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AEMC Issues Paper - Energy Market Arrangements for Electric Vehicles and Natural Gas Vehicles - Project reference code: EMO0022

Dear Mr Pierce

Ausgrid appreciates the opportunity to comment on the AEMC Issues Paper Energy Market Arrangements for Electric and Natural Gas Vehicles. As stated in our Submission to the Approach paper, Ausgrid supports the development and adoption of Electric Vehicles (EVs) and is actively monitoring progress to assess their likely impacts on electricity networks, particularly for peak demand and the development of Smart Grids.

After reviewing the Issues paper, we still maintain that action to alter market arrangements to manage peak demand from electric vehicles is not required at this point in time. Electric vehicle developments need to be watched closely but there still remains substantial inherent uncertainty about the future uptake and energy market impacts of EVs. Unless a major technology breakthrough or government incentive appears, we expect that adoption of EVs will be slow enough to allow networks sufficient time to plan and cope with this uncertainty in the near term.

This view is consistent with the findings in AECOM's "Impact of electric vehicles and natural gas vehicles on the energy markets" Draft Initial Advice, commissioned by the AEMC that:

as this is a new market, there is not a lot of information on past experience from which to draw meaningful assumptions about the future of EVs in Australia.

and

In the central take up scenario, unmanaged charging of EVs starts to have a significant impact on peak demand around 2020. This should allow sufficient time for the electricity market to plan and manage the additional increase in peak load that may be required.

We anticipate that existing energy market arrangements can cope with the charging of EV for the immediate future, as they have historically done with large loads like hot water systems. If

trickle charging at household and workplaces is the dominant form of EV charging, as assumed in the AECOM modelling, then special metering and settlement arrangements will not be required. The bulk of electricity vehicle charging costs would be incorporated in residential customer's household electricity bills and/or employee's arrangements with employers. Furthermore, if the majority of EVs sold to 2030 are Plug-in Hybrid Vehicles (PHEV), as assumed in the AECOM modelling, it is unnecessary to change market arrangements to deal with charging and billing away for home or work as the majority of EVs can operate without charging from the grid if needed.

Ausgrid believes that separate metering and control of EV charging is not prevented or inhibited by current electricity market regulatory arrangements and that it is highly desirable that this should continue in the future. However, incentives for controlled charging of EV are best addressed through an overall market framework that supports demand side participation, Smart Grid development and covers multiple appliances rather than appliance specific policies to accommodate EVs. The business models of electric vehicle service providers should be designed to fit with an efficient overall electricity market regulatory framework, rather than the regulatory framework being designed to fit with the particular business models of electric vehicle service providers.

A range of EV uptake forecasts are available but all have limitations due to the unavoidable uncertainty about the market being modelled. We believe that AECOM's EV uptake scenarios appear optimistic and are best viewed as a way of pressure testing likely scenarios rather than forecasting outcomes. Nevertheless, we agree with their overall finding that:

It is unlikely that the take up of EVs will have a significant impact on the reliability of the electricity market, at either the generation or network level, for the following reasons:

- *Take up is likely to be gradual with enough lead time for the market to respond;*
- *Energy consumption and increases in peak demand due to EVs are relatively small when compared with expected growth without EVs; and*
- *The electricity markets and regulation should continue to work effectively and provide the right incentives for the generation and network businesses to respond to the take up of EVs.*

The inherent uncertainty of outcomes is demonstrated in AECOM's estimated cost in 2030 for upgrading capacity to accommodate EVs within the NEM. This varies from \$40 million, under a Low take-up scenario with smart charging, up to \$25 billion, under unmanaged charging in a High take-up scenario. This is a difference of over 600 times. AECOM comments in it advice that:

Analysis has been undertaken based on published data to provide an order of magnitude of the likely costs. This approach is reasonable for the purposes of this study but should not be used for any other purpose.

As there is not yet a widely agreed industry methodology for estimating the future cost of avoided capacity we would caution that the cost numbers provided are best viewed as a way of pressure testing likely scenarios rather than forecasting and quantifying outcomes. Rather than the values estimated, the important outcome of the modelling is that peak demand impacts and the cost of upgrading capacity are much lower in all scenarios if some means of managed charging is used.

On metering and settlement issues, as outlined in our submission to the Approach paper, we are concerned about applying the existing arrangements for embedded networks to EVs. There are disparate views in the industry about the adequacy and appropriateness of the current rules to determine responsibilities within embedded networks. Ausgrid considers there is an existing lack of clarity and ambiguity in relation to embedded network arrangements (particularly in relation to obligations for metering, registration, activation and maintenance of National Metering Identifiers and other related data). These issues stem from the fact that embedded networks are not expressly addressed in the rules and the existing rules do not adequately address issues such as responsibility for metering within privately owned embedded networks. Whilst some attempt has been made by AEMO to address these issues through its embedded network guideline (2009), that guideline was focussed on the requirements for settlement of customers within embedded networks but could not address physical metering issues without making assumptions about the responsible person which were not supported by the rules. These issues were raised more recently with the AER during its development of the Electricity Network Service Provider Exemption Guideline, December 2011). The AER recognised the complexity of the issue and essentially left the issue of who the responsible person is within an embedded network for participants to resolve.

For this reason Ausgrid would be concerned about extending the arrangements for a class of embedded network connections as it will perpetuate the confusion and ambiguity around market-related issues for embedded networks.

To address this Ausgrid considers it is essential that the National Electricity Rules (and not procedures or guidelines) address the following 2 critical issues:

1. The party responsible for metering within an embedded network, owned, operated and maintained by an embedded network operator that is not a registered network provider; and

2. The party(s) with the obligations in relation to registration and provision of data to support market settlements, including the registration, activation and maintenance of National Metering Identifiers (NMIs).

These issues need to be considered in a consistent manner for all loads (including EVs) as well as generators and not undertaken in a piecemeal way.

If EVs do become a significant part of the National Electricity Market in the medium to longer term it will be important that they are managed as part of a overall efficient national market framework which includes metering, settlement, Smart Grids and appropriate incentives for all energy uses. Settlement and metering arrangements will depend on the business models developed by service providers – as a general principle these should be developed to fit with efficient NEM arrangements rather than the NEM arrangement changed to suit EV service providers business models.

The impact of electric vehicles is one of the areas being explored as part of the Smart City Smart Grid program trials and we will continue to keep the AEMC informed of developments and outcomes from these trials.

Ausgrid looks forward to discussing these and other issues that emerge as part of this review. If you wish to discuss any aspect of this submission please do not hesitate to contact me or Mr Keith Yates, Executive Manager – Regulation and Pricing on 02 9269 4171.

Regards,



Peter Birk
Executive General Manager System Planning & Regulation

Attachments Responses to specific questions

AEMC Issues Paper - Energy Market Arrangements for Electric and Natural Gas Vehicles - Responses to specific questions

Question 1 Assessing the take up of EVs

Is the range of estimates provided by AECOM appropriate for assessing the potential impacts of EVs on the electricity market and developing our advice? Does the range of scenario estimates provide a credible view on the potential penetration of EVs?

We believe it is possible that AECOM's projections may prove optimistic and are best viewed as a way of pressure testing likely scenarios rather than forecasting outcomes.

Question 2 Cost of additional system peak demand

Are these estimates on the cost of additional peak demand provide the correct magnitude of the potential impacts of EVs? Are there any categories of costs not included in this discussion?

As there is not yet a widely agreed industry methodology for estimating the additional future cost of capacity we would caution that the cost numbers provided are best viewed as a way of pressure testing likely scenarios rather than forecasting outcomes. Rather than the values estimated, the important outcome of the modelling is that peak demand impacts and the cost of upgrading capacity are much lower in all scenarios with some form of managed charging.

Question 3 Costs imposed by EVs on electricity markets

Does this discussion capture all the potential costs impacts that EVs could impose on the electricity market?

Question 4 Benefits of EVs on the electricity market

Have we correctly identified the range of benefits of EVs on the electricity market? What are stakeholders view on the materiality of these benefits and the appropriate arrangements of capturing such benefits?

Question 5 Nature of service provided when an EV is charged

Does the EV charging service need to be prescribed as a sale of electricity? What are the implications for consumers and EV charging service business models if EV charging was not classified as a sale of electricity?

At present the business models under which EVs will operate are not established and therefore the costs and benefits of metering, managing and charging infrastructure (including within vehicles) remain unknown. EV charging service business models could be simplified if EV charging service did not need to be prescribed as a sale of electricity but this will depend on the nature of the business model developed.

Question 6 Should EVs be treated differently as against other loads

Should the treatment of EVs in the electricity market regulatory arrangements be different in respect of any or all of their potential uses?

Question 7 EV metering issues

Should EVs be treated as a standard appliance load or should they be separately metered from other load at the premises?

Could sub-metering and roaming NMI be an effective solution to the costs and time issues associated with a separate metering installation?

In the past separate metering was only needed where a separately metered tariff was required (e.g. Domestic and Off Peak tariff would have at least one meter each). For the immediate future there is no compelling reason to have electricity market regulatory arrangements treat EVs or EV charging services differently from other loads. While metering and control of EVs is desirable it can be accommodated within existing and emerging arrangements and in particular as part of, rather than separate from, the emergence of grid side and customer applications for Smart Grids.

At a type 5 or 6 metering installation, sub metering (Ausgrid has assumed that sub-metering in this context is a child metering installation in an embedded network, rather than a non-market private sub-meter) may provide a solution if a separate metering installation was required. However, the ownership, installation, reading, testing and ongoing maintenance would need to be adequately addressed, as this meter would not be the property or responsibility of the Local Network Service Provider (LNSP) (unless it was under a separate contractual arrangement, not as the Responsible Person for the main revenue meter). The LNSP is not the responsible person under the rules and has no responsibility to read the sub meter, consequently there are issues about how this sub meter would be read and the data subtracted off the revenue meter. There are also potential issues with aligning meter reading dates (where Type 4 and Type 5 metering installation exist in the embedded network) so that the data from all metering installations is available, so the MDP can prepare NEM settlement ready data and retail billing data and provide this within the market timeframes to AEMO and FRMPs.

Ausgrid has continually noted that the National Electricity Rules do not recognise embedded networks and therefore there is no basis upon which to determine the role of the Responsible Person for a child metering installation. In consultation with the AEMC and AEMO in the 2010 Provision of Metering Data Services and Clarification of Existing Metrology Requirements, the final determination stated that:

"EnergyAustralia stated that there are no clear provisions in the Rules on who should perform the role of the Responsible Person for child metering points within an embedded network and sought clarification. EnergyAustralia's view was that the Responsible Person for child metering points should be the same as for its parent metering point.

The Commission discussed this issue with EnergyAustralia and AEMO. In these discussions, it became apparent that this issue is sufficiently complex and would require further detailed consultation, which is not available in this Rule Change Request. The Commission considers that this issue is outside the scope of this Rule Change Request due to its complexity. The Commission notes that further consultation between AEMO and industry on this complex issue may lead to a future Rule Change Request.”¹

This response clearly shows that there is a gap in the NER with regard to Embedded Networks and the responsibility for child metering installations. Until this issue is resolved it is Ausgrid’s opinion that the LNSP is not the responsible person for any child metering installation under the NER obligations. Ausgrid may however, under other contractual arrangements provide these services, not as an LNSP but as a contractor to the Embedded Network Operator. It is inappropriate to extend the use of parent and child meters to EVs while there is a gap in the NER with regard to Embedded Networks and the responsibility for child meters. Both AEMO and the AER have to varying degrees sought to address this gap but cannot legitimately do so until the rules are clarified in terms of the responsible person for embedded networks.

For example, the rules do not support AEMO’s embedded network guideline. In clause 1.2 Key Assumptions dot point 6 “Metering requirements and responsibilities for downstream NMIs registered in MSATS are the same as for all other market NMIs under the Rules and the Metrology Procedure. Including if child meters are eligible to be manually read this will be the responsibility of the LNSP associated with the parent connection point.”

AEMO’s guideline is inconsistent with the recently published “AER Electricity Network Service Provider Registration Guideline” where a footnote in clause 8.1 states “The ‘Responsible Person’ is as specified in chapter 7 of the NER and in AEMO metrology procedures the NEM participant with financial responsibility for the energy used by a retail customer. Typically, this is the NEM registered Retailer.” This footnote in itself is ambiguous.

Whilst AEMO and the AER have no doubt struggled to resolve these issues to the best of their ability, it is clearly not appropriate for these important metrology issues to be addressed through assumptions and footnotes within guidelines which have no clear foundation or support in the rules.

A large scale roll out of small embedded networks (i.e. single domestic premises with separate metering for an EV) would impose additional costs on the LNSP to issue NMIs, install and maintain the installation from a MSATS and meter data provider perspective.

Question 11 Network pricing and EVs

Are new or bespoke network tariffs warranted for EV charging? If so, what form should these network tariffs take? How can these network tariffs be better integrated with overall retail tariffs?

If there are to be separate tariffs for EV tariffs, should there be regulations for identifying the EV household and for monitoring consumption? If so, how?

¹ Final Rule Determination National Electricity Amendment (Provision of Metering Data Services and Clarification of Existing Metrology Requirements) Rule 2010 P. 47.

Ausgrid's current Network Time of Use tariffs for business and residential customers provide strong price signals for off peak charging of EVs. Development of new tariffs and supporting load management technologies is part of the larger issue of Network and National Market regulatory arrangements and incentives. EVs need to be considered a part of the overall framework, which is currently under review in the AEMC's "Power of Choice" Stage 3 DSP review.

Question 12 Forecasting the take up of EVs for the network operator and NSP.

Are measures required to facilitate more effective forecasting of EV take up for network operator and NSPs?

The forecasting of EV take up is only likely to improve when there is greater experience of EVs in operation. Ausgrid is continuing to monitor developments, including looking at network impacts of EVs as part of the Smart Grid Smart City program. Any decision on the measures required to facilitate more effective forecasting, like the forecasts themselves, is only likely to improve once the market for EVs is more mature.

Question 13 Network Issues: Connection services

What issues arise in regard to connection services for EVs? Are there further connection issues if additional capabilities such as Vehicle to Grid arise? How should these issues be addressed?

Ausgrid does not believe there are specific issues in regard to connection services for EVs materially different to those of other loads.

Ausgrid believes is unlikely that V2G will emerge as a viable option in the next 10 years and so this issue does not need to be addressed at this time.

Question 14 Network Issues: Network reinforcement and augmentation

What new issues arise regarding requirements for network reinforcement and augmentation to support EV charging and recovery of the costs incurred, and how should they be addressed?

How should the connection services for EV households be classified? It is necessary to differentiate between EV and non-EV households?

Does the take up of EVs require a departure from the current method of recovering the costs of grid augmentation from small customers, with the costs spread across all customers, towards a "causer pays" approach?

Requirements for network reinforcement and augmentation to support EV charging and recovery of the costs incurred, is part of the larger issue of Network and National Market regulatory arrangements particularly the RIT-D. When EVs appear in sufficient numbers they should be considered as part of the overall framework rather than as a specific issue.

Question 15 Retail issues: Retailer and NSP exemptions and embedded networks

Should the provision of commercial charging (both in public spaces and in dedicated charging stations) be classified as on-selling? Do retailer and NSP exemptions and embedded networks provide an appropriate framework to apply to EV charging? What would be the preferable arrangements?

Question 16 Retail issues: Settlement

What new issues for wholesale settlement arise with EVs, and to what extent do they depend on the metrology arrangements in place? How can these issues be addressed?

Question 17 Retail issues: Licensing arrangements

What licensing issues arise with EVs, if licences are required? Do new issues arise because of the nature of EV loads or from new business models for EV charging? Are the existing licensing arrangements still appropriate?

Ausgrid does not support the use of embedded networks for EV charging. Settlement and metering arrangements will depend on the business models developed by service providers – as a general principle these models should be developed to fit with efficient NEM arrangements rather than the NEM arrangement changed to suit specific service providers business models.

Question 18 Vehicle to Grid/Home issues

What additional issues arise from EV discharging and to what extent are those issues different from those that arise from any other on-site small scale generation? Are there any unique issues or requirements if the electricity is only provided to the home and not exported to the grid? Who should control discharging schedules? How can the right incentives be provided to facilitate the use of EV discharging to support DSP?

Ausgrid believes is unlikely that V2G will emerge as a viable option in the next 10 years so this issue does not need to be addressed at this time.

Question 19 Issues specific to Western Australia

No comment on these issues

Question 20-25 Issues specific to NGVs

No comment on these issues.