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Dear Mr Tutaan

AEMC review - Energy market frameworks for electric and natural gas vehicles

The AER welcomes the opportunity to comment on the AEMC's issues paper - review of energy market arrangements for electric and natural gas vehicles. These comments mostly concern electric vehicles, given the anticipated modest impact of gas vehicles on the gas market.

The AEMC's issues paper has identified a range of economic regulatory issues arising from the advent of electric vehicles on the national electricity market (NEM). Overall, the key issue arising from this issues paper concerns the merits or otherwise of adopting specific arrangements for electric vehicles in an attempt to mitigate an exacerbation of peak demand in the National Electricity Market (NEM), and unlock benefits from the demand management potential of stored energy from vehicle batteries. The AER notes the relevance of some of the issues raised by the AEMC are also applicable to the AEMC's broader Power of Choice review and should also be considered in the context of this broader review.

The AER's submission responds to a number of specific matters raised in the issues paper, but the resolution of uncertainties regarding the threshold issue of the 'nature of service' involving vehicle recharging is required before more substantive comments can be made on related issues. Comments are made in relation to the following issues:

- retail issues – nature of service
- impact on peak demand and potential for demand management
- metering
- network connections
- network service provider exemptions.

Retail issues – nature of service

As identified in the issues paper, there is a threshold issue to consider when assessing market arrangements for electric vehicles relating to the nature of service involved in electric vehicle recharging. The paper notes the range of possible ways that recharging can occur, particularly outside of the residential home in commercial stations. In considering whether charging services would be subject to the National Energy Retail Law (Retail Law), the AER has focussed on commercial charging stations.

Section 88 of the Retail Law prohibits the selling of energy "to a person for premises" unless the seller holds a retailer authorisation or is an exempt seller. While this provision would clearly capture the sale of energy to a home or small business, it is less clear how it would impact on the ability of a commercial charging station to 'on-sell' the electricity it purchases to customers seeking to use their service. The recharging of electric vehicles in commercial stations is not directly contemplated by the Retail Law, which focuses on consumer access to essential energy services. The consumer protections in the Retail Law, including protections related to billing, payment difficulties and disconnection matters are designed to address the situation where a person acquires energy for domestic or small business premises. Many of these protections would be inappropriate or unnecessary where a person elects to charge an electric vehicle at a commercial station and pays for the electricity at the point of sale.

Impact on peak demand and demand management

The AER has focused on a key concern emerging from this review which is how to promote efficient investment in network services with the advent of electric vehicles on the NEM. That is, what is the most appropriate load management approach:

- to avoid an exacerbation of peak demand in the NEM (particularly for electricity networks) arising from electric vehicles; and
- what cost recovery approaches should be adopted to allocate costs according to those that cause these costs.

The AER considers there to be three broad categories of costs affecting the NEM that could be expected to arise from the advent of electric vehicles, as follows:

- *system wide generation* – increased wholesale price costs resulting from increased electric vehicle load
- *system wide network* – need for network system upgrades, augmentations or replacements resulting from increased throughput and peak load inefficiencies
- *localised network* – connecting residential or commercial charging stations, metering, information technology infrastructure and local network augmentations.

The issue paper provides a range of estimates of the potential future magnitude of electric vehicle load and the associated costs on the electricity (and gas) markets. These estimates provide an assessment of the potentially significant financial impact if all electric vehicles were to be recharged in an unmanaged and uncoordinated manner. Further, the AER notes this assessment indicates that significant savings (or avoided costs) could occur under different approaches to load management. Accordingly, the choice of load management approach may have implications for the potential to avoid NEM related costs. However, the costs of each

approach for market participants is also likely to vary significantly and will also depend on the regulatory arrangements adopted.

The issues paper has outlined the potential approaches that exist in regard to load management. These range from those that rely on price signalling and therefore place the response emphasis on the consumer, to those where load is managed by consumer consent or completely/directly managed by one party – e.g. the regulated network or a third body. In assessing the merits of these various approaches, the AEMC has advanced the key preliminary question of whether or not the electric vehicle load should be treated on the same basis as any other load to be accommodated in the NEM, (e.g. similar to the load relating to air-conditioners).

In general the AER supports cost reflective pricing, to the extent that this is feasible to manage all customer loads, so that a price signal is provided to consumers to encourage the shifting of load from peak to off peak periods, as with any other load. This approach to load management is consistent with promoting economic efficiency consistent with the National Electricity Objective (NEO) and National Gas Objective (NGO). Under this approach, customers would be incentivised to reduce usage during peak periods irrespective of the customer's type of usage such that electric vehicle loads do not need to be separately identified. This is also consistent with the AEMC's stated criteria that market arrangements should facilitate consumer choice in the way they use these technologies. Accordingly, the AER considers there to be a case to suggest that it would be inappropriate to consider specific arrangements with the development of any new technology, and that any such technology and associated load should be addressed via a common approach to load management.

However, the AER recognises that it is also the case that some loads, in particular air-conditioners, have become a significant source of inefficiency in network infrastructure utilisation. Therefore, it is important to consider from an economic efficiency perspective if there are any circumstances where electric vehicles loads should be treated on a different basis from any other load. The AER considers there are a number of factors that are worth considering, where separate network tariffs for customers with EV loads may promote the NEO. These include:

- The ability to access the demand management potential of electric vehicle batteries. As discussed in the issues paper, vehicle batteries are a potentially significant source of stored energy with potential to feed back into the electricity grid (i.e. vehicle to grid).

- The ability to access a range of load management approaches where price signals alone might not be sufficient to manage peak demand, or may be muted.

- Not to prevent the development of innovative business models for contestable services from emerging in the industry that may address peak demand, such as those identified in the issues paper; and

- The predominant market arrangements and type of battery recharging.

Therefore, the AER generally supports enabling options, that is, price based options that provide impetus for change of behaviour at peak times, rather than options that mandate change. Approaches to peak load management should commence with these types of options, and move along the spectrum to those that involve more direct load control when and if required.

Metering

If the separate identification of electric vehicle load is preferred, various possible metering arrangements are available with respective implications for cost recovery. It should be noted though that even if separate identification of the load is not desired, some form of alternative metering (that is, other than the accumulation meter currently standard in most Australian households) would be required. While metering technologies are rapidly evolving, a number of observations can be made in relation to the current regulatory framework, as follows:

- The regulatory treatment of the provision of meters currently varies between jurisdictions. For example, in Victoria, "smart meters" are classified as standard control services, while in South Australia such meters are classified as negotiated services and therefore not subject to direct regulatory price control.

- Despite these jurisdictional differences, where a customer requires a separate or non-standard meter (that is, capable of identifying EV loads), this would need to be negotiated with the Distribution Network Service Provider (DNSP) or a third party provider.

- To the extent that a customer connection requires non-standard metering, this would be reflected in the costs of the connection.

Accordingly, under the current regulatory arrangements, a customer can request a non-standard meter, which would be required to separately identify electric vehicle loads. However, as this type of metering is not mandated, the likelihood that a customer will request a non-standard meter will depend on factors such as the relative costs of the meter and any benefits associated with network support, where electric vehicle stored energy is provided back to the grid during peak periods (i.e. vehicle to grid). Further, the AER also understands that despite the Victorian Government's roll out (by 2013) of smart meters to residential customers in Victoria, in most cases these meters will not be able to separately identify customer loads.

Network connections

An important principle identified in the AEMC's assessment is the appropriate or feasible allocation of costs arising from electric vehicle loads to the party causing the costs. As noted above, the AER supports cost reflective pricing where feasible as this would be consistent with promoting the NEO and NGO. The costs of the upgrades to the localised network are also subject to existing and prospective regulatory arrangements related to network connections.

Under the National Electricity Rules (NER), the AER is required to classify distribution services provided by distribution networks. A range of factors can be considered by the AER in undertaking its service classification decisions, including whether costs can or should be attributed to a class of customers or whether the service is contestable. In circumstances where the electric car market evolves and these customers are subject to a network tariff, these customers would be subject to standard control services. In general, for customers with vehicle charging connections, these customers would pay an upfront charge where the cost of connection outweighs the expected future revenue of this service.

Also, as noted in the issues paper, the AER is is required to develop and publish connection charge guidelines under chapter 5A of the NER to apply to customers connecting to the distribution network. The AER published a proposed guideline on 22 December 2011, adopting the following principles (amongst others):

- where possible, the connection charge should be reflective of the actual cost for providing the network connection or extension attributed to a particular customer; and
- any cross subsidies between new and existing customers should be minimised.

Accordingly, the AER considers all customer connections should be cost reflective to the extent feasible. The AER's proposed guideline specifies that retail customers should not be required to pay specific network augmentation charges if the customer's maximum demand levels are less than the default levels prescribed in the guideline. The issues paper has identified three levels of electric vehicle charging. The AER expects that 'Level 1' and 'Level 2' of electric vehicle charging would not generally cause a customer's capacity to exceed the augmentation charge threshold in the AER's proposed guideline. However, it is likely that commercial charging facilities may exceed the 'Level 3' of electric vehicle charging and would be required to pay for augmentation charges.

However, the AER notes that it is uncertain as to what the predominant technology or charging capacity of choice will be in the market for electric vehicles, with a number of possible alternatives identified in the issues paper. The implications of the AER's proposed connection guideline on the recovery of electric vehicle connections will depend on the technology adopted and potentially whether the facility is a commercial charging station. For example, if the preferred industry standard becomes a higher powered charger than that envisaged by Level 1, this would have implications for the types and magnitude of costs that should be apportioned across all consumers.

Network service provider exemptions

The AER issued a network service provider (NSP) exemptions guideline in December 2011. Under this guideline a deemed exemption class was created for electric vehicle charging stations in embedded networks. These are subject to minimal extra requirements, such as that the installation needs to be safe and built to the applicable jurisdictional technical standards.

If you would like to discuss further, please contact Mr Bruno Coelho on bruno.coelho@aer.gov.au or by telephone on (08) 8213 3435

Yours sincerely

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