

Project: NECCA
Lumea – Final Report

July 2021

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The views expressed herein are not necessarily the views of the Australian Government, and the Australian Government does not accept responsibility for any information or advice contained herein.

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Abbreviations

Term	Definition
AEMO	Australian Energy Market Operator
AEMC	Australian Energy Market Commission
ARENA	Australian Renewable Energy Agency
BESS	Battery Energy Storage Systems
CAA	Capacity Allocation Advisor
CF	Connection Fee
COGATI	Coordination of Generation and Transmission Investment
DCA / DNA	Dedicated Connection Asset / Designated Network Asset
DPIE	Department of Planning, Infrastructure & Energy
EOI	Expression of Interest
ESB	Energy Security Board
FID	Final Investment Decision
KSR	Knowledge Sharing Report
KWM	King & Wood Mallesons
Lumea	(formally known as TGS)
MHC	Marchmont Hill Consulting
MUFG	Mitsubishi UFJ Financial Group Bank Ltd.
NECCA	New England Connection Capacity Auction
NEM	National Electricity Market
NEMDE	National Electricity Market Dispatch Engine
NETI	New England Transmission Infrastructure
NSW	New South Wales
OCM	O'Connor Marsden & Associates
PIAC	Public Interest Advocacy Centre
RE	Renewable Energy
REZs	Renewable Energy Zones
RFC	Request for Capacity
RIT-T	Regulatory Investment Test for Transmission
T/L	Transmission Line
TNSP	Transmission Network Service Provider

Introduction

The Australian electricity system is in transition to eventually be substantially supported by renewable energy, including solar, wind and hydroelectricity. The 2020 Integrated System Plan forecasts that approximately 26 GW of new utility scale renewable generation is required by 2040 for the optimal development of the power system; this is driven by customer demands, the lower comparative cost of renewable energy and supportive government policies. The generation transition will require significant upgrades and expansion of the existing transmission network to enable more new generation to connect, in locations where renewable energy resources are strongest.

In addition, the expected closure of the Liddell Power Plant in 2023 is underpinning the need for new generation in NSW. Government, regulators and private sector proponents are seeking innovative ways to fast track renewable energy zones and while NSW households and businesses need access to affordable and reliable electricity.

Project NECCA sought to develop and deploy a commercial model for the development of transmission infrastructure in the NEM, providing learnings and a precedent for other renewable energy zones. The project was designed to assess any clear stumbling blocks in this model and advise how those might be overcome in other renewable energy zones, and seek to develop solutions for an outcome where there is partial but not sufficient financial support to secure a clear investment decision by both the transmission and renewable energy investors.



Liddell Power Station

To address above issue, Lumea (“formally known as TransGrid Services”) has been working on an innovative commercial model for the development of enabling transmission infrastructure that would facilitate Renewable Energy Zones in NSW. Lumea proposed to test this model in the market through NECCA pilot project process with ARENA’s support.

The objective is to develop a new high quality transmission infrastructure on an existing easement via the direct support of Renewable Energy project proponents. The upgraded line will form a backbone for the new energy zone which will host 14000MW of new renewable energy generation capacity to connect to the National Electricity Market (NEM).

Lumea would offer participants the ability to secure firm capacity on the NETI through the NECCA in return for an annual services payment.

The New England Transmission Infrastructure (NETI) facilitates the development of the New England RE zone which has been identified, and is supported by, the NSW Government and AEMO as a strategic solution to unlock a significant pipeline of large-scale RE in New South Wales.

AEMO’s Integrated System Plan (ISP) is a whole-of-system plan that provides an integrated roadmap for the efficient development of the NEM over the next 20 years and beyond. AEMO has identified around 35 REZs across the NEM including nine in New South Wales.

The NSW Electricity Infrastructure Roadmap has identified five of these renewable energy zones for priority development:

- New England region
- Central-West Orana region
- South West region
- Hunter region
- Illawarra region

1. New Brand Lumea and its impact on Project NECCA

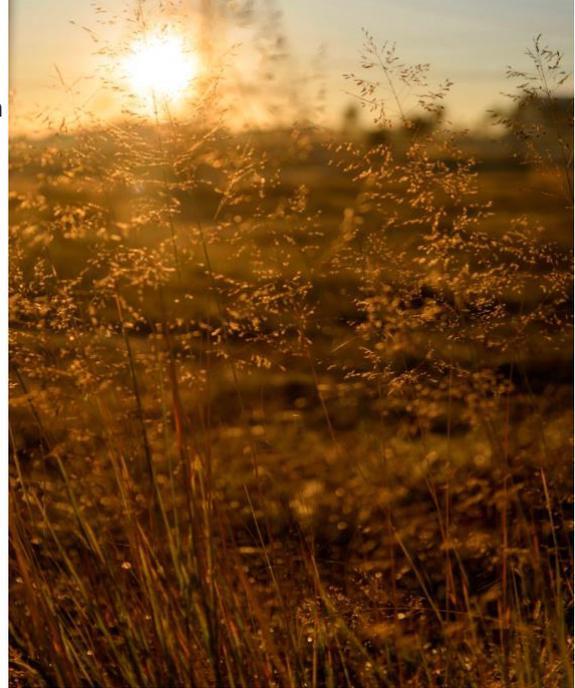
Lumea is the commercial arm of TransGrid. It is the new brand name for TransGrid Services and our Business Growth team. NECCA is a TransGrid Services project and as such, it now comes under the Lumea brand.

Lumea symbolises the illumination of new ideas through a fresh way of thinking. It represents our ambition to light the way in accelerating the energy transition and reflects our commitment to providing the bespoke solutions required to effect that transition. There is no impact on the project and the business based on the Brand change.

2. Description and Analysis of the Project

2.1 Overview

Lumea and its entities are committed to supporting the energy transition in Australia towards Renewable Energy (“RE”) generation. As part of this commitment, Lumea has a new model for the provision of enabling transmission infrastructure that promotes the development of new RE projects in NSW. The new model aims to simplify the challenges, which are otherwise associated with transmission developments of a regulated nature. Lumea sees an opportunity for broader application of the NECCA model in RE/ISP zones throughout the National Electricity Market (“NEM”). The first such opportunity is a planned development in the New England area - the New England Transmission Infrastructure (“NETI”) development and represents an outstanding opportunity for RE developers and generators to participate in the commercial development of the NETI.



Project NECCA was two-staged process comprising

1. an Expression of Interest (“EOI”)
2. Request for Capacity (“RFC”) phase.

EOI Phase

Lumea released the first phase of the NECCA process, the EOI on 17 June 2020, which received a very strong market response including twenty-three (23) submissions totalling 6,900MW of capacity. The list of participants includes very reputable and established local and overseas project developers, with a track record of deliverable bankable renewable energy projects.

Ten (10) participants have been shortlisted representing fifteen (15) proposed projects to take through to the RFC stage of the NECCA process. Depending on final configurations, the requested capacity from the short-listed participants is 3200 – 3600MW, which materially exceeds the NETI capacity.

RFC Phase

Lumea release the next phase “Request for Capacity (RFC)” on 18 December 2020. The process invited ten (10) shortlisted participants from EOI phase to a present a RFC bid to secure capacity on a new, purpose built 330kV transmission line in the New England area (the “New England Transmission Infrastructure” or “NETI”) and the outcome was very positive.

During the RFC phase, the 10 shortlisted participants from EOI phase were invited to participate to bid:

- an all-inclusive Connection Fee (\$/MWAC), and
- comments to the proposed contractual arrangements, which will govern connection to the NETI.

RFC phase received seven (7) compliant RFC Bids on 12 February 2021. No submissions were received late. Responses to the RFC Binding Bid Phase of the NECCA saw interest expressed in PV solar generation and associated battery storage.

Notwithstanding prior engagement and workshops with Participants, the RFC submissions was the first time in the process the market has provided actual formal feedback which proved extremely insightful both by confirming demand for the NETI and also by helping to inform the technical design concept.

Bids during the Request for Capacity (“RFC”) phase of the NECCA have confirmed demand for the NETI; seven (7) bids received totalling 2.6GW.

Shortlisted Participants and next stage

Lumea shortlisted four (4) participants out of seven (7) bids received during RFC phase. The aggregate maximum project capacity of the recommended shortlisted proponents exceeded the design capacity of 1400MWAC.

Selected participants will secure access to the NETI and related rights for their projects via the pre-development phase of the project. Binding bids will be provided by each of the four shortlisted participants to bid a Connection Fee assuming 24-hour access to the NETI.

In return for the binding service fee successful participants will have access to the NETI and related rights, in addition to development obligations for up to but not exceeding a cumulative total of 1,400MW of new RE generation (with the expectation that there will be multiple successful participants

The NECCA pre-development phase will include

- Engagement and briefing with senior management in DPIE, Treasury, CEFC & ARENA
- Binding bids by each of the four shortlisted participants and final selection/negotiation of the successful participants.
- Mobilise to commence community engagement, detailed designs, contractor selection, property acquisitions, and project approvals.

Lastly, NECCA Knowledge Sharing partner- MHC reached out to EOI & RFC participants to obtain feedback on the overall process and received positive feedback, which is captured in Knowledge Sharing Report – 2 in detail.

2.2 Evidence that the project has been completed and the Milestones have been achieved.

At the highest level, the NECCA involved three-core streams of work, being:

1. Expression of Interest (EOI)
2. Technical development Work stream,
3. Request for Capacity (RFC)

1. Expression of Interest (EOI) Work Stream:

- a) Lumea released the EOI on 17 June 2020, followed by Industry Briefing for all registered Participants on 1st July 2020 (digital platform), which received a very strong market response including twenty-three (23) submissions totalling 6,900MW of capacity.
- b) Lumea evaluated the 10 participants for RFC phase as per the evaluation criteria developed and as agreed by Capacity Allocation Advisor/Finance Advisors (MUFG) with input from Lumea, Auction Design (MHC), Probity (OCM), Legal (KWM) and Community Engagement Stakeholders (Lumea).
- c) Ten (10) participants were shortlisted representing fifteen (15) proposed projects to take through to the RFC stage of the NECCA process.
- d) The Stakeholder consultation Group (SCG) has been established to provide a forum for critical project stakeholders (ARENA, AEMO, CEFC and DPIE) to share perspectives on key steps in the process including the EOI and RFC auction processes, and the key rights and obligations, which underpin the auction. Lumea provided the progress and the outcome of EOI process to all members of SCG.

2. Technical Development Work Stream:

- a) In parallel, the technical development work stream was completed i.e. the specific technical design for the enabling transmission infrastructure was developed to reflect the needs of the participating new connecting generation capacity;
- b) Engaged Independent consultant (Acil Allen) to support the definition of the Service offering i.e. advice on market interface and provide options for connecting the New England Transmission Infrastructure (NETI) and its market participants (users) to the shared grid;
- c) Acil Allen was also engaged to provide marginal loss factor (MLF) projections, curtailment projections and settlement residue projections for 1400MW of new solar farm projects (in aggregate the NECCA project or the projects) on the New England Transmission Infrastructure (NETI). The projections were shared with the shortlisted participants for the purpose of their non-binding bids;
- d) Undertook concept designs for transmission line and substations for the NETI;
- e) Engaged with AEMO and TransGrid planning to discuss a Generator Performance Standard coordination process to facilitate multiple simultaneous connections;
- f) Developed terms sheets for key contractual documentation for the construction and operational phase of the NECCA.

3. Request for Capacity (RFC) Work Stream:

- a) The Request for Capacity (RFC) was released on 18 December 2020; the 10 shortlisted participants have been invited to provide binding bids to be assessed with the intent of confirming successful projects by March 2021;
- b) Workshops held with Project team (Lumea, MUFG, KWM and OCM) and individually with all participants shortlisted for the RFC stage to get a better understanding of each project and its viability. It also provided an opportunity for participants to get clarity on the RFC process and the expectations of them;
- c) Q&A document was compiled containing the questions raised during the workshops. This was shared with shortlisted participants;
- d) RFC phase received seven (7) compliant RFC Bids on 12 February 2021. No submissions were received late. Responses to the RFC Binding Bid Phase of the NECCA saw interest expressed in PV solar generation and associated battery storage;
- e) Based on the Non-Binding bids, Lumea shortlisted four (4) participants. The aggregate maximum project capacity of the recommended shortlisted proponents exceeded the design capacity of 1400MWAC;
- f) Outcome of RFC was informed to all participants (successful/unsuccessful) and held workshops with selected participants to discuss the next stage i.e. Pre-Development Phase;
- g) Briefed Stakeholder Consultation Group member and government stakeholders (Local, council, ministers) on the outcome of the RFC and next steps.

The EOI and RFC phase are now successfully concluded and the result was very positive. It confirmed the main objective that this type of commercial model has received a strong and positive market response, which also concludes that; the project has achieved its milestone.

Lumea is planning to publish the RFC outcome in both Local and National Media shortly once community and stakeholder engagement has concluded however, below are the few media releases published last year.

<https://www.transgrid.com.au/newenglandconnection>

<https://www.afr.com/companies/energy/transgrid-offers-link-into-renewables-zone-20200717-p55cx8>

<https://reneweconomy.com.au/transgrid-fast-tracks-first-stage-of-huge-new-england-renewable-zone-42760/>

<https://reneweconomy.com.au/transgrid-shortlists-projects-for-1-4gw-new-england-renewable-zone-57566/>

2.3 Key Highlights and Breakthrough

Highlights

The Key Highlights of the NECCA Projects are:

- a) **Successful EOI and RFC Market Engagement Phase:** The EOI and RFC phase are now successfully concluded and the result was very positive. It confirmed the main objective that this type of commercial model has received a strong and positive market response, which also concludes that; the project has achieved its milestone;
- b) **Commence Pre-Development Phase:** Based on the Non-Binding bids, Lumea shortlisted four (4) participants. The aggregate maximum project capacity of the recommended shortlisted proponents exceeded the design capacity of 1400MWAC. The project will now move to the pre-development phase to confirm/negotiate binding bids and mobilise to commence development phase activities such community engagement, detailed designs, contractor selection, property acquisitions, and project approvals;
- c) **Unique offering:** The New England Transmission Infrastructure (“NETI”) will not be part of the “open access” shared grid and it is the first time a market based auction-funding model will be deployed to capitalise the transmission infrastructure;
- d) **Firm Capacity:** Successful participants will secure access to the NETI and related rights for their projects, in addition to development obligations for up to but not exceeding a cumulative total of 1400MW of new RE generation;
- e) **Fit for Purpose:** The NECCA offer will include additional services as required to support generator connections;
- f) **Fast-Tracked outcomes:** The NECCA will lead to fast tracked outcomes as the NETI lies outside the regulated asset base and is thus not subject to regulatory tests;
- g) **Dedicated Infrastructure:** The NETI will feature sole purpose dedicated substations and access bays;
- h) **Reduced congestion risk on the NETI:** Successful participants will not be exposed to congestion or system strength issues on the NETI like those that can arise on the open access shared grid when new generators subsequently connect to the same part of the grid.

Challenges/ Risks

Challenges identified are as below:

1. **Contracts for capacity:** An extended NECCA process and NETI development timeframe was communicated as a key risk given that many PPAs now have sunset dates that include liquidated damages. Certainty on the NETI construction timeline is therefore highly impactful;
2. **Delays in Property Pathway:** As a “merchant project”, Lumea to consider approvals as if it was being undertaken as a third party. Considerable delays may occur, as compulsory acquisition powers may not available to Lumea;
3. **Delays in Environmental Approval:** Lumea has engaged Department of Planning, Industry and Environment (DPIE), which suggested classifying the Project as State significant infrastructure (SSI)

as this project is important to the State for economic, environmental or social reasons. Subsequently, Lumea has developed and submitted SSI application to the Minister for approval. Any delays in environmental approval will affect the Final Investment Decision (FID) of the project;

4. **Technical Specification Approval Delay:** Once FID is complete, successful generators will make a connection enquiry to TransGrid to commence the negotiation of a connection agreement to the NETI. Lumea will facilitate “batching” of projects that are on a similar timeframe for the purposes of negotiating Generators Performance Standards (GPS) and obtaining a connection offer. Combining GPS application for multiple connections to the NETI may raise a concern of allocation of risk i.e. when any issue arise, which generator contribute to that issue.

2.4 Conclusion:

The EOI and RFC phase are now successfully concluded and the result was very positive.

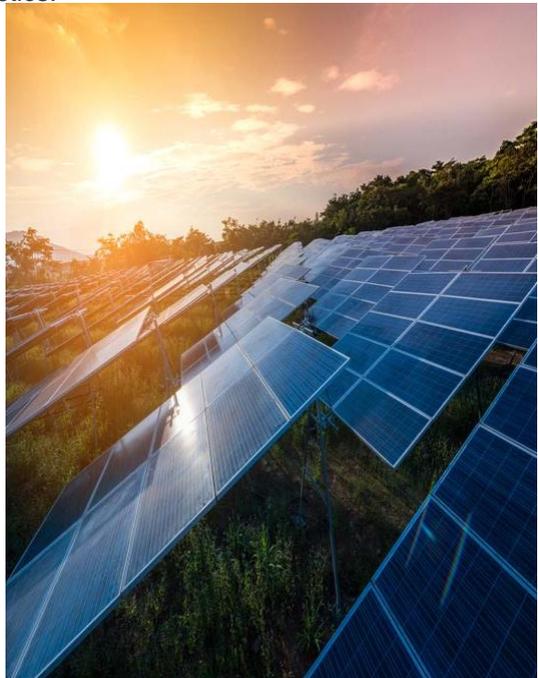
It confirmed the demand for the NETI – seven (7) bids received during the RFC totalling 2.6GW, which represents an oversubscription of approx. 1.4 times, highlighting the strong interest from renewable energy developers keen to develop and connect into new transmission infrastructure that is purpose built to provide the required capacity and with strong performance characteristics.

The list of participants includes very reputable and established local and overseas project developers, as well as utilities and international equipment manufacturers. Lumea is now working intensely with shortlisted participants on the next “pre-development” phase (beyond the EOI and RFC market engagement phase) and to mobilise for the Development Phase that includes executing binding contracts, detailed designs, contractor selection, property acquisition, project approvals, and achieving FID to accelerate the development of the NETI.

There is material momentum within NETI participants for this project. The level of interest shown by selected partners’ highlights the significant opportunity to bring forward new RE generation projects and confirms that this commercial model for infrastructure is viable.

Capacity on the NETI was auctioned based on inter alia the Connection Fee and the location of the project. Lumea and its entities are committed to supporting the energy transition in Australia towards Renewable Energy (“RE”) generation. As part of this commitment, Lumea is focused on this model for the provision of enabling transmission infrastructure that promotes the development of new RE projects in NSW. The new model aims to simplify the challenges, which are otherwise associated with transmission developments of a regulated nature and from the entire EOI and RFC process it is confirmed that this commercial model for infrastructure is viable.

Lastly, Lumea wishes to acknowledge and thank ARENA for its support of this innovative process and model for addressing the material challenges of large-scale renewable energy development in the NEM. This project would not have completed without ARENA’s support. Lumea looks forward to the continuing involvement of ARENA in this project, and to sharing the more comprehensive lessons learned from latter stages in the process i.e. Pre-Development/Development Stages.



3. Knowledge Sharing Report Deliverables

As per the ARENA Funding Agreement, Lumea is required to submit below three Knowledge Sharing Report (KSR).

1. **Knowledge Sharing Report No.1 “EOI Report”**: Completed. Lumea submitted the KSR -1 in September 2020. It outlines below deliverables.
 - a. The Key objective of project NECCA
 - b. EOI Objective
 - c. Key Elements of EOI phase design, documentation, Industry Briefing and Q&A process
 - d. Timing of the key activities in EOI phase
 - e. Evaluation approach for EOI participants
 - f. EOI Response
 - g. Technologies represented during EOI submission
 - h. Conforming and Non-Conforming EOI submissions
 - i. Lesson Learned from EOI Stage
 - j. Stakeholder Engagement

NECCA Knowledge Sharing partner- MHC reached out to project team to capture the lesson learned and challenges .Despite the interruptions created by the COVID-19 pandemic, the Expression of Interest (EOI) process was successfully completed, with the responses received was very positive. The detailed KSR 1 report is available on ARENA website.

2. **Knowledge Sharing Report No. 2 “RFC Report”**: Completed. Lumea submitted the KSR 2 in June 2021. It outlines below deliverables:
 - a. Overview of the process till date (which involves both EOI and RFC phase)
 - b. Stakeholder perspective on Model and Process which includes:
 - o Process for capturing Stakeholder perspective;
 - o Overall Proponent Drivers for Participating in NECCA;
 - o Commercial/Market Perspectives;
 - o Regulatory Perspectives;
 - o Project Development Process Perspectives;
 - c. Key Learnings following the Binding Bid Stage which includes:
 - o The concept of using an auction process to efficiently allocate capacity access rights in exchange for co-investment in network assets is proven;
 - o A closer, more collaborative engagement between Lumea and proponents is needed to refine and optimise technical and commercial details;
 - o Risk allocation in a competitive model;
 - o The need for a Pre-Development/Development Phase.
 - d. Community consultation and Next Stage i.e. Pre-Development/Development Phase.

To capture key stakeholders perspective and key learnings, NECCA – Knowledge Sharing Partner – MHC reached-out to range of Participants and Project Team (MUFG, KWM, OCM and Lumea). This report is under ARENA’s review and approval.

3. **Public Project Knowledge Sharing Report:** On going. NECCA Knowledge Sharing partner- MHC reached out to EOI & RFC participants to obtain feedback on the overall process and received a very positive feedback, which is captured in Knowledge Sharing Report – 2 in detail. MHC is now working on the Public Project Knowledge Sharing Report, which will be available once the contracts are executed with the successful participants.

Note: All the KSRs submitted to date, are based on the interview conducted by MHC with a range of stakeholders involved in the NECCA process. This included all project proponents brought into non-binding bid phase, a selection of proponents that are not active in the non-binding bid phase, and all project participants, thereby ensuring a breadth of views and lesson learned were captured.

4. Statistics for employment

Lumea has concluded both EOI and RFC market engagement phase and has received positive feedback from the market on this commercial model including regulatory reforms and optimised NETI design.

The NETI facilitates the development of the new “privately funded” transmission infrastructure, which has been identified, and is supported by, the NSW Government and AEMO as a strategic solution to unlock a significant pipeline of large-scale RE in New South Wales.

The project will support local businesses and contractors during the construction phase and will generate approx. 2,000 construction jobs and 150 ongoing operational jobs across the NETI and adjacent RE projects connecting to the NETI.

