

# Eco-innovation in Sectors

Dr. Fernando Javier Diaz Lopez

*Eco-innovation Futures Programme*

*Netherlands Organisation for Applied Scientific Research TNO*

**JIP symposium “The Future of Sectoral Innovation” – 19/04/2010**

# Content

1. State of affairs
2. What we (think) we know about eco-innovation
3. Drivers and barriers
4. Sectoral eco-innovation: two examples
5. Sectoral policy challenges

# The State of Affairs today

- Global warming, climate change effects and energy sufficiency
- Current great challenges make eco-innovation the sensible path to follow
- Eco-innovation at the forefront of current policy discussions at all levels

# What we (think we) know

- Understanding of lead markets (ZEW contributions)
- Insights on measures (Mei, Ecodrive)
- Financial gaps (Fundetec)
- Drivers and barriers; diffusion factors (Popa-Ctda)
- Size of eco-industry (Ecorys report)
- Inventory of policies for SCP and SID (Scope2)
- Policy roadmaps (OECD, ETAP )
- Emerging trends (Testnet, several reports)

## What we (think we) know (2)

- Capabilities (German Ministry studies)
- Transfer of ETs (Swedish Chamber of Commerce)
- Transfer and patents (OECD)
- How policy processes should support the success of eco-innovations (?)

But only now we start having an understanding at sector level (Sectoral Innovation Watch-II)

- Emerging trends linked to investment
- Future markets
- Sectoral drivers and barriers

# Old and New Beliefs

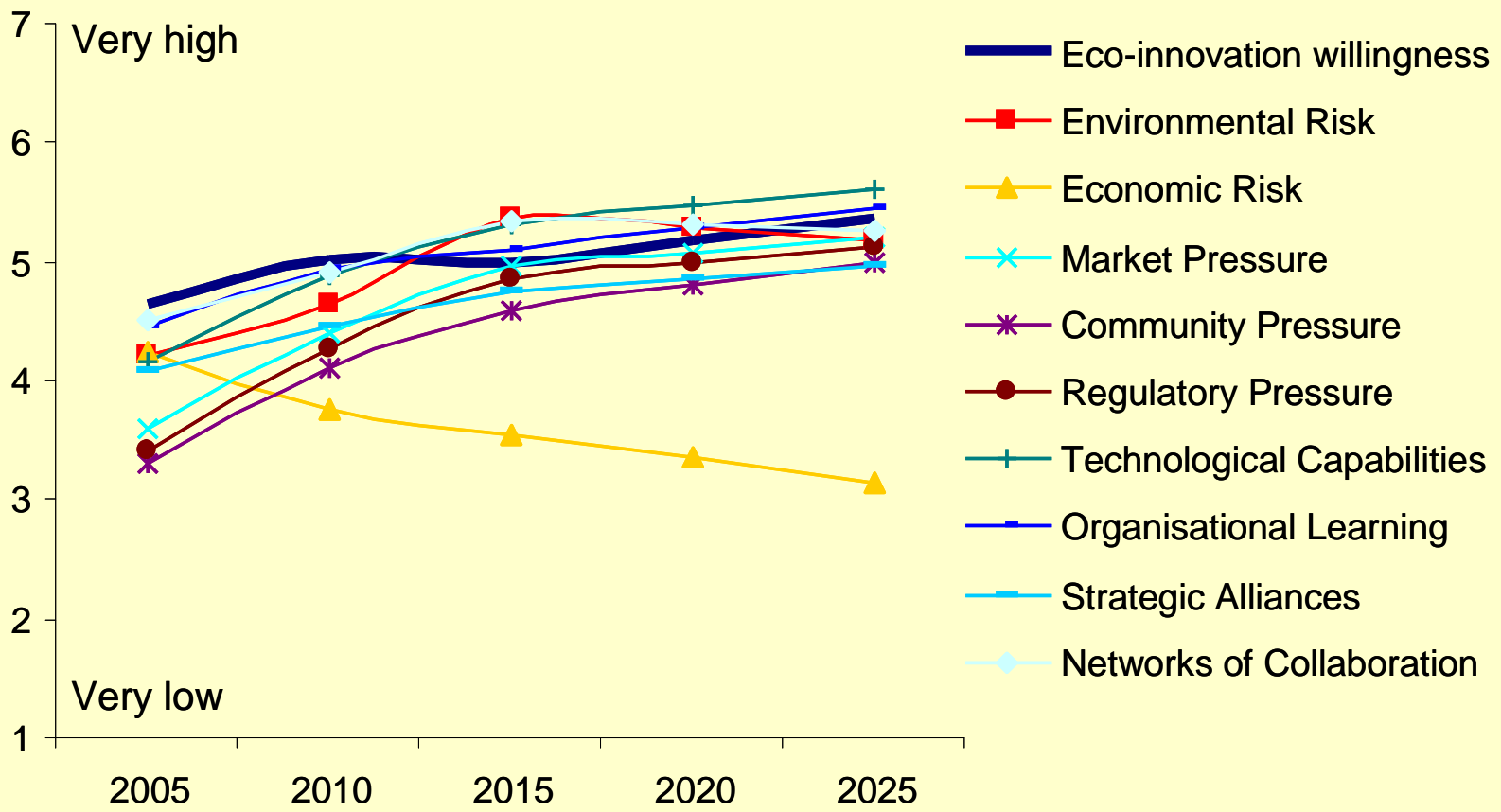
- Cost reduction
- Regulation
- Dominant technological paradigms and trajectories
- Relative prices of environmental goods and services
  
- Change in policy motivation due to recognition of new drivers of innovation
  - Co-creation of value
  - Global knowledge sourcing and collaborative networks
  - Global challenges (environmental sustainability, climate change, ageing population, population growth, etc)
  - Public sector challenges (Fora, OECD, et al 2009)

## Old and New Beliefs (2)

What are we seeing now? Policy setting towards a low carbon economy is also influenced by:

- System failures in innovation systems, in addition to market failures
- Recognition of value of “hidden” innovation
- Consumer behaviour and greener choices
- Ethical business models
- Household consumption

# Willingness to eco-innovate



Source: Montalvo et al., 2007

## 2 examples of emerging eco-innovations

1. Environmental and energy service innovation
  - KIBS lead
  - Virtually all sectors are prospective users

**See:** [http://www.europe-innova.eu/c/document\\_library/get\\_file?folderId=182814&name=DLFE-7140.pdf](http://www.europe-innova.eu/c/document_library/get_file?folderId=182814&name=DLFE-7140.pdf)

2. Advanced materials
  - Biotechnology
  - Textile and Clothing
  - Food and Beverage
  - Construction
  - Aerospace
  - (Chemicals)
  - (Pharmacy)
  - etc

**Source: Diaz Lopez, Montalvo & Brandes (2010)**

# Eco-innovation in E&E services

- Providing services to (virtually) all other NACE sectors
- Eco-industry difficult to distinguish from KIBS (from official statistics)
- No figures at the aggregate level of market evolution, but we can provide some examples:
  - Venture investments in energy efficiency consultancy firms (2001-2009)
    - Globally: 165 million (USD)
    - Europe: 16.5 million (USD) (Source: TNO)
  - Revenues in consultancy services related to automation (energy/resource efficiency oriented)
    - 14 billion (USD) in 2006 (global)
    - Expected to growth to 12% in 2011 (Source: ARC)

## Eco-innovation in E&E services (2)

How many provide E&E-KIBS? Difficult to say, as we do not have enough data

E.g. the European Atlas Observatory reports:

- 274 firms providing eco-design services,
- 103 environmental R&D,
- 58 IT environmental services,
- 53 sustainable water management
- 33 ecosystems management
- 11 resource and materials efficiency

In contrast, there are 1120 for waste recycling and processing! (typical eco-industry)

NOTE: figures are just indicative, as the European Atlas Observatory is a pilot initiative of the European Environmental Agency and no comprehensive data can be derived from it just yet. It is expected that the Eco-innovation Observatory will provide insights on this issue.

# Eco-advanced materials

- 223 global VC deals in the period 2002-2009 with a value of €1,2 bn, which is less than 3% of the proposed European public R&D funding for this enabling technology (44bn/year)
- 82% was concentrated in USA-based firms (some of them with subsidiaries established in the EU)
- European firms (from Belgium, Finland, Germany, Ireland, Italy, Netherlands, Norway, Sweden, and the United Kingdom) reported a discrete 11% share

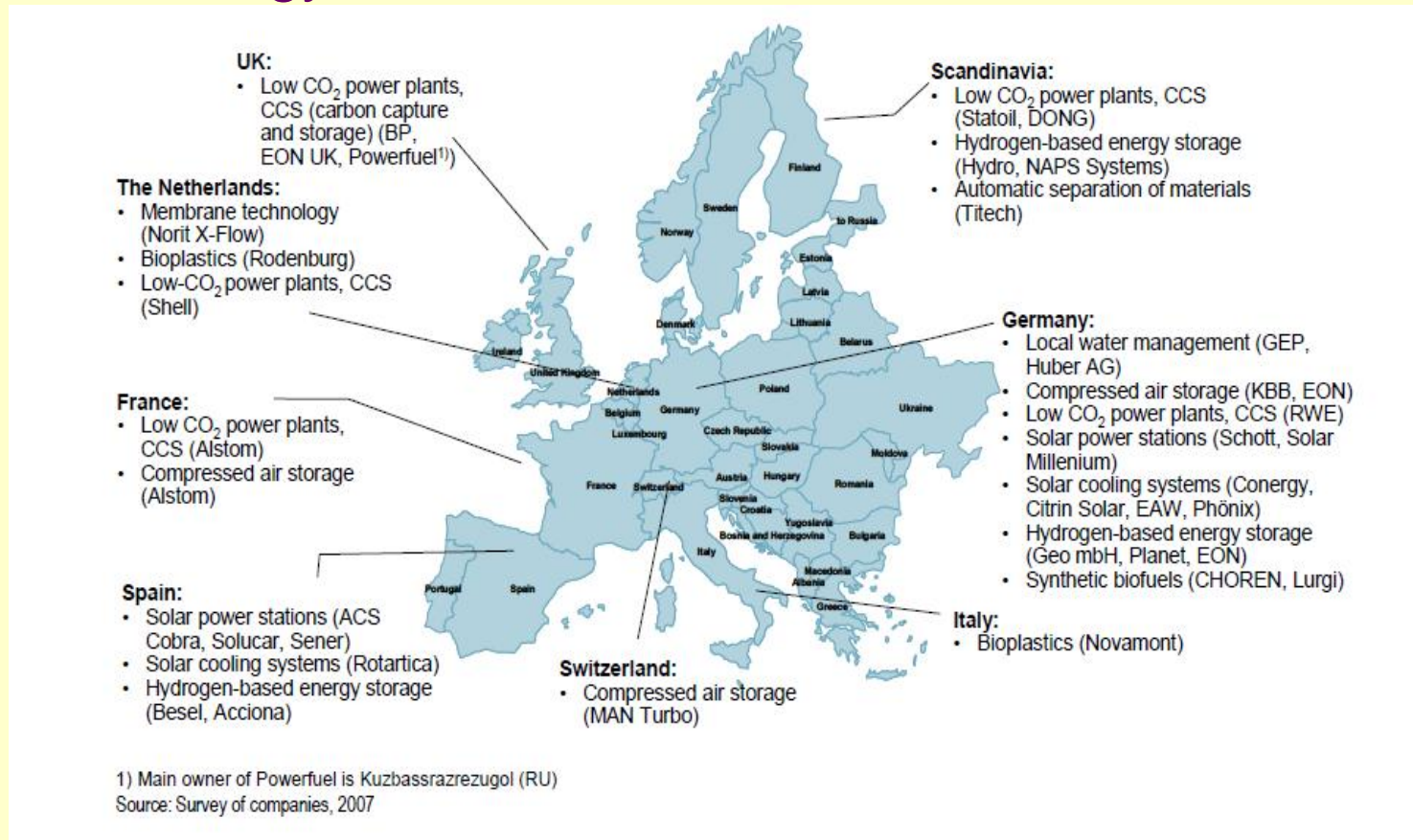
## Eco-advanced materials (2)

- Venture capital investment in Europe in energy generation technologies was €27bn during the same period.
- If we exclude nanomaterials (and we focus only on eco-innovations in bio-materials, advanced ceramics and advanced polymers labelled as ECO), the global value of venture investments was about €728 m.
- BRIC countries (in particular China and India) have been catching up with the rest of competitors with a value close to the 45% of the European venture capital (or 65% of EC, if we exclude nanomaterials).

Source: Diaz Lopez, Montalvo & Brandes (2010)

# Competence is for the markets...

- European position in selected Environmental Technology markets



## Competence is for the markets...(2)

- We know what markets are for first and second generation eco-innovations
- One fifth of the current global venture investment occur in eco-innovation
- Innovation in usual suspects boomed (up to mid 2000s), but venture investment in these areas has decreased in the last 3 years (e.g. solar is % down)
- Due to the intrinsic relation of technology (in manufacturing) and services, relatively more mature areas (e.g. wind, renewable, biofuels: all 30 years +) may boost growth in demand for E&E services (e.g. energy efficiency VC is % up)

# Policy focus

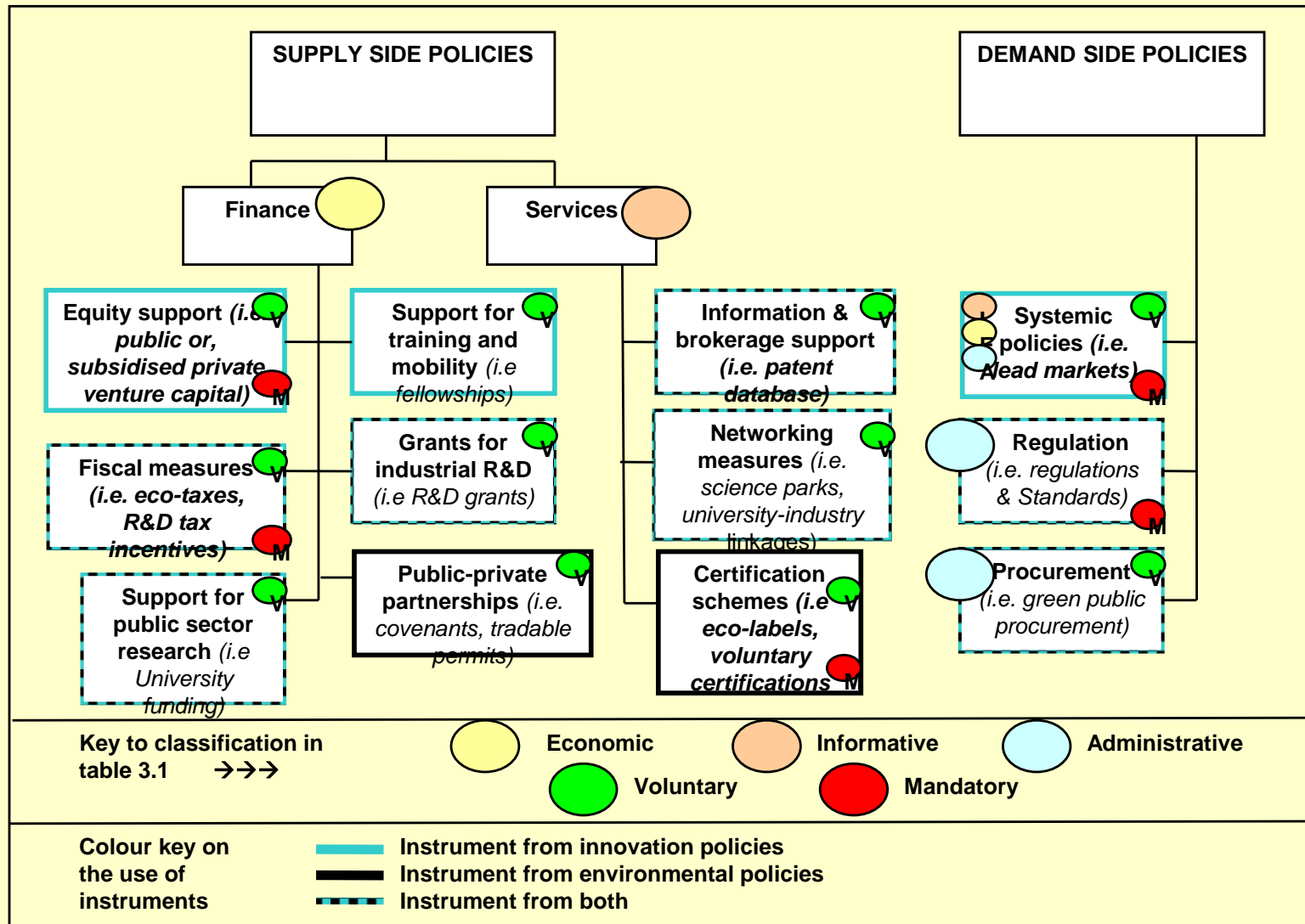
Current focus on first and second generation eco-innovations

Renewable energy technologies dominate the agenda (due to need to secure energy supply)

Emerging eco-innovation areas → are they lead markets?

- Financial gaps still there
- Rate of investment differs across sectors
- Taxonomy of eco-innovations – factor X of improvement and optimal sustainability situation

# Unbalance between innovation and environmental policy instruments



# Policy challenges

- Innovation dynamics is different across sectors, so it is eco-innovation:
  - Regional innovation policies?
  - Technology-specific innovation policies?
  - Sectoral innovation policies?
  - Or a combination of them?
- Investment in emergent eco-innovations, maybe linked to patents and knowledge base

## Policy challenges (2)

- Measures at the sector level are possible, but emergent innovations are difficult to be captured using current statistics
- Linking structural change, sector dynamics, industry trends, sustainability factor, firm behaviour and substitution effects of eco-innovations
- Systemic intervention

Thanks for your attention!

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Dr. Fernando Javier Diaz Lopez – [fernando.diazlopez@tno.nl](mailto:fernando.diazlopez@tno.nl)

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JIIP symposium “The Future of Sectoral Innovation” –Brussels, 19/03/2010