

ENERGY INSTITUTE – ENERGY OPTIMISATION AND STORAGE, SUB COMMITTEE AND WORKING GROUP

1. Introduction

The Energy Institute plans to establish its first Southeast Asia regional sub-committee dedicated to Energy Optimisation and Storage in the region. The sub-committee will be chaired by Hassen Bali, Co-Founder of Ion Ventures (<https://ion.ventures>), a company whose core strategic focus is on the application of technologies and solutions to successfully manage energy networks and market delivery in an environment of rapid technological change and increasing complexities brought about by new grid balancing technologies as well as the incorporation of intermittent supply from renewables and distributed generation capacity etc. Hassen has been focused on renewable energy, clean technology and project financing since 2008 with experience in Solar PV, wind, waste-to-energy and energy storage development.

Globally, these technologies are evolving at a rapid rate that is on the one hand facilitating flexibility but on the other, making the security and maintenance of supply more challenging and complex. Consequently, there is significant benefit to be derived in SE Asia through increasing knowledge, capability and hands on experience within the region. It is anticipated that the Energy Optimisation and Storage sub-committee can be a catalyst to such development both supporting the appropriate adoption of technology and solutions as well as acting as a knowledge base for the development of technical guidance based on global best practices in close cooperation with the Energy Institute's headquarters in London.

2. Scope

South East Asia is experiencing a significant and continuing increase in demand for electrification alongside a diversification in available technologies and potential strategies for meeting this growth.

Key considerations are cost, availability and quality of energy delivered, underpinned by longer-term concerns for security of supply and environmental impact. In parallel, a clear transition is underway towards distributed and highly flexible energy systems, resulting from the inextricable growth in renewable energy and more sophisticated and varied demand side usage. Deployed in a strategic manner, where conditions now and in future have been taken into account, optimisation and storage technologies can enable a broad set of challenges to be addressed, with demonstrable long-term reliability and commercial viability. In remote or islanded locations where comprehensive grid networks are either completely absent or not equipped to meet demand, the circumstances equally lend themselves towards adoption of optimisation and storage technologies to bridge the gap.

Whilst optimisation and storage have relevance globally, each region and country has their own specific conditions that will determine the most suitable way to utilise such technologies and solutions. It is envisaged that the working committee will leverage its collective understanding of the SE Asia region to identify suitable approaches to dovetail the most appropriate technologies and commercial frameworks, aimed at delivering maximum benefit to the varying participants.

We consider the key topics captured under energy optimisation and storage to be:

Energy optimisation and storage

Applicable to all aspects of future energy systems

Commercial and Regulatory Framework

Government and Policy

Payment Reflecting Value

System Operators and Charges

Energy System Architecture

Technical Design

Grid vs Off-Grid

Capacity Planning

Flexibility and Balancing

Aggregators

Virtual Power Plants

Comms Infrastructure

Generation

Transmission connected:

- Predominately thermal fossil fuel
- Challenging to adapt to demand changes
- Long term trend to decrease
- Baseload equivalent needed

Distribution connected:

- Increasingly from renewable sources
- Integrates easily alongside various technologies
- Intermittency is main challenge
- Rapid to deploy and scalable

Micro-grid, Off-Grid and Islands

- Typically hybrid installations
- Broad range of system sizes and demand profiles
- Security of supply is main challenge
- Rapid to deploy and scalable

Demand

- Continual growth across residential and industrial customers
- Grid unreliability necessitates onsite generation (typically diesel) or no power
- Demand profile remains an untapped resource

Capital Investment to Maximise Asset Utilisation

Oversized Centralised Grids?

Adapt to Changing Demands?

Avoid Stranded Assets?

The opportunity to harness the benefits of energy optimisation and storage are clear in many respects, however the shift from the status quo could be significant over the long term. Thus it is paramount to engage across the full spectrum of energy market participants in SE Asia to identify the most prudent and commercially viable means to support the adoption and integration of energy optimisation and storage. The sub-committee seeks to identify key stakeholders from across the region to contribute to an industry led strategic roadmap to aide this transition.

3. Technology

Further to the broad system level objectives of the sub-committee, there is a clear necessity to ensure that relevant focus is maintained on the rapidly evolving technology landscape. By clearly integrating relevant advances in technology and supply chains into a work stream, members of the Energy Institute and a wider audience can be up to date on the most commercially and technically feasible solutions that can be deployed on the ground. At a high level, main current areas to track are:

Storage

- **Batteries**
 - Sodium sulphur;
 - Sodium ion;
 - Redox flow;
 - Solid state; and
 - Lithium sulphur.
- **Gases**
 - Hydrogen;
 - Power to gas; and
 - Liquid air.
- **Mechanical**
 - Flywheels; and
 - Gravitational systems.

Optimisation

- **Technology**
 - SCADA and monitoring;
 - LV switching and
 - Auto load transfer;
 - Smart meters;
 - IoT devices;
 - EV integration;
 - Communications connectivity;
 - Monitoring;
 - Control systems; and
 - Supply / demand balancing.
- **Potential Network Levels**
 - Transmission;
 - Distribution;
 - Zonal;
 - Local; and
 - Behind the Meter.

4. How to Participate

Organisations and individuals interested in active participation on this committee should in the first instance contact **Peter Godfrey, Managing Director Asia Pacific, the Energy Institute (pgodfrey@energyinst.org)** to register. Once sufficient interest has been confirmed, a meeting will be arranged to establish the basis for establishment of appropriate terms of reference and high-level objectives of the committee.

The Energy Institute Singapore is also pleased to announce that Hassen Bali will be the keynote speaker at the next networking event that shall take place on **Thursday 28th March commencing 7.00 pm at the KPMG Ignition Centre, Level 3 Hong Leong Building, 16 Raffles Quay, Singapore 048581**. Hassen's presentation will principally focus on the whole subject of **"Energy Optimisation and Storage"** and will provide a good introductory backdrop for the formation of our proposed sub-committee and working group as proposed above. Registration for this event will shortly be opened online at the Energy Institute Singapore Branch website at <https://www.energyinst.org/ei-near-me/south-east-asia/singapore>

Note: Whilst Singapore shall act as the initial base for the sub-committee / working group, the aim will be to try and develop its objectives on a more regional basis. It is proposed that once fully formed, the membership of the sub-committee will determine its officers and shall vote on which aspects of this broad area to specifically focus on and agree a prioritisation of objectives to proceed with. Interest had already been shown by Malaysia to join once established.

In association with:

