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An architecture to negotiate and monitor energy exchanges in the smart microgrid

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Abstract

Traditional electrical power sources and their long distribution networks can no longer cope with the ever-increasing need for energy. Distributed energy generation in close geographical proximity to the consumption point is an alternative approach to energy provisioning. The complexities introduced by this approach require an advanced management system. The smart microgrid addresses this need. A second need identified in developing regions is for a management system that is both affordable and non-proprietary. This paper presents a smart microgrid architecture, based on open-source platforms, that addresses these needs. The architecture is explained by means of a use case. A database design is given with tables to reflect the contracts and associated energy exchanged between producers, consumers, and energy store devices.