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Measuring the digitalisation of electricity distribution systems in Europe: towards the smart grid

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Abstract-

This paper proposes a set of digitalisation indicators focused on measuring the different digital capabilities and infrastructure of electricity distribution systems, as opposed to previous indicators which have mainly focused on performance and quality of service aspects.
The indicators are classified according to the pillars of digitalisation: sensor and actuator, connectivity, data processing, and digital culture. They are use-case-agnostic and do not require a huge amount of information. In addition to this, three possible new applications of these indicators for distribution system operators and regulatory authorities are identified and discussed.
The extensive use of these indicators in Europe could allow the development of fruitful collaborations between distribution system operators, allow the identification of cause–effect relations between grid performance and digital infrastructure, and improve the replicability of innovative smart grid solutions. However, this will only be possible if regulators promote the adoption of the proposed indicators and the dissemination of their results.

Index Terms- Smart grid; Digitalisation; Distribution system operator; KPIs; Indicators

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