



LIFE CYCLE  
ASSESSMENT  
STANDARDIZATION  
BRIEFING

ERICSSON

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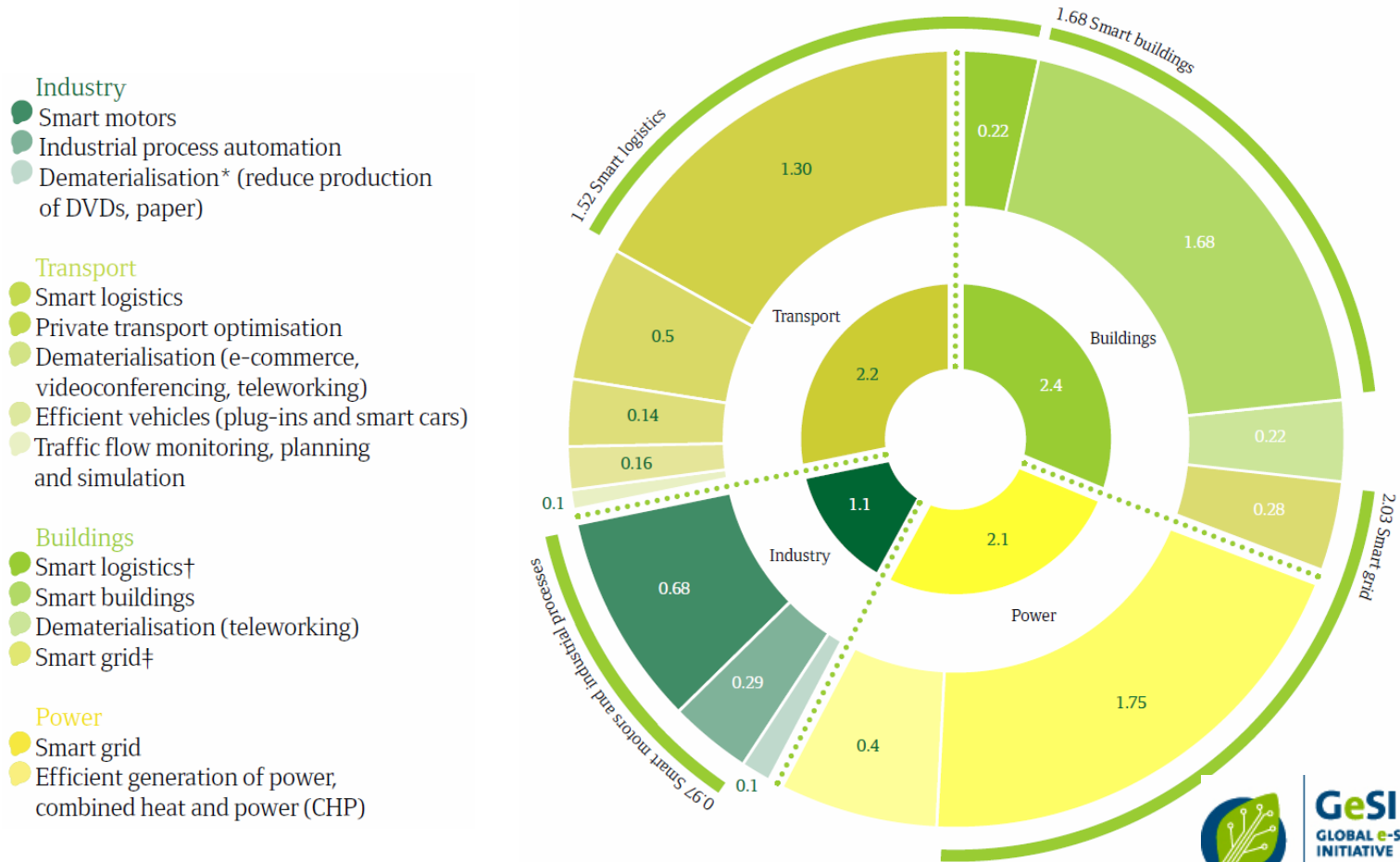


# PREVIOUS MEETING



# ICT AS ENABLER

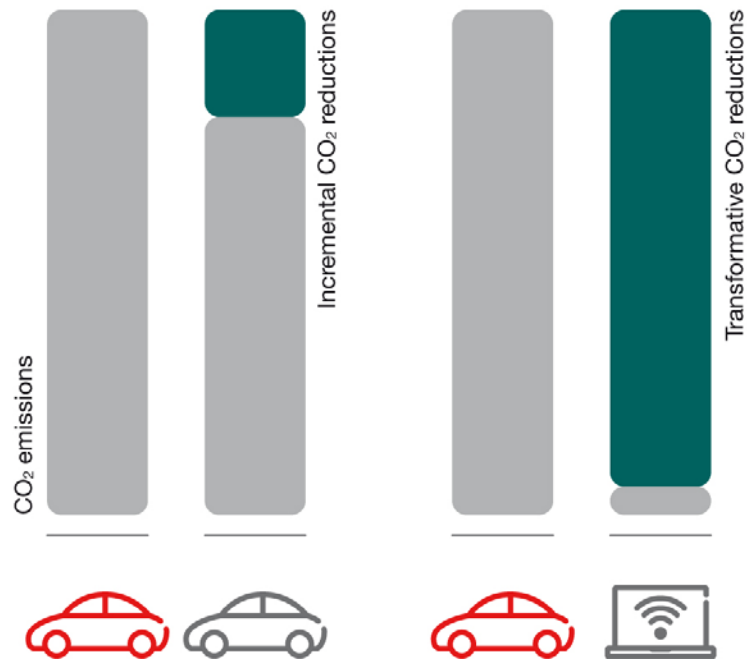
# ICT ENABLING POTENTIAL



**15% CO<sub>2</sub> savings ~ 7.8 GtCO<sub>2</sub>e**

# NEED FOR TRANSFORMATIVE CHANGE

INCREMENTAL AND TRANSFORMATIVE CHANGE



15% CO<sub>2</sub> savings ~ € 600B by 2020

# LIFE CYCLE ASSESSMENT (LCA) STANDARDS

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- › LIFE CYCLE ASSESSMENT STUDIES CAN BE USED TO ESTIMATE THE POTENTIAL OF ICT BASED PRODUCTS, NETWORKS AND SERVICES
  
- › ISO 14040-SERIES ACKNOWLEDGED AS THE BASIC LCA STANDARD
  - ITU-T SG 5 WP3 STANDARDIZATION INTENDED TO GIVE AN ICT SPECIFIC SUPPLEMENTARY STANDARD
  - CORRESPONDING WORK ONGOING IN ETSI EE
  
- › THE INTENTION OF AN ICT SPECIFIC LCA STANDARD IS TO INCREASE
  - MINIMUM QUALITY OF LCA STUDIES
  - CREDIBILITY I LCA STUDIES BY IMPROVING TRANSPARENCY IN REPORTING





THIS MEETING

# OUTLINE

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- › LCA – introduction
- › Use of LCA – opportunities and limitations
- › LCA standardization in ISO
- › LCA standardization in ETSI
- › LCA standardization in ITU
- › Proposed way forward in GISFI

# SUSTAINABILITY

## THE TRIPLE BOTTOM LINE

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### PEOPLE

Social Equity



### PLANET

Environmental Performance



### PROFIT

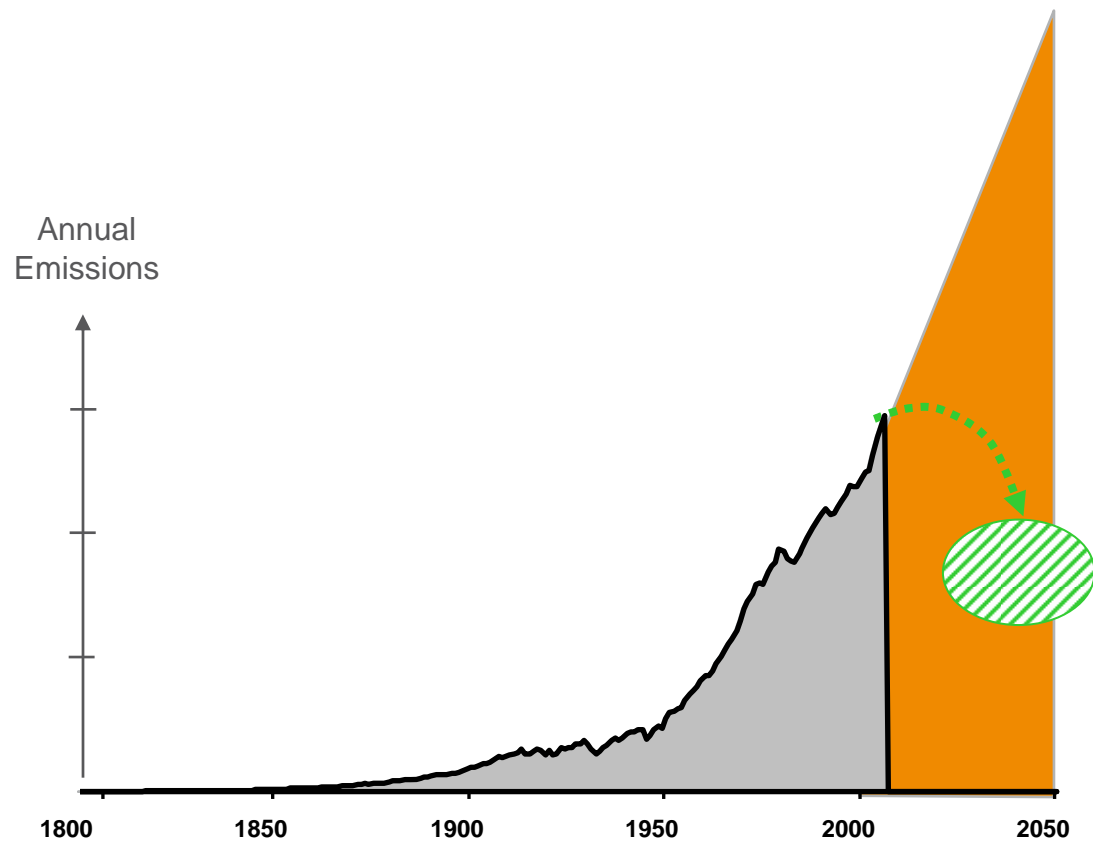
Economic Prosperity

Design for Environment



# GLOBAL CLIMATE CHALLENGE

CHALLENGE - REDUCING TOTAL CO<sub>2</sub> EMISSIONS & INCREASING CARBON PRODUCTIVITY



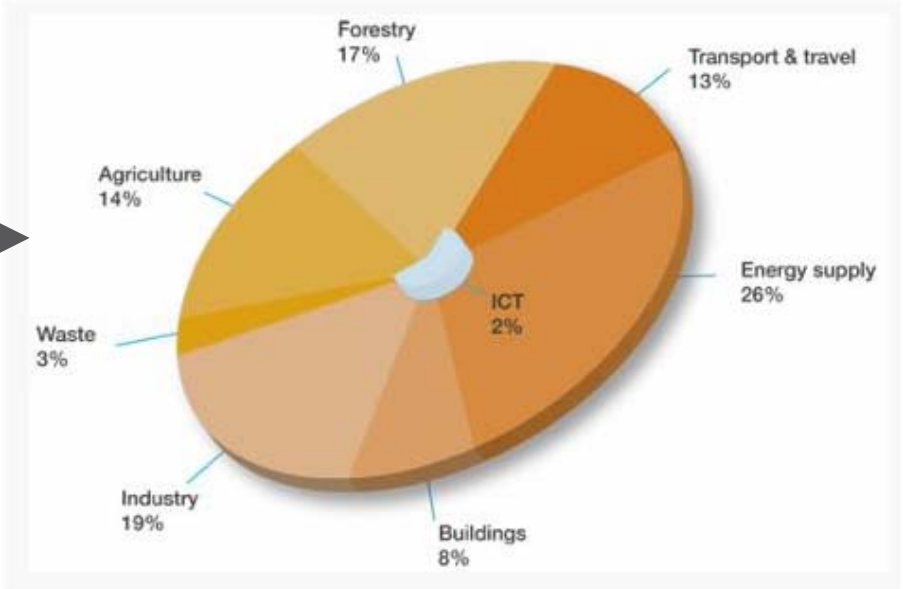
Target area 2050  
(~50-80% reduction)  
While world economy triples...

# THE CLIMATE CHALLENGE

## CO<sub>2</sub> EMISSIONS

- › ICT responsible for 2% of global CO<sub>2</sub> emissions
  - Mobile telecom is only about 0,2% of CO<sub>2</sub> and fixed 0,4%

∅ *How can we reduce our own sector emissions?*



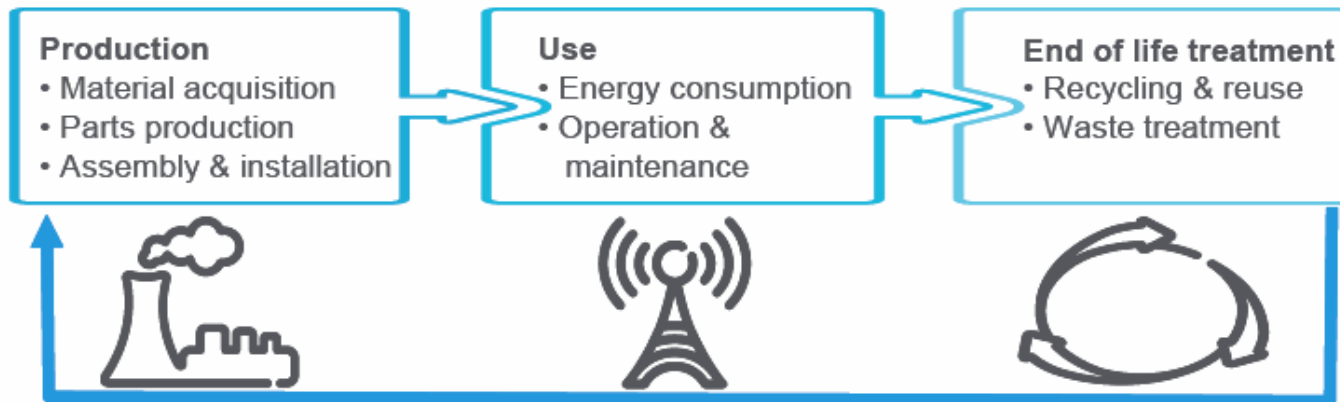
- › ICT key to reduce the other 98% of CO<sub>2</sub> emissions
  - The enabling effect

∅ *How can we enable reductions in other sectors?*



# THE LIFE CYCLE OF ICT PRODUCTS, NETWORK AND SERVICES

- › During production, use and end-of-life treatment, ICT products interact with the environment causing different environmental impacts
- › The environmental impacts from each phase of the product life cycle needs to be considered



- › Life Cycle Assessment methodologies can be used to assess impact not only on climate change – but also on eutrophication, acidification, water depletion etc

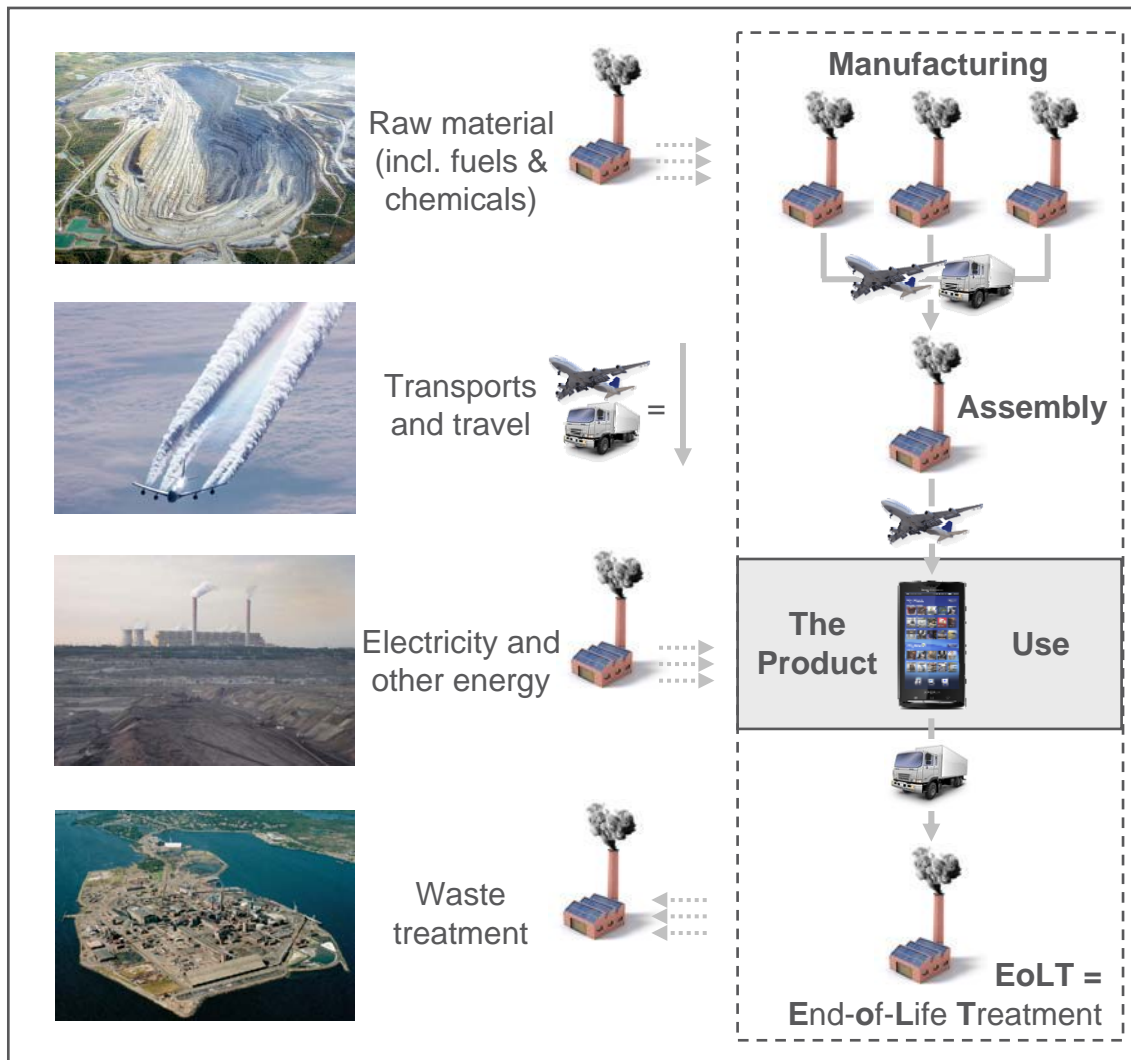
LIFE CYCLE ASSESSMENT IS USED TO UNDERSTAND THE ENVIRONMENTAL IMPACT FROM THE TOTAL LIFE CYCLE FOR DIFFERENT IMPACT CATEGORIES

# LIFE CYCLE ASSESSMENT (LCA)

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- › Life Cycle Assessment (ISO definition):
  - *Compilation and evaluation of the inputs, outputs and potential environmental impacts of a product system throughout its life cycle*
  
- › LCA consist of the following phases:
  - **Goal and Scope definition**
  - **Life Cycle Inventory analysis (LCI)**
    - › *Phase of the life cycle assessment involving the compilation and quantification of inputs and outputs for a product throughout its life*
  - **Life Cycle Impact assessment (LCIA)**
    - › *Phase of the life cycle assessment aimed at understanding and evaluating the magnitude and significance of the potential environmental impacts for a product system throughout the life cycle of the product*
  - *Life Cycle Interpretation*
    - › *Phase of the life cycle assessment in which the findings of either the inventory analysis or the impact assessment, or both, are evaluated in relation to the defined goal and scope in order to reach conclusions and recommendations*

# LIFE CYCLE CONSIDERATIONS



## INPUTS:

### Resources (ex.):

- Material
- Energy
- Water
- Land



**PRODUCT OUTPUT**



## OUTPUTS:

### Emissions to air:

- CO<sub>2</sub>, CH<sub>4</sub>
- NO<sub>x</sub>, SO<sub>x</sub>
- Dust / aerosols / soot



### Emissions to water:

- Cu, As
- Pb, Cd, Hg
- N, P



### Residual waste:

- Landfill
- Special storage



# USE OF LCA

*“LCA is a **relative approach**, which is structured around a functional unit. This functional unit defines what is being studied” (ISO 14040, 4.1.2)*

*“LCA addresses **potential environmental impact**. LCA does not predict absolute or precise environmental impacts” (ISO 14040, 4.3 i)*

## Opportunities

- Identification of opportunities to improve environmental performance
  - › For products, networks, services, organizations...
- Information to decisions-makers in industry, government or non-government organizations
- Selection of relevant indicators of environmental performance
- Marketing

## › Limitations

- LCA is a model-based assessment methodology and as such associated with large uncertainties
- Any result of an LCA study is therefore only valid for the conditions/ assumptions/ boundaries applied for the study
  - › Any conclusion drawn from a study demands good knowledge and careful considerations
  - › Especially comparisons of results between studies need special care and is usually to be avoided.
- LCA is therefore best used to get a deeper understanding of a product system and its environmental impacts
- LCA is not a measurement method
  - › LCA is not suitable to measure absolute impact of a product
- Comparisons of results



# IMPACT FROM ICT

# ASSESSMENT OF ENABLING EFFECTS

- › E-health system in Croatia connecting 2400 primary healthcare teams providing e-referrals and e-prescriptions
  - Potential reduction factor:50



**e-zdravstvo**  
Pametan sustav za vaše zdravlje!

Naslovnica eRecept eNaručivanje eUputnica Kontakt Često postavljena pitanja 24. kolovoz 2010.

**Dobrodošli u suvremeni zdravstveni sustav!**

Znate li da u Hrvatskoj traje informatizacija sustava primarne zdravstvene zaštite? Do kraja godine imat ćemo sustav koji smanjuje Vaše brige i olakšava Vam život. Ovaj sustav povezuje sve koji brinu za Vaše zdravlje i omogućuje im brzo i sigurno međusobno komuniciranje te razmjenu potrebnih informacija.

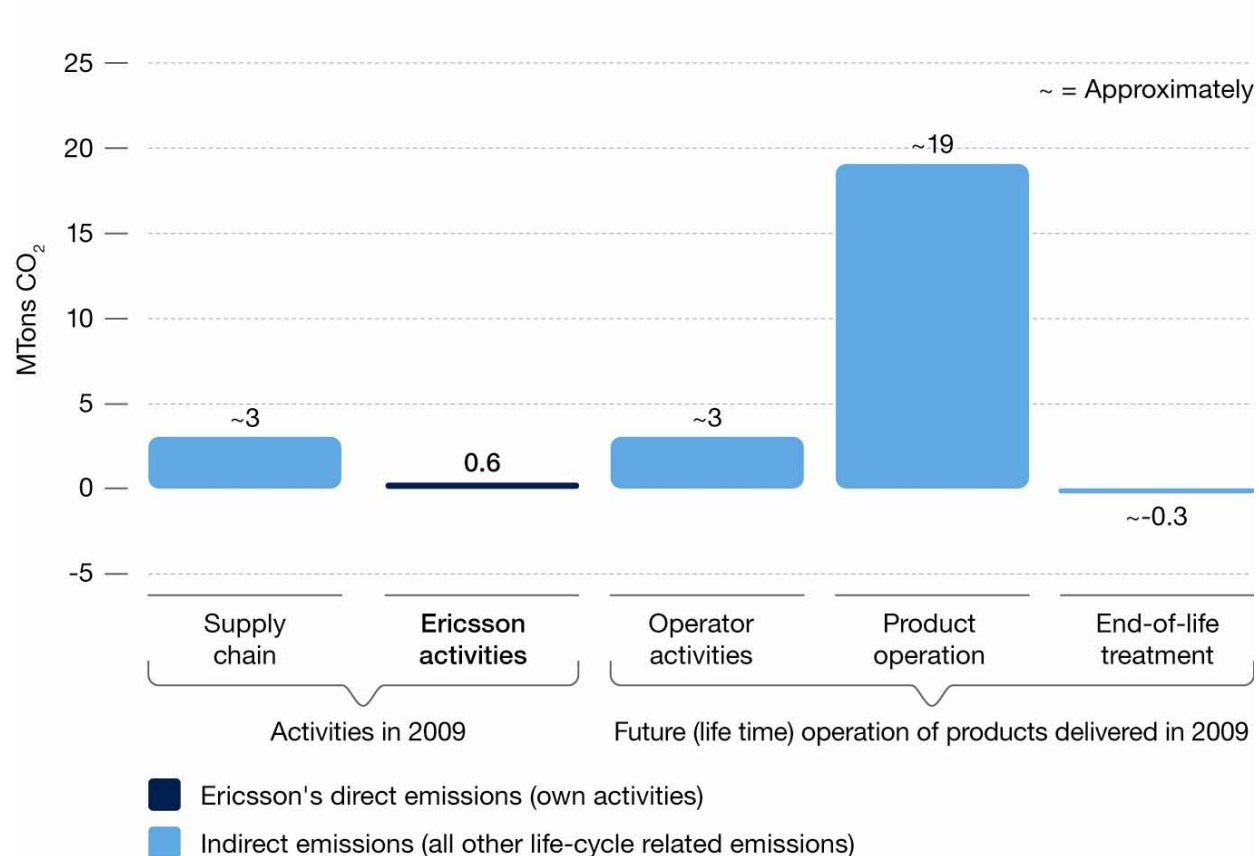
[Pročitaj više](#)

- › Telia Sonera Sweden
  - ”Smart work” 2001-2007
    - Office space reduction ~ 50% per employee
    - Travel reduced by ~ 40% - ~ 75% per employee



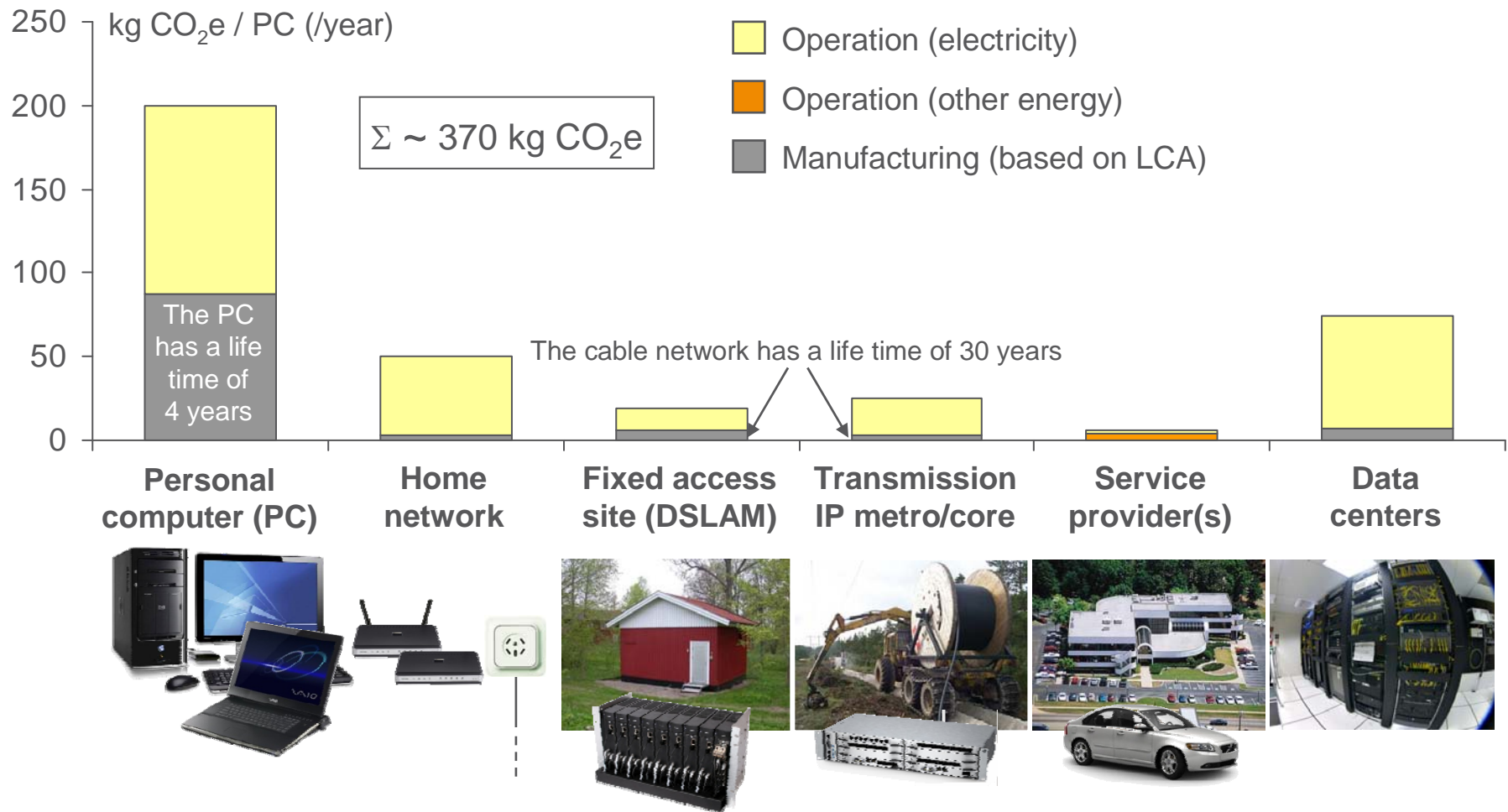
**TeliaSonera**

# ERICSSON CARBON FOOTPRINT 2009



LCA RESULTS ARE USED TO SHOW OUR IMPACT TO  
 STAKEHOLDERS AND TO PRIORITIZE ENVIRONMENTAL  
 WORK

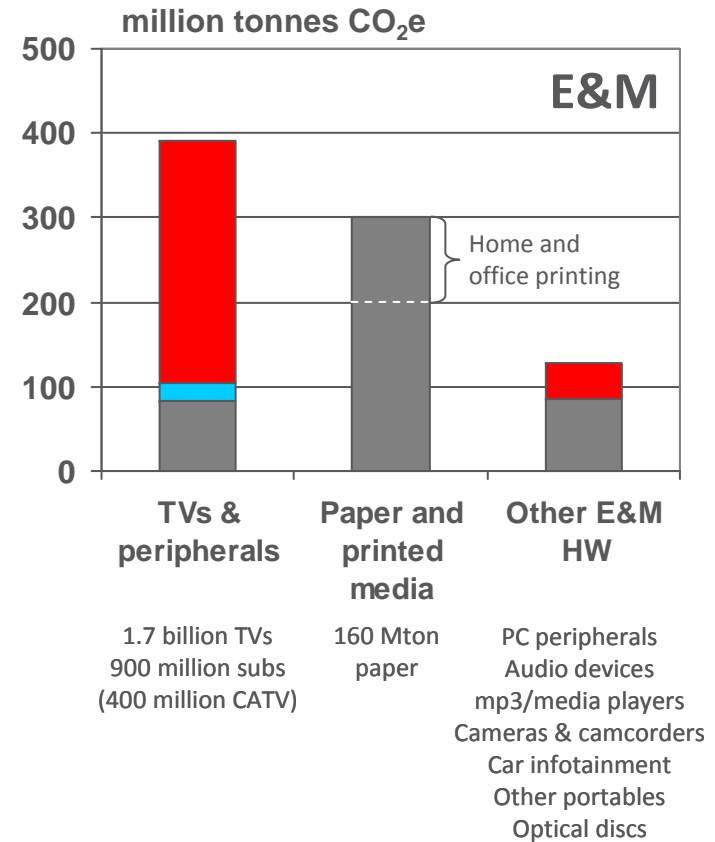
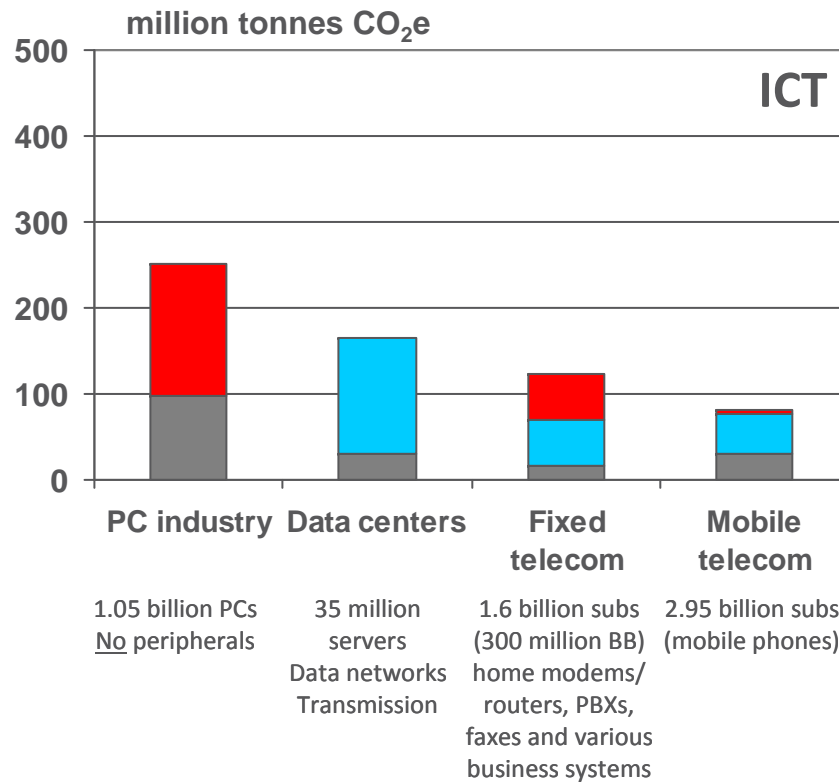
# NETWORK-LEVEL EXAMPLE: PC WITH FIXED BROADBAND



# MACRO LEVEL EXAMPLE: THE GLOBAL FOOTPRINT OF ICT AND ENTERTAINMENT & MEDIA

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■ End-user equipment operation    
 ■ Network operation    
 ■ Manufacturing & business overhead

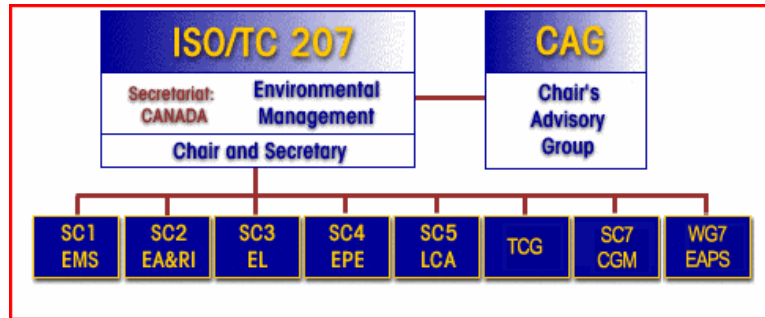


1) Malmodin, J., Å. Moberg, D. Lundén, G. Finnveden, N. Lövehagen. 2010. Greenhouse gas emissions and operational electricity use in the ICT and entertainment & media sectors. Journal of Industrial Ecology. 2010.



ISO 14040/14044

# INTERNATIONAL ORGANIZATION FOR STANDARDIZATION (ISO)



- › Technical Committee 207 on Environmental Management is responsible for developing the [ISO 14000](#) series of standards and guidance documents since 1993.
- › The scope of the committee is: "standardization in the field of environmental management tools and systems."
  - ISO/TC 207 does not set limit levels or performance criteria for operations or products; instead, its activities are based on the philosophy that improving management practices is the best way to improve the environmental performance of organizations and their products.
- › ISO/TC 207 is the "umbrella" committee under which the ISO 14000 series of environmental management standards are being developed. The subcommittees (SC) and working groups (WG) of ISO/TC 207 are producing standards and guidance documents in the following areas:
  - SC 1 Environmental Management Systems (EMS)
  - SC 2 Environmental Auditing & Related Investigations (EA&RI)
  - SC 3 Environmental Labeling (EL)
  - SC 4 Environmental Performance Evaluation (EPE)
  - SC 5 Life Cycle Assessment (LCA)
  - SC 7 Greenhouse Gas Management and Related Activities
  - TCG Terms and Definitions (T&D)
- › LCA main deliverables
  - [ISO 14040:2006 Environmental management – Life Cycle Assessment – Principles and framework](#)
  - [ISO 14044:2006 Environmental management – Life Cycle Assessment -Requirements and guidelines](#)
  - <http://www.tc207.org/pdf/documentdevelopment.pdf>

Source: <http://www.tc207.org/default.asp>





ETSI

# ETSI

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- › The Technical Committee EE is responsible for defining the environmental and infrastructure aspects for all telecommunication equipment in different types of installations. The Environmental activity covers:
  - Environmental conditions on the telecommunication equipment (mechanical, biological and climatic conditions)
  - Active substances (mechanical and chemical)
  - Equipment acoustic noise emission.
  - Environmental tests for all telecommunication equipment and facilities, including customer premises.
  - Observation of European environmental legislation, in terms of ecological aspects, and assessing its impact on Telecommunication infrastructure and equipment
  
- › Environmental activity in terms of ecological aspects covers the combination of climatic, physical, chemical, and biotic conditions that may affect the growth and welfare of organisms and nature conservation. In particular:
  - reduction of energy consumption in telecommunications equipment and related infrastructure
  - alternative energy sources for powering telecom/datacom equipment

# LCA RELATED ACTIVITIES IN ETSI

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- › LCA assessment of telecommunication equipment and service part1: General definition and common requirement
  - ICT specific recommendations for Life Cycle Assessment supplementary to ISO 14040/14044
  - The standard will define rules for
    - › the functional unit selection,
    - › the system boundary selection
    - › the allocation proceduresfor different types of ICT equipment and services.
  - Covers all environmental impact categories
  - Strong product perspective
  - Ericsson member of working group
  - Expected to be ready 2011
  
- › Environmental Impact Assessment of ICT including the Positive Impact by using ICT Services (study item)
  - Early draft since 2008



ITU-T

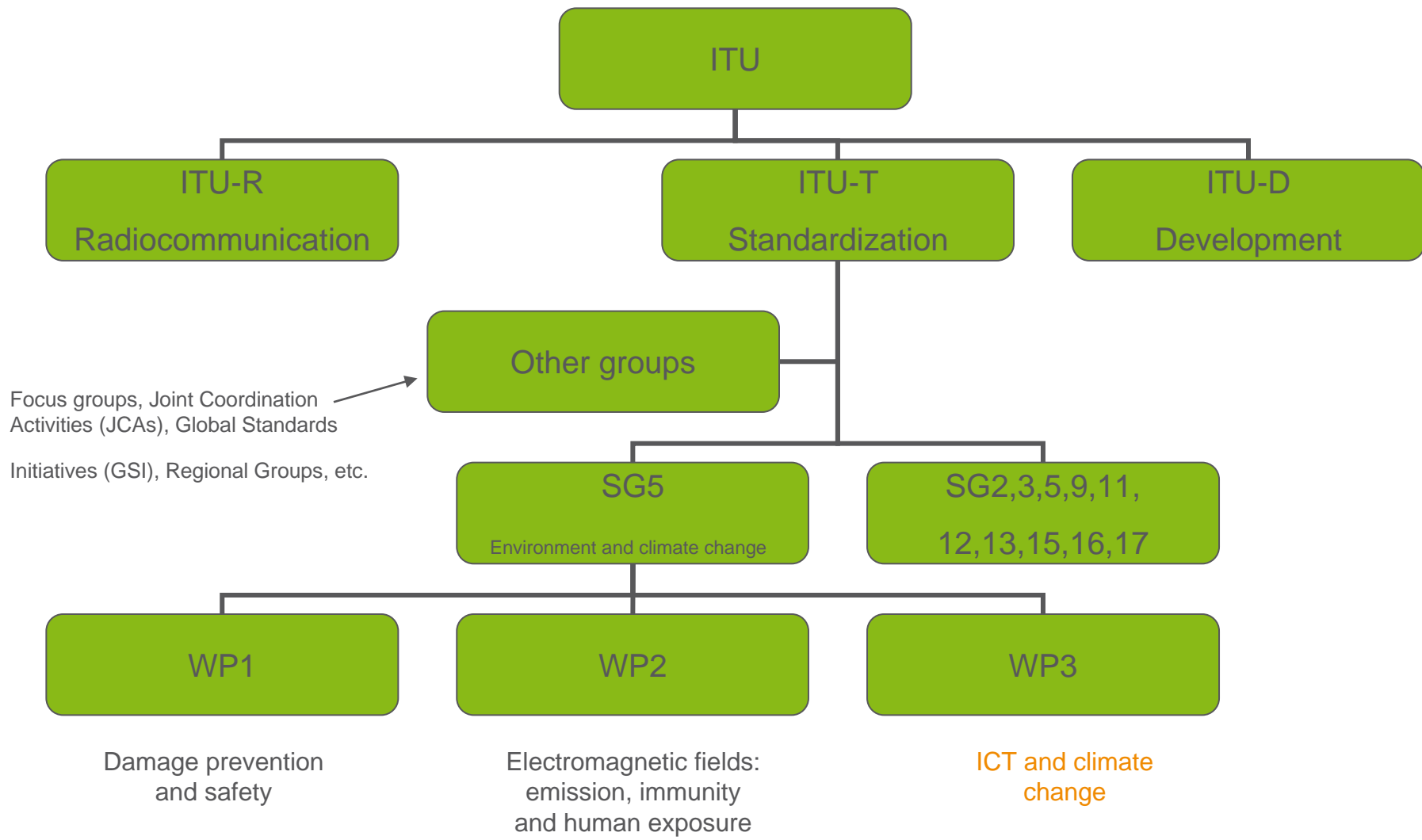
# INTERNATIONAL TELECOMMUNICATION UNIT (ITU)

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- › International Telecommunication Union (ITU) is the leading United Nations agency for information and communication technology issues
- › ITU addresses the following areas
  - radio spectrum
  - international cooperation in assigning satellite orbits
  - Improvements of telecommunication infrastructure in the developing world
  - **worldwide standards** that foster seamless interconnection of a vast range of communications systems
  - global challenges of our times, such as **climate change** and cybersecurity.
- › ITU is based in Geneva, Switzerland
  - Membership includes 191 [Member States](#) and more than 700 [Sector Members and Associates](#).
  - Ericsson is registered as “Telefon AB – LM Ericsson” and is a Sector Member.



# STRUCTURE



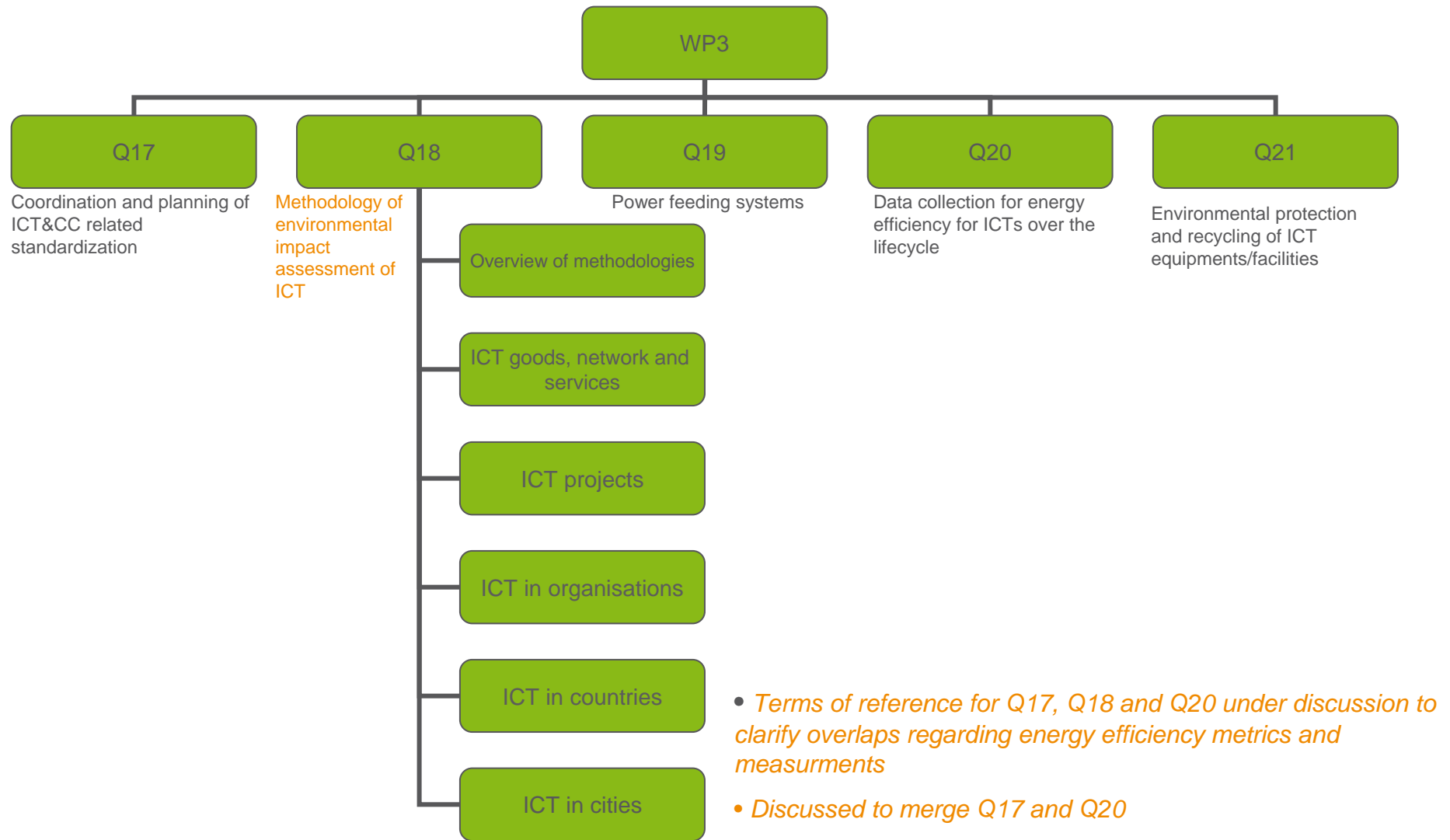
# MANDATE OF SG5 WITH RESPECT TO CLIMATE CHANGE

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*Responsible for studies on methodologies for evaluating the ICT effects on climate change, publishing guidelines for using ICTs in an Eco-Friendly Way, and energy efficiency of the power feeding system.*

*Also responsible for studying design methodologies to reduce environmental effects such as recycling related to ICT facilities, equipments, etc.*

# WP3 - ICT AND CLIMATE CHANGE



# RECOMMENDATIONS UNDER PREPARATION IN Q18

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- › Overview and general principles of methodologies for assessing the environmental impact of ICT
- › **Assessment of the environmental impact of ICT goods, networks, and services**
  - ICT specific recommendations for Life Cycle Assessment supplementary to ISO 14040/14044
  - Focus is on climate change for goods, networks and services
  - Strong service perspective
  - Ericsson member of editor group
  - First version scheduled for 2011
- › Assessment of the environmental impact of ICT in organisation (**title will be updated**)
  - Covers both assessment of ICT organizations and of use of ICT in organizations
- › Assessment of the environmental impact of ICT projects
  - Covers assessments of ICT projects aiming at GHG/EE improvements and assessment of GHG/EE impact from other ICT projects
- › Assessment of the environmental impact of ICT in cities
- › Assessment of the environmental impact of ICT in countries or group of countries



# OTHER RELATED ACTIVITIES - EXAMPLES

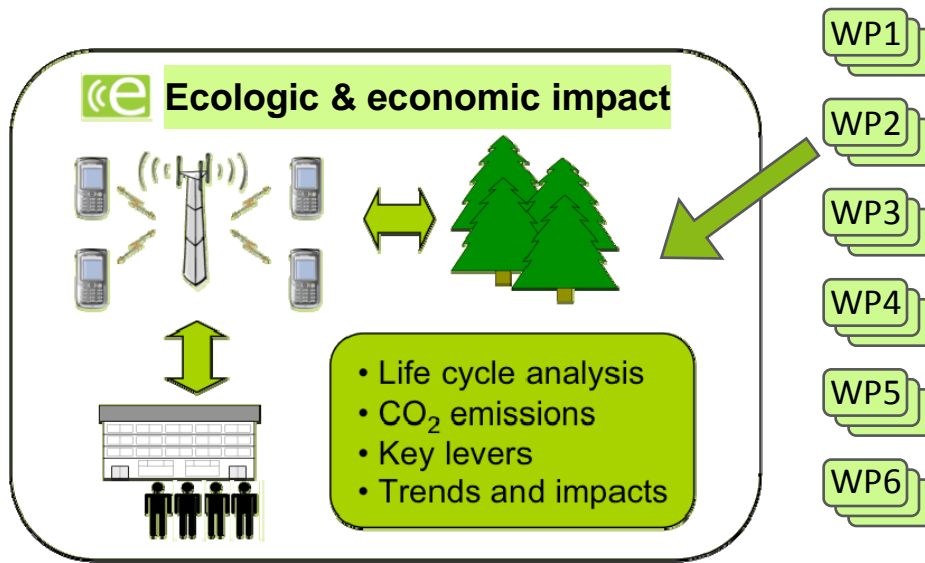
# ILCD HANDBOOK

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- › In the Communication on Integrated Product Policy, the European Commission committed to produce a handbook on best practice in LCA.
- › The **ILCD Handbook** is a series of technical documents that provide detailed guidance on all the steps required to conduct a Life Cycle Assessment (LCA).
- › The Handbook's main goal is to ensure quality and consistency of life cycle data, methods and assessments. It's main target audience is LCA practitioners, data providers, and reviewers.
- › The handbook has a broad approach and covers all product categories

# EARTH EU-PROJECT

The main focus is energy efficiency of mobile cellular networks



**EARTH in a Nutshell**

Energy Aware Radio and network technologies

- The goal of the project is to address the global environmental challenge by improving the energy efficiency of existing and future communication systems
  - The main focus is mobile cellular networks and their evolutions

**EARTH Highlights**

- **Duration**
  - Jan. 2010 – Jun. 2012
- **Consortium**
  - 15 Organisations
  - 10 Countries
- **Budget**
  - 16.43 M€
- **EU Funded Budget**
  - 10.44 M€
- **Resources**
  - 1361 PM
- **PU Deliverables: 19**

Alcatel-Lucent  
ERICSSON  
NIP  
docomo  
DOCOMO Euro-Labs  
TELECOM ITALIA  
cea  
SURREY  
TECHNISCHE UNIVERSITÄT BREITENBURG  
IMEC  
TTI  
ETSI  
World Class Standards  
UNIVERSITY OF OULU

Copyright © 2008 EARTH – Energy Aware Radio and network technologies. All Rights reserved. Proposal Hearing June 3rd 2009 2

## EARTH Task 2.1, The ecologic and economic impact of mobile cellular networks

- Quantify global energy consumption and CO<sub>2</sub> emissions
- Identify future developments, e.g. data rates and no. of subscriptions
- Identify historical key levers for energy efficiency improvements
- Develop scenarios for best and worst case and expected development

# GESI ICT ENABLEMENT STUDY

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- › GeSI ([www.gesi.org](http://www.gesi.org)) is an international strategic partnership of ICT companies and industry associations aiming at “*creating and promoting technologies and practices that foster economic, environmental, and social sustainability and drive economic growth and productivity*”
- › In 2008, GeSI published *SMART 2020: Enabling the low carbon economy in the information age*.
  - The report, produced for GeSI by McKinsey with The Climate Group, identified the potential for ICT to deliver 15% cuts in greenhouse gases by 2020.
- › During 2010 GeSI published *Evaluating the Carbon-Reducing Impacts of ICT*, carried out by the Boston Consulting Group
  - This study aims at describing a tool on how to assess the potential for ICT in delivering reduced carbon emissions
  - It is based on LCA methodology and tries to give practical guidance for comparative studies on use of ICT based services compared to a business as usual scenario
  - From an LCA perspective the GeSI report gives guidance mainly on the initial scoping phase and on reporting

# OTHER ORGANIZATIONS

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## > IEC

- International Electro-technical Commission
  - > Standardization Organization
  - > Proposal initiating work towards reduction of GHG

## > iNEMI

- International Electronic Manufacturing Initiative
  - > Not standardization organization
  - > Co-operation between a number of sub-manufacturers to get common view on LCA and especially LCA reporting of input data.



# PROPOSED WAY FORWARD IN GISFI

# PROPOSED WAY FORWARD IN GISFI

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- › Assess ongoing LCA methodology activities in international/ regional standardization bodies
  - Build relations to identified groups
  
- › Assess related main LCA methodology activities in other groups
  
- › Identify gaps/ supplements needed for the Indian context
  - Avoid repetition of work



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