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To: Energy White Paper Taskforce  
Department of Industry  
GPO Box 1564  
CANBERRA ACT 2601

Re: Submission to the Department of Industry Issues Paper, Energy White Paper.

On behalf of the National Executive of the Australian Electric Vehicle Association Incorporated, please accept the following submission to the Australian Government's Energy White Paper (EWP), released for comment in December 2013.

The AEVA is a not-for-profit, membership-based association dedicated to educating, advocating and promoting the use of electricity for private and public transport. Established in 1973, the AEVA has provided a friendly forum for anyone interested in electric vehicle technology to learn about, build or purchase electric vehicles (EVs) and to assist in the dissemination of informed policy concerning the uptake, supporting infrastructure and safety standards of EVs. Members of the AEVA share a common desire – to see the eventual replacement of liquid fossil fuel powered vehicles with electric drive.

With respect to the issues outlined in the Issues Paper, the AEVA feels it can make a contribution to several of the issues as identified on pages 8 and 9 of the EWP.

#### Security of Energy Supplies

The EWP requests comment on the subject of energy security. On page 11 of the EWP, diversifying our energy sources is listed as sound insurance against threats to energy supply. In admitting that increasing the diversity of energy sources might not always be feasible or 'in line with government policy goals' the AEVA strongly believes that a significant opportunity exists to switch much of our transport energy needs from liquid fossil fuels to electricity, and that this switch would decrease Australia's reliance on imported petroleum products. This is a significant number as illustrated by the image on page 4 (BREE 2013 Energy in Australia). Australian petrol prices are perturbed considerably by exchange rates and global market fluctuations. Running our private and public transport fleets on locally produced electricity is considerably cheaper, and less prone to price fluctuations than our current reliance on imported fuels.

Household electricity prices have increased in recent years, but the rise has been modest when considering other household expenditure over the same period. Upgrades to the distribution networks to deal with peak loads represents a significant over-capitalisation, given the few days of the year where such loads are experienced. The AEVA suggests that electric vehicles can play a major role addressing peak loads not only because their daily load profile is very predictable, but because the recharging load can be managed in real

time. Moreover, electric vehicles present a significant, potential electricity storage option for the grid, as vehicle-to-grid energy flow would allow more intermittent sources of electricity such as that from solar and wind, to be utilised as the need arises. We believe that further investment into the development of “smart” electricity distribution networks is essential, and would deliver considerable efficiencies if executed properly. A premium should be offered to households who can supply electricity to the grid from fully charged EVs, as this represents a premium reserve of electricity which can be accessed rapidly.

The AEVA does not consider further expansion of indigenous liquid fossil fuel production to be necessary. Australia’s potential wealth of renewable energy could conceivably support a transport sector with a high degree of electrification.

#### Regulatory Reform and Role of Government

The AEVA supports efforts to reduce unnecessary regulation in the energy markets, provided measures designed to keep the market fair are maintained. We support a fair and diverse electricity market, particularly one where consumers may choose to purchase power generated by renewable sources. Measures which make it easier for new energy providers to enter the market are welcome.

The AEVA considers the Renewable Energy Target to have been instrumental in uptake of household rooftop solar installations. Owners of EVs are able to economically charge their cars using electricity generated on their roofs due to the greater affordability of photovoltaic installations. Availability of time of use tariffs and ‘smart’ metering could enable electric vehicle owners to recharge their vehicles when prices are low, and export their power when the market returns are high. EV drivers tend to already be very energy conscious.

#### Growth and Investment

Page 19 of the EWP notes that the costs of developing offshore liquid petroleum and gas reserves are increasing. This is unsurprising as fossil fuel resources become increasingly harder and technically challenging to extract. At some point the cost of extracting these low grade reserves will equal the costs of renewable and other clean energy sources. While it is inevitable that some level of offshore oil and gas will be needed in the medium term, the AEVA believes more investment into non-fossil fuel sources of energy and associated technologies should occur, particularly given the environmental sensitivities of the ecosystems which contain these petroleum reserves. The long term benefits to removing our domestic reliance on fossil fuels will be immense.

#### Trade and International Relations

Australia’s abundant coal has provided an attractive export market for many years, however the global appetite for thermal coal is clearly waning. This is due largely to a slowing of the Asian economies, and China’s substantial efforts to clean up its energy sector. In this climate, the AEVA sees the desire to sell more coal products, including Victorian brown coal in an international market as foolhardy, particularly given the technical challenges involved with converting it to a liquid fuel. While brown coal is perhaps the least desirable source of electricity for EVs, it does still represent a more efficient conversion of energy than any lignite reprocessing could offer.

The AEVA also believes that the Australian manufacturing sector could build electric cars and motorcycles here in Australia. The departure of Mitsubishi, Holden, Ford and Toyota

represents a challenge to the local economy but also presents an opportunity to leapfrog to the vehicle manufacturing of the twenty-first century utilising existing labour capacity and expertise. Whether via a foreign automotive co-investment or local design expertise.

Australia is well placed to design, build and market EVs to the world. The AEVA supports any effort to redirect funds away from internal combustion automobiles, and towards plug-in hybrids and pure EVs.

#### Workforce Productivity

The AEVA recognises a massive skills shortage in the development and roll-out of “smart” electricity grids, vehicle-to-grid infrastructure, and the impact this will have on the EV fleet. We support any efforts to train more Australians in these areas, including more trade and TAFE positions, university scholarships, re-skilling and mature-age entry opportunities and innovation awards and prizes. We see a massive opportunity to further develop these technologies in Australia, provided the appropriately skilled workforce can be built around them.

The AEVA also believes the renewable energy sector, which has countless synergies with electric vehicle technologies, is currently experiencing significant shortfalls in trained staff. Like the innovations destined for our electricity grids, renewable energy too needs a well trained workforce. This will ensure greater productivity from both sectors, and a decreased reliance on skilled workers from outside of Australia. The creation of a one to two-year course offering a nationally recognised qualification to allow those already in the energy sector to re-skill would ensure a more rapid deployment of these technologies and related projects.

#### Driving Energy Productivity

Increasing energy efficiency measures into all aspects of the generation, transmission and consumption chain is essential for reducing costs, conserving finite energy reserves and protecting the environment. Demand side management has proven to be one of the most effective, market-based approaches to reducing peak loads during hot days. However the rising number of EVs on the roads presents another opportunity for electricity to be utilised more efficiently. Electric vehicle drivers may plug in of an evening to recharge their vehicle at home. Current capacity in the grid is able to accommodate a large number of EVs recharging at the same time, however time of use metering facilitates a delay in charging the vehicle until after midnight when both grid-wide demand has fallen and electricity tariffs are cheaper.

Likewise, peak solar electricity production typically occurs while most people are at their workplaces. If an incentive to install a PV array at businesses and workplaces was in place, electric vehicle charging would place no additional demand on the grid. The AEVA believes electric vehicles offer an excellent opportunity to take advantage of peak electricity production and demand, and any initiatives to support rooftop solar and recharging infrastructure is most welcome.

Good public transport and town planning offers the potential for significant energy efficiency dividends in the transport sector. Efforts to support local and state government planners to ensure transit-oriented design principles are embedded into all new developments are welcomed by the AEVA. Support for passenger rail services should be extended.

Similarly, the AEVA believes a shift away from road freight by trucks and onto rail is essential for any serious efforts to improve energy efficiency. The freight-ton-kilometre efficiency of rail freight is far superior to road-going trucks, and is even better if the goods are moved using electric power. Although a massive and long-term infrastructure project, AEVA believes the harmonisation and inter-connection of an eastern-seaboard electric rail freight network would create large gains in the freight transport sectors energy efficiency.

#### Alternative and Emerging Energy Sources and Technology

The AEVA does not see large wind farms or solar photovoltaic electricity generation as a significant source of price distortion in the electricity market. Australian electricity grids already have considerable capacity built into them, much of which is used only rarely on peak load days. In fact, large scale renewable energy has generally contributed to an overall lowering of the wholesale electricity price. Combined with reduced demand for electricity overall, generators are finding themselves on the brink of a downward spiral, where the energy they produce has a smaller market, is of lower value, and the cost of production is not recovered. However as electricity grids become more integrated with battery storage, such as EVs on charge, the value of stored electricity will rise considerably. The synergy between rooftop solar, excess wind and EV battery storage presents considerable opportunities for more efficient, rapid-dispatch electricity trading. The AEVA believes the emergence of these technologies should be embraced and factored into any future restructuring of the electricity market.

The AEVA does not have a formal position on nuclear electricity generation, however any new generation investment should be economically feasible, regardless of its source. Currently with decreasing demand for electricity and excess capacity in the grid, in addition to the lengthy approvals, safety and environmental compliances, construction and commissioning, and eventual decommissioning, nuclear energy may not present a sound economic case in Australia. Given that the average cost of renewable electricity generation is comparable with that of nuclear, and the technology is quite mature, expanding the share of solar and wind electricity may be better option.

In the final paragraph of the EWP, the government seeks comment on how it can promote and increase the uptake of alternative fuel vehicles, including battery electric vehicles. The AEVA believes that the government can do several things to expand the EV fleet in Australia.

Direct subsidies at the point of new EV purchase will almost certainly result in a very rapid uptake in the technology. This has been proven in much of Europe and Scandinavia. Just as the rooftop solar rebates saw one in every ten homes install a PV array within a few years, a similar strategy would ensure the EV fleet would grow quickly. However the AEVA also recognises that direct subsidies do not always offer value for money. A low-income household is still not likely to take advantage of the rebate as the initial cost of an EV is still quite high, yet their tax contribution would be helping other wealthier households to buy one. Direct subsidies may also result in significant price distortions. An alternative could be a tax rebate which means there will still be an incentive to buy a new EV, but the benefits are not realised until the owner submits their tax return. Government departments could consider buying EVs as part of their motor vehicle fleet, and then selling them at auction after two or three years. This option would result in the least distortion of vehicle prices in both the new and used car markets while providing a market for affordable EVs.

The AEVA also considers the roll-out of DC fast charging infrastructure as an attractive and very cost effective means to decrease our dependence on liquid fossil fuels. A common barrier to EV uptake is range restriction; 80-120 km prevents an EV from leaving town. If government supported recharging infrastructure was available along popular highways, it becomes possible for a household to own one car, an EV, while not unfairly hurting households who don't buy EVs. The infrastructure will need to be built anyway, particularly as EVs begin to displace petrol powered vehicles. Only a small seed network of a few hundred chargers would be needed initially. Additional private charging stations could be expected to be built as demand increases.

In summary, the AEVA has several sound suggestions for reforming the energy sector in Australia, particularly the electricity network. We believe electric vehicles are a good match with renewable electricity generation, and vehicle-to-grid technology will allow further efficiencies to be introduced into the Australian electricity market. Renewable electricity and electric vehicles also represent a significant component of transport energy security. A local (or foreign) electric car and motorcycle manufacturing industry should be fostered in Australia, and we believe support from the federal government would be a wise investment. Finally, financial incentives would increase the uptake of EVs in Australia. However these would need to be carefully crafted such that they do not distort the new and used vehicle market. Investing in the electric vehicle recharging networks of the future will see more households become petrol free, and more likely to downsize to owning just one vehicle.

Thank you for the opportunity to provide comment on the EWP.

Sincerely,  
Dr Chris Jones  
AEVA