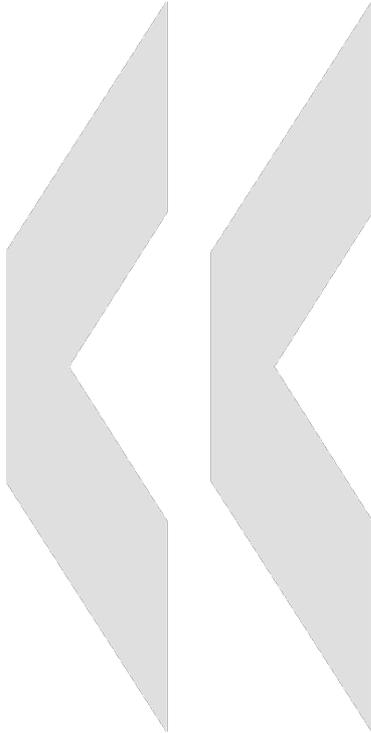


# **Workshop on Delivering Green Growth – Seizing New Opportunities for Industries, Seoul, 4-5 March**



## **Innovation and Green Growth: Findings from the OECD Innovation Strategy**

**Dirk Pilat**

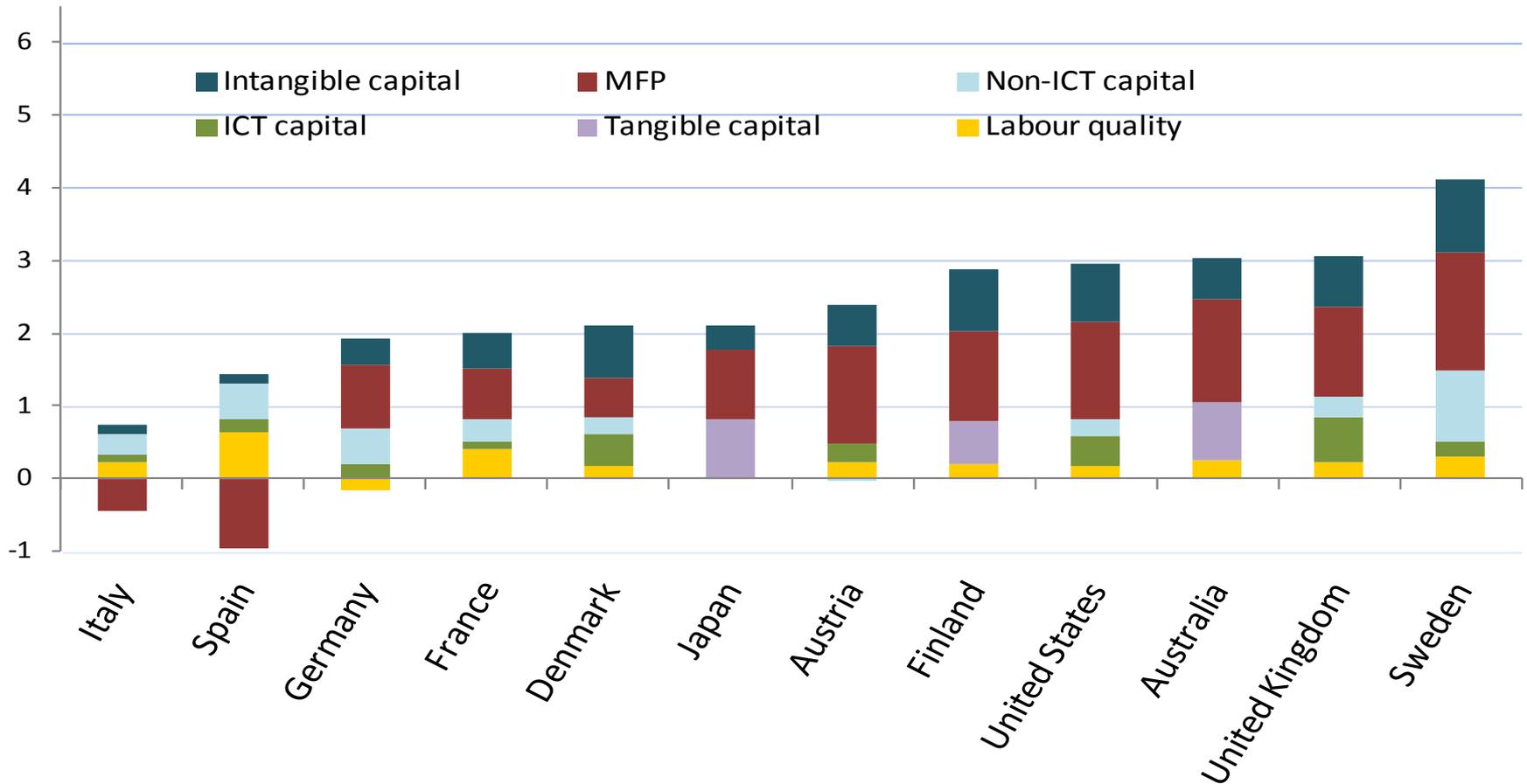
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# Outline

1. Innovation and green growth
2. Why policies for innovation need to adapt
3. Some policy implications from the OECD Innovation Strategy for green growth
4. Some broader policy messages
5. Conclusions

# 1. Innovation is key to growth...

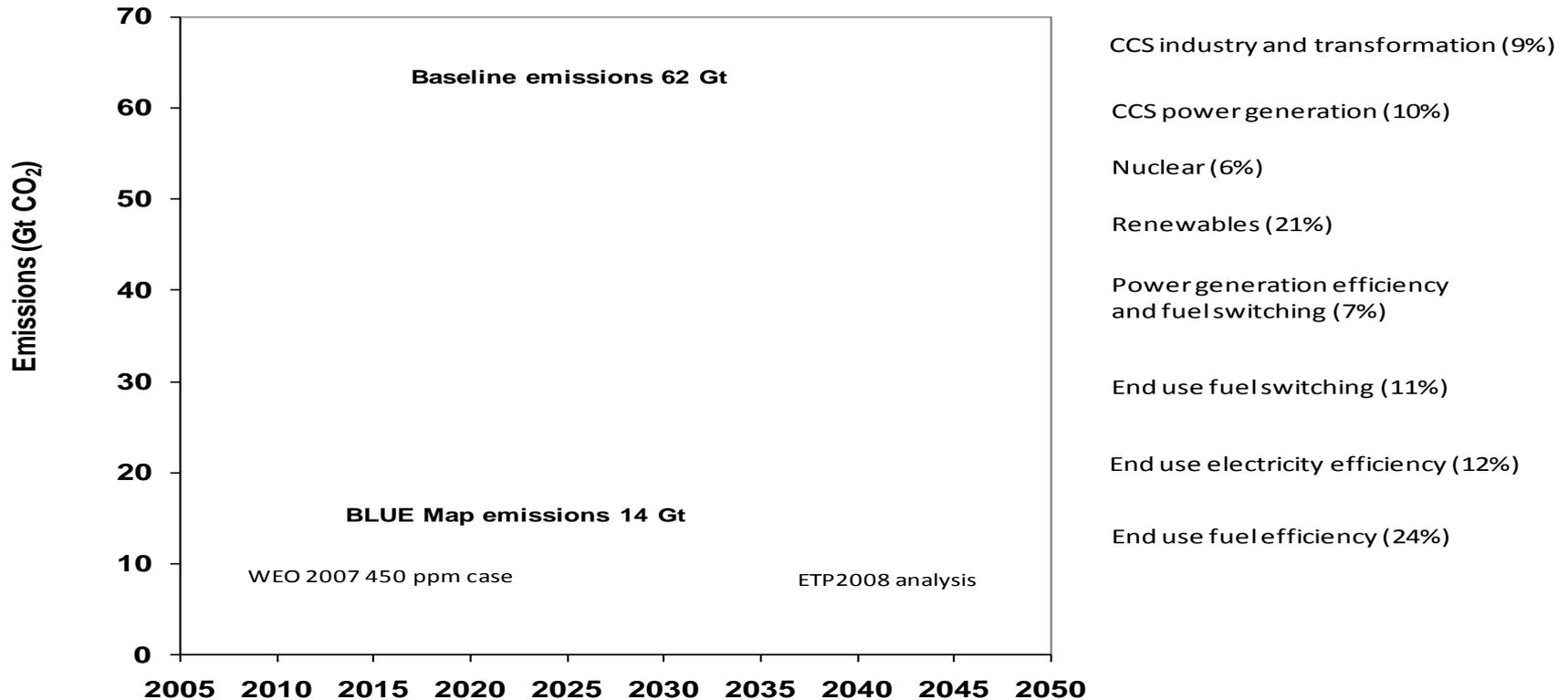
Contributions to labour productivity growth, 1995-2006, in %



*\* Investment in intangibles and multi-factor productivity growth account for between two-thirds and three-quarters of labour productivity growth.*

# ... and to a greener economy

## Potential technological contributions to CO<sub>2</sub> emission reductions



Note: WEO refers to the IEA's 2007 World Energy Outlook.

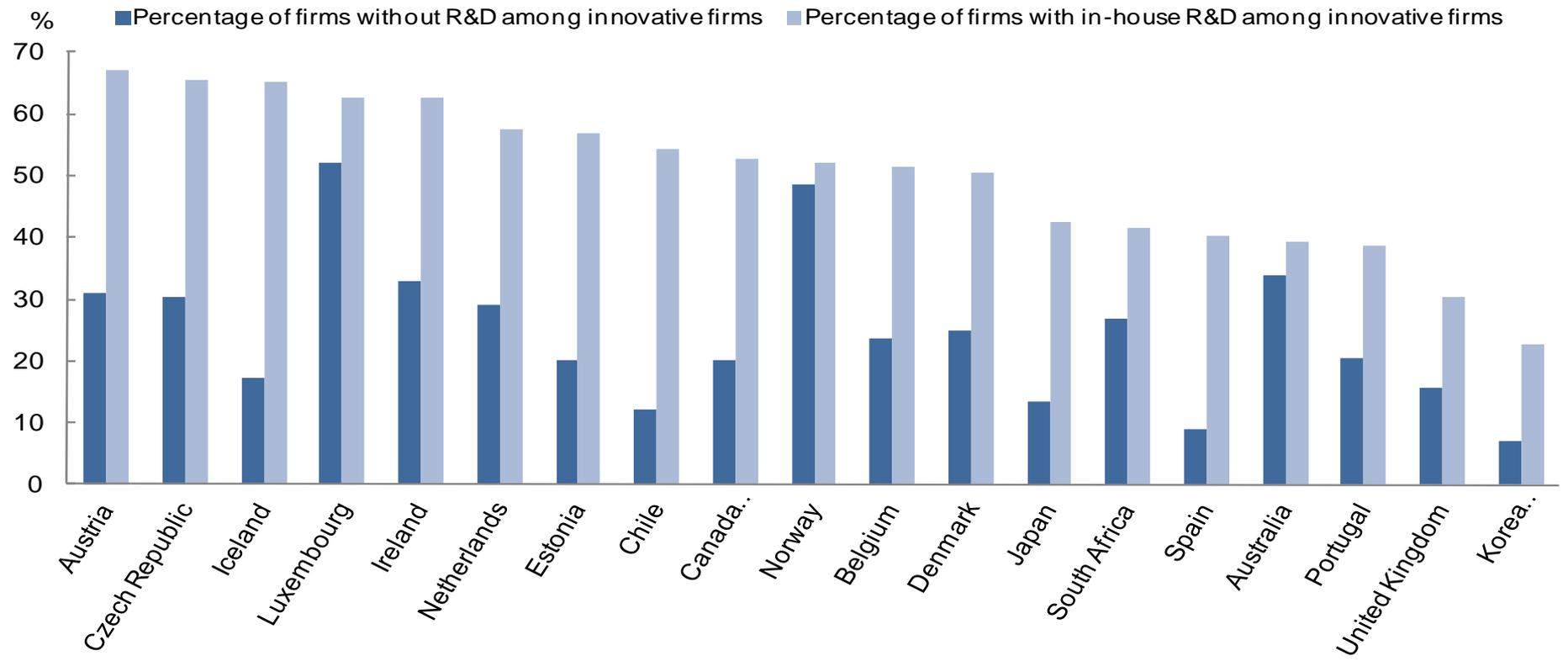
Source: International Energy Agency, Energy Technology Perspectives 2008: Scenarios and Strategies to 2050.

2. But policies for innovation are often ill adapted to innovation today

The **what**, **how** and **who** of innovation has changed!

# The What: Innovation is not only about R&D

**New to market product innovators with and without R&D, 2004-06 (or latest)**  
As a percentage of innovators



# The How: Firms today no longer innovate in isolation ...

## **Then: Closed Innovation**

❑ Approach: “not invented here”

❑ Innovation:

- Strategy independent of overall business strategy
- Performed in-house
- Internal pool of innovators

❑ Outputs:

- Incorporated in firm’s products and services.
- Product revenues finance next cycles of in-house R&D

## **Now: “Open” Innovation**

❑ Approach: “proudly found elsewhere”

❑ Innovation:

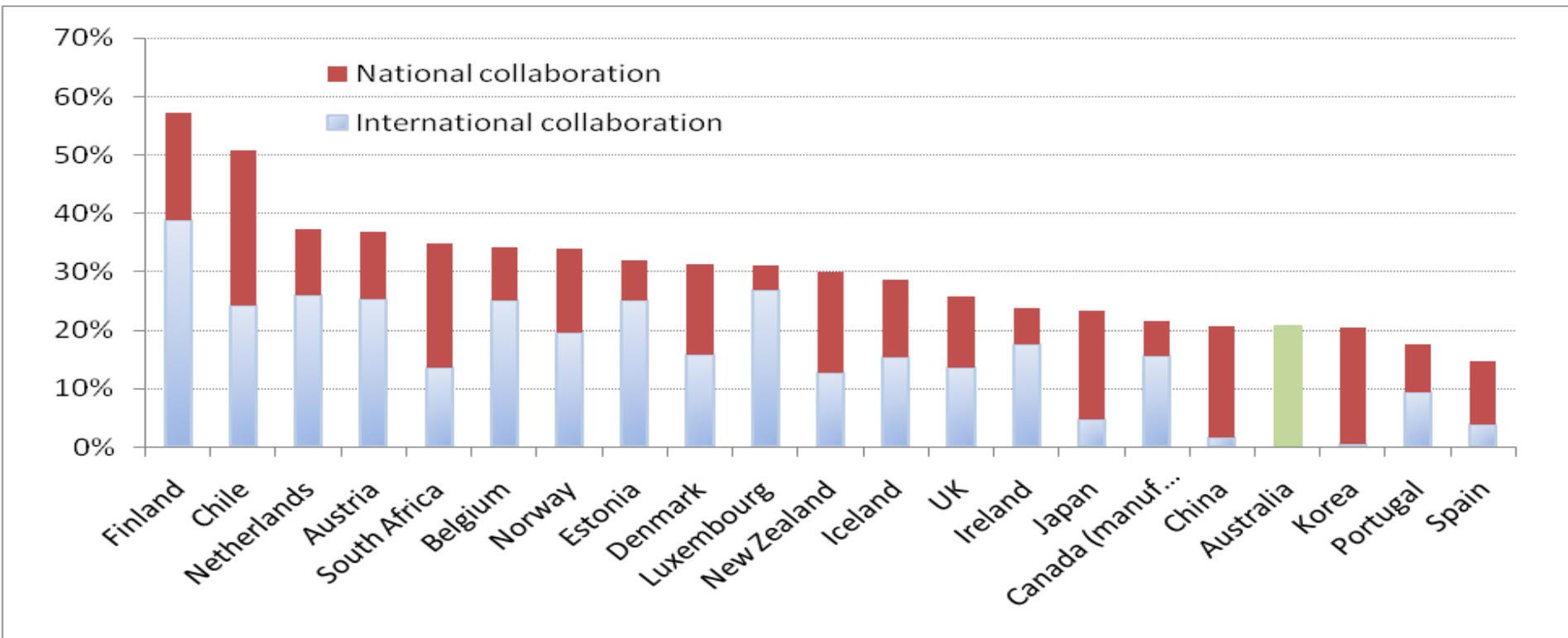
- Business strategy drives targets
- Technology developed cooperatively or acquired
- Work with many innovators and users/consumers
- Leverage own IP

❑ Outputs:

- Both internalized and externalized (*licensing, spin-offs, venturing*)

# ... and increasingly cooperate across borders.

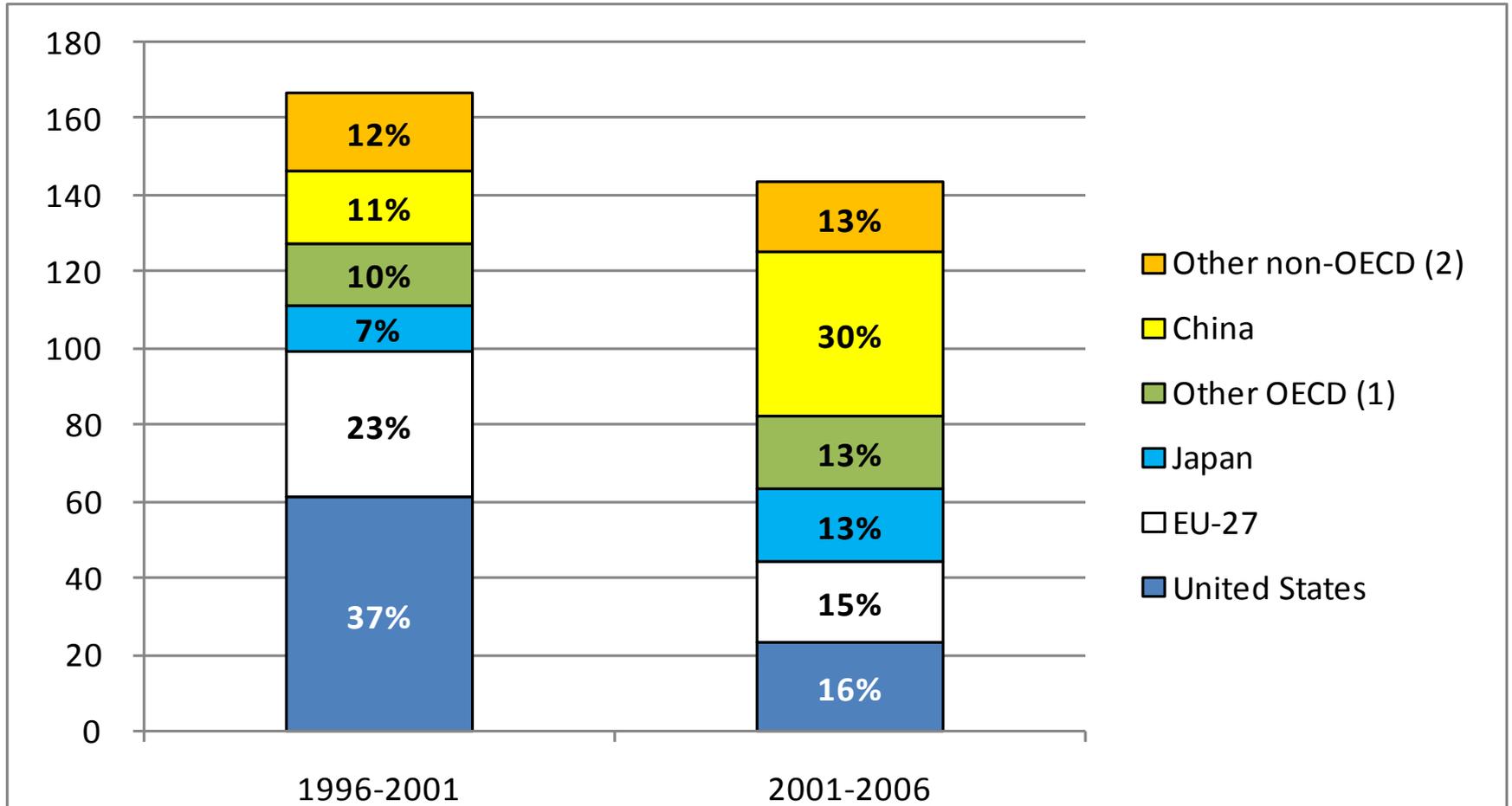
Companies collaborating on innovation, as a percentage of all firms, 2004–2008



Source: OECD, based on CIS and national sources.

# The who: New global players have emerged ...

Contributions to growth in global R&D, 1996–2001 and 2001–2006  
(in billion constant US PPP and %)



Note: (1) Australia, Canada, Iceland, Korea, Mexico, New Zealand, Norway and Turkey

(2) Argentina, Brazil, India, Israel, Russian Federation, Singapore, South Africa, Chinese Taipei

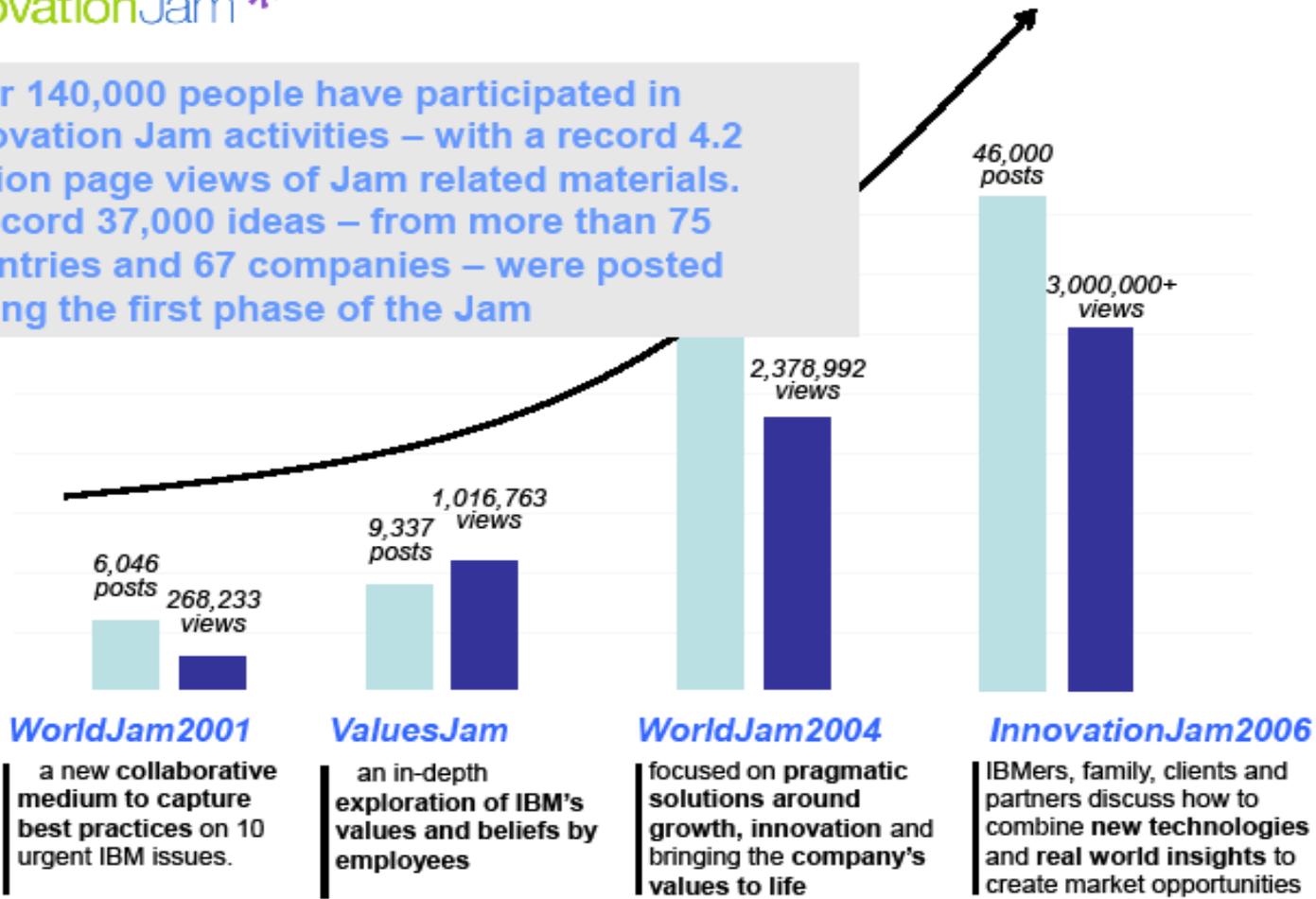
Source: OECD.

# ...and the Internet has enabled much greater participation in innovation.



## InnovationJam\*

Over 140,000 people have participated in Innovation Jam activities – with a record 4.2 million page views of Jam related materials. A record 37,000 ideas – from more than 75 countries and 67 companies – were posted during the first phase of the Jam



**WorldJam2001**  
a new collaborative medium to capture best practices on 10 urgent IBM issues.

**ValuesJam**  
an in-depth exploration of IBM's values and beliefs by employees

**WorldJam2004**  
focused on pragmatic solutions around growth, innovation and bringing the company's values to life

**InnovationJam2006**  
IBMers, family, clients and partners discuss how to combine new technologies and real world insights to create market opportunities

### 3. Key messages from the Innovation Strategy for green growth

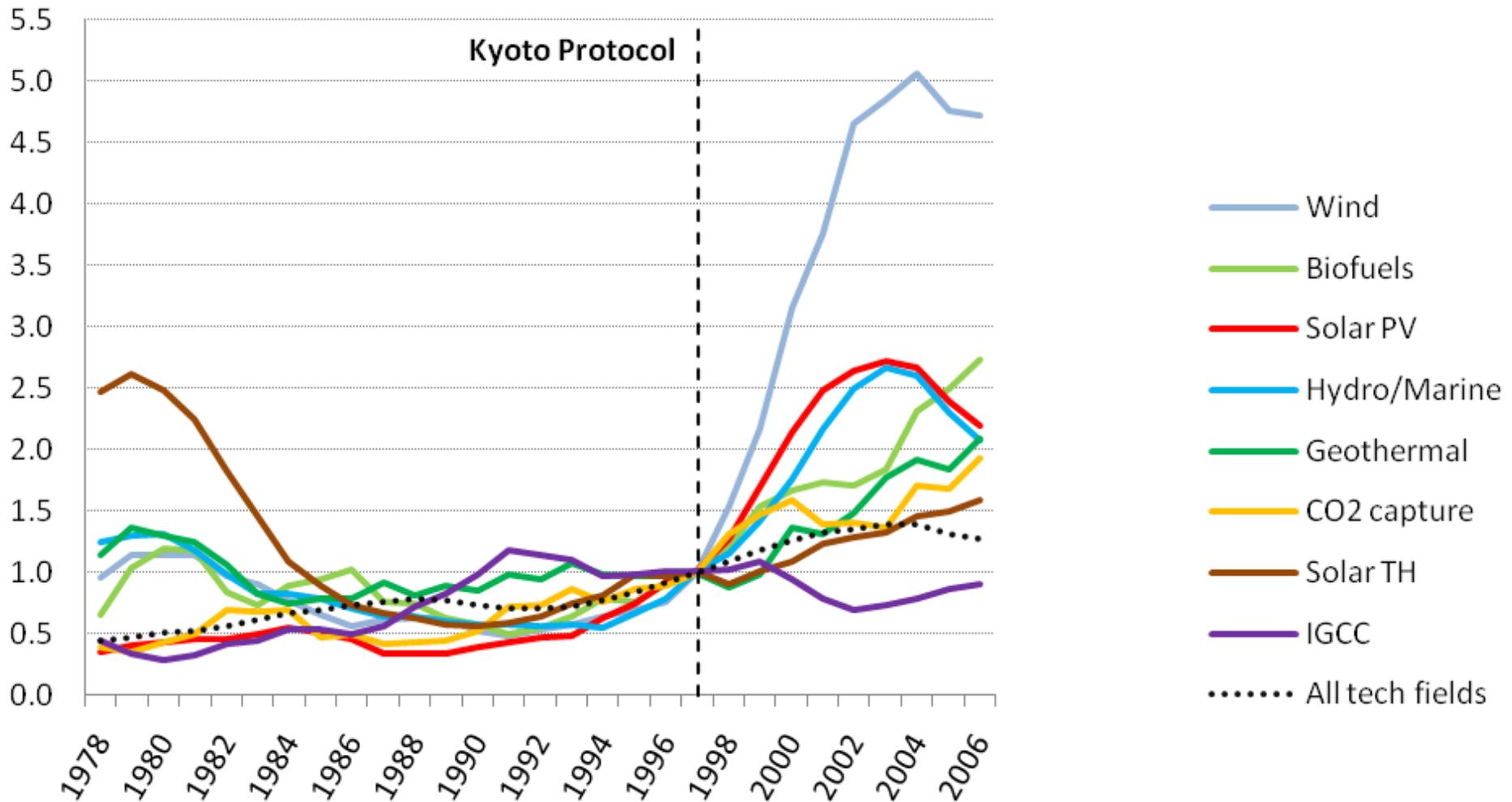
- Strengthening innovation for green growth requires a broad strategy, joining up policies in several areas:
  1. Improving the frameworks for innovation
  2. Fostering the creation **and** application of knowledge
  3. Unleashing innovation in firms
  4. Empowering people to innovate

# 1. Improving frameworks for innovation

- **Innovation can be a powerful force to address global challenges:**
  - Stable policy frameworks that encourage innovation and foster new markets
  - This implies “getting prices right”, e.g. through tax reform, removal of distorting subsidies, or other market instruments.
  - Policies should enable firms to search for the most optimal solution.
  - Investors need a stable and long-term time horizon.

# Policy can induce greater innovation

Patenting in climate mitigation technologies relative to all sectors  
(indexed on 1980=1.0, Annex 1 ratification countries)

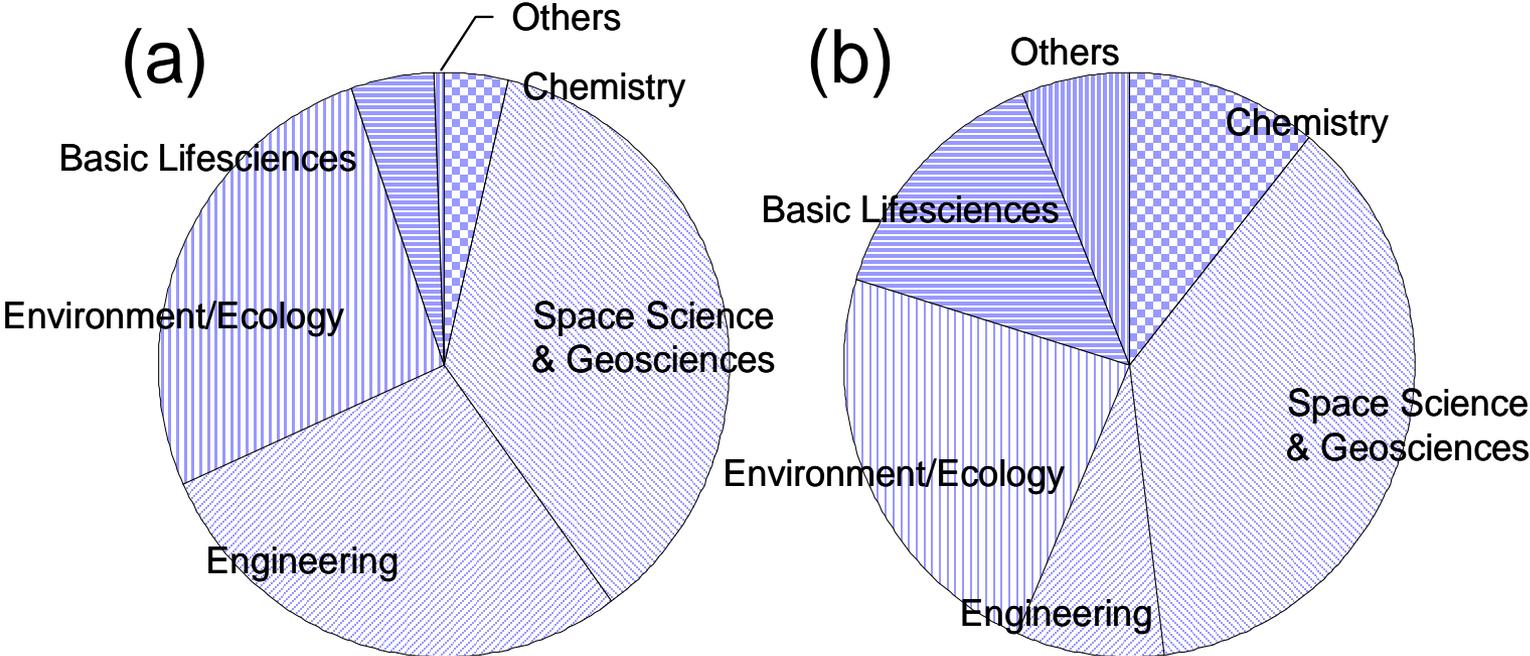


## 2) Creating and applying knowledge

- **Innovation requires public and private investment in knowledge creation and diffusion:**
  - Excellent and effective public research, that needs to be linked to social and economic needs.
  - Well-designed support for pre-competitive research.
  - A modern and reliable knowledge infrastructure, including well-developed ICT networks
  - Well-functioning knowledge networks and markets that support the diffusion and application of knowledge

# Public research funding: breakthroughs can come from anywhere

Fields in (a) core and (b) citing papers in environmental sciences



## 3) Unleash innovation in firms

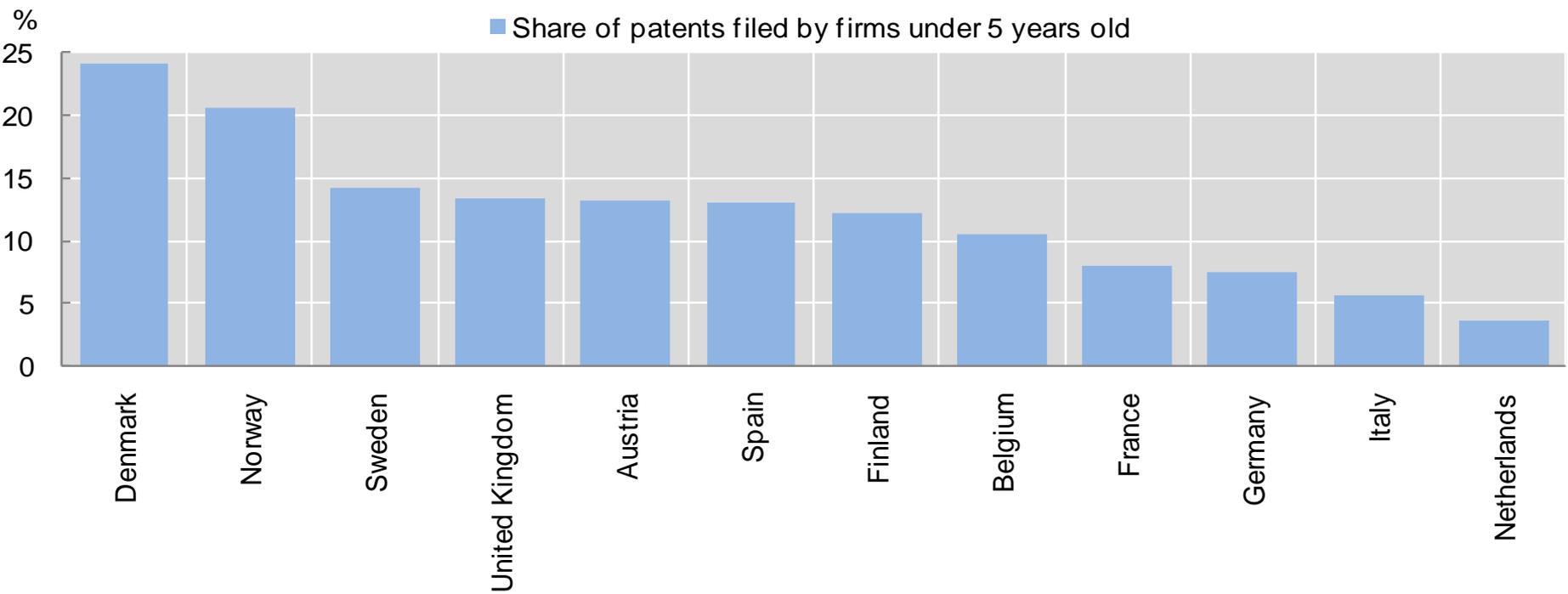
- Firms and an encouraging business environment are the key drivers of innovation:
  - Encouraging **entrepreneurship** – in new and existing firms
  - Strong **framework conditions** (supportive tax climate, competitive markets, openness to trade and investment, stable macro-economic policy, supportive regulations)
  - Strong **private funding for innovation** – well-functioning financial markets, including for risk capital, well-designed government support to address gaps



# New firms are particularly important drivers of (radical) innovation and job creation

## Patent applications filed by young firms, 2005

*As a percentage of patents filed by firms at the European Patent Office (EPO)*



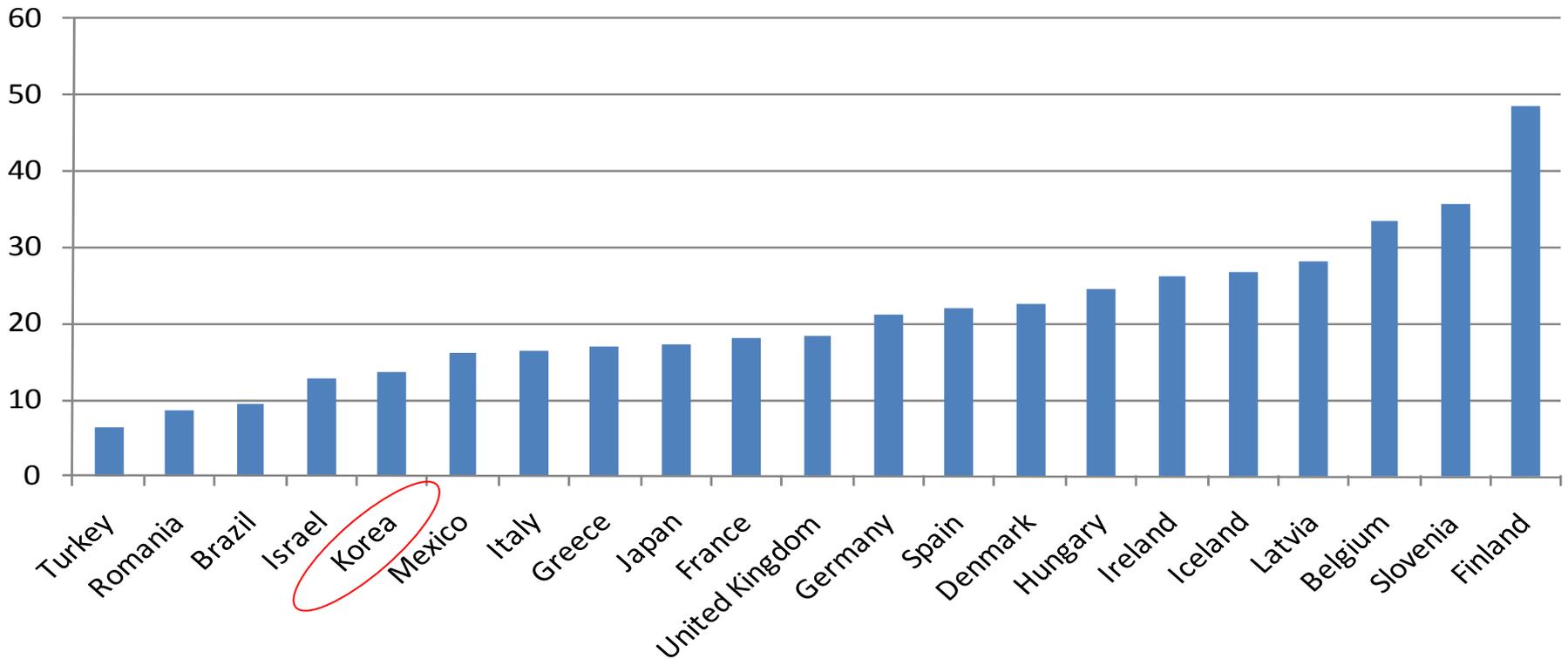
Source: OECD, HAN database, October 2009 and Bureau Van Dijk Electronic Publishing, August 2008

## 4) Empower people to innovate

- Green innovation not only depends on scientists and engineers, but on people in many roles:
  - Entrepreneurs, key to idea generation and commercialisation
  - Workers, key to workplace innovation
  - Users and consumers, influencing the direction of innovation
  - Global talent spreading hands-on knowledge
- Implies:
  - A broad and inclusive agenda for education and training
  - A well-functioning labour market that enables mobility, organisational change and structural change.
  - Policies that empower and enable consumers to engage

# For example, only few people receive entrepreneurial education

**Population aged 18-64 with training in starting a business, 2008**  
*As a percentage of total population*



## 4. Some broader messages

### We need policies for supply and demand:

- The objectives of innovation (growth, sustainability, ...) are achieved through diffusion and take-up
- Most public policy is aimed at the creation of knowledge.
- Need to better join up “push” and “pull” policies:
  - Getting prices right to create markets for environmental innovation and policies that can create radical innovations and breakthroughs.
  - Empowering people to create knowledge and apply knowledge
  - Protecting IPR and creating value from IPR

## Seizing the benefits from green growth:

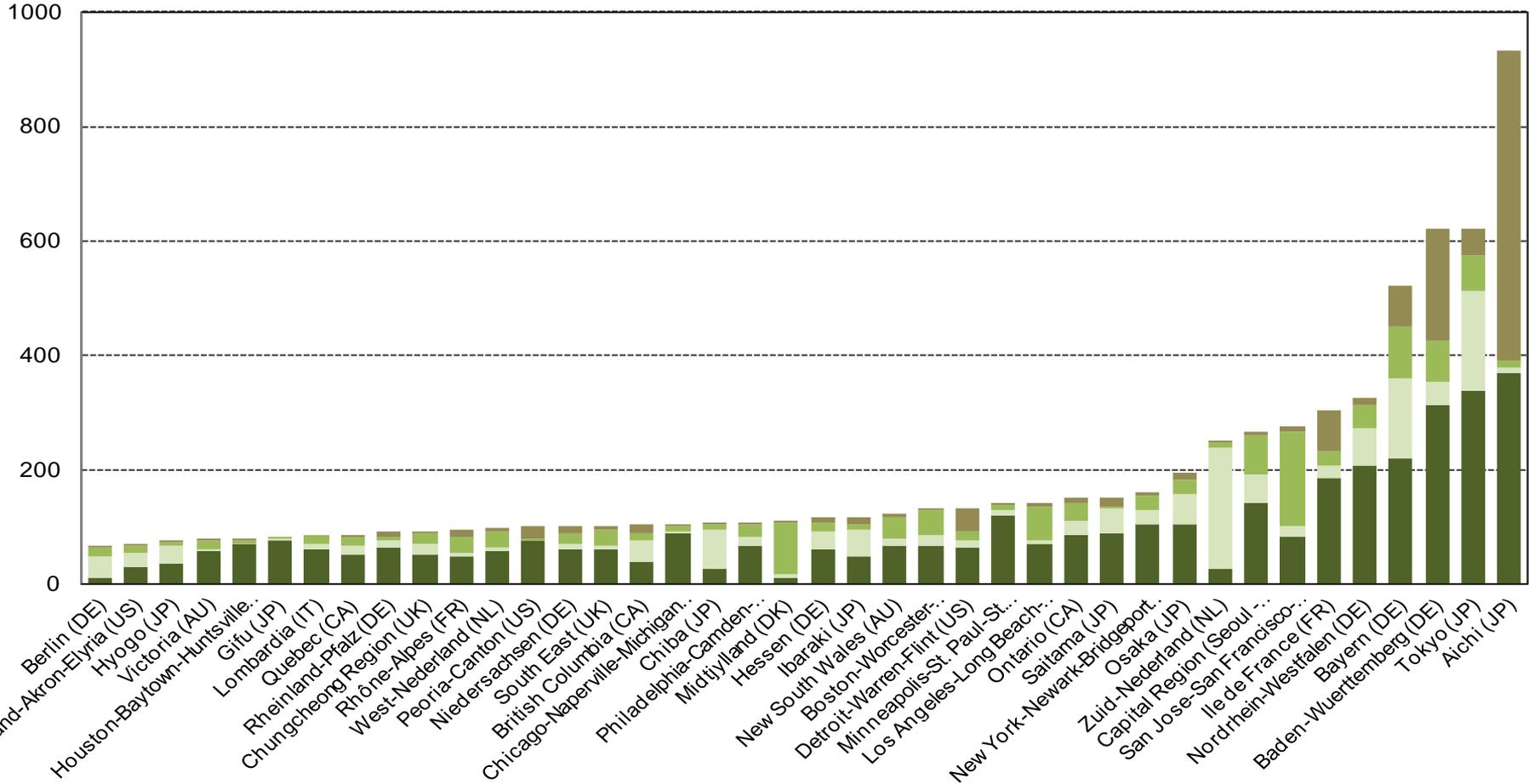
- Setting priorities and creating excellence and critical mass
- Strengthen and capitalise on comparative advantage and local strengths: firms, knowledge institutions, people, services, social factors, culture, etc.
- An open and competitive environment
- Develop a joint vision and strategy for long-term investment

# Some regions are well placed to benefit

## Top 40 regions in green patents

(Patent Cooperation Treaty patents filed in environmental technologies)

■ Pollution abatement and waste management 
 ■ Energy efficiency in buildings and lighting 
 ■ Renewable energy 
 ■ Electric and hybrid vehicles



## The roles of government and business:

- The role of markets can be strengthened to unleash demand: e.g. through getting prices right, regulatory reform, smart use of public procurement, consumer involvement, ..
- At the same time, governments play an important role in driving innovation in the post-crisis environment, e.g. in setting frameworks, and in efficient public investment.
- Need for a true public-private partnership

## Long- and short-term actions:

- Policies for innovation are mainly focused on strengthening growth and addressing challenges over the long term
  
- But some implications in exiting from the crisis:
  - Investment in the long-term sources of growth important, also as private investment may lag due to high costs of finance
  - Support for new firms important, also for employment creation
  
- Not all policies require additional public investment, e.g.:
  - Removal of barriers to innovation
  - Fostering of markets for innovative products and for knowledge
  - Better use of public procurement
  - Tax reform to support innovation and green growth

## 5. Conclusions

### **Driving innovation for green growth will require a mix of policies, including:**

- Better incentives – getting prices right – for firms to invest in innovation and improve efficiency.
- Investment in public research to address fundamental challenges, covering a wide range of areas, as breakthroughs may emerge from a wide range of fields.
- Scope for new firms to deliver radical green innovations that challenge existing firms and business models.

# For further information

**OECD website**

[www.oecd.org/innovation/strategy](http://www.oecd.org/innovation/strategy)

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