Policy brief

# The potential of smart specialisation for driving structural transformation and transition at regional level



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# Argument

S3 is not just a policy instrument – such as R&D subsidies or tax credit or the patent system. It is a general approach to the problem of structural transformations of regional economies.

At the origin of the concept (Foray et al., 2009) was the idea to change the main policy mindset which was predominating by this time in regional policymaking: Most regions tried to specialize in the same trendy areas even if there was no specific assets and capacities in the region that could justify such a choice – a process where poorly differentiated regions competed for the same resources, so that as a result very few regions were able to have any impact (the "another biotech" syndrome). Instead of such sheep-like behaviour, every region was advised to i) generate a vision of its future domains of transformation and diversification, based on its specific capacities and opportunities; ii) translate this vision into a few **priority areas**; and iii) concretize these areas in terms of projects, actions and policy initiatives as identified through a bottom-up process of entrepreneurial discovery.

The S3 concept was, thus, adopted by the European Commission as a central approach for its regional and cohesion policy. Clearly, the first period of S3 implementation in the EU and the feedback and learning processes derived from this unique policy experiment allows to better understand what kind of policy design can be effective to generate structural transitions and strategic initiatives. This is reflected in a large consensus in European policy circles that "*smart specialisation strategies are the EU's principal methodology for reinforcing national and regional innovation ecosystems*" (EC, 2022).

Based on the Prognos & CSIL empirical study on prioritisation in S3[1], we argue that the prioritisation logic – if properly applied – makes S3 approach very well fitted to the problem of addressing grand challenges and critical transitions at regional level. In other words**, the S3 approach has by design some directionality properties.**

Indeed, any S3 process starts with the setting up of priorities which associate sectors and transformational goals – for example establishing a circular economy in the food industry. Through this prioritization phase, policy makers and stakeholders are able to provide **a direction** – e.g., a transformational goal – for their strategy. And in most cases of regional S3, these directions have some relevance with both the green and the digital agenda of the EU. The findings of the Prognos & CSIL study are striking: «*with more than 700 out of 1018 (69%) priority areas of the 185 S3 in the EU, a majority of the priority areas have a connection to the topics of the green and digital transition*» (ibid., p.65). **So, in principle S3 can deliver directionality.**

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[1] Prognos AG & CSIL (2021): Study on prioritisation in Smart Specialisation Strategies in the EU. Study on behalf of the European Commission. Available under: https://ec.europa.eu/regional_policy/en/information/publications/studies/2021/study-on-prioritisation-in-smart-specialisation-strategies-in-the-eu (last access 24.03.2023)

# A brief glimpse of the methodology

The collection and identification of priorities is based on the information collected from the S3 strategies, additional documents, and interviews with managing authorities. General information was collected with regards to the S3 strategy (name, budget, etc.), the priority areas (number, description, etc.) and the Governance/EDP. The information was collected for all 185 identified S3 strategies with the help of an online survey tool, which included a customized survey.

Based on this approach, a comprehensive prioritisation database covering all Member States/regions and the S3 strategies was established. In total, 185 S3 are included in the database. For each priority area, basic information is provided on the corresponding region, priority area name, and priority area description. The latter consist of keywords extracted from the strategy document.

To assess the opportunities related to the green and digital transition, the S3 prioritisation database first needs to be screened and the priorities need to be examined regarding their relevance to the Green and Digital Transition. Thereby, the understanding of the Green and Digital transition follows the descriptions laid out by the European Commission in central documents. At the heart of the Green Transition is the European Green Deal which aims to address the challenges of climate change and environmental degradation by making Europe carbon-neutral by 2050, fostering green technologies, reducing pollution, and creating sustainable industries and transport. The digital transition on the other hand follows the objectives of exploiting digital growth potentials and using innovative solutions for businesses and citizens as well as improving the accessibility and efficiency of public services.

To assess the S3 priorities regarding their relevance to the Twin Transition first an ontology of this concept was constructed.

Figure 1 below shows the identified topics of the topics related to the green and digital transition. These topics cover, for instance, "Bioeconomy" and "Renewable Energy" for the green transition as well as "Artificial Intelligence" and "Smart Mobility" for the digital transition. One topic ("Green IT") is related to both concepts.

**Figure 1: Overview of topics of the green and digital transition**

| 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 AG/Foray (2023).

These ontologies for topics relevant to the green and digital transition were matched with the S3 priority database that was constructed in the predecessor study. Thereby, the descriptions of the 1,240 priority areas of the 185 S3 of the different Member States and regions were matched following a word embedding approach.

Finally, S3 priorities are classified in terms of high, medium and low relevance vis à vis the matched topics of the Twin Transition. Criteria of relevance includes relevant keywords and similarity to the topics of the Twin Transition.

# Findings – contribution of S3 to the Twin Transition

The analysis shows that with **more than 700 out of 1,018 (69%) priority areas[2] of the 185 S3 in the EU a majority of the priority areas have a connection to topics of the green and digital transition**. This demonstrates the potential of S3 to contribute to the Twin Transition. As described above these connections between the S3 priorities and the topics of the green and digital transition were further classified regarding their relevance. As illustrated in Figure 2 below 20% of the identified linkages between S3 priorities and topics of the Twin Transition are classified as having a high relevance. 14% of the identified linkages are classified as having a medium relevance and with 66% most of the linkages show a low relevance to the topics of the Twin Transition. These linkages are scrutinised in more detail in the following thereby examining the correspondence of the priorities to the specific topics of the Twin Transition.

**Figure 2: Identified linkages between S3 priorities and topics of the Twin Transition, by their relevance**
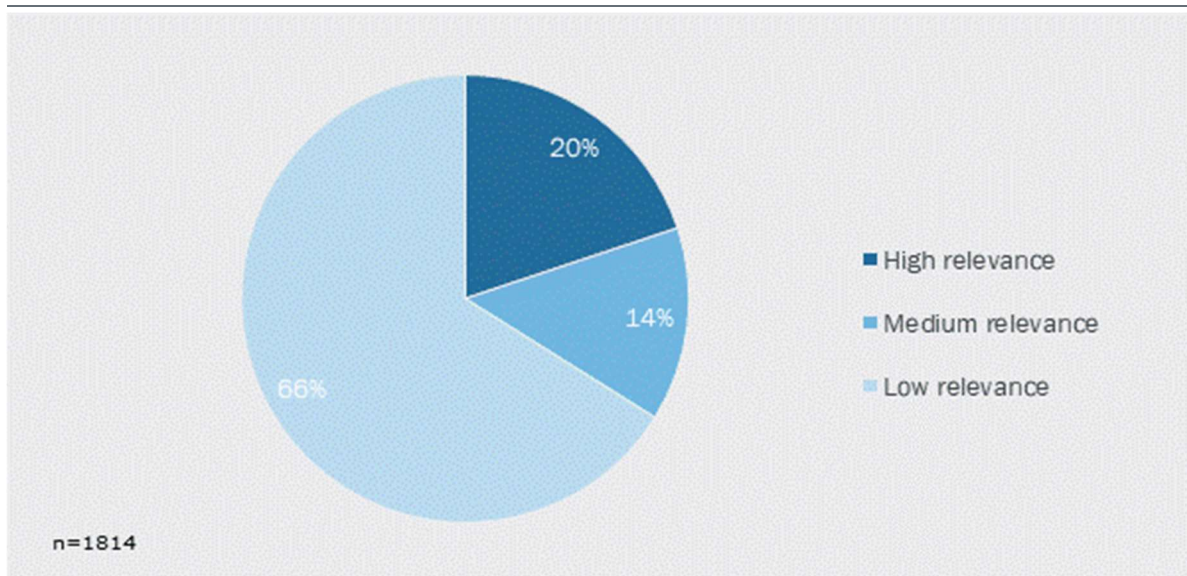


Source: Prognos AG/Foray (2023); n=1814 matches from 702 priority areas. One priority area can have multiple references to topics of the Twin Transition. If a region had updated its strategy during the period 2014-2020, only the updated strategy is included in the analysis.

Figure 3 displays the shares of identified references with a high relevance between S3 priorities and topics of the Twin Transition. Overall, 275 priorities show a high relevance to the topics of the green and digital transition. The majority of the identified links with a high relevance concern topics of the green transition (63%) compared to topics of the digital transition (34%). It is important to highlight that one priority area can have references to several topics of the Twin Transition. For instance, the priority area "Intelligent systems and digital data value chain" of the French region Midi-Pyrénées has strong references to both "ICT" and "Automation, Connectivity & Digital Infrastructure". Many of the strong references between the S3 priorities are found in the topics "ICT" (18%), "Bioeconomy" (15%), "Renewable Energy" (15%), "Fair, healthy & environmentally-friendly food system" (11%), "Energy efficiency & resource efficiency" (11%) and "Automation,

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[2] If a region had updated its strategy during the period 2014-2020, only the updated strategy is included in the analysis.

Connectivity & Digital Infrastructure". These results are in line with the shares of overarching topics addressed by priority areas that were elaborated on in the predecessor study. There the most addressed topics are "Agrofood & Bioeconomy" as well as "ICT" & Industry 4.0".

Other topics of the green and digital transition such as "Sustainable Mobility", "Data & Cybersecurity" or "Climate, Environment & Oceans" show less frequently a high relevance for the S3 priorities. Some topics (e.g., "Artificial Intelligence", "Blockchain", "Circular Economy") do not show a high relevance in the 185 S3 at all.

**Figure 3: Topics of the Twin Transition addressed by S3 priorities, by share of identified references with high relevance**
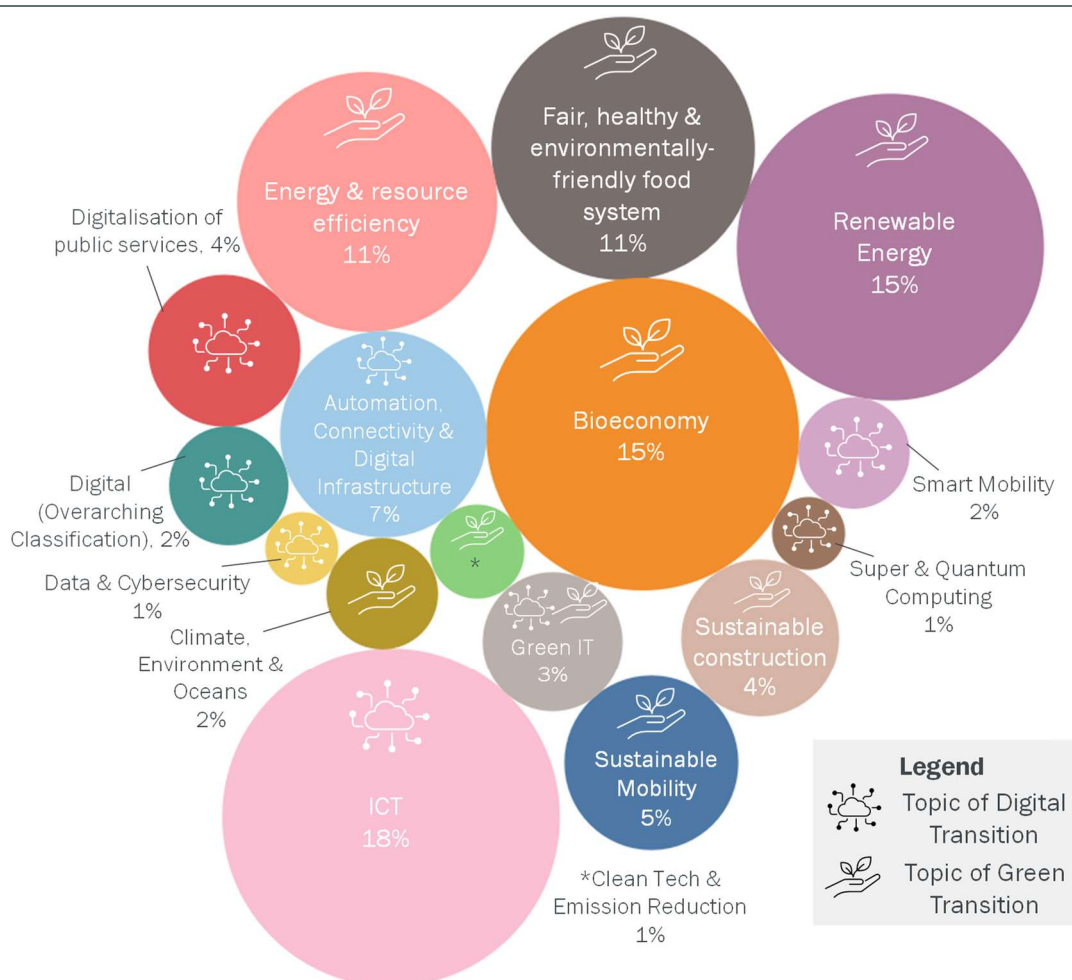


Source: Prognos AG/Foray (2023); n=361 matches with a high relevance from 275 priority areas. One priority area can have multiple references to topics of the Twin Transition. If a region had updated its strategy during the period 2014-2020, only the updated strategy is included in the analysis.
Note: No matches with a high relevance for "Artificial Intelligence", "Blockchain", "Circular Economy", "Digital Skills" and "Hardware".

This changes when examining the S3 priorities that show a medium relevance to topics of the Twin Transition. Regarding the priorities with a **medium relevance** to the Twin Transition 214

priority areas are characterised by a medium correspondence to these topics. Similar to the priorities with a high relevance here topics of the green transition (64%) are more frequently addressed compared to digital topics (31%). Regarding the specific address topics of the Twin Transition are more mixed picture emerges with the topics "Fair, healthy & environmentally-friendly food system" (20%) and "Energy efficiency & resource efficiency" being most frequently addressed. The other identified references with a medium relevance are distributed relatively homogenous among the diverse topics of the green and digital transition with shares between 0.4 and 8%.

# A divine surprise!

At the time of its "invention", the S3 approach was not conceived to support regions in managing green transitions and transformations. The approach was proposed to help regions to gain competitive advantages by transforming and diversifying a few important sectors of the considered regional economy through innovation and capabilities' building. The identified priorities (such as transforming industry X or Y) were then concretized within the framework of the process of entrepreneurial discovery (Foray et al., 2009).

However, because the principle of prioritization remains intact after almost one decade of implementation, it becomes obvious that such principle can be used by regions to conduct their structural transformations towards green and digital trajectories of development.

As argued by the JRCs – *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* (Gianelle et al., 2017).

A "good" S3 priority associates one (or several) sector(s) and a transformational goal. The empirical findings presented here show clearly that a vast majority of regional policy makers have smartly used the opportunity offered by S3 to conduct their green and digital transitions by associating the important sectors of the regional economy with sustainable development and/or digitalization goals.

## Conclusion and future challenge

The S3 concept is, thus, a good narrative for policy-makers at both regional and national level. The message is that the new generation of innovation policies need to manage the tension between top-down prioritisation and bottom-up decentralised actions through an efficient and effective policy design. S3 is characterised by a high level of intentionality and strategic focus and involves, thus, a planning component. However, the planning logic of S3 needs to be complemented by a bottom-up process of entrepreneurial discovery to identify specific problems, gaps and opportunities that a top-down plan cannot capture. Planning and bottom-up discoveries are, thus, the two inseparable logics of S3 policy. This is a precious design which can provide regional governments and public agencies with the appropriate toolbox to manage difficult structural transitions and transformations towards sustainable and/or digital goals.

However, the fact that the S3 approach allows policy makers and stakeholders to establish priorities which are of great relevance as regarding critical transition goals does not mean that the transition process will occur: Generating priorities is one thing, building a transformational roadmap and implementing it through the deployment of the right policy tools is another thing. For example, poorly designed *calls for projects* (as a central policy tool) are hampering effective transitions and transformations in spite of relevant S3 priorities. Here we open the next and urgent agenda which is to raise policy awareness about the importance of designing calls properly so that the target transformation or transition will be effectively executed. This is an important agenda so that the S3 approach can deliver the directionality and transformation properties which are potentially part of its design concept but not always realized.

## References

European Commission (2022) *Communication – A new European Innovation Agenda,* COM(2022) 332

Foray, D., David, P.A. and Hall, B. (2009) S*mart Specialisation: the concept*, Knowledge for Growth, European Commission, Brussels

Gianelle, C., Guzzo, F. and Mieszkowski, K. (2019) *Smart Specialisation from concept to practice: a preliminary assessment,* JRC Policy Insight, JRC116297

Prognos AG & CSIL (2021) *Study on prioritisation in Smart Specialisation Strategies in the EU,* Study on behalf of the European Commission

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