REGIONAL VIRTUAL POWER PLANT BASED ON MINI AND MICRO-CHP TECHNOLOGY

Ideas on utilisation

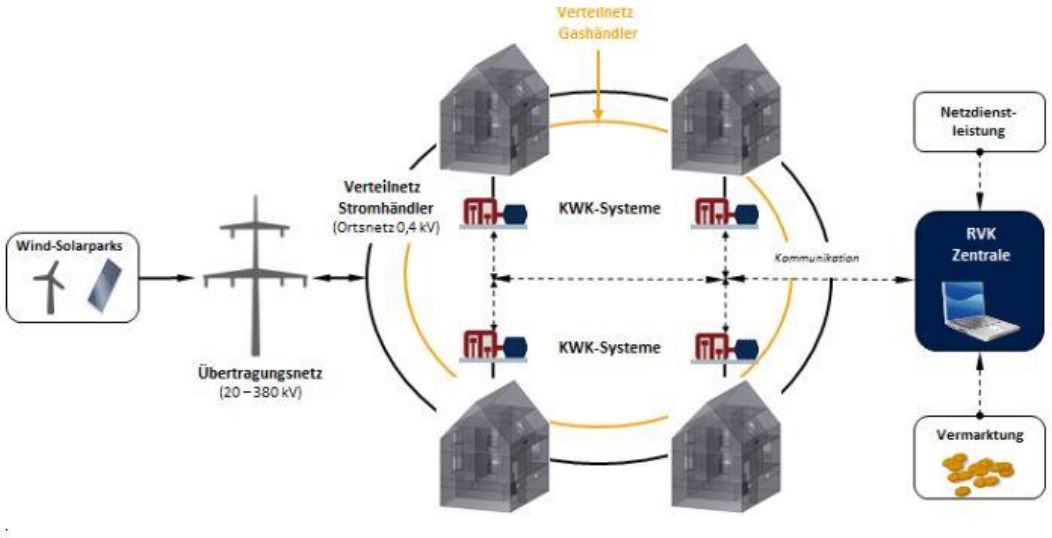

Figure: Basic structure of a Regional Virtual Power Plant.

A "virtual power plant" is the connection of decentralized power generation plants, thermal storage facilities and controllable energy consumers (passive / active) with a communication center. The peculiarity of the Regional Virtual Power Plant (RVK) is that such a power plant is located locally in the low-voltage or medium-voltage plane. This, in turn, means that the different generation units are limited in their performance and that they are predominantly related to the field of micro-cogeneration systems (micro-CHP systems) (Pel <15kWel). Such systems are suitable in the peripheral environment of large cities, where a gas infrastructure already exists, but the said areas can not be opened up by other systems (such as district heating). The targeted control of the RVK can be used to balance or even balance the electrical balancing group at the local level. Furthermore, the connection of electricity and heat will be strengthened on the market. Figure 1 shows the structure of an RVK.

Potential adopters of technology

Users of a Regional Virtual Power Station are first and foremost

- Stadtwerke, regional and national energy supply companies (natural gas companies/ electric energy companies)
- Companies from the field of communication and energy management as well as contracting areas

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Advantages of technology

Key benefits of the technology include:

- real link between electricity and heating market,
- primary energy savings due to the principle of combined heat and power,
- binding customers in peripheral, urban areas to regional energy companies,
- support of local electrical load balancing,
- Flexibilization of energy production.

Market and context of technology

Regional Virtual Power Plants based on mini and micro-CHP technology are not yet widely used in practice as an instrument for load balancing. The first Virtual Power Plants have been installed in the past for larger power classes in the MW range. The extensive development of the building area was not yet carried out with the technology outlined. Demonstration projects are currently being carried out by the TU Dresden. Promising under the present framework conditions is not the sale of electricity on the renewable energy market, but rather direct marketing in the regional environment. Here are possibilities for large industrial customers and for electricity user communities. The biggest advantages of RVK over existing technologies are the extremely high degree of flexibility given by the high number of generating units and the primarily energy-based advantages.

Preconditions in adopting enterprises

Prerequisites in the company are:

- operation of a control room,
- Installation of a communication structure to the decentralized generation units (communication box),
- knowledge about gas and electrical trade / distribution,
- Partner for the maintenance of distributed generation units.

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