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**Access, Terminals, Transmission and Multiplexing (ATTM);
Energy management; Operational infrastructures; Global KPIs;
Part 2: Specific requirements;
Sub-part 2: Fixed broadband access networks**

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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, sub-part 2 of a multi-part deliverable covering Global Key Performance Indicators for energy management of operational broadband deployment infrastructures as identified below:

- Part 1: "General requirements";
- Part 2: "Specific requirements";
- Sub-part 1: "ICT Sites";
- Sub-part 2: "Fixed broadband access networks";**
- Sub-part 3: "Mobile broadband access networks";
- Part 3: "ICT Sites";
- Part 4: "Design assessments".

National transposition dates

Date of adoption of this EN:	23 July 2018
Date of latest announcement of this EN (doa):	31 October 2018
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	30 April 2019
Date of withdrawal of any conflicting National Standard (dow):	30 April 2019

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).

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Introduction

Energy costs continue to rise, a trend that will continue in the future, while broadband penetration is introducing new active equipment to the network architecture. In this context, and to reflect other environmental aspects of sustainability, it is vital that the main telecommunication operators implement effective general engineering of fixed and mobile broadband networks and sites provisioning, managing or using those networks (i.e. ICT sites) in order to respond to critical issues of energy consumption while proposing essential solutions to broadband deployment. To guide this process, it is essential that metrics are defined, termed Global Key Performance Indicators (KPIs), that enable energy usage to be managed more effectively.

The Global Key Performance Indicators of the ETSI EN 305 200 [i.1] series address operational infrastructures and do not consider design or operation of individual components comprising those infrastructures.

The ETSI EN 305 200 [i.1] series of standards comprises:

- ETSI EN 305 200-1 [i.2]: a generic requirements document addressing Global KPIs for operational infrastructures;
- a sub-series ETSI EN 305 200-2 that defines the Global KPIs, and drives energy management targets, for specific operational networks and sites and which describes how the Global KPIs are to be applied (which may be used to support future regulatory objectives):
 - ETSI EN 305 200-2-1 [i.3]: **ICT Sites**;
 - ETSI EN 305 200-2-2: **Fixed broadband access networks**;

NOTE: Excluding cable access networks.

- ETSI EN 305 200-2-3 [i.4]: **Mobile broadband access networks**;

The standards do not define weightings of Objective KPIs or targets or limits for Global KPIs but may contain information on values that have been used by certain organizations.

- a sub-series ETSI EN 305 200-3 [i.5] including ETSI EN 305 200-3-1 [i.6] that defines particular implementations of Global KPIs within ICT sites based on the requirements of ETSI EN 305 200-2-1 [i.3], and which may define levels of performance to simplify and provide clearer understanding of Global KPIs allowing the evaluation of performance of energy use management in ICT sites.

The standards do not define weightings of Objective KPIs or targets or limits for Global KPIs but may contain information on values that have been used by certain organizations.

- a sub-series ETSI EN 305 200-4 including ETSI EN 305 200-4-4 [i.7] that defines design assessments of Global KPIs, and drives energy management targets, for specific operational networks and sites and which describes how the Global KPIs are to be applied (which may be used to support future regulatory objectives).

These standards may be considered to be a contribution to the application of ISO 50001 [i.8] in relation to the development of policy for the continuous improvement of energy management and will accelerate:

- the availability of operational infrastructure architectures and network implementations that use energy more efficiently;
- the definition and attainment objectives for other environmental aspects of sustainability for operational broadband networks.

The present document specifies the requirements for a Global KPI for energy management (KPI_{EM}) and their underpinning Objective KPIs for the fixed access networks (FANs) of broadband deployment. The requirements are mapped to the general requirements of ETSI EN 305 200-1 [i.2].

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1 Scope

The present document specifies the requirements for a Global KPI for energy management (KPI_{EM}) and their underpinning Objective KPIs addressing the following objectives for the fixed access networks (FANs) of broadband deployment:

- energy consumption;
- task effectiveness;
- renewable energy.

The requirements are mapped to the general requirements of ETSI EN 305 200-1 [i.2].

Energy management of fixed access networks comprises a number of independent layers. The present document addresses performance of infrastructures that supports the normal function of hosted ICT equipment within the fixed access network (e.g. power distribution, environmental control, security and safety). The present document does not address other layers such as performance of ICT equipment itself, performance of usage of available processing power, and layers related to final service delivered (e.g. processing power required per itemized outcome) or overlay layers (e.g. energy consumption required per itemized outcome).

The environmental impact and management of different energy sources are outside the scope of the present document.

Within the present document:

- clause 4 describes the energy parameters for FANs together with inclusions/exclusions of different energy contributions;
- clause 5 specifies the requirements for measurement, calculation, classification and reporting of KPI_{EM} .

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2 References

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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] ETSI EN 305 200 series: "Access, Terminals, Transmission and Multiplexing (ATTM); Energy management; Operational infrastructures; Global KPIs".
- [i.2] ETSI EN 305 200-1: "Access, Terminals, Transmission and Multiplexing (ATTM); Energy management; Operational infrastructures; Global KPIs; Part 1: General requirements".
- [i.3] 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".
- [i.4] ETSI EN 305 200-2-3: "Access, Terminals, Transmission and Multiplexing (ATTM); Energy management; Operational infrastructures; Global KPIs; Part 2: Specific requirements; Sub-part 3: Mobile broadband access networks".
- [i.5] ETSI EN 305 200-3 series: "Energy management: Operational infrastructures: Global KPIs - Part 3: ICT Sites".
- [i.6] 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.7] ETSI EN 305 200-4-4: "Integrated broadband cable telecommunication networks (CABLE); Energy management; Operational infrastructures; Global KPIs; Part 4: Design assessments; Sub-part 4: Cable Access Networks".
- [i.8] ISO 50001: "Energy management systems - Requirements with guidance for use".
- [i.9] 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, symbols and abbreviations

3.1 Definitions

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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

cable access network: access network provided by cable operators comprising optical fibre and metallic cabling providing direct connection to customer premises

Customer Premises (CP): any location which is the sole responsibility of the customer

energy consumption: total consumption of energy by an operational infrastructure

energy management: combination of reduced energy consumption and increased task effectiveness, re-use of energy and use of renewable energy

fixed (broadband) access network: access network provided by telecommunications operators comprising optical fibre and metallic cabling providing direct connection to customer premises

Global KPI: KPI, combining two or more Objective KPIs, which reflects the overall energy management performance of an operational infrastructure

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