

DIPLOMA THESIS EVALUATION OPPONENT EVALUATION

Author name: Bc. Pavel Vedel

Thesis title: Modeling and real time optimization of a smart microgrid

Opponent: Ing. Nikita Zemtsov, PhD

Opponent workplace: Eaton European Innovation Center (EEIC)

A. Abstract quality, keywords matching	Excellent (1)
B. Research scope and processing	Excellent (1)
C. Level of theoretical part	Excellent minus (1-)
D. Appropriateness of the methods	Excellent (1)
E. Results elaboration and discussion	Excellent minus (1-)
F. Students own contribution	Excellent (1)
G. The conclusion statement	Excellent minus (1-)
H. Fulfillment of Thesis tasks (goals)	Fulfilled
I. Structure, correctness and fulness of references	Excellent (1)
J. Typographical and language level	Very good (2)
K. Formal quality (text structure, chapters order, clarity of illustrations)	Very good (2)

Comments, remarks

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Overall assessment:

Rapidly increasing share of renewable (uncontrollable) energy sources motivates research in the area of modeling and real-time optimization of energy (smart) grids, microgrids, and its components, thus motivating this work.

The author demonstrates good understanding of the topic including both modelling and optimization parts, which is evident from the theoretical part and high number of cited literature.

The main benefit of the work is the proposed Economic Model Predictive Controller that performs real-time optimization of a smart microgrid. Verification of the optimal control strategy is performed via simulations in Matlab Simulink. The controller provides optimal regimes for controllable components and reduces the operational cost of the microgrid.

Despite good overall assessment, some parts of the work are slightly unclear and require more detailed explanation. E.g. practical reasoning for the microgrid structure, influence of simplifying assumptions on the model accuracy (microgrid model verification), and/or comparison of the investment costs to the achieved savings.

Questions for the defense:

1. What could be another potential source of increasing the savings without significant investments in residential domain that could be included into the optimization problem?
2. What will/can happen to the consumption profile if the real-time electricity pricing is introduced in the grid? How it will influence the consumption predictive model?

Overall classification:

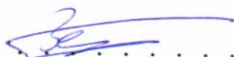
Work meets the Master degree requirements and therefore I recommend it for defense

I suggest to classify this work by grade Excellent minus (1-)

In Prague

date 13.05.2019

By signing I certify that I am not in any personal relationship with the author of the thesis



Opponent signature