Whole Energy Planning Workshop

SuperAIRE

cigre
For power system expertise

Background

- The Whole System approach impacts how energy is generated, transported, consumed, and stored or converted into different forms - linking these processes to the reliability and resilience of energy, particularly the supply of energy.
- The concept of Whole System challenges us to plan and develop infrastructure and networks with knowledge of the full range of solutions and awareness of the impact of our actions beyond the conventional electricity industry boundaries.
- Whole System looking at the energy system holistically which includes:
  - across the energy value chain, from source to delivery to end use;
  - across the vectors and sectors (heat, transport, electricity, hydrogen etc.); and
  - at infrastructure level, new technology, AI, business models, markets, policy, regulation.

Purpose

- CIGRE UK has set up a new taskforce aiming to initiate CIGRE's efforts in supporting and developing a Whole System approach and generating beneficial outcomes for network operators and other key stakeholders within the energy industry as they support the transition to Net Zero.

Benefits

- Promote the transition to cleaner and more efficient energy systems, addressing challenges, and identifying opportunities for sustainable network development that tie together the specific working group focus areas within CIGRE C1 (Power system development and economics) and C4 (Power system technical performance).
- The taskforce would be designed for the benefit of all energy industry parties and their end customers, while bringing together a diverse group of stakeholders who are actively involved in shaping the future of the industry.
- It can create a platform for knowledge sharing, networking, and collaboration among wider stakeholders across energy industry, fostering meaningful discussions and driving positive change within and beyond the conventional technological domains.

Key Deliverables

The taskforce would investigate and report on:

1. Current CIGRE WG involvement in sectors related to electricity transmission networks and the vectors by which they are connected to determine areas of commonality
2. Explore high-level potential synergies with these cross functional areas
3. Propose cross group activities to explore novel areas of research pertaining these cross sectoral areas
4. Build a forum for Whole System thinking across the CIGRE working groups
5. Promote good practices of cross-sector whole system research and their engineering applications

Agenda

Time	Topics	Speaker
10:00-10:05	Welcome	NESO, Head of Offline Modelling Mr Cheng Chen
10:05-10:20	Introduction of Supergen Network Plus in Artificial Intelligence for Renewable Energy	Warwick University, Director of SuperAIRE, Professor Xiaowei Zhao
10:20-10:45	Hydrogen Network Planning overview and Economic Assessment	NESO, Head of Gas & Whole Energy Network Development, Mr Augus Paxton
10:45-11:15	Establish a framework for whole system co-optimisation between sectors	SSEN, Director of Strategic Energy Planning, Dr Bless Kuri
11:15-11:30	Coffee Break	
11:30-11:55	Heterogeneous Multi-gent Proximal Policy Optimisation based control technology for Fast Frequency Response	Warwick University, Assistant Professor, Dr Mostafa Kheshti
11:55-12:20	Grid Inertia Support from Electrified Rail Transportation	Leeds University, Chair in Smart Energy Systems, Professor Kang Li
12:15-13:30	Lunch and Networking	
13:30-14:00	Modelling Electrolyser and Fuel Cell in Power System Simulation Tools	Warwick University, Research Fellow, Dr. Qiaohui He
14:00-14:30	Whole Energy System Modelling: Challenges and Considerations	Birmingham University, Director of Birmingham Energy Institute, Professor Xiaoping Zhan
14:30-15:00	Panel Discussion	Augus Paxton, Kang Li, Bless Kuri, Xiaoping Zhan
15:00-16:00	(Optional) Visit to the Smart Grid Lab and Hydrogen Lab of the Intelligent Control and Smart Energy (ICSE) Research Group, University of Warwick.	

Panel Discussion

Augus Paxton, Kang Li, Bless Kuri, Xiaoping Zhan

Visit (optional)

Smart Grid Lab and Hydrogen Lab

Intelligent Control and Smart Energy (ICSE) Research Group

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