Australian Energy Markets Commission
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Thank you for the opportunity to respond to the AEMC Energy Mark Arrangements for Electric Vehicles and Natural Gas Vehicles Issues paper dated 18th January 2012.

The AEMC summary paper posed 4 main discussion points and whilst the responses to these discussion points are captured and addressed in detail in this submission, we have taken the liberty to provide our summary position.

In relation to the key discussion points:

a) Can and should electric vehicles charging load be treated any differently to other residential loads?

The grounds and reasons to differentiate the EV charging load from other domestic is limited to commercial business models requirements and not by reasons driven by regulatory market arrangements.

Recharging of EV does not present any inherent characteristics or unique aspects that cause a differential approach compared to other appliances. EV recharging potentially differs to other appliances only through a) the size of its load. However by such reasoning will necessitate pool pumps and air conditioning units to be treated likewise; or b) because an EV can be recharged at multiple points, which does not impact residential loads.

By fracturing or disaggregating residential loads through metering will introduce greater complexity, error and cost into the market. We discuss this point at length in our response

b) How can technical barriers to services relating to electric vehicle charging be addressed?

The technical barriers relating to the actual management and monitoring of EV charging can be efficiently and effectively dealt with through the use of smart appliances that provides the ability to manage and monitor residential load.

These smart appliances provide the tools and means to monitor load, perform load shedding and load control, load shift, and perform demand response without the need to for additional NMI's or other segregated commercial metering approaches.

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

ChargePoint believe that a user /causer pay principle should apply. However the introduction of specific user/causer pay principles specifically aimed at EV's without addressing other load drawing appliances will create cross subsidies and act as a barrier to the introduction of EV into the Australian market.

The application of causer pays principles need to be applied in non-discriminatory manner and across residential loads.

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

The optimal method of incentivizing electric vehicles users to minimize peak usage and maximize off peak use is to provide an appropriate tariff structure which gives the necessary incentive to EV drivers to change their behaviour. It should be noted that such tariff incentives need to be across the whole gamut of EV recharging (covering business and commercial users) so that recharging location bias is not introduced.

ChargePoint believes that appropriate incentives and user modifications can occur under the existing technical market arrangements without introducing new or multiple metering approaches or requirements.

The following addresses some of the individual questions raised by the AEMC Energy Market Arrangements for Electric and natural Gas Vehicles paper dated 18th January 2012.

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 find that the ranges of estimates used in the report are appropriate and sound based on the empirical data available at this early stage of the evolution and introduction of EV transportation.

The estimates will be impacted (both positively and negatively) depending on the actions and decisions made by the various local, state and government bodies and authorities, the global demand for EV's, the availability of supply, and the appetite of consumers and companies to utilize EV.

Given the interrelated number of variables and the cause and effect of these variables, we believe that the current forecast represent the best possible estimates.

Question 2 Cost of Additional system peak demand Are these estimates on the cost of additional peak demand providing the correct magnitude of the potential impacts of EV's. Are there any categories of costs not included in this submission?

We find that the potential cost of additional peak demand sound, however in the discussion it is assumed that these additional costs belong purely to EV's.

We believe that the growth in the underlying demand base over the past twenty years through home appliances (plasma TV, computers etc), pools, air-conditioning etc should also be viewed as contributing to the sensitivity of peak demand. These appliances have all collectively caused a significant increase in load and now form the bedrock of base load demand.

The additional load caused by the uptake of EV is no different to the additional demand created by widespread uptake of these appliances.

Therefore to assign the impacts of additional system peak demand and the costs to meet this demand is too narrow. ChargePoint believe that peak load costs, its management and allocation of costs must be done taking a holistic and all-encompassing perspective recognizing all the key drivers of this demand, acknowledging that there are other loads which should bear some accountability for the costs.

We believe that additional data is required in order to confidently estimate the magnitude of EV's impact on peak load. For instance the timing of the impact will significantly moulded by the interaction and management of charging through smart charging infrastructure, the capability (32AMP vs. 15AMP) and capacity (battery size hence range and usage) of the vehicle, the economic incentives and disincentives, and the life style and driving habits of the EV driver.

Our experience has shown depending on the type of user, and the vehicle that the timing of the load and size of the recharge will fluctuate.

ChargePoint is currently seeing a perception from retail EV customers that the basic lowest cost charge unit is appropriate for the home. These units do not contain the metering or smart communication interactions, as such they rely totally on the vehicle for timing of the charge. Usage patterns demand response, and charging data cannot be supplied. In essence charging in this environment will be the same as for uncontrolled air conditioning and pool pump usage. Regulation on the standard of recharging appliance goes hand in hand with any market regulation changes.

The network cost impact of this peak charging cannot on the whole be managed or identified so peak cost cannot be assigned to them.

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?

The full gamut of costs imposed by EV will be largely dictated by the business model employed, the cost of supply, and the cost of metering.

In any discussion of sub metering, roaming NMI's etc. recognition and full end to end understanding of the costs to support, manage, and respond to customers, billing systems changes, a clearing house costs, accounting systems changes, potential increased capital and regulatory oversight and costs , software modifications and developments will be required.

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 materially of these benefits and the appropriate arrangements of capturing such benefits?

The potential benefits for the grid and hence distributors as a result of the introduction EV's and their associated proactive load management has been recognized/identified.

From a retail perspective the benefit is greater sales of energy; however this position is potentially diametric to the derivation of grid benefits. This occurs as the motivation of the retailers is sell more energy whilst the distributors seek to smooth and shift load. Therefore in order to realize the benefits of EV, there needs to be commercial arrangements designed and implemented to encourage retail load/consumption shifting.

ChargePoint foresee that distributors will potentially need to entice retailers and customers to shift load through economic incentives (lower transmission costs in the off peak), in turn retailers will need to pass these incentives on to EV drivers.

The benefits of EV's will be material, and currently appropriate technology is available to effectively capture these benefits, however the market regulatory environment, in particular tariff setting will need to be more flexible to deliver the 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?

The key question is what is the material and key activity when an EV is being charged ?. Only when there is a sale/supply of electricity can any other value add activities or services provided to EV users. These other activities or services revolve around the customer experience, the efficient and effectiveness of the sale of electricity and the associated data and information emanating from the sale of electricity.

A parallel to recharging an electric vehicle is refuelling an internal combustion engine. Vehicles consume a certain number litres of petroleum to travel to a certain number of kilometres. Electric vehicles use a certain amount of kWh to travel certain number of kilometres. Petroleum retailers do not sell to customers a certain number of kilometres and then fill their tanks with petrol based on an algorithm of litres to km.

An EV is only different to an internal combustion due to the fact its propulsion is due to electricity. Thus to attempt to ascribed a different title or characteristic to the selling of fuel (electricity in this case) insinuates that EV's are very different from petroleum, diesel, or LPG propelled vehicles.

An EV is an appliance that utilises electricity to fulfil its role or function as a transportation appliance. The role or function of the EV does not, in itself, change the characteristics of supply of electricity.

A final factor in determining whether 'EV charging is a sale of electricity or some other service can be simply addressed by the question whether these other services or offerings can be sold separately and independently to the sale of electricity. Furthermore do these other services that potentially surround the sale of electricity enhance, or add to such an extent that the sale of electricity is not material.

ChargePoint contends that a charging service is first and foremost a sale of electricity, and that the services and goods that deliver and surround the sale of electricity are the value add activities which a consumer can decide to access or utilize. Recharging using just a 15AMP power outlet is an example of stripping away the benefits of smart appliances, however this approach still involves the sale of electricity to recharge the battery

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?

In essence this question seeks guidance on whether the increased load presented by EV should be regulated with a different commercial regime and approach to other loads.

Different market arrangements can be used to artificially increase the demand for energy or reduce it by placing barriers or incentives in place. This in itself will create a separate regulated market.

The key question is why EV load should be treated differently for market and for what reasons.

If the market regulatory arrangements are designed to shift load, then such arrangements should be placed across other high consumption appliances as well. If the market regulatory arrangements are to be instituted to make the market more efficient and effective then these benefits need to be identified, quantified and articulated.

One outcome of a change in the market regulatory practices for domestic supply would be the splintering or fracturing domestic loads such that a single customer could have multiple suppliers to the same location. This raises the question of why and how creates a more efficient and effective market. The current market regulatory arrangements provide for an efficient and effective supply of electricity to customers, as well as afford them regulatory protection. By providing different market arrangements there will be an increase in capital and servicing costs to support those arrangements.

Any new market regulatory arrangements will need to ensure that the increased investment and servicing costs are more than outweighed by a decrease in the underlying cost of energy, a decrease in the transmission/distribution costs and a seamless manner to measure monitor and billed segregated loads by different suppliers to the same point of consumption.

If the increased investment and servicing costs are not offset then it is difficult to state that the new arrangements pass the efficiency and effectiveness test

On a softer side a change in market regulatory arrangements that allow a segregation of domestic and retail load will lead to a greater volume of financial transactions and accounts to be managed by the end consumer. This will increase the bill pressure.

Bill pressure and ability to pay also needs to be considered in the manner that the new market arrangements would be operate under. If there is a dispute or an inability to pay to an existing household account and the energy supply is disconnected, does this automatically mean that the supply of energy for EV charging supplied

under a separate commercial agreement but through the same parent NMI is also cut off or does supply still flow and the parent NMI retailer is reimbursed or kept whole through other arrangements.

Question 7 EV metering issues
•a) Should EVs be treated as a standard appliance load or should they be separately metered from other load at the premises? b) Could sub-metering and roaming NMIs be an effective solution to the costs and time issues associated with a separate metering installation? c) Are these metering options mutually exclusive or can they coexist thus allowing EV suppliers and customers to choose the solutions that best meet their needs? d) Should metering costs for EVs be recovered any differently than for other existing metering equipment? •e) Are the existing metering data confidentiality arrangements appropriate for EVs and, if not, what modifications should be considered?

The answer to these metering questions all hinge on should EV's be treated as just another appliance or should they be separately metered from other load at the premises.

Excluding pure commercial and business model aspects, in order to come to the conclusion that EV recharging should be separately metered from other loads because it is not a standard appliance one must identify the inherent and structure differences that arise when energy is applied to EV battery as opposed to another appliance.

The treatment of an EV as a unique appliance requiring unique and separate action, and unique and separate regulatory metering can only be ascribe to either the quantum of the load it draws or the fact that recharging can occur at different locations.

To treat EV differently as a result of the quantum load it draws means that the key issue seeking to be addressed is control and management of load. This does not require a separate NMI meter but rather a deeper and richer flow of real time information. It is a logical argument that if load size is a key determinant of requiring separate metering, then extension of this separate metering should be applied to all other high demand load appliances in order to provide appropriate whole of load control.

Secondly if the assumption that an EV should be treated differently due to its mobile nature and this aspect causes the need to separate arrangements or metering then logically the metering should be contained with the EV not a static separately fixed installed meter.

In the current market structure for EV charging across the world, the administrative and commercial complexities of having mobile metering has thwarted the mobile NMI approach. A key challenge of mobile accounts and mobile metering is the complexity of back office reconciliation and balancing of charges and payments for energy across not only different utilities but also different retail companies.

In terms of supporting separate arrangements to increase competition, this competition must deliver a lower total cost to the consumer. Lower cost through competition is the most appropriate way to pass the effectiveness and efficiency test. Unless the cost of electricity is significantly lower to the consumer, such that it outweighs the additional capital and infrastructure investment required to segregate the load as well offset the administration and financiering costs it is difficult to support separate arrangements on an efficiency and effectiveness basis.

b) The sub metering approach will encounter the same efficiency and effective issues as the separate metering proposal. A sub metering approach is likely to exacerbate reconciliation and payment issues for all businesses involved in the delivery of energy. This is because if there is an issue – perceived or real - with an energy bill, whose meter is deemed right and secondly should the consumer continue to settle their accounts if they cannot identify or understand where the issue is.

Also a fundamental issue with sub metering relates to the timing of meter readings and the balancing of these readings. This issue could manifest itself into a significant financial and commercial problems for the business that controls and manages the parent meter. The impact to the customer though will be increased fluctuation and potential “bill shock “as a result of the meter balancing.

Most meter readings in domestic environment are read four times a year, with the intervening billing cycles based on estimated assumed usage. At each meter reading point there is a balancing of estimated energy consumption to actual consumption for that property. Smart meters and interval meters transmit the data electronically for each billing period.

The introduction of a parent /children meter arrangement, a sub meter or a downstream meter arrangement means in the case of estimated usage, the net charge to the customer must take into account an estimated usage of the child, the sub meter or downstream meter as well. Where in the case of EV recharging occurs on the sub meter, if the EV is not used much during the month or used excessively during the month, the impact of the decreased or increased consumption needs to be communicated to the parent retailer for adjustment to the parent bill. If this does not occur then EV induced fluctuations will be reflected in the other domestic bill.

Furthermore because of the large sale number of accounts, and the differing times for meter readings all retailers who run the quarterly meter reading billing cycle will find that their revenue accruals will begin to fluctuate and they will begin to accumulate non-existence revenue based on inflated consumption analytics. This over inflated revenue at a point in time will need to be identified and written.

Roaming NMI with vehicles whilst conceptually could operate, will encounter commercial and logistic issues between the NMI owner and the multiple retailers and companies that supply the energy. The administrative issues and the necessity to invest large scale capital for billing and clearing house activities will negate any potential convenience or driver efficiency aspects. Furthermore roaming NMI will place a barrier to entry for start-up or new retailers due to the complexity of arrangements and counter agreements needed from day one

to support all EV drivers, and the complexity of installing and operating a billing system and supply arrangements.

Roaming NMI's also introduce the issue of involving identification - who get billed for the energy consumed if drivers change. Mobile NMI's will have the potential to distort and confuse analytical data through greater randomness of charging behaviours as drivers continually change locations for charging.

ChargePoint believes existing metering data confidentiality arrangements will be appropriate for EVs provided the financial customer has accesses to their data and the right to disseminate this data as and when they require. This dissemination of data and its confidentiality thereof should be the concern of the financial customer and should not involve a regulatory oversight determining on behalf of the financial customer how and with whom they share their information with.

Question 8 Options for EV charging

To what extent are changes required to the regulatory arrangements to allow different battery charge management scenarios to increase efficiency?

• How should the arrangements ensure that the party in control of charging faces the all system costs?

Who should be providing the information for decision making for smart meter charging?

The key regulatory change to allow differential battery charge management is the ability to introduce market based supply tariffs such that the use of economic levers is available. ChargePoint contends that retailers should be allowed to set specific tariffs designed to support and encourage appropriate charging behaviour. Each state has different tariff setting regimes and the markets contested/regulated in different formats.

Irrespective of the contestability, to achieve better load management and more competition (hence lower retail prices), the ability to have differentiated tariffs within the total load of property will provide the commercial tools to shift behaviours.

Provided the retailers settle the total wholesale cost of the energy consumed at a NMI, and they charge that customer for the total amount of kWh consumed, the market arrangements should be flexible enough to allow tariffs at rates below the regulated tariff. This can be done efficiency and effectively not by instituting separate metering arrangements, but by utilizing smart appliances.

We believe that uncontrolled charging has the potential to be not only detrimental to the management of the grid but also give rise to an inefficient use of energy resources. We also note that uncontrolled charging is sometimes the outcome of the range limitation of the vehicles which requires that they are topped up when used extensively. Our experience has shown that personal or domestic users are consistent in their use for the EV throughout the week and they consistently recharge in afternoon evening period. Anecdotally this recharge pattern reflects use during the day and a top up benefit vehicle is used again in the evening.

The current environment and technology affords the market and users the ability to provide controlled charging and TOU charging when working in conjunction with the EV driver's energy supplier. The TOU and controlled charging through a smart appliance does not require separate metering arrangements or extensive commercial and administrative arrangements. It is possible for current energy retailers to deliver the grid benefits from TOU tariffs through the use of smart EV charging devices.

Controlled charging does not need to be delegated to a third party but does require the charging device have management and metering capabilities and there is cooperation between retailers and distributors. The key question for controlled charging is the determination of who manages the controlled charging/load shedding, when is the direction for controlled management given and by whom. A further complicating factor for controlled charging is the customer management situation where controlled charging is mandated as opposed to chosen. It is noted that the rights to controlled charging can be assigned away by an EV driver in return for lower tariffs.

Who should supply information for decision making in relation to smart meter charging, raises some vexing issues. There is a natural friction between the retailers who need to manage the customer and their expectations and the distributor who have grid stability and supply as their paramount concern. ChargePoint believes that in order for appropriate control of charging and load decision making requires the involvement of both parties.

Question 9 Retail pricing and EVs In an area where the sale of electricity is subject to retail price regulation and given the appropriate metering capability, should the sale of electricity for recharging be treated any differently to other loads? If so, why?

ChargePoint believes there is a case for different tariffs being applied against the total load of the household but this should not require separate NMI metering. There is no fundamental reason to treat the sale of electricity for recharging to be treated any differently to other loads as previously set out.

Question 10 Structure of retail pricing for EVs How are rules regarding the availability of TOU pricing likely to affect efficient uptake of EVs? Should there be a requirement to offer TOU tariffs for EVs? Should other forms of pricing apply to EVs to discourage charging at peak times, such as critical peak tariffs or other dynamic tariff structures? Should EVs be treated any differently from any other load in this regard?

ChargePoint believes that there is a case of competitive retail pricing of tariffs for EV's, however retailers should not be forced to provide TOU tariffs. The market is competitive enough to ensure that TOU tariffs for EV's begin to become the norm amongst retailers. The market arrangements need to facilitate the development of these by providing the right market arrangements.

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?

ChargePoint believes that the necessary data and information on recharging is already being gathered by the infrastructure providers. Couple this with sales forecasts from the OEM's and an effective forecasting model can be developed and utilised. This requires cooperation as opposed to regulatory measures.

In closing should AEMC require further input or information, or wish to clarify aspects of this submission, please contact the undersigned.

Yours faithfully

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