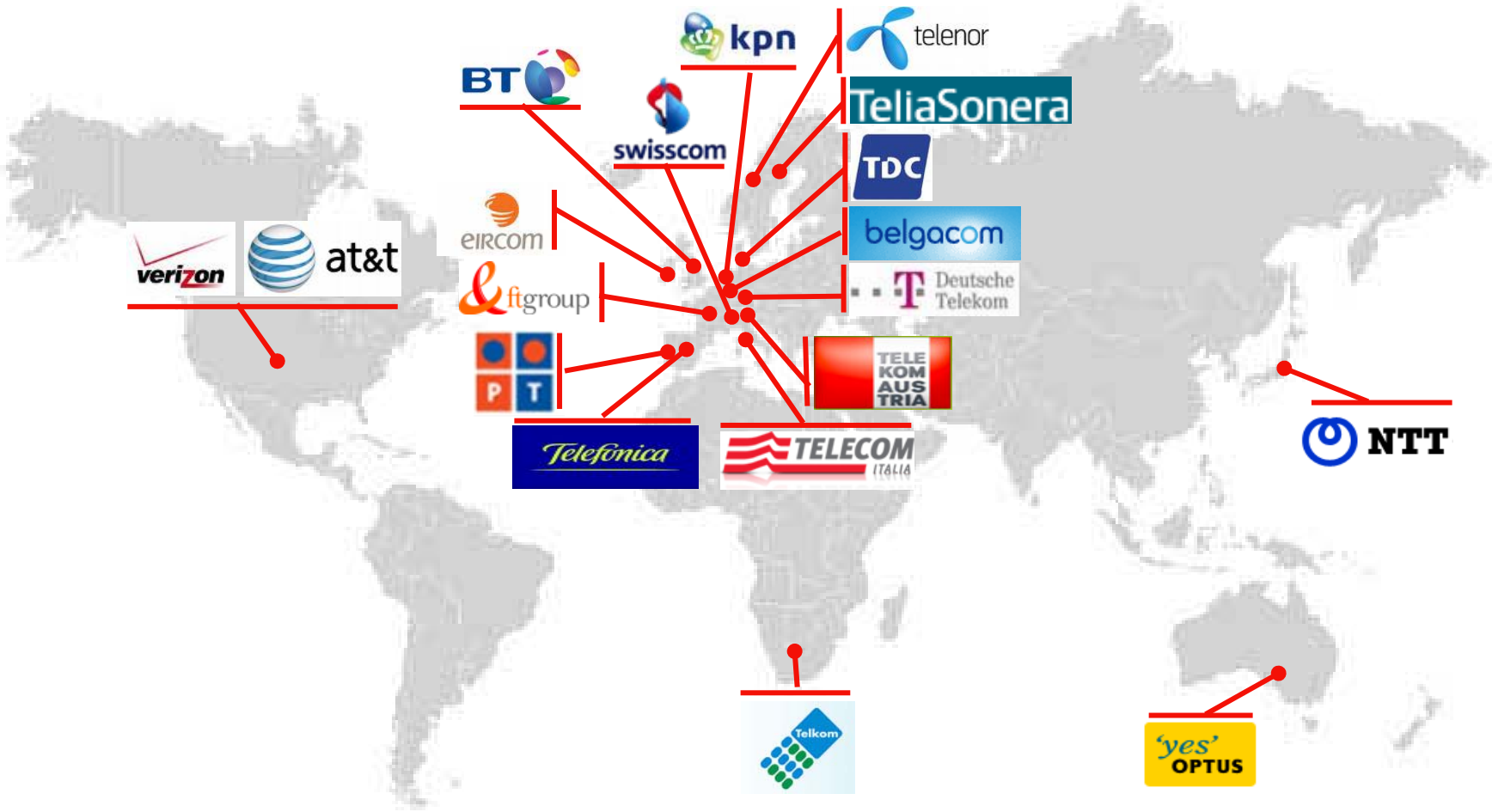
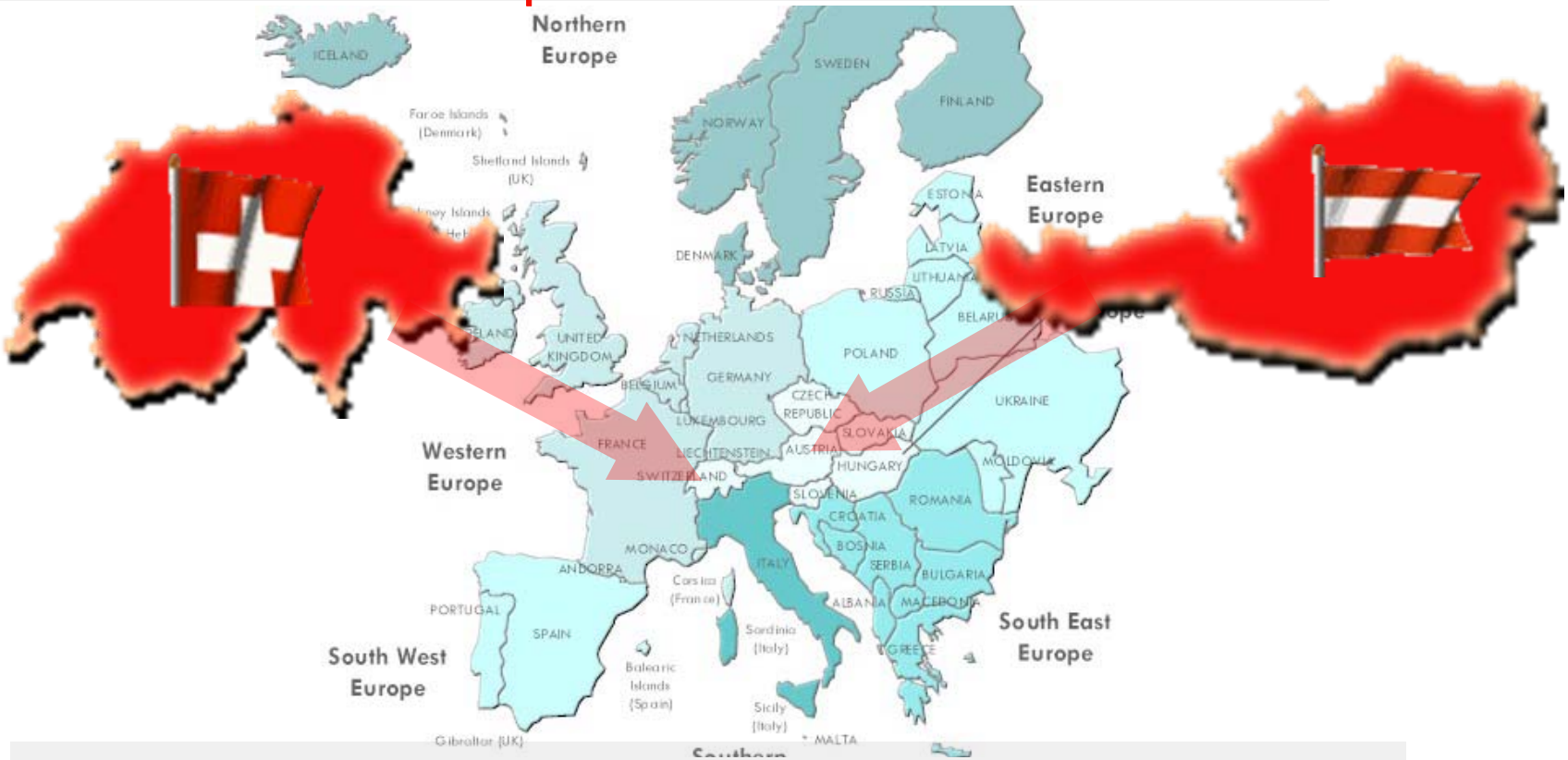
Energy Efficiency Inter-Operator Collaboration Group
General presentation

The Energy Efficiency Inter-Operator Collaboration Group: Members



The Energy Efficiency Inter-Operator Collaboration Group Energy footprint

The electrical energy consumption of the EE IOCG members networks is equivalent to the National consumption of Switzerland



The energy consumption at the customer side is about that of Austria ...

.... without action it would increase dramatically

EE IOCG

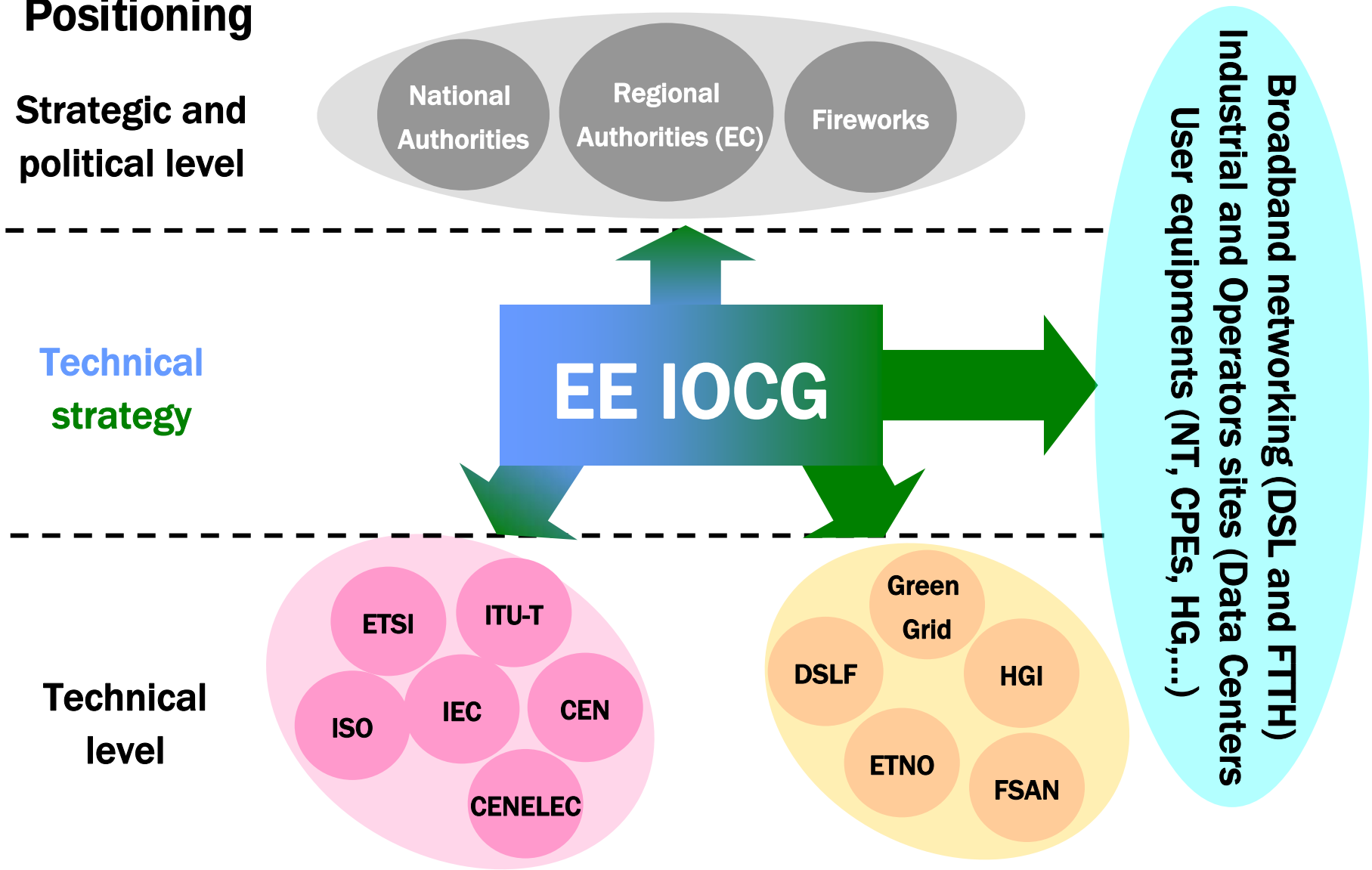
The Energy Efficiency Inter-Operator Collaboration Group: Reasons and Goals

- The energy cost is continuosly growing, and this trend will continue in the future
- Broadband penetration is bringing new active equipment in the network architecture
- Fragmented actions on energy efficiency among different Standardization Bodies/Fora

- Share energy critical issues and agree on common goals
- Define high level strategic actions and coordinated guidance towards
  - Standardization
  - Equipment suppliers (both network and user side)

  in order to speed up the availability of Energy Efficient equipment and networks, helping vendors towards investments optimization
- Finalize high level analysis to support Operator's strategy:
  - Evaluation of energy consumption trends for different FTTx scenarios
  - Definition of a set of KPI to monitor the action implemented

The Energy Efficiency Inter-Operator Collaboration Group: Positioning



The Energy Efficiency Inter-Operator Collaboration Group: Critical Areas and SubAreas

Area	SubArea	Description
Access	xDSL	Hundreds millions of xDSL lines to be deployed will have a great impact on the Operators' energy bills
Data Centres	Environmental Conditions	Need for extension of temperature ranges, in order to allow energy saving and extend free/renewable cooling
	IT Equipment Efficiency	Need for improved IT equipment (less energy hungry); proposal for efficiency ranking
Core/Metro/IP	Switches and routers	Energy optimized IP and LAN
Customer networking	DSL NT/ONT	The consumer has little voice on products. The energy saving policies must optimize both network AND user side
	STB and End User Equipment	Need for STB and End User Equipment with new power save functionalities
Efficient cooling	Cooling @ CO/IDC	Need to implement new solutions in order to reduce the impact of the cooling

The Energy Efficiency Inter-Operator Collaboration Group: Action Points – General overview

SubArea
xDSL
Environmental Conditions
IT Equipment Efficiency
Switches and routers
DSL NT/ONT
STB and End User Equipment
Cooling @ CO/IDC

Action Points towards Organizations

- Attendance/contributions for
  - EC JRC CoCs
  - ETSI EE/ATTM/…
  - ITU-T
  - CEN/CENELEC
  - DSLF
  - ETNO Energy TT
  - Green Grid
- High level actions towards Boards

Action Points towards Vendors

- New purchasing policies (TCO)
- Common energy requirements in the RFI/RFQ
- Roadmaps sharing

The Energy Efficiency Inter-Operator Collaboration Group: Action Points – Main subjects

Subarea	Main subjects
xDSL	- Reduce energy consumption in full power state according to CoC BB - introduce power saving methods when little or no traffic
Environmental Conditions	- Extend temperature ranges for DC rooms to enable more efficient cooling
IT Equipment Efficiency	- Extend temperature ranges of ICT equipment towards Class 3.1 of ETSI Standard EN 300 019-1-3 - Define common target values in RFQs and KPIs for efficient IT equipment
Switches and routers	- Energy optimized IP and LAN
DSL NT/ONT	- Define common target values in RFQs for DSL NT/ONT - Define power saving mechanisms when little or no traffic
STB and End User Equipment	- Define common target values in RFQs for STB - Define power saving mechanisms / architectures
Cooling @ CO/IDC	- Extend fresh air cooling and define KPIs (COP) for efficient cooling

Annex

The Energy Efficiency Inter-Operator Collaboration Group: The proposal

- If no strong care is taken, the energy trend for the next decade could end up into serious increase which, together with the significant increase of the energy unitary cost, would **deeply impact the Operator's financial balance**
- **Without a strong and coordinated action** from the Operators towards Standardization and equipment providers we could then face **serious increase of the electrical bill** both to the Operators and to the Client
- The **inability** to show **clear and substantial** actions towards the **emission reductions** would, together with the **negative image**, bring serious **threat of punitive national caps on prices**.
- The proposal has been to set up an **Energy Efficiency Inter Operators Collaboration Group** where the Operators could:
  - share their energy critical issues and **agree on common goals**
  - **define high level strategic actions** and coordinated guidance **towards Standardization** and **equipment suppliers** (both network and user side)
  - **finalize high level analysis** to support Operator's strategy (e.g. energy consumption trends for different FTTx scenarios, definition of KPI to enable proper monitoring of the actions)
  - **speed up the** standardization and earlier availability of Energy Efficient equipment and networks

The Energy Efficiency Inter-Operator Collaboration Group: Main process

- In order to be more effective, the EE IOCG should reach its goal **within a short period of time**
- The **main process** followed by the EE IOCG are be the following:
  - **highlight the critical areas,** e.g:
    - Access – (e.g. BroadBand systems consumption/efficiency and trends);
    - Data Centers – (e.g. Temperature range, efficiency…);
    - Powering and service continuity;
    - Efficient cooling;
    - Customer premises – (e.g. Energy consumption of network terminations and CPEs)
    - Long haul/Regional/Metro
  - **define the main actions**:
    - high level analysis of the various standardization/fora
    - association of each "critical area" with the reference standardization body
    - launch of **joint actions towards the relevant bodies**
    - launch of **joint actions towards the vendors**
    - finalization of **strategic analysis**

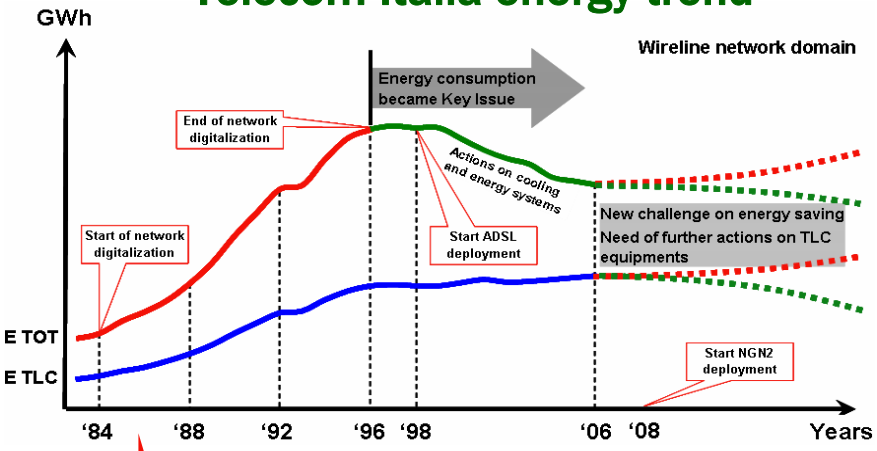
The Energy Efficiency Inter-Operator Collaboration Group: Joint actions

- launch of **joint actions towards the relevant bodies:**
  - Actions towards the Boards of the STD organizations to address their strategies and priorities
  - Actions towards the Technical Committees to push specific topics (e.g. new common proposals for increased temperature range within the equipment's room/cabinet, definition of Key Performance Indicator, etc.)
- launch of **joint actions towards the vendors:**
  - sharing a common process of evaluation of the different vendors during a tender. In particular, the evaluation method could be based on a TCO that includes, other than CAPEX, also the Discounted Cash Flow of the energy OPEX, possibly related to at least 5 years (better 10)
  - giving vendors clear common indications about the operators strong need and commitment towards energy efficiency, spreading the results of this group
- finalization of **strategic analysis:**
  - **energy** consumption **trends** for different FTTx scenarios
  - **definition of KPI** to enable proper monitoring of the actions

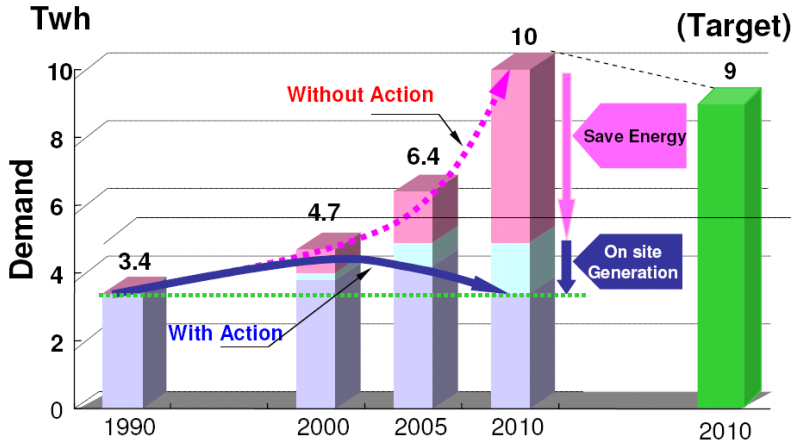
Energy and Telecommunications: past, present and future

- In the last 30 years our **energy** demand has **grown significantly** due to **digitalization** of the Network and, in the last years, to the **BroadBand deployment**
- The Operators have already pursued **energy optimization campaigns** (mainly on cooling and energy stations)…
- …but the Next Generation Networks will **completely change the network paradigm** as the need to deliver higher and higher speed services will bring towards **more distributed electronics in the access network**
- The increasing load at the client's premises will **more than balance** any savings actions into the network → The Operators should **champion efficiency actions** on CPEs, driving not only their products, but the entire market towards a **greener** approach

Telecom Italia energy trend



NTT's future Energy Vision



Growing need for a strong push action towards Energy Efficiency

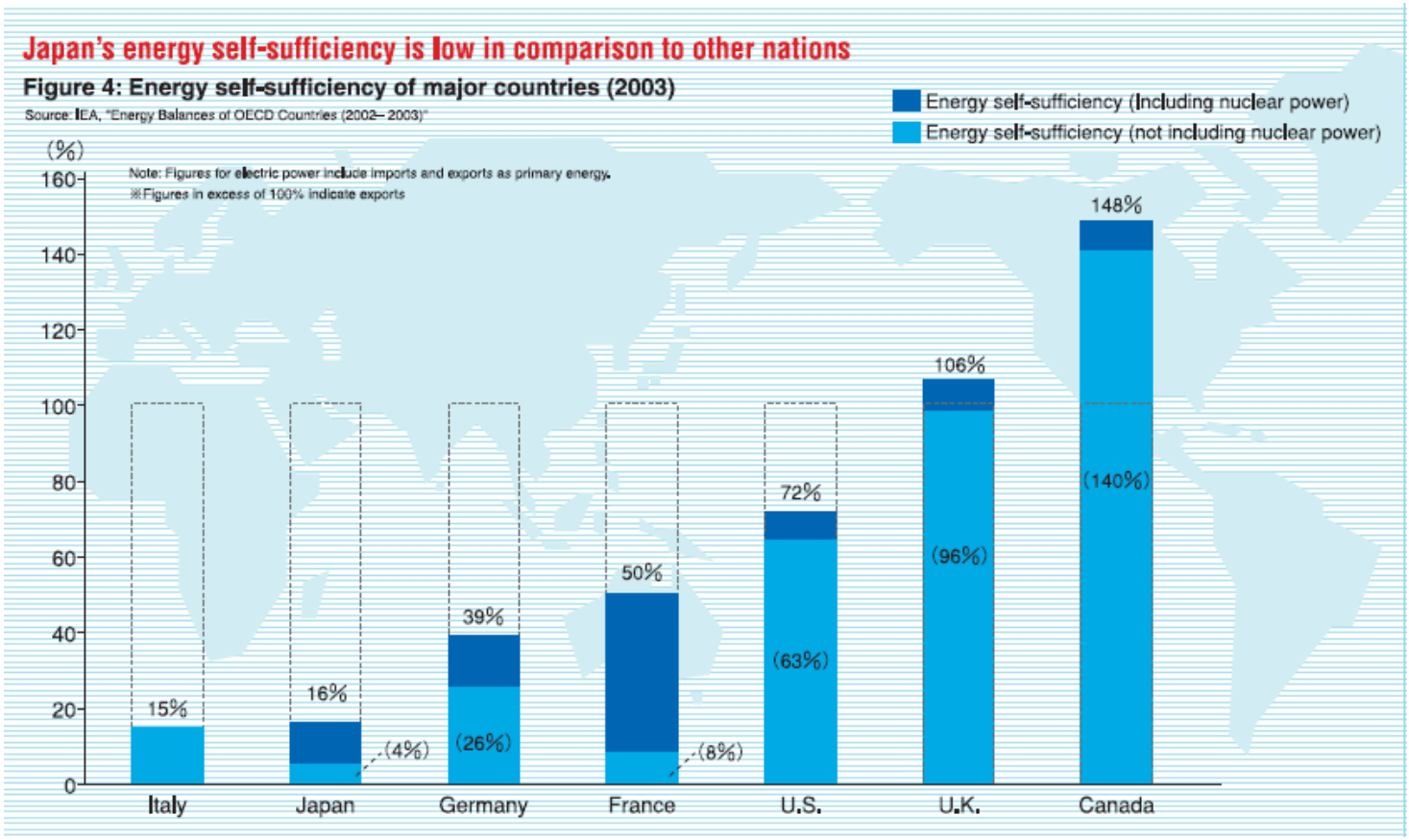
Source: Opening Keynote, Intelec 2007, Stefano Pileri

Panel ans papers – Bianco, Cucchietti, Griffa

Source: Panel discussion, Intelec 2007, Hiroake Ikebe

The energy availability and self sufficiency is a critical item

- The single Operator's energy bill strongly depends on its Country's strategy on energy procurement

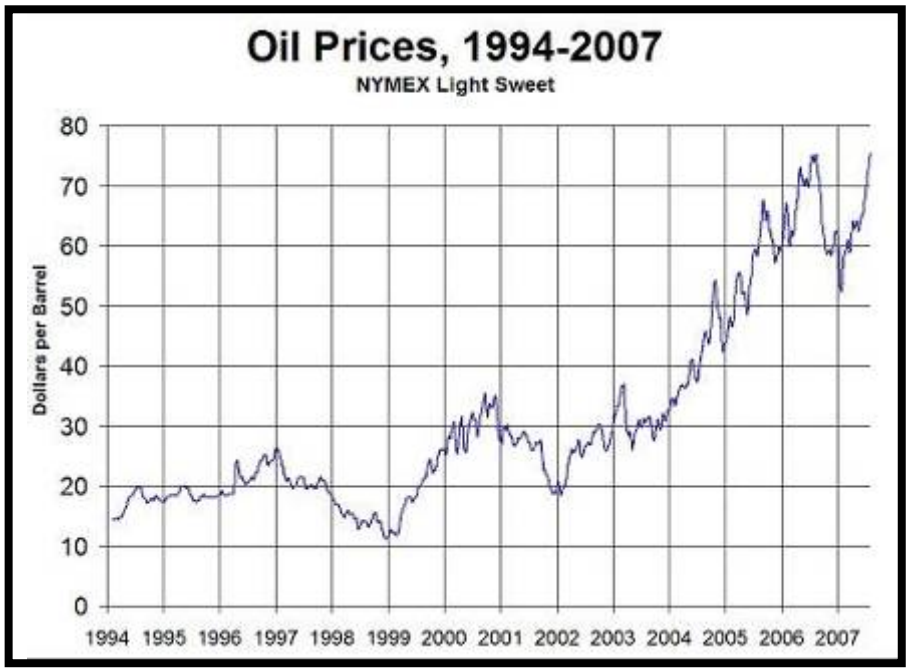


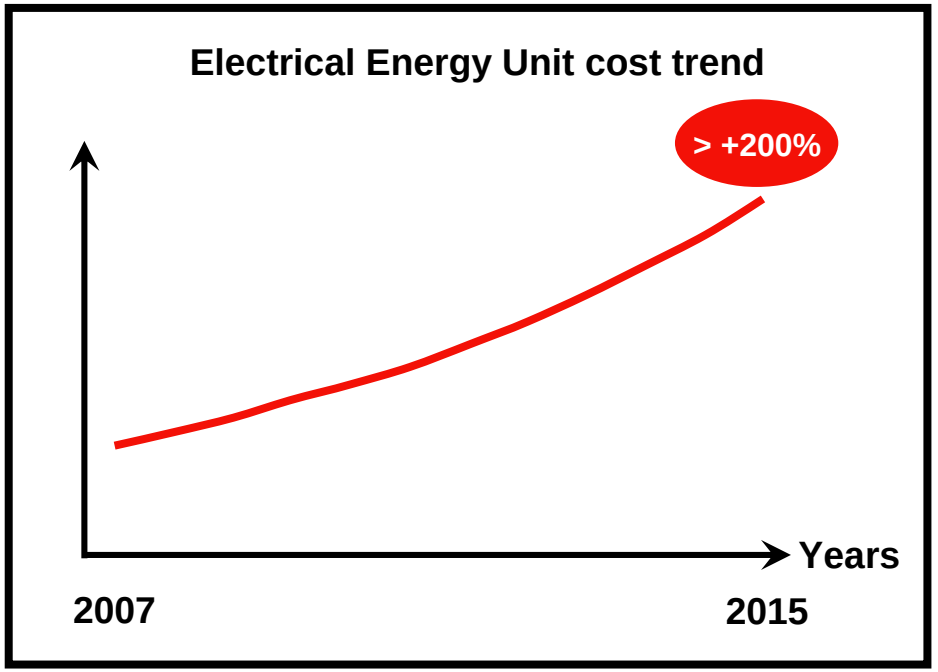
Nations with low energy self sufficiency will face bigger problems

Source: Agency for Natural Resources and Energy – Japan

The energy cost: past, present …and future

- In the last years, the cost of energy **had a significant growth**...
- ...**and it's going to continue in the future**



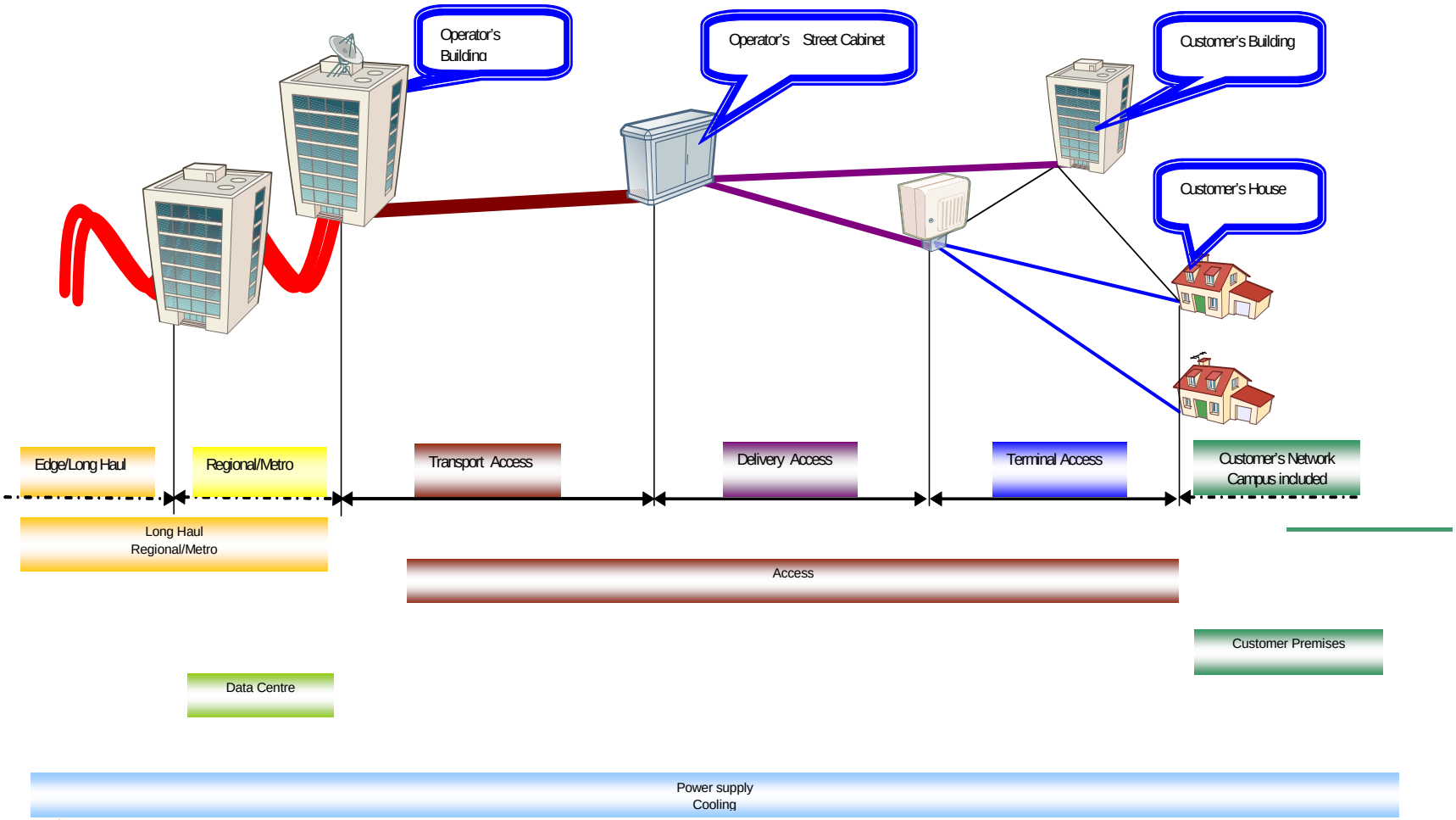


The cost of energy alone will force us towards the Energy Efficiency

Source: www.wrtassoc.com

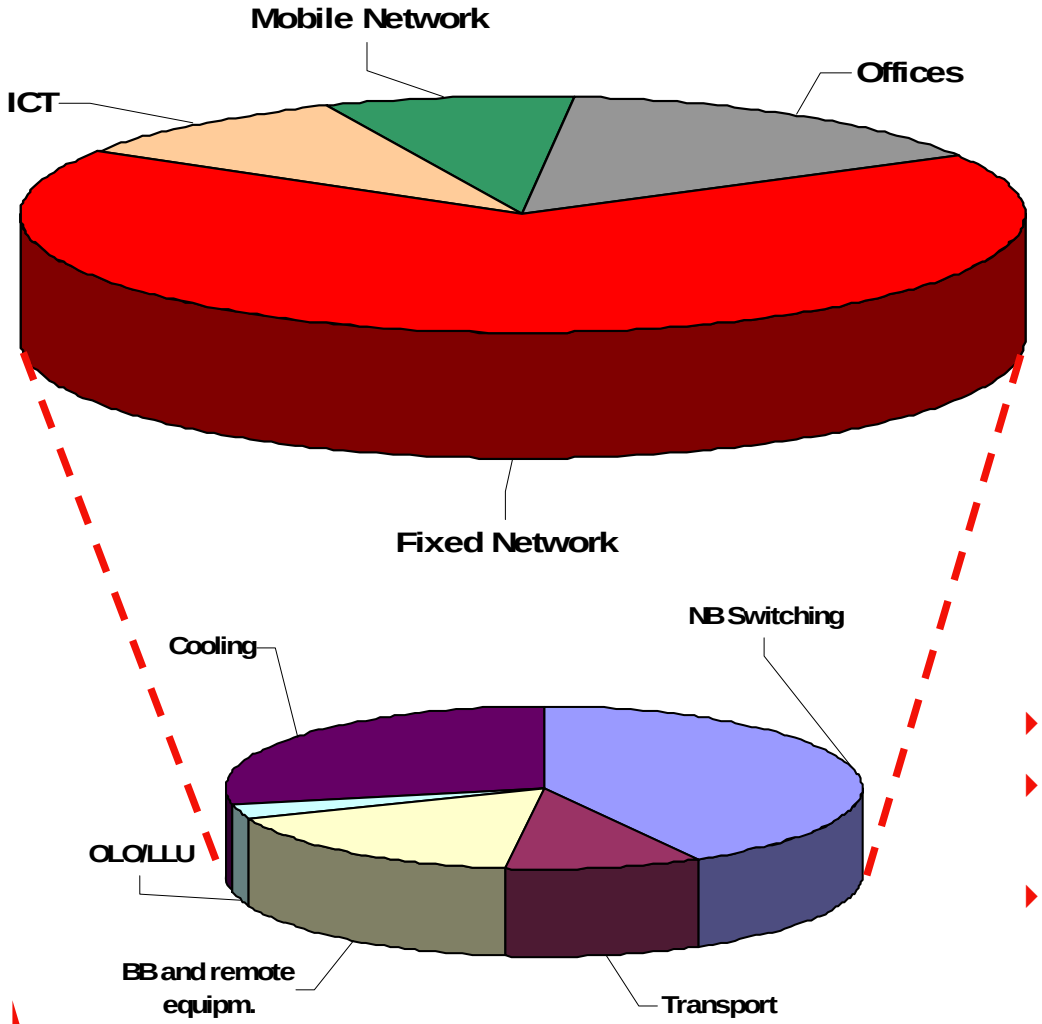
Source: Telecom Italia analysis for the domestic market

Identification of most critical areas



Energy Efficiency in Telecommunication is transversal and covers several areas!

The Energy consumption distribution in Telecom Italia



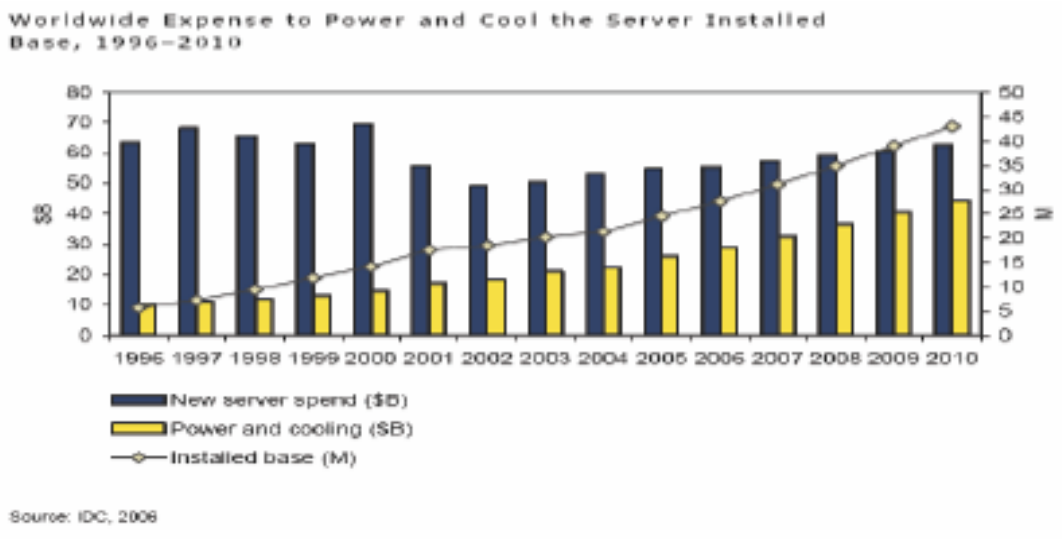
Telecom italia total domestic consumption:

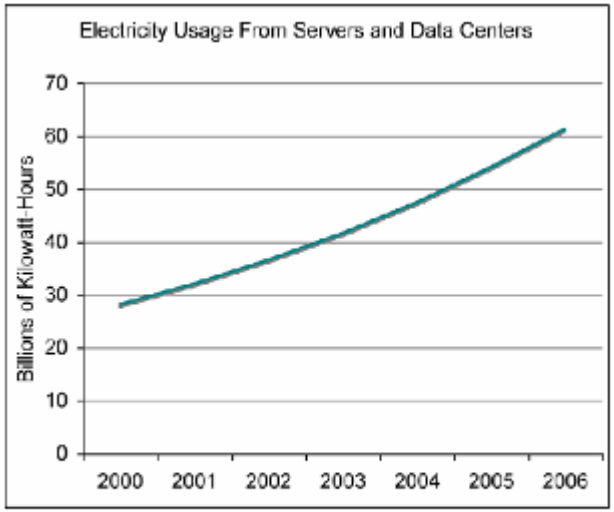
~2,1TWh (year 2006)

- BB and remote equipment will grow
- NB switching is going to decrease and will induce a reduction in cooling
- Moreover, cooling is obviously related to the energy saving of BB

Fixed network is the main component

Operator's energy consumption for Data Centre





- Today, TLC Data Centres have a power consumption of about 10% of the total Operator's energy bill
- In developed countries, Data Centre are already responsible of about 1% of total energy consumption

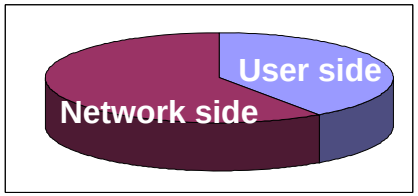
The Data Centres will represent a higher and higher percentage of the Operator's energy bill

Energy consumption for CPE

- Lots of BroadBand related appliances/gadgets already populate our homes…

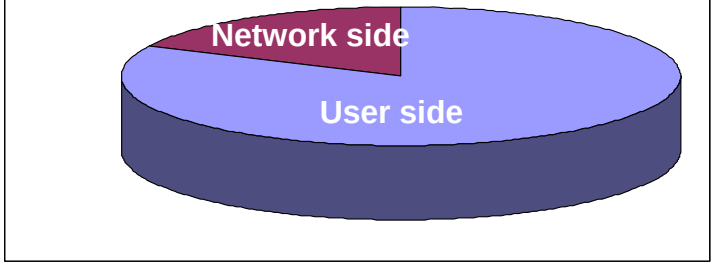
  …and many more will come
- Their consumption is already comparable to the Telecom Network part
- Energy optimization actions are in progress (CoC, Energy Star …) and more will have to be developed to avoid an uncontrollable increase in the home (e.g. minimizing the number of TLC related equipment through integration of functionalities)
- This market is very fragmented
  - The single customer can't influence the market
  - Operators can lead the industries, leveraging on their scale economy

W/average user - Today



4x

W/average user – Long term



In the long term, the user side will represent the vast majority of the global TLC energy consumption

Source: Opening Keynote, Intelec 2007, Stefano Pileri