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Submission on the South Australian Government's Proposed Regulatory Changes for Smarter Homes

Introduction

1. This is Vector Limited's (Vector) submission on the South Australian Government's proposed *Regulatory Changes for Smarter Homes*, released by the Department for Energy and Mining (DEM) in June 2020. This submission responds to four of the five proposals that form part of the consultation package, which include the following:

    a. *Consultation on the proposed remote disconnection and reconnection requirements for distributed solar generating plants in South Australia*;

    b. *Consultation on the proposed export limit requirements for distributed solar generating systems in South Australia*;

    c. *Consultation on the proposed smart meter minimum technical standards in South Australia*; and

    d. *Consultation on proposed tariffs to incentivise energy use in low demand periods in South Australia*.

2. Vector welcomes the South Australian Government's recognition of the enabling role of smart (advanced) meters in the transition to smarter homes in the state. We consider it critically important that the deployment of smart meters be accelerated rather than delayed because this underpins multiple reforms that will facilitate this transition.

3. We are providing confidential and public versions of this submission. The confidential version contains commercially sensitive information and must not be published. We are happy for DEM to publish the public version in its entirety.

4. Vector's contact person for this submission is:

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Vector Metering

5. Vector's Australian and New Zealand advanced metering business – Vector Metering – is an accredited Metering Provider and Metering Data Provider, and a registered Metering Coordinator, in the National Electricity Market (NEM) and the equivalent in New Zealand. Vector Metering provides a cost-effective end-to-end suite of energy metering and control services to energy retailers, distributors and consumers, including in South Australia.

6. Vector is one of New Zealand's largest listed companies and provides energy and technology services across the country, with a vision of *creating a new energy future*. We are the largest provider of electricity and gas distribution network services in New Zealand, and the country's leading provider of smart metering solutions. We also provide fibre network services, solar PV, energy storage, home energy management solutions, and electric vehicle recharging services.

7. As a leading technology solutions company, Vector continues to explore the practical applications of new and relatively untested technologies to deliver improved services to energy consumers. We believe this can be done more efficiently and effectively where the process of adopting new technologies and advanced technical standards is not stifled by highly prescriptive regulations.

8. We believe that any new requirements relating to new technologies should provide the right incentives to accelerate their introduction and enhance, rather than diminish, incentives for innovation and investment. The rapid evolution of energy technologies and markets makes it important for new technologies to be tested or installed to meet the changing requirements of the industry and consumers, rather than stifled through prescriptive regulations. In dynamic markets, the uptake of and transition to new technologies are driven by consumer choice, rather than by prescription.

The limits of mandating technical standards or functionalities

9. In Vector's view, the proposals in this consultation introduce more prescriptive arrangements that would impose additional costs (at least) on Metering Coordinators and Metering Providers. These additional costs will flow back to retailers (who appoint Metering Coordinators) and are ultimately passed on to South Australian energy consumers.

10. We believe that mandating technical standards or functionalities in regulations (or other regulatory instruments) imposes the following limits and costs:

    a. Market competition is limited by locking out existing and potential market participants who are not currently using the required standards or who believe that better standards/ approaches are available or could become available. This effectively becomes a barrier to market entry, stifling market competition and innovation.

    b. Where barriers to entry are created, consumers will not benefit from lower cost service provision or the choice of better services that meet their specific needs.

    c. Mandated technical standards do not provide strong incentives for market participants to rapidly introduce new technologies that enable the delivery of innovative services to consumers. It makes service providers regulator/regulation-focused instead of becoming effective competitors and innovators that strive to meet rising consumer expectations.

    d. Mandating specific technical standards before they are used (or widely used) creates the risk of 'gold-plating' services. This generates unnecessary costs for consumers who do not want or need some of the mandated functionalities.

e. In the near future, new functionalities may not be able to be delivered using today's technology. It would not benefit consumers if market participants do not have ample flexibility to upgrade or alter technical specifications in a timely manner. This could lead to outcomes where the delivery of services is not keeping pace with technological changes or what consumers value.

f. Mandating technical standards is likely to increase the regulatory burden, which increases costs for consumers. Introducing prescriptive technical standards in response to shorter technology life cycles requires substantial resources and takes time (usually years). In addition, the role of regulators in monitoring compliance with any new requirements and addressing industry disputes, some of which could have previously been resolved through contractual means, is expected to expand.

11. As one of the largest non-network metering providers in the NEM, we are currently experiencing growing hesitation by retailers to deploy smart meters due to their inability to recover increasing costs. For example, recent retailer Default Market Offer pricing approved by the Australian Energy Regulator has, in our opinion, failed to recognise the shifts in the market and does not reflect the true cost of smart metering for retailers. If cost recovery is not addressed, retailers will be further disinclined to promote smart meters to customers and this will, in turn, compromise the transition to smarter homes and erode the benefits that the South Australian Government is attempting to realise. Vector suggests that DEM identify any additional costs associated with proposed changes that will proceed and determine how these costs can be allocated fairly and efficiently amongst the relevant parties.

12. We suggest that DEM consider more flexible approaches that would minimise, if not avoid, the above limitations without compromising network security and reliability. We note that the *Power of Choice* reforms in the NEM refrained from imposing minimum technical standards and instead set out "minimum service specifications", focusing on outputs rather than inputs. This is intended to avoid stifling innovation and ensure that consumers across jurisdictions experience similar levels of service when they switch to smart meters. Metering service providers have now well exceeded the minimum service specifications where these have been applied.

13. More flexible approaches can be encouraged, for example, by adopting common design principles or protocols, rather than technical specifications, so existing service providers and new entrants benefit from interoperability and efficiency gains without stifling innovation.

14. Greater flexibility can also be promoted through more demand response in the wholesale market or to support better network management. Demand response is enabled by new and innovative tariffs which require more accurate and real-time data generated by smart meters. This makes the accelerated uptake of smart meters a critical component in optimising the value from demand response.

15. DEM can help facilitate more demand response by promoting the switch to smart meters and removing emerging barriers to their deployment. We identify these emerging barriers below as part of our response to the consultation on proposed tariffs to incentivise energy use in low demand periods.

Consultation on the proposed remote disconnection and reconnection requirements for distributed solar generating plants in South Australia

16. The consultation paper seeks feedback on current technologies that can enable solar generating plants to meet the proposed remote disconnection and reconnection requirements. It is our view that utilising smart meters will represent the most cost-effective method to meet these requirements. We can confirm that the smart meters Vector Metering

currently deploys in South Australia can, in most scenarios, be configured in such a manner to remotely connect and disconnect a customer's solar system on request. We provide more information on the capabilities of our smart meters below.

17. Control of a solar inverter at the premise can be achieved today through a smart meter or other methods. However, it is important to recognise that while today's technologies can deliver the proposed requirements, there is no established framework in which a Registered Agent (a new role proposed in this consultation) can efficiently request a solar system to be switched on or off**,** regardless of the technology used.

18. The ability to remotely connect or disconnect a solar system will usually be managed by a single party. In the case of smart meters, this party is the Metering Provider. Under the proposed regulation, where switching of solar inverters is required, the Metering Provider will need to receive instructions from the Registered Agent and will issue commands to the individual meters. It is most efficient that formal processes are established to support such a request. IT systems will need to be built to receive requests, validate requests or reject those in error, and pass these requests onto the meter management system which will give instructions to the meter to perform the requested action. For these processes to function efficiently, a system would need to be developed so that all Metering Providers can receive the instructions from all Registered Agents and all Registered Agents can send the instructions to all Metering Providers. It is also reasonable to expect the functioning of this system to be geographically based, i.e. solar systems would be switched off in areas that are experiencing grid constraints while other customers remain unaffected, in which case locations of solar systems will need to be mapped against network infrastructure.

19. The mapping of solar systems against the network implies that the distribution network service provider (DNSP) would need to be involved in this process, being the only party that understands where customer connections are located on their network. It is unclear whether this necessary interaction with the network has been considered in this consultation.

20. The processes and systems described above do not exist today and will require funding and time to be established.

21. As mentioned above, it is proposed in the consultation paper that all solar customers will have a Registered Agent, who will be authorised to request for a customer's solar system to be switched on or off. During sessions with stakeholders on this consultation, DEM indicated that Metering Coordinators may be able to fulfil this role. It should be recognised that Metering Coordinators (or Metering Providers) currently do not typically have any commercial arrangements with the customer at the premise. Should a Metering Coordinator wish to perform this role, significant investment in systems and processes are likely to be required. In our view, the costs to a Metering Coordinator of providing this service (i.e. costs associated with compliance, potential liabilities, and system and process changes to make this role viable) are unlikely to be outweighed by any benefits/returns to the Metering Coordinator. Should metering be part of the solution, we consider the retailer or DNSP to be best placed to assume and manage the risks associated with the Registered Agent role.

22. As further mentioned above, the smart meters Vector Metering currently deploys can meet the proposed requirements in most cases. However, we do not consider that the necessary processes and systems can be established by the proposed September 2020 commencement date (less than three months away). We estimate that it would take 12 to 18 months for a basic solar service to be supported using a smart meter and communicating via the Metering Provider, depending on the complexity of market participant interactions. It also depends on how quickly the Registered Agents can establish commercial structures to pay the service charges for remote disconnections and reconnections.

23. In Vector Metering's view, establishing a technical obligation for the proposed export limit requirements for distributed solar systems needs further investigation. This is regardless of how dynamically limiting net generation into the grid is to be achieved. Rushing into specifying new technical obligations without further consideration creates the following risks (which are then discussed further below):

    a. It impacts the deployment of solar systems in South Australia because solar installers cannot currently comply with the intent of the new obligations. Worse still, it encourages the establishment of sites that meet the 'letter' of a technical obligation but cannot deliver the required outcomes.

    b. It creates a blunt instrument that negatively impacts the customer more than necessary, i.e. it limits a customer's solar generation when it is not contributing to system security issues.

24. The objective is to have the capability of dynamically limiting solar generation flows into the grid during times of network instability. To reduce solar generation, control of the customer's solar inverter is required. A key limitation is that the solar system is not aware of the amount of energy that is flowing into the network and therefore must have the information/signal when it is needed to reduce generation.

25. Before an inverter can limit generation, it needs to be determined how much it should be limited by. This requires feedback on how much energy is being exported into the grid – information that is only available from the meter. Limiting solar output without understanding the flow of energy into the grid risks reducing a customer's solar system generation that is not contributing to network issues. This would:

    a. result in unnecessary impacts on the customer who is not exporting excess generation; and

    b. not meet the objective of reducing generation on the network.

26. To achieve the desired objective of dynamically limiting solar generation, feedback from the smart meter is required to inform the solar system when to reduce output and by how much.

27. While simple in concept, establishing the required interaction between the smart meter and the solar system is complex and dependent on the capabilities of both devices. We discuss below two methods that could be used to satisfy the above objective and the issues that need to be resolved to make each method viable.

    a. <u>Direct communication between the smart meter and the inverter</u>

       When dynamic signalling is required, the signal to the inverter to limit generation could come from the smart meter. A message could be received by the smart meter from the Metering Provider and relayed to the inverter, requesting it to limit generation. Alternatively, the inverter could receive continuous feed from the smart meter and the inverter could then make decisions about generation levels.

       For direct communications with the smart meter to work, the obvious issues that would need to be addressed include:

       1) Transporting the message (method of communication) - Inverters will need to support a wired connection to accept signals from the smart meter. This would require co-location of the smart meter and the inverter which is not always the

case. Where location is an issue, further costs would need to be borne by the customer for this to be resolved.

2) Adopting communication protocols (form of message) - Some inverters support external inputs via simple pulse signals which Vector Metering's smart meters also support (with additional programming). These signals may not be adequate to meet the proposed requirements.

Until communication protocols are agreed between inverter and meter manufacturers, direct communication between a solar inverter and a smart meter could be some way off.

b. Indirect communication between the smart meter and the inverter

In this model, the Metering Provider makes available to the manager of the inverter a data stream of information (current or historic) about the generation at the meter. This information could then be used to trigger a signal to the inverter to limit generation. It is up to the manager of the inverter to use a mechanism it sees fit for communicating with the inverter. It could be direct communication via a telecommunications network, via the customer's internet, or via the smart meter where one is installed. Communication protocols would again be required to allow Metering Providers and inverter managers to interact efficiently. However, these would be limited to business-to-business communications and would not involve equipment manufacturers. Timely agreement between these parties would appear to be more achievable than between inverter and meter manufacturers.

Consultation on the proposed smart meter minimum technical standards in South Australia

28. In Vector's view, the development of regulations for smart meters should focus on the desired outcomes rather than specifying the technical nature of the meter. This approach is consistent with the *Power of Choice* reforms which set minimum service specifications rather than technical standards/specifications. For example, regulations could require that:

    a. any metering for a solar installation must be established to allow the separate measurement of the solar system; and

    b. independent on/off switching is controlled by the smart meter.

29. Metering Coordinators, retailers and customers could then determine the most effective way of achieving the desired outcomes. For a simple installation, this may be to install a two element meter. For a site that is more complex and has load controlled hot water system, a single three element meter might suffice (not currently provided by Vector Metering); alternatively, a two meter solution could be used to meet the requirements. Specifying the technical solution rather that the required outcomes will reduce or remove incentives for service providers to innovate and drive down costs.

Mandatory second element

30. It is proposed in the consultation paper that all meters installed from the commencement date must contain a second element regardless of the presence of local generation. This is intended to 'future proof' the installation should the customer decide to install a solar system at a future date.

31. The above approach seems to be based on the following assumptions:

a. That the meter installed initially remains fit for purpose when the customer reconfigures the premise to add a solar system – This may or may not be the case. If the customer decides to take advantage of load control tariffs and elects to put hot water on load control at the same time as adding solar, then the meter that was initially installed will no longer be fit for purpose. Vector Metering's analysis shows that approximately 1/3 of sites with solar also have load control.

b. That the solar system can simply be plugged into the meter without any interaction with the Metering Provider – This is not the case. The solar installer is not permitted to remove the meter cover and connect new circuits. To allow the addition of a solar system to be 'pluggable', additional infrastructure will need to be installed. Vector Metering has concerns that any changes to metering arrangements without its involvement may put its compliance with Metering Coordinator and Metering Provider obligations at risk.

c. That overall upfront costs of installing a two element meter at every site in South Australia will be lower than the costs of a second visit by the Metering Provider to targeted sites when local generation is added – A key metric in this space will be the future growth of solar systems in South Australia. The state reportedly has the highest penetration of solar systems in the world, and that the grid is nearing capacity to handle more solar connections. In this context, it is not unreasonable to assume that future growth of new solar installations in South Australia could be constrained.

32. Should the assumption that deploying a second element meter upfront in anticipation of local generation being installed sometime in the future not eventuate, South Australian consumers will be burdened with ongoing costs for infrastructure that will remain unused.

Solar data from the second element

33. While it is proposed that smart meters installed from the commencement date must contain a second element, it is unclear which party is the recipient of the data from this element or why this data will be collected. Existing wholesale settlement, retailer billing and network billing processes only require consumption and net solar generation data. This data is already available from the existing elements of the meter. While retail products that require 'gross' solar data do exist, they currently only apply to a few special sites across the NEM, and data delivery arrangements have already been directly established between Metering Coordinators and retailers.

34. Vector Metering questions why mandatory gross measurement of the solar generation for all sites is required, noting that provision of this data comes at a cost. We recommend that before additional measurement elements are mandated, clear use cases for these elements should be identified. Otherwise, South Australian consumers will be burdened with ongoing costs that will not provide any tangible benefit.

Communication with the electrical industry

35. Should the above proposal proceed, it is likely that changes to wiring rules will be required and must be communicated to registered electrical contractors (RECs) and solar installers working on behalf of customers. If these changes are not adequately communicated, deployment of smart meters will be disrupted when metering technicians attending the site find that wiring is not in place to support the new metering requirements.

36. Vector Metering recommends that a comprehensive communication programme be run to ensure the electrical industry is aware of any rule changes before they come into effect. This is likely to impact parties' ability to meet the timelines proposed in the consultation paper.

Key metrics on impacted sites

37. Vector Metering commenced the installation of smart meters in South Australia in early 2018. Table 1 below shows a breakdown of sites with and without load control and solar systems.

38. We note that DEM has indicated that the current penetration of solar systems in South Australia is approximately 20%.

[*This section contains commercially sensitive information and is redacted in the public version of this submission.*]

39. It is important to recognise that the above alternative solutions will come with different one-off and ongoing costs for the customer and cannot always be achieved due to practical constraints.

Estimate of costs to support the proposed two element minimum specification

40. There are potentially additional one-off and ongoing costs associated with a technical specification that specifies a two element meter with switchable solar as a minimum requirement.

[*This section contains commercially sensitive information and is redacted in the public version of this submission.*]

Facilitating the transition to smart metering in South Australia

41. Vector Metering strongly supports the acceleration of the deployment of smart meters in South Australia, which in turn, facilitates the transition to smarter homes in the state. As illustrated above, we believe it would be in consumers' best interest that the process of adopting smart meters is not stifled by highly prescriptive regulations that could impose unnecessary costs on consumers and disincentivise innovative solutions.

42. We suggest that DEM consider the outcomes of the upcoming *Metering Market Review* in the NEM before adopting a prescriptive approach for smart metering in South Australia. We understand the terms of reference for this review will be released by the relevant national energy regulators in Q3 2020, and the review proper will commence in Q4 2020. Greater alignment between South Australia's metering approach with the NEM's metering framework would be consistent with good regulatory practice, reducing compliance and other costs for parties operating nationally and for their customers, including in South Australia.

Consultation on proposed tariffs to incentivise energy use in low demand periods in South Australia

43. More accurate and timely consumption information generated by smart meters enable service providers to offer multiple pricing plans to their customers – one of the most

significant consumer benefits of smart meters. New and innovative tariffs enable consumers to make clearer choices about how and when they use electricity through demand shifting, changing consumption patterns, or generating their own electricity.

44. The ability for retailers in South Australia to have a standing offer that includes a tariff structure that incentivises the use of electricity during low demand periods - as proposed in this consultation - will be enabled by smart meters. However, the value of any demand response mechanism can only be optimised where there is widespread uptake of smart meters. In our view, this can best be achieved by large-scale, retailer-led deployments of smart meters in a timely manner and in a competitive metering market, as envisaged by the *Power of Choice* reforms.

45. Accelerating the deployment of smart meters will have the 'cascading effect' of more and more consumers getting exposed to market offers (rather than sticking with their retailer's standing offer), giving them greater choice and control over their energy use and generation. This also allows more consumers to participate in demand response programmes that benefit them while supporting network security and reliability. More accurate and real-time data generated by an increasing number of smart meters improves the quality of data analytics that support various and more sophisticated forms of demand response.

46. However, Vector Metering is concerned with the emergence of barriers to the accelerated deployment of smart meters, including in South Australia. These include, among others:

    a. lower forecast meter installations driven by lower releases of failed meter families by DNSPs;

    b. the setting of retailer Default Market Offers not reflecting more realistic costs of smart metering, and

    c. the sharp economic downturn due to COVID-19, resulting in significant reductions in the volumes of metering installations, increasing per unit cost.

47. We describe these emerging barriers in our submission, dated 20 June 2020, on the Federal Government's *Technology Investment Roadmap – Discussion paper*, where we also proffer some solutions. The web link to the submission is provided below.

    http://vectorams.com.au/documents/597574/1813953/Vector+Submission+Technology+Investment+%0bRoadmap+Discussion+Paper/9248abca-8f0d-401f-aa93-d61915059c56

48. The criticality of smart meters in enabling more demand response mechanisms in South Australia cannot be overstated. Incentives for the accelerated deployment of smart meters should therefore be strengthened rather than weakened by the above emerging barriers. We encourage the South Australian Government to consider how these barriers may be overcome in the state so the value from demand response can be accessed and optimised, and the transition to smarter homes can be achieved in a timely manner.

Concluding comments

49. To recap, we suggest or recommend that DEM:

    a. consider less prescriptive approaches that do not involve embedding technical standards or specifications into regulations, to avoid the limitations of such approaches identified in this submission;

    b. focus the development of any regulations involving new technologies on desired outcomes rather than on technical specifications so service providers can focus on innovative solutions that benefit consumers rather than on regulatory compliance;

c. identify clear use cases for additional measurement elements before these are mandated; otherwise, South Australian consumers will be burdened with ongoing costs that do not provide any tangible benefit;

d. run a comprehensive communication programme to ensure that RECs and solar installers are aware of any rule changes before they come into effect;

e. identify any additional costs associated with proposed changes that will proceed and determine how these costs can be allocated in a fair and efficient manner;

f. consider the outcomes of the upcoming *Metering Market Review* in the NEM before adopting a prescriptive approach for smart metering in South Australia; and

g. consider how emerging barriers to the accelerated deployment of smart meters may be overcome so the value of implementing demand response mechanisms can be accessed and optimised, and the transition to smarter homes can be achieved in a timely manner in South Australia.

50. We are happy to provide further information to support our submission or discuss any aspects of it with DEM officials.

Yours sincerely

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