

How reliable is the proposed microgrid system?

Moreover, the reliability assessment of the proposed microgrid system is also carried out with the following results: EENS = 46.9485 kWh/yr, LOLE = 34.1081 h/yr and LOLP = 0.003904. The reliability of the microgrid system under consideration can be improved with the integration of the WTG, PV and ESS as presented in Table 7.

How to evaluate the reliability of a microgrid design?

To evaluate the reliability of the proposed design, reliability concepts for power system application can serve as a basis to which the microgrid-specific aspects can be added. To estimate the significance and the severity of the events leading to the system interruptions, a quantitative reliability analysis is necessary.

Why is reliability optimization of microgrids important?

See further details here . Clean and renewable energy is the only way to achieve sustainable energy development, with considerable social and economic benefits. As a key technology for clean and renewable energy, it is very important to research the reliability optimization of microgrids.

What are the reliability indices of the proposed microgrid system?

This has further enhanced the reliability indices of the proposed microgrid system such as EENS, LOLE and LOLP with the following values:  $1.3455 \times 10^{-2}$  kWh/yr,  $4.982 \times 10^{-3}$  h/yr and  $5.70 \times 10^{-7}$ .

How can the results of a microgrid analysis be used?

The outcomes of the given analyses can, therefore, be used in the development of the new guidelines for microgrid design. To do so, it is necessary to extend the aforementioned analysis to provide complete and extensive information on the power electronics interactions and reliability impacts on the microgrid system.

What impact will power electronics reliability have on microgrid design & planning?

It is expected that the future microgrid systems will be heavily dominated by the renewable-based, power electronics-interfaced units. In such case, power electronics reliability will have significant impact on microgrid design and planning.

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The integration of renewable energy (RE) and electric vehicles (EVs) into microgrids enhances energy

sustainability, but their variability complicates capacity planning. Therefore, a capacity ...

Before the implementation and deployment of the microgrid technology, it is always advisable to perform both reliability analysis, as well as, techno-economic analysis. Since the results obtained from these two analyses ...

This paper performs reliability, economic, and environmental analysis of microgrid systems: It does not suggest a method to make a resilient microgrid system : In this work, ...

The effect of addition and removal of different distributed generation units on the overall reliability of the system is analysed using Markov approach. Also, techno-economic analysis of different ...

The results obtained from the sensitivity analysis show that the economic, environmental and reliability performances of the proposed microgrid system depend on: Fuel price fluctuations. Changes in the prices of ...

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Wang et al. proposed a series of reliability and economic evaluation indicators, including reliability parameters for isolated MGs, customer-based reliability indexes for MGs, economic indexes for MGs, indexes for DG ...

Reliability, economic and environmental analysis of a microgrid system in the presence of renewable energy resources. / Adefarati, T.; Bansal, R. C. In: Applied Energy, Vol. 236, ...

miscoordination) plays a vital role in reliability evaluation of the microgrid. In this work, these effects are also considered while evaluating the overall reliability of microgrid. Further, hybrid ...



# Microgrid reliability and economic analysis

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