S3C related keywords:

- Understanding the target groups
- End user feedback

"Since industry alone is a major consumer of energy, a wide adoption of smart grid technologies in the industry sector can bring significant benefits to the overall energy system."

Project Summary

KIBERnet is a top-down project aimed to develop a prototype system for automatic control of industrial loads and dispersed electrical generation on the power distribution grid. The project's objective is a novel service designed for distribution system operators, which would introduce it to their industrial consumers and producers of electricity. The purposes of the service are:

- reduce costs of balancing the mismatch between planned and produced electricity
- reduce the need for investments for the amplification of the power grid
- increase security and reliability of the power distribution grid operation
- generate economic benefits to industrial consumers/producers
- enable efficient energy consumption
- enable large integration of dispersed electricity production units

Within the scope of the project new technological solutions and measures have been implemented:

- innovative algorithms of computer control and regulation
- optimization algorithms
- friendly design of the user interface

What sets this project apart from other Smart Grid projects?

The transition towards a smart grid will occur gradually, starting by introducing smart services and products to electricity consumers with high loads, like energy intensive industrial parties that contribute significantly to the overall electricity consumption and whose financial benefits created by implementing smart energy technologies are not negligible. The KIBERnet focuses on the industrial sector's smart energy use and therefore provides an initial step towards a more intensive and widespread roll-out of smart energy use in other consumer groups as well. The project has brought together academic, research, and commercial solutions that have been designed primarily for the industrial energy users. It has generated additional knowledge and experience that will serve as a strong starting point for further development.
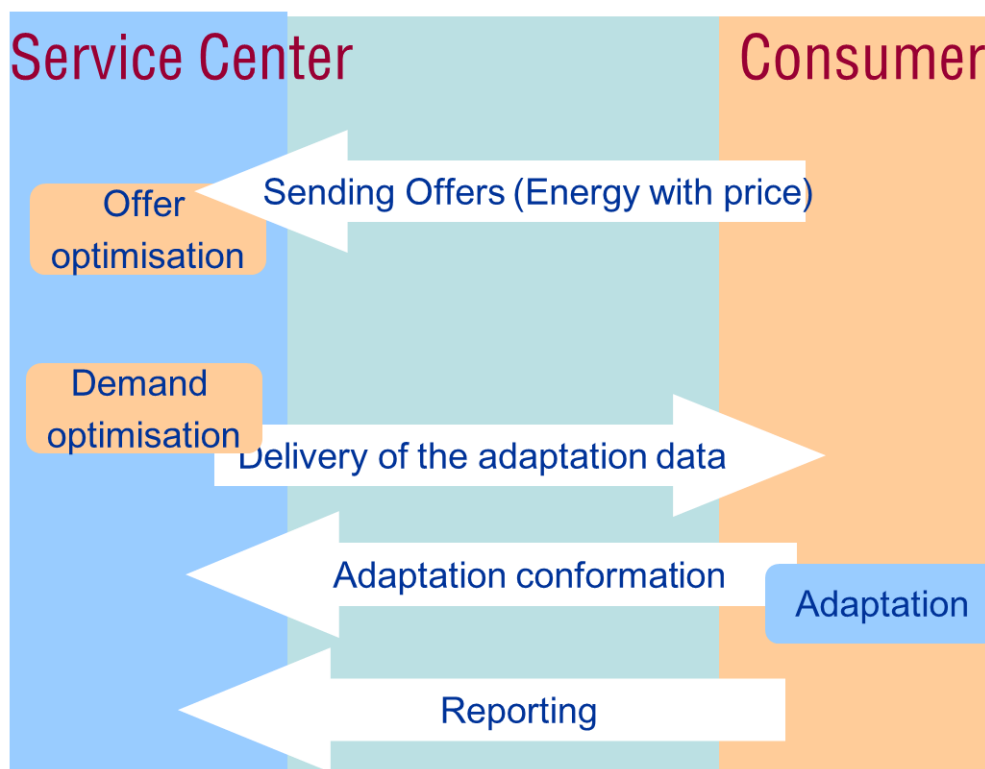
Figure 1: Communication algorithm of the end user with the control center

What happened?

This project resulted in the design and implementation of an automated demand response system, which consists of a control center (designed for KIBERnet system users) and a control and measurement system (designed for end users). The KIBERnet system has been installed and tested at the locations of four industrial partners/end users. By targeting the industry sector and actively including industrial partners in the project, the project ensures an active end user engagement and an end user oriented result.

The project provided a new service to the end user, offering him a financial benefit in exchange for giving up the consumption control. The KIBERnet DSM control system consists of a central control unit (named KIBERnet_RS_SC) and locally installed "slave" units (called KIBERbox) which connect each individual load. Using specially developed advanced control algorithms, running on a PLC (programmable logical controller), each individual load's power is controlled according to its limitations to fulfill the control center demand. In the central control center, a balancing group (an aggregator) aggregates individual consumers/producers (e.g. industrial companies) into a virtual group and manages their integral capacities according to the group's technical and economic best interest.

Further information / Contact

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