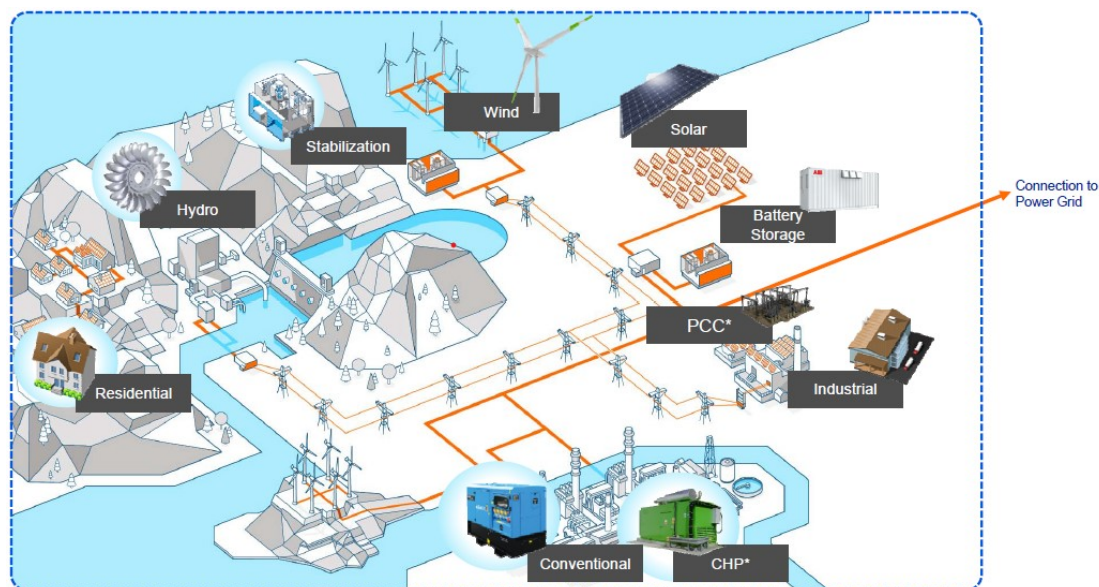


EENX15-21-03 Microgrids: Barriers, Drivers, and Design

Bakgrund



The distribution grid is experiencing a drastic change in the past 20 years from a passive grid that delivers electricity to consumers to an active distribution grid where local generation, such as wind turbines and solar PVs, is expected to play an active role in the daily operation and control of the grid. Furthermore, consumers and prosumers are also encouraged to take a proactive role by providing flexibility resources back to the grid. To take a step further, microgrids, where the distribution grid is able to operate in island mode without the main grid, is growing to become a cost competitive solution for fulfilling grid reliability requirement and tackling bottleneck in grid capacity. It takes about 10 years to build another high voltage power line, but it takes about 2 years to build a microgrid. In recent years, Sweden has also started to evaluate the microgrid solution, including the well-known Simris microgrid pilot project. However, the development of microgrids has been slow due to various reasons.

This project is nominated for the bachelor thesis award by Elkraftrådet

ELKRAFTRÅDET
vid Chalmers Tekniska Högskola

Problembeskrivning

This project is to first investigate the barriers and the drivers in Sweden for distribution grids to adopt microgrid solutions. This will be followed by a review on international microgrid projects implemented and related standards. In the end, the project will evaluate the role of different energy storage technologies for designing a cost efficient microgrid.

1. Review existing regulation and identify limitations and potential drivers in the deployment of energy storage and implementation of microgrid in distribution system in Sweden, including the newly discussed concept on citizen energy community at the European level.
2. Review of international standards and commercial projects on microgrid operation to identify business cases and models for microgrid projects.
3. Evaluate the role of different types of energy storages for microgrid applications, and how that affect the cost-effective design of a selected type of microgrid.

Målgrupp: TKAUT, TKMAS, TKELT, TKDAT, TKTFY,

Gruppstorlek: 3–6 studenter.

Antal grupper: 1

Förkunskapskrav:

Kontaktperson: Peiyuan Chen, peiyuan@chalmers.se

The thesis report should be written in English. You will be part of the research team on Operation and Control of Active Grids at Chalmers. The thesis will be in collaboration with Hitachi ABB Power Grids.

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