Welcome
to the World
of Standards

ETSI
World Class Standards

ENERGY CONSUMPTION IN ICT NETWORKS & STANDARDIZATION INITIATIVES FOR SMART SUSTAINABLE CITIES

Madrid, 14 April 2015
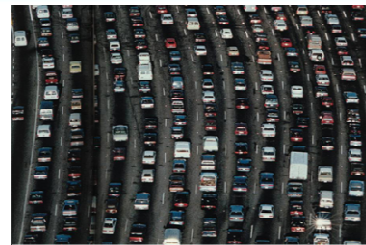
Beniamino Gorini (Alcatel-Lucent)

ETSI TC-EE chairman

Energy consumption in ICT networks

Contribution in carbon emission due to ICT

Global aviation industry

50 million cars

THE NETWORK ENERGY GAP (*)

INTERNET TRAFFIC
X 15
2010-2020

Mobile Data
X 186
2010-2020

Internet Backbone
X 12,8
2010-2020

NETWORKS ENERGY USE
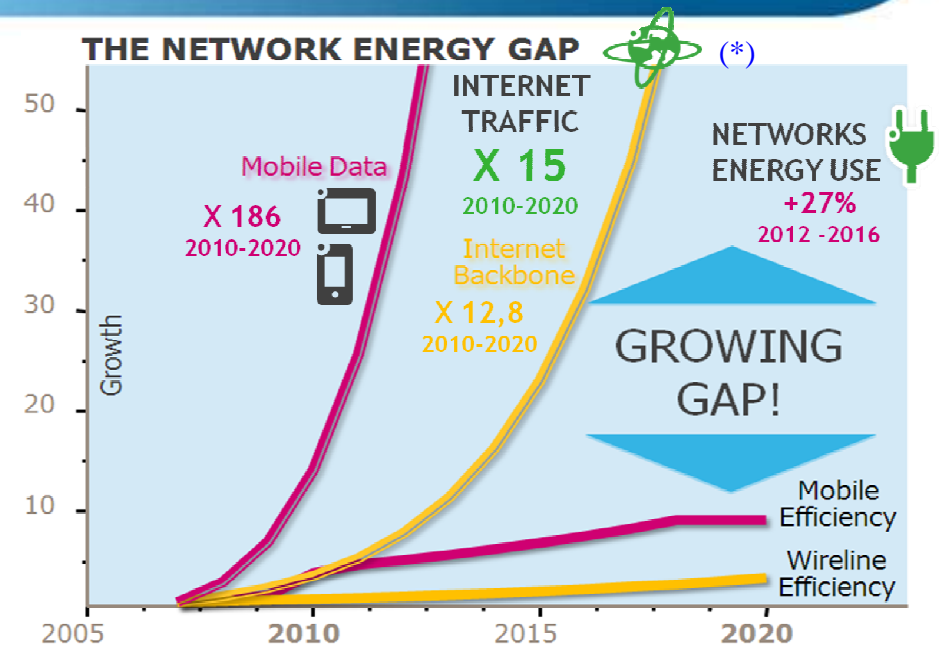**+27%**
2012 -2016

GROWING GAP!

Mobile Efficiency

Wireline Efficiency

Global ICT Emissions: 2.3%, Growing at 4% YoY

GeSI "SMARTer 2020: The Role of ICT in Driving a Sustainable Future", 2012

- **Slow-down in technology improvements**
- **Network energy efficiency only increasing at 10-15% per year**

ICT also has significant enabling effect to reduce global carbon emissions through increased and more intelligent use of communication and networking technologies
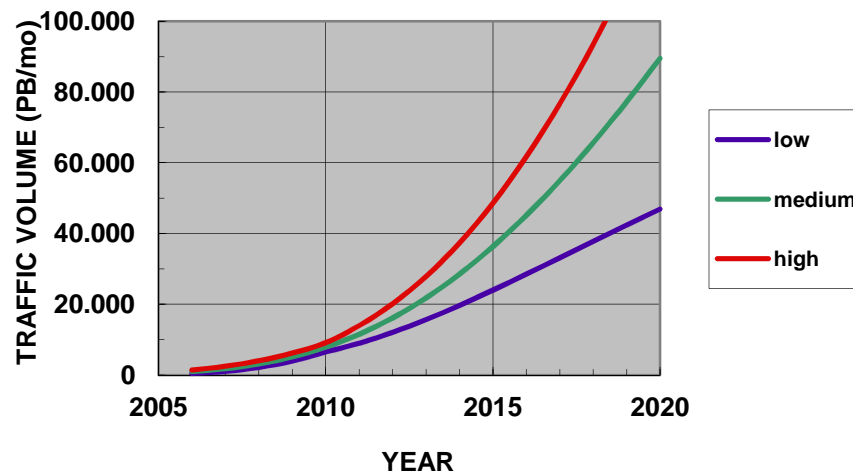
(*) GreenTouch source: http://www.greentouch.org/index.php?page=about-us

Traffic evolution, mature vs emerging markets (*)

Mature Market - Consumer Internet - Total

TRAFFIC VOLUME (PB/mo)

- low
- medium
- high

YEAR

Emerging Market - Consumer Internet - Total

TRAFFIC VOLUME (PB/mo)

- low
- medium
- high

YEAR
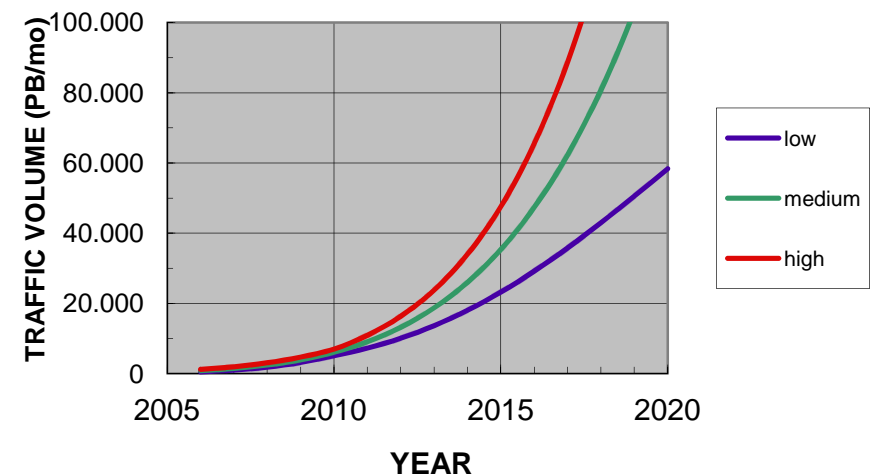
❖ Traffic is still growing

❖ Emerging Market traffic is projected to cross the Mature Market around 2017.

(*) GreenTouch source: http://www.greentouch.org/index.php?page=about-us

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Traffic evolution, fixed vs mobile networks (*) ETSI

Global Internet Traffic
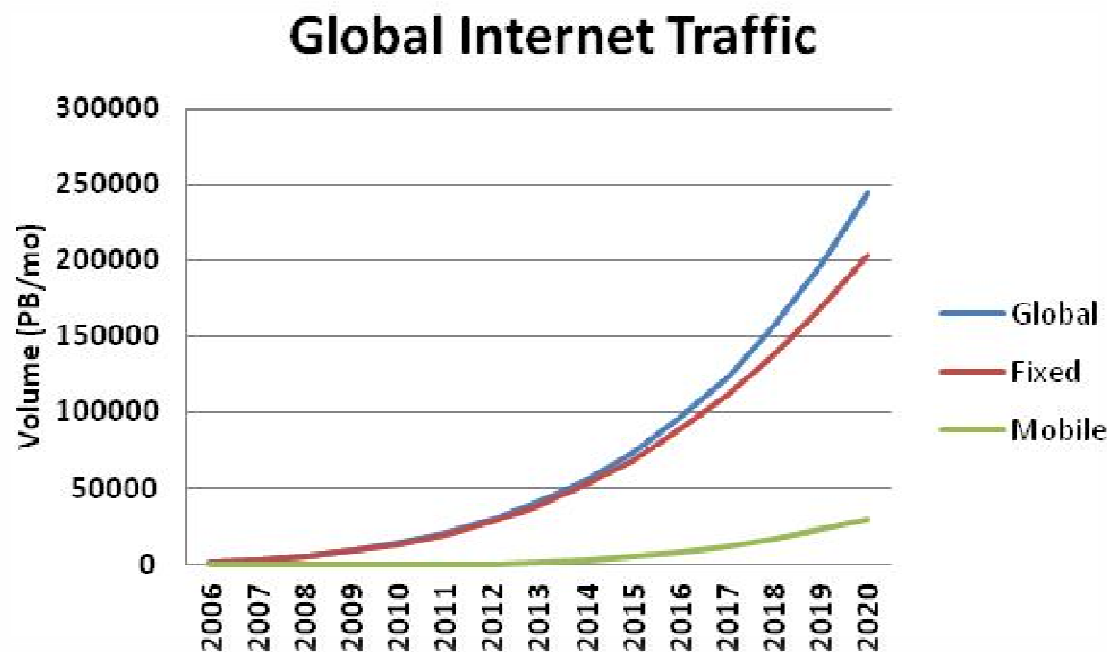
❖ Internet traffic over fixed networks still dominates

  ❖ Today the total volume of fixed IP traffic is ~25 times larger than the volume of mobile IP traffic

(*) GreenTouch source: http://www.greentouch.org/index.php?page=about-us

Evolution of power consumption in networks (*)

Video: 70% of Internet Traffic In 2014

- Network Consumption represents ~75% of the energy bill of an operator
- Between 7 to 20% of its OPEX
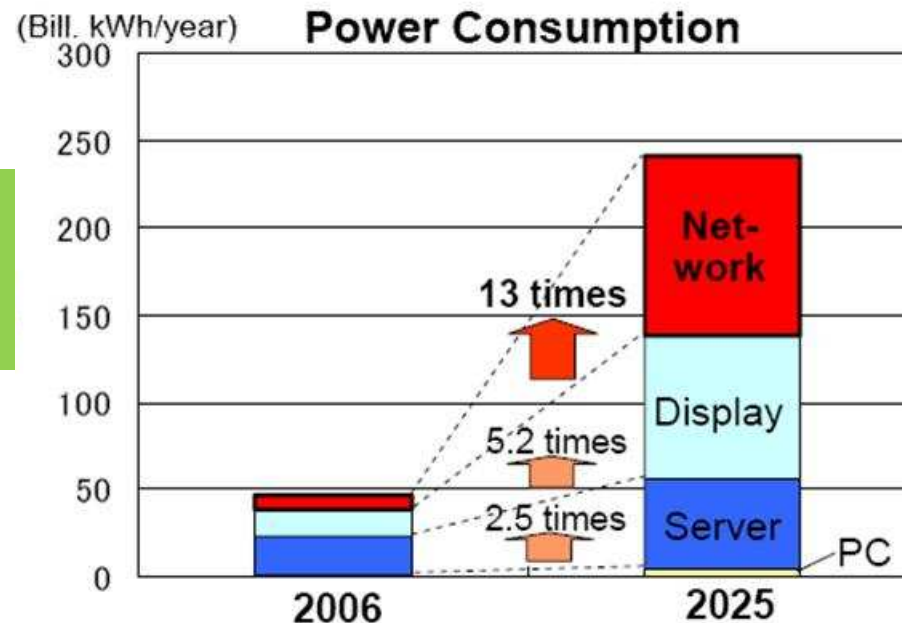
Smartphones: 2.5 billion devices by 2015 32x increase per km2

Mobile Internet : ~ 70% of mobile traffic by 2014

(Bill. kWh/year) **Power Consumption**

13 times
5.2 times
2.5 times

Net-work
Display
Server
PC

2006   2025

Source: METI, Japan

(*) GreenTouch source: http://www.greentouch.org/index.php?page=about-us

Standardization initiatives for Smart Sustainable Cities

Sustainable ICT networks are essential

- ICT is an important enabler of a more sustainable approach to designing, building and operating cities.
- Broadband network becomes a critical urban infrastructure, no different from electricity, water and roadways.
- Smart Communities leverage broadband networks by connecting devices and citizens to:
  - improve public and administration operations,
  - optimize public security operations,
  - develop local economy,
  - provide eGovernment platform and services,
  - improve citizen's engagement, lifestyle and environment

Smart cities: CEN/CENELEC/ETSI initiative

- **Smart and Sustainable Cities and Communities Coordination Group (SSCC-CG)**
  - Board decision of 13 December 2012 meeting
  - Members:
    - CEN and CENELEC members
    - Liaison organizations: Eurocities, ICLEI, Orgalime, Age Platform, ….
    - Liaison members representing ISO/TC 268 "Sustainable develoment in communities", ITU SSC FG, IEC/System Evaluation Group "Smart cities" ..
    - ETSI board decided to join this group (to become CEN/CENELEC/ETSI CG)
- **3 tasks groups:**
  - TG 1: Mapping of relevant International, European and national standardization initiatives
  - TG 2: Mapping of stakeholders and interested parties in Europe
  - TG 3: Mapping of topics and issues to be dealt with under the scope SSCC

Smart cities: CEN/CENELEC/ETSI initiative

SSCC-CG report structure

- Sustainable, smart cities and communities: general background, definition and European specificities
- Objectives of Sustainable and smart cities and communities to be considered
- Stake holders and interested parties involved in the development of smart and sustainable cities
- Ongoing major international initiatives and European ones
- Issues to be considered developing a set of European standards
- Expectation and cost / benefits from a European standardization
- Success and failure factors for a CEN standardization program and for its further implementation
- Communication/strategic plan
- Recommendation and proposed roadmap

ETSI on Smart Sustainable Cities and Communities

🌐 ETSI roadmap

- Operational Implementation Plan for contributing to the European Innovation Partnership on Smart Cities and Communities (EIP-SCC),
- Inventory of available ETSI resources (standards, TBs, etc.)
- Understanding the role of ICT in SSCC
- Definition of a high-level reference model for ICT in Smart Cities
- Identifying benefits, typical use cases and services for ICT in SC
- A High-Level Architecture for ICT in SC could be addressed
- Identification of partners; input to the SSCC-CG
- Understanding what should be done
- The ETSI Smart Cities work plan
- ETSI Smart Cities workshop
- Recommendation to the Board on continuation in 2015

- Open (non-proprietary) Standards for Smart Cities & Communities solutions are needed
- Open Standards should cover platforms for:
  - Data transport information
  - Energy management
  - Building construction
  - Exchanging location information
- Standards also needed for metrics and indicators:
  - To help compare different cities
  - To measure improvements made in a city over time
- Build on standardization initiatives of ETSI-CEN-CENELEC in Smart Grids and extend to City level

Thank you for the attention