Submission by

Alternative Technology Association

on

AEMC's Approach Paper on Energy Market Arrangements for Electric and Natural Gas Vehicles (Ref: EMO0022)

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By Email to: www.aemc.gov.au

For further information or enquiries contact:

Dominic Eales
Energy Analyst and Advocate
ATA – Alternative Technology Association
(03) 9631 5406
E-mail: Dominic.Eales@ata.org.au

1. Introduction

ATA welcomes the opportunity to submit a response to the AEMC's Approach Paper on Energy Market Arrangements for Electric and Natural Gas Vehicles.

The ATA is a national community-based, not-for-profit organisation representing consumers in the renewable energy, energy efficiency and demand management marketplace. The organisation was established in 1980 to empower our community to develop and share sustainable solutions and to promote the uptake of sustainable technologies.

The organisation currently provides service to approximately 6,000 members nationally who are actively engaged with small, medium and large scale renewable energy, energy efficiency, smart meters, electric vehicles (EVs) and the national electricity market.

The ATA has two member branches (in Melbourne and Geelong) that are specifically devoted to EVs including developments in EV technology; electric vehicle conversions and the promotion of EV uptake. This submission has been informed by ATA members with specific knowledge in this field.

2. Drivers for EV / NGV Uptake

2.1 Fuel Prices

Based on the CSIRO Report *Fuel for Thought – The Future of Transport Fuels*, average international oil prices are set to increase over the coming years to 2018[1]. Modelling around international oil prices is extremely challenging, however CSIRO notes that expected prices are likely to be in the range of AUD$2 to AUD$8 per litre in this timeframe.

This same report highlights that Australia is more vulnerable to market changes than some other countries due to the transport sector's 97% reliance on oil and the decline of domestic reserves. These changes in fuel prices can be expected to be one of the main drivers for an increase in the uptake of alternative transport technologies, such as EVs and potentially natural gas vehicles (NGVs).

2.2 Battery Storage

The other significant driver for EV uptake will be the decreasing cost of battery storage, which will in turn decrease the capital cost of EVs.

Battery costs vary widely and whilst there are a range of industry views about likely future cost reduction trajectories, it is reasonable to assert that there is strong consensus that the price of lithium ion batteries in particular, will decline in the future and most likely by a significant amount.

[1] CSIRO 2008, http://www.csiro.au/files/files/plm4.pdf

This is best evidenced by recent research done by AECOM for the Victorian Department of Transport[2], which analyses a range of current international research papers that discuss the question of future battery prices. Additional modelling from the United States Department of Energy[3] currently predicts significant reductions in the cost of automotive battery prices to 2020.

Decreasing costs of battery storage will also encourage the development of EVs with larger ranges, which may in turn amplify the displacement of petrol-based vehicles as oil prices increase.

2.3 NPV Analysis of EVs

The financial costs and benefits of EV technology, as compared with internal combustion engine (ICE) vehicles and the consideration of oil price increases, has recently been modelled in the report *Cape Paterson Eco-Village: Zero Carbon Study Peer Review*. This report is soon to be released and the ATA would be happy to refer the AEMC to the report's author once this occurs.

In the report, twelve scenarios were modelled that analyse the net present value (NPV) over 20 years of purchasing an EV, as compared with either retaining an existing, or purchasing a new, high or low efficiency ICE vehicle, under different levels of oil price increase.

Using very conservative assumptions, the modelling demonstrates that under eight of the twelve scenarios, the purchase of an EV today (i.e. in 2011) has a positive NPV (or was financially beneficial to the end consumer) over a 20 year period. These scenarios will likely become more financially attractive to the end consumer with further changes in fuel prices and battery technology.

3. Market Arrangements for EVs

As residential and businesses consumers begin to shift towards electric vehicles, it will be important that electricity market arrangements adapt to, and even facilitate this process, as efficiently as possible.

In this context, utilising appropriate demand side initiatives will be critical to 'future proofing' the NEM to ensure adequate supply and market stability, at least cost.

In particular, it will be important that where possible, EVs do not exacerbate the existing issues associated with peak demand. In this context, one of the most important market arrangements to reduce the impact of EVs on electricity peak demand in the NEM is tariff structures that both align with the policy objective of mitigating further peak demand impacts, as well as providing the end consumer with an effective opportunity for cost savings for EV charging.

[2] AECOM 2011, *Forecast Uptake and Economic Evaluation of Electric Vehicles in Victoria*, Report commissioned by the Victorian Department of Transport: http://www.transport.vic.gov.au/__data/assets/pdf_file/0010/33499/Economic-Viability-of-Electric-Vehicles-in-Victoria-rev-C-final-issued.pdf

[3] US Department of Energy, *Transforming America's Energy Sector: Batteries and Electric Vehicles,* 14 July 2010.

3.1 Tariff Incentives

Tariff structures should include time-of-use (ToU) tariffs that appropriately reflect the underlying cost of energy supply for EV charging at the time of day the charging occurs. In practice, this obviously means establishing higher tariffs during the peak, with lower shoulder and off-peak tariffs, encouraging EV charging to occur away from peak times.

Without specific regulation of tariff 'shapes' (i.e. regulated times that reflect the intent of the peak demand policy objective), the ATA is sceptical as to whether this issue will be able to be properly managed by market participants alone (either DNSPs or retailers).

A regulated tariff shape could include, for example:

- Summer months pricing:
  - Peak tariffs Monday to Friday from 2pm to 6pm;
  - Shoulder tariffs on Monday to Friday from 12pm to 2pm and from 6pm to 8pm;
- Winter months pricing:
  - Peak tariffs on Monday to Friday from 4pm to 8pm;
- Off peak at all other times.

Note: The example above is based on SPAusNet's 'NSP11' network tariff[4].

By regulating a shape for market offers, similar to the example above, the effect of EV charging on network infrastructure can be encouraged away from peak demand periods.

4. Further Contact

Thank you for the opportunity to submit to this inquiry and please do not hesitate to contact us at Dominic@ata.org.au or on (03) 9631 5406 should you have any questions regarding the content of this submission.

Yours sincerely

Dominic Eales
Energy Analyst and Advocate

[4] SPAusNet 2011. Tariff NSP11 – Small Residential, interval meter time of use. http://www.sp-ausnet.com.au/CA2575630006F222/Lookup/Tariffs/$file/SP%20AusNet%20Schedule%20of%20Distribution%20Tariffs%202011_V2.pdf