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USING EUROPEAN STANDARDS AND BEST PRACTICES TO DEVELOP ENERGY EFFICIENT DATA CENTRES

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2018

THE ENERGY EFFICIENT DATA CENTRE

Topics

- What makes an energy efficient data centre?
- Why do we struggle to address this issue?
- Competing standards
- How can genuine standards help?

EUROPEAN CODE OF CONDUCT ON DATA CENTRE ENERGY EFFICIENCY

- The first government led set of data centre specific best practices published worldwide
- Offers a free to download and use set of tried and tested Data Centre Best Practices available to use on a voluntary basis
- Aims to inform and support data centre operators and owners in reducing energy consumption (Endorsers and Participants)
- Parties signing up are expected to follow the intent of the Code of Conduct and abide by a set of agreed voluntary commitments
- Updated Annually (2018 version released in January - V9.1.0)

EN 50600 AND EU CODE OF CONDUCT FOR DATA CENTRES

- The EU Joint Research Centre (JRC) has close cooperation with CEN/CENELEC
- The Code of Conduct best Practices have been incorporated into CLC/TR 50600-99-1
- This will continue to include all the annual updates (2019 included)
- The TR will be translated into at **least** French and German in addition to English

CENELEC AND EMERGING EUROPEAN STANDARDS

- CENELEC is the European Committee for Electrotechnical Standardization and is responsible for European standardization in the field of electro-technical engineering.
- Designated as a European Standards Organization by the European Commission.
- Works alongside CEN, the European Committee for Standardisation.
- CENELEC are a member of the CEN / CENELEC / ETSI Coordination Group: Green Data Centres (GDC). http://www.cencenelec.eu/standards/Sectors/ICT/Pages/GreenDataCentres.aspx
- CENELEC TC 215 WG3 (EN 50600 series), is responsible for the development of EN50600 series of standards.

EN 50600 BACKGROUND

- EN 50600 (Information technology - Data centre facilities and infrastructures)
- Published but development ongoing by local ISO country representative organisations
- CENELEC TC 215 WG3 (EN 50600 series), are responsible for the development of EN50600 series of standards (data centre facilities and infrastructures)
- Includes sections for building construction, power distribution, environmental control, telecoms cabling, security systems, management and operations
- Now incorporated into ISO/IEC JTC 1 Study Group on Energy Efficiency of Data Centers (SD-EEDC) as ISO/IEC TS 22237 series

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ISO JTC1 IEC
INFORMATION TECHNOLOGY STANDARDS

EN 50600 SERIES OF STANDARDS

EN 50600-1:	*Information technology - Data centre facilities and infrastructures*
	Part 1: General concepts
EN 50600-2-1*:*	*Building construction*
EN 50600-2-2*:*	*Power distribution*
EN 50600-2-3*:*	*Environmental control*
EN 50600-2-4*:*	*Telecommunications cabling infrastructure*
EN 50600-2-5*:*	*Physical security*
EN 50600-3-1*:*	*Management and operational information*
EN 50600-4-1*:*	*KPIs - Overview and general requirements*
EN 50600-4-2*:*	*KPIs - Power Usage Effectiveness (PUE)* ISO/IEC 30134-2
EN 50600-4-3*:*	*KPIs - Renewable Energy Factor (REF)* ISO/IEC 30134-3
EN 50600-4-4*:*	*KPIs - IT Equipment Energy Efficiency for Servers*
EN 50600-4-5*:*	*KPIs - IT Equipment Energy Utilisation for Servers*
TR 50600-99-1:	*Energy management - Recommended Practices*
TR 50600-99-2:	*Environmental sustainability - Recommended Practices*
	(*Note:* **TR 50600-99-4 -** *Data Centre Maturity Model is in development***)**

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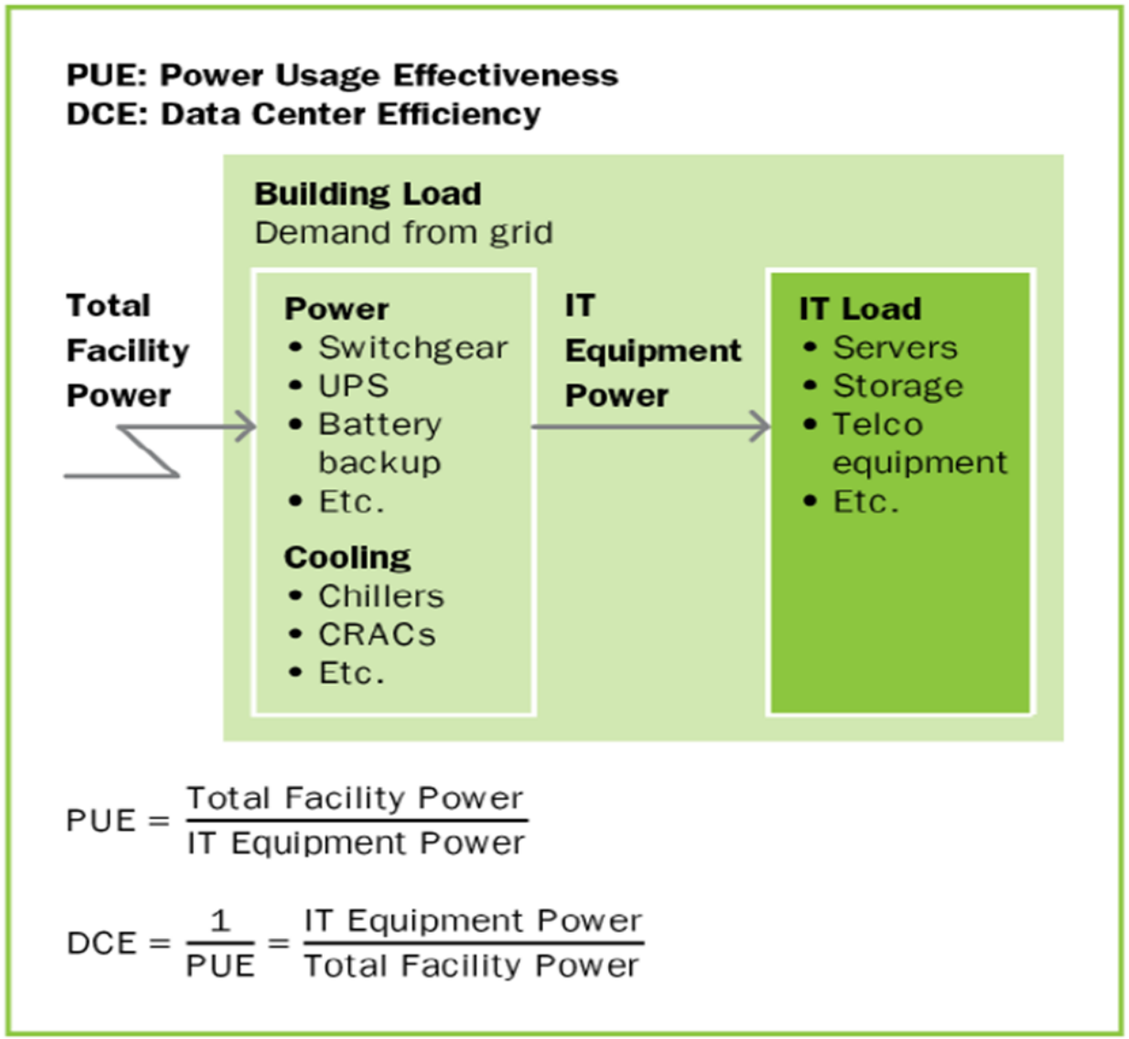
STANDARDS BASED DATA CENTRE KPIS

- CUE (Carbon Usage Effectiveness) , WUE (Water Usage Effectiveness), ERE (Energy Re-Use Usage Effectiveness) are used in many data centres to indicate some areas of performance against building load.
- These either have been, or are being developed into ISO/IEC KPIs by ISO/IEC JTC1
- The current internationally agreed data centre KPIs are: ISO/IEC 30134-2 (EN 50600-4-2) Power Usage Effectiveness (PUE) and ISO/IEC 30134-3 (EN 50600-4-3) Renewable Energy Factor (REF)
- Note that neither of these are measures of data centre energy efficiency.
- A full list of ongoing data centre standards efforts can be obtained from CEN/CENELEC/ETS Coordination Group for Green Data Centres (CG GDC)

Power Usage Effectiveness



PUE is now defined by ISO/IEC 30134-2 (**EN 50600-4-2)**

PUE is **NOT** an Energy Efficiency Metric!

NB PUE reduction can be achieved by INCREASING power consumption.....

the green grid™
get connected to efficient IT

INTERNATIONAL STANDARDS INSTITUTE (ISO)

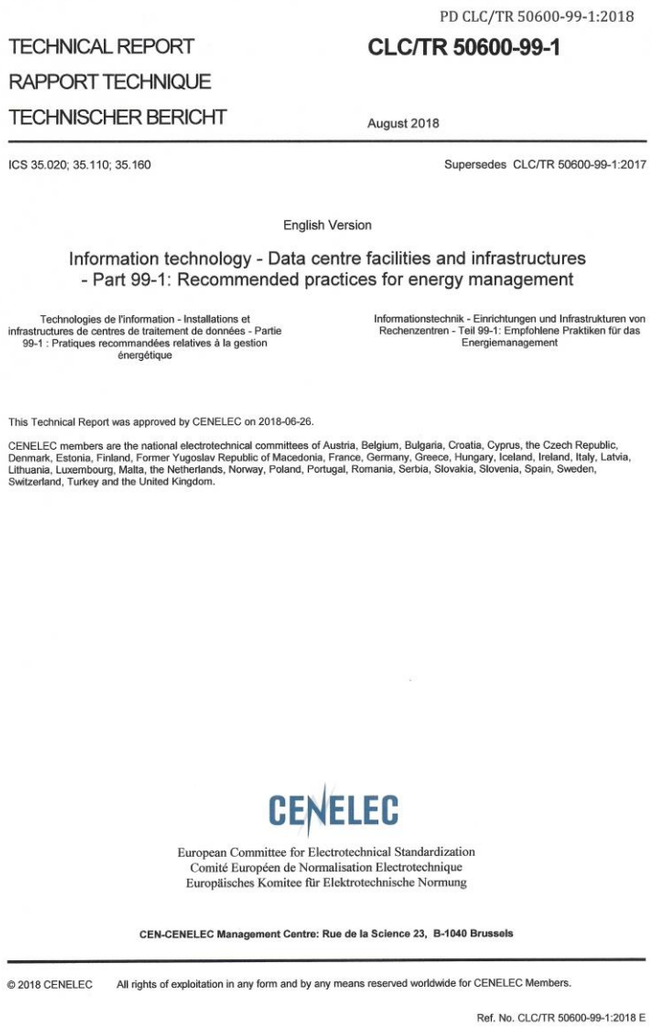
- ISO is an independent, non-governmental membership organization and the world's largest developer of voluntary International Standards
- Members are the national standards bodies of the 163 member countries around the world. Based in Geneva, Switzerland
- Works alongside International Electrotechnical Commission (IEC), in the development of emerging international data centre standards
- ISO/IEC JTC1 SC39 WG1 are responsible for the development of the ISO/IEC 30134 series of standards (data centre resource efficiency KPIs)
- PUE / DCiE from The Green Grid now falls under ISO/IEC JTC1 SC39 and is now defined as ISO/IEC 30134-2
- A key development is the adoption of EN50600 as the ISO/IEC TS 22237 series under ISO/IEC JTC1

ISO JTC 1 IEC
INFORMATION TECHNOLOGY STANDARDS

HOW DOES EN50600 HELP ENERGY EFFICIENCY?

- A single true standard that the sector should and will ultimately support
- Starts with availability classes based on business risk analysis to reduce over provisioning
- This also helps inform the choice of cooling technology deployed
- Requires a realistic review of the IT loads that will be supported
- Offers operational management best practice recommendations

EN 50600 SERIES 99-1 AND 99-2



PD CLC/TR 50600-99-1:2018

TECHNICAL REPORT
RAPPORT TECHNIQUE
TECHNISCHER BERICHT

CLC/TR 50600-99-1

August 2018

ICS 35.020; 35.110; 35.160

Supersedes CLC/TR 50600-99-1:2017

English Version

Information technology - Data centre facilities and infrastructures - Part 99-1: Recommended practices for energy management

Technologies de l'information - Installations et infrastructures de centres de traitement de données - Partie 99-1 : Pratiques recommandées relatives à la gestion énergétique

Informationstechnik - Einrichtungen und Infrastrukturen von Rechenzentren - Teil 99-1: Empfohlene Praktiken für das Energiemanagement

This Technical Report was approved by CENELEC on 2018-06-26.

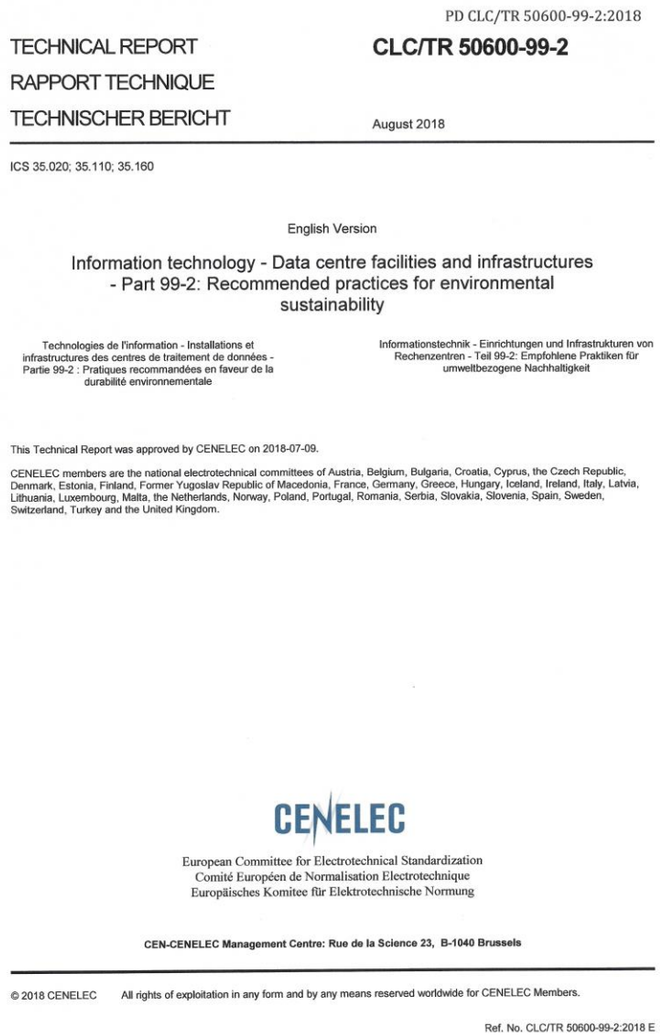
CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Ref. No. CLC/TR 50600-99-1:2018 E



PD CLC/TR 50600-99-2:2018

TECHNICAL REPORT
RAPPORT TECHNIQUE
TECHNISCHER BERICHT

CLC/TR 50600-99-2

August 2018

ICS 35.020; 35.110; 35.160

English Version

Information technology - Data centre facilities and infrastructures - Part 99-2: Recommended practices for environmental sustainability

Technologies de l'information - Installations et infrastructures des centres de traitement de données - Partie 99-2 : Pratiques recommandées en faveur de la durabilité environnementale

Informationstechnik - Einrichtungen und Infrastrukturen von Rechenzentren - Teil 99-2: Empfohlene Praktiken für umweltbezogene Nachhaltigkeit

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CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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Ref. No. CLC/TR 50600-99-2:2018 E

ECO-MANAGEMENT AND AUDIT SCHEME (EMAS)

- A system for environmental management in the workplace published by JRC
- Aligns with the international environmental management standard ISO 14001
- EMAS is open to every type of organisation eager to improve its environmental performance
- Supported by JRC documents published as ‘best environmental management practices’ (BEMPs) , referred to as Sectoral Reference Documents (SRDs)
- References the use of The Best Practices from both EU CoC and TR 50600-99-1

http://ec.europa.eu/environment/emas/register/

http://susproc.jrc.ec.europa.eu/activities/emas/

ISO 50001 – ENERGY MANAGEMENT SYSTEM

- ISO 50001 outlines energy management practices that are considered to globally leading. Implementing the standard can help to save energy, cut costs, and meet environmental and carbon reduction targets.
- ISO 50001 is an international standard based on the management system model of continual improvement also used for other well-known standards such as ISO 9001 or ISO 14001.
- ISO 50001 provides a framework of requirements for organizations to:
  - Develop a policy for more efficient use of energy
  - Fix targets and objectives to meet the policy
  - Use data to better understand and make decisions about energy use
  - Measure the results
  - Review how well the policy works
  - Continually improve energy management.
- CLC TR 50600-99-1 can be used to underpin ISO 50001 certification

Gracias. Thank You. 謝謝. Salamat. Obrigado. شكرا

Спасибо. 감사합니다. ขอบคุณ. Danke. ありがとう. Merci.

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