ElectraNet

21 June 2017

Sebastian Roberts
General Manager
Network Expenditure
Australian Energy Regulator
GPO Box 520
MELBOURNE VIC 3001

Dear Sebastian

re: Network Capability Incentive Parameter Action Plan (NCIPAP) Amendment of Priority Projects

I write to seek amendment of ElectraNet's approved Network Capability Incentive Parameter Action Plan (NCIPAP) for 2015-16 to 2017-18 to include the Energy Storage for Commercial Renewable Integration South Australia (ESCRI) Project.

As you are aware, the purpose of this proof-of-concept project is to demonstrate that utility scale battery storage can effectively support the integration of renewable energy on an interconnected power system. The timely completion of this project is intended to allow valuable lessons to be learned to support the wider adoption of battery storage, as being advocated by the Commonwealth and South Australian Governments.

The Australian Renewable Energy Agency (ARENA) has approved conditional grant funding to support the ESCRI project. Work is underway to implement the project by the end of 2017, including negotiation of a funding agreement with ARENA, negotiation of an operating protocol and lease agreement with AGL, engagement of battery system vendors through a request for proposals process and development of connection arrangements. All parties are working to achieve financial close by July 2017. Confirmation of the regulatory treatment of the project is therefore an urgent matter for all involved.

The AER has confirmed that ElectraNet's proposed approach to separate the use of the Battery Energy Storage System (BESS) to provide regulated transmission services from the provision of other (non-regulated) services broadly complies with the key elements of the relevant rules and guidelines.

The enclosed information is provided to explain the basis for the inclusion of the project in the approved NCIPAP program and proposed allocation of the costs in accordance with ElectraNet's approved Cost Allocation Methodology (CAM).

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1. Economic Justification

The scope of the project involves the installation and commissioning of a nominal 30 MW, 8 MWh BESS together with associated site establishment, high voltage switchgear, secondary systems and telecommunications equipment.

The innovation nature of this project and its focus on improving network capability is strongly aligned with the purpose and intent of the Network Capability Component (NCC) of the Service Target Performance Incentive Scheme (STPIS).

The economic analysis undertaken in relation to this project has identified the following specific benefits to prescribed customers:

- Reduced dispatch costs through a reduction in the Rate of Change of Frequency (RoCoF) constraint on the Heywood interconnector to benefit customers across the network (with estimated benefits of $8.2 million); and
- Reduced unserved energy through improvement in supply reliability to customers supplied from Dalrymple substation (with estimated benefits of $5.3 million).

Improving the capability of the network in this manner directly targets elements of the transmission system most important to determining spot prices, and at times when users place greatest value on the reliability of the transmission system, consistent with the requirements of the network capability incentive.

Specifically the RoCoF constraints that are alleviated by the fast frequency response capability of the BESS bind under low inertia conditions that typically arise during periods of moderate loading, when brown coal fired generation is the marginal plant in Victoria, displacing higher priced gas plant in South Australia. Alleviating this RoCoF constraint on the Heywood interconnector through the fast frequency response capability of the BESS therefore enables increased inter-regional power flows at a time of significant potential price differential between the regions.

The ESCRI project will also demonstrate the ability of a BESS to support islanded operation of a local regional power supply following a transmission outage, working with local solar and wind generation. This is a unique feature of the ESCRI project, which will demonstrate this capability at Dalrymple on the Yorke Peninsula in South Australia. The electricity demand on the Yorke Peninsula is supported by a radial single circuit 132 kV transmission line. The learnings from this aspect of the project will be relevant to other edge of grid applications.

Importantly, the project will also deliver substantial knowledge sharing benefits to electricity customers, as well as other stakeholders, by facilitating further development of utility scale battery storage applications to ensure a safe, reliable, secure and affordable electricity supply. To this end ElectraNet is also entering into significant formal knowledge sharing arrangements as part of its funding agreement with ARENA.

As the prescribed capital cost component of this project will fall below the RIT-T threshold of $6 million, the level of capital expenditure on this project is also consistent with the requirements of the NCC.

The STPIS guideline provides for the amendment of priority projects, which form part of an approved NCIPAP during the course of a regulatory period, with the approval of the AER and endorsement of AEMO[1].

[1] AER, *Electricity Transmission Network Service Providers Service Target Performance Incentive Scheme*, Version 4.1 September 2014, clause 5.4

In accordance with these requirements, ElectraNet proposes to remove the following two priority projects from the approved NCIPAP presently scheduled for completion in the current regulatory period, and replace these projects with the ESCRI project, subject to the successful achievement of financial close on the project:

- Riverland Uprating - increase conductor clearance of Upper South East lines
- Robertstown Waterloo East uprating – increase conductor clearance of Robertstown-Waterloo lines

The net impact of the proposed changes on the approved NCIPAP would be as follows:

NCIPAP Project	BEFORE Cost estimate ($m nom)	AFTER Cost estimate ($m nom)
Riverland 132 kV Line Uprating	**3.3**	**-**
Upper South East Line Uprating	2.3	2.3
Lower South East Line Uprating	1.7	1.7
Waterloo East to Robertstown Line Uprating	**1.4**	**-**
Load model enhancements	0.1	0.1
Distributed rooftop solar PV response to frequency	0.1	0.1
ESCRI	**-**	**5.8**
Total	**8.9**	**10.0**

The average total annual expenditure across the three years of the approved NCIPAP for 2015-16 to 2017-18 would remain at or below the applicable threshold of 1% of average maximum revenue allowance for these corresponding years, which totals $10.0m ($nom).

The relevant information to formalise the removal and substitution of these approved NCIPAP projects will be reported in the next annual STPIS compliance review report due to be lodged in early 2018. For completeness, the above change to the approved NCIPAP will also necessitate a minor adjustment to reporting of expenditure on the NCIPAP program already incurred in prior years on the two approved priority projects to be removed from the program as above.

By way of further background to the assessed economic benefits of the project, I enclose a memo outlining the detailed inputs and assumptions underpinning the calculation of the market benefits to customers associated with the project, and the basis of those assumptions, as recently discussed with the AER's Mark Wilson.

The extent to which prescribed service benefits to customers exceed the total costs to be allocated to the provision of prescribed transmission services is shown below.

Estimated costs and benefits to regulated customers	Estimated PV ($m 2018-19)
Prescribed costs of the project	6.6*
Benefits of reduced unserved energy around Dalrymple	5.3
Benefits of reduced Heywood interconnector constraints	8.2
Net benefits to customers of the Dalrymple ESCRI Energy Storage project	**6.8**

*Inclusive of operating costs, as discussed below

The values above are shown in Present Value (PV) terms and are relative to a 'business as usual' base case, which assumes the project does not go ahead.

The costs and benefits are based on central input assumptions to the analysis. Sensitivity analysis over a reasonably wide range of input assumptions has been undertaken to validate the robustness of this conclusion. The net benefits shown above are conservative with actual benefits realised likely to be materially higher.

In particular, the fast frequency response benefits are based on the Short Run Marginal Cost (SRMC) assumptions applied by AEMO in its most recent National Transmission Network Development Plan, which are reflective of the underlying economics of generation dispatch over the life of the BESS, looking beyond the short term market fluctuations observed in recent months as the market adjusts to the withdrawal of significant generation. Any potential reduction in the RoCoF limit below the current 3Hz/s – currently being actively considered by AEMO – would only increase this benefit further.

The above benefits to customers have also been conservatively estimated to take into account the probable dispatch patterns of the BESS. Appropriate safeguards will be applied in the contractual arrangements for the operating regime of the BESS to ensure adequate capacity is available at the required times to deliver the modelled security and reliability benefits to prescribed network customers.

In particular, the BESS operating protocol and lease agreement will limit AGL's operation of the battery to protect the modelled regulated benefits to customers and ensure that these benefits are realised over the life of the BESS.

2. Cost Allocation

ElectraNet intends to apply its approved CAM to allocate costs between the prescribed services and non-regulated services to be provided by the BESS.

It is proposed that a 'direct attribution' approach would be applied to allocate the capital costs of the project to the relevant service categories, in accordance with the requirements of ElectraNet's approved CAM (section 7.4).

This approach involves the direct allocation of the relevant costs to the respective service categories in the following order:

- Application of full ARENA grant funding (reducing the capital cost);
- Application of other capital cost offsets, including in kind contributions and R&D tax credits (further reducing the capital cost);

- Attribution of the full cost contribution from AGL relating to provision of non-regulated services; and
- Attribution of the remaining capital costs to the provision of prescribed services.

Alternatively, where direct attribution of costs as the preferred method is not possible (which is not the case for the ESCRI project), the CAM provides for costs to be allocated on a causal basis (refer section 7.5). The most appropriate allocator in this case would be the relative benefits to be derived from the provision of the respective prescribed and non-regulated services.

For comparison, the outcomes of these cost allocation approaches are summarised in the following table, based on current capital cost estimates:

$m (nom)	**Direct attribution method**	**Causal allocation method**
ARENA grant funding	12.0	12.0
Capital cost offsets (in kind contributions from consortium members and R&D tax credits)	1.6	1.6
Non-regulated component (AGL Lease)	9.3[1]	6.8
Prescribed component	5.8	8.3
Total capital cost	**28.7**	**28.7**

1. This cost contribution represents 85% of the estimated market trading value to be realised by AGL based on the expected availability of the battery using an open book approach, as agreed with ARENA. Should the tradeable benefits realised fall short of this estimate, the shortfall will be borne by AGL. Should the tradeable benefits exceed this estimate, the additional revenue will be shared in a 75:25 ratio between ARENA and AGL respectively. This arrangement protects prescribed customers from any downside risk from a reduction in the unregulated benefits from the BESS over its lifetime.

ElectraNet proposes to adopt the direct attribution method as the preferred approach to the allocation of capital costs to prescribed services, noting also that this improves outcomes for prescribed customers.

The ongoing operating expenses associated with the BESS would be allocated to the prescribed and non-regulated services in the same proportion as the capital costs under the direct attribution method above.

The prescribed portion of the capital costs to be rolled into the Regulated Asset Base at the commencement of the forthcoming regulatory period is to be allocated across the Secondary Systems – Electronic asset class (having a 15-year standard life) as the most appropriate standard asset category.

Finally, the impact on the capital expenditure forecast contained in ElectraNet's Revenue Proposal from the advancement in timing of the ESCRI project from the coming regulatory period commencing 1 July 2018 to the current regulatory period will essentially be offset through corresponding changes in the timing of expenditure across other existing capital projects since the lodgement of the Revenue Proposal, given the resource requirements to deliver the project and other project timing movements.

A listing of specific deferrals of lower risk project works from the current regulatory period that have been necessary as a consequence of resource constraints on the delivery of substation projects is provided in Attachment 1.

We trust the enclosed information fully addresses the relevant regulatory requirements, and we look forward to your approval for the inclusion of the ESCRI project in ElectraNet's approved NCIPAP for the current regulatory period in substitution for the approved projects listed above, subject to the successful achievement of financial close on the ESCRI project.

As noted above, ElectraNet, ARENA and AGL are working to achieve financial close on the project in July 2017. As confirmation of the regulatory treatment is a prerequisite to achieve financial close on the project, your earliest attention to this matter would be very much appreciated.

Please feel free to call me on (08) 8404 7983 or Simon Appleby on (08) 8404 7324 should you wish to discuss any aspects further.

Yours sincerely

Rainer Korte
Executive Manager Asset Management

Copies: Chris Pattas, Adam Petersen, Mark Wilson

Encl. ESCRI-SA – Economic Assessment Summary

ATTACHMENT 1

Capital Project Timing Delays

Project	Description of works	Expenditure deferred into 2019-2023 ($m 2017-18)
14198 Substation Access Roads and Drainage Upgrade	Completion of works to upgrade access roads and drainage at a number of identified substation sites	0.5
14210 Substation Environmental Investigation	Completion of installation of groundwater monitoring wells and equipment at selected substation sites	1.1
14131 Motorised Isolator Layer of Protection Analysis (LOPA) Improvement	Completion of replacement or refurbishment of mechanical and electrical isolation lock-off points on motorised air insulated isolators	1.2
11747 Substation Lighting and Infrastructure Replacement	Completion of replacement of substation lighting and associated infrastructure at specific sites	1.9
14199 East Terrace, Northfield and Kilburn Emergency Transformer Deployment Preparation	Completion of design and procurement of connection spares for specific Gas Insulated Switchgear (GIS) connected transformers across targeted substation sites on a priority basis	1.9
Total		**6.7**