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Alireza Fereidunian (*IEEE M 2002, SM 2019*) is an Assistant Professor at the K. N. Toosi University of Technology, Tehran, Iran. He received his PhD and MSc from University of Tehran, in 2009 and 1997, where he is still a Postdoctoral Research Associate. Dr Fereidunian has been working at Imperial College London and Aalto University (former Helsinki U of Tech) as visiting researcher/scientist.

His research interests include smart grid, smart home, smart city, data analytics in energy systems, distribution automation, and high-reliability energy distribution systems. Alireza has served as a technical consultant to energy distribution companies for almost ten years on asset management, automation, and data analytics. He has (co-/)authored more than 200 research and tutorial educational papers in journals, conferences and magazines.

Dr Fereidunian has served as Young Professionals Officer of IEEE Iran-Section, Membership Development Officer of IEEE Iran-Section, and Treasurer, Iranian Society of Smart Grid (ISOSG).

Talk: Smart Energy-Aware Cities

Energy awareness is the essence of energy efficiency, since control and management needs awareness. Energy management systems aim at economic efficiency and environmental protection by reducing CO2 and heat emissions.

In essence, the energy awareness concept can be regarded by two approaches: micro approach for the end user and macro approach for the energy management system. In micro approach, the awareness of the end users towards the energy consumption is considered, while in macro approach the awareness of the energy management system regarding the end users' energy consumption pattern is studied.

Energy awareness is technically enabled by advanced metering infrastructure (AMI), which improves the quality of metering and transferring the energy consumption data in the energy delivery system. Such quality data acquired from a bidirectional infrastructure is a highly instrumental in increasing energy awareness in smart cities. The bidirectional communication infrastructure provided by AMI increases the customers' awareness about their consumption behavior, i.e. the mentioned micro approach.

The accurate customer characterization using AMI data is a practical point in increasing energy awareness in the smart cities, especially when trying to engage the customers to be actively participate in energy management, technically known as demand response (DR) programs. The role of AMI in DR programs is embossed when customers are regarded as influencing participants in these programs, an instance of the bottom-up micro approach to energy awareness leading to a macro effect.

This talk is focused on investigating the role of AMI in improving demand response (DR) by costumer characterization in distribution network.