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FOR A STRONGER AND GREENER ECONOMY
UNECE

Innovation and green technologies
Concepts, frameworks and governance

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Structure of the presentation

- **Innovation: concept and types**
- **Eco-innovation**
- **National innovation system**
- **The five dimensions of the national innovation capacity**
- **Innovation policies and instruments**
- **Innovation financing**
- **Putting all together**

What is innovation?

Definition (OECD Oslo Manual):

An innovation is the implementation of a **new** or significantly **improved** product (**good or service**), or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations.

Types of innovation

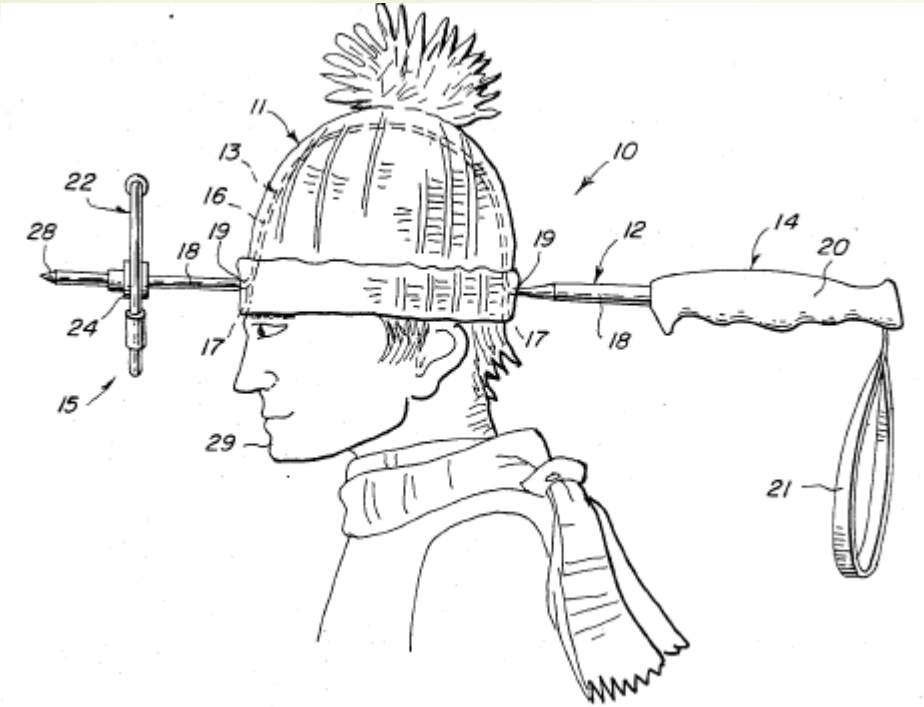
New or significantly improved? → **World**

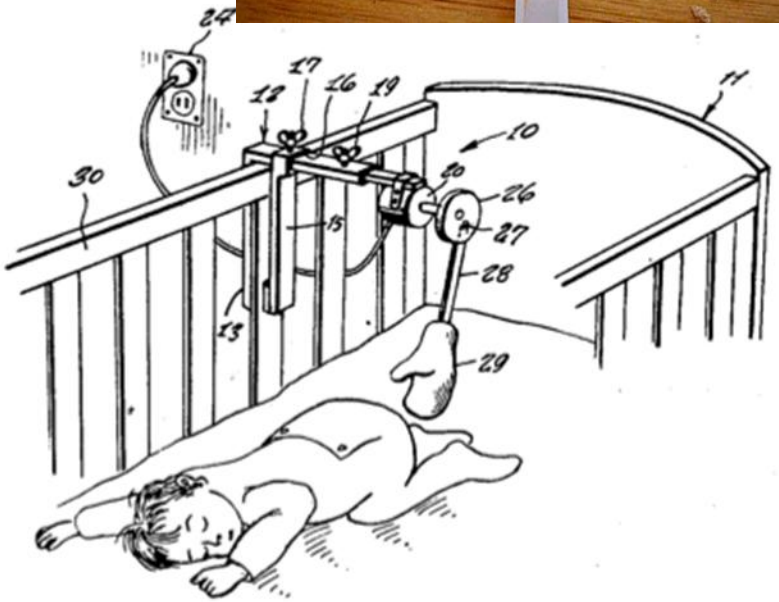
Country

Firm

- **Product, process, marketing, organisational**
- **Technological, non-technological**
- **Radical, incremental innovation**

Innovation is more than a brigth idea





Invention vs innovation

- New technologies may lead to a patent that protects the invention made

- But innovation only takes place when this novelty is used.

- Then the benefits for the economy/environment emerge.

What is eco-innovation?

Any type of innovation that

- benefits the environment
- reduces the environmental impact of economic activities

Eco-innovation may be non-technological and take place in non-environmental areas

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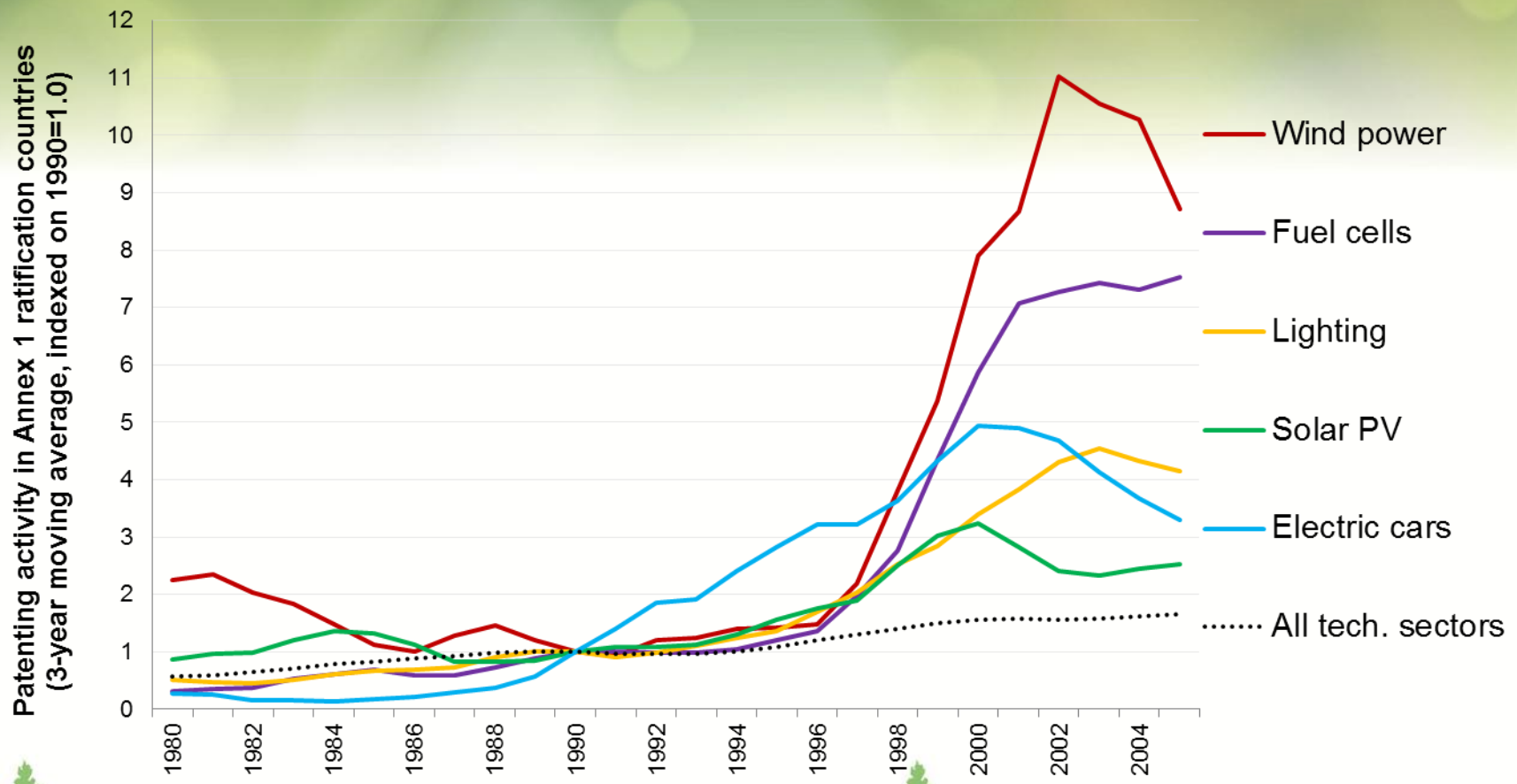
What is eco-innovation?

Environmental benefits may emerge in many areas

Resource use: energy efficiency, greenhouse gas reduction, improved water use, waste minimisation, new materials…

Generic (non-environmental technologies)

Eco-innovation has taken off



Why public policies are essential?

- **Innovation is complex- many sectors are involved and coordination is required**
- **Focus beyond financial resources – strategic guidance**
- **Market failures are widespread – appropriate valuation of environmental costs and benefits is lacking**
- **Financing problems**
- **Maximise impact – emphasis on dissemination**

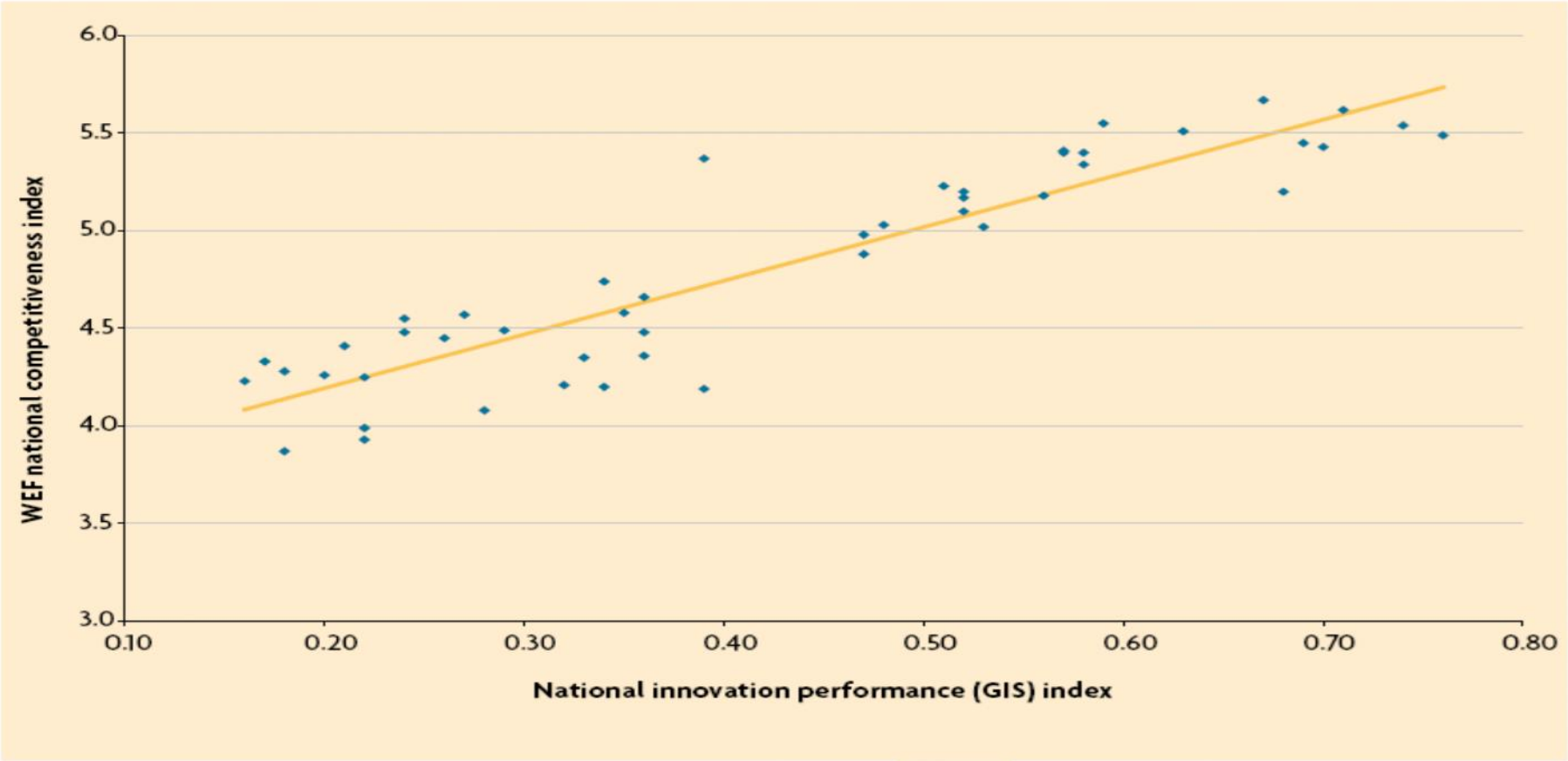
Is there a conflict with economic developent?

- **Eco-innovation can reconcile environmental targets with increasing economic efficiency**

- **Eco-innovation is seen in many countries as a component of strategies seeking to enhance competitiveness and support growth**

- **But a conflict may emerge between different environmental targets**

INNOVATION AS A SOURCE OF COMPETITIVENESS



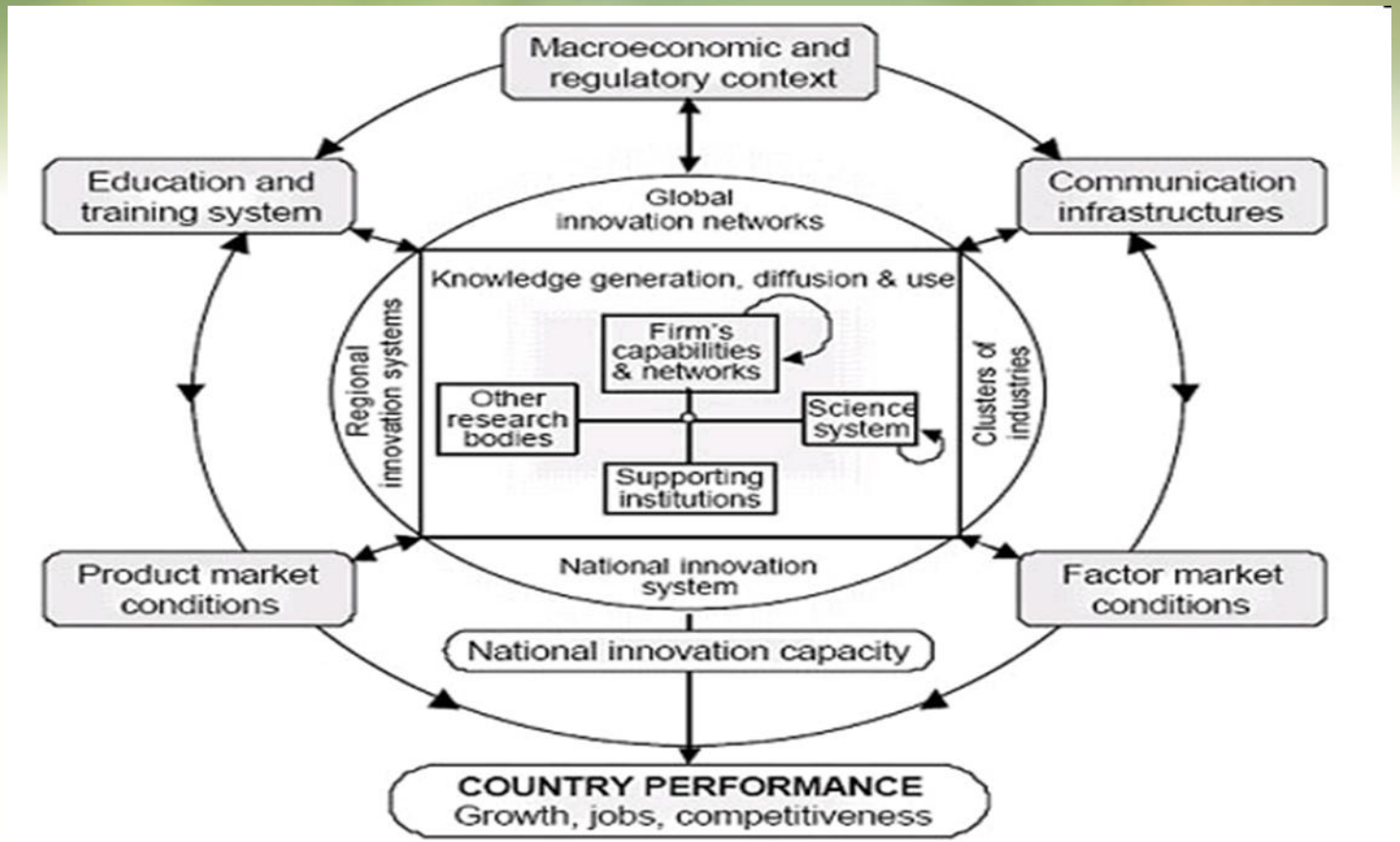
How innovation emerges?

Innovation is a complex process: emerges from a continuous interaction between

- **firms**
- **suppliers and buyers**
- **knowledge institutions like universities or research and development (R&D) organizations**
- **Government policies**

International dimension

NATIONAL INNOVATION SYSTEM



Common problems

- **Only a few large enterprises innovate**
- **The share of innovative SMEs is very small**
- **Weak linkages.**
- **Research disconnect**
- **Innovation policy success limited by framework conditions.**

What is required: strong actors AND strong linkages

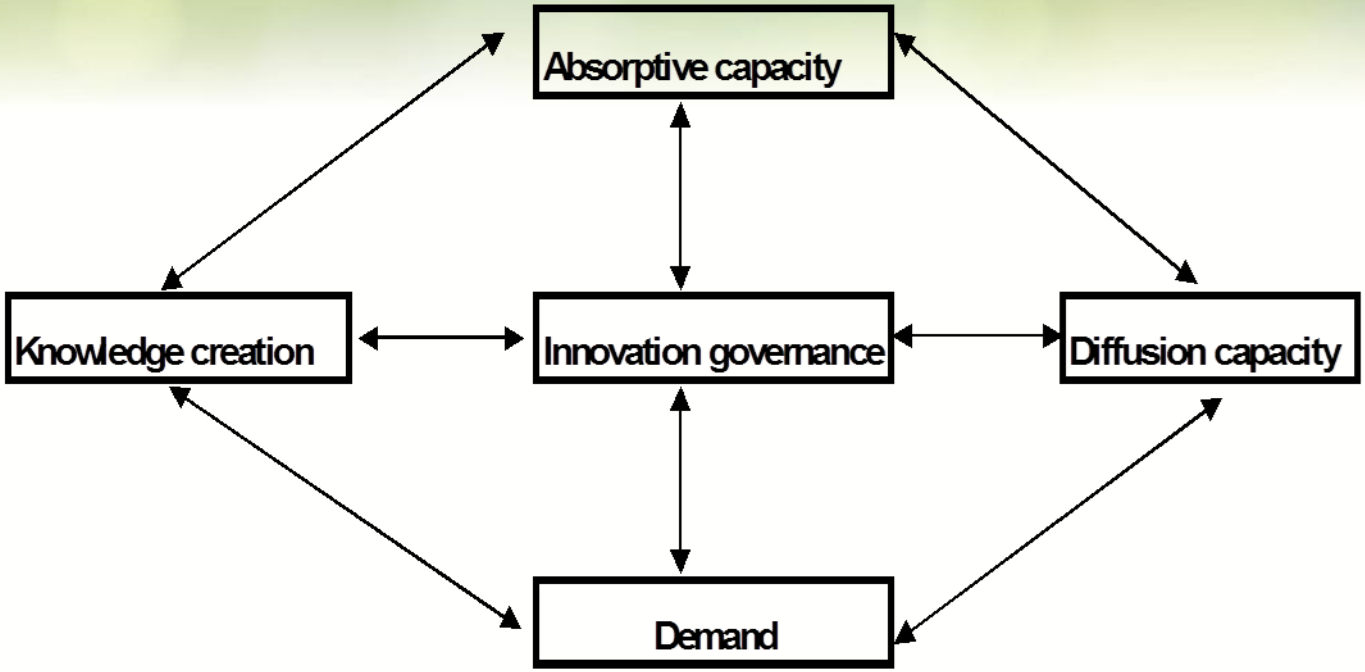
Which policies are required?

- **Targets to be defined on the basis of the understanding of the national innovation system.**
- **Targeting simultaneously various components of NIS (interrelations)**
- **Effectiveness of instruments depends on synergies reached**

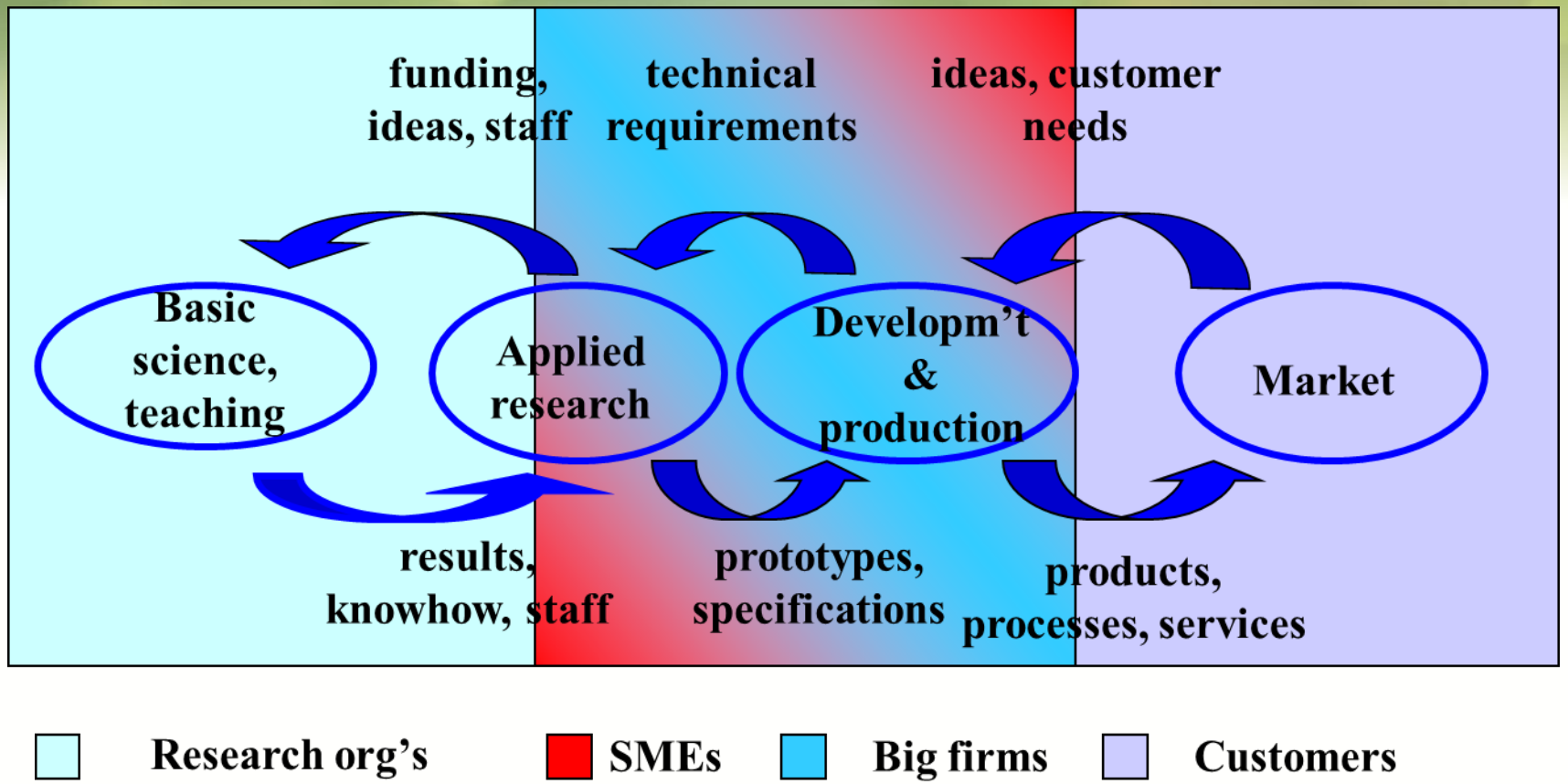
What are the targets?

- Generation of knowledge
- Absorptive capacity
- Diffusion of innovation
- Stimulating demand for innovation
- Improving innovation governance

National Innovation Capacity



Interactive innovation



Generation of knowledge

- Increasing R&D
- In particular, higher business R&D
- Importance of R&D serving to absorb foreign technologies
- Non-technological innovation
- Users-led innovation

Absorptive capacity

- **Human capital development**
- **Business sector involvement (identification needs)**
- **Lifelong learning**
- **Role of universities: teaching, research.**
- **International cooperation.**

What are the typical barriers for technology transfer?

What are the major impediments to technology transfer?

- Lack of scientists and researchers (brain drain)
- Small market size
- Lack of infrastructure
- Quality of the business environment
- Availability of public finance

Diffusion of innovation

A fundamental issue – new knowledge is not useful if not widely applied

Double policy dimension: scope of application and pace of diffusion

Importance of linkages:

- **The role of partnerships**
- **Clusters**
- **Support organisations**

Diffusion of innovation

Hardware (large projects)

Vs

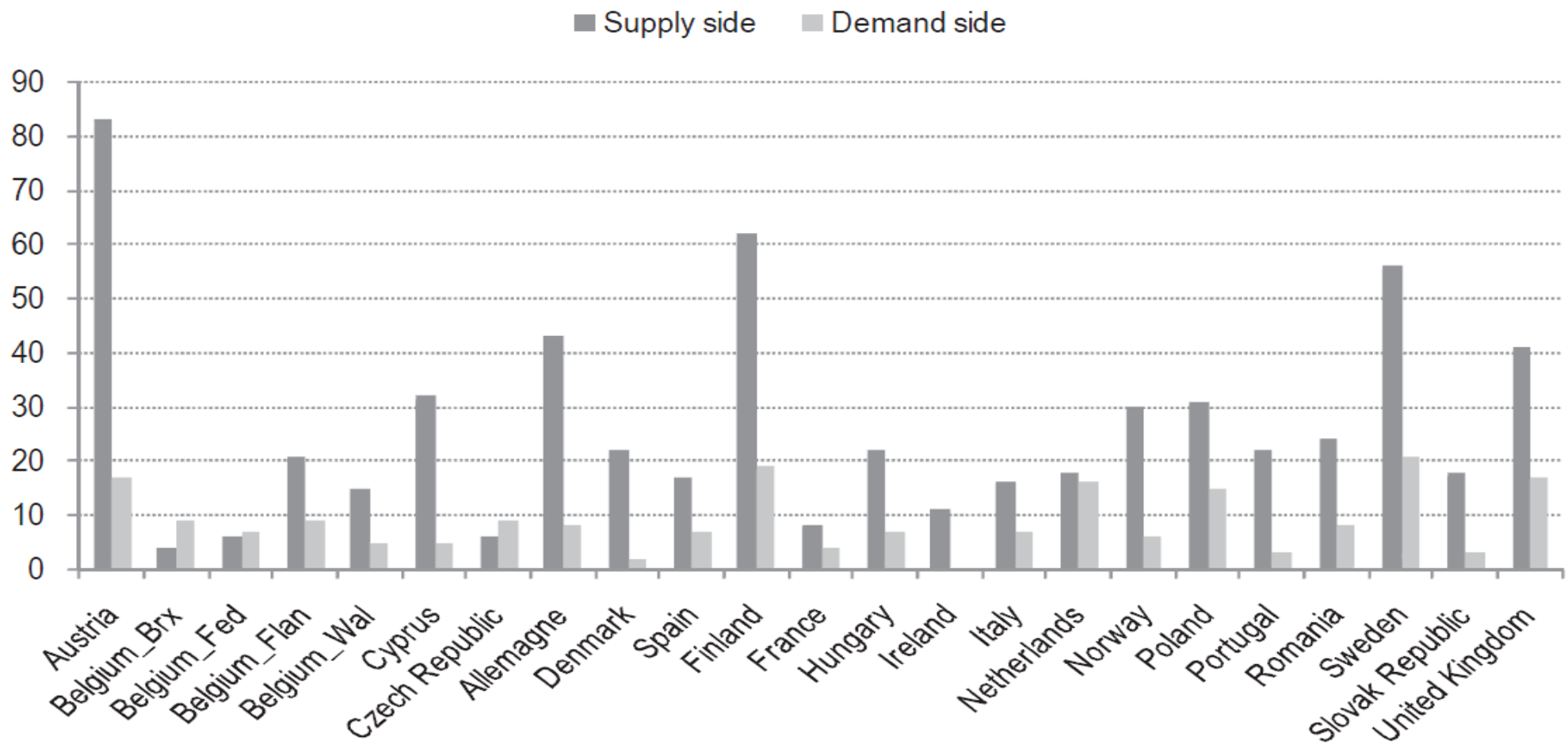
Knowledge required to facilitate the transfers (know-how, tacit knowledge)

- **Education and training (including for low-skill jobs)**
- **Attention to context specific technological and cultural requirements**

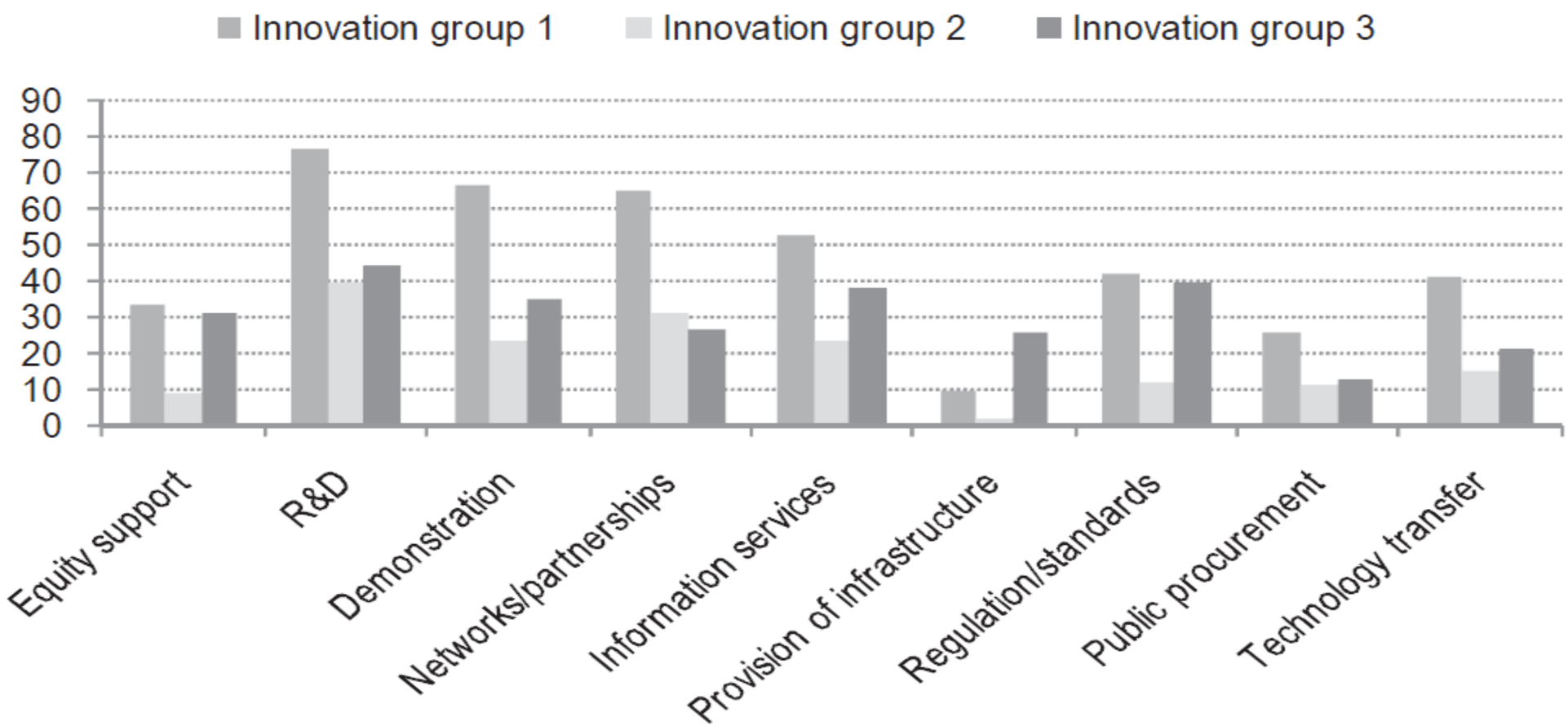
Demand for innovation

- **Framework conditions**
- **Fiscal support**
- **Public procurement**
- **Sustainability: environmental regulations as a source of support for innovation**

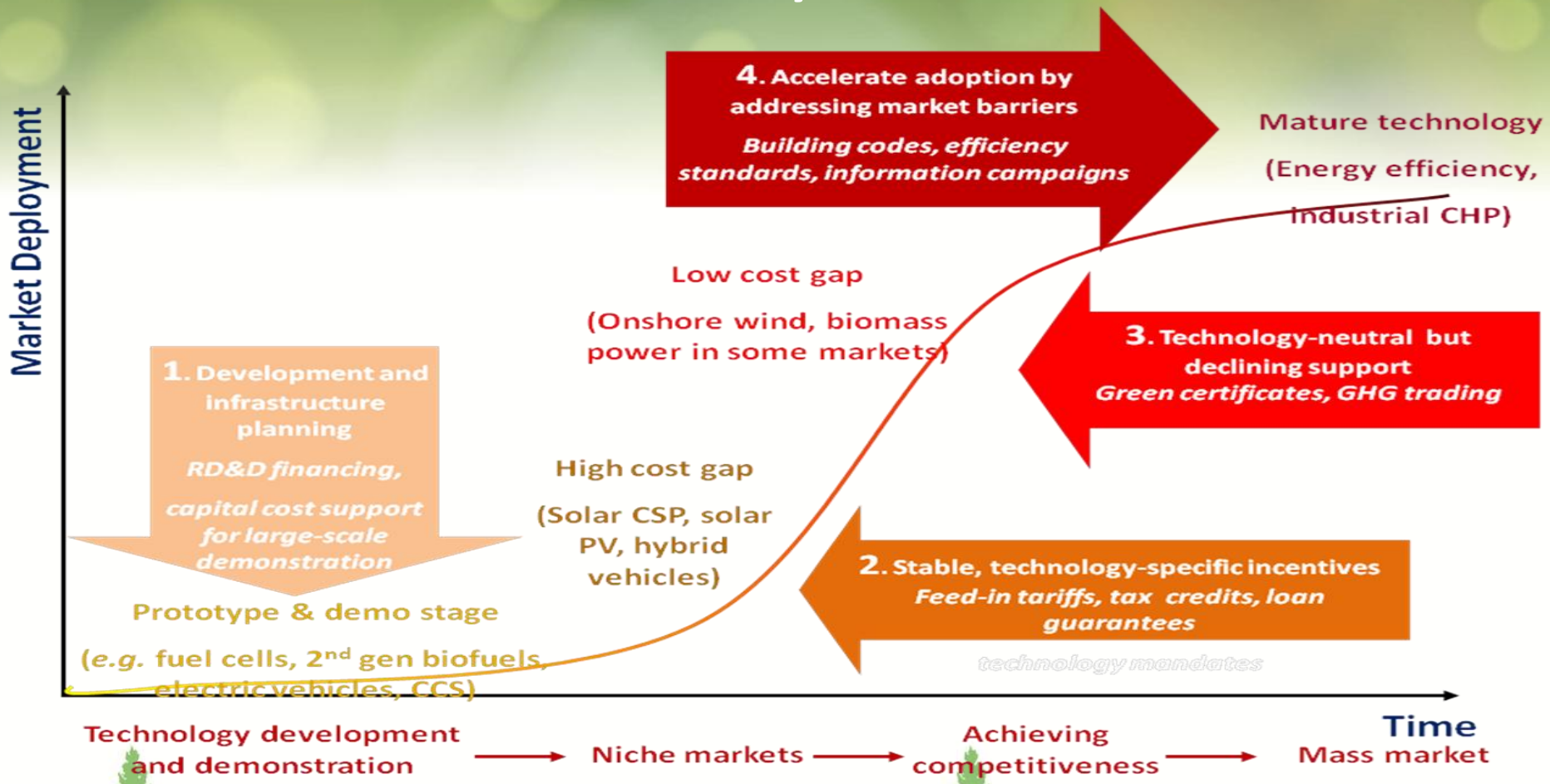
Balance between instruments



Instruments and innovation capabilities



Policies and technology maturity



Case study: Portugal solar tiles

- The product fits national construction traditions
- Developed by a consortium: industry, research and government
- Presence of users in the consortium
- Different policy instruments available: generic innovation incentives, feed-in tariffs, tax exemptions..
- Push to change standard to mobilise demand

Innovation governance

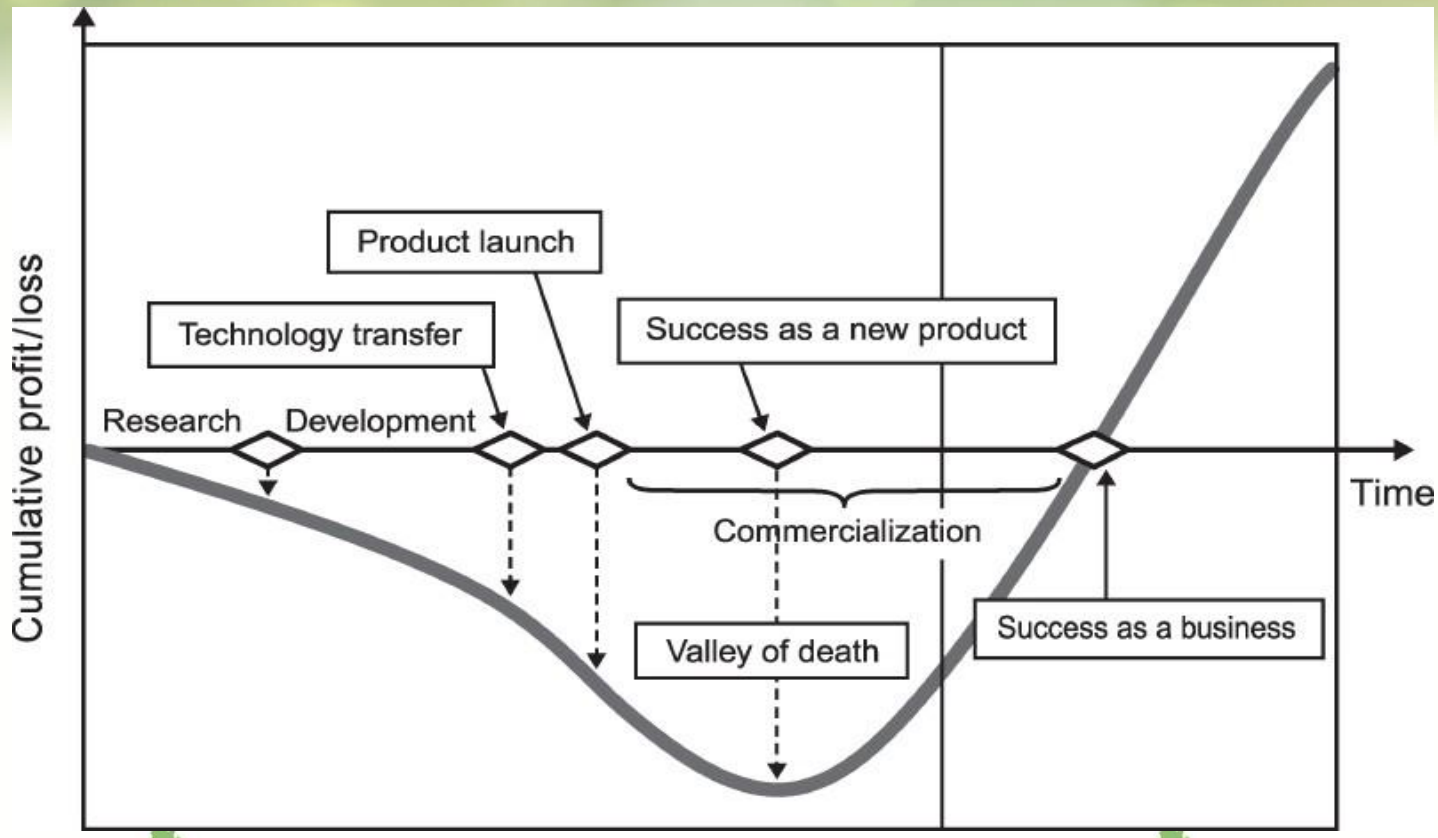
Governance:

Structure and processes to set priorities, coordinate initiatives of different agencies, monitor and assess results and revise policies accordingly.

Innovation governance

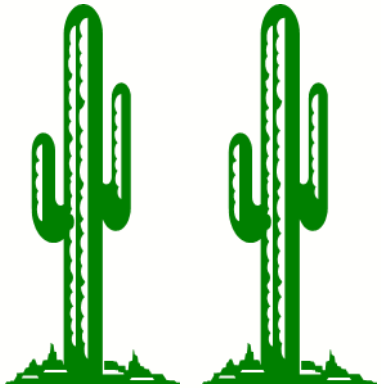
- **Diversity of national experiences but need to avoid fragmentation**
- **Innovation agencies as partners**
- **Coordination mechanisms with stakeholder involvement**
- **National innovation constituency**

Financing: Overcoming the «valley of death»



No Capital

Dead Ideas



Financing

Key challenge: How to maximise the impact of public funding

- **Influence on innovation capabilities – what to support**
- **Attract other sources of investment – how to attract private/international funding**

Eco-innovation roadmaps

National strategies to support eco-innovation:

- **Different governance mechanisms –dual aims (competitiveness and innovation) and need for coordination**
- **Balance – A combination of measures (technology-push and market-pull). But supply side instruments tend to prevail)**
- **Two key constraints: size of the market and knowledge base**

A map into the future

- **Policy learning as part of the cycle of policy-making: embedded evaluation**

- **Importance of strategic intelligence based on a range of instruments**

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Some final remarks

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- **Strong public policies are critical to overcome market failures regarding innovation**

- **The promotion of innovation concerns many different policy areas**

Innovation is risky and costly…

And so it is not to innovate!