

Why should the wind energy industry use financial KPIs?

This should be a common goal of the wind energy industry and academia for the future. All discussed financial KPIs fulfil the necessary properties and can be used as they are, allowing to reveal variations in the financial status of the asset. An overview over the proposed indicators and their properties can be found in Table 2. Table 2.

What is a wind farm operator?

Wind Farm Operator The WF operators' main interest is to maximise the revenue of the WF and hence the energy production throughout Elena Gonzalez et al. / Energy Procedia 137 (2017) 559-561 Gonzalez et al. / Energy Procedia 00 (2017) 000-000 3 the lifetime of the project.

Who owns a wind power project?

The Investor Investors and banks can partially or completely own the WF. They are mainly interested in the economic and financial aspects of the wind power project development, including information about production, efficiency, future expectations, costs, debt, profits and current value of the asset.

How reliable is a wind turbine?

Applied to a WT, its reliability can be defined as its ability to perform properly, without failures, during specified site wind conditions for the whole lifetime (defined to be at least 20 years) or in a specific time window. WT reliability is compromised by component failures, leading to downtime.

Is the denominator a useful indicator for evaluating WF operational efficiency?

Since the denominator is a constant, it does not represent the theoretical energy production according to real on-site wind conditions. Although it is a valuable indicator during feasibility and wind project development stages, we believe it is not an effective indicator for evaluating WF operational efficiency.

Who buys wind energy?

Utility and Grid Operator According to the European grid codes, all the energy produced from wind has to be bought by an electrical companies, i.e. a utility. This stakeholder is usually interested in the energy production of the WF, the future expectations of production and the electricity price.

Operational managers of wind turbines usually monitor a big set of turbines and thus need highly condensed information to identify underperforming turbines and to prioritize their work. Key performance indicators (KPIs) are a solid and frequently used tool for this purpose. However, the KPIs used in the wind industry are not unified to date ...

This paper presents a review of the major existing indicators used in the O&M of wind farms (WFs), as such

information is not available in the literature so far. The different ...

The studied power system is composed of the utility grid and the wind farms. In the utility grid, there are N synchronous generators connected to the system that includes power users and other necessary power equipment. The wind power generation system consists of M wind farms, and they may locate in

growing interest in optimising operations makes wind farm (WF) operation and maintenance (O& M) a new challenging field of study. The use of key performance indicators (KPIs) is one of ...

In the rapidly evolving world of wind farm development, understanding the essential 9 KPI metrics is crucial for success. From energy production efficiency to job creation metrics, each metric provides valuable insights that can dramatically influence decision-making and profitability. Discover how to accurately calculate these KPIs and drive your wind energy ...

DOI: 10.1016/J.EGYPRO.2017.10.385 Corpus ID: 116352177; Key performance indicators for wind farm operation and maintenance @article{Gonzalez2017KeyPI, title={Key performance indicators for wind farm operation and maintenance}, author={Elena Gonzalez and Emmanouil M. Nanos and Helene Seyr and Laura Valdecabres and Nurseda Y. Y{\"u}r{\"u}?en and Ursula ...

Wind farms, however, must reach grid parity, where large-scale power generation costs are equal to or cheaper than current methods, for their integration to be economically viable. Nevertheless, the intermittent nature of wind power poses a potential risk to the reliability of power systems.

The comprehensive evaluation results of wind farms power generation performance (CRITIC weighting method). - "Power Generation Performance Indicators of Wind Farms Including the ...

This communication discusses the two parameters recently emerged as key performance indicators of wind energy facilities, the mean capacity factor over a year, and the standard deviation of the capacity factor from a high-frequency sampling of 1 min or less (the annual mean does not change if the sampling interval of the statistical population is every ...

Wind farm power generation performance evaluation is used to quantitatively evaluate the actual power generation performance and its deviation from the ideal power generation performance ...

Download scientific diagram | The calculation results of comparative indicators of wind farms. from publication: Power Generation Performance Indicators of Wind Farms Including the Influence of ...

1 Introduction. Wind power is developing rapidly in China. By the end of 2017, new installed capacity of wind power generation in China reached 19.66 GW, cumulatively, and the installed capacity has reached 168.2 MW [], ranking first in the world bsequently, the complexity of wind power system has been significantly increasing.

Wind farm power generation indicators

Objectives of the study. This paper provides a comprehensive LCA of an onshore wind farm under development in Aotearoa New Zealand, and more specifically contributes to updating the environmental performance of onshore wind systems by considering the PMS-DD technology and a nominal capacity of 4.3 MW for the individual wind turbines, as ...

The accurate evaluation and fair comparison of wind farms power generation performance is of great significance to the technical transformation and operation and ...

The short-term model forecasts the wind power generation in the next 4 to 24 h, and formulates the day-ahead market dispatch plan. ... indicators such as MACD and KDJ are derived from preprocessed ultra-short-term wind power data. For the LSTM network, wind power technical indicators, historical power data, and future wind speed data are used ...

Key performance indicators (KPI) are tools for measuring the progress of a business towards its goals. Although wind energy is now a mature technology, there is a lack of well-defined best practices to assess the performance of a wind farm (WF) during the operation and maintenance (O& M) phase; processes and tools of asset management, such as KPIs, are ...

From the point of view of the power system, wind turbines can be regarded as production assets with an average power corresponding to 20 to 40% of the rated power, with peaks that are three to five times higher. Wind power performance indicators are related to the principal wind turbine specifications, that is rated power, and rotor diameter.

The quality performance indicator reflects the design and manufacturing quality of WTs and the WF layout Zaki (). The availability performance indicator depends, for the most part, on the reliability, maintainability and supportability of the wind farm IEC and Naseri and Barabady (), and the capacity performance indicator reflects the maximum power delivered by ...

During the past decade, wind power generation has been rapidly developed. As a key component of feasibility analysis, the cost modelling and economic analysis directly affect the construction of ...

Economic analysis methods based on the life cycle cost modelling and economic evaluation indicator play an important role in the feasibility analysis of wind power projects, and are widely used in the analysis of wind farm construction [25], [26], [27], wind farm repowering [28], [29], [30] and wind farm optimization [31], [32], [33]. These methods divide all ...

Phases 1 and 2 of the Bangui Bay wind farm are located on a 9km stretch of shoreline, where 20 turbines from Vestas of Denmark are arranged in a perfect arc. ... INEC is located at the end of the Luzon grid, meaning voltage fluctuations can be more common, so embedded power generation is needed to counteract the effects of being on the far end ...

Wind farm power generation indicators

Wind Farm Power Generation Performance Evaluation Indicator System. 2.1. The Design Principle of Indicator System. Wind farm power generation performance evaluation indicator system is the foundation for the quantitative evaluation and fair comparison of power generation performance among different wind farms. In order to objectively, truly ...

Downloadable! The accurate evaluation and fair comparison of wind farms power generation performance is of great significance to the technical transformation and operation and maintenance management of wind farms. However, problems exist in the evaluation indicator systems such as confusion, coupling and broadness, and the influence of wind energy ...

Wind energy, in particular, has emerged as a vital player in India's quest for sustainable power generation. ... Beyond Electricity Generation. Wind energy farms in India offer a multitude of benefits that extend well beyond their primary function of electricity generation. These farms play a pivotal role in shaping a sustainable and greener ...

Initially, the wind power island is a dead system, and therefore, the location of the self-starter, as well as the energisation strategy, are fundamental for a resilient black start strategy. Once energised by the self-start unit, the OWF is working as a wind farm power island, which is a very weak grid . Once the system is stable and ready ...

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