



Residential DC Nanogrid System

Centralized residential DC nanogrid minimizes conversion losses while managing generation, storage, and integration with AC.

Researchers at Purdue University have developed a centralized DC power distribution system capable of regulating DC power generation, distribution, and storage while also integrating with existing AC infrastructure. This technology is intended for use in residential nanogrid systems to minimize losses associated with AC/DC and DC/AC conversions. As localized renewable DC energy sources (ex. Solar panels) become more common, this system offers a more efficient and consolidated solution for energy management within a residential home.

Advantages

- Improved efficiency via minimization of conversion losses
- Able to manage power generation, storage, and distribution for a home
- Capable of integrating with existing AC infrastructure

Applications

- Energy distribution
- Renewable energy
- Residential power management
- DC Nanogrid

Technology Validation: This concept has been validated through the design of a nanogrid system based on the electrical loads of an experimental DC Nanogrid house located adjacent to Purdue University's campus in West Lafayette, IN.

Related Publication:

Technology ID

2021-ORE-69439

Category

Energy & Power Systems/Grid
Modernization & Smart Grids

Authors

Eckhard Groll
Jonathan Paul Ore
Philip Teague
Frank Teague III

Further information

Parag Vasekar
psvasekar@prf.org

View online



J. P. Ore and E. A. Groll, "Analysis of a Residential House for the Design and Implementation of a DC Nanogrid," 2020 IEEE PES Innovative Smart Grid Technologies Europe (ISGT-Europe), The Hague, Netherlands, 2020, pp. 749-753, doi: 10.1109/ISGT-Europe47291.2020.9248788.

TRL: 3

Intellectual Property:

Provisional-Patent, 2022-07-28, United States

Utility Patent, 2023-07-28, United States

Keywords: DC power, Nanogrid, Power, power distribution, Power Management, Renewable Energy