

# GUIDELINES

## ON ELECTRICITY TARIFF DETERMINATION UNDER INCENTIVE BASED REGULATION (IBR) FOR PENINSULAR MALAYSIA 2021

*Established pursuant to section 26 and 50C of Act 447*

**Document Control**

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**ELECTRICITY SUPPLY ACT 1990**  
**[Act 447]**

**GUIDELINES ON ELECTRICITY TARIFF DETERMINATION UNDER  
INCENTIVE BASED REGULATION (IBR) FOR PENINSULAR  
MALAYSIA 2021**

**GP/ST/No.2/2016(Pin.2021)**

IN exercise of the power conferred by Section 26 and 50C of the Electricity Supply Act 1990 [Act 447], the Commission issues the following Guidelines on Electricity Tariff Determination under Incentive Based Regulation (IBR) for Peninsular Malaysia 2021:

**Purposes**

1. The amendments of these Guidelines are necessary for the following purposes:
  - i) to establish the IBR framework that is employed by the Commission in approving revenues and tariffs for the Regulated Services of the Regulated Business Entities in Peninsular Malaysia;
  - ii) to specify the objectives of the IBR framework that guide the Commission in reviewing and approving revenue and tariff proposals submitted by the Regulated Business Entities; and
  - iii) to define the entities and services that are subject to revenue and tariff regulation by the Commission under the IBR framework and the requirements of these Guidelines.

**Interpretation**

2. The terms and expressions used shall, unless defined in these Guidelines or the context otherwise requires, have the same meaning as in the Electricity Supply Act 1990, including any modification, extension or re-enactment thereof and any subsidiary legislation made there under.

### **Citation and Commencement**

3. These Guidelines may be cited as the “Guidelines on Electricity Tariff Determination under Incentive Based Regulation (IBR) for Peninsular Malaysia 2020” and shall come into operation on the date of its registration.

### **Content of these Guidelines**

4. The contents of these Guidelines which includes all the amendments shall be as in **ANNEX I** and shall replace these Guidelines on Electricity Tariff Determination under IBR which was issued to Tenaga Nasional Berhad in January 2012, on 4 May 2016 (GP/ST/No.2/2016), and on 26 October 2018 (GP/ST/No.2/2016(Pin.2018)).

### **Application of these Guidelines**

5. These Guidelines shall apply to the Regulated Services of the Regulated Business Entities in Peninsular Malaysia under the IBR framework such as Single Buyer (Operations), Transmission, Grid System Operator, Distribution Network and Customer Services, who are licensed under Section 9 of the Electricity Supply Act 1990.

### **Notice by the Commission**

6. The Commission may issue written notices from time to time in relation to these Guidelines.

### **Amendment and Variation**

7. The Commission may at any time amend, modify, vary or revoke these Guidelines or any part thereof, under any of the following circumstances:

- i) to effect changes in the electricity supply industry;
- ii) where it is expedient to ensure reliability of the electricity supply system;
- iii) to rectify any inconsistency or unintentional errors giving rise to grave consequences; and
- iv) any other justifiable reason as the Commission deems necessary.

**Dated:** 28 April 2021

A handwritten signature in black ink, appearing to read 'Razib Din Dawood', with a long horizontal stroke underneath.

**ABDUL RAZIB DIN DAWOOD**  
Chief Executive Officer  
for Energy Commission

**ANNEX 1:**

**GUIDELINES ON ELECTRICITY TARIFF  
DETERMINATION UNDER INCENTIVE BASED  
REGULATION FOR PENINSULAR MALAYSIA  
2021**

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## **1. Basis and Purpose of these Guidelines**

- 1.1. These Regulatory Implementation Guidelines (RIG) are issued by the Commission under the powers conferred by Sections 26 and 50C of the Electricity Supply Act 1990 [Act 447].
- 1.2. These Guidelines:
  - (a) Establish the Incentive-Based Regulation (IBR) framework that is employed by the Commission in approving revenues and tariffs for the Regulated Services of the Regulated Business Entities (RBE) in Peninsular Malaysia.
  - (b) Specify the objectives of the IBR framework that guide the Commission in reviewing and approving revenue and tariff proposals submitted by the RBE.
  - (c) Define the entities and services that are subject to revenue and tariff regulation by the Commission under the IBR framework and the requirements of these Guidelines.
- 1.3. Consistent with Section 26 of the Electricity Supply Act 1990, the purpose of these Guidelines is to describe the methodology, principles, procedures and requirements that must be complied by RBE in submitting electricity tariff proposals.
- 1.4. The Commission may issue written notices from time to time in relation to these Guidelines.
- 1.5. The Commission may at any time review, vary or revoke (in part or fully) these Guidelines.

**END OF SECTION**

## **2. Incentive-Based Regulation Framework**

### **Objectives of the IBR framework**

2.1. The objectives of the IBR framework are to:

- (a) Protect electricity consumers from any potential misuse of monopoly or market power.
- (b) Provide reasonable assurance that, provided that a licensee is efficient, well managed and appropriately financed, it will receive revenues from tariffs and charges that will cover its costs (including a reasonable return on capital) of providing the Regulated Services.
- (c) Facilitate the financing of required and efficient investments in electricity infrastructure and supply.
- (d) Provide incentives for licensees to deliver outcomes consistent with consumer needs and priorities, including efficient operation and quality of service.
- (e) Provide for efficient and evolving allocations of risk between licensees and electricity consumers.
- (f) Design electricity tariff structures that maximise the efficiency of electricity supply and consumption for the approval of the Commission.
- (g) Ensure that revenue and tariff regulation is transparent, that it follows principles consistently, and that regulatory proposals from licensees and the Commission determinations are evidence-based.
- (h) Safeguard that the Commission reviews and approves revenue and tariff proposals in compliance with its prescribed roles and responsibilities in relation to regulating the electricity supply industry, as outlined in the Electricity Supply Act 1990 and the Energy Commission Act 2001.

## **Description of the Incentive-Based Regulation framework**

- 2.2. For the purposes of regulating the revenues and tariffs of licensees responsible for electricity supply in Peninsular Malaysia, the Commission has established the IBR framework as embodied in these Guidelines.
- 2.3. Under the IBR framework, the Regulated Tariffs charged for the provision of Regulated Services shall not exceed an Allowed Average Tariff.
- 2.4. The Allowed Average Tariff is capped at a level that allows a licensee to recover an Allowed Revenue, representing the estimated efficient costs (including financing costs) of providing the Regulated Services.
- 2.5. The Allowed Revenue is determined for the Regulatory Periods. A Base Average Tariff is calculated for each Regulatory Period which will allow a licensee to recover its Allowed Revenue for that period.
- 2.6. The Allowed Average Tariff in each year is calculated as the sum of the Base Average Tariff and any applicable adjustments, such as those related to the Revenue-Cap and Price-Cap mechanisms as described in these Guidelines.
- 2.7. The licensee may also apply a surcharge or rebate for changes in fuel and other generation costs from those originally forecast and included in the Allowed Revenue, under the Imbalance Cost Pass-Through (ICPT) Adjustment. The ICPT Adjustment is a surcharge or rebate and does not form part of the Allowed Average Tariff and is calculated and applied separately.

### **Incentives on licensees**

- 2.8. If a licensee is able to reduce its actual costs below the estimated efficient costs embedded in the Allowed Revenue, then it is able to retain the resulting savings and increased profits. Conversely, if a licensee's costs exceed the estimated efficient costs, then the licensee will bear the difference and its profits will be correspondingly reduced. This provides the incentives for a licensee to improve efficiency above and beyond the expected improvements included in the Allowed Revenue estimation.

- 2.9. The estimation of Allowed Revenue for each Regulatory Period will take account of a licensee's actual costs achieved in preceding periods. This provides the mechanism by which cost reductions resulting from better-than-expected efficiency performance by a licensee are returned to electricity consumers.
- 2.10. In order to provide incentives for a licensee to maintain and, where economically efficient, improve the quality of Regulated Services, incentives and penalties shall be applied to the Allowed Revenue reflecting the licensee's performance against the quality of service benchmarks.

### **Length of the Regulatory Period**

- 2.11. The Commission will determine the length of each Regulatory Period no later than twelve months prior to the start of the next period.

### **Application to Tenaga Nasional Berhad**

- 2.12. Tenaga Nasional Berhad (TNB) is organised into multiple RBE. At present, the following process is applied in estimating Allowed Revenues and determining the Base Average Tariff for each Regulatory Period:
- (a) The Allowed Revenues for each RBE are separately estimated in accordance with these Guidelines. From these, a Base Average Tariff is calculated for each RBE.
  - (b) The Minister approves a Bundled Base Average Tariff applicable to TNB as a whole. This approved Bundled Base Average Tariff may or may not be equal to the sum of the estimated Base Average Tariff for each RBE and the Average Generation Cost.
  - (c) Where a difference exists between the Bundled Base Average Tariff and the sum of the estimated Base Average Tariff for each RBE and the Average Generation Cost then TNB shall, for the purposes of internally allocating revenues and costs between each RBE, allocate all such differences to the Customer Services RBE.

- (d) Similarly, where a difference exists between the Bundled Allowed Average Tariff and the sum of Allowed Average Tariff (after annual regulatory adjustment) for each RBE and the Average Generation Cost then TNB shall, for the purposes of internally allocating revenues and costs between each RBE, allocate all such differences to the Customer Services RBE.

2.13. It is expected that, in future, the Minister will approve an individual Base Average Tariff for each RBE. As and when this happens, the Minister will cease to approve a Bundled Base Average Tariff. Instead, an Unbundled Base Average Tariff will be calculated as the sum of the approved Base Average Tariff for each RBE and the Average Generation Cost. Similarly, the Unbundled Allowed Average Tariff will be calculated as the sum of the Allowed Average Tariff for each RBE and the Average Generation Cost.

2.14. In these Guidelines, the calculation of the Bundled Allowed Average Tariff, comprising the sum of the Bundled Base Average Tariff approved by the Minister and adjustments, is presented in Section 5. The calculation of the Allowed Average Tariff by RBE, comprising the Base Average Tariff for each RBE as approved by the Minister and adjustments, is presented in Section 6. Section 5 shall apply so long as the Minister continues to approve a Bundled Base Average Tariff applicable to TNB as a whole and Section 6 shall apply as and when the Minister approves a Base Average Tariff for each individual RBE.

## **END OF SECTION**

### **3. Application of the IBR framework**

#### **Regulated Services**

- 3.1. The IBR framework applies to Regulated Services which include, but not limited to:
  - (a) the operation, maintenance and investment in the electricity transmission system;
  - (b) the operation, maintenance and investment in the electricity distribution system;
  - (c) the wholesale purchase and sale of electricity to licensees and authorised suppliers; and
  - (d) the retail sale of electricity to consumers.
- 3.2. The costs of generation of electricity are not subject to the IBR framework and are separately regulated through approved Power Purchase Agreements (PPA) in the case of independently-owned generators and through approved Service Level Agreements (SLA) in the case of generators sharing common ownership with a licensee providing Regulated Services. These generation costs are treated as a pass-through item, comprising the sum of the Average Generation Cost, included in the Base Average Cost and the ICPT Adjustment.
- 3.3. The costs of providing Regulated Services are recovered from Regulated Tariffs.
- 3.4. Other Income which is earned from services not directly related to electricity supply, but which are provided using the assets and/or staff of a licensee is deducted from the revenues to be earned from Regulated Tariffs as part of the calculation of adjustments.
- 3.5. Consumer contributions are considered to represent a deferred income used to support the revenues needed to recover the costs of licensees

in providing Regulated Services. These contributions are used to reduce the Regulated Tariffs as part of the calculation of adjustments.

### **RBE under TNB**

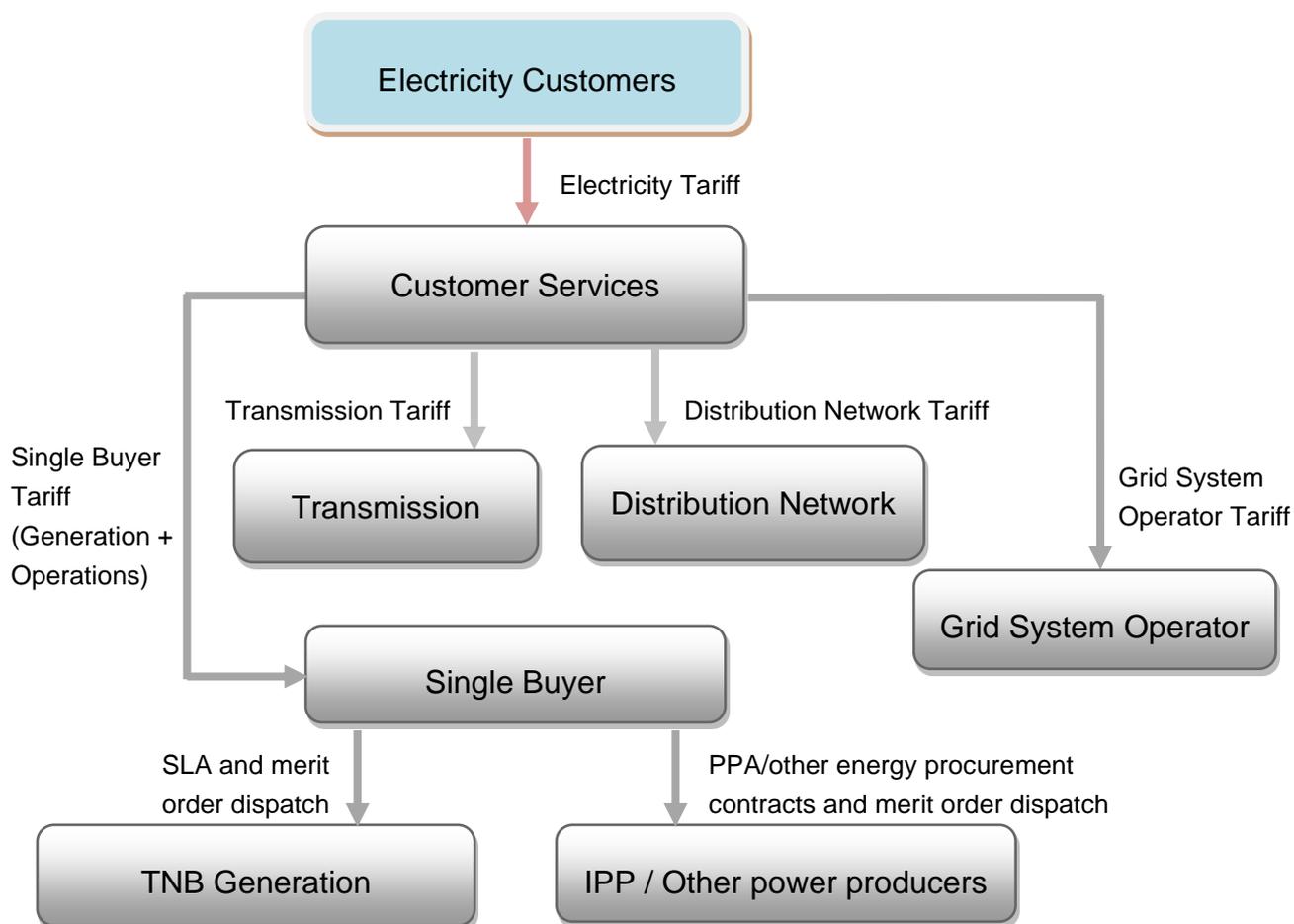
3.6. TNB is organised into a number of RBE, each representing one of the functions involved in the supply of electricity. These RBE currently comprise the following:

- (a) **Single Buyer** is the RBE responsible for managing the procurement of electricity and related services, including long-term planning, scheduling, procuring and settling electricity supply in accordance with the Single Buyer Rules and the Malaysian Grid Code.
- (b) **Transmission** is the RBE responsible for planning, investing in, operating and maintaining the electricity transmission network, that is, the system of lines, substations and related equipment at 132kV and above.
- (c) **Grid System Operator** is the RBE responsible for system security, operational planning, the dispatch of generating units, real-time operation and control of the power system, and coordinating all parties connected to the Grid System in accordance with the Malaysian Grid Code.
- (d) **Distribution** is the RBE responsible for planning, investing in, maintaining, and undertaking the real-time operation and control of the electricity distribution system, that is, the system of lines, substations, and related equipment and buildings below 132kV.
- (e) **Customer Services** is the RBE responsible for supplying and selling electricity to, and managing the interface with, final consumers of electricity.

3.7. The power purchase costs of the Single Buyer are referred to in these Guidelines as Single Buyer Generation. These are distinct from the costs of the Single Buyer's own operations, referred to in these Guidelines as Single Buyer Operations. Reference to the Single Buyer unless

otherwise qualified refer to the Single Buyer Operations and exclude the Single Buyer Generation.

- 3.8. The Customer Services business entity charges electricity customers a tariff for their consumption of electricity. This tariff is a bundled tariff and incorporates a charge for all Generation (Independent Power Producers - IPP, TNB Generation, other power producers, fuel suppliers) and cost of Single Buyer Operations, Transmission, Grid System Operator, Distribution Network and Customer Services). Customer Services receives all the tariff revenue from electricity customers and subsequently pays the Single Buyer, Transmission, Distribution Network and Grid System Operator business entities their share of revenue based on the approved tariffs for each individual business entity.
- 3.9. The Single Buyer charges a Single Buyer Tariff to the Customer Services business entity, comprising a Generation component (based on forecasts costs of generation determined under the PPA, SLA and various other fuel and energy procurement contracts) and an Operations component (based on the operating costs of managing the operations of the Single Buyer). The Single Buyer receives the Generation Revenue and pays TNB Generation, the IPP, other power producers and fuel suppliers.
- 3.10. The flow of funds between the five RBE is shown as following diagram.



3.11. An Allowed Revenue and an Allowed Average Tariff is calculated for each RBE in accordance with these Guidelines.

3.12. Where an individual RBE is a unit within TNB, the Allowed Average Tariff shall be notional in nature as no actual payments and cash transfers will take place between RBE, as these form part of the same legal entity. This shall not prevent TNB managing each RBE as an internal cost or profit centre, if desired.

## Formation of an Independent Single Buyer and Independent Grid System Operator

3.13. Once formation of an Independent Single Buyer (ISB) and Independent Grid System Operator (IGSO) completed, these are the proposed enhancement related to the current RIG under the IBR framework as follows:

- (a) The terms of Single Buyer and Grid System Operator shall be deemed to change as ISB and IGSO in these Guidelines.
- (b) ISB and IGSO shall be treated as regulated business entities.
- (c) Customer Services business entity receives the tariff revenue from electricity customers and subsequently pays the other RBE based on the approved individual tariff as mentioned in Section 3.8. Thus, the Customer Services is responsible for payment the tariff revenue to ISB and IGSO once they are converted as an independent entity.
- (d) Establishment of key performance indicators that will be linked to incentives and penalties.
- (e) Determination of an Allowed Revenue Requirement and an Allowed Average Tariff for ISB and IGSO shall be calculated in accordance with Section 8 to 18 in these Guidelines.

### Forms of control

3.14. Two different forms of IBR control are applied under these Guidelines:

- (a) **Price-Cap.** The average allowed revenue (expressed in sen/kWh) is fixed for the duration of the Regulatory Period. The licensee may not charge tariffs that lead to an actual average revenue in excess of the Price-Cap. Where it does so, the excess is returned to customers through an annual Price-Cap Adjustment. A Price-Cap means that the actual revenue of a licensee will differ from its Allowed Revenue where actual sales volumes differ from the forecast sales volumes used to calculate the Allowed Revenue and the Price-Cap.

- (b) **Revenue-Cap.** The total allowed revenue (expressed in RM) is fixed for the duration of the Regulatory Period. The licensee may not earn more or less than the allowed revenue. Where it does so, the Allowed Average Tariff is subsequently adjusted to offset the difference in revenues through an annual Revenue-Cap Adjustment. A Revenue-Cap means that the actual revenue of a licensee will equal its Allowed Revenue even where actual sales volumes differ from the forecast sales volumes used to calculate the Allowed Revenue.

### **Revenue-Cap RBE**

3.15. A Revenue-Cap is applied to the following RBE, which are collectively designated as the “Revenue-Cap RBE”:

- (a) Single Buyer Operations
- (b) Grid System Operator
- (c) Transmission
- (d) Distribution

3.16. The Commission may amend this list at any time by adding or removing RBE.

3.17. For each of the Revenue-Cap RBE, a Revenue-Cap Adjustment will be annually calculated and applied to the Allowed Average Tariff.

### **Price-Cap Adjustment with bundled tariff**

3.18. Where the Minister approves a Bundled Base Average Tariff, in accordance with Section 2.12, then the Price-Cap shall apply to the bundled tariff. In this instance, the Price-Cap Adjustment shall be calculated annually as the difference between the Bundled Actual Average Revenue and the Bundled Allowed Average Tariff.

3.19. The Bundled Allowed Average Tariff is calculated as the sum of the Bundled Base Average Tariff and of the individual Revenue-Cap

Adjustments for Revenue-Cap RBE and of the Bundled Price-Cap Adjustment applied to the bundled tariff.

- 3.20. The Allowed Average Tariff applicable to those RBE not regulated under a Revenue-Cap is calculated as the Bundled Allowed Average Tariff less the sum of the Average Generation Cost and of the Allowed Average Tariffs for each individual Revenue-Cap RBE.

### **Price-Cap Adjustment with unbundled tariff**

- 3.21. Where the Minister approves a Base Average Tariff for each individual RBE, in accordance with Section 2.13, then a Price-Cap shall apply to the following RBE, which are collectively designated as the “Price-Cap RBE”:

(a) Customer Services

- 3.22. The Commission may amend this list at any time by adding or removing RBE.
- 3.23. For each of the Price-Cap RBE, a Price-Cap Adjustment will be annually calculated and applied to the Allowed Average Tariff.
- 3.24. In this instance, the Price-Cap Adjustment shall be calculated annually as the difference between the Actual Average Revenue and the Allowed Average Tariff for each individual Price-Cap RBE.
- 3.25. The Unbundled Allowed Average Tariff is calculated as the sum of the Average Generation Cost and of the Allowed Average Tariffs for each individual RBE.

### **Price-Cap Adjustment in cases of under-recovery**

- 3.26. In general, it is assumed that a licensee operating under a Price-Cap will be able to adjust individual Regulated Tariffs such that its expected average revenue is equal to the Price-Cap. Therefore, any under-recovery where the actual average revenue is below the Price-Cap is assumed to be a voluntary decision by the licensee.

- 3.27. At present, the Minister continues to approve variations in individual Regulated Tariffs from time to time and, therefore, this assumption does not necessarily hold. In recognition of this, so long as the Minister continues to approve variations in individual Regulated Tariffs, a limited Price-Cap Adjustment will be made for under-recovery where the Actual Average Revenue is below the Allowed Average Tariff. This under-recovery adjustment will be subject to a floor set at 2.5% of the Base Average Tariff.
- 3.28. The Commission may determine when the conditions for allowing such under-recovery no longer hold. Following such a determination, no adjustment for under-recovery will be permitted.
- 3.29. For the avoidance of doubt, a Price-Cap Adjustment will apply at all times where there is over-recovery where the Actual Average Revenue is above the Allowed Average Tariff. This adjustment shall not be subject to any ceiling.

#### **END OF SECTION**

## 4. Setting regulated tariffs

### Allowed Average Tariff

- 4.1. In any given year of a Regulatory Period, a licensee shall set its Regulated Tariffs such that it shall earn no more than the Allowed Average Tariff.
- 4.2. The Allowed Average Tariff is calculated as an average and does not prohibit the adoption of different tariffs and tariff structures for different services and different electricity customers.

### Principles of Regulated Tariffs

- 4.3. The Regulated Tariffs must be consistent with the following principles:
  - (a) **Cost-reflective.** The tariffs must be broadly reflective of the different costs of services to different customers.
  - (b) **Cost-recovery.** The tariffs must at least recover the incremental costs of providing but must not recover more than the stand-alone costs of providing each individual Regulated Service.
  - (c) **Non-discrimination.** The tariffs for an individual Regulated Service may only differ between customers where there are significant differences in the costs of service to these different customers.

### Tariff Table

- 4.4. The individual Regulated Tariffs shall be set out in a Tariff Table which lists tariffs by customer and type. The Tariff Table shall be published by a licensee on its website and by such other means as it considers appropriate to bring the Tariff Table to the attention of existing and prospective customers.
- 4.5. Prior to the commencement of each Regulatory Period, a licensee shall prepare and submit to the Commission a proposed Tariff Table for the next Regulatory Period. The submission should include:

- (a) The licensee shall provide the estimated cost of service based on voltage level and classified into demand, customer and energy related-costs and an explanation of the estimates including data used and methodologies applied. These methodologies may follow any individual or combination of internationally accepted approaches including, but not limited to, the use of long-run marginal cost estimates and of embedded cost estimates.
  - (b) TNB shall provide a justification of the proposed individual Regulated Tariffs showing that these meet the principles set out in this section. The accompanying justification must also explain any changes from the existing Tariff Table. The tariffs set out in the proposed Tariff Table must be consistent with the Base Average Tariff proposed by TNB for the next Regulatory Period.
- 4.6. The Tariff Table will be reviewed and approved alongside the proposed Annual Revenue Requirements and proposed Base Average Tariff.
- 4.7. Once approved, the Tariff Table will be updated in every Regulatory Period.
- 4.8. The ICPT Adjustment, Revenue-Cap Adjustment and Price-Cap Adjustment are supplementary to the applicable Regulated Tariff and do not form part of the Tariff Table.

**END OF SECTION**

## 5. Calculation of the Bundled Allowed Average Tariff

### Application of this section

- 5.1. This Section 5 shall apply for the calculation of the Bundled Allowed Average Tariff where the Minister approves a Bundled Average Base Tariff for TNB as a whole. Where the Minister approves an individual Base Average Tariff for each RBE then the calculation of the Allowed Average Tariff will follow the provisions of Section 6.

### Components of the Bundled Allowed Average Tariff

- 5.2. The Bundled Allowed Average Tariff is the sum of:
- (a) the Base Average Tariff for TNB for the Regulatory Period, as approved by the Minister;
  - (b) the sum of Revenue-Cap Adjustments for each Revenue-Cap RBE, calculated annually; and
  - (c) the Price-Cap Adjustment applied to TNB as a whole, calculated annually.

The Revenue-Cap Adjustments and Price-Cap Adjustment as mentioned above are treated as the Annual Regulatory Adjustment.

- 5.3. The calculation of the Bundled Allowed Average Tariff is made according to the following formula:

$$bALLW_t = bBASE_P + bRCAP_t + PCAP_t$$

Where:

'P' is a Regulatory Period

't' is a single year (1 January to 31 December) in Regulatory Period 'P'

' $bALLW_t$ ' is the Bundled Allowed Average Tariff for the year 't' (expressed in sen/kWh)

' $bBASE_P$ ' is the Bundled Base Average Tariff for Period 'P' (expressed in sen/kWh)

' $bRCAP_t$ ' is the Bundled Revenue-Cap Adjustment in year ' $t$ ' (expressed in sen/kWh)

' $PCAP_t$ ' is the Price-Cap Adjustment in year ' $t$ ' (expressed in sen/kWh)

- 5.4. The Allowed Average Tariff for the Customer Services RBE shall be calculated as follows:

$$ALLW_{t,cs} = bALLW_t - \left( \sum_{rc=1}^{RC} BASE_{P,rc} + AGEN_p + bRCAP_t \right)$$

Where:

' $cs$ ' is the Customer Services RBE

' $rc$ ' is an individual Revenue-Cap RBE

' $BASE_{P,rc}$ ' is the Base Average Tariff for Revenue-Cap RBE ' $rc$ ' for Regulatory Period ' $P$ ' (expressed in sen/kWh)

' $AGEN_p$ ' is the Average Generation Cost for Regulatory Period ' $P$ ' (expressed in sen/kWh)

' $ALLW_{t,cs}$ ' is the Allowed Average Tariff for the Customer Services RBE in year ' $t$ ' (expressed in sen/kWh)

### Calculation of the Bundled Base Average Tariff

- 5.5. The Bundled Base Average Tariff for each Regulatory Period is that approved by the Minister. This may or may not be equal to the sum of the Base Average Tariffs for each RBE and the Average Generation Cost, calculated as below.

### Calculation of the Base Average Tariff for individual RBE

- 5.6. A Base Average Tariff shall be calculated for each RBE prior to each Regulatory Period as the present value of Annual Revenue Requirements over the Regulatory Period, divided by the present value of forecasted electricity sales, in accordance with the following formula:

$$BASE_{P,e} = \left[ \sum_{t=1}^T \frac{REQT_{t,e}}{(1 + WACC_{P,e})^t} \right] / \left[ \sum_{t=1}^T \frac{FSAL_t}{(1 + WACC_{P,e})^t} \right]$$

Where:

' $e$ ' is an individual RBE

' $T$ ' is the length of Regulatory Period ' $P$ ' in years

' $REQ_{t,e}$ ' is the Annual Revenue Requirement of RBE 'e' in year 't' (expressed in RM)

' $FSAL_t$ ' is the forecasted total electricity sales in year 't' as made at the time of setting the Base Average Tariff (expressed in kWh)

' $WACC_{P,e}$ ' is the allowed Weighted Average Cost of Capital of RBE 'e' for Regulatory Period 'P' (expressed as a percentage)

### Calculation of the Average Generation Cost

- 5.7. The Average Generation Cost shall be calculated prior to each Regulatory Period as the present value of forecast fuel costs and forecast other generation-specific costs as specified in Power Purchase Agreements and Service-Level Agreements over the Regulatory Period, divided by the present value of forecasted electricity sales, in accordance with the following formula:

$$AGEN_P = AFUL_P + AGSC_P$$
$$AFUL_P = \left[ \sum_{s=1}^S \frac{FFUL_s}{(1 + WACC_{P,sb})^s} \right] / \left[ \sum_{t=1}^T \frac{FSAL_t}{(1 + WACC_{P,sb})^t} \right]$$
$$AGSC_P = \left[ \sum_{s=1}^S \frac{FGSC_s}{(1 + WACC_{P,sb})^s} \right] / \left[ \sum_{t=1}^T \frac{FSAL_t}{(1 + WACC_{P,sb})^t} \right]$$

Where:

'S' is the length of Regulatory Period 'P' in six-month intervals

' $AFUL_P$ ' is the Average Fuel Cost for Regulatory Period 'P' (expressed in sen/kWh)

' $AGSC_P$ ' is the Average Other Generation Cost for Regulatory Period 'P' (expressed in sen/kWh)

' $FFUL_s$ ' is the Forecast Fuel Cost for six-month period 's' (expressed in RM)

' $FGSC_s$ ' is the Forecast Other Generation Cost, excluding fuel costs, for six-month period 's' (expressed in RM)

- 5.8. Forecast fuel costs and forecast other generation costs shall be calculated using appropriate power system models and shall be based on the most recent approved planting (generation investment) programme, approved electricity demand forecast and approved level of efficient system losses as decided by the Planning and Implementation Committee for Electricity Supply and Tariff (JPPPET).

## Calculation of the Bundled Revenue-Cap Adjustment

- 5.9. The Revenue-Cap Adjustment is calculated annually for each Revenue-Cap RBE and is then summed to give the Bundled Revenue-Cap Adjustment applicable, according to the following formula:

$$bRCAP_t = \sum_{rc=1}^{RC} RCAP_{t,rc}$$

Where:

' $RCAP_{t,rc}$ ' is the Revenue-Cap Adjustment for Revenue-Cap RBE ' $rc$ ' in year ' $t$ '

- 5.10. The Revenue-Cap Adjustment for each Revenue-Cap RBE shall be calculated in accordance with the following formula:

$$RCAP_{t,rc} = \frac{RSLs_{t,rc} + OTHR_{t,e} + UPOX_{t,e} + INTR_{t,e}}{USAL_t}$$

Where:

' $RSLs_{t,rc}$ ' is the Revenue-Cap Sales Adjustment for Revenue-Cap RBE ' $rc$ ' in year ' $t$ ' (expressed in RM)

' $OTHR_{t,e}$ ' is the Other Income Adjustment for RBE ' $e$ ' in in year ' $t$ ' (expressed in RM)

' $UPOX_{t,e}$ ' is the Unpredictable Opex Adjustment for RBE ' $e$ ' in year ' $t$ ' (expressed in RM)

' $INTR_{t,e}$ ' is the Interim Review Adjustment (if any), resulting from any interim review determinations by the Commission, for RBE ' $e$ ' in in year ' $t$ ' (expressed in RM)

' $USAL_t$ ' is the updated forecast of total actual electricity sales in year ' $t$ ' prepared at the time of the calculation of the adjustment (expressed in kWh)

- 5.11. The Revenue-Cap Sales Adjustment adjusts for the annual difference in revenue earned by the individual revenue-cap RBE arising from differences between forecasted and actual sales volumes. The adjustment is calculated according to the following formula:

$$RSLs_{t,rc} = BASE_{P,rc} \times (FSAL_{t-1} - ESAL_{t-1}) \times (1 + WACC_{t-1,rc})$$

Where:

' $ESAL_{t-1}$ ' is the actual total electricity sales in year ' $t-1$ ' (expressed in kWh). If actual values are not available at the time of the calculation and estimate should be used.

If year ' $t-1$ ' falls into the preceding Regulatory Period ' $P-1$ ' then the Base Average Tariff and WACC for Revenue-Cap RBE ' $rc$ ' in the preceding Regulatory Period shall apply in the calculation

5.12. The Other Income Adjustment deducts annual income from sources other than electricity sales and customer contributions. The adjustment is calculated according to the following formula:

$$OTHR_{t,e} = - \left( \sum_{m=-12}^{m=-4} OTHA_{m,e} + \sum_{m=-3}^{m=-1} OTHE_{m,e} \right)$$

Where:

' $OTHA_{m,e}$ ' is the actual other income excluding revenues from electricity sales and customer contributions, as allocated to RBE 'e', in month 'm' (expressed in RM)

' $OTHE_{m,e}$ ' is the estimated other income excluding revenues from electricity sales and customer contributions, as allocated to RBE 'e', in month 'm' (expressed in RM)

5.13. The Unpredictable Opex Adjustment adjusts for the annual difference between the estimated unpredictable opex included in the RBE's annual revenue requirement and actual unpredictable opex. The adjustment is calculated according to the following formula:

$$UPOX_{t,e} = (UPXE_{t-1,e} - UPXF_{t-1,e}) \times (1 + WACC_{t-1,e})$$

Where:

' $UPXE_{t-1,e}$ ' is Estimated Unpredictable Opex for RBE 'e' in year 't-1':

$$UPXE_{t-1,e} = - \left( \sum_{m=-12}^{m=-4} UPXA_{m,e} + \sum_{m=-3}^{m=-1} UPXE_{m,e} \right)$$

Where:

' $UPXA_{m,e}$ ' is actual unpredictable opex of RBE 'e' in month 'm' (expressed in RM)

' $UPXF_{t-1,e}$ ' is the forecast of unpredictable opex included in the annual revenue requirement of RBE 'e' in year 't-1' (expressed in RM). For the avoidance of doubt, the forecast of unpredictable opex may be set to zero.

### Calculation of the Bundled Price-Cap Adjustment

5.14. Where the Commission has determined that an allowance for under-recovery should no longer apply in accordance with Section 3.28, then the Price-Cap Adjustment shall be calculated in accordance with the following formula:

$$PCAP_t = \frac{PSLS_t + CONT_{t,cs} + OTHR_{t,cs} + UPOX_{t,cs} + INTR_{t,cs}}{USAL_t}$$

Where:

' $PSLS_{t,rc}$ ' is the Price-Cap Sales Adjustment in year 't' (expressed in RM)

- 5.15. The Price-Cap Sales Adjustment adjusts for the annual difference between actual and allowed bundled revenues due to non-compliance with the Price-Cap. The adjustment is calculated according to the following formula:

$$PSLS_t = \min(0, RDIF_t) \times (1 + WACC_{t-1,cs})$$

Where:

' $RDIF_t$ ' is the Price-Cap Revenue Difference in year 't' (expressed in RM):

$$RDIF_t = (bALLW_{t-1} - bAVGE_{t-1}) \times ESAL_{t-1}$$

Where:

' $bAVGE_{t-1}$ ' is the Bundled Actual Average Tariff for year 't-1' (expressed in sen/kWh):

$$bAVGE_{t-1} = bEREV_{t-1} / ESAL_{t-1}$$

Where:

' $bEREV_{t-1}$ ' is the Estimated Total Bundled Revenues earned from the provision of Regulated Services in year 't-1' (expressed in RM):

$$bEREV_{t-1} = \left( \sum_{m=-12}^{m=-4} bAREV_m + \sum_{m=-3}^{m=-1} bEREV_m \right)$$

Where:

' $bAREV_m$ ' is the actual total bundled revenues earned from the provision of Regulated Services in month 'm' (expressed in RM)

- 5.16. Where an allowance for under-recovery applies in accordance with Section 3.27, then the first term in Section 5.16 shall be replaced with the following formula:

$$\text{If } RDIF_t \leq 0, \text{ then } PSLS_t = \min(0, RDIF_t) \times (1 + WACC_{t-1,cs})$$

$$\text{If } RDIF_t > 0, \text{ then: } PSLS_t$$

$$= \min(0.025 \times bBASE_p \times ESAL_{t-1}, RDIF_t) \times (1 + WACC_{t-1,cs})$$

## **Process for approving Bundled Allowed Average Tariff**

- 5.17. No later than 30 October of each year, TNB shall submit to the Commission the proposed Revenue-Cap Adjustment and Price-Cap Adjustment and the resulting proposed Bundled Allowed Average Tariff to apply for the period from 1 January to 31 December of the following year.
- 5.18. The submission shall include the estimated resulting Bundled Actual Average Revenue and a comparison of this with the proposed Bundled Allowed Average Tariff for the following year.
- 5.19. The Commission will verify the calculated adjustments and accompanying proposed Regulated Tariffs within 15 working days of receipt from TNB.
- 5.20. In case of over recovery of the calculated adjustment, the amount may be transferred to Electricity Industry Fund (EIF) before it is passed through to the consumers in the form of ICPT. EIF is a fund administered and controlled by the Commission to manage the impact of the electricity tariff on consumers.
- 5.21. Where the Commission has identified an error in the calculations submitted by TNB, then TNB shall be required to revise and resubmit their proposed adjustments and proposed Regulated Tariffs and the Commission will have a further 15 working days from receipt of the revised calculations to accept or reject these.
- 5.22. The value of any over-recovery of Allowed Revenues which results from a delay in the approval of the Regulated Tariffs due to errors in their calculation by TNB shall be determined by the Commission and returned to customers in the form of a reduction in Regulated Tariffs for the following year. Any under-recovery due to errors in the calculation by TNB shall not be compensated.
- 5.23. The Commission will adopt the following approval process for any tariff adjustment:

- (a) If the proposed Bundled Allowed Average Tariff is less than or equal to 7% higher than the Bundled Base Average Tariff, the Commission will approve the proposed adjustments and Regulated Tariffs for the following year.
  - (b) If the proposed Bundled Allowed Average Tariff is greater than 7% higher than the Bundled Base Average Tariff, the Commission will recommend its decision to the Minister for approval.
- 5.24. The Minister may approve a Bundled Allowed Average Tariff and Regulated Tariffs that are different from those recommended by the Commission.
- 5.25. Where approval by the Minister is delayed beyond the start of the following year then the following shall apply:
- (a) Existing Regulated Tariffs shall remain in effect until an approval is issued.
  - (b) The present value of any over-recovery or under-recovery of Allowed Revenues which results from such delay will be determined by the Commission. This shall be calculated as the revenue earned from existing Regulated Tariffs and that would have been earned under the approved Regulated Tariffs for the period of the delay.
  - (c) This difference shall be returned to customers, if an over-recovery, or paid to TNB, if an under-recovery, in the form of a deduction from or an addition to the Regulated Tariffs to be applied for the remainder of the Regulatory Period.
  - (d) If the delay occurs in the last year of the current Regulatory Period, then the adjustment is carried-over to the next Regulatory Period.

## **END OF SECTION**

## 6. Calculation of the Allowed Average Tariff by RBE

### Application of this section

- 6.1. This Section 6 shall apply for the calculation of the Unbundled Allowed Average Tariff where the Minister approves an individual Base Average Tariff for each RBE. Where the Minister approves a Bundled Average Base Tariff for TNB as a whole then the calculation of the Allowed Average Tariff will follow the provisions of Section 5.

### Components of the Unbundled Allowed Average Tariff

- 6.2. The Unbundled Allowed Average Tariff is the sum of:
- (a) The Average Generation Cost for the Regulatory Period, as approved by the Minister.
  - (b) The Allowed Average Tariff for each individual RBE, calculated annually and incorporating the Revenue-Cap Adjustment and the Price-Cap Adjustment as applicable.

The Revenue-Cap Adjustments and Price-Cap Adjustment as mentioned above are treated as the Annual Regulatory Adjustment.

- 6.3. The calculation of the Unbundled Allowed Average Tariff is made according to the following formula:

$$uALLW_t = AGEN_p + \sum_{e=1}^E ALLW_{t,e}$$

Where:

' $uALLW_t$ ' is the Unbundled Allowed Average Tariff for RBE 'e' in the year 't'  
(expressed in sen/kWh)

### Calculation of the Base Average Tariff for individual RBE

- 6.4. A Base Average Tariff shall be calculated for each RBE prior to each Regulatory Period as the present value of Annual Revenue

Requirements over the Regulatory Period, divided by the present value of forecasted electricity sales, in accordance with the following formula:

$$BASE_{P,e} = \left[ \sum_{t=1}^T \frac{REQT_{t,e}}{(1 + WACC_{P,e})^t} \right] / \left[ \sum_{t=1}^T \frac{FSAL_t}{(1 + WACC_{P,e})^t} \right]$$

### Calculation of the Average Generation Cost

- 6.5. The Average Generation Cost shall be calculated prior to each Regulatory Period as the present value of forecast fuel costs and forecast other generation-specific costs as specified in Power Purchase Agreements and Service-Level Agreements over the Regulatory Period, divided by the present value of forecasted electricity sales, in accordance with the following formula:

$$AGEN_P = AFUL_P + AGSC_P$$

$$AFUL_P = \left[ \sum_{s=1}^S \frac{FFUL_s}{(1 + WACC_{P,sb})^s} \right] / \left[ \sum_{t=1}^T \frac{FSAL_t}{(1 + WACC_{P,sb})^t} \right]$$

$$AGSC_P = \left[ \sum_{s=1}^S \frac{FGSC_s}{(1 + WACC_{P,sb})^s} \right] / \left[ \sum_{t=1}^T \frac{FSAL_t}{(1 + WACC_{P,sb})^t} \right]$$

- 6.6. Forecast fuel costs and forecast other generation costs shall be calculated using appropriate power system models and shall be based on the most recent approved planting (generation investment) programme, approved electricity demand forecast and approved level of efficient system losses as decided by the Planning and Implementation Committee for Electricity Supply and Tariff (JPPPET).

### Calculation of the Allowed Average Revenue for Revenue-Cap RBE

- 6.7. The Allowed Average Revenue for each Revenue-Cap RBE is calculated as the sum of the Base Average Tariff and the Revenue-Cap Adjustment applicable to the RBE, according to the following formula:

$$ALLW_{t,rc} = BASE_{P,rc} + RCAP_{t,rc}$$

- 6.8. The Revenue-Cap Adjustment for each Revenue-Cap RBE shall be calculated in accordance with the following formula:

$$RCAP_{t,rc} = \frac{RSL_{t,rc} + CONT_{t,e} + OTHR_{t,e} + UPOX_{t,e} + INTR_{t,e}}{USAL_t}$$

- 6.9. The Revenue-Cap Sales Adjustment adjusts for the annual difference in revenue earned by the individual revenue-cap RBE arising from differences between forecasted and actual sales volumes. The adjustment is calculated according to the following formula:

$$RSL_{t,rc} = BASE_{P,rc} \times (FSAL_{t-1} - ESAL_{t-1}) \times (1 + WACC_{t-1,rc})$$

- 6.10. The Other Income Adjustment deducts annual income from sources other than electricity sales and customer contributions. The adjustment is calculated according to the following formula:

$$OTHR_{t,e} = - \left( \sum_{m=-12}^{m=-4} OTHA_{m,e} + \sum_{m=-3}^{m=-1} OTHE_{m,e} \right)$$

- 6.11. The Unpredictable Opex Adjustment adjusts for the annual difference between the estimated unpredictable opex included in the RBE's annual revenue requirement and actual unpredictable opex. The adjustment is calculated according to the following formula:

$$UPOX_{t,e} = (UPXE_{t-1,e} - UPXF_{t-1,e}) \times (1 + WACC_{t-1,e})$$

### Calculation of the Allowed Average Revenue for Price-Cap RBE

- 6.12. The Allowed Average Revenue for each Price-Cap RBE is calculated as the sum of the Base Average Tariff and the Price-Cap Adjustment, according to the following formula:

$$ALLW_{t,pc} = BASE_{P,pc} + PCAP_{t,pc}$$

Where:

'pc' is an individual Price-Cap RBE

- 6.13. Where the Commission has determined that an allowance for under-recovery should no longer apply in accordance with Section 3.28, then

the Price-Cap Adjustment shall be calculated in accordance with the following formula:

$$PCAP_{t,pc} = \frac{PSLS_{t,pc} + CONT_{t,pc} + OTHR_{t,pc} + UPOX_{t,pc} + INTR_{t,pc}}{USAL_t}$$

- 6.14. The Price-Cap Sales Adjustment adjusts for the annual difference between actual and allowed bundled revenues due to non-compliance with the Price-Cap. The adjustment is calculated according to the following formula:

$$PSLS_{t,pc} = \min(0, RDIF_{t,pc}) \times (1 + WACC_{t-1,pc})$$

- 6.15. Where an allowance for under-recovery applies in accordance with Section 3.27, then the first term in Section 6.16 shall be replaced with the following formula:

$$\text{If } RDIF_{t,pc} \leq 0, \text{ then } PSLS_{t,pc} = \min(0, RDIF_{t,pc}) \times (1 + WACC_{t-1,pc})$$

$$\text{If } RDIF_{t,pc} > 0, \text{ then: } PSLS_{t,pc}$$

$$= \min(0.025 \times bBASE_p \times ESAL_{t-1}, RDIF_{t,pc}) \times (1 + WACC_{t-1,pc})$$

### **Process for approving Unbundled Allowed Average Tariffs**

- 6.16. No later than 30 October of each year, each RBE, either individually or collectively through TNB, shall submit to the Commission the proposed Allowed Average Tariff, including adjustments, for each RBE and the resulting proposed Unbundled Allowed Average Tariff to apply for the period from 1 January to 31 December of the following year.
- 6.17. The submission shall include the estimated resulting Actual Average Revenue by RBE and in total and a comparison of this with the proposed Allowed Average Tariff for each RBE and the Unbundled Allowed Average Tariff for the following year.
- 6.18. The Commission will verify the calculated adjustments and accompanying proposed Regulated Tariffs within 15 working days of receipt.

- 6.19. In case of over recovery of the calculated adjustment, the amount may be transferred to EIF before it is passed through to the consumers in the form of ICPT. EIF is a fund administered and controlled by the Commission to manage the impact of electricity tariff on consumers.
- 6.20. Where the Commission has identified an error in the calculations submitted, then the RBE concerned will be required to revise and resubmit their proposed adjustments and proposed Regulated Tariffs and the Commission will have a further 15 working days from receipt of the revised calculations to accept or reject these.
- 6.21. The value of any over-recovery of Allowed Revenues which results from a delay in the approval of the Regulated Tariffs due to errors in their calculation by the RBE will be determined by the Commission and returned to customers in the form of a reduction in Regulated Tariffs for the following year. Any under-recovery due to errors in the calculation by TNB shall not be compensated.
- 6.22. The Commission will adopt the following approval process for any tariff adjustment:
- (a) If the proposed Unbundled Allowed Average Tariff is less than or equal to 7% higher than the sum of the Average Generation Cost and of the Base Average Tariffs for each individual RBE, the Commission will approve the proposed adjustments and Regulated Tariffs for the following year.
  - (b) If the proposed Unbundled Allowed Average Tariff is greater than 7% higher than the sum of the Average Generation Cost and of the Base Average Tariffs for each individual RBE, the Commission will recommend its decision to the Minister for approval.
- 6.23. The Minister may approve Allowed Average Tariffs for each individual RBE and Regulated Tariffs that are different from those recommended by the Commission.

6.24. Where approval by the Minister is delayed beyond the start of the following year then the following shall apply:

- (a) Existing Regulated Tariffs shall remain in effect until an approval is issued.
- (b) The present value of any over-recovery or under-recovery of Allowed Revenues which results from such delay will be determined by the Commission. This will be calculated as the revenue earned from existing Regulated Tariffs and that would have been earned under the approved Regulated Tariffs for the period of the delay.
- (c) This difference shall be returned to customers, if an over-recovery, or paid to the affected RBE, if an under-recovery, in the form of a deduction from or an addition to the Regulated Tariffs to be applied for the remainder of the Regulatory Period.
- (d) If the delay occurs in the last year of the current Regulatory Period, then the adjustment is carried-over to the next Regulatory Period.

**END OF SECTION**

## **7. ICPT Adjustment**

### **Application of the ICPT Adjustment**

- 7.1. The ICPT Adjustment compensates for differences between the actual and forecast generation costs used in determining the Average Generation Cost in each Regulatory Period. Therefore, it is intended to enable the recovery of actual fuel costs and other generation specific costs.
- 7.2. The ICPT Adjustment is applied as a surcharge or rebate (calculated as a negative surcharge) added to the energy charges applied for electricity sales to those customers liable for the ICPT Adjustment. These liable customers may be determined by the Minister. This surcharge or rebate is an additional to the Regulated Tariffs and the ICPT Adjustment is not included in the calculation of the Allowed Average Tariff.
- 7.3. The ICPT Adjustment is calculated and applied at six-month intervals. The first adjustment in each year applies from January to June and the second from July to December.

### **Calculation of the ICPT Adjustment**

- 7.4. The ICPT Adjustment comprises a Generation Cost Adjustment and a Fund Contribution.
- 7.5. The Generation Cost Adjustment adjusts for differences between the actual and forecast costs for each of fuel costs and other generation-specific costs over the six-month period. The adjustment for each type of cost is split into two parts. The first part uses the actual data for the most recent 2 months for which this is available and estimated data for the following 4 months. The second part corrects for differences between actual outcomes and the estimated data used to calculate the first adjustment.
- 7.6. The Fund Contribution is the net contribution from the Electricity Industry Fund (EIF) over the six-month period, applied by the Commission to

offset generation cost increases. When the Generation Cost Adjustment for a six-month period is greater than zero, the Commission may authorise payment of amounts during the six-month period from the Electricity Industry Fund (EIF) to the Single Buyer, in which case the Fund Contribution will have a negative value. When the Generation Cost Adjustment for a six-month period is less than zero, the Commission may require the Single Buyer to pay amounts during the six-month period into the Electricity Industry Fund (EIF), in which case the Fund Contribution will have a positive value.

7.7. The ICPT adjustment is calculated according to the following formula:

$$ICPT_s = GCAJ_s + FUND_s$$

Where:

' $GCAJ_s$ ' is the Generation Cost Adjustment in the six-month period 's' (expressed in Sen/kWh):

$$GCAJ_s = (FCPT1_s + GCPT1_s) \times (1 + IARR_{s-1})^7 + (FCPT2_s + GCPT2_s) \times (1 + IARR_{s-2})^{13}$$

Where:

' $FCPT1_s$ ' is the first fuel cost pass-through adjustment in the six-month period 's' (expressed in Sen/kWh):

$$FCPT1_s = IFUC_s - AFUL_p$$

Where:

' $IFUC_s$ ' is the Interim Fuel Cost Pass-Through Adjustment calculated for the six-month period 's' (expressed in Sen/kWh):

$$IFUC_s = \left( \sum_{m=-4}^{M=-1} EFUC_m + \sum_{m=-6}^{M=-5} AFUC_m \right) / \left( \sum_{m=-4}^{M=-1} EQU S_m + \sum_{m=-6}^{M=-5} AQU S_m \right)$$

Where:

' $m$ ' is a calendar month and is expressed in relation to the month in which the ICPT Adjustment takes effect. For example, if the ICPT Adjustment is to take effect in January 2019 then ' $m = -4$ ' means the month four months before this or September 2018.

' $EFUC_m$ ' is the estimated total fuel cost for month 'm' (expressed in RM)

' $AFUC_m$ ' is the actual total fuel cost for month 'm' (expressed in RM)

' $EQU S_m$ ' is the estimated total qualifying sales to which the ICPT adjustment is applied for month 'm' (expressed in kWh). Qualifying sales are the sales to those tariff categories who are liable for the ICPT Adjustment, as determined by the Minister.

' $AQU S_m$ ' is the audited total qualifying sales to which the ICPT adjustment is applied for month 'm' (expressed in kWh)

' $GCPT1_s$ ' is the First Other Generation Cost Pass-Through Adjustment in the six-month period 's' (expressed in Sen/kWh):

$$GCPT1_s = IGSC_s - AGSC_p$$

Where:

' $IGSC_s$ ' is the Interim Other Generation Cost Pass-Through Adjustment calculated for the six-month period 's' (expressed in Sen/kWh):

$$IGSC_s = \left( \sum_{m=-4}^{M=-1} TEGS_m + \sum_{m=-6}^{M=-5} TAGS_m \right) / \left( \sum_{m=-4}^{M=-1} EQU S_m + \sum_{m=-6}^{M=-5} AQU S_m \right)$$

Where:

' $TEGS_m$ ' is the estimated total other generation cost for month 'm' (expressed in RM)

' $TAGS_m$ ' is the actual total other generation cost for month 'm' (expressed in RM)

' $IARR_p$ ' is the ICPT Adjustment Remuneration Rate for the for the six-month period 's' (expressed as a percentage)

' $FCPT2_s$ ' is the Second fuel cost pass-through adjustment in the six-month period 's' (expressed in Sen/kWh):

$$FCPT2_s = \left\{ \left[ IFUC_{s-1} \times \left( \sum_{m=-10}^{M=-7} EQU S_m + \sum_{m=-12}^{M=-11} AQU S_m \right) \right] - \sum_{m=-12}^{M=-7} AFUC_m \right\} / AQU S_{s-1}$$

' $GCPT2_s$ ' is the Second Other Generation Cost Pass-Through Adjustment in the six-month period 's' (expressed in Sen/kWh):

$$= \left\{ \left[ IGSC_{s-1} \times \left( \sum_{m=-10}^{M=-7} EQU S_m + \sum_{m=-12}^{M=-11} A Q U S_m \right) \right] - \sum_{m=-12}^{M=-7} T A G S_m \right\} / A Q U S_{s-1}$$

' $FUND_s$ ' is the Fund Contribution for the six-month period 's' (expressed in Sen/kWh):

$$FUND_s = \sum_{m=-0}^{M=5} (FUNP_m - FUNT_m) / \sum_{m=0}^{M=5} EQU S_m$$

Where:

' $FUNT_m$ ' is the approved payment from the Electricity Industry Fund (EIF) to the Single Buyer, relating to the ICPT Adjustment, for month 'm' (expressed in RM)

' $FUNP_m$ ' is the payment by the Single Buyer into the Electricity Industry Fund (EIF), relating to the ICPT Adjustment, for month 'm' (expressed in RM)

- 7.8. The ICPT Remuneration Rate is equal to the most recent One-Month Interbank Rate reported by Bank Negara Malaysia plus 1.5 percentage points, converted to a monthly rate.

### Process for applying the ICPT Adjustment

- 7.9. The proposed ICPT Adjustment report must be submitted to the Commission by either the Single Buyer or, on its behalf, by TNB, by the following dates:

- (a) For an ICPT Adjustment taking effect from January, no later than 10 weeks before the expiry of the relevant six-month period of the preceding year.
- (b) For an ICPT Adjustment taking effect from July, no later than 10 weeks before the expiry of the relevant six-month period of the same year.

- 7.10. In terms of the ICPT Adjustment reporting, the Single Buyer shall submit the following requirements:

- (a) Detailed estimated generation cost report that present calculation of the Estimated Actual Generation Cost and Other Generation

Cost that incurred by the Single Buyer under the PPA and SLA for the relevant six-month period of the Regulatory Period based on actual cost data for the first 2 months and estimates for the remaining 4 months.

- (b) The Single Buyer should provide a detailed generation cost report on actual Fuel Cost, Other Generation Costs, Unit Sold and Revenue collected based on the Single Buyer Tariff for the preceding six-month period. This is to ascertain the amount of over or under recovery of changes in fuel and generation specific costs.
- (c) The report shall include a detailed explanation of the variances between the actual costs of electricity procurement and generation revenue based on the Single Buyer tariff.
- (d) The Estimated Actual Fuel Cost and Other Generation Cost report and the application of the Fuel Cost Adjustment and Other Generation Cost Adjustment prepared by the Single Buyer to be certified as correct by a reputable audit company.
- (e) Together with the proposed ICPT submission and detailed generation cost report submission, Single Buyer is also required to submit the audited actual revenue for the preceding six-month period which based on the Single Buyer tariff and actual sales of electricity to customers. The actual generation specific revenue for the Single Buyer should reflect the generation specific revenue received from Customer Services over the relevant six months.

7.11. The value of proposed ICPT adjustment may also incorporate the calculation of Revenue-Cap Adjustment and Price-Cap Adjustment by each RBE and shall be determined by the Commission.

7.12. The Commission will verify the proposed ICPT adjustment report and accompanying proposed Regulated Tariffs within 15 working days of receipt.

7.13. Where the Commission has identified an error in the calculations submitted, then the Single Buyer will be required to revise and resubmit

their proposed ICPT Adjustment and the Commission will have a further 15 working days from receipt of the revised calculations to accept or reject these.

- 7.14. The value of any over-recovery of Allowed Revenues which results from a delay in the approval of the ICPT Adjustment due to errors in its calculation by the Single Buyer shall be determined by the Commission and returned to customers in the form of a reduction in Regulated Tariffs for the following year. Any under-recovery due to errors in the calculation by Single Buyer shall not be compensated.
- 7.15. The Commission will adopt the following approval process for any tariff adjustment:
- (a) If the proposed ICPT Adjustment is less than or equal to 7% higher than the sum of the Average Generation Cost and of the Base Average Tariffs for each individual RBE, the Commission will approve the proposed ICPT Adjustment.
  - (b) If the proposed ICPT Adjustment is greater than 7% higher than the sum of the Average Generation Cost and of the Base Average Tariffs for each individual RBE, the Commission will recommend its decision to the Minister for approval.
- 7.16. The Minister may approve an ICPT Adjustment that is different from that recommended by the Commission.
- 7.17. Where approval by the Minister is delayed beyond the start of the following year then the following shall apply:
- (a) The existing ICPT Adjustment shall remain in effect until an approval is issued.
  - (b) The present value of any over-recovery or under-recovery of the ICPT Adjustment which results from such delay shall be determined by the Commission.
  - (c) This difference shall be returned to customers, if an over-recovery, or paid to the Single Buyer, if an under-recovery, in the form of a

deduction from or an addition to the ICPT Adjustment to be applied for the following six-month period.

- 7.18. If the delay occurs in the last six months of the current Regulatory Period, then the adjustment is carried-over to the next Regulatory Period.

**END OF SECTION**

## **8. Annual Revenue Requirement**

### **Principles of the Annual Revenue Requirement**

- 8.1. The Annual Revenue Requirement represents the maximum allowed revenues (before adjustments) that a RBE can charge to recover the reasonable and efficient costs (including a fair return on capital) of providing the Regulated Services in each year of a Regulatory Period.
- 8.2. The Annual Revenue Requirement is calculated individually for each RBE and for each year within each Regulatory Period. The sum of the Annual Revenue Requirements by RBE is then levelised to obtain the Base Average Tariff for the individual RBE in the Regulatory Period. The sum of these individual RBE Base Average Tariffs are then used to obtain the TNB Base Average Tariff for the Regulatory Period.
- 8.3. The Annual Revenue Requirement is calculated using a 'building-block' methodology, whereby the total revenue is calculated as the sum of operating costs, depreciation, a return on capital and a tax allowance, plus adjustments.
- 8.4. All calculations are conducted in nominal terms.

### **Application of the Annual Revenue Requirement**

- 8.5. The revenue limits set by the Annual Revenue Requirement apply to the sum of revenues received from both electricity tariffs and other consumer charges:
  - (a) Revenues from electricity tariffs paid by consumers for the supply of electricity typically (although not necessarily) consist of some or all the following - a fixed customer service charge (RM/month), an energy charge (or multiple energy charges) for metered electricity consumption (sen/kWh), and a demand charge (RM/kW).
  - (b) Revenues from other consumer charges include, without limitation, connected load charges, power factor penalties, welding penalties, temporary supply charges, and individual street lighting charges.

Revenues from such other charges must be netted off when designing the end-use consumer electricity tariffs.

- 8.6. For the avoidance of doubt, the Annual Revenue Requirement applies to the Single Buyer Operations and all other RBEs, namely, Transmission, Grid System Operator, Distribution Network and Customer Service.

### Calculating the Annual Revenue Requirement

- 8.7. The Annual Revenue Requirement for all RBEs, except for the Customer Services RBE, shall be calculated according to the following formula:

$$REQT_{e,t} = OPEX_{e,t} + JOIN_{e,t} + WORK_{e,t} + RTOC_{e,t} + DEPN_{e,t} \\ + \max(0, TAXZ_{e,t}) + ECSO_{e,t} + ECSX_{e,t} + SERV_{e,t}$$

Where:

' $REQT_{e,t}$ ' is the Annual Revenue Requirement for an individual RBE 'e'

' $OPEX_{e,t}$ ' is the allowed operating expenditures of the RBE in year 't' and which may include an estimate of Unpredictable Opex

' $JOIN_{e,t}$ ' are allocated Joint and Common Costs in year 't' associated with corporate services provided by TNB to the RBE forming part of TNB

' $WORK_{e,t}$ ' is the cost of Working Capital Requirement of the RBE in year 't'

' $RTOC_{e,t}$ ' is the allowed return on capital of the RBE in year 't':

$$RTOC_{e,t} = \left( RAB_{e,t-1} + 0.5 \times (CPEX_{e,t} - DISP_{e,t}) \right) \times WACC_{e,t}$$

Where:

' $RAB_{e,t-1}$ ' is the closing allowed Regulated Asset Base of the RBE at the end of year 't-1' (which is equivalent to the opening Regulated Asset Base for year 't')

' $CPEX_{e,t}$ ' represents forecast prudent and efficient capital expenditure that is incurred by the RBE in year 't', as set out in the approved investment plan

' $DISP_{e,t}$ ' represents the net value of fixed assets of the RBE disposed of during year 't'

' $WACC_e$ ' is the allowed Weighted Average Cost of Capital of the RBE

' $DEPN_{e,t}$ ' is the allowance for depreciation of the RBE in year 't'

' $TAXZ_{e,t}$ ' is the Corporate Tax and Zakat Allowance of the RBE in year 't' and cannot be negative

' $ECSO_{e,t}$ ' is the allowed operating expenditures Efficiency Carry-Over Scheme adjustment of the RBE in year 't'

' $ECSX_{e,t}$ ' is the allowed capital expenditures Efficiency Carry-Over Scheme adjustment of the RBE in year 't'

' $SERV_{e,t}$ ' is the Quality of Service Incentives adjustment (or penalty if negative) of the RBE applied in year 't' which results from performance against quality of service targets in the preceding Regulatory Period

8.8. The Annual Revenue Requirement for the Customer Services RBE shall be calculated according to the following formula:

$$REQT_{cs,t} = OPEX_{cs,t} + JOIN_{cs,t} + MRGN_{cs,t} + ECSO_{cs,t} + ECSX_{cs,t} + SERV_{cs,t}$$

Where:

'cs' is the Customer Services RBE

' $REQT_{cs,t}$ ' is the Annual Revenue Requirement for the Customer Services RBE

' $OPEX_{cs,t}$ ' is the allowed operating expenditures of the Customer Services RBE in year 't' and which may include an estimate of Unpredictable Opex

' $JOIN_{cs,t}$ ' are allocated Joint and Common Costs in year 't' associated with corporate services provided by TNB to the Customer Services RBE forming part of TNB

' $MRGN_{cs,t}$ ' is the Allowed Retail Margin of the Customer Services RBE in year 't':

' $ECSO_{cs,t}$ ' is the allowed operating expenditures Efficiency Carry-Over Scheme adjustment of the Customer Services RBE in year 't'

' $ECSX_{cs,t}$ ' is the allowed capital expenditures Efficiency Carry-Over Scheme adjustment of the Customer Services RBE in year 't'

' $SERV_{cs,t}$ ' is the Quality of Service Incentives adjustment (or penalty if negative) of the Customer Services RBE applied in year 't' which results from performance against quality of service targets in the preceding Regulatory Period

8.9. If the Customer Services RBE is in significant competition with other retail electricity business(es), then the Allowed Retail Margin will be set with reference to profit margins earned by comparable retail energy businesses other jurisdictions and determinations made by regulators in other jurisdictions on retail margins in the context of default tariffs.

8.10. If the Customer Services RBE is not in significant competition with other retail electricity business(es), then the Allowed Retail Margin will be set according to the following formula:

$$MRGN_{cs,t} = RTOC_{cs,t} + DEPN_{cs,t} + WORK_{cs,t} + \max(0, TAXZ_{cs,t})$$

Where:

' $RTOC_{cs,t}$ ' is the allowed return on capital of the Customer Services RBE in year 't':

$$RTOC_{cs,t} = \left( RAB_{cs,t-1} + 0.5 \times (CPEX_{cs,t} - DISP_{cs,t}) \right) \times WACC_{cs,t}$$

Where:

' $RAB_{cs,t-1}$ ' is the closing allowed Regulated Asset Base of the Customer Services RBE at the end of year 't-1' (which is equivalent to the opening Regulated Asset Base for year 't')

' $CPEX_{cs,t}$ ' represents forecast prudent and efficient capital expenditure that is incurred by the Customer Services RBE in year 't', as set out in the approved investment plan

' $DISP_{cs,t}$ ' represents the net value of fixed assets of the Customer Services RBE disposed of during year 't'

' $WACC_{cs}$ ' is the allowed Weighted Average Cost of Capital of the Customer Services RBE

' $DEPN_{cs,t}$ ' is the allowance for depreciation of the Customer Services RBE in year 't'

' $WORK_{cs,t}$ ' is the cost of Working Capital Requirement of the Customer Services RBE in year 't'

' $TAXZ_{cs,t}$ ' is the Corporate Tax and Zakat Allowance of the Customer Services RBE in year 't' and cannot be negative

8.11. The determination of the individual components of the Annual Revenue Requirement are described in Sections 10 to 18 of these Guidelines.

8.12. The calculations made by the RBEs must be undertaken using a Revenue Requirements Model that is approved by the Commission and is published on the Commission's website (with confidential information

redacted). The RBEs must ensure that all inputs and calculations in the Revenue Requirements Model are verifiable and consistent with the requirements of these Guidelines.

**END OF SECTION**

## **9. Approving Revenue Requirements and Base Average Tariffs**

- 9.1. The Annual Revenue Requirement for each year in a Regulatory Period is determined by the Commission in advance of the start of the Regulatory Period.
- 9.2. The timetable and process for calculating the Annual Revenue Requirements for the next Regulatory Period shall be specified by the Commission prior to each calculation commencing. Where not specified, the following default timetable and process shall apply:
  - (a) No later than twelve months prior to the start of the next Regulatory Period, the RBE shall submit to the Commission their proposed Annual Revenue Requirement for each year of the next Regulatory Period. The submission can be made individually by each RBE or as a combined submission by TNB for all RBE that form part of TNB.
  - (b) The submission shall contain the calculated Annual Revenue Requirement by year along with adequate justifications and supporting evidence. The RBE shall also submit their proposed Base Average Tariff consistent with their proposed Annual Revenue Requirements. TNB or, if the RBE are submitting individually, the Customer Services RBE, shall submit the accompanying Bundled Base Average Tariff or Unbundled Base Average Tariff as applicable and the accompanying proposed Base Tariff Table.
  - (c) The proposed Annual Revenue Requirements shall be derived from a business plan, of a duration of at least equal to that of the next Regulatory Period, in accordance with the obligations of licensees under Section 9A of the Electricity Supply Act. The business plan shall be submitted along with the proposed Annual Revenue Requirements.
  - (d) The Commission will review the proposed Annual Revenue Requirements, Base Average Tariff by RBE, the Bundled or

Unbundled Base Average Tariff and the Base Tariff Table. In undertaking this review, the Commission may require the RBE to provide additional explanations and evidence in written form.

- (e) No later than six months prior to the start of the next Regulatory Period, the Commission may issue a Draft Determination which contains:
  - (i) Its proposed Annual Revenue Requirements by RBE for the next Regulatory Period.
  - (ii) Its proposed Base Average Tariff by RBE and the Bundled or Unbundled Base Average Tariff, consistent with its proposals on Annual Revenue Requirements.
  - (iii) Its proposed Base Tariff Table consistent with its proposals on the Base Average Tariff and any other changes required to ensure conformity with the principles for regulated tariffs.
  - (iv) An explanation of the revisions made to the original proposals by the RBE and the reasons for these revisions.
- (f) The Commission will provide any Draft Determination issued to the RBE. At its own discretion, the Commission may publish part or all the Draft Determination for review and comment by stakeholders. These comments may be requested in written form.
- (g) No later than three months prior to the start of the next Regulatory Period, the Commission may issue a Final Determination which contains:
  - (i) A summary of comments received from the RBE and from stakeholders on the Draft Determination and the Commission's responses to these comments.
  - (ii) Its determined Annual Revenue Requirements by RBE for the next Regulatory Period.

- (iii) Its determined Base Average Tariff by RBE and Bundled or Unbundled Base Average Tariff, consistent with its determined Annual Revenue Requirements.
  - (iv) Its determined Base Tariff Table consistent with its determined Base Average Tariff and any other changes required to ensure conformity with the principles for regulated tariffs.
  - (v) An explanation of the revisions made to the Draft Determination and the reasons for these revisions.
- (h) The Commission will provide any Final Determination issued to the RBE. At its own discretion, the Commission may publish part or all the Final Determination for the information of stakeholders.
- (i) A Final Determination shall be submitted by the Commission to the Minister for review and approval.
- (j) Where the Commission has not issued a Final Determination, it shall submit the original proposals from the RBE to the Minister, along with its comments on these original proposals and its alternative proposals where applicable.
- (k) In issuing their approval, the Minister may revise the Annual Revenue Requirements, Base Average Tariff and/or Base Tariff Table from those contained in the submission by the Commission.
- (l) Where the Minister is approving a Bundled Base Average Tariff, this may differ from the sum of the Average Generation Cost and the individual Base Average Tariffs for each RBE.
- 9.3. Where approval by the Minister is delayed beyond the start of the next Regulatory Period then the following shall apply:
- (a) Existing Regulated Tariffs shall remain in effect until an approval is issued.

- (b) The present value of any over-recovery or under-recovery of allowed revenues which results from such delay will be determined by the Commission. This will be calculated as the revenue earned from existing Regulated Tariffs and what would have been earned under the approved Regulated Tariffs for the period of the delay.
- (c) This difference shall be returned to electricity consumers, if an over-recovery, or paid to the RBE, if an under-recovery, in the form of a deduction from or an addition to the Base Average Tariff to be applied for the remainder of the Regulatory Period.

**END OF SECTION**

## 10. Determining operating expenditures

### Forecasting and assessing operating expenditures

- 10.1. Each RBE and (where corporate costs are shared with a parent, holding or other related entity) each related corporate entity shall forecast its efficient operating and maintenance expenditure that is attributable to the Regulated Services of the individual RBE in each year of the Regulatory Period, excluding any financing costs or taxation on profits or any unreasonable or inflated margin earned by a related entity.
- 10.2. In determining whether forecast operating and maintenance expenditure is efficient, the Commission will consider, among other things, the scope for reasonable productivity improvements having regard to:
- (a) The historical rates of productivity improvement achieved by the RBE.
  - (b) Assessments made for other RBE and for other regulated infrastructure providers in Malaysia.
  - (c) Assessments made by other regulatory authorities for similar businesses in countries with similar incentive-based regulatory regimes
- 10.3. In reviewing and evaluating the cost submissions of the RBE, the Commission may have regard to and employ the available assessment or analytical methods commonly employed by regulators elsewhere to assess the reasonableness and efficiency of operating and maintenance expenditure, including without limitation:
- (a) **Trend Analysis**, the use of trends in historical time series data for specific cost items of the RBE to detect general patterns and the relationship between associated factors or drivers.
  - (b) **Methodology Assessment**, assessment of the robustness of the RBE models used and the related inputs, assumptions and methodologies, for developing expenditure forecasts.

- (c) **Predictive Modelling**, the use of statistical and econometric modelling and analytical techniques to determine the expected pattern of efficient costs over the forthcoming Regulatory Period for specific categories of expenditure.
- (d) **Technical or Engineering Reviews**, usually undertaken with the assistance of specialised technical consultants or experts.
- (e) **Benchmarking**, econometric and statistical techniques that relate allowed costs to benchmarks established by reference to comparator entities.

10.4. In determining whether RBE related entity costs are reasonable and efficient, the Commission may have regard to whether:

- (a) Related party transactions are entered on an arm's length basis through competitive tendering.
- (b) Related party costs reflect the direct cost of providing the services, inclusive of a commercially reasonable return or margin.
- (c) It can be demonstrated that the related party costs are comparable to market benchmarks (if there are several market service providers for the relevant services).

### **Unexpected operating expenditures**

10.5. Unexpected Opex are operating expenditures that arise from an event or circumstance that was not foreseen at the time of setting the Annual Revenue Requirement. These will include but not limited to changes outside of the control of the licensee and changes in licensee obligations that are legally binding on the RBE.

10.6. A RBE can request in writing that the Commission undertake an interim review within a Regulatory Period and that the Commission make an Interim Review Adjustment to the Bundled Allowed Average Tariff, if it can demonstrate that the financial impact of Unexpected Opex on the relevant RBE during the Regulatory Period exceeds the materiality threshold.

- 10.7. The justification for why operating expenditures could not reasonably be foreseen or could not be prudently insured against or otherwise anticipated will be assessed as part of the review of an application for an Interim Review Adjustment.
- 10.8. The materiality threshold relating to Unexpected Opex differences is the greater of 1% of the annual Allowed Revenue Requirement or RM1 million per RBE, and/or that the spend exceeds 5% of annual operating expenditure in the case of TNB Corporate.
- 10.9. The scope of the interim review shall be limited to the matters relating to the specific expenditure requirements and circumstances and will be subject to the standard review processes employed by the Commission.

### **Unpredictable operating expenditures**

- 10.10. Unpredictable Opex are operating expenditures that arise from an event or circumstance that was foreseen at the time of setting the Annual Revenue Requirement, but the level of expenditure associated with that event or circumstance was uncertain, reflecting that the RBE does not have control over the costs to any material extent. The nature and impact of the event or circumstance and the associated costs are the result of actions and decisions made by others, external to the RBE and to TNB.
- 10.11. Unpredictable OPEX may include, but not limited to, an Allowance for Doubtful Debts which are deemed by the Commission to be non-controllable after considering:
- (a) the scale and duration of outstanding bills;
  - (b) the evidence of efforts made by TNB to recover these debts, which may include litigation actions, including obtaining and/or enforcing court orders; and
  - (c) whether legal restrictions or government directives, exist prohibiting disconnection.
- 10.12. Unpredictable OPEX may also include, but not limited to, costs arising from:

- (a) a change to, or introduction of government direction or instruction;  
and
- (b) a change to, or introduction of a tax or licence fee or similar charge.

10.13. The Commission may include an estimate of Unpredictable Opex in the RBE's Annual Revenue Requirement. For the avoidance of doubt, the inclusion of an estimate (if any) would generally apply by exception and do not supplant the primary requirement that RBE accurately forecast expenditure and that the Commission sets allowances on an ex ante basis.

**END OF SECTION**

## 11. Determining the Working Capital Requirement

- 11.1. The Annual Revenue Requirement shall include the cost of Working Capital Requirement for the Single Buyer and the Customer Services RBE.
- 11.2. The projected cost of Working Capital Requirement for the Single Buyer is equal to the estimated Net Cost of Coal Purchases multiplied by the Working Capital Remuneration Rate and is calculated according to the following formula:

$$WORK_{e,t} = WCRR_{e,P} \times COAL_{e,t}$$

Where:

' $WCRR_{e,P}$ ' is the Working Capital Remuneration Rate for the Single Buyer RBE 'e' for the Regulatory Period 'P'

' $COAL_{e,t}$ ' is the Net Cost of Coal Purchases for year 't' (expressed in RM):

$$COAL_{e,t} = (CADR_{e,t} - CADP_{e,t}) \times ADCC_{e,t}$$

Where:

' $CADR_{e,t}$ ' is the average days receivables for coal fuel costs paid to TNB by generators and, as a default, is set at 60 days

' $CADP_{e,t}$ ' is the average days payables for coal purchase costs by TNB and, as a default, is set at 30 days

' $ADCC_{e,t}$ ' is the average daily coal purchase costs and the forecast annual coal purchase costs of TNB in year 't' divided by 365 days.

- 11.3. The projected cost of Working Capital Requirement for the Customer Services RBE is equal to the sum of the net receivables working capital allowance and the average selling price variance working capital allowance, multiplied by the Working Capital Remuneration Rate and is calculated according to the following formula.

$$WORK_{CS,t} = WCRR_{CS,P} \times (NRWC_{CS,t} + APWC_{CS,t})$$

Where:

' $WCRR_{cs,P}$ ' is the Working Capital Remuneration Rate for the Customer Services RBE for the Regulatory Period ' $P$ '

' $NRWC_{cs,t}$ ' is the net receivables working capital allowance, which is set to cover the difference between the timing of receivables from energy sales by the Customer Services RBE and the timing of payments of cost of sales from the Customer Services RBE to the other RBEs

' $APWC_{cs,t}$ ' is the average selling price variance working capital allowance, which is set to cover the variance in revenues between the Customer Services RBE's allowed average revenue (ie, the average selling price) and the Bundled Allowed Average Tariff (ie, the Price-Cap), which may arise due to differences between the forecast and actual mix of sales to different customer categories.  $APWC_{cs,t}$  will equal zero until such a time as the Customer Services RBE is legally separate from the other RBEs. For the avoidance of doubt, the average selling price working capital allowance does not provide for working capital due to differences between forecast and actual volumes sold.

- 11.4. The Working Capital Remuneration Rate is equal to the most recent One-Month Interbank Rate reported by Bank Negara Malaysia plus 1.5 percentage points.
- 11.5. For the avoidance of doubt, the cost of Working Capital Requirement is equal to zero for the Transmission, Grid System Operator, and Distribution Network entities.

## END OF SECTION

## 12. Determining the Weighted Average Cost of Capital

### Principles

- 12.1. The weighted average cost of capital (WACC) represents the commercially fair and reasonable return to debt and equity investors on the Regulated Asset Base of each RBE having regard to the cash flow risks associated with the management of the assets of each RBE.
- 12.2. In setting the WACC for the RBE, the Commission must ensure that:
- (a) the WACC is based on an efficient and prudent capital structure
  - (b) the WACC reflects market-based returns on debt and equity
  - (c) the WACC adequately reflects regulatory and market risk in relation to the RBE's regulated activities
  - (d) there is consistency between all the WACC parameters and the underlying cash flows calculated in determining the Annual Revenue Requirement for the relevant RBE.
- 12.3. A separate WACC may be set for each individual RBE, reflecting the specific regulatory and market risk related to that entity, or a common WACC may be set for all RBE forming part of TNB.

### Calculation of WACC

- 12.4. The WACC for each Regulatory Period is determined on a nominal, post-tax basis and is calculated using the following formula:

$$WACC_{P,e} = [GEAR_{P,e} \times DRTN_{P,e} \times (1 - RATE_P)] + [(1 - GEAR_{P,e}) \times ERTN_{P,e}]$$

Where:

' $WACC_{P,e}$ ' is the weighted average cost of capital in nominal, post-tax terms for RBE 'e' in Regulatory Period 'P'

' $GEAR_{P,e}$ ' is gearing, that is, the share of net debt in the sum of net debt and equity

' $DRTN_{P,e}$ ' is the nominal post-tax cost of debt

' $ERTN_{P,e}$ ' is the nominal (after-tax) return on equity

' $RATE_P$ ' is the statutory corporation tax rate

## **Gearing**

12.5. The level of gearing to be used in the WACC calculation will be determined by the Commission prior to each Regulatory Period. The level of gearing is set based on the Commission's assessment of an efficient financing structure and need not be equal to the actual level of gearing of the RBE.

12.6. In setting the level of gearing, the Commission will have regard to the following:

- (a) Setting a gearing level that is generally consistent with an investment grade rating for the RBE, if assessed on a stand-alone basis for each entity.
- (b) Setting a gearing level that does not lead nor is reasonably likely to lead to financing difficulties for the RBE or to costs of financing that create an unfair burden on electricity consumers considering the entities' forward investment programme.
- (c) The level of gearing applied to other regulated infrastructure providers in Malaysia.
- (d) International practice by regulatory authorities in countries that have similar incentive-based regulation and economic environments.

12.7. In the absence of a decision by the Commission, a default optimal gearing level of 55% will be applied.

## **Cost of debt**

12.8. The forecast cost of debt is equal to the Risk-Free Rate plus the Debt Premium, plus efficient debt issuance costs.

12.9. The Debt Premium is the estimated premium over the Risk-Free Rate that the RBE must pay to finance their debt and reflects the additional

risks of these companies or entities, having regard to their credit rating (if so rated) and their set or notional gearing levels.

12.10. In calculating the Debt Premium, the Commission will have regard to the following:

- (a) The historical or embedded cost of debt of the RBE.
- (b) The historical (5-10 years) average yield on medium to long dated corporate bonds issued by investment-grade companies in Malaysia and elsewhere that face similar business and regulatory environments and have similar credit ratings. Calculations must include bonds that are liquidly traded (as determined by typical turnover metrics and issuance size).
- (c) Assessments made for other regulated infrastructure providers in Malaysia.

### **Cost of equity**

12.11. In setting the cost of equity for the RBE, the Commission will have regard to:

- (a) The Capital Asset Pricing Model or other theoretical models as applied under IBR regimes in Malaysia and internationally.
- (b) Cost of equity assessments made for other regulated infrastructure providers in Malaysia.
- (c) Assessments made by regulatory authorities in countries with similar IBR regimes of generic cost of equity components and of the required risk-related returns for equity investors of utility businesses, provided that such assessments are adjusted to exclude the effect of any country-specific risk.

### **Capital Asset Pricing Model estimation**

12.12. Where the Capital Asset Pricing Model is employed for estimating the cost of equity, the following standard formula shall be used:

$$ERTN_{P,e} = RFR_P + (MRP_P \times \beta_{equity P,e})$$

Where:

' $RFR_P$ ' is the Risk-Free Rate, the rate of return that would be available from a risk-free investment in Malaysia

' $MRP_P$ ' is the Market Risk Premium, the additional return (over the Risk-Free Rate) that can be expected from a balanced portfolio of investments

' $\beta_{equity P,e}$ ' (the Equity Beta) is the exposure to market risk of the RBE, measured by the level of covariance of returns on an investment in the RBE and the returns from the market portfolio divided by the variance of returns on the market portfolio

12.13. In setting the Risk-Free Rate, the Commission will primarily rely on the historical and current average yields on long term Malaysian Government Securities.

- (a) Historical data on MGS yields must span at least (and need not be limited to) five years.
- (b) The Commission may consider whether any temporary or unique circumstances (for example, and without limitation, the actions of the monetary authorities, such as quantitative easing and other unconventional monetary policies) are impacting the calculated Risk-Free Rate.

12.14. In setting the Market Risk Premium, the Commission will use evidence from the Malaysian stock market (KLSE) and from international estimates and precedents set by regulatory authorities in countries with similar regulatory arrangements. In general, greater weight should be given to the most recent price and revenue determinations made by such regulators.

12.15. In setting the Equity Beta, the Commission will have regard to:

- (a) Correlation Coefficient historical data for the RBE or, where this is not a stand-alone listed entity, its parent entity, and the KLSE Composite Index, over at least the past five years.

- (i) Where parent entity data is used, the estimated beta must be adjusted to reflect the systematic risk associated with the relevant RBE alone. This can be done by estimating, from comparators, the beta that would apply to the RBE and to other businesses undertaken by the parent entity if a separate entity.
  - (ii) The directly estimated beta must be adjusted to reflect the regulated gearing level.
- (b) Assessments made for other regulated infrastructure providers in Malaysia.
- (c) The Equity Beta estimates established by regulatory authorities in countries with similar IBR regimes and business risks, with preference given to countries where at least some of the regulated companies are listed on a liquid stock exchange.

**END OF SECTION**

## 13. Determining the Regulated Asset Base

### Principles of the Regulated Asset Base

13.1. The Regulated Asset Base represents net investment by the RBE which is remunerated through regulated tariffs and charges. The general principles applied are that:

- (a) The Regulated Asset Base allows the recovery of the actual costs of efficient investments, excluding any part of these costs that is funded by customer contributions.
- (b) Assets included in the Regulated Asset Base are valued at the historical cost of purchase or construction. No revaluation is applied.
- (c) The Commission may exclude part of the costs of assets from the Regulated Asset Base where it considers these costs to be inefficient.
- (d) The Commission may exclude the full costs of assets from the Regulated Asset Base where it considers these assets to be imprudent investments or otherwise not to be required to deliver the Regulated Services.

### Calculation of the Regulated Asset Base

13.2. Within each Regulatory Period, the Regulated Asset Base at the end of a year 't' of a Regulatory Period is designated  $RAB_t$  and shall be calculated according to the following formula:

$$RAB_{t,e} = RAB_{t-1,e} + CPEX_{t,e} - DISP_{t,e} - DEPN_{t,e} + UNPX_{t,e}$$

Where:

' $CPEX_{t,e}$ ' represents forecast prudent and efficient capital expenditure that is incurred by the RBE 'e' in year 't', as set out in the approved investment plan

' $DISP_{t,e}$ ' represents the net value of fixed assets disposed of during year 't'

' $DEPN_{t,e}$ ' is an allowance for depreciation in year 't'

' $UNPX_{t,e}$ ' represents adjustments for unpredictable capital expenditures calculated in accordance with an *ex ante* mechanism as specified for the Regulatory Period

### **Approved investment plan**

- 13.3. As part of its business plan submitted prior to each Regulatory Period, each RBE shall submit a proposed investment plan for the next Regulatory Period.
- 13.4. At a minimum, this investment plan shall include:
- (a) A list of all projects and programmes (for smaller projects) that the RBE proposes to invest in during the next Regulatory Period.
  - (b) The estimated investment costs of each project or programme, excluding any customer contributions and grants, subsidies or other contributions from third parties that are of a capital or non-current nature.
  - (c) The expected commissioning date of each project or programme.
  - (d) A summary justification for each project or programme explaining the need and the alternatives considered and why these were not adopted.
  - (e) The investment plan shall include repair, rehabilitation, replacement and other maintenance works on existing assets that are expected to lead to an increase in the capacity of that asset or an extension of its usable life or both. Such expenditures will be treated as capital expenditures and added to the Regulated Asset Base.
- 13.5. The Commission will review the investment plan with respect to the need for and proposed costs of each project and programme. Following such review, the Commission will determine an approved investment plan for the purposes of forecasting the Regulated Asset Base in each year of the next Regulated Period.

13.6. In reviewing the investment plan, the Commission may make use of engineering estimates and of benchmarking of the costs of individual projects and programmes and of the investment plan as a whole or by component. For example, the Commission may assess the reasonableness of proposed costs of meeting growth in demand or consumption by comparison with the historical average costs of investments to meet consumption and demand growth.

### **Updating the Regulated Asset Base**

13.7. The Regulated Asset Base will be updated by the RBE at the start of each Regulatory Period. The process for updating is as follows:

- (a) The opening Regulated Asset Base for the preceding Regulatory Period is rolled-forward to the close of that Regulatory Period. This closing value represents the opening Regulated Asset Base for the next Regulatory Period.
- (b) The roll-forward involves the calculation of the closing Regulated Asset Base in each year of the preceding Regulatory Period using the same formula as in paragraph 13.2 but substituting the approved forecast values ( $CPEX_{t,e}$ ,  $DISP_{t,e}$  and  $DEPN_{t,e}$ ) plus any adjustments for approved unpredictable capital expenditures ( $UNPX_{t,e}$ ) with approved actual investment costs and asset disposals in each year. Asset disposals shall be set at an amount that is the lower between the proceeds arising from the sale or transfer of assets by the RBE to other parties, and the fair value.
- (c) The depreciation allowance in each year shall then be recalculated accordingly.
- (d) For the final year of the preceding Regulatory Period, estimated values will be used.

13.8. For the purposes of this roll-forward, the Commission shall disallow some part of the actual investment costs or the inclusion of some expenditure where it considers, following an *ex post* prudency review, that these costs

or assets are inefficient or that they include an unreasonable or inflated margin earned by a RBE-related party.

### **Ex-post prudency reviews of capital expenditure**

- 13.9. In determining the capital expenditure to be included in the asset base and rolled forward between Regulatory Periods, the Commission may undertake an ex post review of historical capital expenditure to assess its prudency and efficiency.
- 13.10. An ex post assessment of capital expenditure shall generally be limited to where there is material overspending by any of the RBE or at the corporate level of a RBE. The materiality threshold will be considered to have been met where the overspend (excluding Unpredictable Capex, other than that subject to a budget ceiling with a prudency review trigger) exceeds 1% of the Annual Revenue Requirement or RM1 million per RBE and 5% of annual capital expenditure spend for related corporate-level expenditure, whichever is greater.
- 13.11. Subject to the materiality thresholds, the scope of the ex post review shall be generally determined by whether the overspend relates to investment projects previously identified and approved in an IBR review and included in an approved investment plan.
- (a) For material overspends on investment projects that were in the approved investment plan, the review shall entail a cost assessment. This review must consider any procurement procedures employed by the RBE in delivering the investment projects, it must examine the causes of the cost overruns, and it must determine whether these causes can be ascribed to the actions of the RBE (or corporate entities) or external factors outside their control.
  - (b) For projects that were not included in the approved investment plan, the ex post assessment may focus on both the need and cost of the investment.

- (i) In determining the prudence or efficiency of such investments, the Commission may have regard to the circumstances prevailing at the time of the investment decision, and the factors that could reasonably be expected to have been considered at the time the relevant capital expenditure was undertaken.
- (ii) The relevant RBE must also demonstrate why the realised expenditure could not have been predicted at the time of developing the capital expenditure programme and setting the Annual Revenue Requirement

13.12. Without limiting the factors that must be considered by the Commission in assessing prudence and efficiency, the Commission may also have regard to:

- (a) Whether the expenditure was reasonably related to the requirements set by the Commission and/or under relevant laws, regulations and licence conditions.
- (b) Whether alternative ways of addressing requirements and needs were considered and justifiably excluded.
- (c) Whether accepted good industry practice was followed.
- (d) Whether the relevant RBE acted prudently in procuring goods, works and services at a reasonably low cost, including whether an appropriate competitive tendering process was followed.
- (e) Whether the timing of construction was appropriate having regard to current and projected demand and quality of service

13.13. Before reaching a conclusion on its ex post review of capital expenditure, the Commission may first convey its analysis to the relevant RBE and provide it with reasonable opportunity to respond and submit comments.

13.14. If, after consulting with the RBE, the Commission is satisfied that certain expenditure in accordance with this section is imprudent or inefficient, it may determine that the amount of the capital expenditure that would

otherwise be added to the Regulated Asset Base should be reduced by such amount as the Commission is satisfied corresponds to capital expenditure incurred that is not prudent or efficient.

### **Unpredictable capital expenditure**

13.15. In determining capital expenditure for the forthcoming Regulatory Period and where there is material uncertainty regarding the timing and/or size of an individual project or programme, a RBE may propose to the Commission an appropriate ex ante mechanism for handling the inclusion of such investments (“Unpredictable Capex”) in the Regulated Asset Base and the Annual Revenue Requirement.

13.16. For the avoidance of doubt, these mechanisms (if any) would generally apply by exception and do not supplant the primary requirement that RBE accurately forecast investment needs and costs, and the Commission sets ex ante allowances and Allowed Revenues.

13.17. Without pre-empting, limiting or prescribing any such mechanisms that may be developed, these may include:

- (a) **Logging-up.** This is where a RBE would be entitled to incorporate in the next Regulatory Period unanticipated capital expenditure, recognised by the Commission after an ex post prudency review, as though it was undertaken at the beginning of the new Regulatory Period with the financial carrying costs of the capital expenditure (calculated using the allowed WACC for the relevant Regulatory Period(s)) included in the Regulated Asset Base.
  - (i) The logging up process aims to put entities in the same financial position as if the obligation had been included in the revenue requirement at a periodic review, but the RBE must bear the financing charges until the investment can be incorporated into the Regulated Asset Base.
  - (ii) Logging up generally applies to relatively small scale and difficult to predict investments, such as telecoms infrastructure or distributed generation-related costs.

- (b) **Fixed volume with price pass-through.** This is where the quantity of investment would be set with an assumed ex ante unit allowance applied, but with the latter updated for actual unit costs incurred (subject to any prudency test) when rolling forward the Regulated Asset Base. This approach could apply when the quantity of investment is known but there is too much uncertainty around costs to set an ex ante allowance e.g. site clearance costs.
- (c) **Fixed unit cost with volume pass-through.** This is where the unit cost of investment would be set with an assumed ex ante volume applied, but with the latter updated for actual investment volumes undertaken (subject to any prudency test) when rolling forward the Regulated Asset Base. This could apply where the unit cost of the investment is known (or predictable) but the volume is uncertain. An example is power line replacement, where the average cost per kilometre might be known but volume (the total number of kilometres) for the duration of the Regulatory Period might be uncertain.
- (d) **Budget ceiling.** This is where a maximum budget would be set for a specific capital expenditure programme. This could either be treated as a firm limit or one that would then trigger a prudency review. Under this approach a maximum budget could be set for a specific capex programme or project to avoid over-investment and exceeding expected benefits that were used to justify the investment, such as smart metering roll-outs.
- (e) **Contingent projects.** This could apply where there are unique investment drivers – such as a major discrete load or expected power station – as opposed to general investment drivers (e.g. expectation of load or peak load growth affecting a broader region), and where it is not sufficiently certain that the event or condition giving rise to the investment need will occur during the forthcoming regulatory period. For projects characterised as being contingent, a RBE could request a change to its Annual Revenue Requirement provided a pre-specified trigger event (that gives rise to the need

for the project) has occurred and subject to the materiality thresholds of paragraph 13.19.

13.18. Following any RBE proposal under 13.15 and 13.17, the Commission may determine whether to accept that such investment is Unpredictable Capex and, if so, whether the proposed treatment is appropriate or whether another mode should be applied.

13.19. For investments that are likely to have a material impact on capital expenditure (and the Regulated Asset Base) that were not foreseen at the time of setting the Annual Revenue Requirement and cannot be subject to an ex ante mechanism in accordance with 13.15 to 13.18 above, a RBE can request that the Commission review within a Regulatory Period the specific proposal and make a separate determination.

- (a) Before undertaking such an interim review, the RBE must demonstrate that the investment project or programme could not have reasonably been foreseen at the time of setting the Annual Revenue Requirement, and that in the absence of the review, the financial impact on the relevant RBE would exceed 1% of the Annual Revenue Requirement or RM1 million per RBE and 5% of annual capital expenditure spend for related corporate-level expenditure, whichever is greater.
- (b) exceed the greater of 1% of the Annual Revenue Requirement or RM1 million per RBE, and/or that the spend exceeds 5% of annual capital expenditure in the case of corporate entities.
- (c) The scope of the review shall be limited to the matters relating to the specific investment project or programme and will be subject to the standard review processes employed by the Commission.

## **END OF SECTION**

## 14. Depreciation allowance

- 14.1. The depreciation allowance is calculated for each year of the Regulatory Period by the RBE, applying the following principles:
- (a) The Regulated Asset Base should be recovered in full by the RBE, through the depreciation allowance, over the expected service (economic) lives of the relevant regulated assets.
  - (b) The RBE shall propose depreciation rates or asset lives by major asset groupings, which are appropriate depreciation policy adopted by the RBE.
  - (c) Depreciation shall be calculated by assuming that, in the year that an asset is added to the Regulated Asset Base, half of it is added at the beginning of the year and half of it is added at the end of the year.
- 14.2. Subject to the remaining provisions of this Section, the RBE shall calculate depreciation based on the depreciation schedules maintained for accounting purposes and for preparing their audited financial statements.
- 14.3. The RBE must also calculate depreciation on capital expenditure incurred in previous Regulatory Periods by using an average remaining asset life for each asset category, rather than according to annual depreciation schedules related to historical capital expenditure.
- (a) In calculating the average remaining asset life for each asset category, the RBE shall ensure that the sum of calculated depreciation over the current Regulatory Period is unchanged.
  - (b) For the avoidance of doubt, the RBE shall use annual depreciation schedules to calculate depreciation on capital expenditure incurred in the current Regulatory Period.
- 14.4. If the calculation of depreciation employing the two respective methods described in paragraphs 14.2 and 14.3 differs by more than 5%, the

Commission will investigate the causes of the deviation and decide the appropriate depreciation allowance.

- 14.5. In all circumstances, the depreciation rates or asset lives employed by each major asset grouping must be verifiable; this includes that they be explicitly captured within the Revenue Requirements Model.

**END OF SECTION**

## 15. Tax and Zakat allowance

- 15.1. The Tax and Zakat Allowance represents an allowance each year for corporate tax payments calculated based on forecasts of taxable income and the applicable corporate tax rate and for zakat payments.
- 15.2. The allowance shall be calculated having regard to taxable revenues, which are equivalent to the Annual Revenue Requirement before the tax and zakat allowance less operating expenditures and capital allowances, as below:

$$TAXZ_{t,e} = RATE_t \times (REQT_{t,e} - OPEX_{t,e} - DEPN_{t,e})$$

- 15.3. Capital allowances shall be based on the applicable rates under the current and relevant Malaysian taxation guide. Where a capital allowance is not calculated then the allowed depreciation for that year shall be applied instead.
- 15.4. Any taxation losses incurred in any year of the Regulatory Period can be carried forward to offset future tax liabilities.

**END OF SECTION**

## 16. Opex Efficiency Carry-Over Scheme adjustment

16.1. The Opex Efficiency Carry-Over Scheme adjustment is intended to ensure that each RBE retains the same benefit or incurs the same cost of outperforming or underperforming, respectively, against forecast operating expenditures in any given year of the Regulatory Period. This ensures that the RBE is indifferent as to the timing of making improvements in the efficiency of operating expenditures.

16.2. The Opex Efficiency Carry-Over Scheme operates as follows:

- (a) For each year of the previous Regulatory Period, actual operating expenditure (except for the last year of the previous Regulatory Period where estimates based on year-to-date expenditures may be used), is compared with the forecast operating expenditure for the corresponding year that was included in the approved Annual Revenue Requirement.
- (b) The difference (positive or negative) between actual and forecasted operating expenditure is quantified for each year of the previous Regulatory Period.
- (c) For each year of the previous Regulatory Period, the incremental efficiency gain or loss is also calculated, as the difference in (b) above relative to the difference in the preceding year.
- (d) The incremental efficiency gain/loss in each year of the previous Regulatory Period is retained/incurred for three years (or, where a different Regulatory Period is used, the length of the Regulatory Period), by being carried forward as necessary into the current Regulatory Period until it has been retained/incurred for three years.

16.3. The Opex Efficiency Carry-Over Scheme adjustment is calculated according to the following formula:

$$ECSSO_{e,t} = \left( \sum_n^N GAIN_{e,n} \right) / T_P$$

Where:

'n' is a year in the previous Regulatory Period and 'N' is the total number of years in the previous period

'GAIN<sub>e,n</sub>' is the carried-forward incremental efficiency gain/loss from year 'n' of the previous Regulatory Period.

'T<sub>p</sub>' is equal to the total number of years in Regulatory Period 'P'

16.4. The incremental efficiency gain/loss ('IEG<sub>n</sub>') is calculated according to the following formula:

If  $t + N \leq n + N$  then  $GAIN_n = (AOPX_n - OPEX_n) - (AOPX_{n-1} - OPEX_{n-1})$

If  $t + N > n + N$  then  $GAIN_n = 0$

*For example, if an incremental efficiency gain is made in Year 2 (n = 2) of the previous Regulatory Period and that previous Regulatory Period has a total of three years (N = 3), then the incremental efficiency gain has a positive value for Years 1 and 2 (t = 1, t = 2) of the current Regulatory Period. For Year 3 (t = 3) of the current Regulatory Period, this incremental efficiency gain is set at zero (as t + N is greater than n + N). The RBE will, therefore, retain the incremental efficiency gain for a total of three years following the year in which it is made (Year 3 of the previous Regulatory Period and Years 1-2 of the current Regulatory Period).*

**END OF SECTION**

## 17. Capex Efficiency Carry-Over Scheme adjustment

- 17.1. The Capex Efficiency Carry-Over Scheme adjustment shares the savings where actual capital expenditures are lower than the approved levels included in Annual Revenue Requirements between the RBE and electricity customers.
- 17.2. This sharing is intended to provide an incentive to entities for efficiency improvements in capital expenditures while, at the same time, recognising that some savings may be due to circumstances outside of the entities' control (for example, a large customer deferring a connection) which do not result from efficiency improvements. As it is generally difficult to attribute a saving to one cause or another, the adjustment equally splits any underspends of actual against approved capital expenditures.
- 17.3. Where there is a capital expenditure overspend in the previous Regulatory Period, there will be no reconciliation in the next Regulatory Period for the associated under-recovery of the of the Annual Revenue Requirement in the previous Regulatory Period.
- 17.4. The adjustment will apply where:
- (a) There is a capital expenditure underspend by a RBE in the previous Regulatory Period.
  - (b) Provided that the underspend is material, defined as an underspend exceeding the greater of:
    - (i) RM 1 million, or
    - (ii) 1% of the aggregate Annual Revenue Requirement of the RBE in the previous Regulatory Period, or
    - (iii) 5% of annual average capital expenditure spend of the RBE in the previous Regulatory Period.

17.5. The Capex Efficiency Carry-Over Scheme adjustment is calculated according to the following formula:

$$ECSX_{e,t} = \left( \sum_n^N SAVE_{e,n} \right) / T_P$$

$$SAVE_{e,n} = \min[0, (ACAP_{e,n} - FCAP_{e,n}) \times WACC_{e,P-1} + (ACAP_{e,n} - FCAP_{e,n}) / LIFE_{e,n}]$$

Where:

' $SAVE_{e,n}$ ' is the savings by RBE 'e' in year 'n' of the previous Regulatory Period

' $T_P$ ' is equal to the total number of years in Regulatory Period 'P'

' $ACAP_{e,n}$ ' is the actual capital expenditure by RBE 'e' in year 'n' of the previous Regulatory Period

' $FCAP_{e,n}$ ' is the approved forecast capital expenditure by RBE 'e' in year 'n' of the previous Regulatory Period

' $LIFE_{e,n}$ ' is the average asset life for depreciation purposes of assets included in the RAB for RBE 'e' in year 'n' of the previous Regulatory Period (expressed in years)

17.6. For the avoidance of doubt, the carry-over mechanism does not apply to costs that are subject to an Unpredictable Capex mechanism.

## END OF SECTION

## 18. Quality of Service Incentives adjustment

- 18.1. The Quality of Service Incentives adjustment provides an incentive or penalty to RBE for their performance relative to the key performance indicators (“KPIs”) as explained in the Standards of Performance issued by the Commission.
- 18.2. For some of the KPIs, the Commission will stipulate a target level of performance to be met by the relevant RBE and an incentive and penalty range and value for exceeding or failing to achieve this target. The incentive and penalty values will be expressed as a percentage of Annual Revenue Requirements in each year. These targets and incentives and penalties will be specified prior to the start of each Regulatory Period.
- 18.3. Prior to the start of each Regulatory Period, each RBE will calculate the monetary sum of the incentives and penalties for the preceding Regulatory Period, according to the following formula:

$$SERV_{P-1,e} = \left[ \sum_{q,n}^{Q,N} (PERF_{e,q,n} \times REQT_{e,n}) \right] + CORR_{P-2,e}$$

Where:

‘ $SERV_{P-1,e}$ ’ is the total monetary incentive or penalty payable to RBE ‘e’ for performance against quality of service KPIs in the preceding Regulatory Period ‘P-1’ (expressed in RM)

‘ $PERF_{e,q,n}$ ’ is the incentive or penalty payable RBE ‘e’ for performance against KPI ‘q’ in year ‘n’ of the preceding Regulatory Period (expressed as a percentage, where a penalty is a negative value). This value will be actual for the first to penultimate years of the preceding Regulatory Period ‘P-1’ and estimated for the last year

‘q’ is an individual quality of service KPI

‘Q’ is the total number of quality of service KPIs in the preceding Regulatory Period

‘ $CORR_{P-2,e}$ ’ is a correction factor which represents the difference between the estimated value of incentives and penalties in the last year of the preceding Regulatory Period ‘P-2’ (as used in the calculation of the incentive to apply in Regulatory Period ‘P-1’) and the actual value of incentives and penalties in that year

- 18.4. The correction factor is required as the incentives and penalties payable for the final year of the preceding Regulatory Period will be an estimated value. A correction for the difference between this estimated value and the value calculated when actual performance is known is added to the monetary sum of incentives and penalties applied in the following Regulatory Period.
- 18.5. This sum will be divided by the number of years in the next Regulatory Period to obtain an annual average value, according to the following formula:

$$SERV_{t,e} = SERV_{P-1,e} / T_P$$

- 18.6. This annual average value shall be included in the Annual Revenue Requirement as the Quality of Service Incentives adjustment term.

**END OF SECTION**

## **19. Joint and common costs**

### **Approval of allocation methodologies**

- 19.1. No later than ten months prior to each Regulatory Period, the RBE shall notify the Commission of the cost allocation methodologies that they propose to use. The Commission will notify the RBE of its acceptance or rejection of the methodology within one month of the receipt of the methodology.
- 19.2. In their description of calculations and assumptions used to prepare the RRS, the RBE shall detail the allocation methodology applied to each significant allocated item. For this purpose, a significant allocated item is defined as one with a value exceeding 1% of the forecast revenues of the RBE in that year.

### **Cost allocation principles**

- 19.3. In reporting costs, revenues and assets in the RRS, and for the period that they remain within the TNB Group, the RBE shall allocate costs based on the following steps:
- (a) Firstly, the total costs of corporate services in each year of the Regulatory Period shall first be calculated following the same methodology as for the calculation of Annual Revenue Requirements for the RBE.
  - (b) Secondly, the costs, revenues and assets attributable to the generation of electricity and Excluded Services (if relevant) shall then be separated from those related to the RBE.
  - (c) Thirdly, the costs, revenues and assets of the RBE shall be separated between the individual RBE.
- 19.4. More generally, all allocations applied by the RBE shall conform to the following principles:

- (a) **Causality.** The allocation base should be the share of or use made by the entity of the activities which cause the costs or liabilities concerned to be incurred, the revenues to be earned or the assets to be acquired.
- (b) **Objectivity.** The basis of allocation should not unduly favour the RBE or any other company or organisation.
- (c) **Consistency.** Where practicable, the basis of allocation should be consistent from year to year.
- (d) **Non-duplication.** A certain joint cost can only be allocated once.
- (e) **Transparency.** The basis of allocation should be clear and understandable.

19.5. In general, the Fully Distributed Cost Allocation Methodology is the Commission's preferred allocation methodology.

#### **END OF SECTION**

## **20. Long-Term Sustainability**

- 20.1. Before deciding on the Annual Revenue Requirement, the Commission may assess that the proposed Annual Revenue Requirement is consistent with the RBE maintaining its long-term sustainability.
- 20.2. For each RBE, the assessment will be done based on legally independent entity without the benefit of a corporate guarantee from TNB.
- 20.3. For the purposes of this assessment, the Commission may have regard to the criteria applied by going concern utility. In particular, the Commission may review whether:
  - a) the return on regulated asset base as stipulated in Section 12.3; and
  - b) the forecast of total net debt to total capital (gearing ratio) as stipulated in Section 12.7.

The above ratios should fall within the level required to maintain its long-term sustainability.

- 20.4. Where this is not the case, the Commission will assess whether this is a transitory concern with ratios returning to the necessary levels later in the Regulatory Period or whether this is a longer-term concern.
- 20.5. If a longer-term concern, the Commission may identify appropriate adjustments to the calculation of the Annual Revenue Requirement that can address this concern.

**END OF SECTION**

## 21. Regulatory Reporting Statements

### Purpose of the Regulatory Reporting Statements

21.1. The purposes of the Regulatory Reporting Statements (RRS) are to allow the Commission to:

- (a) Identify how the RBE are performing relative to forecast outcomes, particularly with regards to regulatory returns on assets, and the reasons for any differences.
- (b) Make consistent assessments over time of the RBE cost efficiency and productivity, which will inform future regulatory decisions.
- (c) Calculate the applicable adjustments to allowed revenues in the following Regulatory Period which arise from differences between actual and forecast outcomes in the current Regulatory Period.

### Content of the Regulatory Reporting Statements

21.2. Regulatory Reporting Statements for each RBE must comprise:

- (a) **Regulatory Financial Statements (RFS).** These will comprise pro-forma financial statements in the same format as Audited Financial Statements (AFS).
- (b) **Financial Returns.** These will provide detailed information on actual relative to forecast costs and revenues, in a format prescribed by the Commission.
- (c) **Physical Returns.** These will provide information on physical outputs and indicators, in a format prescribed by the Commission.
- (d) **Explanatory document.** A description of the underlying calculations and assumptions used to prepare the RRS, including an explanation of significant variances between actual and forecast outcomes, and an explanation of where the RRS differs from the AFS and the implications of these differences.

21.3. The RFS may comprise the following financial statements and supporting documents:

- (a) A profit and loss account
- (b) A balance sheet
- (c) A statement of changes in equity
- (d) A cashflow statement
- (e) A corporate governance statement
- (f) A directors' report
- (g) An Auditor's Regulatory Report, as described in Section below
- (h) A detailed commentary about the operational performance of the RBE, encompassing (where relevant) network performance and performance against customer service standards. This commentary should be in the form of a review by management highlighting key areas of concern for the business and provide details of any programmes or revisions to processes to be implemented by the RBE to address these concerns.
- (i) Appropriate notes to clarify the above points.

#### **RRS submission timing and formats**

21.4. The RRS shall be submitted annually on or by 31 May.

21.5. The RBE shall submit the RFS in MS-Excel and MS-Word as appropriate, or in any other format as advised by the Commission.

21.6. The Financial Returns and Physical Returns shall be submitted using a template that is issued and updated from time to time by the Commission, in consultation with the RBE. This template shall be broadly consistent with the inputs to the Revenue Requirements Model.

## **Verification and auditing of the RFS**

21.7. The information provided in the RFS must be adequately and independently audited by an auditor acceptable to and approved by the Commission. It shall be the responsibility of the RBE to ensure that such approval is obtained prior to the submission of the RFS.

- (a) For the avoidance of doubt, the other items in the RRS, namely Financial Returns and Physical Returns, do not need to be independently audited. However, the RBE shall use their best endeavours to ensure the Financial Returns and Physical Returns are consistent with the RFS.

21.8. The RBE must maintain accounting and reporting arrangements which:

- (a) Enable the RFS to be prepared.
- (b) Allow information in the RFS to be verified by reference to the audited financial statements.

21.9. The RBE should endeavour to propose an accredited auditor for approval by the Commission. However, where a RBE can demonstrate that an accredited auditor is unwilling or unable to conduct the audit, the entity may propose an independent consultant that specialises in regulatory matters and is approved by the Commission.

21.10. The approved auditor must prepare an Auditor's Regulatory Report to be submitted to the Commission with the RFS. This report must give the auditor's opinion as to whether the input data and underlying calculations and assumptions are consistent with these Guidelines issued by the Commission. In particular, the auditor should draw the attention of the Commission to:

- (a) Any deficiencies in accounting records that may make the information contained in the RFS of uncertain reliability.
- (b) Any significant deviations applied in the preparation of the RFS from the provisions of this Section 21.

- (c) A description of how expenditures and revenues for Regulated Services have been separated from expenditures and revenues for services provided by the RBE that are not subject to regulation (Excluded Services). This should highlight:
  - (i) Any differences between the cost allocation methodology used in the preparation of the RFS and any other cost allocation methodology used by the RBE for the audited financial statements or other purposes.
  - (ii) Any inconsistencies found by the auditors between the RFS and the agreed cost allocation methodology together with the reasons for non-compliance, signed off by senior management of the RBE.
  - (iii) Any other matter that may mean that the RFS do not provide a true and fair view of the costs, revenues, and assets of the RBE.

21.11. The provision of the Auditor's Regulatory Report does not remove the responsibility of the RBE for the preparation and submission of RFS, nor does it require the auditor rather than the RBE to assume liability in any form for any errors or omissions in the RFS, other than where such errors or omissions might reasonably have been expected to be identified during an audit conducted to the same standards as for the audit of audited financial statements. For the avoidance of doubt, the Auditor's Regulatory Report is in addition to any report or opinion required to be submitted with the audited financial statements of the RBE.

21.12. The RBE must make appropriate provision for the Commission to require from the Auditor further explanation or clarification of the Auditor's Regulatory Report and further information on the matters covered by the Auditor's Regulatory Report. Such requirements are subject to the requirement that they must not impose unreasonable obligations on the auditor.

## **Publication of the RRS**

21.13. The RRS may be published by the Commission on its official website, except for:

- (a) A description of the underlying calculations and assumptions used to prepare the RRS.
- (b) Other material identified as being confidential by the RBE and accepted as such by the Commission.

21.14. The RBE must employ best endeavours to draw the attention of customers to the availability of the published RRS in a manner appropriate to ensure awareness.

## **Principles for preparing the RRS**

21.15. The RRS shall be prepared in a manner that is consistent with these Guidelines and the Revenue Requirements Model. This includes applying the same principles and methodologies on revenue adjustments, cost and asset allocation, and cost calculation. Any inconsistencies between these Guidelines and the preparation of the RRS should be clearly documented and explained, including detailing the implications of the inconsistencies.

21.16. The RRS shall be prepared in accordance with the accounting principles and policies used to prepare the audited financial statements, adjusted for the differences where the accounting principles and policies used to prepare the audited statements differ from these Guidelines. Any such differences shall be clearly documented and explained, including detailing the implications of the differences.

21.17. In preparing the RRS, the RBE shall report the substance of transactions, rather than the legal form, if these differ. In determining the substance, the RBE shall consider the expectation of and motivation for a transaction. Individual transactions that achieve or are designed to achieve a common commercial effect shall be treated in aggregate.

21.18. Where possible, the RRS should be prepared using a consistent methodology over time. This particularly applies to the:

- (a) Methodology used to allocate costs.
- (b) Capitalisation policy.
- (c) Measurement of physical outputs.

### **Reporting of operating expenditure**

21.19. In preparing and submitting information on operating expenditure in the Financial Returns, the RBE shall:

- (a) Distinguish between categories of expenditure advised by the Commission.
- (b) Show operating expenditure both including and excluding Contracted-Out Services, by category of operating expenditure.

21.20. No expenses based on the provisions for impairment of fixed assets shall be included as operating expenditure. Any impairment should be treated as disposals in the Regulated Asset Base.

21.21. The RBE shall explain any significant variances between actual and allowed operating expenditure in their accompanying notes to the RRS. The Commission will determine the level of significance and inform the RBE sufficiently in advance of the relevant reporting year or period. Such explanations should include, but not be limited to, descriptions of any efficiency gains or losses.

### **Reporting of capital expenditure**

21.22. In preparing and submitting information on capital expenditure in the Financial Returns, the RBE shall report capital expenditure in the following different formats:

- (a) **By each significant capital expenditure project.** Significant projects are defined as projects on which aggregate capital expenditure exceeds 5% of the RBE's total capital expenditure in

the Regulatory Period. If a project is not deemed to be a significant project, then it should be reported as part of a programme of work.

- (b) **By asset category**, as approved by the Commission, which shall each have a different asset life and be used to calculate depreciation of the Regulated Asset Base.
- (c) **By cost driver category**, as advised by the Commission and where applicable to the RBE. These categories shall broadly differentiate between, but not be limited to:
  - (i) Investment in new system assets to accommodate new generation and customer connections.
  - (ii) The upgrade of existing system assets to accommodate load growth and improve performance.
  - (iii) The repair of defects in existing system assets.
- (d) **By physical output category**, as advised by the Commission and where applicable to the RBE. These categories shall be consistent with those in the Physical Returns submission.

21.23. The RBE shall clearly document and explain the allocation of capital expenditure between each category, where applicable.

21.24. The RBE shall explain any significant variances between actual and allowed capital expenditure, for each significant capital expenditure project, in their accompanying notes to the RRS. The Commission will determine the level of significance and inform the RBE sufficiently in advance of the relevant reporting year or period. Such explanations should include, but not be limited to, descriptions of any efficiency gains or losses.

21.25. Where actual capital expenditure is significantly below allowed capital expenditure, TNB's explanation of the variance shall include an estimate of the share of this negative variance attributable to the main potential causes. The main potential causes shall include, but not be limited to:

- (a) Deferral by the RBE
- (b) Deferral, non-payment of charges or cancellation by the customer
- (c) Delays in obtaining access to customer sites
- (d) Delays in obtaining wayleaves or contractor failure
- (e) Delays due to the RBE
- (f) Delays in approval by relevant authorities or land owners, including but not limited to road concessionaires and rail services
- (g) Delays due to circumstances beyond the RBE's control (noting the relevant specific circumstances).

### **Reporting of revenues**

21.26. In preparing and submitting information on revenues in the Financial Returns, Customer Service shall report on:

- (a) Forecast and actual sales by customer group.
- (b) Total and average revenue by customer group.
- (c) The resulting average sales price.

21.27. Average revenues should be shown with and without the application of the ICPT Adjustment.

21.28. The reported revenues shall include all income derived from Regulated Services. As well as the sale of electricity, this may include, but is not limited to:

- (a) Connection fees, disconnection and reconnection charges.
- (b) Charges levied for providing stand-by or back-up power.

21.29. Customer Service shall explain any significant variances between actual and allowed revenues and between the actual and allowed average

sales price, as applicable, in its accompanying notes to the RRS. Such explanations should include, but not be limited to:

- (a) Forecasting errors with respect to electricity sales.
- (b) Changes in share of sales by customer category.

### **Reporting of the Regulated Asset Base**

21.30. In preparing and submitting information on the Regulated Asset Base in the Financial Returns, the RBE shall:

- (a) Roll forward the Regulated Asset Base in a manner that is consistent with Section 13 of these Guidelines and the Revenue Requirements Model; and
- (b) Roll forward the Regulated Asset Base separately for each asset category described in paragraph 21.22(b) above.

### **Reporting of related party transactions**

21.31. The RBE shall detail all significant related party transactions included in the RRS. For this purpose, a significant related party transaction is defined as one where the annual value of payments for the supply of goods or services exceeds 1% of the total forecast revenues of each RBE in that year.

21.32. Where a RBE purchases or sells goods or services from a related party, it must demonstrate that:

- (a) The prices paid or received for these goods or services are reasonable and at fair market value.
- (b) The goods or services are provided at no extra cost than if they were provided from within the RBE's business.
- (c) No cross-subsidy exists between the RBE and other parts of the related entity's business.

21.33. At a minimum, this requires:

- (a) The contract for the supply of goods or services to be awarded through a fair and non-discriminatory competitive tendering process in which three or more bids were received; or
- (b) The price paid for the supply of goods and services should be based on actual costs of supply plus an appropriate rate of return on the capital employed.

21.34. Asset transfers between RBE and related parties shall be at the depreciated value implied in the Regulated Asset Base of the relevant entity, calculated based on:

- (a) The year the asset was brought into service; and
- (b) The applicable asset life used for depreciation of the applicable asset category in the Regulated Asset Base of the relevant entity.

#### **Joint and common costs**

21.35. Joint and common costs associated with the provision of corporate services shall be separately recorded in total and as allocated between the RBE. The reporting of the total costs of the corporate entity/ies shall be consistent with the requirements for reporting for individual RBE.

21.36. If any changes are made to the cost allocation methodology within a Regulatory Period from those applied at the time of calculating Annual Revenue Requirements, then:

- (a) The RRS shall clearly identify and describe the changes made, the justification for these and the impacts on cost allocation to and between RBE.
- (b) For the remainder of the Regulatory Period, the RFS shall be presented using both the allocation methodology applied for calculating Annual Revenue Requirements and with the changed methodology, in order to allow consistent comparisons of costs and revenues over the Regulatory Period.

- (c) For the subsequent Regulatory Period, the Commission will determine whether the changes in the cost allocation methodology should be applied.

**END OF SECTION**

## 22. Definitions

22.1. Unless expressly indicated to the contrary or unless the context otherwise requires, terms adopted and used in these Guidelines shall bear the same meaning as they are defined in the Electricity Supply Act 1990, including any modification, extension or re-enactment thereof and any subsidiary legislation made there under.

22.2. In these Guidelines, the following words shall have the following meanings ascribed to them:

### **Forms of tariff regime**

- (i) “Bundled” in these Guidelines refers to the tariff regime in effect during the period when the responsible Minister approves an average tariff for TNB as a whole
- (ii) “Unbundled” in these Guidelines refers to the tariff regime in effect during the period when the responsible Minister approves an average tariff for each individual RBE and the average tariff for TNB as a whole is calculated as the sum of these individual approved tariffs and the Average Generation Cost

### **Other definitions**

- (iii) “Allowed Average Tariff” means the maximum average revenue that a RBE may earn from tariffs charged for Regulated Services
- (iv) “Allowed Revenue” means the average revenues in a Regulatory Period required to recover the efficient costs of a RBE including a reasonable return on its investments
- (v) “Annual Regulatory Adjustment” means the adjustments in any one year that comprises Revenue-Cap and Price-Cap Adjustment
- (vi) “Annual Revenue Requirement” means the revenues in any one year required to recover the efficient costs of a RBE including a reasonable return on its investments

- (vii) “Average Generation Cost” means the approved forecast average cost of power purchases during a Regulatory Period
- (viii) “Base Average Tariff” means the approved average tariff for a Regulatory Period and is constant in all years of that period
- (ix) “Commission” means the Energy Commission (Suruhanjaya Tenaga)
- (x) “Customer Services” means the RBE responsible for supplying and selling electricity to, and managing the interface with, final consumers of electricity
- (xi) “Distribution” means the RBE responsible for planning, investing in, maintaining, and undertaking the real-time operation and control of the electricity distribution system, that is, the system of lines, substations, and related equipment and buildings below 132kV
- (xii) “Grid System Operator” means the RBE responsible for system security, operational planning, the dispatch of generating units, real-time operation and control of the power system, and coordinating all parties connected to the Grid System in accordance with the Malaysian Grid Code
- (xiii) “Imbalance Cost Pass-Through Adjustment” or “ICPT Adjustment” means the adjustment calculated at six-month intervals and applied as a surcharge or rebate (calculated as a negative surcharge) to pass through the differences between actual fuel and other generation-specific costs and those forecast at the time of approving the Average Generation Cost
- (xiv) “Incentive Based Regulation” or “IBR” means a form of regulation where regulated entities are able to earn additional profits if they out-perform relative to the expected costs of delivering a given quality of service and, conversely, where under-performance results in reduced profits
- (xv) “Other Income” means income not directly related to electricity supply but which derives from the use of assets and/or staff of a licensee engaged in electricity supply

- (xvi) “Price-Cap” means a form of regulation where the average revenue earned by TNB under a Bundled tariff regime or by a RBE under an Unbundled tariff regime cannot exceed a cap
- (xvii) “Price-Cap Adjustment” means an annual adjustment to ensure that, under a Bundled tariff regime, TNB complies with its Price-Cap and, under an Unbundled tariff regime, that a Price-Cap RBE complies with its Price-Cap
- (xviii) “Price-Cap RBE” means a RBE regulated under a Price-Cap in an Unbundled tariff regime
- (xix) “Regulated Asset Base” means the value of fixed assets invested in by a RBE and on which it is permitted to earn a return
- (xx) “Regulated Business Entity” or “RBE” means an entity whose revenues and tariffs are regulated under these Guidelines
- (xxi) “Regulated Services” means the services related to electricity sales which are provided by a RBE under Regulated Tariffs
- (xxii) “Regulated Tariffs” means the tariffs and charges applied for the provision of the Regulated Services and which are regulated under these Guidelines
- (xxiii) “Regulatory Period” means the period for which a Base Average Tariff is determined
- (xxiv) “Revenue-Cap” means a form of regulation where a RBE earns its Allowed Revenue in each year and where its Regulated Tariffs may be adjusted to ensure compliance with this requirement if actual sales volumes differ from the forecast used to calculate the Base Average Tariff
- (xxv) “Revenue-Cap Adjustment” means an annual adjustment to ensure that a Revenue-Cap RBE complies with its Revenue-Cap
- (xxvi) “Revenue-Cap RBE” means an RBE regulated under a Revenue-Cap
- (xxvii) “Single Buyer” means the RBE responsible for managing the procurement of electricity and related services, including long-term

planning, scheduling, procuring and settling electricity supply in accordance with the Single Buyer Rules and the Malaysian Grid Code

- (xxiii) “Single Buyer Generation” means the costs of the Single Buyer related to power purchases
- (xxix) “Single Buyer Operations” means the costs of the Single Buyer’s own operations, excluding those of power purchases
- (xxx) “Tariff Table” means the list of individual tariffs for Regulated Services as published by the licensee for every regulatory period
- (xxxii) “Transmission” means the RBE responsible for planning, investing in, operating and maintaining the electricity transmission network, that is, the system of lines, substations and related equipment at 132kV and above
- (xxxii) “Weighted Average Cost of Capital” means the estimated efficient cost of financing of a RBE and which represents its allowed reasonable return

## **END OF SECTION**

## **Annex: Formula terms and notations**

This annex lists the terms and notations used in the various formula contained in these Guidelines for ease of reference.

## Terms

$\beta_{\text{equity}}$	Equity Beta
ACAP	Actual Capital Expenditure
ADCC	Average Daily Coal Purchase Costs
AFUL	Average Fuel Cost
AFUC	Actual total fuel cost
AGEN	Average Generation Cost
AGSC	Average Other Generation Cost
ALLW	Allowed Average Tariff
AQUS	Actual total qualifying sales to which the ICPT Adjustment is applied
AREV	Actual total bundled revenues earned from provision of regulated services
ASAL	Actual total electricity sales
AVGE	Actual Average Tariff
BASE	Base Average Tariff
CADP	Average Days Payables for Coal Purchase Costs by TNB
CADR	Average Days Receivables for Coal Fuel Costs paid to TNB by generators
CPEX	Forecast Capital Expenditure that is operationally commissioned
COAL	Net Cost of Coal Purchases
CORR	Correction Factor
DEPN	Allowed Depreciation
DISP	Net Value of Fixed Assets Disposed
DOMS	Share of Sales to Domestic Customers with consumption of less than 300 kWh per month
DRTN	Nominal Cost of Debt
ECSSO	Allowed Opex Efficiency Carry-Over Scheme Adjustment
ECSSX	Allowed Capex Efficiency Carry-Over Scheme Adjustment
EFUC	Estimated total fuel cost
EGSC	Estimated Total Other Generation Cost
EIF	Electricity Industry Fund
EQUUS	Estimated total qualifying sales to which the ICPT Adjustment is applied

EREV	Estimated Total Bundled Revenues
ERTN	Nominal (after-tax) Return on Equity
ESAL	Actual total electricity sales
FCAP	Forecast Capital Expenditure
FCPT1	First Fuel Cost Pass-Through Adjustment
FCPT2	Second Fuel Cost Pass-Through Adjustment
FFUL	Forecast Fuel Cost
FGSC	Forecast Other Generation Cost
FSAL	Forecasted total electricity sales
FUND	Fund Contribution relating to the ICPT Adjustment
FUNT	Approved payment from the Electricity Industry Fund (EIF) to the Single Buyer, relating to the ICPT Adjustment
FUNP	Payment by the Single Buyer into the Electricity Industry Fund (EIF), relating to the ICPT Adjustment
GAIN	Incremental Efficiency Gain/Loss
GCPT1	First Other Generation Cost Pass-Through Adjustment
GCPT2	Second Other Generation Cost Pass-Through Adjustment
GEAR	Gearing (share of net debt in the sum of net debt and equity)
IARR	ICPT Adjustment Remuneration Rate
ICPT	Imbalance Cost Pass-Through
IFUC	Interim Fuel Cost Pass-Through Adjustment
IGSC	Interim Other Generation Cost Pass-Through Adjustment
JOIN	Allocated Joint and Common Costs
LIFE	Average Asset Life
MRP	Market Risk Premium
OPEX	Allowed Operating Expenditures
OTHA	Actual other income
OTHE	Estimated other income
OTHR	Other Income Adjustment
PCAP	Price-Cap Adjustment
PDIF	Difference between Actual and Allowed Average Revenues (TNB)
PERF	Incentive/Penalty for performance against individual quality of service KPI

POWR	Forecast Average Power Purchase Cost
PSLS	Price-Cap Sales Adjustment
RAB	Allowed Closing Regulated Asset Base at the end of the year
RATE	Corporation Tax Rate
RCAP	Revenue-Cap Adjustment
RDIF	Price-Cap Revenue Difference
REQT	Annual Revenue Requirement
RFR	Risk-Free Rate
RSLS	Revenue-Cap Sales Adjustment
SERV	Quality of Service Incentives Adjustment (incentive or penalty)
TAGS	Actual total other generation cost
TEGS	estimated total other generation cost
TAXZ	Allowed Corporate Tax and Zakat
UNPX	Unpredictable Capital Expenditures
USAL	Updated forecast of total actual electricity sales
UPOX	Unpredictable Opex Adjustment
UPXA	Actual unpredictable opex
UPXF	Forecast of unpredictable opex included in the annual revenue requirement
WACC	Weighted Average Cost of Capital
WCRR	Working Capital Remuneration Rate
WORK	Working Capital Allowance

### **Notation**

b	(as modifier ahead of term) Bundled
e	RBE
P	Regulatory Period
m	Calendar month, expressed in relation to the month in which an adjustment takes effect
n	Year (1 January to 31 December) in the previous Regulatory Period
N	Total number of years in the previous Regulatory Period
pc	Price-Cap Entity
q	Individual quality of service KPI
Q	Total number of quality of service KPIs in the previous Regulatory Period.

rc	Revenue-Cap Entity
s	Six-month period (either 1 January to 30 June or 1 July to 31 December) in year 't'
t	Year (1 January to 31 December) in the current Regulatory Period
T	Total number of years in the current Regulatory Period
u	(as modifier ahead of term) Unbundled

## **ATTACHMENTS**

The following attachments are provided for explanatory purposes only. They do not form part of these Guidelines. In the case of any discrepancy between these Guidelines and these attachments, these Guidelines prevail.

## Attachment to Section 1

### Relationship to 4 May 2016 Guidelines

The table below shows how the contents of these Guidelines relate to the sections contained in the Regulatory Implementation Guidelines as issued by the Commission on 4 May 2016 (GP/ST/No.2/2016).

Guidelines as issued 4 May 2016		Current Guidelines
RIG	Title	Section
1	TNB Business Entities	3
2	Tariff-Setting Framework	4
3	Revenue Requirement Principles	5, 6, 8
4	Weighted Average Cost of Capital of TNB	12
5	Operating Cost, Capital Cost, Asset and Consumption Templates	10, 11, 13, 14, 15, 20
6	Incentive Framework for Operational Performance	16,17, 18
7	Cost Allocation Principles	19
8	Imbalance Cost Pass-Through Mechanism	7
9	Tariff Design Principles	4
10	Regulatory Accounts Process	21
11	Process for Determining the Revenue Requirement and Tariff	9

## Attachment to Sections 5 and 6

### Example of Price-Cap with and without under-recovery

#### Without under-recovery allowance

<i>sen/kWh</i>	Over-recovery		Under-recovery	
	Allowed tariff < Average revenue		Allowed tariff > Average revenue	
	PCAP = ALLW – AVGE		PCAP = 0	
Allowed tariff (year t-1), ALLW	39.45	39.45	39.45	39.45
Average revenue (year t-1), AVGE	40.24	41.09	38.66	37.87
Difference	+0.79 +2%	+1.64 +4%	-0.79 -2%	-1.64 -4%
Price-cap adjustment (year t), PCAP	39.45 – 40.24 = -0.79	39.45 – 41.09 = -1.64	0	0

For clarity, adjustments for time value of money and revenue-cap adjustments are ignored

#### With under-recovery allowance

<i>sen/kWh</i>	Over-recovery		Under-recovery	
	Allowed tariff < Average revenue		Allowed tariff > Average revenue	
	PCAP = ALLW – AVGE		PCAP = max(2.5% * BASE, AVGE – ALLW)	
Allowed tariff (year t-1), ALLW	39.45	39.45	39.45	39.45
Average revenue (year t-1), AVGE	40.24	41.09	38.66	37.87
Difference	+0.79 +2%	+1.64 +4%	-0.79 -2%	-1.64 -4%
Price-cap adjustment (year t), PCAP	39.45 – 40.24 = -0.79	39.45 – 41.09 = -1.64	39.45 – 38.66 = 0.79	2.5% * 39.45 = 0.99

## Attachment to Section 16

### Example of Opex Efficiency Carry-Over Scheme adjustment calculation

This annex presents an illustrative example of the calculation of adjustments under the operating expenditure Efficiency Carry-Over scheme.

Calculation of incremental efficiency gain in previous Regulatory Period		Year (n)		
		1	2	3
Allowed Opex	$OPEX_n$	100	95	90
Actual Opex	$AOPX_n$	96	92	85
Difference	$(OPEX_n - AOPX_n)$	4	3	5
Incremental Efficiency Gain / Loss	$GAIN_n$	4	(1)	2

Carry-forward of incremental efficiency gains		Previous Regulatory Period (P-1)			Current Regulatory Period (P)		
		Year (n)			Year (t)		
		1	2	3	1	2	3
Incremental Gain in year n = 1	$GAIN_1$		4	4			
Incremental Gain in year n = 2	$GAIN_2$			(1)	(1)		
Incremental Gain in year n = 3	$GAIN_3$					2	
<b>Total gains carried-forward by year</b>	$\sum GAIN_n$				<b>5</b>	<b>1</b>	<b>2</b>

Calculation of annual ECS adjustment			Total
Total carry-forward in Regulatory Period P	$\sum GAIN_{n,t}$		8
Number of years	$T_P$		3
<b>Annual ECS adjustment</b>	<b><math>ECSO_t</math></b>		<b>2.7</b>