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**Information technology — Data  
centres key performance indicators —**

**Part 6:  
Energy Reuse Factor (ERF)**

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

*Partie 6: Indicateur de réutilisation de l'énergie (ERF)*





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CP 401 • Ch. de Blandonnet 8  
CH-1214 Vernier; Geneva  
Phone: +41 22 749 01 11  
Email: [copyright@iso.org](mailto:copyright@iso.org)  
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Published in Switzerland

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## Foreword

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This document was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 39, *Sustainability, IT and Data Centres*.

A list of all parts in the ISO/IEC 30134 series can be found on the ISO and IEC websites.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html) and [www.iec.ch/national-committees](http://www.iec.ch/national-committees).

## 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 and, with less than half of the world's population having access to an internet connection (in 2014), 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 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 the reduction of CO<sub>2</sub> emissions essential.

Within the ISO/IEC 30134 series, the term “resource usage effectiveness” is 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.

The energy reuse factor (ERF) provides the data centre practitioner with greater visibility into energy efficiency in data centres that make beneficial use of any reused energy from the data centre.

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 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. The document presents specific rules on ERF's use, along with its theoretical and mathematical development. The document concludes with several examples of site concepts that can employ the ERF metric.