



## **Operational energy Efficiency for Users (OEU); Global KPIs for ICT Sites**

### ***Disclaimer***

---

This document has been produced and approved by the Operational energy Efficiency for Users (OEU) ETSI Industry Specification Group (ISG) and represents the views of those members who participated in this ISG. It does not necessarily represent the views of the entire ETSI membership.

---

Reference

RGS/OEU-0015

---

Keywords

energy efficiency, user

**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

---

**Important notice**

The present document can be downloaded from:

<http://www.etsi.org>

The present document may be made available in electronic versions and/or in print. The content of any electronic and/or print versions of the present document shall not be modified without the prior written authorization of ETSI. In case of any existing or perceived difference in contents between such versions and/or in print, the only prevailing document is the print of the Portable Document Format (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/chaicor/ETSI\\_support.asp](http://portal.etsi.org/chaicor/ETSI_support.asp)

---

**Copyright Notification**

No part may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm except as authorized by written permission of ETSI.

The content of the PDF version shall not be modified without the written authorization of ETSI.

The copyright and the foregoing restriction extend to reproduction in all media.

© European Telecommunications Standards Institute 2014.

All rights reserved.

**DECT™**, **PLUGTESTS™**, **UMTS™** and the ETSI logo are Trade Marks of ETSI registered for the benefit of its Members. **3GPP™** and **LTE™** are Trade Marks of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners.

**GSM®** and the GSM logo are Trade Marks registered and owned by the GSM Association.

# Contents

Intellectual Property Rights .....	5
Foreword.....	5
Modal verbs terminology.....	5
Introduction .....	5
1 Scope .....	6
2 References .....	6
2.1 Normative references .....	6
2.2 Informative references.....	7
3 Definitions, symbols and abbreviations .....	7
3.1 Definitions .....	7
3.2 Symbols.....	8
3.3 Abbreviations .....	8
4 Definition of Key Performance Indicators .....	8
4.1 Objective KPIs for ICT sites operation .....	8
4.1.1 Energy Consumption ( $KPI_{EC}$ ).....	8
4.1.1.1 Generalities .....	8
4.1.1.2 Scale.....	9
4.1.1.3 Evolution.....	9
4.1.1.4 Formula .....	9
4.1.1.5 Measurement points and processes .....	9
4.1.2 Task efficiency ( $KPI_{TE}$ ).....	10
4.1.2.1 Generalities .....	10
4.1.2.2 Scale .....	10
4.1.2.3 Evolution.....	10
4.1.2.4 Formula .....	10
4.1.2.5 Measurement points and processes .....	10
4.1.3 Energy reuse ( $KPI_{REUSE}$ ) .....	11
4.1.3.1 Generalities .....	11
4.1.3.2 Definition of energy reuse.....	11
4.1.3.3 Scale .....	11
4.1.3.4 Evolution.....	11
4.1.3.5 Formula .....	11
4.1.3.6 Measurement points and processes .....	11
4.1.4 Use of renewable energy ( $KPI_{REN}$ ).....	12
4.1.4.1 Generalities .....	12
4.1.4.2 Scale .....	12
4.1.4.3 Evolution.....	12
4.1.4.4 Formula .....	12
4.1.4.5 Measurement Points and processes .....	12
4.2 Global KPI ( $KPI_{DCEM}$ ) using the Objective KPIs .....	13
4.2.1 Introduction.....	13
4.2.2 Definition of energy consumption gauge of the DC ( $DC_G$ ) .....	13
4.2.3 Definition of performance of the DC ( $DC_P$ ) .....	13
4.2.4 Scale.....	14
4.2.5 Evolution .....	14
4.2.6 Matrix for $KPI_{DCEM}$ .....	14
4.2.7 Measurement points and processes.....	14
<b>Annex A (normative): Definition of Key Performance Indicators for a group of ICT sites .....</b>	<b>15</b>
A.1 Global KPI ( $KPI_{DCEM}$ ) using the Objective KPIs for a group of ICT sites.....	15
A.1.1 Introduction .....	15
A.1.2 Energy Consumption ( $KPI_{ECG}$ ) formula .....	15

A.1.3	Definition of energy consumption gauge of a group of ICT sites ( $DC_{GG}$ ) .....	15
A.1.4	Definition of the class of a group of ICT sites.....	15
A.1.5	Scale .....	15
A.1.6	Evolution .....	16
<b>Annex B (informative): The status of Key Performance Indicators (KPIs).....</b>		<b>17</b>
B.1	Technical KPIs .....	17
B.2	Objective KPIs .....	17
B.3	Global KPIs .....	18
B.4	Summary .....	18
<b>Annex C (informative): Energy Consumption per square metre (<math>KPI_{EC1}</math>) .....</b>		<b>19</b>
C.1	Generalities.....	19
C.2	Scale .....	19
C.3	Evolution .....	19
C.4	Formula .....	19
C.5	Measurement points and procedures .....	19
	History .....	20

---

## 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 Group Specification (GS) has been produced by ETSI Industry Specification Group (ISG) Operational energy Efficiency for Users (OEU).

---

## Modal verbs terminology

In the present document "shall", "shall not", "should", "should not", "may", "may not", "need", "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

Further to the 1997 Kyoto protocol [i.7], the European Commission has issued, and will issue, Directives in order to improve energy management of networks, sites included, of whole industry sectors.

Therefore suppliers and users of information and communication technology (ICT) equipment are obliged to implement "Green" tools (indicators, recognized Green levels) to monitor the efficiency of their greener networks.

ICT sites constitute one of the most important areas of the worldwide growing energy consumption. Consequently, the first target of ETSI ISG OEU has been the development of this Position Paper defining appropriate Objective and Global Key Performance Indicators (KPIs) to be used for operational ICT sites.

The present document has been developed by ISG OEU members (ICT world Users) supported by the CTO Alliance/CRIP in order to define the most efficient tools.

The present document presents the Objective KPIs of the ETSI ES 205 200-2-1 [2] in a simple format and uses them to define a Global KPI which indicates data centre energy usage and efficiency. It is expected that the present document will influence the development and maintenance of the ETSI ES 205 200 Series [i.8] under the responsibility of ETSI ATTM.

---

# 1 Scope

The present document defines the current position of the ISG OEU members in relation to the so-called Global Key Performance Indicators (Global KPIs) enabling the monitoring of data centre (DC) energy management.

The present document defines Global Key Performance Indicators in relation to energy management for ICT sites including, but not limited to: operator data centres (ODC), operator sites (OS) and customer data centres (CDC). It addresses the following objectives:

- energy consumption;
- task efficiency;
- energy reuse;
- renewable energy.

The present document defines:

- four KPIs addressing these objectives (Objective KPIs);
- one Global KPI which combines the four Objective KPIs.

The Objective and Global KPIs defined here apply to ICT sites of any size from initial operation to end of life.

---

# 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 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>.

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.

- [1] ETSI ES 205 200-1: "Access, Terminals, Transmission and Multiplexing (ATTM); Energy management; Global KPIs; Operational infrastructures; Part 1: General requirements".
- [2] ETSI ES 205 200-2-1: "Access, Terminals, Transmission and Multiplexing (ATTM); Energy management; Global KPIs; Operational infrastructures; Part 2: Specific requirements; Sub-part 1: Data centres".
- [3] CENELEC EN 50600 Series: "Information technology - Data centre facilities and infrastructures".
- [4] CENELEC EN 1434 Series: "Heat meters".