

Implementation of Agent Balance Optimization for Real Microgrids

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Abstract— In this study, an optimization model is proposed for Agent Balance component of Secondary Control level. The Agent Balance is responsible for calculating the relevant set points based on information from tertiary control level and information about the microgrid and sending them to the respective agents of the primary control level. The main idea of this optimization model is to resolve errors between the forecasted and real time data at every predetermined time intervals in order to determine the dispatch of resources according to the proposed objectives such as minimizing load shedding, maximizing load dispatch and reliability, providing frequency, voltage stability.

This proposed model will be implemented in 3DMicroGrid which is an ERANETMED funded project aiming towards designing and developing a microgrid framework, ideally including a pilot proof of concept implementation at a university campus in Malta or Jordan. The project is a collaborative effort with university and industry partners from Jordan, Malta, Germany, Turkey, Spain, Cyprus, Algeria, and Greece.

Our simulations will demonstrate the robust performance of the proposed system and results of the optimization of the pilot microgrid used in 3DMicroGrid will be presented.

Keywords—Dynamic energy management, microgrid, optimal control, secondary control

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