ICT Enabling Green: ETSI

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For: 11th GIO Roundtable

28/02/2023

Sustainability

"GREEN" ICT

CO_2 Reduction

Carbon Neutral

Net Zero (Carbon)

Climate Change

Eco-Friendly

Circular Economy

Emissions

Greenhouse Gases

Clean energy

Renewable Energy

Alternative Energy

Energy Efficiency

Resource Efficiency

Spectral Efficiency

Fossil Fuels

Power Saving

Energy Harvesting

Battery Tech

Lifecycle Mgt

ECO-KPIs

ECO Certification

ECO-Friendly

Heat Management

Water Management

Waste Management

Recycling

Hazardous Substances

Carbon Offset

Global Warming

OZONE Layer

Pollution

Deforestation

Environment

Depleted Resources

Air / Water Quality

CO2 Emissions

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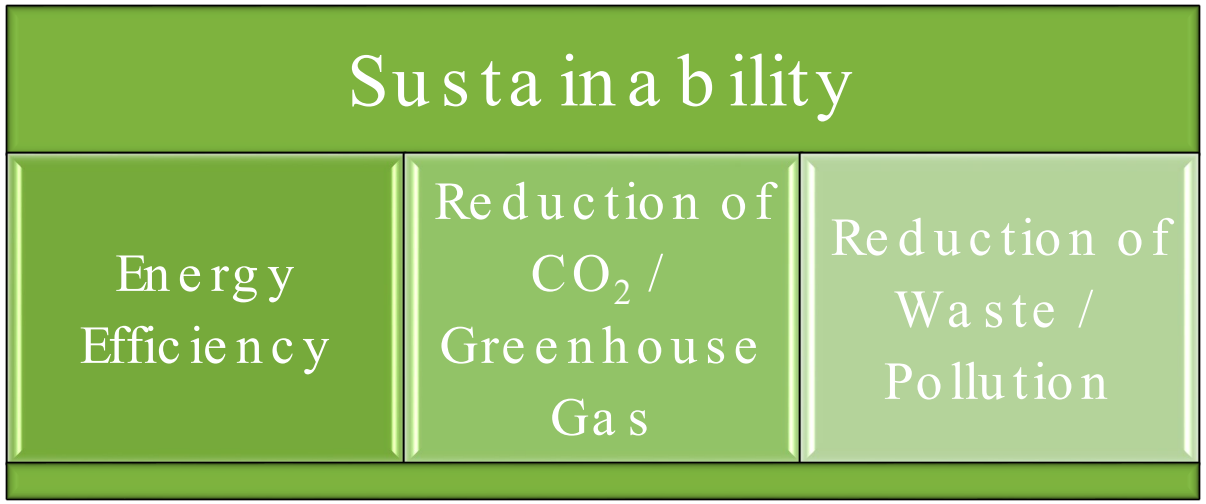
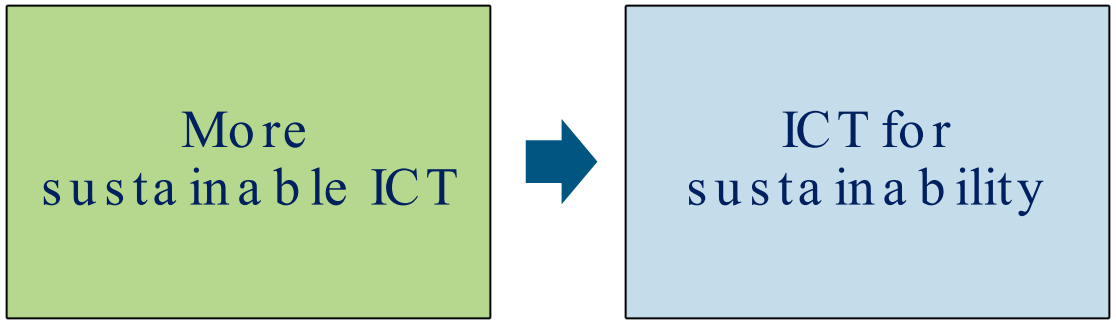
ICT enabled Sustainability





Sustainability in the Telecoms sector is a priority for all.

Operators, Vendors and Policy makers have announced ambitious Energy efficiency and emissions targets

Sustainable ICT includes, energy efficiency, CO2 reductions and waste/materials management. It is important at all phases of the ICT product cycle (build / deploy / use / dispose)

The application of digital technologies can bring efficiency improvements to other sectors. ICT can improve energy efficiency, reduce pollution and even enable new services

Simple examples include 1) ICT enabled remote working 2) Autonomous vehicles 3) smart Grids & Cities ... and many more

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A more sustainable ICT

Energy efficiency, reducing CO_2, reducing waste

ICT Sustainability Dissected

Production | Distribution | Use | Disposal

Energy Efficiency

Aim: Is to *optimize the amount energy consumed by the ICT Sector whilst enabling greater performance / speed / capacity / connectivity.

*optimize is not the same as reduce

Scope: Includes energies such as electricity, but also the energies involved in the production and destruction of ICT products and services

Technologies: Various energy saving technologies in the radio and core networks. Energy efficient processors and data centre architectures. Use of AI for energy management ..and many more.

Challenges: The cost of energy is increasing massively – it is important for operators to reduce their needs in energy (OPEX). Also there is a fine balance between consuming energy in the ICT sector AND reducing energy consumption in other sectors / industries.

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ICT Sustainability Dissected

Production | Distribution | Use | Disposal

Reduction of CO_2 / Greenhouse Gas

Aim: Is to reduce the amount of CO_2 and other greenhouse gases produced by the ICT Sector – to as close to ZERO as possible (NET ZERO)

Scope: Includes the various phases of ICT produce / service lifecycle. Calls for less CO2 being produced in the manufacturing / use / and end-of-life of ICT products & services.

Technologies: Use of alternative / sustainable energy sources (nuclear / hydro / wind / solar). Includes all fossil fuel replacement technologies.

Challenges: Transition takes time and massive investment. However the need is urgent and the target as announced is ZERO CO_2 by 2050. The transition has to begin now.

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ICT Sustainability Dissected

Production | Distribution | Use | Disposal

Reduction of Waste / Pollution

Aim: Is to reduce the amount of waste produced by the ICT Sector at all levels and at the various steps of the product / service lifecycle

Scope: Waste includes materials, heat, pollutant gases, but also data, code, products and services. It is present in all stages of the ICT lifecycle (production – use – destruction).

Technologies: Software as opposed to hardware – recycling / refurbishment / re-use of equipment – longer life cycles for equipment – new materials – biodegradables…More.

Challenges: requires a rethink on how we build ICT products and services. Also large investments required and construction of new facilities (recycling / waste management). Impacts ALL business processes and requires total mind-set change.

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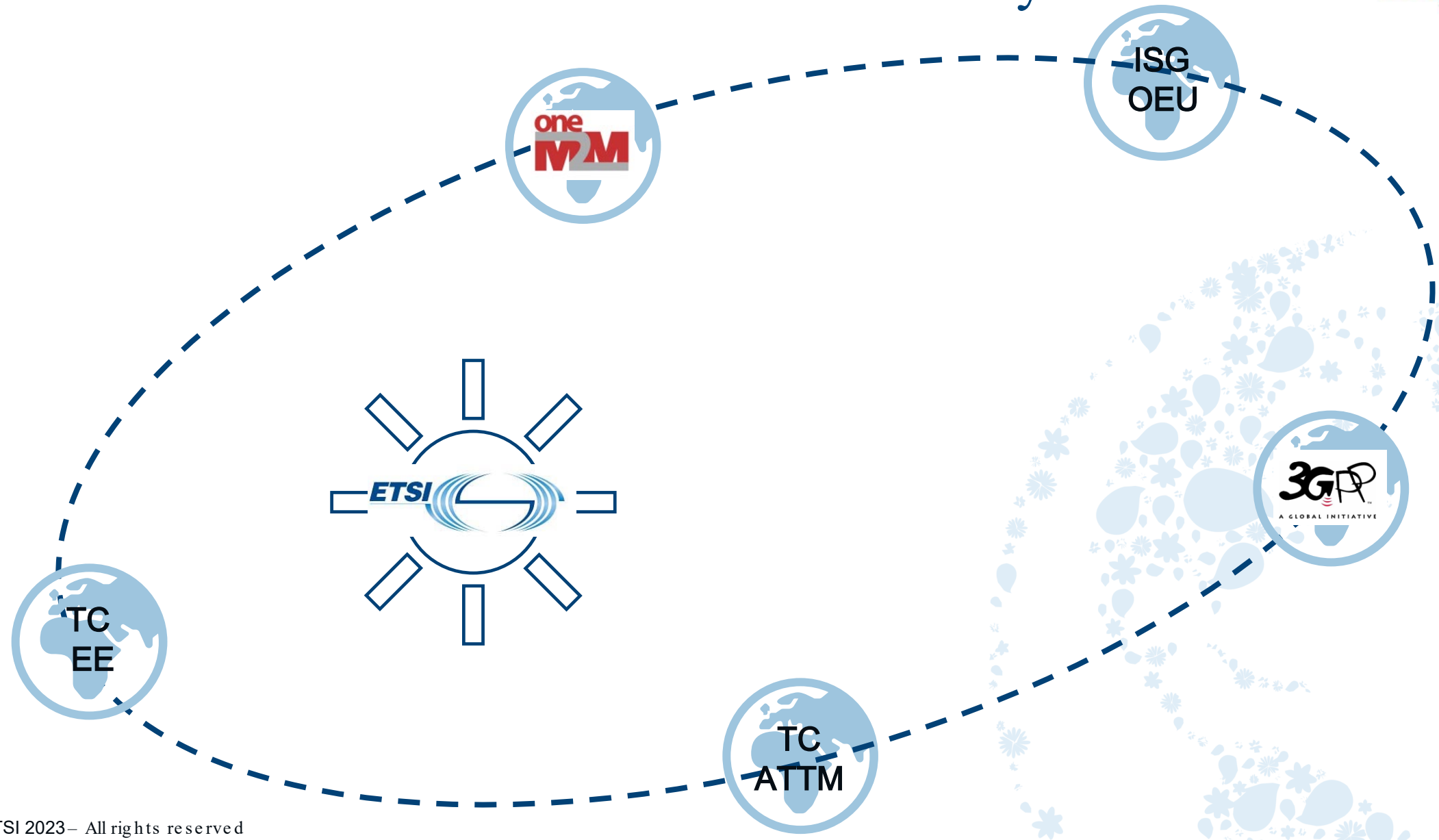
ETSI for Sustainability

ETSI's direct work on sustainability



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TC EE - Environmental Engineering

Works on the Engineering aspects of telecom equipment installations

- climatic, thermal and other environmental conditions;
- physical requirements of equipment racks and cabinets;
- power supplies and grounding;
- Circular Economy (including lifecycle analysis and material efficiency)
- energy performance

Supports European Commission policies, regulation and legislation on eco-design

Cooperation with CEN and CENELEC and ITU-T SG5

Key areas of work in 2022:

- energy efficiency of ICT equipment
- standardization on eco-design aspects
- requirements for power supply interfaces

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https://www.etsi.org/committee/ee

TC ATTM
(Access, Terminals, Transmission & Multiplexing)

Works on the operations & physical aspects of telecom equipment

- Implementation of efficient ICT services
- Sustainability efficiency in operational networks and devices
- Energy management efficiency
- Management of ICT waste in the operational period

Supports sustainable and Green ICT for cities and communities

- Network and service interoperability
- Waste reduction and recycling
- Energy efficiency KPIs and Measurement

Cooperation with:
CEN / CENELEC, ITU-T SG5 & SG15, ISO/IEC JTC1/WG11, WG25 & WG 39

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ISG OEU
(Operational Energy efficiency for Users)

Addressing operational eco-efficient ICT including:

- power consumption
- greenhouse gas emissions

Brings together ICT professionals from a broad cross-section of European industries

Focused on:

- Definition of users' requirements
- Development of reference specifications to define sustainable levels of ICT elements

Participation in the CEN-CENELEC-ETSI Coordination Group on Smart Grid (CG SG)

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https://www.etsi.org/committee/oeu

oneM2M
Sustainability Sub Committee (SSC)

oneM2M is an ETSI Partnership Project, creating global standards for the IoT

oneM2M created a dedicated sustainability subcommittee (SSC) in April 2021

SSC is open & accessible to all (members & non-members)

Two relevant white papers published:

- oneM2M's latest publication builds on an earlier White Paper that explores the market and strategic context for sustainability and IoT.
- Together, the two publications help users and suppliers in the IoT ecosystem to understand promising usage scenarios and the benefits of IoT for sustainability.
- They also provide guidance on sustainable design principles and design practices that organizations can factor in their procurement decisions.

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https://www.onem2m.org/sustain

3GPP
Energy Efficiency and Energy Saving

- 3GPP topics for energy saving/energy efficiency since Release 15

- See also 5G features for improved efficiency;
  - 5G SON & Big Data
  - 5G MIMO enhancements
  - 5G Location and positioning enhancements
  - Dual Connectivity enhancements
  - Device capabilities exchange

Name	Acronym	Rel.	WG	%Compl.
Study on Energy Efficiency as service criteria	FS_EnergyServ	Rel-19	S1	40%
Smart Energy and Infrastructure	SEI	Rel-18		100%
Study on 5G Smart Energy and Infrastructure	FS_5GSEI	Rel-18	S1	100%
Stage 1 of Smart Energy and Infrastructure	SEI	Rel-18	S1	100%
Study on Network and Service Operations for Energy Utilities	FS_NSOEU	Rel-18	S5	55%
Rel-18 Energy and complexity saving	-	Rel-18		100%
Study on network energy savings for NR	FS_Netw_Energy_NR	Rel-18	R1	100%
Network energy savings for NR	Netw_Energy_NR	Rel-18	R1	0%
Core part: Network energy savings for NR	Netw_Energy_NR-Core	Rel-18	R1	0%
Perf. part: Network energy savings for NR	Netw_Energy_NR-Perf	Rel-18	R4	0%
Enhanced Relays for Energy eFficiency and Extensive Coverage	REFEC	Rel-17		100%
Energy efficiency of 5G	EE_5G	Rel-16	S5	100%
Control and monitoring of Power, Energy and Environmental (PEE) parameters in Radio Access Networks (RAN)	PEE_CMON	Rel-15	S5	100%
Study on Energy Efficiency Aspects of 3GPP Standards	FS_ENEFF	Rel-15	SP	100%
Study on OAM support for assessment of energy efficiency in mobile access networks	FS_OAM_EE	Rel-15	S5	100%
Study on system and functional aspects of Energy Efficiency in 5G networks	FS_EE_5G	Rel-15	S5	100%

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https://www.3gpp.org/news-events/energy-efficiency

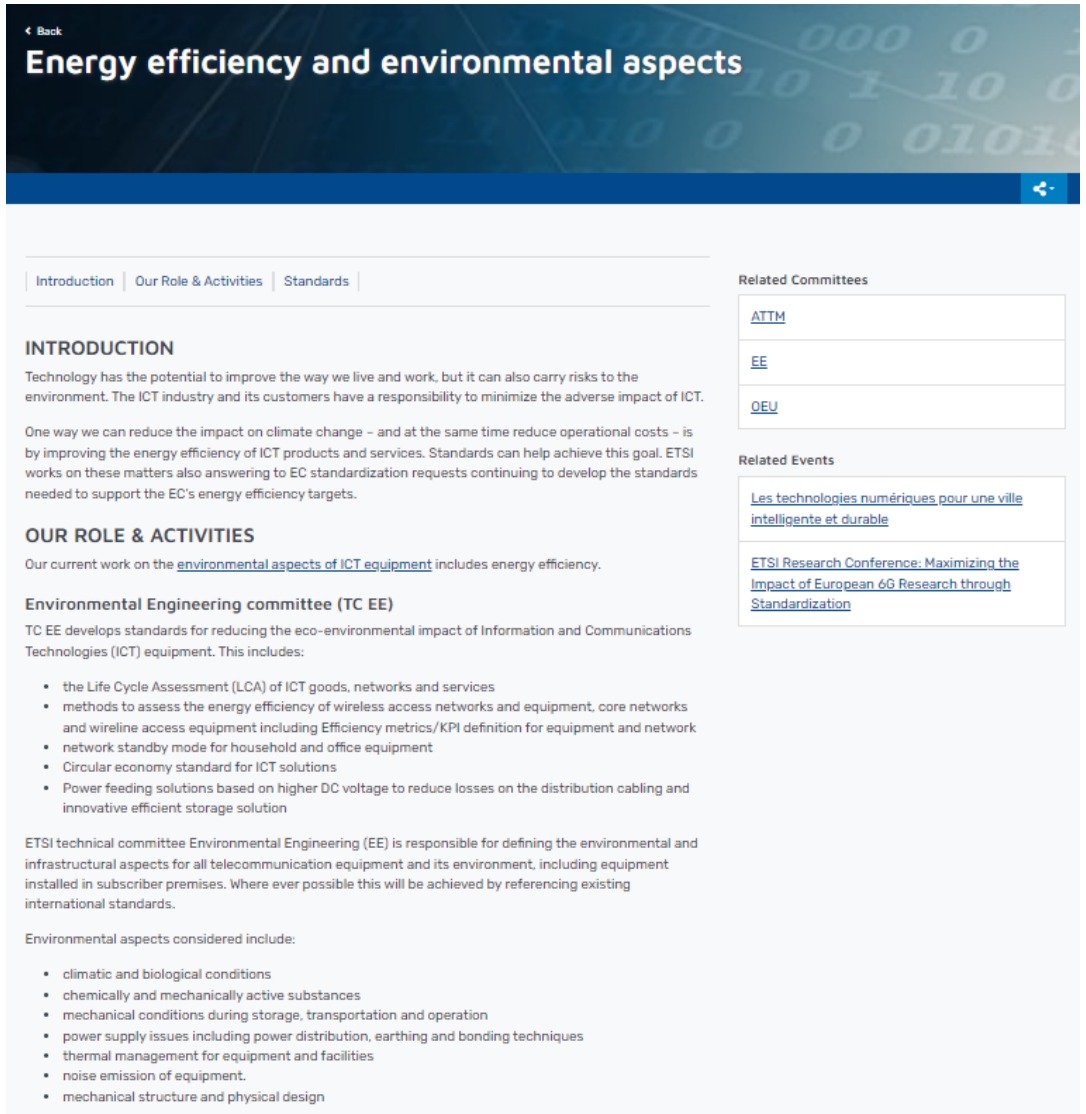
And more in ETSI on sustainability

Sustainability in the ETSI work programme and ETSI enjoy!

ETSI 2022 - 2023 Work Programme
https://www.etsi.org/e-brochure/Work-Programme/2022-2023/mobile/index.html#p=31

Jan 2021 enjoy! special edition
https://www.etsi.org/images/files/Magazine/ETSI_Enjoy_MAG_2021_N01_January.pdf

Energy Efficiency on the ETSI website



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Energy efficiency and environmental aspects

Introduction | Our Role & Activities | Standards

INTRODUCTION

Technology has the potential to improve the way we live and work, but it can also carry risks to the environment. The ICT industry and its customers have a responsibility to minimize the adverse impact of ICT.

One way we can reduce the impact on climate change – and at the same time reduce operational costs – is by improving the energy efficiency of ICT products and services. Standards can help achieve this goal. ETSI works on these matters also answering to EC standardization requests continuing to develop the standards needed to support the EC's energy efficiency targets.

OUR ROLE & ACTIVITIES

Our current work on the environmental aspects of ICT equipment includes energy efficiency.

Environmental Engineering committee (TC EE)

TC EE develops standards for reducing the eco-environmental impact of Information and Communications Technologies (ICT) equipment. This includes:

- the Life Cycle Assessment (LCA) of ICT goods, networks and services
- methods to assess the energy efficiency of wireless access networks and equipment, core networks and wireline access equipment including Efficiency metrics/KPI definition for equipment and network
- network standby mode for household and office equipment
- Circular economy standard for ICT solutions
- Power feeding solutions based on higher DC voltage to reduce losses on the distribution cabling and innovative efficient storage solution

ETSI technical committee Environmental Engineering (EE) is responsible for defining the environmental and infrastructural aspects for all telecommunication equipment and its environment, including equipment installed in subscriber premises. Where ever possible this will be achieved by referencing existing international standards.

Environmental aspects considered include:

- climatic and biological conditions
- chemically and mechanically active substances
- mechanical conditions during storage, transportation and operation
- power supply issues including power distribution, earthing and bonding techniques
- thermal management for equipment and facilities
- noise emission of equipment.
- mechanical structure and physical design

Related Committees

ATTM

EE

OEU

Related Events

Les technologies numériques pour une ville intelligente et durable

ETSI Research Conference: Maximizing the Impact of European 6G Research through Standardization

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ETSI WEB: https://www.etsi.org/technologies/energy-efficiency

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TC EE and ITU-T SG5 are working together to develop technically aligned standards on energy efficiency, power feeding solution, circular economy and network efficiency KPI and eco-design requirement for ICT, with the aim to build an international eco-environmental standardization.

Access, Terminals, Transmission and Multiplexing committee (TC ATTM)

TC ATTM focuses on the 'green' needs of operational networks and sites and broadband transmission including:

- developing global Key Performance Indicators (KPIs) to provide users of ICT with the tools to monitor their eco-efficiency and energy management
- defining the networks connecting digital multi-services in cities, producing KPIs for monitoring the sustainability of broadband solutions
- improving our standards for transmission equipment to support the European Commission's Eco-design of Energy Related Products Directive
- supporting efficient ICT waste management (maintenance period and end of life)

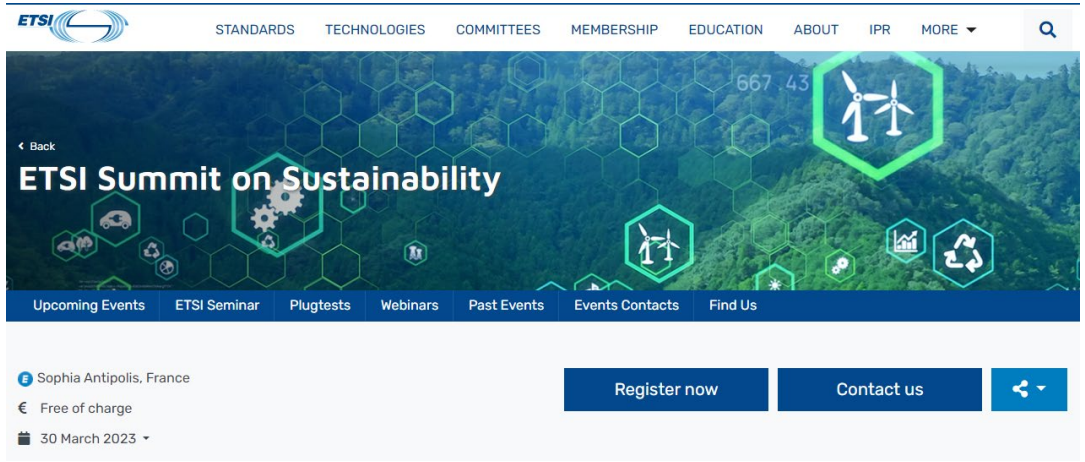
Energy efficiency is now a key focus of TC ATTM which is defining the general landscape of work required to address the energy consumption of all telecommunications equipment and systems. TC ATTM and CENELEC are working together on broadband implementation in Europe. Energy costs continue to rise, while broadband penetration is introducing new equipment to the network architecture. Energy consumption is therefore a major consideration affecting widespread broadband deployment.

Industry Specification Group (ISG) on Operational energy Efficiency for Users (OEU)

ISG OEU is working to minimize the power consumption and greenhouse gas emissions of infrastructure, utilities, equipment and software within ICT sites and networks. This includes:

- the measurement of energy consumption by IT servers, storage units, broadband fixed access and mobile access, with a view to developing global KPIs
- the management of the end of life of ICT equipment
- the definition of global KPI modelling for green smart cities

ETSI Summit on Sustainability - 30th March 2023



EVENT INFO: ETSI - ETSI Summit on Sustainability

The programme of this one-day event will examine:-

What is the role of ICT in sustainability? Get insights on how ICT can help save energy, and reduce waste both for its own industry as well as supporting similar evolutions in other industry sectors.

What are the principal enabling technologies? Deep dive on some of the key technology and standardization activities supporting Green initiatives that are conducted by the ETSI Technical groups as well as 3GPP and oneM2M.

What are the gaps and pending actions to further address sustainability in standardization? Help identify and participate in the debate on new development areas and opportunities for ETSI and its partners.

The **ETSI Summit on Sustainability** - *How ICT developments and standards can enable sustainability and have a positive impact on society,* will take place on **30 March 2023** and will focus on the key role of the ICT industry and related standardization activities to support Green initiatives.

Overview

As the Telecoms Industry looks to future challenges and opportunities, the topics of sustainability and particularly energy efficiency have emerged as among the highest priorities for the industry.

This year, the ETSI Summit will focus on the key role of ICT in supporting Green initiatives with a specific focus on the status of the ongoing and future work in related technology standardization.

Join us at this exclusive summit targeting the ICT community and related industries in order to have the opportunity to discuss the status and future directions for sustainability topics relating to the communications domain and those domains where digitization may help reduce C02 emissions and improve efficiency.

The presentations, debates and open discussions will touch upon the current technologies that enable energy efficiency, CO2 reduction, circular economies, eco-design, and also look to the future requirements.

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In Summary

Sustainability is a fundamental, urgent matter for ALL to address

ICT is a key enabler to sustainability: directly and indirectly

Standards are a must to enable a global, competitive ICT environment

ETSI is a main player in ICT standardization

ETSI takes sustainability very seriously and addresses it from different angles

Thanks for your Attention

You can contact me at

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