



PERTUBUHAN CIRED MALAYSIA

**NATIONAL SMART GRID WORKSHOP 2011
21 – 22 JULY 2011, KLCC CONVENTION
CENTRE
KUALA LUMPUR, MALAYSIA**

SPECIAL REPORT

1.0 Objective of Special Report

This report summarizes key finding and recommendations based on proceedings of National Workshop on Smart Grid for the benefit of key stakeholders, policy makers, responsible agencies and parties for implementation of sustainable development initiatives covering energy efficiency, renewable energy, green technology and smart grid in Malaysia. The organizers are hopeful that this report would provide useful inputs or perspective of professional communities towards advancing the nation's initiative on achieving sustainability goals.

2.0 Background

The National Workshop on Smart Grid with the theme *“Tracking the Vision of Sustainable Future”* was recently held on 21 – 22 July at KLCC Convention Centre, Kuala Lumpur. This event was co-organized by industry-based NGOs and professional societies namely CIRED Malaysia, IEEE-Power Engineering Society and few others.

The objective of the national workshop was to gather experts within the local/international community and key industry stakeholders in Malaysia to share ideas, discuss critical issues and success factors for successful deployment of smart grid in Malaysia in supporting sustainable energy programs dealing with renewable energy, energy efficiency and green technologies in the longer-term.

Workshop presentations cover policy areas, smart grid envisioning and road-mapping, smart grid deployment experiences, enabling capabilities and technologies and R & D efforts in Malaysia. The workshop ended with a special panel discussion to discuss the issues and solutions in smart grid deployment for Malaysia and defining possible way forward.

3.0 Key findings and resolutions

Key findings and resolutions of the workshop are as follows:-

(a) Smart Grid and Sustainability Goals

Smart Grid initiatives in many economies are primarily driven by sustainability goals as set by policy goals and targets of respective governments. The other drivers are energy security, quality of supply and economic development. In the case of Malaysia, there are declared sustainability goals of carbon emission reduction of 40 % from 2005 level, higher contribution of renewable energy (2080 MW by 2020 and 4000 MW by 2030) but smart grid has so far not been taken on board by policy makers as part of national sustainable development agenda.

(b) Common view of Smart Grid and National Smart Grid Vision

Smart Grid is acknowledged as a critical enabler or component of a smarter electricity system which allows higher and efficient integration of RES (renewable energy sources), effective demand and energy management of electricity. Other key enabler is market design and development e.g pricing, regulatory framework. Nevertheless, there is a need for local industry key stakeholders and players (policy makers, KeTTHA, Energy Commission, Utilities, industry-based NGOs) to have a common understanding or view of smart grid capabilities and value propositions to be derived in the context of Malaysia and develop a unifying National Smart Grid Vision.

Smart grid deployment poses complex evolutionary issue not confined to the physical asset of electricity grid alone and requires coordinated approaches and actions amongst many parties namely utilities, customers, regulators and governments. This suggests a clear need for leadership role of government in driving smart grid envisioning, policy development, strategic programs and more complete institutional framework for supporting smart grid deployment.

(c) Smart Grid Deployment: Issues & Challenges

(i) Development of Strategic Smart Grid Roadmap

There is a need for each economy/nation to define the strategic roadmap in realizing the Smart Grid Vision and as policy goals, industry imperatives, issues and maturity level of electricity supply industry and market are different. The strategic plan should include high level policy goals and targets driving smart grid, smart grid capabilities, estimates of investment and value propositions for stakeholders and beneficiaries - utilities, customers, society and economy or nation. Roles and responsibilities in implementation and addressing issues and challenges will have to be included in the roadmap.

(ii) Evolution and investment in smarter grid by T & D electric utilities

T & D network operators or utilities are doing their part in migrating to smarter grid but investments are more influenced by other drivers of providing capacity, security and reliability and operational efficiency. Utilities are constrained by limited funding and lack of incentives in investment on smart grid and will only embark on pilot projects on a smallish scale with limited smart grid capabilities.

Utilities may also not venture into smart homes and buildings as those would require investment on the part of customers and building owners. In view of this, AMI or smart metering projects in some nations are some nations are funded by government grants as benefits to society and nation in terms of demand reduction and savings in deferment of generation plant up are obvious.

At the same time, T & D utilities need to exhaustively identify existing capability gaps in complete scope asset management with reference to industry best practices. The maturity in T & D asset management influences asset performance, operational efficiency, efficiency in investment and cost management and these capabilities need to be fully developed in readiness for smart grid.

Smart grid capabilities will have to be built upon legacy systems and utilities need to be fully conscious of the existing gaps and smart grid implementation, be it on pilot scales, will have to be process or capability-driven rather than mere testing of Smart Grid technologies.

(iii) Market Design/Development and Regulatory Framework

Modernizing of the grid is part of a solution in creating a sustainable energy system, market design and development to incentivize customers into demand response with smart meters is another critical challenge for electricity supply market or industry.

Likewise, the appropriate regulatory framework and innovative economic regulation will have to be developed to incentivize utilities to invest in smart grid technologies. The fact is smart grid benefits many parties but the bulk of investment comes from T & D utilities.

(iv) Customer participation and acceptability of Smart Grid

Customer participation is central in the successful implementation of smart grid. There is a need to better understand customer's perception to smart grid values and sensitivity to dynamic pricing, affordability to engage in demand response with home automation etc. Continuous customer awareness and education program will have to be implemented by both utilities and industry regulators on customer's role and benefits to be derived from smart grid.

(v) Implementation of pilot and demonstration projects

Many economies/nations are currently engaged in smart grid pilot or demonstration projects. The scale, investment and business model varies from one economy to the next. Generally, pilot implementation is to fulfill few objectives:-

- (i) Testing of technologies and related capabilities based on developed objectives and criteria
- (ii) Business opportunities for smart grid solution or technology providers to showcase their products and solutions

- (iii) To demonstrate the values and benefits to key stakeholders and especially consumers and consumer advocates in ensuring customer participation.
- (iv) For all parties to understand smart grid capabilities and to acquire useful learning experiences for larger scale implementation.

Based on what is happening in many economies, strong utility-government-private sector partnership is critical for smart grid pilot projects to fulfill the above objectives.

(vi) R & D projects

The application of smart grid technologies or solutions will have to be driven by issues and gaps of existing grid, desired evolution in terms of ICT solutions, communications and technologies towards targeted levels of operational efficiencies, reliability and asset optimization. In short, application of technologies will have to be integrated with existing system and fully tested to be proven solutions. There are plenty of research areas in advanced protection and control, advanced automation and self-healing, dynamic optimization of network and advanced monitoring of equipment. However, there has to be more collaborative efforts between utilities, universities and technology providers in embarking on research projects to ensure higher possibilities of industry applications of research works.

(vii) Deployment of Smart Grid Technologies

The rate and scale on which smart grid technologies are deployed will depend on the policy drivers and objectives, implementation roadmap including values and benefits as well as funding incentives etc. Smart metering and home automation are key elements for US market as energy efficiency, peak demand reduction and low carbon emission are high on the national agenda. Each economy will have to define its own path depending on the vision, policy goals and objectives, deployment strategy driven by desired capabilities and business cases at national level/utility level as well as maturity level of grid related processes and technologies.

4.0 Recommendations

Specific recommendations following presentations, panel discussion and consensus on key issues related to smart grid deployment in Malaysia are as follows:

- (i) Smart grid deployment is to be recognized by Malaysian Government as part of Malaysia's sustainability development program to support related policy goals, programs and targets. Clear linkages need to be established with National RE policy and action plan and National Energy Efficiency Master Plan as Smart Grid is the enabling and evolving sustainable system to achieve EE, RE targets in the long term for Malaysia. There is a need for the Malaysian Government to identify high level cost and benefits or value of smart grid implementation and impact on sustainability goals.
- (ii) It is essential for the Malaysia to develop a common or unifying Smart Grid Vision, Policies & Strategic Deployment Roadmap and institutional framework to ensure coordinated efforts in making things happen for Malaysia the long-term. There is a clear need for the Malaysian Government to integrate related programs by special agencies (e.g Malaysia Green Technology Corporation) and utilities to ensure effectiveness and non-duplication of efforts and nation's resources in implementation of R & D , pilot or demonstration projects. Separate initiatives of MGTC , if any, in delivering smart building/cities could be also integrated with TNB's pilot projects.
- (iii) In addition to what utilities are doing in small scale pilot testing of smart grid technologies and capabilities, there is a need for Malaysia to embark on sizeable government sponsored smart grid demonstration project on as a scale large enough to realize tangible benefits for stakeholders to be convinced of the values of smart grid. Such pilot project may be co-funded by government, utility and private sectors but a significant portion will have to be specially funded by the Malaysian government.

- (iv) Smart grid is an evolution towards a more sustainable energy system that will ensure energy security, RE and EE objectives and targets for Malaysia are successfully met in the long-term. However, successful implementation of Smart Grid requires changes to grid capabilities towards more active management and optimization, market and regulatory development and most importantly customers' role in managing efficiency. There are many current and future issues and challenges that go beyond T & D utilities to deal with e.g market for demand response through dynamic pricing to incentivize customers and regulatory framework to support smart grid investment. Hence, there is an urgent need for a more significant governmental role in driving smart grid deployment for Malaysia to achieve its sustainability goals through establishing a smarter or sustainable energy system enabled by smart grid.

Prepared by:
Ir. Halim Osman
Chairman of Technical Committee
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