NRG magazine

The Hidden Field of Energy Efficiency

Rational Middle
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Smart about Energy

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I-Balance project

The Energy Academy's EnTranCe living lab facility is hosting part of the I-Balance project, which aims to find ways to optimise balancing decentralised energy generation and demand.

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The main challenge for the power grid is to balance demand and supply, a task made more complex by intermittent supply from wind and solar energy. Decentralised sources of energy can help to increase grid stability and avoid expensive grid reinforcements. But to accommodate these decentralised sources the grid needs to be smarter and to make a smarter grid a deeper understanding of patterns of energy production and consumption is needed. "In order to balance decentralised production and consumption of energy we first have to establish energy profiles of non-controllable sources of energy", says project leader Rolf Velthuijs. "Solar and wind are predictable, but not controllable. We will measure the output of solar panels and wind turbines at the EnTranCe site. The project also includes a residential area in Hooghalen of about fifty households with a lot of decentralised energy production. Smart meters will be installed to read how much energy is produced and what appliances are demanding energy."

For the energy profiles of controllable sources of energy the project has installed BluGen ceramic fuel cells at the EnTranCe site. "The aim is to analyse how a range of fuel cells can best be modulated to achieve a higher or lower output. There is also a micro-CHP installation. The trick is then to make all these energy sources work together in an optimal fashion. That is the first axis of the project. The second axis is to balance production and consumption and the third axis is the flexible integration of these decentralised sources into the electricity and gas network.

''What we are trying to do in the end is to meet local electricity needs with locally produced electricity", says Velthuijs. We've got the energy infrastructure in a residential area and we add a layer of ICT to do the planning, with computer models predicting consumer behaviour. It is then up to the local community to decide how it wants to run all this. They can choose to try to produce and use as much renewable energy as possible. They can also opt to use this technology to react to financial incentives, as energy pricing will be fluctuating much more in the future."

The Energy Valley Foundation is the driving force behind the I-Balance project and is supported by a wide range of partners: the Hanze University of Applied Sciences, TNO, GasTerra, GasUnie, Westland Infra, Hooghalen Duurzaam and RWE Innogy Windpower Netherlands.

EnTranCe
experimental site with
decentralized energy production

Duurzaam Hooghalen
50 households with smart
indicators

Power Quality

Smart Grid
intelligent balancing of
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