FACTS ABOUT
ECOGRID 2.0

EcoGrid 2.0 is a development and demonstration project

EcoGrid 2.0 is a successor to the EcoGridEU project, and re-uses previously installed equipment for control and management of electric heating and heat pumps

There are 1,000 households on Bornholm participating in EcoGrid 2.0

Project timeframe: 3 ½ years (January 2016 to June 2019)

Budget: DKK 98 million

Supported by the Danish Energy Agency's Energy Technology Development and Demonstration Programme with DKK 49 million

Project owner: Danish Energy Association

Read more at www.ecogrid.dk

ECOGRID 2.0
PARTICIPANTS

Bornholms Energi & Forsyning manages the power grid and facilitates communication with the 1,000 participating households.

IBM, Insero Software and Uptime-IT are responsible for business development of IT and aggregator tools.

DTU Electrical Engineering and Copenhagen Business School are contributing with the latest knowledge and research from higher education institutions.

KRUKOW, a consulting group specialising in behavioural science, are helping develop solutions to ensure optimal implementation of flexible power consumption among private consumers.

2+1 Ideasagency will help disseminate the results as they are released.

The Danish Energy Association will help ensure that the results are utilised by power system operators, energy retailers and balance responsible parties.

DANSK ENERGI · INSERO · Uptime-IT · IBM · KRUKOW · CBS · DTU · 2+1

ECOGRID 2.0

TEST OF AN ELECTRICITY MARKET WITH FLEXIBLE POWER CONSUMPTION

In EcoGrid 2.0, we are demonstrating an electricity market with flexible power consumption in private households. We are remotely controlling 1,000 heat pumps and electric radiators on the Danish island of Bornholm in an attempt to optimise their power consumption in line with the amount of power available in the power system at any given time. We don't want the residents to freeze, which is why we are looking into what is required for homeowners to allow their power consumption to be regulated for them, and what their comfort limits are. We are also developing the link between private households and the electricity market with a new actor in the market: The aggregator.

WHAT IS FLEXIBLE POWER CONSUMPTION?

Power consumption for cooking, entertainment, etc. cannot be adjusted without disturbing customers However, power consumption for things such as heating buildings or charging electric cars can, provided that certain agreed-upon comfort limits are respected. For example, consumers can stipulate that they must have a home temperature of 20-22 °C, that their summer cottage must be kept above frost temperatures or that their electric car must be fully charged by 7:00 am every day.

WHAT IS AN AGGREGATOR?

There is a need for something that can link the households with the power system, as adjusting the power consumption of a single heat pump would not be very practical with regards to the power system. However, when you collect (aggregate) something like 500, or perhaps even several thousand of such devices, that's where it begins to get interesting. An aggregator works as a bridge between the households and the power system. This new actor essentially pools flexible power consumption from hundreds of different households and sells it on the electricity market.

WHY IS FLEXIBLE POWER CONSUMPTION NEEDED?

Every year, Denmark's reliance on non-renewable energy sources such as coal, oil and gas decreases as more of the country's power comes from sustainable sources such as wind, biofuel and solar energy. Today, wind turbines and solar panels account for approximately 50% of Denmark's total electric power generation, but this varies from day to day in line with how much the wind is blowing or how cloudy it is. Because the amount of power generated from wind and solar fluctuates throughout the day, we will also increasingly need to adjust our power consumption in line with these fluctuations. Flexible electricity consumption can contribute to that.

HUMAN BEHAVIOURS AND COMFORT LIMITS

Allowing someone else to control how much power you consume in your own home is a fairly new concept. With EcoGrid 2.0, we are examining what is required in order for electricity consumers to be comfortable with allowing their consumption to be regulated for them, and what their comfort limits are. We are looking into whether it is financial incentives, better service or a more environmentally friendly lifestyle that appeals to the homeowners.

EXPORTING ENERGY TECHNOLOGY

Exporting energy technology is good business for Denmark. Developing smart solutions for electricity markets, flexible consumption and IT solutions for aggregators, among other things, can create new jobs and lead to greater exports. Today, many countries are working to minimise their CO_2 emissions in order to limit their impact on the global climate. Increased energy efficiency and a transition to renewable energy are two of the possible routes they can take. Exploiting the potential of flexible power consumption can help make the transition to clean energy less expensive for consumers.