



# ICT for Energy Efficiency

**Shailendra Mudgal, Bio Intelligence Service**

**ICTs and Climate Change: Finding Solutions**

10 December 2008

Poznan (Poland)

**Disclaimer: This presentation contains the results of research by the project consortium and is not to be perceived as the opinion of the European Commission.**

---

*A study conducted by BIO Intelligence Service  
in cooperation with Fraunhofer IZM and E5*

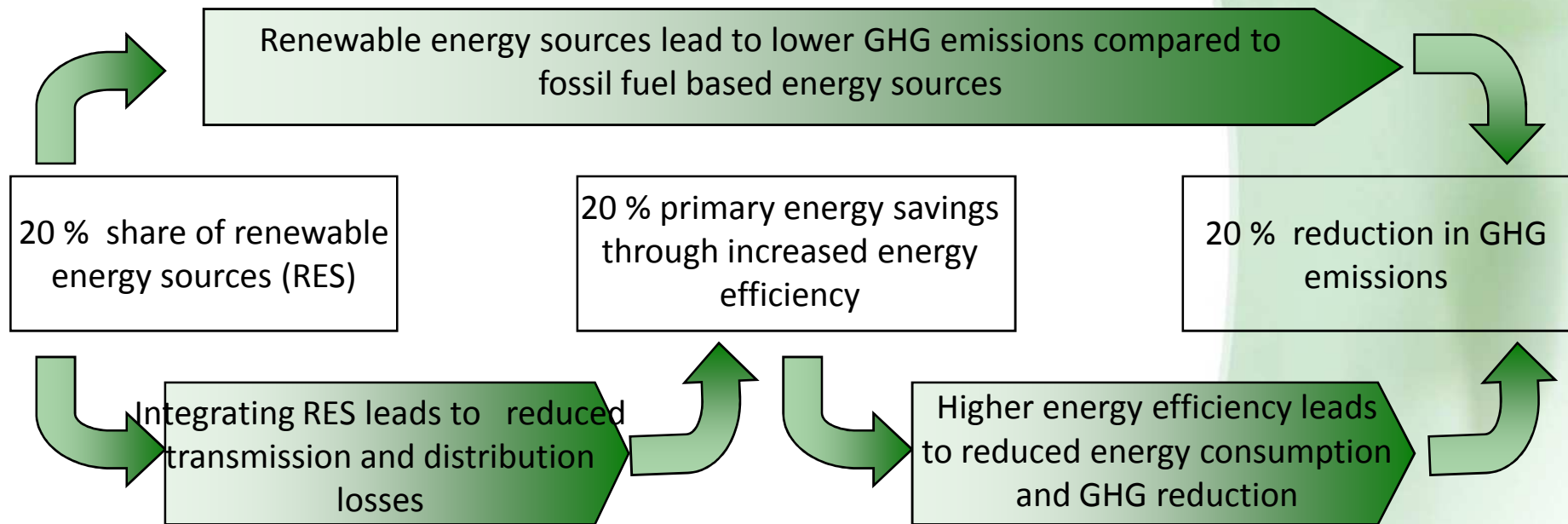




# Content

- Context overview
- Objective and scope
- Approach
- The ICT sector
- ICT as an enabler

● The 20/20/20 puzzle



● Role of Information and Communication Technologies (ICTs) to play in reducing the energy intensity of EU's economy?

## Objectives and scope

- Analyse the direct impacts of the European ICT sector (2020 outlook)

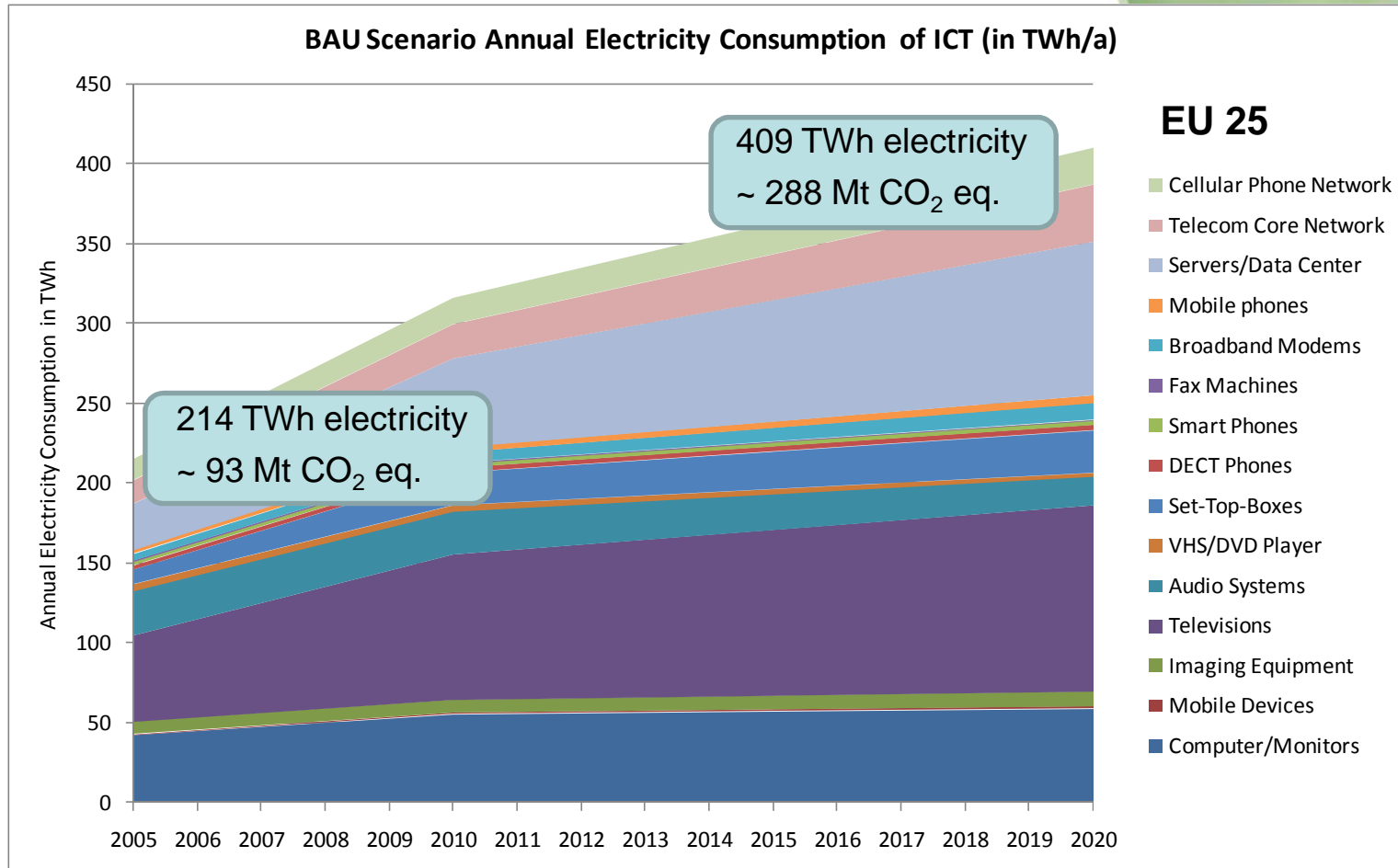
- ICT equipment
  - ICT infrastructure
- Electricity use

- Analyse the energy savings enabled by ICT-based applications in other sectors (2020 outlook)

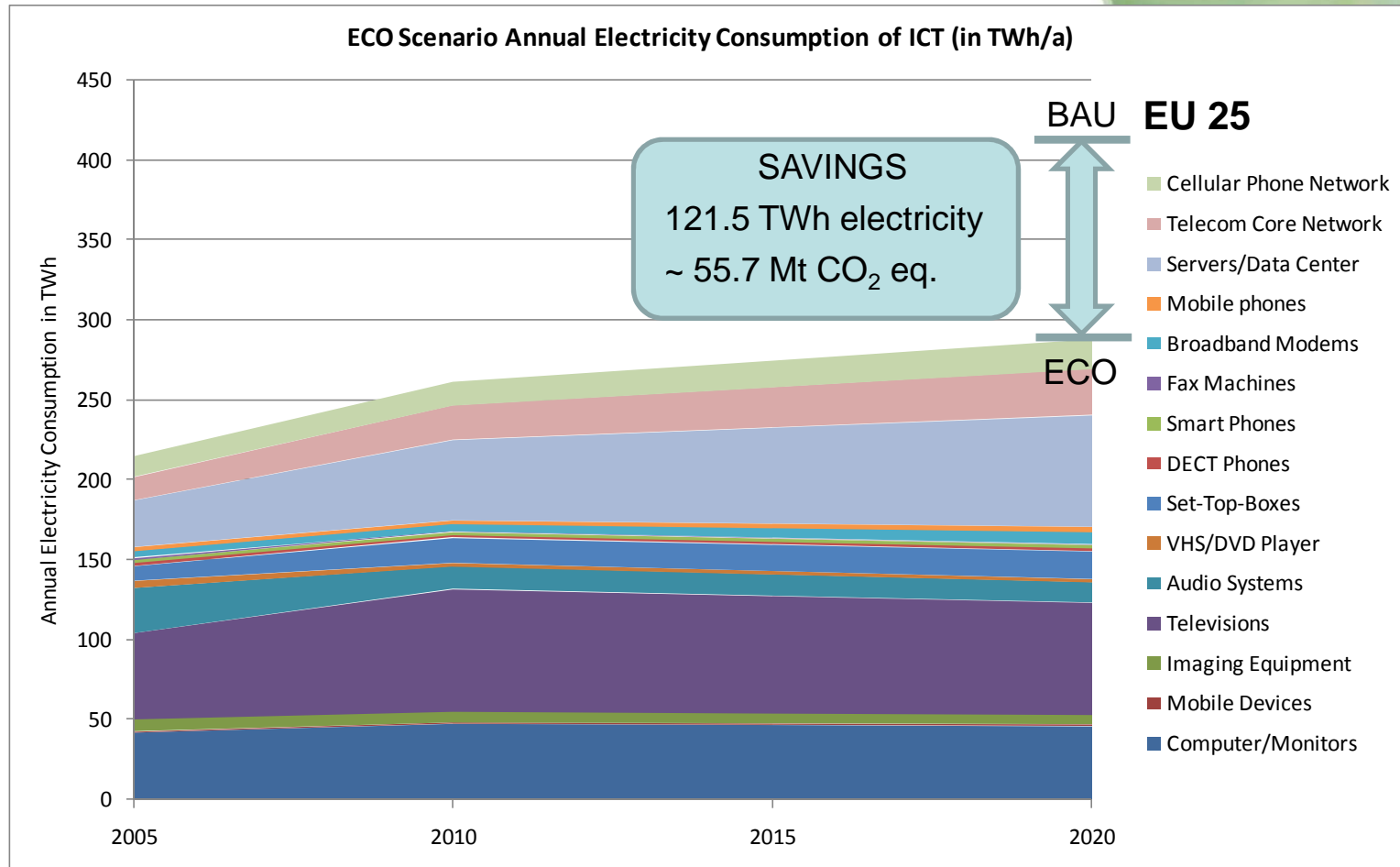
- Buildings (residential and service sector)
  - Industrial equipment and automation
  - Energy grids and Power automation
  - Dematerialisation
- ICT enabled energy efficiency
- ICT enabled energy and resource efficiency



- Bottom up approach
  - ICT Sector
    - $SUM [equipment (a) \times stock (a) + equipment (b) \times stock (b) \dots + equipment (n) \times stock (n)] + Infrastructure$
  - ICT as an enabler in various sectors
    - Within each sector analysis of case studies
    - Extrapolation of the case studies
- Collection of statistical data (e.g. Literature, Eurostat, DG TREN, DG ENV, expert interviews)
- Trend analysis (take up of energy efficient ICT equipment, take up of ICT based applications, technical and market trends...)
- Analysis of the policy framework and business initiatives (e.g. EuP Directive, Energy Star, EU Codes of Conduct, etc. Directive on energy efficiency and energy services, Directive on the Energy Performance of Buildings, and voluntary initiatives such as Climate savers computing initiative, Greengrid)



The ICT sector represents 2% of EU 25 GHG emissions in 2005 and is estimated to represent 4.5 % in 2020 (assuming the 20 % GHG reduction target is reached), considering the use phase only.



The ICT sector represents 2 % of EU 25 GHG emissions in 2005 and 3.2 % in 2020 (assuming the 20 % reduction target is reached) considering the use phase only.



## ■ General recommendations

- **Information to consumer** to promote value efficiency and life cycle cost over purchase costs
- **Adoption of a European Green procurement scheme**
- **Extension of the European Energy star labelling program or of the Energy label to other ICT devices** (with priority to the most significant in terms of overall energy consumption)
- **Develop financial incentives** to foster green products
- **Ensure that innovation in R&D is rewarded** through appropriate means (e.g. tax credit)
- **Encourage further research activities** towards more energy efficient ICT components and systems





## ■ Buildings

- **HVAC** (e.g. temperature monitoring and heating control, switchable vacuum insulated panels, switchable mirror film on windows, integrated cooling of ICT equipment, integrated control of clean room conditions)
- **Lighting systems** (e.g. led lighting, occupancy and daylight sensors)

## ■ Industrial equipment and automation

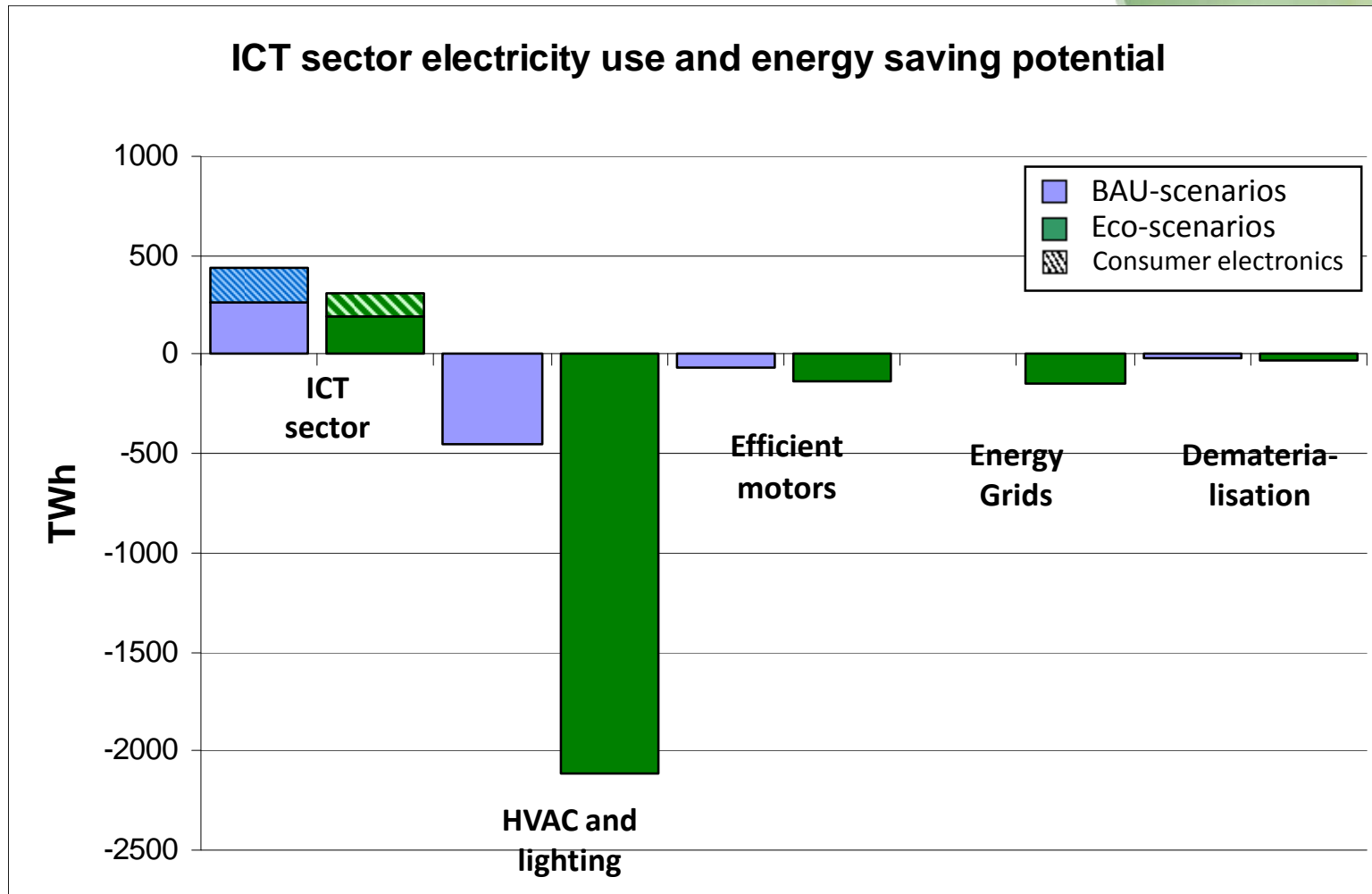
- **Electrical drivers** (motors, pumps and fans)

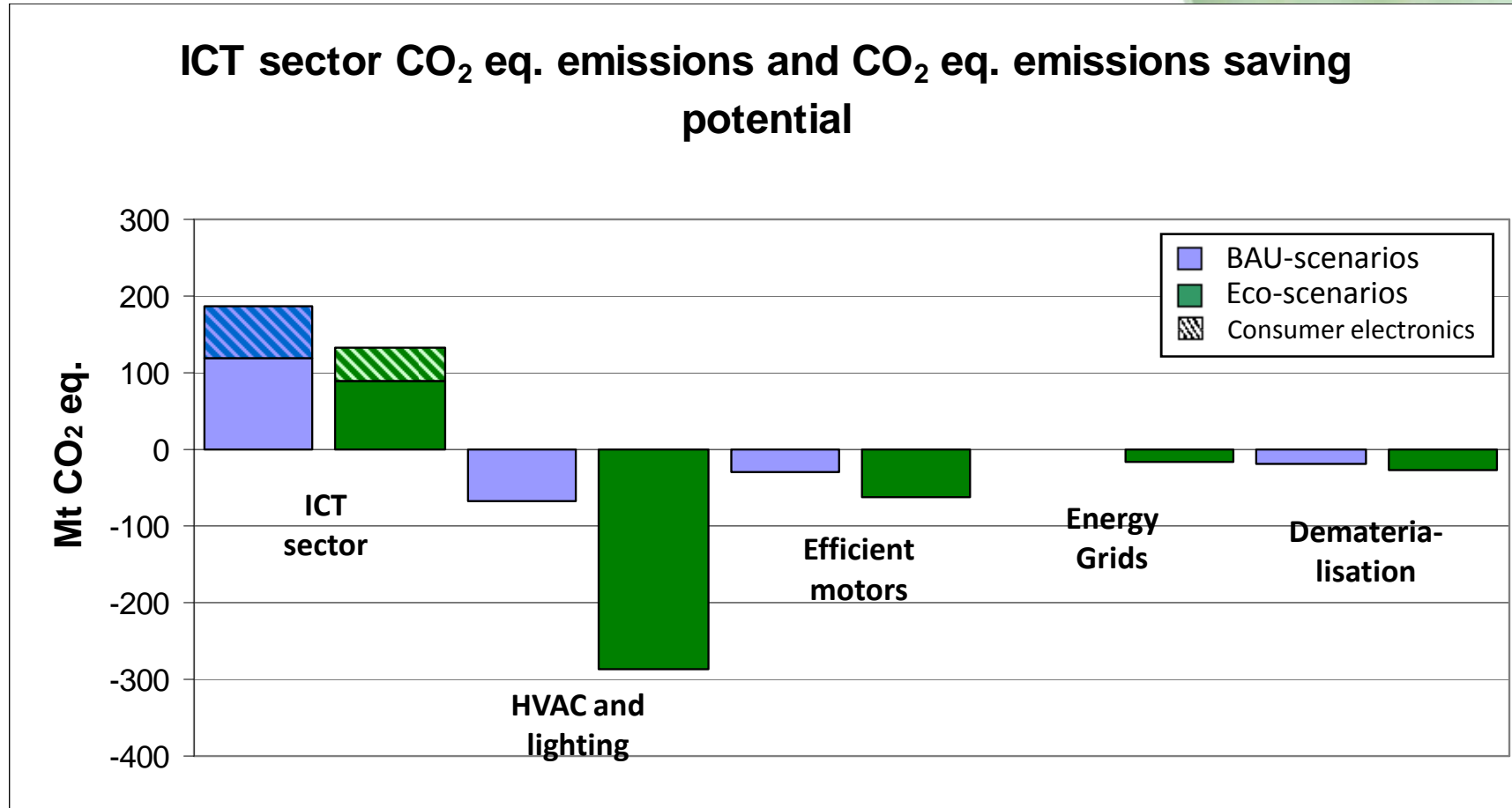
## ■ Energy grid

- **Supply and demand management** (DER, AMI, dynamic pricing)

## ■ Dematerialisation

- **Dematerialisation of goods and services** (e.g. e-gov, audio/video conferencing, e-work, e-tickets, mobile ticketing, ,e-invoicing, RFID tracking)
- **Digital product development** (CAD, CAM, CAE, CS, VR)





## General Recommendations (ICT as an enabler)

- Development of standardised methods to measure environmental performance of ICT based products and services
- Improvement and monitoring of statistical data to make efficiency and effectiveness a reality
- Development of appropriate incentives to encourage the uptake of energy efficient technologies and practices
- Promotion of public-private partnerships in energy efficiency
- Provide Information and guidelines
- Development of internet connectivity to facilitate ICT-based solutions
- Identification of R&D needed in ICT and further support for R&D together with Innovation actions
- **Sector specific recommendations and scenarios available in the study**



**- Thank you for your kind attention ! -**

## **Bio Intelligence Service**

Shailendra Mudgal ([shailendra.mudgal@biois.com](mailto:shailendra.mudgal@biois.com))

*Tel: +33 1 56 20 28 98*

*Full report is available at*

*[http://cordis.europa.eu/fp7/ict/sustainable-growth/studies\\_en.html](http://cordis.europa.eu/fp7/ict/sustainable-growth/studies_en.html)*