes, national and regional agencies can give a significant push forward to parallel and complementary co-funding.

Cumulative and parallel funding is functioning well in the case of ESFRI. Large scale projects are more complex to organise but the commitment and interest on large infrastructures helps. Examples are:

- **The Extreme Light Infrastructure** (ELI) project is a new Research Infrastructure of pan-European interest and part of the European ESFRI Roadmap. It is a laser facility that aims to host some of the most intense lasers world-wide, develop new interdisciplinary research opportunities with light from these lasers and secondary radiation derived from them, and make them available to an international scientific user community. The facility is currently based on three sites and is being implemented in Dolní Břežany near Prague (the Czech Republic), Szeged (Hungary) and Măgurele (Romania), with an investment exceeding € 850 mn. ERDF contributed more than € 375 mn to the construction from the 2007–2013 Operational Programmes and additional funding will be allocated from the Operational Programmes of the current programming period. FP7 contributed to the preparatory phase. Currently, the establishment of ELI as an ERIC (European Research Infrastructure Consortium) is prepared and negotiated with the help of funds from Horizon 2020. The ERIC status will help secure ELI's operation through annual contributions from member countries' own budgets.
- **The European Spallation Source** (ESS) is a multi-disciplinary Research Infrastructure based on the world's next-generation neutron source. This new facility that is co-hosted by the cities of Lund (Sweden) and Copenhagen (Denmark) will be around 30 times brighter than today's leading facilities, enabling new opportunities for researchers in the fields of life sciences, energy, environmental technology, cultural heritage and fundamental physics. The ESS construction cost is estimated to be about € 1.843 bn, and nearly half of the cost will come from the host countries Sweden and Denmark. In the current programming period, approximately € 20 mn will be allocated to ESS by the national ERDF programme of Sweden. Fifty percent of the cost will come from partner countries, and for Estonia and the Czech Republic, the new provision in the Cohesion Policy regulation allowing regions to spend part of their ERDF allocations (up to 15%) in other regions (even abroad) is of interest. In addition, there will be an annual operation

cost of about € 140 mn⁵. The full construction of ESS is expected to be completed by 2025.

3.3.4 MSCA-COFUND

The European Commission has established a dedicated scheme (COFUND) to co-finance high-quality fellowship or doctoral programmes with transnational mobility in the context of the Marie Skłodowska-Curie Actions (MSCA). MSCA-COFUND, which is a H2020 Programme may act synergistically with ESIF, either through upstream sequential funding through different projects, simultaneous parallel funding through different projects or simultaneous cumulative funding within one project. This helps internationalisation of research. It provides organisations with additional financial support for their own researchers' training and career development programmes. The extra funds are available for new or existing schemes for training researchers abroad and across various sectors and scientific disciplines. MSCA-COFUND supports doctoral programmes for PhD candidates, as well as fellowship programmes for experienced researchers.⁶³ All programmes must have an element of transnational mobility, either bringing new researchers into the country, sending researchers outside of the country with or without a mandatory return phase or both. On top of transnational mobility, applicants are encouraged to include elements of intersectoral and interdisciplinary mobility into their programmes.⁶⁴ Participating organisations receive a fixed amount for each supported researcher, as a contribution to their living allowance and for the programme's management costs. The MSCA-COFUND grants do not cover the same items as the national or ESIF funded parts of the programme. Selected programmes will receive co-funding for up to five years, for a maximum total amount of € 10 mn.⁶⁵

The MSCA in its Guide for Applicants⁶⁶ gives examples of ways to exploit the COFUND opportunities:

- A new research centre is being created in a specific region of a certain MS, the building of its large research infrastructures being financed by the ESIF. It aims at attracting promising researchers in several fields of expertise and in particular in recruiting young researchers. However, no PhD programmes exist in this Region to support training of researchers in those scientific areas. The research centre therefore decides to apply for COFUND, to help establish new DP at the local University covering training in those scientific fields of interest. As part of their doctoral training, the recruited researchers shall follow some research training abroad in order to gain international experience and to diversify their skills and working methods.
- An existing fellowship programme run by a University is lacking an international and intersectoral dimension in the current training it proposes and consequently failing to recruit sufficient researchers who will meet the increasing and diversified needs triggered by its evolving research activities. In order to address this issue, the University decides to apply for ESIF to fund national and international researchers that will experience working in the private sector, while applying for COFUND to support further international researchers recruitment and to improve the quality and streamlining of the selection and recruitment procedures of the programme.
- A research organisation established in a MS applies for COFUND and is successful. The living allowance for the recruited doctoral candidates and the management costs for the programme are co-financed by the COFUND grant. The organisation then decides to

⁶³ https://ec.europa.eu/research/mariecurieactions/actions/co-funding-programmes_en

⁶⁴ <https://www.iua.ie/irish-marie-curie-office/funding-calls/cofund/>

⁶⁵ https://ec.europa.eu/research/mariecurieactions/actions/co-funding-programmes_en

⁶⁶ https://ec.europa.eu/research/participants/portal/doc/call/h2020/msca-cofund-2018/1812623-h2020-msca-cofund-2018_guide_for_applicants_final_en.pdf

apply for ESIF to get financial support to fund a part of the research costs (e.g. infrastructure or large equipment with ERDF), and a part of the networking and training costs (mainly with ESF) related to the DP (but not covered by the COFUND action), provided that all ESIF rules are respected.

- The ministry of Education and Research in a given MS has set-up a postdoctoral fellowship programme for researchers working in the country. This fellowship programme is co-financed by the ministry itself and the European Social Fund to enhance the skills of the national R&I human resources and increase the competitiveness of the country's research organisations. The ministry decides to apply for COFUND to open up this programme to international researchers (co-financed through COFUND) and to enhance the quality and quantity of its training options (e.g. offering new intersectoral and interdisciplinary research training opportunities).

The programme is well received and good practices include:

- **SoMoPro**⁶⁷ is a COFUND Marie Curie good practice project exploiting synergies: it is a regional grant programme backed by European funding set up to attract skilled researchers to the South Moravian Region. SoMoPro is a pilot programme planned for four years (2009 - 2013) with an overall budget of € 3 887 158, 60% of which will be financed by regional public sources (Region of South Moravia) and remaining 40% is co-funded by the European Commission through the Marie Curie Actions (COFUND project). It was designed to attract skilled researchers from Czech Republic and abroad to come and carry out their work in South Moravia.
- Ireland has a number of COFUND programmes,⁶⁸ one of which is **EDGE**,⁶⁹ led by Trinity College Dublin on behalf of a group of academic institutions from across Ireland. EDGE offered 71 prestigious Fellowships for experienced researchers (post-doctoral or equivalent) relocating to Ireland over two calls for proposals. EDGE is also a training and development programme for scientific excellence, offering a unique combination of interdisciplinary research themes, career development opportunities and industry engagement to the community of Fellows we recruit. EDGE leverages the strengths and assets of three existing Science Foundation Ireland (SFI) ESIF-cofunded National Research Centres: AMBER, CONNECT and ADAPT. AMBER offers expertise in advanced materials that will play a pivotal role in future systems and devices. CONNECT's focus is on future networks that will underpin the services the world needs and ADAPT brings cutting-edge innovation in digital content. EDGE Fellows will work at the interfaces of the three Centres, in highly interdisciplinary projects, sharing expertise and adding value across the ICT research landscape. Importantly, industry partners will have a primary role in defining, executing and supporting the projects, and will take an active part in the Fellow's progression, through secondments, industry events and specialised training. COFUND is used for the internationalisation of the programme complementing ESIF but used for different expenditures.
- **Slovenia:** The Slovenian Research Agency invites national research institutions that had participated in the MSCA-IF-2016 call evaluation procedure and acquired a score of 85% or more to apply for co-funding of their projects. The Slovenian call foresees a co-financing of 6 research projects, starting from 1 January 2018. Using its own funds, the Agency will support the leading researchers of the selected projects for a period of two years.

⁶⁷ https://www.cordis.europa.eu/project/rcn/91960_en.html

⁶⁸ <https://www.iua.ie/irish-marie-curie-office/funding-calls/cofund/>

⁶⁹ <https://edge-research.eu/about/>

- The **Welsh Government**, in collaboration with universities in Wales,⁷⁰ is looking for high-calibre Fellowship candidates to work with stellar researchers in STEMM (Science, Technology, Engineering, Maths and Medicine) and relevant areas of Applied Social Science in Wales. The fellowships will be three years in duration and are part funded by the European Commission's MSCA COFUND scheme. Applicants must have a PhD with three to five years postdoctoral experience, and should not have worked more than 12 months in the UK in the last three years. Up to 90 fellowships will be available across three calls. Rising Star' packages are expected to be 5 years in duration and can also involve collaboration with relevant commercial or third sector organisations. The programme is co-funded by the ERDF and H2020.

3.3.5 Interreg

A special case for ESIF and H2020 synergies are multi-region or multi-country co-funding activities. This is more difficult at the moment, but can be achieved through Interreg and its combination with H2020. Interesting practices include:

- Calls for Coordination and Support Actions (CSA) constitute an opportunity for multi-country synergies. They fund 100% of accompanying measures such as standardisation, dissemination, awareness-raising and communication, networking, coordination or support services, policy dialogues and mutual learning exercises and studies, including design studies for new infrastructure and may also include complementary activities of strategic planning, networking and coordination between programmes in different countries.⁷¹ For example **SCREEN** is a H2020 Coordination and Support Action where 16 European regions from 12 different European countries, plus 1 UK national body are involved, including Lombardy, Central Portugal, Flanders and Friesland regions attending this workshop. It aims at developing an EU reference framework for establishing operational synergies between H2020 and ESIF related to circular economy. The project is analysing local and regional circular value chains, identifying regional capacities in circular economy, is proposing ideas for cross regional cooperation and developing a methodology for it, to make operable the various H2020-ESIF synergies. In particular in order to tackle the problem of non-selected H2020 proposals (esp. important for less developed regions experiencing their ESIF budgets underspent due to their lower absorption capacity), SCREEN is developing an idea of a "cross-regional common pot" that could fund such projects by contributions from the respective ESIF budgets' residues. This idea, based on Art. 70 of the Common Provisions Regulation of the ESI Funds, is generally possible for many sorts of projects, and it will be tested (outside the SCREEN timeframe) by the interested regions from the consortium.⁷²
- Integrated energy system of the **city Mórahalom**: The Local Government of Mórahalom Region launched in 2007 a feasibility study for the exploitation of geothermal energy produced from a geothermal public utility system. The feasibility study, the construction plans and the preliminary environmental impact assessment were finalized in October 2007 with the support of INTERREG IIIA programme. The objective of the project was to build a demonstrator to further develop the first Hungarian-Serbian cross-border water base and production monitoring system. Building on the results of the study, financed from Structural Funds, the construction and operation of the geothermal cascade system of Mórahalom have been realized. As a result of the project activities, the proportion of renewable energy in the energy utilization of public institutions increased from 0% to 80%. The idea of the FP proposal lied on the novelties of the infrastructure built from Structural Funds focusing on demonstration activities complemented by applied research tasks on (1) the technological background of the

⁷⁰ <https://euraxess.ec.europa.eu/jobs/103951> and <https://businesswales.gov.wales/expertisewales/support-and-funding-researchers/s%C3%A4r-cymru-ii>

⁷¹ http://ec.europa.eu/research/participants/data/ref/h2020/wp/2014_2015/annexes/h2020-wp1415-annex-d-csa_en.pdf

⁷² http://www.screen-lab.eu/documents/1st_POLICYLAB_minutes.pdf

geothermal resources including system optimisation and system integration; (2) and also on the socioeconomic aspects of the current and future investments. The case study represents an upstream sequential funding where Structural Funds investments enabled FP7 participation.

- **The International Iberian Nanotechnology Laboratory (INL)** located in the North Region of Portugal is the first intergovernmental research organisation in Europe in the field of nanoscience and nanotechnology. The INL is the result of a joint decision of the Governments of Portugal and Spain in 2005, whereby the two Governments committed to strong cooperation in the area of ambitious science and technology joint ventures. For the construction phase of the initiative, funding of € 30 mn was received from ERDF in the programming period 2007–2013. The INL project was also co-financed at the time by the INTERREG Cross-border Cooperation Programme between Spain and Portugal. The overall objective of the INTERREG project was to build a centre of excellence in applied nanotechnology research, having a major impact on the region's competitiveness as well as on promotion of qualified employment and new companies. The aim was also to create a model for science-industry cooperation in the region. The project included elements of constructing competitive scientific infrastructures, with the ultimate objective of attracting prominent nanotechnology researchers to the centre. The installation of the INL facilities in the City of Braga in the North Region of Portugal has enhanced the local innovation ecosystem by fostering company spin-offs and integrating the INL in global knowledge networks. The research and innovation actors in the region have benefited from technological infrastructures that are of international quality. These infrastructures have increased the competitiveness of companies, universities and technological centres in the region and resulted in successful Framework Programme projects.
- The **Towards Regional Specialisation for Smart Growth Spirit (TR3S)** project is an inter-regional cooperation initiative for regional and local authorities and actors funded by ESIF (INTERREG IVC). It is coordinated by TECNALIA, the private Research, Development and Innovation group in Spain. The project directly addresses smart specialisation, and at its core is the strengthening of regional innovation systems, maximising knowledge flows and spreading the benefits of innovation throughout the entire regional economy. The project is built upon regional strengths and it seeks to fill the gaps in the effectiveness of regional development policies through mutual learning and exchange of experiences. The ten TR3S partners from nine countries (Spain, Hungary, the United Kingdom, Estonia, Italy, Romania, Poland, Finland and Germany) illustrate the diverse innovation geography in the EU leading to fertile inter-regional cooperation. The project therefore aims to understand different innovation ecosystems and supports the move of regional innovation potential towards creating efficient and smart policy processes and policies for regional development that allow regions to create adequate conditions for growth and long-term investment in R&I. In doing so, the project reinforces the capacities of the actors to participate in Horizon 2020 and promotes synergies between them, making the whole value chain work in an effective manner and thus contributing to economic modernisation and competitiveness. Partnerships across the regions are facilitated and a collaborative and coordinated 'policy intelligence knot' beyond institutional boundaries is created for innovative actions.
- **Trans2care** is a joint project of academic, research, healthcare and technology transfer institutions from Italy and Slovenia, with the University of Trieste as a leading partner supported by the INTERREG IVA Programme. The network works in close cooperation with industry and end-users, in order to address unmet medical needs. INTERREG IVA for Italy and Slovenia had set out a strategic goal for the period 2007–2013 to develop long-lasting solutions for a few major issues in the programme territory, including research and innovation. In this spirit, during the implementation of the Trans2Care project, the actors understood the potential of the project to evolve towards a local 'prototype' for Horizon 2020. Within Trans2Care, a training programme was built that focused on Technology Readiness Levels – a concept which is widely used in the Calls

of Horizon 2020. In 2014, the project actors adopted a 'tool on the Technology Readiness Levels scale'. This tool assesses if research results could have immediate use and thus root technology transfer abilities in the research network. In scientific laboratories, many ideas are conceived and tested as good but often not further exploited. The project actors therefore wanted to familiarise the researchers with the Technology Readiness Levels scale in order to improve exploitation of research results. The tool on the Technology Readiness Levels scale has now become popular in the cross-border biomedical research community, and is expected to pave the way to more stable collaboration with industry and hospitals, as well as to greater success in the calls of Horizon 2020.

3.3.6 EIB/EFPI

The EIB-EIF support instruments and the EIB-managed EFPI (considered more as a support scheme rather than instrument)⁷³ are increasingly involved in R&I. The Bank group offer loans to countries and for projects, which are "bankable" i.e. able to generate revenue to repay the loan. Unlike ESIF, if the Bank's loans to Member States are used for H2020 co-funding they count as national funds, since they have to be repaid by the Member State.

At the same time the EIB manages the InnovFin instrument of H2020 in the context of its EFPI mandate. The Bank created the InnovFin (EU Finance for Innovators) and a corresponding Innovation Advisory Board (InnovFin Advisory). The function of the Board is to help potential (private and public) applicants for EIB loans to prepare a bankable business plan in order to ensure loans respecting the EIB rules. The successful implementation of this type of advisory services are explicit synergies between the EIB and national R&I capabilities and performance. The InnovFin instrument under Horizon 2020 promotes firms pursuing research and innovation and has a leverage target of 9 times (Ferry et al., 2016, p. 41-42). Of particular interest for the MLE is the InnovFin Emerging Innovators, which bridges the research and innovation (R&I) investment gap in EU Member States which are labelled as Moderate Innovators and Modest Innovators in the European Innovation Scoreboard and Horizon 2020 Associated Countries.⁷⁴ The InnovFin Emerging Innovators improves availability of risk finance for fast-growing or R&I-driven enterprises, R&I infrastructures, innovation-enabling infrastructures and other entities.

EIB's role in synergies between H2020 and ESIF would be possible via InnovFin. The general rule is that the Bank co-finances up to 50% (of the eligible project cost), and that the promoter needs to bring in the remaining share. Grants, also from ESIF resources, can be part of that share. As a matter of practice, EIB funding and grants should not exceed 80-90%. Blending structural funds with InnovFin money, or even EIB funding at large, may face one/combination of the following obstacles:

- Timing/a-synchronicity: the bank needs 5-8 months as 'time to contract'. Before signing the contract the bank needs to comfort of the feasibility of the total eligible cost. This timeframe is practically impossible for ESIF grants (organising calls, selecting etc.).
- Eligibility rules often do not coincide; the Bank has specific eligibility criteria under InnovFin as to which projects can be financed, in general the projects need to be 'bankable' (self-sustainable); for the ESIF eligibility criteria are specific to each region.
- State Aid rules may introduce funding ceilings, whereas for the Bank, if it is only a loan (not state guaranteed) there is no barrier.

As a consequence, while occasionally the issue was raised and interest was expressed, no case has ever materialised.

⁷³ European Commission, Mid-term Review H2020

⁷⁴ <http://www.eib.org/products/blending/innovfin/products/emerging-innovators.htm>

There are no direct ways whereby the EIB itself gets involved in creating synergies between ESIF and H2020 but its funding mechanisms offer a range of possibilities to be intelligently used by Member States:

- If Member States wish to circumvent the a-synchronicity barrier they may earmark ESIF funds for projects that are selected by the EIB. This would create synergies between InnovFin and ESIF.
- EIB loans to the Member States for R&I can act as a facilitator for Member States that do not dispose of national resources to generate the necessary national funds for ERA-NET, European Partnerships or the EIT to ensure topping up or payment of fees for which ESIF are not eligible. Greece has applied for an EIB loan used for national R&I grants, which it used mainly to fund national projects for basic research. This type of funding may (in the future) prove to be the basis for upstream synergies.
- In the 2007-2013 the JEREMIE pilot⁷⁵ was a joint initiative set up in 2007 by the European Commission (Directorate-General for Regional and Urban Policy) in co-operation with the European Investment Bank Group and other financial institutions to enhance cohesion across the EU. The JEREMIE instrument was set up to deploy part of the EU Structural Funds allocated to the regional and national Managing Authorities through new risk finance initiatives for SMEs. It was a successful pilot used to match private funding schemes (Venture Capital, Growth Funds, Seed Finance etc.).⁷⁶ Similar schemes (matching ESIF and EIF resources) are replicated by the current ESIF-backed programmes managed by EIF under the new 2014-2020 programming period. Although not directly creating synergies with H2020 they reinforce the national ecosystems.

There is some scope for operational synergies between EFSI and ESIF. EFSI and ESIF can combine at a project level, exploiting the complementarity between grants and market-based instruments. For instance, EFSI can finance the revenue-generating parts of an infrastructure project supported by ESIF grants. EFSI and ESIF can combine at a higher level, through a Financial Instrument (FI) (Ferry et al., 2016, p.59).

A good practice example in that respect is Nord-Pas de Calais: An EFSI has been included in Priority 3 of the ERDF-ESF OP 'Nord-Pas de Calais' 2014-20 with a programme targeting zero carbon emissions by 2050, whereby the region's energy needs would be covered by renewable energy sources, a first for Europe in combining ESI Funds with EFSI in a climate action instrument. The fund assists business-led investments in 'low-carbon economy' projects. The FI involves a loan to an investment company set up by public and private investors to invest in the low-carbon economy in the region. EIB financing under EFSI is € 15 mn. EFSI fits in the initial Priority both in terms of strategy and method of delivery (the MA was planning to use an FI from the outset). Nord-Pas de Calais designed its Third Industrial Revolution strategy and its ERDF-ESF OP before the creation of EFSI. The themes of the Regional Strategy could be covered by ESIF and EFSI. Plus, the Region had already planned to allocate ESIF in the form of FIs. However, key to this integrated approach was EIB's 'double role', as EFSI manager on the one hand and provider of technical assistance for the implementation of FIs with ERDF cofunding on the other hand. EIB's regular contacts with the Regions and MAs created informal channels for exchange of information at preparation meetings for the creation of the ESIF funded regional interventions in the OP. It raised the region's awareness of EFSI as an additional source of funding, while it was designing the FI and setting up arrangements between co-investors. This informal channel allowed EIB to identify favourable timing and led to its early involvement (Ferry et al., 2016).⁷⁷

⁷⁵ <https://www.google.com/search?q=Jeremy+fund+EIF&ie=utf-8&oe=utf-8&client=firefox-b-ab>

⁷⁶ http://www.eif.org/what_we_do/resources/jeremie/index.htm

⁷⁷ based on interviews with French policy makers

Recent research among ESIF MAs indicates limited identification of synergies with EFSI. At present, however, there is a lot of room for improvement and more common projects. These instruments tend to operate in a parallel and separate way. There are still important fundamental characteristics and orientations in ESIF and EFSI that impede the pursuit of synergies (Rubio et al., 2016). In the future EFSI and ESIF can be combined at a higher level, through an investment platform. In this case, the EC recommends establishing 'layered funds' in which ESIF take the 'first loss piece' position, EFSI and the EIB take the 'mezzanine tranche' and private investors take the 'senior' position. The use of ESIF to absorb part of the risk of EFSI investments can be important for countries with less sophisticated financial markets and presenting higher political and regulatory risks. ESIF grants may have a role to play where the associated risks would make it unlikely for EFSI support (Rubio et al., 2016).

3.3.7 Upstream and Downstream synergies (success stories and incidental linear synergies)

The European Commission considers that "Synergies are about obtaining more impacts on competitiveness, jobs and growth in the EU by combining ESIF, Horizon 2020 and other EU instruments in a strategic and also cohesion-oriented manner⁷⁸....Through activities addressing both cohesion and excellence: The main instrument to ensure synergies between ESIF and H2020 was the introduction of 'Smart Specialisation Strategies'⁷⁹ and in particular support both "Upstream actions" to prepare regional R&I players to participate in Horizon 2020, for example through NCP and MA cooperation and "Downstream actions" to provide the means to exploit and diffuse R&I results, stemming from Horizon 2020 and preceding programmes, into the market following RIS3.

However, there are two ways how linear (a term to include both upstream and downstream) synergies operate: one includes incentives or projects designed and, explicitly or implicitly, intended to linearly link ESIF and FP/H2020, which is described in the first sub-section below, while the other is more incidental, nearly serendipitous and one can only draw generic lessons not really learn from good practices.

3.3.7.1 Linear synergies responding to explicit selection criteria

In some of the good practices mentioned above policy makers link funding with synergy criteria. In addition to the current larger Irish schemes explicitly intended by policy makers and linking those to obtaining external funding there are also other cases reported where synergies become criteria for granting national support:

- **Nordrhein-Westfalen Federal State** in Germany will give preference to proposals that have synergy aspects. Applicants have to explain, if applicable, to what extent in the scientific/technological field of the ERDF application projects were already implemented with prior funding by FP7 or Horizon 2020 and thereby cross-references to the proposed ERDF project should be outlined. In addition, if applicable, the applicant has to explain to what extent further applications under Horizon 2020 in the domain of the proposed ERDF project are either concurrently or subsequently planned. In case of the equal value of two ERDF project proposals, priority will be given to the one that demonstrates synergies with FP7 or Horizon 2020 (European Commission, 2016, p.13).

⁷⁸ REGULATION (EU) No 1303/2013 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 17 December 2013 laying down common provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund, the European Agricultural Fund for Rural Development and the European Maritime and Fisheries Fund and laying down general provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund and the European Maritime and Fisheries Fund and repealing Council Regulation (EC) No 1083/2006

⁷⁹ Such strategies may take the form of or be included in a national or a regional research and innovation strategic policy framework for 'smart specialisation'. Smart specialisation strategies shall be developed through involving national or regional managing authorities and stakeholders such as universities and other higher education institutions, industry and social partners in an entrepreneurial discovery process. The authorities directly concerned by Horizon 2020 shall be closely associated with that process.

- **Estonian applications for Infrastructure** receive more points for ESFRI Roadmap infrastructures.⁸⁰

3.3.7.2 *Incidental and serendipitous*

The most common and easy way to view synergies is by identifying cases where ESIF and H2020 have been used to fund the same project or the same organisation. Co-funding is not difficult to achieve for the excellent research teams: research players are few and receiving funding from both sources occur often and may even be a coincidence. Receiving support from ESIF and then succeeding in H2020 applications in individual projects is not necessarily a proof of synergies. Many of synergy examples reported in several documents and workshops (e.g. Stairway to Excellence)⁸¹ by the Member States demonstrate absorption of both ESIF and FP/Horizon 2020 without a direct link to each other.

Upstream activities constitute a conventional way to achieve synergies. When ESIF are used to strengthen national research ecosystems this is always done with the aim to improve their capabilities, drive for excellence and hence be prepared for international collaboration. ERDF funding in particular is used to enhance public and private research capabilities, as well as business-academia cooperation in the (explicit or implicit) hope to strengthen national actors, who would eventually be able to compete for excellence in the FPs. Similarly ESF skill enhancement improves capacity building. All ESIF support to research infrastructure is in a sense hoping to eventually trigger FP/H2020 funding. This may be implicit or explicit, it may have a high multiplication impact, a small one-to-one impact in terms of funding and research generated, or no impact at all. A very large number of projects are reported by the Member States having envisaged or achieved FP/H2020 support following ESIF, but there is no clear evidence of how well linked the two schemes are.

Upstream activities are addressed in most countries now using a simple recipe (e.g. in Romania), where the Competitiveness Operational programme allocates funding for the creation of support centres in research organisations for the preparation of Horizon 2020 proposals and for assisting in the management of ongoing Horizon 2020 projects.

Downstream funding has the advantage that MAs have more discretion over the national spending allowing them to plan with more certainty than the competitive funding of H2020. Hence, in addition to ad hoc synergies (applications by successful FP-funded actors to national commercialisation incentives), funding agencies can launch calls that address explicitly synergetic downstream funding. Good practices include:

- **The University of Plovdiv in Bulgaria** awarded with a grant of € 2 mn under the FP7 Research Potential scheme. The aim of the BioSupport project was to reinforce research infrastructures and human potential in the university's two strongest disciplines and consolidate the science base in these fields. These aims were achieved and in the final stages of the BioSupport project, one of the strategies was to create an association between the University of Plovdiv and several SMEs and apply to establish a Technology Centre and related Technology Transfer Office through means of ESIF. In 2012, the creation of the two entities started with the ESIF support.
- **TIGER** (Transit via innovative gateway concepts solving European intermodal rail needs) is a finalised FP7 project that supported the development of competitive European rail transport and co-modal freight logistics chains. TIGER DEMO, the follow-up project, aimed at taking the pilots developed by the TIGER project forward into full-scale demonstration for subsequent market uptake and commercial exploitation. The results of these pilots, after validation, are replicable in other EU ports and are ready for market exploitation. TIGER DEMO's objective was the demonstration of innovative

⁸⁰ Interview with Estonian Authorities

⁸¹ <http://s3platform.jrc.ec.europa.eu/synergies-examples>

technological and management solutions capable of optimising the container traffic flows to and from the major European ports. The project defined new production processes, technological alternatives and new business models supported by management tools in order to improve performances and competitiveness of the rail connections between seaports and their near and distant hinterlands. During the full-scale demonstration, TIGER DEMO devised co-modal solutions for maritime traffic flows in several geographical sites in Europe.

- A new, non-invasive absolute intracranial pressure (aICP) measurement device was developed during this project. Another FP7 project – “Brainsafe II” followed after the success of the first project. During the “Brainsafe II” the non-invasive absolute intracranial pressure (aICP) measurement device was upgraded and the final product was created. The EU SF provided support for introducing this product to the market. The ERDF-cofunded national policy instrument “New Opportunities” (under the Operational Programme for Economy Growth 2007-2013) provided support for the project **JSC “Vittamed” export development and promotion in foreign markets**, which aimed to introduce new neurodiagnostics technologies to the world market, find new business contacts and start product export.

While this *multi-absorption* shows that good research teams are likely to absorb funds from both sources, there is no explicit policy learning for dynamic synergies.

4. LESSONS LEARNED

The discussion on synergies between FPs/H2020 and ESIF started a long time ago but it was not until the current programming period that they are shifting to centre stage. A lot of support material, studies and reports have been produced to help policy makers embark in synergy creation, however, many countries (and notably the Widening countries)⁸² lack experience in implementing synergies in a smooth and efficient manner.

Synergies constitute a concept that is welcome in theory but, when it comes to implementation, policy makers face many legal, practical and perceived difficulties. The reasons why synergies are less widespread than projected lie in several constraints, some of which may need legal amendments while others are simply creating burdens (accounting complications, systematic coordination, interpretation rules and interpretation anxieties) that national/regional actors are reluctant to cope with. In other words there are *real and unsurmountable barriers*, which cannot be overcome without legal amendments, and *perceived barriers*, which policy makers or others actors can overcome with additional effort, experimentation and persistence. In the eyes of policy makers the devil is in the detail and, despite the encouragement to create synergies, all sorts of delays and burdens may occur when starting a process. This is why there were less concrete, imaginative and detailed good practices identified than originally hoped for. This is the reason why many of the examples used in the report come from the literature and not the cases presented. However, a general lesson is that synergies are more likely to occur and be beneficial the larger the programmes involves and when they are part of a larger mission.

The European organisations have produced a lot of helpful material that can be consulted, including explanations, good practices and examples on what to do and what to avoid, as well as simplification of funding rules. The ex-ante conditionality of Smart Specialisation and the Stairway to Excellence include platforms and organise workshops that help understand the concept and projects on synergies. More can be done and more is announced for the next programming period from the side of the Commission. The Member States themselves need also to do much more to really make synergies happen.

The aim of the paper was to demonstrate that these constraints are manageable and resolvable, as the many Good Practices in the document demonstrate. The idea to learn from Good Practices is to kick starting the process and not wait for it to grow organically.

In this MLE exercise we have adopted a taxonomy and presented good practices of synergies based on:

- Set up of an effective dialogue at the national or regional level, which can be dynamic and proactive or can be in the process of trying to achieve dynamic synergies.
- Synergies through strategies and policies.
- Synergies at operational level.

The table below summarises the main types of synergies, obstacles to overtake and good (or usual) practices identified in the Member States.

⁸² Widening consists of three main actions, i.e. Teaming, Twinning and ERA Chairs, for which specific eligibility conditions apply. This ensures a targeted approach towards Widening Member States and Associated Countries. The Member States currently eligible for Widening support are: Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Luxembourg, Malta, Poland, Portugal, Romania, Slovakia and Slovenia. <http://ec.europa.eu/programmes/horizon2020/en/h2020-section/spreading-excellence-and-widening-participation>

Type of Synergies wished for	Barriers to eliminate	Indicative good practices
<p>Effective and Structured Dialogue leading to dynamic synergies</p>	<p>Eliminate all perceived barriers of safeguarding turf;</p> <p>Overcome short-termism and invest in long term silo breaking</p>	<p>Ireland: long term effort; start with national funds; explicit criteria of ESIF funding for applicants to succeed in leveraging FP</p> <p>Austria: organised platform of cooperation for FP and ESIF</p> <p>Germany: Introduction of systematic interaction</p> <p>Examples of shared OP responsibility, co-location and systematic networking paving the way to silo breaking (Estonia, Sweden, Czech Republic, Slovak Republic, Spain)</p> <p>Increase the scope of responsibilities of NCPs beyond H2020 giving them advanced front-office tasks (Flanders, Estonia, Sweden)</p>
<p>Synergies through strategy and policy</p> <ol style="list-style-type: none"> 1. S3/S2E 2. Partnership Instruments 3. EIT 4. Macro-regional strategies 	<p>Overcome reluctance and risk aversion</p> <p>Coordinate timing</p> <p>Difficulties to top up</p>	<ol style="list-style-type: none"> 1. S3/S2E: EU examples in the Regulation for linear actions; JRC sites with examples, mostly of linear nature 2. Partnership Instruments: Clean Sky (Andalucía, Czech republic), ECSEL; BBI JU Flanders; 3. EIT: Use ESIF to keep contact; Climate KIC 4. Macro-regional: Danube: Future,
<p>Synergies at operational level</p> <ol style="list-style-type: none"> 1. Seal of Excellence 2. ERC 3. Cumulative funding and cost models 4. MSCA-COFUND 5. Interreg 6. EIB/EFSI 7. Linear synergies (explicitly or incidentally linking ESIF with FP success) 	<p>Barriers</p> <ol style="list-style-type: none"> 1. State Aid, in the case of Phase 2 2. No specific instruments available 3. Clarity and multi-audits 4. Separation of funding 5. Lack of ESIF funds for internationalisations 6. Limited possibilities 7. Lack of time congruence 	<ol style="list-style-type: none"> 1. SMEs Vinnova Runner Up Programme; Lombardy Vouchers for Phase 2; CDTI SoE; SoE MSCA: Sweden, Cyprus, Czech Republic 2. ERC: Estonia, preparatory ESIF support for increasing ERC success 3. Clarification of rules by the regulations; introduction of simultaneous/cumulative funding possibilities; BBI JU Flanders; IICT Bulgaria, Nanotech Slovenia 4. COFUND: Examples by EU documents; SoMoPro; EDGE

Type of Synergies wished for	Barriers to eliminate	Indicative good practices
		<ol style="list-style-type: none"> 5. International Iberian Nanotechnology Laboratory, SCREEN (MoU for synergies) 6. EIB: Loans to bridge the matching funds barriers; InnovFin; Jeremy; Nord pas de Calais 7. Individual success stories: Conditional ESIF approvals; South Ostrobothnia region; City of Leeuwarden in Fryslan Linking ESIF with FP success: criteria for eligibility for Irish Research Centres and Estonian ESFRI; there is a very large number of linear, incidental successes of limited value for the MLE

Synthesising the cases studied one may come up with a different taxonomy based on the level of complexity and ambition, which transcends the three main categories used throughout the report:

- Some countries have succeeded in adopting policies for *Dynamic Synergies*; these are the countries that have the best track record of increasing competitiveness and H2020 success. These countries offer good practices on how to embark in long-term, ambitious endeavours. In some cases there are examples of dynamic synergies in process: only individual cases have been generated, but through systematic efforts of coordination there are indications that dynamic synergies will eventually be achieved.
- There is an increasing number of good practice examples of *Targeted Synergies*, both at strategic and operational level, which constitute individual ways to act at strategic level or succeed in eliminating barriers at operational level.
- *Incidental Synergies*: More often than not countries present as synergies examples of linear success stories with research projects or organisations funded (independently and unlinked) both from H2020 and ESIF. These are serendipitous, automatically generated cases, because one can expect that on the balance of probabilities the same good research teams will succeed in getting support from both funds. This is not policy explicitly addressing synergies and as such of less interest for the purposes of this study.

The value of mutual learning lies in increasing knowledge and raising ambitions. Hence the most valuable lessons for policy makers are those that can lead to Dynamic Synergies and Targeted synergies. Incidental synergies can be left to individual research teams.

Under the current conditions then the lessons learned can be summarised as follows:

1. The real value of synergies is to address them as a long-term, systematic value extraction. Few countries have achieved that. Based on the presentations of this MLE Ireland and Germany are the best examples. The former started with external impetus but pursued the coordination strategy persistently over decades. It is interesting to note that Austria (also a good practice reported in the literature) and Ireland are both using their upgrade in the European Innovation Scoreboard as a benchmark for their national policies. Germany started later with a top-down mandate and is already reaping the first benefits. There are also several less demanding ways to kick-start the process envisaging dynamic synergies. Sharing Operational Programme responsibilities, creating networks that meet regularly and share common interests or training and co-locating actors are some of the examples found.

At any rate a more tailor-made approach, than the formal Monitoring Committees interaction, is needed to *formally institutionalise and set up a Structured Dialogue*: a forum with synergy-seeking agendas rather than the more encompassing Monitoring Committee meetings can act as a catalyser for cooperation. A special case of formal institutionalisation was the *preparation of RIS3*. The Commission expected a wide range dialogue between all (public and private) actors involved for the entrepreneurial discovery and prioritisation of activities. In some cases this common exercise has created a momentum in others less so.

Breaking silos between public authorities is the most ambitious approach: re-design is needed, when too many or too few authorities operate, or when overlapping responsibilities lead to tensions and lack of cooperation. The re-design usually created resistance to change, which is much heftier when the silos are created intentionally than when they are established by accident or inertia. At any rate, redesign needs a long-term political commitment and the state-of-mind that pay-off may (and usually does) take time. One potential way for enhancing synergies is for MAs and national funding agencies to identify the strong, influential research players and support them in getting access to ESIF and H2020 at the same time so that large scale success stories pave the way to institutionalising long-term strategic collaboration to ensure synergies.

2. There are many ways to target synergies rather than expect them to arise incidentally. National funds (or EIB loans taken by Member States to facilitate R&I policies if national funds are scarce) can be used to join European Partnerships or EIT KICs and Co-Location Centres. Using the combination of national/regional RIS3 and European Partnerships as opportunities to target strategic priority areas can generate coordination synergies and lead to dynamic synergies.
3. At the operational level the application of the Seal of Excellence is helping reduce time and administrative cost and state aid barriers can be partly overcome. It helps support talented researchers which could not be funded under H2020 due to budget limitations, despite having been evaluated as 'excellent'. Using ESIF to explicitly prepare national teams with potential for the ERC appears rewarding. Targeted synergies are more likely to appear if and when ESIF incentives are conditional for leveraging external resources, H2020 in particular. There is understandable reluctance for such a radical move but evidence suggests that it works. It can be carefully and gradually introduced before becoming a more widespread practice.

In the future there are conditions that may change so that synergies improve further, if the Commission further relaxes the current barriers. Priority areas for this reported during the MLE include:

4. Address as radically as possible the lack of security triggered by the interpretation of norms (e.g. on eligibility) which motivates policy makers to use a "precautionary principle" which implies avoiding any "innovative use" of the resources. While a lot has already been done the creation of a platform with rapid and binding responses to questions addressed by policy makers can help reduce the current conservative approach. Responses by the Commission to questions for interpretation should then be binding for all Member States. Imposing minimum time for response to clarification questions and making the responses clear and binding is the answer to insecurity. However, one should keep in mind that the clarification of rules is not only a matter for the Commission. Often it is internal rules and goldplating that raise barriers. Hence, Member States and regions can undertake a similar exercise; the Commission can help by launching benchmarking studies for the Member States interested to change their internal rules.
5. Eliminate multiple audits: an agreement needs to be reached between funding agencies to mutually recognise accounting rules and audits. The possibility of one chartered accountant for all expenses needs to be studied.

There are already many signs that both DG REGIO and DG RTD are adopting more flexible rules in terms of prerequisites and auditing while the Omnibus and State Aid regulations are also in the process of being amended.

In a nutshell Member States should start ***seeing synergies as a concept and not as funding rules, organise national assessments explaining the lack of synergies and reverse the risk-reward mentality for civil servants***, who are currently not rewarded for synergies but are instead "punished" if they misinterpret rules. Unless the risk-reward nexus is changed experimentation and ambitions are less likely. In other words, as state a few years ago, still "*The potential for operational synergies to develop exists and it is possible to identify emerging initiatives, but these represent good rather than common practice*" (Ferry et al., 2016, p.8).

During this MLE a few ideas have come up, which are not specific good practices but emerging ideas to test on the ground to overcome perceived barriers. They are helpful tips on how to overcome inertia and build up the future:

- Introduce at the Member State and Commission level the "***Cost of Inaction***", or "***Cost of no-synergies***" as far as synergies are concerned using improved metrics. This can be combined with the mandatory Impact Assessment of individual

programmes/interventions and/or the study of the European Parliament on Mapping the Cost of Non-Europe, 2014-2019.⁸³

- Appoint dedicated personnel (champions at sub-national level) to pursue the potential of systematic synergies; in some cases it is suggested to do this by reinforcing or upgrading the NCP function. This may be inhibited by the general austerity policies trying to reduce personnel cost in the public sector.
- If there are no dedicated champions catalysers can be identified and used; in some case universities play an active role but other actors can prove equally valuable.
- At the national and regional level earmark resources ex ante as matching funds for H2020 selected proposals. This would be particularly effective in the case of InnovFin, where speed is a prerequisite for the EIB involvement.

⁸³ The study brings together work-in-progress on a long-term project to identify and analyse the 'cost of non Europe' in a number of policy fields. This concept is used here to quantify the potential efficiency gains in today's European economy from pursuing a series of policy initiatives recently advocated by the Parliament - from a wider and deeper digital single market to better coordinated national and European policies for defence and development. The benefits may be measured in additional GDP generated or a more rational use of public resources. ([http://www.europarl.europa.eu/thinktank/en/document.html?reference=EPRS_STU\(2015\)536364](http://www.europarl.europa.eu/thinktank/en/document.html?reference=EPRS_STU(2015)536364))

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