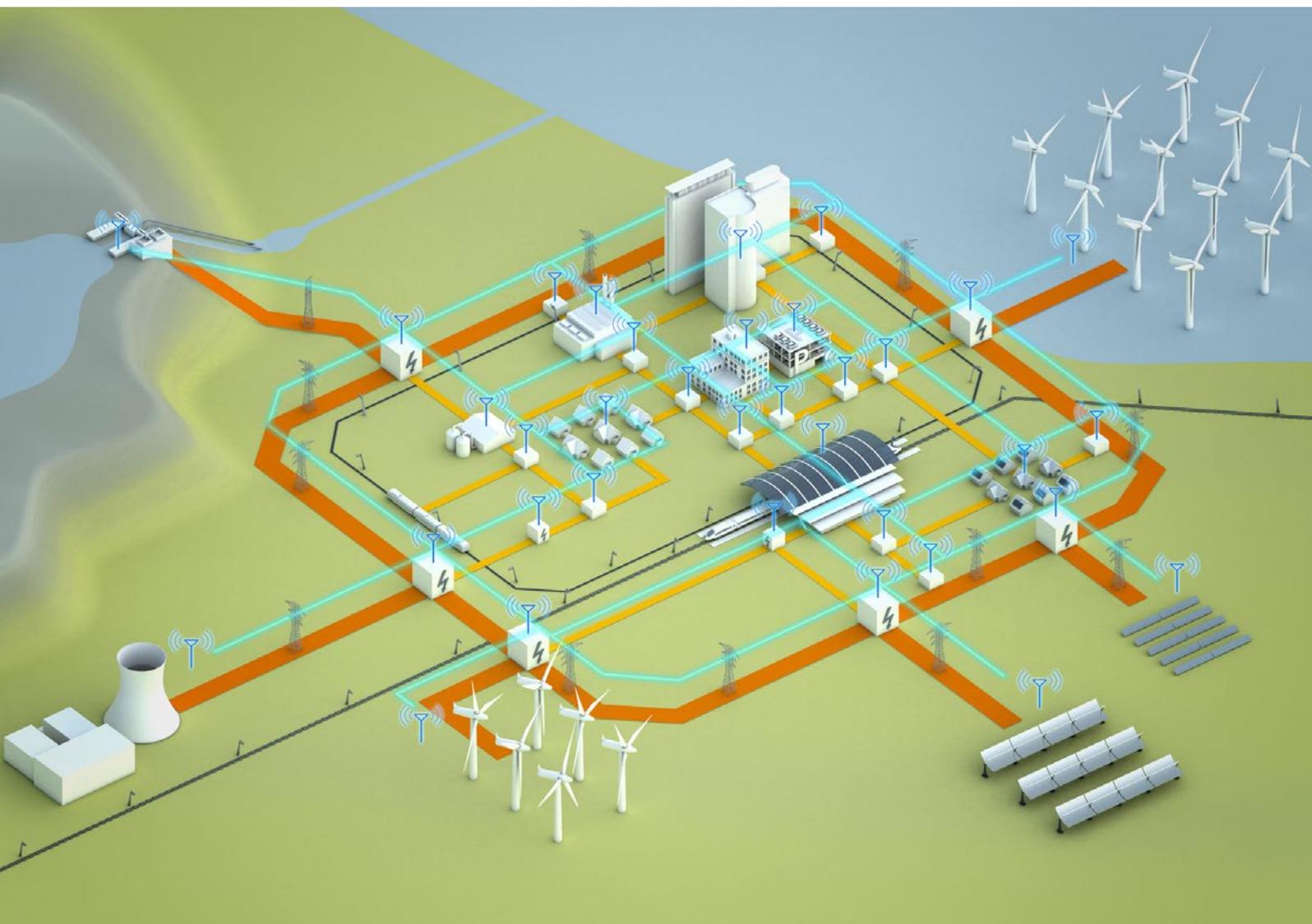


# NEMO PROJECT

Investigates impact of large-scale electric vehicle use  
on European electrical grid



Pioneers in international business

The EU project Electromobility+ (EM+) is a contribution of eleven European countries and regions to the European Green Cars Initiative. The countries and regions involved are France, Germany, the Netherlands, Austria, Finland, Norway, Sweden, Denmark, Poland, Flanders (Belgium), and Piedmont (Italy). The initiative aims to create the long-term conditions required to roll out electric mobility in Europe by 2025. EM+ pools some twenty million euros contributed by the participating countries and regions and the EC's 7th Framework Programme. Nearly twenty research projects have been granted funding; one of them is NEMO. Martijn Huibers of DNV KEMA is the project's coordinator.



**Electromobility+**

The Novel E-Mobility Grid Model (NEMO) is a joint effort by international energy consultancy DNV KEMA, German research institute Fraunhofer ISE, Danish consultancy EMD International, Danish regional transmission system operator RAH, and Danish electric company RFVV. "The goal is to optimise modelling and simulation tools to support the seamless integration of electric vehicles into electrical grids," Huibers begins, "in order to help answer the question, how can we seamlessly integrate the electric car into the European power grid on a large scale in the near future?"

**The research question** According to Huibers, who works for the New Energy Technologies division of DNV KEMA, the NEMO project is unique. Granted, several reports have already been published on a variety of subtopics contained in NEMO's investigation, but none has taken a comprehensive approach. "Each of the project partners can formulate part of the answer to the central research question, but we need each other to generate a complete solution," he says. Huibers believes the impact that electric vehicles will have on the electrical grid is consistently underestimated. "Everyone assumes you can just plug an electric car into the power grid. But more and more charging points are being installed. There is still no good answer to the question, how do you deal with the situation where 30, 40, 50 percent of a vehicle fleet is electric and everyone charges his car at the same time? And let me assure you, if we don't address the issue, things are going to go wrong."

**Modelling** Huibers concludes that there is too little knowledge of the load that electric vehicles will place on the grid and how best to deal with it. "That's why we're going to look at three different scenarios, the potential problems that arise in each situation, and how we can solve them," he explains. "The first scenario assumes a normal situation with regular charging sessions for a specific number of vehicles, in which

the project will specifically investigate the interaction with decentralised energy generation. The second scenario assumes fast-charging vehicles. The final scenario involves abnormal charging situations. Here, we aren't talking about a neighbourhood, but, for example, a football stadium where a large number of vehicles are being charged simultaneously."

The NEMO project will run for three years. Now that the first year is behind them, the project partners are getting up to speed, says Huibers. "We used the first period to align the various organisations' different models and simulation methods, and to create realistic scenarios by really listening to the stakeholders. The second project year, which started just before the summer, will focus on answering the core research question through modelling."

**Simulation** "What's special about this project is not only its comprehensive approach, but also the fact that we are investigating every level of the electrical grid," Huibers continues. "From low-voltage to medium- and high-voltage levels. We also enter into dialogue with the transmission system operators about the problems they encounter, and we can offer them solutions in addition to calculating the technical and economic parameters. In short, NEMO's comprehensive approach makes it unique. In terms of the bottom line, NEMO helps TSOs and power companies assess the impact that electric vehicles will have on the electrical grid and develop potential solutions such as grid expansion, charging management, energy storage, or a combination of these. The final result will be a great deal of knowledge and several recommendations regarding the impact of electric transport on the power grid."

Source: E-mobility magazine, The Netherlands