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Access, Terminals, Transmission and Multiplexing (ATTM); Broadband Deployment and Lifecycle Resource Management; Part 2: ICT Sites

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Foreword

This European Standard (EN) has been produced by ETSI Technical Committee Access, Terminals, Transmission and Multiplexing (ATTM).

The present document is part 2 of a multi-part deliverable, covering lifecycle resource management of broadband deployment as identified below:

ETSI EN 305 174-1: "Overview, common and generic aspects";

ETSI EN 305 174-2: "ICT Sites";

ETSI TS 105 174-4: "Access Networks";

ETSI EN 305 174-5: "Customer network infrastructures";

ETSI TS 105 174-6: "Cable Access Networks";

ETSI TS 105 174-7: "Digital multiservice cities";

ETSI EN 305 174-8: "Management of end of life of ICT equipment (ICT waste / end of life)".

Other documents are planned for development to extend this multi-part deliverable. These are listed in annex B and are mentioned in the present document.

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Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the ETSI Drafting Rules (Verbal forms for the expression of provisions).

"**must**" and "**must not**" are **NOT** allowed in ETSI deliverables except when used in direct citation.

Introduction

The increasing interaction between the different elements of the Information Communication Technology (ICT) sector (hardware, middleware, software and services) supports the concept of convergence in which:

- multi-service packages can be delivered over a common infrastructure;
- a variety of infrastructures is able to deliver these packages;
- a single multi-service-package may be delivered over different infrastructures.

As a result of this convergence, the development of new services, applications and content has resulted in:

- an increased demand for bandwidth, reliability, quality and performance, with a consequent increase in the demand for power which has implications for cost and, in some cases, availability;
- an associated continuous evolution of ICT equipment.

It is therefore important to consider the environmental viability of all network elements necessary to deliver the required services in terms of the management of their operational aspects i.e. energy management (including energy efficiency) and the management of the End-of-Life (EoL) of the ICT equipment.

NOTE: The term "environmental viability" is used while recognizing that well established treatments of "sustainability" feature three separate viability objectives (environmental, economic and social). For the purposes of this multi-part deliverable only operational aspects of environmental viability are considered. A wider approach to environmental viability takes other factors into account including the use of raw materials and avoidance of hazardous substances in the construction of infrastructure or ICT equipment- these factors are not considered.

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New technologies and infrastructure strategies are expected to enable operators to decrease the energy consumption, for a given level of service, of their existing and future infrastructures, thus decreasing their costs. This requires a common understanding among market participants that only standards can produce.

This multi-part deliverable specifies the general engineering of various broadband infrastructures to enable the most effective energy management (and management of other resources) and the appropriate measures for EoL treatment of ICT equipment. Certain of the standards may specify requirements for interoperability.

The present document is part 2 of a multi-part deliverable and specifies requirements for ICT sites within broadband deployment infrastructures.

The present document has been produced by ETSI Technical Committees Access, Terminals, Transmission and Multiplexing (ATTM) and Cable in close collaboration with CENELEC, via the Installations and Cabling Co-ordination Group (ICCG).

1 Scope

The present document is part 2 of a multi-part deliverable which specifies the general engineering of various broadband infrastructures to enable the most effective energy management (and management of other resources) and the appropriate measures for EoL treatment of ICT equipment.

The present document specifies the requirements for resource management of ICT sites, as a combination of:

- energy management;
- management of the End-of-Life (EoL) procedures for ICT equipment by reference to ETSI EN 305 174-8 [1].

2 References

2.1 Normative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at http://docbox.etsi.org/Reference.

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The following referenced documents are necessary for the application of the present document.

[1] ETSI EN 305 174-8: "Access, Terminals, Transmission and Multiplexing (ATTM); Broadband Deployment and Lifecycle Resource Management; Part 8: Management of end of life of ICT equipment (ICT waste / end of life)".

[2] ETSI EN 305 200-2-1: "Access, Terminals, Transmission and Multiplexing (ATTM); Energy management; Operational infrastructures; Global KPIs; Part 2: Specific requirements; Sub-part 1: ICT Sites".

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2.2 Informative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

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The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

[i.1] CEN EN 15978: "Information Sustainability of construction works - Assessment of environmental performance of buildings - Calculation method".

[i.2] CENELEC CLC/TR 50600-99-1: "Information technology - Data centre facilities and infrastructures - Part 99-1: Recommended practices for energy management".

[i.3] CENELEC EN 50600-1: "Information technology - Data centre facilities and infrastructures - Part 1: General concepts".

[i.4] CENELEC EN 50600-2-2: "Information technology - Data centre facilities and infrastructures - Part 2-2: Power supply and power distribution".

[i.5] CENELEC EN 50600-2-3: "Information technology - Data centre facilities and infrastructures - Part 2-3: Environmental control".

[i.6] CENELEC EN 50600-2-4: "Information technology - Data centre facilities and infrastructures - Part 2-4: Telecommunications infrastructure".

[i.7] CENELEC EN 50600-4-2: "Information technology - Data centre facilities and infrastructures - Part 4-2: Power usage effectiveness".

[i.8] CENELEC EN 50600-4-3: "Information technology - Data centre facilities and infrastructures - Part 4-3: Renewable energy factor".

[i.9] ISO EN 14001: "Environmental management systems. Requirements with guidance for use".

[i.10] ISO EN 14040: "Environmental management. Life cycle assessment. Principles and framework".

[i.11] ISO EN 14044: "Environmental management. Life cycle assessment. Requirements and guidelines".

[i.12] ISO EN 50001: "Energy management systems. Requirements with guidance for use".

[i.13] ETSI EN 305 200-3-1: "Access, Terminals, Transmission and Multiplexing (ATTM); Energy management; Operational infrastructures; Global KPIs; Part 3: ICT Sites; Sub-part 1: DCEM".

[i.14] ETSI TS 105 174-2: "Access, Terminals, Transmission and Multiplexing (ATTM); Broadband Deployment and Energy Management; Part 2: ICT sites".

[i.15] EU Code of Conduct for AC Uninterruptible Power Supplies.

[i.16] ISO/IEC 20000 series: "Information technology. Service management".

[i.17] CENELEC EN 50600-3-1: "Information technology - Data centre facilities and infrastructures - Part 3-1: Management and operational information".

[i.18] Mandate M/462: "Standardisation mandate addressed to CEN, CENELEC and ETSI in the field of ICT to enable efficient energy use in fixed and mobile information and communication networks".

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3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

access network: functional elements (that is equipment and infrastructure) that enable communication between an Operator Site (OS) and a customer network

Base Station (BS): network telecommunications equipment which serves one or more cells within a coverage area of a mobile network

base station site: Network Distribution Node (NDN) which accommodates a base station

core network: functional elements (that is equipment and infrastructure) that enable communication between Operator Sites (OSs) or equivalent ICT sites

End-of-Life (EoL): established point in a product life cycle after a period of primary use and at which a decision is required with regard to reuse, recycling or disposal

free cooling: use of low temperatures, external to the ICT site, to reduce or eliminate the need for powered refrigeration

ICT equipment: equipment providing data storage, processing and transport services

NOTE: A combination of Information Technology Equipment and Network Telecommunications Equipment.

ICT site: site containing structures or group of structures dedicated to the accommodation, interconnection and operation of ICT equipment together with all the facilities and infrastructures for power distribution and environmental control together with the necessary levels of resilience and security required to provide the desired service availability

Information Technology Equipment (ITE): equipment providing data storage, processing and transport services for subsequent distribution by Network Telecommunications Equipment (NTE)

Last Operators Connection point (LOC): interface to the fixed access transport networks of one or more operators from which cabling is routed to a customer network

mobile access network: telecommunications network in which the access to the network (connection between user equipment and network) is implemented over the air interface

Network Data Centre (NDC): data centre embedded within the core network

NOTE: A network data centre of a cable access network may be termed a master head-end.

Network Telecommunications Equipment (NTE): equipment between the boundaries of, and dedicated to providing connection to, core and/or access networks

Operator Site (OS): premises accommodating Network Telecommunications Equipment (NTE), providing direct connection to the core and access networks, and which may also accommodate Information Technology Equipment (ITE)

NOTE 1: An operator site that is only connected to the core network is considered as a network data centre.

NOTE 2: An operator site of a cable access network may be termed a local head-end.

Terminal Equipment (TE): principal device within customer premises allowing user access to the services provided by the fixed access network

User Equipment (UE): device allowing user access to the services provided by the mobile access network

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3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

AC	Alternating Current
ATTM	Access, Terminals, Transmission and Multiplexing
BS	Base Station
CEN	European Committee for Standardization
CENELEC	European Committee for Electrotechnical Standardization
CLC	CENELEC
CLC/TR	CENELEC Technical Report
CP	Customer Premises
CRAC	Computer Room Air Conditioning
CRAH	Computer Room Air Handling
EoL	End-of-Life
EU	European Union
ICCG	CENELEC/ETSI Installations and Cabling Co-ordination Group
ICT	Information Communications Technology
IEC	International Electrotechnical Committee
ISO	International Standards Organization
IT	Information Technology
ITE	Information Technology Equipment
ITIL	Information Technology Infrastructure Library
KPI	Key Performance Indicator
LCA	Life Cycle Analysis
LOC	Last Operators Connection point
NDC	Network Data Centre
NTE	Network Telecommunications Equipment
OS	Operator Site
PUE	Power Usage Effectiveness

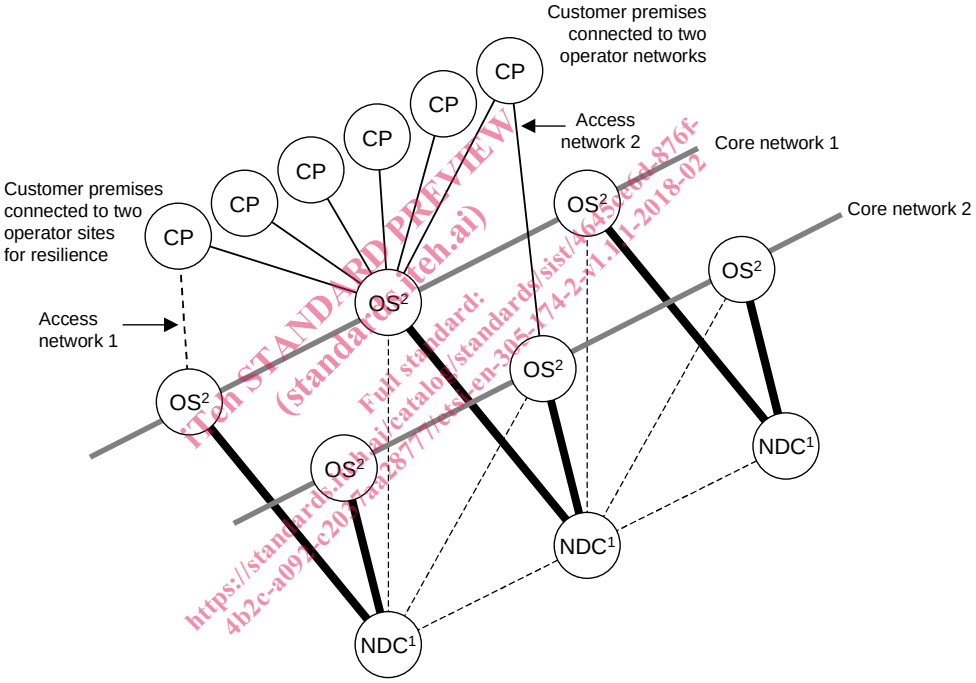
TE	Terminal Equipment
TRX	Transceiver Equipment
UE	User Equipment
UPS	Uninterruptible Power Supply

4 Broadband deployment and ICT sites

4.1 ICT sites

4.1.1 General

Figure 1 is a technology-agnostic diagram depicting a segment of a broadband network showing the interconnection of ICT sites and customer premises installations for fixed access networks. In principle, every operator network can contain any number of each of these elements and may be connected to any number of other operator networks.



[1] For cable access networks this is termed "Master head-end/OS"
[2] For cable access networks this is termed "Local head-end/OS"

Figure 1: Network sub-systems of fixed broadband access network infrastructure

Figure 2 is a technology-agnostic diagram depicting a segment of a broadband network showing the interconnection of ICT sites and base stations (BS) for mobile access networks. Each BS may provide services to a variable number of "end-use IT equipment" shown as User Equipment (UE) in Figure 2.

In principle, every operator network can contain any number of each of these elements and may be connected to any number of other operator networks.

Broadband provision is an enabling technology capable of supporting a reduction of global energy consumption.

EXAMPLE: By providing facilities such as home working and video conferencing to reduce travel demands.

For this reason, it may not be the case that the total energy consumption of broadband networks will be reduced, though the application of effective energy efficiency measures will minimize any increases due to predicted service evolution.