ISO/IEC 30134-2:2016(en) Information technology — Data centres — Key performance indicators — Part 2: Power usage effectiveness (PUE)

Foreword

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT), see the following URL: Foreword — Supplementary information.

The committee responsible for this document is ISO/IEC JTC 1, *Information technology*, Subcommittee SC 39, *Sustainability for and by Information Technology*.

ISO/IEC 30134 consists of the following parts, under the general title *Information technology — Data centres — Key performance indicators*:

— *Part 1: Overview and general requirements*

— *Part 2: Power usage effectiveness (PUE)*

— *Part 3: Renewable energy factor (REF)*

The following parts are under preparation:

— *Part 4: IT Equipment Energy Efficiency for Servers (ITEEsv)*

— *Part 5: IT Equipment Utilization for Servers (ITEUsv)*

Introduction

The global economy is now reliant on information and communication technologies and the associated generation, transmission, dissemination, computation and storage of digital data. All markets have experienced exponential growth in that data, for social, educational and business sectors and, while the internet backbone carries the traffic there are a wide variety of data centres at nodes and hubs within both private enterprise and shared/collocation facilities.

The historical data generation growth rate exceeds the capacity growth rate of the information and communications technology hardware and, with less than half (in 2014) of the world's population having access to an internet connection, that growth in data can only accelerate. In addition, with many governments having “digital agendas” to provide both citizens and businesses with ever faster broadband access, the very increase in network speed and capacity will, by itself, generate ever more usage (Jevons Paradox). Data generation and the consequential increase in data manipulation and storage are directly linked to increasing power consumption.

With this background, it is clear that data centre growth, and power consumption in particular, is an inevitable consequence and that growth will demand increasing power consumption despite the most stringent energy efficiency strategies. This makes the need for key performance indicators (KPIs) that cover the effective use of resources (including but not limited to energy) and the reduction of CO_2 emissions essential.

Within the ISO/IEC 30134 series, the term “*resource usage effectiveness*” is more generally used for KPIs in preference to “*resource usage efficiency*”, which is restricted to situations where the input and output parameters used to define the KPI have the same units.

In order to determine the overall resource effectiveness or efficiency of a data centre, a holistic suite of metrics is required. This part of ISO/IEC 30134 specifies power usage effectiveness (PUE), which has become a popular metric to determine the efficient utilization and distribution of energy resources within a data centre.