

# TNB HANDBOOK

ASIA RISING DRAGONS 1x1 FORUM 2016

HILTON HOTEL, KL

21<sup>st</sup> NOVEMBER 2016

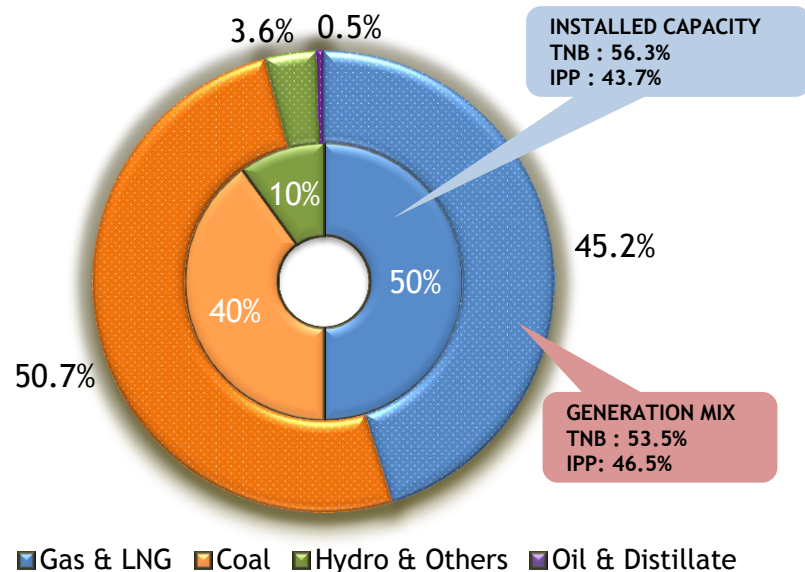
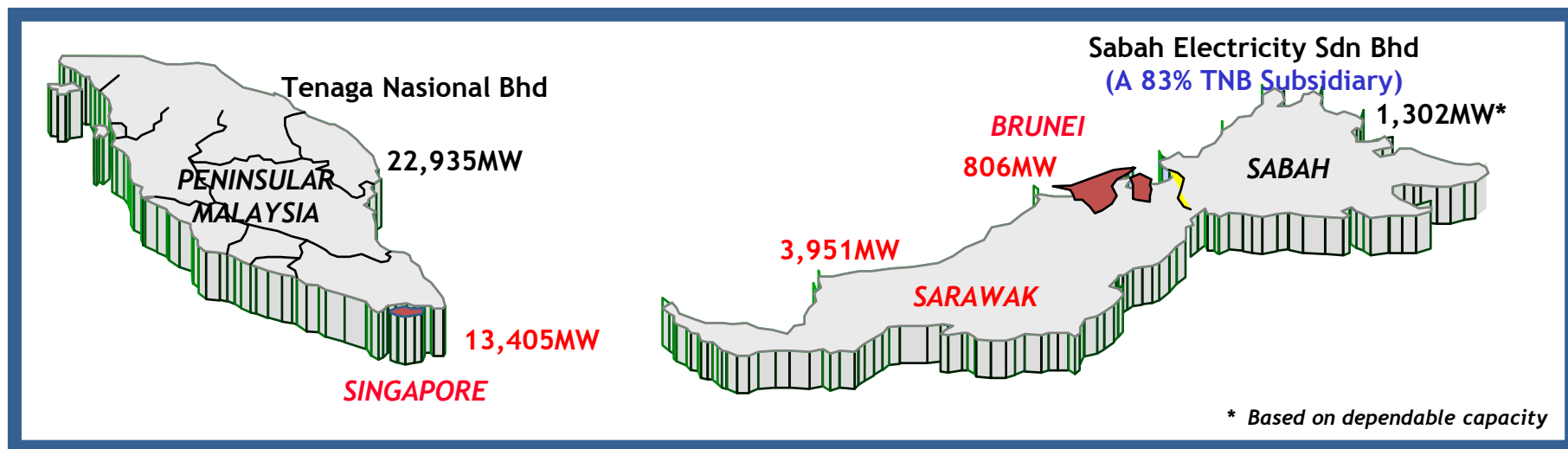
J.P.Morgan

FY'16

1. INTRODUCTION TO TENAGA
2. INTRODUCTION TO MESI
3. TARIFF
4. BUSINESS STRATEGY & DIRECTION
5. DIVIDEND POLICY
6. FINANCIAL HIGHLIGHTS

# INTRODUCTION TO TENAGA

## Three Major Utilities in Malaysia

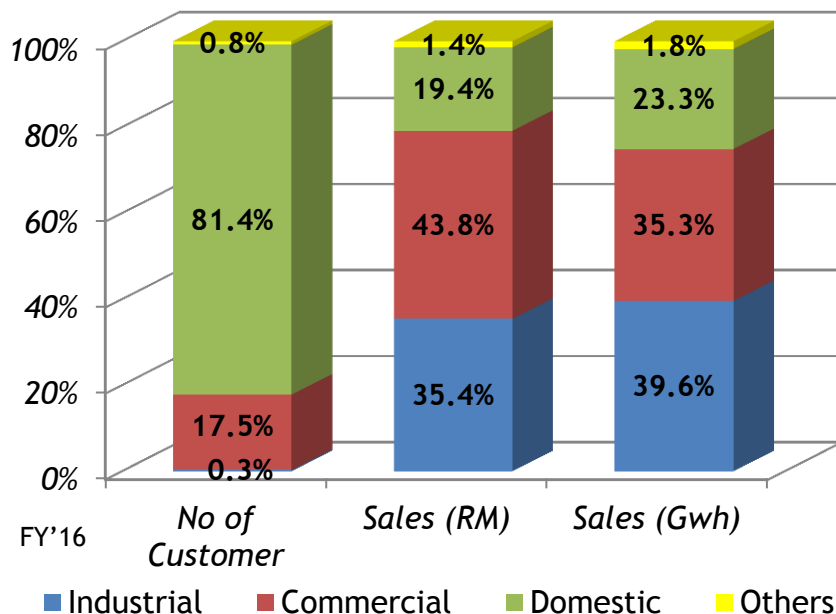


	FY'12	FY'13	FY'14	FY'15	FY'16
TNB - Peninsula Installed Capacity (MW)	11,462	11,462	10,814	11,708	12,904
Total units sold (Gwh)	102,132	105,479	108,102	110,837	115,505
Total customers (mn)	8.36	8.35	8.64	8.94	9.21
Total employees ('000)	33.6	35.0	36.1	36.0	35.6
Total assets (RM bn)	88.5	99.0	110.7	117.1	132.9

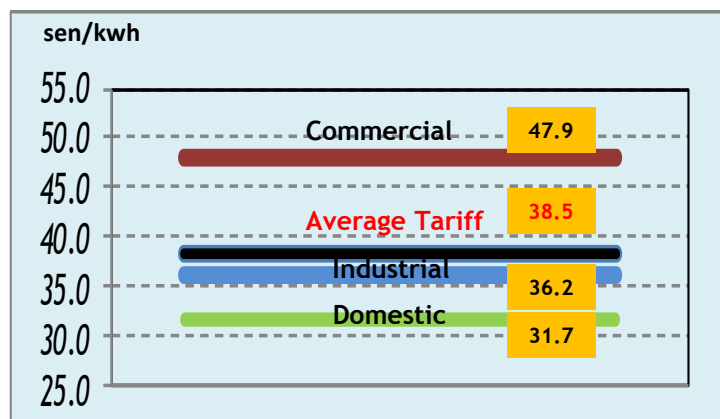
Peninsula Installed Capacity vs. Generation mix

# INTRODUCTION TO TENAGA

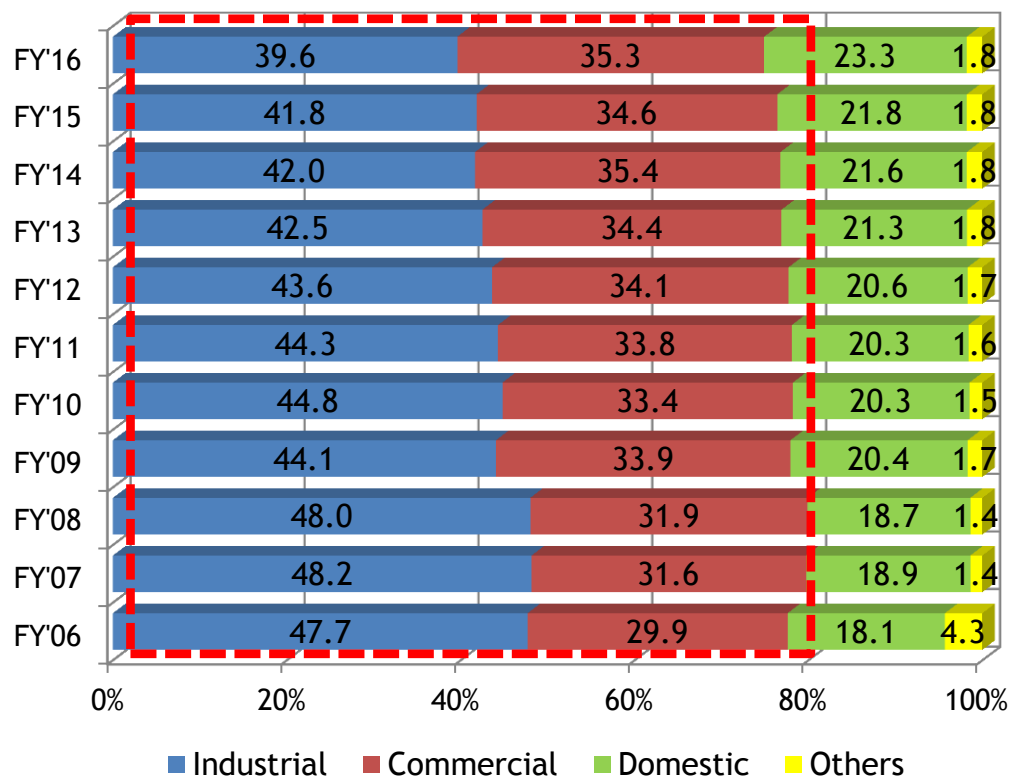
## No of Customer vs. Sales Value vs. Unit Sales



### Average Base Tariff by Sector



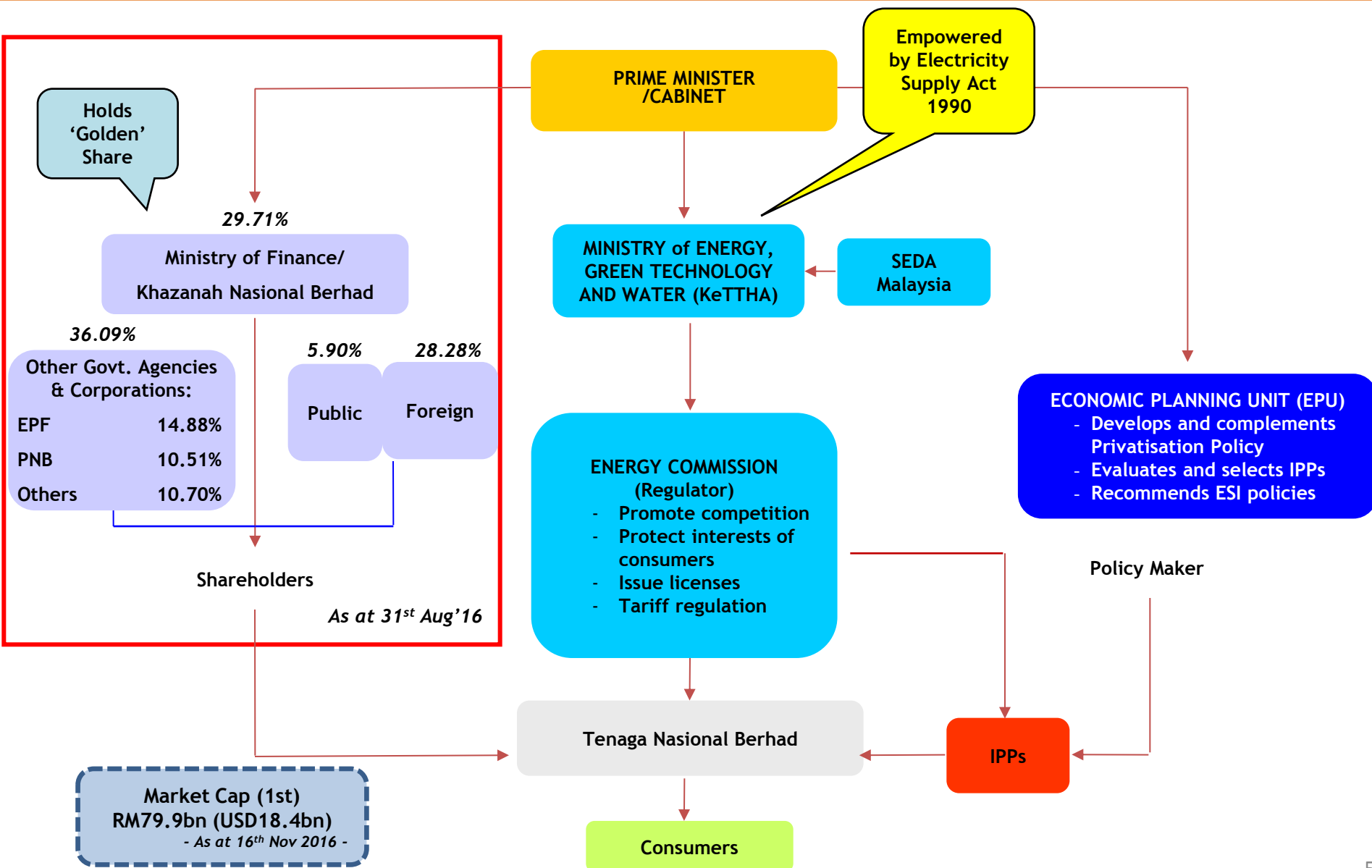
## Sectoral Sales Analysis (Gwh)



- Shift from Industrial-based to Service-based economy
- Increasing market share from Commercial sector
- Commercial sector contributes the highest electricity sales margin

# INTRODUCTION TO TENAGA

## Industry Regulatory Framework



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# TRANSFORMATION INITIATIVES BY GOVERNMENT

Aimed at Delivering a Reliable, Transparent, Efficient and Sustainable ESI

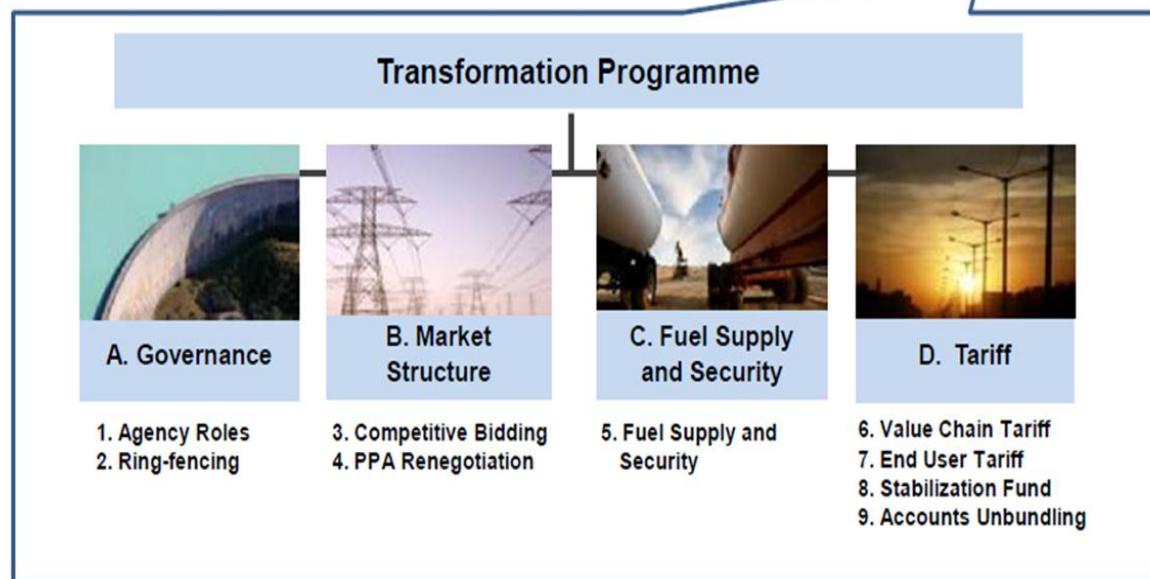
*New  
Energy  
Policy*



Jun - Dec 2008  
Khazanah's MESI Study

Jan - Dec 2009  
KeTTHA-led syndication

4 Dec 2009  
Cabinet endorsement to  
transform ESI



1<sup>st</sup> Gen IPP /  
Restricted  
Bidding

Subsidy  
Rationalisation  
Programme

FCPT  
Mechanism

LNG  
Importation

Nuclear Energy  
Capacity  
Building

National RE  
Policy & Action  
Plan

FIT & RE Fund

Legal &  
Regulatory  
Framework  
Enhancement

# INCENTIVE BASED REGULATION (IBR)

## The Move Towards Better Regulation

IBR mechanism to strengthen the following:

 The Economic Regulatory Framework for Regulating TNB

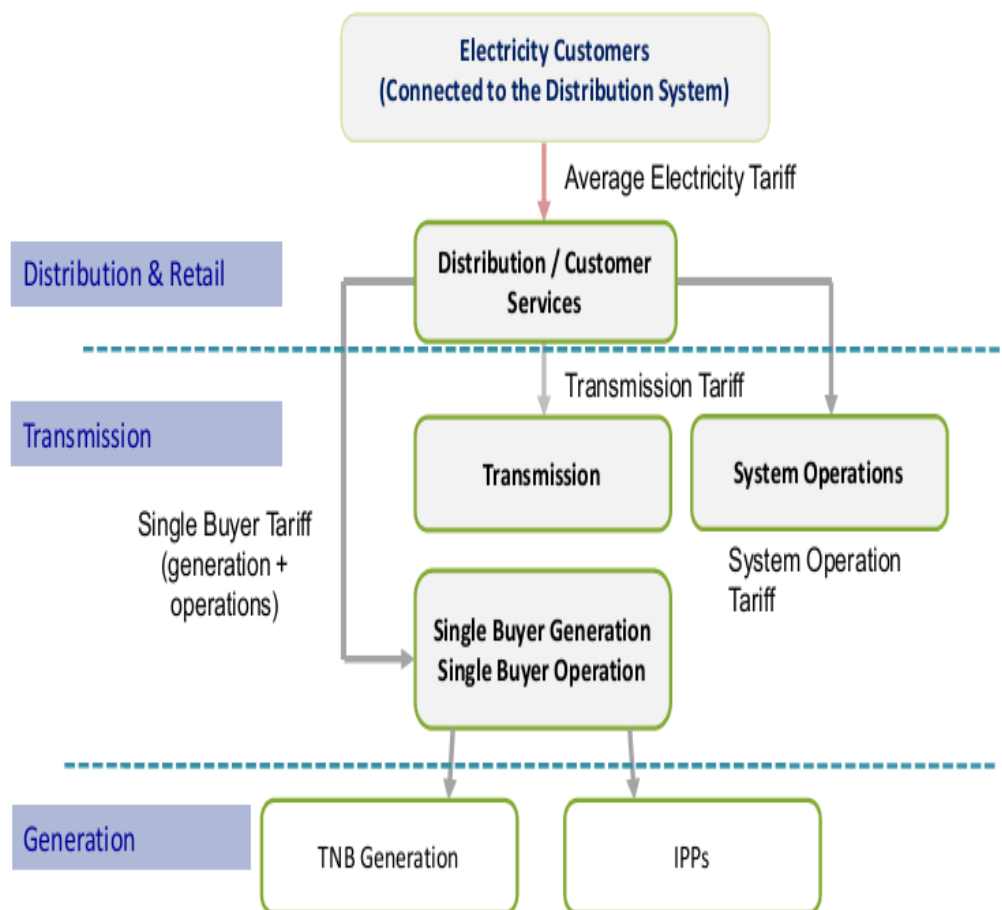
 The Tariff Setting Mechanism and Principles for Tariff Design

 Incentive Mechanisms to Promote Efficiency and Service Standards

 The Process of Tariff Reviews

 Creation of Regulatory Accounts and Its Annual Review Process

5 Business entities under IBR  
(Accounting Separation)

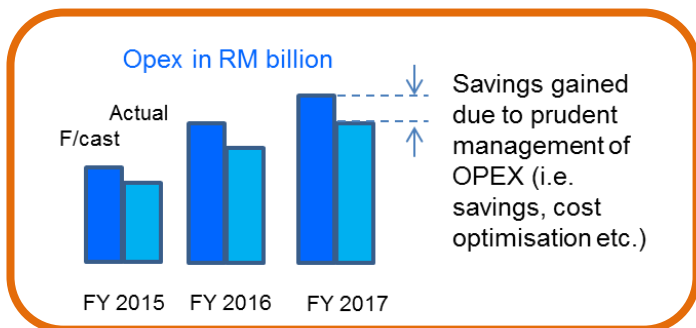


**11 Regulatory Implementation Guidelines (RIGS) were Developed for IBR Implementation**



# INCENTIVE BASED REGULATION (IBR)

## Economic Regulation Methodology to Promote Efficiency And Transparency



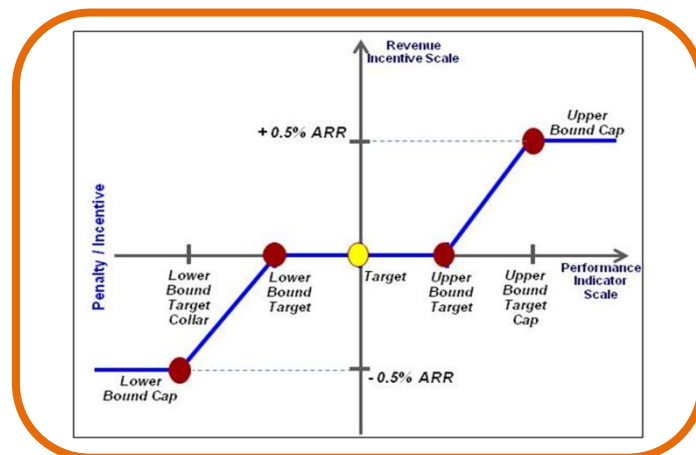
### Operational Efficiencies

- Rewarded for seeking efficiencies in operational and capital expenditure



### Financial Efficiencies

- Rewarded for maintaining an efficient capital structure



### Performance Efficiencies

- Rewarded for delivering improvements in network performance

# INCENTIVE BASED REGULATION (IBR)

Regulatory WACC for TNB under IBR (FY2014 - 2017) is 7.5%

WACC Parameters	Actual market Parameters	TNB's Proposal	Recommendation
Stock $T_{NB}$ Beta	0.92[1]	1.435	1.435 [[4]
Market Return ( $R_m$ )	8.8%[2]	12.3%	8.8%
Risk free ( $R_f$ )	4.0%	4.0%	4.0%
Market Risk Premium ( $R_m - R_f$ )	4.8%	8.3%	4.8%
Debt Margin ( $D_m$ )	2.19%	2.24%	2.24%
Tax Rate	25.0%	25.0%	25.0%

## Weighted Cost of Capital Calculation

	Actual market Parameters			TNB's Proposal			Recommendation		
Capital Structure	Cost	Capital Structure	Weighted Cost	Cost	Capital Structure	Weighted Cost	Cost	Capital Structure	Weighted Cost
Cost of Equity ( $K_e$ )	8.38%	60.5%	5.1%	15.91%	45.0%	7.16%	10.85%	45.0%	4.88%
Cost of Borrowing ( $K_b$ )[3]	6.18%	39.5%	1.8%	6.24%	55.0%	2.57%	6.24%	55.0%	2.57%
<b>Weighted Cost of Capital</b>			<b>6.9%</b>			<b>9.7%</b>			<b>7.5%</b>

Note:

[1] Based on beta for the period 2004-2012

[2]  $R_m$  - Market return of 10 yrs KLSE Index

[3] Average Gearing (2004-2011) is 39.5%

[4] Adjusted to reflect optimal gearing.

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# TARIFF

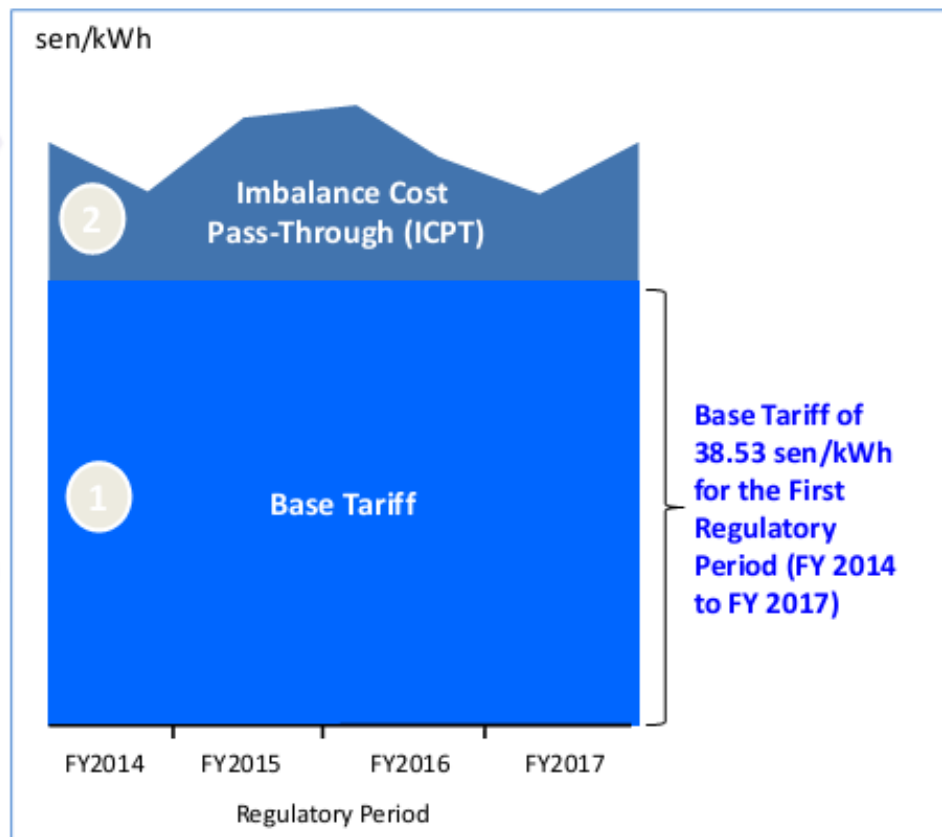
**Electricity Tariff Review = Base Tariff + Imbalance Cost Pass-Through (ICPT)**

## Imbalance Cost Pass-Through (ICPT):

- Tariff adjustment to reflect uncontrollable fuel costs and other generation costs (difference between forecast and actual cost of procuring electricity that is beyond the control of utility)

## Base Tariff under IBR framework reflects:

- a) CAPEX and OPEX of
  - transmission, distribution, system operation (SO) and single buyer operation (SB)
- b) Power purchase cost charged by generators (including base price for fuel) to the SB
- c) Return on regulated asset (rate base) of transmission, distribution, SO and SB business units



## Principle for ICPT Calculation

Cost components comprise of:

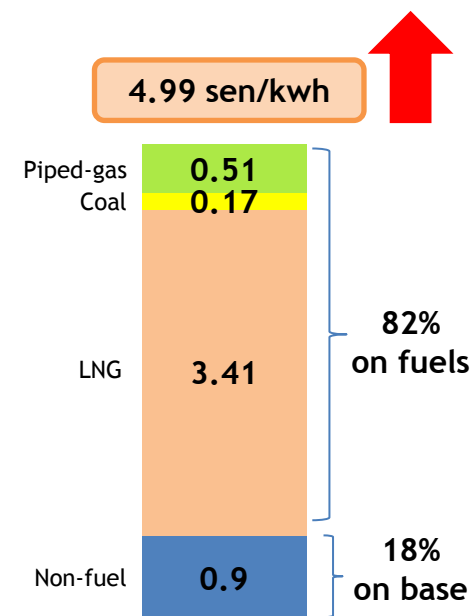
- Actual vs forecast cost of fuels & other generation costs for the preceding 6-month period; and
- Piped gas price increase of RM1.50/mmBtu for the next 6-month period

Note 1 : CAPEX = Capital expenditure  
Note 2 : OPEX = Operational expenditure

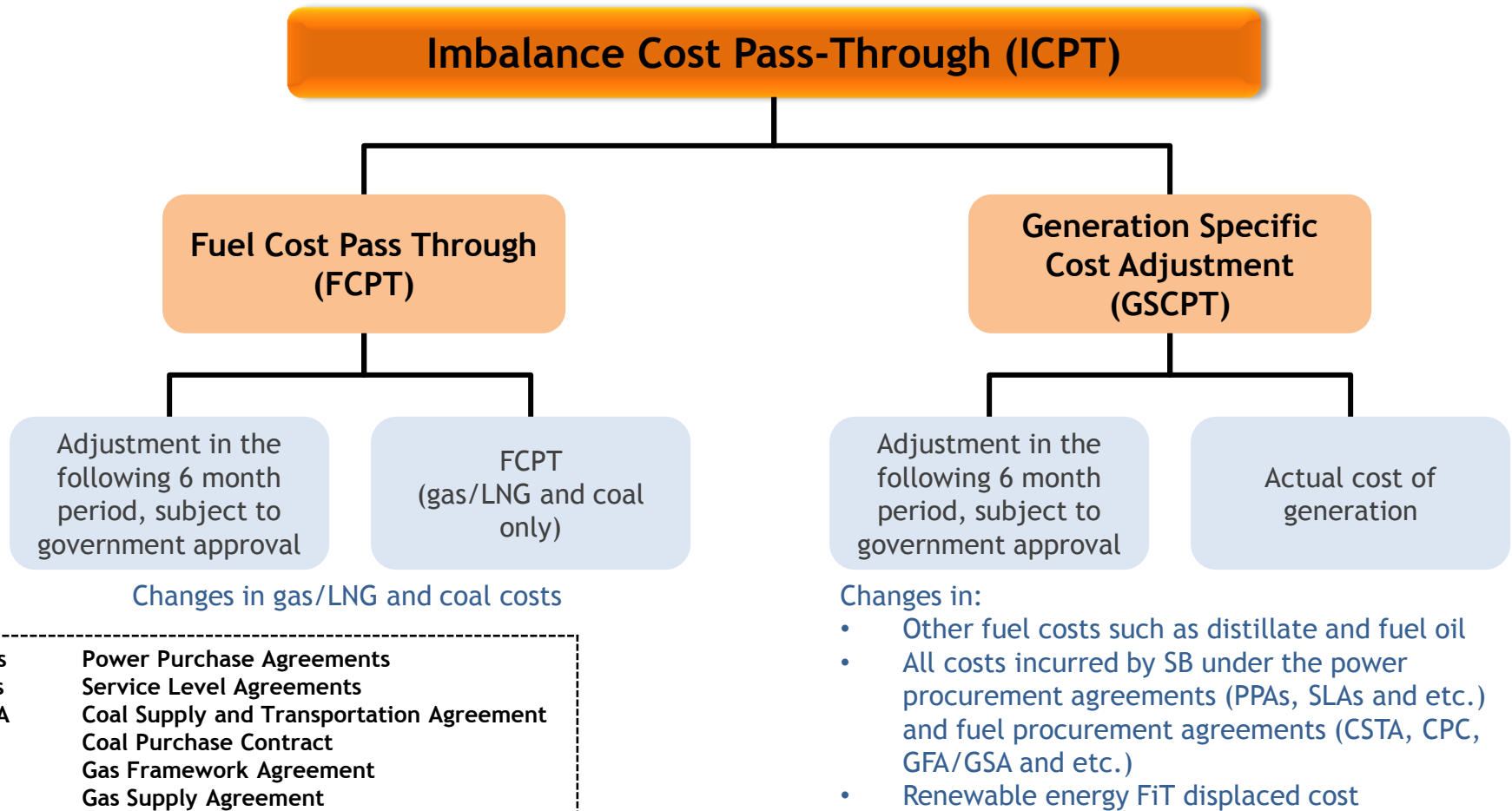
# TARIFF

**Average Base Tariff of 38.53 sen/kwh is Effective from 1<sup>st</sup> January 2014**

Tariff Components	sen/kWh	% increase
Average Tariff (Jun 2011)	33.54	
Fuel Components:		
<ul style="list-style-type: none"> <li>Piped-gas regulated price (from RM13.70/mmBTU to RM15.20/mmBTU @1,000 mmscfd)</li> </ul>	0.51	1.52
<ul style="list-style-type: none"> <li>Coal (market price) (from USD85/tonne to USD87.5/tonne CIF@CV 5,500kcal/kg)</li> </ul>	0.17	0.51
<ul style="list-style-type: none"> <li>LNG RGT market price at RM41.68/mmBTU (for gas volume &gt; 1,000 mmscfd)</li> </ul>	3.41	10.17
Non-fuel component (TNB Base Tariff)	0.90	2.69
<b>AVERAGE BASE TARIFF EFFECTIVE 1<sup>st</sup> JANUARY 2014</b>	<b>38.53</b>	<b>14.89</b>



## Imbalance Cost Pass-Through (ICPT) Comprises Two Components



ICPT	Announcement	Rebate	Period
Jan - Dec'14	RM727 mn	2.25sen/kwh	Mar - Jun'15
Jan - Jun'15	RM1,086 mn	2.25sen/kwh	July - Dec'15
Jul - Dec'15	RM762 mn	1.52sen/kwh	Jan - Jun'16
Jan - Jun'16	RM758 mn	1.52sen/kwh	Jul - Dec'16

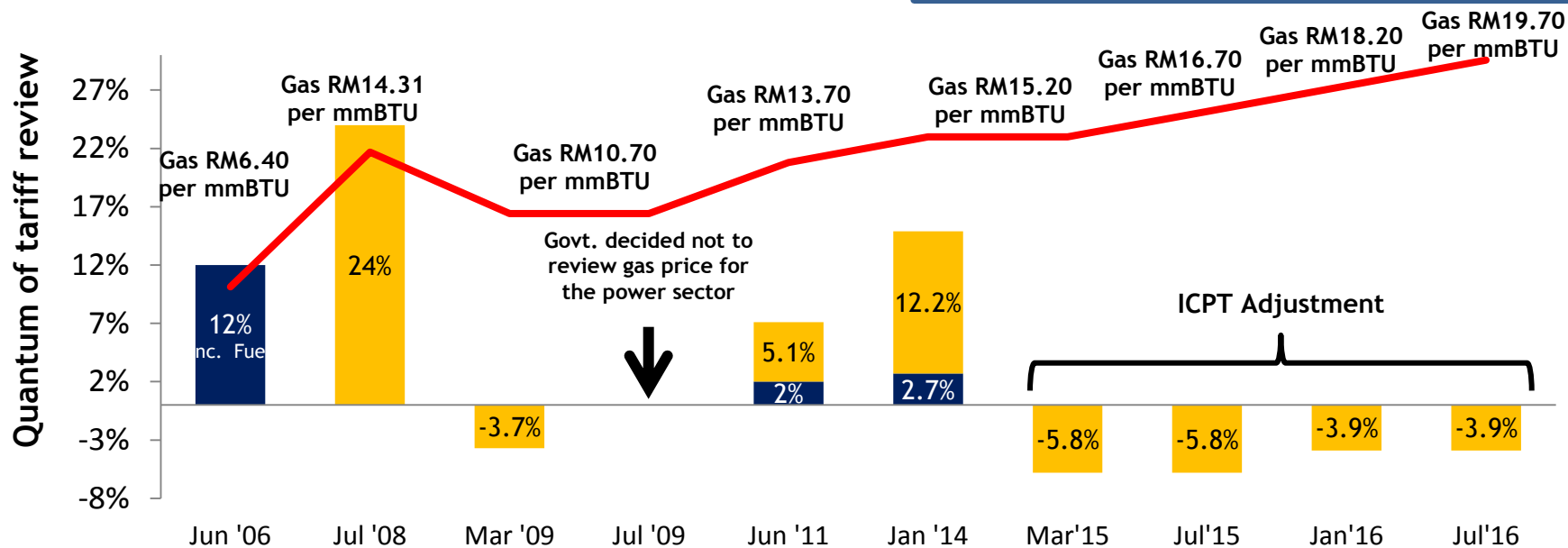
# TARIFF

## Frequency of Review & Underlying Assumptions

IBR

ICPT

Approval date	May 2006	Jun 2008	Feb 2009	Jun 2009	May 2011	Dec 2013	Feb 2015	Jun 2015	Dec 2015	Jun 2016
Effective date	Jun 2006	Jul 2008	Mar 2009	Jul 2009	Jun 2011	Jan 2014	Mar 2015	Jul 2015	Jan 2016	Jul 2016
Quantum	12%	23 - 24%	(3.7%)	Neutral	7.1%	14.9%	(5.8%)	(5.8%)	(3.9%)	(3.9%)
Gas (RM/mmbtu)	6.40	14.31	10.70	10.70	13.70	15.20	15.20	16.70	18.20	19.70
Coal (USD/MT)	45.00	75.00	85.00*	85.00*	85.00*	87.50**	87.50**	87.50**	87.50**	87.50**
Average Tariff (sen/kWh)	26.2	32.5	31.3	31.3	33.5	38.5	38.5	38.5	38.5	38.5



\* Forex (RM/USD) = RM3.6

\*\*Forex (RM/USD) = RM3.14

Base tariff adjustment

Fuel adjustment

Gas price

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# BUSINESS STRATEGY & DIRECTION

## 20-Year Strategic Plan

THE PLAN LAYS DOWN THE PATH TOWARDS  
REALISING OUR VISION OF GLOBAL LEADERSHIP  
It builds upon the progress of T7

**GLOBAL  
LEADERSHIP 2025**

- Excel in:
  - All business areas
  - Reputation as a strong business partner
  - Ability to continue to create shareholder value
- Tenaga acknowledged as amongst the most admired companies globally

**OVERSEAS  
INVESTMENT 2020**

- Improved financial position and human resource readiness
- Venture into power/energy related investments in the international arena

**GEOGRAPHICAL  
EXPANSION  
(SERVICES) 2015**

- Expand works and services related to the energy sector
- Creation of new revenue stream leveraging on Tenaga's knowledge and competencies in the energy business

**SERVICE  
EXCELLENCE 2010**

- Improve Core Operations under T7 Strategy
- Place Tenaga as the best performing company in Malaysia by 2007 and as the Regional best by 2010

**T7**



## Where We Are Now...

### TNB TODAY

- Tenaga is a strong player in the growing ASEAN region
- Fresh industrial reforms has resulted in a more transparent regulatory environment
- Management team focused on addressing complexities and unlocking value
- A new forward looking strategy centered on growth

## New Strategic Direction & Focus...

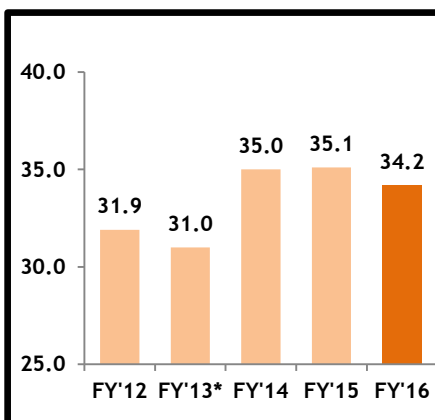
### TNB TOMORROW

- Will further strengthen efforts to optimise operation efficiencies
- Is set to grow the company in key emerging markets
- Capitalises on the technological disruption and evolution currently confronting the utility sector
- Unlock value across the value chain, from the generation segment to segments beyond the meter

## Financial & Technical 5-Year Performance

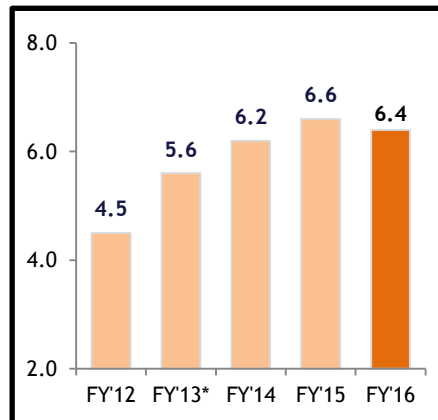
### FINANCIAL PERFORMANCE

1 COMPANY CPU (sen/kwh)#



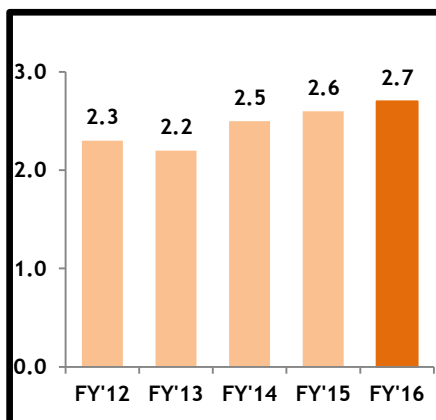
# Exclude Finance Cost

2 ROA (%)



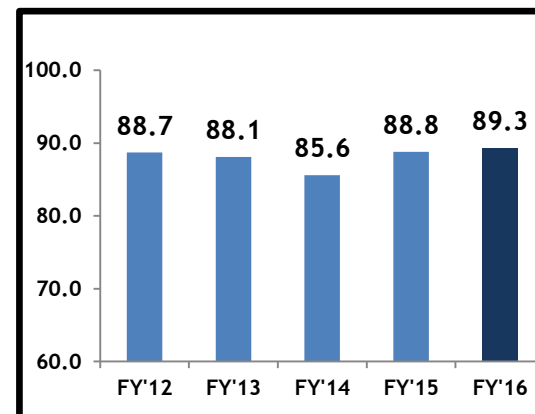
\* FY13 - restated

3 REVENUE FROM NON-REGULATED BUSINESS (RM bn)

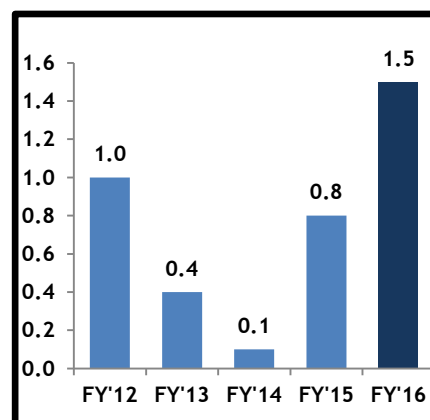


### TECHNICAL PERFORMANCE

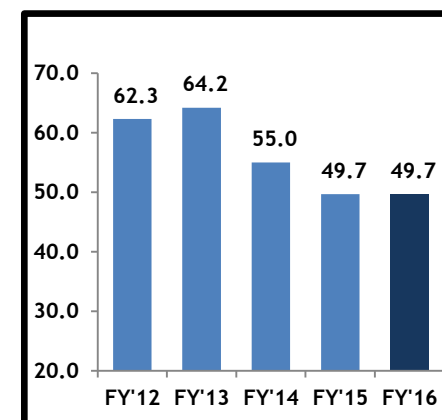
1 EQUIVALENT PLANT AVAILABILITY FACTOR (EAF) (%)



2 SYSTEM MINUTES (mins)



3 SAIDI (mins)



### Global Drivers

### TNB Direction

1

Future DEMAND GROWTH will come from cities in EMERGING MARKETS



Regional growth strategy targeting emerging markets

2

Technological disruptions will impact demand and create new opportunities



Grid digitalization and new business approach to capitalize on customer relationship

3

Technology evolution in renewable generation



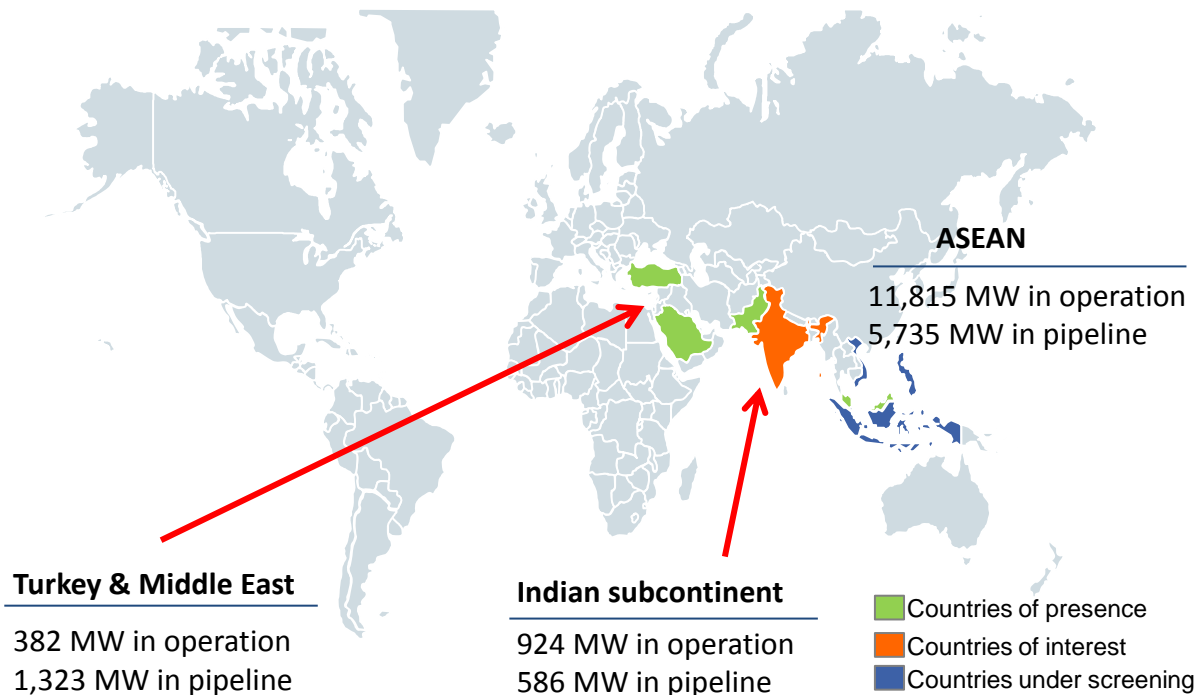
Planned increase penetration in renewable generation

**TNB New Strategic Direction and Focus**

## Growth drivers

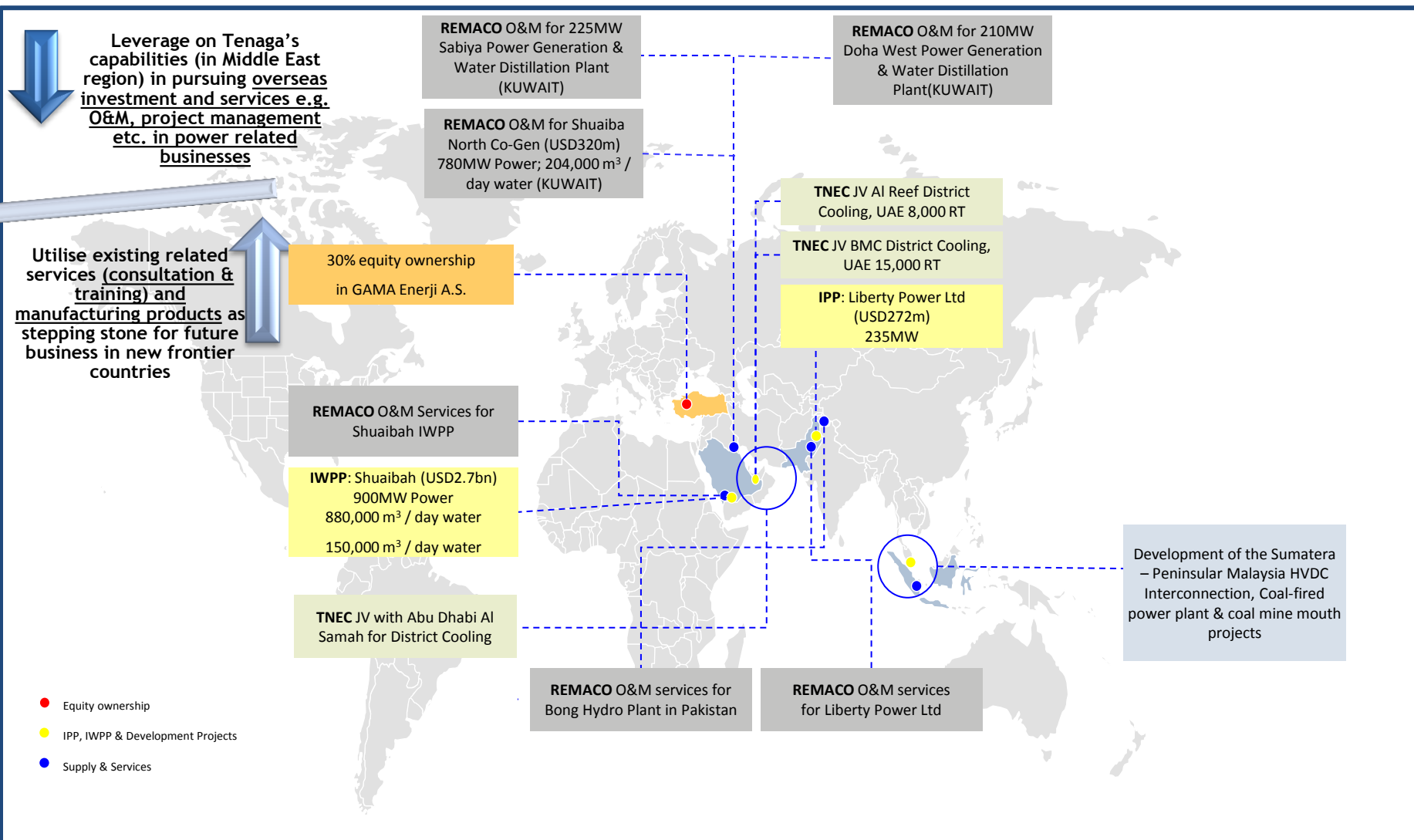
1. Global economic centre of gravity is shifting east and south from Europe towards Asia
2. 2.5 billion people will live in Asian cities by 2025
3. ~400 emerging market cities will generate 50% of global GDP growth in 2025
4. Emerging economies will grow 75% faster than developed nation by 2025

## TNB direction



**TNB is Positioning to Expand Into Key Growth Areas**

## TNB International Footprint in Energy Related Businesses



Note: REMACO is a 100% owned subsidiary with a focus on O&M; MTM is a wholly owned subsidiary manufacturing transformers with contracts in Saudi Arabia, Brunei & Indonesia; TSG is a subsidiary manufacturing high voltage switchgears with contracts in Pakistan, Indonesia, Thailand & Vietnam; TNEC is a wholly owned subsidiary providing project services and developing energy related projects; ILSAS provides training & programs related to electricity supply sector for local and international participants.

## 2 KEY THEMES : TECHNOLOGY DISRUPTION

### Growth drivers

Technological advancements will impact demand and create new business opportunities



Battery storage is emerging as the “new power plant” of the future

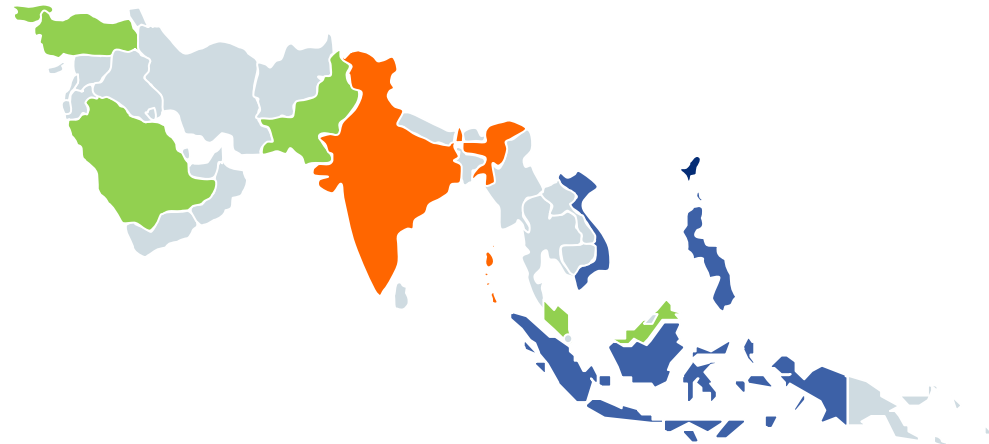


Large scale innovations in infrastructure (smart grid, metering, IoT)



Innovation technology (energy efficiency, analytics) will create market for integrated services

### TNB direction



■ Countries of presence  
■ Countries of interest  
■ Countries under screening

Market Population: ~2.2 billion

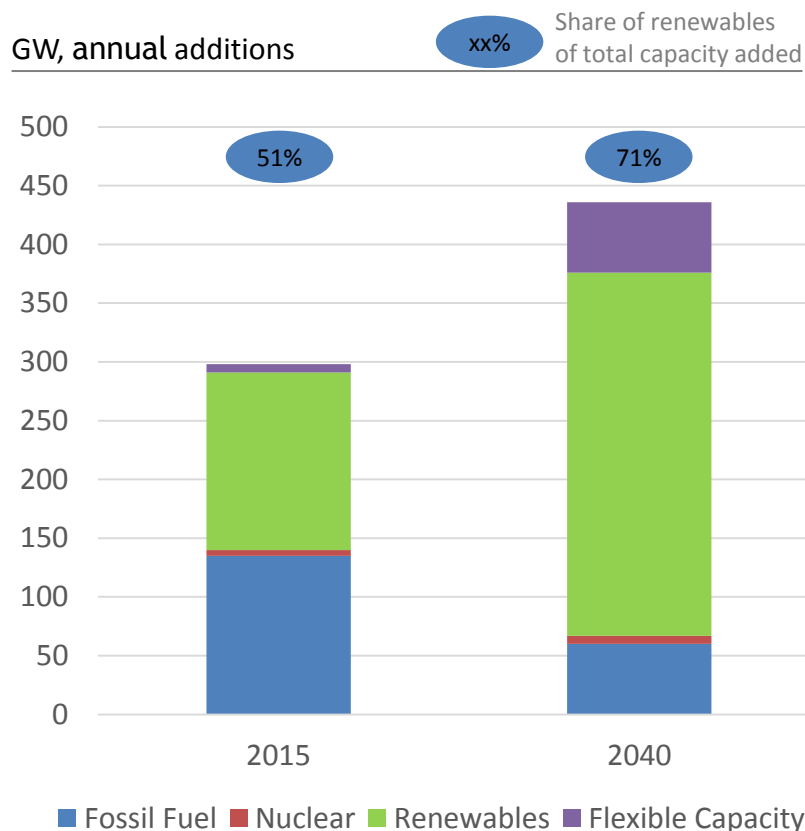
**Technology Advancement Will Allow TNB to Further Unlock the Value of Our Potential Customers**

# 3 KEY THEMES : RENEWABLE GENERATION

The Malaysian Government has Committed to COP21 Targets & Renewable Energy is Critical to Achieve This Effort

## Growth drivers

Renewables will represent up to ~70% of new capacity additions globally by 2040...



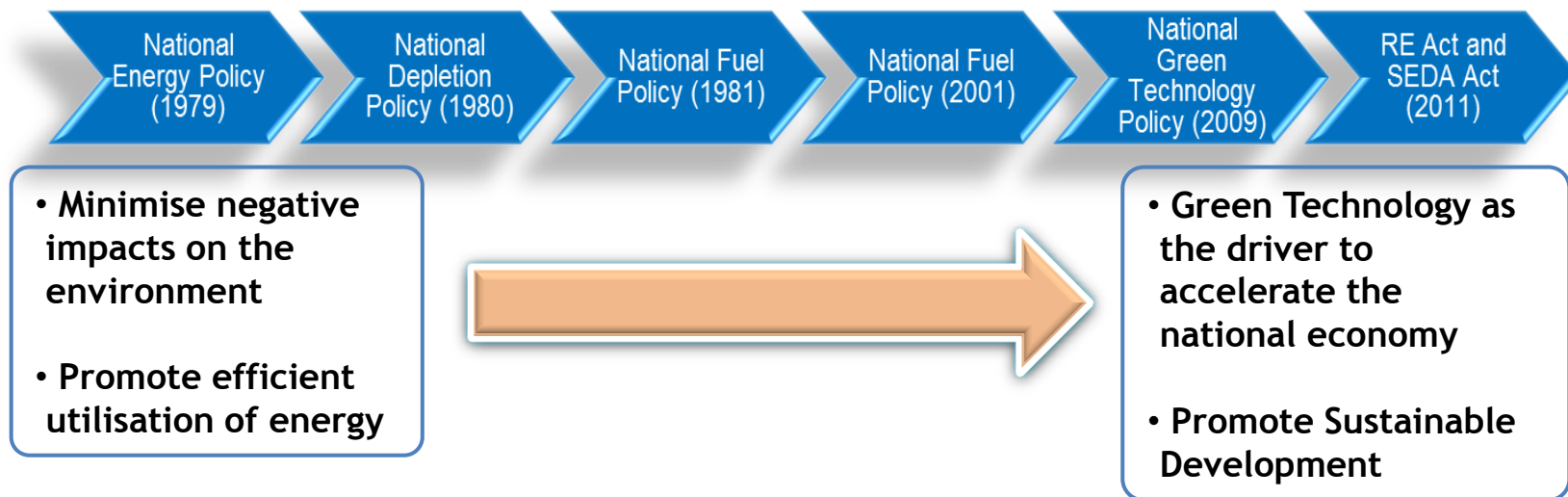
## TNB direction

1. Malaysia is looking to add ~2GW of renewable generation by 2020
2. ASEAN region will require large investment in RE to deploy ~50GW of renewable generation by 2025
3. Tenaga Nasional is positioning to tap both its domestic market and the ASEAN regional market

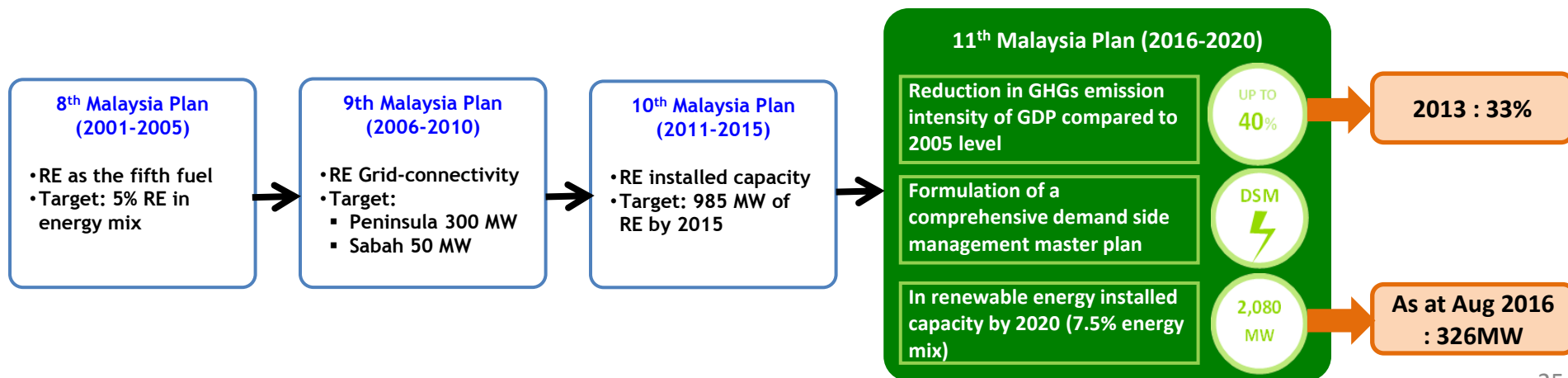


## Government Green Policy & Initiatives

### Evolution on National Energy Policies



### Government Green Development Plan



## TNB Green Policy

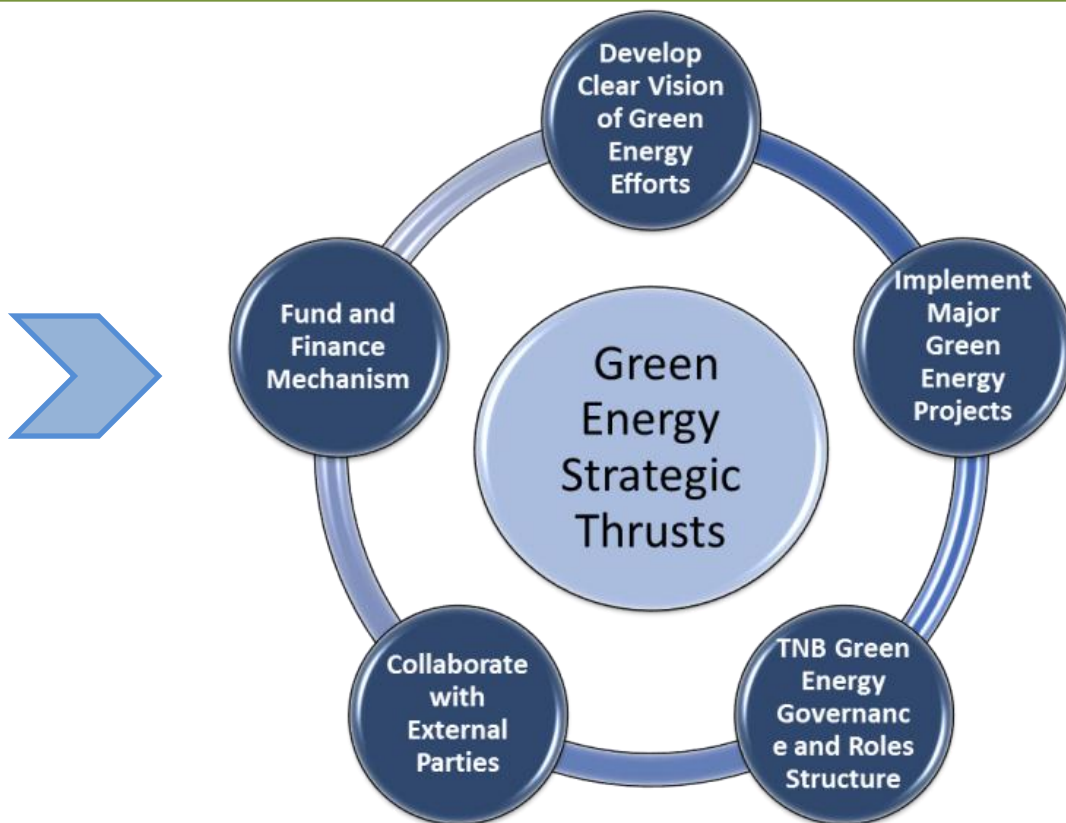
*“TNB is committed to support the national green agenda and minimise the environmental impact of our business by applying sustainable, efficient operations and delivering green energy through the application of appropriate technologies and investments”*

**TNB RE Targets  
by 2020****Domestic**

- 60-80% of national targets by 2020 (1,248 -1,664 MW)

**International**

- In accordance to TNB Investment policy and guidelines on ventures, M&A and bidding for Green Energy Projects



## TNB Green Initiatives

### Major Green Projects

- 1) Ultra-supercritical technology for coal plants
  - 10% less CO<sub>2</sub> emission compared to conventional subcritical technology
- 2) Carbon footprint study - supply side (2012)
  - Preliminary assessment of Carbon Inventory for TNB Thermal Power Plants
  - Recommendation on the most suitable methodology of measuring Carbon Footprint for TNB power plants
- 3) R&D projects for enhancing power plants efficiency
- 4) Smart Grid (SG) Project
- 5) Various District Cooling (DCS) & Thermal Energy Storage (TES) projects

### Demand Side Management (DSM) Programs

- Special tariff rates for DCS & TES
- Thermal energy storage
- DSM study on Enhanced Time of Use (ETOU) & interruptible scheme
- Development of training & capacity building centres
- Pilot Electric Vehicles (EV) charging terminal

### Renewable Energy Projects

- 1) Non FiT and Off-grid installation:
  - Solar Hybrid project
    - 850kW in RPS Kemar, Perak.
- 2) FiT projects:
  - JV project with Felda Global Ventures
    - 10MW Biomass (Jengka)
  - JV with Sime Darby
    - 2MW Biogas Hadapan Palm Oil Mill
    - 2MW Remington Palm Oil Mill
  - JV with Amcorp Power Sdn Bhd
    - 20MW Mini Hydro at Sg Liang, Pahang
  - Floating solar pilot project in Negeri Sembilan

### Energy Efficiency (EE) Programs

- Energy audits & power quality services by TNB Energy Services, a subsidiary of TNB
- Pilot Home Energy Report (HER) Programme
- TNB EE Managers Programs
- TNB EE campaigns
- TNB participation in EE awareness programs

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# DIVIDEND

## Policy and Yield

Tenaga is committed to pay out dividend based on its Dividend Policy whereby:  
*Dividend is paid out based on **40%-60%** of its Company's Annual Free Cashflow;  
 Cashflow from Operations less Normalised Capex and Interest Servicing*

### INTERIM DIVIDEND

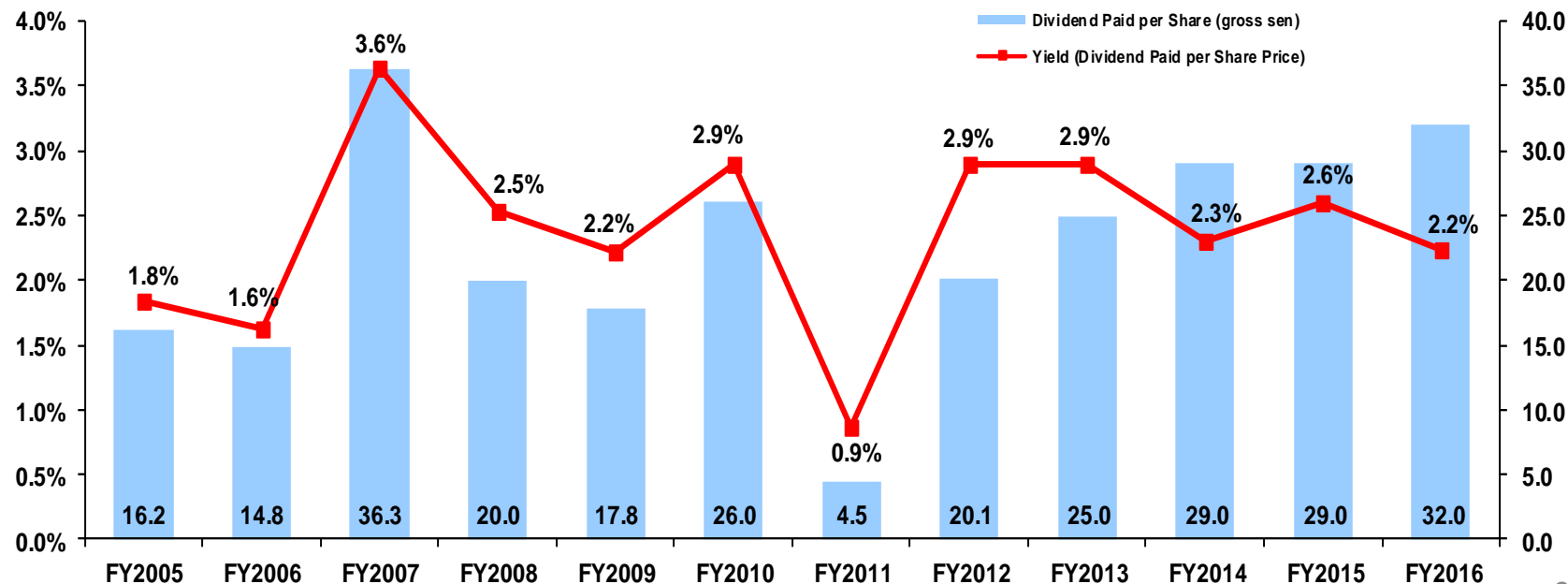
Interim Single-Tier Dividend  
 of 10.0 sen per ordinary share

**PROPOSED  
FINAL**

Single-Tier Dividend  
 of 22.0 sen per ordinary share

Dividend Yield

Sen/Ordinary Share



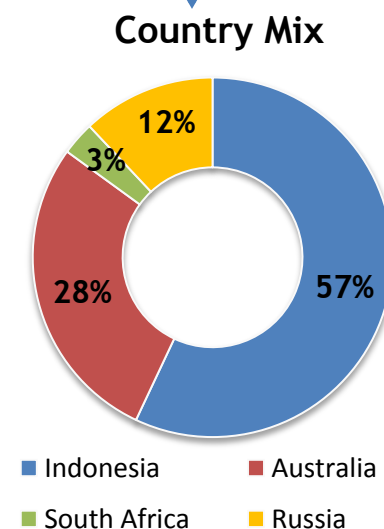
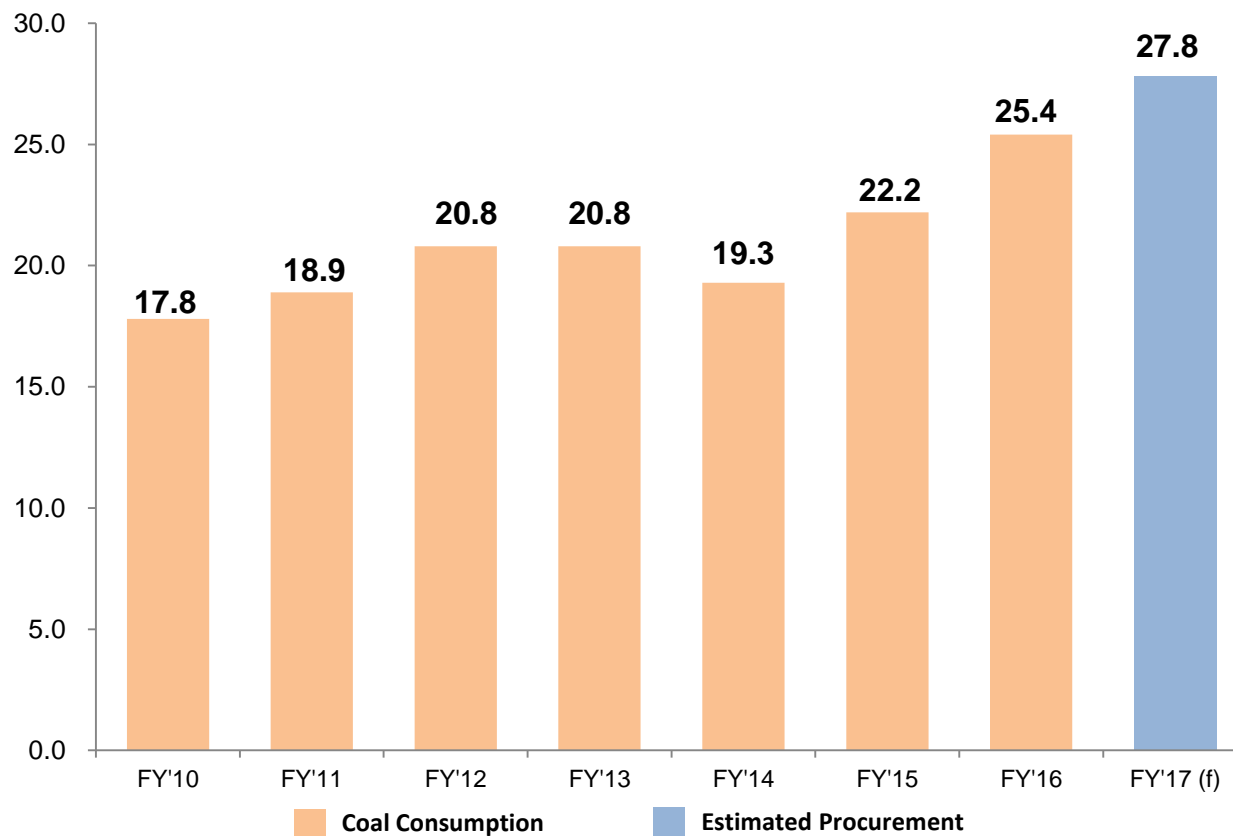
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# COAL REQUIREMENTS

Average Coal Price for FY'16 was at USD55.7/MT @ RM231.1/MT

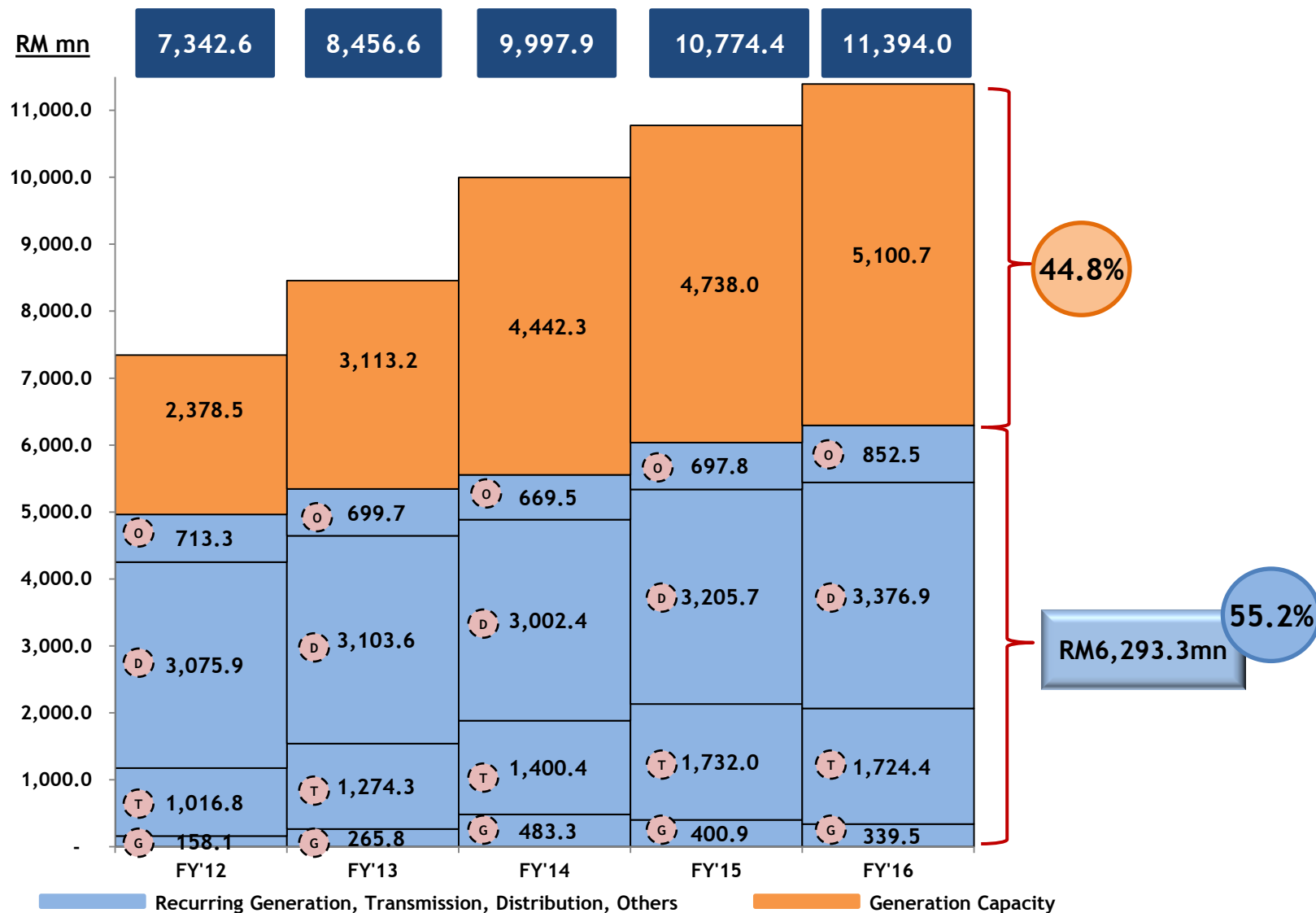
Average Coal Price (CIF)	FY'10	FY'11	FY'12	FY'13	FY'14	FY'15	FY'16
(USD/metric tonne)	88.2	106.9	103.6	83.6	75.4	66.0	55.7
(RM/metric tonne)	293.8	325.9	321.9	259.5	244.6	236.0	231.1

Tonne (mn)



# CAPITAL EXPENDITURE

Major Projects Represent 44.8% of Total CAPEX





# STATUS OF MAJOR PROJECTS

4 Generation Projects With Capacity of 1,882MW Successfully Commissioned

## COAL

### Janamanjung Unit 5

**96%** **1,000MW**

*COD 1<sup>st</sup> Oct 2017*

### Jimah East Power

**22%** **2,000MW**

*COD*

*15<sup>th</sup> Jun 2019 (U1)*

*15<sup>th</sup> Dec 2019 (U2)*

## HYDRO

### Hulu Terengganu Hydro

**COMPLETED** **250MW**

*COD Dec 2015 (U1 & U2)*

### Tembat

**99%** **15MW**

*COD Dec 2016 (U3 & U4)*

### Ulu Jelai Hydro

**COMPLETED** **372MW**

*COD*

*27<sup>th</sup> Sep 2016 (U1)*

*15<sup>th</sup> Aug 2016 (U2)*

## GAS

### Connaught Bridge

**COMPLETED** **375MW**

*COD 27<sup>th</sup> Feb 2016*

### Prai

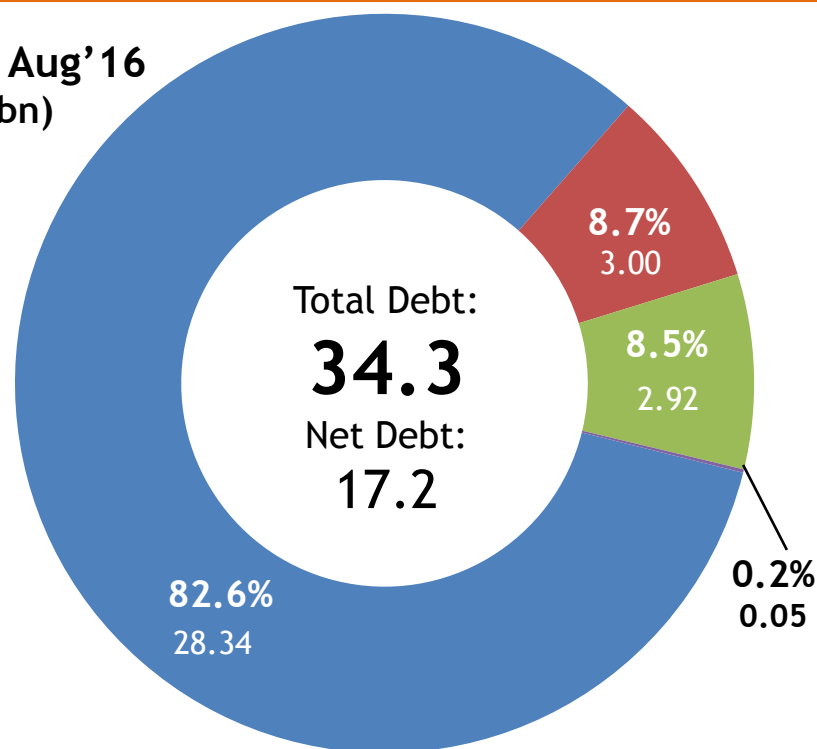
**COMPLETED** **1,071MW**

*COD 20<sup>th</sup> Feb 2016*

# DEBT EXPOSURE & GEARING

Higher Debt due to Loan Issuance for Jimah East Power of RM8.98bn  
& Gama Enerji of RM1.20bn

31<sup>st</sup> Aug'16  
(RM bn)



“The Group is required to hedge a minimum of 50.0% of TNB’s known foreign currency exposure up to 12 months period. The Group uses forward exchange contracts and currency options contract to hedge its foreign currency risk. Most of the forward exchange contracts have maturities of less than three months”

## HEDGING POLICY

Statistics	31st Aug'16	31st Aug'15
Gearing (%)	39.5	34.2
Net Gearing (%)	19.7	21.9
Fixed : Floating (%)	96.4 : 3.6	100.0 : 0.0
Final Exposure (%)	96.4 : 3.6	100.0 : 0.0
Weighted Average Cost of Debt (%)	5.06	4.80
Final Exposure (%)	5.06	4.80

Closing	31 <sup>st</sup> Aug'16	31 <sup>st</sup> Aug'15
USD/RM	4.06	4.19
100YEN/RM	3.96	3.47
USD/YEN	102.53	120.75

\* Net Debt excludes deposits, bank and cash balances & investment in UTF

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**THANK YOU**