Intelligent use of energy Storage in Energy Management System for buildings (INSEMS)

Gap Analysis:

INSEMS will be a collaborative project between Pakistan and Turkey aiming to use application-oriented approach for an intelligent control of energy storage in buildings with particular focus on local energy requirements and solving associated challenges. The target is to provide a cost economic and optimized solution to the buildings while promoting renewable energy, providing reliable power supply and helping distribution system by providing ancillary services in terms of voltage and frequency support. Energy storage is a key technology that can provide an uninterrupted and reliable energy supply. However, it is challenged by the uncertain power generation from renewable energy sources and forecast accuracy of energy consumption. This is aggravated by the less reliable grid supply thus prompting the buildings to plan alternate sources of energy for either back-up or as continuous support. Often the alternate supply comes as diesel or fossil fuel generators that are expensive, have environmental emissions and require frequent maintenance. Energy storage can provide valuable support and is increasing replacing the fossil fuel-based backups for buildings. However, the control system of such energy storage systems is generally not flexible, are expensive and have less provisions to provide ancillary services the grid. This project aims to fill this vacuum.

Academic organizations from both countries shall be involved in performing research and development for a prototype controller development that will have a distinct forecasting and optimization module. The prototype level of testing shall be performed at academic side, that will help in developing competences at education. The industrial partners involved shall be closely participating in this process by providing the specifications and testing of the prototype with the practical challenges. Industrial partners shall prepare the platform for the validation of the proposed solution in the field and will be responsible for the design of the interface to the controller.

Industrial Partner:

Austrian Institute of Technology

- 1 BS thesis: Energy Metering on Multiple Buildings and Loggin on central console
- 1 MS thesis: Management and Optimization of energy consumption and selective load shedding for achieving global optimal solution