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Energy Market Arrangements for Electric and Natural Gas Vehicles – Issues Paper

The Energy Supply Association of Australia (esaa) welcomes the opportunity to make a submission to the Australian Energy Market Commission's (AEMC) Issues Paper – Energy Market Arrangements for Electric and Natural Gas Vehicles.

esaa is the peak industry body for the stationary energy sector in Australia and represents the policy positions of the Chief Executives of 38 electricity and downstream natural gas businesses. These businesses own and operate some $120 billion in assets, employ more than 61,000 people and contribute $19.3 billion directly to the nation's Gross Domestic Product each year.

The Association agrees that Electric Vehicles (EVs) and Natural Gas Vehicles (NGVs) will play a growing role in meeting Australia's transport needs. Consistent with the efficient allocation of resources in the broader Australian economy, esaa considers that energy prices that reflect the true economic cost of supply, including the full cost of carbon for the transport sector, will be the primary driver for the take up of EVs and NGVs.

Where price signals are efficient, the market – both suppliers and consumers – can be expected to find a way to deliver cost-effective passenger and commercial transport options. However, the provision of the recharging infrastructure and billing architecture necessary to support large scale adoption of EVs and NGVs must be addressed. Encouragement for improved system-wide capital utilisation in EV recharging and the identification of any potential supply chain bottle-necks for fuelling NGVs must be priorities.

The Association understands that the purpose of the Issues Paper is to identify what energy market arrangements are needed to support the economically efficient uptake of EVs and NGVs. Bearing this in mind, this submission first makes some general observations about the draft findings in the Issues Paper. It then makes specific comments addressing the particular questions posed therein.

Estimated take up

The Issues Paper baseline scenario found that while take up of electric vehicles is likely to be low in the short to medium term, by 2020 they could comprise 20 per cent

of new car sales, which could rise to a possible 45 per cent by 2030. Given that new car sales in Australia totaled 1,008,437 in 2011,that equates to, on 2011 figures, over 200,000 EV sales in 2020 and 453,796 by 2030. Such a growth in sales would be truly spectacular, given the low initial supply of the vehicles to the market, world-wide and in Australia.

Table 1 below addresses the projected volumes, ranges and prices of EVs for the Australian Market by 2013. It is drawn from a variety of media and trade sources and should be seen as an estimate only.

Table 1: Electric Vehicle Volumes for the Australian Market 2012 – 2013

Manufacturer	*Model*	*Market*	*Volume*	*Range (kms)*	*Price ($A)*
Blade	Electron	Aust, NZ	<5000	100	48,000
Energetique	evMe	Aust, NZ	<100	200	70,000
Mitsubishi	iMiEV	Aust, Asia, EU, US, Can	30,000	160	50,000
Nissan	LEAF	Aust, Asia, EU, US, Can	50,000	160	60,000
E-Day	E3	Aust, NZ	>500	160	10,000
E-Day	E5	Aust, NZ	>500	160	30,000
Renault	Fluence ZE	EU, Aust	unknown	185	40,000 (plus battery)
Holden	Volt (Hybrid)	US, Aust	unknown	500	60,000

Source; Various print media

While the LEAF may be the best performed on safety, this vehicle is not expected to be available in Australia until 2013 and even then, production volume for the LEAF is expected to be around 50,000 units, for the total global market. Nissan suggests only 1000 LEAF vehicles per year would be allocated to the Australian market and high demand in other markets may distort either the price and/or supply of even that small number. It should be noted that the LEAF requires the operator to purchase an additional charge-station facility, costing $3,000 to $4,000, as it does not have an on-board charger and so cannot be charged from any incidental 240v 10Amp power outlet.

The Renault Fluence is the only EV destined for the Australian market that has swappable battery capacity and will be available in limited numbers in Australia from the second quarter of 2012.

As with the LEAF, the higher production numbers proposed for the $50,000 Mitsubishi iMiEV are global, rather than Australian. While no Australian supply figures have yet been made publicly available, it is not unreasonable to expect that again, the US and European markets will take the lion's share. The Victorian and Queensland state governments have committed to purchasing 110 of the new i-

MiEVs by 2013. Holden has indicated that it hopes to sell 50 of its plug-in electric hybrid Volt per month from 2013.

Accordingly, it appears likely that the entire electric car fleet on Australian roads by 2013 may number as few as 7,000. That figure presumes that all vehicles supplied are purchased. Growth to 2020 and beyond will be governed by consumer perceptions of value for money, range anxiety, refueling availability, safety and performance, as well as an increasing supply of vehicles for purchase. The WA market, with its extensive driving distances means that the current range limitations of EVs present as an even greater barrier to take up than in the NEM.

On all of these grounds and in the absence of any widespread community concern about oil security, the uptake of EVs in Australia seems likely to be of minimal impact for the energy supply industry, certainly in the decade to 2020.

It should be noted that natural gas vehicles do not present with the same list of issues to overcome, and given the existing refueling infrastructure via the current service station network, a significant increase in their numbers would not be expected to present any significant issues for the downstream energy supply industry.

As regards EVs, in the longer term, a prudent approach would be to prepare for the smooth integration of larger numbers of EVs through mandating a time of use (ToU) tariff for recharging in order to avoid placing further stain on the peak demand times.

Impacts on the electricity market

The advent of EVs could in time become a significant new source of load on the grid. In the medium term, as Australia's exposure to oil price spikes becomes more frequent and prolonged, this may raise public awareness of oil supply vulnerability to European levels. As EVs become more available, the integration of rising numbers of these vehicles may present challenges and opportunities for managing peak load.

As the Issues Paper notes, extra consumption of electricity by a growing EV fleet could either lower or raise electricity retail tariffs, depending on whether or not they are charged on peak demand. Accordingly, the right prices and signals are needed. If not, consumers have no incentive to consider the impact of their decisions on the grid.

The Chevy Volt if charged at home is expected to increase the annual energy draw of the average US home by 13 per cent, while the Nissan LEAF comes in at an additional 19 per cent. The US based Electric Power Research Institute estimates these annual costs to amount to between US$190 and $278 to consumers. That compares to US$151 to run a refrigerator for a year or US$228 to run an air conditioner. Given the lead time available, the challenges of additional load should be easily manageable.

Incentives to charge vehicles at other than times of peak demand will be sensible, and accordingly, ToU tariffs will form part of the essential regulatory framework to manage this impact.

We turn now to the specific questions raised in the Issues Paper.

Can and should EVs charging load be treated any differently to other residential loads?

One of the significant barriers to consumer acceptance of EVs, and their integration into the energy supply system, is the length of time potentially required to recharge the battery – up to twelve hours in some cases. In California, AeroVironmment (an EV charging station maker) is partnering with Think (a Norwegian EV company) to test 440 volt, quick charging stations that can, it is claimed, recharge an EV in 15 minutes. (Standard US wall sockets supply electricity at a rate of 120 volts.) Widespread use of such fast charging technology has the potential to create new "mini-peaks".

If such technology is made available from the home, it could indeed create an additional variable for peak load management. Of course many homes do not have a garage in which to install a quick charging station, even if the homeowner wanted to do so. As well, such an option would not usually be available to tenants, so EV recharging for many owners may of necessity have to be done during the day and away from home.

The question for regulators will be whether a light touch regulatory model is available to manage the demand on load that would potentially accompany significant growth in EV numbers. It would seem that the judicious application of well understood incentives such as ToU charging could mean that EVs become an enormous driver of efficiency in currently under-utilised, highly expensive plant. Alternatively, the roll out of significant numbers of EVs without a market based price signal to guide charging may result in consumers having to bear very significant costs incurred in building new regulated infrastructure. The choice seems obvious.

How can technical barriers to services relating to EV charging be addressed?

Metering and settlement arrangements for charging away from home can be addressed in exactly the same way that electronic car parking fees with payment by credit card are currently addressed in Melbourne's CBD. A pre-commitment choice of a certain length or dollar value of charge can be selected by the consumer a pre-commitment on a credit card entered into the meter. The roll out of this technology can be determined using usual commercial processes in an open market for retail services.

How should the market allocate costs consistent with the causer-pays principle to ensure that inefficient cross subsidies are minimised?

Properly allocating the costs of new grid infrastructure to the companies wanting to build charging stations will an important early focus. While charging station, plug connection and battery uniformity would be ideal, these can only come later, if at all.

The present moratorium on ToU pricing for networks imposed by the Victorian Government in 2010, means there is little incentive for retailers to develop new products and services incorporating ToU pricing to encourage more efficient use of electricity during peak times, a critical requirement for the efficient integration of EVs into the demand profile.

What are the optimal ways of incentivising electric vehicle users in order to minimise the impacts on peak demand?

Finding ways to flatten demand peaks, and increase EV charging in off-peak times, would minimise the need for costly upgrades to the system in the future to cater for relatively few days of very high demand. For consumers to understand when are the critical times to reduce or shift consumption, they need a price signal – the high reliability of the network means that congestion is not otherwise visible to them (unlike say road users who get stuck in a traffic jam). As such, efficient price signals and the enabling metering infrastructure are a necessary condition for integrating significant numbers of EVs into a more efficient electricity system.

Conclusion

The widespread uptake of EVs could become a significant new source of load on the grid. While this represents a welcome challenge for the energy industry, the transition needs to be managed actively. To unlock this potential, the right price signals are needed. If not, consumers have no incentive to consider the impact of their decisions. The Association has long supported the removal of retail price regulation where retail markets are contestable. Open, competitive energy markets free from distortions such as retail price regulation naturally encourage prices to be efficient through the development of competitive market offers.

Competition in retail energy markets, as in other sectors of the Australian economy, encourages businesses to improve service, develop products that meet consumer needs and find ways to lower their costs and to pass those costs onto consumers. As a result, retail prices are set as low as is sustainably possible while businesses can still make an appropriate return.

The Review of Energy Market Arrangements for Electric and Natural Gas Vehicles comes at an important time for Australia's energy markets. Recent rises in the prices of energy have heightened the focus on energy supply. Addressing this has increased the already high expectations of the community on the energy industry. It has also created an environment where changes in the way consumers choose to engage in their energy consumption may be possible. The Association looks forward to participating in subsequent stages of the review.

Any questions about our submission should be addressed to Andrew McNamara, by email to andrew.mcnamara@esaa.com.au or by telephone on (03) 9670 0188.

Yours sincerely

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