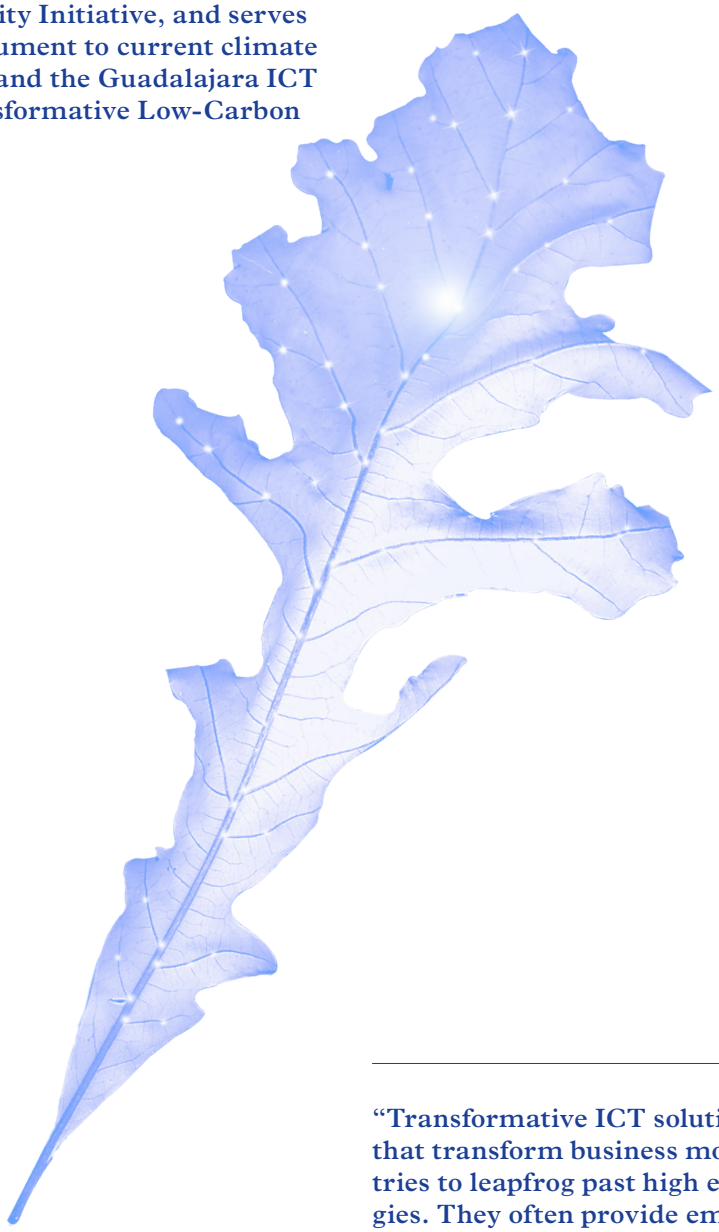
ICT SOLUTIONS FOR A SMART LOW-CARBON FUTURE

Supporting a solution agenda in Cancun

GeSI
GLOBAL e-SUSTAINABILITY INITIATIVE

This paper is a result of a public private dialogue in Guadalajara, Mexico, the 8-9th of November 2010, focusing on the innovative and strategic role of *Information and Communication Technology* (ICT) solutions in the global climate negotiations. The meeting was hosted by the Mexican government to discuss ways that the ICT industry can contribute to the climate negotiations, and how the negotiations can support accelerated uptake of transformative low-carbon ICT solutions.

The paper has been prepared by GeSI, the Global e-Sustainability Initiative, and serves as a background document to current climate change negotiations and the Guadalajara ICT declaration for Transformative Low-Carbon Solutions.



"Transformative ICT solutions are solutions that transform business models or allow countries to leapfrog past high emitting technologies. They often provide emissions reductions of 80% or more from the status quo, and they depend on an underlying energy-efficient infrastructure." (see p.2)

UNFCCC and ICT: Time for synergies that deliver results

The *United Nations Framework Convention on Climate Change* (UNFCCC) climate policy work and the ICT (*Information and Communications Technology*) sector's work with low carbon solutions, have up until now developed in parallel. This document aims to build a bridge to ensure synergies between the parallel efforts to deliver a low-carbon society.

The Need for Transformative Change

As long as the *Kyoto Protocol* was focused on the establishment of a structure to deliver the first reductions of around 5%, the role of the ICT sector was limited, and the focus on marginal improvement in high emitting sectors logical. It is now widely recognized that incremental solutions, those that marginally reduce emissions within current systems, are important, but far from sufficient.

The need for more rapid and concrete actions in the development of a low carbon economy is critical by 2050. The need for 30% reductions or more by 2020 in many OECD countries has been voiced by policy makers. Such reductions can be achieved by transforming towards a "low carbon networked economy and society".

Achieving significant carbon emission reductions with ICT solutions is an area where GeSI, and many companies, have developed important know-how based on concrete cases. Conservative estimates have demonstrated that the potential to reduce global emissions with ICT solutions is more than 7.8 Gt by 2020, equivalent to 15% reduction of global emissions, with low increase of ICT's own emissions.[1]

With an increased focus on transformative solutions the contribution to reduced emissions could be significantly larger in both developed and developing countries. Transformative ICT solutions are solutions that transform business models or allow countries to leapfrog past high emitting technologies. They often provide emissions reductions of 80% or more from the status quo, and they depend on an underlying energy-efficient infrastructure.

With today's ICT solutions many of the largest sources of emissions can become part of the solution: buildings can be net producers of renewable energy, electric/hydrogen cars can be an integrated part of a zero emission economy, and virtual meetings, digital health and education, dematerialisation of physical products and teleworking can all become part of 21st century business models.[2]

New Opportunities

The fact that broadband infrastructure is being deployed all over the world lays the foundation for a dramatic increase in transformative ICT solutions. ICT has been proven to positively impact on the economic growth of nations.[3]

The recently formed *Broadband Commission for Digital Development*, which delivered its first report to the *UN Secretary General* on September 19, 2010, also includes a specific recommendation on "Employing Broadband to Help Combat Climate Change".[3]

Future service delivery in health, education, energy, transportation and content distribution will rely on ICT solutions. This will also increase the importance that countries plan for 21st century broadband infrastructure that supports access to these solutions.

By 2020 there could be 50 billion connected devices, and the number of mobile subscriptions is expected to reach six billion. *Machine-to-machine* (M2M) connectivity will allow for solutions that deliver real time information, dematerialisation and support for low-carbon lifestyles. With the right type of policy and investment framework, the uptake of these solutions can be accelerated, and the resources saved can be used to accelerate further carbon reductions.

The UNFCCC processes would benefit by focussing on transformative solutions, and begin to include solution providers in the development of current and future policies. The ICT sector is ready to engage in such a process and help provide necessary solutions.[4] GeSI, and many other ICT companies, believe that such a solution agenda would enable faster CO_2 reductions, support new green jobs, productivity and economic development.

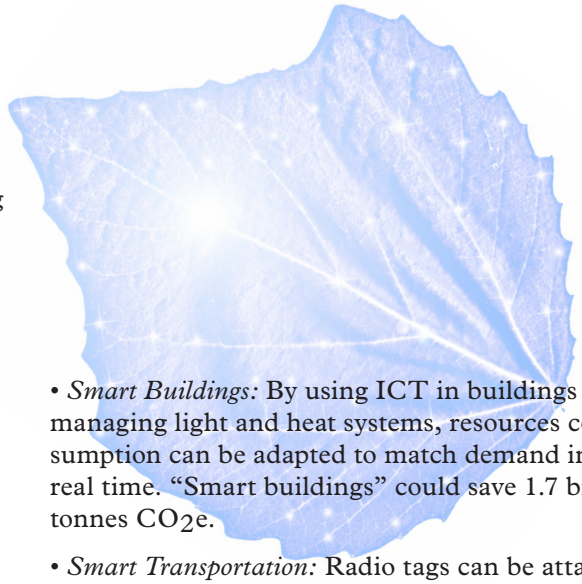
1. GeSI Smart 2020, http://www.gesi.org/ReportsPublications/Smart2020/tabid/192/Default.aspx
2. ICC Discission Paper: ICTs and Environmental Sustainability, Document No 373/494,Oct 2010
3. www.broadbandcommission.org
4. Guadalajara ICT Declaration for Transformative Low-Carbon Solutions

ICT and the current climate negotiations

The ICT sector is already contributing, and could contribute much more, to fulfillment of the Bali Action Plan and other initiatives to help reduce global CO_2 emissions. While ICT's ability to deliver transformative low-carbon solutions is the focus of this paper, ICT can also deliver solutions in areas such as adaptation, measurement and data analysis. The GeSI/ITU paper "Using ICTs to Tackle Climate Change" provides more detailed examples, but highlights are provided here.

1: Mitigation of Climate Change

The ICT sector has many solutions that can significantly mitigate climate change and which can be implemented in both developed and developing countries. The *Smart2020 Report* provides many good examples.[5]



MITIGATION CASES:
Examples of transformative solutions that often help reduce emissions by 80% or more and can be used by both developing and developed countries[6]:

• *e-commerce:* From farmers checking prices and books being downloaded, ICT solutions allow for dramatic reductions of physical transport and support dematerialization. Depending on uptake, these solutions can avoid more than a billion tonnes of CO_2e.

• *Virtual meetings and remote working:* Remote collaboration will significantly reduce greenhouse gas emissions caused by travel. 0.5 billion tonnes CO_2e can be saved without any major investments.

• *Smart Grid:* Connected electricity supply grids can be controlled so that energy is sent to industries and homes in the most efficient way, accelerating the uptake of renewable energy. By 2020, this could reduce greenhouse gas emissions by two billion tonnes.

• *Smart Motor Systems:* In factories, the motors used to power machines such as pumps or conveyor belts can be made "intelligent" through the use of ICT. With ICT, emissions from motor systems could be reduced by 0.97 billion tonnes CO_2e.

• *Smart Buildings:* By using ICT in buildings for managing light and heat systems, resources consumption can be adapted to match demand in real time. "Smart buildings" could save 1.7 billion tonnes CO_2e.

• *Smart Transportation:* Radio tags can be attached to items in a cargo and their journey tracked from manufacturer, to warehouse and to shop. This makes it easier to move and stock goods efficiently. Using ICT could help cut emissions of distribution and transportation by 1.52 billion tonnes CO_2e.

• *Dematerialization:* The substitution of high-carbon products and activities with low-carbon alternatives. Depending on incentives this can become one of the most important contributions to a low-carbon development.

5. Available at www.gesi.org
6. Solutions resulting in 80% or more reductions can be found in GeSI reports such as SMART 2020 and Evaluating the Carbon-Reducing Impacts of ICT as well as many reports by companies and independent organizations such as WWF, WEF and OECD

2: Technology Development and Transfer

The ICT sector is organized around collaboration and technology exchange. The need to collaborate and develop joint standards is necessary for a global ICT network to function. The ICT sector wants to contribute to technology development and transfer. This to ensure that transformative solutions are given a role in the negotiations. Activities, in which intellectual property protection plays an important and supportive role, should also be considered.

3: Adaptation

ICT performance is crucial for adaptation and in particular in the case of catastrophes. Here are some examples:

ADAPTATION CASES:
Example of ICT solutions for adaptation:

- *Early warning systems:* ICT systems are often used to provide people with warnings and information regarding threats like extreme weather events.
- *Smart planning:* By using ICT systems, urban and rural planning can be improved and solutions can be tested based upon their resilience.
- *E-health:* Smart ICT can bring down costs for health and allow correct treatment, especially in case of pandemics and new health challenges where local knowledge might be insufficient.
- *Education:* The key to resilience in any society is education. ICT can help reduce costs, enable access and improve the quality.

"By 2020 there could be 50 billion connected devices, and the number of mobile subscriptions is expected to reach six billion." (see p.2)

"The ICT sector wants to contribute to technology development and transfer. This to ensure that transformative solutions are given a role in the negotiations." (see p.4)

4: Science and Data Monitoring

ICT infrastructure allows for real-time monitoring and enables processing of data in order to allow for increased understanding as well as better planning when it comes to areas such as urban planning and investments in transport systems as well as the impacts of low-carbon policies.

"By shifting from a product to a service perspective, we can use the connectivity of a 21st century infrastructure to provide services that people and businesses need, instead of only replacing products with marginally better ones." (see p.5)

Securing success for global climate work with ICT solutions

ICT solutions can enable the transformation to a low-carbon lifestyle, while at the same time stimulating economic growth. Strategic actions in the UNFCCC negotiations, and in other leadership fora, are urgently needed. Some suggestions follow below.

Outside the UNFCCC:

Encourage transformative leadership

Cooperation amongst countries and companies that want to prioritize low-carbon development should be encouraged by governments.

Integrate ICT in national economic plans

Countries and cities should include ICT solutions in relevant national programs and infrastructural plans. Climate strategies as well as education, health, transport, and building strategies among others are important and inextricably inter-linked.

Focus on solution providers

In many fora developing recommendations for climate activities, the focus is mainly on the high emitting sectors, and industry has been predominantly viewed as a polluter. Many sectors, such as ICT, can provide transformative solutions to climate change, where economic development and carbon reductions can go hand in hand.

Develop standards for measuring and reporting positive contributions

General global guidance on carbon reporting and accounting is available for calculating companies own direct emissions. However, the ICT sector must continue to drive towards agreed global standards for calculating and reporting CO_2 reductions related to its own emissions and to support the development of reporting and accounting for smart low-carbon solutions.

The GeSI report *Evaluating the Carbon-Reducing Impacts of ICT* [7] provides an important step in the right direction with regards to positive contributions, and increased focus on standardization in this area is of the utmost importance. During 2011, GeSI will accelerate the application of the methodology and demonstrate concrete examples of ICT solutions that help reduce emissions in society.[8]

Inside the UNFCCC:

The decisions taken in Cancun should reflect the following important areas:

Increased solution engagement

Relevant negotiations should consider not only sectors that must reduce their own emissions, but also sectors that help to deliver emission reductions in society.

Establish a work stream for "transformative low-carbon solutions"

Much of the focus has been on incremental reductions in existing systems, such as measures which make energy production and transport systems slightly better. These measures are important, but not enough to significantly offset CO_2 emissions by 2020. A work item under UNFCCC would ensure that transformative solutions from solution sectors (such as the ICT) are included in policy instruments and national targets.

Recognize the need for a 21st Century infrastructure and solutions provision

By shifting from a product to a service perspective, we can use the connectivity of a 21st century infrastructure to provide services that people and businesses need, instead of only replacing products with marginally better ones. An approach which delivers measurable savings and "smarter" ways of doing things can increase quality of life while dramatically reducing emissions.[8]

ICT technologies and solutions can also enable efficient adaptation measures and monitoring of greenhouse gases. GeSI, together with the International Telecommunication Union (ITU) have also highlighted these opportunities.[9]

The recent work of the *Broadband Commission on Digital Development* highlighted the role of broadband in tackling climate change.[10]

7. http://www.gesi.org/ReportsPublications/AssessmentMethodology/tabid/193/Default.aspx, ITUs work is also very relevant: http://www.itu.int/ITU-T/studygroups/com05/index.asp
8. http://www.ericsson.com/res/thecompany/docs/corporate-responsibility/cr08_doc/wwf_ericsson_5step_plan.pdf
9. Using ICTs to Tackle Climate Change
10. http://www.broadbandcommission.org/report1.pdf

A Cancun process for closing the emissions gap with smart solutions

National emission reduction pledges to date have for the most part not taken into account the role that ICT can play in helping to achieve low-carbon development. Transformative low-carbon ICT solutions can help close the significant gap between the emission reductions pledged so far and the needed reductions to stay within the remaining global carbon budget, to stabilize warming to 1.5°C (or 2°C) above pre-industrial levels. Below are a number of recommendations for COP16, that would help support the uptake of low-carbon ICT solutions and recognizing ICT companies as solution providers.

Recommendations which would help to ensure the successful integration of ICT in Cancun and support the establishment of a transformative solutions work item

(a) Statements recognizing solution sectors (such as ICT), that through their products and services help to provide solutions which can significantly reduce emissions.

(b) Statements supporting the creation of a work stream with focus on transformative low-carbon solutions from sectors (such as the ICT).

(c) Statements supporting a global low-carbon ICT workshop, supported by regional workshops, highlighting government policy best practices in enabling the solutions role of ICT.

(d) Statements supporting, the development and adoption of, an agreed methodology for calculation and reporting of the positive impact of solutions that companies provide (including transformative ICT and increasingly broadband solutions).

(e) Statements demonstrating that countries already include ICT solutions in the national and local emissions reduction strategies.

(f) Statements focusing on collaboration between cities and other stakeholders leading the development towards a low-carbon economy with the help of ICT solutions.

(g) Statements supporting increased financing for low-carbon 21st century infrastructural development in both developed and developing countries.

(h) Statements focusing on how transformative solutions can free resources that can be re-invested into more transformative low-carbon solutions.

(i) Statements linking ICT strategies for reduced emissions to other policy areas, such as energy, environment, education and health.

The public private dialogue in Guadalajara was an important step to ensure that the ICT sector is an integrated part of the global climate discussions and that the solutions from the sector are understood and promoted in the global climate negotiations.

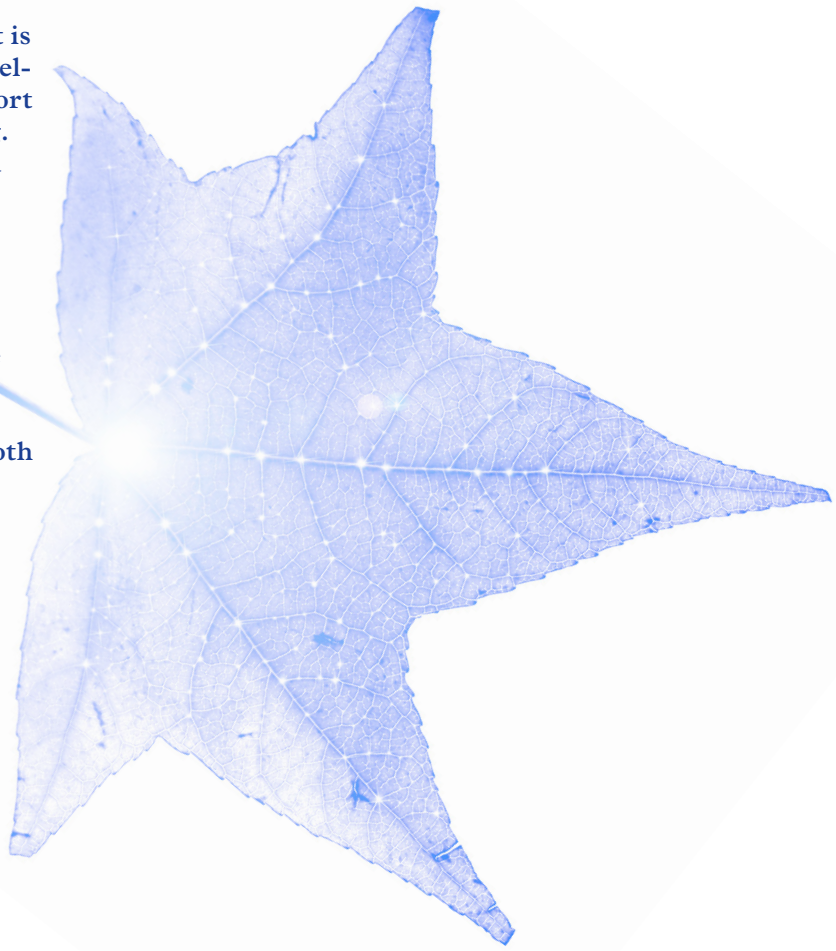
This paper provides a context for ICT in relation to the global negotiations, and identifies a number of areas that could be important to further explore in order to ensure a solution agenda in Cancun and beyond.

The ICT sector:

1. Already delivers many solutions that help reduce emissions often by 80% or more, depend on an underlying infrastructure that is very energy efficient, and can be used in developed and developing countries alike to support transformational technological leapfrogging. The uptake of these must be accelerated and new solutions encouraged.

2. Is a "solution sector" with relatively small emissions profile, is working hard to reduce emissions, and has a very large potential to help reduce emissions in society through the services it provides.

3. Has many solutions that can be used by both rich and poor countries.



GeSI
GLOBAL e-SUSTAINABILITY INITIATIVE

GeSI Contact
GeSI Secretariat c/o Scotland House Rond Point Schuman 6 B-1040 Brussels, Belgium
Tel: +32 2 282 84 42 Fax: +32 2 282 84 14
Email: info@gesi.org
Website: www.gesi.org