SLOVENSKI STANDARD
SIST ES 205 200-1 V1.1.1:2014

01-marec-2014

Dostop, priključki, prenos in multipleksiranje (ATTM) - Gospodarjenje z energijo - Globalni ključni kazalniki uspešnosti (KPI) - Operativne infrastrukture - 1. del: Splošne zahteve

Access, Terminals, Transmission and Multiplexing (ATTM) - Energy management - Global KPIs - Operational infrastructures - Part 1: General requirements

iTeh STANDARD PREVIEW
(standards.iteh.ai)

Ta slovenski standard je istoveten z: ES 205 200-1 Version 1.1.1

ICS:

33.060.40	Kabelski razdelilni sistemi	Cabled distribution systems

SIST ES 205 200-1 V1.1.1:2014   **en**

iTeh STANDARD PREVIEW
(standards.iteh.ai)

ETSI ES 205 200-1 V1.1.1 (2013-05)

ETSI Standard

Access, Terminals, Transmission and Multiplexing (ATTM);
Energy management;
Global KPIs;
Operational infrastructures;
Part 1: General requirements

Reference
DES/ATTM-02018

Keywords
performance, power

ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00   Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

iTeh STANDARD PREVIEW
(standards.iteh.ai)

Important notice

Individual copies of the present document can be downloaded from:
http://www.etsi.org

The present document may be made available in more than one electronic version or in print. In any case of existing or
perceived difference in contents between such versions, the reference version is the Portable Document Format (PDF).
In case of dispute, the reference shall be the printing on ETSI printers of the PDF version kept on a specific network drive
within ETSI Secretariat.

Users of the present document should be aware that the document may be subject to revision or change of status.
Information on the current status of this and other ETSI documents is available at
http://portal.etsi.org/tb/status/status.asp

If you find errors in the present document, please send your comment to one of the following services:
http://portal.etsi.org/chaircor/ETSI_support.asp

Copyright Notification

Contents

Intellectual Property Rights

IPRs essential or potentially essential to the present document may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: *"Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards"*, which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (http://ipr.etsi.org).

Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Foreword

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

The present document is part 1 of a multi-part deliverable covering operational energy management and sustainability of broadband deployment as identified below:

> **Part 1:** **"General requirements"**;
>
> Parts 2: "Specific requirements".
>
> NOTE 1: Additional documents are in development by ETSI Technical Committee Access, Terminals, Transmission and Multiplexing (ATTM) which include:
>
> > ES 205 200-1-1: "Access, Terminals, Transmission and Multiplexing; Guidance; Energy management; Global KPIs; Guidance";
> >
> > ES 205 200-2-2: "Access, Terminals, Transmission and Multiplexing; Energy management; Global KPIs: Operational infrastructures: Fixed (excluding cable) access networks";
> >
> > ES 205 200-3: "Access, Terminals, Transmission and Multiplexing; Energy management; Global KPIs: Monitoring of sustainability".
>
> NOTE 2: A further document is under consideration ETSI Technical Committee CABLE to address "cable access networks (ES 205 200-2-4)".

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 actors implement effective general engineering of fixed and mobile broadband networks and sites provisioning, managing or using those networks (i.e. operator sites, operator data centres and customer data centres) in order to respond to critical issues of energy consumption while proposing essential solutions to true broadband deployment. To guide this process, it is essential that metrics are defined, termed Global Key Performance Indicators (KPI_{EM}) that enable energy usage to be managed more effectively.

The ES 205 200 series of standards comprises:

- ES 205 200-1: a generic requirements document addressing Global KPIs for operational infrastructures;

    NOTE: Global KPIs do not address design/operation of components or subsystems of broadband deployment networks.

- a sub-series ES 205 200-2 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);

    - ES 205 200-2-1: Data centres;

    - ES 205 200-2-3: Mobile access networks.

    These documents do not define KPI limits or targets (which is outside the scope of the ES 205 200 series of standards).

These documents will accelerate:

- 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.

Within the present document:

- clause 4 explains the context underlying the need for the development of Global KPIs for energy efficiency and introduces the Objective KPIs upon which the Global KPIs are founded;

- clause 5 outlines the role of the Objective KPIs that are used throughout the ES 205 200-2 series;

- clause 6 describes the general requirements that are applied to all KPIs defined within the ES 205 200-2 series;

- clause 7 provides a mapping of the operational infrastructures addressed by the ES 205 200-2 series to those described in the ESO response to the European Commission Mandate M/462 [i.1];

- clause 8 summarizes the applicability of the Global and Objective KPIs defined in the ES 205 200-2 series;

- Annex A discusses the roles of different types of Key Performance Indicators i.e. Technical, Objective and Global in relation to the overall energy management concepts of the present document.

1 Scope

The present document describes the energy management landscape of the operational infrastructures of broadband deployment addressed by the ES 205 200 series of documents, their inter-relationship and boundaries.

The present document specifies the following aspects for Global Key Performance Indicators (KPI_{EM}) in relation to energy management for the operational infrastructures of broadband deployment:

- common objectives in relation to:

    - energy consumption;

    - task efficiency;

    - energy re-use;

    - renewable energy;

- general requirements for all KPIs specified in the ES 205 200-2 series in relation to:

    - infrastructure scalability;

    - infrastructure evolution;

    - formulae and definitions of terms;

    - measurement points and procedures;

- the use of KPIs.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

2 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 reference 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.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

2.1 Normative references

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

Not applicable.

2.2 Informative references

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]   EC Mandate M/462: "Standardisation mandate addressed to CEN, CENELEC and ETSI in the field of Information and Communication Technologies".

[i.2]   European Commission DG JRC Code of Conduct for Data Centre Energy Efficiency.

[i.3]   European Commission DG JRC Code of Conduct on Energy Consumption of Broadband Equipment.

[i.4] ISO Guide 82: "Guide for addressing sustainability in standards".

3 Definitions, symbols and abbreviations

3.1 Definitions

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

customer data centre: data centre connected to the access network

data centre: structure, or group of structures, dedicated to the centralized accommodation, interconnection and operation of information technology and network telecommunications equipment providing data storage, processing and transport services 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

energy consumption: total consumption of energy by an operational infrastructure

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

energy re-use: transfer or conversion of energy (typically in the form of heat) produced by the operational infrastructure to do other work

fixed access network: functional elements that enable wired (including optical fibre) communications to customer equipment

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

mobile access network: functional elements that enable wireless communications to customer equipment

Network Telecommunications Equipment (NTE): equipment dedicated to providing direct connection to core and/or access networks

Objective KPI: KPI assessing one of the objectives of operational energy performance which is subsequently used to define a Global KPI for energy management (KPI_{EM})

operational infrastructure: combination of information technology equipment (ITE) and/or network telecommunications equipment (NTE) together with the power supply and environmental control systems necessary to ensure provision of service

operator data centre: data centre embedded within the core network

operator site: premises accommodating network telecommunications equipment providing direct connection to the core and access networks and which may also accommodate information technology equipment

renewable energy: energy produced from dedicated generation systems using resources that are naturally replenished

task efficiency: measure of the work done (as a result of design and/or operational procedures) for a given amount of energy consumed

3.2 Symbols

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

Δt	the maximum time variation between measurement points of the different Objective Key Performance Indicators within a given Global Key Performance Indicator
KPI_{EM}	Global Key Performance Indicator of energy management
KPI_{EC}	Objective Key Performance Indicator of energy consumption
KPI_{TE}	Objective Key Performance Indicator of task efficiency
KPI_{REN}	Objective Key Performance Indicator of renewable energy usage

KPI_{REUSE}	Objective Key Performance Indicator of energy re-use
T_{KPI}	period of time over which Objective KPIs are assessed
T_{REPEAT}	the minimum time between which the Objective KPIs can be assessed to determine relevant trend information
W_{EC}	weighting factor applied to KPI_{EC}
W_{TE}	weighting factor applied to KPI_{TE}
W_{REN}	weighting factor applied to KPI_{REN}
W_{REUSE}	weighting factor applied to KPI_{REUSE}

3.3   Abbreviations

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

ITE	Information Technology Equipment
KPI	Key Performance Indicator
NTE	Network Telecommunications Equipment
ODC	Operator Data Centre
OS	Operator Site

4   Context

The Global Key Performance Indicators (KPI) for energy management (KPI_{EM}) specified in the ES 205 200 series of standards shall reflect and encourage:

Objective 1:   a reduction in energy consumption;

NOTE: Other sustainability issues are not considered within ES 205 200-1 or ES 205 200-2.

Objective 2:   improvements in task efficiency (although the meaning of task efficiency may depend on the particular operational infrastructure);

Objective 3:   the re-use of energy;

Objective 4:   the contribution of renewable energy.

While objectives 1 and 2 are in the foreground of the development of all Global KPIs, the relative priority given to the objectives 3 and 4 above may differ depending on the opportunities available to the particular operational infrastructure.

Figure 1 shows the combination and inter-relation of the four objective KPIs in the production of the KPI_{EE} for an operational infrastructure.

Figure 1: Schematic of foundations of Global KPIs

For each of the operational infrastructures considered within the ES 205 200-2 series of documents, there may be more than one KPI_{EM} but each KPI_{EM} reflects a combination of the four separate objective KPIs:

- energy consumption (KPI_{EC});

- task efficiency (KPI_{TE});

- re-use of energy (KPI_{REUSE});

- use of renewable energy (KPI_{REN}).

The KPI_{EM} may either:

- be a single-valued parameter based upon a specified function comprising each of the objective KPIs in a form as shown below:

$$KPI_{EM} = f\left(KPI_{EC}, KPI_{TE}, KPI_{REUSE}, KPI_{REN}\right)$$

or

- require each of the four Objective KPIs to be met on an agreed basis (as shown schematically in Figure 2).

The approach taken, the relative priority and definition of each Objective KPI may differ between each operational infrastructure considered.
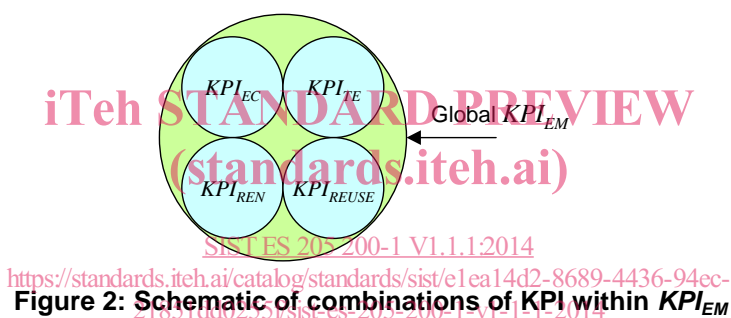

Figure 2: Schematic of combinations of KPI within KPI_{EM}

5 Objective KPIs of ES 205 200-2 series

5.1 Energy consumption

The reduction in the energy consumption required to provide a given level of service is a primary objective of this series of standards.

This objective shall be clearly identified within the KPI for each operational infrastructure which specifically addresses energy consumption (KPI_{EC}).

5.2 Task efficiency

An improvement in task efficiency is a primary objective of this series of standards.

This objective shall be clearly identified within the KPI for each operational infrastructure which specifically addresses task efficiency (KPI_{TE}).