Innovation policy, sustainability transitions and the global green shift

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The road towards net zero & the role of innovation

- Dealing with **climate change** essential for the sustainability transition
- Requires **extensive change** (and **quickly**)
- For which **innovation** of all sorts – and therefore also **innovation policy** – will be essential.

Innovation policy = policies that (significantly) impact innovation

Role of innovation policy in the transition

- **Mission-oriented** (goal-oriented) innovation policy: Projects with a concrete aim («man on the moon») in a specific sector/activity
- **General** (economy-wide) innovation policy: Improve the working of the innovation system
- "Net zero" requires **extensive changes in all sectors** and contributions from **many different actors**: a new policy approach ("transformative innovation policy")

More: Edler og Fagerberg 2017, Fagerberg 2018

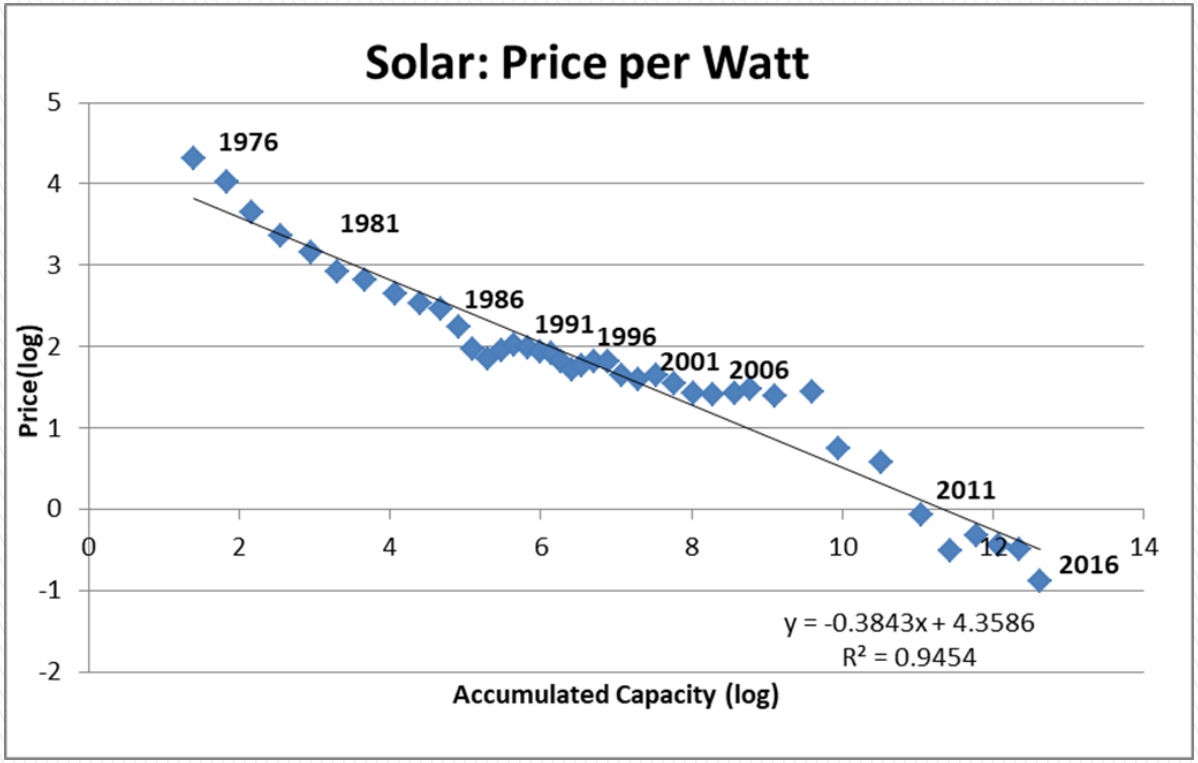
Technological revolutions

- A set of radical innovations with pervasive **effects** throughout the economy
- A "**core factor**" with **low – rapidly falling – costs**, **almost unlimited availability** and **broad applicability** (f.i. oil, semiconductors)
- Leads to (presupposes) big changes in **infrastructure**, social/economic **organization og institutions**
- And **rapid growth** in affected industries and **extensive structural change**

More: Fagerberg 2018, Fagerberg and Verspagen 2021

Renewable energy: a new technological revolution

- The sun – an abundant source of energy
- Basis for **solar energy, wind energy, bioenergy** etc
- Rapidly **decreasing costs**
- **Competitive** with conventional sources of energy

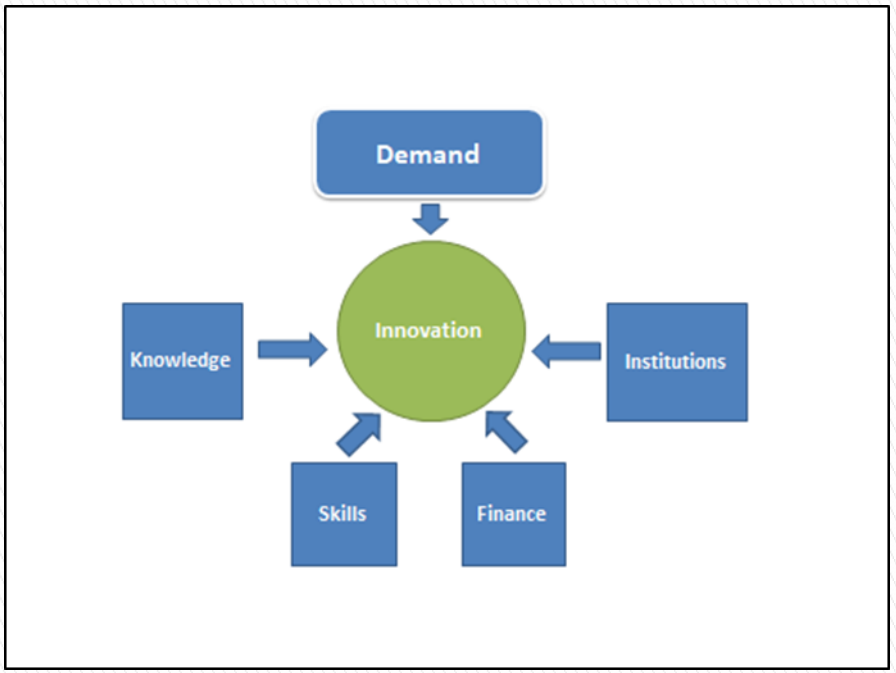


Source: Fagerberg 2018

- Can replace **fossil energy** in most applications
- Requires extensive changes (**innovation)** in energy storage, distribution and use

Innovation processes & policy

- Innovation depends on several factors (**processes**)
- Which in most cases are **complimentary**
- Little help in having access to some promising knowledge if other required factors (skills, finance, demand) are **lacking**

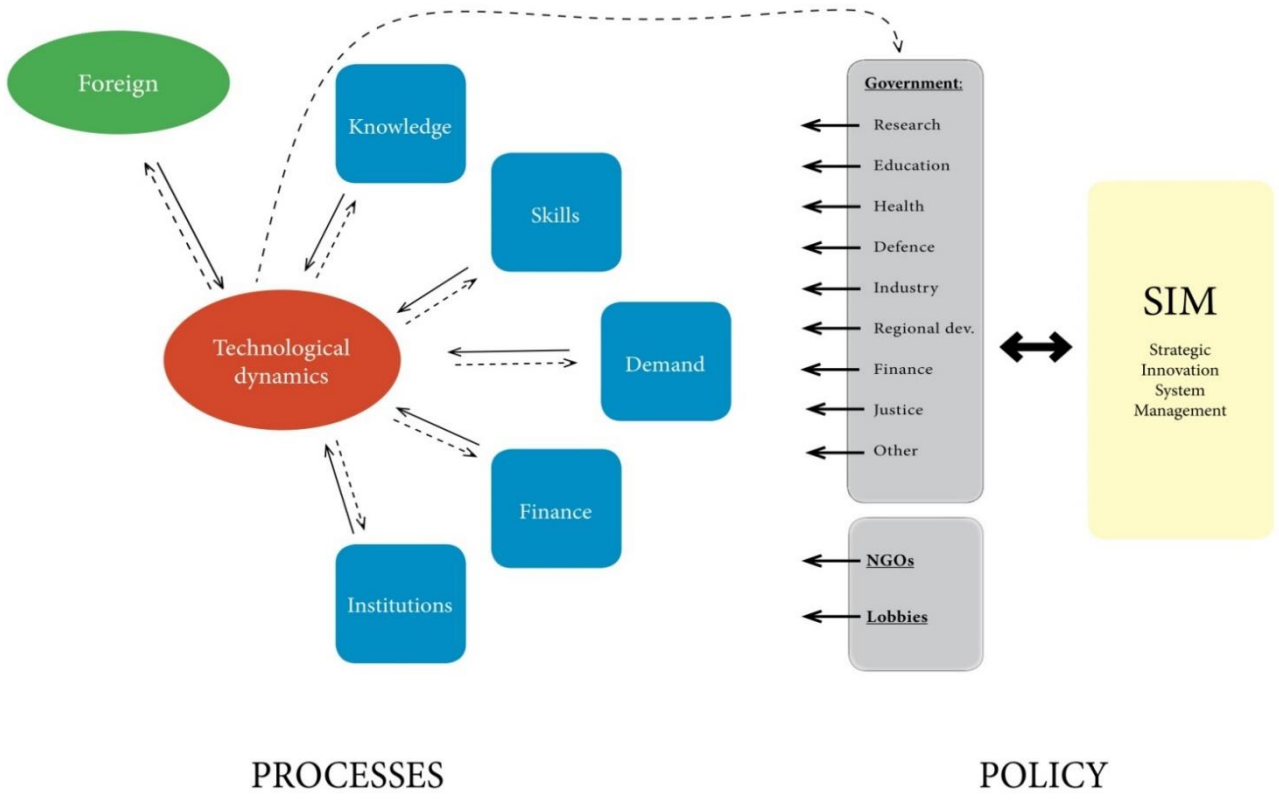


A **holistic (system) perspective** essential for policy

More: Fagerberg (2004)

Processes that matter for innovation are influenced by numerous policies/agencies

- How to secure that these policies are **consistent**?
- Policy **co-ordination, alignment** essential for Net-Zero
- Changes in **innovation policy governance** required?



Source: Fagerberg (2017) Innovation Policy: Rationales, Lessons and Challenges, Journal of Economic Surveys

Coordination/aligment of policy: Two models

Organizational

- **"Innovation council "** led by the prime minister and with central innovation actors as participants
- Coordination **within government** or in the entire **innovation system**?
- Transparency & accountability

Cognitive

- A common **vision** may mobilize resources for **change & unleash innovation**
- Needs to be based on a thorough analysis of **opportunities and challenges**
- … and engage **a broad range of actors** ("stakeholders") in & outside politics
- … and be **broadly supported/robust** to shifting parliamentary majorities

No Mission without Vision?

Finland: Pioneering innovation policy governance

- Traditionally specialized in natural resources (forestry, mining)
- Vision (80s –): **Transition to a modern, «high tech» economy (ICTs)**, public innovation agency TEKES (1983) funds «technology programs», a **«high road»** out of the crisis of the 1990s
- Strong **policy coordination** through national **"research and innovation council" (RIC)**, chaired by the prime minister (consisting of main public and private innovation actors), suggesting **strategic plans for R&I policy** & evaluating results

More: Fagerberg & Hutschenreiter (2020) Coping with societal challenges: Lessons for innovation policy governance, Journal of Industry, Competition and Trade

Policy-making in times of crisis

- Last decade: Finland hard hit by the combined effect of the **financial crisis and NOKIA's demise**
- **Drastic reduction in public support to innovation**
- Finnish business R&D drop by one third
- A **turn to a more traditional (university-centred) policy stance**
- Reduced role for RIC
- Continuing stagnation ….
- New vision needed?

A new (green) innovation policy stance?

- **Innovation policy**: not mainly about **R&D**, but creating (exploiting) **opportunities** (e.g., demand), supporting **experimentation**, enhancing **learning** & **capabilities**
- Main policy elements: Increase **renewable energy**, electrify **transport & industry**, increase **energy efficiency, circular economy**, actively **reduce polluting sectors** …
- Special **"missions" for hard to abate sectors**, e.g., international aviation and shipping
- Needs to penetrate **all policy areas** (sectors/levels), **include** all relevant actors ("stakeholders"), and distribute costs and benefits **fairly**
- **Improving innovation policy governance**

Riding the waves of renewables and electricification

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