



BRIDGES project, 5th call, additional activities: policy instrument improvement recommendations

Synthesis report

June – September 2022

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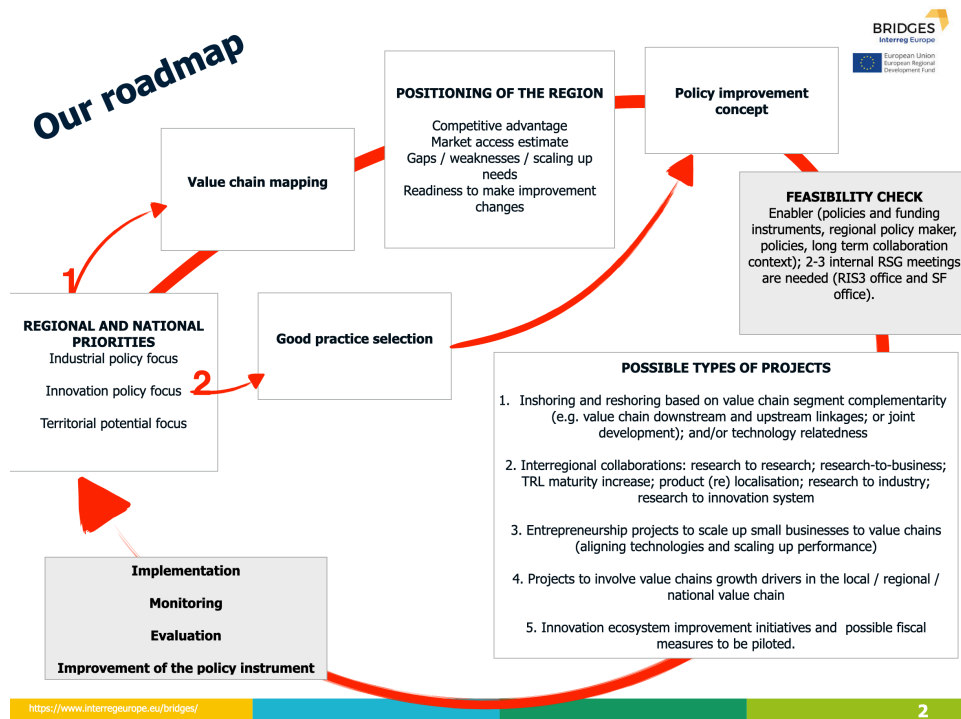
1. Background

1.1 Overall objective of the synthesis report

The policy instrument improvement recommendations synthesis report is a final deliverable of the additional activities of the BRIDGES project approved under the 5th call of the Interreg EUROPE (IE) programme, on 31.5.2021. It synthesises the five (5) regional (Kainuu, Helsinki-Uusimaa, Western Macedonia, Western Slovenia and Western Transdanubia) policy instrument improvement recommendations reports, formulated during the period 1.10.2021-30.9.2022. The objective of the report is to reach policy instrument improvement recommendations exploring value-chain based development related to RIS3 industries.

Contrary to Phases 1 & 2, during which an action plan was formulated, and policy instrument improvement was achieved, the relatively limited time (12 months) allocated to the additional activities, did not allow achieving actual policy impact. What has been achieved is that it has been possible to (i) identify good practices, (ii) formulate and test a value chain mapping methodology in five (5) regions, (iii) gain insights on localising and internationalising RIS3-associated industrial policy, (iv) reach conclusions relating to re-shoring, in-shoring and near-shoring of value chain segments, identify and select good practices, and develop interregional relatedness opportunities and profiles, and (v) devising a roadmap for policy instrument improvement recommendations and preparing regions to mainstream these findings during the forthcoming RIS3 update period in 2023, Figure 1.

Figure 1 Policy improvement recommendations roadmap



The structure of the synthesis report is reflecting the path that we followed for reaching the policy improvement recommendations for each one of the regions:

- 1. Background (1.1 Overall objective, 1.2 Overview of the BRIDGES project additional activities, 1.2 Overview of the BRIDGES project additional activities)
- 2. Good practices (2.1 Good practice identification, 2.2 Good practice selection, 2.3 Good practice selection conclusions)
- 3. Value chain mapping (3.1 Value chain mapping methodology, 3.2 Value chain mapping results per partner region, 3.2 Value chain mapping results per partner region)
- 4. Policy instrument improvement recommendations (4.1 Policy instrument improvement roadmap, 4.2 BRIDGES partner regions , 4.3 Policy instrument improvement recommendations)
- 5. Conclusions
- 6. Annex: regional case studies
- 7. Contributions

1.2 Overview of the BRIDGES project additional activities

The BRIDGES project was planned during 2014-2015, approved in 2016. Phases 1 and 2 were implemented during 2016 – 2017, and additional activities were approved under the 5th call on 31.5.2021. The project was motivated by early RIS3 experiences (2011- 2014 for example) and the challenges regions were facing when trying to plan, implement and benefit from RIS3. The BRIDGES project tackled two types of challenges: (i) mismatches between the economic and research base and what interregional complementarities can/could do about them, and (ii) visibility of the RIS3 implementation results, how are these results perceived in society, when does this happen.

During Phases 1 & 2 of the project, interregional complementarities were further tested through the BRIDGES pilot action. The pilot action tested the conditions and contexts in which interregional complementarities would be essential for the RIS3 implementation of the respective regions. The complementarities identified and tested were of two kinds: research-to-business, research -to-research, and research-to-research-to-business. The funding came partially from the pilot action and partially from the regions' Structural Funds. The pilot action's findings indicate that addressing interregional complementarities is an essential dimension of the RIS3 planning and implementation. Phases 1 and 2 came to the conclusion, reflected in the approved action plans of the partner regions (July & August 2019), that mismatches between the economic & research bases, can be addressed through interregional collaboration schemes, which must be foreseen among regions' Structural Funds eligible activities. Two more findings were that RIS3-based interregional collaboration need not be only about transfer of knowledge / technology, it can also be about joint development. At that time, in 2020, we realised that research and / or product (re)localisation can and do give rise to new knowledge, new potential for all concerned, and this was part of the joint development potential.

<http://www.interregeurope.eu/bridges/>

The visibility of RIS3 results was not explored in equal depth. However, in one of the Interreg EUROPE events to which BRIDGES project was invited¹, discussed the matter. In the joint exercise that was part of the meeting, we had proposed that "RIS3 should reflect economic and otherwise concentrations in a region and location quotient are good tools for this. Where policy measures and visibility of results meet, we proposed to consider "(1) *increase of the concentration of a certain industry including parts of the value chain in a region*, i.e. from industry based to cluster-based, i.e. increase of embeddedness. To the 'person in the street' this would mean more visible businesses and employment demand for certain industries, and probably higher exports. (2) *Increase of the diversification of RIS3 industries resulting from scaling up of the RIS3 industries in the region, for example turnover growth of RIS3 industries that have adopted advanced manufacturing/ turnover growth of the same industries that have not adopted new types of production*. To the 'person in the street' this would mean more demand for highly skilled labour. To the education base it would mean demand for scaled up skills and new types of spin-offs. (3) *Increase of the returns to scale from the research projects co-funded with the regions' research units*, for example measuring spin-offs or income generated from commercialised research / total co funded research projects. This would be reflected in the GDP composition and in the demand for more researchers in the area. (4) *New types of specialisation based on the diversification of existing industries towards new product lines and / or introduction of new industries in the region*. To the 'person in the street' this would mean demand for new employment segments of highly skilled labour"². The thematic workshop of 25.9.2019, opened paths for considering types of returns-to-scale based on the RIS3 implementation, and concepts to be taken up further by policy makers and researchers.

Item 1 of these recommendations was the base that inspired the BRIDGES project additional activities application in May 2021. The objective and content of the 'additional activities' should be understood as a partial extension, a deepening and a systematisation of the BRIDGES project insights gained during Phases 1 & 2 (2016-2021), aiming at improved RIS3 implementation through interregional collaboration. The goal of the additional activities is to highlight and make accessible value-chain based development policies and measures by (i) re-shoring and in-shoring initiatives based on identification of competitive advantage and (ii) strengthening regions' value chain integration through near-shoring options coherent to re-shoring and in-shoring priorities.

Accordingly, the BRIDGES project additional activities focus on interregional complementarities as a RIS3 tool based on value chain policies. This is done by re-shoring, inshoring & near-shoring productive activities based on value chain (VC) analysis selected by the regions. Linking interregional complementarities to VC-based development and to regional resilience, was inspired by the EC's New Industrial Strategy³ and the

¹ Thematic Workshop on Better Monitoring, Evaluating, and Designing Regional Research and Innovation Strategies for Smart Specialisation (RIS3),25.9.2019.

² Chaniotou N. and Lainevu A. (2019). QUANTITATIVE INDICATORS FROM 25-9-2019 RIS3 DESIGN & MONITORING DISCUSSION (v1). Note submitted to the IE Policy Learning Platform innovation experts and the EC on 27.9.2019. Note available upon request.

³ Updating the 2020 New Industrial Strategy: Building a stronger Single Market for Europe's recovery, COM (2021) 350 final. "In the areas of common dependencies with its partners, the EU may choose to pool resources and build stronger and more diverse alternative supply chains with our closest allies and partners", p13. https://ec.europa.eu/info/sites/default/files/communication-industrial-strategy-update-2020_en.pdf.

<http://www.interregeurope.eu/bridges/>

EPRS, PE 653.626 – March 2021 study⁴, arguing how geographically diversified production structures result in reinforced regional clusters, contributing to the resilience of economies⁵. VC re-, in- & near- shoring drivers are identified as⁶: product design, innovation (R&D), flexibility, quality, market proximity & addressing VC weaknesses (e.g. Green Deal gaps). These arguments, favouring VC-based policy measures were further reinforced: we became increasingly aware that (1) value-chain based policies are and will be more and more important strategic & diversification tools; (2) the impacts of the Ukraine war on the EU productive space. OECD⁷ notes that “The substantial economic costs of the war, elevated uncertainty (p13)” and later on that “Exports will continue to benefit from deep integration into value chains (p181)”. Re-localisation has various dimensions. For example, OECD⁸ notes that while through re-localisation countries have less exposure to external shocks, at the same time they risk becoming less efficient and stable in their production models. Therefore, it is important that re-localisation is combined with updated business & production models. These considerations allow scope for governments to “join efforts with businesses to improve risk preparedness” (page 8). In the BRIDGES project additional activities, two (2) good practice (GP) themes are dedicated to these issues^{9, 10}, and eight (8) GPs have been identified, mostly from the EU and the USA (Table 2). Project partners (PP) from Phases 1 & 2 participate in the additional activities except for PP1 (restructured as a result of municipal decisions) and PP3 (internal adjustment processes). All partner regions focus on RIS3: (i) the selected value chains are part of partner regions' RIS3 prioritised sectors. They were selected with the intention to explore and strengthen innovation-based growth; (ii) the RIS3, through the SF 2021-2027 Policy Objective 1 (PO1) 7th enabling condition on ‘interregional innovation investments’, provides the / an operational context.

⁴ Post Covid-19 value chains: options for reshoring production back to Europe in a globalised economy. [https://www.europarl.europa.eu/thinktank/en/document/EXPO_STU\(2021\)653626](https://www.europarl.europa.eu/thinktank/en/document/EXPO_STU(2021)653626).

⁵ According to the EC, for example, the COVID-19 crisis affected the EU economy, across eco systems but not homogenously. The crisis exposed the interdependence of global value chains and demonstrated the critical role of a globally integrated and well-functioning Single Market. The key issues highlighted by the crisis are: Borders restricting free movement of people, goods and services; Interrupted global supply chains affecting availability of essential products; Disruption of demand; 6.3% decline of EU economy; 60% of SMEs reported a fall in turnover in 2020; 24% fall in intra-EU trade in Q2 & Q3 2020; 1.7% SME employment decrease in 2020 - 1.4 million jobs; 45% of firms expected to reduce investment in 2021. https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/european-industrial-strategy_en.

⁶ The European Re-shoring Monitor [REM] (2018). <https://www.eurofound.europa.eu/publications/report/2019/reshoring-in-europe-overview-2015-2018>.

⁷ OECD (2022), OECD Economic Outlook, Volume 2022 Issue 1: Preliminary version, OECD Publishing, Paris, <https://doi.org/10.1787/62d0ca31-en>. <https://www.oecd-ilibrary.org/sites/62d0ca31-en/index.html?itemId=/content/publication/62d0ca31-en>.

⁸ Arriola, C., S. Guilloux-Nefussi, S. Koh, P. Kowalski, E. Rusticelli and F. Van Tongeren (2020), "Efficiency and Risks in Global Value Chains in the context of COVID-19", OECD Economics Department Working Papers, No. 1637, OECD Publishing, Paris. <https://www.oecd-ilibrary.org/docserver/3e4b7ecf-en.pdf?expires=1656179716&id=id&accname=guest&checksum=F42775C8A630F30A6106D8D2567733CA>.

⁹ **GP Theme 1** Good practices about value chain mapping, identification of competitive advantage and decision-making criteria related to value chain re-shoring and nearshoring. **GP Theme 2** Good practices for anticipating interregional complementarities and including them into their S3 have not yet been addressed sufficiently (Balland and Boschma 2021).

¹⁰ Balland P-A, and Boschma R. (2021). Complementary interregional linkages and Smart Specialisation: an empirical study on European regions. Article in *Regional Studies* · January 2021 DOI: 10.1080/00343404.2020.1861240. <https://www.researchgate.net/publication/348587340>.

Table 1 BRIDGES project, additional activities, policy instruments per region

Partner organisation		Region	Policy instrument	Timetable
PP 2 /LP	Regional Council of Kainuu	Kainuu, FI	RIS3 2021-2027; revision 2023	Revision in 2023
PP4	Regional Council of Helsinki - Uusimaa	Helsinki-Uusimaa, FI	RIS3 2021-2027; revision 2023	Revision in 2023
PP5	ANKO	Western Macedonia, GR	RIS3 2021-2027	Finalisation 2023
PP6	SVDC	Western Slovenia, SI	Community-led Local Development (CLLD), LAG (local action group) Soča Valley	2021-2027
PP7	PBN	Western Transdanubia, HU	EDIOP PLUS and Szombathely 2030	2021-2027

The whole effort of value chain mapping and policy instrument improvement recommendations appears to be, ultimately, an optimisation exercise valorising RIS3 (place-based approach, concentration of funds, critical mass), strengthening potential and complementing barriers by exploring systematically interregional complementarities. Regional contexts have been analysed in depth, quantitatively (statistics) and qualitatively (understanding what regions want, what they wish to excel in). This exercise led to further insights discussed more in [5. Conclusions](#) section. We feel that it would be worth researching further, piloting, correcting and finally mainstreaming these findings.

2. Good practices

2.1 Good practice identification

According to the BRIDGES project additional activities, Good Practices (GPs) explore five (5) GP themes: (1) Tools for targeting value chain reshoring & nearshoring segments; (2) instruments for identifying interregional complementarities related to value chain re- and near- shoring priorities; (3) Targeted, VC related science-based entrepreneurship programmes and TRL¹¹ 5-8 promotion; (4) Integration of Green Deal & Digital Transformation into VC; (5) Benefitting from EDIHs.

The purpose of the good practice exercise is to identify good practices that can become policy tools for supporting re-, in- shoring and near-shoring initiatives of the partner areas, namely into the regional S3 of Helsinki-Uusimaa, Kainuu, (both FI) and Western Macedonia (GR); the CLLD of Western Slovenia (SI), and the national S3 of Western Transdanubia (HU)¹². The exercise foresees near-shoring to be based on interregional complementarities mostly within the partnership, but it is not excluding more extensive collaboration schemes and networks.


The good practice identification took place between 1.10.2021 – 31.3.2022. It proved very challenging to identify good practices for all five themes. Finally, eleven (11) GPs were identified. Three come from BRIDGES project regions (2 come from Greece and 1 comes from Spain), 1 was identified during the Policy Learning matchmaking session organised by the PLP and the BRIDGES project on 30.3.2022, three from the USA, two are European Parliament initiatives, and two come from European Commission studies.

More than half of the good practices identified concern the 1st Theme (6 GPs), while the 2nd theme has two GPs, the 3rd theme 1 GP, and the 4th theme 2 GPs. No satisfactory GPs were identified for the 5th theme on EDIH contributions to value chains. One of the challenges of the 5th thematic area, the EDIHs, is that often, there is a tendency to apply the term "digital innovation hub" or even "innovation hub" in a somewhat general way, often denoting a concentration of activities without specification of qualifications, functionalities, or

¹¹ **TRL = Technology readiness level = TRL= Technology Readiness Level.** Technology readiness levels (TRLs) are a method for estimating the maturity of technologies during the acquisition phase of a program, developed at NASA during the 1970s. The use of TRLs enables consistent, uniform discussions of technical maturity across different types of technology [Mihaly, Heder (September 2017). "From NASA to EU: the evolution of the TRL scale in Public Sector Innovation" (PDF). The Innovation Journal. 22: 1–23]. A technology's TRL is determined during a Technology Readiness Assessment (TRA) that examines program concepts, technology requirements, and demonstrated technology capabilities. The European Commission advised EU-funded research and innovation projects to adopt the scale in 2010. TRLs were consequently used in 2014 in the EU Horizon 2020. In 2013, the TRL scale was further canonised by the ISO 16290:2013 standard. "Technology readiness levels (TRL); Extract from Part 19 - Commission Decision C(2014)4995" (PDF). *ec.europa.eu*. 20149]. https://en.wikipedia.org/wiki/Technology_readiness_level . MORE: <https://www.ic.gc.ca/eic/site/080.nsf/eng/00002.html>; https://www.nasa.gov/directorates/heo/scan/engineering/technology/technology_readiness_level .

A comprehensive approach and discussion of TRLs has been published by the European Association of Research and Technology Organisations (EARTO) [The TRL Scale as a Research & Innovation Policy Tool, EARTO Recommendations (PDF). European Association of Research & Technology Organisations. 30 April 2014].

¹² Besides the BRIDGES project partners, the good practices contribute to the methodological tools of the BERRY+ S3

partnership ( <https://s3platform.jrc.ec.europa.eu/berry/>), and to any region & their networks that are interested in institutionalising value chain-based policies and initiatives into their RIS3.

<http://www.interregeurope.eu/bridges/>

results. Table 2 provides summary information the identified GPs according to their thematic domain and focus. Detailed descriptions of the GPs are included in the document *BRIDGES project, 5th call, additional activities: good practices*; <https://projects2014-2020.interregeurope.eu/bridges/library/>, while more information can be accessed also through the cited [url:s](#) in Table 2.

Table 2 BRIDGES project additional activities, good practices (GP)

GP number and name	Theme	Focus
Good practice 1 The future of manufacturing in Europe (FOME) pilot project.	1	Pilot project of the European Parliament, 2015-2018. https://europa.eu/european-union/about-eu/agencies/eurofound_en . Study investigating re-shoring industries, priorities, practices.
Good practice 2 Reshoring advanced manufacturing supply chains to generate good jobs (Brookings)→ Reshoring decision framework.	1	Brookings Metropolitan Policy Programme (2020). Reshoring advanced manufacturing supply chains to generate good jobs. July 2020. https://www.brookings.edu/interactives/metro-recovery-watch/ . Policy recommendations for re-shoring, 6 measures, fiscal, financial, and guaranteed contracting are proposed.
Good practice 3 Post Covid-19 value chains: options for reshoring production back to Europe in a globalised economy. → Reshoring decision framework.	1	European Parliament (2021). Post Covid-19 value chains: options for reshoring production back to Europe in a globalised economy. European Parliament, Policy Department for External Relations Directorate General for External Policies of the Union PE 653.626 – March 2021. Near/off shoring and re-shoring decisions are required to be based on <i>multi-dimensional optimisation approaches</i> , while policies supporting re-shoring, should take into account the specific characteristics of the GVC under consideration, i.e., “no general policy approach to re-shoring exists”. Policy recommendations for re-shoring; reshoring decision framework. ACCESS: https://www.europarl.europa.eu/thinktank/en/document/EXPO_STU(2021)653626 SECTORIAL: https://www.europarl.europa.eu/RegData/etudes/STUD/2021/659437/EPRS_STU(2021)659437_EN.pdf OLDER: https://www.europarl.europa.eu/EPRS/140791REV1-Reshoring-of-EU-manufacturing-FINAL.pdf
Good practice 4 The use of 3D printing in manufacturing: the case of Inertia Racing Technology.	1	Reshoring Institute (https://reshoringinstitute.org/), in collaboration with the University of San Diego Supply Chain Management Institute. Re-shoring case study. Gives ideas for business-based projects preparatory funding for re-defining business model in view of re-shoring interests.
Good practice 5 Increased innovation and service level in fashion: the case of Ted Shelton.	1	Reshoring Institute (https://reshoringinstitute.org/), in collaboration with the University of San Diego Supply Chain Management Institute. Re-shoring case study. Gives ideas for business-based projects preparatory funding for re-defining the business model in view of re-shoring interests.
Good practice 6 BILAKATU programme (direct incentives to promote re-location and near-shoring; includes measures on direct incentives, collaboration with clusters and thriving companies needs)	1	Policy Learning Platform session, 30.3.2022 Policy initiative for re-location associated with value chains, three types of incentives / policy measures are proposed: direct incentives, collaboration with clusters, thriving companies needs (direct subsidies to strengthen embeddedness). https://www.spri.eus/es/ayudas/bilakatu/ https://www.fundacioncarmengandarias.com/contenidos.php?seccion=3&categoria=14&subcategoria=5&lang=en
Good practice 7 Exploring the impact of interregional linkages on regional	2	European Commission, report by Baland & Boschma 2019 https://ec.europa.eu/regional_policy/sources/docgener/brochure/impact_ir_linkages_en.pdf

GP number and name	Theme	Focus
diversification in Europe, in the context of smart specialisation		
Good practice 8 Mapping the potential of EU regions to contribute to Industry 4.0	2	European Union, Balland, P.A. and Boschma, R. (2021). Mapping the potentials of regions in Europe to contribute to new knowledge production in Industry 4.0 technologies. <i>Regional Studies</i> , 55:10-11, 1652-1666, DOI: 10.1080/00343404.2021.1900557
Good practice 9 DEFINE network	3	ePlatform for the development of fashion networks. https://www.define-network.eu/
Good practice 10 Symbiotic networks of bio-waste sustainable management	4	https://symbiosisproject.eu/ Applying digital tools to develop symbiotic networks, to improve cross industry resource efficiency through waste, by-products and raw material trading and sharing assets in an environmentally sustainable way.
Good practice 11 SYMBIOICT	4	https://apps.symbiolabs.gr/symbio/ A digital platform to collect and analyse datasets relating to industrial facilities, regional waste production and supply chain economics with the aim to detect and visualize geographic areas and industrial sectors with high Industrial Symbiosis potential. GP 11 has complementarities with GP 8.
[Good practice 12 Value chain mapping methodology].	1	GP12 is currently under evaluation by Interreg Europe Policy Learning Platform innovation experts. It is the instrument that has been used for the value chain mapping reports under the 5 th call additional activities. The methodology focuses on identifying and exploring (0 building initiatives) for re-shoring, in-shoring and near-shoring value chain potential related to products and services, including access to markets. Competitive advantage is calculated according to different types of concentrations, sometimes absolute (like location quotient) and sometimes relative, reflecting potential of regional concentrations. The methodology is aligned with GP2 and GP7. Its advantage is that it can reflect even baseline competitive advantage in regions and propose also better suited diversification strategies. At the same time, it is a tool that can build on interregionalities and on long term collaborations. Criteria for the value chain mapping are in Table 6 Summary of the value chain (VC) mapping approach.

By analysing the eleven (11) GPs, we found thirteen (13) policy measures proposed by them. We notice that the same policy measures can be found in more than one GPs. This discussion is summarised in Table 3 Policy measures proposed by the identified good practices (GP12 is not included as it is currently under evaluation).

Table 3 Policy measures proposed by the identified good practices (GP12 is not included as it is currently under evaluation)

Proposed policy measures	Relevant GPs (*)										
	1	2	3	4	5	6	7	8	9	10	11
Tools for the Identification of interregional complementarities							X	X			

Proposed policy measures	Relevant GPs (*)										
	1	2	3	4	5	6	7	8	9	10	11
Financial & fiscal incentives¹³ Investment (subsidies) support, for example, for technological upgrading to Industry 4.0 / additive manufacturing, research centres and academic programmes for workforce upgrading; Interest rates, provisions oriented to facilitate re-shoring, i.e. a way of directing investments.	X		X			X					
Monetary policies, financial measures, subsidies. Interest rates, provisions oriented to facilitate re-shoring, i.e. a way of directing investments.		X	X			X					
Innovation policies Financial incentives for mission oriented, technological upgrading / investments, upskilling of workforce, research centres-university synergies.			X								
Industrial policies Identification of grand challenges, missions, strategic sectors, industrial clusters, etc. to channel investment into strategic areas, Industrial clusters / smart spec.	X	X	X	X	X	X	(x)	(x)			
Trade policies Anti-dumping / countervailing duty orders; Tariffs / quotas; Patent / copyright enforcement.	X		X								
Environment policies Lower energy cost; Lower tax on energy use; Lower environmental standards.			X								
Public procurement (including defence policies), including guaranteed contracting.		X	X	X	X			X			
Competitive advantage; crash test Map most important industries locally and assess their performance ("crash test"); identify competitive advantage for re-shoring and in-shoring.	X	X	X	X	X	X	X	X			
Connect to and leverage regional talent generators and workforce development providers. With the labour demand of many manufacturers shifting from low-skill, low-cost labour to mid- to high-skill engineering and technical capabilities, U.S. educational institutions are well positioned to produce the very talent that will increasingly be in demand from	X	X		X	X	X					

¹³ Financial, fiscal and monetary: **financial** (relating to finance, which is the commercial activity of providing funds and capital, or to put it the other way, the ways in which individuals and organizations raise money); **fiscal** (relating to financial matters, especially government tax revenues and government expenditure and debt); **monetary** (relating to the money supply: the amount of money in circulation, its rate of growth, and interest rates). <https://difference-between.com/finance/financial-fiscal-monetary/>.

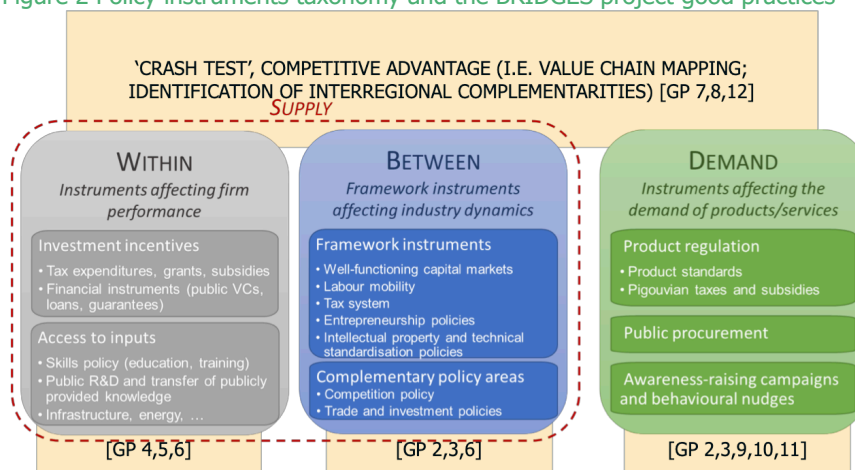
Proposed policy measures	Relevant GPs (*)											
	1	2	3	4	5	6	7	8	9	10	11	
these sectors. Connect to the need for a digitally fluent workforce, massive disruption is underway in manufacturing, with an increased reliance on technology as opposed to low-cost labour.												
Take advantage of Opportunity Zones https://eig.org/opportunityzones		X		X	X	X						
Invest in regionally based soft-landing services Companies setting up new operations in any community will need assistance with site selection, permits and local approvals, and optimizing their processes.		X		X	X							
E-Platforms facilitating value chain cooperation									X	X	X	
LEGEND: GP 1 FOME; GP 2 BROOKINGS; GP3 EPRS; gp4 & GP5 RESHORING INSTITUTE; GP 6 Basque Country; GP 7 & 8 identification of interregional complementarities as a tool to focus reshoring, in shoring and near-shoring initiatives; GP 9, 10, 11: e-platforms as tools supporting the implementation of thematic interregional complementarities.												

The proposed policy measures cover a wide range of interventions, some of which go beyond regional jurisdictions. They reveal a well-structured, multi-dimensional, optimisation approach that appears to rely on the complementarity between and among policy instruments. For example, instruments affecting firm performance, industrial dynamics and demand for products & services are all present among the 13 measures included in Table 3. It is worth mentioning that these 13 measures, appear to be aligned with the OECD taxonomy of policy instruments. The OECD (OECD 2022_[1]¹⁴ and OECD 2022_[2]¹⁵, page 19) proposes a new taxonomy of industrial strategy policy instruments, which “allows identifying the channels through which instruments operate and potential complementarities”. ... In addition to keeping with the traditional distinction between horizontal and targeted policies, the taxonomy distinguishes between demand-pull instruments and two types of supply-push instruments: those that improve firm performance (“within” instruments) and those that affect industry dynamics (“between” or framework instruments) [OECD 2022_[2], page 19]. The 13 measures & the associated GPs go beyond the alignment with the OECD policy instrument taxonomy. They reveal an implementation path, an optimal re- and in-shoring potential decision making. In this path, the notion of the ‘crash test’, of competitive advantage’ is predominant and it is this concept that is supported by the policies (Figure 2).

¹⁴ Criscuolo, C. et al. (2022), “Are industrial policy instruments effective? A review of the evidence in OECD countries”, *OECD Science, Technology and Industry Policy Papers*, No. 128, OECD Publishing, Paris. Accessed at <https://www.oecd-ilibrary.org/docserver/57b3dae2-en.pdf?expires=1656421972&id=id&accname=quest&checksum=15E3AF775AC84757C3AFF89F02F402CA>.

¹⁵ Criscuolo, C., et al. (2022), “An industrial policy framework for OECD countries: Old debates, new perspectives”, *OECD Science, Technology and Industry Policy Papers*, No. 127, OECD Publishing, Paris, <https://doi.org/10.1787/0002217c-en>. Accessed at <https://www.oecd-ilibrary.org/docserver/0002217c-en.pdf?expires=1656418796&id=id&accname=quest&checksum=102441FCC1D46A6B1629CA71A29C0220>.

Figure 2 Policy instruments taxonomy and the BRIDGES project good practices



Source: adjusted from OECD

2022^[2], page 19.

2.2 Good practice selection

Partners analysed the good practices and selected those that were most relevant to them. The selection process 1.4.4044 – 30.6.2022, included interregional, national (in some cases) and regional stakeholder as well as administrative meetings, with date marking the final decision making, the 17th ISC (Interregional Steering Committee), organised online on 14.6.2022. To make the good practice selection, GPs were analysed according to approaches, measures [see the proposed thirteen (13) measures already discussed, Table 3] and intervention Types (IE taxonomy). Table 4 Types of policy instrument impact recommendations based on the GP selection per region below, summarises the GP selection including also the types of policy instrument improvements according to the taxonomy proposed by the Interreg EUROPE programme.

Table 4 Types of policy instrument impact recommendations based on the GP selection per region

Type of policy impact (*)		Partners' GP selection (**)				
		PP2/LP	PP4	PP5	PP6	PP7
Good practice 1 The Future of Manufacturing in Europe (FOME) pilot project.						
Good practice 2 Reshoring decision framework (Brookings)						
Type 2	Value chain mapping / competitive advantage for in shoring and re-shoring	1	1		1	1
Type 2	Guaranteed contracting (requires negotiations with national level, too)		1			
Good practice 3 Reshoring decision framework (EPRS)						
Type 2	Regionally based soft landing services (competence building and specialisation of intermediaries to effectively support re-shoring and in-shoring)	1		1	1	1
Good practice 4 The use of 3D printing in manufacturing: The case of Inertia Racing Technology						
Type 1	Branch-based feasibility studies helping businesses re-define their business concept to re-shoring. As preconditions for res-shoring business and research projects, for the sports equipment sector and stressing utilisation of 3D printing.					1

Type of policy impact (*)		Partners' GP selection (**)				
		PP2/LP	PP4	PP5	PP6	PP7
Type 1	Business plans implementing primarily re-shoring and in-shoring business plans based on the respective feasibility studies; for the sports equipment sector and stressing utilisation of 3D printing.				1	1
Good practice 5 Increased innovation and service level in fashion: The case of Todd Shelton						
Type 1	Branch-based feasibility studies helping businesses re-define their business concept to re-shoring. As preconditions for res-shoring business and research projects, for the textiles sector.		1			
Type 1	Business plans implementing primarily re-shoring and in-shoring business plans based on the respective feasibility studies; for the textiles sector, and especially renewable and re-cyclable textiles.		1			1
Good practice 6 BILAKATU programme (direct incentives to promote re-location and near-shoring)						
Type 3	Direct incentives					
Type 1	Collaboration with clusters (this is aligned with GP3)	1	1	1	1	1
Type 2	Thriving companies' needs (this is aligned with GP2, option 1)	1		1		1
Good practice 7 Exploring the impact of inter-regional linkages on regional diversification in Europe in the context of smart specialisation.						
Type 2	Network (at least 3) feasibility studies to identify complementary technologies for joint development; important for coordinated near-shoring with in-shoring	1	1	1	1	1
Good practice 8 Mapping the potential of EU regions to contribute to Industry 4.0						
Type 2	Network (at least 3) feasibility studies to identify complementary technologies for joint development	1				
Good practice 9 DEFINE network						
Type 1	e-Platform for the development of fashion networks.					
Good practice 10 Symbiotic networks of bio-waste sustainable management						
Type 1	Applying digital tools to develop symbiotic networks, to improve cross industry resource efficiency through waste, by-products and raw material trading and sharing assets in an environmentally sustainable way.					
Good practice 11 SYMBIOICT						
Type 1	A digital platform to collect and analyse datasets relating to industrial facilities, regional waste production and supply chain economics with the aim to detect and visualize geographic areas and industrial sectors with high Industrial Symbiosis potential.	1				
LEGEND						
(*) : Type 1 = new projects; Type 2= improvement of the policy instrument management; Type 3= new policy instrument						
(**): PP2/LP Kainuu; PP4 Helsinki-Uusimaa; PP5 Western Macedonia; PP6 Western Slovenia; PP7 Western Transdanubia						

2.3 Good practice selection conclusions

Partner regions made their GP and measure selection according to their interests (development priorities and absorptive capacity). From the GP selection we observe that eight (8) out of the eleven (11) GPs have been

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selected, ideally leading to seven (7) Type 1 (new projects) and four (4) Type 2 (improvement of programmes) to be included into the policy improvement recommendations. A message that comes through the GP selection is that

- All regions confirm the importance of mapping interregional complementarities (GP2, GP3, GP7, including [GP12, see Table 5]), value-chain based, targeted collaboration with clusters, and support / creation of 'soft landing services' to attract re-shoring and near shoring investments, and the notion of basing RIS3-related initiatives in-shoring, re-shoring, near-shoring on competitive advantage peaks and valleys, has been well accepted.
- Operationalising tools for identifying interregional complementarities can be bilateral or multilateral. Technology-based complementarities path the way for longer term joint development collaborations (GP7, GP8). All regions have committed to the GP7 transfer, and one region is also adopting GP8.
- Competitive advantage becomes operational through value chain mapping and building related initiatives ((GP2, GP3, GP7, including [GP12, see Table 5]).
- Industry-related business and innovation services & collaboration with cluster units appear to be relevant to all partners as well (GP3, GP6).
- Re-shoring interest has been moderate (GP4 and GP5), three regions have been interested. Nevertheless, we anticipate that building new business models for re-shoring parts of value chains, will be a priority in the immediate future.

In conclusion: the concept and strategic tools for value-chain based development, are being appreciated by all partner regions. Operationalisation of the approach and consideration of its implications in more depth, need to be explored and understood better.

3. Value chain mapping

3.1 Value chain mapping methodology

The following value chains were selected to be mapped: forest industry side-streams (Kainuu, FI), recyclable and renewable textiles (Helsinki-Uusimaa, FI), dairy industry side-streams (Western Macedonia, GR and Western Slovenia, SI), and e-health equipment (Western Transdanubia).

The value chain mapping was done by applying a methodology devised by the BRIDGES project Phase 1, namely through the action plan of the LP/PP2, and the feasibility study for the renewal of the berry industry of Kainuu (Action 2)¹⁶. The feasibility study included a supply chain mapping of the berry industry as a whole, with detailed reference to technologies, end products, inputs, markets and policies, Figure 3.

Figure 3 The berry industry supply chain grid¹⁷

	Key technologies		Products	Application	Key investment	Promotion	Policy, 3S, industrial modernisation/ agrifood	Partnership/ Markets
Input/ raw material	Cultivation development in field and forest (wilderness)	Facilitative: ICT and logistics	Cultivars, lines, material from specified production	Correct raw material to correct process	Plant breeding	Economic sustainability	Rural (innovation) policy	Horticulture, agriculture, forestry,
Harvesting	Harvesting technology	Primary supply networks	Harvester: robot or hand-held tools	Intensification of the harvesting process	Automatic, robotics	Sustainability, naturalness	(Rural) innovation policy	Robotic, sensor technology markets
Storing	Storage manufacturing	Logistics	Optimization	Balancing of the input to processing	Renewable energy, material efficiency	Clean technology	Energy and climate policy	Energy technology
Cleaning	Sorting, cleaning, grading – utilization of side flows	Robotics, blockchain technologies	Fresh products	Food and food ingredients	Automatization	Naturalness, organic, freshness, cleanness, health impacts, sustainability	Nature-based innovation, clean investment, competition, health, SDG	Manufacturing
Processing	Extraction – utilization of side flows, deoil	Assembling critical masses, stabilizing (drying and freezing)	Berry juice concentrates, berry nfc juices and syrups. Purees with seeds.	Food, feed, end ingredients	Extraction facilities- concentration –(hot water, ethanol, supercritical I-CO2 circulation	Naturalness, organic, freshness, cleanness, health impacts, sustainability, techn. quality	Nature-based innovation, clean investment, competition, health, SDG metrics	Food technology
	Dewater, dry, deoil, grinding		Berry powders for feed, food Grinded material for cosmetics compensate plastic beans	Food, feed, cosmetic ingredients	Mill/grinder, separator, drier, cocentrator SFE	Naturalness, organic, cleanness, health impacts, sustainability, techn. quality	Innovation (purity), clean investment, competition, transparency, health, SDG metrics	Food technology, cosmetics technology
	Functional food and cosmetic ingredient processing	Critical quality of the raw material, wide spectrum	Aromatic ingredients, functional polyphenolics, seed oil, fibre, stains	Cosmetics	Extraction facilities- concentration –(hot water, ethanol, supercritical I-CO2 circulation	Naturalness, organic, cleanness, health impacts, sustainability, techn. quality	Innovation (purity), clean investment, nature-based competition, transparency, health, SDG metrics	Cosmetics technology
	Consumer product processing	Encapsulation (micro, nano) from the extract during the drying process	Consumer product for feed, for food, for cosmetic	Consumer products in combination with oat ingredients (together with Valio and Dermosil etc.)	Food technology investments	Taste, applicability, naturalness, organic, health impacts, cleanness, sustainability, image building	Health, food, Innovation (purity), clean investment, nature-based competition, transparency, SDG metrics	Food, feed, health care, hotel services, sports, fashion and life style enterprises and NGOs

¹⁶ Kainuu action plan; https://projects2014-2020.interregeurope.eu/fileadmin/user_upload/tx_tevprojects/library/file_1565773671.pdf

¹⁷ Kainuu action plan, page 10. Grid developed by LUKE professor Dr. Sirpa Kurppa. https://projects2014-2020.interregeurope.eu/fileadmin/user_upload/tx_tevprojects/library/file_1565773671.pdf

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During Phase 3 (additional activities) of the project, the initial grid was further developed into a value chain mapping methodology, with the purpose to maximise the benefits of RIS3 implementation and industrial policy effectiveness. The development consists of linking the supply chain grid to regional and interregional development & investment initiatives, by building on regions' mapped competitiveness (peaks) and addressing weaknesses (valleys). The value chain integration ensures market access for final and intermediate goods and it is a pull factor for orienting diversification and scaling up.

Regional competitiveness can be measured in various ways, including entrepreneurship, technological readiness, and quality of institutions¹⁸. In any case, researchers confirm that measuring regional competitiveness by GDP alone is not sufficient¹⁹. The definition of the criteria for mapping the value chains in the BRIDGES regions aimed at discussing regional strengths and weaknesses, as well as regional potential, i.e. strengths that can be revealed, realised in the future. We took into account baseline findings about value chains as expressed, e.g. by the IMF research paper on *Measuring competitiveness in a world of global value chains*²⁰, and the reference to Paul Armington who showed that "in a world in which goods produced by different countries were imperfect substitutes for each other" (page 6). We also took into account the discussion raised by Stöllinger et al 2018²¹, indicating how industrial value chains turn into regional value chains and how they differ than global value chains.

We came up and tested a mix of criteria, quantitative and qualitative, and we relied on the Martin report, page 7-1²²: "The competitiveness of a region resides not only in the competitiveness of its constituent individual firms and their interactions, but also in the wider assets and social, economic, institutional and public attributes of the region itself. Therefore, the notion of regional competitiveness is as much about qualitative factors and conditions (such as untraded networks of informal knowledge, trust, social capital, and the like) as it is about quantifiable attributes and processes (such as inter-firm trading, patenting rates, labour supply and so on). Furthermore, the causes of competitiveness are usually attributed to the effects of an aggregate of factors rather than the impact of any individual factor". Our proposed criteria include business, product, research (on going + programmes), research results, solutions available, education and skills, and policies, Table 5.

¹⁸ Moirangthem, N.S. and Nag, B. (2022), "Measuring regional competitiveness on the basis of entrepreneurship, technological readiness and quality of institutions", *Competitiveness Review*, Vol. 32 No. 1, pp. 103-121. <https://doi.org/10.1108/CR-11-2020-013>.

¹⁹ Barna, K. (2007). Measuring regional competitiveness. *Journal of Central European Agriculture*, CC BY-ND 4.0.

²⁰ Tamim Bayoumi ; Maximiliano Appendino ; Jelle Barkema ; Diego A. Cerdeiro (2018). Measuring Competitiveness in a World of Global Value Chains. IMF working papers, <https://www.imf.org/en/Publications/WP/Issues/2018/11/01/Measuring-Competitiveness-in-a-World-of-Global-Value-Chain-45544> . Page 6.

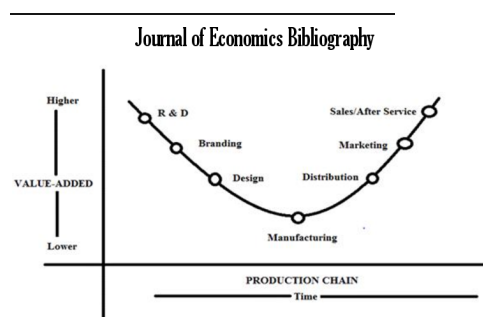
²¹ Roman Stöllinger (coordinator), Doris Hanzl-Weiss, Sandra Leitner, and Robert Stehrer (2018). Global and Regional Value Chains: How Important, How Different?. Vienna Institute for International Economic Studies. Research report 427. <https://wiiw.ac.at/global-and-regional-value-chains-how-important-how-different-dlp-4522.pdf> .

²² Cambridge Econometrics and ECORYS NEI, Prof. Ronald L. Martin (.....). A Study on the Factors of Regional Competitiveness. A draft final report for The European Commission, Directorate-General Regional Policy. https://ec.europa.eu/regional_policy/sources/docgener/studies/pdf/3cr/competitiveness.pdf .

Table 5 Criteria for identifying regional value-chain related peaks and valleys

In relation to concrete RIS3 industry		
Criteria	Competitiveness measures	Data collection methods
Business	Turnover, exports, employment, location quotient	Statistical data and statistical analysis
Product	Product range, product added value, product innovation, exports	Statistical data and statistical analysis
Research	On-going research programmes dedicated to addressing the selected domain.	Field data (interviews) with research units in the region. We are seeking concentrations of research
Research results, solutions	Patents, registered IPR, TRL achievement level in projects related to the selected industry.	Review of patents; field data (interviews) with research units in the region.
Skills available	University faculties and educational programmes including technical education dedicated to improving entrepreneurship, management and implementation skills in the selected industry.	Review of educational programmes in the region; field data (interviews) with educational units in the region.
Policy enablers	Strategies and project calls for (i) increasing research inputs to product development; (ii) bringing innovations to market; (iii) commercialising research; (iv) supporting national & interregional collaboration for technology transfer; (v) entrepreneurship programmes in diversified domains of traditional sectors; (vi) incentives for attracting investments related to in- shoring and / or re-shoring evidence-based potential.	Field data (interviews) with educational units in the region.

These criteria were mapped against the supply chain grid categories, Table 6. The mapping exercise sought to also identify regional concentrations reflecting a currently accepted 'VC smiling curve'²³ references. However, field inputs from the five regions, indicate that the impact of covid19 has been crucial for the regions in terms of the value-added activities of the smiling curve, an adaptation of the initial concept has been generated. This has been one of the main findings of this last period of the project, and it is discussed further in the 5. Conclusions section and mapped in Figure 5 A re-interpretation of the smiling curve. The difference between the "old" and the newly generated smiling curve is in the types of activities (some have been added) their positioning along the value chain in terms of added value. We found, for example, that raw materials have high added value especially in terms of new types of products that are traditionally not anticipated; another addition is automation, and still another insight comes from the upgrading of manufacturing because of the evolution towards more and more knowledge intensive skills. Nevertheless, the logic of matching competitive advantage to added value across value chain segments as tool mapping



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Figure 2. The Smile Curve
Source: Mudambi (2008)

Aggarwal, S. (2017). Smile Curve and its linkages with Global Value Chains. Page 4; https://mpr.aub.uni-muenchen.de/79324/1/MPRA_paper_79324.pdf .

regional contexts and identifying trans-regional complementarities, remains.

Table 6 Summary of the value chain (VC) mapping approach.

Value chain mapping based on supply chain linkages								
Key technologies			Products	Application	Key in-vestment	Promotion	Policy, 35, industrial modernisation/ agrifood	Partnership/ Markets
Input / raw material	Cultivation development in field in forest (wilderness)	Facilitative: ICT and logistics	Cultivars, lines, material from specified production	Correct raw material to correct process	Plant breeding	Economic sustainability	Rural (innovation) policy	Horticulture, agriculture, forestry,
Business Product Research Solution								
Skills available (none, some, average, very good, seeking to transfer knowledge and curricula)								
Policy								
Harvesting	Harvesting technology	Primary supply networks	Harvester: robot or hand-held tools	Identification of the harvesting process	Automatic, robotics	Sustainability, naturalness	(Rural) innovation policy	Robotic, sensor technology markets
Business Product Research Solution								
Skills available (none, some, average, very good, seeking to transfer knowledge and curricula)								
Policy								
Storing	Storage manufacturing	Logistics	Optimization	Balancing of the input to processing	Renewable energy, material efficiency	Clean technology	Energy and climate policy	Energy technology
Business Product Research Solution								
Skills available (none, some, average, very good, seeking to transfer knowledge and curricula)								
Policy								
Cleaning	Sorting, cleaning, grading – utilization of side flows	Robotics, blockchain technologies	Fresh products	Food and food ingredients	Automatization	Naturalness, organic, freshness, cleanliness, health impacts, sustainability	Nature-based innovation, clean investment, competition, health, SDG	Manufacturing
Business Product Research Solution								
Skills available (none, some, average, very good, seeking to transfer knowledge and curricula)								
Policy								
Processing	Extraction – utilization of side flows, deoil	Assembling critical masses, stabilizing (drying and freezing)	Berry juice concentrates, berry nfc-juices and syrups. Purees with seeds.	Food, feed, end ingredients	Extraction facilities- concentration –(hot water, ethanol, supercritical I- CO2 circulation)	Naturalness, organic, freshness, cleanliness, health impacts, sustainability, techn. quality	Nature-based innovation, clean investment, competition, health, SDG metrics	Food technology
Business Product Research Solution								
Skills available (none, some, average, very good, seeking to transfer knowledge and curricula)								
Policy								
	Dewater, dry, deoil, grinding	Logistics	Berry powders for feed, food, ground material for cosmetics compensate plastic beans	Food, feed, cosmetic ingredients	Mill/ grinder, separator, drier, concentrator SFE	Naturalness, organic, cleanliness, health impacts, sustainability, techn. Quality	Innovation (purity), clean investment, competition, transparency, health, SDG metrics	Food technology, cosmetics technology
Business Product Research Solution								
Skills available (none, some, average, very good, seeking to transfer knowledge and curricula)								
Policy								
	Functional food and cosmetic ingredient processing	Critical quality of the raw material wide spectrum	Aromatic ingredients, functional polyphenolics, seed oil, fibre, stans	Cosmetics	Extraction facilities- concentration –(hot water, ethanol, supercritical I- CO2 circulation)	Naturalness, organic, cleanliness, health impacts, sustainability, techn. quality	Innovation (purity), clean investment, nature-based competition, transparency, health, SDG metrics	Cosmetics technology
Business Product Research Solution								
Skills available (none, some, average, very good, seeking to transfer knowledge and curricula)								
Policy								
	Consumer product processing	Encapsulation (micro, nano) from the extract during the drying process	Consumer product for feed, for food, for cosmetic.	Consumer products in combination with oat ingredients (together with Valio and Dermosil etc.)	Food technology investments	Taste, applicability, naturalness, organic, health impacts, cleanliness	Health, food, Innovation (purity), clean investment, nature-based competition.	Food, feed, health care, hotel services, sports, fashion and life style enterprises and NGOs
Business Product Research Solution								
Skills available (none, some, average, very good, seeking to transfer knowledge and curricula)								
Policy								

The mapping was organised according to 5 steps:

- Step 1 definition of the supply chain grid
- Step 2 criteria for linking the supply chain grid to regional competitiveness
- Step 3 data collection through desk research & statistical analysis; data collection through face-to-face interviews with research and education institutions
- Step 4 In-shoring, re-shoring, and near-shoring recommendations, and
- Step 5 Formulation of initiatives and implementation of the selected options among the recommendations made in Step4.

What proved crucial in the whole process were five aspects:

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1. The competences of the expert who made the supply chain grid: The person who is making the supply chain map is a high-level science & industry expert. Our experience is that anything less than that reduces the effectiveness and, most importantly, the potential understanding of the issues at hand.
2. The competences of the expert who made the data collection, the statistical analysis and the interviews: mapping the regional peaks and valleys, requires a statistician and a regional economic developer. We have researched how the identification of the peaks and the valleys can be linked to current regional statistics and to regional competitiveness, and also what are some unknown or underutilised strengths.
3. The on-going collaboration between contracting and the contracted (i.e. the experts) organisations and especially the active & positive involvement of regional policy makers. The value chain mapping findings have to be mainstreamed into development initiatives. They relate to in-shoring, re-shoring and near-shoring of value chains. Regional authorities and policy decision makers need to be involved to
4. The collaboration between and among regional authorities that are participating in the same value chain. It starts from the national level and proceeds to European level. The near-shoring will start through such initiatives that require deeper understanding and MoU confirmations.
5. Continue improving the methodology, and researching further how it can be systematised, and liaise with more complementarity mapping tools. We remind that our methodology has been conceived as a complementary approach to that introduced by GP7 (Balland & Boschma 2019²⁴) which identifies interregional linkages based on the technologies present in patents. To identify interregional complementarities, requires that two regions interested in the same value chain, are making in parallel the value chain mapping or, that thanks to known performance of the region and / or the RIS3 planning studies, such complementarities are indicated.

The relative advantage of this value chain mapping approach is that it can be tailored to all types of regions, innovation leaders or leaders + to innovation modest regions, according to the identified regional concentrations.

3.2 Value chain mapping results per partner region

Following the withdrawal of PP3 Lubelskie Voivodship PL, from the BRIDGES additional activities, the value chain mapping has been applied in five (5) regions. The results are summarised below.

Table 7 Summary of the value chain mapping²⁵, PP2/LP Kainuu

²⁴ Pierre-Alexandre Balland, Ron Boschma, Joan Crespo & David L. Rigby (2019) Smart specialization policy in the European Union: relatedness, knowledge complexity and regional diversification, *Regional Studies*, 53:9, 1252-1268, DOI: 10.1080/00343404.2018.1437900. To link to this article: <https://doi.org/10.1080/00343404.2018.1437900>.

²⁵ **MITY REPORT TO BE NAMED HERE**. Report made for BRIDGES project, RCK PP2/LP. **IE UPLOAD URL**.

VALUE CHAIN: FOREST INDUSTRY SIDESTREAMS
Region: PP2/LP REGIONAL COUNCIL OF KAINUU

Peaks (re-shoring and in-shoring potential)

The forest industry value chain was analysed in terms of lignin. In Kainuu there are 3 and forthcoming one more medium sized & large businesses that produced lignin, can process lignin, and consider lignin applications. Lignin is not an ultimately defined substance. "Lignin, as a natural polymer, exists in all terrestrial plants, although some aquatic organisms may contain lignin or "lignin-like" components. Lignin molecules, starting with dimerization of two monolignol radicals, grow via cross coupling between a monolignol radical and the previously formed dimeric or oligomeric lignol radicals. Lignins are plant polymers made from phenylpropanoid building units. They contain most of the wood methoxyl content. Lignins are resistant to acid hydrolysis, readily oxidized, soluble in hot alkaline and bisulfite, and readily condensed with phenols or thiols."²⁶ "Lignin is a water-insoluble, long-chain heterogeneous polymer composed largely of phenylpropane units which are most commonly linked by ether bonds. The conversion of cellulose and hemicellulose into fuels and chemicals leaves lignin as a by-product. In recent years, removal of lignin from lignin-carbohydrate complex has received much attention because of potential application in the pulp and paper industry."²⁷ In Kainuu, lignin is produced as side-stream of biofuels production, and novel utilisation applications for it especially for wood construction industry (glues) is studied.

In terms of regional peaks,

___ the large and medium sized enterprises located in Kainuu provide in-shoring potential based on own product development priorities & strategies

___ the research unit (MITY) of the University of Oulu is an important specialisation actor in bio-based and measurement technology research.

Valleys (near-shoring and in more rare cases, in-shoring potential)

The most important challenge is the relevantly small regional market that does not encourage the development of small, specialised businesses. Another important issue, associated with the main challenge, is the level of education and skills in the sector. Both of these challenges can be addressed through FDI initiatives, encouraging the re-location of medium sized businesses to Kainuu and, in parallel, by education and training that reflects the needs of the sector under development. Finally, MITY, as lignin-innovation research unit, could develop related innovation services as a specialised intermediary supporting forest side-streams technologies and business development.

Interregionality (near shoring)

Kainuu is an ideal region for locating forest-industry and forest-industry side-stream businesses. It implies a targeted FDI strategy and development of soft-landing services.

MITY is a very strong forest-industry and measurement technology research unit, very active in international and

²⁶ Fachuang Lu, John Ralph, in *Cereal Straw as a Resource for Sustainable Biomaterials and Biofuels*, 2010

²⁷ B.C. Saha, R.J. Bothast, in *Encyclopedia of Microbiology (Third Edition)*, 2009.

<https://www.sciencedirect.com/science/article/pii/B9780123739445001462> .

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<p>VALUE CHAIN: FOREST INDUSTRY SIDESTREAMS Region: PP2/LP REGIONAL COUNCIL OF KAINUU national innovation projects.</p> <p>Joint development and patneting with national and foreign partners of solutions of lignin application challenges.</p>

Table 8 Summary of the value chain mapping²⁸, PP4 Helsinki-Uusimaa

<p>VALUE CHAIN: BIO-BASED AND RECYCLABLE TEXTILES Region: PP4 REGIONAL COUNCIL OF HELSINKI-UUSIMAA</p>
<p>Peaks (re-shoring and in-shoring potential)</p> <p>Regional reshoring is focused on high-end luxury products, highly valued brand products and high-quality technical textile products and additionally, different micro-factories who offer repair, and re-making services. This means micro-factories with sewing, printing small scale dyeing capabilities.</p> <p>Reshoring of cellulosic textile fibre spinning already started as Infinited Fiber Company announced plans to build its commercial-scale Infinna™ fiber factory.</p>
<p>Valleys (near-shoring and in more rare cases, in-shoring potential)</p> <p>No in-shoring potential – unless digital transformation is systematically introduced, in mass production of the labour-intensive production steps, such as yarn spinning, weaving of fabrics, dyeing and finishing of fabrics.</p> <p>Near-shoring potential in textile assembly (e.g., sewing and assembly of the final product) that has already started. Near-shoring potential in labour intensive production steps but finding and matchmaking of right partnerships has delayed this.</p> <p>Two conclusions follow from the suggestions above: (i) that it is important and relevant to apply interregional complementarity tools with indicated. EU regions and (ii) projects to automate labour intensive stages should be made asap.</p>
<p>Interregionality (near shoring)</p> <p>In textile recycling value chain, South-West Finland region are logical partner regions. For the wood based cellulosic textile fibres, logical partner-regions in Finland are those where pulps mills are situated.</p> <p>Near-shoring potential has been identified in the Baltics, Sweden and Denmark, as well as Italy (Friuli Venezia Giulia, cellulose and specialisation alignment), France (textile, garment and research market) and Portugal (Centro and Norte, textile production and cellulose; also textile-specialised innovation intermediaries). It follows that Interregionality assessments should take into account these areas, and it can be done also multilaterally. Turkey and Morocco are relevant countries to nearshoring textile production (very low labour costs) so far as labour intensive stages are concerned. On the other hand, given transport costs, these destinations appear less plausible. Logical near shoring countries are Baltic countries when considering especially textile assembly. For textile recycling Nordic countries, especially Sweden and Denmark are desired.</p>

Table 9 Summary of the value chain mapping²⁹, PP5 Western Macedonia

²⁸ VTT/ Kampuri T., and Heikkilä P. (2022). **Value chain mapping for novel and recycled textile fibres.** CUSTOMER REPORT VTT-CR-00622-22. Report made for BRIDGES project, HURC PP4. [IE UPLOAD URL](#).

²⁹ Kaimakamis J. (2021). Χαρτογράφηση της αλυσίδας αξίας των γαλακτοκομικών προϊόντων στη Δυτική Μακεδονία. https://projects2014-2020.interregeurope.eu/fileadmin/user_upload/tx_tevprojects/library/file_1662459763.pdf.

VALUE CHAIN: DAIRY INDUSTRY & SIDE-STREAMS

Region: PP5 ANKO, WESTERN MACEDONIA

Peaks (re-shoring and in-shoring potential)

- (i) Traditional production

Regional in-shoring is focused on the production capacity increase of the existed high-end quality traditional dairy products and highly valued brand products (feta, kaseri, manouri, kefalograviera, anevato, batzos). There is potential of export of cheese.

Regarding reshoring there is a significant primary production (milk) in terms of quantity and quality - following the model of grazing sheep and goat breeding – that has to be processed by the local dairy businesses, and which is currently exported to nearby regions.

- (ii) Diversification potential

The side streams from the cheese production (whey).

Valleys (in-shoring potential)

- (i) Cheese production

It is anticipated that cluster scaling up investments for whey processing and to apply interregional complementarity tools and to cooperate with indicated EU regions as well. Investment projects aiming at increasing the dairy businesses production capacity, branding and the improvement of export performance are needed.

- (ii) Diversification potential

There is no in-shoring potential of dairy side streams (whey) processing, and they are used just as animal feed. However, whey is considered one raw material with important applications.

This should be understood as a diversification effort focusing on an emerging industry. For the development of the emerging industry the whey products that the new industry will focus on need to be decided, the production ecosystem needs to be acknowledged and assessed, related gaps should be addressed, introduction of the new products into market outlets need to be identified from the start with collaboration agreements to be introduced. Skills need to be developed. There is lack of research centres and knowledge in the field of dairy industry in the region.

Assessing regional clusters regarding their potential in whey applications is necessary, and a comprehensive development programme will be needed.

Interregionality (near shoring)

- (i) Access of cheese production to markets outside the region

Near-shoring potential has been identified in Finland and Slovenia as well as in other EU countries.

- (ii) Development of the whey industry

A first step, as discussed in the "Valleys" section, item ii, that a comprehensive diversification programme should be developed. Joint research projects regarding whey should be developed with research units beyond the region and, in parallel, effort to attract investments by industries that are dealing with preferred whey applications should be considered. Discussions with entrepreneurs who are already buying whey as (exported) raw material, could be prioritised. Interregional collaborations could be based on these options.

And: Kaimakamis J. (2022). Mapping the dairy value chain in Western Macedonia Region -Technical Report. Kaimakamis J. (2022). https://projects2014-2020.interregeurope.eu/fileadmin/user_upload/tx_tevprojects/library/file_1662460158.pdf .Both reports made for BRIDGES project, ANKO PP5.

Table 10 Summary of the value chain mapping³⁰, PP6 Western Slovenia

<p>VALUE CHAIN: DAIRY INDUSTRY & SIDE-STREAMS Region: PP6 SVDC, WESTERN SLOVENIA</p>
<p>Peaks (re-shoring and in-shoring potential)</p> <p>Traditional dairy products</p> <ol style="list-style-type: none"> 1. Cheese with European and other designations of origins and brands (Bovec cheese, Tolminc cheese) 2. Other traditional dairy products (butter, yogurt, cottage cheese ...) <p>Due to a geographical origin of the milk as the main precondition at production of protected cheeses it is already based only in the region. With an already high anticipation of the quality of the products on the market it is however possible to extend the production.</p> <p>In addition to the large dairy there are several smaller producers (farmers) that both produce and sell products on the market and are in a way creating a competitive (inshoring) environment.</p> <p>Side products</p> <ol style="list-style-type: none"> 1. Whey (a smaller part is used as the raw ingredient used in nutrition products and local cuisine and in production of whey drinks). The majority of whey is not used at all.
<p>Valleys (near-shoring and in more rare cases, in-shoring potential)</p> <p>Traditional dairy products</p> <p>The main challenges:</p> <ul style="list-style-type: none"> - Limitations in production (organic farming, summer mountain pastures, freshness of products) - The whole Alps are known for very good cheese products <p>Side products</p> <p>There are two main pillars of whey usage to be further developed:</p> <ul style="list-style-type: none"> - Extraction of proteins and use for nutrition of humans (partly already in progress by the dairy) - Use of proteins for: <ul style="list-style-type: none"> o Production of (fish) food (spirulina algae) for local fish farms o Bio plastics
<p>Interregionality (near shoring)</p> <p>Traditional dairy products</p> <p>There is potential in better positioning in the foreign markets with production staying in the region.</p> <p>Side products</p> <p>Dairy producers are aware of the whey challenges and are already thinking about new ways of using it. Some opportunities have been identified (both R2B and B2B) in the alpine arch neighbouring countries (Italy, Austria).</p>

Table 11 Summary of the value chain mapping³¹, PP7 Western Transdanubia

³⁰ REFERENCE TO THE REPORT BY THE EXPERT. Report made for BRIDGES project, SVDC PP6. [IE UPLOAD URL](#).

³¹ Bárdo, K. (2022). Value Chain Analysis in Healthcare related manufacturing Western Transdanubia. Report made for BRIDGES project, PBN PP7. [IE UPLOAD URL](#).

VALUE CHAIN: HEALTH CARE ICT EQUIPMENT

Region: PP7 PBN, WESTERN TRANSDANUBIA

Peaks (re-shoring and in-shoring potential)

In the West-Transdanubian region there is potential to realize innovative products:

Potential 1:

Locally present manufacturing companies with production and testing capacity, participate in prototyping procedures, local health companies take part e.g. in bioengineering education and further educational programs.

Example 1:

In key technology 'advance manufacturing', in 'robotics domain' the value chain team identified the possibility for 'Exoskeleton development and manufacturing'. The addressing project is going to support the rehabilitation of stroke patients with product development. To realize this project the West-Transdanubian region has the potential to have local companies capable of robotics manufacturing and the region has a local stroke hospital center which is ideal for testing facility. Through the product development the next step is to build exoskeleton manufacturing unit with R&D department in the West-Transdanubian region. The project is explicitly included in the Szombathely 2030 agenda.

Example 2:

In key technology 'advance manufacturing', in 'robotics domain' the value chain team identified a second project which aims to develop sensors with improved capacity and low energy consumption which can be applied in Intelligent inhalators, smart newborn incubators. To realize this project in West-Transdanubia a PCB Service company is present as potential producer. The project is not included in the Szombathely 2030 agenda.

Potential 2:

Based on the two products introduced in the previous lines further activities in product development and improvement can be started. AM-LAB in West-Transdanubia is Hungary's first Digital Innovation and provides professional services in product development, testing and training, is a platform for constant development and obtains international social capital through PBN:

- Product development and prototyping - Designing custom products and tools from idea to prototype production, model and tool preparation and mass production optimization, Model and tool preparation and mass production optimization
- 3D scanning and reverse engineering
- Extended reality - Model and tool preparation and mass production optimization
- Data science – analysis of production data of manufacturing companies
- Entrepreneurial trainings – industry 4.0

Potential 3:

Local institutional actors and end users are present in the region and open to cooperate with own resources:

- Local university faculties act as leading actors in the transition to a new sector
- local hospital provides rehabilitation services and specialists
- thermal water based rehabilitation facilities are available
- Local social care organisation provides test environment
- Local end-user basis is given participation in needs-assessment and involved in testing and

Potential 4:

The local policy background is supportive, and healthcare related developments are priority of the city. National level policy background is open for good examples and proposals.

Valleys (near-shoring solutions within Hungary and the research area)

(1) DOMINANT ECONOMIC BASE CONTEXT, over relying on the dominating of the automotive industry. This weakness is a possibility on the same time: the presence of manufacturing companies led the city and its surroundings to redefine the possibilities, in the knowledge of global trends, through international experience, the design, testing, application and training of products related to the health industry, and the organization of education became possible.

(2) LACKING COMPETENCES AND KNOWLEDGE OF MATERIAL SCIENCES:

2.1 PROJECT-BASED "REACTION": Through the value chain mapping the VC mapping team determined the project: "Intelligent 4Dprinted materials for Smart product and production development". To the

VALUE CHAIN: HEALTH CARE ICT EQUIPMENT

Region: PP7 PBN, WESTERN TRANS-DANUBIA

realization in the West-Transdanubian region there are manufacturing companies present and ready to introduce such prototypes but the project needs collaborative research between academia-business for 4Dprints which is only realizable on country or interregional level.

- 2.2 PROGRAMME-BASED APPROACH: Could there be a programme foreseen in the new EDIOP for strengthening materials science knowledge, skills, and longer-term collaborations with synchrotrons for example, explicitly focusing on health care applications based on ICT? This cross disciplinary approach is a strength for. PP7 and as a domain it deserves to be expressed more openly.

(3) TEST-BEFORE-INVEST NEEDS IN VIEW OF DEVELOPING NEW PRODUCTS

- 3.1 Need for application site of the new product at e.g a technical university. In the 'Advanced manufacturing' key technology topic in 'Autonomous' systems domain the VC mapping team determined the project: 'Doctoral school based on Teaching and Learning Factory' to apply in research and international doctoral schools. To the realization engineers at regional large companies can be involved but the academic knowledge from technical universities and international PhD students is missing, e.g. the Technical universities' PhD in Budapest can offer practical application site.
- 3.2 Need for a large testing base of applications, programs: (1) in the exoskeleton project testing cooperation with national rehabilitation institutes is planned, regionally testing base is limited. (2) In case of 'Applications developed for dementia prevention' project in Life Science technologies a country wide test environment for novel product/app development is needed and planned.
- 3.3 Technical barriers in 3D and 4D printing. In the projects: Local advanced polymer 3Dprinting service and Intelligent 4Dprinted materials Increased collaboration with leading European material science team coming from the wider research area is a basic need.
- 3.4 Lack of training and education in special domains: improve competencies in 3Dprinting, fundament for 4Dprinting potential, etc.
- 3.5 In general, academic background is available mainly on national and international level.

Interregionality (near shoring)

Interregional cooperations are inevitable in developing, testing and realizing new products and processes. If we take in consideration the 15 projects defined as the outcome of the values chain mapping we can list the following possible cooperation fields:

(1) TRAINING AND EDUCATION

1.1 Cooperation field 1: Key interregional capital is training and education through joint educational programs to support the restructuring of the regions' academy, to attract companies and universities to the region through joint actions of the nearby regions through educational programs, exchange of training materials, etc.

1.2 Cooperation field 2: Develop a joint degree programme in MSc Biomedical Engineering.

1.3 Cooperation field 3: Connected to product development parallel to ICT co-operation, the cooperation with design companies is essential in order to create practical, aesthetic and clear-out products for end users in the health industry.

- (2) GOOD PRACTICES: The exchange of healthcare related good practices and the exchange of knowledge in healthcare related manufacturing supportive technologies like industry 4.0 solutions, data processing cyber security. In the value chain mapping we identified the following examples:
- Good Practices in advanced materials in general and connected to this increase the competency in advanced materials
 - Intelligent 4Dprinted materials - Good Practices and exchange of experience in 4D printing

VALUE CHAIN: HEALTH CARE ICT EQUIPMENT Region: PP7 PBN, WESTERN TRANSDANUBIA
<ul style="list-style-type: none"> ○ Machine-vision and neural network applications ○ Exchange knowledge in applying statistics into production improvement, ○ Exchange experience about cybersecurity application introductions.

3.3 Value chain mapping conclusions

The value chain mapping results are summarised in Tables 6,7,8,9, and 10 below. Each one of them summarises the findings of the value chain mapping and reflects deeper insights that resulted from intense exchanges among the regions during the period June-August 2022. This was a necessary step, as it was the first time that the value chain mapping methodology, based on the identification of peaks (competitive advantage) and valleys (gaps) was applied, i.e., the validity of the approach and the relevance of the outcomes to the objectives (increase of regional resilience through value chains) of the approved additional activities, required deeper analysis and understanding.

The insights reached can be summarised as follows:

1. **IN-SHORING, RE-SHORING AND NEAR-SHORING:** We found that the value chain approach is very useful when diversifying or scaling-up production. In-shoring and re-shoring potential is appreciated above all as in relation to existing and easily accessible knowledge, research and competence resources; the whole effort is seen as part of specialisation based on research-to-industry schemes. Re-shoring, benefitting from relevant FDI (forward direct investment) options is not explored yet.
2. **PRODUCT CYCLE:** The focus has been on in-shoring and re-industrialisation (innovation strong & leader+) as well as extension of industrial activities (all other regions). In some cases, in-shoring introduced re-industrialisation through scaling up specialisation, in others through emerging industries. Moving upwards in the value chain smiling curve was a priority for the less innovation-performing regions.

An unexpected finding is the interest of diversification through re-industrialisation and in-shoring. All partner regions, to a higher or lesser degree have appreciated the potential of value-chain based development for developing new sectors. Relatedness has been also addressed in this effort, and regions have stressed relatedness in terms of raw materials, available skills, or direct access to research services. This finding led to a better understanding of the type of economies that value chain-based development might prioritise, and a discussion on economies of scale or economies of scope emerged among the partners, indicating suitable project and business co-funding and co-financing criteria.

3. **INTERREGIONALITY:** Near-shoring was appreciated more as off-shoring for accessing new markets. Nevertheless, all regions emphasised the need to identify and build on value chains aligned with interregional complementarities. In the innovation leader / leader + regions, interregionally – based joint development has also been a priority. Our hope, our aim, is that through interregional complementarity mappings, joint-development bilateral and trilateral or even larger collaborations, joint development schemes can eventually emerge.
4. **METHODOLOGY:** In general, the value chain mapping exercise was very positively received by the partner regions. The mapping exercise took longer than expected, as it was for several regions, a first-time methodology. However, all partner-regions feel that this is a good practice that can be used also in the future. It is possible that the proxies for competitive advantage could be further discussed and improved. Based on the partners' feedback, a good practice application has been submitted to the Policy Learning Platform of the Interreg Europe programme.

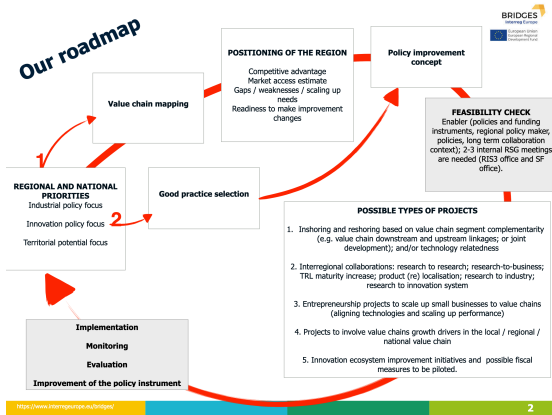
<http://www.interregeurope.eu/bridges/>

The value chain mapping and the good practice selection are operationalised by proposing new initiatives, to benefit regions through the policy instrument improvement recommendations. The policy instrument improvement recommendations, discussed in the next section, indicate how regions try to maximise these benefits by embedding into the current contexts. The revealed potential for scaling up and regional diversification through value-chain based development deserves further exploration as well.

4. Policy instrument improvement recommendations

4.1 Policy instrument improvement roadmap

Figure 1 replicated in the insert below, proposes a roadmap for reaching policy instrument improvement



recommendations in each one of the regions: (i) we take into account three sources of inputs: RIS3, value chain mapping and good practices; (ii) new projects and policy instrument recommendations are discussed both, internally in the regional policy makers organisations and with the regional stakeholders.

The policy instrument improvement is intended to serve three purposes: (1) strengthen the regional productive base by inshoring and reshoring parts of segments of the selected value chains; (2) support

interregional innovation investments and collaborations through value chain nearshoring opportunities; (3) support integrating value chain "thinking", value chain management as a development approach to be included into the range of RIS3 tools and development channels of the partner regions.

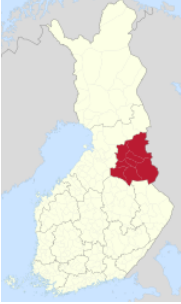


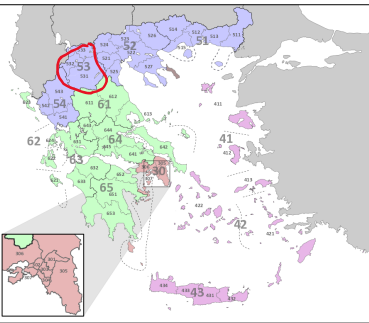
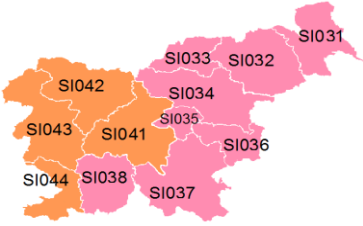
The value chain mapping was expected to generate regional and interregional initiatives (Figure 1, replicated in the insert above) which strengthen re-shoring and in-shoring relevant activities and coherently position/align such activities together with near-shoring (=off shoring), with the aim to reach VC-based strong and solid development paths. These initiatives are either new types of projects (Type 1 policy instrument impact according to the Interreg Europe terminology) or / and activities that strengthen the evidence base of the RIS3 and through that, the range of possible collaborations (Type 2 policy instrument impact according to the Interreg Europe terminology). For example, good practices 1, 4,5,9,10,11 are examples of potential Type 1 initiatives, while good practices 2,3,6,7 and 8 are examples of potential Type 2 initiatives (Figure 1 and Table 2 BRIDGES project additional activities, good practices (GP)).

The proposed process is a blend of statistical, policy (industrial, based on concrete value chains) and experience inputs and integration. It is piloting a path which, if useful, can be replicated in future efforts.

4.2 BRIDGES partner regions

In this section, regional profiles are outlined. The BRIDGES regions are very different and each one of them is a different case for tailoring innovation policies and value-chains. In this section references are made to the basic economic data (Table 11) and innovation performance of the regions (Figure 3, Figure 4 and Table 12). Detailed accounts of regional profiles and their RIS3, are accessible at <https://projects2014-2020.interregeurope.eu/bridges/library/> → BRIDGES additional activities, policy instrument, while access to summaries of the regional policy instrument reports can be found in section 6. Annex: regional case studies.

Table 12 BRIDGES project partners' regional profiles

Partner	Region	Regional profile
PP2/LP	 <p>Kainuu, in North-East Finland NUTS2 FI1D, Kainuu, NUTS3 FI1D4</p> 	<p>Area: 22 687,38³² km²</p> <p>Population: 71 255³³</p> <p>Regional GDP: € 34 082 per capita³⁴</p> <p>Economy: In 2017, the top 5 industries in Kainuu were: 1. Bioeconomy (renewable natural resources) (502M €); 2. Mining (300.7M €)3. Energy (226.9M €); 4. Forestry (193.6 M €) 5. Metal (152.5M €)³⁵.</p> <p>Innovation system performance: Strong innovator</p>
PP4	 <p>³⁶ Helsinki-Uusimaa, NUTS2 FI1B; Helsinki-Uusimaa NUTS3 FI1B1³⁷</p>	<p>Area: 9 440 km²</p> <p>Population: 1 702 678</p> <p>Regional GDP: 36% of the national GDP 232,11 billion €³⁸ /232, 11 billion US dollars in 2021³⁹.</p> <p>Economy⁴⁰:81,9% tertiary sector, 17,3% secondary sector, 0,8% primary sector; 50% of GERD of Finland.</p> <p>Innovation system performance: Leader + innovator</p>
PP5	 <p>Western Macedonia, NUTS 2 EL53</p>	<p>Area: 9 451 km²</p> <p>Population: 283 689</p> <p>Regional GDP (2019): Regional GDP (2019): 3,795 billion € - 2,07% of the National GDP, 14.284 € per capita.</p> <p>Economy: Primary- 9,5%, Secondary (including energy) - 40,5%, Tertiary - 50,1% .</p> <p>Innovation system performance: Emerging innovator</p>
PP6	 <p>Western Slovenia, NUTS 2 SI02, (Goriska, SI 043)</p>	<p>Area: 7 840km2</p> <p>Population: 1 000 000</p> <p>Regional GDP per capita: 33 000€. [56,5 % of national GDP]</p> <p>Economy: Primary sector 1,3%, secondary sector 26,4%, tertiary sector 72,3%.</p> <p>Innovation system performance: Moderate innovator+</p>

³² <https://kainuunliitto.fi/en/kainuu-in-statistics/> .³³ 6.6.2022, <https://kainuunliitto.fi/en/kainuu-in-statistics/>³⁴ Data 2019, <https://www.statista.com/statistics/1150699/finland-gross-domestic-product-gdp-per-capita-by-region/> .³⁵ Regional Council of Kainuu, 2018.³⁶ Source: <https://uudenmaanliitto.fi/en/helsinki-uusimaa-region/> .³⁷ Source: <https://uudenmaanliitto.fi/en/helsinki-uusimaa-region/> .³⁸ 1€ approximately = 1\$, <https://www.forex.fi/en/currency/usd> .³⁹ <https://data.worldbank.org/indicator/NY.GDP.MKTP.KN?locations=FI> .⁴⁰ https://issuu.com/uudenmaanliitto/docs/helsinki-uusimaa_region_in_figures_30cc2b377c71d0 .


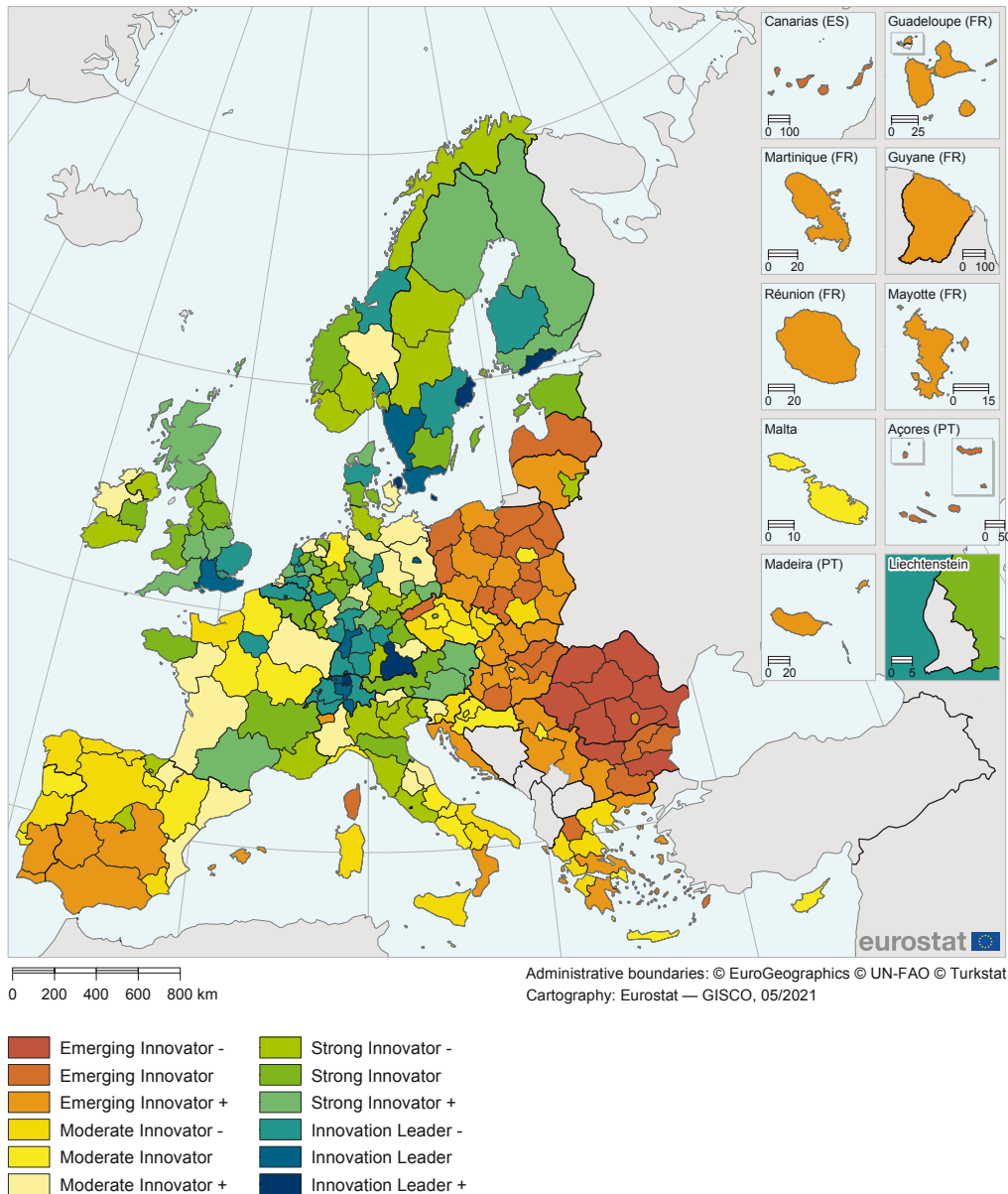
Partner	Region	Regional profile
PP7	 <p>Western Transdanubia, NUTS2 HU22</p>	<p>Area: 4 208,05 km²</p> <p>Population: 463 201</p> <p>Regional GDP: 11 371€ per capita (2020 data)</p> <p>Economy:</p> <p>Innovation system performance: Emerging innovator +</p>

Figure 4 The performance of innovation systems across Europe⁴¹



⁴¹ European Commission, Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs, (2021). *Regional innovation scoreboard 2021*, Publications Office. <https://data.europa.eu/doi/10.2873/674111>, page 6. <https://op.europa.eu/en/publication-detail/-/publication/b76f4287-0b94-11ec-adb1-01aa75ed71a1>.

<http://www.interregeurope.eu/bridges/>

As the economic profiles in Table 11 show, in all partner regions the tertiary sector dominates. And yet, all regions are focusing their growth efforts on the development of the secondary sector. Our experience is that innovation-based growth requires a suitable innovation- & knowledge- friendly environment. One of the key concerns of the BRIDGES project and the possible collaboration options between and among the partner regions (as well as beyond the partnership) has been identifying deeper dimensions on which regions could base their collaboration. One of these dimensions, we found out⁴², is the coherence between the growth patterns of the secondary and tertiary sectors, matching manufacturing with research and innovation services. To this structural characteristic identified during Phases 1 and 2 of the project, the value chain mapping analysis done thanks to the additional activities ("Phase 3" for short), has been orienting, focusing interactions between the manufacturing and advanced services sectors, and also identifying a source of foundational interregional complementarities.

In conclusion, through the BRIDGES project, we have identified and matched four (4) types of interregional complementarities which directly liaise with a more effective implementation of partner regions' RIS3 strategies, listed below, alphabetically:

- [1]. Complementary technologies and complementary technology development (as per GP7 and 8, Balland & Boschma methods).
- [2]. Localisation of research results to new markets and joint product development.
- [3]. Research and business services development (joint development and transfer of know how) for product diversification.
- [4]. Transfer of technology for product scaling up or diversification.

4.3 Policy instrument improvement recommendations

Each one of the partner regions developed a policy instrument improvement approach with the objective of mainstreaming it after the conclusion of the additional activities. This has been a feasible option since the short duration of the 3rd phase of the project did not allow for the development of a full action plan and actual policy instrument change.

The policy improvement documents are summarised in Tables 12,13,14,15, and 16. Policy instruments are reminded (RIS3 for PP2, PP4, PP5 and PP7) and the CLLD (PP6). We note that for all regions, value chain-based development is integrated into the policy instrument text during the anticipated revision (2023). This is a good result, as it opens options for further insights in the regions. Then, transferred good practices cover interregional complementarity identification, cluster collaboration (specialisation and qualification of cluster organisations), and business plans for re-shoring or inshoring. We feel this is a reasonable, coherent start. We consider inevitable that the potential of value chains for re-shoring as part of Foreign Direct Investment policies of regions, will be better explored in the future.

Possible funding sources are also considered. Differentiation of funding sources is made for two reasons: SF funding feasibility (not all regions have the same amount of structural funds (SF) availability) as well as other

⁴² Based on location quotient analysis.

<http://www.interregeurope.eu/bridges/>

sources of funding opportunities, national, regional or EU, potentially responding better to the policy instrument improvement recommendations.

Association with funding sources is indicative of the potential of regions to absorb good practices, institutionalising and operationalising policy improvements, leading to actual improvements. For example, one region clearly names the Regional Structural Funds programme, another region names the local policy instrument that combines several Structural funds, two regions name combinations of regional and national funds, and yet one more region puts more emphasis on external funding. External funding is mentioned also by three (3) out of the four (4) preceding regions however, references are made in complementarity to the existing national and regional funds. We feel it would be important, in the structural funds planning, to ensure access to policy improvements to all regions, so that improvements can be more predictable. This might imply discussions also at national not only regional or local levels, and this kind of joint sessions might also be foreseen.

Table 13 Policy instrument improvement recommendations, Kainuu region, PP2

Type of policy impact (*)		PP2/LP		
		Possible initiative	Policy instrument impact	Potential funding sources
Policy instrument		Kainuu RIS3 2021-2027. Value chain - based development will be mentioned in the text under revision (2023).		
Good practice 2 Reshoring decision framework (Brookings)				
Type 2	Value chain mapping / competitive advantage for in-shoring and re-shoring	Project (-s) to map regional competitive advantage of selected value chains and liaise with EU value chains for further development.	Call criteria and evaluation will be mentioned in the SF	Structural Funds and / or national funds
Good practice 5 Increased innovation and service level in fashion: The case of Todd Shelton				
Type 1	Branch-based feasibility studies helping businesses re-define their business concept to re-shoring. As preconditions for res-shoring business and research projects, for the textiles sector.	Support with external calls intermediary institutions to develop new types of business plans and feasibility studies, beyond labour costs (comparative advantage), for example in the forest industry & sidestreams sector. These new types of business plans are industry related, automation related, green deal related and access to research related.	Call criteria and evaluation will be mentioned in the SF. Interregional and transnational projects.	Structural Funds, Interreg and / or I3 calls
Type 1	Business plans implementing primarily re-shoring and in-shoring business plans based on the respective feasibility studies; for the textiles sector, and especially renewable and re-cyclable textiles.	Open calls for implementing the above business plans. It requires existing and/or start up groups of businesses to be also involved, including specialised intermediary.	Call criteria and evaluation will be mentioned in the SF	Structural funds
Good practice 6 BILAKATU programme (direct incentives to promote re-location and near-shoring)				
Type 3	Direct incentives			
Type 1	Collaboration with clusters (this is aligned with GP3)	External project to develop certified industrial intermediaries in the bio-based and recyclable textiles y in the ICT/ health care sector and introduces network-based development with counterparts across the EU.		Interreg and / or I3 calls
Good practice 7 Exploring the impact of inter-regional linkages on regional diversification in Europe in the context of smart specialisation.				
Type 2	Network (at least 3) feasibility studies to identify complementary technologies for joint development; important for coordinated near-shoring with in-shoring	Agreeing interest of at least 2-3 regions in shared value chains; joint projects for identification of technological complementarities as per the Balland & Boschma methodology.	Structural Funds and / or national funds	Interreg and / or I3 calls
LEGEND				
(*) : Type 1 = new projects; Type 2= improvement of the policy instrument management; Type 3= new policy instrument		(**): PP2/LP Kainuu; PP4 Helsinki-Uusimaa; PP5 Western Macedonia; PP6 Western Slovenia; PP7 Western Transdanubia		

Table 14 Policy instrument improvement recommendations, Helsinki-Uusimaa PP4

Type of policy impact (*)		PP4		
		Possible initiative	Policy instrument impact	Potential funding sources
Policy instrument		Helsinki-Uusimaa RIS3 2021-2027. Value chain - based development will be mentioned in the text under revision (2023).		
Good practice 2 Reshoring decision framework (Brookings)				
Type 2	Value chain mapping / competitive advantage for in shoring and re-shoring	Value chain mapping to identify competitive advantage in products and services, including near shoring options.	The topic is mentioned in the updated RIS3. External call criteria.	Structural Funds and / or national funds
Good practice 5 Increased innovation and service level in fashion: The case of Todd Shelton				
Type 1	Branch-based feasibility studies helping businesses re-define their business concept to re-shoring. As preconditions for res-shoring business and research projects, for the textiles sector.	Business support projects to re-define business model in view of re-shoring or in-shoring.	The topic is mentioned in the updated RIS3. External call criteria.	Structural Funds and / or national funds
Type 1	Business plans implementing primarily re-shoring and in-shoring business plans based on the respective feasibility studies; for the textiles sector, and especially renewable and re-cyclable textiles.	Measures to support re-shoring, in-shoring and near-shoring in specific value chains & related segments.	The topic is mentioned in the updated RIS3. External call criteria.	Structural Funds and / or national funds
Good practice 6 BILAKATU programme (direct incentives to promote re-location and near-shoring)				
Type 1	Collaboration with clusters (this is aligned with GP3)	Measures to improve the regional ecosystem related to specific segments of selected value chains.	The topic is mentioned in the updated RIS3. External call criteria.	Structural Funds and / or national funds Interreg and / or I3 calls
Good practice 7 Exploring the impact of inter-regional linkages on regional diversification in Europe in the context of smart specialisation.				
Type 2	Network (at least 3) feasibility studies to identify complementary technologies for joint development; important for coordinated near-shoring with in-shoring	Measures to identify interregional & national technological & eco-system complementarities Agreeing interest of at least 2-3 regions in shared value chains; joint projects for identification of technological complementarities as per the Balland & Boschma methodology.	The topic is mentioned in the updated RIS3. External call criteria.	Structural Funds and / or national funds Interreg and / or I3 calls
LEGEND				
(*) : Type 1 = new projects; Type 2= improvement of the policy instrument management; Type 3= new policy instrument		(**): PP2/LP Kainuu; PP4 Helsinki-Uusimaa; PP5 Western Macedonia; PP6 Western Slovenia; PP7 Western Transdanubia		

Table 15 Policy instrument improvement recommendations, Western Macedonia, PP5

Type of policy impact (*)		PP5		
		Possible initiative	Policy instrument impact	Potential funding sources
Policy instrument		Structural Funds programme of Western Macedonia and the Greek Recovery Fund. Operational Programme for Just Development Transition 2021 - 2027 Development Law 4887/2022 "Greece Strong Growth", 6th Aid Scheme: Agri-food - primary production and processing of agricultural products - fisheries and aquaculture. New theme in the RIS3 (will be finalised during 2023)		
Good practice 3 Reshoring decision framework (EPRS)				
Type 2	Regionally based soft landing services (competence building and specialisation of intermediaries to effectively support reshoring and in-shoring)	Whey industry development and implementation programme; Interregionality strong	Call and evaluation criteria	Operational Programme of Western Macedonia Region 2021 - 2027 Specific Objective RSO1.3 – Enhancing sustainable growth and competitiveness of SMEs and job creation in SMEs, including by productive investments/ 1.3.1 - Strengthening of existing and creating new businesses focusing on integrating new technologies and innovation (indicative actions: Strengthening of existing and establishing new businesses with emphasis on areas of smart specialization strategy, enhancing business extroversion and supporting exports with emphasis on sectors of smart specialization strategy, strengthening of clusters and businesses of circular economy (closed supply chains)) Operational Programme for Just Development Transition 2021 - 2027 Specific Objective JSO8.1 – Enabling regions and people to address the social, employment, economic and environmental impacts of the transition towards the Union's 2030 targets for energy and climate and climate-neutral economy of the Union by 2050, based on the Paris Agreement / Competitiveness of SMEs, digital business transformation(indicative action: Support of existed businesses targeting to the improvement of their extroversion and their participation in regional and interregional added value chains.) Development Law 4887/2022 "Greece Strong Growth" 6th Aid Scheme: Agri-food - primary production and processing of agricultural products - fisheries and aquaculture.
Good practice 5 Increased innovation and service level in fashion: The case of Todd Shelton				
Type 1	Business plans implementing primarily reshoring and in-shoring business plans based on the respective feasibility studies; for the textiles sector, and especially renewable and re-cyclable textiles.	Improvement of the production capacity & branding of the cheese industry	Call and evaluation criteria	Operational Programme of Western Macedonia Region 2021 - 2027 Specific Objective RSO1.3 – Enhancing sustainable growth and competitiveness of SMEs and job creation in SMEs, including by productive investments/ 1.3.1 - Strengthening of existing and creating new businesses focusing on integrating new technologies and innovation (indicative actions: Strengthening of existing and establishing new businesses with emphasis on areas of smart specialization strategy, enhancing business extroversion and supporting exports with emphasis on sectors of smart specialization strategy.) Operational Programme for Just Development Transition 2021 - 2027 Specific Objective JSO8.1 – Enabling regions and people to address the social, employment, economic and environmental impacts of the transition towards the Union's 2030 targets for energy and climate and climate-neutral economy of the Union by 2050, based on the Paris Agreement / Competitiveness of SMEs, digital business transformation(indicative action: Support of existed businesses targeting to the improvement of their extroversion and their participation in regional and interregional added value chains.) Development Law 4887/2022 "Greece Strong Growth", 6th Aid Scheme: Agri-food - primary production and processing of agricultural products fisheries and aquaculture.
Good practice 7 Exploring the impact of inter-regional linkages on regional diversification in Europe in the context of smart specialisation.				
Type 2	Network (at least 3) feasibility studies to identify complementary technologies for joint development; important for coordinated near-shoring with in-shoring	Tools for the identification of interregional complementarities	Call and evaluation criteria	Specific Objective RSO1.1 – Developing and enhancing research and innovation capacities and the uptake of advanced technologies / 1.1.2 - Strengthening research of businesses and research institutions focusing on the priority areas of Smart Specialization Strategy (indicative action: Support of businesses, collaborative schemes and research bodies to participate in international R&D activities.)
LEGEND				
(*) : Type 1 = new projects; Type 2= improvement of the policy instrument management; Type 3= new policy instrument		(**): PP2/LP Kainuu; PP4 Helsinki-Uusimaa; PP5 Western Macedonia; PP6 Western Slovenia; PP7 Western Transdanubia		

Table 16 Policy instrument improvement recommendations, Western Slovenia, PP6

Type of policy impact (*)		PP6		
		Possible initiative	Policy instrument impact	Potential funding sources
Policy instrument		The policy instrument is the 2021-2027 CLLD mechanism in the area of Local action group (LAG) Soča valley. It is currently in initial stage of the preparation. Funding sources are a combination of several EU funds. Interregional cooperation projects within CLLD (the EU CLLD system allows interregional projects locally funded & / or co-funded, but the option has to be clearly mentioned in LAG strategies Value chain - based initiatives will be mentioned in the text under formulation.		
Good practice 2 Reshoring decision framework (Brookings)				
Type 2	Value chain mapping / competitive advantage for in shoring and re-shoring	Project (-s) to mapping regional competitive advantage of selected value chains and liaise with EU value chains for further development.	CLLD	Interreg and / or I3 calls CLLD funding
Good practice 3 Reshoring decision framework (EPRS)				
Type 2	Regionally based soft landing services (competence building and specialisation of intermediaries to effectively support re-shoring and in-shoring)	Competence building and specialisation of intermediaries to effectively support re-shoring and in-shoring. Local, transnational and interregional initiatives. SVDC food sector & sidestreams specialisation.	CLLD	Interreg and / or I3 calls CLLD funding
Good practice 5 Increased innovation and service level in fashion: The case of Todd Shelton				
Type 1	Business plans implementing primarily re-shoring and in-shoring business plans based on the respective feasibility studies; for the textiles sector, and especially renewable and re-cyclable textiles.	Small scale R2B (regionally adjusted scheme to focus on selected sectors, supporting mainly SMEs). Funding of initiatives building on side flows from processing of (regional) natural resources.	CLLD	
Good practice 6 BLAKATU programme (direct incentives to promote re-location and near-shoring)				
Type 1	Collaboration with clusters (this is aligned with GP3)	OPTION 1 (counting from GP3 suggestions) External project to develop certified industrial intermediaries in the bio-based and recyclable textiles y in the ICT/ health care sector and introduces network-based development with counterparts across the EU. OPTION 2 SVDC collaborates with other cluster units or other qualified innovation intermediaries with the purpose to increase localisation potential of the food sector and its sidestreams: increase of the demand-led approach, absorptive capacity of businesses and align education for new needed skills. This	CLLD	Interreg and / or I3 calls CLLD funding
Good practice 7 Exploring the impact of inter-regional linkages on regional diversification in Europe in the context of smart specialisation.				
Type 2	Network (at least 3) feasibility studies to identify complementary technologies for joint development; important for coordinated near-shoring with in-shoring	Bilateral and multilateral initiatives for the identification of interregional complementarities. We hope to further link these findings for the implementation of prioritised initiatives with further local projects as well as with transnational Interreg options, as also discussed below. Agreeing interest of at least 2-3 regions in shared value chains; joint projects for identification of technological complementarities as per the Balland & Boschma methodology. In the case of the Alps, it is feasible to apply reshoring (GP7) also on cross or trans-border areas (accessibility, traditional markets, R&D hubs, ...).	CLLD	Interreg and / or I3 calls CLLD funding
LEGEND				
(*) : Type 1 = new projects; Type 2= improvement of the policy instrument management; Type 3= new policy instrument		(**): PP2/LP Kainuu; PP4 Helsinki-Uusimaa; PP5 Western Macedonia; PP6 Western Slovenia; PP7 Western Transdanubia		

Table 17 Policy instrument improvement recommendations, Western Transdanubia, PP7

Type of policy impact (*)		Possible Initiative	PP7 Policy instrument impact	Potential funding sources
Policy instrument		EADIOP+ and Szobathely 2030		
Good practice 2 Reshoring decision framework (Brookings)				
Type 2	Value chain mapping / competitive advantage for in shoring and re-shoring	1). Follow up actions (deeper analysis, identification of structural collaboration & development opportunities) of the value chain mapping of the ICT & health sector done during the BRIDGES project additional activities. 2) Project (-s) to mapping regional competitive advantage of selected value chains and liaise with EU value chains for further development.	1) Interregional innovation investment (13) sector-taraged options. 2) ALSO RECOMMENDED Open call across Hungary. Open call can be thematic or sector-based. Criteria of the call to be co-agreed.	1) Transnational and interregional Interreg programme options; 13 calls; 13-related initiatives as they are forthcoming (e.g. EC Innovation pilot). 2) ALSO RECOMMENDED: EADIOP +
Good practice 3 Reshoring decision framework (EPRS)				
Type 2	Regionally based soft landing services (competence building and specialisation of intermediaries to effectively support re-shoring and in-shoring)	The aim would be further developing already existing services inside PBN and resuring market linkages: - Providing a test environment for product development validation of new products before market introduction - Supporting research and development of prototypes to help renew the elderly care at home - Demonstration environment and trainings: the showroom of PBN's unit AT.HOME, which lists more than 50 digital solutions, AT.HOME staff presents practical and modern solutions in a thematic, interactive way. - connect relevant regional SMEs to the demanded services, project proposals	1) The results obtained during the BRIDGES value chain analysis and the 1st activities carried out by AT.HOME (PBN's healthcare focused testing facility) will be included in the so-called Integrated Urban Development Strategy of the City of Szombathely through the proposal of PP7 towards the City Council. The elaboration of this strategy will be started in Autumn 2022 and it is connected to the Szombathely2030 strategy of the City of Szombathely. (Type 2 policy impact). PBN as regional development organization, intermediary and contracted partner of the City of Szombathely will be direct contributor to this Urban Strategy.	Interreg and / or 13 calls
Good practice 4 The use of 3D printing in manufacturing: The case of Inertia Racing Technology				
Type 1	Branch-based feasibility studies helping businesses re-define their business concept to re-shoring. As preconditions for re-shoring business and research projects, for the sports equipment sector and stressing utilisation of 3D printing.	STEP 1 Participate in the development of new types of business plans and feasibility studies, beyond labour costs (comparative advantage). These new types of business plans are industry related, automation related, green deal related and access to research related.	In Szombathely 2030 business plan it is already included : 1.1. Settlement of healthcare enterprises: - Creation of a favorable environment for manufacturing companies connected to the health industry, education and scientific life based on a production orientation, and on the other hand, encouraging the introduction of new production systems by companies already producing In order to attract the above actors to Szombathely, a complex program of activities must be implemented, which includes, in addition to the available investment areas, the appropriate scientific and training background, digitalization services (robotization, automation, artificial intelligence). In this concept it is outlined that the businesses have to redefine their scopes to connect to health industry. On the other hand in Autumn 2022 the City of Szombathely will start to draft the so-called Integrated Urban Development Strategy of the City of Szombathely in which regionally competent organisations will contribute (also PBN) in which also industry and research related concept will be drafted.	Several connected centers, testing places and labors are planned in this concept with the cooperation of regional and national actors and with the involvement of actors from abroad. Their realization will be financed mainly from e.g. - Competitive Hungary Operational Program; - HORIZON, - Interreg; - Business Development and Innovation Operational Program
Type 1	Business plans implementing primarily re-shoring and in-shoring business plans based on the respective feasibility studies; for the sports equipment sector and stressing utilisation of 3D printing.	STEP 2 Open calls for implementing the above business plans. It requires existing or strat up businesses to be also involved.	Open call across Hungary. Open call can be thematic or sector-based. Criteria of the call to be co-agreed.	EADIOP +
Good practice 6 BLAKATU programme (direct incentives to promote re-location and near-shoring)				
Type 1	Collaboration with clusters (this is aligned with GP3)	OPTION 3 (counting from GP3 suggestions) PBN is certified as industrial intermediary in the ICT/ health care sector and introduces network-based development with counterparts across the EU.		Interreg and / or 13 calls
Type 2	Thriving companies' needs (this is aligned with GP2, option 1)	Negotiate direct subsidies with Hungarian Investment Promotion Agency (HIPA) for FDI investing in establishing local Centre for high tech and / or education in the ICT/health care sector: The program is focusing on the establishment of a Regional Research and Development Centre in Szombathely , with special focus on research, education and product development focusing on elderly care and rehabilitation. The aim is to realize special product development projects like Exoskeleton development mentioned in Value chain mapping. This Centre will be the new home of PBN, AM-LAB and AT.HOME and several R&D companies. On base of a global market research the complete business plan (activity field, services, employees, financing, cooperating partners) of the Centre has been elaborated in the last few months by Pannon Business Network and external expert and now the next step is to discuss the financing of building the Centre. In September or October this year PBN is going to negotiate this program with the representative of the Hungarian Investment Promotion Agency (HIPA) to gain FDI investment support to realize the establishment of this centre. One other component of this Centre is planned to be financed from IPCEI support, the application has been submitted Spring this year.	The plan of the Center is demonstrated in the Szombathely2030 strateg of Szombathely City	Support of Hungarian Investment Promotion Agency (HIPA)and IPCEI
Good practice 7 Exploring the impact of inter-regional linkages on regional diversification in Europe in the context of smart specialisation.				
Type 2	Network (at least 3) feasibility studies to identify complementary technologies for joint development; important for coordinated near-shoring with in-shoring	Agreeing interest of at least 2-3 regions in shared value chains; joint projects for identification of technological complementarities as per the Ballard & Boschma methodology.		Interreg and / or 13 calls
LEGEND				
(*): Type 1 = new projects; Type 2= improvement of the policy instrument management; Type 3= new policy instrument		(**): PP2/LP Kainuu; PP4 Helsinki-Uusimaa; PPS Western Macedonia; PP6 Western Slovenia; PP7 Western Transdanubia		

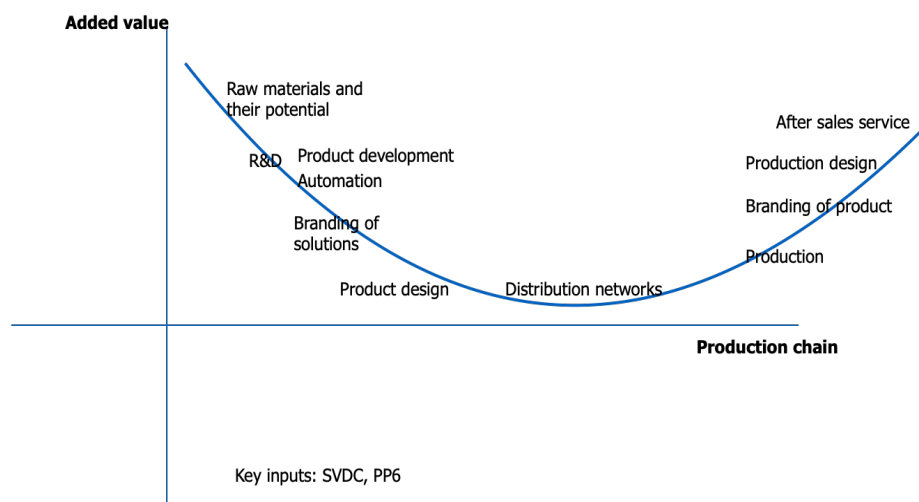
5. Conclusions

The BRIDGES project additional activities were designed to address regions' resilience in the context of the COVID19 impact. The focus was on two questions: (i) can we strengthen regional resilience through value-chain policies and projects, and how can this be achieved? and (ii) what types of interregional exchanges would naturally ensue from the value-chain approach. During the first quarter of 2022, a new historical conjecture reinforced the importance of localised natural resources, of acknowledging the inevitability of trans-regional collaborations, and the value of predictable and effective value-chain based collaborations.

The key finding confirmed that regions' resilience will be reinforced through re-orientation of economic activities towards more manufacturing localisation, combined with digital and green transition objectives, and stronger trans-regional interactions. In some cases, the relevance of national (vs strictly regional) innovation systems is reinforced by re-industrialisation and as a way to address critical mass restrictions, access to immediate supply & demand markets, leading to overall intensification of interactions.

A second finding has been the evolution of the value chain smiling curve.

Figure 5 A re-interpretation of the smiling curve



A third finding relates to the economic model that evolves. Achieving bottom-up transformative growth related to RIS3 is about localising science & research – to-economy practices and competences. To some regions, this implies radical transformation, i.e. changes in what & how they produce; to other regions, it implies specialisation of what they produce. There is a cross cutting dimension however: regional contexts may be different, but they all need to speak the same language when it comes to RIS3 and innovation-based growth. It implies that RIS3-transformative growth is an optimisation between local economies of scale and economies of scope. Linkages between the two, especially resource and competence linkages provide a base

<http://www.interregeurope.eu/bridges/>

of relatedness smoothing transformative efforts. Research indicates that density of relatedness (and especially that of skills) is important, too⁴³. Location quotient and shift share analyses, interpreted at different territorial levels and involving different types of industry and/ or knowledge concentrations, as well as the interactions between them, can help position regions' interests & emerging potential. Value-chain based development can be instrumental for making this optimisation game work and interregional collaboration based on competitive advantage, is essential part of value chain collaborations. In this effort, it is a requirement to link different growth opportunities, leading to growth continuities. For example, mainstreaming to regional initiatives and projects the results of Horizon / IPCEI / ERA / national research excellence efforts, appears essential. To this direction, the recently introduced New European Innovation Agenda is an essential, cross - cutting enabler: The New European Innovation Agenda will, inter alia, "help create **"regional innovation valleys"** that will strengthen and better connect innovation players through Europe, including in regions lagging behind; improve the policy framework through clearer terminology, indicators and data sets, as well as **policy support to Member States**⁴⁴." Further research confirms the potential for cumulative growth effect based on trans-regional flows. "Removing borders among countries in the area enhances scale economies due to a large market for inputs and goods, both within regions and across Central European area regions. This paper identifies untapped potentials by looking at the missed regional GDP growth due to the inefficient exploitation of regional growth assets. Results hint at a complex and heterogeneous spatial distribution of untapped potentials, involving several growth factors⁴⁵".

In the medium and longer run, interregional systems of innovation will ensue. In them, innovation leader regions can benefit from the demand-led approach by turning compliance (to new regulations, anticipated market trends) into opportunity (innovations, new products, new knowledge). Innovation strong, moderate and emerging regions can benefit from demand-led profiled opportunities and development of methods for spreading and uptake of innovations.

Finally, a fourth finding, thanks to the partners' detailed good practice selection and regional policy instrument improvement recommendations, is a provisional roadmap to support the activation of the value chain-based approach in regions. The emphasis is on development actions, maybe indicative of the early stage of value-chain based policies adoption: institutionalisation, competitive advantage and

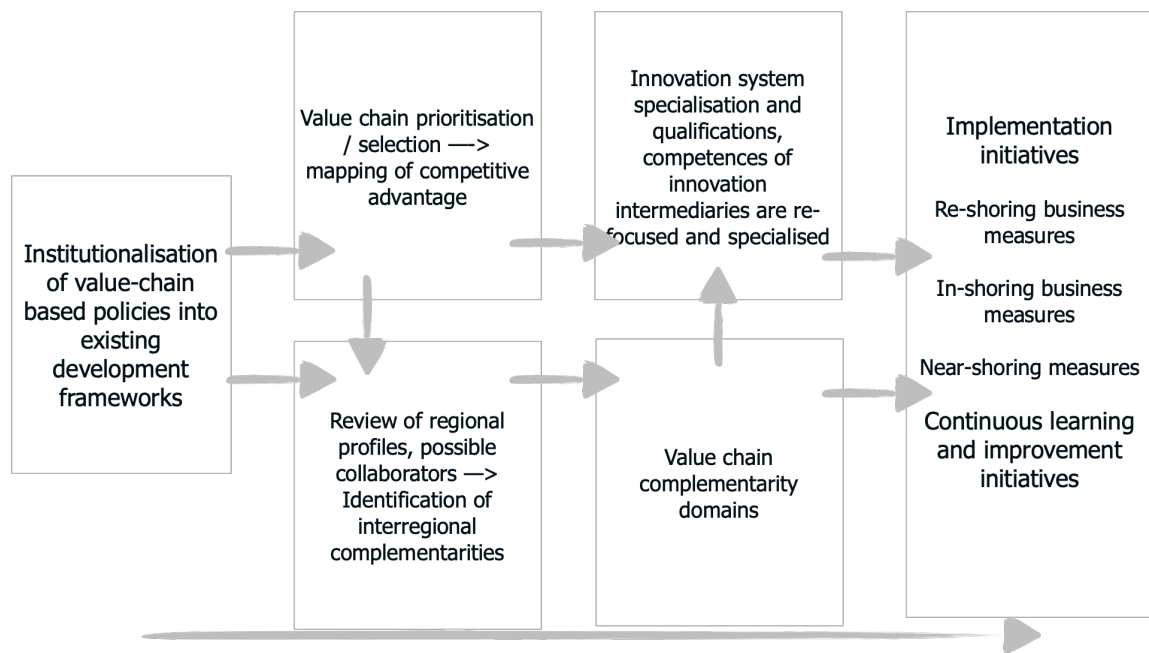
⁴³ Lahdelma, T. (2022). Localized labour flow networks in knowledge-intensive industries. *Journal of Regional Science*, 1– 28. <https://doi.org/10.1111/jors.12609>. From the Abstract: "The results from the analysis of various tie formation processes reveal that the formation of a link by interorganizational employee mobility within an integrated labour market area is more likely between organizations geographically closer to each other, all else being equal. The findings highlight the importance of local density for the job search process".

⁴⁴ European Commission, Directorate-General for Research and Innovation, *A new European innovation agenda*, Publications Office of the European Union, 2022, <https://data.europa.eu/doi/10.2777/066273>. Adopted on 5.7.2022. The five objectives of the agenda are to help companies scale up; enable experimentation and public procurement; strengthen innovation ecosystems; foster talent; and improve policymaking tools. https://ec.europa.eu/info/research-and-innovation/strategy/support-policy-making/shaping-eu-research-and-innovation-policy/new-european-innovation-agenda_en.

⁴⁵ Caragliu, A. (2022). *Better together: Untapped potentials in Central Europe*. © 2022 The Author. *Papers in Regional Science* published by John Wiley & Sons Ltd on behalf of Regional Science Association International. *Pap Reg Sci.* 2022;1– 35. <https://rsaiconnect.onlinelibrary.wiley.com/doi/epdf/10.1111/pirs.12690>.

complementarity identification, implementation of development initiatives and ensuring continuous learning. Identification of competitive advantage and sector or technology-based complementarities lead to localisation of industrial policy and enhancement of the place-based approach. Continuous learning and complementarity & insight building are also crucial. We have tried to sum up these findings in Figure 5 below. We feel these issues deserve further researching.

Figure 6 A provisional road map to reinforce value-chain based policies



6. Annex: regional case studies

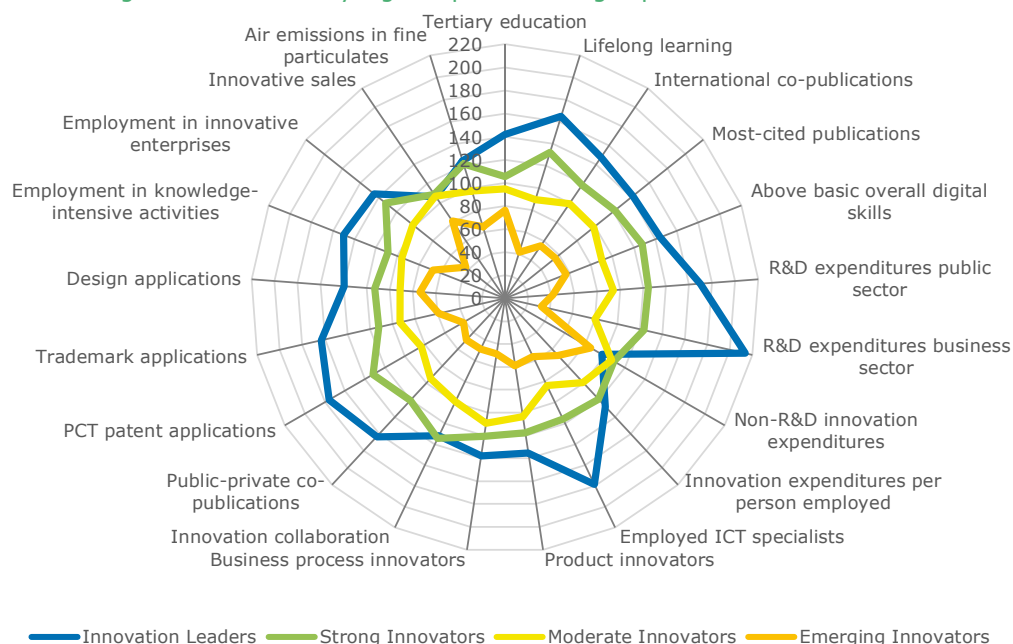
Regional case studies of the policy instrument improvement recommendations reports are accessible through the links in Table 14 below. Together with the good practice report (https://projects2014-2020.interregeurope.eu/fileadmin/user_upload/tx_tevprojects/library/file_1659251514.pdf) and the value chain mapping reports (<https://projects2014-2020.interregeurope.eu/bridges/library/> → *BRIDGES additional activities, value chain mapping*), they form the evidence base for the formulation of the present document.

Table 18 Policy instrument improvement recommendations, access to the regional case studies

Policy instrument improvement recommendations	
Region	Link
Kainuu, FI	https://projects2014-2020.interregeurope.eu/fileadmin/user_upload/tx_tevprojects/library/file_1661155644.pdf
Helsinki-Uusimaa, FI	https://projects2014-2020.interregeurope.eu/fileadmin/user_upload/tx_tevprojects/library/file_1660729456.pdf
Western Macedonia, GR	https://projects2014-2020.interregeurope.eu/fileadmin/user_upload/tx_tevprojects/library/file_1660982662.pdf
Western Slovenia, SI	https://projects2014-2020.interregeurope.eu/fileadmin/user_upload/tx_tevprojects/library/file_1660982662.pdf
Western Transdanubia, HU	

Figure 6 and Table 18 open, for individual regions, references made in Table 12. They summarise how, for each individual region, the good practice selection is reflected in the policy improvement recommendations and the corresponding funding sources.

Figure 7 Average indicator scores by regional performance group⁴⁶



⁴⁶ European Regional Innovation Scoreboard 2021_ETBC21001ENN.en. Page 17. "Average scores for each performance group relative to the EU average (=100). Scores calculated excluding countries for which statistical regions at NUTS 1 and NUTS 2 do not exist (Cyprus, Estonia, Latvia, Luxembourg and Malta). Scores have been corrected, since the average of the unweighted group averages is either above or below 100 for all indicators.⁶ The correction makes sure that this average is equal to the EU average of 100. Full details are provided in the RIS 2021 Methodology Report [<https://ec.europa.eu/docsroom/documents/45972>]".

Table 19 Average indicator scores by regional performance group⁴⁷

	Innovation Leaders	Strong Innovators	Moderate Innovators	Emerging Innovators
Population aged 25-34 having completed tertiary education	142	105	95	76
Population aged 25-64 participating in lifelong learning	165	132	89	42
International scientific co-publications	148	118	99	55
Most-cited scientific publications	142	122	99	56
Individuals who have above basic overall digital skills	145	128	90	57
R&D expenditures in the public sector	170	125	94	42
R&D expenditures in the business sector	214	124	80	32
Non-R&D innovation expenditures	97	109	107	86
Innovation expenditures per person employed	128	119	99	68
Employed ICT specialists	179	116	84	56
SMEs with product innovations	135	118	103	59
SMEs with business process innovations	138	121	109	49
Innovative SMEs collaborating with others	132	134	99	48
Public-private co-publications	163	121	95	49
PCT patent applications	176	132	84	42
Trademark applications	163	112	93	59
Design applications	140	113	91	74
Employment in knowledge-intensive activities	150	109	96	67
Employment in innovative SMEs	145	132	102	43
Sales of new-to-market and new-to-enterprise innovations	107	109	107	81
Air emissions in fine particulates (PM2.5) in Industry	125	122	97	65

⁴⁷ Ibid., previous.

7. Contributions

1. Regional Council of Kainuu, PP2/LP (Jouni Ponnikas, Ninetta Chaniotou)
2. Regional Council of Helsinki – Uusimaa, PP4 (Ari Lainevuori, Venla Virkamäki)
3. ANKO, PP5 (Tasos Sidiropoulos)
4. Sočča Valley Development Centre, PP6 (Miro Kristan)
5. Pannon Business Network, PP7 (Andrea Kurucz, Balázs Barta, Robert Nemeth)