Title: Organizing flexibility in distribution grids – Panel Discussion
Organizers: Mathijs de Weerdt, Arjen van der Meer and Laurens de Vries

Note: This session focuses on the Dutch situation for distribution network operators. To make it easier to discuss and to prevent confusion about terminology, we have decided to hold *this session in Dutch*. Apologies to our non-Dutch colleagues.

A sustainable energy system will be largely dependent on renewable generation, which will mostly produce electrical energy. A challenge in any electrical system is that power needs to be balanced at all times. There will be an important role for flexible demand to balance the fluctuations in the output of solar and wind generators. Ideally, a large part of demand becomes more flexible, for example, by adding intelligent control to hot water boilers, heat pumps, and charging of electric vehicles.

However, this demand flexibility poses a new challenge to the electrical system. Flexible loads will respond in similar ways, often simultaneously, to signals – such as prices – that indicate when they are needed. This is likely to increase demand peaks significantly, to the point that the network might need to be reinforced substantially. However, as the cause of these new and high demand peaks is the flexibility of load, the same flexibility can be used to prevent network overload. While in an efficient market this will increase the cost of generation, this cost increase may well be less than the required network investment in an uncontrolled situation.

There are several options for avoiding the need to reinforce the infrastructure. One solution is to limit the capacity that is allocated to end users, for instance by requiring them to buy this well in advance. A more flexible solution is to charge users that put high demand on the available capacity significantly more for their use of the network in real time. A close to real-time market for network capacity can also be envisaged. It is currently not clear which of these alternatives provides the best combination of system efficiency, costs and service quality to end-users, and technical complexity and maintainability to system operators, both in the short and the long term.

To discuss these different possibilities, we would like to combine input from both professionals and scientists. In this session we aim to facilitate this discussion, with the goal of identifying candidate solutions (and criteria) that seem good enough for pilot projects. For this discussion we have invited the following panelists:

- Fons Jansen is Strategic Advisor Smart Grids and Europe at Enexis and active at both the national and the European (as member of EDSO) level in discussions regarding the design of the energy market, the roles of the distribution service operators, the energy transition, and the potential of flexible demand.
- Willem van den Reek is Product developer flexibility and tariffs at Alliander, one of the large distribution network operators in the Netherlands experimenting with a USEF-based market for flexibility to prevent congestion.
- Machiel Mulder is professor of Regulation of Energy Markets at University of Groningen. He recently published papers on the impact of energy transition on the electricity market and the consequences of electrification of heating and transport for the energy system. He is director of the Centre for Energy Economics Research at the University of Groningen and is coordinator of several course programmes on energy economics.
- Jorg van Heesbeen is Head of New Energy Business at Jedlix Smart Charging. Jedlix provides smart charging services to users of electric vehicles, using the flexibility in charging to reduce charging costs without losing comfort.

Preliminary Program:

- Welcome and introduction of the discussion topic and session objective (5 minutes)
- Position statement by each of the panelists (30 minutes)
- Discussion (45 minutes)
- Closing summary (5-10 minutes)

Participation from the audience in the discussion is very much appreciated.