Electricity supply options for the North West Minerals Province

Consultation Regulatory Impact Statement

December 2021

Queensland Government

Contents

1 Executive summary

The Queensland Government is committed to supporting prosperous regional communities, economic growth and delivering employment outcomes. This includes ensuring the right infrastructure is available to meet the long-term needs of the community and to support sustainable economic prosperity. It also includes delivering on the Government's commitment to provide an affordable, secure, reliable, and sustainable supply of electricity to Queenslanders.

The North West Minerals Province (NWMP) is an area rich in new economy minerals – minerals that can power Queensland's energy transformation and support global decarbonisation efforts. Mining in the 375,000 square kilometres province, which is centred on Mount Isa, is an important source of employment and royalties for Queensland.

In the NWMP, electricity is principally supplied through the North West Power System (NWPS) to meet the needs of the community and industrial customers. Outside the NWPS, electricity is generated locally near the sources of demand, primarily from diesel or gas-fired generators. Hybrid systems with a renewable energy component, such as solar and batteries, are also gaining traction in the mining sector. Due to its remote geographic location, the NWMP is not connected to the National Electricity Market (NEM).

Large commercial and industrial customers, connected to the NWPS system, pay a higher delivered cost of electricity than those energy users connected to the NEM.

There is a proposal to build a transmission line connecting the NWMP to the NEM near Townsville. Private sector company, CuString Pty Ltd (CuString), is seeking to build the CopperString 2.0 transmission line and derogate from the national framework, to deliver lower power prices to large customers in the NWMP, which could stimulate more resource production and investment in the province. The transmission line is around 1,100 kilometres in length and requires regulatory certainty for the project to proceed. Given the potential economic benefit that accrues from the project, CuString proposes that, if its 'high demand' case eventuates, NWMP customers will pay up to three quarters of the cost of the project (actual revenue recovery will be subject to volume and cost risks, among others). The balance of the project cost after the NWMP contribution would be paid by customers in the rest of Queensland through electricity network charges.

This Consultation Regulatory Impact Statement (CRIS) discusses the options for Government to deliver an affordable, secure, reliable, and sustainable electricity supply to the NWMP. It focuses on the rationale, costs, benefits and risks of several options including business as usual local generation and NEM-connection solutions, such as CopperString.

Electricity pricing options for households and small businesses in the NWMP are not the subject of this CRIS. Under the Queensland Government's Uniform Tariff Policy, their electricity prices are subsidised so that they pay a price reflective of the prices paid by similar customers in South East Queensland.

Through this CRIS, the Queensland Government seeks stakeholder feedback on:

A. What is the evidence of inefficiently high electricity prices in the NWMP? Are there enduring barriers (or market failures) to efficient electricity prices for industrial customers in the NWMP?
    - Does the difference in the delivered price of electricity between NWMP and NEM connected customers indicate a market failure that requires Government intervention to address?

B. How can the Queensland Government facilitate an affordable, secure, reliable and sustainable supply of electricity in the NWMP? What are the feasible options that best address the issue, while considering:
   - Equity (does the option fairly distribute costs, benefits and risks between different stakeholder groups, including electricity customers and taxpayers?).
   - Cost-effectiveness (does the option improve electricity price outcomes for customers, and by how much and at what cost?).
   - Practicality (can the option be implemented and is it robust to changing demand and technology developments?).

C. Is a physical transmission connection to the NEM required for the NWMP?
   - The contribution the NWMP should make to the connection.
   - The contribution the rest of Queensland should make to the connection.

D. What else the Government should consider?

Table 1: Overview of options

Three options are being considered in this CRIS. Stakeholder feedback on this CRIS will inform a final recommendation to Government on electricity supply options for the NWMP.

#	Name	Summary
Local generation		
1	Business as usual	• Customers and suppliers in NWMP continue to negotiate energy supply arrangements, with new supply added based on market demand.
NEM connection		
2	CopperString 2.0	• Private proposal to build a $2.5 billion, 1,100km electricity transmission line to connect the NWPS to the NEM. • Introduces legislation to remove the requirement for a Regulatory Investment Test-Transmission (RIT-T) and applies differential regulated pricing arrangements through a bespoke framework, administered by the State.
3	NEM connection (CopperString 2.0) through AER RIT-T framework	• Assess CopperString 2.0 through an amended RIT-T, which considers the project's broader economic benefits. • Deliver and operate the project in accordance with standard Australian Energy Regulator (AER) regulatory allowances.

2 About this Consultation Regulatory Impact Statement (CRIS)

2.1 What is a CRIS?

A crucial element in developing regulatory proposals is the preparation of a Regulatory Impact Statement (RIS). One element of the RIS process is the development of a Consultation Regulatory Impact Statement (CRIS). A CRIS is a systematic approach to critically assess the impacts of options, and is designed to elicit feedback, though a public consultation process, to provide Government with information about the expected impacts of a range of policy options.

This CRIS seeks to assess three options for affordable, secure, reliable, and sustainable electricity in the NWMP.

2.2 Have your say

Feedback is invited on this CRIS. The Queensland Government welcomes any additional information about the options and the costs and benefits of options.

Specific questions on which feedback is sought are listed throughout this CRIS.

Feedback will be accepted until **5pm, 28 February 2022**. To submit a response, visit our *Electricity supply options for the North West Minerals Province* consultation web page at gld.gov.au/northwest-electricity-supply.

3 Introduction

3.1 North West Minerals Province

The NWMP covers approximately 375,000 square kilometres. It is an area rich with new economy minerals that has the potential to power Queensland's energy transformation and support global decarbonisation efforts. Mining operations in the province are centred around Mount Isa and are an important source of employment, directly employing more than 7,400 workers in the NWMP. These mining operations are also an important source of royalties for Queensland.

Due to its remote geographic location, the NWMP is not connected to the National Electricity Market (NEM). Most of the NWMP is supplied electricity through an islanded power transmission and distribution network – the North West Power System (NWPS). The NWPS services the needs of both the community and industrial customers in the City of Mount Isa, Cloncurry and at nearby mining operations. The NWPS has limited electricity supply options and is predominantly sourced from gas-fired generation, resulting in a higher delivered cost of electricity than to energy users connected to the NEM.

Outside the NWPS, electricity is generated locally – either at or near the sources of demand – and primarily from diesel or gas-fired generators. Hybrid systems with a renewable energy component, such as solar and batteries, are also gaining traction in the mining sector.

Figure 1: NWMP geographic area

3.2 Prices

3.2.1 Mining and major industrial customers

Most major customers in the NWPS have individual, confidential supply contracts with a generating business. For the purposes of this CRIS, an electricity price in the NWPS of $140 per megawatt hour (MWh) was calculated, based on gas prices and the efficiency of conversion to electricity. By comparison, large customers within the NEM typically incur electricity costs of $74/MWh to $93/MWh. These are delivered electricity costs which include wholesale electricity costs, network charges (transmission and distribution) and other fees and costs.

CuString forecasts delivered electricity costs in the NWMP could be reduced to $90/MWh through a NEM connection, dependent on NEM outcomes and demand for electricity in the NWMP. There are difficulties in estimating the price elasticity of demand for energy in the NWMP given the competitive dynamics of the global resource industry.

3.2.2 Residential and small business customers in the region

Ergon Retail receives a subsidy from the Queensland Government via the Community Service Obligation (CSO) in order to implement the long-standing Queensland Government policy that household and small business customers in regional and rural areas, such as the Mount Isa-Cloncurry region, pay similar regulated tariffs to customers in South East Queensland. The total CSO payment for the Mount Isa region is approximately $24 million a year[1]. Accordingly, for all of the options detailed in this CRIS (or any other subsequently identified preferred option), pricing impacts to residential and small business customers in the region are mitigated through the above-mentioned policy and the CSO.

3.3 Electricity regulation in Queensland

Queensland's electricity sector is governed by state laws and applied national laws. National regulatory bodies and rules play a central role in Queensland's electricity sector management. The key state-specific legislation is Queensland's *Electricity Act 1994* while the national framework is adopted in Queensland through the *Electricity – National Scheme (Queensland) Act 1997* which applies the National Electricity Law (NEL) and the National Electricity Rules (NER) in Queensland.

Although the NWPS is not connected to the NEM, under the *Electricity – National Scheme (Queensland) Act 1997,* the Australian Energy Regulator (AER) is currently responsible for the economic regulation of distribution services provided through the Mount Isa-Cloncurry supply network, as if it were part of the national grid.

The AER regulates electricity transmission and distribution networks in the NEM, aiming to ensure the network service providers operate these assets reliably and cost-effectively, given networks are primarily regulated monopolies. Regulatory allowances are usually set every five years on a prudent and efficient basis. The five-year regulatory cycle was established to help encourage a stable investment environment.

The NER provides the framework within which the AER sets the maximum prices that electricity network businesses can charge for the services they provide or the maximum revenue (Maximum Allowable Revenue or MAR) they can earn.

Regulation helps to manage the potential risks of monopoly pricing so that consumers do not pay any more than necessary for the reliable supply of electricity.

[1] Ergon Retail

The objective of the NEL is to "promote efficient investment in, and efficient operation and use of, electricity services for the long-term interests of consumers of electricity with respect to:

- price, quality, safety, reliability and security of supply of electricity
- the reliability, safety and security of the national electricity system."

The cost of building and maintaining the transmission and distribution networks in the NEM is spread across all customers. Electricity network charges can represent about 10-20 per cent of total costs for large energy users, and about 40–50 per cent for residential consumers[2]. Recognising the monopolistic nature of network supply, the regulatory framework includes mechanisms to protect consumer interests by prescribing how to reach decisions on whether to build new transmission lines and how much revenue its owners can collect from customers.

One regulatory mechanism is the Regulatory Investment Test-Transmission (RIT-T). The RIT-T is an economic cost-benefit test administered by the AER. It promotes investment prudency and efficiency by imposing transparency and accountability on major transmission investment decisions. The RIT-T is solely focussed on the electricity system. The AER specifically requires that: "Any cost or market benefit that cannot be measured as a cost or market benefit to those who produce, consume and/or transport electricity in the market *must not* be included in any analysis under the RIT–T" (emphasis added).[3]

[2] Understand your retail energy bill | energy.gov.au

[3] AER (August 2020), *Regulatory investment test for transmission*. Available at: www.aer.gov.au/system/files/AER%20-%20Regulatory%20investment%20test%20for%20transmission%20-%2025%20August%202020.pdf

4 Problem identification

The Queensland Government is committed to supporting prosperous regional communities, economic development and delivering employment outcomes. This includes ensuring the right infrastructure is available to meet the long-term needs of the community and ensuring all Queenslanders have access to an affordable, secure, reliable, and sustainable electricity supply.

The NWMP is supplied electricity locally through the NWPS to meet the needs of the community and industrial customers. Due to its remote geographic location, the NWMP is not connected to the NEM and has a higher delivered cost of electricity. This means large commercial and industrial customers connected to the NWPS currently pay more for electricity than those energy users in the NEM as the NWPS is predominantly supplied by gas-fired generation which is relatively expensive compared to the alternative generation sources available in the NEM (coal, hydro and renewables). High electricity prices place a constraint on economic development in the NWMP by adding costs to mining and processing operations that dominate the region.

Due to its remoteness, there is a lack of competition and supply options for electricity in the NWMP. Currently, there is one major supplier that provides electricity from relatively expensive gas-fired generation. Feedback is sought on the size and scope of electricity pricing issues and the cause (or barriers) to efficient pricing for industrial customers in the NWMP.

With the Queensland Government's commitment to affordable energy and the development of new economy mineral projects, this CRIS discusses three electricity supply options for the NWMP.

5 Consideration of options

5.1 Introduction

There are a number of options that may support efficient pricing in the NWMP. Some options, including direct subsidies, have already been investigated and ruled to be inefficient and unsustainable. While the focus of this CRIS is on the CopperString proposal, as presented to Government by CuString, stakeholders are encouraged to identify any alternative options that should be considered and assessed.

This CRIS presents the benefits, risks and costs of three electricity supply options for the NWMP, including their impacts on customers in the NWMP and on the rest of Queensland. This options analysis has been informed by economic modelling and analysis commissioned by the Queensland Government, using CuString's information on the estimated costs of a transmission line connecting the NWMP to the NEM and the legislative changes required for implementation.

The options have been tested at three demand scenarios over a 40-year period (i.e. the economic life of a new transmission line). They are:

1. Low demand – existing mining operations run to completion and demand in the NWMP declines over time.
2. Flat demand – status quo levels of demand continue (i.e. 373 megawatts (MW)).
3. High demand case – this is CuString's target demand case and assumes an increase in mining activity as a consequence of a lower electricity price (i.e. NEM connected electricity demand peaks at 556MW and averages approximately 395MW over the life of the project).

This CRIS also assesses the options against the following key criteria:

- Equity – does the option fairly distribute costs, benefits, and risks between different stakeholder groups, including electricity customers and taxpayers?
- Cost-effectiveness – does the option improve electricity prices for NWMP customers, by how much and at what cost?
- Practicality – can the option be implemented by the Queensland Government and is it robust to changing demand and technology developments?

Table 2: Description of options

#	Name	Summary
Local generation		
1	Business as usual	• This option provides a benchmark against which other options can be assessed, and represents the Queensland Government's forecast as to how energy supply would evolve in NWMP if no specific actions or intervention were taken. • This includes assumptions about the future output of existing generators, the amount of new generation investment that would occur in response to market conditions and an assessment of the future price of gas.

#	Name	Summary
		NEM connection
2	CopperString 2.0	• CuString proposes to build a 1100km transmission line connecting the NWMP (i.e. from Mount Isa) to the NEM, near Townsville. This option uses CuString's forecasts that access to NEM-sourced electricity – in combination with recovering a quarter of the project's cost from electricity customers outside the NWMP – would increase demand and bring delivered energy costs down to $90/MWh. • This option requires the introduction of new legislation in Queensland for the project to proceed.
3	NEM connection (CopperString 2.0) through AER RIT-T framework	• The Queensland Government would seek to apply the National Electricity Rules in Queensland per the RIT-T framework, however modify it to allow the broader economic benefits of the project to be assessed. • This option would require the introduction of new legislation or an amendment to the National Electricity Rules, but would only amend the process for approval of new investments. It would not guarantee the project passes such an assessment and would not amend the economic or technical regulatory regime in relation to transmission investment and operation.

5.2 Detailed discussion and stakeholder impact assessment

5.2.1 Option 1 – Business as usual

Overview

This option considers the outlook for the NWPS if the Queensland Government took no direct, additional action to support an affordable, secure, reliable, and sustainable electricity supply.

At present, the NWPS has around 360MW of generation capacity, supplied by natural gas, and has a very low reserve capacity. This means if unplanned outages or longer outages for maintenance occur, large customers that are connected to the system are required to reduce their demand. Unplanned outages of a single significant generator or associated network infrastructure can lead to widespread loss of supply (blackouts) in the NWPS, reducing the quality and reliability of electricity supply. Widespread blackouts affect small and large business customers, and residential customers, including households who rely on electricity for life support equipment.

In 2021, two significant events occurred that resulted in loss of power in the NWPS for several hours. Electricity customers were without power for four hours on 10 November 2021 and five hours on 23 April 2021. In large inter-connected systems, such as the NEM, the impact from the loss of a single critical piece of infrastructure is reduced by the inherent redundancy from greater inter-connectedness.

Further, there may not currently be enough firm supply to meet demand in the NWPS, potentially leaving a demand/supply gap.

This option assumes there will be incremental change to the BAU arrangements, with new local generation added to the current generation mix based on market conditions. Key elements of this option include:

- Existing generation continues and a 200MW solar farm is added at Mount Isa in 2022.

- The current price for electricity in the NWPS is approximately $140/MWh.
- Any demand/supply gap will be met by the market per historical trends.
- Customers' existing agreements for service levels, pricing and contractual arrangements remain in place. It is understood some major users have contracts for electricity supply in place until 2030 or longer.

Issues

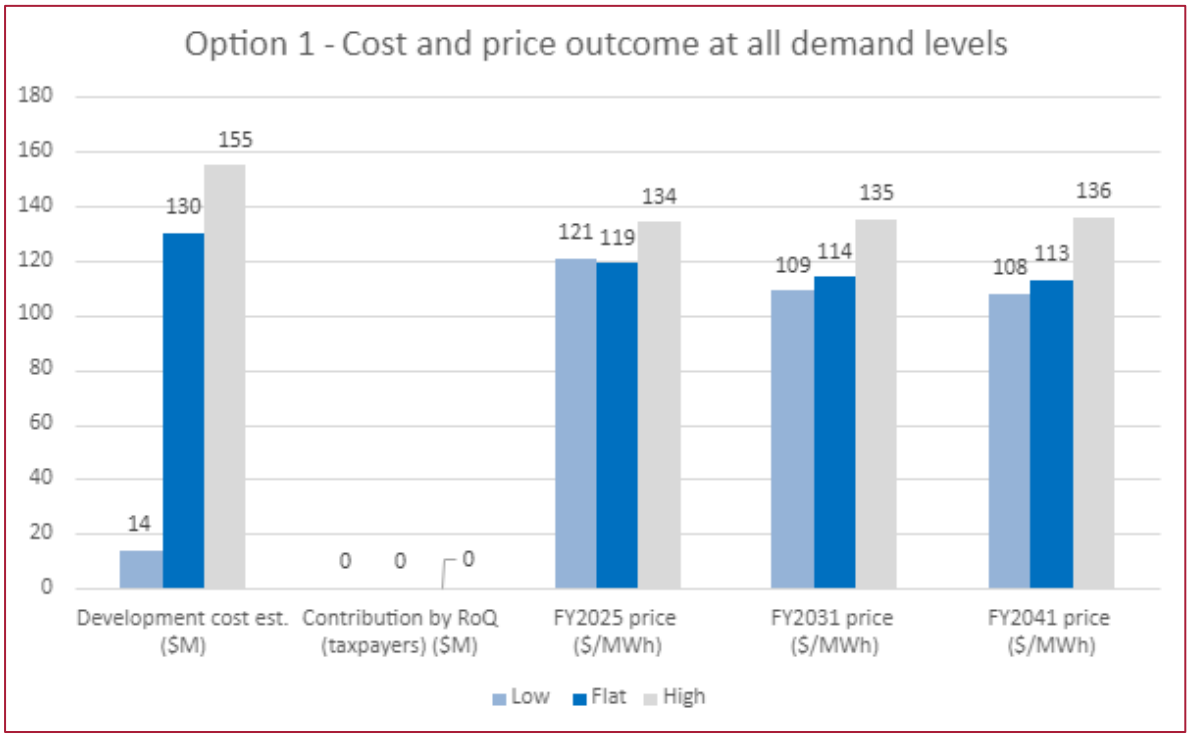
In this option, the assumption of new solar generation is based on indications that at least two providers are investigating building new power plants in the NWMP that rely primarily on renewable energy. APA Group recently announced it is beginning construction of a 44MW solar farm, with plans to expand to 88MW, in Mount Isa[4]. Details of other providers' proposals are not in the public domain.

Outcomes and impacts

The financial modelling for the costs of adding 200MW solar and the resultant prices for all three demand scenarios are shown in Figure 2 and Table 3 (below). Table 5 outlines how this option affects each major stakeholder group.

At the flat demand scenario, this option costs $130 million and cuts prices to between $119/MWh in FY2025 and $113/MWh at FY2041, compared with the current $140/MWh.

Figure 2: Chart of Option 1 modelling



[4] APA to commence stage one of Mica Creek Solar Farm

Table 3: Summary of results Option 1

Demand level	Development cost est. ($M)	Contribution by RoQ (taxpayers) ($M NPV)	FY2025 electricity price ($/MWh)	FY2031 electricity price ($/MWh)	FY2041 electricity price ($/MWh)
Low	14	0	121	109	108
Flat	130	0	119	114	113
High	155	0	134	135	136

Instead of continuing with gas generation as per the status quo, the NWPS could be built out with higher volumes of renewable (solar and wind) and firming (battery) generation technology, to meet the same demand outcomes. This would involve higher development costs than gas fired generation development given the additional requirements to firm the load, however the delivered costs of energy would be lower.

Table 4: Summary of results Option 1 – Greater renewable penetration

Demand level	Development cost est. ($M)	Contribution by RoQ (taxpayers) ($M NPV)	FY2025 electricity price ($/MWh)	FY2031 electricity price ($/MWh)	FY2041 electricity price ($/MWh)
Low	347	0	121	82	83
Flat	485	0	119	82	76
High	2,105	0	95	101	88

Table 5: Impact analysis

Stakeholder	Impact
NWMP electricity customers	***Advantage/s*** • Option for renewables development helps reduce prices in the NWPS and provides an opportunity to reduce Queensland's greenhouse gas emissions. • Ability for generation to scale in alignment with customer demand. ***Disadvantage/s*** • This option delivers no benefit for projects/proponents outside the NWPS network. • This option may not provide sufficient firm supply to meet demand, or may require additional investment to firm the load, leaving unserved load or leading to further costs. • Reliability of supply may not be improved, leaving potential for loss of supply (blackouts) in the event of planned or unplanned outages of a single critical generator. ***Risk/s*** • The ability for this option to deliver lower power prices for NWPS customers is reliant on generators passing on the savings of cheaper generation to customers.

Stakeholder	Impact
	• There may be system security impacts and technical challenges in integrating renewables into the NWPS at scale.
Queensland Government (taxpayers)	***Advantage/s*** • This option enables holistic network planning and supply that follows NWPS demand. • Nil cost to the Queensland Government/taxpayers. ***Disadvantage/s*** • This option may be viewed as not delivering an affordable, secure, reliable, and sustainable supply of electricity for Queenslanders. ***Risk/s*** No risks identified.
Rest of Queensland electricity customers	***Advantage/s*** • No cost impact for the electricity customers in the rest of Queensland. ***Risk/s*** No risks or disadvantages identified.
Electricity generators/ storage developers	***Advantage/s*** • Decisions for generator and storage assets are driven by market conditions. ***Risk/s*** • Market and project specific risks accepted by the proponents.
Network businesses	***Advantage/s*** • Energy Queensland and Powerlink are not impacted by this option. ***Risk/s*** • There may be system security impacts and technical challenges in integrating renewables into the NWPS at scale.

Assessment against criteria:
Equity: This option fairly distributes costs and benefits as the costs would be covered by the consumers who benefit from the supply of the electricity. There may be system security impacts and technical challenges in integrating renewables into the NWPS at scale, and reliability issues may persist.

Practical: This option relies on existing supply arrangements and evidence that businesses are investigating the development of further supply.

Cost effective: In all demand scenarios this option is cost effective, requiring a prudent amount of expenditure over the forecasting period for each dollar in electricity price saved.

Focus questions:

- Does this option deliver affordable, secure, reliable, and sustainable electricity supply in an equitable, practical, and cost-effective manner?
- How well does this option capture the pipeline of generation projects for the NWPS?

- Are there any concerns around the key inputs and assumptions?
- Are there any risks or gaps to raise with Government?

5.2.2 Option 2 – CopperString NEM connection

Overview

The NWPS has a higher delivered cost of energy than users connected to the NEM. Private sector company, CuString, is seeking to build a transmission line that connects the NWMP to the NEM, near Townsville, to deliver lower power prices for large customers in the NWMP.

The total project cost is estimated at $2.5 billion and CuString anticipates it could reduce the cost of electricity for large NWMP customers to around $90/MWh. CuString anticipates the project would be operational from 2025 and be operated by CuString for the first 40 years, with Government then taking ownership of the project (and its remaining debt of $1.1 billion, or around $170 million in present value terms). CuString has identified various scopes and options to deliver the NEM to the NWMP. This analysis is of a project with network assets of:

- 330kV double circuit transmission line from Townsville to Cloncurry
- a 220kV double circuit transmission line from Cloncurry west to Mount Isa
- a “Southern Spur” comprising a 220kV and 132kV double circuit transmission line from Cloncurry south to facilitate the NEM connection of industrial facilities not currently connected to the NWPS
- associated substations and facilities.

The project is proposed to be funded through concessional debt financing (i.e. Northern Australia Infrastructure Facility (NAIF)), commercial loans, and private equity investment.

For the project to proceed, CuString requires project specific derogations from the NER as set out in Appendix 1.

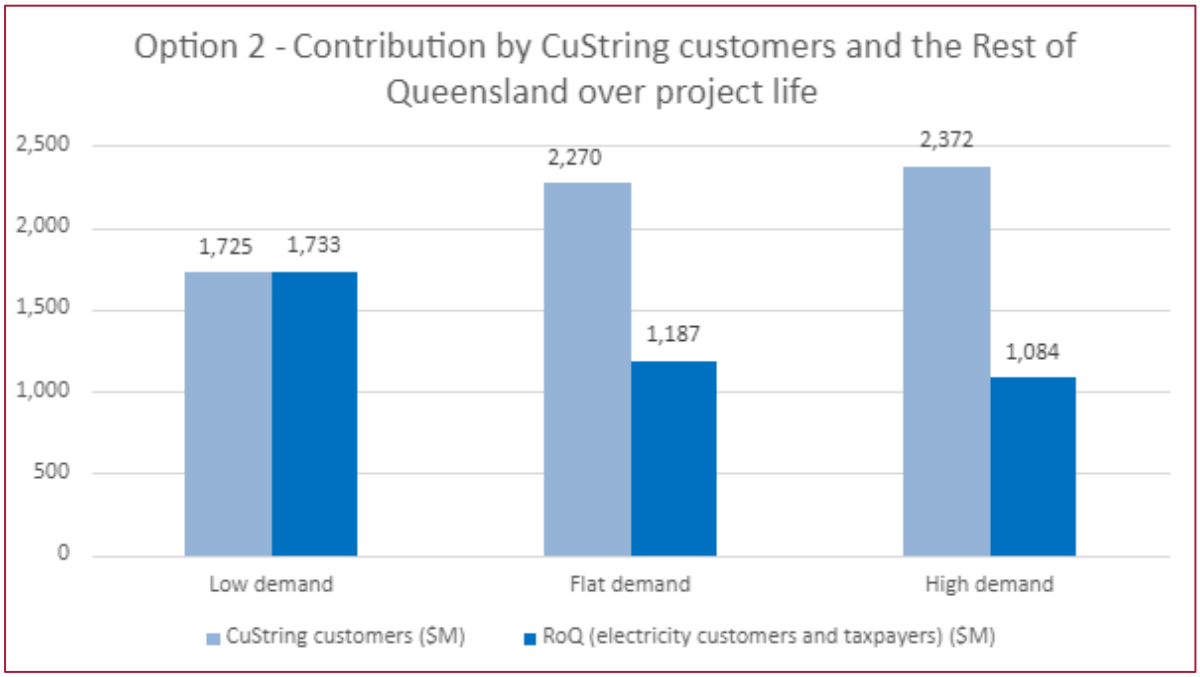
The key elements of this option are described below:

- The current price for electricity in the NWPS is $140/MWh.
- The wholesale cost of electricity (prior to delivery charges) is assumed at $50/MWh for the forecast period.
- Assumes a solar farm has not been constructed (unlike Option 1 or APA’s recent announcement for 44/88MW).
- Parliament passes legislation that allows revenue to be collected from electricity customers across Queensland.
- A pre-approved rate of return as per Appendix 1.

Issues

To achieve a delivered cost of energy of approximately $90/MWh in 2041, at least 26 per cent of the project’s costs must be recovered from Queensland electricity customers outside the NWMP. Major industrial customers, currently connected to the NEM, are likely to experience the greatest impact and could pay more in transmission charges annually. These figures are likely to rise if demand from NWPS customers is lower than forecast (shown in Figure 3), or if new renewable generation is sent from the west to the east coast along the line.

Figure 3: Option 2 – Contributions shows the CopperString transmission costs component of the total energy costs for NWPS customers for the life of the asset against the contribution from the Rest of Queensland.



Other risks:
For large projects of this magnitude, delivery challenges and risks need to be managed carefully. Similar projects in other states, such as Project Energy Connect (the NSW-SA interconnector), have experienced significant cost increases. Modelling shows that increases in project costs flow through to electricity customers in rest of Queensland. An increase in the allowable revenue of CopperString of $31 million in FY25 results in an increase in cost to the rest of Queensland contribution of $17 million.

Outcomes and impacts
The financial modelling for the costs of the proposal, the resultant prices in the NWMP, and the rest of Queensland contribution for all three demand scenarios are shown in Figure 4 and Table 6. Table 7 outlines how this option affects each major stakeholder group. If demand remains steady, this option reduces prices in the NWMP to $105/MWh in FY2025 and $95/MWh in FY2041.

Figure 4: Chart of Option 2 modelling

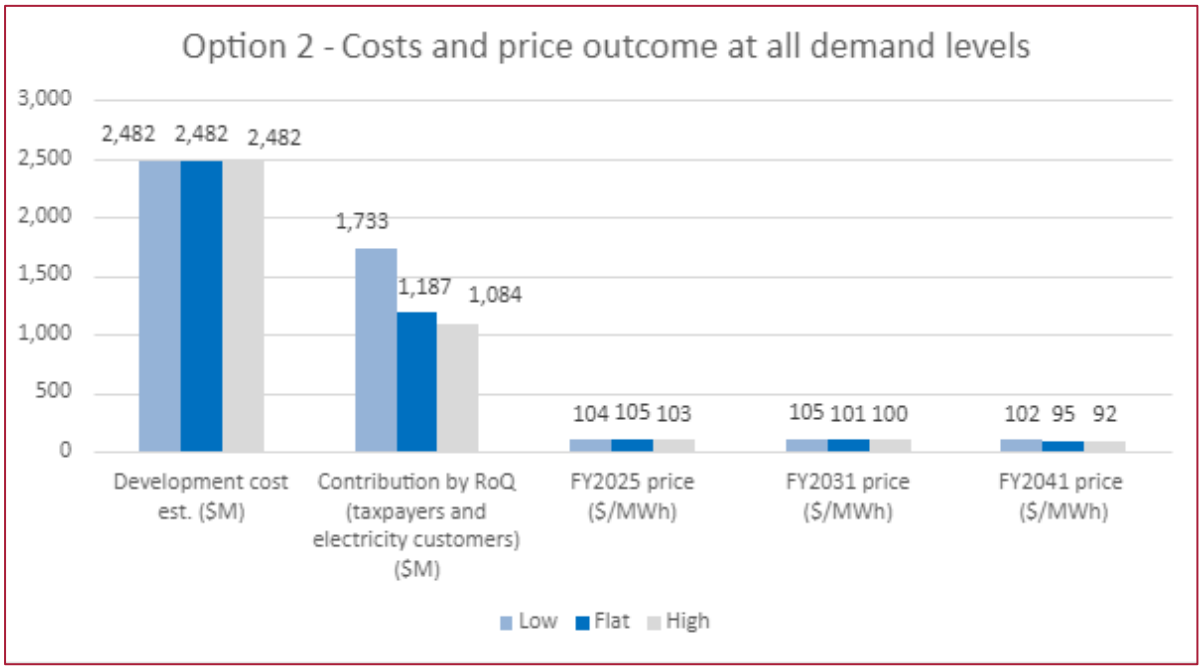


Table 6: Summary of results Option 2

Demand level	Development cost est. ($M)	Contribution by RoQ (taxpayers and electricity customers) ($M NPV)	FY2025 electricity price ($/MWh)	FY2031 electricity price ($/MWh)	FY2041 electricity price ($/MWh)
Low	2,482	1,733	104	105	102
Flat	2,482	1,187	105	101	95
High	2,482	1,084	103	100	92

Table 7: Impact analysis

Stakeholder	Impact
NWMP electricity customers	***Advantage/s*** • This option delivers lower electricity prices for large customers connected to the NWPS and other customers who connect to the project. • This option could support the development of renewable energy in Northern Queensland, particularly in the Hughenden region. ***Disadvantage/s*** • This option only benefits those customers connecting to the NWPS and other customers who directly connect to the project. • The transmission line will be 1,100km in length, providing minimal redundancy across its length.

Stakeholder	Impact
	Risk/s • If the connection to the NEM results in the retirement of existing local generation, the operations will be vulnerable to line operation (i.e. damage to the line will result in unplanned outages in the NWPS). • While prices in the NEM are currently low, this may not always be the case.
Queensland Government (taxpayers)	***Advantage/s*** • The project, and lower electricity prices, may lead to increased economic activity, e.g. investment and resource production in new economy minerals in the region. An increase in mine production could increase economic production and royalties to the State. ***Disadvantage/s*** • Implementation requires a large up-front investment, with future demand uncommitted. • The Queensland Government would be required to take on regulatory responsibilities for the financial and operating aspects of the project, which would otherwise be managed and resourced by the AER. • At year 40, the Queensland Government would be required to take ownership of the project and its remaining $1.1 billion debt (or approximately $170 million in present value terms). • The Queensland Government and electricity customers in the rest of Queensland are required to pay between $1.1 billion (high demand) and $1.7 billion (low demand) (including GOC network businesses augmentation expense) over a 40-year period, depending on demand levels. ***Risk/s*** • Under this option, 70 per cent of construction cost overruns will be added to the project's regulatory asset base and recovered through project revenues. • The State guarantees project revenue. • Underutilisation and that of the interconnection becoming a stranded asset in the absence of customer commitments.
Rest of Queensland electricity customers	***Disadvantage/s*** • The Queensland Government and electricity customers in the rest of Queensland are required to pay between $1.1 billion and $1.7 billion over a 40-year period, depending on demand levels. For a typical residential customer, this will be a negligible bill increase of approximately $5 bill increase per annum. Major industrial customers, currently connected to the NEM, are likely to experience greater impact and could pay more in transmission charges annually.

Stakeholder	Impact
	Risk/s • There is a risk the project is underutilised and becomes a stranded asset – if the asset is underutilised, the residential bill impact may see an increase of $7 per annum, with the exact quantum determined by the level of demand in the NWMP. • Any funding gaps for the project may increase the Queensland Government's contribution or bill impact for electricity customers in the rest of Queensland. ***Advantage/s*** No advantages have been identified.
Electricity generators/ storage developers	***Advantage/s*** • This option could create additional demand for NEM connected generation projects and developers and create a new path to market for NWMP renewables. • This option also provides a pathway for new renewable projects to connect at resource rich areas such as Hughenden. ***Disadvantage/s*** • This option could create reduced demand for Mount Isa generators and may disincentivise new, renewable generation investment and development in the NWMP. • This option duplicates supply in the NWMP and could lead to over-capitalisation and under-utilisation of existing supply assets in the short to medium term. ***Risk/s*** No risks have been identified.
Network businesses	***Disadvantage/s*** • Energy Queensland and Powerlink will be required to make investments in their networks to connect the CopperString 2.0 project to their networks – these costs would need to be recovered from customers or taxpayers. ***Risk/s*** No advantages or risks have been identified.

Assessment against criteria:
Equity: Option 2 would provide an electricity price benefit to a small number of mining and large industrial customers in the NWMP, with some costs offset by the Queensland Government (taxpayers) and Queensland electricity customers outside the NWMP. Other major electricity users in and outside the NWMP would receive no benefit.

Practical: The practicalities of building a transmission line are well understood. The proponents would be responsible for reaching financial close with their investors and constructing the line. The processes for achieving the law changes required by CuString and establishing an alternative oversight mechanism are dependent on Parliamentary consideration and passage.

Cost effective: Under the flat demand case, this option requires a total of ~$63 million in development spending and ~$30 million in subsidies over the 40-year forecasting period to deliver each $1/MWh reduction in electricity prices in FY2031.

Focus questions:

- Does this option deliver affordable, secure, reliable, and sustainable electricity supply in an equitable, practical, and cost-effective manner?
- Are there any concerns around the key inputs and assumptions?
- Are there any risks or gaps to raise with Government?

5.2.3 Option 3 – Modifying the AER Regulatory Framework RIT-T (NEM connection)

Overview

Similar to Option 2, this option considers the outcomes of building a transmission line connecting the NWMP to the NEM. However, under this option, the project would apply the AER regulatory framework through an amended RIT-T process and regulation would be in accordance with the economic parameters applied under the AER's economic regulatory regime.

Under the National Electricity Rules, the RIT-T is solely focused on the electricity system:

Any cost or market benefit that cannot be measured as a cost or market benefit to those who produce, consume and/or transport electricity in the market must not be included in any analysis under the RIT–T. The allocation of costs and market benefits between electricity and other markets must be based on the cost allocation principle.

The amended RIT-T process proposed in this option would allow the cost-benefit assessment to consider the project's broader economic benefits. To achieve an amended RIT-T option, the Queensland Government would seek a NEM rule change or parliamentary approval for a Queensland specific law change, to give the same effect. Relative to Option 2, the CuString proposal, this option restores the safeguards of the RIT-T process.

The key elements of this option are described below:

- The current price for electricity in the NWPS is $140/MWh and no solar farm is built (as per option 2).
- An 1,100km transmission line NEM connection is completed by 2025.
- The wholesale cost of electricity (prior to delivery charges) is $50/MWh for the forecast period.
- An amended RIT-T process is followed, allowing the broader economic benefits of this project to be considered.
- The rate of return calculated in line with the AER's economic regulatory regime.
- Customers in the rest of Queensland contribute to revenue for the line.

Issues

Changing rules

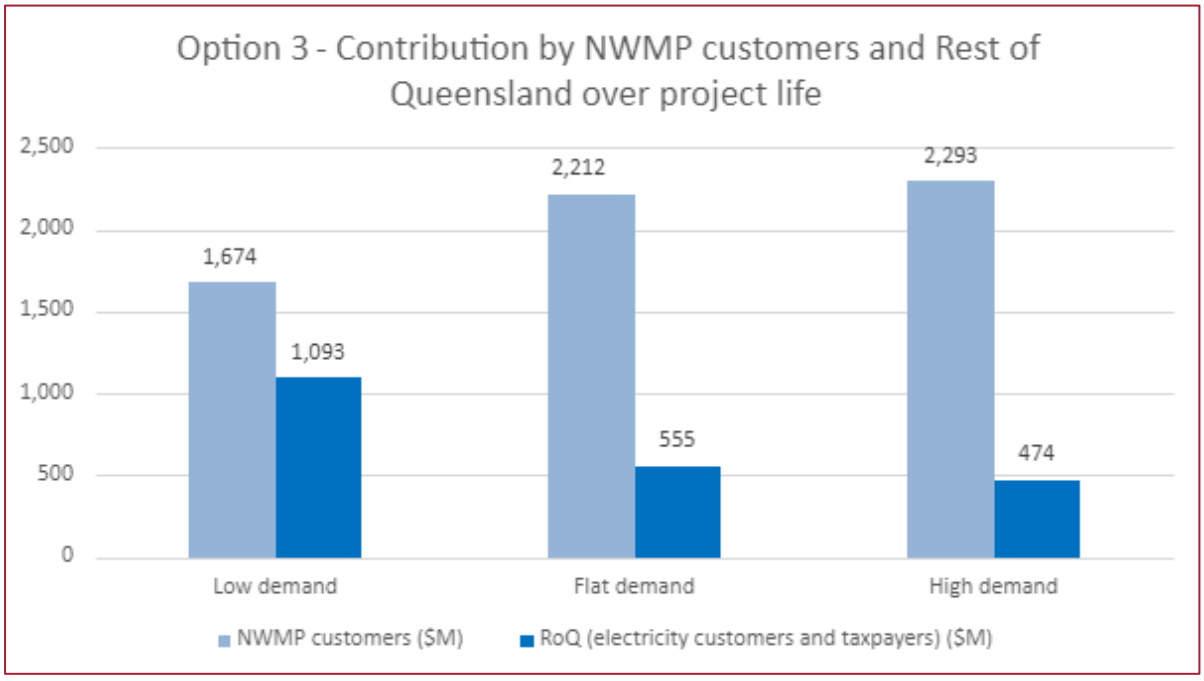
The standard process to make a rule change may take between six and 12 months depending on the complexity. Alternatively, the Queensland Government could seek Parliamentary approval for a specific rule change (a derogation) that allowed a similar amendment to the RIT-T criteria within Queensland.

Modelling

The data below is based on the AER's Post Tax Revenue Model. Relative to Option 2, Rate of Return parameters are calculated in line with the AER's Post Tax Revenue Model and Rate of Return Instrument. For the purposes of the modelling, both Option 2 and Option 3 have the same assumed risk free rate to ensure the Option 3 case is presented on a like-for-like basis as Option 2. As there is uncertainty regarding what the AER would allow in relation to a new transmission line not developed by an existing TNSP, two options have been considered: a low case and a high case. Both cases exclude some contingency and financing costs, however the low case assumes capex contributes to a rolling Regulatory Asset Base which is indexed at Weighted Average Cost of Capital, while the high case capitalises costs of funds into the Regulatory Asset Base based on CuString parameters. A mid-point between these two cases is shown in the results below. As with CuString's analysis for Option 2, 100% east to west load flows over CopperString are assumed.

Electricity customers in the rest of Queensland pay less than a third of the amount they would pay under Option 2, and the beneficiaries pay the larger share.

Figure 5: Option 3 – Contributions shows the CopperString transmission costs component of the total energy costs for NWPS customers for the life of the asset against the contribution from the Rest of Queensland.



Outcomes and impacts

The financial modelling for the costs of building the line approved under a modified RIT-T process and the resultant prices for all three demand scenarios are shown in Figure 6 and Table 8 (below). *Table 9* outlines how this option affects each major stakeholder group. In the flat demand scenario, the option delivers a fall in electricity costs to $105/MWh in FY2025 and $94/MWh in FY2041 for a development cost of $2.2 billion.

Figure 6: Chart of Option 3 modelling

Table 8: Summary of results Option 3

Demand level	Development cost est. ($M)	Contribution by RoQ (taxpayers and electricity customers) ($M NPV)	FY2025 electricity price ($/MWh)	FY2031 electricity price ($/MWh)	FY2041 electricity price ($/MWh)
Low	2,238	1,093	104	104	101
Flat	2,238	555	105	100	94
High	2,238	474	102	100	92

Table 9: Impact analysis

Stakeholder	Impact
NWMP electricity customers	***Advantage/s*** • This option could deliver lower electricity prices for large customers connected to the NWPS. • This option could support the development of renewable energy in Northern Queensland, particularly in the Hughenden region. ***Disadvantage/s*** • This option only benefits those customers connected to the NWPS or directly connected to the line. • The transmission line will be approximately 1100km in length, creating inherent electricity reliability exposure. • The rule change and assessment process could take up to 12 months and there is no guarantee the line would pass a modified RIT-T.

Stakeholder	Impact
	Risk/s • If the connection to the NEM results in the retirement of existing, local generation, the operations will be vulnerable to line operation (i.e. damage to the line will result in unplanned outages in the NWPS). • While prices in the NEM are currently low, this may not always be the case. • The amended RIT-T requires endorsement and approval by external bodies – the Queensland Government does not control this process.
Queensland Government (taxpayers)	***Advantage/s*** • The project, and lower electricity prices, may lead to an increase in economic activity (e.g. investment and resource production) in the region. An increase in mine production would increase royalties to the State. • The risks and costs to the Queensland Government and taxpayers could be lower than Option 2 as the AER's regulatory oversight would provide rigour to the cost and operation of the project. ***Disadvantage/s*** • Implementation requires a large up-front investment commitment, with future demand uncommitted. • The Queensland Government and electricity customers in the rest of Queensland are required to pay between $474 million and $1.1 billion over a 40-year period, depending on demand levels. ***Risk/s*** No risks have been identified.
Rest of Queensland electricity customers	***Risk/s and Disadvantage/s*** • The Queensland Government and electricity customers in the rest of Queensland are required to pay between $474 million and $1.1 billion over a 40-year period, depending on demand levels. ***Advantage/s*** No advantages have been identified.
Electricity generators/ storage developers	***Advantage/s*** • This option could create additional demand for NEM connected generation projects and developers and create a new path to market for NWMP renewables. ***Disadvantage/s*** • This option could create reduced demand for Mount Isa generators and may disincentivise new, renewable generation investment and development in the NWMP. ***Risk/s*** No risks have been identified.

Stakeholder	Impact
Network businesses	***Disadvantage/s*** • Energy Queensland and Powerlink will be required to make investments in their networks to connect a line to their networks – these costs would need to be recovered from customers or taxpayers.

Assessment against criteria:
Equity: Option 3 retains the NEM rules for operation of the transmission line. This means existing arrangements that are geared at protecting the interests of all consumers are embedded.

Practical: There are existing mechanisms for making a national rule change or passing legislation in Queensland for a specific derogation, making this proposal feasible. However, it would take time and it is not certain the line would pass the amended cost/benefit test.

Cost effective: Development costs and subsidies combined are lower than Option 2 and achieve a slightly larger reduction in electricity prices in demand and year measures.

Focus questions:

- Does this option deliver affordable, secure, reliable, and sustainable electricity supply in an equitable, practical, and cost-effective manner?
- Should wider economic benefits of a project be considered in the RIT-T?
- Are there any concerns around the key inputs and assumptions?
- Are there any risks or gaps to raise with Government?

6 Conclusion

The Queensland Government has committed to supporting prosperous regional communities, economic growth and delivering employment outcomes. This includes ensuring the right infrastructure is available to meet the long-term needs of the community and ensuring all Queenslanders have access to an affordable, secure, reliable, and sustainable electricity supply.

Based on the impact analysis, there is no clear preferred option to achieve the objective of delivering an affordable, secure, reliable, and sustainable electricity supply in the NWMP.

The Queensland Government welcomes your views and feedback to assist in identifying the most equitable, practical and cost-effective option.

The Queensland Government acknowledges electricity prices and electricity infrastructure is just one element of regional prosperity and economic development.

7 Consultation

This CRIS will be used as the main basis for consulting with interested parties to allow stakeholders to consider and comment on the analysis of impacts and the evaluation of policy options.

The Queensland Government will consider all submissions and feedback on the most fair, practical, and cost-effective solution to deliver affordable, secure, reliable, and sustainable supply in the NWMP.

Feedback will be accepted until **5pm, 28 February 2022**. To submit a response, visit our *Electricity supply options for the North West Minerals Province* consultation web page at gld.gov.au/northwest-electricity-supply.

8 Consistency with fundamental legislative principles

The *Legislative Standards Act 1992* requires that legislation has sufficient regard to rights and liberties of individuals and the institutions of Parliament.

9 Appendixes

Appendix 1: Derogations sought by CuString.

9.1 Appendix 1 – Derogations sought by CuString

This Appendix 1 summarises how the Queensland Government would need to change its cooperative scheme energy laws and rules to support the CopperString project under Option 2.

Pre-approval of capital expenditure on project: Transmission network service providers (TNSPs) operating in the National Energy Market (NEM) must submit to economic regulation by the Australian Energy Regulator (AER). Proposed capital and operating expenditure is assessed by the AER and approved if it is determined to be 'efficient' within established regulatory tests.

CopperString: Derogations to create a 'deemed regulatory determination' made by the State and generally exclude the AER from CopperString's economic regulation for its first five years of operation. The derogations would allow the project's costs (i.e. construction of the line plus a contingency for unforeseen circumstances and an allowance for operating expenditure and capital expenditure required to sustain the project) to be assessed in advance by an Independent Expert based on a test similar to that applied by the AER but adapted to the 'greenfield' nature of the project and adjusted to be more timely. Overruns of pre-approved expenditure will also be approved if the Independent Expert determines they are efficient. Some expenditure, including some financing costs and development fees and costs will be automatically approved.

The deemed determination would cover other matters normally covered by a regulatory determination, such as efficiency and service target schemes, and the allocation of locational transmission charges.

23-year fixed return: A regulated transmission network operating in the NEM would currently attract an indicative overall rate of return (nominal vanilla) of 4.65 per cent for a five-year regulatory period.[5] The allowed return would be reassessed at the time of each regulatory 'reset'.

CopperString: Proposed derogations would allow CopperString investors to earn on the approved opening asset base (and any extensions approved by the State before the opening asset base is interconnected), for a term of 23 years a preapproved WACC (based on a shadow post tax revenue model) of 5.03 per cent. This assumes an average cost of debt (including NAIF debt) of 3.28 per cent and a risk-free rate of 2 per cent.

Preservation of Regulatory Asset Base (RAB): If a privately funded transmission network wished to join the NEM, the AER would determine its RAB in terms of the value of the network to NEM customers, rather than how much it cost to build.

CopperString: Derogation to ensure that when the AER commences economic regulation of the CopperString network the AER cannot disallow expenditure in CuString's RAB that has already been approved by the Independent Expert. This would have the effect of protecting the basis on which CuString derives its revenue in the future.

[5] Per Powerlink Draft Decision (September 2021), see AER - Powerlink 2022-27 Draft Decision - Rate of Return - September 2021

Adjustments to a TNSP's regulated revenue allowances: The AER examines any TNSP spending beyond its approved allowance and can disallow it if inefficient.

CopperString: Two ways to manage overruns in spending:

a. A bespoke contingency risk sharing mechanism:
    i. if costs are below the allowed expenditure + agreed contingency, 100 per cent of the difference will be returned to Queensland customers by lower tariffs
    ii. if costs exceed the allowed expenditure + agreed contingency, the excess will be split as follows: 30 per cent borne by investors and 70 per cent by Queensland customers
b. allow CuString to adjust estimated sustaining capital and operating expenses to reflect actual costs, ahead of the AER assuming a role as regulator after its fifth year, provided any overspends are deemed 'efficient' by the Independent Expert applying the 'efficiency test'.

Foundation customer discounts: A transmission network can offer discounts to a customer if it would benefit other customers (e.g. because the size of their load or location on the line reduces costs for all customers or helps the line operate more efficiently). The recovery of customer discounts can require AER approval in certain cases.

CopperString: This derogation would allow CuString to offer discounted transmission costs to attract approximately six large customers to commit to the network. The State would be entitled to approve the discounts prior to financial close of the project. The aggregate of discounts would be recovered from other customers in Queensland.

Cost Allocation and Pricing Methodologies: TNSPs must submit Cost Allocation and Pricing Methodologies to the AER for approval every five years, which categorise and present their costs to the AER and set out how a transmission line will recoup its allowed revenue from customers.

CopperString:

a. Derogation to remove AER oversight of CuString's cost and pricing methodologies for the first five years after commissioning, and instead allow the State to approve these before financial close.
b. CuString's revenue will be recouped from North West and Rest of Queensland electricity customers.

Transitional protections: Over time, the technical standards for connection to the NEM have increased. When standards raise, existing connections are typically only required to upgrade their equipment when that equipment is replaced, unless it risks harming the rest of the system.

CopperString: This derogation would allow existing connections in the North West to be 'grandfathered' so they only have to meet the minimum NEM standards unless doing so negatively impacts the NEM. If a customer is currently below the minimum standard, the customer will pay its upgrade costs. If they meet the minimum standard but AEMO still requires a further augmentation, then CuString will meet those upgrade costs but they will be passed onto Queensland customers. Grandfathering will be in place until a customer's connection is replaced naturally, at which time an upgrade will be required.

Operation and Maintenance

CopperString: CuString is presently in negotiations with Powerlink Queensland to provide complete operation and maintenance services for the new network. CuString proposes that

Powerlink Queensland's costs and charges be passed on to its customers, on the basis that they are approved in advance by an Independent Expert or the AER, or on another basis approved by the State before financial close.

Significant network investments The NER requires that network businesses have to pass a cost benefit test (a Regulatory Investment Test) before they make investments of more than $6m, to test the prudency and efficiency of the proposal.

CopperString: To connect the CopperString network to the NEM, Powerlink Queensland and Ergon Energy need to undertake connection works, costing approximately $70m. Derogation would allow Powerlink and Ergon Energy to construct these improvements and recover the costs from their customers without undergoing that test.

Single transmission pricing across all NWMP connection points Under the NER, separate transmission prices may be calculated for each connection point within a network. This enables different prices to be charged depending on where in the network a particular customer is located.

CopperString: CuString proposes that the same transmission price be applied to all customers west of Richmond.