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Information technology — Data centres key performance indicators —

Part 9: Water usage effectiveness (WUE)

*Technologies de l'information — Indicateurs de performance clés des
centres de données —*

Partie 9: Efficacité dans l'utilisation de l'eau (WUE)



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Foreword

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Introduction

The global economy is today 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 information and communications technology hardware. 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 processing and storage are directly linked to increasing power consumption.

With this background, data centre growth, and power consumption in particular, is an inevitable consequence; this 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 water) and the reduction of CO₂ 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.

Water usage effectiveness (WUE) is intended to support data centre practitioners in obtaining an in depth understanding of the performance of the data centre’s cooling installation in comparison with similar systems, thereby creating a tool for improving the sustainability of the data centre. The impact of operational water usage is emerging as being extremely important in the design, location and operation of current and future data centres.

In order to determine the overall resource efficiency of a data centre, a holistic suite of metrics is required. This document is one of a series of International Standards for such KPIs and has been produced in accordance with ISO/IEC 30134-1, which defines common requirements for a holistic suite of KPIs for data centre resource efficiency. This document does not specify limits or targets for the KPI and does not describe or imply, unless specifically stated, any form of aggregation of this KPI into a combination with other KPIs for data centre resource efficiency. This document presents specific rules on WUE’s use, along with its theoretical and mathematical development. This document concludes with several examples of site concepts that could employ the WUE metric.