THE HISTORY OF THE DUTCH ENERGY SYSTEM AND THE CURRENT ENERGY TRANSITION

Ir. O. (Otto) Swertz
Statistics Netherlands (CBS)

The presentation will give an overview of the history of the energy system in the Netherlands focusing on the energy flows. It will show the earlier transitions in the country like amongst others the rapid transition to natural gas in the 1960s and the impact of the 1973 oil crisis and the slow but steady rise of renewable energy in this millennium. Further shown will be relevant variations within energy consumption and the drivers for this. An example is the influence of the North-West European electricity market and/or the wholesale market prices on energy consumption in the Netherlands.

As an introduction to the next speakers, the main policy goals for energy transition and emission reduction in the light of climate change will be summarized. The relation between energy products and greenhouse gases will be shown. Policy targets are internationally agreed like the Paris Agreement from 2018 and the recent European Green Deal. Also shown will be the Dutch translation of the national goals to regional goals within the Dutch Climate Agreement (Klimaatakkoord). The regional datasets developed for communities to help them in working on the local energy transition will be presented.

OTTO SWERTZ is since 2017 heading the energy statistics team within Statistics Netherlands, better known as CBS. This is the National Statistical Institute by task responsible for the statistics publication within the country. The energy team consists of over 20 persons. From 2007 till 2017 Otto was project manager responsible for the production of the energy balance and the monthly statistics on fossil fuels and electricity.

DATA ANALYTICS WILL HELP ENERGY MARKETS TO BETTER ACCOMMODATE RENEWABLE ENERGY

Dr. R. (Ronald) Huisman
Erasmus University

The increase of supply from renewable energy sources challenges power markets. As supply from renewables is driven by weather conditions it is not perfectly predictable. This frequently results in a mismatch between supply and demand with outages and extreme prices as a result. My presentation shows that energy markets have to become more flexible to accommodate renewable energy. I'll argue that increased flexibility can be achieved with statistics, data analytics, and models. In the second part I'll discuss a quantile regression approach to better predict when power prices will be extremely high or low.

RONALD HUISMAN studied econometrics at the Erasmus University Rotterdam and has a PhD in financial economics from Maastricht University. Currently, he is associate professor financial economics at the Erasmus University Rotterdam. There he teaches about and research topics on financial economics applied to (renewable) energy markets, sustainability, and impact investing. Besides academia, Ronald has co-founded Energy Global, a data-driven energy company. After leaving Energy Global he co-founded Modex Analytics (a data management and analytics company), and Floyd Davis Finance (a company that helps impact entrepreneurs to become investment ready).

PROSUMERS AND THE FUTURE OF SMART ELECTRICITY GRIDS

Prof. dr. M.F. (Miguel) Anjos
University of Edinburgh

A smart grid is the combination of a traditional electrical power system with information and energy both flowing back and forth between suppliers and consumers. We focus on how the accessibility and reducing cost of decentralized renewable energy sources are stimulating the emergence of small-scale residential prosumers who can produce and consume electricity. Such prosumers may increase the uncertainty of consumption behaviour, reduce consumption from the grid, and potentially disconnect altogether from the grid. Alternatively, they may remain connected, and their energy potential can provide flexibility as a service to the grid. The behaviour of such prosumers depends on tariff policies, investment conditions, and environmental and operational conditions. In particular, the rapid improvement in commercial storage technologies has made it possible for prosumers to become fully electricity self-sufficient. We propose a decision-support framework accounting for these factors and combining strategic and operational planning optimization models. Using this framework, we show how changes in tariff policy may not only create a financial incentive for self-generation and self-consumption but may also push prosumers towards disconnecting from the grid. Our results motivate a thoughtful reconsideration of current schemes for the economic integration of prosumers in the energy system.

MIGUEL F. ANJOS is Chair of Operational Research at the School of Mathematics, University of Edinburgh, and Schöller Senior Fellow at the University of Erlangen-Nürnberg. His research interests are in the theory, algorithms and applications of mathematical optimization. He is particularly interested in the application of optimization to problems in power systems management and smart grids. He is the Founding Academic Director of the Trottier Institute for Energy at Polytechnique Montreal, and current President of the INFORMS Section on Energy, Natural Resources, and the Environment. He is a Fellow of the Canadian Academy of Engineering.

THE PSYCHOLOGY OF CLIMATE CHANGE

Prof. dr. L. (Linda) Steg
University of Groningen

Common approaches to encourage pro-environmental behaviour typically target extrinsic motivation, by offering incentives that change personal costs and benefits of behaviour. I will explain why such approaches are not always as effective as assumed. Next, I will discuss factors and strategies that can foster and secure intrinsic motivation to engage in pro-environmental behaviour. Intrinsically motivated people behave without being coerced or incentivised, even when pro-environmental behaviour is somewhat costly, as doing so is meaningful and makes them feel good.

LINDA STEG is professor of environmental psychology at the University of Groningen. She studies factors influencing sustainable behaviour, the effects and acceptability of strategies aimed at promoting sustainable behaviour, and public perceptions of technology and system changes. She is a member of the Royal Netherlands Academy of Sciences (KNAW) and the European Academy of Sciences and Arts. She is laureate of the Dutch Royal Decoration with appointment as the Knight of the Order of the Netherlands Lion, and laureate of the Stevin prize of the Dutch Research Council. She is lead author of the IPCC special report on 1.5°C and AR6, and participates in various interdisciplinary and international research programmes in which she collaborates with practitioners working in industry, governments and NGOs.