



TransGrid

**TransGrid Revised Revenue Proposal
2018/19 – 2022/23**

Appendix C

Frontier Economics:

**The AER modifications to
EBSS**



AER modifications to the efficiency benefit sharing scheme

A REPORT PREPARED FOR TRANSGRID

November 2017

AER modifications to the efficiency benefit sharing scheme

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AER modifications to the efficiency benefit sharing scheme

Executive summary

1 I, Rajat Sood, am an employee of Frontier Economics. My curriculum vitae is provided in an appendix to this report.

2 I have been asked by TransGrid for advice on the following issue arising from the Australian Energy Regulator's (AER's) draft decision on TransGrid's transmission determination for 2018/19 to 2022/23:

TransGrid would like to know Frontier Economics' view of the AER's modifications to the efficiency benefit sharing scheme in response to TransGrid's proposed carry over period of five years rather than the four years determined by the AER for the 2014/15-2017/18 regulatory control period; in particular:

- how appropriate are the AER's modifications to TransGrid's proposed application of a five year carry over period for the current four year 2014/15 to 2017/18 regulatory control period
- how appropriate are references to the provisions of the National Electricity Rules or AER Guidelines applied by the AER to justify the proposed modifications
- any other observations on the AER's decision.

3 In its initial Revenue Proposal of January 2017, TransGrid proposed adopting a five year carryover period for its efficiency benefit sharing scheme (EBSS) in respect of incremental savings (or losses) made in the current 2014/15 to 2017/18 regulatory control period (RCP). TransGrid commented that while the AER's April 2015 final determination for the current RCP adopted a four year carryover period, this was in the context of an expectation that the next (2018/19 onwards) RCP would also be four years. Given that the forthcoming RCP is now expected to be five years in length, TransGrid suggested that the carryover period in respect of the current RCP also be extended to five years.

4 In its draft decision, the AER agreed with moving to a five year carryover period, but also proposed to make additional modifications to the EBSS that would alter the payoffs attributable to incremental opex savings (or overruns) made in 2013/14, in the *previous* RCP.

5 I note that the AER's modifications to the EBSS – beyond accepting TransGrid's proposed five year carryover period – are not necessary to ensure either:

- Consistency with the AER's representations to TransGrid during the Framework and Approach process; or
- A 30:70 sharing ratio in respect of incremental efficiency gains or losses made by TransGrid in the *current* RCP.

6 I also note that the AER's modifications are not justifiable by reference to the specific National Electricity Rules (NER) provisions the AER emphasised in its EBSS guideline and explanatory statement regarding the length of the carryover period.

- 7 TransGrid’s behaviour from 2016/17 onwards was explicitly and directly influenced by the AER’s representation that TransGrid “should continue to pursue efficiency gains in line with the objectives of the EBSS”. No such undertaking was made by the AER prior to that representation.
- 8 Taken literally, provisions in the NER suggest that it is now too late to change the carryover period applicable to either the previous or the current RCPs. However, there are two reasons why these provisions should not be applied strictly to prevent a move to a five year carryover period for the current RCP in the present circumstances.
- First, contrary to TransGrid’s understanding as of the time of the final determination in respect of the current RCP (April 2015), the forthcoming RCP will be five years rather than four.
 - Second, given the AER’s representations made during the Framework & Approach process, the integrity and credibility of the regulatory process (and the AER) requires that the AER adopt whatever changes are necessary to uphold those representations.
- 9 Importantly, these reasons for not applying the above provisions strictly do not apply to the AER’s additional modifications.
- 10 More broadly, the AER’s additional modifications should not be imposed because:
- As noted above, they are not necessary to achieve the objectives of the EBSS in respect of the current or forthcoming RCPs;
 - They could not affect TransGrid’s incentives to make opex efficiencies and/or capitalisation decisions;
 - They seek to achieve a sharing ratio outcome that the AER has not pursued consistently; and
 - They represent a far more detailed and *ad hoc* change to the EBSS than simply altering the length of the carryover period. Unlike the question of carryover length, the AER’s modifications have not previously been discussed or even flagged in either the NER, the EBSS guideline or the AER’s explanatory statement to the guideline.
- 11 Therefore, adoption of the AER’s additional modifications to the EBSS would represent a departure from good regulatory practice.
- 12 Finally, Attachment 9 in the AER Draft Decision’s Attachment 9 appears to contain some errors.

1 Introduction

13 I, Rajat Sood, am an employee of Frontier Economics. My curriculum vitae is provided in an appendix to this report.

14 I have been asked by TransGrid for the following advice in relation to the Australian Energy Regulator's (AER's) draft decision on TransGrid's transmission determination for 2018/19 to 2022/23:¹

TransGrid would like to know Frontier Economics' view of the AER's modifications to the efficiency benefit sharing scheme in response to TransGrid's proposed carry over period of five years rather than the four years determined by the AER for the 2014/15-2017/18 regulatory control period; in particular:

- how appropriate are the AER's modifications to TransGrid's proposed application of a five year carry over period for the current four year 2014/15 to 2017/18 regulatory control period
- how appropriate are references to the provisions of the National Electricity Rules or AER Guidelines applied by the AER to justify the proposed modifications
- any other observations on the AER's decision.

15 In its initial Revenue Proposal of January 2017, TransGrid proposed adopting a five year carryover period for its efficiency benefit sharing scheme (EBSS) in respect of incremental operating expenditure (opex) savings (or losses) made in the current 2014/15 to 2017/18 regulatory control period (RCP).² TransGrid commented that while the AER's April 2015 final determination for the current RCP adopted a four year carryover period, this was in the context of an expectation that the next (2018/19 onwards) RCP would also be four years. Given that the forthcoming RCP is now expected to be five years in length, TransGrid suggested that the carryover period in respect of the current RCP also be extended to five years.

16 In its draft decision, the AER agreed with moving to a five year carryover period, but also proposed to make additional modifications to the EBSS that would alter the payoffs attributable to incremental opex savings (or overruns) made in 2013/14, in the *previous* RCP.³

17 I have read, understood and complied with the Federal Court of Australia Practice Note entitled, "Expert Witnesses in Proceedings in the Federal Court of Australia",

¹ AER, *Draft Decision, TransGrid transmission determination 2018 to 2023*, September 2017, available at: <https://www.aer.gov.au/networks-pipelines/determinations-access-arrangements/transgrid-determination-2018-23/draft-decision> (accessed 30 October 2017).

² TransGrid, *Revenue Proposal, 2018/19 – 2022/23*, p.203.

³ AER, *Draft Decision, TransGrid transmission determination 2018 to 2023, Attachment 9 – Efficiency benefit sharing scheme*, September 2017 (Draft Decision, Attachment 9), p.9-11.

which commenced on 4 June 2013. The opinions I have expressed in this report are based wholly or substantially on my specialised knowledge.

18 This report is structured as follows:

- Section 2 outlines the case for adopting a five year carryover period in relation to incremental efficiencies made in the current RCP.
- Section 3 summaries the AER's position as set out in its draft decision.
- Section 4 responds to the AER's proposed modifications in its draft decision.
- Appendix A reproduces the terms of reference provided to me by TransGrid.
- Appendix B provides a copy of my curriculum vitae.

2 Case for a five year carryover period

19 The AER's EBSS guideline provides that the EBSS carryover period will generally be five years, unless the length of the upcoming RCP (RCP_n), or the RCP following that (RCP_{n+1}), is not five years.⁴

20 The AER's EBSS guideline also provides that in determining the length of the carryover period, the AER will have regard to the matters it is required to under the National Electricity Law (NEL) and Rules (NER), including but not limited to:

- The length of RCP_n and RCP_{n+1} , and
- The balance of incentives provided by the EBSS, capital expenditure sharing scheme and the service target performance incentive scheme.

21 The AER's explanatory statement for the EBSS emphasises two slightly different NER provisions in describing how the AER will determine the length of the carryover period:⁵

- the need to provide NSPs with a continuous incentive to reduce opex; and
- any incentives that NSPs may have to capitalise expenditure.

22 In the present case, adopting a five year carryover period in respect of the present 2014/15 to 2017/18 RCP would result in a 30:70 benefit-sharing ratio (assuming a 6% real discount rate) for incremental opex savings (or overruns) made in any year of the current RCP, in accordance with the AER's stated normal approach.

23 I note that in April 2016 (ie before the start of the 2016/17 year), through the Framework and Approach process, TransGrid alerted the AER to the perverse incentives created by the application of a four year carryover period to the current RCP, in light of the fact that the forthcoming RCP would be five years in length.⁶ The application of a four year carryover period would make it financially attractive for TransGrid to boost opex in the 2016/17 base year (or better still, bring forward opex from the 2017/18 final year into the 2016/17 base year). This would provide TransGrid with a benefit from a higher forecast opex allowance in the next RCP while imposing comparatively lower EBSS penalties than if a five year carryover applied. Using the AER's own "EBSS period length" spreadsheet shows that if TransGrid (inefficiently) increased its opex in 2016/17 (and only that year) by \$10, it would actually provide TransGrid with a NPV benefit of \$4.5 (reflecting a -

⁴ AER, *Better Regulation, Efficiency Benefit Sharing Scheme for Electricity Network Service Providers*, November 2013 (EBSS guideline), p.5.

⁵ AER, *Better Regulation, Explanatory Statement, Efficiency Benefit Sharing Scheme for Electricity Network Service Providers*, November 2013 (EBSS explanatory statement), p.18.

⁶ Letter from Tony Meehan, Executive General Manager – Business Growth and Revenue, TransGrid, to Sebastian Roberts, General Manager – Networks Branch, AER, April 2016.

45:145 sharing ratio). The EBSS would, if operating normally, ordinarily impose a \$3 NPV penalty on TransGrid for such a cost increase.

24 In response, the AER said:⁷

...we understand TransGrid's concern that applying a four year carryover period may create inappropriate incentives.

We consider the NER provides the flexibility for us to implement an EBSS in a way which will address any inappropriate incentives arising from a change in the duration of regulatory control periods. Noting this, if TransGrid considers that a four year carryover period creates inappropriate incentives, TransGrid should continue to pursue efficiency gains in line with the objectives of the EBSS. If, at the time of submitting its regulatory proposal, TransGrid maintains that a five year carryover period is preferable, then we will consider whether that better meets the requirements of the NER.

25 I understand that based on these representations by the AER, combined with TransGrid's enduring view that a five year carryover period would be preferable to a four year carryover period, TransGrid pursued efficiency savings in 2016/17 *against its ostensible interests as they stood at that time*. Preserving the integrity and credibility of the regulatory process requires that the AER should now adopt a five year carryover period in respect of the current RCP.

⁷ AER, *Framework and approach for TransGrid, For regulatory control period commencing 1 July 2018*, July 2016 (Framework & Approach), p.16.

3 AER draft decision

26 In its draft decision, the AER accepted the case for a five year carryover period to apply to incremental savings in the current RCP. However, it commented that:⁸

...due to the current period being only four years, TransGrid's proposal [for a five year carryover period] would reward it for the higher opex it incurred in 2013–14.

27 The AER's EBSS period length spreadsheet shows that with a five year carryover period, a non-recurrent increase in opex of \$10 in 2013/14 would provide a \$4.5 NPV *benefit* to TransGrid. This compares to a \$2.5 NPV loss under the existing four year carryover period (reflecting a 25:75 sharing ratio).

28 To offset such impacts, beyond accepting a five year carryover period in relation to the *current* RCP, the AER made some additional modifications to the EBSS to alter the payoffs applying to incremental savings in 2013/14, in the *previous* RCP. These additional modifications are not defined algebraically in the draft decision. However, they effectively involve decreasing TransGrid's 2018/19 net opex target⁹ by the amount of its 2013/14 efficiency loss. This modification results – *ex post* – in a 30:70 sharing ratio in respect of incremental savings made in 2013/14.

⁸ AER, *Draft Decision, TransGrid transmission determination 2018 to 2023, Attachment 9 – Efficiency benefit sharing scheme*, September 2017 (Draft Decision, Attachment 9), p.9-11.

⁹ 'Net opex target' refers to the sum of an NSP's forecast opex allowance plus any carryover amounts from previous RCPs.

4 Response to AER's draft decision modifications

4.1 Justification for the AER's modifications

29 I note that the AER's modifications to the EBSS – beyond accepting TransGrid's proposed five year carryover period – are not necessary to ensure either:

- Consistency with the AER's representations to TransGrid during the Framework and Approach process; or
- A 30:70 sharing ratio in respect of incremental efficiency gains or losses made by TransGrid in the current RCP.

30 Simply adopting TransGrid's proposal for a 5-year carryover period to incremental efficiencies made in the current RCP would achieve these outcomes: a five year carryover period would achieve a 30:70 sharing ratio for incremental efficiencies made in 2014/15 to 2016/17 (inclusive), whereas the sharing ratio for incremental efficiencies in 2017/18 will be 30:70 irrespective of the length of the carryover period.¹⁰

31 This is contrary to the AER's assertion that a five year carryover period “does not solve these problems”.¹¹ A five year carryover period does solve the problem in relation to the present and forthcoming RCPs. The AER's modifications only alter the sharing ratios applicable – after the fact – to incremental efficiencies originating in 2013/14, which lies in the *previous* RCP.

32 I also note that the AER's modifications are not justifiable by reference to the specific NER provisions the AER emphasised in its EBSS guideline and explanatory statement regarding the length of the carryover period: The AER's modifications are not relevant to ensuring TransGrid faced continuous and balanced incentives to make opex savings in 2013/14. This is because at that time, TransGrid had no reason to believe that it did not face a continuous incentive to make efficiency savings or that it had incentives to (inefficiently) capitalise expenditure. The decision to adopt a four year RCP (2014/15 to 2017/18) and a four year carryover period was made too late to realistically influence TransGrid's opex and capitalisation incentives for that year. Thus, there is no efficiency purpose served by now retrospectively altering the EBSS payoffs in respect of the last RCP.

33 Conversely, TransGrid's behaviour from 2016/17 onwards was explicitly and directly influenced by the AER's representation that TransGrid “should continue

¹⁰ This is because the forthcoming RCP will be five years, such that any efficiencies made in 2017/18 will ‘automatically’ be enjoyed for five years beyond 2017/18.

¹¹ Draft Decision, Attachment 9, p.9-13.

to pursue efficiency gains in line with the objectives of the EBSS". No such undertaking was made by the AER prior to that representation, even though the adoption of the current four year RCP naturally altered the sharing ratios applicable to incremental savings made in the previous (2009/10 to 2013/14) RCP.

4.2 Provisions dealing with when the carryover period is established

34 I note that the AER's EBSS guideline states that:¹²

The carryover period length to apply for regulatory control period n will be determined at the final determination **prior to the commencement of regulatory control period n**. [Emphasis added]

35 Further, clause 6A.6.5(f) of the NER states that:

The AER may, from time to time and in accordance with the transmission consultation procedures, amend or replace an efficiency benefit sharing scheme, except that no such amendment or replacement may change the application of the scheme to a Transmission Network Service Provider in respect of a regulatory control period that has commenced before, or that will commence within 15 months of, the amendment or replacement coming into operation.

36 Taken literally, these provisions suggest that it is now too late to change the carryover period applicable to either the previous (2009/10 to 2013/14) or the current (2014/15 to 2017/18) RCPs, as the final determination for the current RCP – which imposed a four year carryover period – was made in April 2015. This would prevent both a shift to a five year carryover period for the present RCP, as TransGrid has proposed, as well as the AER's additional modifications.

37 However, there are two reasons why these provisions should not be applied strictly to prevent a move to a five year carryover period for the current RCP in the present circumstances.

- First, contrary to TransGrid's understanding as of the time of the final determination in respect of the current RCP (April 2015), the forthcoming RCP will be five years rather than four. In my view, this ought to trigger a reassessment of the carryover period under the terms of the EBSS guideline as noted above:¹³

The carryover period length will be five years unless the length of regulatory period n, or regulatory control period n+1, is not five years. If the length of regulatory period n, or regulatory control period n+1, is not five years we may determine a different carryover period length.

¹² EBSS guideline, p.5.

¹³ EBSS guideline, p.5.

Given that the length of the upcoming 2018/19 to 2022/23 RCP ('RCP_{n+1}' in the present context) will now be five years, it would be appropriate for the carryover period applying in respect of the current RCP that was established previously to be modified in the manner of a correction to a material error or deficiency under 6A.15 of the NER.

- Second, given the AER's representations made during the Framework & Approach process, the integrity and credibility of the regulatory process (and the AER) requires that the AER adopt whatever changes are necessary to uphold its representation that "...TransGrid should continue to pursue efficiency gains in line with the objectives of the EBSS."

38 Importantly, these reasons for not applying the above provisions strictly do not apply to the AER's additional modifications. In particular, from the perspective of 2013/14, there has been no change to the length of either RCP_n (ie 2009/10 to 2013/14) or RCP_{n+1} (2014/15 to 2017/18). Therefore, the trigger for reassessing the application of the existing EBSS to incremental efficiencies arising in the current RCP is lacking with respect to incremental efficiencies originating in 2013/14.

39 More broadly, the AER's additional modifications should not be imposed because:

- As noted above, they are not necessary to achieve the objectives of the EBSS in respect of the current or forthcoming RCPs;
- Modifications made now to sharing ratios that apply retrospectively to 2013/14 could not and will not affect TransGrid's incentives to make opex efficiencies and/or capitalisation decisions at any point in time. As such, they are inconsistent with the intrinsically forward-looking nature of expenditure incentive schemes and incentive regulation more generally;
- The modifications seek to achieve a sharing ratio outcome that the AER has not pursued consistently. For example, if the upcoming RCP (2018/19 onwards) remained four years in length, as it was originally intended to be, the benefit-sharing ratio for the 2014/15 to 2017/18 RCP would be 25:75; and
- The AER's modifications represent a far more detailed and *ad hoc* change to the EBSS than simply altering the length of the carryover period. Unlike the question of carryover length, the AER's modifications have not previously been discussed or even flagged in either the NER, the EBSS guideline or the AER's explanatory statement to the guideline. In this context, I highlight again that the AER's modifications have not even been defined algebraically, as the existing EBSS has.

40 For all these reasons, adoption of the AER's additional modifications to the EBSS would represent a departure from good regulatory practice.

4.3 Apparent errors

41 Some of the discussion in the AER Draft Decision's Attachment 9 seems confused. For example, on the bottom of p.9-12, the AER says:

When a service provider makes a non-recurrent, or one-off, efficiency gain (loss) its opex reduces (increases) in a single year only. A non-recurrent efficiency gain (loss) can be thought of as a recurrent gain (loss) made in one year followed by an equal but opposite recurrent loss (gain) in the immediately following year. **When a network business makes a non-recurrent gain (loss) in the base year the EBSS carryover carries forward the recurrent saving (loss) but the opex forecast for the next period carries forward the recurrent loss (saving).** If the length of the next regulatory control period is longer than the carryover period the network business will be penalised (rewarded) for the non-recurrent efficiency gain (loss). [Emphasis added]

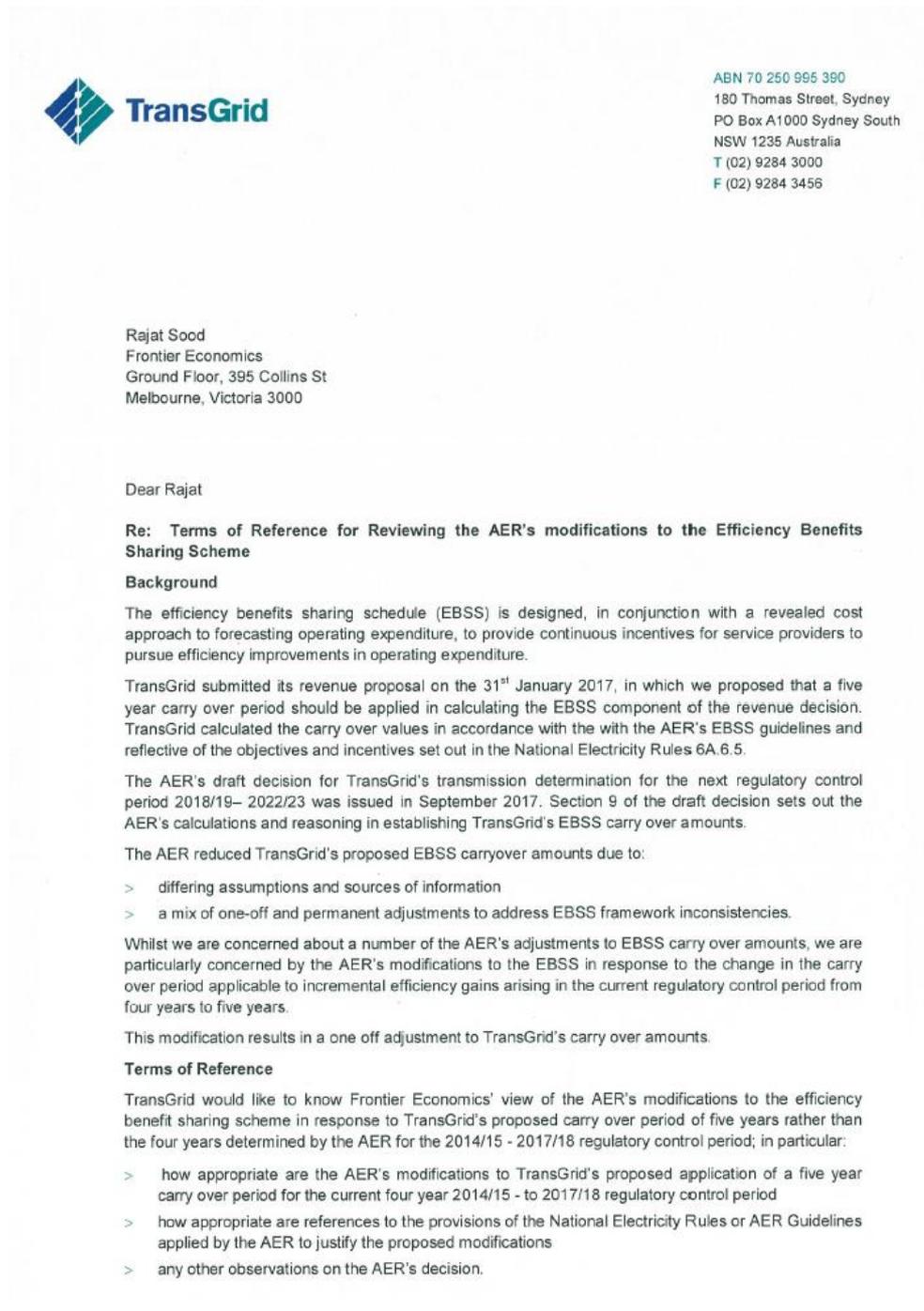
42 With respect to the bolded sentence, it is the opex forecast (rather than the EBSS carryover) that carries forward the efficiency gain made in the base year. This is why, as noted in the final sentence, a NSP is penalised if it makes a non-recurrent efficiency gain in its base year when the next RCP is longer than the EBSS carryover period.

43 On the top of p.9-13, the AER says:

Consequently, if we apply a four year carryover period to TransGrid in the 2014–18 regulatory control period it would be penalised (rewarded) for any non-recurrent efficiency gains (losses) it has made in 2016–17. It would receive a dollar in both 2021–22 and 2022–23 for every extra dollar of opex it spent in 2016–17. **This is because the incremental loss in 2016–17 would be carried forward for an additional four years (until 2020–21) by the EBSS carryovers but the incremental loss in 2017–18 would be carried forward for an additional five years (until 2022–23) through the opex forecast for the 2018–23 control period.** [Emphasis added]

44 The bolded sentence is confusing because it refers to incremental losses in two consecutive years (2016-17 and 2017-18), whereas the AER may have meant to refer to one of these as an incremental gain. This may have occurred because the AER switched from referring to base year efficiency gains in the first sentence of the paragraph to base year efficiency losses in the second sentence.

Appendix A – Terms of reference



The relevant AER guideline for calculating the EBSS is set out in the "Efficiency Benefit Sharing Scheme for Electricity Network Service Providers (November 2013). During the current 2014/15 – 2017/18 and next regulatory control period TransGrid operated under version two of the electricity transmission network service providers' EBSS.

Yours sincerely



Nicola Tully
Manager, Prescribed Revenue and Pricing

Appendix B – CV for Rajat Sood

NAME:	RAJAT SOOD
Profession:	Economist



Rajat is a founding member of Frontier Economics and is a qualified solicitor, as well as a trained economist. Rajat has a broad range of experience in advising state and national governments, regulatory bodies and businesses on issues arising in market design and governance arrangements, access regulation, cost-benefit analysis and competition evaluation.

Over his career, Rajat has been a key advisor to institutions such as the Australian Energy Market Commission (AEMC), the Australian Energy Regulator (AER), the New Zealand Electricity Authority and the Singapore Energy Market Authority, as well as a variety of transmission and distribution network businesses in Australia and overseas. Since 2013, Rajat has been advising Queensland distributor, Ergon Energy, on its network tariff strategy and the preparation of its Tariff Structure Statement. Rajat recently returned from a secondment to the AEMC where he was acting Senior Director of the Strategic and Economic Analysis team, responsible for overseeing a range of key AEMC reports and projects.

Prior to working as an economist, Rajat was a solicitor at the law firm Freehill Hollingdale & Page in Melbourne (now Herbert Smith Freehills) where he worked on commercial and trade practices issues.

KEY EXPERIENCE

Energy network regulation

Electricity network regulation

- ***Ergon Energy network pricing:*** Rajat has been advising Ergon Energy (and more recently, the merged Ergon-Energex 'EQL' business) on network pricing issues for nearly four years. He initially advised Ergon on the development of appropriate network pricing principles and the transition of its existing tariffs to a new structure more consistent with those principles. His role subsequently included the preparation of a Tariff Implementation Report for Ergon, followed by assistance in drafting Ergon's Tariff Structure Statement (TSS), which was submitted to the AER. Rajat then assisted Ergon with responding to stakeholder comments on the TSS. He is currently assisting EQL by reviewing the long term fitness-for-purpose of its LRMC-based tariff structure

in an environment of slowing load growth and increased penetration of distributed energy resources (2013 – ongoing).

- **Prudent discount:** Rajat advised AEMO on its review of an application from a transmission customer for a prudent discount on the customer's transmission charges (2015-16).
- **Value of local generation:** Rajat was part of the Frontier Economics team engaged by the Energy Networks Association (ENA) to undertake a detailed qualitative and quantitative analysis of the value of embedded generation in response to a proposed amendment to the National Electricity Rules (NER). The proposed amendment was to include a requirement for network businesses to offer a network credit to eligible Embedded Generation (EG) for electricity exported to the network. The analysis and report demonstrated that the interaction of any generally available network credit with the existing regulatory, policy and market settings could lead to unintended consequences, including incentivising inefficient investment in, and use of, EG in locations, quantities or technologies where it may create net costs to networks and potentially lead to higher electricity prices for consumers. The report was submitted to the AEMC (2015).
- **Singapore Power connection charge:** Rajat advised Singapore Power (SP) and a Singaporean generator on the appropriate charge payable by SP to the generator in return for the generator agreeing to allow SP to install a transformer at the generator's switchyard. Our advice drew from Nash bargaining theory to devise a charge that shared the benefits of the transformer between the generator and SP's customers. The Singapore Energy Market Authority was consulted throughout the analysis and approved our recommended connection charge (2015).
- **TransGrid long-term lease:** Rajat was part of the Frontier team advising one of the consortia bidding for New South Wales electricity transmission business, TransGrid. Rajat's role included explaining the operation and application of the AER's expenditure incentive schemes to TransGrid. These schemes are the:
 - Efficiency-Benefit Sharing Scheme (EBSS) for operating expenditure and
 - Capital Expenditure Sharing Scheme (CESS) for capital expenditure (2015).
- **Transpower IRIS:** Rajat prepared a report for Transpower New Zealand examining the implications of the Commerce Commission's intended changes to Transpower's Incremental Rolling Incentive Scheme (IRIS). The Commission was planning to implement a 'symmetric' IRIS, which would penalise aggregate over-spending by Transpower during a regulatory period at the same rate as it would reward aggregate under-spending. While this would be appropriate under a conventional 'base year' approach to forecasting

operating expenditure, our report noted that in light of the Commission's 'bottom-up' approach to forecasting Transpower's allowed operating expenditure, application of a symmetric IRIS could lead to perverse incentives for Transpower to engage in inefficient behaviour. Our report suggested that Transpower's current IRIS mechanism (or no IRIS mechanism at all) would be preferable to the Commission's proposed IRIS under these circumstances (2015).

- **Major Operating Projects:** Rajat advised TransGrid on the appropriate regulatory treatment of TransGrid Major Operating Projects (MOPs). In particular, he prepared a report discussing whether the AER had correctly applied to TransGrid the framework he developed when advising the AER on a different business's regulatory proposal (2014-15).
- **Replacement project evaluation template:** Rajat advised electricity distributor, Jemena, on the appropriate methodology to undertake a cost-benefit analysis of its replacement network projects. This included overseeing the development of a sophisticated spreadsheet template to enable Jemena to conduct a cost-benefit analysis of alternative network replacement projects. The template allows users to test and compare the potential public benefits from different network and non-network options. The template builds on the framework adopted by the AER in its Regulatory Investment Test for Distribution and is designed to assist the business justify its proposed replacement capital expenditure to the regulator (2014).
- **Network planning arrangements in Western Australia:** Rajat led the drafting of a report for the Public Utilities Office (PUO) of Western Australia to inform the state government's Electricity Market Review. The report assessed the benefits and costs of existing transmission planning and connection arrangements in Western Australia and commented on the appropriateness of changes to these arrangements. The report also discussed the implications of alternative transmission planning and connection arrangements for the operation of the Western Australian wholesale electricity market. The report was used by the PUO to prepare a detailed set of reforms and implementation arrangements, which were provided to the Minister for Energy (2015).
- **Metering competition:** Rajat advised the AEMC on the implications of opening up of metering activities to competition for the competitiveness of retail electricity supply and the supply of energy services. As part of this work, Rajat presented to the AEMC Commissioners and spoke at an AEMC Public Forum (2014).
- **Transpower WACC:** Rajat was part of the Frontier team supporting Transpower through a review by the Commerce Commission on the approach to estimating the cost of capital. This included preparing a number of reports

setting out the conceptual, empirical and regulatory evidence for choosing a WACC value above the midpoint of the estimated WACC range (2014).

- ***Meralco Performance-Based Regulation:*** Rajat was part of the Frontier team that provided advice to Meralco, the largest electricity distribution network in the Philippines, on aspects of the review of the operation of performance-based regulation (PBR) being conducted by the Electricity Regulatory Commission of the Philippines. Our advice covered the successes of the existing PBR regime, reasonable expectations for the forthcoming period, and the advantages and disadvantages of changes to various parameters used to set prices (such as asset valuation and depreciation methodology) (2014).
- ***New Zealand Default Price-Quality Path distribution reset:*** Rajat was part of the Frontier team advising the Electricity Networks Association of New Zealand on:
 - the formulation and testing of econometric models that identify and quantify the drivers of network capital and operating expenditure for the Electricity Distribution Businesses' (EDBs') default price-quality path (DPP) resets; and
 - potential approaches for making use of EDBs' Asset Management Plan forecasts in their DPP resets. This included the scope for adopting innovative 'menu regulation' in New Zealand (2013-2014).
- ***SP AusNet controllable opex:*** Rajat advised the AER on the appropriateness of the application of a single base year approach to forecasting SP AusNet's total controllable operating expenditure, including SP AusNet's 'asset works' opex (2013-2014).
- ***AEMO VCR Issues Paper:*** Rajat helped prepare an issues paper on the Value of Customer Reliability (VCR) for AEMO. The issues paper highlighted the key roles and potential applications of a VCR in the Australian National Electricity Market and discussed the strengths and weaknesses of the various methodologies that had been used for estimating VCR in Australia and internationally (2013)
- ***Jemena distribution pricing Rule change:*** Rajat prepared a report for Jemena Electricity Networks discussing the pros and cons of alternative means of recovering distribution network businesses' sunk costs not recovered through charges reflecting long run marginal cost. His report compared and contrasted Ramsey pricing and postage stamp pricing as well as equity-based pricing approaches (2013).
- ***AER Expenditure Incentives Guidelines:*** Rajat advised the AER on the development of network expenditure incentive guidelines as part of the AER's 'Better Regulation' work program (2013).

- ***AER cost of capital:*** Rajat helped advise the AER on the nature and extent of risks to which Australian energy networks are exposed. This work fed into the AER's work on defining the "benchmark efficient entity", an important part of its regulatory framework and element of its 2013 Rate of Return Guidelines as part of the AER's 'Better Regulation' work program (2013).
- ***AER RIT-D:*** Rajat advised the AER on the development of the Regulatory Investment Test for Distribution (RIT-D) and the RIT-D Application Guidelines. The RIT-D is an economic cost-benefit test for assessing distribution network augmentations, which requires augmentation options to be compared against DG and demand-side response options (2013).
- ***New Zealand Transmission Pricing Methodology:*** Rajat prepared a report for Mighty River Power reviewing the New Zealand Electricity Authority's proposed Transmission Pricing Methodology. The Authority proposed introducing two new transmission charges – a 'beneficiaries-pay charge' and a 'residual charge' (2012-13).
- ***Power of Choice Review:*** Rajat provided advice to the AEMC in relation to a number of matters including:
 - barriers to more cost-reflective retail pricing in the NEM as a means of encouraging more demand-side response from end-use customers. His role included presenting Frontier's findings to the AEMC's Third Stakeholder Reference Group Meeting in May 2012
 - amending the distribution pricing principles in the National Electricity Rules to provide better guidance for businesses to develop efficient and flexible tariff structures that support demand-side participation (2012).
- ***Smart meter rollout:*** Rajat advised the Victorian Department of Treasury and Finance on the regulatory consequences of halting, suspending or modifying the rollout of smart meters in Victoria. His advice covered issues such as the potential avenues for changing the rollout, cost recovery implications, timing implications and the need to maintain good regulatory practice (2012).
- ***Connection Initiatives project:*** Rajat assisted AEMO on the development of policies for (i) the management of multiple connection applications and (ii) cost-sharing arrangements at terminal station hubs. His advice helped the AEMO to develop connection arrangements that promote economic efficiency, especially in an environment of increasing connection applications, particularly from wind farms. In doing so, he helped AEMO to meet its statutory objectives (2011).
- ***Basslink conversion:*** Rajat was part of the Frontier team investigating the benefits and costs of converting the Basslink market network service into a prescribed service, on behalf of Hydro Tasmania. This work included calculating the market benefits of Basslink and determining the potential value

of the regulated asset base that would apply to Basslink should it be converted. Rajat also advised Hydro Tasmania on the potential Rule changes that may be required to preserve the System Protection Scheme, which helps to maintain the non-firm transfer capacity of Basslink (2011).

- ***United Energy Distribution operating expenditure:*** As part of the Victorian electricity distribution determination process, the AER examined United Energy Distribution's (UED's) operating expenditure forecasts. UED was implementing a new business model in which it outsourced fewer services and undertook more activities in-house in order to improve the quality and flexibility of its service performance. Frontier was asked to advise Johnson Winter & Slattery about the meaning and interpretation of clause 6.5.6(c) of the National Electricity Rules in relation to how it applied to UED's proposed operational expenditures under its new business model. The AER quoted approvingly from Frontier's report in its Final Determination (2010).
- ***Transmission Frameworks Review:*** Rajat provided preliminary advice to the Northern Generators in relation to formulating their submission to the AEMC's Transmission Frameworks Review Issues Paper (2010).
- ***AER RIT-T drafting:*** Rajat advised the AER on the appropriate drafting of the proposed Regulatory Investment Test for Transmission (RIT-T), which replaced the Regulatory Test, and the accompanying RIT-T Application Guidelines (2009 – 2010).
- ***Climate Change impacts on transmission:*** Rajat assisted a group of NEM participants on the appropriate response to the AEMC's recommended changes to transmission pricing and congestion management in light of climate change policies (2009 – 2010).
- ***NERGs advice:*** Rajat advised the AER on the economic efficiency and regulatory implications of the AEMC's proposed options for a new regulatory regime for dealing with new generator-serving transmission network extensions (NERGs) (2009).
- ***Victorian AMI audit:*** Rajat advised the Victorian Auditor-General's Office (VAGO) on VAGO's performance audit of the Victorian Government's decision to mandatorily roll-out smart meters across Victoria from 2009. Frontier's analysis fed into VAGO's report, which was tabled in the Victorian parliament in November 2009 (2009).
- ***NZ Transmission pricing:*** Rajat prepared a report for the New Zealand Electricity Commission (now the Electricity Authority) on the economics of transmission pricing, international experience and potential 'high-level' options for consideration as part of the Commission's Transmission Pricing Review. Our report is available on the Electricity Authority website (2009).

- ***Prescribed and negotiated transmission services:*** Rajat advised VENCORP on the interpretation and application of those aspects of the National Electricity Rules that deal with the delineation between regulated (or ‘prescribed’) and unregulated (or ‘negotiated’) transmission services (2009).
- ***Multi-sector utilities:*** Rajat was primary author of a report for the New Zealand Commerce Commission on international approaches to the regulation of multi-sector utilities (2008).
- ***Inter-regional transmission charging:*** Rajat drafted a report for the AEMC advising on the pros and cons of different approaches to inter-regional transmission charging in the NEM (2008).
- ***EnergyAustralia Rule Change:*** Rajat assisted the AEMC with the analysis of a proposed Rule change from EnergyAustralia concerning the appropriate regulatory treatment of EnergyAustralia’s transmission assets. This included preparing a draft of the AEMC’s Draft Decision and the Rule change itself (2008).
- ***Regulatory Test amalgamation:*** Rajat advised the AEMC on the merits of various options for amalgamating the “reliability” and “market benefit” criteria of the Regulatory Test, pursuant to a direction from the Ministerial Council on Energy (MCE). Also advised on aspects of the new “RIT-T” to replace the Regulatory Test (2007-08).
- ***Regulatory Test Guidelines:*** On behalf of the AER, Rajat developed guidelines for the application of the Regulatory Test by network service providers, as required by a Rule change instituted by the AEMC. Also advised the AER on appropriate revisions to the Regulatory Test following the Rule change (2007).
- ***Real options:*** Frontier and SFG Consulting is advising the Victorian transmission planner, VENCORP, on how a real options analysis can be used to guide investment decisions in easements in advance of developing network augmentations (2007).
- ***Transmission pricing:*** Rajat advised the AEMC on its review of transmission pricing in the NEM. This included the preparation of a scoping paper for the review, Working Papers explaining various technical topics, an Issues Paper for stakeholder consultation and leading the development of the Commission’s Rule Change Proposal, Draft Determination and Final Determination (2006).
- ***Revenue Rule Proposal:*** Rajat advised the AEMC on a range of matters relating to the AEMC’s Rule Change proposal on the regulation of transmission revenues in the NEM. Specifically, this included advice on the appropriate treatment for network asset depreciation, large ‘contingent projects’ and transmission incentives (2005-06).

- **ACCC metering:** Analysis of the costs and benefits of maintaining a distributor monopoly over small customer electricity metering services for the ACCC (2004).
- **NZ Grid Investment Test:** Development of a draft “Grid Investment Test” (GIT) for the New Zealand Electricity Commission – available [here](#) (2004).
- **NZ Transmission pricing methodology:** Development of a transmission pricing methodology on behalf of the New Zealand Electricity Commission to apply to the recovery of existing and new investment costs by Transpower – available [here](#) (2004).
- **Regulatory Test competition benefits:** Theoretical and empirical report for the ACCC on amendments to the Regulatory Test for transmission augmentations to allow for the inclusion of competition benefits in the assessment of transmission investments. – see [here](#) (2003).
- **Transmission policy paper:** On behalf of the NSW jurisdiction, drafted a policy discussion paper for the NEM Ministers’ Forum on the role and governance of networks in the NEM (2002).
- **SNI appeal:** Key member of the NSW Minister for Energy’s team on the South Australia- New South Wales Interconnector appeal, addressing issues such as:
 - the interpretation and application of the ACCC’s Regulatory Test and
 - network governance and revenue regulation, including treatment of capital expenditures and asset optimisation (2001-02).

Gas network regulation

- **Transmission depreciation methodology:** Rajat advised the Australian Energy Regulator on the implications of APA GasNet’s proposed approach to depreciation of their Victorian gas transmission assets as part of APA GasNet’s 2013-17 access arrangement. In particular, Rajat advised the AER on whether APA GasNet’s proposed approach was likely to lead to reference tariffs that would vary, over time, in a way that promotes efficient growth in the market for reference services. APA GasNet appealed the AER’s decision and the Australian Competition Tribunal upheld the AER’s decision (2012-13).
- **Services contract buyout:** Rajat advised the Australian Energy Regulator on the appropriate regulatory treatment of the costs incurred by APT Petroleum Pipelines Ltd in the buyout of a contract for services from Agility. Our advice was cited by the AER in its Final Decision (2012).
- **Multinet forecasting efficient operating expenditure:** Rajat helped prepare a report for Multinet Gas in Victoria challenging the AER’s approach to forecasting the distributor’s level of efficient operational expenditure in the

2013-17 arrangement period. Our report was submitted as part of the distributor's response to the AER's Draft Decision (2012).

- ***WA gas access arrangement revisions:*** Rajat provided economic advice to the Western Australian Economic Regulation Authority on revisions to the Access Arrangements of the Goldfields Gas Pipeline and the Mid-West and South-West Gas Distribution Systems (2009-2011).
- ***VENCorp real options application:*** With SFG Consulting, Rajat advised VENCorp on the application of a real options analysis framework to the acquisition of easements for potential future gas pipelines (2007-2009).

Wholesale electricity market design and reform implementation

- ***Market power monitoring framework:*** Rajat recently drafted a report for the AER that explores and recommends a framework for the AER to undertake its new market monitoring functions under the National Electricity Law. These functions require the AER to assess whether the wholesale electricity market is 'effectively competitive' and whether there are any features of the market that may be detrimental to either effective competition or the efficient functioning of the market (2017).
- ***Market power mitigation mechanisms:*** Rajat was part of the Frontier Economics team advising the Singapore Energy Market Authority on its review of the vesting contract regime and alternative mechanisms for managing market power in the Singapore wholesale electricity market (2015- 16).
- ***Participant fees:*** Rajat prepared a report for Queensland generator, CS Energy, in response to AEMO's proposed approach to (i) allocating AEMO's operating budget between participant classes and (ii) setting its fee structure. Our report applied the principles in the National Electricity Rules to develop a more robust and economically efficient cost allocation and fee structure. Our report was attached to CS Energy's submission to AEMO's consultation process (2016).
- ***Response to rebidding Rule change:*** Rajat prepared a report for CS Energy, responding to the AEMC's second draft Rule determination on the rebidding Rule change. Our report critiqued the AEMC's analysis, including its estimates of 'economic harm' from 'deliberate late rebidding' by generators. Our report also highlighted a range of flaws with the AEMC's proposed Rule change. The report was submitted by CS Energy to the AEMC as part of the consultation process on the second draft Rule determination (2015).
- ***Barriers to exit:*** Rajat contributed to a report for the AEMC on generator barriers to exit. The report discussed what factors could drive generators of different technologies to partly or fully exit the NEM (2015).

- ***Financial Market Resilience:*** Rajat prepared a report for the AEMC assessing potential options for preserving the financial resilience of the NEM in the event of a large retailer failure. His analysis included examining different scenarios of large retailer failure to project the implications for AEMO and distribution network credit support. He also put forward a new option of delayed settlement for addressing financial contagion risks. Frontier's report was used by the AEMC to assist in the preparation of its second interim draft report (2014-15).
- ***Optional Firm Access:*** Rajat was involved in preparing a series of reports for a group of NEM participants on the issues raised by the AEMC's Optional Firm Access (OFA) proposal, as described in the AEMC's First Interim report on OFA design and testing. Rajat's role focussed on examining the qualitative arguments in favour of OFA, in particular the robustness of the purported generation-transmission investment coordination benefits. Rajat also examined some of the access pricing results tabled in the First Interim Report (2014-15).
- ***Capacity mechanisms:*** Rajat prepared a report for the AEMC on the role of electricity market design in facilitating efficient generator entry and exit in the NEM and other electricity markets (2014).
- ***New Zealand single buyer model:*** Rajat drafted a report for Meridian Energy on the opposition Labour and Greens parties' proposal to abolish the New Zealand wholesale electricity market and replace it with a single buyer known as 'NZ Power' (2013).
- ***CarbonNet Project:*** Rajat advised the Victorian Department of Primary Industries on the implications of the proposed CarbonNet carbon capture & storage project on participant incentives and price outcomes for the Australian National Electricity Market (2012-13).
- ***Transmission Frameworks Review – Optional Firm Access:*** Rajat advised the National Generators' Forum on the economic impacts of the proposal for Optional Firm Access contained in the AEMC's Second Interim Report for its Transmission Frameworks Review. Rajat's response was attached to the NGF's submission and he subsequently met with the AEMC to explain the points highlighted in the report (2012).
- ***Transmission Framework Review options critique:*** Rajat prepared a paper that formed the basis of a submission from the National Generators' Group to the AEMC's First Interim Report for its Transmission Frameworks Review. Rajat's response highlighted the shortcomings of the AEMC's proposed five options for congestion management (2012).
- ***Tasmanian electricity reform:*** Rajat was part of the Frontier team advising the Tasmanian Electricity Supply Industry Expert Panel (the Panel) on its investigation into the current position and future development of Tasmania's electricity industry. There were two key aspects to Frontier's advice:

- An assessment of the effectiveness of the wholesale electricity sector. Frontier examined historic outcomes in the wholesale sector, and undertook market modelling, to assess the extent of market power in the Tasmanian wholesale electricity sector. Frontier found that there was no evidence of sustained market power being exercised in the wholesale sector even though there is significant potential for sustained market power to be exercised.
- Advice on structural, regulatory and governance options to reform Tasmania's electricity industry, and analysis of anticipated changes in the performance of the market. Among other things, Frontier found that disaggregating bidding control of generation assets in Tasmania would diminish the potential for sustained market power to be exercised

Rajat's role included assistance in drafting the Panel's report to the Tasmanian Government (2011-12).

- **Generator market power:** Rajat drafted a report for the National Generators Group responding to questions and issues raised in the AEMC's Consultation Paper on generator market power in the National Electricity Market (2011).
- **Increasing the MPC and CPT:** Rajat was the primary author of a report for the AEMC discussing the non-reliability implications of increasing the Market Price Cap and Cumulative Price Threshold in the NEM. This included the implications for generator investment, wholesale prices, financial contracting, incentives to exercise market power, demand-side response and prudential requirements – available [here](#) (2010).
- **Victorian system force majeure dispute:** Rajat advised TRUenergy on the economic interpretation of the system force majeure provisions in the Victorian Gas Market and System Operation Rules in relation to a dispute with VENCorp before the gas industry Dispute Resolution Panel. This advice included quantification of the impact of a gas interruption on the Victorian gas market. Rajat also acted as an expert witness for TRUenergy before the Panel. The Panel decided in favour of VENCorp. (2009)
- **WA Wholesale Market Review:** Rajat advised the Economic Regulation Authority on the preparation of their second and third reports to the Minister on the effectiveness of the Wholesale Electricity Market in Western Australia. (2008 – 2009).
- **AEMC generator nodal pricing:** Rajat drafted a paper reviewing the theory and practice of generator nodal pricing for the AEMC as part of the Congestion Management Review (2008).
- **AEMC Congestion Management Review:** Rajat was an advisor to the AEMC on approaches to congestion management in the NEM pursuant to a review reference from the MCE. Rajat's role included coordinating Frontier's

market and risk modelling contributions to the CMR and assisting with the drafting of various AEMC publications (2006-08).

- ***Generator Impacts of Climate Change Policies:*** Rajat was the primary author of a report for the AEMC assessing the impacts of the CPRS and the enhanced RET on generator bidding, contracting and investment decisions in the NEM for the AEMC (2008).
- ***Western Australian and Northern Territory impacts of climate change policies:*** Rajat drafted a report for the AEMC on the potential implications of the CPRS and RET for the Western Australian and Northern Territory energy markets (2008).
- ***ETS auction design:*** Rajat advised the National Generators Forum (NGF) on the Federal Government Green Paper's proposed CPRS auction design, with Frontier's report forming an attachment to the NGF's submission (2008).
- ***Snowy region boundary change proposals:*** Rajat advised the AEMC on the three proposals put forward by participations for redrawing the Snowy regional boundaries in the NEM. Rajat coordinated Frontier's modelling for the assessment of all three proposals, drafted the AEMC's modelling appendix and provided drafting assistance for the AEMC's determinations (2007).
- ***Singapore EMA and EDB embedded generation:*** Prepared a report jointly for the Singapore Energy Market Authority (EMA) and the Economic Development Board (EDB) with the assistance of engineers SKM, assessing the efficiency of the existing regulatory arrangements for embedded generation in the Singapore National Electricity Market and recommending potential improvements (2005-06).
- ***Victorian coal royalty increase:*** Preparation of a paper for Loy Yang Marketing Management Company discussing the likely ability of Victorian brown coal generators to 'pass through' an increase in the coal royalty to customers via spot or wholesale prices (2005).
- ***Victorian energy cross-ownership laws:*** Developing a submission on the review of Victorian energy cross ownership laws for the Energy Users Association of Australia (2005).
- ***Reliability Panel guidelines for NEMMCO intervention:*** Drafted a report for the AEMC assessing and refining the Reliability Panel's proposed guidelines for NEMMCO's reserve contracting powers (2005).
- ***Remuneration for system restart services:*** Development of a submission for Macquarie Generation on the appropriate remuneration for system restart services in the NEM (2005).
- ***Singapore EMA embedded generation:*** Drafted a report for the Singapore EMA on the appropriate regulatory treatment of *existing* embedded generators

in the Singapore National Electricity Market. The recommendations of the report were implemented by the EMA (2005).

- ***‘Snowy’ trial of CSP/CSC arrangements:*** Contributor to a submission from Macquarie Generation to the ACCC on the merits of introducing constraint support pricing (CSP) and constraint support contracts (CSC) arrangements within the Snowy region of the NEM (2004).
- ***NETA:*** Paper for the Japanese Central Research Institute of the Electric Power Industry (CRIEPI) describing the origin and workings of the England and Wales New Electricity Trading Arrangements. The paper also examined recent regulatory developments and price outcomes, as well as recent transactions in the UK power sector (2003).
- ***NSW MIG and MEU:*** Rajat was a key member of the Frontier team advising the New South Wales Market Implementation Group and Ministry of Energy and Utilities of a range of electricity market, regulation and governance issues (1999-2003).
- ***Market fees:*** Co-authored a report to the National Retailers Forum on the appropriate structure of market fees in the NEM (1998).
- ***Queensland electricity reform:*** Part of the team advising the Queensland Electricity Reform Unit in relation to issues arising in the Queensland Interim Market (1998).

Retail electricity market reform and implementation

- ***AEMC Review of NEM Financial Resilience:*** Rajat advised the AEMC on the assessment of potential options for limiting the risk of ‘financial contagion’ in the NEM as a result of the failure of a large electricity retailer. Rajat’s analysis builds on and extends the AEMC’s work in its First Interim Report for the Financial Resilience Review (2014).
- ***Distributor credit support:*** Rajat was part of the Frontier team that undertook, on behalf of AGL, Origin Energy and Energy Australia, a critical review of the current distribution network service provider (DNSP) credit support scheme operating in the NEM, and provided recommendations on possible improvements (2013-14).
- ***ERAA costs of interval metering:*** Critical review of retailers’ costs of accommodating interval meter roll out across Australian and international jurisdictions (2006-07).
- ***Ofgem:*** Part of a team working for the England and Wales gas and electricity markets regulator examining certain developments in the retail electricity market (2003).

- ***Full retail competition in NSW:*** Key member of the team implementing FRC in electricity in New South Wales and undertaking a range of assignments, including:
 - Development of the small customer protection framework – including the original Marketing Code of Conduct and default customer connection contracts
 - Default rules for interaction between retailers and monopoly distribution network businesses
 - Default rules for metering
 - Drafting submissions to the ACCC supporting a National Electricity Code derogation to allow customers to switch retailer without needing to install an interval meter
 - Retailer of last resort provisions (2000-2003).

Competition analysis

- ***AGL proposed acquisition of Macquarie Generation:*** Rajat was part of the Frontier Economics team advising AGL's lawyers, Ashurst, on competition issues raised in the proposed acquisition of Macquarie Generation. AGL were successful in the Australian Competition Tribunal (2014).
- ***ACCC vertical integration:*** Rajat drafted a paper for the ACCC on the competition and efficiency implications of vertical mergers in electricity, with specific reference to the acquisition of TXU Australia (a retailer, distributor and generator in the NEM) by Singapore Power (the owners of Victoria's transmission network) (2004).

CAREER

1999 to present	Consultant, Frontier Economics
1998 to 1999	Consultant, London Economics
1997 to 1998	Articled clerk, then solicitor, Freehills, Hollingdale & Page

EDUCATION

1990 – 1995	LLB (honours), University of Melbourne
1990 – 1993	B.Com (first class honours), University of Melbourne

Rajat maintains an Australian legal practising certificate and is a Barrister and Solicitor of the Supreme Court of Victoria.

PUBLICATIONS

“Implications of AGL v ACCC – Market Power and Competition in the National Electricity Market” (2004) 32 *Australian Business Law Review* 375.

“Evolution of Australia’s National Electricity Market”, Chapter 19 in *Evolution of Global Electricity Markets, New paradigms, new challenges, new approaches*, Edited by Fereidoon P. Sioshansi (2013) Elsevier Inc., with Alan Moran

“Decentralized Generation in Australia’s National Electricity Market? No Problem”, Chapter 19 in *Distributed Generation and Its Implications for the Utility Industry*, Edited by Fereidoon P. Sioshansi (2014) Elsevier Inc., with Liam Blanckenberg

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