Smart specialization strategies

advancing regional innovation policies

Dominique Foray (Ecole Polytechnique Fédérale Lausanne & BAKS3)

From idea..

Smart specialisation in a truly integrated research area is the key to attracting more R&D to Europe

Dominique Foray and Bart Van Ark

There are concerns expressed at different levels in Europe about the increasing numbers of European companies basing their R&D operations outside Europe, at the same time as the number of overseas companies carrying out their R&D in Europe is falling. This phenomenon of the 'internationalisation' of R&D does not necessarily have to be negative for Europe, say an influential group of economists, advising the European Science and Research Commissioner, Janez Potočnik. But if Europe is to benefit from this increasing trend, it has to make fundamental changes to the way in which R&D is organised there. The creation of truly European centres of excellence will be of more benefit in the long-run than each individual country having low-level expertise in a full range of scientific areas.

R&D has become a global game. There is a perception in Europe, borne out to some degree by recent surveys, that European companies are increasingly looking outside Europe for their R&D, and overseas companies are less and less inclined to base their R&D in Europe. Studies by the OECD and other international organisations show that between 1995 and 2003, there was an increase in US R&D investment in countries like China and India, at Europe's expense. Surveys about European and US managers' anticipations of their next location decisions tell us the same story (see figure 1).

Decisions about where to base research capacities are primarily made according to the availability of new ideas and technologies, highly skilled human resources and academic collaborations. While these resources are increasingly flexible and mobile, where they move to is far from random. Star scientists will move to where they can work with other star scientists, or with high-tech firms. Corporate R&D will gravitate to strong universities. Innovation service providers will appear close to large R&D companies. This is called an *agglomeration* process, and it gives rise to benefits for those participants that are in a position to profit from the pool of talents, ideas, services, and infrastructures that accumulates in that particular region. This in turn acts as a powerful force in attracting new R&D capacities from foreign countries.

Therefore, if Europe is to be a serious competitor in the global game of R&D location, policies need to be adapted to the rules of that game. There are two main areas in which Europe is hampered in its efforts to attract international R&D.

26

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3 - Smart Specialisation: The Concept

Dominique Foray[15], Paul A. David[16] and Bronwyn Hall[17]

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Rationale for invigorating the R&D specialisation policy discussion

Addressing the issue of specialisation in the R&D and innovation is particularly crucial for regions/countries that are not leaders in any of the major science or technology domains. Many would argue that these regions/countries need to increase the intensity of knowledge investments in the form of high education and vocational training, public and private R&D, and other innovation-related activities. The question is whether there is a better alternative to a policy that spreads that investment thinly across several frontier technology research fields, some in biotechnology, some in information technology, some in the several branches of nanotechnology, and, as a consequence, not making much of an impact in any one area. A more promising strategy appears to be to encourage investment in programs that will complement the country's other productive assets to create future domestic capability and interregional comparative advantage. We have termed this strategy "smart specialisation."

Smart specialisation is expected to create more diversity among regions than a regime in which each region tries to create more or less the same in an imitative manner. The latter would almost certainly result in excess correlation and duplication of R&D and educational investment programs, which in turn would diminish the potential for complementarities within the European knowledge base. It is both an idea and a tool to help regions or countries to answer this critical question about their respective (and unique) positions in the knowledge economy.

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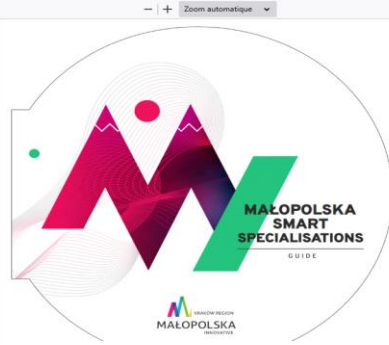[17] Professor at the University of California at Berkeley and Professor of Economics of Technology and Innovation at the University of Maastricht, Netherlands.
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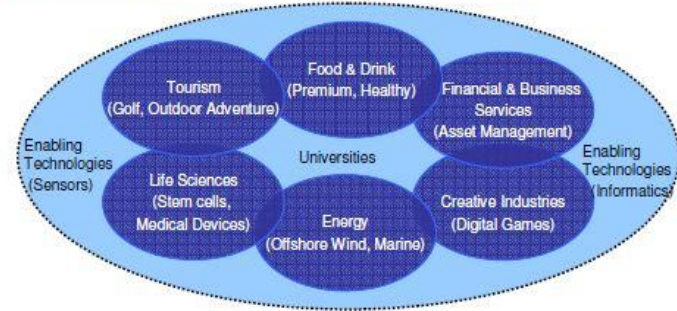http://ec.europa.eu/invest-in-research/monitoring/knowledge_en.htm

.. to impact

GIPPSLAND Smart Specialisation
Developing and implementing an approach to regional innovation and development in Gippsland, Victoria (2018-2020)

MAŁOPOLSKA SMART SPECIALISATIONS GUIDE
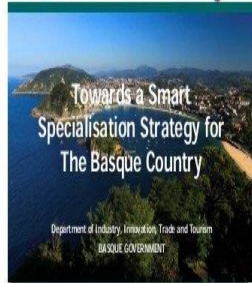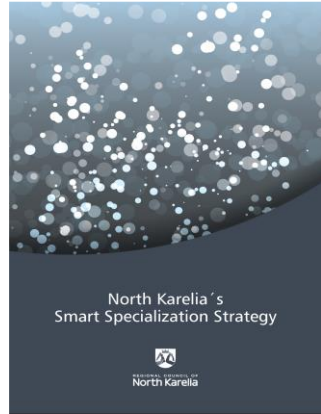MAŁOPOLSKA

Scotland's smart specialisation strategy focuses on

Tourism (Golf, Outdoor Adventure)
Food & Drink (Premium, Healthy)
Financial & Business Services (Asset Management)
Enabling Technologies (Sensors)
Universities
Life Sciences (Stem cells, Medical Devices)
Energy (Offshore Wind, Marine)
Creative Industries (Digital Games)
Enabling Technologies (Informatics)

Our niches within each of these (examples in brackets)

Towards a Smart Specialisation Strategy for The Basque Country
Department of Industry, Innovation, Trade and Tourism
BASQUE GOVERNMENT
Warsaw (February 2012)

North Karelia´s Smart Specialization Strategy
REGIONAL COUNCIL OF North Karelia

Smart Specialisation Strategies
Region Värmland
AER

DIRECTIONS IN DEVELOPMENT
Countries and Regions
Smart Specialization in Croatia
Inputs from Trade, Innovation, and Productivity Analysis
Arabela Aprahamian and Paulo Guilherme Correa, Editors
WORLD BANK GROUP

estrategia RIS3 Extremadura
Estrategia de Investigación e Innovación para la Especialización Inteligente de Extremadura

SMART SPECIALISATION STRATEGY OF MONTENEGRO 2019 - 2024
Montenegro Ministry of Science
S.me

CAMPANIA
Smart Specialization
RIS③
STRATEGY

S3 as a central pillar of innovation policy for strengthening regional innovation systems – (EC Communication – **A New European Innovation Agenda)**

S3 competences and knowledge are now highly decentralized – no longer concentrated in a few places – there is now a thick market for S3 expertise (Technopolis, Prognos, VDI, E&Y, more) - The Commission is investing a lot in supporting S3 practices and infrastructures (metrics, CoPs, etc..)

S3 is going global – many countries outside Europe and International Organizations commitment (OECD, WB, WIPO)

We have learned a great deal about policy design and implementation
For example: *Implementation of S3 in Portugal: an assessment,* Laranja, Edwards, Pinto & Foray, 2020

S3 – the script
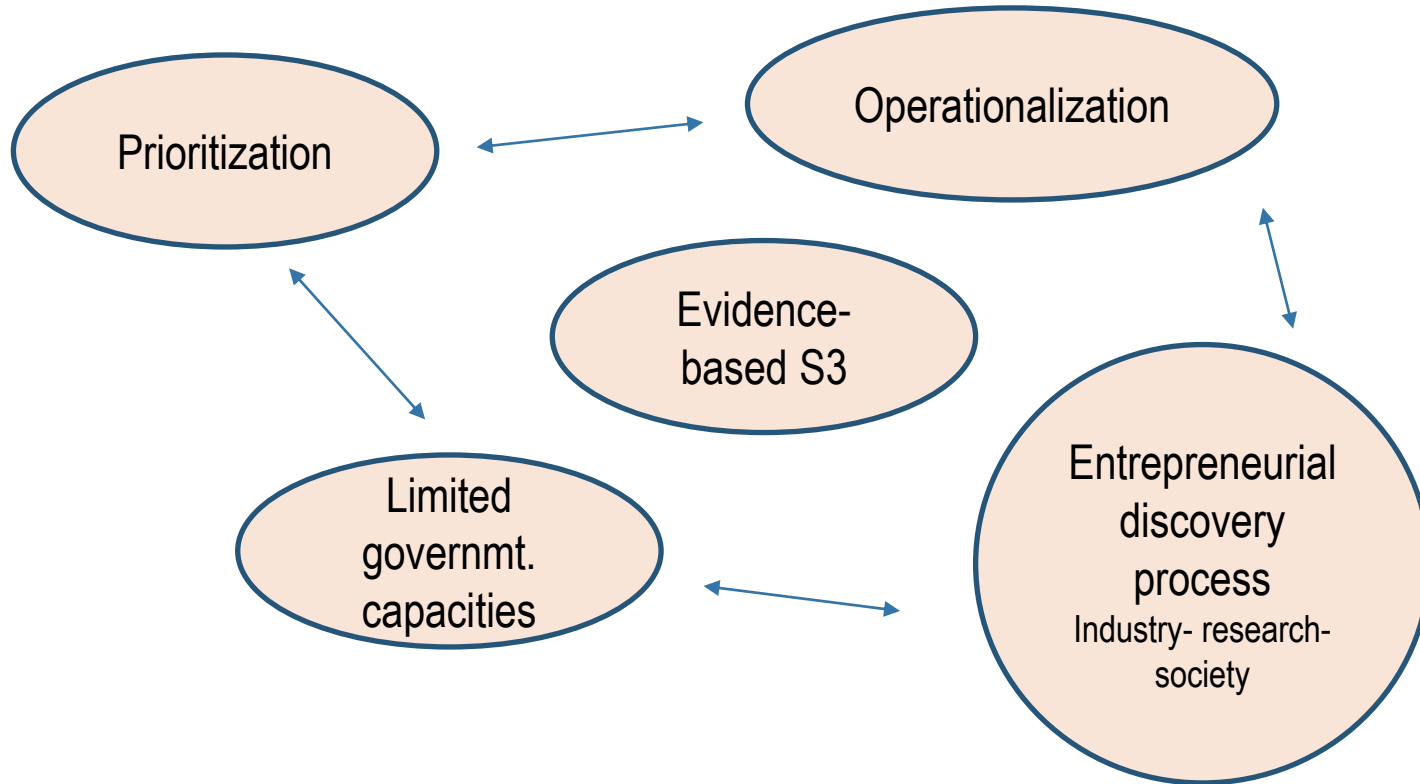
Prioritization – why and how?

Why?

Prioritization allows in most (medium-sized and small) regions for concentration of resources – a condition to benefit from potential agglomeration, synergies and spillovers. It is not efficient to spread too thin, trying hard to cover all fields to some degree

Innovation support systems need to be very specific – medtech versus foodtech versus videogame – but the Government cannot address all specific issues for all industries: choices are inevitable

Make the best use of prioritization - knowledge and experience acquired in choosing the right priority areas will be valuable for carrying out the subsequent stages (*Enos*)

Prioritization – why and how? *Cont.*

How?

Priorities are built on and are related to existing capacities and potential opportunities – avoid the "'another biotech cluster" syndrom – related diversification or transformation (*Boschma & Frenken*)

Priorities are vertical – they target specific industries, firms, research

> Some industries are more important for Region X
>
> Again : innovation support systems need to be industry-specific (*Hausmann and Rodrik*) and horizontal policy (by definition) cannot capture industry-specific issues

Azores: Agriculture, livestock and agri-business

> Fisheries and sea
>
> Tourism

Priorities are not on industries but on the transformation of these industries – **picking changers!**

Establishing a circular economy in the food industry

Make use of the available assets and resources (firms, research of the regional food sector)

Target a specific industry (food)

Identify a vertical transformation (a circular economy for the whole value-chain),

Norte – Symbolic capital, technologies and tourism services

Operationalisation

Once a priority has been established – associating one (several) industries with a transformational goal

Provide the specific inputs (skills, knowledge, services) needed to undertake innovative activities according to the priority

Support the concentration of resources and relational density because innovative activities have scale and agglomeration economies – "pulling SMEs", "involving large companies", "promoting partnerships"

Design solutions to coordination problems : platforms for services, incubators to support entrepreneurships, consortium for transfer of technologies

All these policy actions aim at increasing the chance of micro-systems of innovation to be formed within the priority area to achieve the desired transformation

Networks of complementary actors and entities emerge temporarily to solve specific innovation problems

Can the Government do all of this?

There is no such thing as an ominiscient planner *(Rodrik, Sabel)*

Government has limited capacities to address innovations in specific sectors to achieve specific transformations

Innovation is uncertain and can't be planned (*Rosenberg*)

The informational requirement (to provide specific inputs and solve specific coordination problems) is out of reach

Entrepreneurial discovery process

Bottom up and decentralized process through which stakeholders and government engage in strategic interactions to elicit informations about needs, gaps, opportunities and identify the policy actions in response

Given the priority area – *establishing a circular economy in the food industry* – the EDP will uncover a collection of complementary activities dealing with training and skills, R&D, technology adoption, specific infrastructures and services

The target transformation can't follow a path decided from the top

EDP is not just "nice to have" – it is a necessary step – should not be viewed as an administrative obligation but as a crucial policy practice

EPFL

Planning

EDP

Innovation for a sustainable food system

Process development in food and packaging

Transformational goal is translated into a transformational roadmap

EDP

Two logics: Planning and bottom up discovery - It is the combination of the two policy that constitutes the S3 trademark – S3 is neither absolute top down nor total bottom up

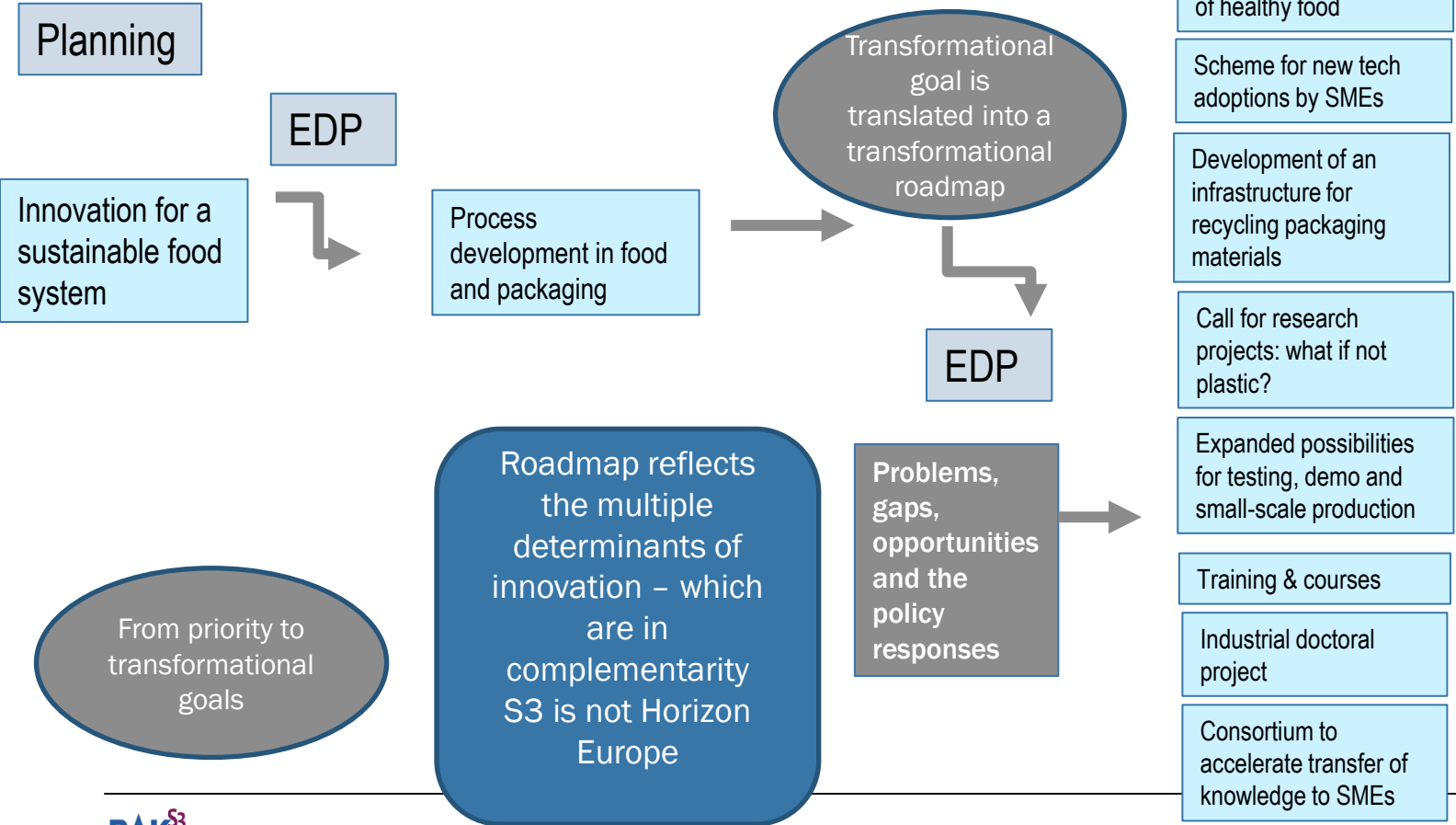From priority to transformational goals

Problems, gaps, opportunities and the policy responses

Provision of audit and expertise for certification of healthy food

Scheme for new tech adoptions by SMEs

Development of an infrastructure for recycling packaging materials

Call for research projects: what if not plastic?

Expanded possibilities for testing, demo and small-scale production

Training & courses

Industrial doctoral project

Consortium to accelerate transfer of knowledge to SMEs

BAK S3
ASSOCIATION

Planning

Innovation for a sustainable food system

EDP

Process development in food and packaging

Transformational goal is translated into a transformational roadmap

EDP

From priority to transformational goals

Roadmap reflects the multiple determinants of innovation – which are in complementarity S3 is not Horizon Europe

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EPFL

S3 – some debates

EDP and the usual suspects
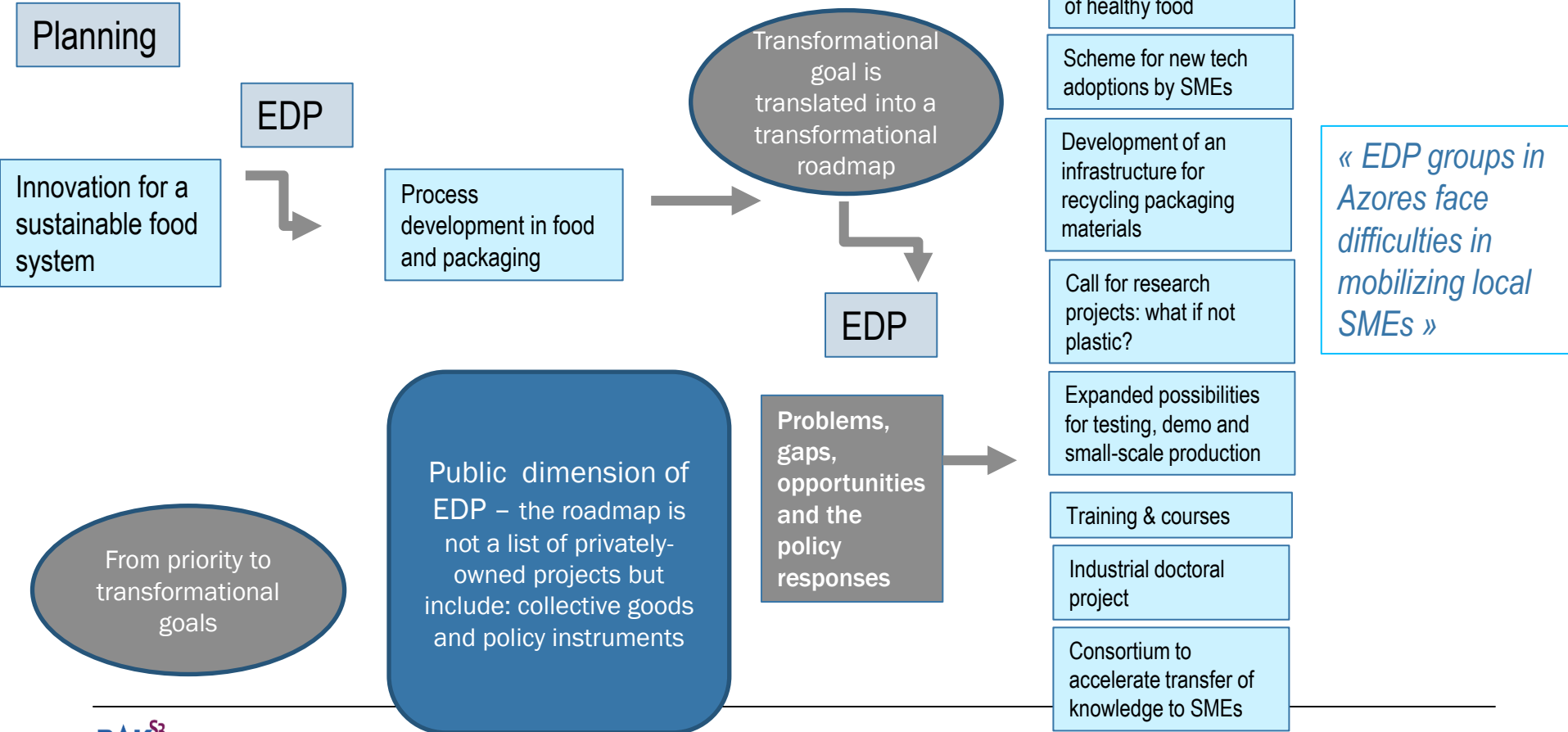
S3 and directionality

S3 priorities target vertical transformations

EDP and the usual suspects!
Two problems:
How to avoid policy capture?
How to include SMEs?

EDP and the usual suspects!

EPFL

Planning

EDP

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Public dimension of EDP – the roadmap is not a list of privately-owned projects but include: collective goods and policy instruments

From priority to transformational goals

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« EDP groups in Azores face difficulties in mobilizing local SMEs »

BAK S3

S3 approach has, by design, directionality properties

Prioritization provides great latitude and leeway to regional stakeholders for identifying priorities which are relevant to grand challenges

And actually this is what happened

EPFL

- Analysis of **1240** priorities from **185** EU regional S3

- Matching procedures between key topics of the twin transitions and the priorities

- Significant overlaps between topics of the twin transition and priorities:

- **> 700** out of total number of priorities have a connection to the topics (69%) and 20% of priorities are classified as highly relevant
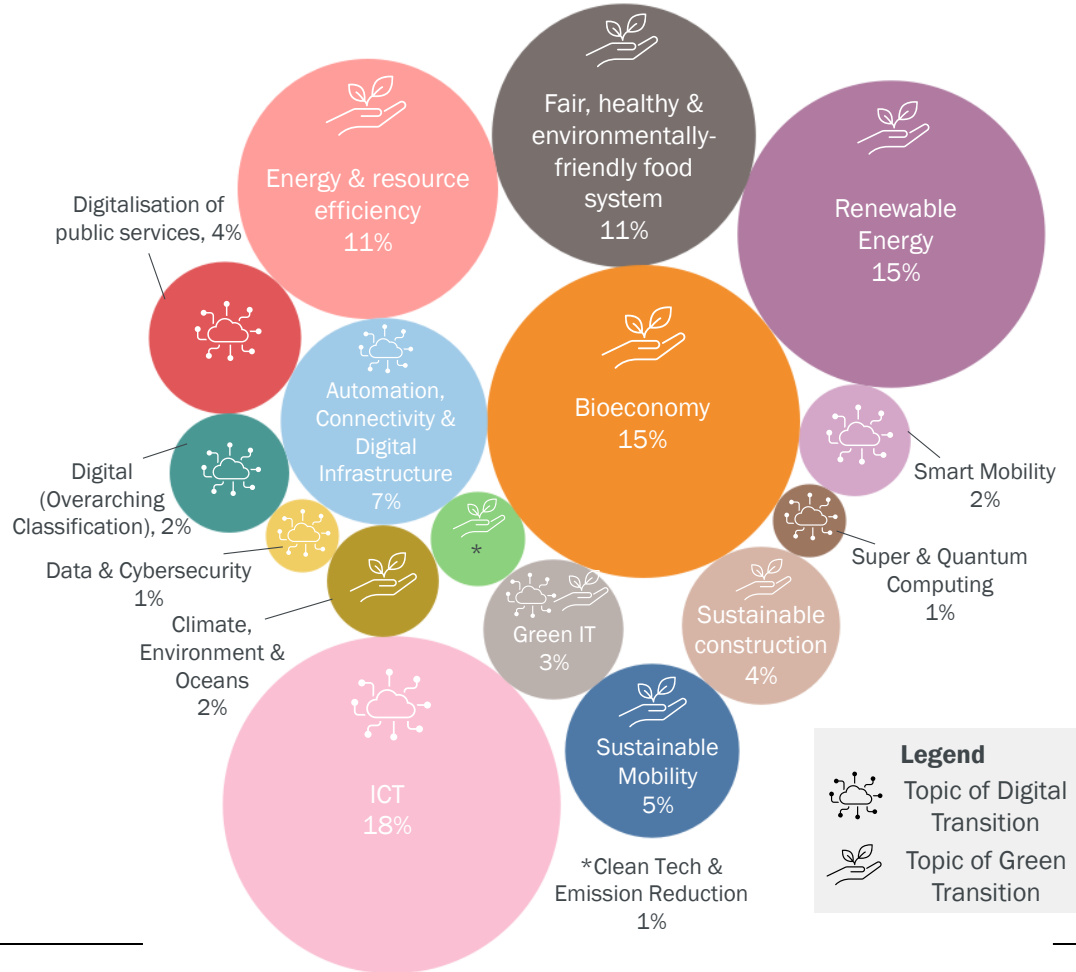

Green Transition		Digital Transition	
Bioeconomy	Circular Economy	Artificial Intelligence	Automation, Connectivity & Digital Infrastructure
Clean Tech & Emission Reduction	Climate, Environment & Oceans	Blockchain	Data & Cybersecurity
Energy efficiency & resource efficiency	Renewable Energy	Digital Skills	Digitalisation of public services
Sustainable Construction	Sustainable Mobility	Hardware	ICT
Fair, healthy & environmentally friendly food system		Smart Mobility	Super & Quantum Computing
		Digital (General Classification)	
Green IT			

Source – Prognos and Foray, 2023

BAK S3

Share of topics among priorities of high relevance with regard to the twin transition

Source : Prognos & Foray

EPFL

- Analysis of **49,749** projects: **71% (35,157)** are linked to the topics of the green and digital transition
- 36% of projects connected to priorities with high relevance

- There is a great overlap between the 185 strategies and the topics of the green and digital transition
- *Even though the original S3 was not initially designed with a strong green focus in mind, many regions have successfully used the S3 approach to promote innovation for green transformation (JRC)*
- S3 provides the rationale (prioritization) and the toolkit for policy makers to address grand challenges and transitions at regional level

EPFL

Digitalisation of fisheries

EDP 1

Digitalisation of tourism

EDP 2

Digitalisation of agrofood

EDP 3

« The regional governmt created three thematic wg..these groups are very active in identifying project ideas and proposals »

Digital transformation

Horizontal policy?

How specific issues could be captured and how the EDP would work?

Conclusion

What does S3 bring to regional policy?

A vertical policy which supports structural transformations and relies on EDP to discover transformational goals, problems and opportunities and the policy responses

New policy narrative

> An innovative policy design – combines planning and bottom up discovery
>
> Place-based innovation policy – differentiation and concentration
>
> Vertical transformation – pick changers

Not just a R&D policy (another Horizon Europe) but a development policy involving all determinants of innovation & productivity and addressing complementarity and coordination issues

The opportunity for regions to associate their important sectors with transition/sustainable goals – this allows regions to use S3 and EDP to manage their transitions

What did we learn?

- Complex approach, difficult to handle, *not ready to wear* but *haute couture*

- S3 as novel policy narrative – the design and implementation concept: planning and EDP –S3 allows regions to drive transitions

- S3 demands high engagement and competences by the public sector and public agencies – and high commitment from relevant stakeholders

- But such challenges is also its strength: if well designed and implemented - S3 can mobilize a regional economy and society around a unique project of transformation and transition

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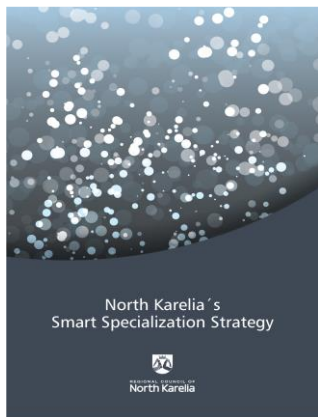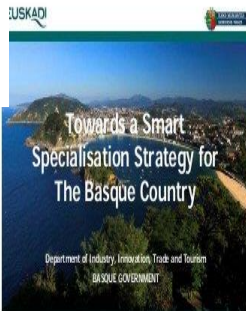
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DIRECTIONS IN D...
Countries and Region...

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Merci!