Government of Western Australia
Department of Treasury

Improving access to, and operation of, the Pilbara electricity network – the North West Interconnected System

Issues Paper

Department of Treasury | Public Utilities Office

14 November 2017

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1. Introduction

1.1 Policy objective for the Pilbara electricity network

The Pilbara region is a significant driver of Western Australia's economic and export performance, yet the electricity system is fragmented, high-cost and uncompetitive. It has evolved in an ad-hoc manner, with high levels of uncertainty and risk restricting optimal outcomes.

Establishing a regulatory framework for the North West Interconnected System (NWIS) is likely to enhance the availability, security, and lower the cost of electricity services through better integration of network investment, generation investment and system operation in the NWIS. In turn, a more secure and efficient electricity system will contribute to the future economic development of the Pilbara.

The fundamental policy objective that underpins the State Government's focus and priority in this area is about providing a framework that delivers efficiency.

- Efficiency that will provide benefits to electricity consumers in the region through lower prices, greater choice, and potential innovations in product offerings.

- Efficiency for industry and energy producers to make prudent investment decisions by creating the potential for shared use of common infrastructure and avoiding wasteful duplication.

- Efficiency that will boost regional economic growth and development and create jobs, whether that be by lowering the operating cost of local business, lowering the cost of electricity as an investment hurdle for expanding mining and other industry operations in the Pilbara; or creating new opportunities and jobs in the energy sector.

- An efficient process that is not overly burdensome or introduce undue costs. The NWIS, as it stands today, is not equivalent to the South West Interconnected System (SWIS) in terms of size or relative market development and as such, the framework that is developed must by fit-for-purpose today as well as cater for the growth and development of the NWIS in the future.

These are not novel ideas. A number of reports over the last decade have identified broad benefits to the region from creating a framework that provides incentive for greater interconnection of, and access to, electricity assets in the NWIS.[1] These reports have outlined a number of benefits for reform, including:

- enabling a competitive retail market that results in lower prices for electricity consumers;
- more efficient capital investment resulting from greater planning and coordination;

[1] Power for the Pilbara – Report of the North West Interconnected System Taskforce (WA Govt 2002), Electricity Reform Task Force – Discussion Paper on the Reform of the Electricity Supply Industry in Western Australia (WA Govt 2002), Pilbara Coast Petroleum and Minerals Study (SMEC 2005), Power for the Pilbara Region (Allen Consulting 2008), Pilbara Cities (WA Govt 2012), Pilbara 2050 (Curtin University 2014) Pilbara Planning and Infrastructure Framework (WA Govt 2012, 2015), Pilbara Electricity Infrastructure Project (WA Govt 2016)

- the ability for smaller mining and industrial loads to connect to lower cost centralised generation;
- efficient dispatch of power stations, lowering the cost of electricity to consumers; and
- the ability of new renewable generators to add to the supply mix, taking advantage of abundant renewable resources in the region.

Some benefits can be achieved quickly by putting in place regulatory and legislative solutions. Others approaches would require far greater cooperation and coordination between industry stakeholders than exists at present, while full integration and market development would require significant capital investment and time.

Removing barriers to network access on the NWIS and creating an environment that facilitates increased competition will pave the way for future growth and assist development opportunities in this region in preparation for the next round of economic expansion.

The issue of third party access to Horizon Power's component of the network is a clear example of how failing to recognise the maturation of the NWIS limits potential benefits to consumers. Alinta Energy's 2014 submission for Horizon Power section of the NWIS to be covered under the *Electricity Networks Access Code 2005* (the Access Code) demonstrates the need for change. Alinta Energy's application was withdrawn with the intent of a negotiated outcome.

The negotiations between Alinta Energy and Horizon Power were ultimately frustrated and highlighted gaps and deficiencies that, in other electricity systems, are dealt with by appropriate regulatory protections and arrangements.[2]

On 9 August 2017 the Government announced that it will address the ongoing uncertainty by designing fit-for-purpose regulatory and system operator frameworks for the NWIS, including resolving issues of access to Horizon Power's network.

The Public Utilities Office has been tasked with developing the design of this new regulatory framework and associated arrangements for Government's consideration. The Minister for Energy (Minister) has requested that advice on the detailed reform proposal is provided by March 2018. Implementation will follow soon after once a decision is made by the Government on the final form, which is expected to require legislative changes.

1.2 Approach and timeframes

To ensure the Public Utilities Office can deliver the detailed reform proposal for the NWIS regulatory framework to Government within the required timeframe, a staged approach is being taken to allow industry stakeholders the greatest level of opportunity to provide input. The milestones and expected timeframes is provided in Table 1.

[2] On 4 August 2017, Alinta Energy again submitted a coverage application under the Access Code. The Minister is yet to make a determination under that process.

Table 1. NWIS regulatory framework design timetable

Milestone	Timing
Issues Paper released	Mid November 2017
Closing date for submissions to Issues Paper	Early December 2017
Publish Design Paper	Mid-January 2018
Closing date for submissions to Design Paper	Early February 2018
Final Design Report to Government	March 2018

Development of the detailed proposal will be further supplemented through ongoing engagement with a Stakeholder Reference Group made up of key industry stakeholders operating in the NWIS.

This work is being conducted in parallel with Alinta Energy's 2017 Access Code coverage application, as regulatory reform of the NWIS is required regardless of the outcome of that process.

1.3 Purpose of this Issues Paper

This Issues Paper is intended to provide guidance on matters relevant to the NWIS, with regard to:

- a light handed regulatory framework for the NWIS that provides a more suitable alternative to that currently in the Access Code, with a focus on the Horizon Power coastal network; and
- an independent system operator to enhance security of the whole network, manage ancillary services and network planning.

Interested parties are encouraged to respond to the questions raised in this Issues Paper as well as raise any other matters they consider relevant to the design of a light handed regulatory framework and arrangements for a formalised system operator model.

1.4 Making a submission

The Public Utilities Office invites written submissions on this Issues Paper. Submissions must be provided to the Department of Treasury, Public Utilities Office, by 5:00pm (WST) on 4 December 2017.

Electronic copies of submissions are preferred and should be emailed to PUOsubmissions@treasury.wa.gov.au.

Alternatively, submissions can be sent to:

Attn: Noel Ryan
Acting Director, Electricity Networks
Public Utilities Office
Department of Treasury
Locked Bag 11
Cloisters Square WA 6850

In the interests of transparency and to promote informed discussion, submissions will be made publicly available, unless the submitter requests otherwise. Accordingly, stakeholders should clearly specify if information they provide is confidential, and, where possible should separate confidential information from non-confidential information.

Any claim for confidentiality should be clearly noted on the front page of the submission and the relevant section(s) of the submission should be marked as confidential, so the remainder of the document can be made publicly available. Where a submitter claims confidentiality over only part of a submission, it would be appreciated if a complete version and redacted version of the submission could be provided.

Persons making any claim for confidentiality should familiarise themselves with the provisions of the *Freedom of Information Act 1992* (WA), which imposes obligations on the Department of Treasury in respect to the release of documents.

Submissions will be available for public review at:

www.treasury.wa/gov/au/Public-Utilities-Office/Open-consultations-reviews/NWIS-Regulatory-Reform

Contact information, other than the submitter's name and organisation (where applicable) will not be published.

All enquiries may be directed to:

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(08) 6551 4668
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2. Background

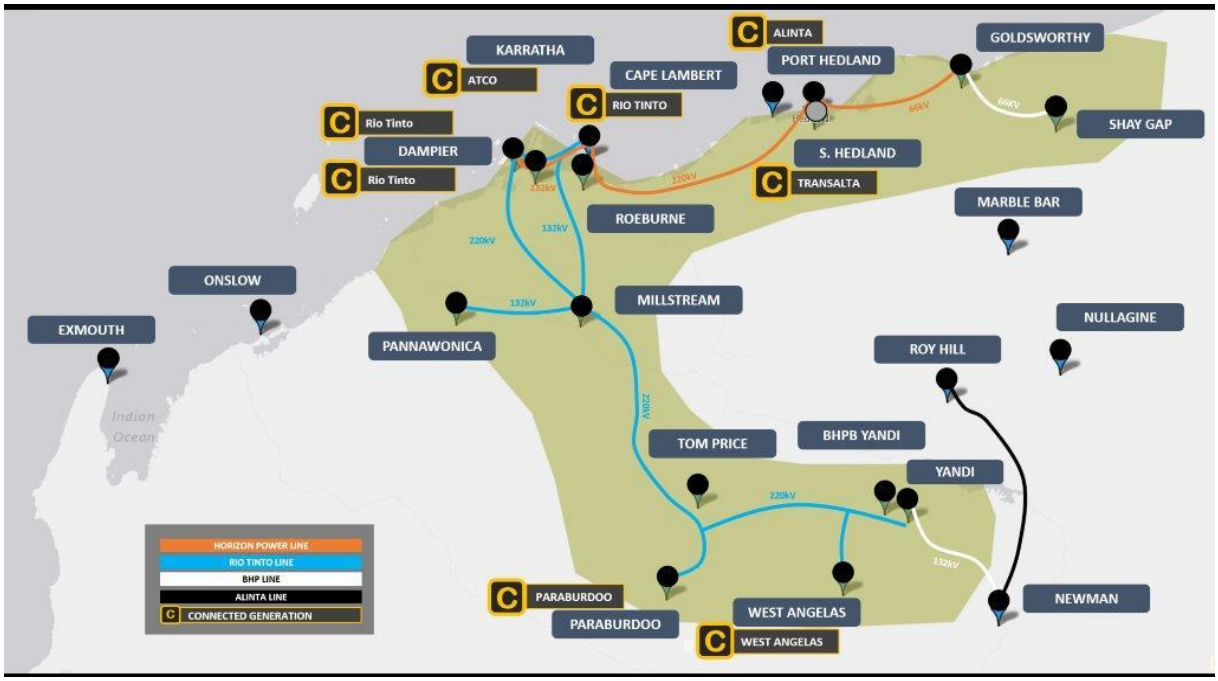
2.1 The North West Interconnected System

The NWIS comprises of interconnected electricity generation, transmission and distribution assets in the Pilbara region of Western Australia, including the major towns of Port Hedland and Karratha. The NWIS is made up of assets owned by many different parties, under both private and public ownership.[3]

The NWIS is not centrally planned or operated and has developed in an ad hoc manner over several decades, as resources and energy companies made individual investments in generation capacity and network infrastructure to meet their own needs, with government meeting the needs of other users in the major towns of Port Hedland and Karratha through Horizon Power.

While the transmission infrastructure is somewhat interconnected, the interconnections are electrically weak, with a range of different voltages, multiple points of transformation and constrained capacity at many points of the system. Figure 1 below provides a high-level overview of the infrastructure in the NWIS.

Figure 1. North West Interconnected System



Source: Compiled from publicly available information by Department of Treasury, Public Utilities Office, Note: BHP and Alinta lines from Newman are not connected to the NWIS.

In acknowledgment of the economic importance of the Pilbara to the State, studies have previously been undertaken by various governments examining the benefit of reforming electricity infrastructure in the Pilbara. The recommendations of these studies vary, but all recognise the benefit that can be achieved with greater coordination and planning, and the creation of effective governance framework.

[3] https://nwis.com.au

2.2 Industry structure

2.2.1 The network sector

The vast majority of network assets in the NWIS are operated by five companies.

Table 2. Interconnected networks forming the NWIS

Owner/Operator	Area	Voltage	Length (approximate)
Alinta DEWAP	Port Hedland (connects to BHP, Horizon Power and FMG).	66kV	21.7km
BHP	Port Hedland (connects to Alinta and Horizon Power).	66kV	25.4km
Fortescue Metals Group	South Hedland (connects to Alinta)	66kV	<5km
Horizon Power	Port Hedland, Karratha and Dampier Port (connects to Alinta, BHP, FMG, Rio Tinto and Roy Hill).	220kV, 132kV, 66kV	464km
Rio Tinto	Dampier and Cape Lambert coastal. South to Pannawonica, Paraburdoo Tom Price, inland to Hope Downs and West Angelas mines (connects to Horizon Power at Dampier and Cape Lambert at 33kV).[4]	220kV, 132kV	700km

Horizon Power operates distribution networks, which were recently undergrounded, in the Port Hedland and Karratha areas. Rio Tinto operates distribution networks in Dampier, Wickham, Pannawonica, Paraburdoo and Tom Price.[5]

The NWIS distribution networks in the Cape Lambert and Dampier area operate in parallel, creating a local transmission ring. In the Port Hedland area, the networks operated in an interconnected grid with varying open points.

A couple of transmission lines are in proximity to the NWIS, but not linked. Alinta DEWAP operates a transmission line connecting its Newman power station with the Roy Hill mine to the north. BHP operates a transmission line from its Newman power station to its Yandi mine. It also operates a distribution network in the town of Newman.

[4] The Rio Tinto and Horizon Power segments of the NWIS are weakly connected at a distribution voltage of 33kV. The interconnection between these networks is governed by bi-lateral commercial arrangements.

[5] Specified rights and powers relating to the generation, transmission and supply of electricity on the Rio Tinto Network are established under relevant State Agreements.

2.2.2 The generation sector

There are currently four companies operating seven generation facilities within the NWIS, as shown in Table 3.

Table 3. Generation connected to the NWIS[6]

Owner/Operator	Location	Size
Alinta Energy	Port Hedland[7]	210MW (126MW + 84MW)
ATCO Australia	Karratha Power Station	86MW
TransAlta	South Hedland Power Station[8]	150MW
Rio Tinto*	Yarralyi Maya (Karratha Seven Mile) Power Station	200MW
	Paraburdoo Power Station	140MW
	West Angelas Mine Power Station	80MW
	Cape Lambert Power Station (due for completion Q1 2018)	80MW

*Rio Tinto generation is weakly connected to the Horizon Power network at a distribution voltage of 33kV. The interconnection is governed by bi-lateral commercial arrangements.

There is a new generation facility under development which is intended to be connected to the Horizon Power network by 2019 – New Energy Corporation's 15MW waste to energy plant in the Boodarie Industrial Estate, Port Hedland.[9]

In addition to the generators connected to the NWIS, there are six large stand-alone generation facilities in the Pilbara within close proximity as shown in Table 4.

Table 4. Large stand-alone Generators[10]

Owner/Operator	Location	Size
Alinta Energy	Newman Power Station	178MW
BHP	Yarmina Power Station (Newman)	190MW
CITIC Pacific	Cape Preston	450MW
Fortescue Metals Group	Solomon Iron Ore Mine Power Station	125MW
Woodside Energy	Karratha Gas Plant	240MW
	Pluto Gas Plant	160MW

Horizon Power also supplies electricity to the small, isolated town micro-grids of Onslow, Marble Bar and Nullagine in the Pilbara.

6 Source: PUO data
7 Generator split amongst two localities in Port Hedland.
8 http://www.transalta.com/facilities/plants-operation/south-hedland-power-station/
9 http://www.newenergycorp.com.au/projects/pilbara-wa/ this facility is dependent on NWIS regulatory reform and access to the Horizon Power distribution network.
10 Source: PUO data

2.2.3 The retail sector

The retail electricity market of the NWIS is technically open to full retail contestability. This means that electricity retailers are permitted to offer electricity services to all electricity customers in the NWIS. This contrasts with the SWIS, where retailers other than Synergy are not permitted to supply electricity services to customers who consume less than 50MWh per year.

Successive State Governments have applied a Uniform Tariff Policy to small-use customers (residential and business) who consume less than 160MWh per year in the SWIS and 4380MWh per year in Horizon Power service areas. Under the Uniform Tariff Policy, all small-use customers in Western Australia have access to regulated retail tariffs, with eligible customers paying the same prices for electricity regardless of geographical location.

The costs of supplying electricity to small-use customers in the regional and remote areas Horizon Power operates in are typically high and as a result, regulated retail tariffs are set at a level below the costs Horizon Power incurs in supplying electricity to its small-use customers.

Horizon Power currently receives a subsidy in the form of a Tariff Equalisation Contribution (TEC)[11] to fund higher cost of electricity generation in regional and remote Western Australia. The TEC is currently funded by a levy on Western Power network tariffs charged to customers on the SWIS. In effect, electricity users in the South West are subsidising lower prices for Western Australian regional and remote customers on regulated tariffs. The State Government is currently reviewing the subsidy paid to Horizon Power to ensure that it is appropriate and suitable for today's needs.

Horizon Power is a vertically integrated business providing electricity to about 15,800 retail accounts within the NWIS (see Table 5). These represent the majority of customers by number in the region.

Table 5. Horizon Power NWIS customer profile

Market segment	Number of accounts	Annual sales volume (GWh)
Residential customers (Tariff A2 and K2)	14,031	159
Small business customers (Tariff L2)	1,132	25
Medium business customers (Tariff L4)	389	99
Large customers	11	136 [12]
Government – medium business customers	158	41
Other tariff classes	58	8
Total	15,779	468

Source: Information provided by Horizon Power on 31 August 2017.

[11] http://www.ourstatebudget.wa.gov.au/Budget-Papers/ see budget paper 3 page 303.
[12] Horizon Power's largest customer in this market segment, Fortescue Metals Group (FMG), uses about 82GWh per annum.

Horizon Power is the electricity retailer for almost all of the customers connected to its NWIS network. Alinta Energy (as Alinta DEWAP) currently has access to limited services on a specific section of the Horizon Power NWIS network in Port Hedland under an existing agreement for the sole purpose of supplying a single large user (BHP).

Alinta Energy holds retail licences to sell electricity within the NWIS[13] but does not have access to Horizon Power's NWIS network to sell electricity to any customers other than BHP Billiton.[14] Alinta Energy currently supplies, through its own NWIS connected network, the Fortescue Metals Group Port operations.[15]

Rio Tinto's vertically integrated electricity generation and network infrastructure is primarily focussed on self-supply for its mining and port operations. It does however also retail electricity to about 4000 small use customers in towns connected to its network[16]. These customers are charged rates that reflect the regulated retail tariffs in other parts of the State. It should be noted that Rio Tinto's retail activities are limited by relevant State Agreements in terms of who it can supply power to and for what purpose.

Residential and small business users only represent about 25 per cent of NWIS connected loads, with mining and industrial loads making up the majority of electricity demand.

Large enterprise consumers (largely mining or port facilities) who are near but not connected to the NWIS have an energy demand over twice that of all the entire interconnected system.

While not connected to the NWIS, BHP Billiton supplies around 2400 residential and commercial customers in the town of Newman under the terms of its State Agreement.

Questions for stakeholders

1. Would customers outside Horizon Power's network benefit from competition?
2. Does the lack of a coordinated approach to electricity infrastructure in the NWIS present a barrier to entry for junior miners and renewable energy projects?
3. Is there economic benefit to a consolidated approach to coordinating development of electricity assets in the NWIS? Provide examples where possible.

[13] See Electricity Integrated Regional Licences EIRL7 and EIRL8, held by Alinta DEWAP Pty Ltd and Alinta Sales Pty Ltd respectively, available at: https://www.erawa.com.au/electricity/electricity-licensing/licence-holders

[14] Alinta Energy, *Network Coverage Application for Horizon Power NWIS* Network, 4 August 2017 ("Alinta Energy Coverage Application"), 3.

[15] Fortescue Metals Group was to be a foundation customer for the TransAlta Port Hedland Power Station and was expected to commence offtake around June 2017. On 13 November 2017 Fortescue Metals Group issued a notice of termination to TransAlta citing that performance conditions under the electricity supply contract had not been met. Both Horizon Power and Alinta Energy have been supplying Fortescue Metals Group to date. No further information is available at the time of publication of this issues paper.

[16] Rio Tinto – Pilbara Region Electricity Network Reliability and Quality Annual Report 2011/12

2.3 The current situation and issues – Network Access

2.3.1 Existing arrangements for access to networks within the NWIS

None of the networks that form the NWIS are currently covered under the Access Code. This means that there is no requirement for network owners to provide access to loads, generators or retailers. The exception to this is Horizon Power which has a regulatory obligation to connect premises where the customer consumes 160MWh of electricity per annum or less, and the connection would not require the distribution network to be extended by more than 100 metres.[17]

Where parties are unable to negotiate private arrangements, the only alternative option available is for an application for the network to be declared as a covered network under either the Access Code or Part IIIA of the *Competition and Consumer Act 2010*.

Horizon Power has previously indicated to the Public Utilities Office that it offers connection at 66kV and above in the NWIS to all generators, retailers and users on an open access basis with contracts determined by commercial negotiation[18], this has not eventuated for retail access due to limitations presented by Horizon Power's vertically integrated nature and issues associated with the absence of an independent system operator.

2.3.2 Recent attempts to gain third party access

In its 2014 and 2017 coverage applications Alinta Energy submitted that access to services provided by means of the Horizon Power NWIS network would promote a material increase in competition in the market for the retail supply of electricity to customers supplied using the Horizon Power NWIS network. In 2014 Horizon Power also sought access to the Alinta Energy network, claiming it was needed in order to compete for Alinta's customers.

Alinta Energy claims that the inability to obtain access to the Horizon Power NWIS network is the only factor preventing it from competition with Horizon Power.[19]

Horizon Power claims that a primary issue preventing a negotiated access arrangement with Alinta Energy is the lack of insurance and indemnity for Horizon Power as the de-facto system operator. In other Australian networks where third party access is guaranteed by legislation an independent system operator exists and holds regulatory immunities. In the NWIS this is absent and Horizon Power considers the associated financial risk too high to cover without appropriate insurances, which would add significant costs to consumers.

The absence of a binding dispute resolution process meant that the frustrated negotiations between Alinta Energy and Horizon Power had no path for resolution outside a coverage application.

Alinta Energy states that electricity consumers currently supplied through the Horizon Power NWIS network have expressed interest in the opportunity to choose between retailers, and that Alinta Energy has pre-signed electricity contracts with four customers since 2016.

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17 *Electricity Industry (Obligation to Connect) Regulations 2005* r4 and 5.

18 Horizon Power, *Application for Coverage of Alinta's East Pilbara Network* (12 November 2014) [6] – [9]; Horizon Power, *Discussion Paper on coverage of networks in the Pilbara* (26 November 2014) ("Horizon Power Discussion Paper) 1.

19 For a very small number of large enterprise customers, it might be economic for Alinta Energy to construct dedicated network connections from its existing infrastructure, but this is not relevant to discussions of open access.

New Energy, which is in the process of developing a waste to energy plant in Port Hedland, has also approached Horizon Power seeking access to its network. New Energy announced in 2016 that it has entered into a 20-year Waste and Power services agreement with the town of Port Hedland.[20]

Questions for stakeholders

4. What process should be used to determine which networks and related assets should initially be subject to the arrangements?

5. Under what circumstances should other networks in the NWIS become subject to the regulatory arrangements at a later date? Should this be on a voluntary (i.e. 'opt-in') or mandated (i.e. 'deemed') basis?

2.3.3 Barriers to competition

Horizon Power's position as a vertically integrated business, with retail, network and generation responsibilities complicates its ability to offer access even once the issues of liabilities and access contracts are solved. It has an obligation, under section 61 of the *Electricity Corporations Act 2005* to act in a commercial manner. This means that it cannot ignore the effects on its retail business that providing access to its networks will have. This can only be overcome by the introduction of an appropriate regulatory framework that requires it to provide access, or by direction from the Minister under the *Electricity Corporations Act 2005*.

Implementing a third party access regime on any section of the NWIS where a network owner also acts as a retailer, such as Horizon Power's network, will require a functional segregation or ring-fencing of that business' network and retail functions to ensure there is no conflict of interest or misuse of market power (real or perceived) on their network section.

Questions for stakeholders

6. What barriers do you see to increased competition in the NWIS?

7. Do stakeholders consider information asymmetry to be an issue in negotiating access? If yes, what additional information is required?

8. What 'ring fencing' arrangements should be required of networks subject to the new regulatory framework to ensure access seekers are treated on an equitable basis? How should compliance with ring fencing arrangements be enforced?

9. What implications arise from the Uniform Tariff Policy with respect to any new regulatory framework in the NWIS?

[20] http://www.newenergycorp.com.au/news-and-media/news/full/new-energy-and-town-of-port-hedland-sign-20-year-waste-and-renewable-power-services-agreement

2.4 The current situation and issues – System and Market Operation

2.4.1 Current arrangements for system and market operation in the NWIS

At present, there is no central system operator for the NWIS. For many of the functions normally performed by a system operator, Horizon Power acts as a de facto provider and absorbs the costs.

There is no one party responsible for coordinating system recovery following disruption, and ancillary services are managed in a sub-optimal level with accusations that some parties are acting in their own interests to the detriment of other users.

Good industry practice involves formalised planned outage coordination and unplanned outage management policies and procedures, and requires that major outage incidents be investigated to attempt to identify the root cause and rectify these matters where economically practicable. Within the NWIS there are no formally agreed outage coordination procedures in place, and there is no formal process for investigating outage incidents.

While there is a cooperative approach to managing outage events, these often result in sub-optimal outcomes with commercial settlements made after the fact. This lack of formal process falls short of best practice, relies on goodwill, and increases in complexity as new stakeholders join the network.

There is no central planning framework for load forecasting, to identify new investment opportunities or enable efficient expansion of generation and networks, such as is presented in the Electricity Statement of Opportunities or Gas Statement of Opportunities.

The characteristics and evolution of the NWIS have also prevented the development of an energy market with centralised economic dispatch, balancing and short-term functions. Currently large enterprise customers self-supply (Rio Tinto), or tender for long term supply (BHP, FMG, Roy Hill). Distribution customers, including large enterprise, are restricted by the issues identified in the section on access above. The small number of participants mean that any market, in the terms of a coordinated energy market, is emergent at best and would require appropriate frameworks to develop.

Questions for stakeholders

10. What barriers do you see to the introduction of an independent system operator in the NWIS?

11. What operational and financial inefficiencies result from the current NWIS system operation model and could be addressed by introducing an independent system operator?

12. Are there significant foregone opportunities for providing more efficient dispatch of available generation resources in the NWIS, or for the integration of currently non-interconnected loads and generators in the region? What are the barriers?

2.4.2 Technical Rules

Technical Rules typically contain the performance standards and technical requirements for all assets connecting to an electricity network. They set the standard for the power quality on an electricity network.

A substantial focus of Technical Rules is on generation assets, as generation assets have a significant influence on the behaviour of the electricity system and quality of the electricity supply. Technical Rules typically detail:

- the physical design and capability of electricity supply industry equipment;
- operational requirements of generators during normal and emergency situations;
- control and protection requirements;
- equipment testing requirements and procedures; and
- information sharing requirements.

It is important for Technical Rules to be technology neutral, and to apply equally to all participants. Where Technical Rules have been introduced after investments have been made, asset owners are typically given a period of time (usually several years) to modify equipment to achieve compliance.

There are no final and agreed set of technical rules that apply consistently across the NWIS. Rather there is a perception that technical requirements for network connections can be negotiated and are exploited for individual commercial advantage.

Questions for stakeholders

13. What aspects of technical rules currently applied in the NWIS cause significant issues to loads/generators?

14. What obligations to comply with a proposed new set of NWIS Technical Rules should be introduced?

2.4.3 Ancillary Services, Reliability and Security of Supply

To ensure consistent and reliable electricity supply, electricity system operators procure a number of ancillary services. The typical ancillary services required to maintain system reliability and security of supply include:

- Frequency Control Services which are used to maintain the frequency on the electrical system, at any point in time, close to fifty cycles per second. In real-time, Frequency Control Services are typically provided by generators with Automatic Generator Control (AGC) increasing or decreasing their output;
- Network Control Services which are used to control the voltage at different points of the electrical network to within the prescribed standards, or control the power flow on network elements to within the physical limitations of those elements; and
- Stand-by and Black-Start Services which are reserved for contingency situations in which there has been a whole or partial system blackout and the electrical system must be restarted.

In addition to ancillary services, capacity and energy reserve management is undertaken on networks. These involve daily and short-term planning and operations processes to ensure sufficient generation supply is available to provide for the expected load.

The *Electricity Industry (Network Quality and Reliability of Supply) Code 2005* establishes the standards for electricity supply reliability in the NWIS. Each owner of network infrastructure is currently responsible for the operation of its own network to meet this standard.

In the absence of centralised dispatch, frequency control is largely reliant on individual generator AGCs and or local controls. This presents challenges to a growing network configuration and increased sensitivity to disturbances and uncoordinated generator frequency control response. Emergency network situations are often dealt with "at the time" and are commercially settled ex-post in good faith. Informal agreements exist at operations level and are likely to be tested by personnel changes and the fundamental pressures of meeting primary customer and business objectives.

In some cases formal agreements are in place, for example for spinning reserve and frequency control between Horizon Power and Rio Tinto at the Dampier connection.

Questions for stakeholders

15. What barriers to cooperation and or the efficient provision of ancillary services are caused by the low number of large and diverse/competitive interests in the NWIS and under what circumstances?

3. Proposed Design

3.1 Network Access

3.1.1 A fit-for-purpose access regime

Economic regulation is an effective tool for addressing issues around market power and facilitating third party access to electricity network infrastructure. However, the form of economic regulation that is available under the current Access Code is considered unnecessarily burdensome for the size, composition and maturity of the NWIS. In place of the 'heavy-handed' form of regulation currently under the Access Code, a fit-for-purpose 'light-handed' regulatory regime can balance the need for facilitating open access to the NWIS network while minimising the regulatory burden and costs imposed on market participants.

There is no light-handed option for electricity network infrastructure operating within Australia. Electricity networks are either subjected to full regulation, in which open access terms and prices are determined for defined Regulatory Periods through a propose-respond regulatory process, or they not regulated at all. Light-handed regimes are often applied to other industries where owners of major infrastructure assets hold substantial market power. Such assets include airports, port and rail facilities, as well as gas pipelines.

A light-handed regulatory regime applies to electricity distributors in New Zealand. Under this framework, distributors are subject to an Information Disclosure regime which is considered to address information asymmetry. Networks are required to disclose to the regulator[21] (and to publish) a range of specified and well-defined accounting and technical information. A default price-quality path (DPP) applies to non-consumer-owned distributors, unless the distributor applies for a customised price quality path (CPP). Distribution pricing methodologies are also required to be disclosed, in accordance with a set of Pricing Principles established by the NZ Electricity Authority.[22] Other than where a distributor seeks a CPP, distribution tariffs are not determined by the regulator.

There is no 'one size fits all' model for a light-handed access regime. However, a common feature in such regimes is that a regulator does not determine the terms and conditions of access, particularly price. Instead, under light-handed regulation the regulator can be limited to setting an upper and lower price limit to price negotiations. Under some models, the regulator merely monitors access negotiations without any involvement.

The light-handed regime that applies to non-covered gas pipelines under the National Gas Access Law and National Gas Rules provides a model that could potentially be applied to the NWIS. Light-handed regulation of non-covered gas pipelines does not have any form of price oversight or regulation, and relies on transparency and arbitration of disputes to determine access to the relevant pipeline services.[23]

An access regime can be designed for certification as an 'effective access regime' under the *Competition and Consumer Act 2010* to ensure it has exclusivity over other access legislation. The National Competition Council has issued guidelines outlining its approach to considering certification applications.

[21] NZ Commerce Commission: http://www.comcom.govt.nz/regulated-industries/electricity/
[22] NZ Electricity Authority https://www.ea.govt.nz/operations/distribution/pricing/
[23] It should be noted however that the regime for covered gas pipelines under the NGR is not dissimilar to the NEM and SWIS electricity network regulatory regimes.

The Public Utilities Office will consider the merits of seeking certification of the proposed access regime as part of the design process. Regardless of the State's ultimate decision on certification, the National Competition Council guidelines will assist in designing a fit-for-purpose access regime for the NWIS. These guidelines are outlined in the following table:

Guideline	Description
Consistency with the declaration criteria	The access regime will need to have a coverage test and the coverage criteria will need to be consistent with the declaration criteria in Part IIIA of the *Competition and Consumer Act 2010*.
A negotiate/arbitrate framework with binding arbitration	The access regime should provide a balance between commercial negotiation and regulatory intervention to facilitate access negotiations. This means that regulatory intervention supports negotiated outcomes, particularly addressing information asymmetry.
Independent regulation	Regulation or deterministic arbitration must be undertaken by an independent body.
Price guidance	The Competition Principles Agreement contains matters that need to be taken into account when determining terms and conditions, including price. While prices will not be determined by a regulator under light-handed regulation, these matters are relevant for arbitration and would need to be incorporated in the NWIS access regime.
Other terms and conditions	A light-handed access regime will not need to specify the requirements of access terms and conditions publicised by a service provider. However, in the event of a dispute, an arbitrator will need to determine matters relating to: safety; allocation of spare capacity amongst competing users; interoperability and service quality.
Periodic reviews	The access regime should be subject to mandated reviews on a periodic basis. The review process must be independent, transparent and open.
Reasonable endeavours	The access regime should require the service provider to use reasonable endeavours to provide access and require a process to promote information disclosure within a response time.
Independent dispute resolution	Provisions for dispute resolution could be modelled on those currently provided under the Access Code. Alternatively, such provisions could be designed to allow an independent person to appoint an independent arbitrator.
Prohibition from hindering access	The access regime will need to be designed so that it prohibits an owner or user of a service from engaging in conduct for the purpose of hindering access to that service by another person.
Separate accounting and ring-fencing	These provisions will require vertically integrated service providers to segregate their network assets and staff from other business areas under the access regime.

Establishing a network access regime for the NWIS will require legislative changes. The power to establish an access regime is provided in section 104 of the *Electricity Industry Act 2004* (the Electricity Industry Act). Limitations with current legislation that must be addressed in designing and implementing a light-handed access regime include to following:

- The Electricity Industry Act contemplates only one access code to regulate electricity networks in Western Australia. If the option of a stand-alone NWIS access code is pursued, then there will need to be an amendment to the Act to provide for this.
- The Electricity Industry Act contemplates an access code in the form of an approved access arrangement. Under the Access Code, this is currently a full 'heavy handed' regulation process. In other words, the Access Code does not provide for a light-handed option for regulating electricity networks in Western Australia. The Act will require amendment to enable a light-handed regime to be inserted in the Access Code, if this is the approach ultimately taken by the State.

Questions for stakeholders

16. Are the National Competition Council guidelines for designing a fit-for-purpose access regime for the NWIS sufficient? Should additional guidelines or criteria be considered based on the specific circumstances of the NWIS?

17. How should the costs and benefits of potentially moving to a new regulatory framework be assessed in developing the new framework?

18. If you are a generator or electricity retailer, would you be interested in seeking access to the services of the Horizon Power NWIS network, or any other Pilbara network now or in the foreseeable future?

19. To what extent should access arrangements be based on negotiation between parties and to what extent should they be subject to imposed requirements on both parties?

20. The National Gas Law and National Gas Rules provide a framework for the regulation of pipeline services. For a lightly regulated service, a more limited access arrangement can be lodged where the pipeline operator determines its own tariffs. The access arrangement provides a starting point for parties to negotiate access on commercial terms. In the event of a dispute, the National Gas Rules contain a dispute resolution mechanism.

a. What features of the framework for the regulation of pipeline services do you consider may be appropriate for the regulation of electricity network services in the NWIS?

b. Are there features of the framework for the regulation of pipeline services that may not be appropriate for the NWIS, given its particular circumstances?

21. If agreement on an access-related matter cannot be reached, how should disputes be resolved? What is the appropriate dispute resolution body?

22. Should guidance relating to the setting of electricity network access prices, such as the build-up of costs (e.g. asset valuation, cost of capital, operating costs) and tariff design (e.g. tariff structures, postage stamp pricing, etc.), be specified in the regulatory framework or should this be addressed solely via commercial negotiation?

23. Should any regulatory oversight or monitoring of electricity network access prices on the NWIS be undertaken? If so, how and by whom?

24. What is the period that parties are likely to seek to have network access prices locked in? Does this period vary between a framework with negotiated outcomes or one with stronger regulatory oversight?

25. How would capital expenditures and upgrades to the networks be addressed in the new regulatory arrangements, particularly with respect to price and service outcomes?

26. How should non-price considerations (such as security and reliability of supply and customer service standards) form part of a light-handed regulatory framework?

27. How should capacity constraints be addressed in the new regulatory framework? Should the networks be required to only offer an unconstrained connection (e.g. N-1)? How are constraints managed post connection?

28. What issues do you see as contentious for access seekers or access providers that are unlikely to be resolved through commercial negotiation (e.g. liability and indemnity)? How could these issues be resolved without unreasonably impacting the property rights of participants? Do other parties have a right to object to connections or material changes that might impact them?

29. Should periodic reviews of a new regulatory framework be conducted to ensure the framework achieves the targeted objectives?

30. What information requirements should be placed on participants to ensure any new regulatory framework for the NWIS is operating as intended?

3.2 System Operation

3.2.1 Formalising system operation and management

Under current arrangements, individual network operators manage their own networks and have limited or no visibility on what happens on other networks. Given its central geographic location and the composition of its customer base, Horizon Power has assumed the role of de facto system operator in the NWIS, making best endeavours to keep the electricity system operating reliably using both formal and informal agreements, even though it has no direct control over other generators and networks operators.

There is no single, final and agreed set of Technical Rules for electricity generation and network operations that applies consistently across the NWIS. This has contributed to the perception that technical requirements for network connection can be negotiated and that Horizon Power is able to use its Technical Rules for its own commercial advantage.

Formalising independent system operator arrangements for the NWIS will enable a 'whole-of-system' approach to the operation of the power system, outage and contingency management, procurement of ancillary services and budget management (cost allocation and recovery). This also provides an opportunity to develop and implement an agreed set of

Technical Rules that can be applied consistently and transparently to the NWIS. To be effective, the independent system operator will need to have full visibility of the power flows across the network and authority to direct system participants in cases of declared system emergencies.

Legislative changes are a fundamental design element of the proposed independent system operator arrangements as they will define the functions and establish the powers of the operator, enabling it to carry out its role. In designing arrangements for an independent system operator for the NWIS, the Public Utilities Office will consider the role and functions of the operator, its ownership structure, data and information requirements, and objectives to guide its activities. Provisions for a new set of Technical Rules will also be considered.

The following table provides a summary of the design elements to be considered for the independent system operator arrangements for the NWIS:

Component	Description
Core functions	Core functions of the system operator are likely to include: the day-to-day operation of the power system, outage and contingency management, procurement of ancillary services and budget management (cost allocation and recovery).
Market-related functions	Provisions for further market-related responsibilities can be included in arrangements for establishing the independent system operator and be activated (subject to certain triggers) as the NWIS matures. This would provide flexibility for an energy market to evolve based on commercial agreements, rather than formal market rules.
Ownership structure	The two most likely ownership models to be considered for the design of the system operator are: 1. Establish the independent system operator as an entity that is separate to the network business via a cooperative approach involving all market participants (this role could potentially be fulfilled by the Australian Energy Market Operator). 2. Establish the independent system operator as a segregated (ring-fenced) entity within an existing network operator.
Data and information	The system operator will require a high level of visibility over the electricity system, and will have substantial data and information requirements to support real-time decision making to maintain system security.
Technical Rules	The independent system operator will likely be the custodian of a new set of Technical Rules outlining the technical requirements that will apply consistently to electricity generation and network operations in the NWIS.
Guiding objective	Mandated objectives similar to the National Electricity Objective or the Wholesale Electricity Market objectives, could guide the independent system operator's activities. These objectives would be designed to meet the specific needs of the NWIS – including the minimum safety and reliability objectives.

Other factors	The physical location, human resources and communications technology required to support the effective execution of the independent system operator role will be considered as part of the design.
Legislative changes	The State will need to legislate powers and functions for the independent system operator in the form of a new statutory instrument or modification of an existing instrument.
Efficient cost recovery	Costs should be apportioned in a fair and appropriate manner among participants relative to the benefits that are accrued (including the ability to sell or receive services). The efficient setup and operation of the independent system operator will be a key element of the design process.

Questions for stakeholders

31. What should the guiding objectives for the independent system operator be? Are the National Electricity Objectives appropriate for the NWIS?

32. Should the proposed independent system operator be granted statutory immunity that excludes, or caps, liability for damages claims from third parties? Should there be any exclusions from immunity?

33. Is there a preference for the independent System Operator functions to be held by a separate entity or ring-fenced within an existing network operator? Similarly, is there a preference for how the costs of an independent system operator should be recovered?

34. What level of governance should be applied to the proposed independent system operator? What should the key features of the governance framework be?

35. How much visibility of the NWIS power system will an independent system operator require? How far should the visibility (and real-time data requirements) extend into generation facilities and the distribution network?

36. Will a more formalised approach to managing outages (planned and unplanned) benefit electricity users on the NWIS?

37. Should an independent system operator for the NWIS have powers to manage and investigate system critical events similar to that of SWIS system management? What dispute resolution mechanism is preferred?

38. Is there a reason why a system of economic dispatch of generation and constrained network access should not be introduced to the NWIS?

39. If introduced, should the independent system operator include oversight of longer term planning and forecasting requirements that inform development of the NWIS?

40. Are there additional functions to be included in the independent system operator role and when?

41. What are the potential costs of introducing an independent system operator?

4. Guiding principles for a regulatory framework

The design of the regulatory framework in the NWIS will be guided by the following policy and technical principles:

1. *Recognition of existing property rights*

The network access arrangements should provide a return to an asset owner who meets the efficient costs of operating this infrastructure, including a suitable return on investments made. In addition, it is important that the proposed regulatory arrangements respect the commercial interests and priorities of privately-owned electricity network assets in the NWIS.

2. *Safety of the network and security of existing supply arrangements*

The proposed system operation arrangements should ensure the electricity network maintains a high level of supply reliability.

3. *Open access with light-handed regulation*

The proposed access arrangements should support the ability of third parties to negotiate network access on reasonable terms and conditions within a suitable timeframe.

4. *Cooperative approach to system operation*

A new set of technical rules for managing and operating the system should be developed in collaboration with relevant stakeholders. These agreed rules and protocols must be implemented through formal process with accountability. Technical standards applied should not present a physical constraint to potential future interconnection of the NWIS, or a barrier to any particular technology type.

5. *Contractual and regulatory certainty*

Existing contractual or other arrangements by network owners for self-use of the network infrastructure must be preserved. New users of the network must also be able to obtain contractual certainty through access contracts. Any opting-out of the new model by a network owner (or a subsequent change in the grid management model) must preserve all access contracts for that owner's segment of the grid.

6. *Greater transparency of energy demand and forecast requirements of the transmission network*

Increased transparency will require an agreed process for the provision of information to assist energy demand forecasting, and also public reporting on the current and future load requirements for the transmission network.

7. *Stakeholder and industry feedback on regulatory design issues*

Industry and stakeholder feedback on design features and issues will be an important part of the regulatory design process.

Questions for stakeholders

42. Are the guiding principles listed above for the design of a regulatory framework in the NWIS complete? Should additional guiding principles be considered?

Appendix – Summary list of questions for stakeholders

1. Would customers outside Horizon Power's network benefit from competition?

2. Does the lack of a coordinated approach to electricity infrastructure in the NWIS present a barrier to entry for junior miners and renewable energy projects?

3. Is there economic benefit to a consolidated approach to coordinating development of electricity assets in the NWIS? Provide examples where possible.

4. What process should be used to determine which networks and related assets should initially be subject to the arrangements?

5. Under what circumstances should other networks in the NWIS become subject to the regulatory arrangements at a later date? Should this be on a voluntary (i.e. 'opt-in') or mandated (i.e. 'deemed') basis?

6. What barriers do you see to increased competition in the NWIS?

7. Do stakeholders consider information asymmetry to be an issue in negotiating access? If yes, what additional information is required?

8. What 'ring fencing' arrangements should be required of networks subject to the new regulatory framework to ensure access seekers are treated on an equitable basis? How should compliance with ring fencing arrangements be enforced?

9. What implications arise from the Uniform Tariff Policy with respect to any new regulatory framework in the NWIS?

10. What barriers do you see to the introduction of an independent system operator in the NWIS?

11. What operational and financial inefficiencies result from the current NWIS system operation model and could be addressed by introducing an independent system operator?

12. Are there significant foregone opportunities for providing more efficient dispatch of available generation resources in the NWIS, or for the integration of currently non-interconnected loads and generators in the region? What are the barriers?

13. What aspects of technical rules currently applied in the NWIS cause significant issues to loads/generators?

14. What obligations to comply with a proposed new set of NWIS Technical Rules should be introduced?

15. What barriers to cooperation and or the efficient provision of ancillary services are caused by the low number of large and diverse/competitive interests in the NWIS and under what circumstances?

16. Are the National Competition Council guidelines for designing a fit-for-purpose access regime for the NWIS sufficient? Should additional guidelines or criteria be considered based on the specific circumstances of the NWIS?

17. How should the costs and benefits of potentially moving to a new regulatory framework be assessed in developing the new framework?

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