

REPORT TO
UTILITIES COMMISSION
15 FEBRUARY 2019

2018 SYSTEM CONTROL CHARGES REVIEW



REVIEW OF POWER AND
WATER'S SUBMISSION TO
THE COMMISSION
FINAL REPORT





ACIL ALLEN CONSULTING PTY LTD
ABN 68 102 652 148

LEVEL NINE
60 COLLINS STREET
MELBOURNE VIC 3000
AUSTRALIA
T+61 3 8650 6000
F+61 3 9654 6363

LEVEL ONE
50 PITT STREET
SYDNEY NSW 2000
AUSTRALIA
T+61 2 8272 5100
F+61 2 9247 2455

LEVEL FIFTEEN
127 CREEK STREET
BRISBANE QLD 4000
AUSTRALIA
T+61 7 3009 8700
F+61 7 3009 8799

LEVEL ONE
15 LONDON CIRCUIT
CANBERRA ACT 2600
AUSTRALIA
T+61 2 6103 8200
F+61 2 6103 8233

LEVEL TWELVE, BGC CENTRE
28 THE ESPLANADE
PERTH WA 6000
AUSTRALIA
T+61 8 9449 9600
F+61 8 9322 3955

167 FLINDERS STREET
ADELAIDE SA 5000
AUSTRALIA
T +61 8 8122 4965
ACILALLEN.COM.AU

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EXECUTIVE SUMMARY

The Utilities Commission (the Commission) is currently reviewing revised system control charges submitted by the Power and Water Corporation (PWC) and has engaged ACIL Allen Consulting (ACIL Allen) to assess PWC's submission and make recommendations in relation to the following matters:

- PWC's identification of regulated system control functions, noting that some of the regulated system control functions are limited to the Darwin-Katherine electricity system (i.e. not a regulatory function for the Alice Springs and Tennant Creek electricity systems)
- PWC's recommendation that the system control charge be consistent across all three regulated systems despite some functions being limited to the Darwin-Katherine system
- PWC's methodology for allocating costs to activities, to verify that costs are correctly attributed to the Power System Controller's regulated and unregulated functions, and that the cost allocation model is well constructed (i.e. logical, accurate, repeatable)
- PWC's allocation of corporate overheads to the Power System Controller
- PWC's inclusion of costs associated with a proposed new Control and Administrative Centre in the system control charge
- the appropriateness of using the proposed energy consumption forecasts provided to PWC by the Australian Energy Market Operator (AEMO) for PWC's distribution determination for determining the system control charge, and if not appropriate, a better alternative
- whether a pricing or revenue control mechanism would be appropriate and if so, a proposed mechanism, setting out why this mechanism is appropriate.

Identification of regulated system control functions

The Power System Controller undertakes 70 activities to meet its regulatory obligations. There are a further 56 activities associated with non-regulated functions (Service Level Agreements with Power Networks, Remote Operations, Water Services, and Territory Generation) and eight activities for Business Management.

Of the 70 regulated activities listed, 52 relate solely to PWC's system control functions, 17 relate solely to its market operator functions and one relates to both the system control and market operator functions.¹

The time that is allocated by the Power System Controller's employees to regulated activities needs to relate to activities that the Power System Controller is obligated to provide under the legislative and regulatory framework rather than to services provided to Power Networks and Territory Generation, regardless as to whether the service is provided under an SLA.

¹ In its submission, Territory Generation identified 14 activities that appear to relate to the market operator functions.

Territory Generation queried whether three of the activities identified as system control functions relate to regulatory obligations. The three activities queried are:

- maintaining wall boards (19)
- witnessing code compliance testing and assessing evaluation (23)
- scoping code compliance testing (24).²

We discussed the allocation of time to these activities with PWC. There was no evidence to suggest that the allocation of time to these activities is materially incorrect.

Number of charges

PWC originally proposed a single system control charge, consistent with the structure of the current charge, to recover the costs associated with the system control and the market operator functions.

There is merit in disaggregating the proposed system control charge into a system control charge and a market operator charge. The costs of doing so would be immaterial as the activities associated with the system control function and the market operator function are easily separable. The benefits associated with disaggregating the charges are:

1. Further development of the market is envisaged. If there is a separate charge for the market operator functions, there is greater transparency as to the cost impacts of any market developments.
2. The system control functions are more mature than the market operator functions. A system control charge could be determined over a longer period of time (subject to some form of price control mechanism) than a market operator charge.
3. The system control functions are undertaken on behalf of customers in each of the three regulated systems, while the market operator functions are only being undertaken by the Power System Controller on behalf of customers in the Darwin-Katherine area. Under an efficient cost recovery regime that minimises cross subsidies, the costs associated with the market operator functions undertaken by the Power System Controller should only be recovered from customers in the Darwin-Katherine area.
4. Customers in Alice Springs and Tennant Creek are already paying Territory Generation for market operator functions and therefore should not also be paying for market operator functions in the Darwin-Katherine area.

As the benefits associated with separating the proposed system control charge into a separate system control charge and a market operator charge are likely to exceed the costs, we recommend that there be two charges:

- A system control charge that is paid by all customers supplied by the Darwin-Katherine, Alice Springs and Tennant Creek regulated systems.
- A market operator charge that is paid by customers supplied by the Darwin-Katherine regulated system only.

We met with PWC on 17 January 2019 to discuss its original submission. Following that meeting, it revised its submission, proposing two charges over a five-year period (2019-20 to 2023-24). The revised proposed charges are set out in Table ES 1.

TABLE ES 1 PWC'S REVISED PROPOSED CHARGES (NOMINAL)

	2019-20	2020-21	2021-22	2022-23	2023-24
System control charge (\$/kWh)	0.0051	0.0052	0.0050	0.0051	0.0052
Market operator charge (\$/kWh)	0.0005	0.0005	0.0013	0.0013	0.0013

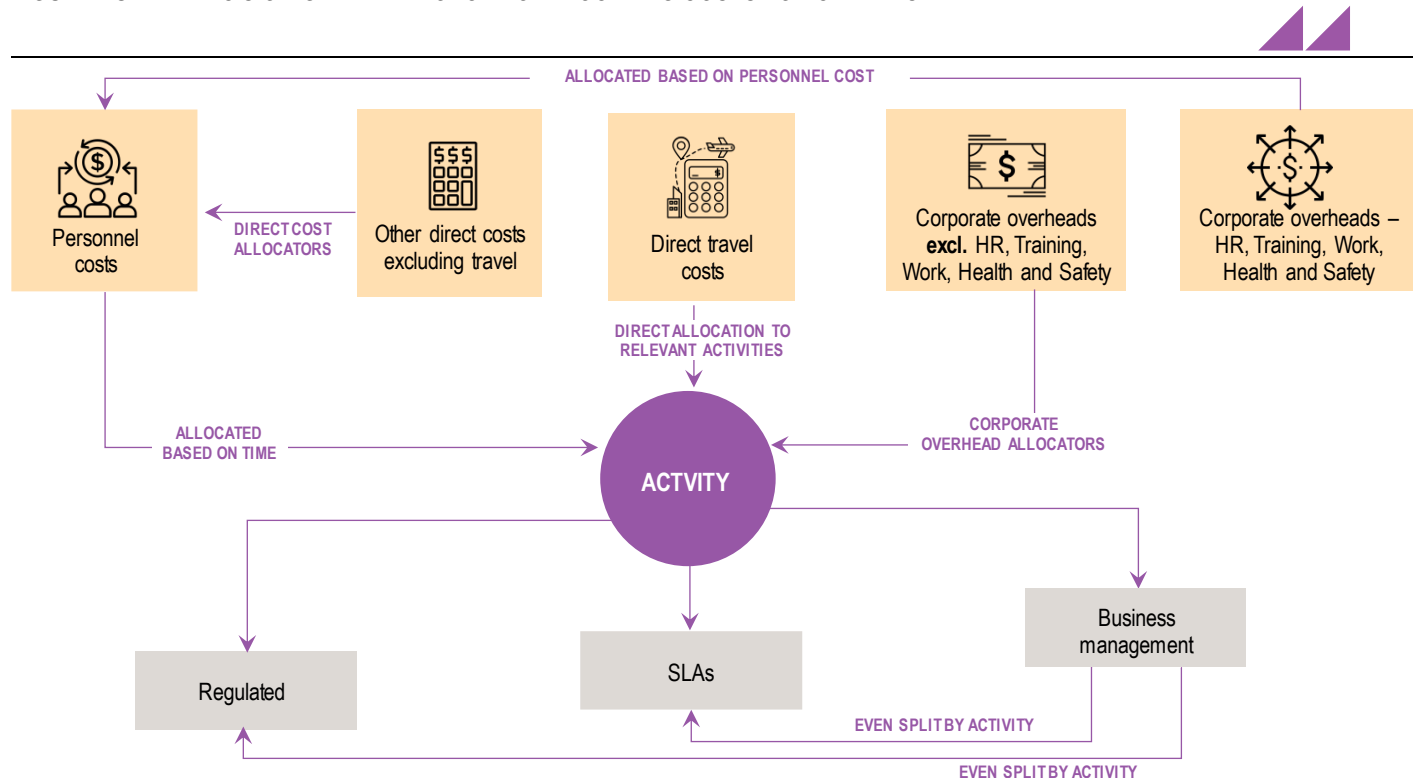
SOURCE: PWC'S REVISED SUBMISSION

² Territory Generation's submission on the Commission's Issues Paper, pages 1-2

Methodology for allocating costs to activities

The methodology originally adopted by PWC to allocate costs to activities is illustrated in Figure ES 1.

FIGURE ES 1 PWC'S ORIGINAL APPROACH TO ALLOCATING COSTS TO ACTIVITIES



Note: SLA – Service Level Agreement

SOURCE: ACIL ALLEN ANALYSIS

We are of the view that the allocation of most of the direct costs to activities is appropriate. However, materials, external service agreements, property charges and other costs were originally allocated on the basis of Full Time Equivalent (FTE) salary cost. PWC agreed with our view that these costs are driven more by FTE numbers than FTE costs.

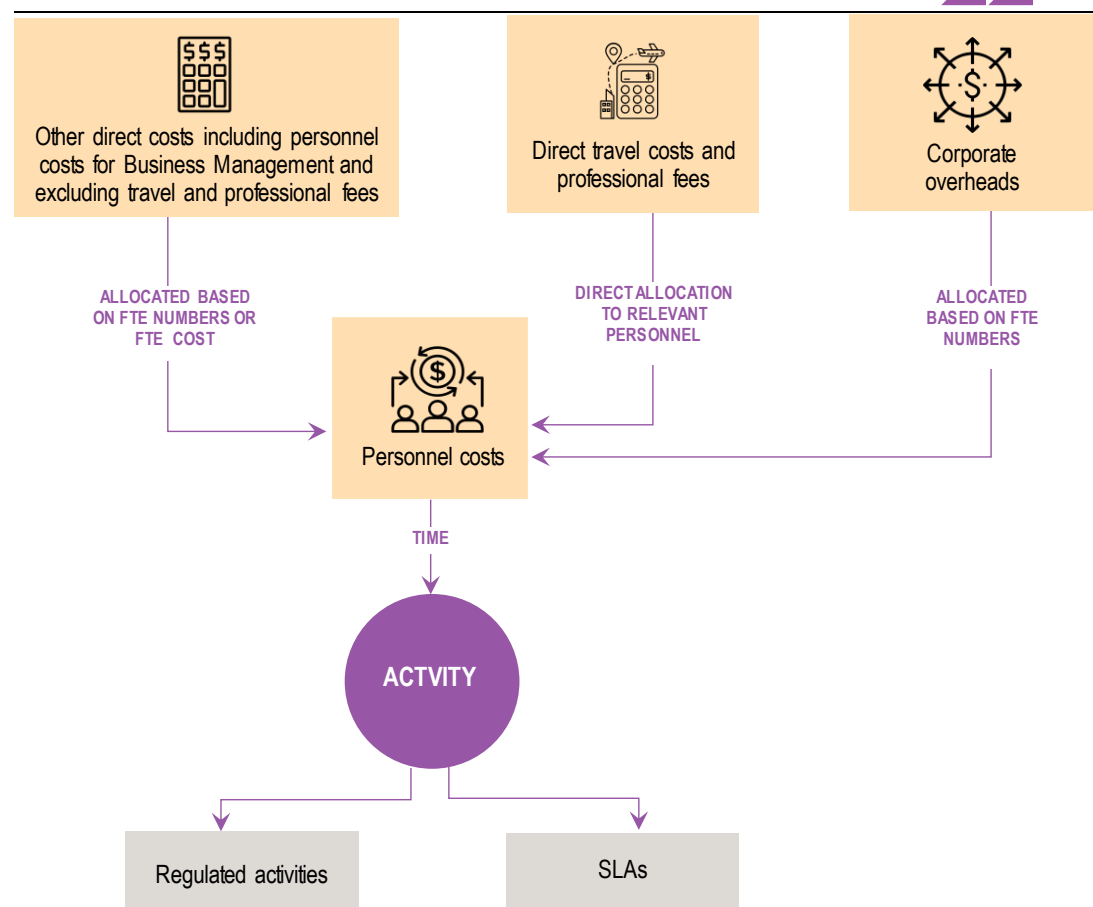
We identified a number of issues with the way in which PWC originally allocated corporate overheads to activities.

1. There are a number of corporate overhead costs that are allocated evenly across all activities, except those in the Business Management group of activities. An even allocation of corporate overheads results in some less time intensive activities bearing a very high proportion of corporate overheads while very time intensive activities bear a relatively small proportion of corporate overheads. This does not appear to be a reasonable approach.
2. The basis for allocating some of the corporate overheads to activities is inconsistent with the methodology for allocating corporate overheads to the Power System Controller.
3. The final step in the allocation of costs to activities is to allocate the costs, which have been allocated through this process to Business Management, evenly across all the other activities. This approach is illogical. For example, each person allocates a proportion of their time to leave. The costs associated with this time are then allocated evenly across all activities. The costs associated with an employee's leave are recovered equally from activities which have little of that employee's time attributed to them as those which have a lot of time attributed to them.

The resulting allocation of costs to activities is complex, with many steps in the allocation process, and results in an illogical allocation of costs to activities. While 78.4 per cent of the Power System Controller's personnel costs are allocated to regulated activities, only 63.3 per cent of the corporate overheads are allocated to regulated activities.

PWC changed its cost allocation methodology for its revised submission. PWC's revised approach to allocating costs to activities is illustrated in Figure ES 2.

FIGURE ES 2 PWC'S REVISED ALLOCATION OF COSTS TO ACTIVITIES



Note: SLA – Service Level Agreement; FTE – Full Time Equivalent
SOURCE: ACIL ALLEN ANALYSIS

The allocation of direct costs to employees is similar to the original approach.

The total corporate overheads are allocated to the employees that are not designated as Business Management on the basis of FTE numbers. While this allocator does not align with the allocator that is used to allocate the costs to System Control for all costs, it appears to be a reasonable approximation.

The personnel costs associated with six employees that have been designated as Business Management are allocated to the other employees on the basis of FTE numbers. While this may be appropriate for some of these employees, it is not appropriate for the Senior Real Time Operations Manager and the Control Room Coordinators. These two roles clearly relate to the system control functions but some of their costs will be allocated to the market operator function by adopting this approach. The costs associated with these roles should not be allocated to the roles that relate only to market operations.

We recommend that the personnel costs associated with the Senior Real Time Operations Manager and the Control Room Coordinators, which have been allocated to Business Management, not be allocated to personnel with market operator functions only.

Allocation of corporate overheads to the Power System Controller

PWC's original submission indicates that corporate overheads are allocated to the Power System Controller function in accordance with the Cost Allocation Methodology approved by the AER.³ The submission also includes a table that sets out the corporate overhead activities and causal allocators.⁴ The table of corporate overhead allocators included in the submission is inconsistent with the Cost Allocation Methodology approved by the AER.

We were provided with a more detailed breakdown of the corporate overhead costs, the basis for allocating those costs. The more detailed breakdown indicated that the cost allocation used in preparing the original submission is inconsistent with the Cost Allocation Methodology approved by the AER and the causal allocators as set out in PWC's submission.

While PWC submitted that it used the Cost Allocation Methodology approved by the AER to allocate corporate overheads to its Power Networks business for the purposes of the 2019-24 electricity distribution determination process, it appears to have used the same cost allocation methodology as set out in the more detailed breakdown.

PWC engaged EY to audit its cost allocation methodology. EY concluded that:

The allocation methodology applied in the Corporate Cost Model is consistent with the methodology set out in the AER-approved CAM.⁵

However, it found that there were a few differences between PWC's cost allocation methodology and the Cost Allocation Methodology approved by the AER. EY was of the view that the differences it identified were not inconsistent with the Cost Allocation Methodology approved by the AER.

The cost allocation methodology that is used to determine the system control charges should be consistent with the methodology that is used by PWC to allocate overhead costs to other parts of the business. If different cost allocation methodologies are used, then PWC could recover more than 100 per cent of the costs across different business units and different regulatory processes.

There are currently differences between PWC's current allocation of corporate overheads and the Cost Allocation Methodology approved by the AER.

If the AER requires PWC to align its cost allocation methodology with that approved by the AER in its final determination on PWC's distribution revenues for the 2019-24 period (due in April 2019), we recommend that any change in the allocation of corporate overheads to the Power System Controller arising from that decision should be made to the system control charges.

Costs associated with a proposed new Control and Administrative Centre

PWC originally submitted costs for a proposed new Control and Administrative Centre of \$670,000 in 2019-20 and \$681,063 in 2020-21. The rationale for moving to a new centre is to address the issues associated with the current facility at Hudson Creek, which include:

- the current facility is relatively old with restricted ability to renovate or extend the current building
- lack of a suitable back-up facility in the event that the current control centre is extensively damaged or destroyed
- a number of single points of failure in the SCADA infrastructure
- perception that an independent System Control function continues to be controlled/managed by PWC.⁶

PWC has not yet developed a business case for the proposed new Control and Administrative Centre. A proposal submitted by a developer for the new centre indicates that it would be completed within 7-9 months from signing of the lease agreement. It therefore does not appear feasible for a new

³ PWC submission, *Review of system control charges and associated funding issues*, October 2018, page 35

⁴ *ibid*

⁵ EY, *Cost Allocation Method – Independent Report, Power and Water Corporation*, 20 November 2018, page 5

⁶ PowerWater, *Utilities Commission submission, Review of System Control Charges and Associated Funding Issues*, October 2018, pages 18-19 and 33-34

Control and Administrative Centre to be operational by 1 July 2019. PWC has indicated that a more likely commencement date is 1 July 2021.

Given the uncertainty of the timing for the new proposed Control and Administrative Centre, we recommend that the costs associated with the new centre be excluded from the system control charges at this stage, with the costs passed through when there is more certainty.

Proposed energy consumption forecasts

PWC's submission indicates that it has adopted the energy consumption forecasts prepared by AEMO for the purposes of PWC's distribution determination for the 2019-24 period,⁷ as the basis for converting the Power System Controller's costs into a charge.

The energy consumption forecast used by PWC to estimate the system control charge is consistent with AEMO's forecast.

In its draft determination on PWC's distribution determination, the AER was of the view that AEMO's demand forecasting methodology is:

... likely to be reasonable and unbiased.⁸

However, it raised three concerns in relation to the forecasts:

1. The timing and quantum of forecast block loads included had not been justified.
2. The forecasts may not fully account for the NT Government's Roadmap to Renewables, improvements in energy efficiency, and increasing PV and/or energy storage penetration.
3. The forecasts did not account for the latest available forecasts of macroeconomic driver inputs such as GSP and population forecasts.

The AER expected PWC to update its forecasts and/or provide additional information to validate key inputs and assumptions⁹ when submitting its revised proposal.

In response to the AER's draft determination, AEMO reviewed its energy consumption forecasts in November 2018. AEMO did not update the energy consumption forecasts as its:

... assessment of the impacts of updated driver variables indicates that changes to demand and energy consumption would be immaterial and within historical variability observed at the overall level covering PWC's three regulated power systems.¹⁰

AEMO provides independent energy consumption forecasts for the National Electricity Market (NEM) and each of the NEM regions. Its forecasting methodology has been developed over an extended period, and has been subject to extensive consultation and scrutiny. As found by the AER, AEMO's forecasts are likely to be reasonable and unbiased.

As the energy consumption forecast used by PWC to estimate the system control charge is consistent with AEMO's forecast, we are of the view that the energy consumption forecast used by PWC is fair and reasonable for the purposes of determining the system control charge.

PWC's revised submission included separate charges for the system control functions and the market operator functions, with both charges calculated based on the energy consumption in the three regulated systems. We recommend that the market operator charge is calculated based on the energy consumption forecast in the Darwin-Katherine area only as the charge only applies in that area.

This has the effect of increasing the market operator charge relative to that proposed in PWC's revised submission.

⁷ PWC submission, *Review of system control charges and associated funding issues*, October 2018, page 22

⁸ Australian Energy Regulator, *Draft decision – Power and Water Corporation Distribution determination 2019-24, Attachment 5: Capital expenditure*, September 2018, page 5-95

⁹ *ibid*

¹⁰ Australian Energy Market Operator, *Forecasting Advice for the Revised Regulatory Proposal*, November 2018, page 3

A pricing or revenue cap mechanism

Under a revenue cap, if the revenue recovered from customers in one year is greater (or lesser) than the required revenue for that year, the charge in a subsequent year¹¹ is adjusted so that less (or more) revenue is forecast to be recovered from customers than the required revenue for that subsequent year. That is, the charge will be lower (or higher) than it would otherwise be. This is administered through an overs and unders account.

The system control and market operator costs will not vary with changes in energy consumption. However, if the energy consumption is less (or more) than forecast, the revenue recovered will be less (or more) than the required revenue. Under a revenue cap, the Power System Controller's revenues are adjusted so that, over time, the required revenues are recovered in full. Under a price cap, the Power System Controller will under (or over) recover revenue relative to the required revenue. There is thus an incentive to under forecast energy consumption so as to over recover revenue.

The advantage of a price cap is that it is easier to administer than a revenue cap.

To reduce the administrative costs associated with a revenue cap, a materiality band could apply to the overs and unders account. The over or under in each year could be added to the overs and unders account. Only when the amount in the overs and unders account is outside a pre-determined band, say five per cent of required revenue, would the required revenue be adjusted by the amount in the overs and unders account. This would smooth any volatility from year to year but allow the charge to be increased (or decreased) if the energy consumption forecast is systematically either too low or too high.

On balance, we recommend the use of a revenue cap mechanism to regulate the system control and market operator charges over time, with an overs and unders account which is only applied when the balance in the overs and unders account exceeds a materiality band.

This ensures that the charge is adjusted if there is a material variation between forecast and actual demand, particularly if there is a material variation in demand in response to the Territory Government's *Roadmap to Renewables*.

We have previously recommended that any costs associated with the proposed new Control and Administrative Centre be excluded from the required revenue until there is greater certainty on the timing and costs for the new centre. We have also recommended that additional market operator costs proposed by PWC from 2021-22 be excluded until there is greater certainty as to the timing and scope of the transition from the Interim Northern Territory Electricity Market (I-NTEM) to the NTEM. When there is greater certainty, the required revenue for the system control and market operator charges could be adjusted accordingly for each of the remaining years in which a determination has previously been made.

We therefore recommend that the revenue cap mechanisms allow for an increase in the charges to include the costs associated with the proposed new Control and Administrative Centre and additional market operator costs. This same mechanism could allow for a decrease in the charges if the System Controller's market operation functions are reduced.

We also recommend that the revenue cap mechanism include:

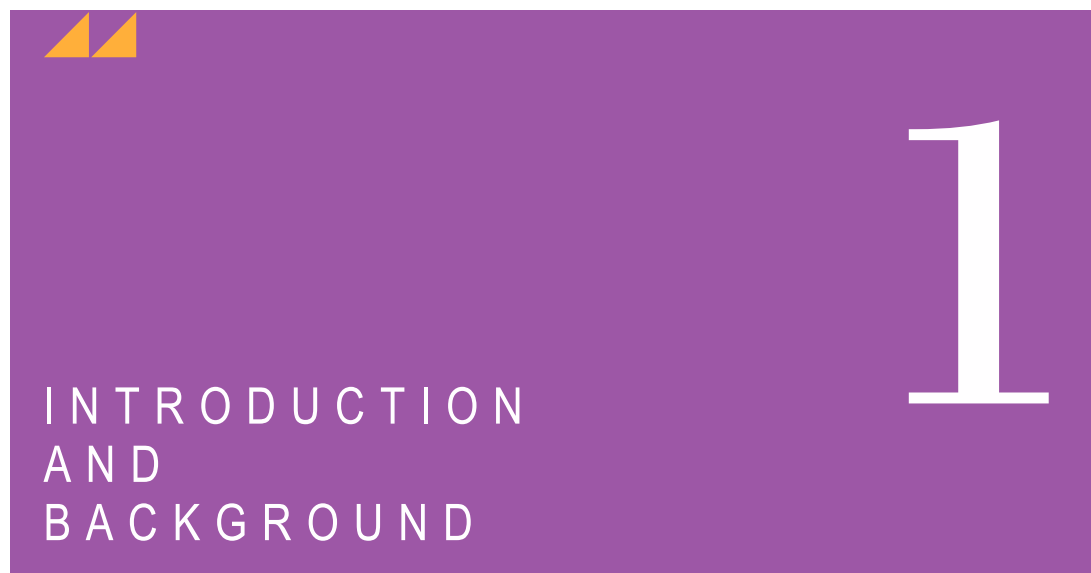
- annual CPI escalation based on the data series published by the Australian Bureau of Statistics¹²
- an X factor determined so that the net present value (NPV) of the smoothed revenue requirement over the period is equal to the NPV of the unsmoothed revenue requirement over the period, the nominal WACC as determined by the AER for Power Networks is used to discount the revenues (5.22 per cent)¹³, the X-factor is the same in each year, and the revenue in the final year (2023-24) is the same as the unsmoothed revenue requirement in that year.

¹¹ The year after the following year. The charges are not adjusted in the following year as the actual data is not known when the charges are being set for that year.

¹² CPI All Groups, Weighted Average of Eight Capital Cities, December quarter

¹³ Post tax revenue model for AER's draft determination on PWC's revenue for the 2019-24 period, available at <https://www.aer.gov.au/networks-pipelines/determinations-access-arrangements/power-and-water-corporation-determination-2019-24/draft-decision>

A proposed mechanism is set out in section 5.2.



The Utilities Commission (the Commission) is currently reviewing revised system control charges submitted by the Power and Water Corporation (PWC) and has engaged ACIL Allen Consulting (ACIL Allen) to assess PWC's submission and make recommendations.

The legislative framework for the system control functions is described in section 1.1, and the background to the review of the system control charge is provided in section 1.2. Our scope of work is set out in section 1.3, and the purpose and structure of this report is provided in section 1.4.

1.1 Legislative framework

The Commission is an independent statutory body with a range of regulatory responsibilities in the Territory as set out in the *Utilities Commission Act* (the Act).

The Commission has granted a system control licence to PWC, thereby making it the Power System Controller as defined in the *Electricity Reform Act* (the ER Act). Section 38(1) of the ER Act states that the Power System Controller has the function of:

... monitoring and controlling the operation of the power system with a view to ensuring that the system operates reliably, safely and securely in accordance with a technical code (the System Control Technical Code) prepared by the system controller and approved by the Utilities Commission.

The Power System Controller is responsible for:

- setting the target frequency of the Territory's power system and arranging for ancillary services to maintain that frequency
- establishing operating protocols for generation dispatch and to maintain power system security
- operating the power system in such a way that:
 - the system transfers electricity securely and efficiently
 - the number of interruptions customers experience is minimised
 - the system can be restored as soon as reasonably practical after an interruption
- ensuring that equipment used on the network meets the applicable requirements.

The Power System Controller's responsibilities apply in the three regulated power systems in the Territory – Darwin-Katherine, Alice Springs and Tennant Creek.

In August 2013 the Northern Territory Government embarked on a reform of the energy sector in the Territory. One aspect of that reform was to establish a wholesale electricity market. In July 2014 the Government decided to implement an Interim Northern Territory Electricity Market (I-NTEM) for Darwin-Katherine, which came into being in May 2015.

The Electricity Reform (Administration) Regulations provide for the Power System Controller to be the operator of the I-NTEM¹⁴ and for the System Control Technical Code to provide for the operation of the wholesale electricity market in Darwin-Katherine.¹⁵ The market operator has the following functions:

- administering the market participant registration process
- managing electricity market settlements arrangements
- publishing various market data on a daily basis
- preparing and publishing plans, specifications and designs for market operation processes and systems necessary for I-NTEM to operate efficiently
- consulting with stakeholders before relevant documents are published.¹⁶

Section 39 of the ER Act states that a Power System Controller is entitled to impose and recover charges relating to the operations of system control, subject to the approval of the Commission.

Section 8.6 of the System Control Technical Code governs these charges. It states:

- (a) *The Power System Controller services attract charges which shall be recovered from System Participants in receipt of those services.*
- (b) *The charge will be recovered as a "Postage Stamp Amount" applied to all energy transfers in the relevant power system.*
- (c) *The charge is based on the revenue energy meters of customers and is as approved by the Utilities Commission.*
- (d) *The charge shall be paid monthly.*

1.2 System control charge

PWC currently recovers \$0.001 towards the cost of providing system control and market operation services for each kWh of electricity it 'delivers' to customers. This amount was set by the Commission in 2000 and has remained constant in nominal terms since then. In real terms it has fallen to around 63.4 per cent of the 2000 value over that time.¹⁷

While this real decline has occurred, the number and complexity of the system control functions required has increased. This leaves the amount customers are charged for system control services substantially below cost reflective levels. Under-recovery of system control costs leads to inefficiency and cross subsidy in electricity tariffs, which means that the current situation is likely to be inconsistent with the National Energy Objective and with section 2 of the Act, both of which require electricity market settings to be efficient.

It also creates financial challenges for PWC.

For these reasons, in October 2018 PWC made a submission¹⁸ to the Commission that the system control charges should be reviewed. With substantial changes anticipated in the next few years, associated with ongoing development of the NTEM, PWC submitted that:

- system control charges should be increased from \$0.001/kWh to \$0.0057/kWh (i.e. a 570% increase)
- the cost base for the review, and for future system control charges, should be its actual 2017-18 costs and 2017-18 Statement of Corporate Intent
- its cost allocation model be adopted (this reflects an update from the 2014 model approved by the Commission)
- this and future determinations set system control costs in real terms
- there be further engagement with market participants, customers and stakeholders to inform future price control mechanisms and tariff reform
- there be annual reviews of the system control charges from now on
- system control charges should be subject to a price cap.

¹⁴ Regulation 3F

¹⁵ Regulation 5A(2)

¹⁶ System Control Technical Code, section A6.1

¹⁷ Based on All Groups CPI for Darwin, from March 2000 to September 2018.

¹⁸ <http://www.utilicom.nt.gov.au/PMS/Publications/UC-SUB-SC-PWC-CHARGEREV-PNOV18.pdf>, accessed 17 January 2019

In November 2018, the Commission published an Issues Paper on PWC's submission¹⁹, which raised five key questions. The Commission sought stakeholder comments on whether:

- the particular activities PWC has identified in its submission accurately reflect the roles and responsibilities it has in its capacity as Power System Controller
- the demand projections PWC proposes to use to convert total costs to a charge per kWh are appropriate given the Government's commitment to *Roadmap to Renewables*²⁰
- system control charges should be covered by a price or revenue cap (i.e. the form of control)
- system control charges ought to be levied equally across the three regulated systems in the Territory
- the system control charge should be levied on generators, retailers or both in combination
- timing issues including:
 - whether it is appropriate for new charges to commence from 1 July 2019
 - the way future price changes should be addressed, including frequency of future reviews and the appropriate treatment of charges between reviews.

In its submission on the Commission's Issues Paper, EDL noted that the step increase in the system control charge proposed by PWC is significant.²¹

1.3 Scope of work

Following the release of the Issues Paper, the Commission engaged ACIL Allen to assess, and make recommendations, where appropriate, on:

- PWC's identification of regulated system control functions, noting that some of the regulated system control functions are limited to the Darwin-Katherine electricity system (i.e. not a regulatory function for the Alice Springs and Tennant Creek electricity systems)
- PWC's recommendation that the system control charge be consistent across all three regulated systems despite some functions being limited to the Darwin-Katherine system
- PWC's methodology for allocating costs to activities, to verify that costs are correctly attributed to the Power System Controller's regulated and unregulated functions, and that the cost allocation model is well constructed (i.e. logical, accurate, repeatable)
- PWC's allocation of corporate overheads to the Power System Controller
- PWC's inclusion of costs associated with a proposed new Control and Administrative Centre in the system control charge
- the appropriateness of using the proposed energy consumption forecasts provided to PWC by the Australian Energy Market Operator (AEMO) for PWC's distribution determination for determining the system control charge, and if not appropriate, a better alternative
- whether a pricing or revenue control mechanism would be appropriate and if so, a proposed mechanism, setting out why this mechanism is appropriate.

1.4 Purpose and structure of this report

The purpose of this report is to describe our methodology for undertaking a review of the system control charges submitted by PWC, our findings from the review, and our recommendations.

The rest of this report is structured as follows:

- Chapter 2 describes the methodology for undertaking a review of the system control charges submitted by PWC
- Chapter 3 discusses the system control costs forecast by PWC, including the direct costs incurred, the overhead costs that are allocated to the system control function, the activities undertaken by system control and the allocation of costs to the activities.

¹⁹ Utilities Commission, *2018 System Control Charges Review*, November 2018

²⁰ The Roadmap to Renewables was released in September 2017. It sets out a roadmap to achieve an increase in the proportion of renewable energy generation in the Territory from around 4 per cent in 2017 to 50 per cent by 2030, while maintaining the affordability of energy supply and without compromising network reliability and security.

²¹ EDL's submission on the Commission's Issues Paper, page 1

- Chapter 4 discusses the magnitude and structure of the charges proposed, including the basis for allocating the charge to customers and the demand forecasts.
- Chapter 5 discusses the regulatory approach to setting the system control charges.
- Our findings and recommendations are summarised in chapter 6.



Our review of the system control charges submitted by PWC was undertaken by:

1. reviewing PWC's October 2018 submission to the Utilities Commission on a *Review of System Control Charges and Associated Funding Issues*
2. reviewing relevant publicly available information
3. reviewing additional material provided by PWC
4. reviewing submissions made in response to the Commission's Issues Paper
5. meetings with PWC and other stakeholders.

Further detail on these steps is provided in the following sections.

2.1 Relevant publicly available information

We reviewed the following information that was available in the public domain:

- PWC's Cost Allocation Methodology that was approved by the Australian Energy Regulator (AER) in January 2018²²
- the demand forecasts prepared by AEMO for the purposes of determining PWC's distribution revenues²³
- other documentation relating to the AER's determination of PWC's distribution revenues for the 2019-24 regulatory period²⁴
- PWC's responses to the AER's Regulatory Information Notices²⁵
- PWC's 2018-19 Statement of Corporate Intent.²⁶

²² <https://www.aer.gov.au/system/files/AER%20Decision%20-%20Power%20and%20Water%20Corporation%20Cost%20Allocation%20Method%20-%20January%202018%20pdf.pdf>, accessed 8 January 2019

²³ <https://www.aer.gov.au/system/files/PWC%20-%2004.4P%20AEMO%20PWC%20Maximum%20Demand%2C%20Energy%20Consumption%20and%20Connection%20Forecasts%20-%20Sep%202017.pdf> and <https://www.aer.gov.au/system/files/PWC%20-%2003.2P%20-%20Forecasting%20Advice%20for%20the%20Revised%20Regulatory%20Proposal%20-%2029%20November%202018.pdf> accessed 8 January 2019

²⁴ <https://www.aer.gov.au/networks-pipelines/determinations-access-arrangements/power-and-water-corporation-determination-2019-24> accessed 18 January 2019

²⁵ <https://www.aer.gov.au/networks-pipelines/network-performance/power-and-water-corporation-rin-responses> accessed 18 January 2019

²⁶ https://www.powerwater.com.au/data/assets/pdf_file/0020/162092/sci-2018-19.pdf, accessed 8 January 2019

2.2 Additional material provided by PWC

In response to our questions, PWC provided additional confidential material to support its submission. This included:

- the Excel spreadsheets underpinning the tables in its submission
- an Excel spreadsheet that allocated PWC's corporate overheads to the Power System Controller
- Excel spreadsheets that allocated the direct costs and corporate overheads by activity
- a proposal for the proposed new Control and Administrative Centre
- information on the equipment required for the proposed new Control and Administrative Centre.

Following our meeting with PWC on 17 January 2019, PWC submitted revised costs for the Power System Controller.

2.3 Submissions made in response to the Commission's Issues Paper


We considered submissions made in response to the Commission's Issues Paper by the retailers, Jacana Energy and Rimfire Energy, and generators, Territory Generation and EDL.

2.4 Meetings with PWC and other stakeholders

We met with PWC and other stakeholders to discuss the submissions that had been, or were being, made, as set out in Table 2.1.

TABLE 2.1 SCHEDULE OF MEETINGS

Date	Organisation	Representatives
16 January 2019	Utilities Commission	Kimberlee McKay
	Jacana Energy	David Brown
		Roger Dunstan
	Territory Generation	Neil Hay
		Andrew Roberts
17 January 2019	PWC, System Control	Malcolm Conway
		Amelia Farmilo
		Mary Powell
	Utilities Commission	Kimberlee McKay



3

THE POWER SYSTEM CONTROLLER'S COSTS

The Power System Controller undertakes a range of functions. Some of these are regulated, such as the system control functions and market operator functions, and some of these are unregulated. The Power System Controller currently has or has had System Level Agreements (SLA) with other parts of PWC (Power Networks, Remote Operations and Water Services) and with Territory Generation.

This Chapter considers the costs that are forecast to be incurred by the Power System Controller to undertake these functions. Section 3.1 considers PWC's cost forecasts and section 3.2 considers PWC's allocation of the costs to activities. Section 3.3 discusses the costs that we recommend be recovered through the system control charge.

3.1 Cost forecasts

PWC proposes to base its system control charge on escalating the actual costs incurred in 2017-18, including personnel costs, other direct costs and corporate overheads, plus any incremental costs that are estimated to be incurred. The forecast costs associated with the Power System Controller's regulated functions, as set out in PWC's original submission, are replicated in Table 3.1.

TABLE 3.1 FORECAST COSTS ASSOCIATED WITH THE POWER SYSTEM CONTROLLER'S REGULATED FUNCTIONS

	2017-18 Actual	2018-19 Forecast	2019-20 Forecast	2020-21 Forecast
Personnel costs	6,339,860	6,449,300	6,515,225	6,731,925
Other direct costs	639,949	1,451,300	1,387,475	1,300,575
Total direct costs	6,979,809	7,900,600	7,902,700	8,032,500
Corporate overheads	2,030,142	2,153,800	1,899,100	1,723,400
New Control and Administrative Centre	0	0	670,000	681,063
Total costs	9,009,951	10,054,400	10,471,800	10,436,963

SOURCE: PWC SUBMISSION, REVIEW OF SYSTEM CONTROL CHARGES AND ASSOCIATED FUNDING ISSUES, OCTOBER 2018, PAGE 26

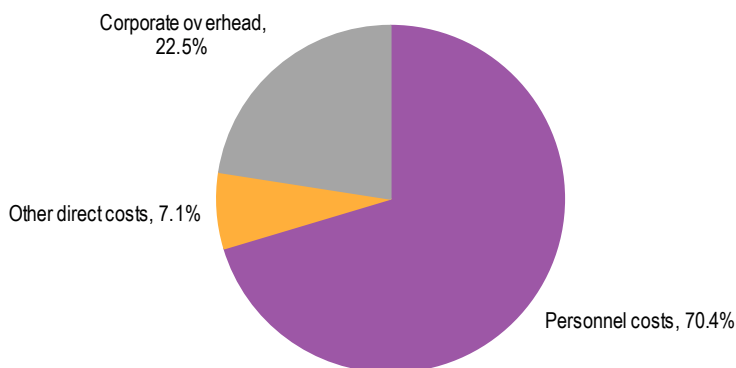
In its submission to the Commission's Issues Paper, Jacana Energy has questioned the efficiency of the costs proposed by PWC, in particular the corporate overheads.²⁷

Figure 3.1 provides a breakdown of the regulated costs in 2017-18. It illustrates that personnel costs comprise the majority of the regulated costs (70.4 per cent), while corporate overheads represent a significant component (22.5 per cent). Other direct costs, which include, IT and communications,

²⁷ Jacana Energy's submission on the Commission's Issues Paper, page 4

vehicle costs, travel costs, training costs, insurance, materials, telecommunications, property charges and other costs, are a smaller proportion of the regulated costs (7.1 per cent).

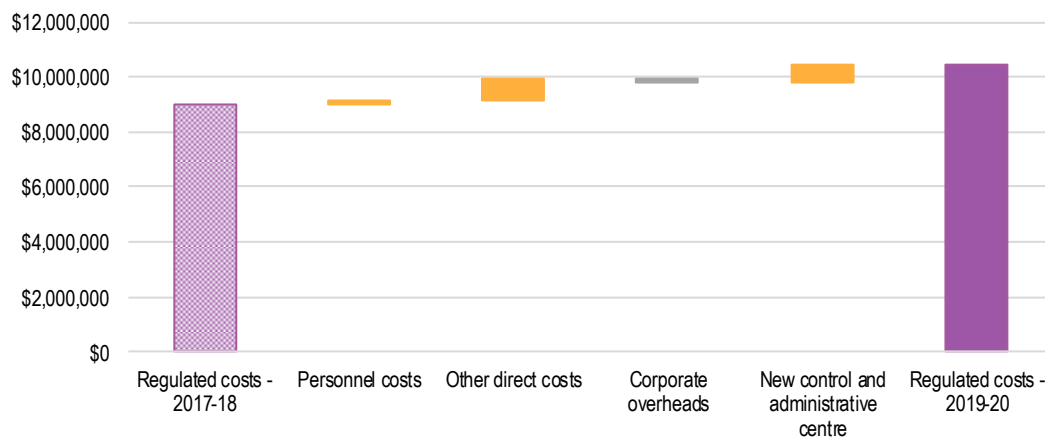
FIGURE 3.1 BREAKDOWN OF REGULATED COSTS, 2017-18, ORIGINAL SUBMISSION



SOURCE: ACIL ALLEN ANALYSIS

Figure 3.2 illustrates the increase in the regulated costs from 2017-18 actual to 2019-20 budget. It indicates that the most significant increases in costs from 2017-18 to 2019-20 relate to other direct costs and the proposed new Control and Administrative centre. There is a modest increase in personnel costs (1.4 per cent per annum) and a decrease in corporate overheads.

FIGURE 3.2 INCREASE IN REGULATED COSTS FROM 2017-18 ACTUAL TO 2019-20 BUDGET, ORIGINAL SUBMISSION



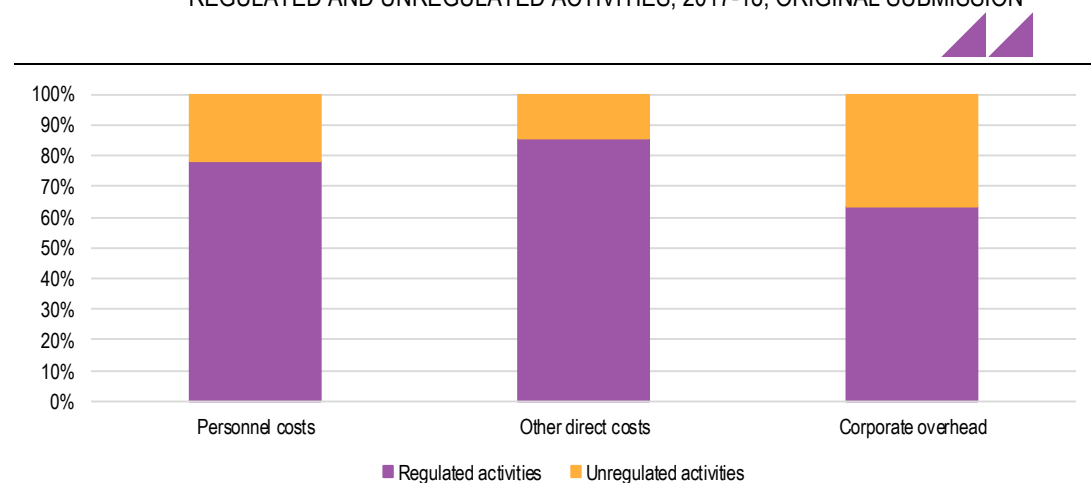
SOURCE: ACIL ALLEN ANALYSIS BASED ON PWC SUBMISSION, REVIEW OF SYSTEM CONTROL CHARGES AND ASSOCIATED FUNDING ISSUES, OCTOBER 2018, PAGE 25

Table 3.2 and Figure 3.3 provide a breakdown of the Power System Controller’s total costs between regulated and unregulated activities for 2017-18. There is an approximately 80:20 split in the personnel costs between regulated activities and unregulated activities. There is a slightly higher allocation of direct costs to regulated activities and a significantly lower allocation of corporate overheads to regulated activities.

TABLE 3.2 BREAKDOWN OF THE POWER SYSTEM CONTROLLER'S COSTS BETWEEN REGULATED AND UNREGULATED ACTIVITIES, 2017-18, ORIGINAL SUBMISSION

	Total costs	Regulated activities	Unregulated activities
	\$	% of total costs	% of total costs
Personnel costs	8,090,508	78.4%	21.6%
Other direct costs	746,962	85.7%	14.3%
Total direct costs	8,837,470		
Corporate overheads	3,204,918	63.3%	36.7%
Total costs	12,042,388		

SOURCE: ACIL ALLEN ANALYSIS BASED ON PWC SUBMISSION, REVIEW OF SYSTEM CONTROL CHARGES AND ASSOCIATED FUNDING ISSUES, OCTOBER 2018, PAGE 27

FIGURE 3.3 BREAKDOWN OF THE POWER SYSTEM CONTROLLER'S COSTS BETWEEN REGULATED AND UNREGULATED ACTIVITIES, 2017-18, ORIGINAL SUBMISSION

SOURCE: ACIL ALLEN ANALYSIS BASED ON PWC SUBMISSION, REVIEW OF SYSTEM CONTROL CHARGES AND ASSOCIATED FUNDING ISSUES, OCTOBER 2018, PAGE 27

The personnel costs are discussed further in section 3.1.1, the other direct costs in section 3.1.2, the corporate overheads in section 3.1.3 and the proposed new Control and Administrative Centre in section 3.1.4.

3.1.1 Personnel costs

As illustrated in Figure 3.1, personnel costs comprise a significant proportion of the Power System Controller's regulated costs (70.2 per cent) in PWC's original submission, with approximately 78.2 per cent of the total personnel costs allocated to regulated activities.

PWC is forecasting to progressively decrease the number of real time operators over the 2017 to 2021 period, from 28 to 22. The extent to which PWC can reduce the number of staff is limited by the lack of economies of scale in its System Control operations and the need to man the System Control centre around the clock. That said, PWC's submission provided for 27 real time operators in 2018-19, 2019-20 and 2020-21, that is, no decrease in the number of real time operators. The only change was a reduction by one in the number of market operations analysts.

Territory Generation noted that PWC had proposed a reduction in the number of staff, but notes that the personnel costs are increasing.²⁸ The total personnel costs for the Power System Controller increased by 0.8 per cent from 2018-19 to 2019-20 and 3.1 per cent from 2019-20 to 2020-21.

In its revised submission, PWC submitted personnel costs over a five-year period – 2019-20 to 2023-24. It reduced the number of real-time operators to 22 in each of those years, but increased the

²⁸ Territory Generation's submission on the Issues Paper, page 2

number of other personnel.²⁹ In aggregate, the total number of personnel reduced from 48 in 2019-20 and 47 in 2020-21 in the original submission to 46 in both years in the revised submission, and the total personnel costs reduced by 4.9 per cent relative to the original submission in 2019-20 and 2020-21.

In its revised submission, PWC included six additional personnel from 2021-22 to undertake market operator functions at a cost of around \$890,000 in 2021-22.

We recommend that these personnel be removed from the cost forecasts until there is greater certainty on the transition from the I-NTEM to the NTEM.

PWC increased its direct labour costs by 3.0 per cent each year. This is a higher labour price growth rate than assumed by the AER as part of its draft revenue determination for PWC's Power Networks business. The AER increases labour costs in line with labour price growth forecasts produced for each state's utility sector by Deloitte Access Economics (DAE).³⁰ DAE's real labour price growth forecasts, as used in the AER's draft determination for PWC's Power Networks business for the 2019-24 period, are set out in Table 3.3.

TABLE 3.3 LABOUR PRICE GROWTH FORECAST, UTILITIES SECTOR, NORTHERN TERRITORY

	2019-20	2020-21	2021-22	2022-23	2023-24
Labour price growth (real)	-0.2%	-0.2%	0.3%	0.5%	0.6%

SOURCE: DELOITTE ACCESS ECONOMICS, LABOUR PRICE GROWTH FORECASTS PREPARED FOR THE AUSTRALIAN ENERGY REGULATOR, 19 JULY 2018, TABLE VII, PAGE XIV

We recommend that the labour costs be presented in real terms with salaries assumed to increase in line with DAE's labour price growth forecast and escalated by CPI each year, rather than presenting the costs in nominal terms inclusive of PWC's assumption of CPI. This will eliminate the potential for any variance between the actual and forecast CPI.

3.1.2 Other direct costs

In PWC's original submission, there is a substantial increase in other direct costs from 2017-18 to 2018-19 and subsequent years. The detailed spreadsheets provided by PWC indicate that there has been a double counting of around \$600-700k in costs, which has been confirmed by PWC.

This error was corrected in PWC's revised submission. The total direct costs in 2019-20 decreased by 12.0 per cent from \$938k to \$825k with a significant reduction in professional fees (\$102k) and contract labour (\$50k), offset by increases in other costs based on PWC's actual costs for the July-December 2018 half year.

The direct costs are forecast to increase by 8.7 per cent from 2019-20 to 2020-21 largely due to an increase in professional fees from \$450k to \$526k, which aligns with PWC's original forecast for professional fees.

The direct costs are forecast to decrease by 26.5 per cent from 2020-21 to 2021-22 with a decrease in professional fees from \$526k to \$250k offset by CPI increases in costs (2.5 per cent) and increases in personnel-related costs (IT & Communications, training costs and materials) for the additional personnel to undertake market operations functions.

The AER has assumed that non-labour costs will increase in line with CPI in its draft decision on the revenue for PWC's Power Networks business for the 2019-24 period.³¹

We recommend that the non-labour costs be presented in real terms with charges escalated by CPI each year. This will eliminate the potential for any variance between the actual and forecast CPI.

²⁹ Two Control Room Coordinators were added to improve efficiency of control room operations, two graduate engineers were added to prepare for integration into the NTEM and an assistant was added (although the salary cost for the assistant was previously included).

³⁰ Australian Energy Regulator, *Draft decision – Power and Water Corporation, Distribution determination, Attachment 6: Operating expenditure*, page 6-65

³¹ *ibid*, page 6-66

3.1.3 Corporate overheads

This section first considers the total corporate overhead costs and then considers the allocation of corporate overhead costs to the Power System Controller.

Corporate overhead costs

In 2017-18 the Power Networks business was allocated \$19.4 million of PWC's corporate overheads, of which:

- \$13.4 million was for standard control distribution services
- \$1.7 million was for alternative control distribution services
- \$3.4 million was capitalised
- \$1.0 million was for unregulated services.³²

As part of the determination of its revenues for the 2019-24 period, PWC allocated \$8.2 million (in \$2018-19) of corporate overheads to standard control distribution services as operating expenditure³³, with \$1.31 million of efficiency gains included³⁴ and an additional \$3.3 million of corporate overheads capitalised.³⁵

Using partial performance indicator (PPI) benchmarking and trends, the AER assessed PWC's corporate overheads as very high.³⁶ However, it made no adjustment to the proposed expenditure in its draft decision. It stated that it had:

*... not identified any efficiency reductions to Power and Water's corporate overheads at this point. Power and Water's corporate overhead opex has decreased over time, and it has programs in place to examine opportunities for further efficiencies.*³⁷

However, it also noted that:

*We may examine this cost category in more detail once Power and Water has provided its revised proposal, updated and audited [Regulatory Information Notices] RINs and details of further progress to its [Target Operating Mode] TOM program.*³⁸

As the AER has not adjusted PWC's total corporate overheads as part of its draft determination on PWC's distribution revenue for the 2019-24 period, it would not be reasonable to adjust the corporate overheads for the purposes of the system control charge.

However, if the AER reduces PWC's corporate overheads as part of its final determination on PWC's distribution revenue for the 2019-24 period (due in April 2019), we recommend that the corporate overheads allocated to the System Control function should reduce in line with that adjustment.

Allocation of corporate overhead costs to the Power System Controller

PWC's original submission indicated that corporate overheads are allocated to the Power System Controller function in accordance with the Cost Allocation Methodology approved by the AER.³⁹ The submission also includes a table that sets out the corporate overhead activities and causal allocators.⁴⁰ The table of corporate overhead allocators included in the submission is inconsistent with the Cost Allocation Methodology approved by the AER.

³² PWC's Category Analysis RIN template for 2017-18, available at <https://www.aer.gov.au/networks-pipelines/network-performance/power-and-water-corporation-rin-responses>

³³ Australian Energy Regulator, *Draft decision – Power and Water Corporation Distribution determination 2019-24, Attachment 6: Operating expenditure*, Table 6.4

³⁴ PWC's SCS Opex Model, 29 November 2018, available at <https://www.aer.gov.au/networks-pipelines/determinations-access-arrangements/power-and-water-corporation-determination-2019-24/revised-proposal>

³⁵ Australian Energy Regulator, *Draft decision – Power and Water Corporation Distribution determination 2019-24, Attachment 6: Operating expenditure*, page 6-47

³⁶ *Ibid*, Table 6.4

³⁷ *Ibid*, page 6-56

³⁸ *Ibid*

³⁹ PWC submission, *Review of system control charges and associated funding issues*, October 2018, page 35

⁴⁰ *Ibid*

We requested, and were provided with, a more detailed breakdown of the corporate overhead costs, the basis for allocating corporate overhead costs and the value of the cost allocators (total for PWC and for System Control). The more detailed breakdown indicated that the cost allocation used in preparing the original submission is inconsistent with the Cost Allocation Methodology approved by the AER and the causal allocators as set out in PWC's submission, as summarised in Table 3.4.

TABLE 3.4 COMPARISON OF COST ALLOCATION METHODOLOGIES

Cost category	Cost Allocation Methodology approved by the AER	PWC original submission	Confidential PWC spreadsheet
Customer and billing	Full Time Equivalent (FTE) and Contractors	No allocator specified	FTE and Contractors
Finance			
	General FTE	FTE	FTE and Contractors
	Overdraft Debt level	No allocator specified	Nil
	Accounts payable Invoice numbers	Invoice numbers	Nil
IT			
	FMS, GIS, Maximo, RMS Licence numbers		"OPS Driver", FTE and Contractors
	Business Intelligence system, Datasmart system, EDMS, Internet administration, Intranet administration, Service desk, Small systems administrator	Licence numbers	"OPS Driver", "CON Driver", FTE and Contractors
	BSIM administrations	FTE and Contractors	FTE and Contractors
HR			
	Training	FTE and Contractors	FTE
	HR Operations and Employee Relations	FTE	FTE; FTE and Contractors
Insurance			
	Workcover insurance	FTE	Number of legal activities
	General insurance	Assets	Number of legal activities
	Vehicle insurance	Vehicle numbers	Number of legal activities
Other corporate			
	Work, Health and Safety	FTE and Contractors	No allocator specified
	Facilities; Managing Director; Sustainable Energy	FTE and Contractors	FTE
	Risk, Audit & Compliance	FTE and Contractors	FTE; Engagement of external consultants
	Executive; Records Management	Revenue	FTE and Contractors
	Board; Procurement; Communications and Marketing	Revenue	FTE
	General Counsel	Legal instructions	Number of legal activities
	Design & Diagnostic, Ministerial and Client Relations	Forecast share	FTE
	Wholesale Markets	Forecast share	Time
	Environmental Services	Environmental	No allocator specified
	Project Management Office	PMO	No allocator specified

Cost category	Cost Allocation Methodology approved by the AER	PWC original submission	Confidential PWC spreadsheet
Strategy & Planning	Even	No allocator specified	Even; FTE and Contractors
Economics & Regulation	Time	FTE	Time

SOURCE: POWERWATER, COST ALLOCATION METHOD FOR DISTRIBUTION SERVICES, 1 JULY 2019, PAGES 33-34; POWERWATER, UTILITIES COMMISSION SUBMISSION, REVIEW OF SYSTEM CONTROL CHARGES AND ASSOCIATED FUNDING ISSUES, OCTOBER 2018, PAGE 35

While PWC submitted that it used the Cost Allocation Methodology approved by the AER to allocate corporate overheads to its Power Networks business for the purposes of the 2019-24 electricity distribution determination process, it appears to have used the same cost allocation methodology as set out in the confidential PWC spreadsheet.

PWC engaged EY to audit its cost allocation methodology. EY concluded that:

The allocation methodology applied in the Corporate Cost Model is consistent with the methodology set out in the AER-approved CAM.⁴¹

However, it found that there were a few differences between PWC's cost allocation methodology and the Cost Allocation Methodology approved by the AER, which are provided in Box 3.1. EY was of the view that the differences it identified were not inconsistent with the Cost Allocation Methodology approved by the AER.

BOX 3.1 FINDINGS FROM EY REVIEW OF PWC'S COST ALLOCATION METHODOLOGY

- The costs for the Training Unit (Cost Centre "TUN") are allocated to the Corporate Cost Model on a combination of "FTE" and "FTE + Contractors". The cost allocator for training listed in Appendix 1 of the AER approved [Cost Allocation Methodology] CAM is "FTE and Contractors". This has been interpreted as FTE and Contractors, or one or the other. This is considered to be consistent with the AER-approved CAM given the nature of the costs, some of which are only applicable for internal employees;
- There are some cost allocators in the model that are consistent with the AER-approved CAM. However, in each case, the value(s) for the transactions and/or cost centres are null or sum to nil for 2017-18 (at the cost centre level). Thus, there are no costs allocated to the Operational Business Units, and thus no inconsistency with the AER-approved CAM; and
- Appendix 1 of the AER-approved CAM lists "licences" as the allocator for the following IT systems: FMS, GIS, Maximo and RMS. The allocator applied in the Corporate Cost Model is "OPS Driver", which is a composite allocator derived from licence numbers, hardware and labour. The primary driver for the value of the "OPS Driver" allocator is licence numbers and, hence, "OPS Driver" is considered to be consistent with "Licences" as an allocator.

SOURCE: EY, COST ALLOCATION METHOD – INDEPENDENT REPORT, POWER AND WATER CORPORATION, 20 NOVEMBER 2018, PAGE 5

The cost allocation methodology that is used to determine the system control charges should be consistent with the methodology that is used by PWC to allocate overhead costs to other parts of the business. If different cost allocation methodologies are used, then PWC could recover more than 100 per cent of the costs across different business units and different regulatory processes.

There are currently differences between PWC's actual allocation of corporate overheads and the Cost Allocation Methodology approved by the AER.

If the AER requires PWC to align its cost allocation methodology with that approved by the AER in its final determination on PWC's distribution revenues for the 2019-24 period, we recommend that any change in the allocation of corporate overheads to the Power System Controller arising from that decision should be made to the system control charges.

In its revised submission, the corporate overheads allocated to System Control in 2019-20 decreased by 28 per cent from \$3.66 million in its original submission to \$2.63 million. The total corporate

⁴¹ EY, *Cost Allocation Method – Independent Report, Power and Water Corporation*, 20 November 2018, page 5

overheads are forecast to decrease by around 4.0 per cent in nominal terms from 2019-20 to 2020-21 and by around 2.0 per cent in nominal terms in each subsequent year.

The corporate overheads have been escalated:

.. in line with CPI as forecast by the Department of Treasury and Finance in the 2017-18 Mid-Year Report, or in line with goods and services contract provisions as appropriate.⁴²

The CPI assumed by PWC in its 2018-19 Statement of Corporate Intent are set out in Table 3.5.

TABLE 3.5 CPI ASSUMED BY PWC IN ITS STATEMENT OF CORPORATE INTENT

	2019-20	2020-21	2021-22
CPI	1.9%	2.4%	2.5%

SOURCE: POWER AND WATER CORPORATION, STATEMENT OF CORPORATE INTENT 2018-19, PAGE 33

We have assumed that a CPI of 2.5 per cent is used in each year following 2021-22.

We recommend that the corporate overheads be presented in real terms and escalated by CPI each year, rather than presenting the costs in nominal terms inclusive of PWC's assumption of CPI. This will eliminate the potential for any variance between the actual and forecast CPI.

Territory Generation's queries on the corporate overhead costs

Territory Generation sought further explanation on the corporate overheads, in particular:

- why is BSIM so high
- what are 'Customer & Stakeholder' activities
- what are 'Retail' activities.⁴³

BSIM includes the costs associated with PWC's IT systems including its financial management systems, geographical information systems and asset management systems, the costs of which are allocated on the basis of the number of FTEs and contractors and an "OPS Driver", and intranet administration, internet administration and service desk, the costs of which are allocated on the basis of the number of FTEs and Contractors, an "OPS Driver" and a "CON Driver".

Customer and Stakeholder activities include Ministerial and client relations, and communications and marketing, the costs of which are allocated on the basis of the number of FTEs and Contractors.

Retail activities are customer and billing, the costs of which are allocated on the basis of the number of FTEs and contractors.

3.1.4 Proposed new Control and Administrative centre

PWC originally submitted costs for a proposed new Control and Administrative Centre of \$670,000 in 2019-20 and \$681,063 in 2020-21. The rationale for moving to a new centre is to address the issues associated with the current facility at Hudson Creek, which include:

- the current facility is relatively old with restricted ability to renovate or extend the current building
- lack of a suitable back-up facility in the event that the current control centre is extensively damaged or destroyed
- a number of single points of failure in the SCADA infrastructure
- perception that an independent System Control function continues to be controlled/managed by PWC.⁴⁴

In its submission on the Commission's Issues Paper, Jacana Energy was of the view that there was insufficient information in PWC's submission to have an informed opinion on the viability or otherwise

⁴² Power and Water Corporation, *Statement of Corporate Intent 2018-19*, page 33

⁴³ Territory Generation's submission on the Commission's Issues Paper, pages 2-3

⁴⁴ PowerWater, *Utilities Commission submission, Review of System Control Charges and Associated Funding Issues*, October 2018, pages 18-19 and 33-34

of the existing arrangements or if the proposed expenditure is prudent and efficient. It supported a rigorous review of the proposal to ensure that customers' interests are protected.⁴⁵

Territory Generation is of the view that a new Control and Administrative Centre is:

... a reasonable requirement given that the state of the existing facilities appears to be inadequate.

However, Territory Generation understands that the new Control and Administrative Centre is not well advanced as a project and thus will not be operational by 1 July 2019.⁴⁶

PWC has not yet developed a business case for the proposed new Control and Administrative Centre. A proposal submitted by a developer for the new centre indicates that it would be completed within 7-9 months from signing of the lease agreement. It therefore does not appear feasible for a new Control and Administrative Centre to be operational by 1 July 2019. PWC has indicated that a more likely commencement date is 1 July 2021.

PWC has assumed that the facility will be leased with the fit-out costs, control room equipment and communications equipment amortised over a ten-year period. The rate of return on the investment has not explicitly been stated. We would expect that the magnitude and treatment of costs would be scrutinised in far more detail in the process of developing a comprehensive business case.

It is currently assumed that 90 per cent of the costs for the new centre will be paid for by System Control through regulated charges and 10 per cent will be paid for by Power Networks.

We recommend that the allocation of the costs for the new Control and Administrative Centre to System Control and Power Networks be more robust.

PWC has assumed that no costs will be avoided by moving to a new Control and Administrative centre – the Hudson Creek facility will be retained as a back-up facility. From our discussions with PWC, the existing back-up facilities at Hammond Creek are extremely rudimentary so any costs avoided by not using those facilities will be immaterial.

Given the uncertainty of the timing for the new proposed Control and Administrative Centre and the magnitude and treatment of the associated costs, we recommend that the costs associated with the new centre be excluded from the system control charge at this stage, with the costs passed through when there is more certainty.

PWC provided two versions of its revised submission – one including the proposed new Control and Administrative Centre and one excluding the centre. For the purposes of this report, we have used the version of the submission that excludes the costs associated with the proposed new Control and Administrative Centre.

3.2 Allocation of costs to activities

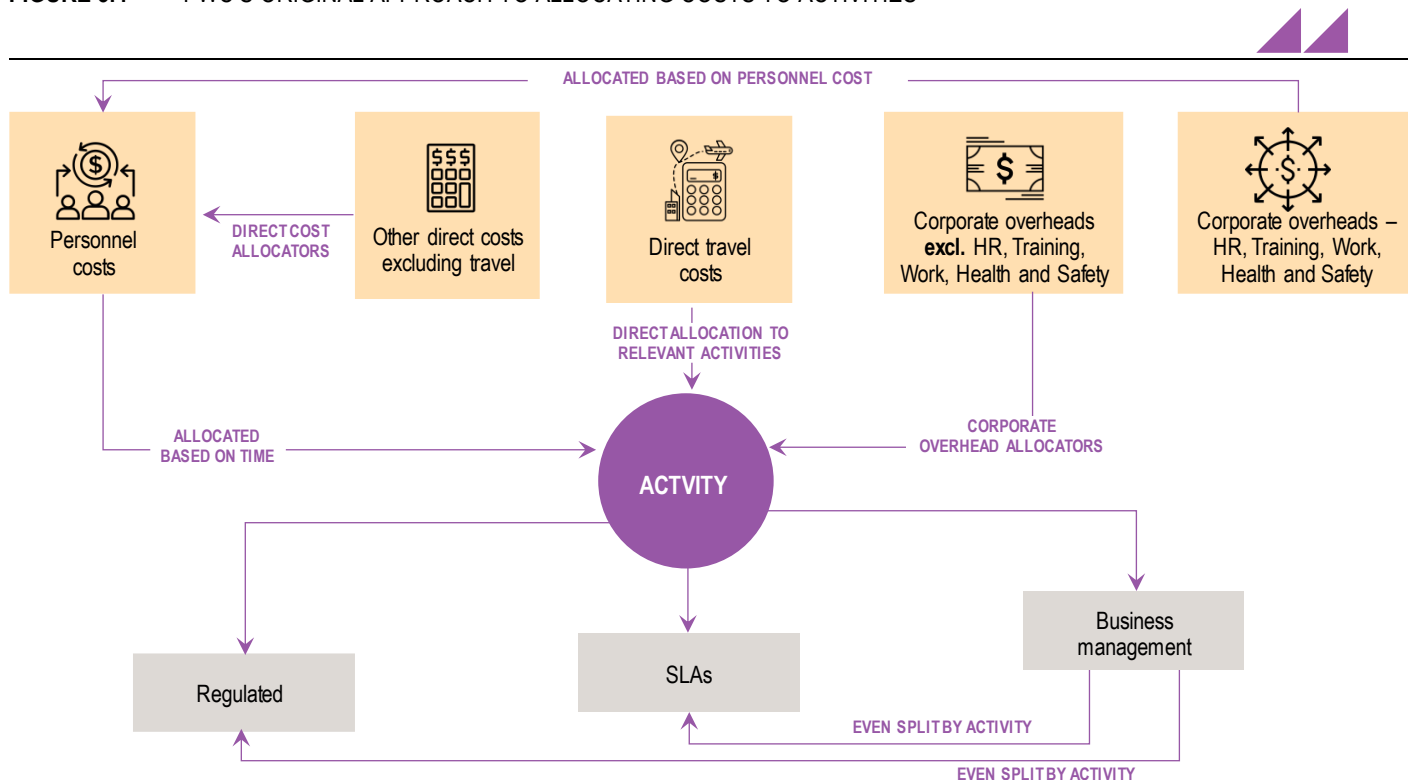
The Power System Controller undertakes 70 activities to meet its regulatory obligations, which are set out in PWC's submission and replicated in Appendix A. There are 29 activities associated with the Power Networks SLA, seven activities associated with each of the Remote Operations SLA and the Water Services SLA, and five activities associated with the Territory Generation SLA, and eight activities for Business Management.

An overview of PWC's original approach to allocating costs to the 126 activities and thereby to regulated and unregulated charges is provided as Figure 3.4.

⁴⁵ Jacana Energy's submission on the Commission's Issues Paper, page 2

⁴⁶ Territory Generation's submission on the Commission's Issues Paper, page 3

FIGURE 3.4 PWC'S ORIGINAL APPROACH TO ALLOCATING COSTS TO ACTIVITIES



Note: SLA – Service Level Agreement
SOURCE: ACIL ALLEN ANALYSIS

The activities to which time and costs are allocated are discussed in section 3.2.1, the allocation of time by personnel to activities is discussed in section 3.2.2, and the allocation of costs to activities as set out in PWC's original submission is discussed in section 3.2.3.

Following our meeting with PWC, it revised its submission to change the way in which costs are allocated to activities. This is discussed in section 3.2.4.

3.2.1 Activities to which time and costs are allocated

We have reviewed PWC's list of activities against the references to the System Control Technical Code as set out in its submission.⁴⁷ In reviewing the activities we note that:

- There is not a one to one mapping of regulatory obligations to activities. For example, activities 22 (witnessing black start testing and assessing black start capability), 23 (witnessing code compliance testing and assessing evaluation) and 24 (scoping code compliance testing) all reference section 6.24 of the System Control Technical Code.
- The terminology in the activity description does not align with the System Control Technical Code. For example, activity 28 refers to preliminary fault reports while section 7.4.3 of the System Control Technical Code refers to initial reports.
- The distinction between some activities is only evident by referencing the System Control Technical Code. For example, activity 50 (Code review) relates only to System Control functions. Review of the Code in relation to market operator functions is activity 60 (NTEM Development).
- Some of the references to the System Control Technical Code do not exist, for example, there is no clause 3.2.1(c)(4) (which is referenced by activity 21) or clause 6.2.4 (which is referenced by activity 56).

⁴⁷ PWC submission, *Review of system control charges and associated funding issues*, October 2018, page 26

Of the 70 activities listed, 52 relate solely to its system control functions, 17 relate solely to its market operator functions and one relates to both the system control and market operator functions.⁴⁸ The market operator functions reference Attachment 6 of the System Control Technical Code, which sets out the duties of the Market Operator. The list in Appendix A of this report identifies which activities relate to its system control functions and which relate to its market operator functions.

PWC also provides unregulated activities to Power Networks and Territory Generation, as well as to Water Services and Remote Operations. The time that is allocated by the Power System Controller's employees to regulated activities needs to relate to activities that the Power System Controller is obligated to provide under the legislative and regulatory framework rather than to services provided to Power Networks and Territory Generation, regardless as to whether the service is provided under an SLA.

Territory Generation has queried whether three of the activities identified as system control functions relate to regulatory obligations. The three activities queried are:

- maintaining wall boards (19)
- witnessing code compliance testing and assessing evaluation (23)
- scoping code compliance testing (24).⁴⁹

These are discussed in the following sections.

Maintaining wall boards

PWC references System Control Technical Code clauses 3.3.1(b) and (c) as the basis for identifying maintaining wall boards as a regulated activity. These clauses state that the power system security responsibilities of the Power System Controller include to:

- (b) *monitor the operating status of a power system;*
- (c) *co-ordinate Network operational personnel in undertaking certain activities and operations and monitoring activities of a power system;*

Territory Generation is of the view that the Code requires the Power System Controller to adopt a monitoring and coordination role, rather than to maintain the wall boards.⁵⁰

We discussed this concern with PWC. PWC was of the view that the time allocated to the activity related only to its regulatory obligations⁵¹ and that Power Networks incurs significantly higher costs to maintain the wall boards.

We note that the personnel costs allocated to this activity represent approximately 0.7 per cent of the total personnel costs.

There is no evidence to suggest that the allocation of time to this activity is materially incorrect.

Code compliance testing

PWC references System Control Technical Code clause 6.24 as the basis for identifying witnessing and scoping Code compliance testing as regulated activities. This clause states that:

- consistent with the Network Technical Code, each generator must periodically perform tests on each generating unit to confirm its performance capability
- the Power System Controller determines the nature and periodicity of such tests
- the performance of the tests must be negotiated and coordinated with the Power System Controller
- the Power System Controller may request that a generator review and amend Performance Capability Information if it does not believe a generating unit meets that performance capability.

⁴⁸ In its submission, Territory Generation identified 14 activities that appear to relate to the market operator functions.

⁴⁹ Territory Generation's submission on the Commission's Issues Paper, pages 1-2

⁵⁰ *Ibid*, page 1

⁵¹ Confirmed in an email from Mary Powell dated 22 January 2019

Territory Generation has raised a number of concerns:

1. The sections of the Code referenced relate more to capability or capacity testing of generators, rather than Code compliance testing.
2. When System Control undertakes Code Compliance Testing activities on behalf of the Network Operator, the costs are rightly recoverable under clause 7.5.1(i) of the Network Technical Code.
3. The costs of generator code compliance should be recovered from the generator for which those services are performed.⁵²

It is clear to us that the Power System Controller has obligations under the System Control Technical Code that relate to performance capability tests. However, we question whether the Power System Controller has any obligations related to **witnessing** performance capability tests. While the Network Technical Code entitles the Network Operator to witness tests⁵³ and provides the Network Operator with the right of entry and inspection to a generating unit⁵⁴, neither the System Control Technical Code nor the Network Technical Code entitle the Power System Controller to witness tests or provide the Power System Controller with the right to entry or inspection to a generating unit.

When we queried PWC about their regulatory obligations, they referred to their broad responsibility to maintain power system security. They indicated that issues have only been identified through their witnessing of tests. If they did not witness tests, then power system security may be compromised.

The confidential information provided to us by PWC indicates that it separately allocates time to additional activities under the Power Networks SLA that relate to generator testing. The question then is whether the employees that allocated their time to activities have appropriately allocated their time between the activities that are undertaken to meet the Power System Controller's regulatory obligations and those that are undertaken on behalf of Power Networks.

PWC has assured us that the time has been appropriately allocated to these activities.⁵⁵ We note that the time allocated to the two activities is not material – in aggregate, the time allocated represents around 0.5 per cent of the personnel costs.

There is therefore no evidence to suggest that the allocation of time to these activities is materially incorrect.

To provide clarity on the allocation of time to activities for the next review of system control (and market operator) charges, we recommend that:

1. **more detailed descriptions of activities are provided to provide greater clarity between those activities that are regulated functions and those activities that are not**
2. **the description of the activity aligns with the wording in the System Control Technical Code**
3. **to the extent possible, there is a 1:1 mapping between regulatory obligations and activities.**

3.2.2 Allocation of time to activities

The cost allocation process is driven by the allocation of time by employees to activities. This is generally done by specifying the time on the basis of:

- x hours per day
- x hours or days per week
- x hours or days per month
- x hours or days a year.

This time is then converted to “hours per week” and the proportion of an employee's time spent on each activity is then calculated.

We identified three issues associated with the process undertaken for the original submission.

⁵² Territory Generation's submission on the Commission's Issues Paper, pages 1-2

⁵³ Sections 5.4.1 and 5.6.2

⁵⁴ Section 5.7.1

⁵⁵ Email from Mary Powell dated 22 January 2019

Firstly, in some cases, a standard 37.5 hour week is assumed and in others a standard 35 or 40 hour week is assumed. For example, leave is consistently calculated on the basis of five 37.5 hour weeks per year. But in another case, two days a year is assumed to be 14 hours a year.

Secondly, a month is assumed to have four weeks. As a result, one hour a month is 0.25 hours per week.

Thirdly, there is not a consistent approach for accounting that each employee works 47 weeks per year rather than 52 weeks per year.

Partly as a result of these inconsistencies, the average hours worked by employee is generally more than a standard week.

We recommend that a consistent approach be adopted for allocating time to activities. This will change the proportion of time that is allocated by each employee to each activity, albeit that the differences will not be material.

In its revised submission, PWC changed the way in which it allocates time to activities. Rather than all employees allocating time to business management activities (predominantly leave), it has allocated the following personnel to business management:

- Business & Strategy Manager
- Executive Assistant
- General Manager (50 per cent)
- Senior Real Time Operations Manager (30 per cent)
- Control Room Coordinators.

This change has eliminated most of the inconsistencies with the allocation of time to activities. The remaining inconsistencies are unlikely to be material.

3.2.3 Allocation of costs to activities – original submission

Direct costs

The direct costs, other than travel costs, were allocated to each employee based on the allocators as set out in Table 3.6 in the original submission.

TABLE 3.6 ALLOCATION OF DIRECT COSTS (OTHER THAN TRAVEL COSTS) TO EMPLOYEES, ORIGINAL SUBMISSION

Cost category	Direct cost allocator	Recommendation
IT and Communications	FTEs	No change
Vehicle costs, Insurance	Allocated to employees with vehicles	No change
Training costs	FTE salary cost	No change
Professional fees, contract labour	Allocated to Engineer	No change
Insurance	Allocated to employees with vehicles	No change
Materials, External service agreements, Property charges, Other costs	FTE salary cost	Change allocator to FTEs

SOURCE: ACIL ALLEN ANALYSIS BASED ON DETAILED INFORMATION PROVIDED BY PWC

The allocation of IT and Communications costs on the basis of FTEs, and of vehicle costs and insurance (which is related to vehicles) on the basis of employees with a vehicle, appears reasonable.

Training costs could be allocated on the basis of FTE numbers or FTE salary cost. PWC is of the view that the training costs incurred by employees are a function of FTE salary cost rather than FTE numbers – the higher the salary for an employee, the more expensive the training undertaken by that employee.

PWC advised that professional fees and contract labour are incurred to support the Engineer. It is therefore reasonable that these costs be allocated to the Engineer.

PWC allocates the costs associated with materials, external service agreements, property charges and other costs on the basis of FTE salary cost. The external service agreements relate to IT and communications services supplied by the Department of Corporate and Information Services (DCIS). We suggested, and PWC agreed, that these costs would more reasonably be driven by employee numbers rather than employee costs.

The direct travel costs are allocated evenly across five activities that incur travel:

- regulated activities:
 - witnessing black start testing and assessing black start capability
 - witnessing code compliance testing and assessing evaluation
- non-regulated activities:
 - generator test witness
 - generator test validation
- business management – office administration / meetings.

There is no evidence to suggest that this allocation is inappropriate.

Corporate overheads

In the original submission, the corporate overhead costs that are allocated to the Power System Controller on the basis of the cost allocators set out in Table 3.4, were then allocated to activities within System Control based on the allocators set out in Table 3.7.

TABLE 3.7 ALLOCATION OF CORPORATE OVERHEADS TO ACTIVITIES, ORIGINAL SUBMISSION

Cost category	Allocation of corporate overhead to activity	Allocation of corporate overheads to System Control
Customer and billing	Direct allocation to relevant activities	FTE and Contractors
Finance		
General		FTE
Overdraft	Personnel plus other direct costs	Nil
Accounts payable		Nil
IT		
FMS, GIS, Maximo, RMS		“OPS Driver”, FTE and Contractors
Business Intelligence system, Datasmart system, EDMS, Internet administration, Intranet administration, Service desk, Small systems administrator	Personnel plus other direct costs	“OPS Driver”, “CON Driver”, FTE and Contractors
BSIM administrations	Nil	FTE and Contractors
HR		
Training	Personnel costs	FTE
HR Operations and Employee Relations	Personnel costs	FTE; FTE and Contractors
Insurance		
Workcover insurance	Allocated evenly across all activities, except Business Management	FTE and Contractors
General insurance		Nil
Vehicle insurance		Vehicle numbers
Other corporate		

Cost category	Allocation of corporate overhead to activity	Allocation of corporate overheads to System Control
Work, Health and Safety	Personnel costs	FTE and Contractors
Facilities; Sustainable Energy, Managing Director, Risk, Audit & Compliance; Executive; Board	Allocated evenly across all activities, except Business Management	FTE and Contractors
Records Management; Procurement	Personnel plus other direct costs	FTE and Contractors
Communications and Marketing	Direct allocation to relevant activities	FTE and Contractors
General Counsel	Allocated evenly across all activities, except Business Management	Legal instructions
Design & Diagnostic	Personnel plus other direct costs	FTE and Contractors
Ministerial and Client Relations	Direct allocation to relevant activities	FTE and Contractors
Wholesale Markets	Personnel plus other direct costs	Time
Environmental Services	Allocated evenly across all activities, except Business Management	Environmental
Project Management Office	Direct allocation to relevant activities	FTE and Contractors
Strategy & Planning	Allocated evenly across all activities, except Business Management	Even; FTE and Contractors
Economics & Regulation	Personnel plus other direct costs	Time

Note: FTE – Full Time Equivalent

SOURCE: POWERWATER, COST ALLOCATION METHOD FOR DISTRIBUTION SERVICES, 1 JULY 2019, PAGES 33-34

There are a number of issues with the approach taken by PWC to allocate corporate overhead costs to activities in its original submission.

Firstly, there are a number of corporate overhead costs that are allocated evenly across all activities, except those in the Business Management group of activities. These include Insurance; General Counsel; Facilities; Sustainable Energy; Managing Director, Executive and Board; Risk, Audit & Compliance; Environmental Services; and Strategy & Planning. The direct costs associated with these activities range from less than \$10,000 to more than \$6 million. An even allocation of corporate overheads results in some less time intensive activities bearing a very high proportion of corporate overheads while very time intensive activities bear a relatively small proportion of corporate overheads. This does not appear to be a reasonable approach.

Secondly, the basis for allocating some of the corporate overheads to activities is inconsistent with the methodology for allocating corporate overheads to the Power System Controller. For example, while corporate training costs are allocated to the Power System Controller on the basis of the number of FTEs, corporate training costs are allocated to System Control activities based on personnel costs.

Thirdly, there are some corporate overheads that are allocated to the System Control function on the basis of an allocator which are then directly attributed to specific activities. In some cases, the activity may have a label that implies that it relates to the corporate overhead being allocated. However, the basis of allocating the corporate overhead to the System Control function may not be related to the activity, and the corporate overhead may be significantly higher than the direct costs associated with the activity.

For example, corporate overheads labelled retail are allocated to the System Control function on the basis of the number of FTEs and contractors. The majority of these costs (85 per cent) are then

allocated to the activity “Customer / Retailer inquiries”. This results in an allocation of corporate overheads that is more than four times higher than the personnel costs associated with the activity.

Either the basis for allocating corporate overheads labelled retail is incorrect and there should be a more direct attribution of costs, or the allocation of those costs to activities should be on the same basis as the allocation of costs to the System Control function.

The final step in the allocation of costs to activities is to allocate the costs, which have been allocated through this process to Business Management, evenly across all the other activities. This approach is illogical. For example, each person allocates a proportion of their time to leave. The costs associated with this time are then allocated evenly across all activities. The costs associated with an employee’s leave are recovered equally from activities which have little of that employee’s time attributed to them as those which have a lot of time attributed to them.

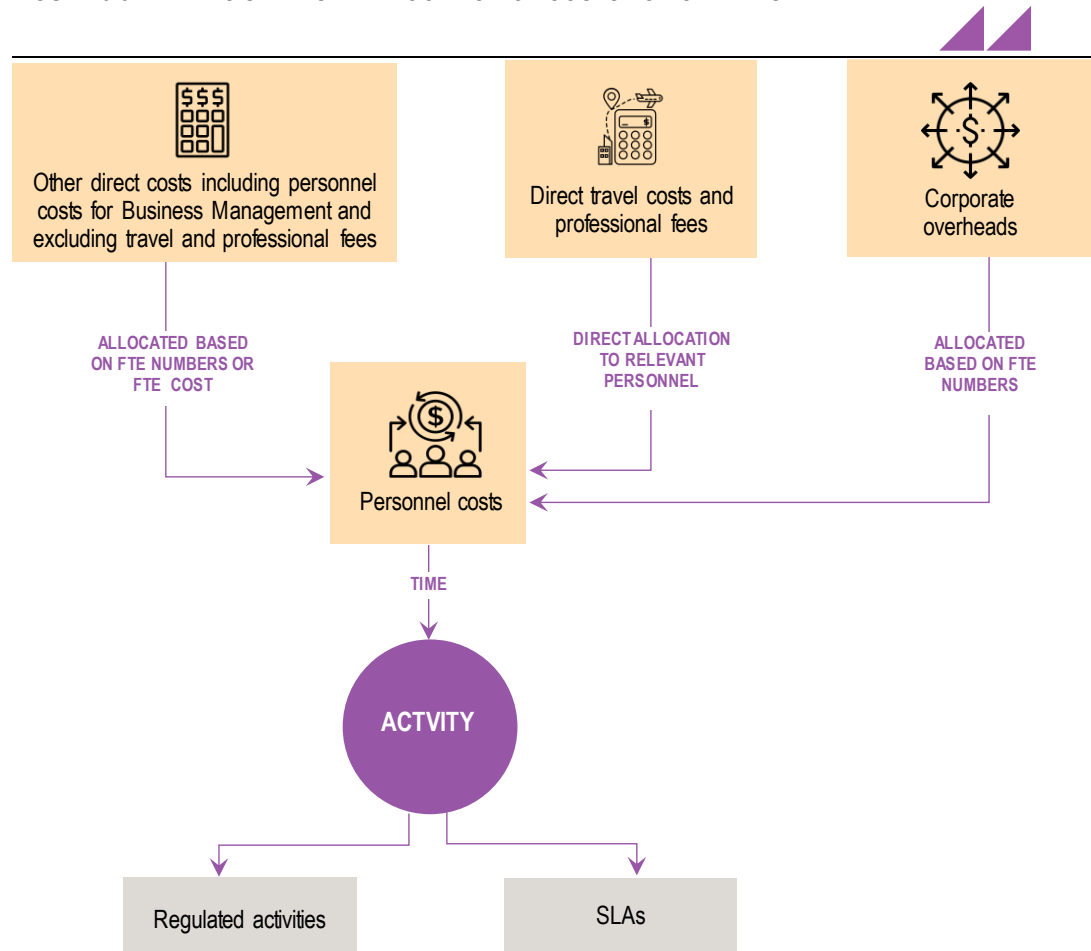
The resulting allocation of costs to activities is complex, with many steps in the allocation process, and results in an illogical allocation of costs to activities. We recommend that the cost allocation process be simplified to ensure that it is logical.

PWC indicated that it would review the way in which it allocates costs to activities.

3.2.4 Allocation of costs to activities – revised allocation

PWC’s revised approach to allocating costs to activities is illustrated in Figure 3.5.

FIGURE 3.5 PWC’S REVISED ALLOCATION OF COSTS TO ACTIVITIES



Note: SLA – Service Level Agreement; FTE – Full Time Equivalent
 SOURCE: ACIL ALLEN ANALYSIS

- The allocation of direct costs to employees is similar to the original approach. The only changes are:
- Direct costs are not allocated to the employees that are designated as Business Management.
 - Travel costs are directly allocated to specific personnel (the portion of the General Manager not designated as Business Management and the Engineers) rather than activities.

The total corporate overheads are allocated to the employees that are not designated as Business Management on the basis of FTE numbers. While this allocator does not align with the allocator that is used to allocate the costs to System Control for all costs, it appears to be a reasonable approximation.

The personnel costs associated with the employees that have been designated as Business Management are allocated to the other employees on the basis of FTE numbers. While this may be appropriate for 50 per cent of the General Manager, the Executive Assistant and the Business & Strategy Manager, it is not appropriate for 30 per cent of the Senior Real Time Operations Manager and the Control Room Coordinators. These two roles clearly relate to the system control functions but some of their costs will be allocated to the market operator function by adopting this approach. The costs associated with these roles should not be allocated to the roles that relate to market operations – the Market Operations – Analysts and Market Operations – Manager in 2019-20 and 2020-21, and to the new market operator roles that commence in 2021-22.

We recommend that the personnel costs associated with the Senior Real Time Operations Manager and the Control Room Coordinators, which have been allocated to Business Management, not be allocated to personnel with market operator functions only.

3.3 Recommended costs to be recovered

The costs that we recommend be recovered through a system control and/or market operator charge, in real 2019 dollars, are set out in Table 3.8.

These costs have been estimated based on the revised information submitted by PWC and making the following adjustments:

- **Personnel costs:**
 - Removing the costs associated with additional personnel for the market operator function. We recommend that these costs be passed through when there is greater certainty as to the timing and scope of the transition from the I-NTEM to the NTEM.
 - Converting the salaries to real dollars by applying the forecast real labour price growth as set out in Table 3.3 to the salaries in 2019-20.
- **Other direct costs:**
 - Removing any increase in other direct costs associated with additional personnel for the market operator function.
 - Converting the other direct costs (other than professional fees) to real dollars by assuming the costs remain constant at the 2019-20 level if there is no decrease in costs from 2019-20 or at the 2020-21 level if there is a decrease in costs from 2019-20 to 2020-21.
 - Converting the professional fees to real dollars by assuming the costs in 2020-21 are the same as in 2019-20 and the costs in 2022-23 and 2023-24 are the same as proposed by PWC for 2021-22.
- **Corporate overheads** – converting the corporate overheads to real dollars by removing the escalation as set out in Table 3.5.
- **Control and Administrative Centre** – removing the costs associated with the proposed new Control and Administrative Centre. We recommend that these costs be passed through when there is greater certainty as to when the new centre will be operational.
- **Cost allocation methodology** – not allocating the personnel costs associated with 30 per cent of the Senior Real Time Operations Manager and the Control Room Coordinators to personnel with market operator functions only.

TABLE 3.8 RECOMMENDED SYSTEM CONTROL AND MARKET OPERATOR COSTS TO BE RECOVERED, REAL \$2019

	2019-20	2020-21	2021-22	2022-23	2023-24
System control					
Personnel costs	\$6,246,938	\$6,234,444	\$6,253,147	\$6,284,413	\$6,322,120
Other direct costs	\$621,059	\$615,667	\$465,367	\$465,367	\$465,367
Corporate overheads	\$2,005,861	\$1,882,657	\$1,805,923	\$1,726,639	\$1,650,835
Total	\$8,873,858	\$8,732,767	\$8,524,438	\$8,476,419	\$8,438,322
Market operator					
Personnel costs	\$516,019	\$514,987	\$516,532	\$519,115	\$522,230
Other direct costs	\$105,420	\$104,759	\$74,107	\$74,107	\$74,107
Corporate overheads	\$211,001	\$198,041	\$189,969	\$181,629	\$173,655
Total	\$832,440	\$817,787	\$780,608	\$774,851	\$769,992

SOURCE: ACIL ALLEN ANALYSIS

In real terms, the personnel costs are forecast to be reasonably consistent over the 2019-24 period. The other direct costs are forecast to decrease from 2020-21 to 2021-22 with the reduction in professional fees. Corporate overheads are forecast to decrease each year over the five-year period.

Table 3.9 compares the recommended system control and market operator costs to be recovered with the costs submitted by PWC. The costs submitted by PWC have been converted from nominal to real dollars by assuming the CPI as set out in Table 3.5. PWC did not disaggregate the system control and market operator costs in its original submission and so the total only has been presented.

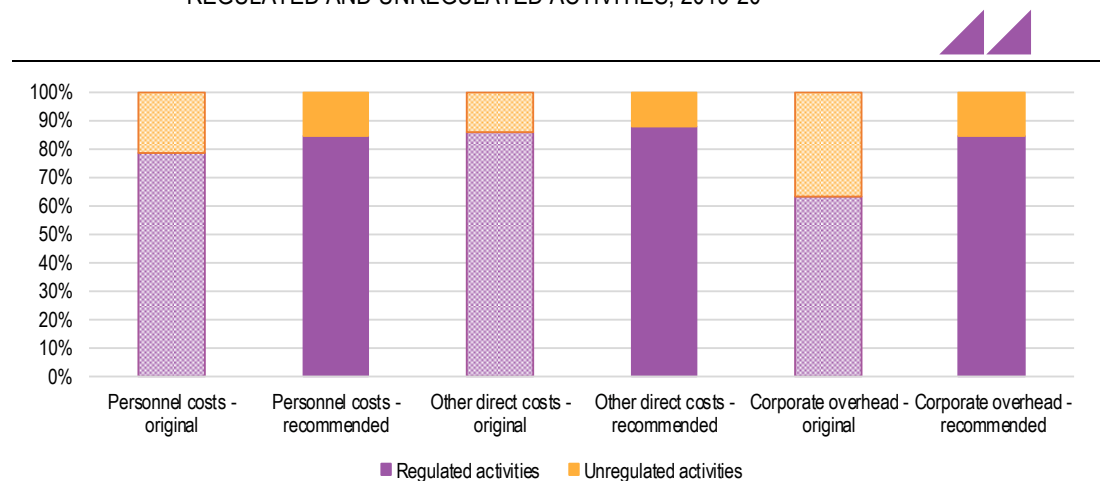
TABLE 3.9 RECOMMENDED SYSTEM CONTROL AND MARKET OPERATOR COSTS TO BE RECOVERED, REAL \$2019

	2019-20	2020-21	2021-22	2022-23	2023-24
System control					
Recommended	\$8,873,858	\$8,732,767	\$8,524,438	\$8,476,419	\$8,438,322
PWC – revised submission	\$8,810,891	\$8,799,727	\$8,678,924	\$8,635,320	\$8,599,474
Market operator					
Recommended	\$832,440	\$817,787	\$786,608	\$774,851	\$769,992
PWC – revised submission	\$850,854	\$847,354	\$2,183,902	\$2,166,214	\$2,150,361
Total regulated					
Recommended	\$9,706,299	\$9,550,554	\$9,305,046	\$9,251,270	\$9,208,314
PWC – original submission	\$10,471,800	\$10,242,358			
PWC – revised submission	\$9,661,745	\$9,647,081	\$10,862,826	\$10,801,535	\$10,749,835
Non-regulated					
Recommended	\$1,778,124	\$1,748,857	\$1,717,663	\$1,707,529	\$1,699,418
PWC – original submission	\$3,232,600	\$3,069,284			
PWC – revised submission	\$1,822,678	\$2,001,137	\$1,612,704	\$1,859,423	\$2,099,149
Total costs					
Recommended	\$11,484,423	\$11,299,411	\$11,022,710	\$10,958,799	\$10,907,732
PWC – original submission	\$13,034,900	\$12,643,376			
PWC – revised submission	\$11,484,423	\$11,468,342	\$12,023,134	\$11,958,634	\$11,904,879

SOURCE: PWC SUBMISSIONS, ACIL ALLEN ANALYSIS

The recommended regulated costs to be recovered are less than those originally submitted by PWC. The costs associated with the proposed new Control and Administrative Centre are not included in the recommended costs to be recovered – they are assumed to be passed through when there is greater certainty as to when the new centre will be operational. The corporate overhead costs have decreased, however, this reduction is offset by an increase in the allocation of shared costs to the regulated functions, as illustrated in Figure 3.6.

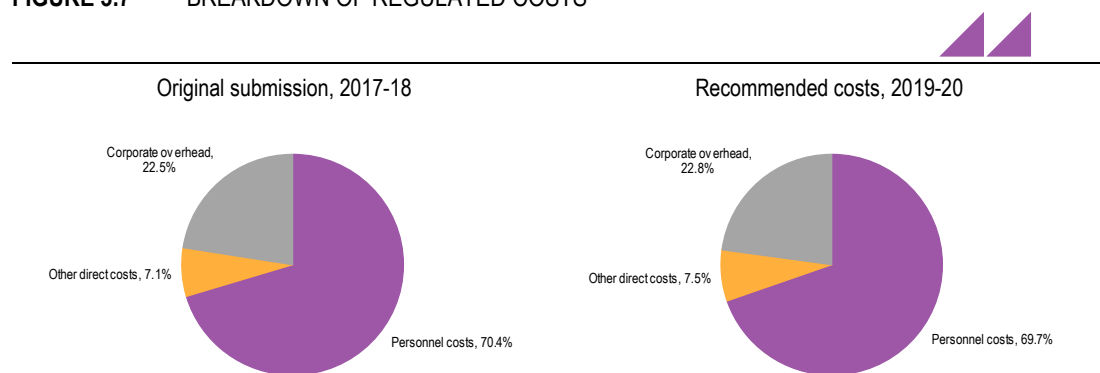
FIGURE 3.6 BREAKDOWN OF THE POWER SYSTEM CONTROLLER'S COSTS BETWEEN REGULATED AND UNREGULATED ACTIVITIES, 2019-20



SOURCE: ACIL ALLEN ANALYSIS

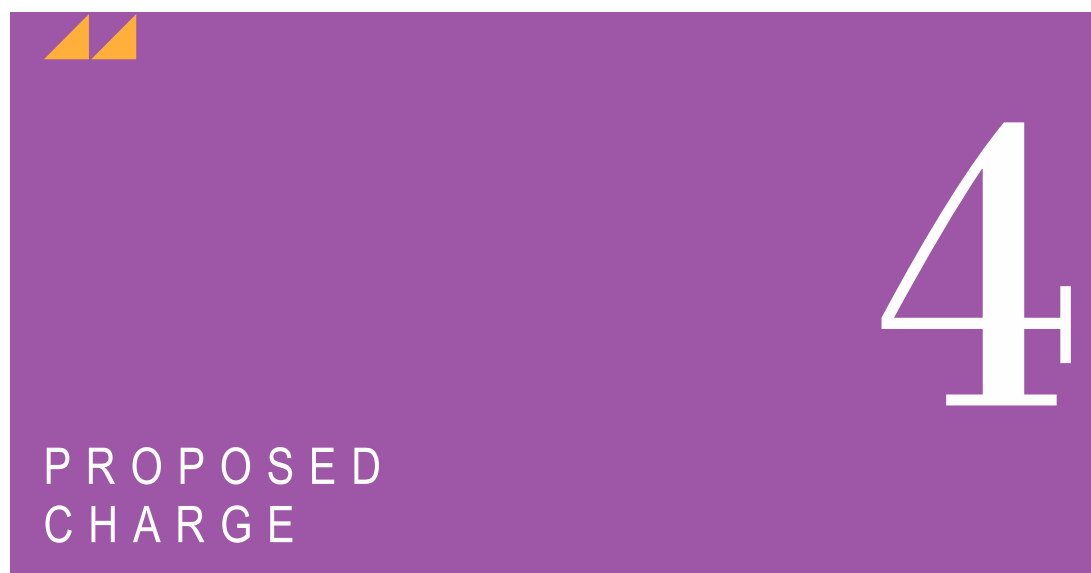
Figure 3.7 compares the breakdown of the regulated costs as originally submitted by PWC for 2017-18 and recommended for 2019-20. It illustrates that the breakdown of the recommended costs is similar to the breakdown of costs as originally submitted.

FIGURE 3.7 BREAKDOWN OF REGULATED COSTS



SOURCE: ACIL ALLEN ANALYSIS

The recommended regulated costs to be recovered in 2019-20 and 2020-21 are similar to PWC's revised submission. From 2021-22 the recommended costs recovered for the system control functions are slightly lower than PWC's revised submission and the costs recovered for the market operator functions are significantly lower. The costs associated with additional personnel for the market operator function are assumed to be passed through when there is greater certainty as to the timing and scope of the transition from the I-NTEM to the NTEM. This has the effect of reducing the direct costs and corporate overheads recovered through the market operator functions compared to PWC's revised submission, with a commensurate relative increase in those costs recovered through the system control functions.



The system control charge is a function of the costs incurred in undertaking the regulated activities, as discussed in chapter 3, and the demand forecast. PWC has proposed that the system control charge in 2019-20 should be \$0.0057 per kWh, as set out in Table 4.1.

TABLE 4.1 PROPOSED SYSTEM CONTROL CHARGE

	2017-18 Actual	2018-19 Forecast	2019-20 Forecast	2020-21 Forecast
Total proposed costs	9,009,951	10,054,400	10,471,800	10,436,936
Forecast energy (MWh)	1,872,500	1,842,700	1,828,800	1,828,800
System control charge (\$ per kWh)	0.0048	0.0055	0.0057	0.0057

SOURCE: PWC SUBMISSION, REVIEW OF SYSTEM CONTROL CHARGES AND ASSOCIATED FUNDING ISSUES, OCTOBER 2018, PAGE 26

The energy consumption forecast that underpins the proposed system control charge is discussed in section 4.1, the appropriate number of charges to be levied by the Power System Controller is discussed in section 4.2, and the basis for charging customers for system control and market operator functions is discussed in section 4.3.

4.1 Energy consumption forecast

PWC's submission indicates that it has adopted the energy consumption forecasts prepared by AEMO for the purposes of PWC's distribution determination for the 2019-24 period,⁵⁶ as the basis for converting the Power System Controller's costs into a charge.

AEMO's energy consumption forecasts prepared for PWC in September 2017 are set out in Table 4.2.

⁵⁶ PWC submission, *Review of system control charges and associated funding issues*, October 2018, page 22

TABLE 4.2 AEMO'S ENERGY CONSUMPTION FORECAST, 2017-18 – 2020-21

	2017-18 Forecast	2018-19 Forecast	2019-20 Forecast	2020-21 Forecast
	MWh	MWh	MWh	MWh
Darwin – Katherine	1,626,300	1,591,100	1,579,500	1,581,600
Alice Springs	216,800	214,300	211,900	209,700
Tennant Creek	29,400	37,300	37,400	37,500
Total	1,872,500	1,842,700	1,828,800	1,828,800

SOURCE: AUSTRALIAN ENERGY MARKET OPERATOR, POWER AND WATER CORPORATION MAXIMUM DEMAND, ENERGY CONSUMPTION, AND CONNECTIONS FORECAST; 2017 IMPLEMENTATION OF FORECASTING PROCEDURE; SEPTEMBER 2017; PAGES 6, 12 AND 18

The energy consumption forecast used by PWC to estimate the system control charge is consistent with AEMO's forecast.

In its draft determination on PWC's distribution determination, the AER was of the view that AEMO's demand forecasting methodology is:

*... likely to be reasonable and unbiased.*⁵⁷

However, it raised three concerns in relation to the forecasts:

1. The timing and quantum of forecast block loads included had not been justified.
2. The forecasts may not fully account for the NT Government's Roadmap to Renewables, improvements in energy efficiency, and increasing PV and/or energy storage penetration.
3. The forecasts did not account for the latest available forecasts of macroeconomic driver inputs such as GSP and population forecasts.

The AER expected PWC to update its forecasts and/or provide additional information to validate key inputs and assumptions⁵⁸ when submitting its revised proposal.

In response to the AER's draft determination, AEMO reviewed its energy consumption forecasts in November 2018. AEMO did not update the energy consumption forecasts as its:

*... assessment of the impacts of updated driver variables indicates that changes to demand and energy consumption would be immaterial and within historical variability observed at the overall level covering PWC's three regulated power systems.*⁵⁹

AEMO provides independent energy consumption forecasts for the National Electricity Market (NEM) and each of the NEM regions. Its forecasting methodology has been developed over an extended period, and has been subject to extensive consultation and scrutiny. As found by the AER, AEMO's forecasts are likely to be reasonable and unbiased.

As the energy consumption forecast used by PWC to estimate the system control charge is consistent with AEMO's forecast, we are of the view that the energy consumption forecast used by PWC is fair and reasonable for the purposes of determining the system control charge.

Territory Generation and Jacana Energy both supported the use of AEMO's energy consumption forecasts.⁶⁰

We therefore recommend that AEMO's energy consumption forecasts, produced for PWC's distribution determination for the 2019-24 period, be used as the basis for determining the system control and/or market operator charge.

AEMO's energy consumption forecast for the five-year period commencing 2019-20 is set out in Table 4.3.

⁵⁷ Australian Energy Regulator, *Draft decision – Power and Water Corporation Distribution determination 2019-24, Attachment 5: Capital expenditure*, September 2018, page 5-95

⁵⁸ *ibid*

⁵⁹ Australian Energy Market Operator, *Forecasting Advice for the Revised Regulatory Proposal*, November 2018, page 3

⁶⁰ Territory Generation's submission on the Commission's Issues Paper, page 3; Jacana Energy's submission on the Commission Issues Paper, page 2

TABLE 4.3 AEMO'S ENERGY CONSUMPTION FORECAST, 2019-20 – 2023-24

	2019-20	2020-21	2021-22	2022-23	2023-24
	MWh	MWh	MWh	MWh	MWh
Darwin – Katherine	1,579,500	1,581,600	1,584,300	1,587,600	1,592,600
Alice Springs	211,900	209,700	207,800	206,000	204,600
Tennant Creek	37,400	37,500	37,600	37,700	37,800
Total	1,828,800	1,828,800	1,829,700	1,831,300	1,835,000

SOURCE: AUSTRALIAN ENERGY MARKET OPERATOR, POWER AND WATER CORPORATION MAXIMUM DEMAND, ENERGY CONSUMPTION, AND CONNECTIONS FORECAST; 2017 IMPLEMENTATION OF FORECASTING PROCEDURE; SEPTEMBER 2017; PAGES 6, 12 AND 18

4.2 Number of charges

PWC originally proposed a single system control charge, consistent with the structure of the current charge, to recover the costs associated with the system control and the market operator functions.

Jacana Energy supports different charges across the three regulated power systems to reduce cross subsidies between customers and customer classes.⁶¹

Territory Generation is of the view that it is not appropriate for customers in Alice Springs and Tennant Creek to pay for market operator functions, given that PWC has no market operator role in those power systems.⁶² It has also questioned the legality of recovering the costs associated with the market operator functions through the system control charge.⁶³ We understand that the Commission is examining this issue.

Regardless of the outcome of the Commission's review of the legality of recovering the costs associated with the market operator functions through the system control charge, there is merit in considering disaggregating the proposed system control charge into a system control charge and a market operator charge. The costs of doing so would be immaterial as the activities associated with the system control function and the market operator function are easily separable. The benefits associated with disaggregating the charges are:

1. Further development of the market is envisaged. If there is a separate charge for the market operator functions, there is greater transparency as to the cost impacts of any market developments.
2. The system control functions are more mature than the market operator functions. A system control charge could be determined over a longer period of time (subject to some form of price control mechanism) than a market operator charge.
3. The system control functions are undertaken on behalf of customers in each of the three regulated systems, while the market operator functions are only being undertaken by the Power System Controller on behalf of customers in the Darwin-Katherine area. Under an efficient cost recovery regime that minimises cross subsidies, the costs associated with the market operator functions undertaken by the Power System Controller should only be recovered from customers in the Darwin-Katherine area.
4. Customers in Alice Springs and Tennant Creek are already paying Territory Generation for market operator functions and therefore should not also be paying for market operator functions in the Darwin-Katherine area.

⁶¹ Jacana Energy's submission on the Commission's Issues Paper, page 2

⁶² Territory Generation's submission on the Commission's Issues Paper, page 3

⁶³ Ibid, page 2

As the benefits associated with separating the proposed system control charge into a separate system control charge and a market operator charge are likely to exceed the costs, we recommend that there be:

- **A system control charge that is paid by all customers supplied by the Darwin-Katherine, Alice Springs and Tennant Creek regulated systems.**
- **A market operator charge that is paid by customers supplied by the Darwin-Katherine regulated system only.**

This approach is consistent with the Western Australian wholesale electricity market in which AEMO levies a system management fee and a market operator fee.

PWC's revised submission included separate charges for the system control functions and the market operator functions, with both charges calculated based on the energy consumption in the three regulated systems, for the five-year period commencing 2019-20. The revised charges submitted are set out in Table 4.4.

TABLE 4.4 PWC'S REVISED PROPOSED CHARGES (NOMINAL)

	2019-20	2020-21	2021-22	2022-23	2023-24
System control charge (\$/kWh)	0.0048	0.0049	0.0050	0.0051	0.0052
Market operator charge (\$/kWh)	0.0005	0.0005	0.0013	0.0013	0.0013

SOURCE: PWC'S REVISED SUBMISSION

The system control charge is less than originally submitted, and is also less when the market operator charge is also considered.

We have recommended above that the market operator charge will only apply in the Darwin-Katherine area. We recommend that the market operator charge is calculated based on the energy consumption forecast in that area only.

This has the effect of increasing the market operator charge relative to that proposed in PWC's revised submission.

4.3 Based on energy or demand

The System Control Technical Code stipulates that the system control charge is levied based on energy, which is consistent with the way in which AEMO levies its system control and market operator fees.

With the increased take-up by customers of solar panels and battery storage, this may not be an appropriate approach to charging for system control and market operator functions moving forward. Customers installing solar panels will use less energy from the grid and will thereby contribute less to the costs associated with the system control and market operator functions if the charge is based on energy used, with customers that do not install solar panels paying commensurately more. Although customers with solar panels installed will pay less for the Power System Controller's functions, they will not reduce the costs that are incurred by the Power System Controller. In fact, they may increase the costs that are incurred with the additional complexity to maintain power system security with solar panels installed.

The system control charge could be levied on the basis of demand (the amount of electricity consumed at a point of time) or be a fixed charge which is the same for all customers. As the impact of a change in a customer's load on system security will be greater for larger customers than for smaller customers, demand is a more appropriate basis for allocating the costs of these functions than a fixed charge.

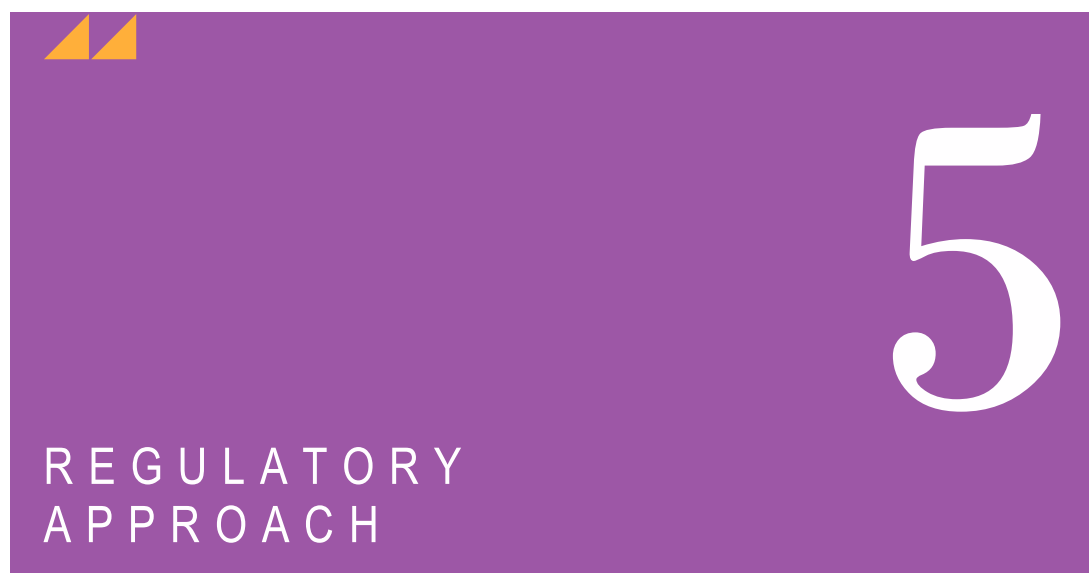
We therefore recommend that the Commission consider requesting PWC to amend the System Control Technical Code so that the charges can be levied on the basis of demand in the future.

That said, in the short term, the ability to charge for system control and market operator functions is limited by the metering technology available. Customers need to have an interval meter or smart meter installed to enable a demand charge to be levied.

Customers in the Territory using more than 750 MWh per annum currently have interval or smart meters installed. PWC anticipates that customers using more than 40 MWh per annum will have an interval or smart meter installed by 1 July 2019. The AER has approved a program whereby all new and replacement meters will be smart meters from 1 July 2019, noting that all customers installing rooftop solar are required to install a smart meter. More than half of the electricity customers in the Territory will have a smart meter installed by the end of June 2024.

From 1 July 2019, the network charge for all customers with a smart meter installed will have a demand component.

When the change has been made to the System Control Technical Code, a system control charge levied on the basis of demand could be introduced for all customers with a smart meter installed, with all other customers paying for the system control charge on the basis of energy consumption.



The current system control charge was set in 2000 and has not been updated since. To ensure that the charge continues to align with costs over time, the charge could be set for a defined period, with some form of price control mechanism to determine how the charge may vary over time.

The form of price control mechanism is discussed in section 5.1 and the associated formulae to implement the recommended form of price control mechanism are set out in section 5.2.

5.1 Form of price control mechanism

As discussed in section 4.2, there is merit in having a separate charge to recover the costs associated with the market operator functions. The form of price control mechanism for the system control charge is discussed in section 5.1.1 and for the market operator function in section 5.1.2.

5.1.1 System control charge

Period of time for which charge is determined

We would expect that the system control charge, excluding the costs associated with the proposed new Control and Administrative Centre, could be forecast with a reasonable degree of certainty over a period of time as the functions are relatively mature.

The timing of the proposed new Control and Administrative Centre is highly uncertain as a business case for the new centre has not yet been prepared and it has not been approved. Accordingly, a charge could be determined to recover the costs associated with the system control functions (excluding the costs associated with the new Control and Administrative Centre) for a defined period of time, with a price control mechanism to determine how the charge may vary over time to include the costs associated with the proposed new Control and Administrative Centre.

The appropriate length of that period is informed through balancing the certainty of costs over the period and the administrative costs associated with consulting on, and determining, the charges. The shorter the period the greater the certainty of costs over the entire period but the higher the administrative costs. The longer the period the lower the certainty of costs over the entire period but the lower the administrative costs.

EDL was of the view that the length of the time period should depend in part on:

... the Commission view on the robustness of PWC's current proposal.⁶⁴

⁶⁴ EDL's submission on the Commission's Issues Paper, page 1

While Territory Generation considers a five-yearly periodic review of the process would be appropriate⁶⁵, Jacana Energy suggested a shorter period given the uncertainty around the electricity market.⁶⁶

We are of the view that PWC's proposal is more robust and more certain for the system control charge, excluding the costs of the proposed new Control and Administrative Centre, than for the market operator charge. Accordingly, a system control charge could be set for a longer period than the market operator charge. That said, the price control mechanism can be designed in a way to allow for the pass through of material changes in costs during the five-year period

Inputs to the system control charge include the corporate overheads and the demand forecasts, on which the AER forms a view as part of its five-yearly determination of revenues for the Power Networks business. To ensure consistent treatment of corporate overheads and demand forecasts, there is considerable merit in aligning the determination of the system control charge with the five-yearly determination of revenues for the Power Networks business.

We recommend that the system control and market operator charges be determined for a period of five years.

Revenue or price cap?

The price control mechanism for the system control charge could be a revenue cap or a price cap.

Under a revenue cap, if the revenue recovered from customers in one year is greater (or lesser) than the required revenue for that year, the charge in a subsequent year⁶⁷ is adjusted so that less (or more) revenue is forecast to be recovered from customers than the required revenue for that subsequent year. That is, the charge will be lower (or higher) than it would otherwise be. This is administered through an overs and unders account.

The system control costs will not vary with changes in energy consumption. However, if the energy consumption is less (or more) than forecast, the revenue recovered will be less (or more) than the required revenue. Under a revenue cap, the Power System Controller's revenues are adjusted so that, over time, the required revenues are recovered in full. Under a price cap, the Power System Controller will under (or over) recover revenue relative to the required revenue. There is thus an incentive to under forecast energy consumption so as to over recover revenue.

The advantage of a price cap is that it is easier to administer than a revenue cap.

To reduce the administrative costs associated with a revenue cap, a materiality band could apply to the overs and unders account. The over or under in each year could be added to the overs and unders account. Only when the amount in the overs and unders account is outside a pre-determined band, say five per cent of required revenue, would the required revenue be adjusted by the amount in the overs and unders account. This would smooth any volatility from year to year but allow the charge to be increased (or decreased) if the energy consumption forecast is systematically either too low or too high.

In its submission, EDL supported:

*... the adoption of an overs and under revenue control mechanism.*⁶⁸

However, it was of the view that this should be subject to an assessment of the costs and complexity of adopting such a mechanism and the degree to which there is evidence of material variations between forecast and actual demand. The application of a materiality band will reduce the complexity of the revenue cap mechanism if there is not a material variation between forecast and actual demand.

Similarly, Territory Generation supported an "unders-and-overs" mechanism.⁶⁹

⁶⁵ Territory Generation's submission on the Commission's Issues Paper, page 5

⁶⁶ Jacana Energy's submission on the Commission's Issues Paper, page 3

⁶⁷ The year after the following year. The charges are not adjusted in the following year as the actual data is not known when the charges are being set for that year.

⁶⁸ EDL's submission on the Commission's Issues Paper, page 1

⁶⁹ Territory Generation's submission on the Commission's Issues Paper, page 4

By way of contrast, Jacana Energy preferred the simplicity of a price cap mechanism during periods of stable energy consumption.⁷⁰

On balance, we recommend the use of a revenue cap mechanism to regulate the system control charge over time, with an overs and unders account which is only applied when the balance in the overs and unders account exceeds a materiality band.

This ensures that the charge is adjusted if there is a material variation between forecast and actual demand, particularly if there is a material variation in demand in response to the Territory Government's *Roadmap to Renewables*. As discussed above, the application of a materiality band will reduce the complexity of the revenue cap mechanism if there is not a material variation between forecast and actual demand.

We have previously recommended that the system control charge exclude any costs associated with the proposed new Control and Administrative Centre. When there is greater certainty as to the timing and costs associated with the proposed new Control and Administrative Centre, the required revenue for the system control charge could be adjusted accordingly for each of the remaining years in which a determination has previously been made.

We therefore recommend that the revenue cap mechanism allow for an increase in the system control charge to include the costs associated with the proposed new Control and Administrative Centre.

5.1.2 Market operator charge

For the same reasons that we recommend a revenue cap the system control charge, we recommend a revenue cap for the market operator charge with an overs and unders account which is only applied when the balance in the overs and unders account exceeds a materiality band.

The costs associated with the market operator functions are currently highly uncertain with the timing and scope of the transition from the I-NTEM to the NTEM uncertain.

As the uncertainty as to the costs that will be incurred for the market operator functions is greater than the uncertainty as to the costs that will be incurred for the system control functions, the market operator charge could either:

- be determined for the same period as the system control charge, with the ability to reopen that determination if and when there is greater certainty as to the transition from the I-NTEM to NTEM
- be determined for the same period as the system control charge, with a pass through mechanism to allow the costs to be increased (or decreased) if there is an increase (or decrease) in the System Controller's market operation functions, or
- be determined for a shorter period than the determination of the system control charge.

On balance, we recommend that the market operator charge be determined for a five-year period with the revenue cap mechanism allowing the charge (and the system control charge) to change as costs associated with undertaking the market operator function (and the associated allocation of costs) change.

5.2 Revenue cap formulae

The formulae to implement a revenue cap form of price control mechanism for the system control (or market operator) charge are set in this section.

The adjusted annual revenue requirement in the first year of the period in which the charge is to be determined is the forecast total costs for the system control (or market operator) function for that year, subject to any smoothing of the revenue.

⁷⁰ Jacana Energy's submission on the Commission's Issues Paper, page 2

$$AAR_t = AR_t \quad (1)$$

where:

AAR_t is the adjusted annual smoothed revenue requirement for year t

AR_t is the annual smoothed revenue requirement for year t, including any overs and unders carried over from the previous period

The adjusted annual smoothed revenue requirement in the subsequent years of the period is the adjusted annual revenue requirement in the previous year escalated by CPI and an "X-factor".

$$AAR_t = AAR_{t-1} \times (1 + \Delta CPI_t) \times (1 - X_t) \quad (2)$$

where:

ΔCPI_t is the annual percentage change in the ABS CPI All Groups, Weighted Average of Eight Capital Cities from the December quarter in year t-2 to the December quarter in year t-1, calculated as follows:

$$\Delta CPI_t = \frac{CPI_{t-1}}{CPI_{t-2}} - 1 \quad (3)$$

X_t is the X factor so that the Net Present Value (NPV) of the smoothed revenue requirement over the period is equal to the NPV of the unsmoothed revenue requirement over the period

In their submissions on the Commission's Issues Paper, Jacana Energy supported a CPI-X adjustment⁷¹, and Territory Generation recognised the need for escalation.⁷²

The total allowable revenue in each year is the adjusted annual smoothed revenue requirement and, when the materiality threshold of the overs and unders account has been exceeded, the balance of the overs and unders account. It also includes the costs associated with the proposed new Control and Administrative Centre, any costs associated with additional market operator functions, and any consequent change in the allocation of direct costs and corporate overheads.

$$TAR_t = AAR_t + B_t + C_t \quad (4)$$

where:

TAR_t is the total allowable revenue in year t

B_t is the true-up in year t for any under or over recovery of actual revenue collected through the system control (or market operator) charge

C_t is:

- a. the costs in year t associated with the proposed new Control and Administrative Centre, when approved by the Commission
- b. the change in costs in year t associated with a change in the market operator functions
- c. a change in the allocation of direct costs and corporate overheads in year t arising from these events.

Territory Generation supports a means to change the charges for significant changes in resourcing requirements (presumably due to changes in the market operator function rather than the system control function) within the defined period.⁷³ The formula for the total allowable revenue provides for these changes to be made during the period for which a determination on the charges has been made.

⁷¹ Jacana Energy's submission on the Commission's Issues Paper, page 3

⁷² Territory Generation's submission on the Commission's Issues Paper, page 5

⁷³ Territory Generation's submission on the Commission's Issues Paper, page 5

The total allowable revenue is converted to a system control (or market operator) charge, which is calculated in accordance with equation (5).

$$TAR_t \geq \sum_{i=1}^n p_t^i q_t^i \tag{5}$$

where:

- p_t^i is the system control (or market operator) charge i in year t
- q_t^i is the forecast quantity of system control (or market operator) charge i in year t

Overs and unders account

The overs and unders account balance for each of the system control charge and the market operator charge is determined using the following approach:

1. The under/over recovery of revenue in the first year is the revenue recovered through the system control (or market operator) charge less the total allowable revenue for that year.
2. The under/over recovery in item 1 is adjusted by 18 months of interest.

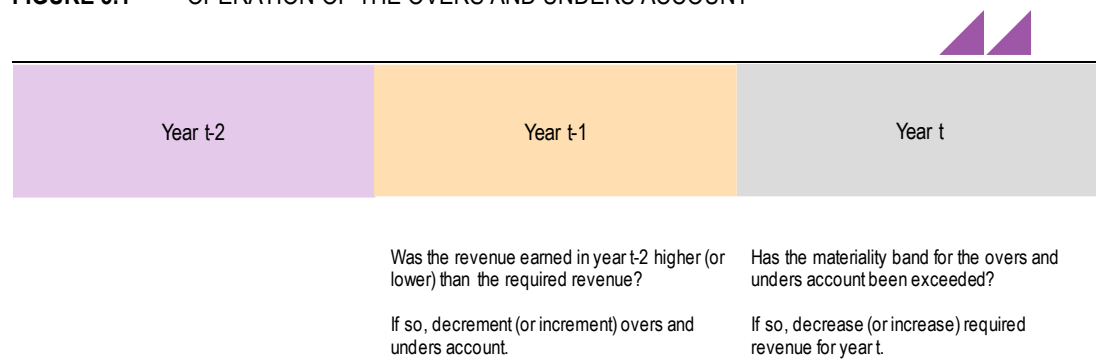
We recommend that the interest rate be the nominal weighted average cost of capital (WACC) for each year approved by the AER for the purposes of the regulated Power Networks business.

The under/over recovery item will be adjusted by the WACC in year $t-2$ for half a year and the WACC for year $t-1$ for a year.

3. The sum of items 1 and 2 is the closing balance for the first year of the period (year $t-2$).
4. If the closing balance exceeds the materiality band (say, 5 per cent of the total allowable revenue) for that year, it is applied in year t .
5. If the closing balance is less than the materiality band (say, 5 per cent of the total allowable revenue) for that year, it is the opening balance for the next year.
6. The under/over recovery of revenue in the next year (which is now year $t-2$) is the revenue recovered through the system control (or market operator) charge less the total allowable revenue for that year.
7. The under/over recovery in item 6 is adjusted by 18 months of interest (WACC in year $t-2$ for half a year and WACC in year $t-1$ for a year) and the opening balance is adjusted by 12 months of interest (WACC in year $t-1$).
8. The sum of items 5 to 7 is the closing balance for the next year of the period.
9. Items 4 to 8 are repeated each year.

The operation of the overs and unders account is illustrated in Figure 5.1.

FIGURE 5.1 OPERATION OF THE OVERS AND UNDERS ACCOUNT



SOURCE: ACIL ALLEN

5.3 Recommended charges

The key variables for determining the system control and market operator charges under a revenue cap formula are the average annual smoothed revenue, the X-factor and the CPI.

The unsmoothed revenue is set out in Table 3.9. We recommend that the unsmoothed revenue is smoothed by assuming that:

- the revenue in the final year of the period (2023-24) aligns with the forecast costs in that year
- the NPV of the smoothed revenue over the five-year period is the same as the NPV of the unsmoothed revenue over that period
- the NPV of the revenue is calculated by discounting using the nominal Weighted Average Cost of Capital (WACC) as determined by the AER for the Power Networks business (5.22 per cent)⁷⁴
- the X-factor is the same in each year from 2020-21.

The recommended smoothed revenues and X-factors are set out in Table 5.1. The recommended X-factors are positive indicating a real decrease in the costs associated with the system control and market operator functions over the five-year period.

TABLE 5.1 RECOMMENDED SMOOTHED AND UNSMOOTHED REVENUE, REAL \$2019, AND X-FACTOR

	System control		Market operator	
	Unsmoothed revenue	Smoothed revenue	Unsmoothed revenue	Smoothed revenue
2019-20	\$8,873,858	\$8,787,141	\$832,440	\$821,515
2020-21	\$8,732,767	\$8,698,607	\$817,787	\$808,320
2021-22	\$8,524,438	\$8,610,965	\$780,608	\$795,336
2022-23	\$8,476,419	\$8,524,207	\$774,851	\$782,561
2023-24	\$8,438,322	\$8,438,322	\$769,992	\$769,992
NPV	\$37,099,156	\$37,099,156	\$3,429,255	\$3,429,255
X-factor		1.02%		1.63%

SOURCE: ACIL ALLEN ANALYSIS

The CPI is determined annually from the data series published by the Australian Bureau of Statistics.

The system control revenue is converted to a charge based on the energy consumption across all three regulated systems and the market operator revenue is converted to a charge based on the energy consumption in the Darwin-Katherine area only (refer Table 4.3). The recommended charges (in real \$2019), assuming no adjustment for unders and overs, are set out in Table 5.2. These recommended charges are based on the energy consumption by retailers' customers.

TABLE 5.2 RECOMMENDED CHARGES (REAL \$2019)

	2019-20	2020-21	2021-22	2022-23	2023-24
System control charge (\$/kWh)	0.0048	0.0048	0.0047	0.0047	0.0046
Market operator charge (\$/kWh)	0.00052	0.00051	0.00050	0.00049	0.00048

SOURCE: ACIL ALLEN ANALYSIS

⁷⁴ Post tax revenue model for AER's draft determination on PWC's revenue for the 2019-24 period, available at <https://www.aer.gov.au/networks-pipelines/determinations-access-arrangements/power-and-water-corporation-determination-2019-24/draft-decision>

5.4 Commencement of new system control charges

Jacana Energy submitted that there should be a transition to the new system control charge over a period of at least five years given the magnitude of the increase in the charge proposed by PWC. It also noted that, if the tariff structure changed, then adequate time for IT system changes needed to be considered.⁷⁵

Rimfire Energy commented on the impact of an increase in the system control charge on customers and the market:

Should the proposed increase in the system control charges be implemented without either an equivalent increase in the [Community Service Obligation] CSO payment (a cost to the NT Government), or an equivalent increase in the regulated tariff (a cost to the consumer), the sale of electricity to regulated customers would become a loss-making exercise for retailers.

Such an impact would necessarily result [in] the exit of retail competition from the <750 MWh regulated customer segments of the electricity supply industry, contrary to the overall objectives of the ongoing electricity reform process since it commenced in 2000.⁷⁶

No change to the structure of the system control charge is being proposed – it continues to be based on energy consumption. Retailers could choose to enter one charge into their IT system which aggregates the system control charge and the market operator charge, or two charges.

The retailers will need to update the network charges in their IT systems from 1 July 2019. The system control charges can be updated at that same time.

Accordingly, there are no practical barriers to implementing the new system control charges from 1 July 2019.

There are customer impacts associated with increasing the system control charges. This is a matter for the Territory Government to consider in determining the regulated retail tariffs and CSO payments that are applicable from 1 July 2019.

⁷⁵ Jacana Energy's submission on the Commission's Issues Paper, page 3

⁷⁶ Rimfire Energy's submission on the Commission's Issues Paper, page 2



6

FINDINGS AND RECOMMENDATIONS

In October 2018, PWC made a submission to the Commission to increase the system control charge from \$0.001/kWh to \$0.0057/kWh in 2019-20.

During a meeting with PWC on 17 January 2019, we raised a number of concerns in relation to its original submission, in particular:

- Forecast costs:
 - Personnel costs – there appeared to be some anomalies in the salaries for personnel.
 - Other direct costs – there appeared to be double counting of around \$600-700k in direct costs.
 - Proposed new Control and Administrative Centre – the costs for the new centre were included from 1 July 2019, but it did not appear to be reasonable to expect a new centre to be operating from that date.
- Allocation of time to activities – there were inconsistencies in the way in which the time for activities was estimated.
- Allocation of costs to activities – the cost allocation methodology was complex and resulted in an illogical allocation of costs to activities.
- Number of charges – PWC had proposed a single system control charge to recover the costs associated with providing system control functions to customers in the three regulated systems in the Territory, and for providing market operator functions only to customers connected to the Darwin-Katherine system.
- Period for which estimates were provided – forecast costs were provided for a two-year period only (2019–20 and 2020-21).

PWC revised its submission. It addressed the issues that we had raised, including removing the costs associated with the proposed new Control and Administrative Centre, simplifying and improving its cost allocation methodology, and proposing separate charges for the system control functions and for the market operator functions over a five-year period (2019-20 to 2023-24).

By extending the cost forecasts beyond 2020-21, it included an additional six personnel from 2021-22 to undertake market operator functions. In the process of simplifying the costs allocation methodology, it allocated costs to market operator activities that appeared to be related to system control activities.

In the preceding chapters, we have made the following of recommendations in relation to PWC's revised submission:

Cost forecasts (section 3.1)

1. Remove the six additional market operator personnel from the cost forecasts until there is greater certainty on the transition from the I-NTEM to the NTEM.

2. Present the labour costs in real terms with salaries assumed to increase in line with Deloitte Access Economics' real labour price growth forecast and escalate by CPI each year.
3. Present the non-labour costs in real terms and escalate by CPI each year.
4. If the AER, as part of its final determination on PWC's distribution revenue for the 2019-24 period (due in April 2019):
 - a) reduces PWC's corporate overheads, reduce the corporate overheads allocated to System Control in line with that adjustment.
 - b) requires PWC to align its cost allocation methodology with that approved by the AER, change the allocation of corporate overheads to the Power System Controller in line with that decision.
5. Present the corporate overheads in real terms and escalate by CPI each year.
6. Exclude the costs associated with the proposed new Control and Administrative Centre from the cost forecasts until there is greater certainty as to the timing, and the magnitude and treatment of costs.
7. Provide a more robust basis for allocating the costs associated with the proposed new Control and Administrative Centre to System Control and Power Networks.

Allocation of costs (section 3.2)

8. Provide greater clarity for the allocation of the employees' time to activities by:
 - a) providing more detailed descriptions of activities to provide greater clarity between those activities that are regulated functions and those that are not
 - b) aligning the description of the activities with the System Control Technical Code
 - c) to the extent possible, providing a 1:1 mapping between regulatory obligations and activities.
9. Not allocate the personnel costs associated with the Senior Real Time Operations Manager and the Control Room Coordinators, which have been allocated to Business Management, to personnel with market operator functions only.
10. Recover the costs, as set out in Table 6.1, through a system control and/or market operator charge.

TABLE 6.1 RECOMMENDED SYSTEM CONTROL AND MARKET OPERATOR COSTS TO BE RECOVERED, REAL \$2019

	2019-20	2020-21	2021-22	2022-23	2023-24
System control					
Personnel costs	\$6,246,938	\$6,234,444	\$6,253,147	\$6,284,413	\$6,322,120
Other direct costs	\$621,059	\$615,667	\$465,367	\$465,367	\$465,367
Corporate overheads	\$2,005,861	\$1,882,657	\$1,805,923	\$1,726,639	\$1,650,835
Total	\$8,873,858	\$8,732,767	\$8,524,438	\$8,476,419	\$8,438,322
Market operator					
Personnel costs	\$516,019	\$514,987	\$516,532	\$519,115	\$522,230
Other direct costs	\$105,420	\$104,759	\$74,107	\$74,107	\$74,107
Corporate overheads	\$211,001	\$198,041	\$189,969	\$181,629	\$173,655
Total	\$832,440	\$817,787	\$780,608	\$774,851	\$769,992

SOURCE: ACIL ALLEN ANALYSIS

Charges (chapters 4 and 5)

11. Use AEMO's energy consumption forecasts, produced for PWC's distribution revenue determination for the 2019-24 period and set out in Table 6.2, as the basis for determining the system control and/or market operator charge.

TABLE 6.2 AEMO'S ENERGY CONSUMPTION FORECAST, 2019-20 – 2023-24

	2019-20	2020-21	2021-22	2022-23	2023-24
	MWh	MWh	MWh	MWh	MWh
Darwin – Katherine	1,579,500	1,581,600	1,584,300	1,587,600	1,592,600
Alice Springs	211,900	209,700	207,800	206,000	204,600
Tennant Creek	37,400	37,500	37,600	37,700	37,800
Total	1,828,800	1,828,800	1,829,700	1,831,300	1,835,000

SOURCE: AUSTRALIAN ENERGY MARKET OPERATOR, POWER AND WATER CORPORATION MAXIMUM DEMAND, ENERGY CONSUMPTION, AND CONNECTIONS FORECAST; 2017 IMPLEMENTATION OF FORECASTING PROCEDURE; SEPTEMBER 2017; PAGES 6, 12 AND 18

12. Determine two charges:
 - a) a system control charge that is paid by all customers supplied by the Darwin-Katherine, Alice Springs and Tennant Creek regulated systems, and is determined based on the total energy consumption in those systems
 - b) a market operator charge that is paid by customers supplied by the Darwin-Katherine regulated system only and is determined based on the energy consumption in that system only.
13. Consider requesting PWC to amend the System Control Technical Code so that the charges can be levied on the basis of demand (the amount of electricity consumed at a point in time).
14. Regulate the system control and market operator charges using a revenue cap, with:
 - a) an overs and unders account which is only applied when the balance in the overs and unders account exceeds a materiality band
 - b) a mechanism for allowing the charge(s) to change when there is greater certainty on the costs associated with a proposed new Control and Administrative Centre and with transitioning from the I-NTEM to the NTEM
 - c) annual CPI escalation based on the data series published by the Australian Bureau of Statistics⁷⁷
 - d) an X factor determined so that the NPV of the smoothed revenue requirement over the period is equal to the NPV of the unsmoothed revenue requirement over the period, the nominal WACC as determined by the AER for Power Networks is used to discount the revenues (5.22 per cent)⁷⁸, the X-factor is the same in each year, and the revenue in the final year (2023-24) is the same as the unsmoothed revenue requirement in that year.

Recommended charges

By applying these recommendations, the recommended X-factor is 1.02 per cent for the system control charge revenue and 1.63 per cent for the market operator charge revenue⁷⁹, and the charges, assuming no adjustment for overs and unders, are set out in Table 6.3.

TABLE 6.3 RECOMMENDED CHARGES (REAL \$2019)

	2019-20	2020-21	2021-22	2022-23	2023-24
System control charge (\$/kWh)	0.0048	0.0048	0.0047	0.0047	0.0046
Market operator charge (\$/kWh)	0.00052	0.00051	0.00050	0.00049	0.00048

SOURCE: ACIL ALLEN ANALYSIS

⁷⁷ CPI All Groups, Weighted Average of Eight Capital Cities, December quarter

⁷⁸ Post tax revenue model for AER's draft determination on PWC's revenue for the 2019-24 period, available at <https://www.aer.gov.au/networks-pipelines/determinations-access-arrangements/power-and-water-corporation-determination-2019-24/draft-decision>

⁷⁹ That is, there is a real reduction in the charges over time.



APPENDICES



The activities that are undertaken by the Power System Controller to fulfil its regulatory obligations are set out in Table A.1.

TABLE A.1 REGULATED SYSTEM CONTROL ACTIVITIES

Activity no.	Activity description	Nature of function
1	Near real time power system monitoring and control	System control
2	Develop and enhance operational tools e.g. SCADA interfaces, contingency analysis module	System control
3	Half yearly reports to UC	System control
4	Short term advices & directions	System control
5	Development of Operational Procedures / SCOD	System control
6	Review of Operational Procedures / SCOD	System control
7	AGC and Real Time Generation Monitoring	System control
8	UFLS scheme	System control
9	RFA process	System control
10	GOTR process	System control
11	System risk process	System control
12	Load flow studies for contingency analysis	System control
13	System Participants technical compliance auditing	System control
14	Customers Complaints monitoring and tracking/investigation	System control
15	SCADA alarm limits	System control
16	Liaison with Asset Managers	System control
17	Issuing non-reliable notices	System control
18	Outage Coordination Meetings with Power Networks and TGEN	System control
19	Maintaining wall boards	System control
20	Approval of generation black start procedures	System control
21	System restart procedures	System control
22	Witnessing black start testing and assessing black start capability	System control
23	Witnessing code compliance testing and assessing evaluation	System control

Activity no.	Activity description	Nature of function
24	Scoping code compliance testing	System control
25	Developing operational test plans	System control
26	Develop and maintain system models	System control
27	Review incidents for reporting requirements	System control
28	Preliminary fault reports	System control
29	Final incident reports	System control
30	Track FIR recommendations	System control
31	Follow up FIR recommendations with participants	System control
32	UFLS strategy	System control
33	Generation dispatch	System control
34	Ancillary services dispatch	System control
35	Voltage control dispatch	System control
36	Develop and review SSG	System control
37	Consult and publish SSG	System control
38	Monitor and report on compliance SSG	System control
39	Outage restoration	System control
40	Monitor System Participant advice	System control
41	Evaluate risk based on participant advice	System control
42	Pre-dispatch	Market operator
43	Market Price	Market operator
44	Participant registration	Market operator
45	Market consultations	Market operator
46	Annual load forecasting	System control
47	Market settlements	Market operator
48	Short term load forecasting	System control
49	Market, industry and regulatory reform	50% System control: 50% Market operator
50	Code review	System control
51	Plant outage approval	System control
52	Day ahead plant schedule	Market operator
53	Daily Plan dispatch	Market operator
54	Generator start and Stop	System control
55	Post trip Management	System control
56	Test run of power plants	System control
57	Reporting	System control
58	Emergency Operation	System control
59	Develop KPIs	System control
60	NTEM Development	Market operator
61	Voltage management plan	System control

Activity no.	Activity description	Nature of function
62	Historical Data Requests	Market operator
63	Standard Data Requests	Market operator
64	Customer Transfers	Market operator
65	Darwin - Katherine settlements	Market operator
66	Ancillary Services Calculations	Market operator
67	Maintain participant register	Market operator
68	IES deemed profile allocations	Market operator
69	Perform ad hoc revisions	Market operator
70	Publication of market data	Market operator

SOURCE: ACIL ALLEN ANALYSIS BASED ON PWC SUBMISSION, REVIEW OF SYSTEM CONTROL CHARGES AND ASSOCIATED FUNDING ISSUES, OCTOBER 2018, PAGE 26

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