



15 November 2019

**TransGrid**

By email [regulatory.consultation@transgrid.com.au](mailto:regulatory.consultation@transgrid.com.au)

**Submission to the QNI Upgrade PSCR /Option 5B-Large Scale BESS**

Dear Lulu

Following the meeting with TransGrid team on 6 Nov 2019, GAIA Australia (“**GAIA AU**”) is pleased to re-submit the proposal for a Option5b-200MW/120MWh BESS .

As discussed in the meeting, GAIA AU prefer the location of BESS at Dumaresq switchyard project as part of Bonshaw solar farm which could reduce the risk of time & cost. But we can confirm that the our system cost proposed will remain same if applied to Liddell or Calvale substation area. Please note that the cost related to land & development are not included for Liddell & Calvale substation option.

In order to provide the best offer to TransGrid, GAIA AU is offering an annual fee for 15 years. Our fee is based on estimated system capex of 112m and GAIA have done our best to reflect situation changed and to maximize the cost savings compared to our proposal submitted at Feb 2019.

	Annual fee in AUD
Year 1	16,100,000
Year 2	16,486,000
Year 3	16,882,000
Year 4	17,287,000
Year 5	17,702,000
Year 6	18,127,000
Year 7	18,562,000
Year 8	19,008,000
Year 9	19,464,000
Year 10	19,931,000
Year 11	20,409,000
Year 12	20,899,000
Year 13	21,401,000
Year 14	21,914,000
Year 15	22,440,000

More detail on the economic analysis is included within Section 3 of this report.

As shown in PDAR, the gross benefit from option 5B can exceed the ones of any other options. Apart from the preferred option selected from Transgrid, GAIA would like to propose to consider our option for medium & long-term solution to keep the benefit of whole stakeholders.

GAIA AU looks forward to receive feedback from TransGrid.  
Please contact Luke Kim, for any queries or questions:

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# Proposal for Bonshaw Battery Project

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## 1. GAIA AUSTRALIA

GAIA Australia (GAIA AU) was established in 2015 to take the lead in renewable energy developments in Australia, with a clear target and vision to become an active large scale renewable energy project developer and operator in NSW. GAIA AU is partnered with GAIA Korea, a renowned infrastructure developer in Korea with a focus on renewable energy development sector in Australia. Current development project lists are listed in Table 1 below.

*Table 1- GAIA AU Australian renewable energy projects pipeline*

Project	MW	Commissioning Date	Status
Bonshaw solar and battery	200MW solar + 100MW battery	2020-2021	Under development
Colinton solar and battery	100MW solar + 100MW battery	2021-2022	Under development

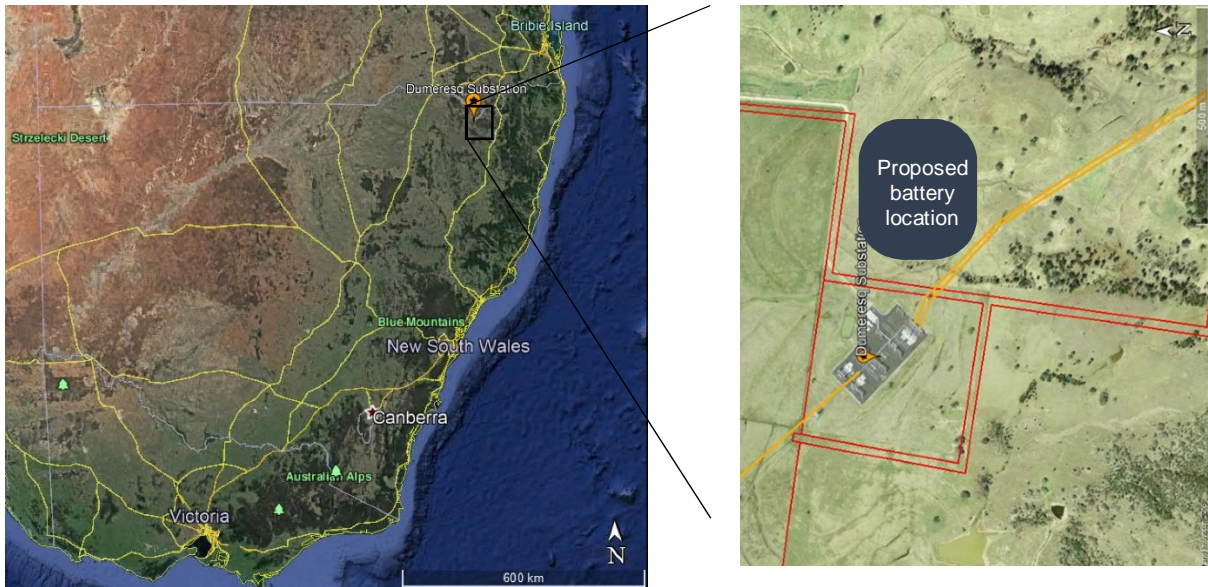
GAIA is committed to working closely with all stakeholders to ensure success in battery projects for TransGrid and providing environmental and economic benefit to Australia. GAIA AU as a company is committed to the principles of social responsibility and will apply these principles through the whole process of development from planning to operation.

## 2. BONSHAW SOLAR PV & ESS/BATTERY PROJECT

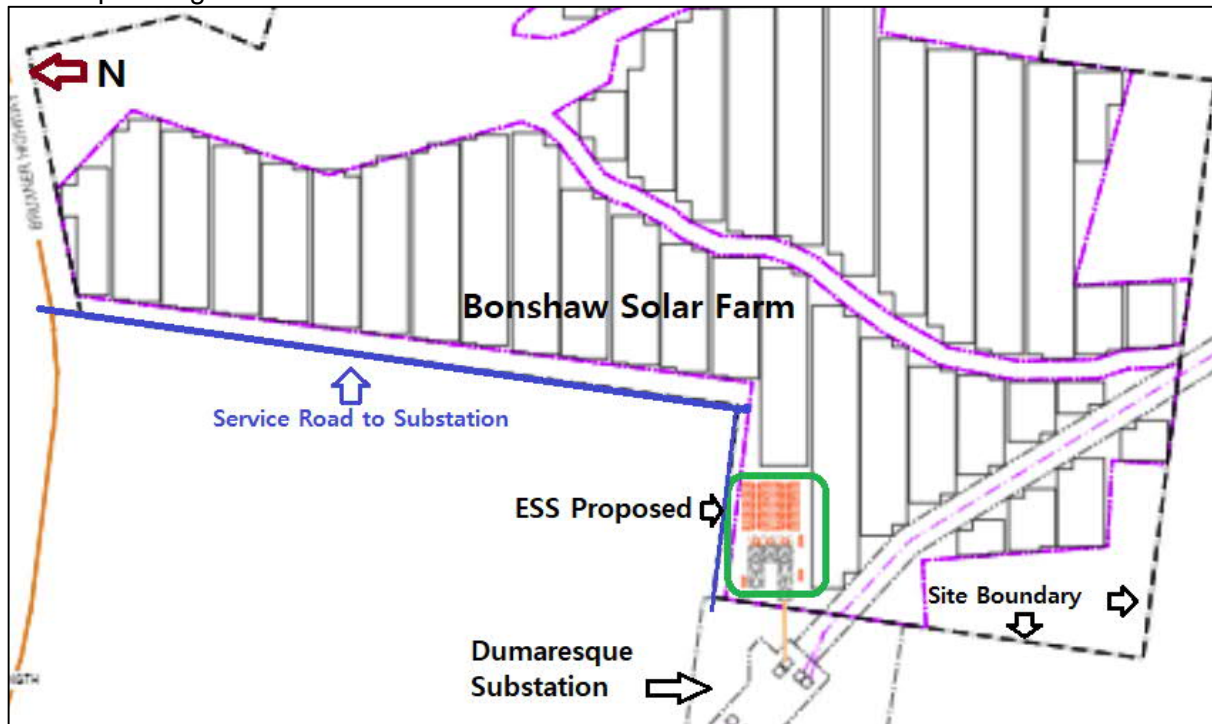
### 2.1 Site Description

The proposed Project site is located next to Dumaresq switchyard in NSW. An illustrative site layout for battery energy storage system is shown below, noting that the final design would depend on the planning approval of the Bonshaw project. Bonshaw project is undergoing planning approval process and DA is expected to be submitted before end of May 2019.

Figure 1- Bonshaw project site location and layout



### Concept Design



## 2.2 Process to completion

The proposed battery energy storage system on the site connects to Dumaresq switchyard.

### *Approval*

GAIA AU has engaged multinational planning consultant to assist in getting planning approval for the project at Bonshaw. Preliminary Environmental Assessment has been lodged to NSW Department of Planning and Environment and Development Application is expected to be submitted before end of April 2019 and Development Approval received by Q4 2019.

### *Grid connection*

Dumaresq switchyard is part of TransGrid asset and Preliminary connection enquiry for the solar farm has been submitted to TransGrid and feedback received is very positive with more than 500MW able to connect to Dumaresq switchyard. Grid connection process will kickstart in Q4 2019. In response to interests from TransGrid regarding grid support battery at Dumaresq switchyard, GAIA AU is looking to have a separate connection for 200MW battery and Bonshaw solar farm in order to have flexibility in contracts as well as management of both projects. Grid connection agreement for Battery storage system is expected to be in a position to execute by end of Q2 2020.

### *Construction*

The Construction of the ESS Project is relatively straightforward and construction works at the Project site are expected to be limited to less than 6 months. The main construction works at the Project site will include creating the access road by compacting or using gravel, civil works for battery storage, building for the battery storage systems.

### *Technology*

Determining specification of the energy storage system is the key to the project. GAIA AU has already engaged leading technology providers who has carried out similar utility scale battery solution for grid support purposes in Australia. This will ensure fast start of the project which will lead to early operation of the battery for service. Please find project program below in figure 2.

Below is a summary of the key Technology providers and specifications:

*Table 3- Technology Providers*

	Technology provider
Battery	Samsung SDI, Tesla and Fluence
Inverter	Tesla, Fluence and ABB
EPC	Tesla, Fluence and CPP

*Table 4- Technology Specification*

	Site	Description
Battery	Battery type	Lithium ion battery
	C-rate	2C
	Battery sizing	120MWh
	Project life	10 years
	Duration of discharge & recharge	30 minutes
	Number of cycles per day	1
Inverter	Inverter sizing	200MW

- Agreement with TransGrid is preferred to be placed by July 2019 to commence Grid connection consulting.

### 3. ECONOMIC ANALYSIS (15 YEAR CONTACT BASE)

GAIA AU believe the one of the strength of GAIA AU is ability to finance a project at very competitive rates while having very low return for investment through owning and operating a very stable project for a long term. Hence rather than providing breakdown of all the cost, GAIA AU is proposing to offer annual fee for ten years and it is listed below. CPI (i.e. 2.4%) applied for the calculation of Yr. 2 to 15.

This analysis is based on 15yr contract reflecting the average life of Li-ion battery on the current market. Our fee is based on estimated system capex of 112m with reinvestment cost expected. The revised 10yr option proposed for comparison.

Annual fee (15 yr. lease)	AUD
Year 1	16,100,000
Year 2	16,486,000
Year 3	16,882,000
Year 4	17,287,000
Year 5	17,702,000
Year 6	18,127,000
Year 7	18,562,000
Year 8	19,008,000
Year 9	19,464,000
Year 10	19,931,000
Year 11	20,409,000
Year 12	20,899,000
Year 13	21,401,000
Year 14	21,914,000
Year 15	22,440,000

Annual fee (10 yr. lease)	AUD
Year 1	18,420,000
Year 2	18,963,000
Year 3	19,437,000
Year 4	19,922,000
Year 5	20,421,000
Year 6	20,931,000
Year 7	21,454,000
Year 8	21,991,000
Year 9	22,540,000
Year 10	23,104,000

GAIA AU is aware that similar sized battery is required at Liddell substation or Canvale to strengthen QLD to NSW interconnector. High level investigation of the site shows that the substation land is large enough for 200MW battery storage. GAIA AU is keen to developing, building and operating another 200MW battery which is able to charge/discharge for 30 minutes at the same price as above if TransGrid allows GAIA AU to lease the portion of land where battery can be built.