

Clean Energy Hub Feasibility Study

September 2017



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Introduction

In June 2017, the Queensland Government released the “*Powering Queensland Plan: an integrated energy strategy for the state*”. The Plan confirms the State Government’s commitment to a 50 per cent renewable energy target by 2030. Among the measures to achieve the Plan is a commitment to the development of strategic transmission infrastructure in North and North-West Queensland to support a Clean Energy Hub, subject to a feasibility study.

On behalf of the State Government, Powerlink has commenced work on the feasibility study, which is focused on examining the concept of a Clean Energy Hub in North Queensland, located generally between Einasleigh and Hughenden. The Clean Energy Hub will comprise one or more transmission assets developed to facilitate the connection of additional clean energy capacity to the National Electricity Market (NEM).

To inform the feasibility study, Powerlink called for Expressions of Interest (EOI) to identify potential projects that may seek to connect to the network if and when the Clean Energy Hub is constructed. EOIs closed on 8 September 2017.

By testing the market, on a confidential basis, Powerlink, on behalf of the Queensland Government, aims to identify which areas are likely to be the most prospective for new clean energy developments and thereby inform the assessment of which transmission options will deliver the greatest benefit.

Proponents should be aware that no commercial undertakings will be entered into by Powerlink or the Queensland Government at this early investigation stage. Further information on the feasibility study of the Clean Energy Hub concept and linkages with the Queensland Government’s policy objectives and the reverse auction is provided below.



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Background

State Government Policy Commitments

In June 2017, the Queensland Government released the “*Powering Queensland Plan: an integrated energy strategy for the state*”¹. The Plan confirms the Government’s previously announced commitment to a 50 per cent renewable energy target for Queensland by 2030. Among the measures to achieve the Plan is a commitment to the development of strategic transmission infrastructure in North and North-West Queensland to support a Clean Energy Hub including a commitment of \$150 million, subject to a feasibility study.

In the Plan, the Government also committed to undertake a reverse auction for up to 400 megawatts of renewable capacity, to commence in the second half of 2017 including the securing of up to 100 megawatts of energy storage prior to 2020.

Recognising the importance of power system security, the Government has established the Queensland Energy Security Taskforce (QEST). Among other responsibilities, the Taskforce has been asked to investigate strategic transmission infrastructure in North and North-West Queensland to support a Clean Energy Hub.

More detail on the Clean Energy Hub is available at:

www.powerlink.com.au/Projects/Far_North/Clean_Energy_Hub.aspx.

Understanding the Clean Energy Hub

The *Powering Queensland Plan* and the associated *Powering North Queensland Plan* included an investigation into the feasibility of developing strategic transmission infrastructure in North and North-West Queensland. The objective of this infrastructure development is to support a clean energy hub including potentially 2,000 megawatts of renewable energy projects. Figure 1 on page 3 is an extract from the *Powering Queensland Plan* illustrating the area of interest and the potential renewable energy projects that are known at this time.

¹ Queensland Government, June 2017, *Powering Queensland Plan*, page 5.

Figure 1: Illustration of potential transmission paths for Clean Energy Hub



Source: *Powering Queensland Plan, June 2017, page 4.*

This feasibility study forms the first stage of the Clean Energy Hub evaluation process and is aimed at gathering information and ideas from relevant stakeholders and developing a range of options that will facilitate the connection of renewable generation in this region.

The region has been identified as providing the opportunity for a diverse range of renewable generation and storage options including wind and solar generation, pumped storage hydroelectric development and potentially large scale battery storage.

There is currently limited electricity infrastructure necessary to support large scale generation or storage options. Assessing the feasibility of strategic transmission infrastructure is the first step towards providing access for renewable generators and potential energy storage options.

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Feasibility Study

To support the Government's priorities and commitments in the *Powering Queensland Plan*, Powerlink has been asked to manage the feasibility study into the Clean Energy Hub, under the supervision of QEST, with the goal of completing the investigation by December 2017.

The feasibility study will assess, among other things:

- the technical feasibility of the Clean Energy Hub;
- project economics and cost-effectiveness;
- likely new projects to develop generation, storage and/or loads and their timeframe for development;
- broader market and transmission impacts;
- proposed commercial arrangements and business models to underpin the project; and
- high level design options, taking into account the costs and environmental feasibility of different routes.

The EOI process undertaken in August / September 2017 performed an important role in the feasibility study, since the assessments involved require an understanding of the renewable and storage projects that are likely to seek to connect under various configurations and any significant new loads that may connect to the network. The EOI is Powerlink's principal vehicle to inform the feasibility study of the potential projects in the region.

The feasibility study will include a strategic assessment and aspects of due diligence in respect of the Clean Energy Hub concept. The feasibility study will define the project need and will be informed by responses to the EOI process which will be assessed and ranked according to defined criteria (presented below). These findings will then inform the development of possible network options.

The feasibility study involves various technical assessments, including detailed definition of possible network options, the identification of a preferred option and any associated staging. It will also include the modelling of electricity market outcomes and outcomes in the market for Large-scale Generation Certificates. This assessment will inform considerations of economic, social and environmental impact.

The feasibility study will include impact evaluations across economics, environment, social and regional considerations.

The feasibility study will address commercial, financial and regulatory framework considerations and will consider possible network access terms and conditions.



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The feasibility study will include strategic oversight by Powerlink and the Government as well as peer review and independent analysis and advice on key strategic matters. This will occur continually throughout the project.

Renewables 400 Reverse Auction

The Queensland Government is separately conducting the 'Renewables 400' reverse auction process for up to 400MW of additional renewable capacity and up to 100MW of new energy storage capacity. The process will invite proponents to indicate their willingness to offer new qualifying generation capacity for a given level of financial support from the State Government, by means of a competitive reverse auction.

More detail on the 'Renewables 400' Reverse Auction is available at:

<https://www.dews.qld.gov.au/electricity/powering-queensland-plan/transition/renewables-400>.

Information for proponents

The Powerlink network

Proponents should be aware of Powerlink's network and in particular Powerlink's Annual Planning Report (TAPR) which sets out known and anticipated network constraints.

The TAPR can be accessed via the Powerlink website:

www.powerlink.com.au/About_Powerlink/Publications/Transmission_Annual_Planning_Reports.aspx.

Not a commercial process

The EOI process is not a commercial process and it is not expected that it will directly result in commercial undertakings between proponents and any agencies or market participants. Further, the EOI process is not related to and will not in any way substitute for the connection application process under Chapters 5 and 5A of the National Electricity Rules.

All information will be treated as commercially sensitive and strict confidentiality will be maintained. Powerlink will ensure that information obtained through the EOI process is kept confidential and has offered to enter into a Confidentiality Agreement on request.

Relationship to the National Electricity Rules

The Clean Energy Hub is envisaged as an infrastructure project that can rapidly facilitate State Government policy objectives. Those objectives go beyond existing national energy policy and will require innovative approaches to infrastructure delivery. Nonetheless, the



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investigation and development of the Clean Energy Hub will be informed by the same considerations of prudence, efficiency and effectiveness in meeting the Government's renewable targets.

How we will assess potential projects

The selection of any recommended transmission network option will be informed by an assessment of the renewable generation projects in respect of which an EOI is received.

In essence, the Queensland Government's overriding policy objective is to deliver a transmission solution that facilitates the efficient connection of viable renewable projects to the existing grid in a way that does not undermine system security and resilience, consistent with the *Powering Queensland Plan*. In this context, the overall purpose of the feasibility study is to address the following questions:

1. Is there enough interest to justify a transmission project? and
2. If so, what is the best transmission solution?

Projects will be assessed against several broad criteria and the information sought from proponents corresponds with these criteria. These criteria reflect the Queensland Government's policy objectives, broad project readiness and commerciality considerations.

Proponents should be aware that different transmission development options will facilitate different sets of potential clean energy projects to differing degrees. The assessment process will be considering each project in connection with other projects, rather than the merits of individual projects in isolation. It will be the combined merit of the set of projects enabled by each transmission option that will ultimately inform the identification of the preferred option.

The criteria against which Clean Energy Hub options will be assessed includes:

- Contribution to policy objectives, including:
 - Contribution to meeting the Queensland Government's renewable energy target; and
 - Contribution to energy security objectives, including physical inertia, fault ride-through capability and storage capabilities.
- Benefit to, and demands placed on, the system, including:
 - MW of capacity;



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- The likely dispatch patterns of generators in relation to other generators and loads, both regionally and across the NEM;
 - Whether projects (individually or collectively) can defer investments elsewhere in the network;
 - Impact of connection on the system; and
 - Contribution to services such as inertia, fault currents and local voltage support.
- Project readiness, including:
 - Current status or meeting of project milestones, including detailed design, approvals, finance, land acquisition and procurement;
 - Expected time to commissioning;
 - Known contingencies on which projects rely;
 - Absence of bankability / commerciality concerns.
 - EOI completeness, including:
 - How fully has the project's EOI been completed and substantiated.



Next steps

The call for EOIs closed on 8 September 2017.

During September / October 2017, potential projects will be evaluated and indicatively ranked. This project-level information will be incorporated into the broader assessment of transmission options to occur through to November 2017. The feasibility study will conclude with recommendations to the Queensland Government by late 2017 or early 2018 regarding the feasibility of, and optimal approach for, the Clean Energy Hub.

Figure 2 below explains the process Powerlink intends to follow in developing the feasibility study. The EOI process forms an essential part of the “Identify possible renewable generation projects”.

Figure 2: Powerlink Assessment Process

