

Ensuring Energy Sustainability : Smart Grid



**TENAGA
NASIONAL BERHAD**

**Datin Roslina binti Zainal
Vice President (Planning)
Tenaga Nasional Berhad**

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Challenges faced by TNB

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Demand for electricity continues to grow (Average ~ 4% p.a.)

2

Customers demand for higher supply reliability & quality

3

Increasing cost of supply (generation)

4

Changing landscape of Malaysian Electricity Supply Industry (MESI)

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Increasing capital investment for Infrastructure and justifications (IBR to begin 2014)

6

Increasing difficulty in obtaining land and right-of-way for new transmission lines

7

Higher public awareness on environmental and societal issues

8

Ensuring Energy Sustainability

Focus Areas for Transmission Development

- **System Security and Reliability** still paramount
- **Enhancing the degree of intelligence** in transmission grid to increase reliability and robustness and address risks via deployment of technologies such as:
 - System Protection and Wide Area Defense Schemes
 - Coordinated Voltage Control
 - Congestion Management, Dynamic Rating, etc.
- **Ensuring high asset utilization rate** taking into consideration the high cost of putting up new infrastructure
- **Maximizing transmission capacity** of existing and new corridors due to increasing difficulty in obtaining new land and right-of-way
- **Realizing interconnections with neighboring utilities**, e.g. PGL (Singapore), EGAT (Thailand), PLN (Indonesia) as part of the APG

Focus Areas for Distribution Development

- **Need to respond to higher customers expectations** of almost zero interruptions and higher power quality with lower tariff:
 - Better customer service and faster response time
 - Reduction of Distribution SAIDI to 50 minutes
- **Reduce technical and non-technical losses** via the use of technology such as remote metering, low loss electrical installations, and others.
- **Impact of penetration from more RE sources** with introduction of FIT and increased customer awareness on environmental/green energy initiatives. Distribution systems must be designed to accommodate this.
- **Reassessment of distribution systems** to accommodate the possibility of Electric Vehicles coming into the grid; requires investment in infrastructure upgrades and suitable control systems and technologies.
- **Increase customer participation** through Smart Grid initiatives.

Smart Grid & Its Relevance

- Is Smart Grid the Way Forward?

- **Transmission**

- **Existing Transmission Systems already incorporate smart elements**
 - Control, Protection, Isolation, Detection, Monitoring schemes
- **Further enhancing the degree of intelligence in transmission grids to increase reliability and robustness is timely and relevant in achieving:**
 - Greater awareness of grid system operation limits
 - Reduction of Risks of Blackouts
 - Efficient Asset Utilization and Management
 - Higher Operation Efficiencies in Demand Management and Generation Dispatch

Smart Grid & Its Relevance

- *Is Smart Grid the Way Forward?*

- **Distribution**

Incorporating greater smart elements in Distribution Systems will allow the following:

- **Empowering customer & Improving network & efficiency:**
 - Increase Productivity, Reliability, Efficiency & Control via Smart Meter and related technologies
 - Full Visibility and Control of energy usage to facilitate customer participation i.e. ***Demand Side Management, 'Prosumer'***
 - Enhance Customer Service/Engagement through Integrated Customer Information System which enables quick information access between customer and service provider
- **Facilitate green energy & technology:**
 - Integration of Renewable Energy, Energy Efficiency and Electric Vehicle will contribute to reduction of CO₂

TNB's Smart Grid Plan

- **TNB is considering the possibility of implementing smart grid concept through out the system:**
 - Three demonstration projects at the distribution network are in the pipeline (Bukit Bintang, Bayan Lepas, Medini) to gain experience before full deployment
- **Rationales for TNB smart grid implementation program:**
 - Concerns on future energy security
 - Concerns on Energy Sustainability
 - Concern on increasing energy cost in view of Malaysia's national plan to restructure subsidy for energy sector
 - Implementation of Feed-In-Tariff (FIT) to facilitate RE and EE
 - Malaysia's commitment to reduce carbon emission intensity by 40% by year 2020



THANK YOU

DATIN ROSLINA BINTI ZAINAL

**VICE PRESIDENT (PLANNING)
TENAGA NASIONAL BERHAD**