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# **New Dynamics of STI policy in Europe: Missions and Transformative policy for Grand Challenges**

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## Contents of my presentation

- The STI policy in European countries and EU are increasingly focusing on missions and transformative innovation policy for addressing grand challenges.
- This ‘problem-oriented’ focus requires a new approach.
- Missions are ‘actionable’ and transformative innovation is about impact and effective transformation.
- Besides STI policy for curiosity, and for industrial competitiveness, we have also STI policy for missions solving complex problems.
- Two dimensions of these policies are relevant:
  - How to design new STI policy instruments
  - How STI policy can be implemented: Looking at capacity of public sector organizations



# Background information: what are grand challenges?

- Wicked (complex) problems
- Long-term
- Market and non-market aspects
- Technology is not the only aspect: solutions are also about changing behavior



# SUSTAINABLE DEVELOPMENT GOALS





## Novelties in STI policy: Missions and transformation

- It is about STI policy contributing to address grand challenges.
- It is about transforming current socio-technical systems towards concrete solutions: f.ex phasing in zero-emissions fuels and phasing out fosile fuels, providing medicines to neglected diseases, etc
- Pendulum between: general enabling technologies vs. more specific combinations of knowledge and technologies, hence, need to embed R&I into sector policies.
- STI policy becomes more embedded in sector policies. F.eks. Transport, energy, etc.



# Implementation is crucial: Impact is the main focus

- Putting STI policy to solve grand challenges....is not easy:
- Is about defining specific goals (missions) – setting clear and piecemeal goals
- This requires the interaction of many different actors (public actors, private, private-not-for-profit, civil society)
- It is also about addressing the risks and opportunities, and the tensions related to overcoming path dependencies (not least incumbents opposition).
- Creating suitable policy instruments
- Designing suitable policy mixes
- Securing the capacity of public sector organizations to deliver



## **Two dimensions:**

Design of policy instruments

Public sector organizations' capacities



# Dimension 1: STI policy instruments

- Traditional policy instruments in STI policy are about funding.
- In a grand challenge context, these policy instruments need to be designed in a wider manner:
  - Inclusive – new actors beyond traditional research performers
  - Long-termed and ambitious targets
- Recent empirical findings:
  - The OECD "STIP COMPASS" database on policy instruments:
  - In depth comparison of policy instruments





## The OECD database: Examples of grand challenge-oriented policy instruments

Country	Instrument Name	Description	Objectives	Types of R&I actors targeted
USA	US Global Development Lab	The US Global Development Lab seeks to increase the application of science, technology, innovation and partnerships to accelerate the Agency's development impact in helping to end extreme poverty and promote inclusive economic growth. (...)	The Lab brings together a diverse set of partners to find new innovations, tools and approaches to solve development challenges more effectively and sustainably. The Lab serves as a central hub for shared learning on science, technology, innovation and partnerships, and its works across USAID and (...)	Researchers; Civil society
Sweden	Challenge-Driven Innovation	The Challenge-Driven Innovation (CDI) programme aims to contribute to a significant increase in sustainable growth by transforming and utilising sector-wide innovation in new processes, products and services that meet specific social needs	The programme funds projects of international eminence and develop sustainable solutions to tackle key societal challenges.	Researchers; Firms and Entrepreneurs; Civil Society
Turkey	Healthcare-Related Industries Structural Transformation Program	National transformation program within the scope of the Tenth Development plan, which is dedicated to establishing a production structure that may produce products with high added value, provide products and services to global (...)	This program aims to transform to a production structure that may produce products with high added value, provide products and services to global markets and fulfil a larger portion of the domestic requirement for human medicinal products and medical devices (...)	Researchers; Firms and Entrepreneurs; Capital and Labour



**Article Howoldt & Borrás :  
"Innovation Policy Instruments for Grand Challenges"**

<https://doi.org/10.1080/13662716.2022.2112397>

- We have studied Grand Challenge-oriented instruments in the OECD database
- We have studied in particular the targeted groups of these policy instruments.
- We found that:
- Despite the advancement of the GC policy rationale, there is only partial consistency with the design of its policy instruments:
- We have identified a positive association between GC instruments with 'wide constellations' of R&I actors; but
- civil society actors play a subordinate role in those constellations.

## Article Borrás & Schwaag-Serger:

### ”The design of transformative R&I policy instruments for grand challenges”

<https://doi.org/10.1093/scipol/scac017>

Country	Hosting agency	Program	Annual budget	Program Objective
Denmark	Danish Innovation Fund	Grand Solutions Program (2015)	100 m €	<i>”collaborative projects based on excellent research with clear focus on solutions of great value for Danish society”.</i>
Finland	Academy of Finland	Flagship Program (2018)	13 m €	<i>“supports future knowledge and know-how and sustainable solutions to societal challenges and advances economic growth by developing new business opportunities”</i>
Norway	Research Council, Enova and Innovation Norway	Pilot E (2016)	12 m €	Accelerate development and implementation of new products and services in environmentally friendly energy technology to contribute to reduced emissions in Norway and internationally
Sweden	Vinnova	Challenge-driven innovation program (2011)	23 m € 2017	collaborative projects which seek to provide solutions to societal challenges and thus contribute to the SDGs in Agenda 2030



## **Borrás & Sylvia Schwaag Serger**

We have studied the extent to which the 4 Nordic GC-oriented programs are ‘nested’ in a consistent manner in relation to the expectations of transformative policy rationale:

- Directionality
- Experimentation
- Embedded in policy mixes
- Cross-agency collaboration
- Epistemic boundary spanning
- Wide stakeholder involvement
- Flexible time-frame for funding

We have found that two of the programs are weakly nested (Denmark and Finland), and two are medium nested (Norway and Sweden).



There have been defined 5 missions (2021-27) to deliver solutions to Grand Challenges:

1. Adaptation to Climate Change including Societal Transformation
2. Cancer
3. Healthy Oceans, Seas, Coastal and inland Waters
4. Climate-Neutral and Smart Cities
5. Soil health and Food



## What are missions in the EU?

Are about pooling the necessary resources in terms of funding programs, policies and regulations, at EU, national, regional and local levels of government.

Are about mobilizing society and private actors, such as research institutes, farmers and land managers, entrepreneurs and investors to create real and lasting impact.

Are about creating solutions: not only knowledge, but its uptake and impact.



Each mission has the following governance structure:

**Mission Manager:** a EU-Commission coordinator (civil servant)

**Chair of mission board:** A high level politician (politician)

**Mission board:** An expert committee formed by 10 members appointed as individual experts

But their implementation varies: f.ex. The city mission:

- Is being coordinated by “NetZeroCities” (a network of networks, by EIT Climate-KIC)
- 100 Cities have been selected on the basis of their “Climate City Contracts”
- They can apply for EU funding in Horizon Europe (transport, energy, etc)



# Dimension 2: The capacity of public sector organisations for implementing

- Public sector organisations are entrusted to create change and address grand challenges, but do they have the capacity to do so?
- Engage and active mobilise resources and skills at organizational level, not only policies and policy mixes.
- Not only about new knowledge and technologies, but it is about transforming socio-technical systems and breaking technological path dependencies.





# **”CAPACITOR”**

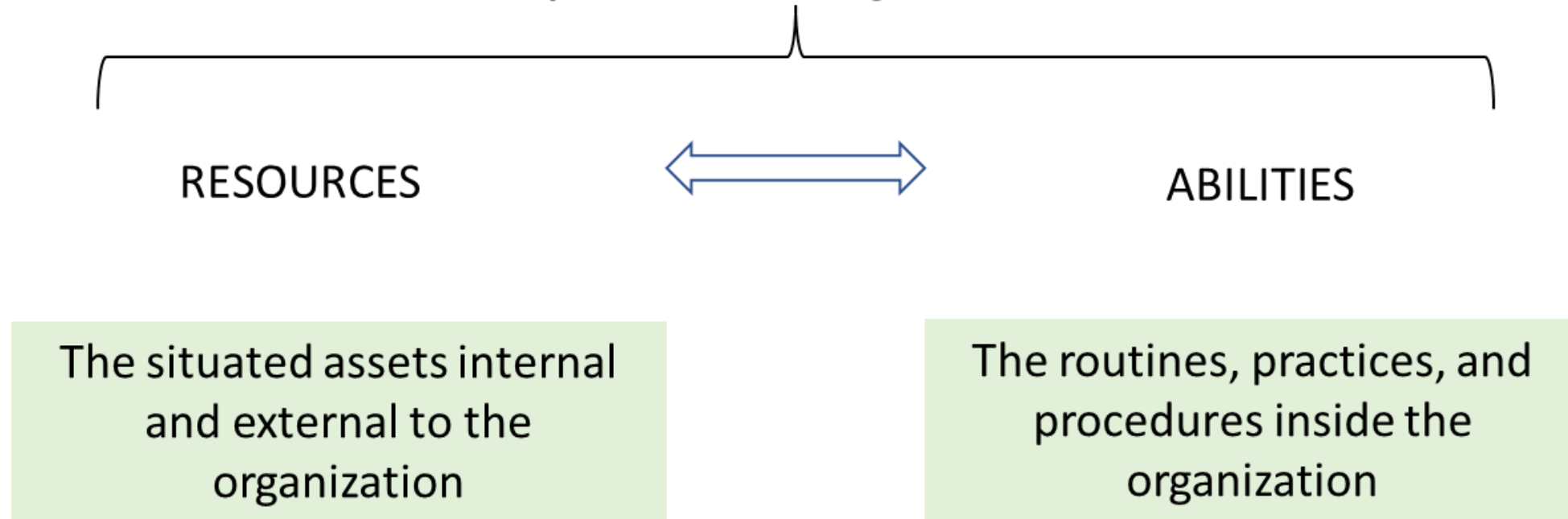
**is a research project at  
Copenhagen Business School  
about green technologies in sustainability  
transitions**



- Public actors (municipalities, national agencies, public utilities) are key actors in the governance of socio-technical change towards green transitions.
- However, the governance of that socio-technical change towards green transitions is complex (coordinating many stakeholders, creating market and institutional contexts for investments, adapting standards and safety regulations, etc.).
- What are the capacities of public actors? How are those capacities developed & used?

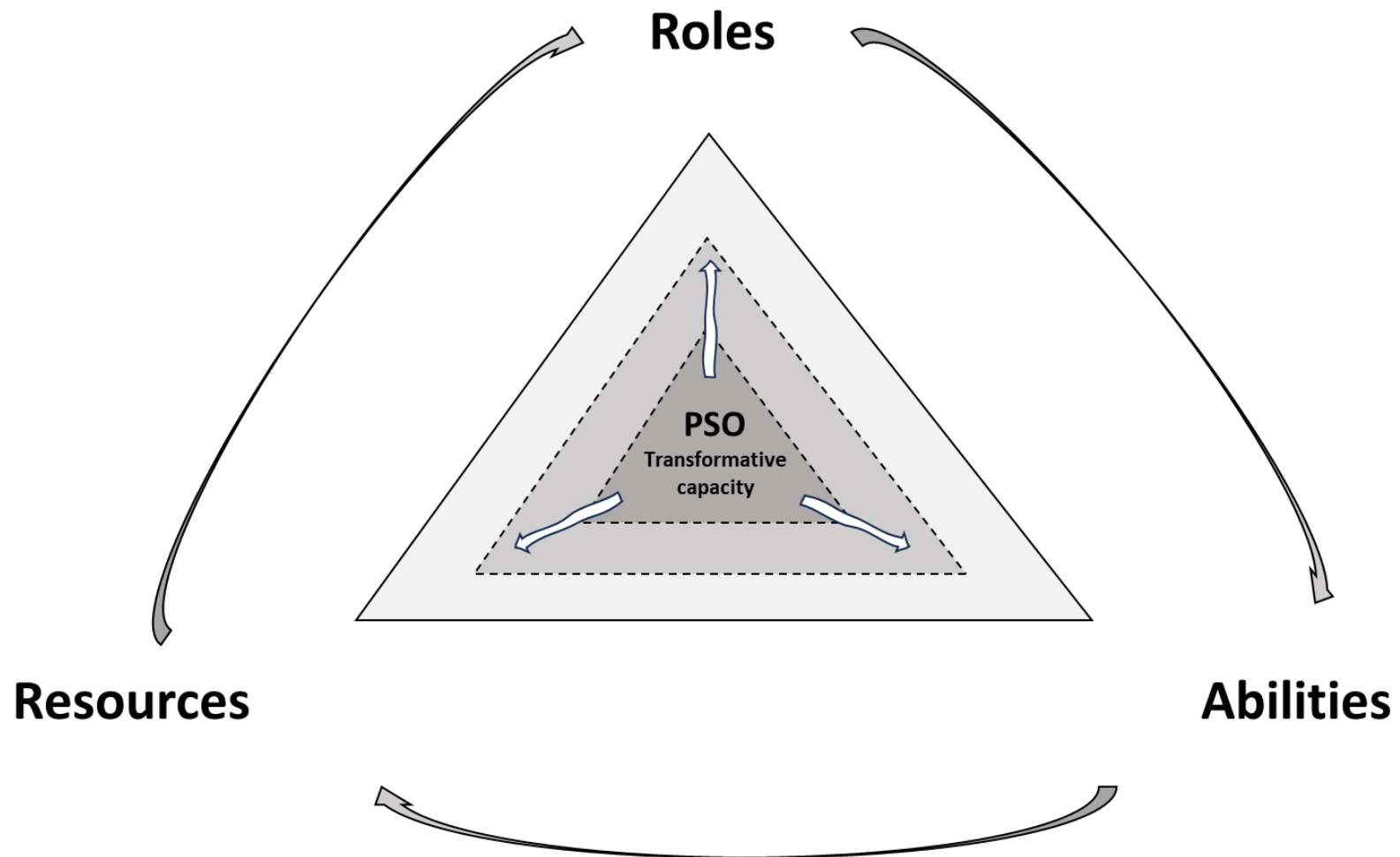


## THE CAPACITY of public sector organizations





<b>Resources</b>	<b>Roles</b>	<b>Abilities</b>
<i>Assets internal and external to the organization:</i>  Natural, human, financial, knowledge, legitimacy, mandate, network, cultural	<i>Tasks performed by the organization enacting institutional work:</i>  Maintaining institutions, changing institutions, disrupting institutions	<i>Organizational abilities or competences (practices and routines):</i>  Analytical abilities, coordination abilities, operational abilities, learning abilities





## Summing up

- STI policy missions for addressing grand challenges are about transformation
- This requires thinking how to implement the missions in an ‘actionable’ manner.
- Need to focus on two aspects of implementing missions:
  - The design of suitable STI policy instruments towards addressing grand challenges
  - And building the capacities of public sector organisations to make this happen.



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**Thank you!**

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