

Research Laboratories associated to RISE



Intellectual Building (IB) Laboratory

Associated to: Smart Buildings and Smart Energy Systems

Location: ZN804
Host Department: BEEE
Area: 60m²



Theme-based Smart MicroGrid Research Laboratory

Associated to: District Energy Systems and Smart Grid

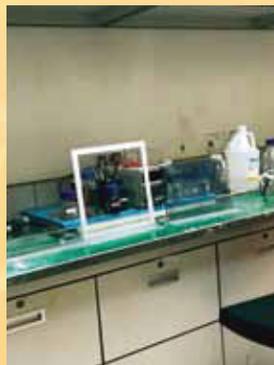
Location: AG713
Host department: EE
Area: 64 m²



Solar Simulator Laboratory

Associated to: Advanced and Renewable Energy Conversion Technologies

Location: ZN1013
Host department: BEEE
Area: 50m²



Renewable Energy Laboratory

Associated to: Advanced and Renewable Energy Conversion Technologies/ Advanced Energy Materials

Location: ZS1004
Host department: BEEE
Area: 20m²



Advanced Materials and Electronics Laboratory

Associated to: Advanced Energy Materials

Location: BC701
Host department: EIE
Area: 46m²



Laboratory for Flexible Energy Materials and Devices

Associated to: Advanced Energy Materials

Location: W602 and QT806
Host department/unit: ITC
Area: 80m²



Materials Synthesis Laboratory

Associated to: Advanced Energy Materials

Location: Y1306
Host department: ABCT
Area: 90m²



Otto Poon Charitable Foundation Research Institute for Smart Energy (RISE)

潘樂陶慈善基金
智慧能源研究院



About RISE

Energy is one of the most crucial global problems that humanities are facing today. Sustainable energy solutions are the fundamental means to comply with the national and global carbon-neutral policies. Due to the depletion of fossil fuel and the need of resilient energy supply, scientists and engineers worldwide are facing increasing challenges. They put more efforts into new research areas, including how to carry out efficient conversion and harvesting of renewable energies, how to use energy effectively and smartly on demand side, as well as how to balance the mismatch of power supply and demand patterns effectively.

The Otto Poon Charitable Foundation Research Institute for Smart Energy (RISE), The Hong Kong Polytechnic University, is established, in May 2020, to bring the experts, with very diverse expertise, ranging from energy and power systems, smart buildings, energy storage to material science distributed in various academic departments, together to develop innovative technologies and solutions to meet these challenges.

With over 50 faculty members from 12 departments, RISE also aims to pursue translational research on innovative energy and carbon-neutral solutions and to foster a university community for conducting interdisciplinary research with greater impacts.

能源對人類發展至關重要，它也是全球所面對最棘手的問題。使用可持續能源解決方案是回應國家及全球碳中和目標的根本方法。由於化石燃料日漸耗竭及對可靠的能源供應的需求，全球科學家及工程師面臨重大挑戰，包括如何高效轉換和收集可再生能源、令需求方有效率及靈活地使用能源，以及平衡錯配的電力供需，均是極需努力解決的難題。

香港理工大學潘樂陶慈善基金智慧能源研究院(RISE) 成立於2020年5月，匯聚來自多個學系和不同背景，從能源電力系統、智慧建築、儲能，到材料科學等涉及眾多範疇的專家，合力開發創新技術及方案以應對這些挑戰。

RISE現有超過50位來自12個學系的學者，致力進行創新能源及碳中和方案研究及技術轉化，並凝聚大學社群相關學者，攜手進行具影響力的跨學科研究，服務社會。



RISE Management Team

Director



Prof. Shengwei WANG
Chair Professor of Building Energy and Automation and Otto Poon Charitable Foundation Professor in Smart Building

Associate Directors



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Chair Professor
Dept of Applied Biology & Chemical Technology



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Professor
Dept of Electronic and Information Engineering



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Prof. Yang YANG



Prof. Z.Y. DONG



Mr Alex WONG

Vision

To be a leading institute that advances and transfers knowledge and technologies on smart and sustainable energy, for the benefit of Hong Kong, the nation and the world.

Mission

- To pursue translational research concerning both energy system technologies and enabling energy technologies;
- To nurture innovative solutions for energy problems through interdisciplinary research;
- To foster a university community for conducting interdisciplinary research on energy issues, in which members from different disciplines can excel in their aspirations with greater impacts;
- To be a key node for the local, national and international network on smart and sustainable energy connecting academia, industry and government.

RISE Research Focus Areas

RISE has identified five important research areas: (1) district energy systems and smart grid; (2) smart buildings and smart energy systems; (3) advanced energy storage technologies; (4) advanced and renewable energy conversion technologies; and (5) advanced energy materials. The wide scope covers both energy system technologies and enabling energy technologies, which serve both the energy system and service industries as well as the energy product manufacturing industries.

District Energy Systems and Smart Grid



This focus area mainly covers the topics of smart grid and district energy system planning, design and operation, including predictive analysis of renewable generation and energy demand, supply and demand flexibility, design and optimization of DCS (district cooling system), DHS (district heating system), CCHP (combined cooling, heat and power) and distributed renewable generations, micro grids and other grid control architectures, as well as smart multi-energy complementary operation strategy.

Smart Buildings and Smart Energy Systems



This focus area main covers the topics of smart building materials and façade, robust optimal design, control optimization, commissioning and diagnosis of building HVAC&R (heating, ventilation, air-conditioning and refrigeration) systems, smart built environment/occupancy sensing and building automation technologies as well as the development and applications of advanced IoT (Internet of Things), big data and AI (artificial intelligent) technologies for smart buildings.

Advanced Energy Storage Technologies



This focus area covers the topics of chemical energy storage, electrical energy storage, and thermal energy storage, including both fundamental science, engineering design and optimization of fuel cells and electrolyzers, rechargeable batteries, supercapacitors and materials for sensible/latent thermal energy storage.

Advanced and Renewable Energy Conversion Technologies



This focus area covers broad areas in renewable energy conversion technologies, including solar energy technologies (various types of solar cells, solar PV systems and applications, solar driven water desalination), Biomass energy technology, wind energy harvesting and deployment, green hydrogen generation technologies, and the synergetic combination of these renewable energy technologies such as solar fuel and solar PV hydrogen generation.

Advanced Energy Materials



Energy materials have nowadays demonstrated a bright landscape in both academia and industry applications. This focus area covers the development and application of smart energy materials, including solar cell materials, battery materials, energy storage medium and building energy saving materials. Conducting research of these smart energy materials is fundamental not only to the progress of science and technology, but also to our daily life and production activities.