I POWER ELECTRONICS COMPONENTS AND CONVERTERS

Topic 1: DEVICES, COMPONENTS, PACKAGING AND SYSTEM INTEGRATION

01.a. Passive Components
01.b. Active Devices and Components (Si)
01.c. Active Devices and Components (Wide Bandgap and other New Materials)
01.d. Components and Devices for Specific Applications, including for Pulsed Power
01.e. System Integration, Packaging & Thermal Management
01.f. Reliability & Life-Time

Topic 2: POWER CONVERTERS TOPOLOGIES

02.a. Modular Multilevel Converters
02.b. Solid State Transformers
02.c. Grid Connected Converters
02.d. Resonant Converters
02.e. HF Power Converters
02.f. Wide-Band Gap Power Electronics

Topic 3: CONVERTER MODELLING, DESIGN AND LOW-LEVEL CONTROL

03.a. Converter Design and Optimisation
03.b. Converter Modelling and Low-level Control, including Gate-Drives
03.c. EMI/EMC in Power Electronics including HF Phenomena

Topic 4: MEASUREMENT, SUPERVISION AND CONTROL FOR POWER CONVERTERS

04.a. Standard and Advanced Modulation Techniques
04.b. Standard and Advanced Current / Voltage / Synchronization Control Techniques
04.c. Estimation, Identification and Optimisation Methods
04.d. Measurement Techniques, Sensors and State Observers
04.e. Condition Monitoring and Life-Time Prediction

II POWER ELECTRONICS APPLICATIONS

Topic 5: ELECTRICAL MACHINES AND DRIVE SYSTEMS

05.a. Electrical Machines and Actuators
05.b. Adjustable-Speed Drives and Converter-Machine Interactions
05.c. Design, Optimisation and Control of Electric Drives
05.d. Condition Monitoring and Life-Time Prediction

Topic 6: RENEWABLE ENERGY POWER SYSTEMS AND POWER-TO-X

06.a. Wind-Energy Systems
06.b. Solar-Energy Systems
06.c. Energy Storage Systems for Renewable Energy
06.d. Energy Management Systems
06.e. Energy Harvesting
06.f. Power-to-X
06.g. Other Renewable-Energy Systems

Topic 7: POWER ELECTRONICS IN TRANSMISSION AND DISTRIBUTION SYSTEMS

07.a. HVDC, FACTS, Solid State Transformers and Hybrid Circuit Breakers
07.b. Smart Grids
07.c. AC and DC Distribution and Micro Grids, including Fault Coordination and Protection
07.d. Power Quality Issues and Power Factor Correction Techniques
07.e. Charging Power Stations, Bidirectional V2G
07.f. Energy Harvesting, Energy Storage Systems and Renewable Diurnal and Seasonality Issues
07.g. Smart and Energy Efficient Buildings
07.h. Real-Time Simulation and Hardware in the Loop

Topic 8: E-MOBILITY

08.a. Electric Drive Trains for Passenger and Light Duty Vehicles
08.b. Electric Drive Trains for Heavy Duty Vehicles and Buses
08.c. Electric Drive Trains for Rail Vehicles
08.d. Electric Drive Trains for Aerospace Applications (Aircrafts, Drones)
08.e. Electric Drive Trains for Marine Applications (Offshore, Subsea and Ships)
08.f. On-Board Power Converters, WBG Technology as well as On-Board DC-Voltage Networks
08.g. Vehicle Battery Chargers: On-Board (Wired and Inductive) and Stationary (Ultra) Fast Chargers
08.h. Smart Charging and Vehicle to Grid Interaction
08.i. Batteries: Management Systems (BMS), Monitoring and Life-Time Prediction
08.j. Fuel Cells: Converters, Control, Diagnostics and System Integration

Topic 9: POWER SUPPLIES AND INDUSTRY-SPECIFIC APPLICATIONS

09.a. Wireless Power Transfer Systems
09.b. Applications for Electrolyzers and Fuel Cells
09.c. Applications in Hydrogen Storage and Transmission
09.d. Low Voltage DC Power Supplies
09.e. High Voltage DC Power Supplies
09.f. Distributed Power Supplies
09.g. Uninterruptible Power Supplies (UPS)
09.h. Lighting: Solid-State Lighting and Electronic Ballasts
09.i. Industry-Specific Applications (Cement, Steel, Paper, Textile, Mining, etc…)
09.j. Applications in Physics Research and Related Areas

Topic 10: DATA ANALYSIS, ARTIFICIAL INTELLIGENCE AND COMMUNICATION

10.a. Data Analysis applied to Power Electronics and Drive Systems
10.b. Application of Artificial Intelligence to Power Electronics and Drive Systems
10.c. Communication for Power Electronics and Drive Systems
10.d. Wireless Control of Power Electronics Systems
10.e. Diagnostics of Power Electronics Systems
10.f. Digital Twin of Power Electronic Converters and Systems
10.g. Big Data and Artificial Intelligence in Energy Conversion

III FOCUS TOPICS

Topic 11: FOCUS TOPICS

11.a. Renewable Energy Systems and Power-to-X
11.b. Energy Islands
11.c. Energy-Storage Technologies
11.d. Electric Vehicles
11.e. Emerging Power Electronic Devices and Semiconductors
11.f. Reliability and Artificial Intelligence in Power Electronic