The European COC

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Energy Efficient Ethernet

IEEE P802.3az EEE Task-Force
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Never stop thinking

Objectives

- Introduce the European Power Initiative in form of the Code of Conduct

EUROPEAN COMMISSION
DIRECTORATE-GENERAL JRC
JOINT RESEARCH CENTRE
Institute for the Environment and Sustainability
Renewable Energies Unit

- Link the COC Objectives to the EEE
- Present Target Numbers valid for the COC compliant devices
- Setup Severity to the Objectives of the European COC

COC Motivation

Expectations are that broadband equipment will contribute to the electricity consumption of households in European Community in the near future. Depending on the penetration level, the specifications of the equipment and the requirements of the service provider, a total European consumption of up to 50 TWh per year can be estimated for the year 2015. With the general principles and actions resulting from the implementation of this Code of Conduct the (maximum) electricity consumption could be limited to 25 TWh per year, this is equivalent to 5,5 Millions tons of oil equivalent (TOE) and to total saving of about € 7,5 Billions per year.

The potential new electrical load represented by this equipment needs to be addressed by EU energy and environmental policies. It is important that the electrical efficiency of broadband equipment is maximised.

To help all parties to address the issue of energy efficiency whilst avoiding competitive pressures to raise energy consumption of equipment all service providers, network operators, equipment and component manufacturers are invited to sign this Code of Conduct.

This Code of Conduct sets out the basic principles to be followed by all parties involved in broadband equipment, operating in the European Community, in respect of energy efficient equipment.

http://sunbird.jrc.it/energyefficiency/html/standby_initiative.htm

COC is based on Self-Commitments

Signatories of this Code of Conduct agree to make all reasonable efforts to:

4.1 Abide by the General Principles contained in Annex A.

4.2 Achieve the power consumption targets set out in Annex B, for at least 90% of the number of the new broadband equipment that are introduced on the market or installed in the network after the indicated date.

4.3 Provide end-users with information about power consumption of end-use equipment and about switching off end-use equipment.

4.4 Co-operate with the European Commission and Member State authorities in an annual review of the scope of the Code of Conduct and the power consumption targets for two years ahead.

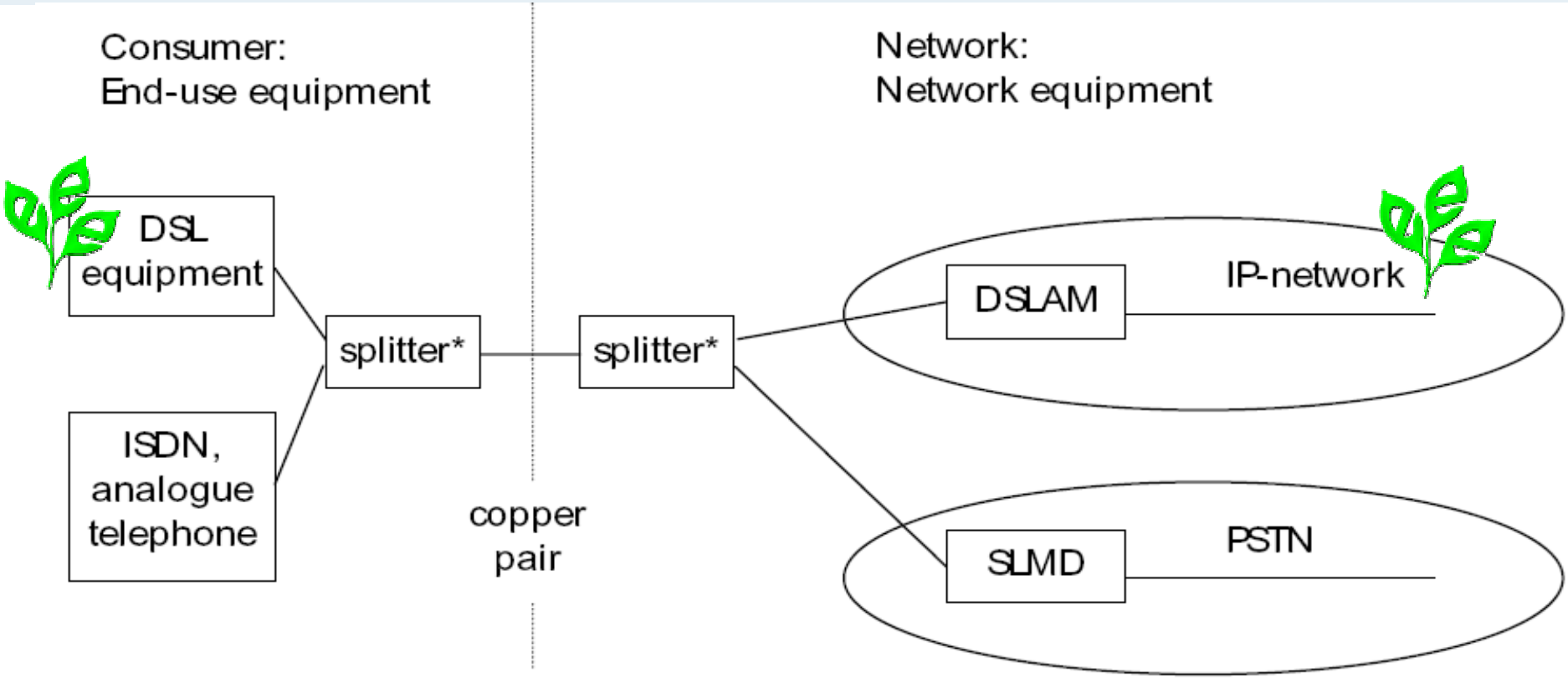
4.5 Co-operate with the European Commission and Member States in monitoring the effectiveness of this Code of Conduct through the excel reporting form that will be available from the European Commission by September 2007.

4.6 Ensure that procurement specifications for broadband equipment are compliant with this Code of Conduct.

COC Sub-Fields

- **COC for Data Centers**
- COC for Digital TV Services
- **COC on Energy Consumption of Broadband Communication Equipment**
- COC on Efficiency of External Power Supplies
- COC on AC Uninterruptible Power Systems (UPS)
- … more to come

COC Reference Diagram



* needed when the same line is used for both digital and analogue services

- EEE concerned focus is in the DSL Equipment (Home-Networks)
- EEE becomes more and more sensitive to IP-networks of the operators as well

COC Affected Equipment

End-user equipment[1] associated with broadband distribution for residential customers and SOHO	Network equipment
• DSL modem • Cable modem • PLC modem • (DSL) router with/without WLAN up to 5 ports (1WAN port and 4LAN ports) up to 1000 Mbits/s • Small hubs and switches up to 8 ports (10/100/1000 Mbits/s) • WLAN access points • WiMAX[2] • Small printer server (connected to broadband) • Home gateway[2] • Telephone devices for VoIP (ATA or VoIP-Handset) • Optical network termination (ONT) Equipment that is a combination of one or more of the equipment above	• DSL port (example: ADSL, ADSL2, ADSL2+, VDSL2) • Combined port (example: MSAN, POTS/ISDN + ADSL2+ etc) • NTBA (ISDN terminator at customer premises)[2] • WiMAX Base Stations[2] • PLC & Cable service provider equipment[2] • Optical line termination (OLT)[2]

European Code Of Conduct (COC) [1/2]

Equipment	Tier 1: 1.1.2007-31.12.2008		Tier 2: 1.1.-31.12.2009		
	Off	*On*	*Off*	*Low power state* [5]	*On*
ADSL / VDSL-modem powered by USB	0 W	1,5 W	0 W	0,8 W	1,5 W
ADSL-modem[6] (maximum ports or functionalities: 1 DSL, 1 port Ethernet 10/100, 1 USB device 1.1/2.0, Router, NAT,firewall)	0,3 W	6,0 W	0,3 W	2,0 W	4,0 W
VDSL-modem (maximum ports or functionalities: 1 DSL, 1 port Ethernet 10/100/1000, 1 USB device 1.1/2.0, Router, NAT,firewall) [4]	0,3 W	8,0 W	0,3 W	2,0 W	6.0 W
Simple Cable Modem (maximum ports or functionalities: 1 WAN, 1 port Ethernet 10/100, 1 USB device 1.1/2.0, Router, NAT,firewall)	0,3 W	7,0 W	0,3 W	2,0 W	7,0W
Optical Network Termination (maximum ports or functionalities: 1 optical interface, 1 port Ethernet 10/100/1000, 1 USB device			0,3 W	TBD	12,0W

- Measured at the power-plug
- +/-50mW makes a difference
- The OFF/LPS mode is critical where LPI would serve well.
- Power-Savings get much more linked to cost than in the past

European Code Of Conduct (COC) [2/2]

1.1/2.0, Router, NAT,firewall)					
WLAN access points with 802.11a/b/g/n standard[7]	0,3 W	6,0 W	0,3 W	2,0 W	6,0 W
VoIP-Device (ATA or VoIP handset)	0,3 W	5,0 W	0,3 W	2,0 W	5,0 W
Additional Colour Display (typically found in VoIP devices) TFT QVGA and VGA	-	+ 3,5 W[8]	-	+ 0,7 W	+ 2,5 W[8]
Small printer server	0,3 W	5,0 W	0,3 W	2,0 W	5,0 W
Small hubs and switches (up to 8 Ethernet 10/100/1000 ports)	0,3 W	5,0 W	0,3 W	2,0 W	5,0 W
Routers up to 9 (1 WAN and 8 LAN) Ethernet 10/100/1000 ports	0,3 W	10,0 W	0,3 W	2,0 W	8,0 W
Each additional function of the following: WLAN 802.11a/b/g, FXO, FXS/VoIP, hub/switch for up to 4 ports, DECT, Bluetooth,		+ 2,0 W			+ 2,0 W
An additional WLAN 802.11n function		+ 3,0 W			+ 3,0 W

Conclusion

- Objectives of EEE match to the COC
- EEE with focus on Standby and Off-Mode is essential
- EEE is a major contributor for COC compliant devices
- A real Off-Mode is required in case of no traffic

Thank You!