



Investor Presentation



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INTRODUCTION TO TENAGA



INCENTIVE BASED REGULATION (IBR)



BUSINESS STRATEGY & DIRECTION



CAPITAL MANAGEMENT



FINANCIAL & TECHNICAL HIGHLIGHTS

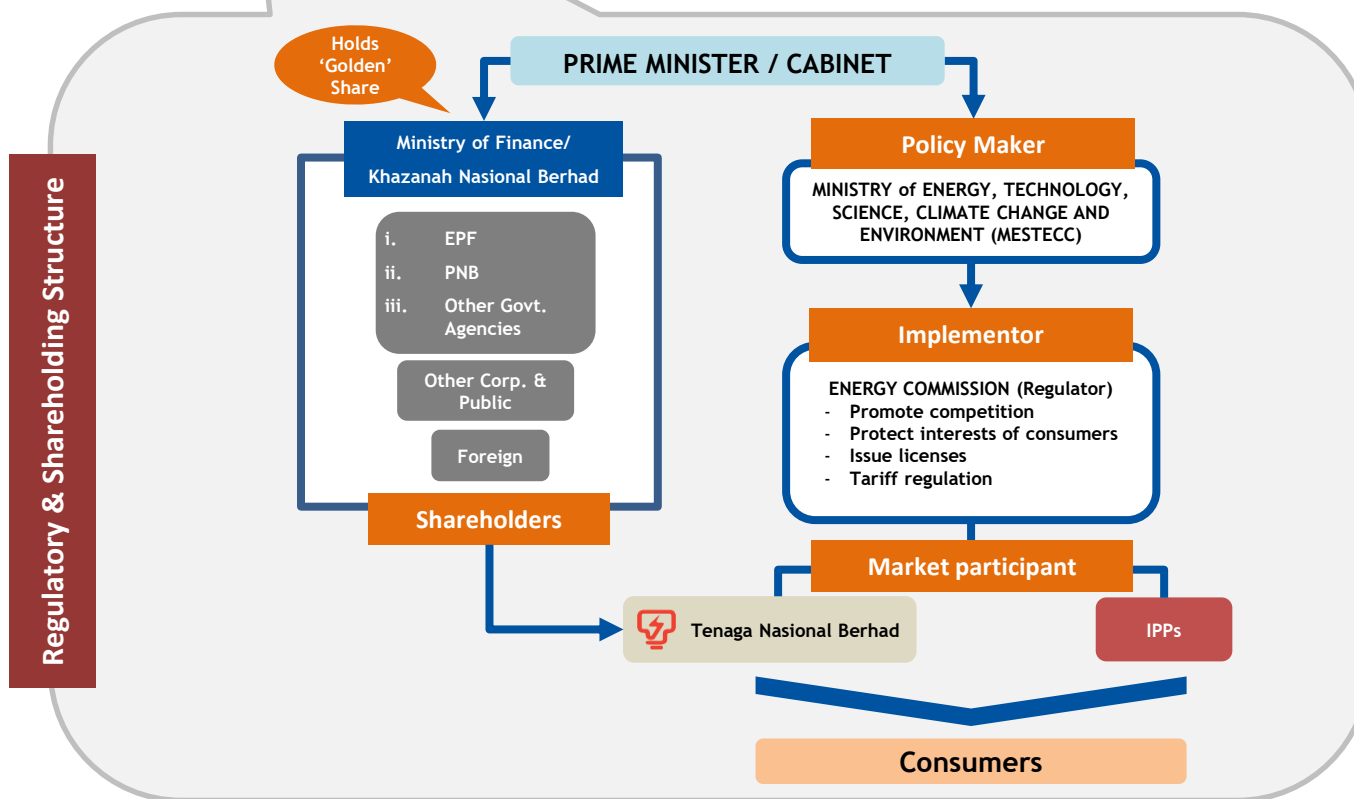
INTRODUCTION TO TENAGA







Tenaga Nasional Bhd (TNB)

**Sabah Electricity
Sdn Bhd (SESB)**
(83% owned by TNB)
Dependable Capacity:
1,290MW

Sarawak Energy Bhd (SEB)



INTRODUCTION TO TENAGA

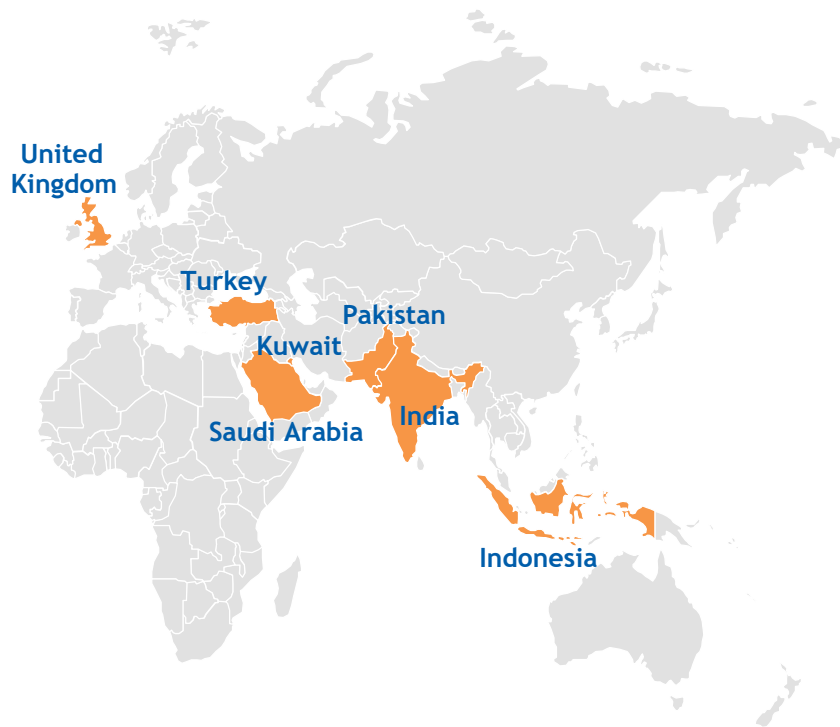
Core Business	Generation	Grid/Transmission	Distribution Network & Customer Service
	Non-Regulated Business	Regulated Business	
	<p>Generation Mix:</p> <div> <div>Oil & Distillate </div> <div>Hydro </div> <div>Gas & LNG </div> <div>Coal </div> </div> <p>Installed Capacity: 24,304MW <i>(TNB: 13,158MW, IPP: 11,145MW)</i></p> <p>Generation Market Share: 54.3%</p> <p>Equivalent Availability Factor (EAF): 89.9%</p>	<p>Transmission Network Length: 22,840KM</p> <p>Transmission Substations: 439</p> <p>Transmission System Minutes: 0.35 mins</p>	<p>Distribution Network Length: 632,929KM</p> <p>Distribution Substations: 78,981</p> <p>SAIDI: 48.19 mins</p> <p>Customer Satisfaction Index (CSI): 8.1</p>

Note: Data / Info as at 4QFY18 (December 2018)

Non-Core Business	Subsidiaries		
	Non-Regulated Business		
	<p>Operation & Maintenance (O&M)</p> <ul style="list-style-type: none"> TNB Repair & Maintenance Sdn. Bhd. (REMACO) <p>Manufacturing</p> <ul style="list-style-type: none"> Tenaga Switchgear Sdn. Bhd. Malaysia Transformer Manufacturing Sdn Bhd. Tenaga Cables Industries Sdn. Bhd. 	<p>Renewables & Energy Efficiency Services</p> <ul style="list-style-type: none"> TNB Renewables Sdn. Bhd. GSPARX Sdn. Bhd. TNB Energy Services Sdn. Bhd. TNB Engineering Corporation Sdn. Bhd. 	<p>Education & Research</p> <ul style="list-style-type: none"> TNB Integrated Learning Solution Sdn. Bhd. (ILSAS) TNB Research University Tenaga Nasional (UNITEN)

BUSINESS STRATEGY & DIRECTION

Expanding Global Footprint To Achieve Aspiration - TNB is currently present in more than 5 countries



TNB'S FOCUS ON

**INTERNATIONAL EXPANSION
AND INVESTMENT IN THERMAL &
RENEWABLE ENERGY**



United Kingdom

- 50% equity ownership in Vortex Solar Investments S.à.r.l
- 80% equity ownership in Operational Onshore Wind Portfolio in UK



Turkey

- 30% equity ownership in GAMA Enerji A.Ş.



Saudi Arabia

- 20% equity ownership in a Malaysian Shoaiba Consortium Sdn Bhd
- REMACO O&M Services for Shuaibah IWPP



Kuwait

- REMACO O&M for 225MW Sabiya Power Generation & Water Distillation Plant
- REMACO O&M for Shuaiba North Co-Gen 780MW Power; 204,000 m³/day water
- REMACO O&M for 210MW Doha West Power Generation & Water Distillation Plant



Pakistan

- Liberty Power Ltd 235MW
- REMACO O&M Services - Bong Hydro Plant
- REMACO O&M Services - Balloki Power Plant



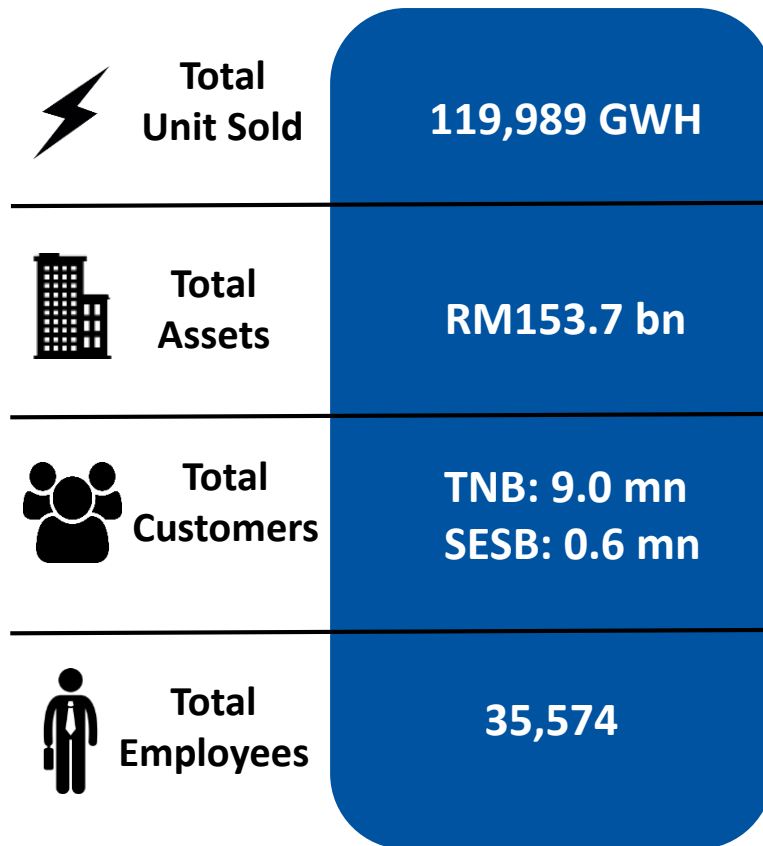
India

- 30% equity ownership in GMR Energy Ltd
- 30% convertible debenture in Bajoli Holi

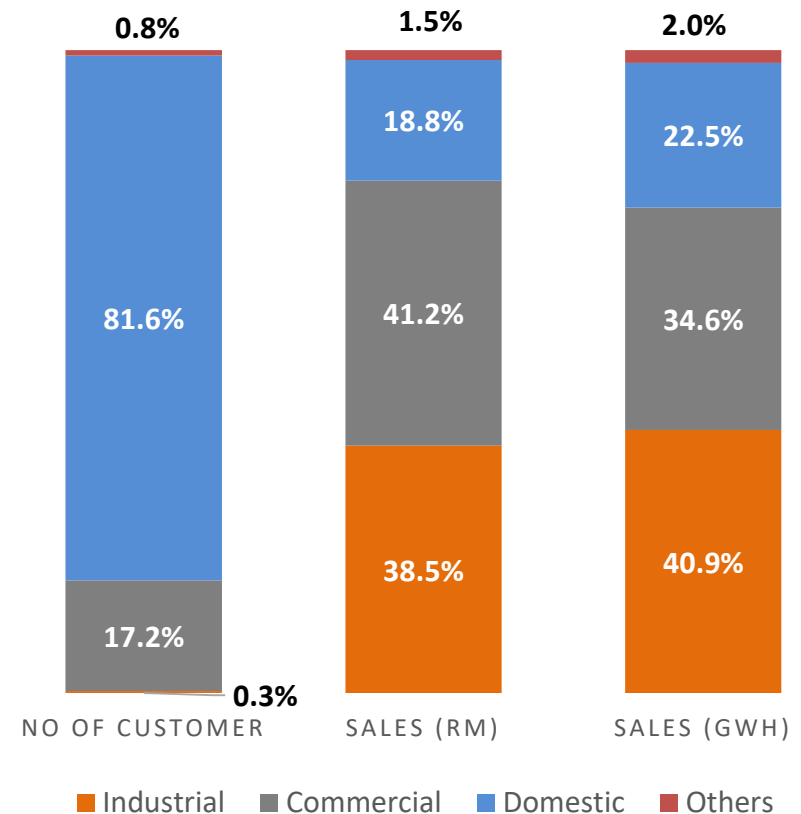


Indonesia

- Development of the Sumatra - Peninsular Malaysia HVDC Interconnection, coal-fired power & coal mine mouth projects



TNB Sectoral Sales Analysis*



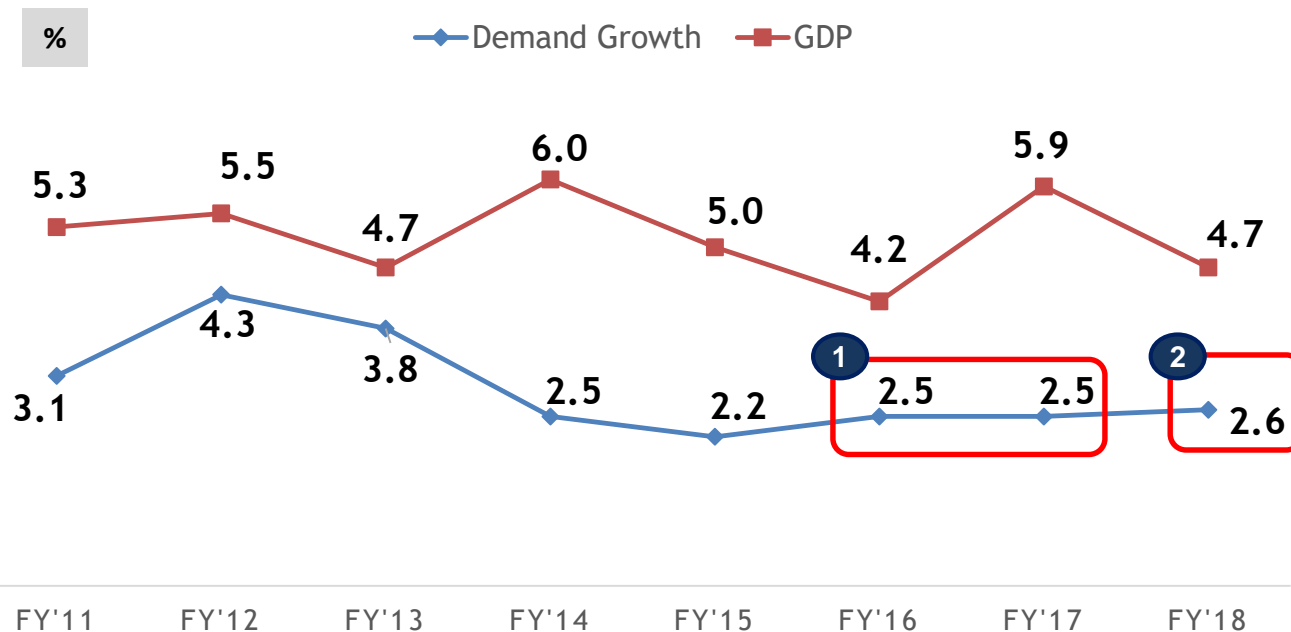
Note: Data / Info as at 4QFY18 (December 2018)

* TNB exclude SESB

INTRODUCTION TO TENAGA

Steady Y-o-Y Sales Growth

GDP & Demand Growth by Financial Year



By Calendar Year	Growth (%)
JAN'16-DEC'16	4.6
JAN'17-DEC'17	0.1
JAN'18-DEC'18	2.6

1 Average demand growth for FY2016 & FY2017. This is to eliminate the one-off El-Nino phenomenon during 3QFY'16

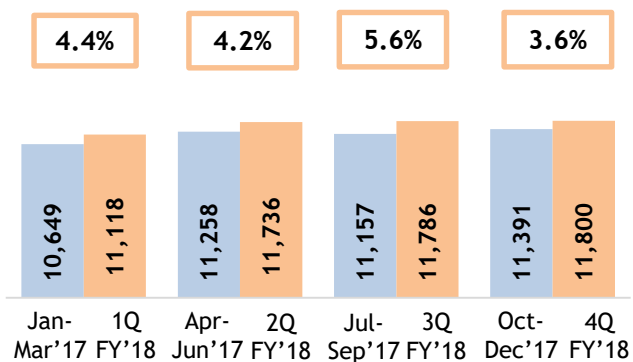
2 Comparison between Jan'18-Dec'18 and Jan'17-Dec'17

INTRODUCTION TO TENAGA

Positive Growth for All Sector

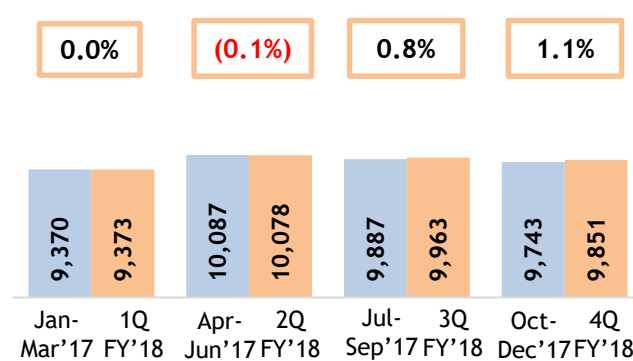
Industrial

Gwh



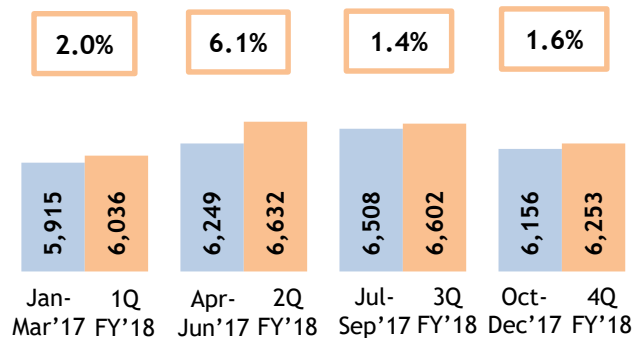
Commercial

Gwh



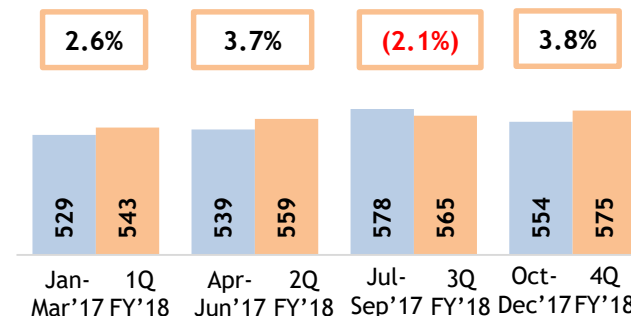
Domestic

Gwh



Others

Gwh



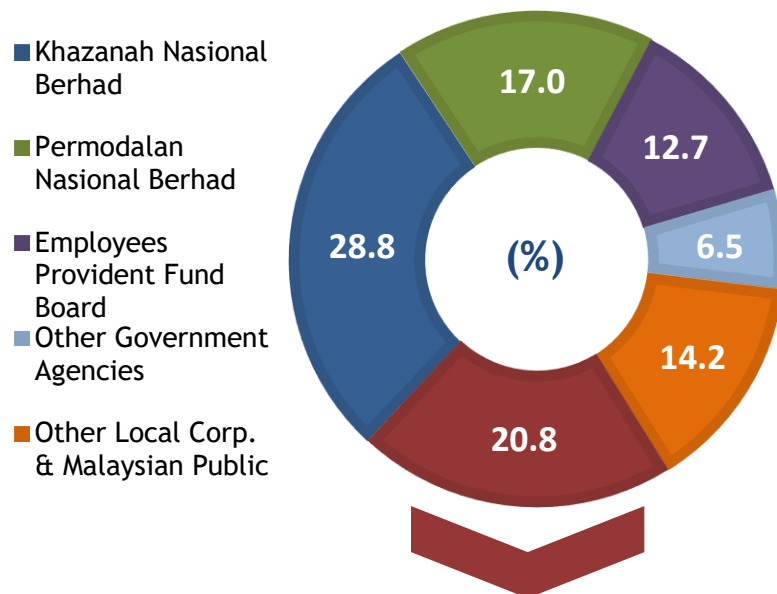
 /  Unit Sales in 2017 / 2018

 Growth in 2018 (Calendar Year)

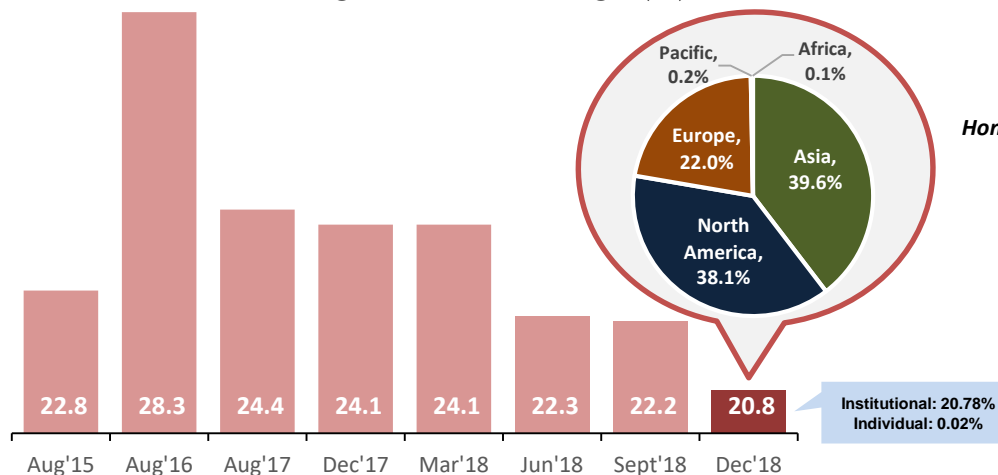
INTRODUCTION TO TENAGA

Reducing Trend of Foreign Shareholding

Shareholding as at Dec'18

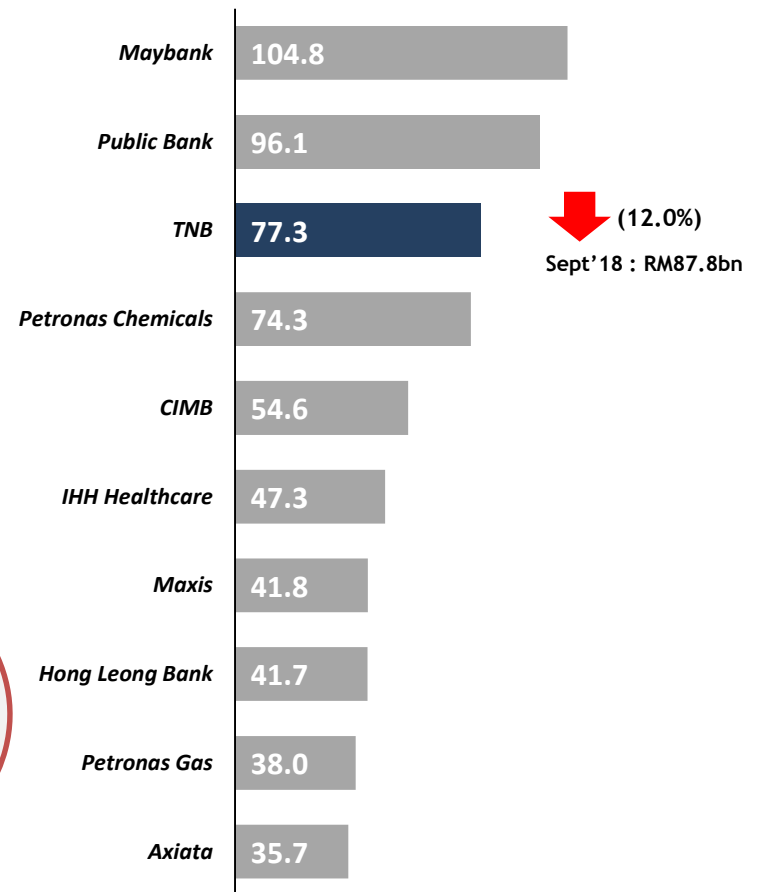


Foreign Shareholdings (%)



Top 10 KLCI Stocks by Market Capitalization as at Dec'18

(RM bn)



INTRODUCTION TO TENAGA

Composition of BOD



CHAIRMAN
TAN SRI LEO MOGGIE
Years of directorship: 14 years



EXECUTIVE DIRECTOR / CEO
DATUK SERI IR. AZMAN BIN MOHD
Years of directorship: 8 years

Independent Non-Executive Directors (Total = 5)



JUNIWATI BINTI RAHMAT HUSSIN
(**< 1 Year**)
Expertise: Project Management,
Corporate Planning and Human Resource



**GEE SIEW
YOONG**
(**2 Years**)
Expertise: Audit & Finance



**NORAINI BINTI
CHE DAN**
(**2 Years**)
Expertise: Audit & Finance



**GOPALA KRISHNAN A/L
K.SUNDARAM**
(**< 1 Year**)
Expertise: Law



ONG AI LIN
(**< 1 Year**)
Expertise: Audit & Finance

Non-Independent Non-Executive Directors (Total =2)

**DATUK AHMAD BADRI BIN
MOHD ZAHIR**
(**MoF**)
(**< 1 Year**)



AMRAN HAFIZ BIN AFFIFUDIN
(**Khazanah**)
(**< 1 Year**)

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INTRODUCTION TO TENAGA



INCENTIVE BASED REGULATION (IBR)



BUSINESS STRATEGY & DIRECTION



CAPITAL MANAGEMENT



FINANCIAL & TECHNICAL HIGHLIGHTS

INCENTIVE BASED REGULATION (IBR)

A Mechanisms For Tariff Setting With Incentives To Improve Efficiency & Greater Transparency

Regulatory Environment:

1. Clear and Transparent Regulatory Framework

Clear and transparent regulatory framework governed by the Energy Commission provides investors with confidence in TNB's cash flow visibility

2. Consistent and Clear Returns

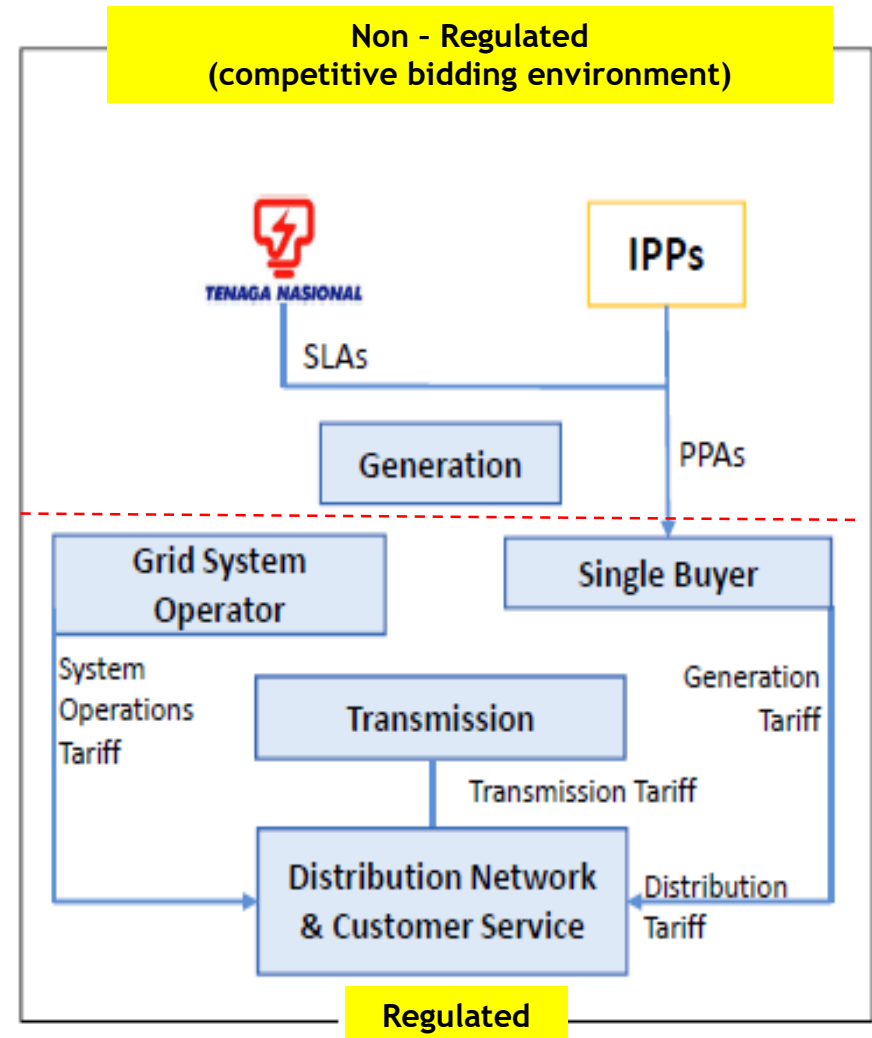
Regulatory WACC of 7.3% provides consistent and clear return to debt and equity holders

3. Shield against Uncontrollable Swings

Imbalance Cost Pass-Through mechanism shields Tenaga against uncontrollable swings in input costs, with a review every 6 months

4. Incentives for Operational Efficiencies

Incentive / Penalty mechanism provides clear incentives for TNB to achieve operational efficiencies



INCENTIVE BASED REGULATION (IBR)

Imbalance Cost Pass-Through (ICPT) Mechanisms Ensures TNB Remain Neutral

Base Tariff under IBR framework comprises of:

- a) Opex, Depreciation of Regulated Assets & Tax Expenses of Business Entities - transmission, grid system operation, Single Buyer operation, distribution network and customer services
- b) Power purchase cost charged by generators to the Single Buyer **(based on fuel forecast base price)**
- c) Return on regulated assets (rate base) of Business Entities
 - **Reviewed every 3 years**

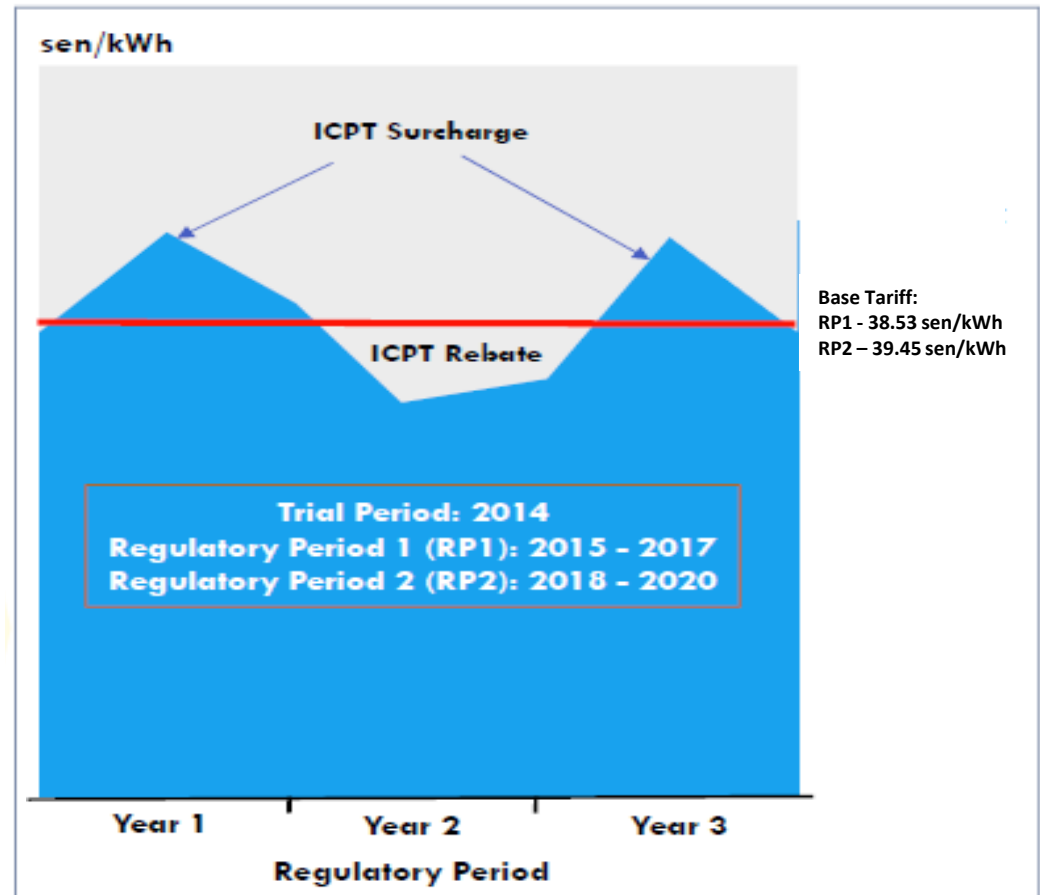
Imbalance Cost Pass-Through (ICPT):

- a) ICPT is 6-monthly pass-through of variations in uncontrollable fuel costs and other generation specific costs (imbalance cost) incurred by utility for the preceding 6-month period
 - **Reviewed every 6 months**

Principle for ICPT Calculation

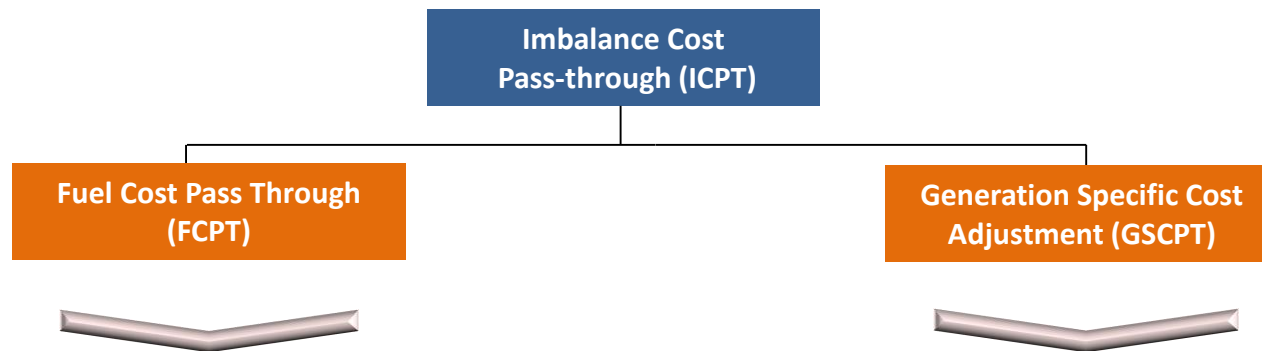
Cost components comprise of

- The ICPT is calculated based on an estimated actual fuel cost and generation specific costs for a particular six (6) months period against the corresponding baseline costs in the Base Tariff.



INCENTIVE BASED REGULATION (IBR)

Imbalance Cost Pass-Through (ICPT) Comprises Two Components



Changes in Gas/LNG and Coal Costs

PPAs Power Purchase Agreements
SLAs Service Level Agreements
CSTA Coal Supply and Transportation Agreement
CPC Coal Purchase Contract
GFA Gas Framework Agreement
GSA Gas Supply Agreement

Changes in:

- Other fuel costs such as distillate and fuel oil
- All costs incurred by SB under the power procurement agreements (PPAs, SLAs and etc.) and fuel procurement agreements (CSTA, CPC,
- Renewable energy FiT displaced cost

RP2

ICPT	Announcement	Surcharge	Period
Jan – Jun'18	RM698.19mn	1.35sen/kWh	Jul – Dec'18
Jul – Dec'18	RM948.00mn	2.15sen/kWh	Jan – Jun'19

INCENTIVE BASED REGULATION (IBR)

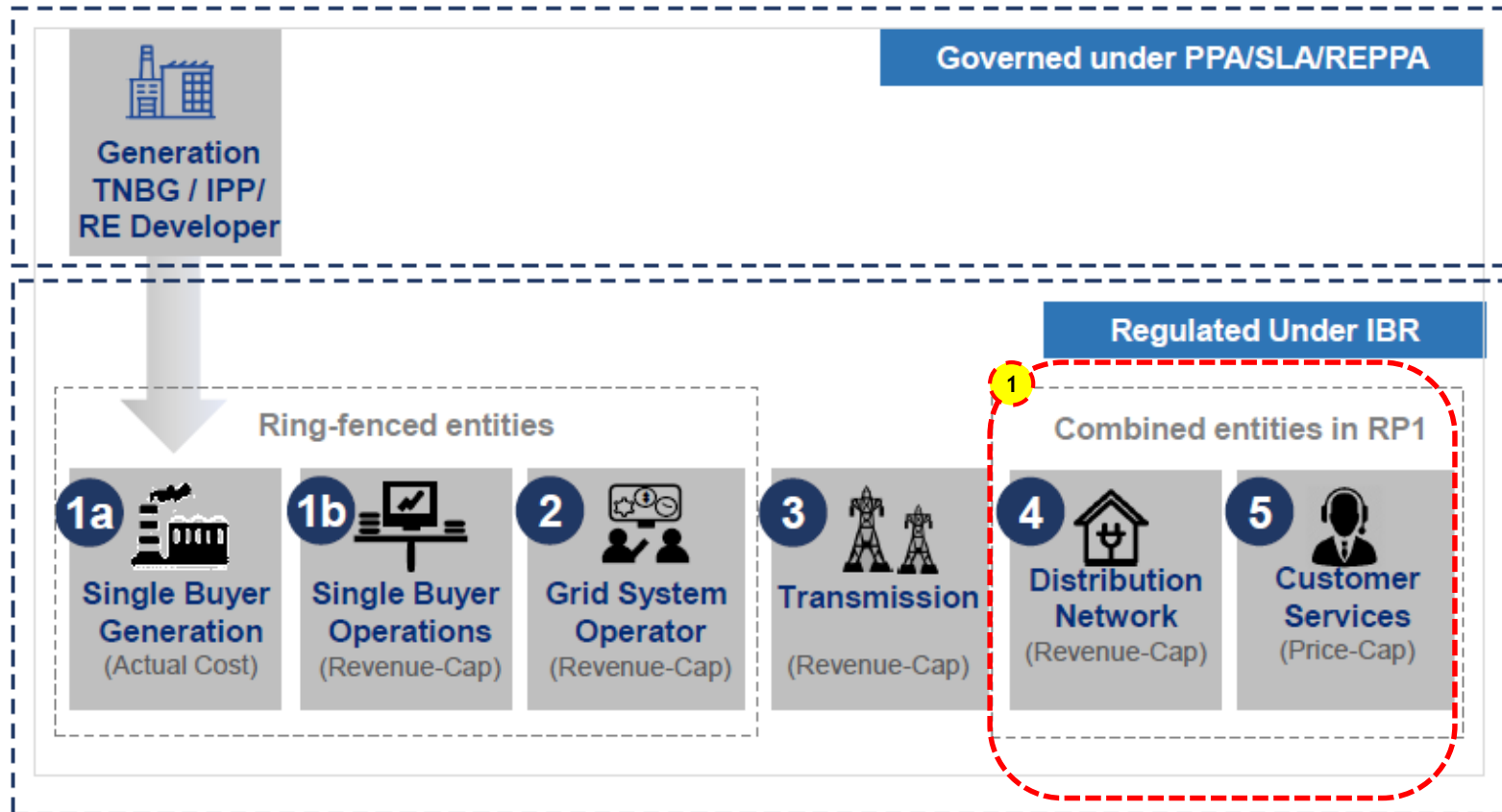
New Features in Electricity Tariff Review for RP2 (2018-2020)

More efficient and reliable electricity supply	Support Government's initiatives and aspirations	New addition in Key Performance Indicators *	Separation of Distribution Networks and Customer Services
<ul style="list-style-type: none">• Efficient and reliable electricity supply at the lowest efficient cost;• Enhancement in safety and reliability with smart grid capabilities.	<ul style="list-style-type: none">• Supporting Government's initiatives in green energy and sustainability for example AMI, Distribution Automation, Group Relamping of streetlight, etc.• Continue the gas price subsidy rationalization by gradual removal of gas price subsidy;	<ul style="list-style-type: none">• New performance indicators on each business entity that are in line with Government's policies;• Enhancement on KPI mechanisms and principles (symmetric and asymmetric).	<ul style="list-style-type: none">• Separation of these business entities will enhance the system reliability and consumer experience;• This will increase the productivity and consumer satisfaction.

*Has yet to be approved and finalized by regulator

INCENTIVE BASED REGULATION (IBR)

IBR Entities

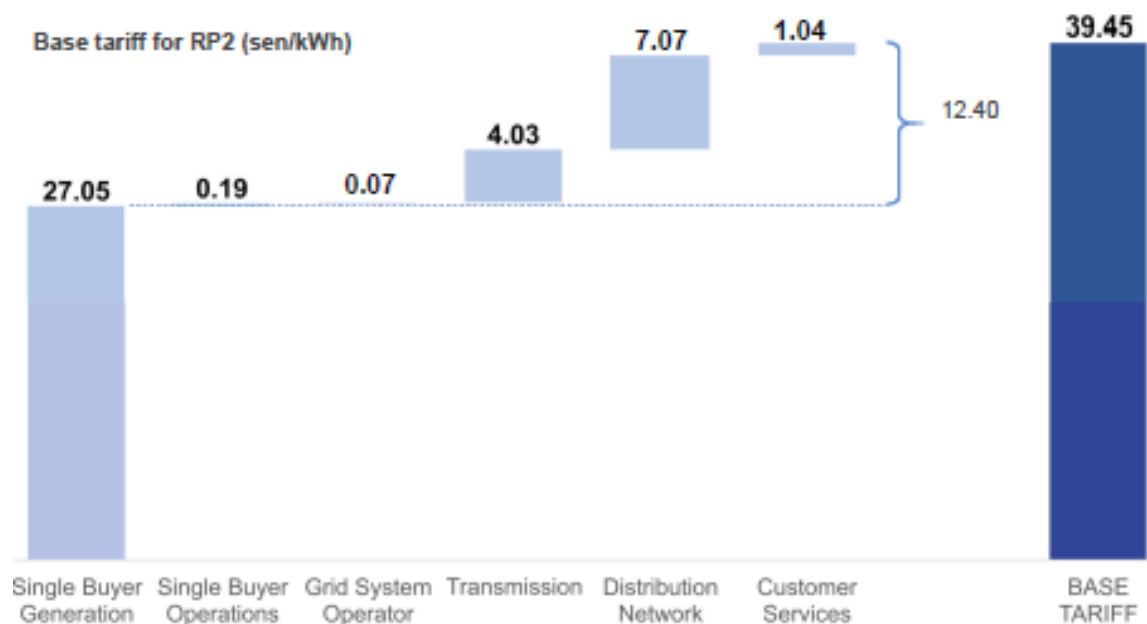


1 In RP1, these 2 entity are grouped as Price -Cap entity

INCENTIVE BASED REGULATION (IBR)

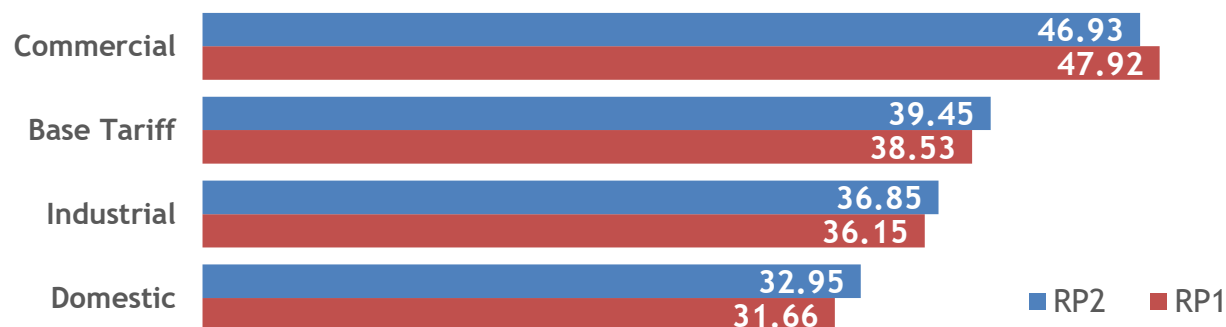
New Base Tariff Under IBR Mechanism RP2

Average Tariff by Entities (sen/kwh)



Entities		RP1 (sen/kWh)	Variance (sen/kWh)
Single Buyer	Generation	26.76	+0.29
	Operation	0.19	-
Grid System Operator		0.05	+0.02
Transmission		3.66	+0.37
Distribution		7.87	+0.24
Base Tariff		38.53	+0.92

Average Tariff by Sectors (sen/kwh)



INCENTIVE BASED REGULATION (IBR)

RP2 Parameters

WACC

7.3%

RP1: 7.5%

Avg. Regulated Asset Based (RAB)

RM54.8bn

(Avg. RAB in 2020)

RP1: RM43.6bn

(Closing RAB)

CAPEX

RM18.8bn*

(Approved CAPEX)

RP1: RM15.7bn

(Closing CAPEX)

OPEX

RM18.2bn

(Approved OPEX)

RP1: RM16.9bn

(Closing OPEX)

TARIFF

39.45 sen/kwh

RP1: 38.53 sen/kwh

*** Special Projects approved**

1.5 million
smart meters in homes

367,000
LED streetlights

Fibre Optic
network development for energy security & reliability

Fuel Parameters

Coal



USD75/MT

(RM14.47/mmbtu @ RM4.212/USD)

RP1: USD87.5/MT @ RM3.100/USD

LNG

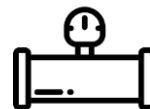


RM35/mmbtu

RP1: RM41.68/mmbtu

Regulated Gas

@1,000mmscfd



RM24.20/mmbtu (Jan'18 - Jun'18)

RM25.70/mmbtu (Jul'18 - Dec'18)

RM27.20/mmbtu (Jan'19 - Dec'20)

RP1: RM15.20/mmbtu – RM22.70/mmbtu

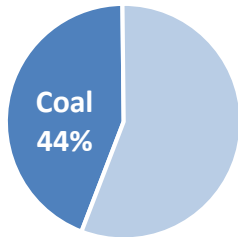
RP2 Forecasted Gas Utilization: 840 mmscfd

INCENTIVE BASED REGULATION (IBR)

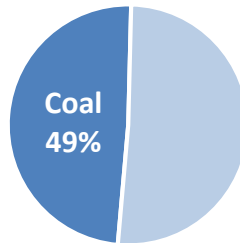
Generation and Customer Mix

Generation Mix RP1 vs RP2

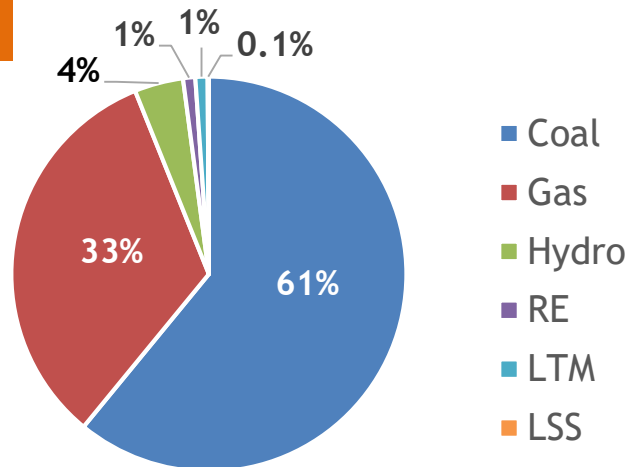
RP1 Base



RP1 Actual

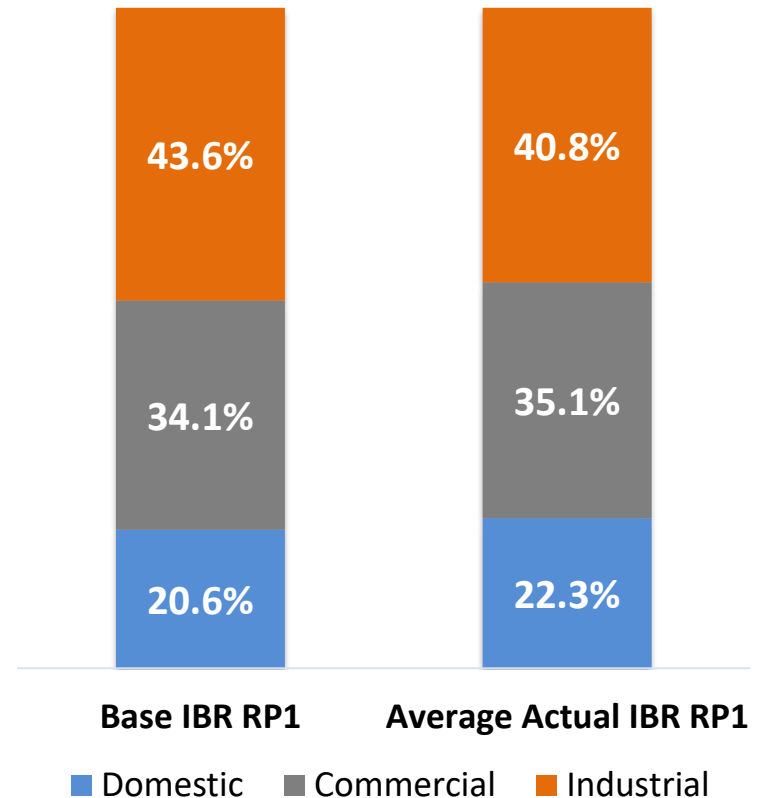


RP2



Made possible by improved coal plants performance and additional commissioning of coal plants.

Changes in Customer Mix (%) in RP1 (2015-2017)



RP2 Forecasted Demand Growth: 1.8 – 2.0%

INCENTIVE BASED REGULATION (IBR)

The Government has reactivated MyPower to drive MESI Reform 2.0

Objectives of MESI Reform 2.0



To increase industry efficiency through:

- Greater utilisation of market-based competition
- Reduce government intervention & increase transparency
- Cost reflective & time based tariff with targeted subsidies
- Increase cross-border trade



To future-proof industry, structure, regulations and key processes

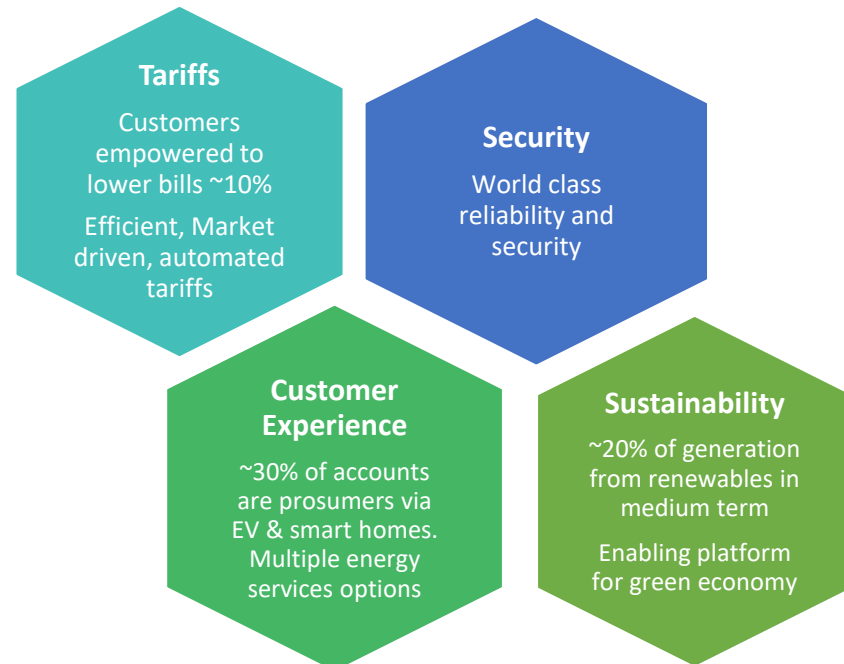
to ensure the introduction of market-based competition, adoption of new technologies, promotion of RE and EE initiatives will add value to consumers & improve energy security.



To empower consumers

by facilitating the growth of prosumers, at the same time incentivising consumers to change their consumption patterns as and when required.

Aspirations from the public for greater participation in MESI - MyPower



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INCENTIVE BASED REGULATION (IBR)



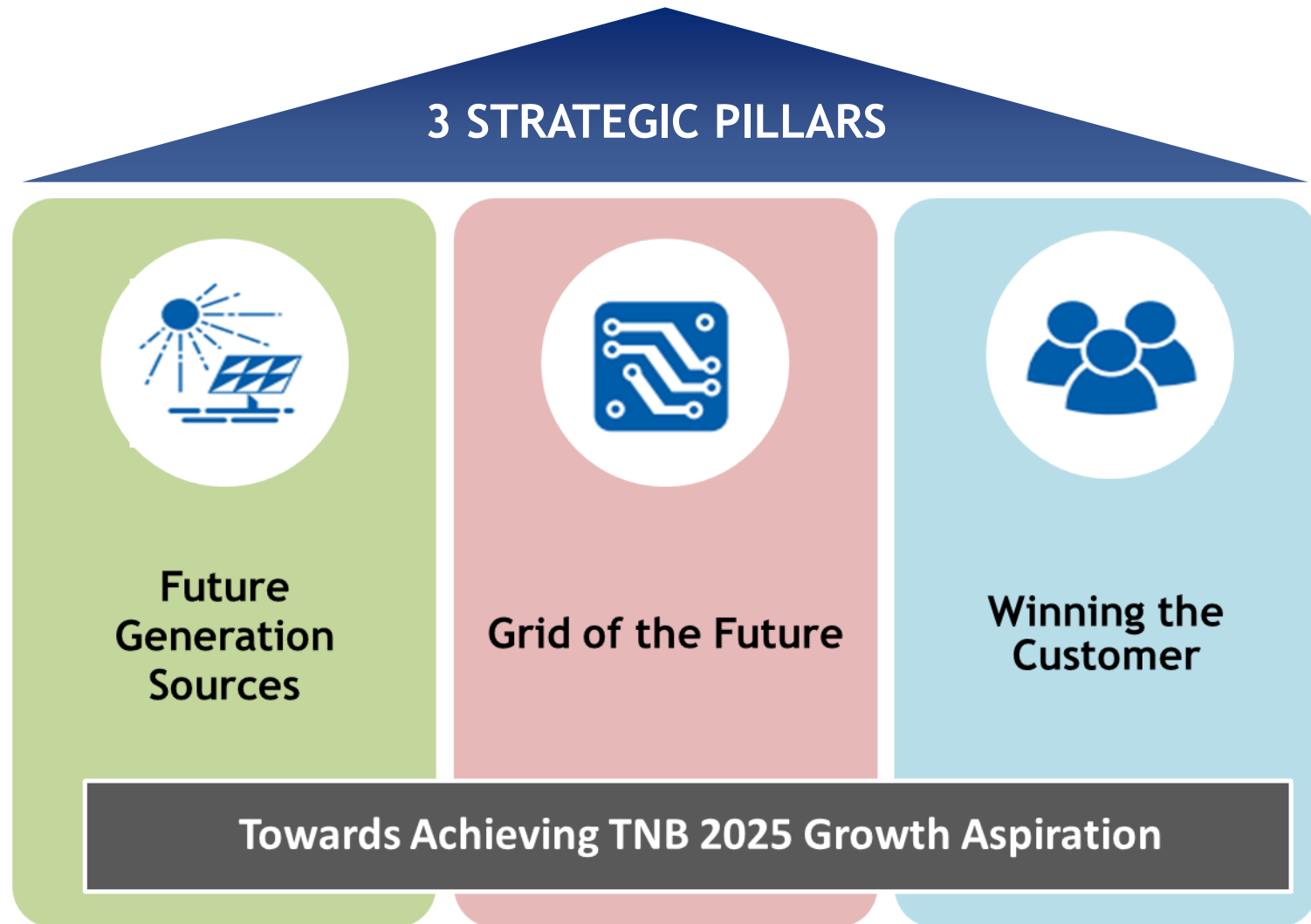
BUSINESS STRATEGY & DIRECTION



CAPITAL MANAGEMENT



FINANCIAL & TECHNICAL HIGHLIGHTS



BUSINESS STRATEGY & DIRECTION

International Acquisition - Four International Acquisitions to Support Aspiration



30%

Equity interest of GAMA Enerji A.S.

Assets include a 840MW natural gas-fired plant and 117.5MW wind plants



30%

Equity interest of GMR Energy Limited.

Assets include 2,298MW coal, gas and solar plants.

Vortex Solar UK

50%

Equity interest of Vortex Solar Investments S.a.r.l.

Assets include 24 operational solar PV Farm across England and Wales with net installed capacity of about 365MW

Tenaga Wind Ventures

80%

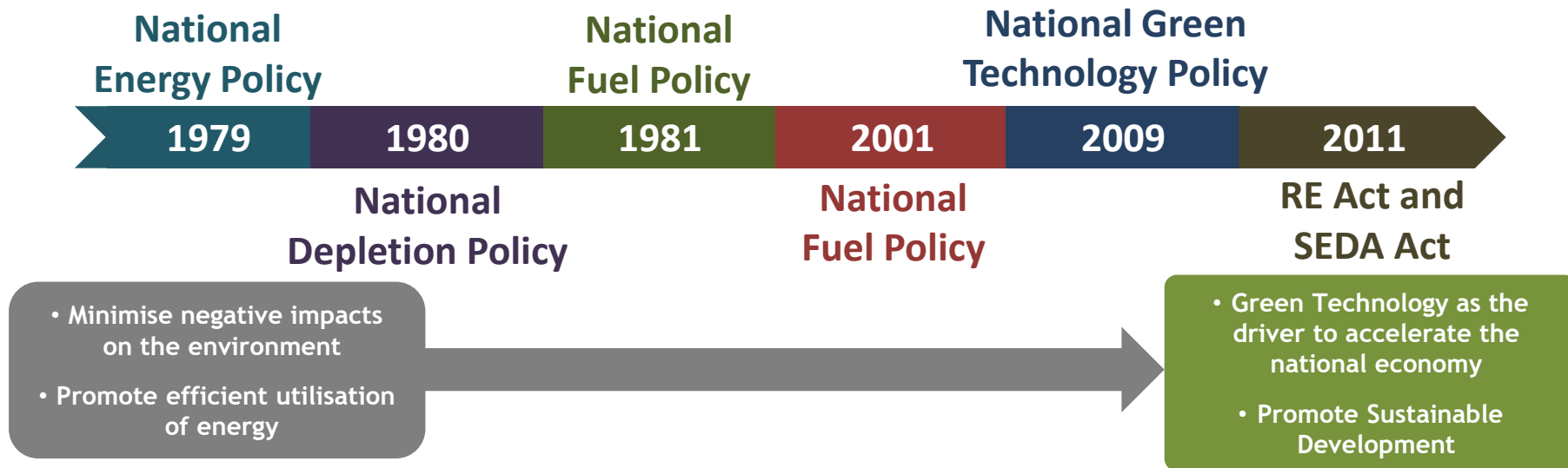
Equity interest of GVO Wind Limited & Blumerang Capital Limited

Assets include 53 operational onshore medium wind turbines with a total combined capacity of 26.1MW

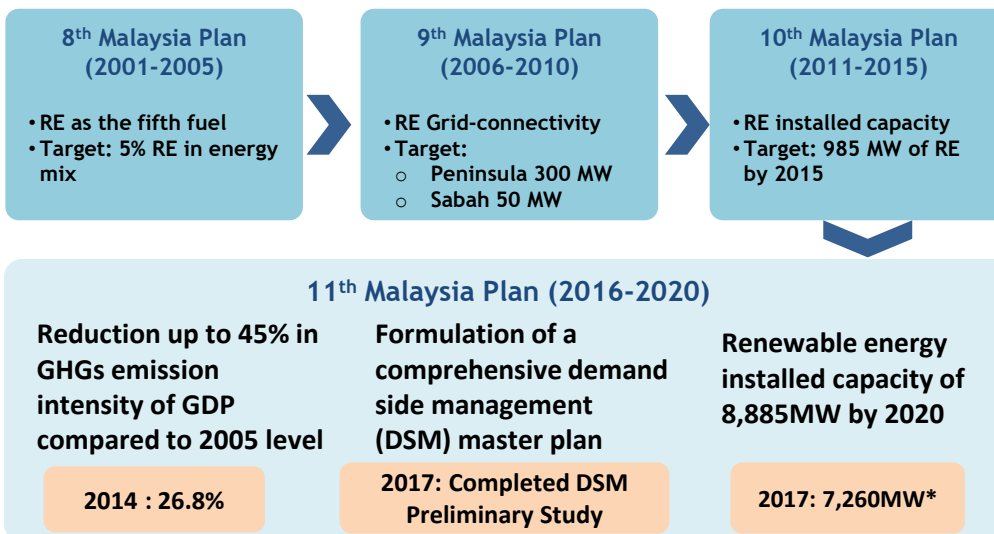
BUSINESS STRATEGY & DIRECTION

Renewable Generation - Government Green Policy & Initiatives

Evolution on National Energy Policies



Government Green Development Plan



NEW RE TARGET SET BY MESTEC
20% of Total Installed Capacity
by 2025

MESTEC = Minister of Energy, Science, Technology, Environment and Climate Change

* The increase in the total installed capacity of RE is based on the adoption of the ASEAN definition of RE by Malaysia in 2016 which takes into account all types of hydro energy in the calculation without limiting their capacities.

BUSINESS STRATEGY & DIRECTION

Green Projects

- **Clean coal plant** – Ultra-Supercritical technology
- **District Cooling System** - Significant cost savings in air-conditioning expenses and environmentally-friendly technology (i.e. KLIA2, IJN, UiTM Seremban 3, BMC Abu Dhabi)
- **Demand Side Management** - Promote efficiency, increase system reliability and reduce peak electricity demand

Biodiversity Management

- **Preserving animal habitat** such as Kelah sanctuary and Lampan Sungai fish breeding
- **TNB Youth Environmental Education & Awareness Programme** focusing on National Elephant Conservation Center at Sungai Dekka, Hulu Terengganu.

TNB Green Energy Policy

TNB Environmental Policy

Commissioned

Renewable Generation

Domestic (62MW)

- TNB Sepang Solar – 50MW
- Biomass (10 MW) JV with Felda @ Felda Jengka, Pahang
- Biogas (3.2 MW) JV with Sime Darby Plantations, @ Layang-layang, Johor and Bagan Datuk, Perak
- Floating solar in Sg Labu WTP in Sepang - 108kWp

International (284MW)

- TNB Vortex Solar, UK - Solar (182.5MW)
- TNB Wind Ventures, UK - Wind (20.9MW)
- GAMA, Turkey - Wind (33.8MW), Hydro (39.4MW)
- GMR, India – Solar (7.8MW)

In the pipeline

Renewable Generation

Domestic

- Bukit Selambau – 30MW
- GSPARX Rooftop Solar – Target 500MW by 2020

International

- GMR Bajoli Holi, India – Hydro (Gross 180MW)

Environment Management

- **Strategic partner with Department of Environment (DOE)** to promote **Guided Self Regulation (GSR) for environmental management** within Malaysia.
- GSR is an initiative to **transform regulation enforcement** and **build a culture of better environmental awareness and management.**

BUSINESS STRATEGY & DIRECTION

Building Renewable Energy Portfolio for Greener Future

**TNB RE Targets
by 2025
1,700MW**

As at to date:
International - 280MW
Domestic - 80MW *

*exclude RE below 30MW



Large Scale Solar (LSS)



TNB Sepang Solar

50 MW

**COD: 19th Nov 2018
(Completed)**



TNB Bukit Selambau

30 MW

COD: 31st Dec 2020

**Physical Progress: 22%
(Planned: 19%)**

Note: PPA Tenure 21 years



BUSINESS STRATEGY & DIRECTION

Conventional Generation Projects



Coal

Jimah East Power **2,000 MW**

COD:

U1: 15th June 2019, U2: 15th Dec 2019

Physical Progress: 98%
(Planned: 99%)

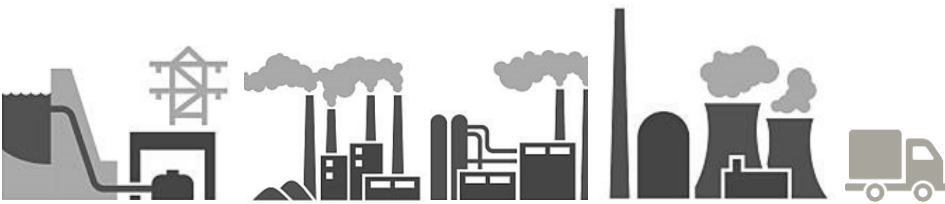
Gas

Southern Power Generation **1,440 MW**

COD:

1st July 2020

Physical Progress: 74%
(Planned: 71%)



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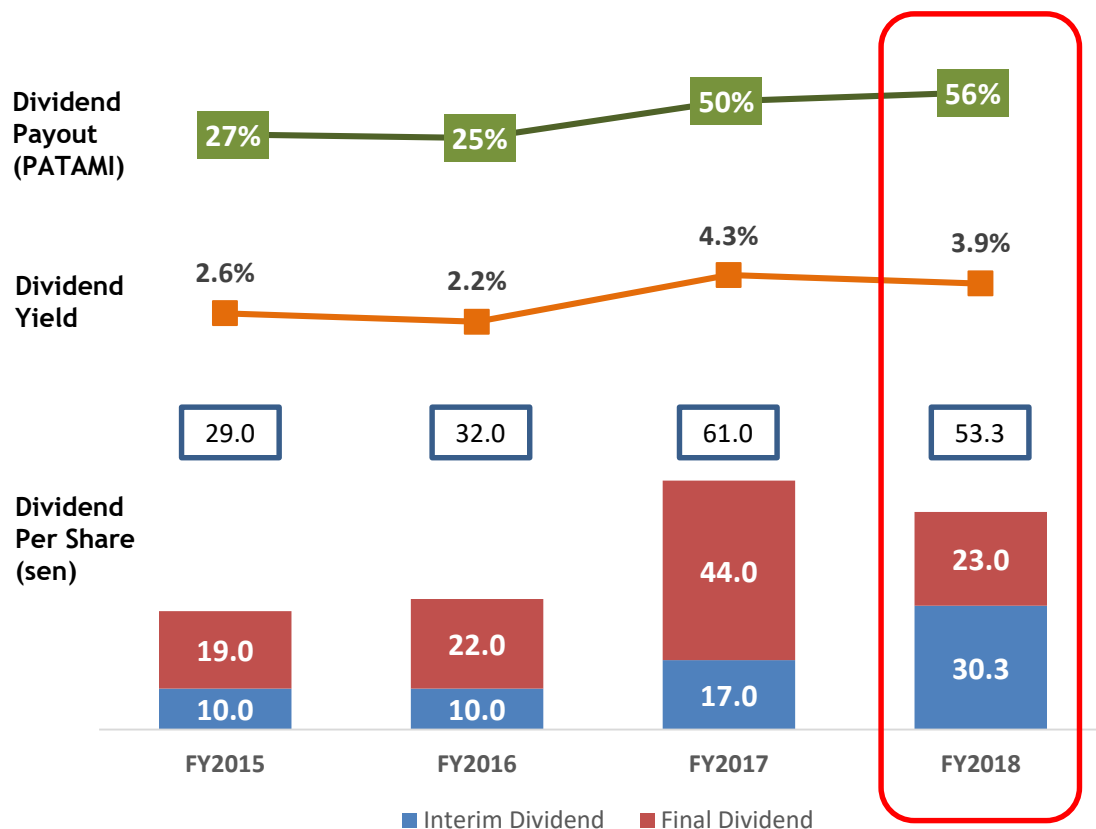


FINANCIAL & TECHNICAL HIGHLIGHTS

Highest Dividend Payout at 56% of Adjusted PATAMI

Dividend Policy

Distribution of dividend is based on 30% to 60% dividend payout ratio, based on the reported Consolidated Net Profit Attributable to Shareholders After Minority Interest, excluding Extraordinary, Non-Recurring items



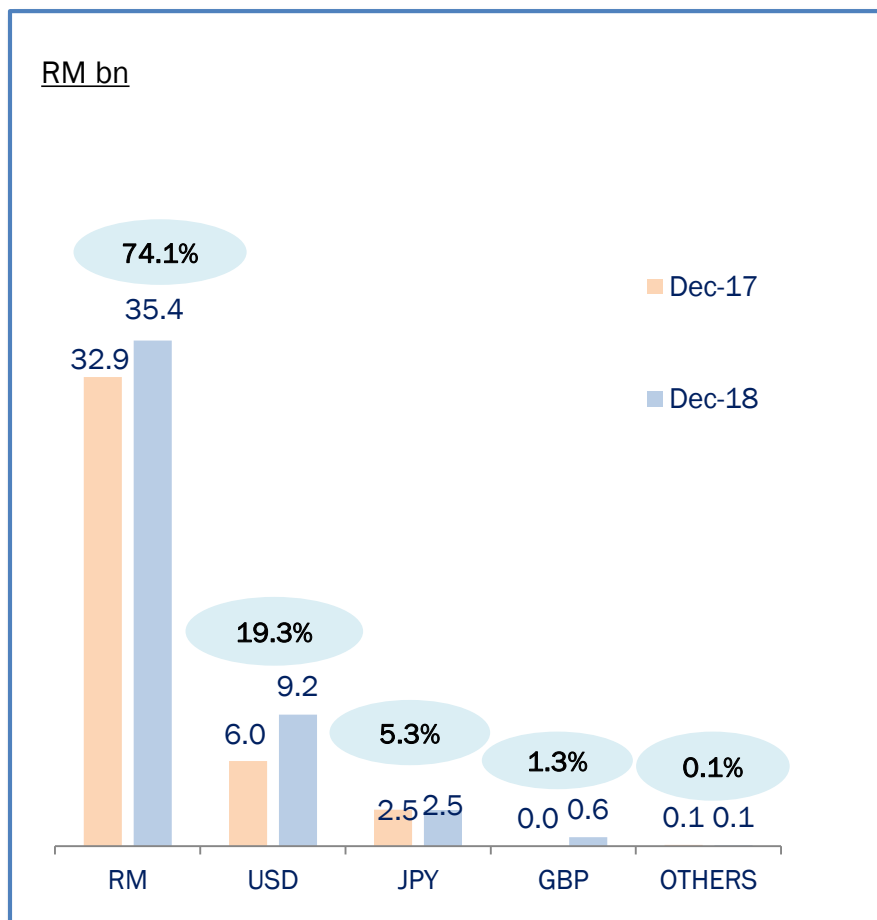
		FY2018
Group PATAMI (RM bn)		3.72
Net Adjustments* (RM bn)		1.70
Adjusted Group PATAMI (RM bn)		5.42
Distributable Group PATAMI for Dividend (RM bn)		3.03
Dividend Payout Ratio		56%
Dividend per share (sen)	Total	53.27
	Interim	30.27
	Final	23.00

* Breakdown of adjustments:

- a) Impairments – RM1.1bn
- b) FOREX Translation loss – RM0.4bn
- c) SESB Tariff & Fuel Subsidy – RM0.3bn
- d) Net Salary Adjustment – (RM0.1bn)

CAPITAL MANAGEMENT

Gearing Level Registered at 44.8%



Note:

Debt consists of Principal + Accrued Interest + Accounting Treatment (FRS139)

Statistics	31 st Dec'18
Total Debt (RM' Bil) [*]	47.8
Net Debt (RM' Bil)	29.6
Gearing (%)	44.8
Net Gearing (%)	27.7
Fixed : Floating	95:5
Weighted Average Cost of Borrowing ^{**}	4.98
Final Exposure	4.99

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

** Inclusive of interest rate swap

Closing FOREX	31 st Dec'18
USD/RM	4.14
100YEN/RM	3.75
GBP/RM	5.27
USD/YEN	110.28

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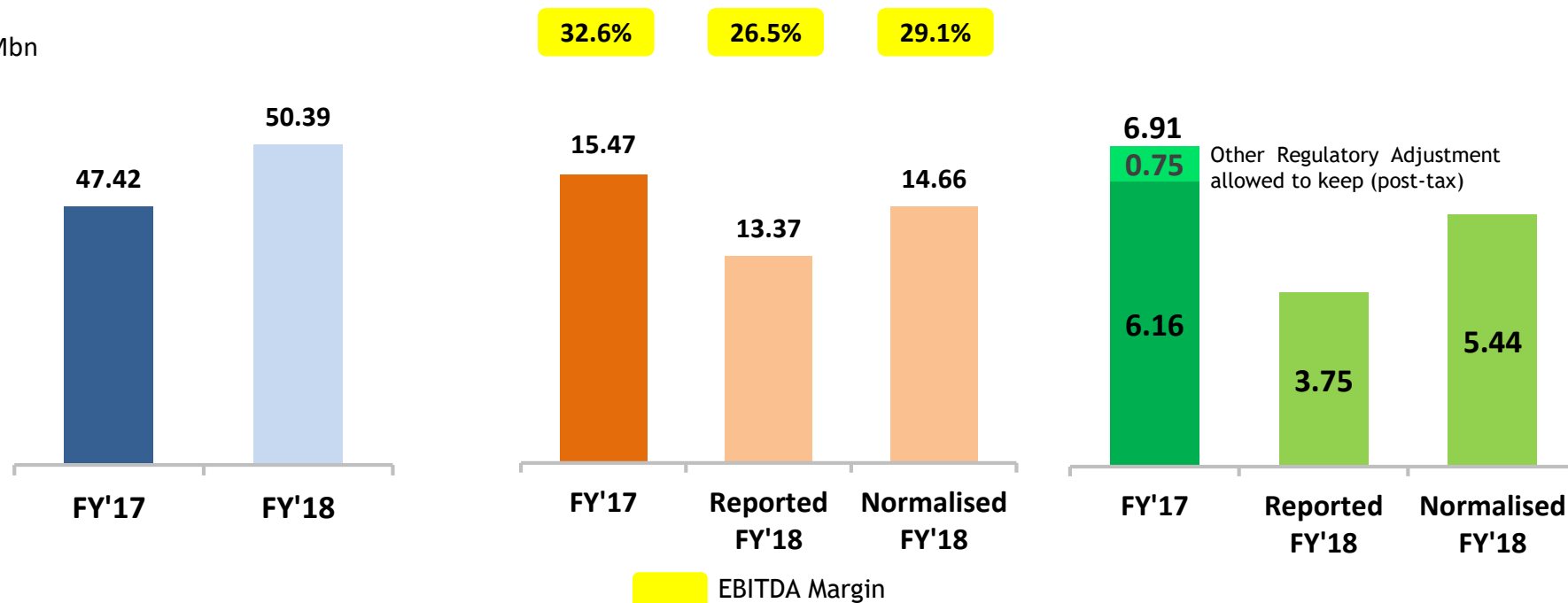


FINANCIAL & TECHNICAL HIGHLIGHTS

FINANCIAL & TECHNICAL HIGHLIGHTS

Financial Performance Overview for FY'18

RMbn



REVENUE

- Higher revenue due to net increase in sales of electricity after other regulatory adjustments and ICPT



EBITDA

- Lower EBITDA mainly due impairment for :
 - GAMA of RM0.50bn
 - GMR of RM0.30bn
 - Financial guarantee for GAMA of RM0.27bn



PAT

- PAT further reduced due to substantial forex translation losses of RM0.39bn
- Normalised PAT of RM5.44bn After One-Off Adjustments

FINANCIAL & TECHNICAL HIGHLIGHTS

Consistent Technical Performances

Equivalent Plant Availability Factor (EAF)



89.92%*
FY'17 87.30%*

Transmission System Minutes



0.35 mins
FY'17 : 0.23 mins

Distribution SAIDI



48.19 mins
FY'17 : 50.20 mins

Note :

*The figure is for all TNB plants

Previously, the EAF figure disclosed only include SLA plants and JMJC : 89.94% as at FY'18 / 89.5% as at FY'17

DISCLAIMER

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THANK YOU


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