



# ENERGY SMART

# RESEARCH

# INNOVATION



Energy Research Institute @ NTU (ERI@N) is a vibrant centre-of-excellence in energy innovations. Expertise in Science & Engineering, and partnerships with Policy and Social Scientists shape a thriving, multidisciplinary and collaborative research environment.



ERI@N strives to be a leading energy-focused research institute that addresses Singapore's sustainability goals and supports global industry in development and deployment of innovative solutions in energy efficiency and distributed energy resources.



Our focus on cutting-edge research and development empowers us as a strategic partner in collaborating with industry for technology-driven solutioning and beneficial outcomes.



**ERI@N**



## OUR RESEARCH



### SMART AND SUSTAINABLE BUILDING TECHNOLOGIES (SSBT)

SSBT provides efficient and cost-effective solutions for green and smart buildings, in particular for the tropics. R&D includes simulation, cooling technologies, digitalisation, and building management systems.



### ELECTRIFICATION

The Electrification group works to deploy advanced power electronics and improve energy efficiency of our industrial sector and ports.



### FUTURE MOBILITY SOLUTIONS (FMS)

FMS drives the vision and efforts for a low carbon car-lite city with autonomous transportation and electric vehicles. The group also works on certification and development of AV solutions for public transportation.



### ENERGY STORAGE AND FUEL CELLS (ESFC)

The team develops advanced batteries for high energy / power densities, next-gen supercapacitors, hydrogen and fuel cell technologies.

### RENEWABLES & LOW CARBON GENERATION (RLCG)

Focus areas of the group include perovskite solar cells, wind / marine renewables, platforms for offshore renewables, and enhancing the efficiency of low carbon energy systems.



### RENEWABLES INTEGRATION & MULTI-ENERGY GRIDS (RIMEG)

The group conducts R&D in integration of renewables, design and interoperability of AC-DC hybrid mesogrids, complex multi-energy systems to address challenges, stability and reliability of Energy Grid 2.0.



### EcoCAMPUS

The EcoCampus programme is an ERI@N initiative to testbed energy efficient and sustainable building technologies on the NTU Campus and neighbouring CleanTech Park sites.



### EcoLABS: TECHNOLOGY TRANSLATOR & ACCELERATOR

EcoLabs aims to build and accelerate deep-tech energy innovation capabilities with Start-ups and SMEs and provide them with essential translational facilities and connections to commercialise and scale their innovation efforts.



## OUR FACILITIES

ERI@N is equipped state-of-the-art facilities that drive research excellence.



The Energy Storage prototyping lab enables researchers to develop battery materials and process technologies scalable to industry applications. This facility features wet labs, electrode preparation, dry room for assembly & packaging, and testing equipment for safety and reliability.



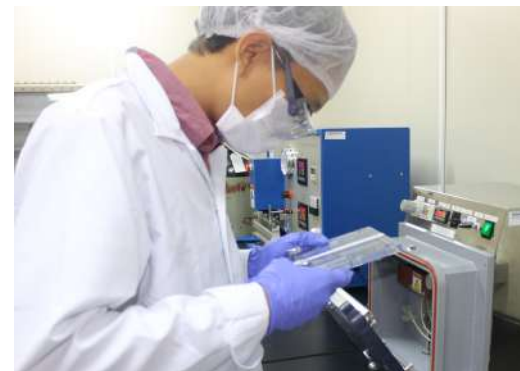
The Systems Engineering Lab is a 520sqm bustling hub for research work in Autonomous Vehicles (AV) and Solid State Transformers (SST). Here, researchers design systems for Energy Grid 2.0 and AV kits for vehicle platforms ranging from buses to robotic delivery systems.



Located on Jurong Island, the 4500sqm Experimental Power Grid Centre is home to one of the largest megawatt-scale grid facility in the region. The centre offers real-time simulation and testing platforms for equipment manufacturers and system integrators to test their technologies at actual power before deployment.



The Renewable Energy Integration Demonstrator - Singapore (REIDS) on Semakau Landfill is a facility for test-bedding cutting-edge technologies for smart grids, microgrids, and urban electricity systems.

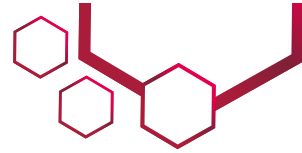


The Fuel Cell labs facilitate research and translation of nanomaterials catalysts, fuel cells, and hydrogen technologies at component and system levels.



The Centre of Excellence for Testing & Research of Autonomous Vehicles - NTU (CETRAN) provides an environment for autonomous vehicles testing and also develops standards and certification protocols for safe deployment of AVs in urban environments.

# OUR STORY



Established in 2010, the Energy Research Institute @ NTU (ERI@N) distinguishes itself through research excellence directed towards outcomes of industry relevance, with focus on systems-level research for tropical megacities. The Institute integrates research across NTU in the context of the energy challenge, and then helps translate outcomes into industry and practice.

The Institute's research focuses on a host of Interdisciplinary Research Programmes, Flagship Programmes, Consortium Platforms and an Accelerator Programme that covers the energy value chain from generation to innovative end-use solutions, motivated by industrialisation and deployment.

## Energy Research Institute @ NTU

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