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Project Title: Evaluation of the customers' baseline estimation methods and revise the regulation entitled "Enhancement of the participation of the residential and commercial customers in load management programs in the presence of DR aggregators"

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Project Financial Code:	169001	Project Quality Code:	(Font:Times New Roman 10)
Type of Project/Program:	Based on an agreement	Assistant:	Distribution Research Centers

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Keywords: Demand Response, Measurement and Verification, Base-load estimation, Load Management, Averaging Method, Estimation pillars.

Project Necessity:

Baseline estimation/Customer Base Load (CBL) evaluation methods are the ways to measure the real potential of Demand Response (DR) programs. The success level of DR programs could be determined using these approaches by estimating the customers' load levels. Indeed, CBL could be considered as an expected load level index.

CBL calculation has a key role to evaluate the performance of DR programs. DR programs are activities taken by customers to adjust their electricity consumption patterns in order to mitigate the volatility of electricity market's prices; or reliability problems on the electricity network.

Therefore, a successful implementation of DR depended to the identification of the CBLs. Baseline estimation is to evaluate the electricity demand levels if customers have not received DR calls. Indeed, CBLs are required to measure and verify the performance of DR.

Project Goals:

The investigation of the baseline estimation methods is addressed in this project. Hence, a comprehensive study is done to identify different baseline estimation methods. Then, the performances of some of the averaging-based methods are evaluated using the real data from the Tehran Province Electricity Distribution Company (Load data of Spring, Summer, and fall in 1399 is used). To this end, a calculation tool is developed for the estimation of the CBLs

using 44 averaging-based methods. Finally, the existing regulation (“Enhancement of the participation of the residential and commercial customers in load management programs in the presence of DR aggregators”) is revised based on the feedbacks from the implementation experiences in the first year and the relevant explanations are provided.

Abstract:

Successful implementation of demand response (DR) programs needs to estimate the customers’ baseline (CBL). CBL estimation means to evaluate the electricity consumption if the customers have not participated in DR programs. Indeed, the CBL evaluates the effective load reduction values due to the participation of the customers in DR programs. However, the main challenge is to accurately determine the CBL, since the consumption level could be affected by various phenomena such as the season, weather, etc. In addition to the accuracy, there are other factors that should be considered, such as the simplicity of the selected approach. Since the evaluation of the customers’ baseline is essential to evaluate the real potential of the DR programs, the main goal of this project is to investigate the CBL estimation methods. Moreover, revising the existing regulation (“Enhancement of the participation of the residential and commercial customers in load management programs in the presence of DR aggregators”) based on the feedbacks from the experiences in the first year of implementation is done in this project.

Steps and Methodologies:

- Identify different baseline estimation methods;
- Evaluate the performance of averaging methods using the real data of the Tehran Province Electricity Distribution Company;
- Revise the existing regulation (“Enhancement of the participation of the residential and commercial customers in load management programs in the presence of DR aggregators”) based on the feedbacks from the experiences in the first year of implementation.

Main Results (technical outputs, patents, papers, books, reports, etc.):

- Technical reports;
- Calculation tool to evaluate the CBLs using 44 different averaging-based methods;
- Revised version of the regulation, entitled “Enhancement of the participation of the residential and commercial customers in load management programs in the presence of DR aggregators”.