ICS 35.020, 35.110, 35.160 PREDBEŽNÁ SLOVENSKÁ TECHNICKÁ NORMA November 2023

STN P	**Informačné technológie Zariadenia a infraštruktúra výpočtových stredísk Časť 5-1: Model vyspelosti pre energetické manažérstvo a environmentálnu udržateľnosť**	**STN P CLC/TS 50600-5-1** 36 7254

Information technology - Data centre facilities and infrastructures - Part 5-1: Maturity Model for Energy Management and Environmental Sustainability

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 10/23

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English Version

Information technology - Data centre facilities and infrastructures - Part 5-1: Maturity Model for Energy Management and Environmental Sustainability

Technologies de l'information - Installation et infrastructures des centres de traitement de données - Partie 5-1: Modèle de maturité pour la gestion de l'énergie et la durabilité environnementale

Informationstechnik - Einrichtungen und Infrastrukturen von Rechenzentren - Teil 5-1: Reifegradmodell für Energiemanagement und Umweltverträglichkeit

This Technical Specification was approved by CENELEC on 2023-08-28.

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European foreword

This document (CLC/TS 50600-5-1:2023) has been prepared by CLC/TC 215, “Electrotechnical aspects of telecommunication equipment”.

This document supersedes CLC/TS 50600-5-1:2021, CLC/TR 50600-99-1:2021 and CLC/TR 50600-99-2:2021 and all of their amendments and corrigenda (if any).

CLC/TS 50600-5-1:2023 includes the following significant technical changes with respect to CLC/TS 50600-5-1:2021:

a) document has been completely restructured with clauses organized in topics rather than maturity levels;

b) previous references to CLC/TR 50600-99-1:2021 and CLC/TR 50600-99-2:2021 have been replaced by including the text into this document;

c) the practices have been technically revised and consolidated to remove redundant requirements;

d) practices of CLC/TR 50600-99-1:2021 and CLC/TR 50600-99-2:2021 not used in the maturity levels have been transferred to Annex A and Annex B, respectively, thus replacing the Technical Reports CLC/TR 50600-99-1:2021 and CLC/TR 50600-99-2:2021.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a standardization request addressed to CENELEC by the European Commission. The Standing Committee of the EFTA States subsequently approves these requests for its Member States.

Any feedback and questions on this document should be directed to the users’ national committee. A complete listing of these bodies can be found on the CENELEC website.

Introduction

The unrestricted access to internet-based information demanded by the information society has led to an exponential growth of both internet traffic and the volume of stored/retrieved data. Data centres are housing and supporting the information technology and network telecommunications equipment for data processing, data storage and data transport. They are required both by network operators (delivering those services to customer premises) and by enterprises within those customer premises.

Data centres usually provide modular, scalable and flexible facilities and infrastructures to easily accommodate the rapidly changing requirements of the market. In addition, energy consumption of data centres has become critical both from an environmental point of view (reduction of environmental footprint) and with respect to economical considerations (cost of energy) for the data centre operator.

The implementation of data centres varies in terms of:

a) purpose (enterprise, co-location, co-hosting or network operator facilities);

b) security level;

c) physical size;

d) accommodation (mobile, temporary and permanent constructions).

The needs of data centres also vary in terms of availability of service, the provision of security and the objectives for energy efficiency. These needs and objectives influence the design of data centres in terms of building construction, power distribution, environmental control, telecommunications cabling and physical security as well as the operation of the data centre. Effective management and operational information is important in order to monitor achievement of the defined needs and objectives.

Recognizing the substantial resource consumption, particularly of energy, of larger data centres, it is also important to provide tools for the assessment of that consumption both in terms of overall value and of source mix and to provide Key Performance Indicators (KPIs) to evaluate trends and drive performance improvements.

At the time of publication of this document, the EN 50600 series is designed as a framework of standards, technical specifications and technical reports covering the design, the operation and management, the key performance indicators for energy efficient operation of the data centre as well as a data centre maturity model.

The EN 50600-2 series defines the requirements for the data centre design.

The EN 50600-3 series defines the requirements for the operation and the management of the data centre.

The EN 50600-4 series defines the key performance indicators for the data centre.

The CLC/TS 50600-5 series defines the data centre maturity model requirements and recommendations.

The CLC/TR 50600-99-X Technical Reports cover recommended practices and guidance for specific topics around data centre operation and design.

This series of documents specifies requirements and recommendations to support the various parties involved in the design, planning, procurement, integration, installation, operation, maintenance and assessment of facilities and infrastructures within data centres. These parties include:

1) owners, operators, facility managers, ICT managers, project managers, main contractors;

2) consulting engineers, architects, building designers and builders, system and installation designers, auditors, testing and commissioning agents;

3) facility and infrastructure integrators, suppliers of equipment;

4) installers, maintainers;

5) policy makers, assessors.

At the time of publication of this document, the EN 50600 series will comprise the following standards and documents:

EN 50600-1, *Information technology — Data centre facilities and infrastructures — Part 1: General concepts*

EN 50600-2-1, *Information technology — Data centre facilities and infrastructures — Part 2-1: Building construction*

EN 50600-2-2, *Information technology — Data centre facilities and infrastructures — Part 2-2: Power supply and distribution*

EN 50600-2-3, *Information technology — Data centre facilities and infrastructures — Part 2-3: Environmental control*

EN 50600-2-4, *Information technology — Data centre facilities and infrastructures — Part 2-4: Telecommunications cabling infrastructure*

EN 50600-2-5, *Information technology — Data centre facilities and infrastructures — Part 2-5: Security systems*

EN 50600-3-1, *Information technology — Data centre facilities and infrastructures — Part 3-1: Management and operational information*

EN 50600-4-1, *Information technology — Data centre facilities and infrastructures — Part 4-1: Overview of and general requirements for key performance indicators*

EN 50600-4-2, *Information technology — Data centre facilities and infrastructures — Part 4-2: Power Usage Effectiveness*

EN 50600-4-3, *Information technology — Data centre facilities and infrastructures — Part 4-3: Renewable Energy Factor*

EN 50600-4-6, *Information technology — Data centre facilities and infrastructures — Part 4-6: Energy Reuse Factor*

EN 50600-4-7, *Information technology — Data centre facilities and infrastructures — Part 4-7: Cooling Efficiency Ratio*

EN 50600-4-8, *Information technology — Data centre facilities and infrastructures — Part 4-8: Carbon usage effectiveness*

EN 50600-4-9, *Information technology — Data centre facilities and infrastructures — Part 4-9: Water usage effectiveness*

CLC/TS 50600-5-1, *Information technology — Data centre facilities and infrastructures — Part 5-1: Maturity Model for Energy Management and Environmental Sustainability*

CLC/TR 50600-99-3, *Information technology — Data centre facilities and infrastructures — Part 99-3: Guidance for the application of* EN 50600 series

The inter-relationship of the documents within the EN 50600 series is shown in Figure 1.

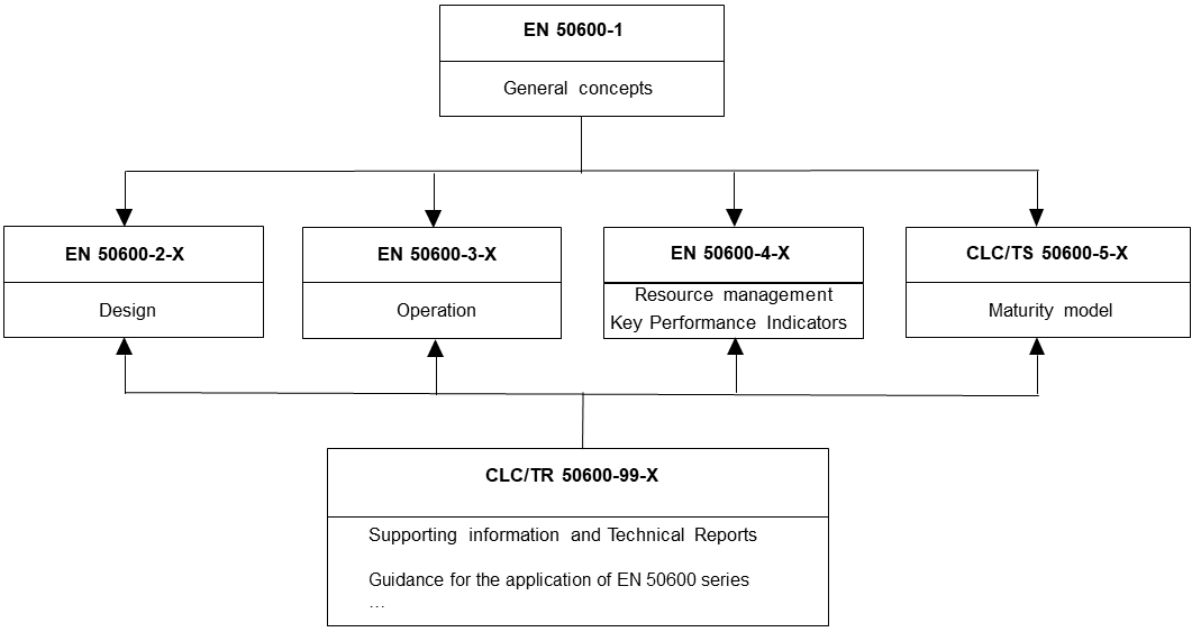

Figure 1 — Schematic relationship between the EN 50600 series of documents

EN 50600-2-X documents specify requirements and recommendations for particular facilities and infrastructures to support the relevant classification for “availability”, “physical security” and “energy efficiency enablement” selected from EN 50600-1.

EN 50600-3-X documents specify requirements and recommendations for data centre operations, processes and management.

EN 50600-4-X documents specify requirements and recommendations for key performance indicators (KPIs) used to assess and improve the resource usage efficiency and effectiveness, respectively, of a data centre.

This document, CLC/TS 50600-5-1 describes a 5-level maturity model which separately addresses multiple elements of the facilities, infrastructures, the information and communication technology (ICT) equipment and software of the data centre; while the current document focusses on the environmental impact (energy management and environmental sustainability), other elements are expected to be included in future documents.

NOTE The term “environmental sustainability” is used recognizing that well established treatments of “sustainability” feature three separate viability objectives (environmental, economic and social). For the purposes of this document, only elements of environmental viability are considered.

The maturity model covers design, procurement, operation and end-of-life.

The purpose of the document is to enable data centre owners/operators to:

— employ a framework to baseline their data centre design and practices;

— determine the level of maturity applicable to their data centre by assessment;

— identify relevant guidance on potential areas of improvement together with the anticipated benefits to justify the resources required;

— develop an action plan to migrate to higher maturity levels.

This document supports the wider adoption of recommended practices of other documents in the EN 50600 series and those of other recognized relevant standards in the area of energy management and environmental

sustainability. The document can be useful in an assessment process to define the level of environmental impact maturity of a data centre.

1 Scope

This document specifies a maturity model addressing the environmental impact (energy management and environmental sustainability) of the facilities, infrastructures and the information and communication technology (ICT) equipment accommodated by and the and ICT software deployed in the data centre.

NOTE The term “environmental sustainability” is used recognizing that well established treatments of “sustainability” feature three separate viability objectives (environmental, economic and social). For the purposes of this document, only elements of environmental viability are considered.

The elements address the whole life cycle including design, procurement, operation and decommissioning.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 14511 (all parts), *Air conditioners, liquid chilling packages and heat pumps with electrically driven compressors for space heating and cooling*

EN 50600 (all parts), *Information technology – Data centre facilities and infrastructures*

EN 50600-1, *Information technology - Data centre facilities and infrastructures - Part 1: General concepts*

EN 50600-4-2, *Information technology - Data centre facilities and infrastructures - Part 4-2: Power Usage Effectiveness*

EN 50600-4-3, *Information technology - Data centre facilities and infrastructures - Part 4-3: Renewable Energy Factor*

EN 50600-4-6, *Information technology - Data centre facilities and infrastructures - Part 4-6: Energy Reuse Factor*

EN 50600-4-7, *Information technology - Data centre facilities and infrastructures - Part 4-7: Cooling Efficiency Ratio*

EN 50600-4-9, *Information technology - Data centre facilities and infrastructures - Part 4-9: Water Usage Effectiveness*

ISO/IEC 20000 (all parts), *Information technology — Service management*

ISO/IEC 30134-4, *Information technology — Data centres — Key performance indicators — Part 4: IT Equipment Energy Efficiency for servers (ITEEsv)*

ISO/IEC 30134-5, *Information technology — Data centres — Key performance indicators — Part 5: IT Equipment Utilization for servers (ITEUsv)*

EN ISO 14040, *Environmental management - Life cycle assessment - Principles and framework (ISO 14040)*

EN ISO 16890-1, *Air filters for general ventilation - Part 1: Technical specifications, requirements and classification system based upon particulate matter efficiency (ePM) (ISO 16890-1)*

ITU-T L.1410, *Methodology for environmental life cycle assessments of information and communication technology goods, networks and services*