

GLOBAL INFORMATION SOCIETY WATCH 2010

Focus on ICTs and environmental sustainability



ASSOCIATION FOR PROGRESSIVE COMMUNICATIONS (APC)
AND HUMANIST INSTITUTE FOR COOPERATION WITH DEVELOPING COUNTRIES (HIVOS)

Global Information Society Watch

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Indicators for measuring green ICTs

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Background

In the debate on sustainability, the role of information and communications technologies (ICTs) is becoming ever more prominent. On the one hand, ICT is a key technology to be used for achieving sustainability by making better use of resources and encouraging efficiency (greening using ICTs). On the other hand, the sustainability of the technology itself is important (green ICTs) in terms of, for example, energy use and the disposal of equipment (electronic waste or e-waste). In the process towards a greener society, creating awareness is an important step,¹ as is assembling reliable data to make decisions. One instrument that can be used for both is benchmarking countries on their achievements and actions in arriving at a more sustainable use of ICTs. Benchmarking can provide insight into the relative position of countries regarding their progress, but more importantly it can provide examples and best practices from countries that are ahead of the game. The scope of this chapter will be limited to green ICTs; however, greening ICTs is included in the benchmarking framework to some extent, as this is necessary to provide the right context for the first.

Thinking on green ICTs

There are examples available where sets of indicators are used to benchmark “greenness” in general, but quite often these do not focus on countries – for example, they may focus on companies (e.g. the Company Report Card by Greenpeace),² products (e.g. the European Ecolabel)³ or cities (e.g. the European Smart Cities Ranking).⁴ Benchmarks at a national level often include indicators for measuring sustainability in the broadest sense (e.g. the United Nations work on indicators of sustainable development)⁵ and include indicators that are not directly relevant to green ICTs.

Examples of indicators aimed more specifically at (the role of) ICTs are the ICT Sustainability Index by the International Data Corporation (IDC),⁶ which scores countries’ efforts in using ICTs to meet their CO₂ emission targets, and the Green ICT Scorecard, which was developed in the United Kingdom (UK) to monitor the government’s ICT strategy.⁷ This scorecard uses a list of 301 green ICT-related questions in the categories of sustainable development, corporate social responsibility, technology optimisation, and green ICT policies.

International organisations such as the Organisation for Economic Co-operation and Development (OECD) and the UN’s International Telecommunication Union (ITU) refer in their work to the important role for governments as well as companies in encouraging sustainable and green ICTs. There are examples of governments with policies in place aimed at green ICTs. The UK Cabinet Office’s⁸ Greening Government ICT strategy⁹ sets out the first steps that can be taken to reduce the carbon footprint by, for example, extending the life cycle of ICT purchases and reducing the number of PCs and laptops used. The ITU recommends developing such strategic planning frameworks along with action plans as important steps in dealing with ICTs and sustainability.¹⁰ More examples of such programmes and initiatives can be found in an OECD study assessing policies and programmes on ICTs and the environment of 92 government programmes and business initiatives across 22 OECD countries, plus the European Commission.¹¹ Many of these target energy consumption during ICT use and using ICTs to reduce energy consumption. Only a few initiatives focus on optimising ICT value chains.¹² For business programmes, objectives relate most to supporting (green ICT) innovation, design of resource-efficient ICTs and the promotion of green ICT standards and labels (including measurement and accounting tools). The OECD has also started to research the link

1 ITU (2008) *ICTs for e-Environment*, p. 100.

2 Greenpeace (2010) *Guide to Greener Electronics*. www.greenpeace.org/international/en/campaigns/toxics/electronics/how-the-companies-line-up

3 European Commission (2008) Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on the Sustainable Consumption and Production and Sustainable Industrial Policy Action Plan. ec.europa.eu/environment/ecolabel/about_ecolabel/what_is_ecolabel_en.htm

4 Giffinger, R. (2007) Smart Cities: Ranking of European medium-sized cities. www.smart-cities.eu/index2.html

5 United Nations (2007) Indicators of Sustainable Development. www.un.org/esa/dsd/dsd_aofw_ind/ind_index.shtml

6 IDC (2009) IDC Readies ICT Sustainability Index Ahead of United Nations’ COP15 Climate Change Conference. www.idc.com/getdoc.jsp?sessionId=&containerId=prUS22091709&sessionId=672F9DED3A0A6EEEB840AD954C07AE0

7 Cabinet Office (2008) Greening Government ICT. [wearchive.nationalarchives.gov.uk/+http://www.cabinetoffice.gov.uk/cio/greening_government_ict.aspx](http://www.cabinetoffice.gov.uk/cio/greening_government_ict.aspx)

8 The Cabinet Office supports the Prime Minister and the Cabinet, helping to ensure effective development, coordination and implementation of policy and operations across all government departments.

9 Cabinet Office (2008) Greening Government ICT. [wearchive.nationalarchives.gov.uk/+http://www.cabinetoffice.gov.uk/cio/greening_government_ict.aspx](http://www.cabinetoffice.gov.uk/cio/greening_government_ict.aspx)

10 ITU (2008) *ICTs for e-Environment*, p. 103.

11 OECD (2009) *Towards Green ICT Strategies: Assessing Policies and Programmes on ICTs and the Environment*.

12 *Ibid*, p. 23.

between ICTs and the environment¹³ in which an extensive list of indicators on ICTs and the environment is suggested, including potential data sources. This list can be used to develop a set of indicators for a benchmark and already provides an assessment of availability of data.

Indicators for green ICTs

The first step in the development of indicators for benchmarking green ICTs is the establishment of the main areas on which the indicators will focus, rather than the development of specific indicators itself. For this it is necessary to identify the main factors or stakeholders that are important in striving for green ICTs. Based on research commissioned by Hivos and TNO, a number of important areas have been identified: ICT penetration,¹⁴ green ICT government policies (aimed at government organisations as well as at markets and citizens) and green ICTs in other domains, such as industry or civil society. A short survey among this year's GISWatch authors identified government policy as a key area to be included in a framework for benchmarking. Regarding ICT penetration, a number of standard indicators should also be included to measure the level of ICT development. Including these helps to relate the level of green ICTs in a country to ICT penetration generally, and so ratios can be developed.

An example of how the benchmarking framework and a format to be used for collecting data might look like is depicted in Table 1. The case of the Netherlands has been used to test such a format.¹⁵ This example illustrates that a number of international sources are available for collecting standardised data.¹⁶ For a number of indicators, collecting data involves the use of national sources and national knowledge (such as indicators on national policy). The example also illustrates that collecting data for a number of relevant indicators will be quite a challenge.

Figure 1 and Figure 2 provide a summary of the survey among the GISWatch authors. The first describes the relevance of including a specific indicator in a framework for benchmarking green ICTs. The second refers to the extent to which the authors expect it to be possible to access data for the specific indicator.

The inclusion of data on green ICTs in an indicator is important. However, this area is underdeveloped in terms of the availability of reliable and standardised data that can be used for benchmarking. This refers to indicators regarding the impact of ICTs on the environment, for example, in terms of energy use and policies for disposal of unused or obsolete equipment.

Indicators for measuring the actions taken by important stakeholders should be included. These are governments and organisations. Governments have an important role in stimulating green ICTs, on the one hand through policies that are aimed at society as a whole (e.g. aimed at consumers or industry) and on the other hand as an important user of ICTs. Indicators could include the use of energy-efficient equipment and efficient use of the equipment via power management, aimed at consumers/businesses as well as government organisations. Industry is another important stakeholder through the policies they set for themselves, for example, those dealing with sustainable design in production, the handling of discarded products, and lowering energy use and CO₂ emissions.

The way forward

Many indicators can be relevant, but data will not always be available for a number of countries. For example, the OECD has already established that there is lack of reliable and standardised data regarding unused equipment and its disposal, and that national household surveys in general lack questions in this area. This lack of data makes it difficult to monitor developments regarding green ICTs and assess the impact of measures taken. A framework for benchmarking countries on green ICTs should take into account the limitations of availability of data and focus on a set of indicators for which data are generally available (for example, see the work done by the OECD on assessing data availability).¹⁷

As mentioned, actions taken by major stakeholders such as governments are a good starting point for mapping progress on green ICTs. This could be measured by establishing whether policies are available or by developing indicators that require more specific information such as a scale indicating the level of policies (e.g. from intentions for national policy to a fully implemented action plan, including monitoring instruments). Other stakeholders are not always included in current research. For example, the civil society sector in some countries can be substantial, and their role in green ICT projects, awareness raising, and policy advocacy should also be reflected in a benchmarking framework.

Further research should develop a solid set of indicators, based on the work and data of organisations such as the OECD and the ITU, and projects such as the Smart Cities Index and the ICT Sustainability Index. Moreover, further research is necessary on how to generate data that are still lacking. Finally, it may be that regional indicators in relatively synchronous and stable policy environments, such as the European Union, might be easier to develop than global benchmarks. ■

13 OECD (2009) *Measuring the Relationship between ICT and the Environment*. www.oecd.org/dataoecd/32/50/43539507.pdf

14 Such as the number of mobile phones, computers and internet users per 1000 inhabitants.

15 The data for the Netherlands only serve to illustrate the use of the format and are based on a short, non-exhaustive quick scan.

16 Although other (national) sources are available for some of the data, it is recommended that international sources are used to ensure the use of standardised, comparable data.

17 OECD (2009) *Measuring the Relationship between ICT and the Environment*, p. 26. www.oecd.org/dataoecd/32/50/43539507.pdf

Table 1. Benchmarking format example: The Netherlands		
	2008	Source
General indicators		
Population	16,445,593	World Bank
GDP (USD)	871,000,000,000	World Bank
GDP per capita (USD)	52,963	World Bank
ICT indicators		
Number of computers per 1000 inhabitants	880	OECD
Number of mobile phones per 1000 inhabitants	1210	OECD
Number of internet users per 1000 inhabitants	860	OECD
Number of broadband internet users per 1000 inhabitants	350	OECD
ICT expenditure (% of GDP)	6.30%	World Bank
ICT expenditure per capita (USD)	3337	Estimate
Government policy (aimed at other organisations)		
Policy on sustainability	Yes	VROM (NL)
Policy on green ICTs	Yes	Ministry of Economic Affairs (NL)
R&D investment in green ICTs	NA	
Government policy (aimed at government organisations)		
Policy on green ICTs	Yes	Ministry of Economic Affairs (NL)
Implementation of green ICT policy	Strategy and action plan	Ministry of Economic Affairs (NL)
Non-government organisations		
Industry		
Green ICT policy	NA	
Energy reduction	Yes	Commissie benchmarking (NL)
R&D in green ICTs	NA	
ICT industry		
Green ICT policy	Yes	ICT Office (NL)
Energy reduction	Yes	ICT Office (NL)
R&D in green ICTs	NA	
Energy indicators		
Carbon footprint		
Carbon dioxide emissions (thousand metric tonnes of CO ₂)	173,244	UN statistics division
Ecological footprint (global hectares per capita)	4.6	Global Footprint Network
Energy use per capita (kilograms of oil equivalent [kgoe] per person)	4.909	World Bank
Energy use of ICT-producing sector	NA	
Energy use of ICTs, per capita	NA	
Amount of “clean” energy (% of total energy)	1.80%	World Bank
Amount of combustible renewables and waste	3.50%	World Bank
Amount of renewable energy used in ICT sector	NA	

Figure 1. Relevance of indicators

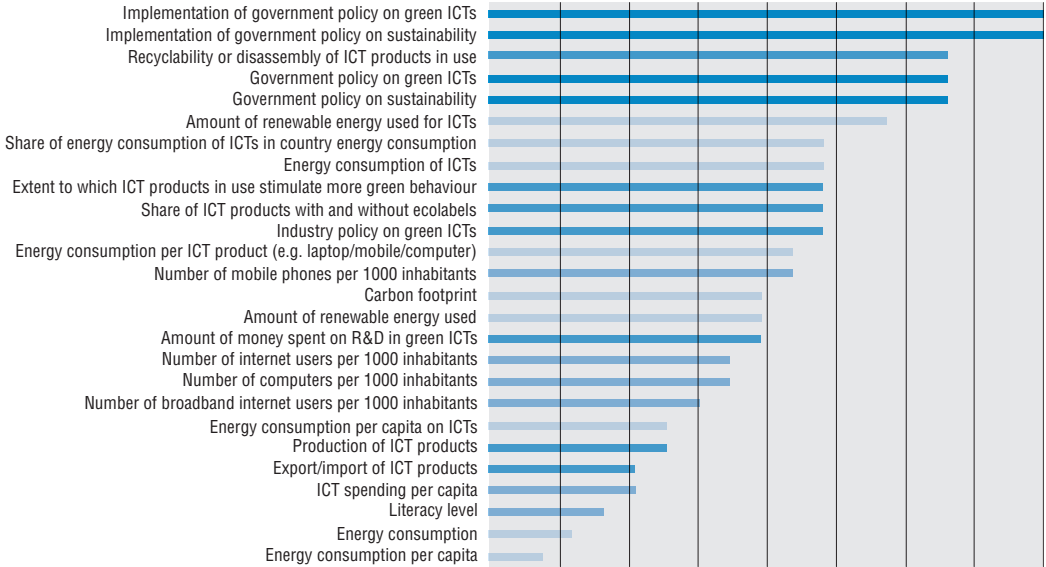
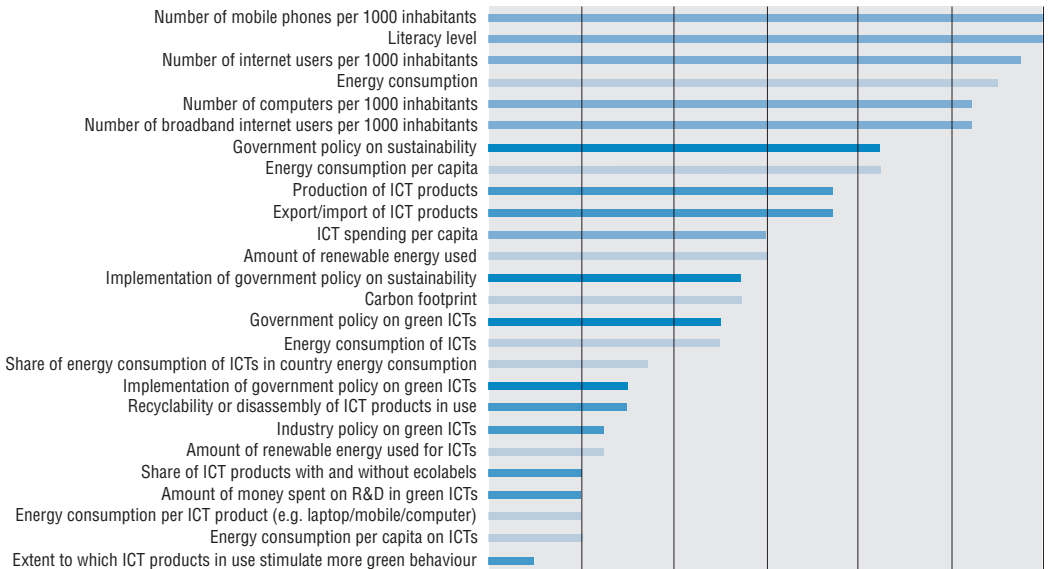


Figure 2. Feasibility of indicators (availability of data)



GLOBAL INFORMATION SOCIETY WATCH 2010 investigates the impact that information and communications technologies (ICTs) have on the environment – both good and bad.

Written from a civil society perspective, **GISWatch 2010** covers some 50 countries and six regions, with the key issues of ICTs and environmental sustainability, including climate change response and electronic waste (e-waste), explored in seven expert thematic reports. It also contains an institutional overview and a consideration of green indicators, as well as a mapping section offering a comparative analysis of “green” media spheres on the web.

While supporting the positive role that technology can play in sustaining the environment, many of these reports challenge the perception that ICTs will automatically be a panacea for critical issues such as climate change – and argue that for technology to really benefit everyone, consumption and production patterns have to change. In order to build a sustainable future, it cannot be “business as usual”.

GISWatch 2010 is a rallying cry to electronics producers and consumers, policy makers and development organisations to pay urgent attention to the sustainability of the environment. It spells out the impact that the production, consumption and disposal of computers, mobile phones and other technology are having on the earth’s natural resources, on political conflict and social rights, and the massive global carbon footprint produced.

GISWatch 2010 is the fourth in a series of yearly reports critically covering the state of the information society from the perspectives of civil society organisations across the world.

GISWatch is a joint initiative of the Association for Progressive Communications (APC) and the Humanist Institute for Cooperation with Developing Countries (Hivos).

GLOBAL INFORMATION SOCIETY WATCH
2010 Report
www.GISWatch.org

