

Recent and Future Research on Microgrid Clusters

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Abstract

Electricity systems around the world are experiencing a radical transition as the consequence of replacing fossil fuels, used for electricity production, by sustainable and cleaner energies. The growing penetration of renewable energies requires smarter techniques capable of handling the uncertainties of these intermittent sources. Along with this change, traditionally centralized power systems are also converting into distributed self-sufficient systems, often referred to as microgrids, that can operate independently. This talk will focus on remote area microgrids as a hot research topic in Australia and Southeast Asia that have hundreds of remote and off-grid towns and communities, and islands. It is expected that remote area microgrids will strongly benefit these remote locations in the forthcoming years. This talk will briefly introduce the progress of research in this field around the world and Australia, and will also discuss some of the technical challenges associated with interconnection of neighbouring microgrids as a key step to improve their survivability in the course of unexpected imbalances between the demand and the available generation from intermittent renewable resources.

Keywords: *Microgrid Clusters, cleaner energies, renewable energy.*

Short biography



A/Professor Farhad Shahnia received his PhD in Electrical Engineering from Queensland University of Technology (QUT), Brisbane, in 2012. He is currently an A/Professor at Murdoch University. Before that, he was a Lecturer at Curtin University (2012-15), a research scholar at QUT (2008-11), and an R&D engineer at the Eastern Azarbayjan Electric Power Distribution Company, Iran (2005-08). He is currently a Fellow member of Engineers Australia, Senior Member of IEEE, and member of the Australasian Association for Engineering Education.

Farhad's research falls under Distribution networks, Microgrid and Smart grid concepts. He has authored one book and 11 book chapters and 100+ peer-reviewed scholarly articles in international conferences and journals, as well as being an editor of 6 books.

Farhad has won 5 Best Paper Awards in various conferences and has also received the IET Premium Award for the Best Paper published in the IET Generation, Transmission & Distribution journal in 2015. One of his articles was listed under the top-25 most cited articles in the Electric Power System Research Journal in 2015 while one of his 2015 journal articles has been listed under the top-5 most read articles of the Australian Journal of Electrical and Electronics Engineering. He was the recipient of the Postgraduate Research Supervisor Award from Curtin University in 2015 and the Australia-China Young Scientist Exchange Award from the Australian Academy of Technology and Engineering in 2016.

Farhad is currently a Subject Editor, Deputy Subject Editor, and Associate Editor of several journals including IEEE Access, IET Generation, Transmission & Distribution, IET Renewable Power Generation, IET Smart Grid, IET Energy Conversion and Economics, and International Transaction on Electrical Energy Systems and has served 35+ conferences in various roles such as General, Technical, Publication, Publicity, Award, Sponsorship, and Special Session Chairs.

Farhad is currently the Chair of the IEEE Western Australia Section and a member of IEEE's Industrial Electronics Society (IES)'s Technical Committees of Smart Grid and Energy Storage