IEA and ISGAN workshop: Flexibility for resilience in integrated systems

October 3rd – 4th , 2022

9, rue de la Federation, Paris, France
Location: Room 2

International Energy Agency

Background

Climate change directly affects every segment of the electricity system, altering generation potential and efficiency, testing physical resilience of transmission and distribution networks with rising sea levels and extreme weather events,, and changing demand patterns, including through more variable heat and cold patterns, which will add significant challenges to the resilience of electricity systems. In this context, power systems need to become both more flexible and more resilient to be able to adapt to sharp drops in generation or increases in demand, as well as to withstand, recover from and adapt to the impact of severe events.

At the same time, power system decarbonisation combined with end-use electrification could lead electricity demand to rise by 45% by 2050 if efforts are made to meet net zero emissions (IEA Net Zero by 2050 Scenario). These trends are driving the deployment of higher shares of variable renewables, which require increased flexibility to be integrated into power systems. The IEA net-zero scenario sees the need for flexibility increase fourfold by 2050, with batteries and demand response becoming the first sources of flexibility. Electrification and a shift towards more distributed energy resources will create both new issues and new opportunities for resilience in power systems, encompassing the whole spectrum from the design, planning and investment stage to operation and maintenance of systems, as well as asset management.

As defined in the ISGAN WG6/ETIP-SNET white paper *How can flexibility support resilience?* the concept of power system resilience has two temporal dimensions: by informing planning decisions for new investment, it aims to build resilience in *future* power systems, while at the same time it also seeks to improve operations of *existing* power systems to strengthen their inherent resilience attributes.

About the event

ISGAN and IEA's Digital Demand-Driven Electricity Networks (3DEN) Initiative are co-organising the international high-level expert workshop "Flexibility for resilience in integrated systems" to enhance international collaboration and research, share best practices and provide policy guidance on deploying flexibility for resilience.

This workshop will gather international experts to present and discuss how innovative flexibility services can be developed to support grid operation with high penetration of renewable energy sources, bringing evidence from ongoing analysis and successful projects. It will also discuss

how these services can be integrated in the investment planning stage, thus building up resilience to future-proof power systems in the long-term.

A particular focus will be on emerging economies and developing countries. Oftentimes being the most affected by severe events, there is an opportunity to build in resilience while still expanding and developing their power systems in line with growing electricity demand, rather than having to retrofit existing assets.

The workshop will feature interventions by IEA, ISGAN, the Norwegian University of Science and Technology NTNU, Research Institute of Sweden RISE, ENTSO-E, ETIP SNET, the Austrian Institute of Technology AIT, regulatory agencies, think-tanks and other organisations working on this topic.

During the workshop we will:

i) Discuss the societal transformation where a new generation of stakeholders will provide power flexibility services for the grid, and its importance for energy policy and regulation, based on the findings of the 2022 ISGAN WG6/ETIP-SNET white paper *How can flexibility support resilience?*

ii) Explore best practices and innovative approaches for leveraging active demand side flexibility.

iii) Provide input to advance key policy messages related to the nexus of flexibility, resilience and digitalisation.

iv) Identify synergies and possibilities for future international collaboration, including through IEA and ISGAN and interested partners.

The IEA gratefully acknowledges the Italian Ministry for Ecological Transition for their support for this expert workshop as part of their contributions to IEA's Digital Demand Driven Electricity Networks (3DEN) Initiative on power system modernisation and effective utilisation of demand side resources through digitalisation and to the Clean Energy Transitions Programme.

Agenda

Day 1: Monday 3 October 2022	
13:00 – 13:30	Registration, welcome snacks and coffee
13:30 – 14:10	**Welcoming remarks** • Dr. Brian Motherway, Head of the Energy Efficiency Division, IEA **Introductory remarks** • Luciano Martini, Executive Committee Chair, ISGAN • Joni Rossi, Researcher, Research Institutes of Sweden (RISE) and Operating Agent of ISGAN WG6 on Power Transmission & Distribution Systems • Irina Oleinikova, Professor, Norwegian University of Science and Technology and ISGAN WG6 on Power Transmission & Distribution Systems • Vida Rozite, 3DEN Project Manager, Energy Efficiency Division, IEA
14:10 – 15:00	**Scene setting:** Moderated by Vida Rozite, 3DEN Project Manager, Energy Efficiency Division, IEA • Dr. Martha Symko-Davies, Accelerating Clean Energy at Scale Program, Laboratory Program Manager, NREL • Jagabanta Ningthoujam, Principal, Electricity and Energy Storage, RMI India Q&A session.
15:00 – 15:30	Coffee break
15:30 – 16:30	**Panel 1: Key issues, opportunities and experience.** Moderated by Emi Bertoli, Energy Analyst, Energy Efficiency Division, IEA • Pauline Henriot, Energy Analyst, Energy Efficiency Division, IEA Digitalisation and benefits in the power system • Barbara Herndler, Research Engineer, Austrian Institute of Technology AIT, ISGAN WG6 on Power Transmission & Distribution Systems • Marcos Venícius Leite Vasconcelos, Specialist at the Superintendence of Distribution Services Regulation Bruno Goulart de Freitas Machado, Specialist at the Superintendence of Generation Services Regulation, Brazilian Energy Regulatory Agency ANEEL • Hossein Farahmand, Professor, Norwegian University of Science and Technology and ISGAN WG9 on Flexibility Markets Q&A session.

16:30 – 17:30	**Moderated discussion with workshop participants (plenary)** Moderated by Vida Rozite, 3DEN Project Manager, Energy Efficiency Division, IEA Kick off view: - Dr. Hannele Holttinen, Operating Agent, Grid Integration Task 25 of IEA Wind TCP
17:30 – 17:40	Introduction to Day 2 breakout group work and related logistics. - Irina Oleinikova, Professor, Norwegian University of Science and Technology and ISGAN WG6 on Power Transmission & Distribution Systems - Emi Bertoli, Energy Analyst, Energy Efficiency Division, IEA
17:40 – 19:30	Reception at IEA Café
19:30	End of Day 1

Day 2: Tuesday 4 October 2022	
8:30 – 9:00	Welcome coffee
9:00 – 10:45	**Breakout group discussion and reporting back** Topics: **A. Planning and investment in power system resilience.** B. **Pathways to implementation: balancing short and long term needs in the current energy and climate crisis.**
10:45 – 11:15	**Reporting back:** Moderated by Irina Oleinikova, Norwegian University of Science and Technology and ISGAN WG6 on Power Transmission & Distribution Systems Speakers: designated members from each breakout group and moderators.
11:15 – 12:30	**Panel 2: From planning to implementation.** Moderated by Irina Oleinikova, Norwegian University of Science and Technology and ISGAN WG6 on Power Transmission & Distribution Systems • Kjetil Obstfelder Uhlen, Special Adviser, Statnett • Javier Toro Cabrera, Head of Electrical Markets Unit, Chile's National Energy Commission • Pierre Bivas, Founder and CEO, Voltalis • Joni Rossi, Researcher, Research Institutes of Sweden (RISE) and Operating Agent of ISGAN WG6 on Power Transmission & Distribution Systems Q&A session.
12:30 – 12:45	**Final remarks, next steps and closing.** Luciano Martini, Executive Committee Chair, ISGAN Vida Rozite, 3DEN Project Manager, Energy Efficiency Division, IEA
12:45	End of workshop