



Green power maximization in distributed generation environment through an energy optimization framework

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Abstract:

The use of renewable energy is getting widespread application due to the advancements in related technologies and realization of climate change effects. The emerging smart grid scenario entails distributed generation of energy comprising renewable and non-renewable sources. Localized generation of green energy through solar and/or wind farms is consequently becoming popular. In such a scenario maximum utilization of green (renewable) energy sources is desirable by the utility. A mathematical framework has been developed in this paper that ensures maximum use of renewable energy by the smart grid. The utility function ensures preference to green (solar/wind) sources by assigning a penalty factor to the energy cost of conventional sources. The problem is scalable to n number of sources and considers four basic types of energy sources i.e., green utility, conventional utility, green local, conventional local. The non-linear problem is linearized through McCormick approximation and solved through interior point method for giving optimum results while considering the availability of different types of sources.

*We calculate ANE (Watt-hour) multiplying the streamflows (m³ per second) X turbines efficiency (%) X hydraulic head (m). We estimate ANE for each reservoir hydro-power plants of the Brazilian electricity sector.

Biography:

Dr Faran Ahmed is an Electrical Engineer by profession and heads the Faculty of Engineering at Hajvery University, Lahore, the metropolitan city of Pakistan. He holds a doctorate in Electrical Engineering, with specialization in wireless communication. He has a diverse experience encompassing public sector, industry and academia, spanning three decades of rich involvement in technology. His research interests include ICTs, renewable energy and technology management. He is also passionate about



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Publication of speakers:

1. F. A. Ahmed, I. M. Naeem, Muhammad, and A. Anpalagan, "Renewable energy assisted base station collaboration as micro grid," in In Proceeding of IEEE Electrical Power and Energy Conference. Ottawa, Canada: IEEE, 2016.
2. M. Deshmukh and S. Deshmukh, "Modeling of hybrid renewable energy systems," *Renewable and Sustainable Energy Reviews*, vol. 12, no. 1, pp. 235–249, 2008.
3. X. Fang, S. Misra, G. Xue, and D. Yang, "Smart grid", the new and improved power grid: A survey," *Communications Surveys & Tutorials*, IEEE, vol. 14, no. 4, pp. 944–980, 2012.
4. J. Xu, L. Duan, and R. Zhang, "Cost-aware green cellular networks with energy and communication cooperation," *Communications Magazine*, IEEE, vol. 53, no. 5, pp. 257–263, 2015.
5. J. Leithon, T. J. Lim, and S. Sun, "Energy exchange among base stations in a cellular network through the smart grid," in In IEEE ICC, 2014, pp. 4036–4041.

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