

Accommodation

Hotel Information:

[Elite Hotel Arcadia](#): 5-minute walk to KTH

[Scandic Park](#): 12-minute walk to KTH

[Hotel Birger Jarl](#): 15-minute walk to KTH

Traffic Information: Stockholm Arlanda Airport to Stockholm Central Station

Transportation Method: [Arlanda Express](#)

Departure: Stockholm Arlanda Airport

Destination: Stockholm Central Station

Estimated Travel Duration: 20 minutes

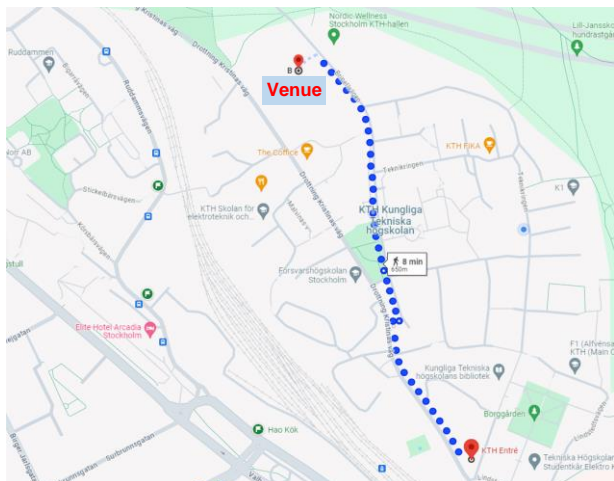
Metro Information: T-Centralen to KTH

Metro Line: **T14** (Red Line)

Departure: T-Centralen

Destination: Tekniska Högskolan

Ticketing: Debit or credit cards



Registration

Registration is **free** and deadline is **09 June 2024**.

A no-show fee of €300 is charged for registrant who does not show up. Registration link and QR code:

<https://www.kth.se/form/high-power-electronics-workshop>



Organization

Sponsor IEEE Power Electronics Society
KTH Royal Institute of Technology
Digital Futures

Chairmen Prof. Xiongfei Wang
KTH Royal Institute of Technology, Sweden
Dr. Frans Dijkhuizen
Hitachi Energy Research, Sweden

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Venue B2, Floor 1, Brinellvägen 23
KTH Royal Institute of Technology
Stockholm, Sweden



IEEE Workshop on High-Power Electronics for Decarbonizing Energy Grids

19-20 June 2024

KTH Royal Institute of Technology
Stockholm, Sweden



digital futures

Hitachi Energy

STandUP
for
ENERGY

High-Power Electronics for Decarbonizing Energy Grids

The worldwide shift towards electrification and digitalization mandates the adoption of energy-efficient and economically viable methods for electricity generation, transmission, and utilization. Meeting this demand requires the integration of power electronics and digital technologies, which are critical to address these challenges. Recently, modern energy grids are increasingly incorporating high-power, high-/medium-voltage power electronic converters and systems, e.g., high-voltage direct-current (HVDC), static synchronous compensators (STATCOMs), large-scale renewable power plants and power-to-x stations, hyperscale data centers, solid-state circuit breakers, solid-state transformers, and grid-forming energy storage systems, etc.

The objective of this workshop is to provide a forum where speakers from government, industry and academia can share and discuss the latest developments in high-power electronics and digital technologies for future net-zero energy systems. With a strong industry focus, the event is co-sponsored by IEEE Power Electronics Society (PELS) and Digital Futures, and co-organized by KTH Royal Institute of Technology and Hitachi Energy. The programme features three topic areas: 1) high-power electronic devices and converters, 2) system integration and operation, 3) grid stability, security, and digitalization.

The workshop is chaired by:

Xiongfei Wang
KTH Royal Institute of Technology, Sweden

Frans Dijkhuizen
Hitachi Energy Research, Sweden

Day 1 (June 19)

Introduction and Opening Speech

- 08:30** Xiongfei Wang
KTH Royal Institute of Technology, Sweden
- 08:45** Johan H Enslin, IEEE PELS President-Elect
Department of Energy, ARPA-E, USA

Session 1: High-Power Devices and Converters

- 09:00** **Transforming the U.S Grid: Innovations in Next-Generation Hardware**
Andre Pereira, Department of Energy, USA
- 09:30** **Modular Multilevel Converters Based on IGCT: Insights and Application Use-Cases**
Philippe Maibach, Hitachi Energy, Switzerland
- 10:00** **High Power SiC and GaN Device Technology for Sustainable Electrification**
Mikael Östling
KTH Royal Institute of Technology, Sweden
- 10:30** **Break**
- 11:00** **System Benefits, Design, Control, and Testing of High Voltage SiC Power Electronics for Grid Applications**
Fred Wang, University of Tennessee, Knoxville, USA
- 11:30** **Potential of SiC Power Devices for Overloadability Assessment**
Muhammad Nawaz, Hitachi Energy, Sweden
- 12:00** **Latest Developments on High Voltage Power Semiconductor Devices and Packaging**
Alan Mantooh, University of Arkansas, USA
IEEE PELS Past President
- 12:30** **Panel Discussion**

13:00 Lunch

Session 2: System Integration and Operation

- 14:00** **Renewable Generation Integration Through Power Electronics: GB System Experience**
Xiaoyao Zhou, National Grid ESO, UK
- 14:30** **The Role of Multi-Terminal HVDC Networks to Fast Track Capacity Release for Renewable Generation Integration**
Johan H Enslin, IEEE PELS President-Elect
Department of Energy, ARPA-E, USA
- 15:00** **Wide Bandgap Power Electronics for HVDC: Challenges and Opportunities**
Jin Wang, The Ohio State University, USA
- 15:30** **Break**

- 16:00** **VSC -The Right Toolbox for AC and DC Grids**
Frans Dijkhuizen, Hitachi Energy, Sweden
- 16:30** **System Integration Challenges of Renewable Hydrogen Production**
Yin Sun, Shell, Netherlands
- 17:00** **Interaction on AC side – Multi-Infeed Study – Theory and Practice**
Ying-Jiang Hafner, Hitachi Energy, Sweden
- 17:30** **Panel Discussion**

18:30 Mingle Event

Day 2 (June 20)

Session 3: Stability, Security, and Digitalization

- 09:00** **Navigating the Electricity Landscape: Perspectives on Power Electronics**
Bogdan DŽONLAGA, Électricité de France, France
- 09:30** **Bridging Theory and Practice: Managing Stability in Future Swedish Power System**
Oscar Lennerhag, Svenska Kraftnät, Sweden
- 10:00** **Passivity and Dissipativity as Design Objectives and Stability Assessment of Grid-Connected VSCs**
Lennart Harnefors
ABB Corporate Research, Sweden
- 10:30** **Break**
- 11:00** **Exploring Functional Specifications of Grid-Forming Converters**
Xiongfei Wang
KTH Royal Institute of Technology, Sweden
- 11:30** **Toward a Coherent Theory for Grid Forming Control Analysis**
Xavier Guillaud, University of Lille, France
- 12:00** **Power Electronics and Digitalization for a Flexible Fossil-Free Energy System**
Ambra Sannino, Vattenfall, Sweden
- 12:30** **Challenges on Power System Protection within IBR Source Penetrated Systems**
Jianping Wang, Hitachi Energy, Sweden
- 13:00** **Panel Discussion**
- 13:30** **Lunch**
- 14:30** **Close-Door Brainstorming Discussion**
- 14:30** **IEEE Technology Roadmap on High-Power Electronics for Modern Energy Grids**
Xiongfei Wang, Roadmap Leader