



## OVERARCHING TOPICS

### A1 - Power System Modelling and Grid Operations

- A1.1 Large-Scale Load and Data Center Modelling
- A1.2 Grid Code Compliance for Large Loads and Data Centers
- A1.3 Grid Congestion Analysis and Mitigation
- A1.4 Power System Expansion and Planning
- A1.5 Operational Aspects of Power Systems
- A1.6 Synchronous Condenser Technology and Applications
- A1.7 Neighborhood-Based/Cellular Solutions for Distributed Network Operations

### A2 - Regulatory Framework and Market Dynamics

- A2.1 Compliance with Regulatory Standards and Policies
- A2.2 Regional Market Structures and Dynamics
- A2.3 Grid Code Testing and Certification Procedures
- A2.4 Demand-Side Management (DSM) Strategies
- A2.5 Demand-Side Regulations and Standards

### A3 - Power-to-X Technologies and Sector Integration

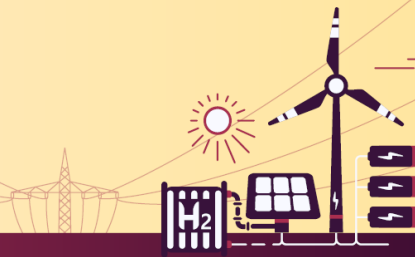
- A3.1 Power-to-X System Modelling (e.g., Hydrogen, E-Fuels)
- A3.2 Power-to-X Project Implementation and Case Studies
- A3.3 Grid Code Compliance for Power-to-X Systems
- A3.4 Sector Coupling and Integration with Hydrogen

### A4 - Smart Grids, Automation, and Cybersecurity

- A4.1 SCADA (Supervisory Control and Data Acquisition) Systems
- A4.2 Smart Grid Technologies and IT Innovations
- A4.3 AI and Machine Learning for Grid Integration
- A4.4 Cybersecurity Solutions for Critical Infrastructure

### A5 - System Stability and Security of Energy Supply

- A5.1 Energy Supply Security and Risk Mitigation Strategies
- A5.2 HVDC (High Voltage Direct Current) and FACTS (Flexible AC Transmission Systems)
- A5.3 Role of Synchronous Condensers in Grid Stability



## A6 - Challenges in Weak Grids and Emerging Markets

A6.1 Infrastructure Challenges and Solutions for Weak Grids

A6.2 Global South: Grid Integration Challenges

## A7 - Ancillary Services and Forecasting

A7.1 Ancillary Services for Grid Support

A7.2 Power System Forecasting and Predictive Modelling

A7.3 Smart Innovations for Ancillary Services

## A8 - Decarbonization and Industrial Applications

A8.1 Decarbonization Strategies for Energy Sectors

A8.2 Decarbonizing Industrial Processes

## A9 - Grid Codes and Emerging Challenges

A9.1 Grid Codes and Standards: Current Challenges and Future Trends

A9.2 Power System Balancing and Stability Aspects

## WIND POWER RELATED TOPICS

### W1 - Grid Integration of Wind Power Plants

W1.1 Project Experience with Grid Integration of Wind Power Plants

W1.2 Grid Forming Capabilities and Practical Experience

W1.3 Transmission Grid and Power System Integration Aspects

W1.4 Distribution Grid Challenges for Wind Power Integration

W1.5 Power Quality Aspects in Wind Energy Integration

W1.6 Compliance with Grid Codes Using New Hardware

### W2 - Offshore Wind Power Systems

W2.1 Offshore Wind Power System Modelling

W2.2 Offshore Wind Power Projects with HVDC Systems

W2.3 Project Experience in Offshore Wind Power Integration

### W3 - Wind Power System Studies and Modelling

W3.1 Power System Studies for Wind Energy Integration

W3.2 Challenges and Solutions in Wind Power System Modelling



## W4 - Hybrid Power Systems with Wind Energy

- W4.1 Modelling of Hybrid Power Systems (Island Systems)
- W4.2 Project Experience with Hybrid Power Systems (Island Systems)
- W4.3 Modelling of Hybrid Power Plants (Wind + Batteries + Other Technologies)
- W4.4 Project Experience with Hybrid Power Plants (Wind + Batteries + Other Technologies)
- W4.5 Battery Storage Aspects: Operation and System Modelling

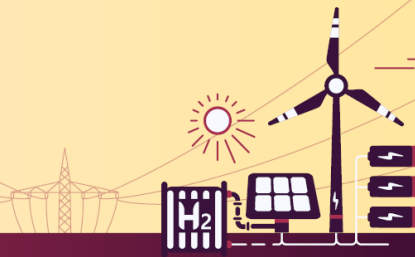
## SOLAR POWER RELATED TOPICS

### S1 Grid Integration of Solar PV and Battery Systems

- S1.1 Case Studies and Lessons Learned: Integrating PV and Battery Systems into Transmission Grids
- S1.2 Grid-Forming Capabilities and Operational Experience: Voltage and Frequency Control in PV Systems
- S1.3 Power System Studies: Stability, Capacity, and Operational Behavior with High PV Penetration
- S1.4 Distribution Grid Challenges: Voltage Regulation, Load Balancing, and Infrastructure Upgrades with PV Integration
- S1.5 Transmission Grid Challenges: Stability, Capacity, and Reactive Power Management for High PV Penetration
- S1.6 Power Quality Aspects: Addressing Harmonics, Voltage Fluctuations, and Flicker in PV-Integrated Grids
- S1.7 Grid Code Compliance and Future Requirements: Ensuring PV Systems Meet Current and Future Standards
- S1.8 Ancillary Services from PV and Battery Systems: Frequency Regulation, Spinning Reserve, and Voltage Support
- S1.9 Power System Balancing: Strategies for Managing Variable Solar PV Generation

### S2 - Modelling and Operational Strategies for PV and Storage Systems

- S2.1 Modelling Challenges: Simulating PV and Battery System Behavior Under Varying Conditions
- S2.2 Battery Storage Operation and System Modelling: Performance Optimization in Grid Applications



## S3 - Digitalization, Forecasting, and Smart Grid Solutions

S3.1 Aggregation and Management of Distributed Energy Resources (DER): Coordinating Distributed Solar PV Resources for Grid Services

S3.2 Forecasting Solar PV Generation: Optimizing Grid Operations and Market Participation

S3.3 Smart Grid Technologies and IT Innovations: Enhancing PV Grid Integration and Resilience

S3.4 Artificial Intelligence and Machine Learning: Optimizing Grid Management, Forecasting, and Fault Detection for PV Systems

## S4 - Energy Market, Policy, and Sector Coupling

S4.1 Energy Market Structures and Regulatory Frameworks: Governing PV and Battery Storage Integration

S4.2 Sector Coupling Solutions: Integrating PV Systems with Hydrogen Production and Storage

S4.3 Decarbonization of Energy Sectors: Leveraging PV and Battery Storage to Reduce Carbon Emissions

## S5 - Hybrid Power Systems with PV

S5.1 Modelling and Operation of Hybrid Power Systems: PV, Storage, and Other Energy Sources

S5.2 Project Experience with Hybrid Power Plants: Deployment and Operational Case Studies

S5.3 Energy System Management: Coordinating Hydrogen Production and PV Systems for Grid Stability

## HYDROGEN RELATED TOPICS

### H1. Hydrogen for Power System Stability and Balancing

H1.1 Power System Balancing with Hydrogen-Based Solutions: Stabilizing Electricity Supply and Demand through Hydrogen Production, Storage, and Consumption

H1.2 Ancillary Services from Hydrogen Systems: Frequency Regulation, Voltage Control, and Reserve Power Provided by Hydrogen Technologies

### H2. Modelling and Simulation of Hydrogen Systems

H2.1 Electrolyzer System Modelling for Grid Integration: Simulation of Electrolyzer Behavior and Performance in Power Systems

H2.2 Electrolyzer Modelling for Power System Studies: Detailed Analysis of Electrolyzer Operation in Grid Applications

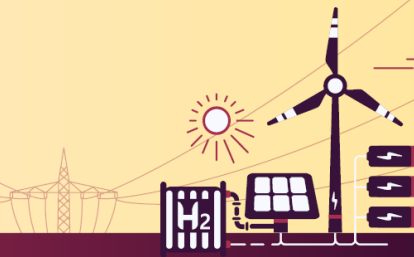
H2.3 Fuel Cell System Modelling: Simulating Fuel Cell Performance for Integration into Energy Systems

H2.4 Hydrogen Plant and System Modelling: Comprehensive Modelling of Hydrogen Systems for Grid Applications

# 24th Wind & Solar Integration Workshop

07-10 OCT '25  
BERLIN  
GERMANY 

organized by **energynautics**



## H3. Renewable Hydrogen Technologies and Applications

H3.1 Renewable Hydrogen Technologies: Innovations in Hydrogen Production, Storage, and Consumption for Renewable Energy Integration

H3.2 Applications of Hydrogen in Renewable Energy Systems: Practical Deployment and Use Cases of Hydrogen in Power and Energy Sectors

## H4. Energy System Management and Hydrogen Integration

H4.1 Energy System Management with Hydrogen: Strategies for Coordinating Hydrogen Production, Storage, and Consumption in Energy Systems

H4.2 Energy System Modelling with Hydrogen: Analyzing Hydrogen's Role in Optimizing Energy Flows and Enhancing Grid Stability

## H5. Hydrogen Market Dynamics and Regulations

H5.1 Hydrogen Energy Market Dynamics: Market Mechanisms and Trading Strategies for Hydrogen in the Energy Sector

H5.2 Regulatory Frameworks for Hydrogen: Policies and Standards Governing Hydrogen Systems in Energy Markets