



Societal challenges as a driver for innovations

-

The Nordic Region – an attractive place for advanced businesses?

**Helsinki
2018-05-23**

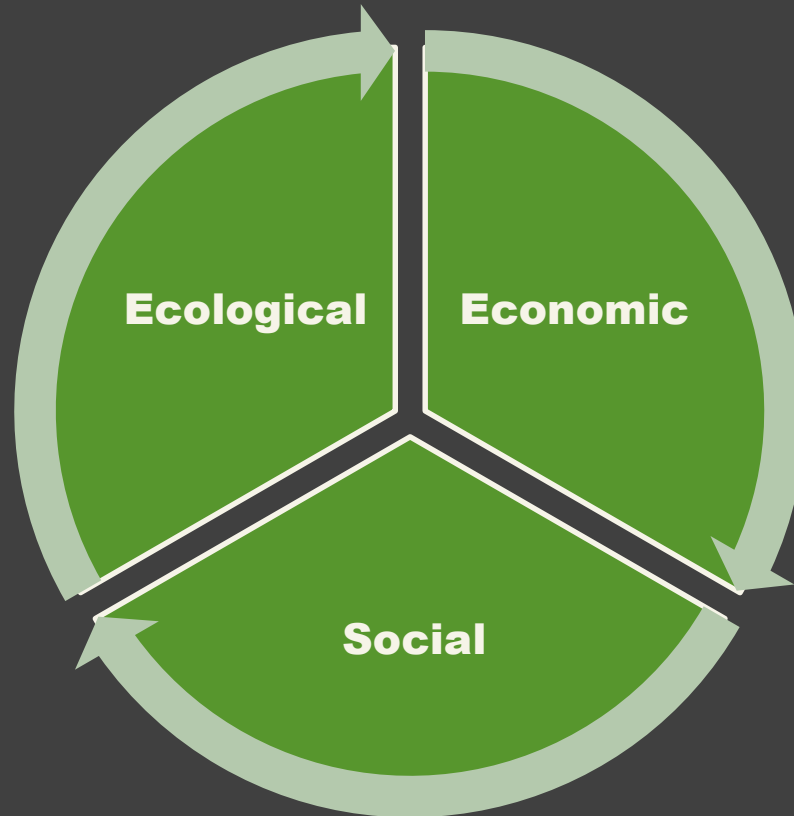
Göran Marklund

Strategic Focus



Sustainable Growth – Catalyzing virtuous cycles

Attractive places for business!





Health



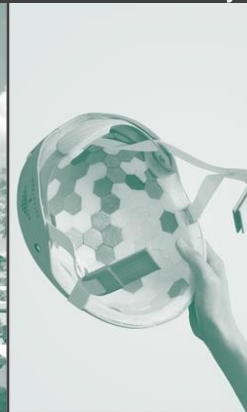
Connected Industries and New Materials



Smart Sustainable Cities



Circular and Biobased Economy



Smart Mobility and Transports



Research and Innovation

Projects, Clusters, Programs



Public Innovation Governance

Production, Procurement, Management



Smart Regulations

Laws, Rules, Incentives

Challenge Driven Innovation

2009 →



2011 →



Characteristics for Challenge-driven Innovation



**Societal
challenges**



**Challenge-driven
innovations**



**Cross-sectorial
collaborations**



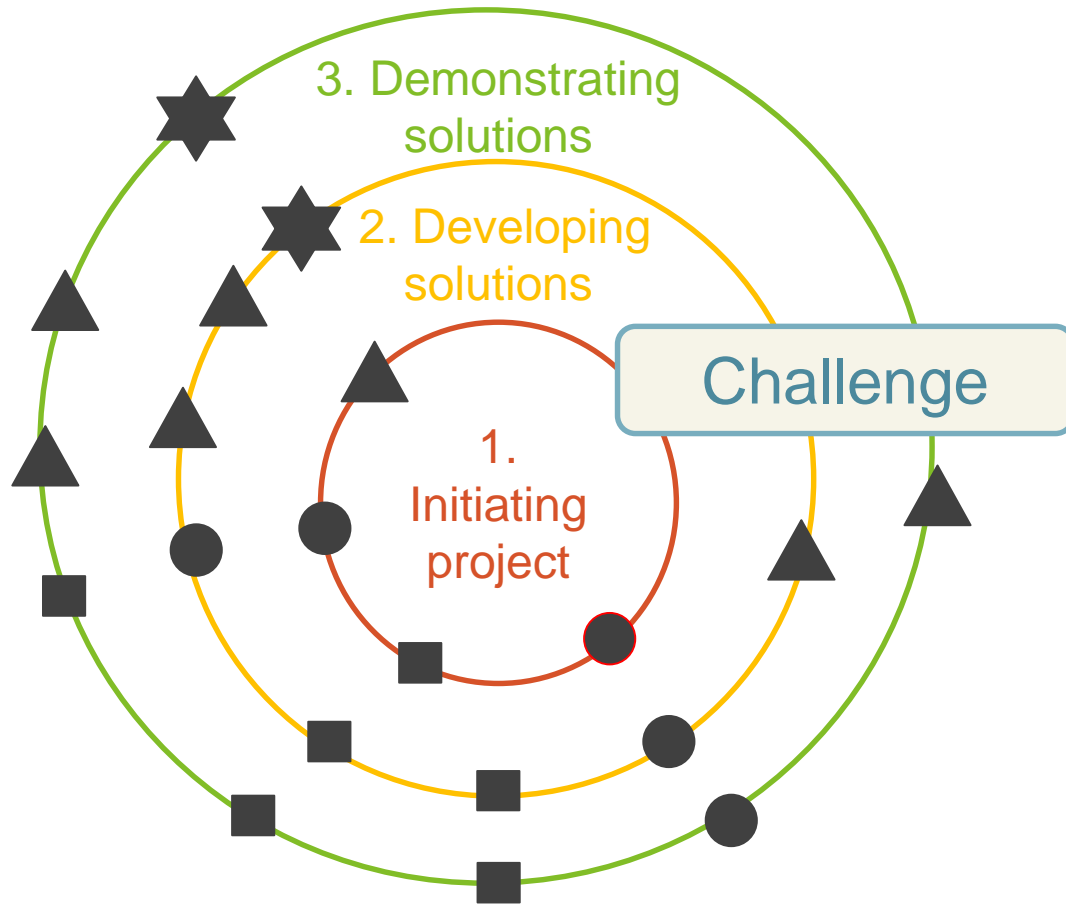
**International
ambitions**



**Potential for
systemic
transformation**



**Gender equality as
key factor**

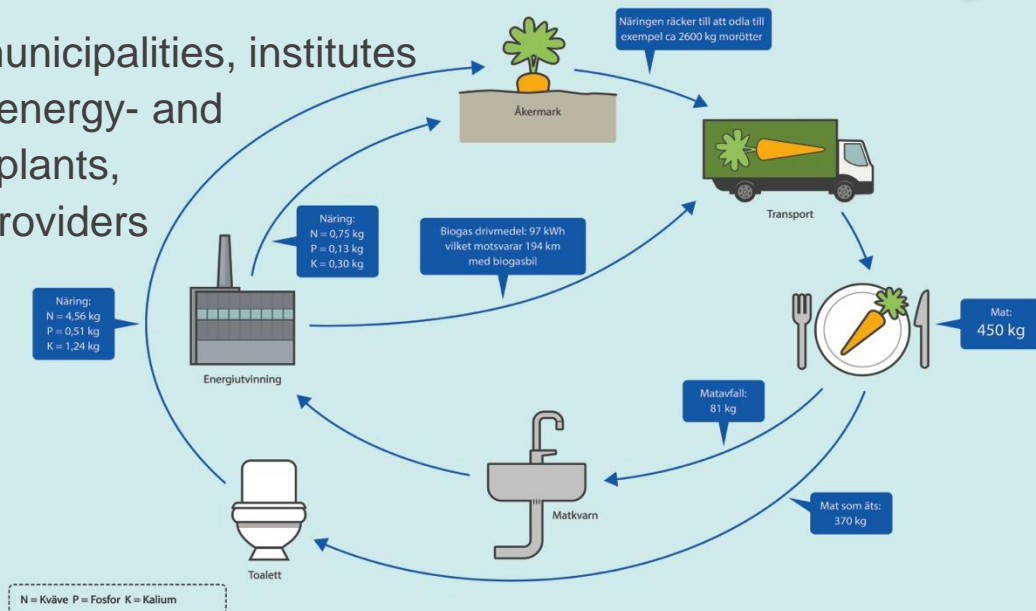


- Private sector
- Research performing organisations
- ▲ Public sector
- ★ Civil society

MACRO – Food in robust circular systems

- Utilize organic waste from household as a resource for agricultural land and renewable energy production
- Develop systems and technologies for the densely populated city where both the city and agriculture will benefit from food waste and wastewater streams

Academia, municipalities, institutes consultants, energy- and waste water plants, technology providers





CHALLENGE 2016-2018
Sustainable
Attractive Cities


STAGE



SIPTex – Swedish Innovation Platform for Textile Sorting

 4,3 million tons textile waste are dumped or combusted within EU each year

 Efficient and automated sorting for a high quality recycling process (fibre-to-fibre)

 Research institute, companies and organisations (fashion, collecting, sorting and recycling of textiles), municipalities and authorities

CHALLENGE 2016-2018
Competitive
Industries

STAGE



AutoMed

– Automation within Specialized Care



Highly qualified health personnel spend too much time on repetitive, manual and administrative tasks



Holistic approach to develop automation solutions, including robotize support functions to reduce labor intensive and monotone tasks



Academia, hospitals, institute and companies (robotics, logistics and automation)

CHALLENGE 2016-2018

Future
Healthcare

STAGE



Strategic Innovation Programs

Swedish SIP

Strategic innovation programs

Swedish innovation agency, Swedish Energy Agency, A Swedish Research Council for Sustainable development



SIP - Objective

- ✓ **Sustainable solutions to global challenges**
- ✓ **International competitiveness**
- ✓ **Pooling of national resources**



INFRASweden2030



Drive Sweden



RE:Source



Smart Built Environment



Medtech4Health



Innovair



SIO Grafen



**Smartare
elektroniksystem**



IoT Sverige



BioInnovation



Swelife



**STRIM (gruv och
metallutvinning)**



Lättvikt



**Processindustriell
IT och Automation (PiIA)**



Produktion2030



Metalliska material



Viable Cities

Med stöd från:



**STRATEGISKA
INNOVATIONS-
PROGRAM**



RE:Source

Minimizes waste, save resources, reduce dependence on fossil fuels

Producing innovations that reduce over-consumption of the Earth's resources.

BiInnovation

Towards a bio-based economy

New bio-based materials, products and services is essential in order to meet the challenge of climate change.

Viabile Cities
digitalisation is used to speed up
the transition to sustainable energy
systems for cities.



16 billion SEK

In total public-private funding 2013 - 2029



What happens within these programmes?

- Strategic visioning and roadmapping
- Coordinate strategic portfolios
- Call for proposals
- Supporting demonstration plants
- Project brokerage
- Conferences
- Support and follow up initiated projects
- EU coordination, and much more ...

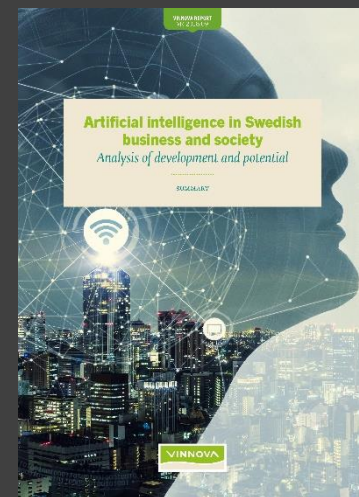
Evaluation Mechanism

Artificial Intelligence

Artificial Intelligence



Summaries in Swedish and English



Opportunities

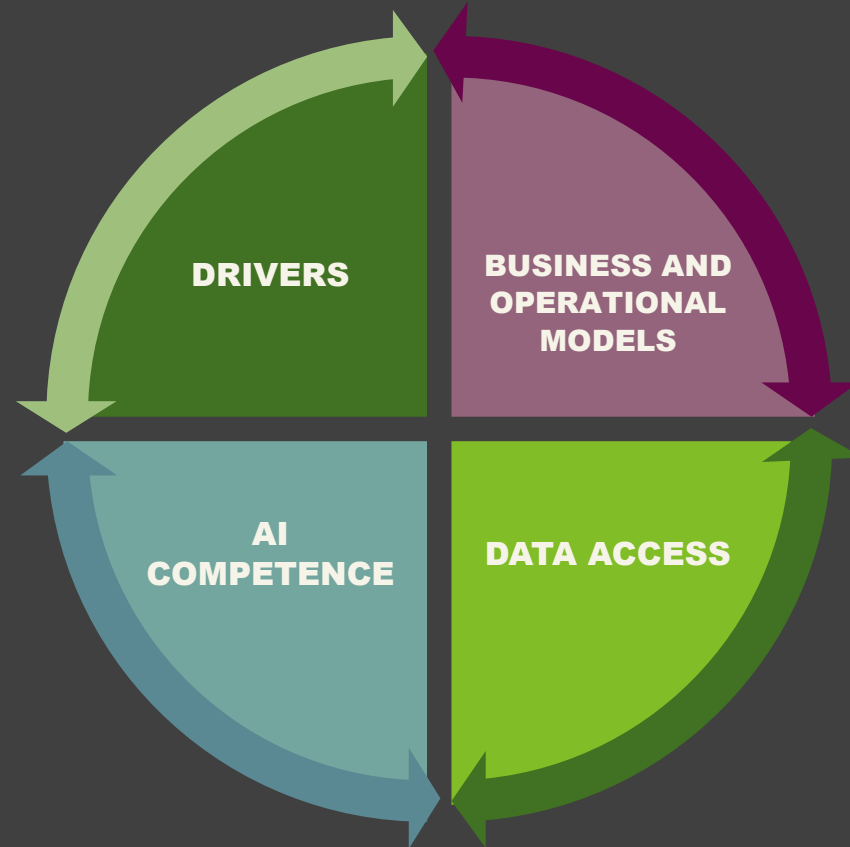
**Automating functions
in established value
chains, operations
and functions**

**Developing new
business models,
products, services
and system solutions**

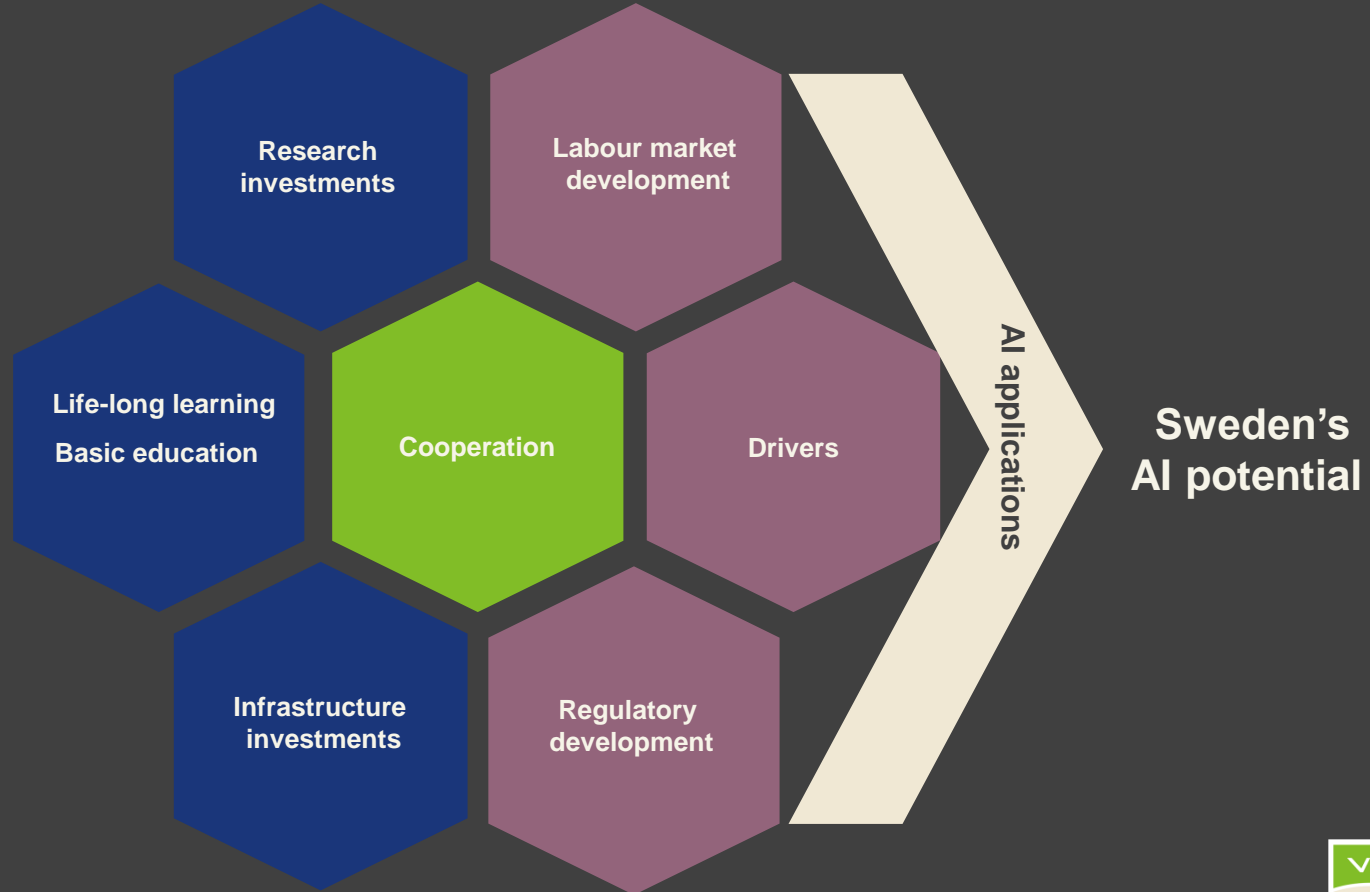
**Transforming value
chains and sectors
for brand new
development paths**



Mutual dependencies – Towards virtuous cycles



Policy areas and mutual dependencies



Policy Learning

OECD

TIPC

MOIN

MLE

Innovation System
Research

2013→



SYSTEM INNOVATION: SYNTHESIS REPORT



2016→

CIRCLE



Policy for system innovation the case of Strategic Innovation Programs in Sweden

Lars Coenen (lars.coenen@circle.lu.se)
CIRCLE, Lund University, Sweden & University of Melbourne, Australia
Markus Grillitsch (markus.grillitsch@circle.lu.se)
CIRCLE & Department of Human Geography, Lund University, Sweden
Teis Hansen (teis.hansen@circle.lu.se)
CIRCLE & Department of Human Geography, Lund University, Sweden
Johan Miörner (johan.miörner@circle.lu.se)
CIRCLE & Department of Human Geography, Lund University, Sweden
Jerker Moodysson (jerker.moodysson@ju.se)
CIRCLE, Lund University & Jönköping Business School, Sweden

Papers in Innovation Studies Paper no. 2017/03

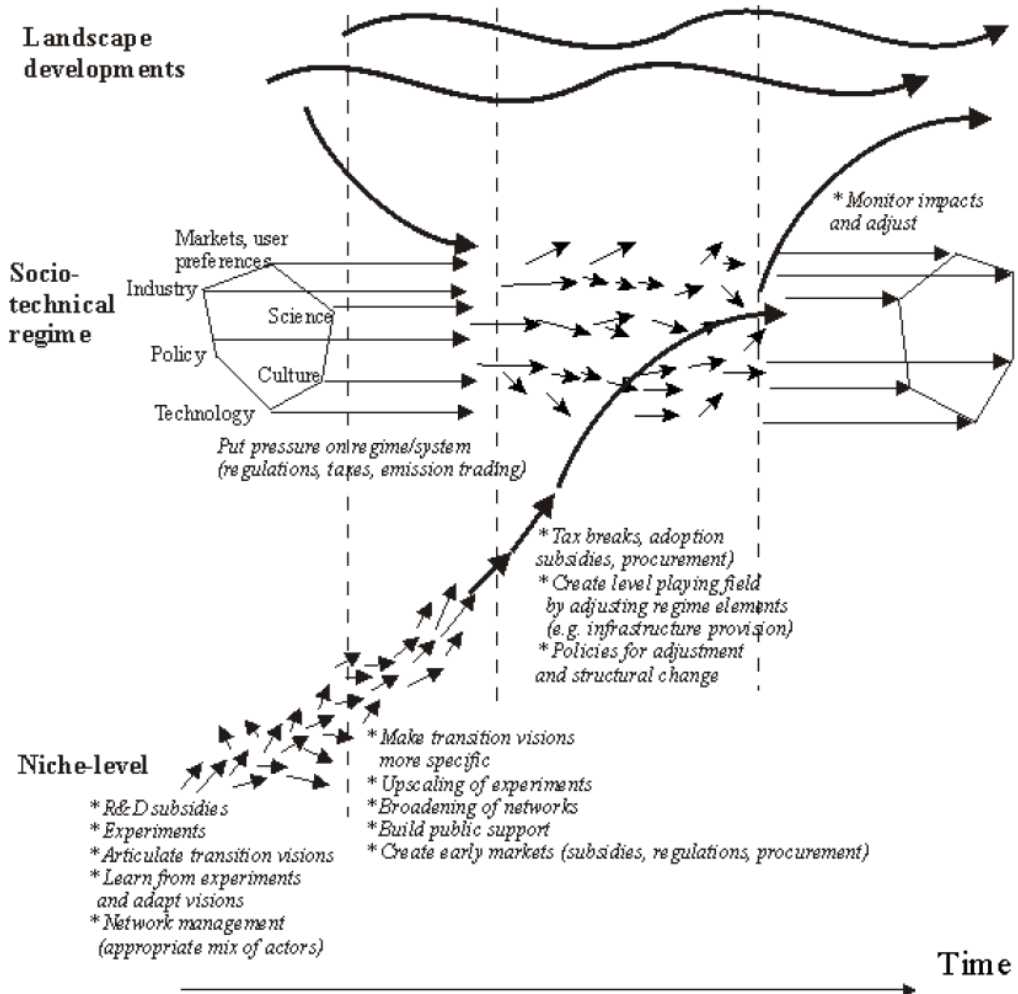
This is a pre-print version of a report for the OECD.

This version: March 2017

Centre for Innovation, Research and Competence in the Learning Economy (CIRCLE)
Lund University
P.O. Box 117, Sölvegatan 16, S-221 00 Lund, SWEDEN
<http://www.circle.lu.se/publications>

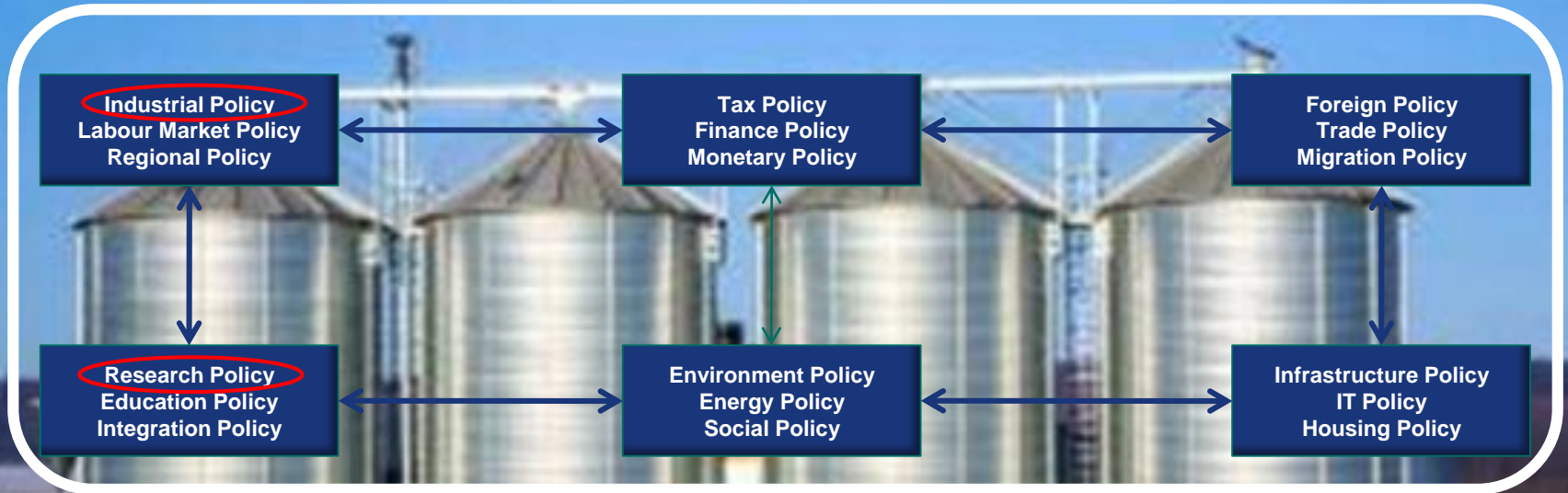


System Innovation



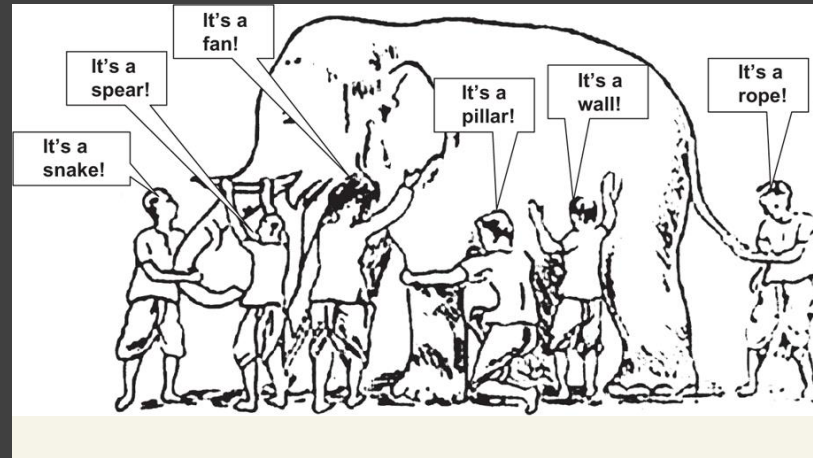
Source: Prof. Frank Geels, Sustainable Consumption Institute, Manchester University

Innovation Policy



Silo Governance

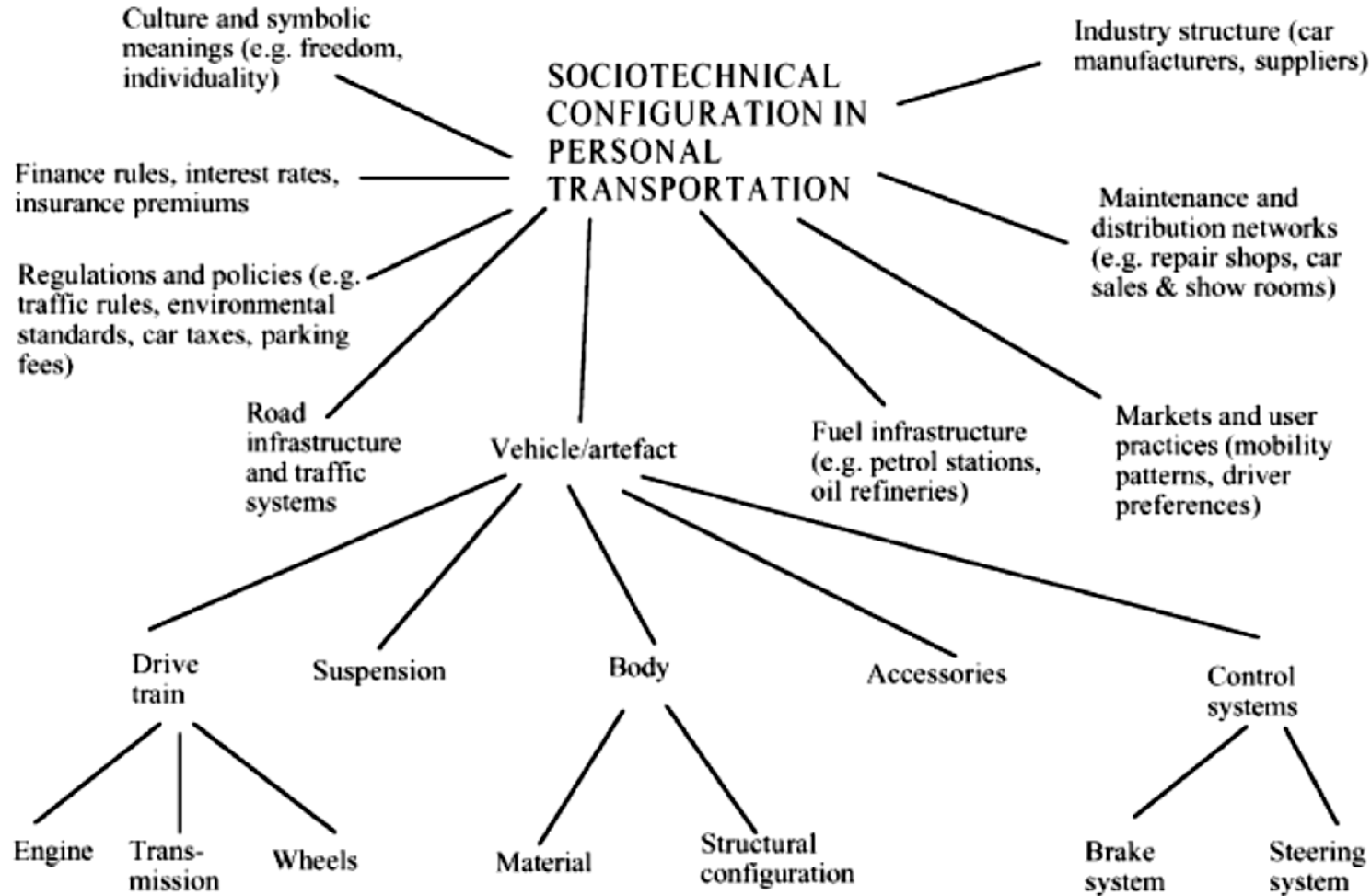
Main obstacle to Societal Challenge Innovation



Policy Motives

Challenges – Opportunities – Failures

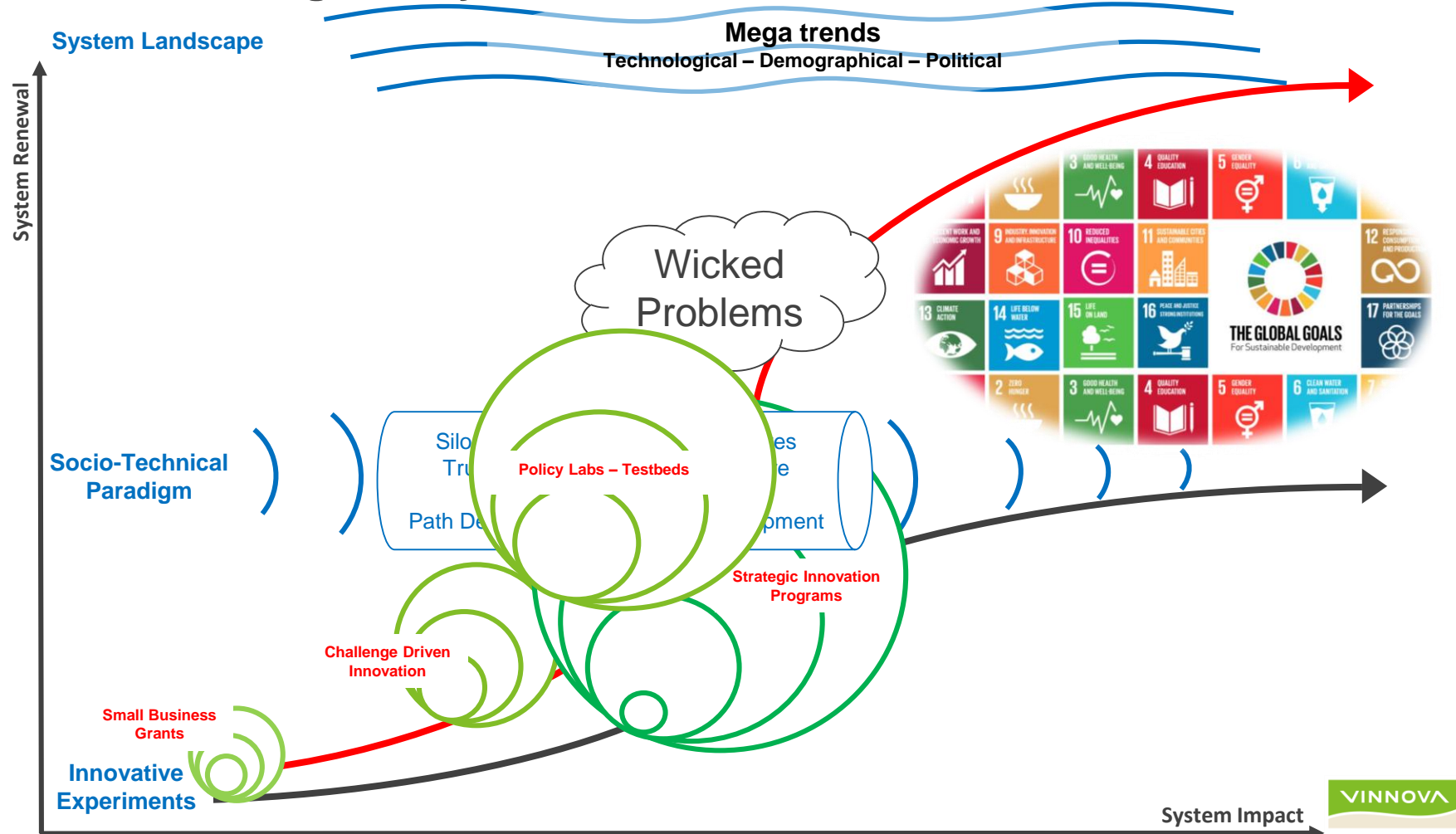
Market Failures <i>(Neoclassical model)</i>	Structural System Failures <i>(Innovation systems)</i>	Transformational System Failures <i>(System Innovation)</i>
Limited Experimental Economy	Infrastructure Failures	Directionality Failures
Underinvestments in R&D	Institutional Failures	Demand Articulation Failures
Unaccounted negative externalities	Network Failures	Policy Coordination Failures
Overexploitation of commons	Capability Failures	Reflexivity Failures



Geels, 2002

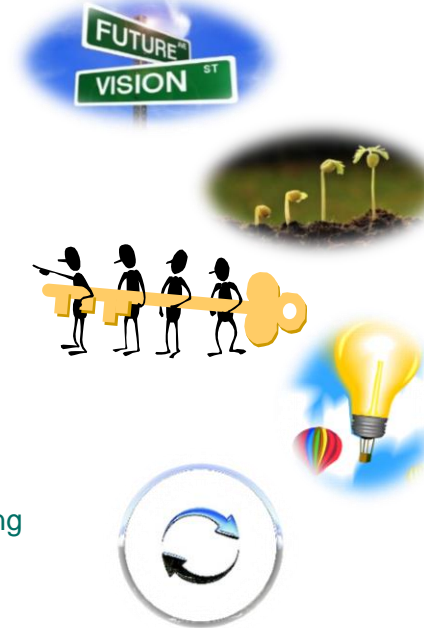
Fig. 1. Elements from the sociotechnical configuration in transportation.

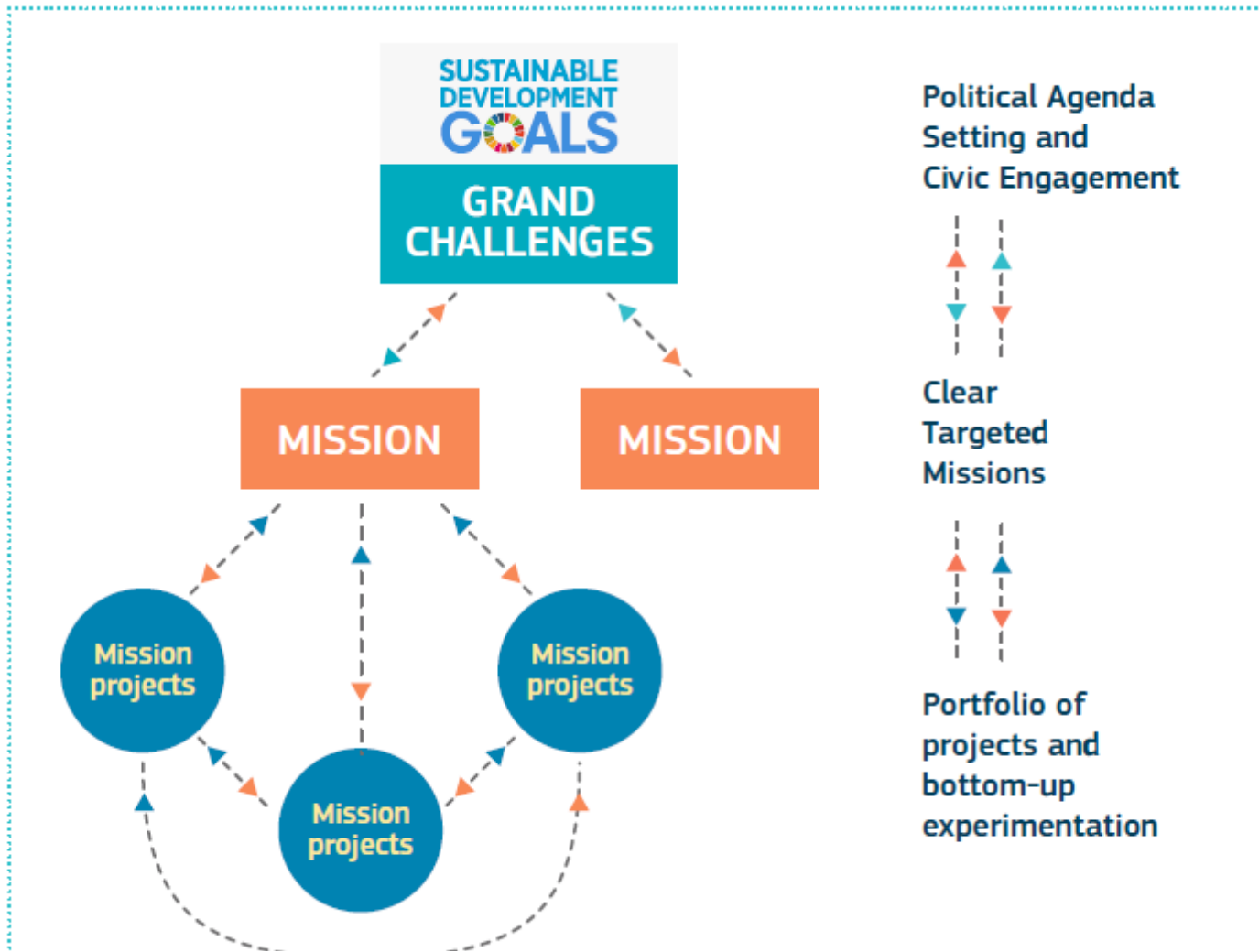
Societal Challenges – System Innovation



System Innovation Principles

- **Visioning** – scoping potential solutions
- **Ideation** – stepwise towards unwicked cross-functional roadmaps
- **Catalyzing** – stepwise user-producer investment attraction
- **Demonstrating** – stepwise solutions of wicked problems
- **Reflexivity** – stepwise evaluation for screening, direction and scaling
- **Impact**
 - Ownership and Demand
 - Reduced Uncertainty
 - Resource Connectedness
 - System Innovation
 - System Transformation





Source: Mazzucato, Mission-Oriented Research & Innovation in the European Union A problem-solving approach to fuel innovation-led growth

Sveriges innovationsmyndighet



**Vi stärker Sveriges innovationskraft för
hållbar tillväxt och samhällsnytta**

www.vinnova.se

Appendix

Research & Development – A Linear Policy Trap



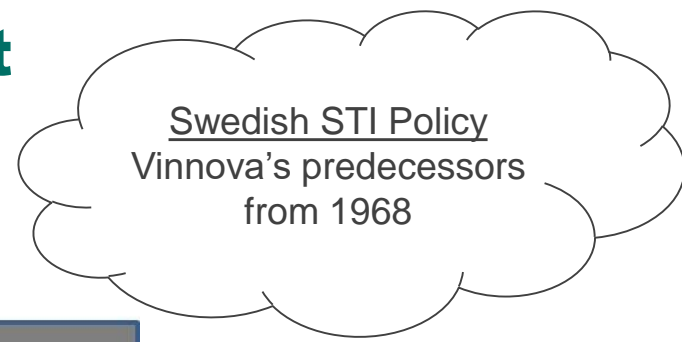
The Endless frontier
Vannevar Bush
1945

R&D Statistics
OECD
1963

Innovation Statistics
OECD
1992

Pasteur's Quadrant

Practical Use?



Quest For Fundamental
Understanding?

	No	Yes
Yes	Pure Basic Research BOHR	Use-Inspired Basic Research PASTEUR
No	Unnamed	Pure Applied Research EDISON

Research Motives and Innovation Processes

