

Energy Transition Theme

Theme Chairs

Dr. Sertac Bayhan (QEERI), Dr. Haitham Abu-Rub (TAMUQ)

The main goal of this theme is to bring together international experts from academia and industry - as well as relevant stakeholders - to share latest research, technology and innovation developments in the area of Energy. This theme focuses on contemporary industry topics ranging from Power Systems and Smart Grids; Renewable Energy and Energy Storage Systems; Sustainable Energy Solutions; Sustainable Petrochemical Industry; Sustainable and Circular Chemical Economy; Smart Building Technologies; Transportation Electrification, Solar Energy Applications, Power Plants Building, Maintenance and Operations cost reduction. The technical topics for the regular sessions are not limited to the following.

Session 1: Economics and policy of energy transitions

Session Chairs

Dr. Marcello Contestabile (QEERI), Dr. Muez Ali (Earthna)

Oil and gas exporting countries have a critical role to play in the global transition to net-zero. They face the double challenge of rapidly reducing the carbon content of the fuels and energy vectors they produce while also ensuring secure and affordable energy supplies, for both the domestic and international markets. Moreover, they must achieve this while continuing to support domestic economic and social development. In this session we welcome papers addressing the energy transition challenge faced by oil and gas exporting countries from the economics, policy and strategy perspective, outlining pathways to net-zero that are economically, technically and politically feasible. Papers in this session will preferably focus on the GCC region but can also discuss relevant insights from other oil and gas exporting countries. The papers can address, but are not restricted to, the following topics:

- National and regional energy transition pathways
- The development of low-carbon energy exports such as hydrogen and its derivatives
- The development of competitive national and regional climate tech sectors
- National and regional climate action, policymaking, and strategy development

Session 2: Sustainable Energy Conversion Solutions

Session Chairs

Dr. Juan Lopez Garcia (QEERI), Dr. Rahul R. Bhosale (Qatar University)

This session will be focused, but not limited to advanced and new material and concepts, PV and wind productivity, reliability, performance, O&M and integration with special attention to harsh desert environments. Cost reductions strategies to build, maintain and operate a utility scale power plant are of relevance to this session, including but not limited to soiling prediction and forecasting, robotic

cleaning, digitalization and automation. Multidisciplinary efforts required to ensure the rapid deployment of sustainable and renewable energy technologies are also included in this session.

Session 3: Sustainable and Circular Chemical Economy

Session Chairs

Dr. Sarim Dastgir (QEERI), Dr. Shahid Rasul (Northumbria University)

This session will explore the latest research, innovations, and best practices related to energy transition, with a focus on implementing a circular chemical economy and effective carbon management strategies. The program will cover a wide range of chemical industrial sectors, including sustainable manufacturing of platform molecules, utilizing CO₂ as a C1 feedstock, and adopting circular economy principles for textiles, plastics, and bio-feedstock production. By examining both the benefits and barriers of these approaches, participants will gain valuable insights into how to drive the transition towards a more sustainable and low-carbon future.

Session 4: Energy Management and Integration

Session Chairs

Dr. Dunia A. Bachour (QEERI), Eng. Rafah Alarrouqi (Mowasalat)

The goal of this session is to highlight innovations, advances and new research over a broad range of themes in energy management and integration, including new perspectives on renewable energy integration, distributed energy resources technologies, particular integration of PV systems, advances in power electronics for efficient grid integration, transportation electrification and renewable energy resource assessment. You are encouraged to contribute to this session with your innovative work in one of these thematic areas.

Session 5: Energy Demand and Efficiency

Session Chairs

Dr. Ameni Boumaiza (QEERI), Dr. Yusuf Bicer (HBKU-CSE)

This session will bring together the audience to explore the latest energy demand and efficiency technologies trends, showcase market initiatives, opportunities, and challenges for Qatar, the region, and abroad. The session will offer a series of substantive discussions on improving energy efficiency in buildings and in industry and on unlocking energy efficiency potential through digitalization. It will also address the issues and showcase the challenges in the energy transition era. The session will include various subtopics ranging from smart homes, smart sensors, renewable energy, demand response, load forecasting to communications and computational intelligence.