

# Master Project

## Industrial Load Dynamic Modelling Using Field Measurements

**Introduction:** The conventional architecture of power system is changing from unidirectional power flow to bidirectional power flow, which not only challenges the network stability but also control of power system integrity of power generation, transmission, distribution and loads. Therefore, the power generation will be more relying on renewable energy sources (RES) predominantly by solar and wind units, which are desired to operate continuously despite are dependent on weather condition. In order to balance the power generation and consumption, active load variation is presented as a promissory approach. With such a scenario, accurate loads dynamic models play vital role to study of demand side management.

Load modeling is essential to power system analysis, planning, and control. Loads are modelled either by their exact parameters or by estimating the parameter through field measurements [1]. The exact parameters are normally confidential and only known by manufacturers. Therefore, Parameter estimation through field measurement provides reasonable results that can be applied for research and simulation purposes.

**Tasks:** Within this project, it is desired to develop a method to identify the load parameters through field measurements that can simulate an industrial load behavior under operation. The following tasks are intended to be carried out:

- Literature review on load type and their role in power system
- Identifying the essential load parameter
- Developing an algorithm/approach to identify and estimate the parameters through field measurements
- Building the model in PowerFactory (DigSilent) simulation software in DSL (DigSilent Simulation Language)
- Validating the model within a given grid by studying voltage/frequency quality in a RMS environment

### Requirements:

- Electrical power engineering background
- Interest in power managements/system
- Basic knowledge of power system simulation software and a programming language
- Interest in modelling and parameters identification

## References

- [1] A. Arif et al. "Load Modeling—A Review". In: *IEEE Transactions on Smart Grid* 9.6 (2018), pp. 5986–5999.