Green ICT Technologies:
how they can help mitigate the effects of Climate Change

ICT & Climate Change Training Program

Session 7

ITU and climate change

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Session Objectives

This module focuses on Mitigation. It provides an understanding of the key technologies, applications and services that will help mitigate against climate change. It then goes on to show how all of these technologies can be put together to create smart sustainable cities and communities.

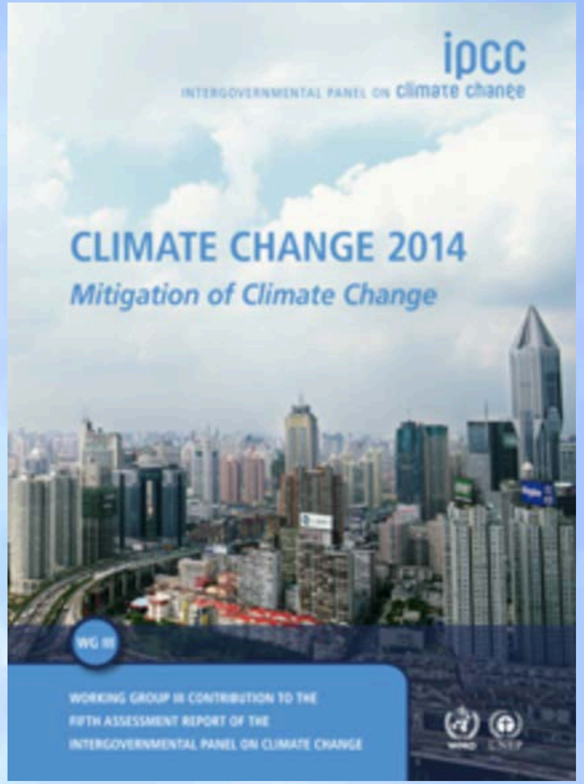
STUDENTS

Session Topics

- How a range of technologies can be used to reduce GHG emissions.
- What are potential GHG savings from introduction of green technologies?
- Barriers to introduction of green technologies.
- How policy makers and regulators can promote and enable introduction of green technologies.
- Best practises in Smart Sustainable Cities.
- Enabling Standards.

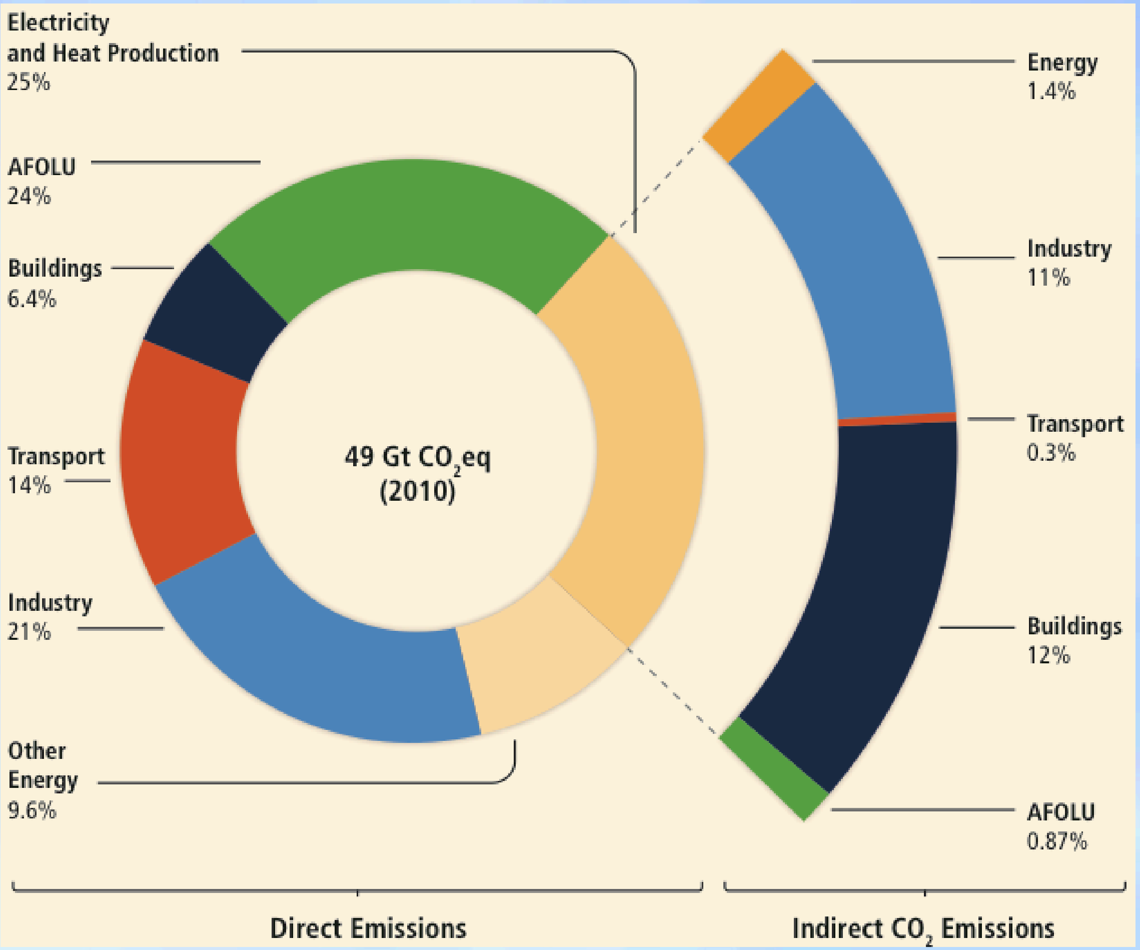
The importance of Mitigation

- Without additional efforts to reduce GHG emissions beyond those in place today, emissions growth is expected to persist driven by growth in global population and economic activities.
- Mitigation scenarios reaching about 450 ppm CO_2e in 2100 typically involve temporary overshoot of atmospheric concentrations, as do many scenarios reaching about 500 ppm to about 550 ppm CO_2e in 2100.



www.ipcc.ch/pdf/assessment-report/ar5/wg3/ipcc_wg3_ar5_summary-for-policymakers.pdf

GHG Emissions by Economic Sector



www.ipcc.ch/pdf/assessment-report/ar5/wg3/ipcc_wg3_ar5_summary-for-policymakers.pdf 5

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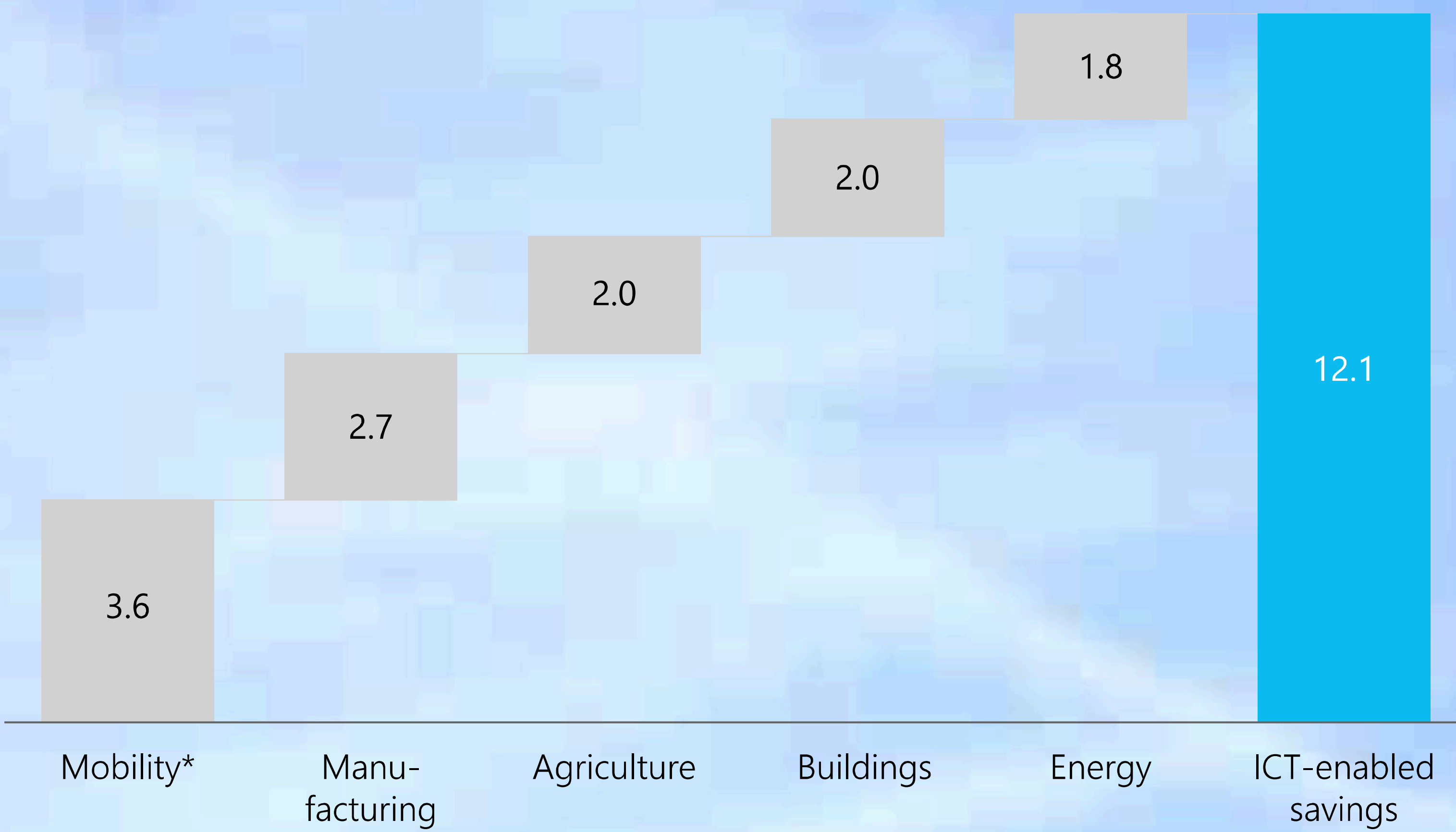
Mitigation: Emission reductions possible in other sectors using ICTs

Categories	Effects
Consumption of materials	By reducing materials consumption (dematerialization), the environmental load related to goods production and disposal as well as waste generation can be reduced.
Power / energy consumption	By enhancing the efficiency of power and energy use to reduce consumption, the environmental load related to power generation, power transmission, etc. can be reduced.
Movement of people	By reducing the movement of people, the environmental load required for transportation can be reduced.
Movement of materials	By reducing the movement of materials, the environmental load required for transportation can be reduced.
Improved efficiency of office space	By using office space efficiently, power consumption for lighting, air conditioning, etc. can be reduced, thus reducing environmental load.
Storage of goods	By reducing storage space of goods, power consumption for lighting, air conditioning, etc. can be reduced, thus reducing environmental load.
Improved work efficiency	By enhancing work efficiency, the environmental load can be reduced.
Waste	By reducing waste emissions, the environmental load required for environmental preservation as well as for waste disposal can be reduced.

Source: ITU-T Recommendation L.1400 “Overview and general principles of methodologies for assessing the environmental impact of ICT” www.itu.int/rec/T-REC-L.1400

CO2e abatement potential by sector (2030)



Source: GeSI: SMARTer2030 ICT Solutions for 21st Century Challenges, 2015.

Examples of ICT technologies which can be used to reduce GHG emissions

- Smart Metering and Smart Grids
- ICT for Smart Buildings Management
- Sustainable Transport, including electric vehicles, real time navigation (RTN) and e-logistics
- E-commerce
- E-government, including e-civil service
- E-learning
- Telepresence

The case of Korea

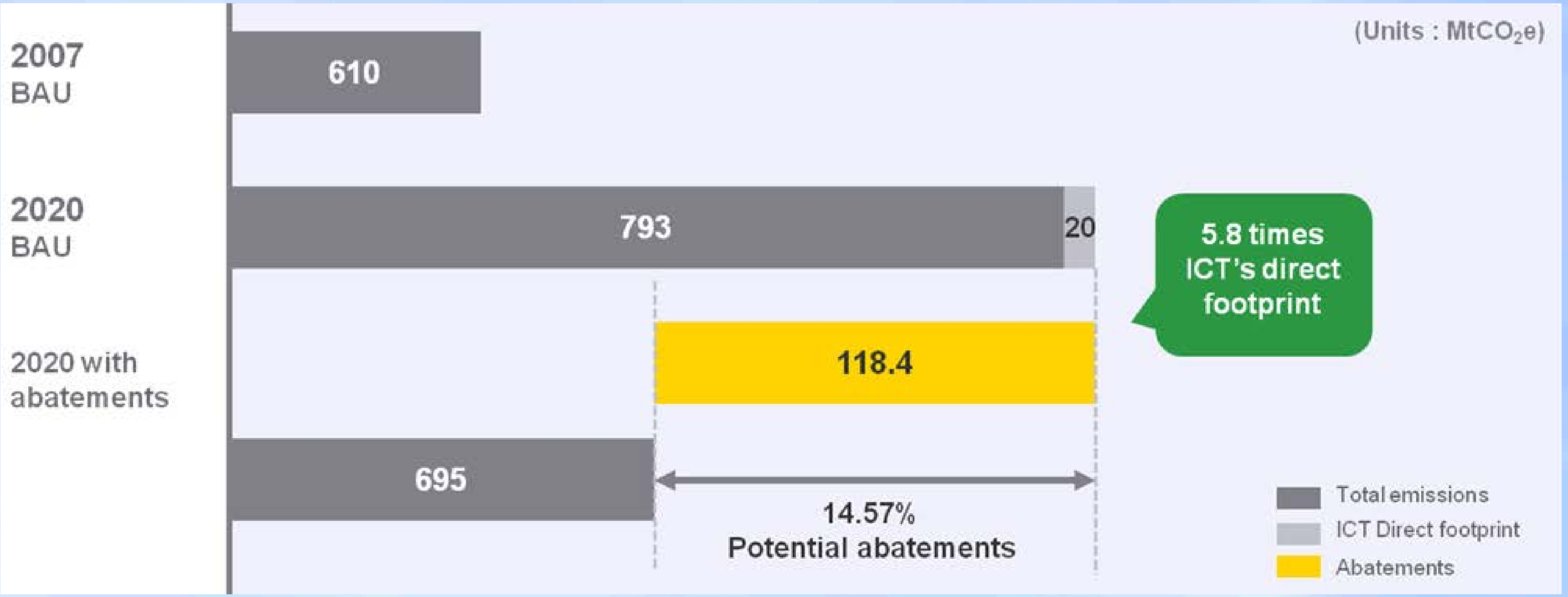
- Smart grids
- Telepresence
- E-commerce
- E-civil service
- E-logistics
- Real-time navigation
- E-government
- Smart motors
- Home energy management systems
- Digital contents
- Smart work
- E-learning
- Bus information systems
- E-health care

ITU Report: "The case of Korea - The quantification of GHG reduction effects achieved by ICTs", 2013 – www.itu.int/pub/T-TUT-ICT-2013-08

Potential GHG emission reductions arising from the introduction of 14 ICT services

www.itu.int/pub/T-TUT-ICT-2013-08

Potential GHG emission reductions compared to Business as Usual (BAU)



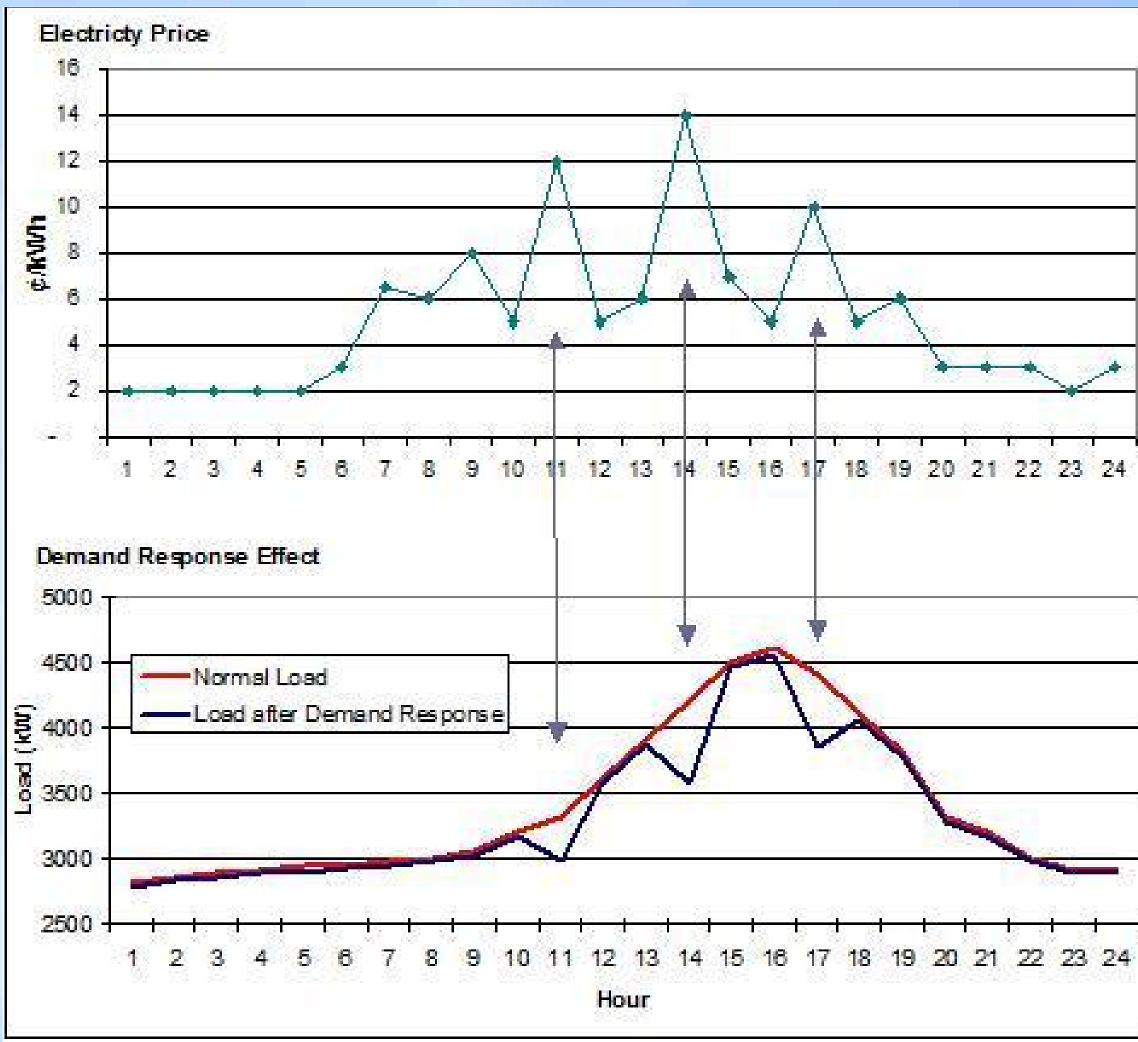
www.itu.int/pub/T-TUT-ICT-2013-08

Smart Energy

- A ‘smart grid’ is a set of software and hardware tools that enable generators to route power more efficiently, reducing the need for excess capacity and allowing two-way, real time information exchange with their customers for real time demand side management (DSM).
- Demand control (electricity) by load shifting via smart meters and appliances
  - Reduces peak demand saving hot standby power stations
  - E.g. temporary turn off, for refrigerator, dishwasher etc. (future electric vehicle charging)
  - Requires communication to meters and appliances

More in Session 9.

Demand Side Management



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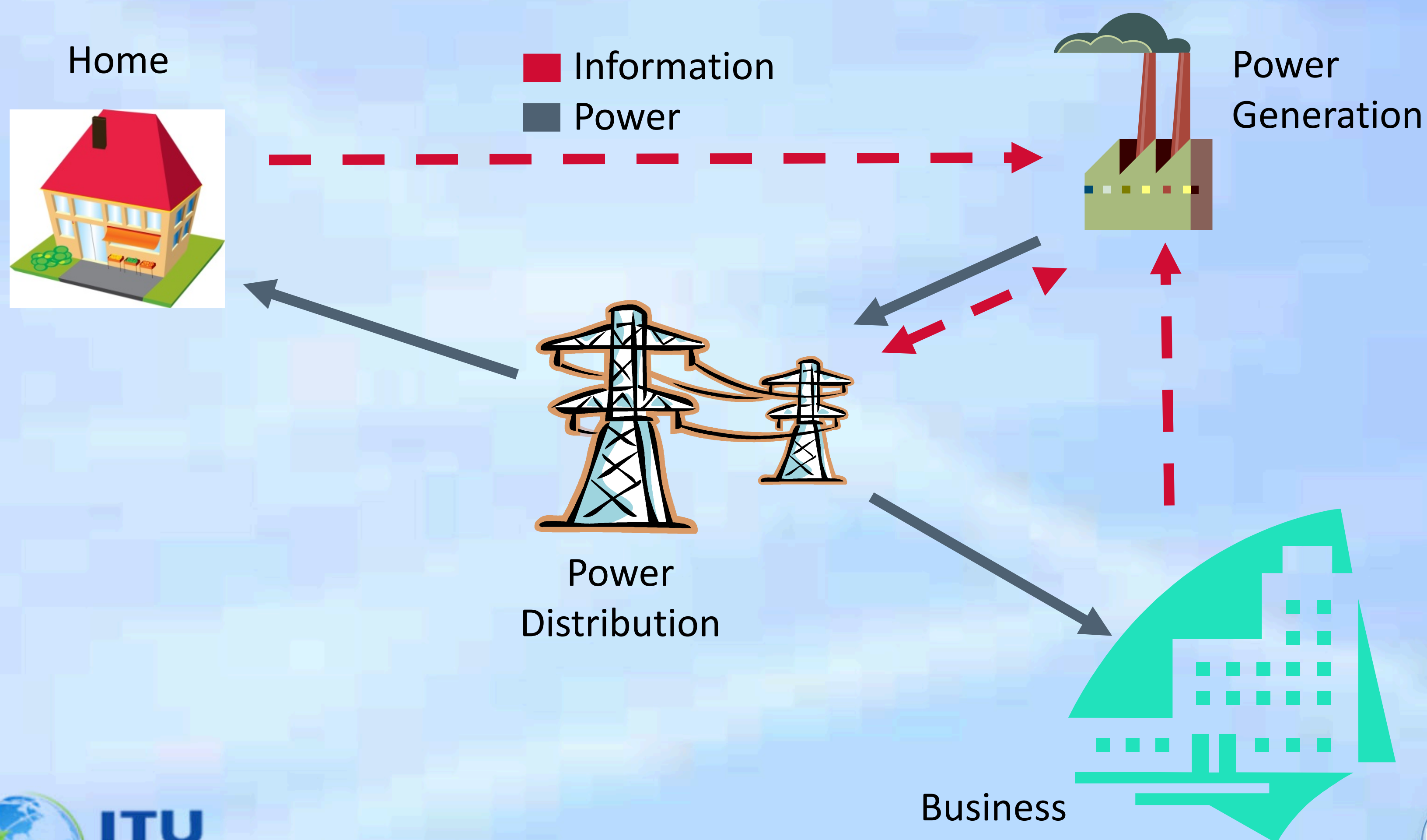
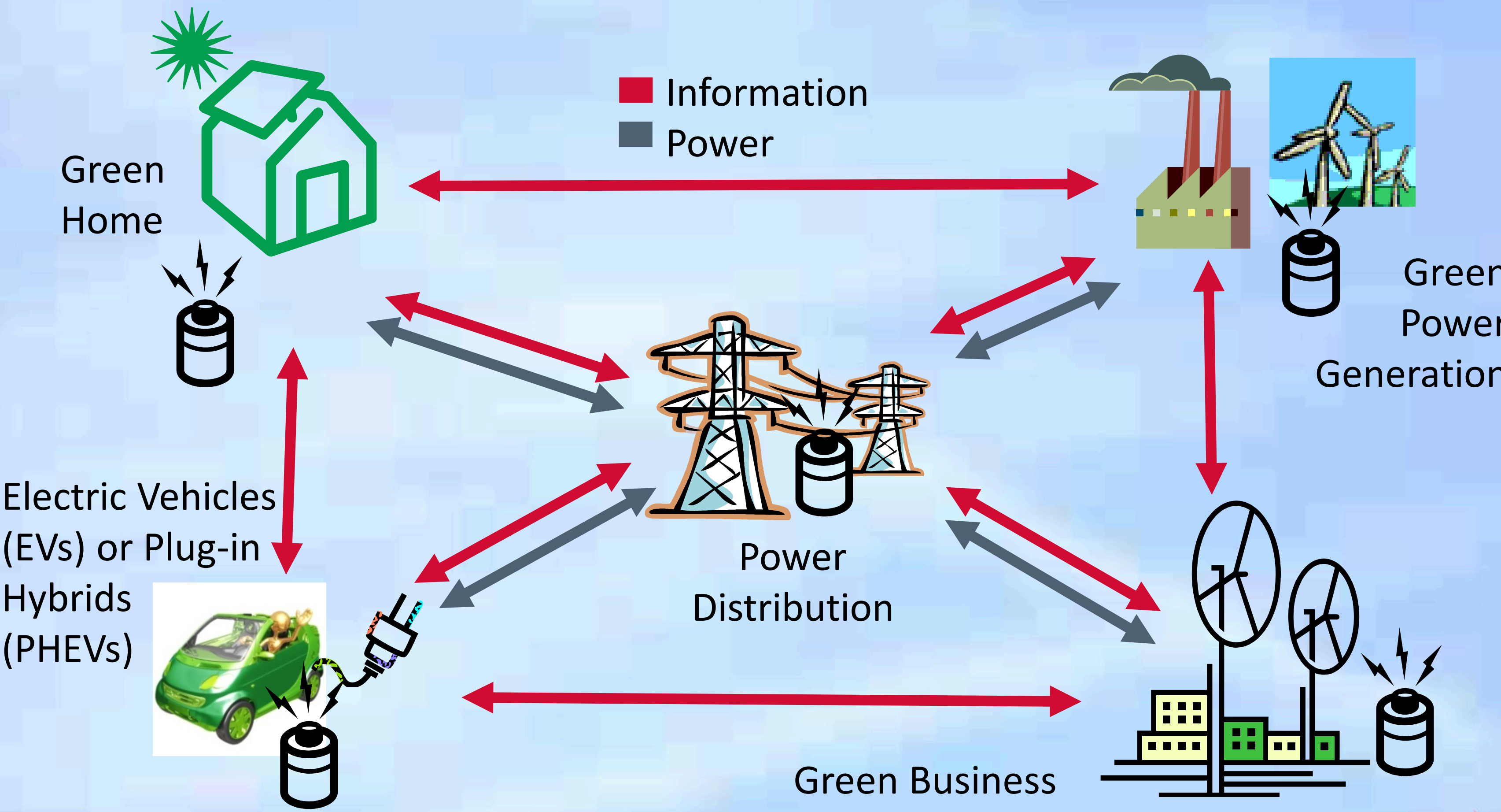
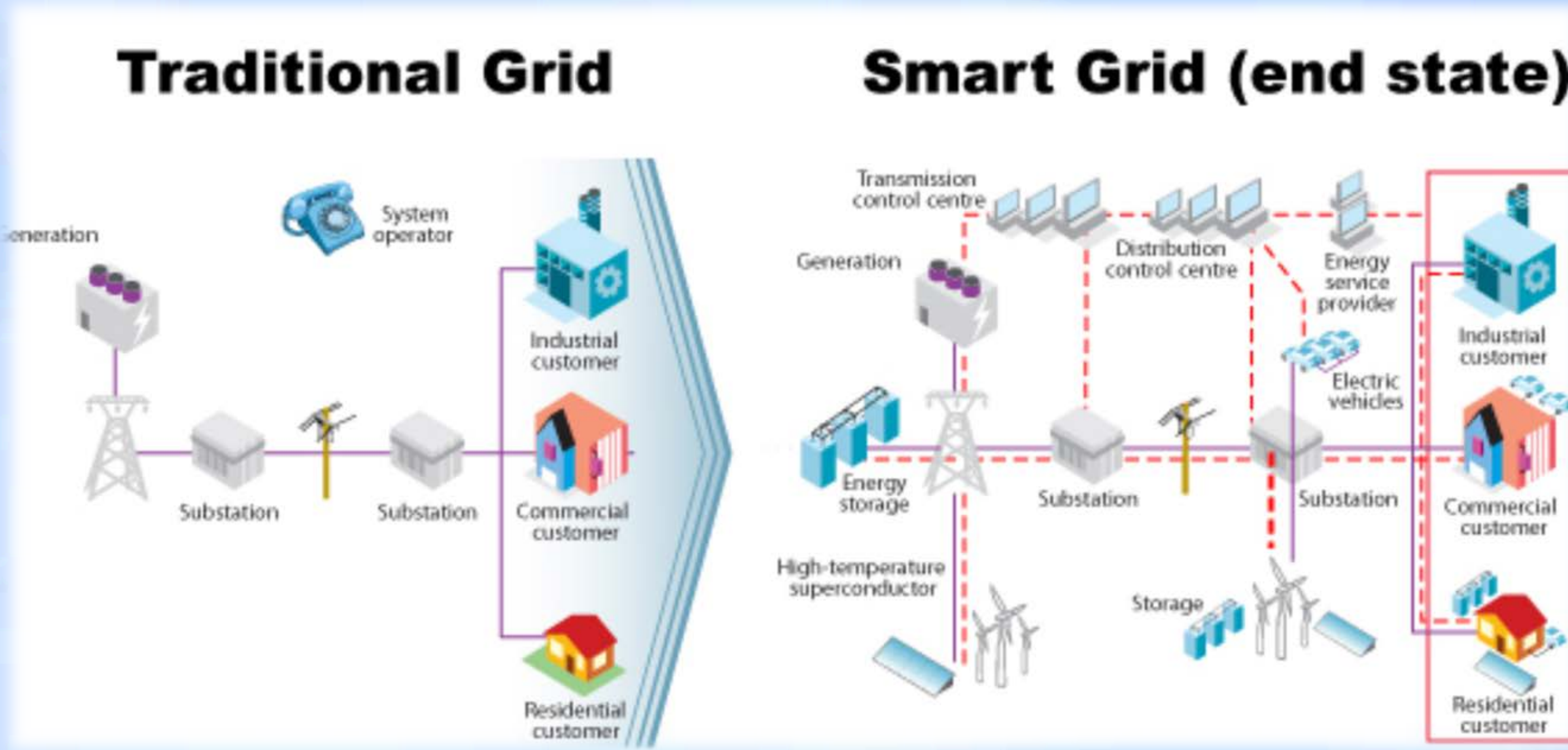
A Simplified View of "Smart Grid": Today One-way Flow of Power and Information



The Simplified "Smart Grid": Tomorrow
Full Bi-directional Flow of Energy & Information



Evolution to the Smart Grid

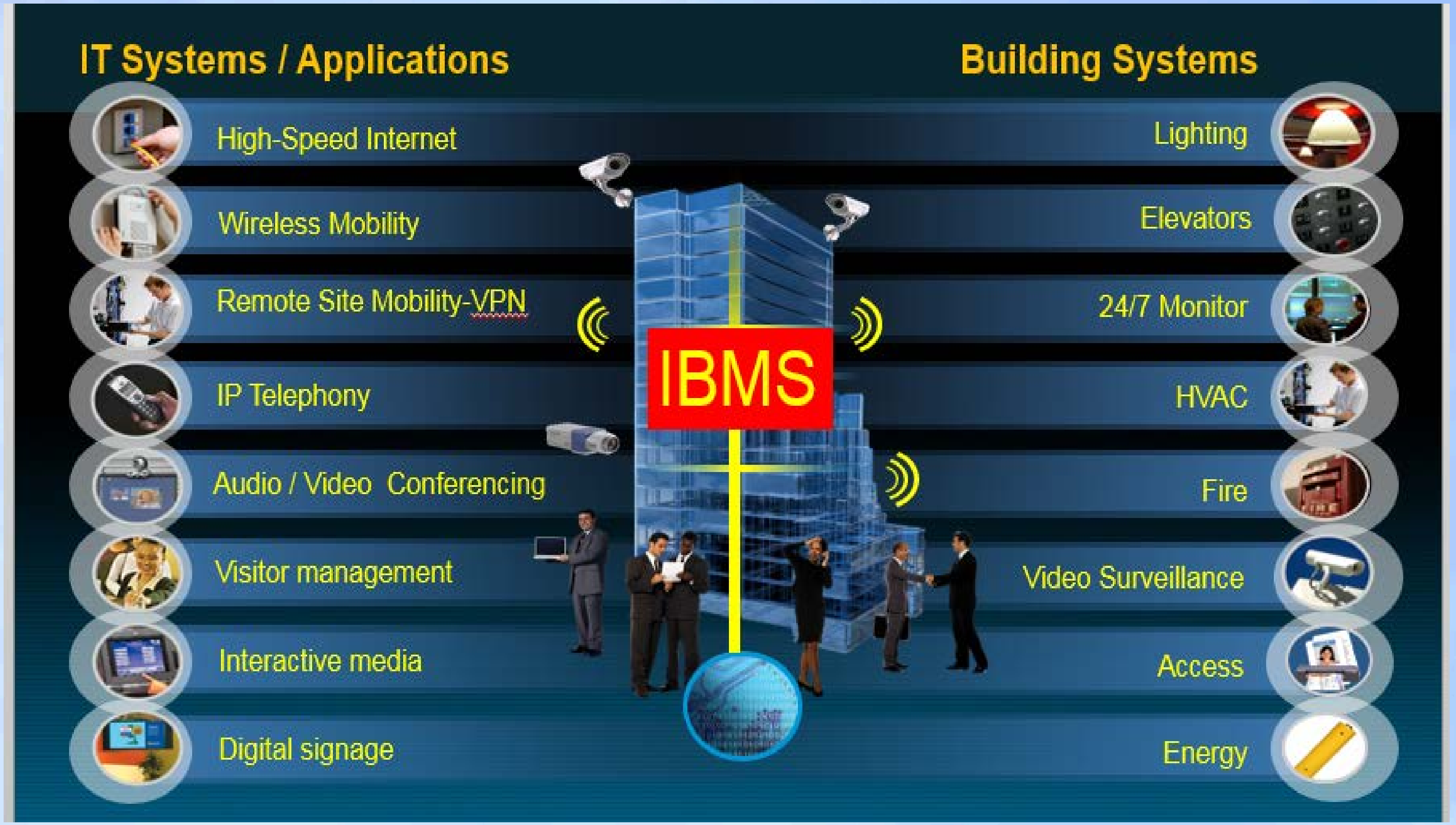


Smart Buildings

- Smart building management systems with up-to-date information can make intelligent modifications to:
  - improve building energy efficiency,
  - reduce wastage,
  - make optimum usage of water.
- Increasing occupant satisfaction:
  - for both new and existing through simple retrofit programs.

Source: ITU-T FG-SSC "Overview of Smart Sustainable Cities and the Role of ICTs" and http://saveonenergy.ca/Business/Program-Overviews/Retrofit-for-Commercial.aspx

Integrated Building Management System



Source: ITU-T FG-SSC "Intelligent sustainable buildings for smart sustainable cities"

Sustainable Transport – Electric Vehicles

- EVs save >50% of carbon emissions over vehicle lifetime.
- EVs are currently expensive compared to petrol and diesel fuelled vehicles but are becoming available in quantity. Adoption could be brought forward by policy makers stimulating the market.
- India recently launched a National Mission on EV Mobility with target of 6 million EVs (two wheelers and four-wheelers) by 2020.
- Market for manufacture and sale of EVs should be established in developing countries promoted by:
  - Piloting an EV charging infrastructure, initially in major cities.
  - Promoting awareness of the benefits of EVs, including that *lifetime* costs of an EV are much lower than for other options.
  - Subsidising the sale of EVs to promote the market.
- Quality of EV batteries should be monitored by EPA to avoid increase in eWaste arising from premature expiry during use of these vehicles.
- Electric vehicles (EVs) could also have a role as providers of energy storage for the smart grid.

"Smart Grid Vision and Roadmap for India"
http://indiasmartgrid.org/en/resource-center/Reports/Smart%20Grid%20Vision%20and%20Roadmap%20for%20India.pdf

Transport: Travel Avoidance using ICT

- Teleworking
  - Up to 260 MtCO2e savings each year. For example, in US, if up to 30 million people could work from home, emissions could be reduced 75-100 MtCO2e in 2030, comparable to likely reductions from other measures such as fuel efficient vehicles.
  - Delivers less benefit if your home's heating and cooling is less efficient than at a central office.

- Tele- and videoconferencing
  - Conducting meetings online or on the phone instead of face-to-face could also reduce emissions.
  - Previous conservative estimates have suggested that tele- and videoconferencing could replace between 5 and 20% of global business travel.
  - Advanced videoconferencing applications in the early stage of adoption could have a very significant impact in transport sector reduction.

How to assess potential GHG savings from the introduction of green technologies

- ITU-T Rec. L.1410 provides a common methodology for assessing the ICT carbon footprint.
- Basis of methodology is to compare the GHG emissions from a Business as Usual (BAU) scenario and a scenario which includes the ICT service.
- Must be carried out over the full life cycle (LCA).
- Helps to establish the business case to go green.

Using the Methodology: E-commerce

- Example Country: Pakistan
- Scenario: Customers are able to purchase a variety of goods and services without visiting stores.
- This leads to:
  - reduced fuel consumption of vehicles,
  - reduced electricity consumption for lighting, heating and cooling in buildings,
  - increased fuel consumption and GHG emissions caused by parcel delivery service since number of parcel deliveries will increase,
  - may be a rebound effect where customers do other things with the time not spent visiting stores (and therefore use energy).

Calculating the change in GHG emissions

- Following data is required to calculate the savings for e-commerce:
  - Population who have PCs or smartphones and could use online shopping is around 20 million.
  - Proportion of these customers that might adopt e-commerce: assume 75%
  - Number of customers adopting e-commerce: 15 million
  - number of visits per customer per year that would be replaced by e-commerce: assume 20,
  - round-trip distance to visit stores to purchase goods: around 11 km,
  - extra travel distance to deliver parcels (using a light delivery van): assume 2km per parcel delivered,
  - energy consumption for lighting, cooling and heating in stores.

Comparative assessment of the effects of e-commerce

Functional unit	Baseline scenario	ICT service scenario
To allow 50% of the population in Pakistan to shop and purchase goods	Purchasing carried out by consumers visiting the store.	Consumers order online and then have their shopping delivered without going to the store.
Travel distance of private vehicles	27.5 billion km	13.75 billion km
Travel distance of delivery vehicles	zero	2.5 billion km
Electricity consumption	3 billion kWh	2.8 billion kWh

- This results in a reduction of 13.75 billion km in distance travelled by private vehicles.
- Assuming the office space which is not needed is closed, there will also be a reduction of 293 million kWh of electricity usage to heat, light and air-condition the retail stores.
- This all adds up to a reduction of 1.93 MtCO_2e of GHG emissions which is potentially one of the largest savings of any e-service.

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Source: ITU Report: "Enabling Energy Efficiency through ICTs: The case of Pakistan"

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Teleworking

Typical CO_2 emissions per unit area of office space:

Japan

1. CO_2 emissions per unit area of office space

	Energy Consumption [Mcal/m²/year] A	Basic Unit of CO_2 Emissions [kg-CO_2/Mcal] B	CO_2 Emissions [kg-CO_2/m²/year] A x B
Electricity	136	0.441	59.9
Urban gas	44	0.237	10.4
Heavy oil A	9	0.309	2.8
Kerosene	2	0.299	0.6
District heat and cooling	17	0.324	5.5
Total	**208**		**79.2**(1)

2. Space occupied by an office worker for clerical work
13.6 m^2/person(2)

3. Basic unit of office space
(1) x (2) = 1,078 kg-CO_2/person/year

* If the annual working hours are 2040 hours (170 h x 12 m),

CO_2 emissions are estimated to be **0.528 kg-CO_2/person/ hour when an office worker works for one hour in Japan.**

USA

1. CO_2 emissions per unit area of office space

	Energy Consumption [Mcal/m²/year] A	Basic Unit of CO_2 Emissions [kg-CO_2 / Mcal] B	CO_2 Emissions [kg-CO_2/m² /year] A x B
Electricity	134	0.66	88.8
Natural Gas	79	0.21	16.6
Fuel oil	9	0.29	2.5
District heat	24	0.31	7.5
Total	**246**		**115.4**(1)

2. Space occupied by an office worker for clerical work: 21.4 m^2/person (2)

3. Basic unit of office space
(1) x (2) = 2,470 kg-CO_2/person/year

* If the annual working hours are 2040 hours (170 h x 12 m),

CO_2 emissions are estimated to be **1.21 kg-CO_2/person/ hour when an office worker works for one hour in USA.**

Source: www.itu.int/rec/T-REC-L.1410

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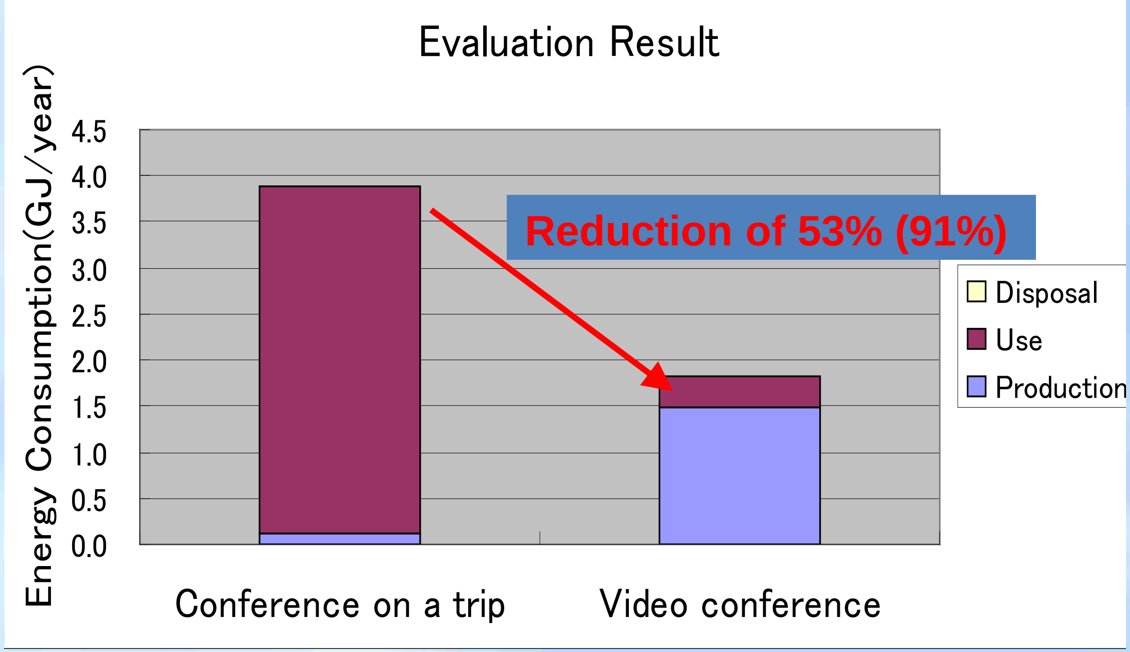
Videoconferencing

Scenario: Video conference held between Tokyo and Yokohama, once a week (48 times / year), one hour each time, participated in by two people from each office.



www.itu.int/rec/T-REC-L.1410

Smart Transport

- Smart transportation management systems.
  - collect information about mobility patterns:
    - enabling city managers to check the existing infrastructure is being best used,
    - improves the level of citizens' lifestyle in the transportation of goods, services and people.
- In addition, ICT can help to reduce overall need for transportation and travel by offering virtual alternatives to physical movements.

Source: ITU-T FG-SSC "Overview of Smart Sustainable Cities and the Role of ICTs"

Smart Logistics

- Smart logistics: Through a host of efficiencies in transport and storage, smart logistics in Europe could deliver fuel, electricity and heating savings of 225 $MtCO_2e$. The global emissions savings from smart logistics in 2020 would reach 1.52 $GtCO_2e$, with energy savings worth US$441.7 billion
- Avoid unnecessary journeys by using
  - GPS for locating and directing delivery vehicles
  - ‘always turn right rule’ (Verizon)
  - Mobile phone to (or PDA) to inform of ‘next call’
  - Mobile phone to ‘ring ahead’
- Smart traffic control
  - Lights send out status signals to warn drivers they need to stop
- Smart parking
  - Vehicles directed to an empty space
  - No touring around to find a slot

www.smart2020.org

Smart Agriculture

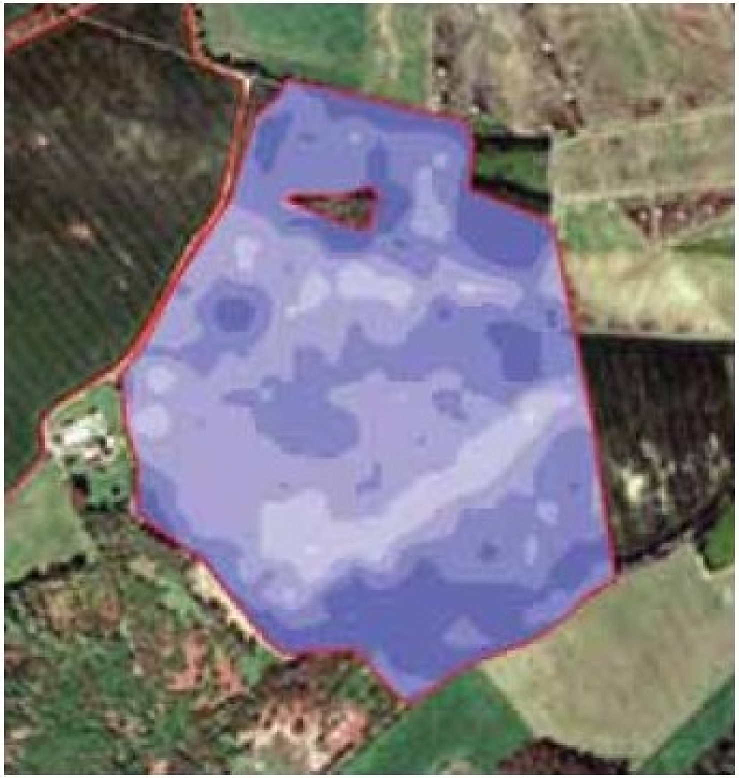
- Agriculture sector emitted 10.6 GtCO2e in 2008
  - over 21% of world's total GHG emissions.
- Smart Agriculture could:
  - boost crop yields by 30%,
  - avoid 20% of food waste,
  - deliver economic benefits worth $1.9 trillion worldwide,
  - reduce water needs by 250 trillion litres,
  - save 2.0 Gt CO_2e.

Source: GeSI: SMARTer2030 ICT Solutions for 21st Century Challenges, 2015

Smart Agriculture (Example)

Control of watering and fertilisers using satellite imaging and Global Positioning Systems

- “In the past a complete field would receive the same treatment, whereas precision farming makes it possible to split up the crop into sub-field management areas. Today it is even possible to conduct spatial analysis of the crop in blocks as small as 20m by 20m. This allows local soil or climate conditions to be taken into consideration and encourages more efficient fertiliser application”.



A nitrogen management map for winter wheat.

www.geoconnexion.com/uploads/precisionfarming_intv9i5.pdf

Smart Forestry

Satellite monitoring of forests.

- Forests are stores of carbon and can be either sinks or sources depending upon environmental circumstances. Mature forests alternate between being net sinks and net sources of carbon dioxide [1].
- Deforestation accounts for about 20 per cent of man-made greenhouse gas emissions, more than those produced by the entire transport sector.
- Copenhagen “Accord (2009) specifies need to recognize reduced emissions from deforestation and forest degradation (REDD+) through immediate establishment of mechanism to enable mobilization of financial resources from developed countries”.

[1] http://en.wikipedia.org/wiki/Deforestation
[2] www.unep.org/yearbook/2010/

NASA photo of deforestation in Tierras Bajas project, Bolivia, from ISS in April 2001 [2]

Barriers to introduction of green technologies

- Technical barriers – e.g. lack of a fast broadband infrastructure, lack of an e-payments gateway.
- Commercial barriers – e.g. lack of effective competition.
- Regulatory barriers – e.g. regulatory environment is encouraging the status quo.

How policy makers and regulators can enable and encourage the introduction of green technologies

- Accelerate the roll-out of high speed broadband (30-100 Mbps) so that e-services can be deployed effectively.
- Set targets for premises where fast broadband is available.
- Set targets for premises where fast broadband is taken up.
- Set targets for e-services deployment.

Smart Sustainable Cities

"A smart sustainable city is an innovative city that uses information and communication technologies (ICTs) and other means to improve quality of life, efficiency of urban operation and services, and competitiveness, while ensuring that it meets the needs of present and future generations with respect to economic, social and environmental aspects".

Source: ITU-T FG SSC "Smart Sustainable Cities: An Analysis of Definitions"

Specification for a Smart Sustainable City

A Smart Sustainable City is a city that leverages the ICT infrastructure in an *adaptable, reliable, scalable, accessible, secure, safe and resilient* manner in order to:

- **Improve the Quality of Life of its Citizens**
- Ensure tangible economic growth such as higher standards of living and employment opportunities for its citizens.
- Improve the well-being of its citizens including medical care, welfare, physical safety and education.
- Establish an environmentally responsible and sustainable approach which "meets the needs of today without sacrificing the needs of future generations".
- Streamline physical infrastructure based services such as the transportation (mobility), water, utilities (energy), telecommunications, and manufacturing sectors.
- Reinforce prevention and handling functionality for natural and man-made disasters including the ability to address the impacts of climate change.
- Provide an effective and well balanced regulatory, compliance and governance mechanisms with appropriate and equitable policies and processes in a standardized manner.

Source: ITU-T FG SSC 'Definitions and Attributes of a Smart Sustainable City'

How can cities be made sustainable?

- Answer lies in making cities 'smarter' by:
  - efficient management of resources and infrastructure,
  - greener environment,
  - smart governance resulting in better quality of living of its citizens.
- All of which can be enabled by the effective use of ICTs leading to:
  - efficient water management based on real time information exchanges,
  - public transport systems organized through information gathered by satellites,
  - solutions to concerns related to air quality monitoring,
  - electromagnetic field monitoring,
  - etc.

Source: ITU-T FG-SSC "An Overview of Smart Sustainable Cities and the Role of ICTs"

Core pillars of a smart sustainable city

3 overarching and closely interrelated **dimensions** at the core of a city:

a. environment and sustainability

b. city level services

c. quality of life

Economy	Governance	Environment	Society
•Employment	•Regulatory	•Sustainable	•People
•GDP	•Compliance	•Renewable	•Culture
•Market – Global/Local	•Processes	•Land use	•Social networks
•Viability	•Structure	•Biodiversity	•Tech Savvy
•Investment	•Authority	•Water/Air	•Demographics
•PPP	•Transparency	•Waste	•Quality of life
•Value chain	•Communication	•Workplace	•User experiences
•Risk	•Dialogue		•Equal access
•Productivity	•Policies		•End consumers
•Innovation	•Standards		•Community needs
•Compensation	•Citizen services		•The city as a database

Reclassification into **4 areas (pillars)**

(1) **Economy** – The city must be able to thrive – jobs, growth, finance

(2) **Governance** – The city must be robust in its ability for administrating policies and pulling together the different elements

(3) **Environment**26 – The city must be sustainable in its functioning for future generations

(4) **Society** – The city is for its inhabitants (the citizens)

26 The term 'environment' in this particular description incorporates sustainability.

Source: ITU-T FG-SSC "An Overview of Smart Sustainable Cities and the Role of Information and Communication Technologies (ICTs)"

What is ITU doing to shape Smart Sustainable Cities?

ITU-T Study Group 5
“Environment and Climate Change”

ITU-T Study Group 20
IoT and its applications, including smart cities and communities

ITU-D Study Question 1/2:
Creating the smart society: Social and economic development through ICT applications

Focus Group on Smart Sustainable Cities

Raising awareness and building partnerships

Research and development

Setting the Vision for Smart Sustainable Cities

Partnerships

Long-term sustainability ambitions

International standards

City as "System of Systems"

ITU-T Focus Group and Study Group on SSC

Working Groups & Deliverables

- ✓ 2013-2015
- ✓ As an open platform for smart-city stakeholders
- ✓ 23 Reports

1. ICT role & roadmap for Smart Sustainable Cities (SSC)

5 Reports

2. Smart Sustainable Cities Infrastructure

11 Reports

3. Standardization gaps, KPIs and metrics

6 Reports

4. Policy & positioning (liaisons)

1 Report
>30 liaisons

ITU-T FG Smart Sustainable Cities
Reports from WG 1 and 3

High Level Reports & WG1 Reports (5)

1. Smart Sustainable Cities: an analysis of definitions.
2. Overview of Smart Sustainable Cities & the Role of ICTs.
3. The city we want: **a guide for city leaders**
4. The city we want: **a master plan** for smart sustainable cities
5. Framework for evaluating the **impacts of a smart sustainable city**

Working Group 3 – KPIs & Standardization Gaps (5)

1. Overview of key performance indicators (KPIs) in smart sustainable cities
2. KPIs definitions for smart sustainable cities
3. KPIs related to the use of ICTs in smart sustainable cities
4. KPIs related to the sustainability impacts of ICTs in smart sustainable cities. **Standardization Roadmap** for Smart Sustainable Cities.
5. **Standardization activities** for SSC and suggestions to ITU-T SG5

ITU-T Focus Group on SSC

Key Performance Indicators (KPIs) Series Documents

1. Technical specifications on "Overview of key performance indicators in smart sustainable cities”
2. Technical report on KPIs definitions for smart sustainable cities
3. Technical specifications on KPIs related to the **use of ICTs** in smart sustainable cities
4. Technical specifications on KPIs related to the **sustainability impacts of ICTs** y in smart sustainable cities

- ✓ KPI dimensions aligned with UN-HABITAT
- ✓ KPIs include **ICT use** and **ICT impact**
- ✓ KPIs include the **ICT & sustainability** impacts together
- ✓ Complementary & broader than other set of KPIs (i.e ISO)
- ✓ Basis for **a SSC Index**

ITU-T FG Smart Sustainable Cities

Reports from WG 2 and 4

Working Group 2 Reports – Infrastructure (11)

1. Overview of Smart Sustainable Cities Infrastructure
2. Best practices and use cases for Smart Sustainable Cities Infrastructure
3. ICTs Architecture of Smart Sustainable Cities
4. Multi-service infrastructure for Smart Sustainable Cities in new-built areas
5. Anonymization infrastructure and open data in smart sustainable cities
6. **Smart buildings** for Smart Sustainable Cities
7. ICTs for **Climate Change Adaptation** in Cities
8. **Smart Water Management** in Smart Sustainable Cities.
9. **Cyber-security**, data protection & cyber-resilience in SSC
10. **EMF** considerations in Smart Sustainable Cities
11. Integrated management for Smart Sustainable Cities

Working Group 4 – Policy & Positioning (1)

1. Setting the Stage for Stakeholder Engagement for SSC.

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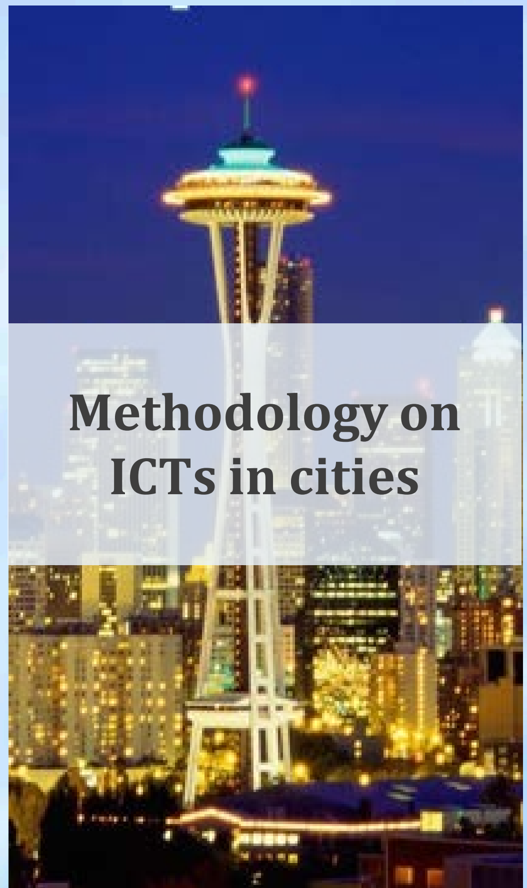
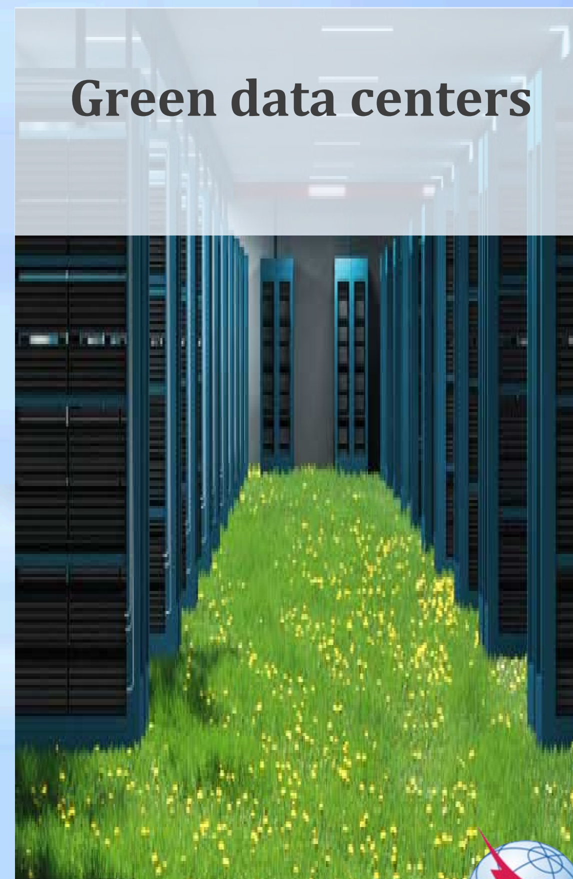
ITU-T Recommendations

Standards are vital to shape Smart Sustainable Cities





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www.itu.int/en/ITU-T/climatechange/Pages/default.aspx

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ITU-T, Environment and Climate Change

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ITU-T, ENVIRONMENT AND CLIMATE CHANGE AT A GLANCE

ITU-T is the **ideal platform for climate change stakeholders** to exchange knowledge and identify policy and standard needs.

More

ITU-T STUDY GROUP 5 - ENVIRONMENT AND CLIMATE CHANGE

ITU-T Study Group 5 (SG5) is the lead study group on ICT environmental aspects of electromagnetic phenomena and climate change. **Next meeting: 12-23 October 2015, Geneva, Switzerland**.

More

FOCUS GROUP ON SMART SUSTAINABLE CITIES (FG-SSC)

ITU-T ACTIVITIES ON HUMAN EXPOSURE TO ELECTROMAGNETIC FIELDS

Quick Links | News | Contact

- Report on "Sustainable Management of Waste Electrical and Electronic Equipment in Latin America" *NEW*
- 21 Technical specifications and reports of the Focus Group on Smart Sustainable Cities
- ITU Green Standards Week
- Green ICT Standards
- 3rd ITU Green ICT Application Challenge
- Toolkit on Environmental Sustainability for the ICT Sector

UPCOMING EVENTS AND MEETINGS

- Forum on Internet of Things: Empowering the New Urban Agenda
  19 October 2015, Geneva, Switzerland
- 5th Green Standards Week
  14-18 December 2015, Nassau, The Bahamas

More

Focus Groups | Regional Groups | Joint Activities

- Focus Group on Smart Sustainable Cities (FG-SSC)
- Focus Group on Smart Water Management (FG SWM)

SG20 Tasks and objectives

- Develop framework and roadmaps for the harmonized and **coordinated development of IoT**, including M2M communications, ubiquitous sensor networks and smart cities and communities;
- **Assess** how the use of IoT has an **impact** on the smartness of cities;
- Study **requirements** and capabilities of IoT and its applications including SC&C;
- Develop standards, guidelines, methodologies and best practices to help cities (including rural areas and villages) deliver services using the IoT, with an initial view to address city challenges;
- **Cooperate** with other regional and international standards-development organizations (SDO) and industry forums.

The Internet of Things (IoT)

- IoT can be viewed as a global infrastructure for the information society, the technology that connects not just humans with things but also things with every other thing
  - By 2020, 50 billion ***things**** estimated to be inter-connected, with each item having a unique IP address.
  - Sensors or RFID (Radio Frequency Identification Device) tags will connect ***things*** through the internet to a server (rather like your email operates today but without the human interfaces).
  - Recommendation ITU-T Y.206058* provides an overview of the concept
    - Examples of physical layer interfaces are ZigBee wireless and Bluetooth
    - A gateway function is needed to interconnect devices on different types of physical layer
- Ubiquitous sensor networks (USNs) can be considered as part of the IoT
  - collectively monitoring physical/environmental conditions

(e.g., temperature, sound, vibration, pressure, motion or pollutants)

Source: ITU-T FG-SSC "Overview of Smart Sustainable Cities and the Role of ICTs",
*http://www.itu.int/rec/T-REC-Y.2060-201206-I
** http://www.itu.int/en/ITU-T/about/groups/Pages/sg20.aspx

ITU-T SG20: Internet of Things and its applications, including smart cities and communities

SG20 will develop standards and guidelines that leverage IoT technologies to address urban-development challenges

Key work will include, *inter alia*:

- The standardization of end-to-end architectures for IoT and mechanisms for the interoperability of IoT applications and datasets employed by various vertically oriented industry sectors.

ITU-T, Environment and Climate Change

ITU-T, ENVIRONMENT AND CLIMATE CHANGE AT A GLANCE

ITU-T is the **ideal platform for climate change stakeholders** to exchange knowledge and identify policy and standard needs.

More

ITU-T STUDY GROUP 5 - ENVIRONMENT AND CLIMATE CHANGE

ITU-T Study Group 5 (SG5) is the lead study group on ICT environmental aspects of electromagnetic phenomena and climate change. **Next meeting: 12-23 October 2015, Geneva, Switzerland**.

More

FOCUS GROUP ON SMART SUSTAINABLE CITIES (FG-SSC)

ITU-T ACTIVITIES ON HUMAN EXPOSURE TO ELECTROMAGNETIC FIELDS

Quick Links | News | Contact

- Report on "Sustainable Management of Waste Electrical and Electronic Equipment in Latin America" *NEW*
- 21 Technical specifications and reports of the Focus Group on Smart Sustainable Cities
- ITU Green Standards Week
- Green ICT Standards
- 3rd ITU Green ICT Application Challenge
- Toolkit on Environmental Sustainability for the ICT Sector

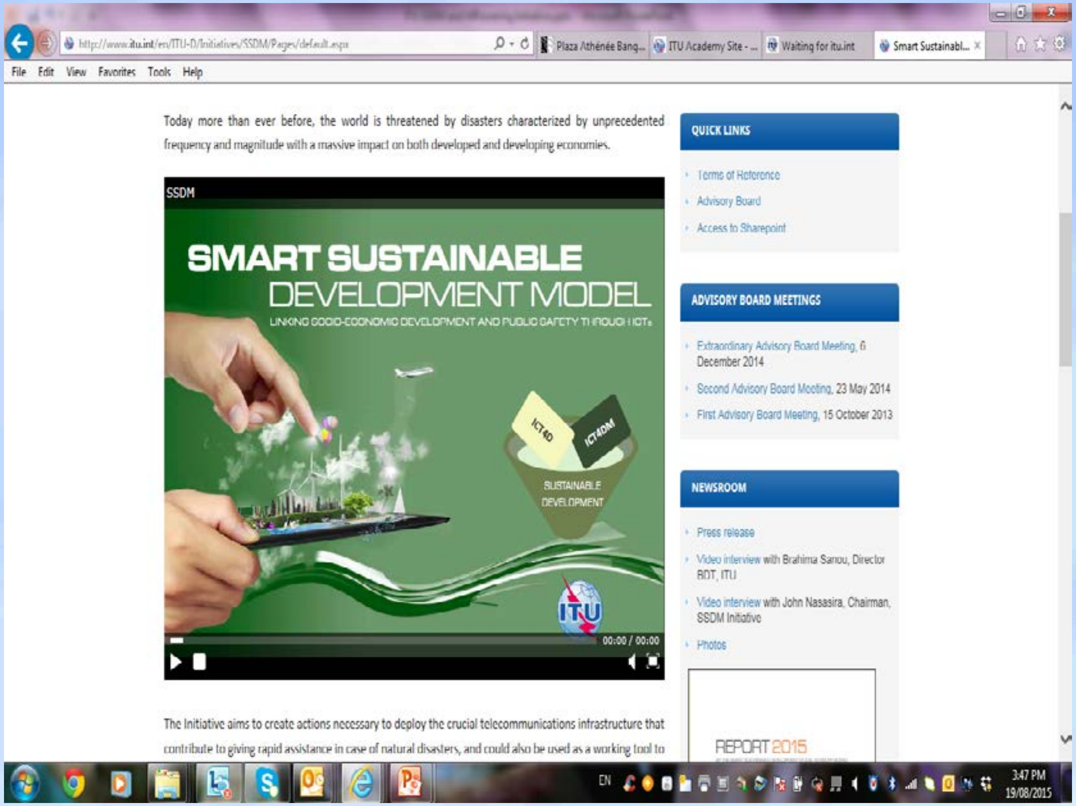
UPCOMING EVENTS AND MEETINGS

- Forum on Internet of Things: Empowering the New Urban Agenda
  19 October 2015, Geneva, Switzerland
- 5th Green Standards Week
  14-18 December 2015, Nassau, The Bahamas

More

Focus Groups | Regional Groups | Joint Activities

- Focus Group on Smart Sustainable Cities (FG-SSC)
- Focus Group on Smart Water Management (FG SWM)



ITU-D SG 2: (2014-2017)
Ongoing Study Question 6/2
ICT and Climate Change

Objectives

- Harness the potential of ICTs in changing lives through development and saving lives at times of emergencies
- Link rural telecommunications/ ICT development to both disaster risk reduction and management efforts.
- Make optimal use of scarce and high cost resources such as satellite systems by putting in use unused satellite capacity.
- Create ecosystems where investments made for deploying telecom infrastructures for economic development are also used for disaster response for public safety.
- Ensure deployment of robust and resilient communication networks that continues to provide services in the immediate aftermath of disasters.
- Avoid duplication in efforts by development partners (governments, private sector, Inter-governmental Organizations, etc.) focusing on either development
- only or disaster management only without taking into account the other.

Summary

- A wide range of Green ICT services can be used to reduce GHG emissions in other sectors.
- The GHG emissions saved can be quantified using the ITU-T L.1400 series methodologies.
- Smart Sustainable Cities will incorporate many of these technologies.
- There are barriers to the introduction of these technologies which policy makers and regulators should address.
- ITU is working on the standardisation of these technologies to enable their effective deployment.

References for further reading:

- IPCC Climate Change 2014 Mitigation of Climate Change, Summary for Policymakers www.ipcc.ch/pdf/assessment-report/ar5/wg3/ipcc_wg3_ar5_summary-for-policymakers.pdf
- SMARTer2030 “ICT Solutions for 21st Century Challenges”, GeSI, 2015 – www.gesi.org/portfolio/project/82
- ITU Report: “The case of Korea - The quantification of GHG reduction effects achieved by ICTs”, 2013 www.itu.int/pub/T-TUT-ICT-2013-08.
- ITU Report: “Enabling Energy Efficiency through ICTs: The case of Pakistan”.
- ITU-T SG 5 ICT and Climate Change www.itu.int/en/ITU-T/climatechange/Pages/default.aspx