Best Environmental Management Practice in the Telecommunications and ICT Services Sector

The European Commission's Joint Research Centre (JRC) is developing a sectoral reference document on best environmental management practice for the telecommunications and ICT services sector[1]. This will be a guidance document on techniques, measures or actions that allow organisations in the Telecommunications and ICT Services sector to minimise their impact on the environment in all the aspects under their direct control (direct environmental aspects) or on which they have a considerable influence (indirect environmental aspects). This activity is part of the JRC's work on identification of best environmental management practice and development of Sectoral Reference Documents under the EU Eco-Management and Audit Scheme (EMAS). This brief introduction outlines the proposed scope and priorities of the project and provides a provisional list of proposed Best Environmental Management Practices (BEMPs) for the sector.

The work will cover the most relevant core activities and processes of the sector such as wired and wireless telecommunication, data centres, broadcasting and software development, from planning and design of networks and data centres to their operation and maintenance all the way to end-of-life. The manufacturing of ICT equipment and the treatment of WEEE are not part of the scope, as they are covered in the parallel work on electrical and electronic equipment manufacturing[2]. For all these activities and processes, BEMPs will be identified both of a technical or technological nature, such as improving the energy efficiency of a certain process, or of a more management or organisational type, such as providing training to employees or engaging in environmental improvement with suppliers. BEMPs will be identified not only within the physical site boundaries of the organisations of the sector but looking at minimising environmental impacts across the entire value chain. Besides BEMPs that improve the environmental performance of the Telecommunication and ICT Services sector, BEMPs on how this sector can improve the environmental performance of other sectors are also considered (Figure 1).
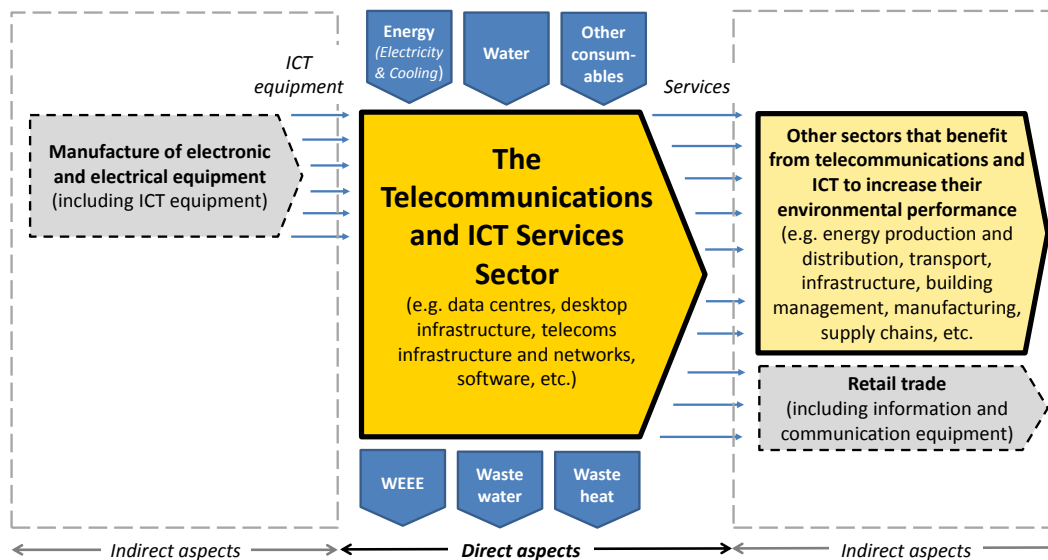

Figure 1: Overview of the proposed scope (*Manufacture of electronic and electrical equipment and Retail trade are addressed in other sectoral reference documents*)

JRC contracted Ernst & Young (EY) to support the identification of the main environmental issues for the sector, and put forward proposals of BEMPs and environmental performance indicators. These proposals are summarised below and will be the basis for discussion with stakeholders via the forum of a European Technical Working Group (TWG) of sectoral experts to be established in October-November 2015. Expressions of interest to join the TWG can be sent to JRC-IPTS-EMAS@ec.europa.eu.

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[1] For more information, see http://susproc.jrc.ec.europa.eu/activities/emas/telecom.html
[2] For more information, see http://susproc.jrc.ec.europa.eu/activities/emas/eeem.html

Proposal of BEMPs for the Telecommunications and ICT Services Sector

BEMPs to improve the energy performance of telecommunication networks	
Change of access network technology	*Changing of the access network technology may save energy by increasing the efficiency of the access network (energy consumed per bit of data transferred), e.g. Passive Optical Networks (PON) and Point-to-Point optical networks (PtP).*
Consolidating the location of network components	*Removing unused lines and using smaller remote nodes while renovating or upgrading a wireline network may save energy. For a wireless network, the main reductions in energy consumption may be achieved through heterogeneous and cooperative network designs.*
Consolidating data and optimising traffic using routing protocols	*Dynamic rerouting (nodes and links switch off, traffic redistribution, etc.) and protection technology (filters, sorry servers, etc.) can result in significant energy savings by controlling the traffic in a dynamic manner.*
BEMPs to improve the energy performance and minimising the environmental impacts of data centres	
Better site location and planning of data centres	*Environmental conditions (e.g. local climate) and surroundings (e.g. type of energy supply, possibility for heat reuse) should be parameters considered for locating a new data centre.*
Optimising data centre utilisation and management	*Data centre energy efficiency may be improved by developing or purchasing energy-efficient software, consolidating the use of servers through virtualisation and improving data management and storage.*
Efficient cooling technologies and systems	*When designing a data centre cooling system, the most energy-efficient technologies (e.g. free cooling and water cooling) should be selected and then deployed by using the most appropriate equipment and settings (variable fans, chilled water with an increased temperature, etc.).*
Airflow management and design, and reuse of heat	*An energy-efficient airflow management relies on separating hot airflows from cold airflows (hot aisle / cold aisle layout, airflows containment, equipment segregation, etc.), adjusting air parameters (temperature, humidity, etc.) and reusing waste heat.*
BEMPs to improve the energy performance of ICT equipment	
Procurement for energy-efficient equipment and installation	*Green procurement can lead to significant energy savings by selecting energy efficient ICT equipment that is mobile, shared, multifunctional, appropriately sized, suitable for the operating environment and enabling energy management (e.g. stand by and power off modes).*
Improving energy efficiency of ICT equipment	*Assess the use of IT devices, remove unused equipment and increase the use of switch off and stand-by modes. Organisational (training and communication) and technological (software and advanced plugged strips) solutions should be implemented.*
Cross-cutting measures for minimising energy consumption and carbon footprint	
Use of renewable energy sources	*Purchasing electricity from renewable sources (PV, wind, geothermal or biomass energy) and on-site renewable electricity generation.*
Reduction of energy losses due to electricity conversion	*Installing newer energy-efficient rectifiers and selecting ICT equipment functioning with DC current may reduce energy losses related to energy conversion.*
Energy monitoring and management	*Energy management relies on identifying benchmarks, monitoring and analysing energy use, and establishing a systematic strategy to improving energy performance.*
BEMPs related to raw materials consumption and waste management	
Improving life cycle asset management and waste prevention	*Waste prevention aims to extend the life of ICT equipment. This can be implemented through procurement policies (applying environmental criteria, contracting leasing service, etc.), asset management and programmes for collection, reuse, reselling or donation of ICT equipment.*
Improving WEEE collection, recycling and recovery	*Establishing collection and recovery (e.g. reuse, repairing, remanufacturing) channels can reduce the amount of waste sent to landfill and to ensure that it is recycled properly.*
BEMPs related to other environmental impacts of telecommunication and broadcast infrastructures	
Reducing the effects of ICT infrastructures on landscape	*In order to reduce the impact of new telecommunications infrastructure on habitats, fauna, flora and natural landscapes, these could be placed underground, close to road access, camouflaged and integrated in existing infrastructure.*
Reducing noise and electromagnetic radiations from networks	*Electromagnetic field exposure may be reduced through monitoring and communication measures, limiting antenna access, installing well-oriented antennas and ensuring that ICT equipment is compliant with public exposure guidelines.*
BEMPs related to improving the energy and environmental performance in other sectors	
Reducing the impact of ICT services usage	*Establish energy and environmental performance criteria for ICT equipment used by customers, e.g. set-top boxes, routers, etc. Collect and recover used ICT equipment from customers.*
Reducing the environmental impact of other sectors through ICT services	*Provide ICT services that can reduce the environmental impact of activities in other sectors such as reducing commuting and business travel, paper consumption (e.g. electronic invoicing) and heating and energy consumption.*