Radical & systemic eco-innovation and the role of business models

OECD Project on Green Growth & Eco-innovation

24 October 2011

Tomoo Machiba
Senior Policy Analyst, OECD

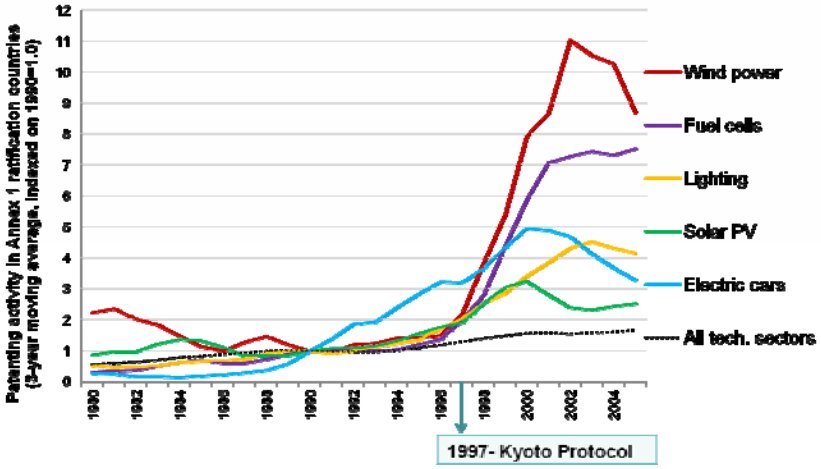
OECD Green Growth Strategy

- June 2009: OECD Ministerial Council Meeting (MCM) adopted the **Declaration on Green Growth**
- OECD to develop horizontal **Green Growth Strategy** to achieve economic recovery and capture new source of growth based on sustainability
- Led by core Directorates: ENV, ECO, STD & DSTI
- Final report published as ***Towards Green Growth*** in May to be presented as Rio+10 contribution
- Work for implementing the Strategy will continue subsequently.

Innovation helps green and growth

- Innovation involves the generation and creative use of knowledge as well as its diffusion through increasingly global markets and networks
- Enhances the growth potential of the economy, *e.g.:*
  - Innovation accounted for **over 2/3 of labour productivity growth** in several OECD economies in 1995-2006
- Facilitates the transition to a greener economy, *e.g.:*
  - Climate mitigation **costs in 2050 would be halved** - reduced from 4% of world GDP to 2% through innovation

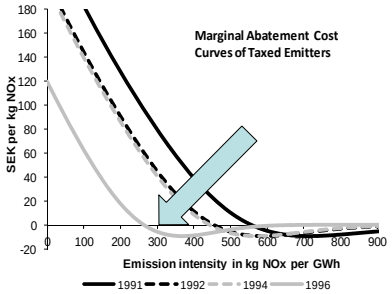
Importance of clear policy signals



Source: OECD (2010), *The Invention and Transfer of Environmental Technologies*

Taxes could promote innovation

- **Swedish NOx tax**
  - Patents increased; emission intensities declined; Marginal abatement costs fell



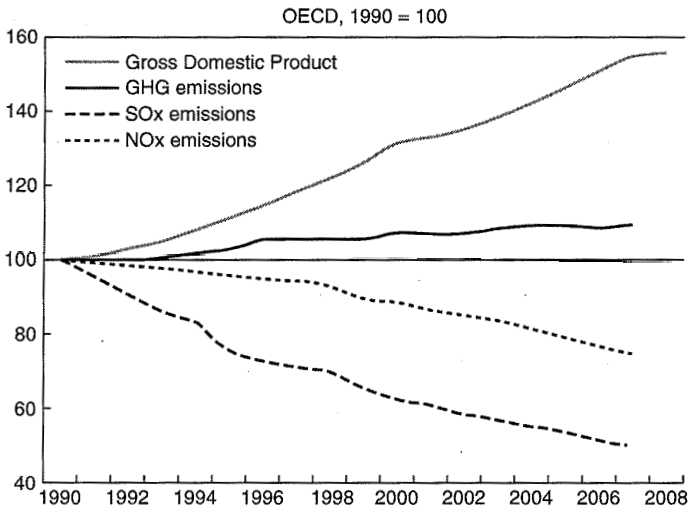
- **Swiss VOC tax**
  - Firms found many solutions involving changes in organisational and production practices that did not result in patenting of technologies
- **UK Climate Change Levy**
  - Firms that agreed to a voluntary emission-reduction agreement received a 80% reduction on carbon tax = > innovated less

Source: OECD (2011), *Taxation, Innovation and the Environment*

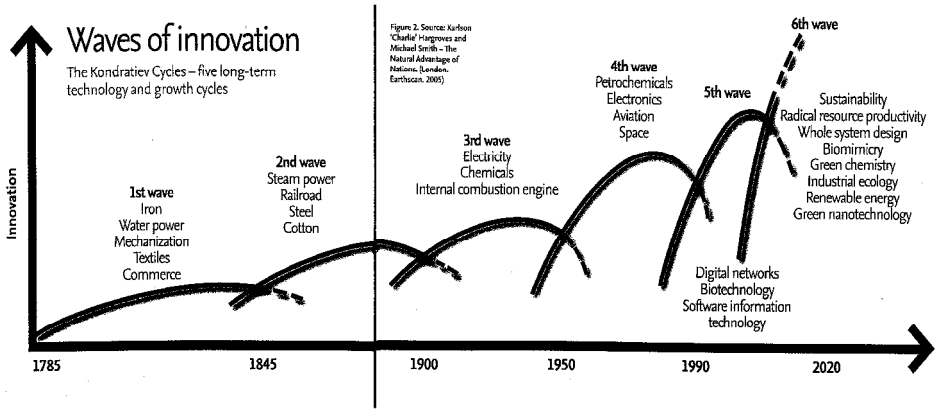
But pricing is not enough

- Market instruments – *e.g.* a tax on carbon – will increase the incentives for firms to invest in eco-innovation, but has tended to lead mainly to incremental innovation
- Pricing will not remove all barriers to eco-innovation.
- Additional policies to strengthen eco-innovation, *e.g.:*
  - Investment in research (including international co-operation)
  - Support for other technologies, including ICT, biotech, nanotech, etc.
  - Demand-pull policies
  - Technology transfer, to diffuse technologies globally

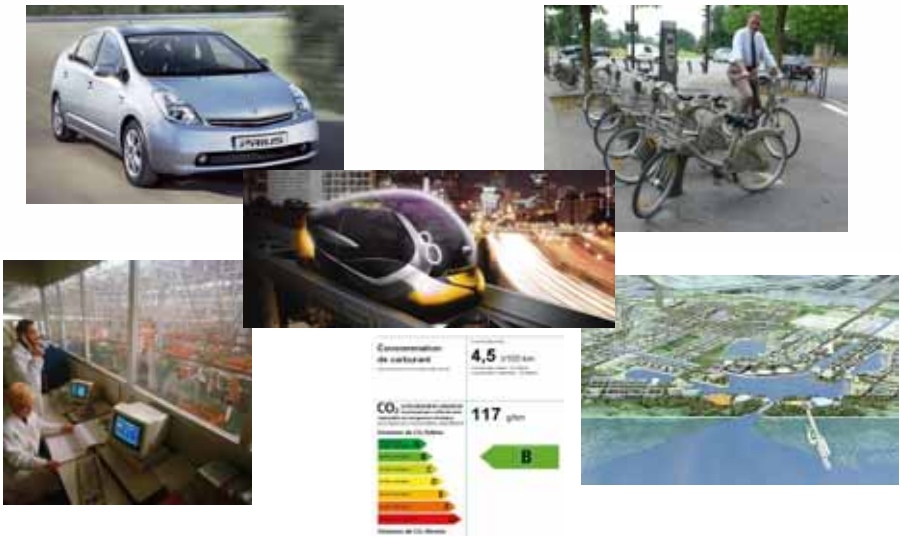
Resource productivity is the guide



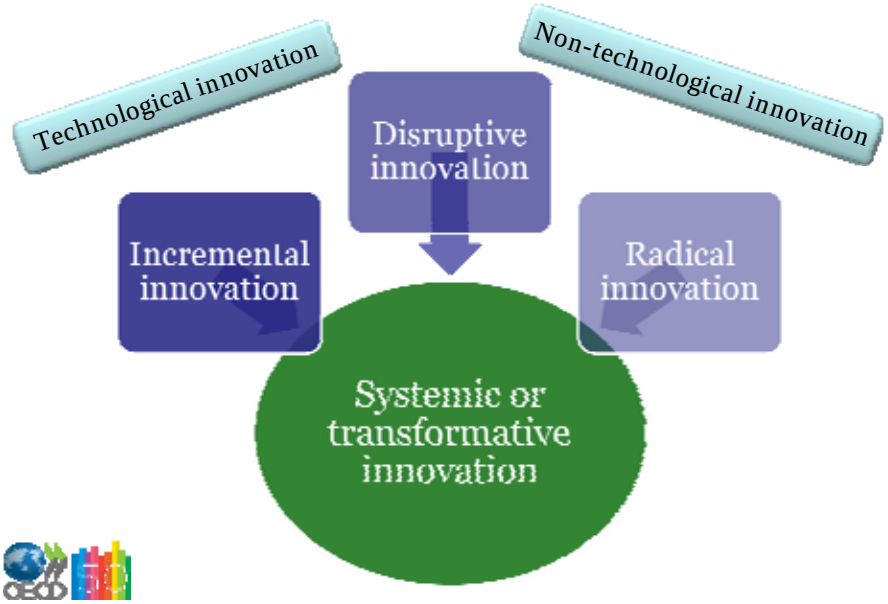
Aiming for technology transition



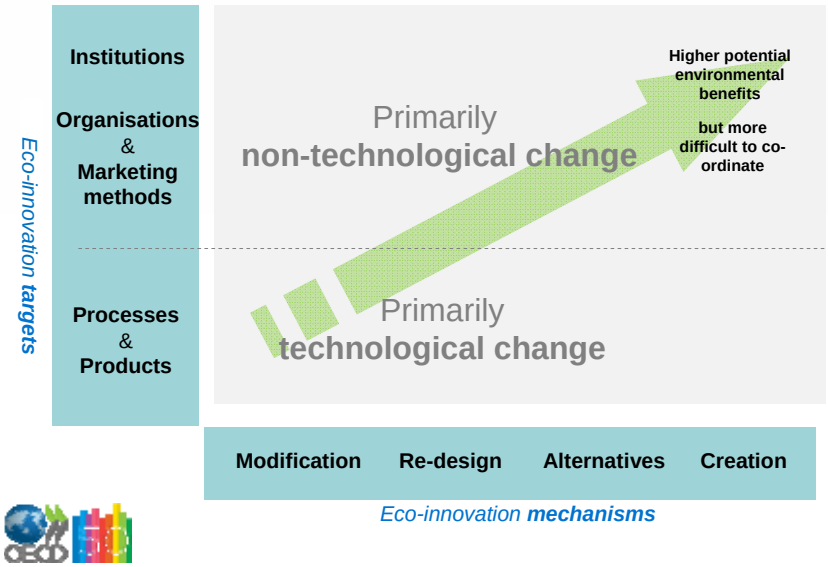
Different types of solutions needed



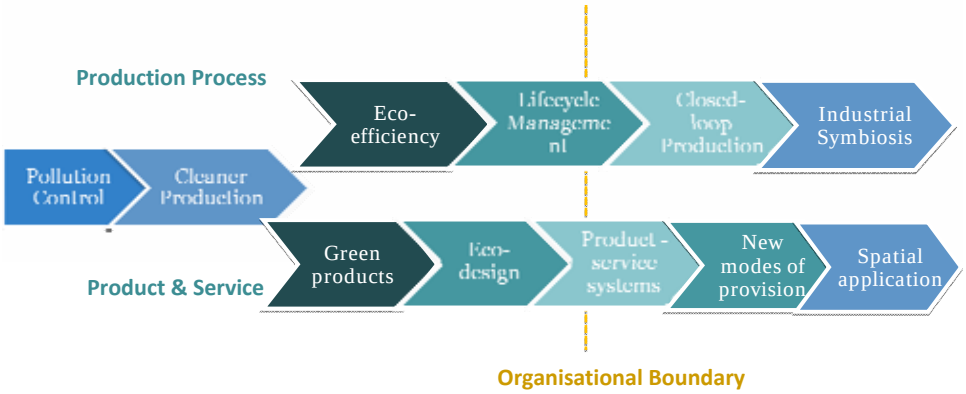
Different levels of innovation



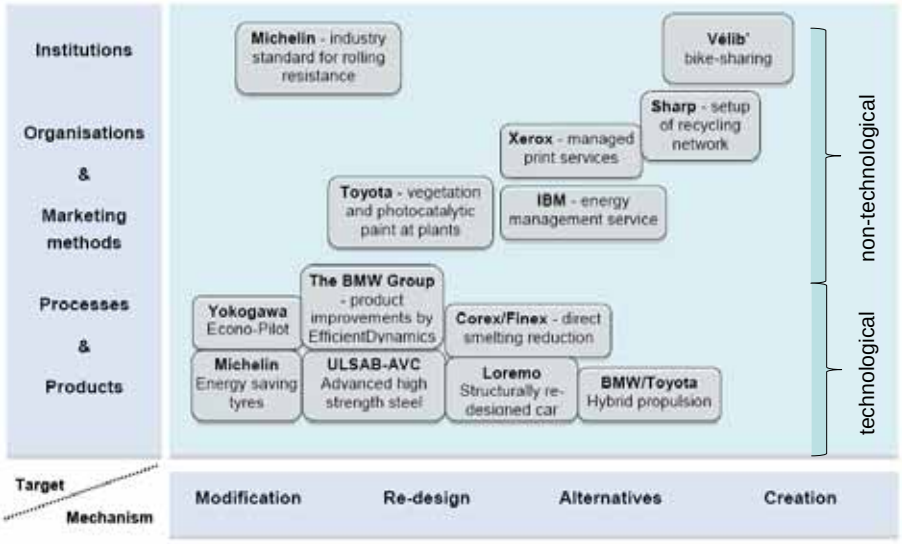
Eco-innovation framework



Evolution of eco-solutions



Eco-innovation examples



Econo-Pilot

- For every dollar spend on powering a computer server, another dollar for cooling; half the office energy used for cooling
- Japan's Yokogawa Electric invented a technology that controls pumping pressure, applicable for existing systems
- Can reduce pump power consumption by up to 90%
- Developed with a few companies and demonstrated with support from NEDO

High-strength steel

- Weight matters: 10% lighter vehicles can improve 1.9-8.2% in fuel efficiency.
- Ultra-Light Steel Auto Body (ULSAB) initiative was formed by global steelmakers and vehicle designers
- A few concepts and experiments are ongoing.
- Germany's entrepreneur Loremo invented 50km/l car with conventional diesel engine.

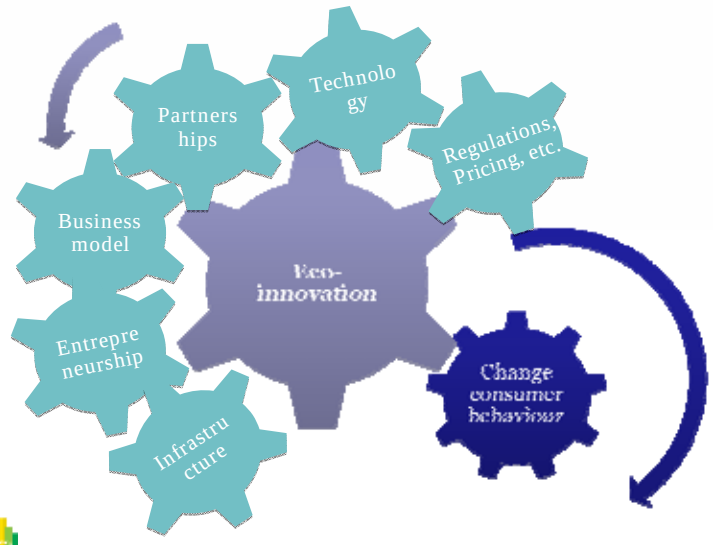
Michelin & Xerox

- LCA shows 86% of CO2 from the rolling phase
- Introduce green tyres with lower rolling resistance ... reduce fuel by 0.2l per 100km
- Fleet Solutions: Sell tyre maintenance services by kms driven ... longer lifetime
- Managed Print Services: Supply document services with tailored solutions ... assessment, optimisation, maintance
- Solid Ink technology ... no need of cartridges

Vérib' in Paris

- Congestion and air pollution is worse than other cities.
- Introduced 24,000 bikes at 1,750 sharing points every 300m
- 24 hours and free for 30 minutes
- Use smart card and IT monitoring system
- Run by City of Paris and an advertising agency
- Autolib' to be launched end 2011

Multiple actors for innovation

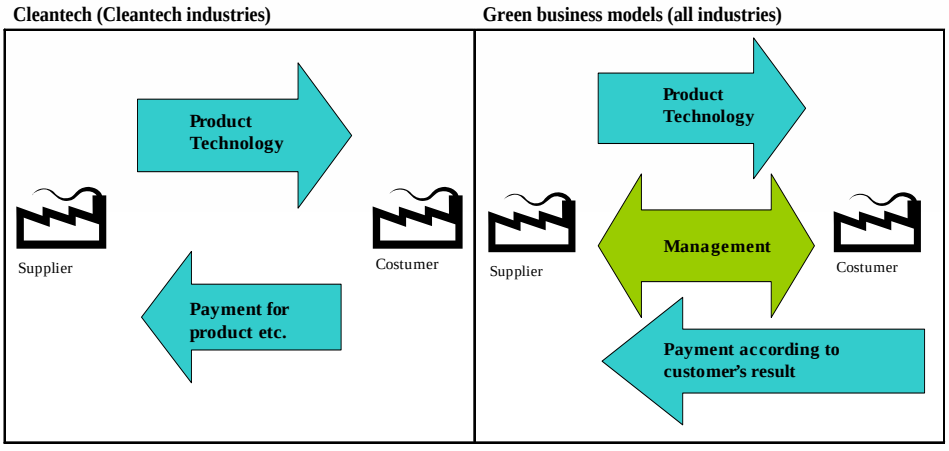


Emergence of new business models

- *Functional sales*: Customers pay for the functionality or result of the product.
- *Energy saving company (ESCO)*: Sell energy saving solutions
- *Chemical management services (CMS)*: Long-term contract to supply and manage
- *Design, Build, Finance and Operate (DBFO)*: 20-30 year contract over construction, maintenance and operation
- *Sharing/renting*: Encourage shift from private ownership

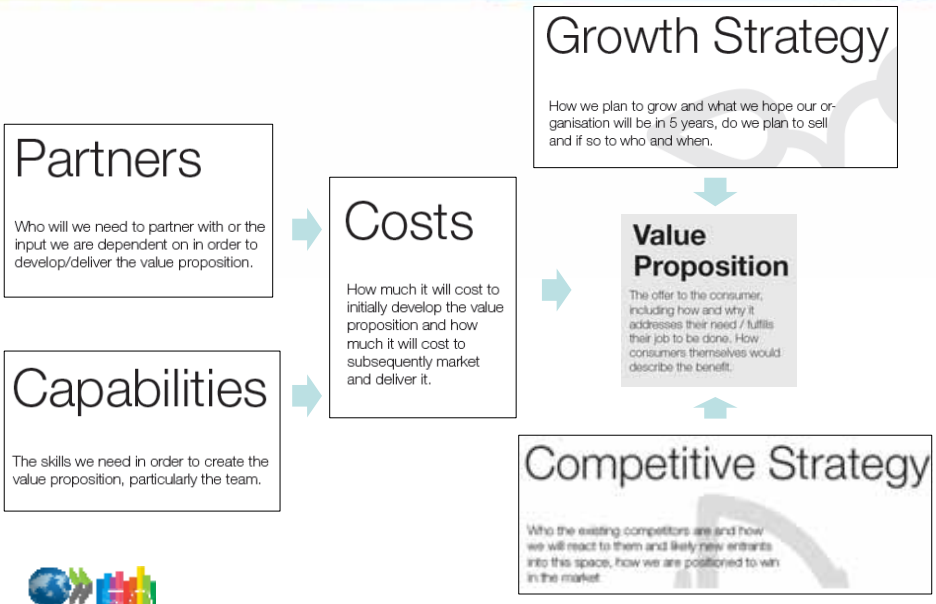
Source: FORA (2010), *Green Business Models in the Nordic Region*

How to understand business models (1)



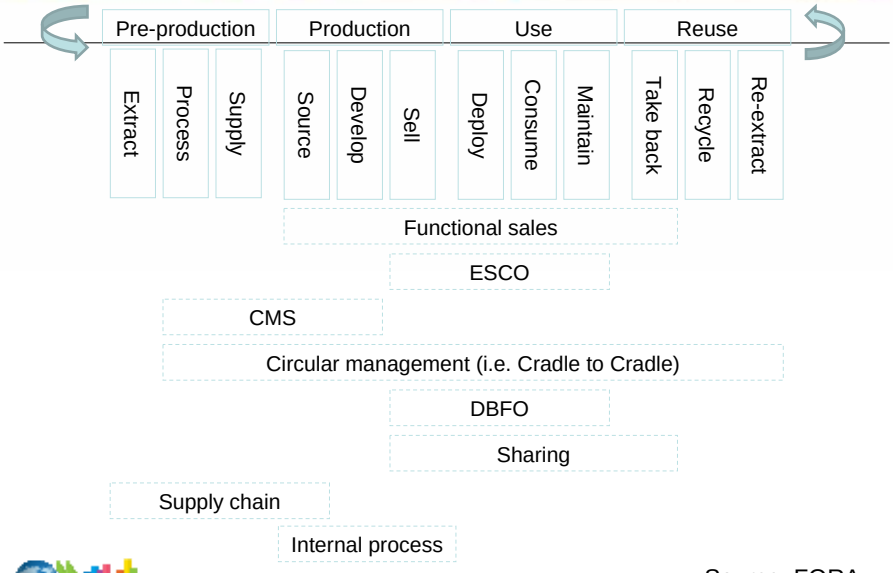
Source: FORA

How to understand business models (2)



Source: FORA

How to understand business models (3)



Source: FORA

Business case studies

- Focus on radical & systemic eco-innovation ... higher potential to enable decoupling and challenge the technology regime
- Particular attention to innovation in business models ... *e.g.* a shift from selling products to providing functions
- 27 countries are taking part and 95 examples (out of 490 nominations) are being examined by country experts – interviews & write case reports
- The study will be closed by end of year and the analysis will be published in 2012.
- Prominent cases: New mobility, Green building, Eco-towns, Material reuse & recycle, Product improvement, IT optimisation, Industrial symbiosis, Water saving

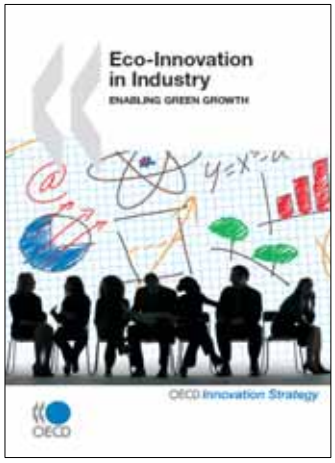
Questions to investigate

- *Solutions & business models*: How the case functions differently and how innovative
- *Impacts & benefits*: How environmental/economic/social benefits are created and how they are defined
- *Innovation processes*: Who initiated, where idea came from, How new technologies were developed, How they turned into a business
- *Influencing factors*: Drivers and barriers to innovation, particularly policies
- *Lessons from innovators*: How government could help better, advice to other innovators

Policies for systemic shift

- Focus on particular technologies ... renewables, electric vehicles, etc. –> System thinking is lacking
- Try to match short-term growth and job objectives –> Restructuring need is not taken
- Mainly supply-side measures, especially R&D –> Demand and "valley of death" is not addressed
- Focus on "low-hanging fruit" and lack exploration of long-term options and infrastructural investment –> Avoid technology lock-in and plan a green transformation

Looking forward to collaboration



- Phase I report launched at COP15 in 2009
- OECD Sustainable Manufacturing Toolkit launched in September
- Conference planned in January 2012
- Phase II report in 2012

tomoo.machiba@oecd.org

www.oecd.org/innovation/green

Sustainable Manufacturing Toolkit

www.oecd.org/innovation/green/toolkit

- Help supply chain and SMEs understand and improve environmental performance through 18 key indicators
- Visual Start-up Guide (free to download) & Web Portal
- Ideas for dissemination among SMEs are appreciated.
- Your tools and initiatives can be linked to Web Portal.