IRENA IEW 2023 Side Event

Planning for the renewable future: electricity demand profiles in the clean energy transition

13 June 2023; 12:15-13:45

Location: Friedhoff Hall, Green Center • Colorado School of Mines • Colorado, USA

BACKGROUND

In 2017, IRENA published the report *Planning for the Renewable Future – long-term modelling and tools to expand variable renewable power in emerging economies*, to provide an overview of the considerable knowledge that had been developed to represent variable renewable energy (VRE) sources like solar and wind in long-term models. This report benefitted immensely from thoughtful engagement during IEW side events held in Beijing in 2014 and in Abu Dhabi in 2015, as well as thorough commentary by a number of conference attendees during the review process.

IRENA is now expanding on its work under the *Planning for the Renewable Future* series, through thematic reports which aim to address additional methodologies in long-term planning and modelling that can foster the integration of high shares of VRE.

As all energy planners and modellers know, perhaps the most basic function of long-term analysis is to understand how future supply will meet future demand. While the representation of VRE supply has continued to improve since the release of IRENA's *Planning for the Renewable Future* in 2017, the representation of electricity demand continues to be a common challenge. While this has always been the case, due to the naturally uncertain socio-economic drivers behind electricity demand, additional complexities have emerged as part of the ongoing clean energy transition. Low-cost VRE in combination with digitalization is enabling power sector-coupling with transport, industry and buildings which will affect the size and profile of electricity demand, as well as how flexible it may be in the future. **Understanding how to best represent future electricity demand profiles in the context of the clean energy transition will be crucial to ensure that VRE supply can continue to be expanded at pace.** Developing countries face an additional challenge of planning for rapid demand growth, as well as the changing nature of what electricity may be used for.

For this reason, IRENA's next thematic installment of the *Planning for the Renewable Future* series will aim to provide an overview of best practices, tools, and methodologies to develop electricity demand profiles in long-term planning and modeling, to make better-informed decisions for the integration of high shares VRE.

OBJECTIVE AND FORMAT OF THE SESSION

Taking advantage of the presence of the energy modellers at the IEW, IRENA is organising a brainstorming session to discuss the following related to representation of electricity demand in long-term planning and modelling: (1) mapping the most pertinent issues, (2) identifying existing methodological approaches and initiatives, and (3) identifying existing expertise for future collaboration.

The session will be moderated by Professor Brian O'Gallachoir (University College Cork). It will start with short presentations from IRENA on the background and the topic, followed by input remarks by the panellists and discussion with the participating modellers.

GUIDING QUESTIONS

In the context of pursuing net-zero goals:

1.What are the expected changes in the demand profile associated with the electrification of end-use sectors?

2What are the key strategies for managing demand in the context of VRE-dominated power systems?

3.How well do the models capture the above dynamics? What can be done better?

Agenda

12:15 – 12:30	**Arrival of participants / Lunch**	
12:30 – 12:35	**Welcome by the moderator**	Brian O'Gallachoir (UCC)
12:35 – 12:40	**Opening presentation**	Asami Miketa (IRENA)
12:40 – 13:10	**Scene setting interventions**	Geoffrey Blanford (EPRI); Doug Arent (NREL); Anna Krook Riekkola (LUT - ETSAP); Bruno Merven (UCT).
13:10 – 13:40	**Inputs from the floor**	
13:40 – 13:45	**Closing**	Brian O'Gallachoir (UCC)