

# NICE Technical Training Measuring Green IT

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## Methodologies to assess ICT footprint in cities

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**International Telecommunication Union**

# Agenda

- Introduction
  - Recommendation L.1440 ICT in Cities
  - Recommendation L.1410 ICT Goods, Networks and Services
  - Recommendation L.1420 ICT in Organizations
  - Recommendation L.1430 ICT Projects
  - Conclusions
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# ITU, The UN agency responsible for ICT 193 Member States and more than 700 Sector Members

*Co-operations include on methodologies :*



**United Nations**  
Framework Convention on  
Climate Change



Organisation  
internationale de  
normalisation



**GeSI**  
GLOBAL e-SUSTAINABILITY  
INITIATIVE



**The Greenhouse Gas Protocol Initiative**  
*The foundation for sound and sustainable climate strategies*



## ITU-T Study Group Environment and Climate Change Question on methodologies

**3 recommendations published**

**3 recommendations under preparation**

- L.1400 Overview and general principles  
<http://www.itu.int/rec/T-REC-L.1400>
- L.1410 Environmental impact of ICT goods, networks and services  
<http://www.itu.int/rec/T-REC-L.1410>
- L.1420 Environmental impact of ICT in organisations  
<http://www.itu.int/rec/T-REC-L.1420>
- L.1430 Environmental impact of ICT projects (consent expected in 2012)
- L.1440 Environmental impact of ICT in cities (consent expected in 2013)
- L.1450 Environmental impact of ICT in countries (consent expected in 2013)

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## L.ICT in cities (to become L.1440), under preparation

- This Recommendation will present general principles on how to evaluate the environmental impact of Information communication technologies (ICT) in cities, or other urban areas with a focus on greenhouse gas (GHG) emissions
  - It is built with a large number of representatives from the ICT sector and governments and in relationship with UNEP and UN-HABITAT. **Your participation is welcome !**
- It is expected that L.1440 will cover the following aspects :
  - aggregation of impacts at cities level of ICT goods, networks and services
  - aggregation of impacts at cities level of ICT in organizations
  - Impacts of ICT projects in cities, for instance in the construction sector, the energy sector, the transport sector
- L.1440 will in particular cover how to assess the impacts of the use of ICT in cities to reduce the GHG emissions of other sectors

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## Impact of Goods, Networks and Services at city level

### L.1410 : What is it ? What is it for ?

- It is a Recommendation that complements ISO 14040 and ISO 14044 and provides guidance on how to assess environmental impacts of ICT Goods, Networks and Services
  - It has been built with a large number of representatives from the ICT sector and governments. It has been built to be consistent with EC/JRC, ETSI, IEC and GHG Protocol ICT supplement initiatives
- There are 2 Parts in the Recommendation:
  - Part I : ICT Lifecycle assessment: framework and guidance
  - Part II : Comparative analysis between ICT and baseline scenario : framework and guidance
- The 2 Parts describe clear steps to follow in order to assess environmental impacts over the entire life cycle
  - This helps identify what are the major activities and life cycle stages impacting the environment, design and prepare action plans and prioritize actions
  - This helps identify risks, save costs and develop new opportunities



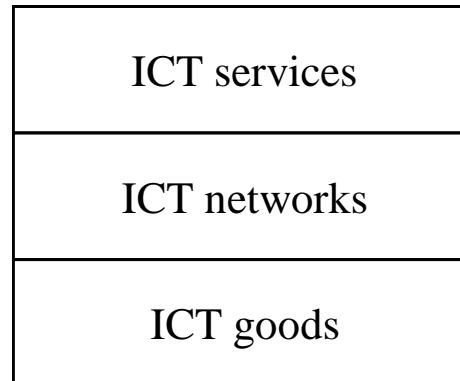
## Benefits of an LCA approach

- To provide an assessment of the environmental impact of a product system as a basis for improving it
- To understand the relative importance of different life cycle stages /activities - where to put best efforts for improvement
- To monitor performance improvements over time



## L.1410 Part I

- Relationship between methodologies of LCA for ICT Good Networks and services



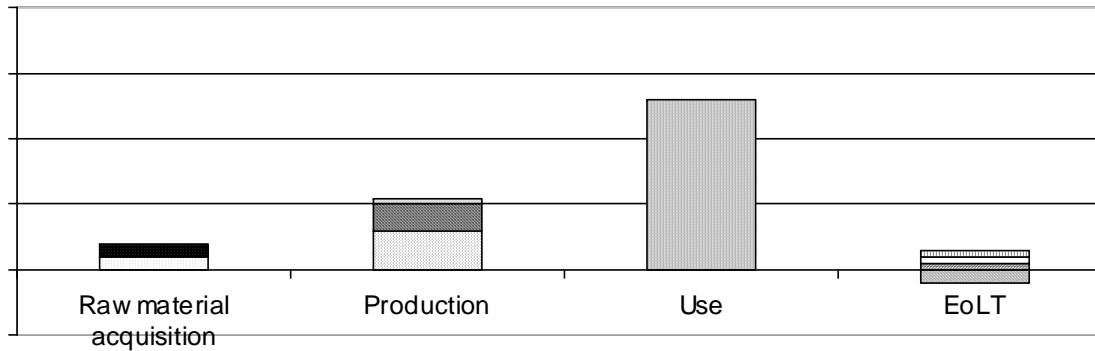
- ICT Networks are composed of ICT goods and ICT services utilize ICT networks: ICT Goods are the basis for the methodologies for ICT networks and ICT services.

## L.1410 Part I: What are the steps to follow?

- General requirements
- Goal and scope definition
- Functional unit definition
- System boundaries definition
- Cut-off rules
- Data quality requirements
- Life Cycle Inventory
  - Data collection
  - Data calculation
  - Allocation procedure
- Life Cycle impact assessment
- Life cycle interpretation
- Reporting

## L.1410 Part I Reporting : example

**GHG emissions**  
[kg CO2e per subscriber per year]



- Other EoLT
- ICT specific EoLT
- Metal recycling
- Transports
- ICT goods use
- Transports
- Assembly
- Parts production
- Raw material processing
- Raw material acquisition

## L. 1410 Part II : key principles

- There are two target systems for comparative analysis
  1. Comparison between a reference product system and an ICT service  
e.g. travel to a face to face meeting (flight, train, car, hotel stays) versus the use of a Video conferencing service
  2. Comparison between two ICT goods or two ICT networks or two ICT services  
e.g. an old data centre compared to a “Green” efficient one
- **Key principles :** Systems must be compared using the same functional unit and equivalent methodological considerations, such as system boundary, data quality, allocation procedures and cut off rules (if applied)

In a comparative analysis what one is seeking to capture is the difference between the two systems rather than the magnitude of both

## L.1410 Part II : What are the steps to follow ?

- General requirements
- Goal and scope definition
- Functional unit in the case of comparison
- System boundaries definition
- Cut-off rules
- Data quality requirements
- Life Cycle Inventory
- Life Cycle impact assessment
- Life cycle interpretation
- Reporting

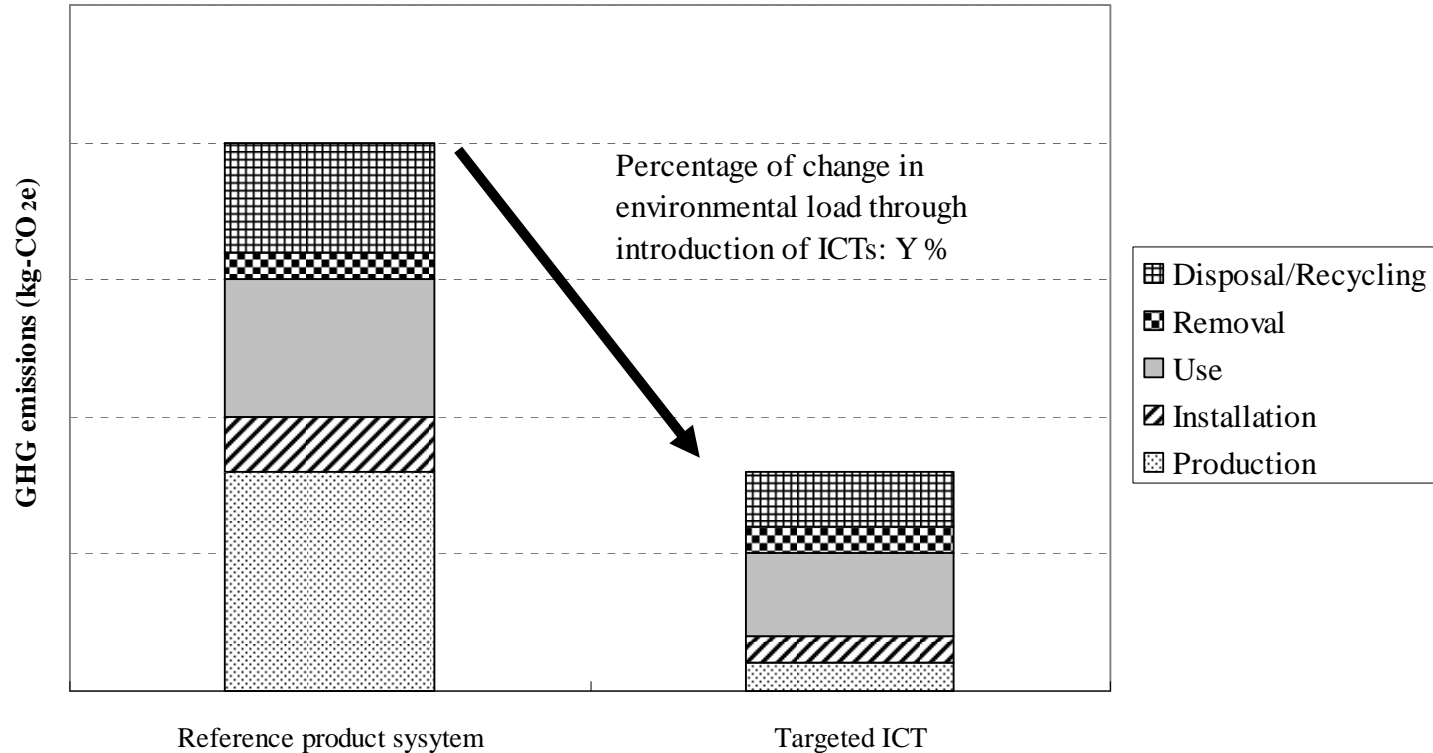
N.b. For Part II which is a comparative analysis between an ICT system and a reference product system the above steps need to be carried out on BOTH the ICT system and the reference product system

## Comparison categories

### Comparison category and its secondary effects

Comparison categories	Second order effects
Consumption of goods	By reducing goods consumption (paper, etc.), EI related to goods can be reduced.
Energy consumption	By enhancing the efficiency of power and energy use, EI related to power. can be reduced.
Movement of people	By reducing the movement of people, EI required for transportation can be reduced.
Movement and storage of goods	By reducing the movement of goods, EI required for transportation can be reduced.
Improved work efficiency	By using office space efficiently, power consumption for lighting, air conditioning, etc. can be reduced, thus reducing EI
Waste	By reducing waste emissions, EI for waste disposal etc. can be reduced.

## L. 1410 Part II, example of reporting



Example of comparative evaluation between ICT and reference product system with categories of life cycle stages.



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## Impact of organizations at city level

### What is Recommendation L.1420 ? What is it for?

- It is a Recommendation that provides guidance on how to assess environmental impacts of ICT in organizations.
  - It has been built with a large number of representatives from the ICT sector and governments. It deals with energy consumption and GHG emissions.
  - It is in line with widely used international voluntary measuring and reporting schemes. It complements ISO 14064-1 and the GHG Protocol.
- This Recommendation covers:
  - The assessment of the life cycle environmental impact of ICT Goods, Networks and Services used by an organization (“Non-ICT organizations”)
  - The assessment of the environmental impact of an ICT organization (“ICT organizations”)
  - The reporting of these impacts to ensure fair and transparent communications

## L.1420 : Scope

- The assessment of the environmental impact of an ICT organization.
  - An ICT organization is an organization, the core activity of which is directly related to the design, production, promotion, sales or maintenance of ICT goods, networks or services.
- The assessment of the life cycle environmental impact of ICT Goods, Networks and Services used by an non-ICT organization .
  - Other organizations
- The interpretation of these impacts and their fair and transparent reporting
  - Documentation is required
- This Recommendation does not address rebound effects
  - Rebound effects are still under study

## L.1420 : Scope (continued)

- The Recommendation covers the 3 following scopes:
  - **Scope 1 (Direct emissions):** Activities owned or controlled by your organization that release emissions straight into the atmosphere.
    - Examples of scope 1 emissions include emissions from combustion in owned or controlled boilers, furnaces, vehicles.
  - **Scope 2 (Energy indirect):** Emissions being released into the atmosphere associated with your consumption of purchased electricity, heat, steam and cooling.
    - These are indirect emissions that are a consequence of your organization's activities but which occur at sources you do not own or control.
  - **Scope 3 (Other indirect):** Emissions that are a consequence of your actions, which occur at sources which you do not own or control and which are not classed as scope 2 emissions.
    - Examples of scope 3 emissions are business travel by means not owned or controlled by your organization, waste disposal, or purchased materials.
- Assessment and reporting for scope 1 and scope 2 emissions are mandatory.
- Assessment and reporting for scope 3 emissions are optional.

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## Impact of ICT projects in cities

### L.ICT projects (to become L.1430), under preparation

- This Recommendation will specify principles, requirements and methods in order to quantify, monitor and report GHG emission reductions, energy consumption savings, energy efficiency improvements resulting from ICT projects, in complement to ISO 14064-2 and GHG Protocol.
  - It is built with a large number of representatives from the ICT sector and governments and in relationship with the UNFCCC.
- It is expected that L.1430 will provide requirements and guidance for :
  - planning an ICT project and its baseline scenario;
  - identifying and selecting GHG sources, sinks and storages relevant to the ICT project and baseline scenario;
  - identifying and selecting energy consumption sources, generators and storages relevant to the ICT project and baseline scenario;
  - managing data quality;
  - monitoring, quantifying, documenting and reporting ICT project performance; and
  - validating and/or verifying the ICT project plan or report.

## Examples of ICT projects in cities

- This Recommendation could for example be used for the following type of projects related to cities :
  - Optimization of public lighting, optimization of water usage at city level
  - Optimization of waste management
  - Smart metering
  - Smart buildings
  - Smart grid
  - Smart mobility
  - Creation of new connected work places
  - Remote public services with videoconferencing
  - Use of Software for urban planning
  - Connected hospital
  - Hospital at home

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## Conclusions

- **ITU-T Recommendation L.1410 and Recommendation L.1420** are available for free
  - They cover the assessment of ICT Goods, Networks and Services and the assessment of ICT in organizations
  - You are welcome to use them to assess the carbon footprint of ICT in cities
  - Suggestions for improvements are welcome
- **ITU-T Recommendations L.ICT projects and L.ICT in cities** are under development
  - Suggestions and contributions are welcome
  - Next meeting to discuss contributions is expected to take place in Geneva on October 8-12, 2012

# Thank you !



<http://www.itu.int/ITU-T/climatechange/>

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