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Suruhanjaya Tenaga

Regulatory Implementation Guidelines Briefing

7 February 2011

Economics & Strategy Advisory

February 2011

Agenda

Presentation overview

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We are helping the Commission to develop Regulatory Implementation guidelines (RIGs) to establish the following:

- the economic regulatory framework for regulating TNB;
- the tariff setting framework and principles for tariff design;
- incentive mechanisms to promote efficiency and service standards;
- the process of tariff reviews; and
- the format of regulatory accounts and annual review process.

TNB and other stakeholders will be consulted with prior to finalising the RIGs.

Agenda

Presentation overview

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	Topic	Description
Session 1	RIG 1	Define business entity; specify functions of each business entity; specify the flow of funds between business entities.
	RIG 2	Tariff setting framework for each business entity (price or revenue regulation, regulatory term)
Session 2	RIG 3	Revenue requirement principles for each business entity & establish incentive framework (incl. treatment of variances)
	RIG 4	Rate of return on capital for each business entity (WACC)
	RIG 5	Detailed operating cost, capital cost, asset and consumption templates for each business entity
Session 3	RIG 6	Incentive framework for operational performance (service standards)
	RIG 7	Cost allocation principles (to allocate common costs)
Session 4	RIG 8	Generation specific cost (fuel etc) pass through mechanism
	RIG 9	Tariff design principles
Session 5	RIG 10	Regulatory Accounts process: timing, reconciliation to audited statutory accounts and explanation of variances
	RIG 11	Process for establishing revenue requirements and tariffs for each business entity

Regulatory Implementation Guideline 1 (RIG 1)

Objectives

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The objectives of RIG 1 are as follows:

- establish the business entities of TNB which will be subject to incentive based regulation;
- define the functions of each of the business entities; and
- specify the flow of funds between the business entities.

Regulatory Implementation Guideline 1 (RIG 1)

Defining business entities

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The Managed Market Model incorporates 5 business entities

1. **Single Buyer:** This business entity comprises the functions of the existing TNB's Energy Procurement Division. The Single Buyer procures electricity from IPPs and TNB Generation based on the terms of the PPAs entered into with the IPPs and Service Level Agreements (SLAs) entered into with TNB Generation. The Single Buyer dispatches TNB's generation units and the IPPs based on a dispatch merit order. The Single Buyer produces the day-ahead dispatch

2. **TNB Generation:** This business entity includes the ownership, management and operation of generation plants owned by TNB. TNB Generation contracts with the Single Buyer for the sale of electricity based on Service Level Agreements (SLAs).

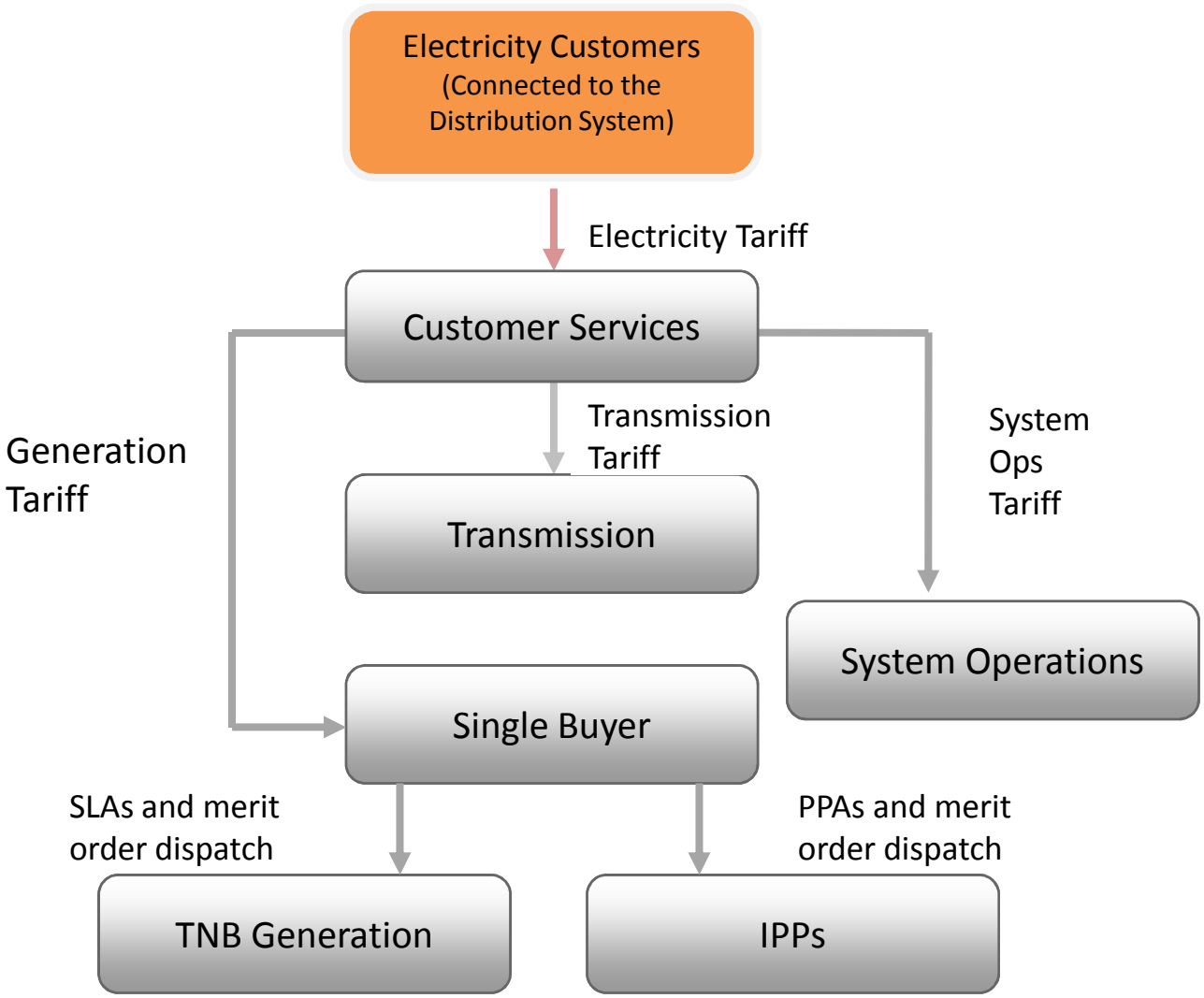
3. **Transmission:** This business entity includes the management, maintenance and development of the TNB transmission system for the transmission of electricity to end customers.

4. **System Operator:** This business entity includes the current functions of transmission system operations of TNB.

5. **Customer Service:** This business entity includes the management, maintenance and development of the distribution system and the sale of electricity to customers.

Regulatory Implementation Guideline 1 (RIG 1)

Managed Market Model: Flow of funds



- The Customer Services business entity charges electricity customers a bundled tariff for the use of electricity.
- Customer Services pays Transmission, based on a Transmission Tariff and System Operations based on System Operations tariff
- Customer Services pays Single Buyer based on Generation Tariff (comprising a generation specific component and a component for other operational costs of the Single Buyer). The Single Buyer pays TNB Generation based on SLAs & IPPs based on PPAs

Regulatory Implementation Guideline 1 (RIG 1)

Managed Market Model: Flow of funds

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Preference is to adopt the Managed Market Model. This is because:

- the Managed Market Model is consistent with TNB's operations;
- enhances transparency between TNB generation and IPPs; and
- is broadly consistent with the recommendations of the Project Management Office (PMO).

The Managed Market Model requires the operating rules for the Single Buyer to be established upfront:

- The principles for the Single Buyer and the high level rules for dispatch are incorporated in the current draft of the Grid Code.
- However, further work needs to be done to develop in detail the operating procedures (or the Managed Market Rules) to ensure transparency and clear guidelines for the Single Buyer to follow in preparing the day-ahead dispatch schedule.

Regulatory Implementation Guideline 2 (RIG 2)

The objectives of RIG 2 are as follows:

- establish the tariff setting framework for each TNB business entity operating in the Managed Market Model; and
- set the Regulatory Term for each of the five TNB business entities.

Regulatory Implementation Guideline 2 (RIG 2)

Tariff setting framework

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1. **Price Cap:** Price (and price path) is set for the Regulatory Term based on forecasts of cost and electricity sales. Business entities exposed to revenue risk based on actual sales varying from forecasts used to set price and price path.
2. **Revenue Cap:** Annual revenue set for every year of the Regulatory Term. No exposure to revenue risk.
3. **Actual cost:** Revenue based on recovering actual costs (including return).
4. **Hybrid Model:** The Hybrid Model is a combination of a Price Cap and a Revenue Cap regime or alternatively a combination of all three regimes. Offers flexibility to apply either a Price Cap or Revenue Cap or Actual Cost to different parts of the regulated value chain.

Regulatory Implementation Guideline 2 (RIG 2)

Analysis of options

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Distribution: Typically regulated distribution business operates under a Price Cap regime. Distribution businesses costs vary more with electricity sales due to customer connections and localised capacity expansions due to electricity sales growth.

Transmission: Typically operate under a Revenue Cap regime. This is because transmission costs are largely fixed and do not vary with electricity sales in the short to medium term

Generation: In competitive markets, the recovery of generation costs depends upon the nature of the market. Under a market pool, recovery of generation costs depends primarily upon pool price, bidding strategy of market participants and the contracting strategy of the generator. Under a regulated model, like that of Singapore for domestic customers, generators work under a pure Price Cap regime. In Australia initially when the domestic market was regulated, generators operated under vesting contracts which was a pure Price Cap regime.

Regulatory Implementation Guideline 2 (RIG 2)

A Hybrid Model is recommended

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Final prices: bundled tariff

It is intended that Customer Services will charge a bundled tariff to electricity customers, being the sum of individual tariff components from Customer Services , Transmission, System Operations and the Single Buyer.

Customer Services: Price Cap

It is intended that a pure Price Cap regime will apply to Customer Services. The Customer Services component of the bundled tariff will be fixed for the Regulatory Term, and will not vary with changes in electricity sales within the Regulatory Term.

Transmission: Revenue Cap

Any annual revenue shortfall or surplus will be recovered or passed on to electricity customers through an adjustment to final bundled price which is charged by Customer Services.

System Operations: Revenue Cap

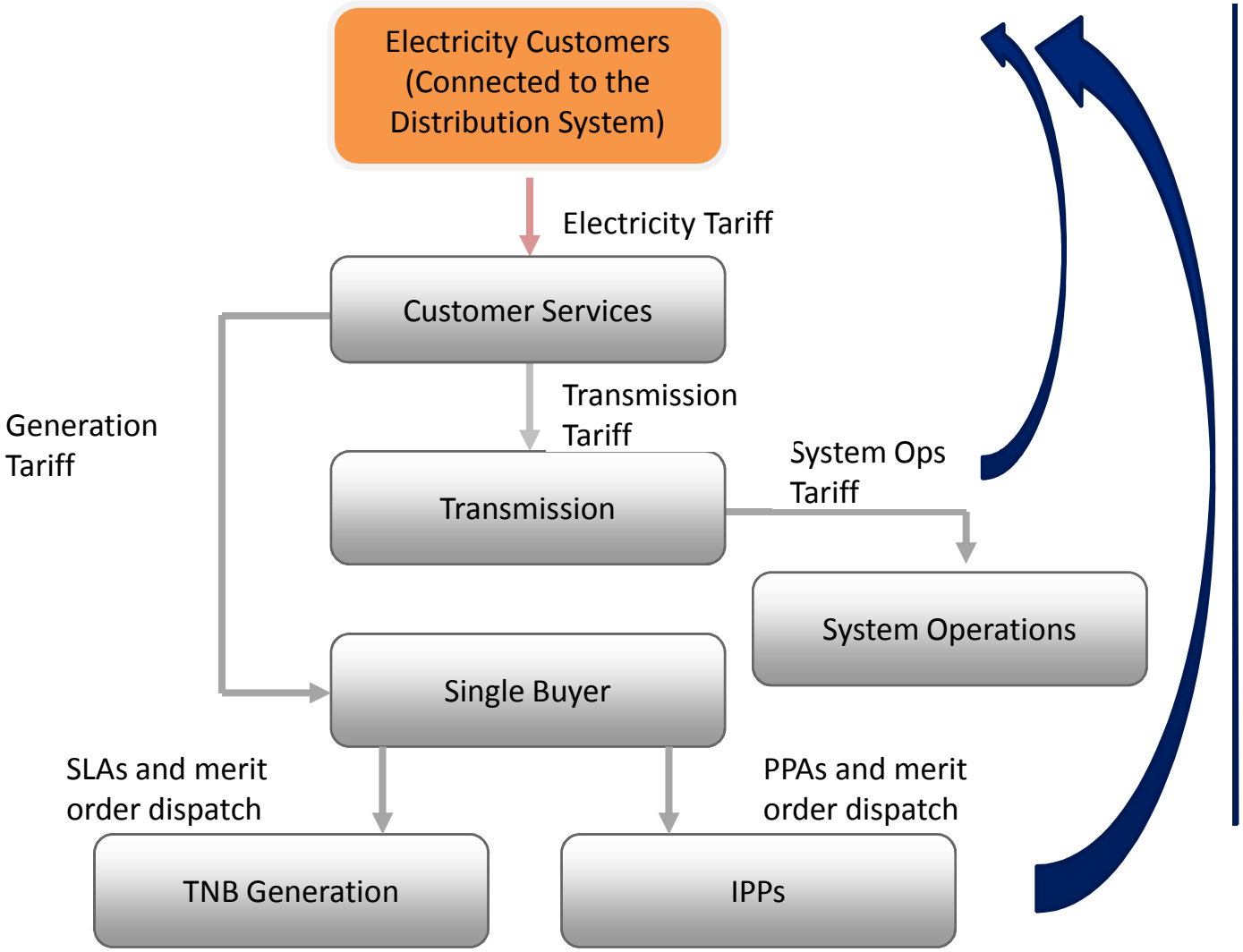
Any annual revenue shortfall or surplus will be recovered or passed on to electricity customers through an adjustment to final bundled price which is charged by Customer Services.

Single Buyer: Revenue Cap combined with Actual Cost

The Single Buyer will pass on all its actual costs of procuring electricity from the IPPs and TNB Generation to Customer Services (including fuel, capacity payments etc). Other operational and capital related costs of running the Single Buyer operations (including an allocation of joint costs (if any)) will be subject to a Revenue Cap regime.

Regulatory Implementation Guideline 2 (RIG 2)

Hybrid Model illustration



1. Tariff adjustments for Transmission , System Ops and Single Buyer
2. Annual tariff adjustments for Transmission and System Ops
3. Single Buyer tariff adjusted every 6 month

Regulatory Implementation Guideline 2 (RIG 2)

Hybrid Model worked example

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Consider the following worked example

- Final bundled tariff of 25 s/kWh (10 s/kWh for Customer Services, 4.8 s/kWh for Transmission, 0.2 s/kWh for System Ops and 10 s/kWh for Single Buyer
- The 10 s/kWh average tariff for the Single Buyer comprises 9.8 s/kWh for generation specific costs (including fuel etc) subject to an Actual Cost regime, and 0.2 s/kWh for other operational and capital costs subject to a Revenue Cap regime.
- Tariff based on forecast sales of 100 kWh (and methodology as per RIG 3)

	Bundled	Customer Services	Transmission	System Operations	Single Buyer	
					Generation specific	Operational
Sales forecast (kWh)	100	100	100	100	100	100
Average Tariff (s/kWh)	25	10	4.8	0.2	9.8	0.2
Revenue Forecast (RM)	25	10	4.8	0.2	9.8	0.2

Regulatory Implementation Guideline 2 (RIG 2)

Hybrid Model worked example

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Actual position at the end of the period

- actual electricity sales are 110 kWh, 10 kWh higher that forecast; and
- actual costs of Single buyer are higher by 0.7 RM, due to higher sales requiring additional generation.

	Bundled	Customer Services	Transmission	System Operations	Single Buyer	
					Generation specific	Operational
Actual Sales (kWh)	110	110	110	110	110	110
Average Tariff (s/kWh)	25	10	4.8	0.2	9.8	0.2
Actual Revenue (RM)	27.5	11	5.28	0.22	10.78	0.22
Forecast revenue (RM)	25	10	4.8	0.2	9.8	0.2
Revenue cap / Actual (RM)		N/A Price Cap	4.8 Revenue Cap	0.2 Revenue Cap	10.5 Actual Cost	0.2 Revenue cap
Surplus / (deficit) RM	0.8	0	0.48	0.02	0.28	0.02

Total system over recovery of 0.8 RM is passed back to customers via a reduction in the relevant components of the average bundled tariff for the next year.

Regulatory Implementation Guideline 2 (RIG 2)

Regulatory Term

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Regulatory term

The Regulatory Term is the period (in years) regulated entities operate under a Price, Revenue, or Hybrid regime with no review of the revenue requirement.

This places strong incentives upon the business to seek efficiencies in cost and improve utilisation as it largely retains these (discussed in RIG 3). The longer the Regulatory Term the greater the reliance on forecasts and the stronger the incentives for the business.

The Regulatory term is set at five years for Transmission and Distribution in UK, Australia and Singapore.

Recommendation on Regulatory Term

The Commission is recommending a Regulatory Term of three years.

This is shorter than a five year Regulatory Term applicable in Australia, UK and Singapore, because it is the first time the Regulatory Term concept will be applied in Malaysia.

As the Commission gets more comfortable with forecast and cost data it will consider increasing the Regulatory Term to five years.

Regulatory Implementation Guideline 3 (RIG 3)

The objectives of RIG 3 are as follows:

- establish the revenue requirement principles for each of the five TNB business entities; and
- establish the incentive framework for the five TNB business entities.

Incentive regulation

Overview

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Broadly two forms of regulation

Cost Plus Regulation	Incentive Regulation
Focus is on recovery of historical costs	Recovery of forecast efficient expenditure
No incentives for pursuing efficiency	Efficiency target set
Emphasis on asset growth	Efficiency sharing mechanism in place
Regulation of inputs	Regulation of outcome/performance
Most risk passed on to customer	***Risk shared with customer***

Incentive regulation

Overview

Deloitte.

Broadly three kinds of incentives

1. Incentives to seek operational efficiencies

   Rewarded for seeking efficiencies in operational and capital expenditure

2. Incentive to pursue financial efficiencies

   Rewarded for maintaining an efficient capital structure

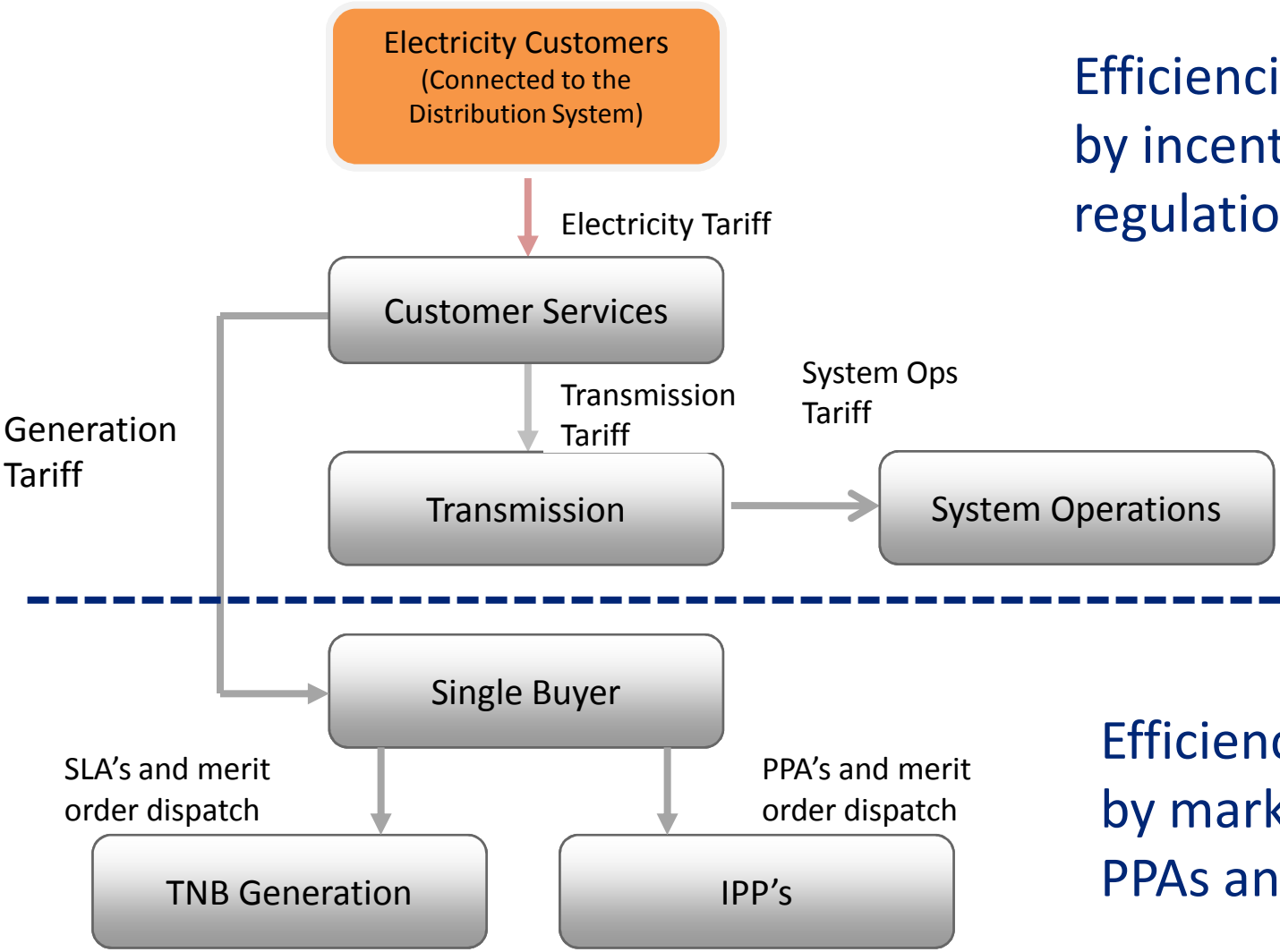
3. Incentive to pursue performance efficiency

   Rewarded for delivering improvements in network performance

These efficiency gains achieved are then shared with the customer.

Incentive regulation

Overview



Efficiencies achieved by incentive regulation

Efficiencies achieved by market testing PPAs and SLAs

Incentive regulation

Overview

The incentives to pursue operational, financial and network performance efficiencies are achieved by:

1. The price / revenue setting process; and

2. Network performance schemes.

Regulatory Implementation Guideline 3 (RIG 3)

Principles of Revenue Requirement

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The key principles underlying the price / revenue setting process is that price / revenue for a utility should:

- be set for a predefined forecast period: The Regulatory Term;
- be based on forecasts of efficient costs and sales; and
- deliver a market based cost of capital.

These three principles are all incorporated in the Building Block Model

Regulatory Implementation Guideline 3 (RIG 3)

Principles of Revenue Requirement

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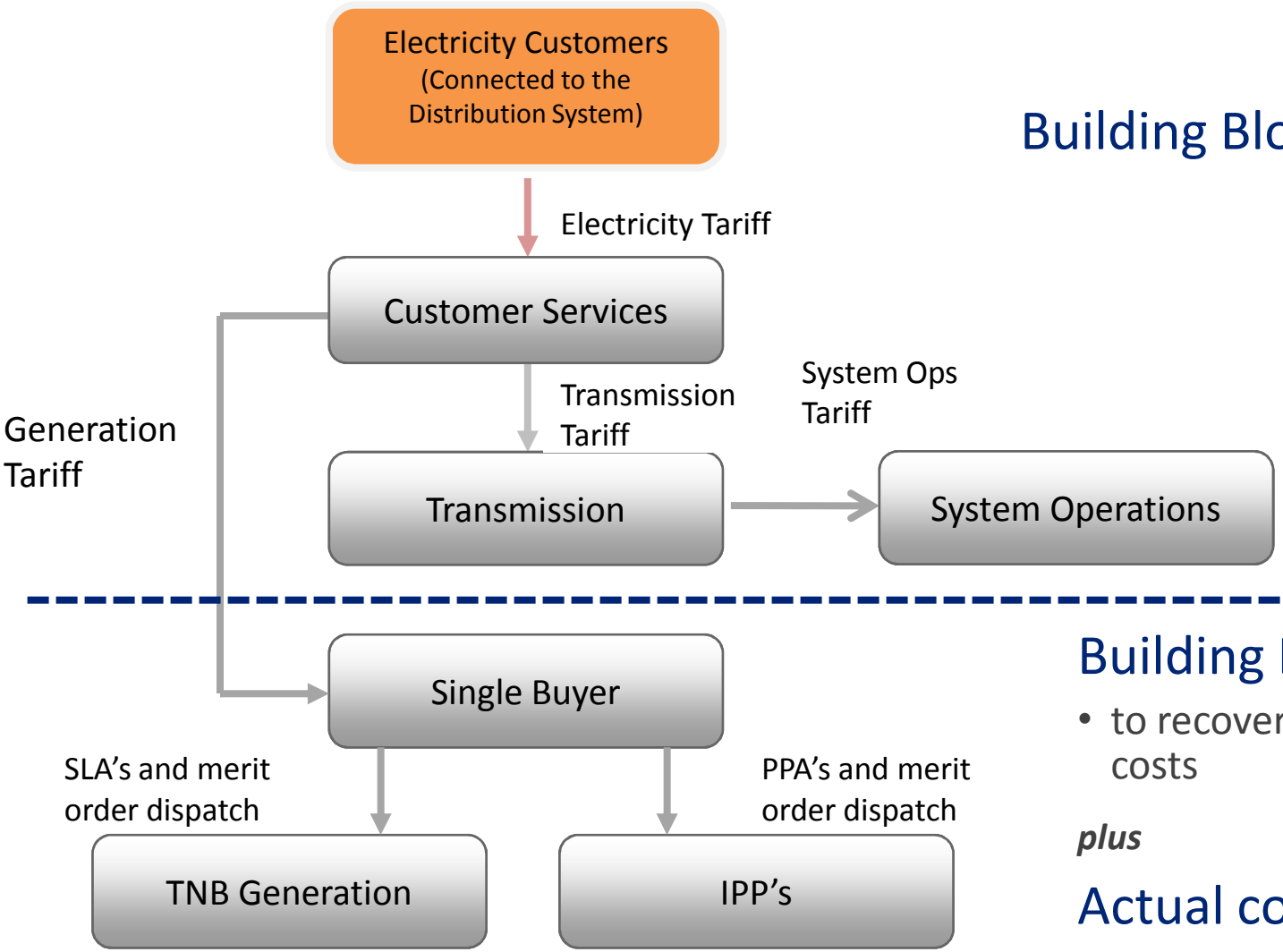

Building Block Model

Building Block Model

- to recover operational costs

plus

Actual cost

- to recover fuel related costs

Regulatory Implementation Guideline 3 (RIG 3)

Principles of Revenue Requirement – building block model

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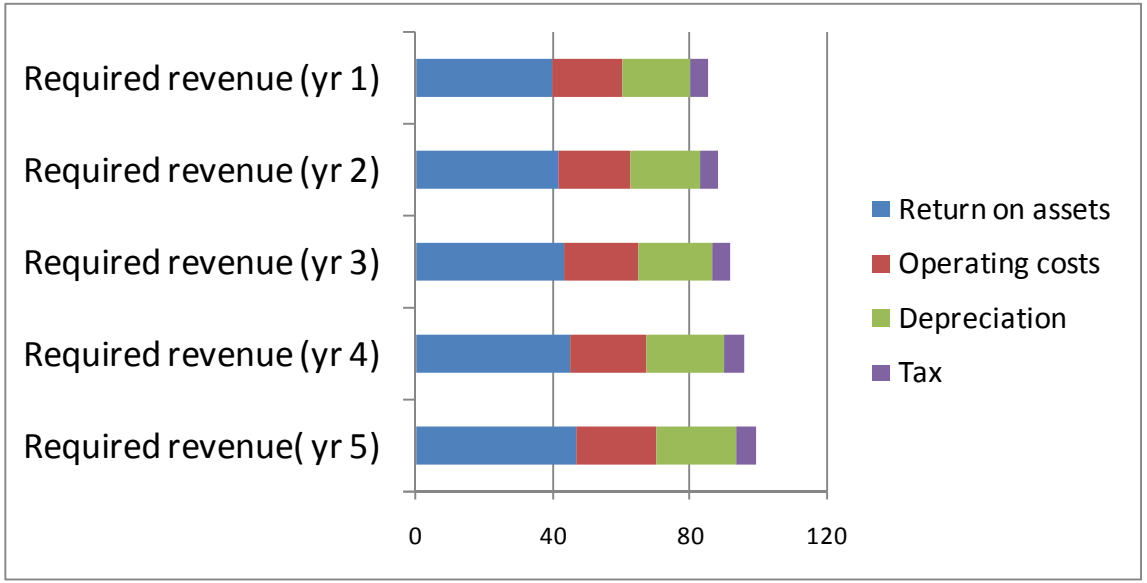
Required revenue = **WACC** x **Regulated asset base (RAB)** (**Return on Assets**) + Operating costs + Depreciation + Tax payments + Efficiency carryover amount

Will only form part of the revenue requirement from the 2nd Regulatory Term

Revenue requirement calculation over a (5 year) Regulatory Term



Regulatory Implementation Guideline 3 (RIG 3)

Revenue Requirement based on building block model

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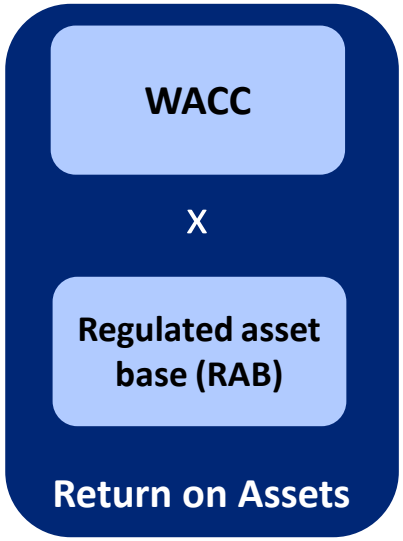
Return on Assets (ROA):

The ROA component should deliver an efficient market based return to investors in the business entities (WACC X RAB)



WACC The forecast market return is set as the nominal after tax weighted average cost of capital (WACC). Is discussed comprehensively in RIG 4.

RAB Average of ***starting asset value*** and ***closing asset value.***

Starting asset value: measure of company investment

- Once set, not changed, promotes certainty & lowers risk
- Includes only fixed assets such as plant and equipment
- Does not include other assets such as cash, financial assets, investment in subsidiaries, tax assets intangibles and goodwill.
- The starting asset values are net of upfront customer contributions or capital received from governments in the form of government grants or subsidies.

Closing asset value:

- Starting asset value – annual depreciation + forecast capital expenditure

Regulatory Implementation Guideline 3 (RIG 3)

Revenue Requirement based on building block model

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Operating costs (opex):

The opex allows the recovery of forecast efficient operating costs incurred in supplying electricity to end customers

Efficiency

- testing for efficiencies through benchmarking (where relevant)
- review of historical cost performance
- efficiency and prudency of asset management policies
- consistency with capex and sales forecast

Related party transactions

will only be incorporated in efficient operating cost forecasts if:

- these related party transactions are entered into on an arm's length basis through competitive tendering; or
- They contain no margin or profit and purely reflect the direct cost of providing these services and the cost is efficient; or
- it can be demonstrated that these related party costs are comparable to market benchmarks

Regulatory Implementation Guideline 3 (RIG 3)

Revenue Requirement based on building block model

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Depreciation	Annual depreciation of the RAB and new capital expenditure will be based on the efficient economic life of assets • Asset lives reflect optimal useful life – engineering assessment, not accounting • Once the useful life estimates are finalised, annual depreciation forecasts will be based on a straight line basis.
Forecast tax payments	Annual tax payments will be based on a calculation of forecasts of taxable income (pre interest) and the applicable tax rates • Taxable income will be based on the forecasts of return on assets, operating costs and capital allowances. • Any tax losses incurred in any year of the Regulatory Term will be carried forward and offset future tax liabilities.

Regulatory Implementation Guideline 3 (RIG 3)

Revenue Requirement based on building block model

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Cost Incentive framework:

Incentives are captured by the Base Incentive and the Efficiency Carryover Scheme

Base Incentives	Encourages pursuit of cost efficiencies. Business entities to retain any variances between actual opex and capex relative to forecasts within the Regulatory Term (subject to set variance threshold of 25%)
Efficiency carryover scheme	The purpose of the efficiency carryover scheme (ECS) is to provide the business entities a continuous and sustained incentive to pursue cost efficiencies during every year of the Regulatory Term. This is important as under the base incentive regime, the business entities incentive to pursue efficiencies weaken as they approach the end of the Regulatory Term.

Regulatory Implementation Guideline 3 (RIG 3)

Revenue Requirement based on building block model

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Efficiency Carryover Scheme (Worked example)

	First Regulatory Term				Second Regulatory Term		
	Year 1	Year 2	Year 3		Year 1	Year 2	Year 3
Operating expenditure forecast	120	120	120		100	100	100
Actual operating expenditure	100	100					
Estimated operating expenditure			100				
Annual cost efficiency	20	20	20				
Cost Efficiency Amount				60			
Sharing Cost Amount				30			
Efficiency Carryover Amount %					50%	30%	20%
Efficiency Carryover Amount					**15**	**9**	**6**
ARR Operating expenditure forecast	120	120	120		115	109	106

Regulatory Implementation Guideline 3 (RIG 3)

Revenue Requirement based on building block model

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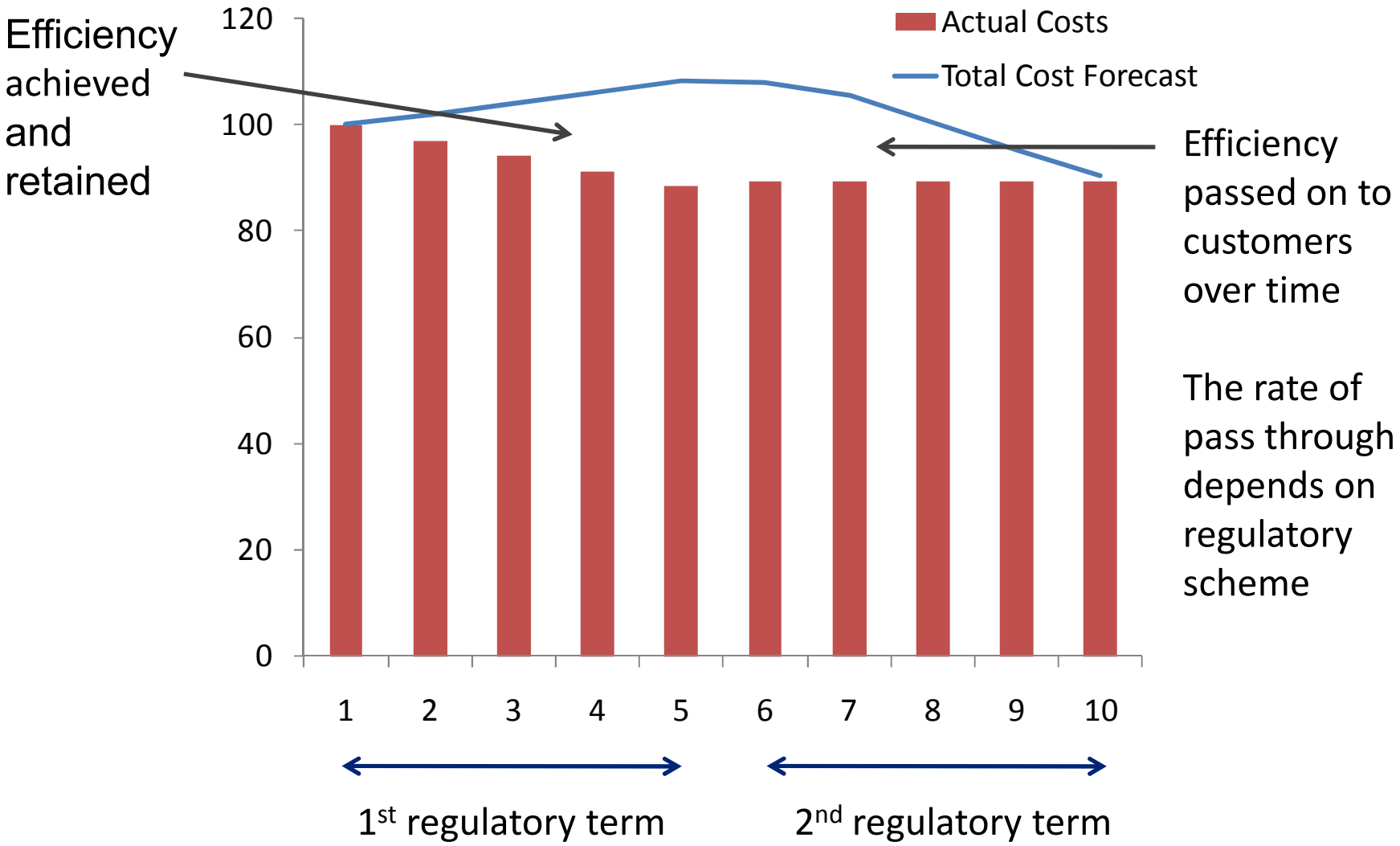
Efficiency Carryover Scheme (Worked example)



Regulatory Implementation Guideline 3 (RIG 3)

Revenue Requirement for Single Buyer

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The Single Buyer purchases electricity from the Independent Power Producers (IPPs) based on PPAs and from TNB Generation based on SLAs.

The revenue requirement for the Single Buyer for the Regulatory Term comprises of the following:

- Cost of electricity purchases based on the contractual terms (capacity payments, other fuel and other variable costs) and forecast dispatch (subject to an Actual Cost regime); and
- Building block model revenue

Required revenue = Cost of electricity purchases + Building block revenue

Regulatory Implementation Guideline 3 (RIG 3)

Converting Revenue Requirement to Average Tariffs

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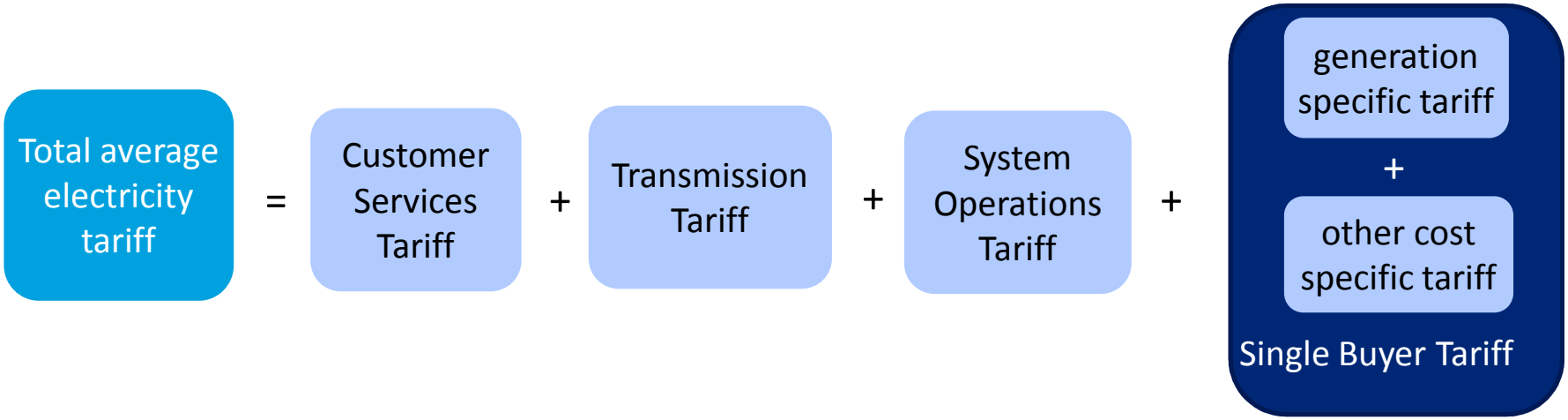
The total average electricity tariff is the sum of all Component Average Tariffs for each of the TNB business entities

- The key principle for setting the Average Component Tariffs for the TNB business entities is to ensure that the set tariffs over the Regulatory Term recover the total Annual Revenue Requirement (ARR) over the Regulatory Term on a Net Present Value (NPV) basis.



Regulatory Implementation Guideline 3 (RIG 3)

Converting Revenue Requirement to Average Tariffs

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Worked example of ARR for a TNB business entity for each year of the Regulatory Term.

		First Regulatory Term		
		Year 1	Year 2	Year 3
Annual Revenue Requirement (RM)		100	100	100
WACC	8.5%			
NPV of ARR (RM)	255			
Forecast electricity sales (kWh)		50	52	53
Starting Price, Po (RM/kWh)	1.80			
Price escalation (X Factor)		4.0%	4.0%	4.0%
Forecast Price (RM/kWh)		1.87	1.95	2.02
Forecast revenue (RM)		94	100	107
NPVof forecast revenue (RM)	255			
NPV difference	0			

In this example, the forecast Component Average Tariff has to increase by 4% per annum to ensure the recovery of the ARR over the Regulatory Term on an NPV basis. This is achieved by setting the Price escalation factor (X Factor) at 4% per annum.

Regulatory Implementation Guideline 3 (RIG 3)

Incentive regime

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Broadly three kinds of incentives for TNB:

1. Incentives to seek cost efficiencies (RIG 3)
   - Base incentive, where TNB can retain variances between forecast and actual opex
   - Efficiency Carryover Scheme, where TNB carries forward 50% of the Cost Efficiency Amount

2. Incentive to pursue financial efficiencies (RIG 4)
   - Rewarded for maintaining an efficient capital structure and outperforming the benchmark WACC

3. Incentive to pursue performance efficiency (RIG 6)
   - Rewarded for delivering improvements in network performance and customer service

These efficiency gains achieved are then shared with the customer.

Regulatory Implementation Guideline 4 (RIG 4)

The objective of RIG 4 is as follows:

- to outline the guidelines the Commission will adopt in determining the appropriate weighted average cost of capital (WACC) for the TNB business entities.

Regulatory Implementation Guideline 4 (RIG 4)

Overview of WACC

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Companies finance their investments through a combination of equity and debt.

The WACC represents the weighted average cost of equity and debt (effectively the required return to suppliers of capital)

Overview of the WACC

- WACC is the economic cost (return) associated with a firm's requirement for capital – i.e. suppliers of capital require a market return on capital provided
- The required return will depend on the riskiness of the firm and the nature of the capital instrument – i.e. debt, equity or hybrid securities

Regulatory Implementation Guideline 4 (RIG 4)

Overview of WACC

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Key principles related to setting the WACC:

- Market expectations.
  - Capital providers expect to receive adequate compensation for the funds they have provided, otherwise capital is deployed elsewhere
  - If market expectations are not met, capital becomes more expensive or more difficult to raise
- Regulatory considerations. In setting the rate of return for regulated businesses, the regulator must balance:
  - **Consumer interests** in having lower prices
  - **Investor interests** in having a return on their investment, and providing adequate incentives for investments in infrastructure

Regulatory Implementation Guideline 4 (RIG 4)

Overview of WACC

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Key principles related to setting the WACC (cont.):

- Efficiency. The Commission will ensure that the WACC:
  - is based on an efficient capital structure and credit rating;
  - reflects market based returns on debt and equity;
  - adequately reflects regulatory and market risk; and
  - is consistent with the underlying cash flows calculated in the determining the ARR for the relevant TNB business entities.
- Market data and trends:
  - Where possible, the WACC will be based on Malaysian capital market data
  - Where Malaysian data is not suitable, international data will be used as a reference point
- International best practice:
  - The Commission will also consider relevant international regulatory precedence
  - In particular: the Commission will consider regulatory decisions on the WACC and WACC parameters in countries with similar regulatory regimes as the one proposed for Malaysia, such as Australia, the UK and Singapore

Regulatory Implementation Guideline 4 (RIG 4)

WACC definition

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Nominal after tax WACC

- Consistent with TNB, SESB and GMSB, the Commission is proposing to use a nominal after tax ('text book') WACC

$$WACC = \underbrace{(Rf + Dm) * (1 - Tc) * G}_{\text{Cost of debt}} + \underbrace{(Rf + Be*MRP)*(1-G)}_{\text{Cost of equity}}$$

Where:

Rf	=	*Risk free rate*
Dm	=	*Debt margin, spread above Rf required to finance debt*
Tc	=	*Tax rate*
G	=	*Gearing, measure as Debt / (Debt + Equity)*
Be	=	*Equity Beta, systematic riskiness of firm or industry in comparison with the overall market*
MRP	=	*Market risk premium, (market return – Rf)*

Regulatory Implementation Guideline 4 (RIG 4)

WACC definition: Risk Free rate

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Risk Free Rate:	Reflects the yield on the safest investment
1. Type of risk free asset	Investing in Malaysian Government Securities (MGS) reflects sovereign risk and is the safest underlying and stand alone investment in Malaysia. Consistent with regulatory practice in Australia, UK, Singapore and New Zealand.
2. Term to maturity	Should reflect the life of the underlying asset. Australian regulators use the yield of a 10 year government bond; Singapore adopts the yield on a 20 year government bond. Recommendation is to adopt the yield on the MGS with term to maturity between 10 to 20 years.
3. Calculation of the risk free rate	The Commission will set the risk free rate based on the relevant historical average and current yields on 10 to 20 year MGS at least two months prior to the start of the first Regulatory Term.

Regulatory Implementation Guideline 4 (RIG 4)

WACC definition: Debt Margin

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Debt Margin:	Addition margin required to invest in TNB debt
1. Benchmark credit rating	The Commission considers that a utility such as TNB, whose operations have a significant impact on the economy of Malaysia, should be rated at least investment grade. Approach consistent with Australia, Singapore, UK. Recommend setting of an efficient debt margin based on an implied investment grade rating of BBB+ (based on S&P ratings); translates to credit rating of AA as determined by RAM Holdings Berhad.
2. Term to maturity of debt portfolio	Noting the lack of liquidity and depth of long dated corporate debt issues in Malaysia, the Commission recommends that the average maturity of an efficient debt portfolio be set at ten years. Australia adopts 10 years, Singapore 20 years and UK up to 20 years.
3. Calculation of debt margin	The Commission recommends that the debt margin (margin above yield of MGS) on ten year corporate bonds with a rating of BBB+ (S&P estimate) or AA (RAM estimate) be set based on a historical five year average. This is consistent with the setting of the risk free rate.

Regulatory Implementation Guideline 4 (RIG 4)

WACC definition: Gearing

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Gearing :	Total debt as a percentage of debt plus equity
1. Efficient benchmark	It is appropriate to adopt a benchmark gearing as opposed to actual gearing in order to incentivise utilities towards a more efficient capital structure Actual benchmarks of listed utilities, gearing typically between 40 to 70%
2. Regulatory precedence	• Australia adopts 60% for T&D • UK adopts between 50 to 60% • New Zealand which had used 40% looks likely to increase this to 60% in setting revised parameters for WACC in 2010 • Singapore adopts between 50 to 60%.

Our recommended range of gearing is therefore 50 – 60%, with 55% for the first Regulatory term

Regulatory Implementation Guideline 4 (RIG 4)

WACC definition: Equity Beta

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Equity Beta:	Measure of systematic risk of equity
1. TNB stock price analysis	Commission recommends that market data be used to calculated TNB's equity beta. In assessing equity beta estimates the Commission recommends the following: • at least seven years of historical market data be used; • adjustments made to historical data for events like the GFC; • adjusted to reflect regulated gearing; and • estimates be crosschecked with published equity beta estimates by Bloomberg & other financial market data providers.
2. Regulatory precedence	Equity beta should reflect regulatory risk and maturity. Benchmarks are as follows: • In Australia, the regulator adopts an equity beta of 0.8, with gearing of 60%. • Most equity beta calculations for UK and American utilities range from 0.8 to 0.5, for a gearing of 60%.

Regulatory Implementation Guideline 4 (RIG 4)

WACC definition: Market Risk Premium (MRP)

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MRP:	premium to invest in share market above risk free assets
1. Methods of calculation	The main methods adopted in regulatory settings are; • Historical analysis: requires at least 50 years of data • Sovereign risk assessment: equity market risk is influenced by sovereign credit ratings. • Forward looking analysis: dividend growth model based on investor expectations of future market returns. • Benchmarking with other markets: Typically more risky markets will tend to have a higher MRP.
2. Regulatory precedence	Benchmarks are as follows: • Regulators have adopted a MRP of 6.5% for Australia, • 7%+ for New Zealand, • 7% for Singapore, • 5%+ for UK

Draft recommended of MRP for Malaysia is 7.5

Regulatory Implementation Guideline 4 (RIG 4)

Setting WACC parameters

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Parameter	Key principles	Parameter value
Risk free rate (Rf)	10 to 20 year yield on MGS	Value based on 5 year historical average at the start of the First Regulatory Term
Debt margin (Dm)	Credit rating of BBB+ (S&P estimate) or AA (RAM estimate) Debt portfolio based on 10 year term to maturity.	Based on 5 year historical average
Gearing (G)	Consistent with maintaining investment grade credit rating (BBB+, S&P estimate or AA, RAM estimate).	Draft determination of 55%.
Equity beta (Be)	Market analysis and Benchmarking. Consistent with gearing assumption.	Initial estimate of 1.15. Final determination based on updated market analysis and benchmarking.
Market Risk Premium (MRP)	Benchmarking with other markets. Relevant international regulatory benchmarks.	Draft Determination of 7.5%

Regulatory Implementation Guideline 5 (RIG 5)

The objective of RIG 5 is as follows:

- to establish detailed operating cost, capital cost, asset and consumption templates for the TNB business entities.

Regulatory Implementation Guideline 5 (RIG 5)

Managed Market Model

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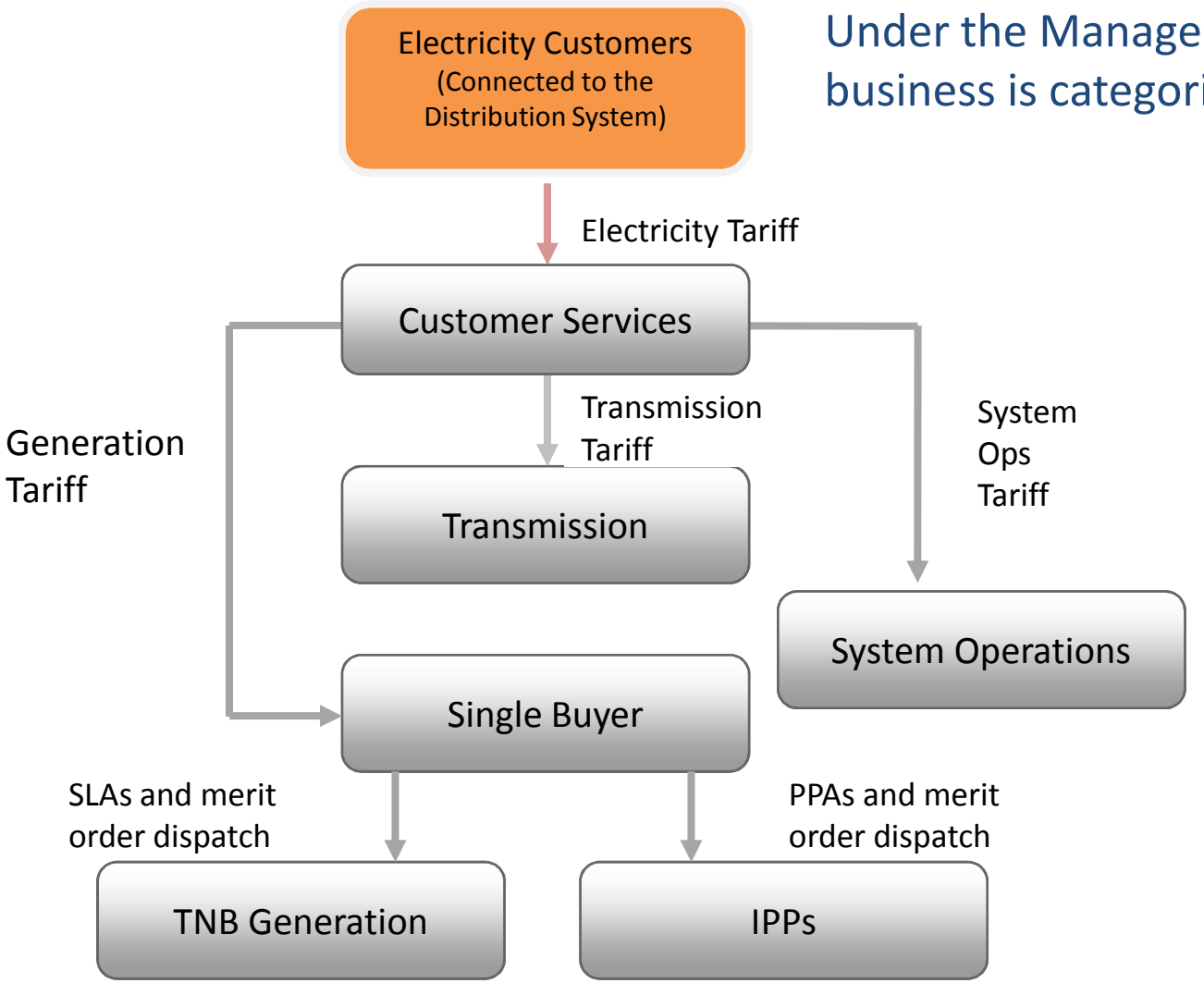

Under the Managed Market Model, TNB's business is categorised into 5 entities:

- Customer Services
- Transmission
- System Operations
- Single Buyer
- TNB Generation

Regulatory Implementation Guideline 5 (RIG 5)

Data requirement

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The Commission requires forecast data for every year of the Regulatory Term to implement the regulatory framework

- To calculate annual revenue requirements under the Building Block Model for Customer Services, Transmission, System Ops, Single Buyer (other operating costs)
- Single buyer total costs for procuring generation (based on PPAs and SLAs)

Reporting requirements

- TNB must ensure that it is able to report actual cost data (both asset and operating costs) in exactly the same format as the finalised data templates.

Regulatory Implementation Guideline 5 (RIG 5)

Single buyer

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Single Buyer Data for forecasting cost of electricity procurement	
1. IPP data	Key requirements are based on individual PPAs and Single Buyer Dispatch Rules: • IPP general information (capacity, availability, fuel, contract end date) • Forecast dispatch for every six months • Capacity payments, fuel cost, variable cost
2. TNB generation data	Key requirements are based on individual SLAs and Single Buyer Dispatch Rules: • General information (capacity, availability, fuel, contract end date) • Forecast dispatch for every six months • Capacity payments, fuel cost, variable cost In addition, asset information on each TNB generation entity to enable calculation of RAB and return of assets and depreciation. Required to ensure capacity payments deliver a WACC return • Opening assets, asset remaining life, capital expenditure

Regulatory Implementation Guideline 5 (RIG 5)

Single buyer

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Single Buyer Building Block Model data requirements		
1.	Single Buyer Opex	Forecast operating costs to operate and manage the functions of the Single Buyer
2.	Single Buyer Assets & Capex	Opening assets base, remaining life, forecast capital expenditure to operate and manage the functions of the Single Buyer
3.	Single Buyer tax	Opening tax assets base and forecast capital expenditure costs to operate and manage the functions of the Single Buyer

Regulatory Implementation Guideline 5 (RIG 5)

Single buyer: Data template examples

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IPP data examples

IPP general information

Name	Capacity (MW)	Type (Base, Mid, peaking)	Fuel	Average heat rate (mmBtu/MWh)	Contract end date (mm/yyyy)
IPP 1	400	Base	Coal	7.5	12/2016
IPP 2	200	Mid	Gas	10.0	01/2017
IPP 3	100	Peaking	Gas	12.0	02/2017
IPP 4	400	Base	Coal	7.5	03/2017
IPP 5	200	Mid	Gas	10.0	04/2017
IPP 6	100	Peaking	Gas	12.0	05/2017
IPP 7	400	Base	Coal	7.5	06/2017

IPP Capacity Payment (RM)

		Base year capacity payment	Regulatory Period - forecast capacity payment		
	Start Date	1/09/2008	1/09/2009	1/09/2010	1/09/2011
	End Date	31/08/2009	31/08/2010	31/08/2011	31/08/2012
IPP 1					
IPP 2					
IPP 3					
IPP 4					
IPP 5					
IPP 6					
IPP 7					

IPP dispatch information

		Base year dispatch (MWh)	Regulatory Period - Forecast Dispatch (MWh)		
	Start Date	1/09/2008	1/09/2009	1/09/2010	1/09/2011
	End Date	31/08/2009	31/08/2010	31/08/2011	31/08/2012
IPP 1					
IPP 2					
IPP 3					
IPP 4					
IPP 5					
IPP 6					
IPP 7					

TNB data examples

TNB generation general information

Name	Capacity (MW)	Type (Base, Mid, peaking)	Fuel	Average heat rate (mmBtu/MWh)
TNB 1	400	Base	Coal	7.5
TNB 2	200	Mid	Gas	10.0
TNB 3	100	Peaking	Gas	12.0
TNB 4	400	Base	Coal	7.5
TNB 5	200	Mid	Gas	10.0
TNB 6	100	Peaking	Gas	12.0
TNB 7	400	Base	Coal	7.5

TNB generation Capacity Payment (RM)

		Base year capacity payment	Regulatory Period - forecast capacity payment		
	Start Date	1/09/2008	1/09/2009	1/09/2010	1/09/2011
	End Date	31/08/2009	31/08/2010	31/08/2011	31/08/2012
TNB 1					
TNB 2					
TNB 3					
TNB 4					
TNB 5					
TNB 6					
TNB 7					

TNB generation dispatch information

		Base year dispatch (MWh)	Regulatory Period - Forecast Dispatch (MWh)		
	Start Date	1/09/2008	1/09/2009	1/09/2010	1/09/2011
	End Date	31/08/2009	31/08/2010	31/08/2011	31/08/2012
TNB 1					
TNB 2					
TNB 3					
TNB 4					
TNB 5					
TNB 6					
TNB 7					

Regulatory Implementation Guideline 5 (RIG 5)

Building Block Model inputs

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Building Block Model inputs

For Customer Services, Transmission, System Ops, Single Buyer

1. Asset data	The asset base inputs include asset categories, opening asset values, remaining life, useful life and capital expenditure forecasts for the Regulatory Term. Inputs include all tax inputs and inputs on any upfront customer contributions or government grants.
2. Operating cost	All operating cost forecasts for each year of the regulatory term. For the Single Buyer, it may include working capital.
3. Joint costs	Joint costs are those costs which are common to all (or at least two) TNB business entities. These costs will be allocated to the TNB business entities based on a cost allocation principles (RIG 7). Centralised head office functions like corporate finance & human resources, IT, legal and other administrative services. Assets which are used by more than one business entity, such as the head office building, TNB University etc.

Regulatory Implementation Guideline 5 (RIG 5)

Appendix 1

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TNB will be provided with an Excel model incorporating the following worksheets for the provision of data (Appendix 1 to RIG 5)

Worksheet	Description
Single Buyer	Data inputs on IPPs, TNB generation. Costs based on IPPs and SLAs. Objective is to calculate all costs of generation (including fuel) which the Single Buyer incurs in procuring electricity.
TNB Generation	Asset base inputs for TNB Generators. The objective is to check if the capacity payments in the SLAs deliver an appropriate return to the respective generators.
Asset inputs	Asset base inputs for Transmission, System Operations, Single Buyer and Customer Services. The objective is to calculate return on asset, return of asset and tax payments in the revenue requirement model.
Opex inputs	Operating cost inputs for Transmission, System Operations, Single Buyer and Customer Services. The objective is to forecast recovery of efficient operating costs in the revenue requirement model.
Joint cost inputs	This worksheet captures all assets and operating costs which are common to more than one TNB business entity. These joint costs will be allocated to the various TNB business entities based on the cost allocation principles enshrined in RIG 7.

Regulatory Implementation Guideline 6 (RIG 6)

The objective of RIG 6 is as follows:

- to provide guidelines to establish an incentive framework for operational performance for the TNB business entities.

Regulatory Implementation Guideline 6 (RIG 6)

Background

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Broadly three kinds of incentives for TNB:

1. Incentives to seek cost efficiencies (RIG 3)

- Base incentive, where TNB can retain variances between forecast and actual opex
- Efficiency Carryover Scheme, where TNB carries forward 50% of the Cost Efficiency Amount

2. Incentive to pursue financial efficiencies (RIG 4)

- Rewarded for maintaining an efficient capital structure and outperforming the benchmark WACC

3. Incentive to pursue performance efficiency (RIG 6)

- Rewarded for delivering improvements in network performance and customer service

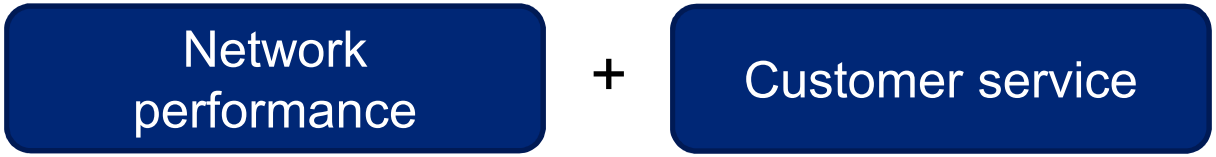
Regulatory Implementation Guideline 6 (RIG 6)

Background

Deloitte.

Operational performance incentives:

- ***Operational performance*** is defined as:



- Operational performance incentives are required to:
  - Ensure that cost and financial efficiencies are not achieved at the expense of operational performance
  - Provide signals to suppliers about appropriate or desired levels of service in the absence of effective market signals (for example, pricing does not typically reflect quality of service).

Note: the operational performance incentive scheme will work in conjunction with other performance and customer service standards set for TNB (such as meeting set appointment times etc) and any guaranteed minimum service level standards.

Regulatory Implementation Guideline 6 (RIG 6)

Finalising operational performance indicators

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Developing performance indicators is possibly the most important step in designing the scheme

Performance indicators must meet the following criteria:

- relates closely to the business activities of the TNB business entities;
- highly valued by electricity customers;
- can be objectively measured; and
- can be independently audited.

The Commission proposes that each of the TNB business entities proposes a list of no more than 3 operational performance indicators

Regulatory Implementation Guideline 6 (RIG 6)

Finalising operational performance indicators

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Examples of performance indicators for business entities

Business entity	Possible performance indicator	Comment
Customer services	System average interruption duration index (SAIDI) and system average interruption frequency index (SAIFI)	Commonly used by electricity distribution businesses in Australia, UK and New Zealand
	Restoration time and power supply interruption events	Used in Singapore
	Call centre performance and losses	Adopted recently by regulators in Australia and UK.
Transmission	Circuit and plant availability, supply interruption and losses	Commonly used for transmission businesses in Australia, UK and Singapore
	Power quality indicators (voltage dip incidents)	Used in Singapore for transmission
System Operations/ Single Buyer	Market and system rule compliance and demonstration of efficiency and transparency	Key performance indicators adopted for independent system operators and market companies

Regulatory Implementation Guideline 6 (RIG 6)

Setting targets and incentive scheme

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When setting or approving targets for TNB's approved performance indicators, the Commission will consider:

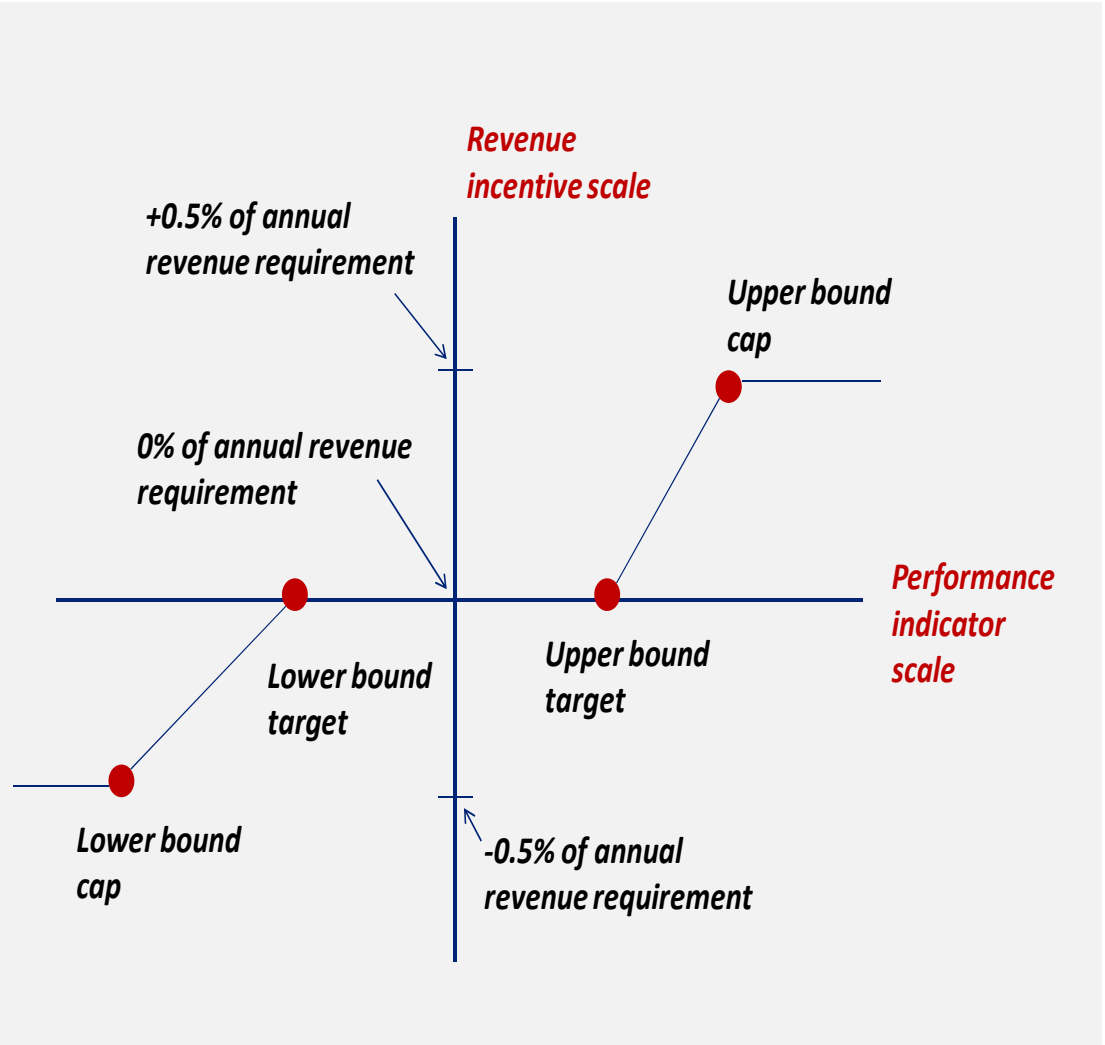
- Historical performance; Preferably 3 years of historical data
- Impact on capex and opex; Higher standards of performance will typically be associated with higher prices (and vice versa)
- Inherent variability in performance data; For example, unexpected natural events may impact performance

The Commission proposes to set an upper bound and a lower bound target for each performance indicator:

- Penalty payment if actual performance < lower bound target
- Incentive payment if actual performance > upper bound target
- The Commission proposes to cap penalty / incentive payments at 0.5% of the business entity's Annual Revenue Requirement

Regulatory Implementation Guideline 6 (RIG 6)

Incentive Scheme



Actual performance compared to target

- Incentive / penalty capped at +/- 0.5% of annual revenue
- No incentive or penalty if performance between the upper and lower bound targets

Regulatory Implementation Guideline 6 (RIG 6)

Implementation process

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First Regulatory Term:

- TNB business entities to propose at least 3 performance indicators
  - Including 3 years of historical data to justify upper and lower bound targets
- Incentive or penalty amounts calculated but not passed through to tariffs

Second Regulatory Term:

- Accumulated incentive/penalty amount to be added to the Revenue Requirement over the Second Regulatory Term
- The Commission will assess the scheme and consider implementing:
  - annual tariff adjustments for performance
  - Increasing the cap on incentive/penalty payments in line with international benchmarks (typically 2% to 5% of ARR).

Regulatory Implementation Guideline 7 (RIG 7)

The objective of RIG 7 is as follows:

- to provide guidelines to establish cost allocation principles for allocating joint costs incurred by TNB in supplying electricity to customers in Malaysia between the various TNB business entities.

Regulatory Implementation Guideline 7 (RIG 7)

Background

The costs that a regulated entity incurs in the provision of regulated services can be broadly categorised into either direct costs or joint costs.

Direct costs

Costs incurred for activities that are required solely for providing regulated services applicable for that specific regulated entity.

Ring fenced from other activities of the corporate group and are recorded and captured directly in an account category which belongs solely to the relevant regulated entity.

E.g., costs incurred for meter reading activities typically are direct costs for a regulated distribution business entity.

Joint Costs

Costs for activities performed centrally by the corporate group for more than one regulated entity (or a combination of regulated and non-regulated business entities).

Centralisation of certain corporate functions such as corporate IT and Treasury is often the most efficient means of delivery.

Joint costs related to regulated services have to be allocated to the relevant regulated business entities to enable regulated cost recovery from electricity customers via electricity tariffs.

Regulatory Implementation Guideline 7 (RIG 7)

Key principles for allocating joint costs

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The Commission's cost allocation principles are as follows:

- Only those joint costs are to be allocated to regulated business entities which are incurred in the provision of **regulated services** for the respective regulated entities.
- Only **efficient** joint costs will be allocated to regulated entities.
- A particular joint cost can only be allocated once.
- The regulated entity must clearly specify how joint costs are allocated and the basis for allocation (cost allocation methodology).
- A stand alone basis for allocating joint costs is not acceptable. The sum of allocated joint costs must not exceed the total value of the joint costs.
- The basis of allocating joint costs, once approved by the Commission must be reflected in the preparation of the regulatory accounts and must not be changed during the course of the Regulatory Term.

Regulatory Implementation Guideline 7 (RIG 7)

Implementation

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Cost allocation methodology:

The Commission expects TNB to propose a detailed cost allocation methodology, incorporating the following minimum requirements:

1	A clear presentation of the structure of the parent company, with a complete listing of both regulated and non regulated business entities
2	A clear explanation of all joint costs and justification on how these costs are relevant to the provision of supplying electricity to customers connected to the TNB electricity network in Malaysia.
3	Detailed justification of the basis adopted to allocate joint costs to the various business entities. The Commission expects that a causal basis be adopted to allocate most joint costs. If a causal basis to allocate joint costs is not applicable, then the rational for departure from a causal basis must be clearly explained.
4	Demonstration that the sum of all allocated costs is not greater than the total joint costs.

Cost allocation methodology (cont)

5	Explanation on how the proposed joint cost allocation will be implemented in the financial and management accounting systems. The business entities must be able to allocate actual joint costs incurred based on the proposed cost allocation methodology in an efficient and timely manner.
6	The Commission will review and approve the cost allocation methodology within 2 months of receiving the cost allocation methodology.
7	The cost allocation methodology, once approved will not change during the Regulatory Term.
8	Any changes to the approved cost allocation methodology for subsequent Regulatory Term's must be approved by the Commission.

Regulatory Implementation Guideline 7 (RIG 7)

Implementation

Deloitte.

Compliance with the cost allocation principles will be ensured via the Regulatory Accounting Framework and price review process

Regulatory Accounts (RIG 10):

- The Commission will expect the Regulatory Accounts for the TNB business entities to be based on the approved cost allocation methodology. The Commission will require the following:
  - A statement from the auditors confirming that the regulatory accounts are consistent with the approved cost allocation methodology.
  - Any inconsistencies found by the auditors between the proposed regulatory accounts and the cost allocation methodology must be highlighted along with the reasons for non compliance signed off by TNB.

Forecasts and review:

- In determining the revenue requirement, the Commission will ensure that joint costs are allocated based on the approved cost allocation methodology.

Regulatory Implementation Guideline 8 (RIG 8)

The objective of RIG 8 is as follows:

- to provide guidelines to establish a fuel cost pass through mechanism to enable the recovery of actual fuel related and other generation specific costs incurred by the Single Buyer.

Regulatory Implementation Guideline 8 (RIG 8)

Background

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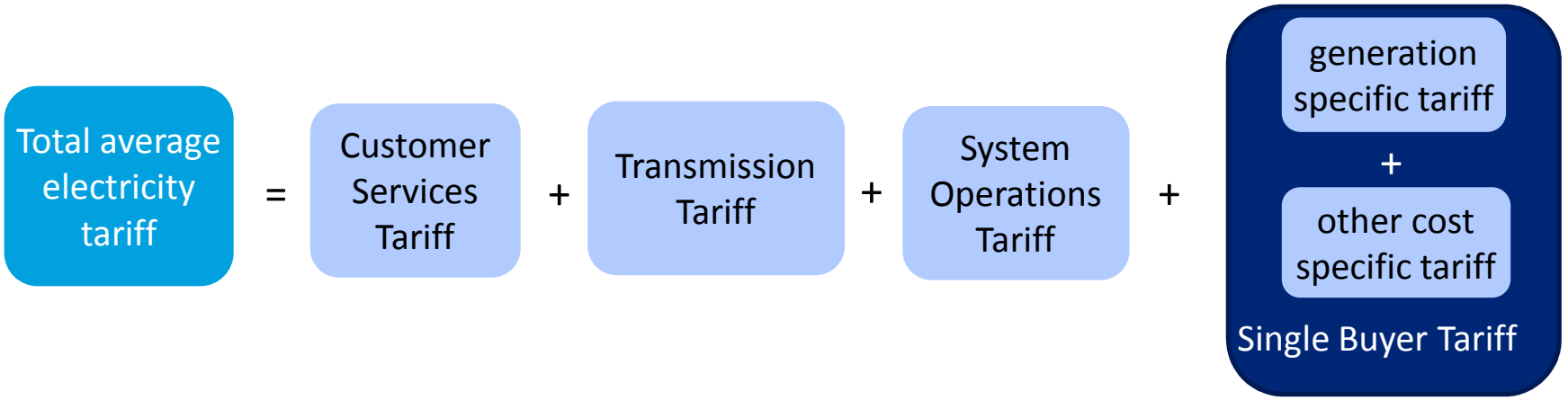
Under the Managed Market Model (RIG 1):

- the Single Buyer procures the required electricity generation (to meet customer demand) from IPPs and TNB generation based on Power Purchase Agreements (PPAs) and Service Level Agreements (SLAs) respectively

The Single Buyer Tariff charged by the Single Buyer to Customer Services comprises:

- ***The generation specific tariff component***, based on all costs of generation including fuel, capacity payments and other costs associated with the terms and conditions of the PPAs, SLAs and other fuel procurement contracts
- ***The other cost specific tariff component***, based on the other operational and capital related costs of running the Single Buyer operations (including an allocation of joint costs).



Regulatory Implementation Guideline 8 (RIG 8)

Background

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Actual Cost regime:

- The Single Buyer operates under an Actual Cost regime (RIG 2) with respect to the costs of procuring electricity.
- As per RIG 2, the actual revenue earned by the Single Buyer based on the ***generation specific tariff component*** of its total Single Buyer Tariff is compared to the actual cost of electricity procurement for every six month period and variances adjusted for in subsequent six month periods.
- Actual Costs may vary from forecast costs due to variances between:
  - actual customer demand and forecast demand;
  - actual gas and coal prices and forecast prices;
  - forecast plant mix and actual dispatch; and
  - actual payments (and receipts from liquidated damages and withholding of capacity payments etc) from other terms and conditions of the various contracts, including the PPAs, SLAs and fuel procurement contracts from those included in the forecasts.

Regulatory Implementation Guideline 8 (RIG 8)

Implementation

Deloitte.

Six monthly fuel cost report:

- The Commission will expect the Single Buyer to submit a detailed fuel cost report for every 6 month period of the Regulatory Term no later than 2 months after the expiry of the relevant six month period
- The contents of the 6 monthly fuel report will be as follows:

Item	Description of required content
Six month actual cost	Actual cost of electricity procurement as outlined (fuel, capacity payments etc).
Six month actual revenue	The actual revenue from the generation specific tariff component of the Single Buyer Tariff due to actual sales of electricity to customers.
Explanation of variances	Detailed explanation of the variances between actual costs of electricity procurement and actual revenue from the generation specific tariff component.
Proposed tariff adjustment	Required adjustment to the generation specific tariff component, with adjustments to occur in the following 6 month period, as opposed to the next (see next slide).
Audit requirement	The fuel cost report prepared by the Single Buyer must be certified as correct by a reputable audit company.

Regulatory Implementation Guideline 8 (RIG 8)

Implementation – Tariff adjustment

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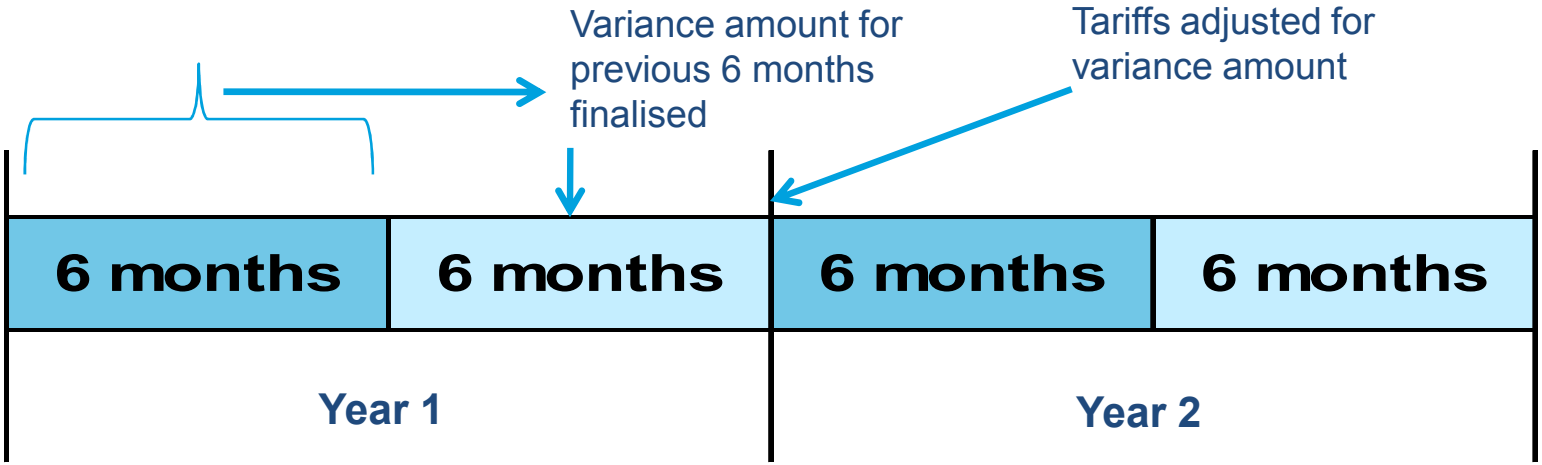
Proposed tariff adjustment:

- Actual cost and variance calculations will only be finalised 3 months after the end of the six month period
- Therefore, the Commission proposes that any adjustments to the ***generation specific tariff component*** should be implemented not in the immediate next six month period, but in the following six month period
  - To account for this delay, the variance amount will be adjusted for interest (the time value of money), based on a 6 month Malaysian Interbank Lending Rate or equivalent measure.



Regulatory Implementation Guideline 8 (RIG 8)

Implementation – Tariff adjustment

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Approval of proposed tariff adjustment:

- The Commission proposes to adopt the following approval process in reviewing and approving any tariff adjustment based on the fuel cost pass through mechanism:
  - If the proposed adjustment to the ***generation specific tariff component*** is less than 7%, the Commission will approve and implement the adjustment
  - If the proposed adjustment to the ***generation specific tariff component*** is equal to or greater than 7%, the Commission will recommend its decision to the Minister for approval.

Regulatory Implementation Guideline 9 (RIG 9)

The objectives of RIG 9 are as follows:

- set out the principles to be followed by TNB when proposing prices; and
- establish the annual price approval process.

Regulatory Implementation Guideline 9 (RIG 9)

Pricing Principles

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Overarching pricing principles:

- ***Cost recovery***: Prices should allow TNB to recover its operating and maintenance costs and achieve an appropriate rate of return on its investments, ensuring the financial viability of the regulated business. Cost recovery is addressed via the Tariff Setting Framework and form of price control (RIG 2), and the establishment of Annual Revenue Requirements under the building blocks method (RIG 3); and

- ***Cost reflectivity*** (allocative efficiency): Prices should reflect the cost of delivering services (that is, the costs imposed on TNB by electricity consumers), thereby providing appropriate incentives for customers concerning how and when they use electricity.

- There are also a number of ***implementation issues*** that TNB must have regard to when proposing prices.

Cost reflectivity – upper and lower pricing bounds:

- Economic efficiency suggests that prices for a customer group should be set between an upper bound representing stand-alone costs and a lower bound representing avoidable or incremental cost, where:
  - ***Stand-alone cost*** is the total cost TNB would incur if it provided services only to the customer group in question, with no other service provided to any other customer group; and
  - ***Avoidable cost*** is the cost that would be avoided by not serving a particular customer group.
- In practice there is likely to be a wide range of potential tariffs and tariff structures that would fall within these bounds.

Regulatory Implementation Guideline 9 (RIG 9)

Pricing Principles

Deloitte.

Cost reflectivity – Long Run Marginal Cost:

- Regulators typically require utility service providers to have regard to the ***Long Run Marginal Cost (LRMC)*** of supply in proposing and justifying tariffs and tariff components, e.g.:
  - Australia's National Electricity Rules (NER)
  - Singapore's Energy Market Authority (EMA)
- LRMC estimates aim to reflect the impact of electricity use by customers on decisions by TNB concerning upgrades and augmentation to generation and transmission infrastructure.

Approaches to estimating LRMC:

- ***Incremental LRMC*** approaches – Average Incremental Cost (AIC), Marginal Incremental Cost (MIC)
- Greenfields approach – ***Long Run Average Cost*** (LRAC)

Cost reflectivity – Incremental LRMC approaches:

- Incremental LRMC approaches are entirely forward looking and ignore sunk costs (by assuming there is existing plant available to meet demand)
  - Prices based on incremental LRMC will provide cost signals for incremental usage, but do not ensure revenue adequacy (full cost recovery), as sunk costs are ignored
- Where there is excess capacity in a system, or the next supply augmentation is some way off, estimates of incremental LRMC may be very low, suggesting that very low variable usage charges should be applied.
- Very low variable charges may limit the effectiveness of tariffs in terms of:
  - Customers' ability to exercise control over their bills by changing usage patterns; and
  - The provision of incentives for customers to use energy efficiently.

Regulatory Implementation Guideline 9 (RIG 9)

Pricing Principles

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Cost reflectivity – Long Run Average Cost (LRAC):

- The LRAC approach (greenfields approach) assumes there is currently no plant available to meet demand, and involves the estimation of an optimised replacement cost to meet existing and future demand:
  - This approach captures all costs (including a return to investors) to serve customers, as sunk assets are re-valued at replacement cost estimates

The Commission is open to considering alternative approaches to estimating the cost of serving customers that meet the objectives of the pricing principles.

Prices should still fall within the bounds of stand-alone and avoidable cost and send appropriate signals to customers about how and when they consume electricity.

Regulatory Implementation Guideline 9 (RIG 9)

Pricing Principles

Deloitte.

Implementation issues:

- In addition to the high-level principles, TNB must have regard to the following issues when proposing tariffs:

Issue	Approach
Recovery of costs	TNB's prices should be structured so as to ensure that it recovers its revenue requirement for each business entity over the Regulatory Term.
Consistency with Govt policy	TNB's prices should be consistent with any applicable Government policy (e.g. impacts on vulnerable customer groups and economic and regional development issues, including employment and investment growth).
Customer impacts	Where adverse impacts on customers from changes to, or increases in, tariffs are identified, TNB should provide details of its strategies for addressing customer impacts.
Transparency and simplicity	For any price signals to be effective, tariffs must be able to be readily understood by customers. Highly complex tariff structures, while potentially being more cost reflective, may not be effective in influencing behaviour if they are not clearly understood.
Costs and benefits of changes to tariff structures	Where TNB proposes to revise its tariff structures it should take into account the costs of implementing the new tariffs (e.g. changes to billing systems and informing customers) with the anticipated benefits (e.g. improving cost reflectivity or behavioural change incentives).

Regulatory Implementation Guideline 9 (RIG 9)

Tariff setting process

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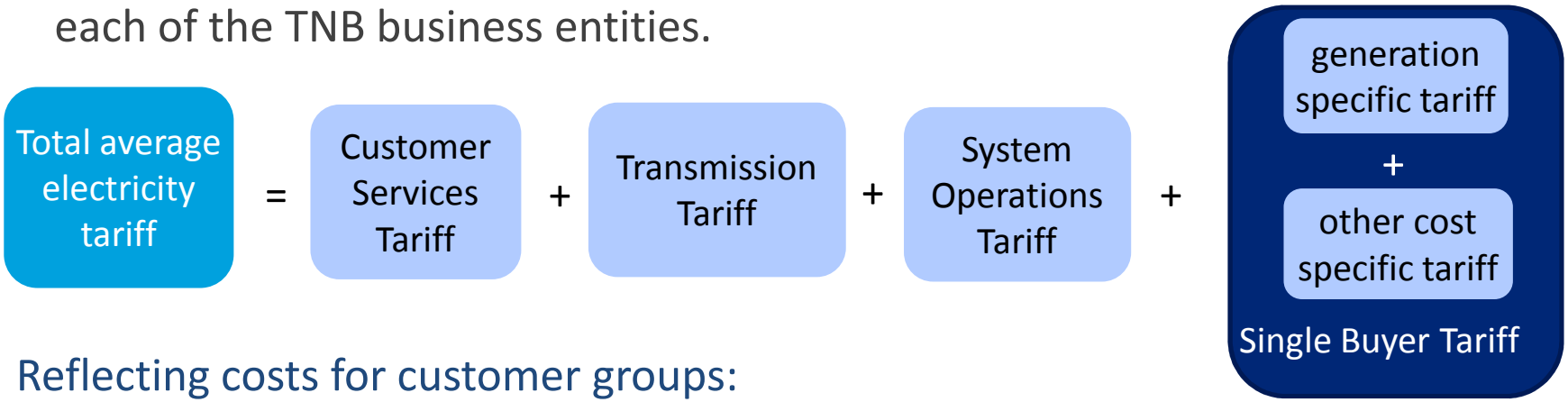
Tariff setting process:

- The final tariff paid by customers (the total average electricity tariff) is set by Customer Services and is the sum of all Component Average Tariffs for each of the TNB business entities.



Reflecting costs for customer groups:

- Customer Services should allocate the costs to the tariffs charged to specific customer groups based on information from each business entity about the cost of providing services to those customer groups.
- For example, costs of generation passed from the Single Buyer to the Customer Services business entity (and on to final customers) should reflect the load profile of customer groups or segments and TNB's associated network planning considerations (such as type of generation required to serve that customer group).

Regulatory Implementation Guideline 9 (RIG 9)

Tariff setting process

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Annual tariff adjustments:

- Any changes in components of the total average electricity tariff due to Revenue Cap adjustments or Actual Cost adjustments for individual business entities will flow through directly to prices charged to final customers.
- The total average electricity tariff constraint allows TNB to increase (or decrease) some individual tariffs for customer groups by more or less than others, so long as the total average electricity tariff condition is met. The Commission will set side constraints on the movement of individual tariffs to guard against customers being subject to price shocks.
- The Commission proposes that rebalancing of tariffs will only occur at annual intervals, with the six month adjustments for Single buyer actual fuel related costs being enacted as a direct and proportional pass-through to all tariffs

Regulatory Implementation Guideline 9 (RIG 9)

Tariff setting process

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Annual tariff adjustment process:

- Two months prior to the end of the regulatory year, TNB will be required to submit its proposed tariff schedule to the Commission, with any rebalancing proposals accompanied by evidence of compliance with the pricing principles and implementation issues.
- Adjustments for revenue under or over recovery under the revenue cap arrangements will be based on an estimate of revenue for the current regulatory year (combining the most recent actual data and forecasts for the remainder of the year).
- Any difference between estimated revenue and actual revenue will need to be accounted for in revenue cap adjustments in subsequent regulatory years
- Following approval by the Commission, TNB will publish its approved tariffs on its website at least ten business days prior to the commencement of the next regulatory year.

Regulatory Implementation Guideline 10 (RIG 10)

The objectives of RIG 10 are as follows:

- to set out the framework for the development of regulatory accounts for each of TNB's regulated business entities.

Regulatory Implementation Guideline 10 (RIG 10)

Background

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Purpose of Regulatory Accounts:

- Incentive regulation is based on efficient forecasts of operating expenditure, capital expenditure and operational performance which form the basis of prices for the Regulatory Term

- The purpose of the Regulatory Accounts will be to assist the Commission in its assessment of TNB's actual performance in terms of:
  1. financial benchmarks, and forecasts of operating and capital expenditures that make up the revenue requirement; and
  2. operational performance standards and key performance indicators, developed in accordance with the framework is set out in RIG 6.

Regulatory Implementation Guideline 10 (RIG 10)

Background

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Requirement for regulatory accounts:

- Regulatory Accounts are drawn from statutory/financial accounts, but differ in that:
  - ***financial accounts*** provide a description of the financial performance of the business as a whole
  - ***Regulatory Accounts*** are specific to items related to the provision of regulated services
- Regulatory Accounts are required because a number of items are treated differently for regulatory purposes, for example:
  - regulatory depreciation of the regulatory asset base (RAB)
  - the treatment of customer contributions).
- There will also be a range of expenditure and revenue items included in the financial accounts that relate to services that are not subject to regulation and therefore should be excluded from the Regulatory Accounts and regulated prices for the TNB business entities.

Regulatory Implementation Guideline 10 (RIG 10)

Form of regulatory accounts

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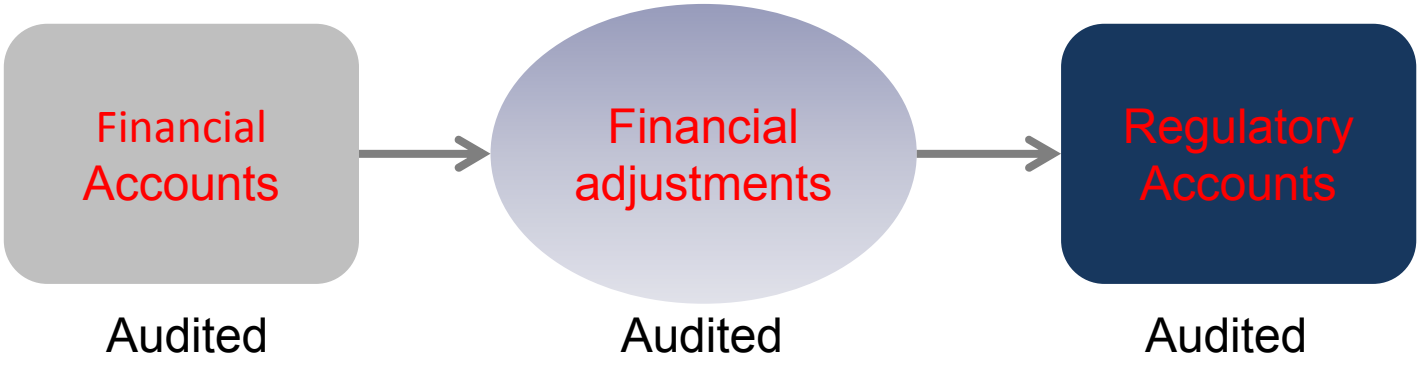
Development of Regulatory Accounts:

- The Regulatory Accounts will be in the same form as the data input templates used for setting prices for the regulatory term. They should include:
  - A description of how expenditures and revenues for regulated services have been separated from expenditures and revenues for services provided by TNB that are not subject to regulation,
  - Confirmation of compliance with the approved cost allocation methodology for joint costs (RIG 7)
- The translation of data from the audited financial accounts to the Regulatory Accounts (including compliance with the joint cost allocation methodology) should be audited.



Explanation of variances:

- The annual Regulatory Accounts submission should be accompanied by an explanation of variances between actual and forecast data / performance, for example:
  - Efficiency gains
  - Cost over runs
  - Forecasting errors

Commentary on performance:

- The annual Regulatory Accounts submission should be accompanied by a commentary from senior management on the operational performance of the TNB business entities, including areas of concern and service improvement initiatives in relation to:
  - Network performance
  - Customer service standards

The audited Regulatory Accounts will be used by the Commission to:

- Update the RAB with actual capital additions made over the Regulatory Term (including deductions for customer contributions) and ensure that the regulatory depreciation applied is appropriate;
- Review operating expenditure and the efficiency carry over amounts for the efficiency carry over scheme (RIG 3);
- Review revenues and costs for the purposes of making adjustments under the Revenue Cap and Actual Cost regimes; and
- Assess TNB's performance against its targets for performance indicators (as set out in RIG 6), and in subsequent Regulatory Terms, inform the incentive or penalty amounts associated with either meeting or falling short of the targets.

Regulatory Implementation Guideline 11 (RIG 11)

The objective of RIG 11 is as follows:

- to outline the regulatory review process to be followed for the first regulatory period.

Regulatory Implementation Guideline 11 (RIG 11)

Overview of regulatory review process

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Key elements of in the regulatory review process:

- ***TNB o develop comprehensive Single Buyer Rules*** which govern the operations of the Single Buyer;
- ***TNB to propose service standards*** for each of its business entities (RIG 6). The Commission will decide upon TNB's proposed service standards before considering required revenue and prices;
- ***TNB to propose annual revenue requirement*** to meet its service standards, including targets for operating and capital expenditure (see RIG 3) and a rate of return of capital expenditure (RIG 4);
- ***The Commission to review and approve prices*** proposed by TNB. Following a draft decision on prices, the Commission will consult with relevant stakeholders and may also consider submissions before making its final decision.

Regulatory Implementation Guideline 11 (RIG 11)

Overview of regulatory review process

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Stage	Indicative dates	Process
Stage 1: RIGs	January 2012	Commission to publish the Regulatory Implementation Guidelines and provide TNB with a Revenue Requirement Model.
Stage 2: Service standards	February 2012 – May 2012	TNB to develop proposed service standards and targets in accordance with RIG 6. Each of the TNB business entities will propose operational performance indicators, with a lower and upper bound performance target.
	April 2012	Commission draft decision on service standards.
	June 2012	Commission final decision on service standards. The Commission will consult with the TNB business entities and other stakeholders as required.
	February 2012 – July 2012	Development of Single Buyer Rules (indicative dates only, as work program will depend upon existing documentation and robustness of processes).

Regulatory Implementation Guideline 11 (RIG 11)

Overview of regulatory review process

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Stage	Indicative dates	Process
Stage 3: TNB submission (6 months)	July 2012	TNB to prepare its submission to the review in accordance with the RIGs and services standards.
	(no later than) December 2012	TNB to provide the Commission with completed Revenue Requirement Model and any relevant accompanying documentation.
Stage 4: Draft decision (8 months)	January 2013 – August 2013	Commission to assess TNB's proposal and make a draft decision on prices. Public Consultation
Stage 5: Final decision (4 months)	September 2013	Following the release of the draft decision, the Commission will consult with relevant stakeholders, including government, the Economic Planning Unit (EPU), TNB and customer groups. The Commission may also consider submissions from TNB and other parties on its draft decision.
	December 2013	The Commission to release its final decision.

Regulatory Implementation Guidelines

In Summary

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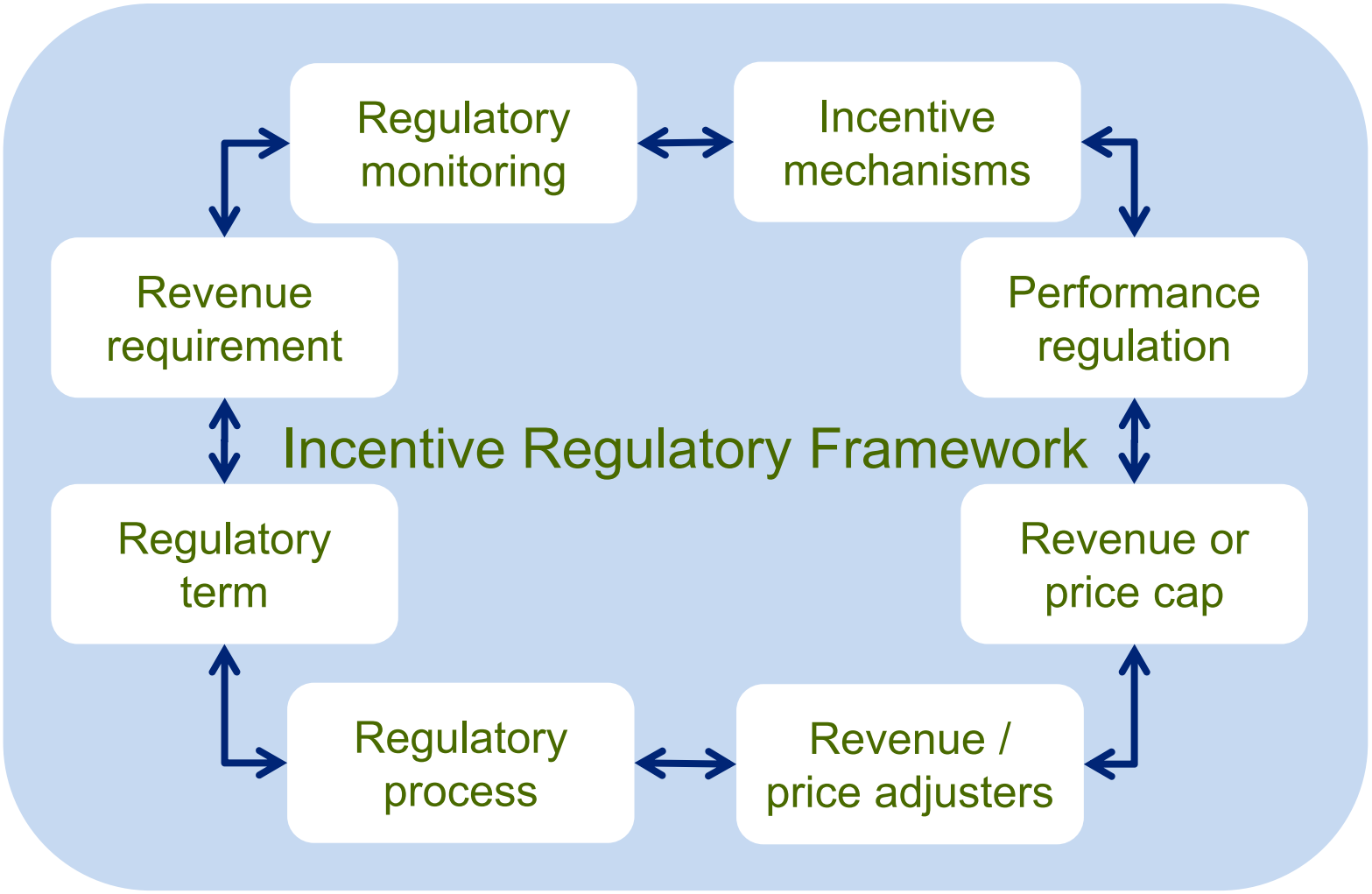
To work efficiently all the key elements of Incentive Regulation must be implemented

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