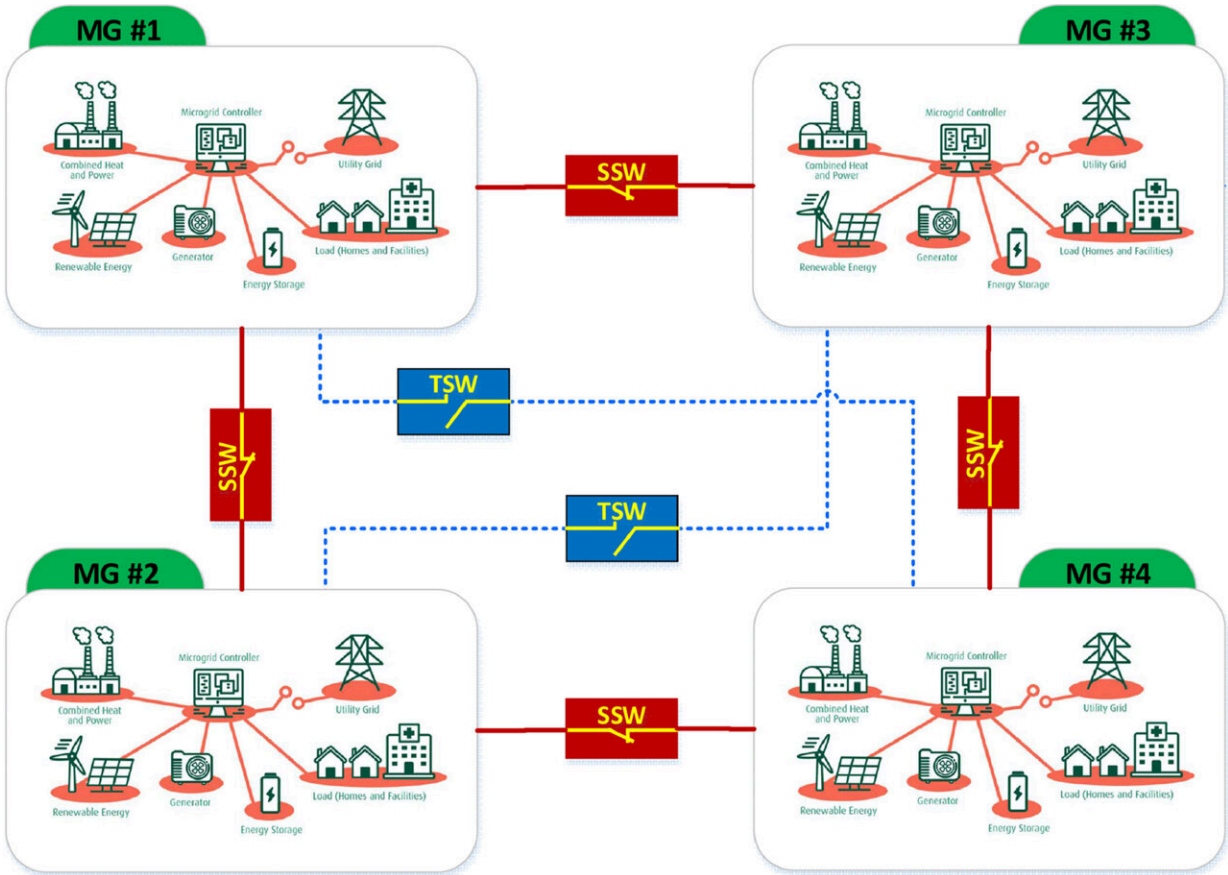


Microgrids could help solve challenges of renewable energy

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A reconfigurable multi-microgrid system. Credit: *Electric Power Systems Research* (2024). DOI: 10.1016/j.epr.2024.110285

Renewable energy is the way of the future, but issues such as variability

and surplus generation have so far created headaches in the move to fully utilizing these energy solutions. New research led by Murdoch University, School of Engineering and Energy, Associate Professor Ali Arefi has found that using interconnected scattered microgrids may be the answer.

"There are challenges associated with the intermittent nature of both energy demands and [renewable energy](#) sources that cannot be handled in traditionally designed [power grids](#)," Associate Professor Arefi said.

"Our new research suggests that interconnected scattered multi-microgrids may be the way of the future.

"Microgrids, are small-scale power systems powered by clean energy. By creating a system to efficiently exchange power among the microgrids, we can mitigate variability in load demand and renewable energy source generation.

"This new system could help us maximize the use of renewable energy sources, like solar and wind power, and efficiently integrate electric vehicles (EVs) in microgrids for enhanced sustainability.

"This would reduce our reliance on fossil fuels, maximize the use of renewable energy sources and help us to replace [fossil fuels](#) by clean energy resources as we fight against climate change."

The research team introduced the concept of a "reconfigurable multi-microgrid system."

This idea involves connecting different small microgrid systems to support each other when needed. By coordinating the links between microgrids based on system requirements, [technical challenges](#) can be addressed, and operational costs reduced.

The approach not only facilitates the use of [clean energy](#) but also enhances the reliability and cost-effectiveness of the entire system, resulting in affordable energy costs for end-users.

"The end goal is to speed up the shift to a future where we produce almost no [carbon emissions](#), making our planet greener for everyone," Associate Professor Arefi said.

"The findings of this research have the potential to revolutionize the way renewable energy and EVs are integrated into microgrids."

The full study is [published](#) in *Electric Power Systems Research*.

More information: Ali Azizivahed et al, Stochastic scheduling of energy sharing in reconfigurable multi-microgrid systems in the presence of vehicle-to-grid technology, *Electric Power Systems Research* (2024). [DOI: 10.1016/j.epsr.2024.110285](https://doi.org/10.1016/j.epsr.2024.110285)

Provided by Murdoch University

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