

ICTs and the environment: Perspectives and policies

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between ICT and Energy
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The framework: ICTs and the environment

- Smart information and communication technology applications can improve the environment and tackle climate change.
- Promising applications in buildings and urban systems, transport, energy, manufacturing, and supporting sustainable consumption and greener lifestyles.
- But economies and populations and global production and consumption continue growing. ICT-related changes in production, consumption and living are necessary to address environmental challenges.
- Government policy and guidelines have a major role in improving the environmental performance of their ICT-related activities and encouraging wider application of ICTs to improve environmental performance.

The framework: ICTs and the environment

- **Direct effects:** ICT R&D and innovation to improve environmental performance of ICTs. Reducing energy use and waste generation
- **Enabling effects:** "Smart" ICT applications to increase efficiency in buildings and urban systems, transport and logistics, electricity systems, and in production, distribution and consumption
Sensors and sensor networks to improve performance. Online 'digital' delivery
- **Systemic behavioural change:** Substantially change peoples' behaviour over time and space

ICTs and the environment: some examples

- **Direct effects:** ICT producers affect the natural environment in production of ICT hardware, components and services and in their operations (e.g. operating infrastructures, offices, vehicle fleets). Consumers can choose energy-efficient and certified "green" ICT equipment and return equipment for re-use, recycling, etc.
- **Enabling effects:** *Optimisation:* ICTs can reduce another product's environmental impact, e.g. embedded systems for fuel-efficient driving, "smart" electricity distribution, and intelligent heating and lighting systems.
- *Dematerialisation and substitution:* Digital replacement of products and processes.
- **But Induction:** ICT products increase demand for other products. And *Degradation:* E.g. "smart" tags in car tyres, bottles and cardboard require specific recycling.
- **Systemic behavioural change:** Positive environmental outcomes depend on wide end-user acceptance and lifestyle changes. Applications include:
 - *Providing information:* For households (e.g. "smart" meters), businesses (e.g. verifying "green" claims), and governments (e.g. emission allowances).
 - *Enabling dynamic pricing and fostering price sensitivity:* Electricity customers can turn on non-critical devices when cheap renewable energy is available.
 - *Fostering technology adoption:* Digital music, communications and teleconferencing.
- **Rebound effects:** Macro "rebound effects" can offset micro efficiency gains. E.g. a 30% more efficient technology may lead to greater use/other energy-intensive activities and not necessarily yield 30% total energy savings.

What are government and industry doing? Reviewing 92 government programmes and industry initiatives in 2009

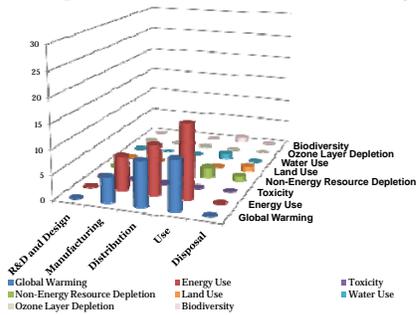
- Programmes and initiatives classified by:
 - **Type of effect:**
direct effects of ICTs
enabling effects through ICT applications.
 - **Environmental impact areas:**
Global Warming, Energy Use, Toxicity, Resource Depletion, Land Use, Water Use, Ozone Layer Depletion, Biodiversity.
 - **Life cycle phases:**
R&D and Design, Manufacturing, Distribution, Use, Disposal.
- Programmes and initiatives very concentrated on energy savings in direct ICT use

Source: OECD, Towards Green ICT Strategies, 2009.

Focus areas of government programmes targeting direct effects: day-to-day energy use and disposal

Source: OECD, Towards Green ICT Strategies, 2009.

Focus areas of government programmes targeting enabling effects: water use, biodiversity very low



Source: OECD, Towards Green ICT Strategies, 2009.

... and measurement and evaluation weak

- Few initiatives have implemented measurable targets for the evaluation of their policies or programmes.
- Governments provide measurable indicators more frequently than industry associations.
- Efforts are being made to develop and promote instruments to measure the quality and impacts of policies and programmes. More is needed

Green ICTs: International initiatives to set the framework for governments, business, consumers and users

- Policies to promote **enabling** environmental impacts
 - Major element of national economic crisis responses
 - Increasing international importance
 - OECD high-level conference, Denmark, 2009
 - OECD Green Growth strategy, ongoing
 - ITU, IGF, World Bank, EC activities
- Policies to limit **direct** environmental impacts
 - Life cycle approaches, government procurement, etc.
- **OECD Council Recommendation on ICTs and the environment** adopted April 2010

The **OECD Recommendation** – 10 points

- **Coordinating ICT, climate, environment and energy policies**
- **Adopting life cycle perspectives**
- **Supporting research and innovation in green technologies and services**
- **Developing green ICT skills**
- **Increasing public awareness of the role of ICTs in improving environmental performance**

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The **OECD Recommendation** – 10 points (cont.)

- **Encouraging best practices**
- **Governments leading by example**
- **Improving public procurement**
- **Encouraging measurement**
- **Setting policy targets and increasing evaluation**

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The **OECD Recommendation** – implementation

OECD countries invited to disseminate the Recommendation throughout public and private sectors, and encourage participants to take the necessary steps to better harness information and communication technologies to tackle environmental challenges and to improve their environmental performance

Non-OECD countries invited to adhere to the Recommendation and collaborate with OECD countries in implementation

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More information

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- **OECD Recommendation at :**
 - www.oecd.org/sti/ict/green-ict
- **ICT, the environment and climate change:**
 - www.oecd.org/sti/ict/green-ict
- **OECD Information Technology Outlook at:**
 - www.oecd.org/sti/ito
- **ICT industry, ICTs, growth and jobs, digital content:**
 - www.oecd.org/sti/information-economy