Australian Energy Market Commission

Power of Choice Review - Directions Paper

Responses on Selected Consultation Questions

4 May 2012

Australian Energy Market Commission

PO Box A2449

Sydney South NSW 1235

Contact person for submission

Tim Watts
Better Place Australia
114 Balmain St
Richmond VIC 3121
Tel: (03) 8679 0800
Email: tim.watts@betterplace.com
Website: www.betterplace.com.au

Contents

1. Why Electric Vehicle Charging Load is Well Suited to Demand Side Participation

The AEMC's Issues Paper in its *Review of Energy Market Arrangements for Electric Vehicles* forecasts that there will be more than 230,000 EVs on Australian roads by 2020 with potentially more than 560,000 by 2020 if battery costs fall more rapidly than expected.[1] EV charging therefore represents a substantial new source of load in the NEM.

EV charging load is well suited to demand-side participation (DSP) for a variety of reasons:

- **EV charging occurs at a different time to EV use** – Most consumer appliances for lighting, cooking, cooling, heating, and entertainment typically draw electricity from the distribution network at the same they are being used and enjoyed. Therefore, shifting the timing of these loads around must necessarily have a direct impact on consumers' lifestyle and personal habits. In contrast, EVs have high capacity batteries which store electricity via the charging process for later use in propelling the vehicle around the road network. EV charging occurs at a different time to EV use. EV charging load therefore has the potential to be shifted in time without directly impacting consumers preferred times for using their EVs for transportation.
- **EV drivers have a large window of time in which their charging can occur** – Our consumer research indicates that an average car is parked for 20 of the 24 hours in a day. Using a 3.7 kW charger, it takes only 2 to 3 hours to refill a battery in a 2012 EV after the average Australian vehicle's daily journey of 40 km. So, an EV driver has a lot of flexibility in when their EV charging is scheduled.
- **EV charging is amenable to remote management by aggregators** – As flagged above, EV charging is well suited to being shifted in time because there is a large window of opportunity during which charging can occur without impacting driver amenity. It is also straightforward to remotely monitor an EV battery's state of charge to identify those rare occasions when urgent charging is necessary. Therefore, EV charging is well-suited to active management by aggregators like Better Place who can schedule charging at periods which both: (I) Deliver the battery refill outcome which drivers need; and (II) Keep electricity costs to a minimum by monitoring in real-time the wholesale price of energy and the real-time cost of network services. While the transaction costs for an individual EV owner of monitoring energy and network costs may be prohibitively high relative to the potential savings, this is not the case for an aggregator managing a portfolio of EV chargers at a range of different customer homes and workplaces.
- **Compared to other common devices in the home, EV charging is a substantial load** – 2012 vehicles from Nissan and Renault have been designed for charging at home at 16 amps or 3.7 kW. But models slated for release in 2013 and 2014 from Ford, BMW and others have bigger batteries and therefore are specified for much more rapid charging – up to 63 amps or 14.5 kW in some cases.

[1] AEMC, *Issues Paper – Review of Energy Market Arrangements for Electric Vehicles*, 18 January 2012

If the regulatory settings are right, we see EV charging load as a potentially very strong contributor to demand side participation in the NEM over the next decade. But this will not occur without careful regulatory design. More detail on this is outlined in our submission below.

2. Responses to Consultation Questions

Questions – Supporting efficient investment decisions in DSP technology

15. Are there any practical additional mechanisms that could help alleviate the barriers to consumer investing in DSP technology?

Yes, there are practical mechanisms – specifically in the area of metering regulations – which can help alleviate the barriers to consumer investment in DSP technology. Details are provided below.

DSP from EV charging load – A summary of our business model

It would be inaccurate to describe the Better Place business as simply replacing petrol with electricity. Instead, we package a group of services for the driver which together make driving an EV convenient and cost-effective. For a fixed monthly fee, Better Place subscribers receive:

i. Use of an EV charging appliance, installed in their home or workplace garage or driveway and managed remotely by the Better Place network operations centre;
ii. All the electricity drawn for charging that EV;
iii. Use of a performance-guaranteed EV battery in their car;
iv. Use of an in-car navigation and trip-planning software system – Oscar™ – which assists drivers to locate Better Place charging and battery switch facilities while on the road network.
v. Unlimited access to Better Place battery switch stations and public charge spots at various convenient locations across the road network.

Electricity is therefore just one of the many parts of the solution we provide to drivers. In the electricity market, Better Place can be categorised as an Energy Services Company (ESCO): we provide a managed charging service for EV drivers. When a driver plugs their car into the Better Place charging appliance installed in their garage or driveway, they make their car available for charging. The scheduling and rate of charging (and therefore electricity consumption) is set dynamically by Better Place with reference to the state of charge of the car battery at any point in time, the customer's travel plans, and several other parameters. Our approach is to strike a balance between our contractual commitment to provide the customer with a reliable battery filling service and the cost of the electricity we consume from the market to provide this service.

Better Place's pricing model is a fixed monthly subscription fee. The same fixed fee is levied regardless of how many kWh that Better Place consumes in order to keep the driver's battery filled each month. The level of the monthly fee is tied to an annual mileage plan. At the end of the year, customers who have travelled a higher number of kilometres than the cap specified in their plan can upgrade to a new higher mileage plan or pay a surcharge for their excess kilometres.

As the party financially liable for the cost of the electricity used in charging our customers' cars, Better Place has an incentive to be an active demand side participant in the NEM. We remotely manage the charging appliances installed at our customers' garages and driveways, and we precisely set the scheduling and rate of charging that we provide. We structure our electricity supply contracts to allow us to benefit from our ability to manage our loads. Under these contracts, the prices we pay generally reflect price movements in the wholesale market. Wherever possible, we seek to negotiate our network tariff structures with DNSPs which deliver us cost savings for charging during off-peak periods on the network.

Barriers to customers making use of the Better Place service

Many customers face a regulatory barrier to establishing the Better Place charging service at their home or workplace. Metering regulations impose unreasonably high costs on many customers seeking to contract with an ESCO like Better Place for an electricity-included vehicle charging service which is separate from their electricity retail contract for their general home or workplace load. Why? For an ESCO to be the party financially liable for the car charging load at a customer's home or workplace requires that the load be metered and for it to be allocated its own National Metering Identifier number (a NMI). Under current NEM regulations, the only way to obtain a NMI is to establish a 'new occupancy' or 'premises' with its own separate electrical system. This typically costs $1000 to $8000 per site because it essentially means duplicating the connection assets and metering installation already in place at the property. An electrician must physically connect to the distribution network, put in another or larger meter panel, another supply disconnection device, and another switchboard with main switch, just for the EV charging load.

Distributors (who are currently the only party who can issue a new NMI) do not allocate new NMIs to a measurement element within a metering installation. Instead the distributors' policy is that every NMI must have its own metering installation. Appendix II below outlines the costs and delays incurred in establishing separate metering and a NMI for the EV charging load at 3 typical homes in suburban Melbourne in 2011-12 who were participants in the Victorian Government's Electric Vehicle Trial.

Proposed Regulatory Change I – Establish the right for a consumer to allow two financially responsible market participants to share the connection and metering installation at their premises

A more efficient alternative approach is to allow two NMIs to be allocated for one metering installation and for two Financially Responsible Market Participants (typically retailers) to share the metering installation. This would mean that a customer can make use of their existing connection assets, switchboard and meterboard and simply upgrade the meter itself to make it capable of measuring the EV charging load, independent of the rest of their household load. This can be achieved via use of a 2 or even 3 element meter or a 2nd meter on the meterboard. In a physical sense this is *identical* to the metering installations currently in place at tens of thousands of homes throughout Australia with off-peak hot water or slab heating.

The AEMO-accredited Meter Data Agent (MDA) responsible for the metering installation would then collect and distribute consumption data to the two retailers, the distributor, and to AEMO's Market Settlement and Transfer Solution (MSATS) system. The MDA would supply two datastreams: the first

datastream for the existing NMI for the household consumption and, the second datastream for the new NMI for the EV charging consumption.

It is important to recognise that at thousands of small customer sites across the NEM, meter data agents are already collecting and distributing multiple datastreams to AEMO's MSATS system from a single site. This occurs for customers with metering configurations for off-peak hot water or slab heating and for customers with solar panels. These multiple datastreams are now aggregated into a single NEM-12 format file for the NMI. But under our proposed regulatory change these datastreams would be distributed in two separate files for the two NMIs to market participants and to AEMO's MSATS database.

Figure 1 below outlines the cost difference for the consumer between the duplication of connection and metering assets required under current regulations and the model of 2 NMI at the one metering installation that we are proposing:

	Under Current Regulations	Proposed Approach	Average Net Benefit
Item	**Second F.R.M.P. installs second metering installation and connection**	**Two F.R.M.P. share the one metering installation and connection**	
1. Meter panel	New or larger replacement meter panel	Retain existing meter panel	Saving of ~$1000
2. Supply disconnect device	Additional supply disconnection device	Retain existing supply disconnection device	Saving of ~$50
3. Meter	Additional meter	Replacement of old meter with new two element meter	Saving of ~$150
4. Main switch	Additional main switch	Retain existing main switch	Saving of ~$50
5. Switch board	Additional switchboard	Retain existing switchboard	Saving of ~$500
		ESTIMATED TOTAL	$1,750

Figure 1 – Savings from Proposed Regulatory Change

It is important to recognise that implementation of this change will involve amendments to several different regulatory instruments. This includes amendments to the Responsible Person (RP) clauses in the National Electricity Rules to clarify how the RP for a metering installation shared by two retailers is determined. New regulations to govern disconnections in the case of non-payment of bills by the customer of one FRMP sharing the metering installation will also be required. Full customer consent will clearly be an important first step requirement before a shared metering installation is established at a home or workplace.

Question

16. What should be the role of intermediaries such as ESCOs in addressing the barriers to efficient consumer investment and what factors could be impeding the development of these parties?

Electric vehicle owners have several options for procuring services to charge their cars. These include:

1. **Add EV load to household retail account** – The driver can buy a charging appliance outright, operate it themselves and have the additional kWh this appliance consumes billed to them under their existing household electricity account with a NEM retailer at the same pricing structure.
2. **Managed charging service** – Alternatively, they can choose a managed charging service like that provided by Better Place under which they pay a fixed monthly fee for a remotely monitored charging appliance powered by electricity which is billed to Better Place.
3. **Open an EV-specific retail account** – A driver could also choose to buy a charging appliance outright, operate it themselves, but secure a specific retail account for their electric vehicle. This might be appealing because the pricing terms on the EV-specific retail account are more attractive – for example, such an account could include very low off-peak prices and also a critical peak price to protect the retailer against high-price periods in the spot market. This Option might also be appealing to a driver whose car is provided by their employer and whose employer is the one who is liable for the fuel costs for the vehicle. It could also appeal to residents of apartment buildings who park their EV in a shared carpark which is currently supplied with electricity billed to their body corporate.

Current metering regulations in the NEM impose significant cost and delay burdens which disadvantage Options 2 and 3 relative to Option 1. A consumer who wishes to charge their car using Option 2 or 3 must, under current regulations, invest in establishing a duplicate electrical system at their premises (see Figure 1 above). This typically costs $1000 to $8000 depending on the site. This has the effect of creating a price advantage for Option 1 and impeding the development of ESCOs like Better Place seeking to offer drivers Option 2 and retailers offering Option 3.

Improving metering regulations in the manner discussed on page 5 above would serve to lower barriers to ESCOs in the EV charging market and increase efficient consumer investment in DSP technology and services.

Question - Commercial driven investment in DSP technology

17. What amendments to the metering arrangements in the NEM are required to facilitate commercial investment in metering technology which supports time sensitive tariffs?

Questions - Consumer choice in metering capability

18. Are the current arrangements sufficient to facilitate a consumer's decision to install their own meter as a revenue meter? If not, what changes to the current arrangements are required?

19. Are any amendments to the arrangements required to encourage either the network businesses or retailers in invest in metering capability in order to support DSP options?

We recommend a range of proposed changes to metering regulations in the NEM which will remove the unreasonable cost barriers faced by consumers seeking to establish a specific tariff, retailer or managed service provider for their electric vehicle charging load or any other flexible load suitable for demand side participation. These changes will promote consumer choice in metering services and strengthen demand-side participation in the NEM.

The first of our proposed regulatory changes would establish the right for a consumer to allow two financially responsible market participants to share the connection and metering installation at their premises. This proposal is outlined in detail on page 5 above.

Proposed Regulatory Change II - The premises occupant should have the right to choose the features of their own metering installation. Right now this right is held by their retailer and distributor

If a premises occupant wishes to make changes to their metering installation, they cannot do so without their current retailer's and distributor's permission. The current design of the 'Responsible Person' clauses in the National Electricity Rules enables the incumbent retailer and, in some cases, the distributor, to block requests for metering installation changes using AEMO's MSATS Procedures.

For example, when a business provides an employee with a company car EV with a Better Place subscription our first step is to establish charging services for the employee at their home, including a new NMI for which Better Place will be the billable party. Adding a new NMI to an existing premises requires change requests to be submitted via AEMO's MSATS system. Under MSATS procedures, the incumbent retailer can reject change requests involving a NMI for which they are the Financially Responsible Market Participant. This allows an incumbent retailer to block the customer from accessing Better Place services using their existing connection. Distributors are the only party authorised to issue NMIs for connection points to their network, so they too have the power to delay or block a request for changes to the metering at an existing connection point.

Changes to regulations are required to give the premises occupant the clear right to authorise changes to their connection point and their metering installation to facilitate the allocation of an additional NMI for their EV charging load, if they wish to do so.

This is important both in the case of the residential home environment and also at multi-occupant environments like apartment buildings and at business premises. The owner of an apartment with a dedicated parking spot in the basement who seeks to establish Better Place charging services for their new EV must, under current regulations, get the permission of the body corporate's electricity retailer before making changes to the site's metering installation and getting a new meter and NMI allocated. Where a business with a new EV takes out a Better Place subscription and Better Place seeks to establish our charging services at their corporate headquarters, we must seek the permission of the business's electricity retailer to make changes to their metering installation to enable the establishment of separate metering and a new NMI for the EV load. Having been through this process many times, Better Place can report that in these circumstances retailers do not authorise changes to their customers' metering installations. Our assessment is that this is because incumbent retailers have a commercial interest in (A) not allowing other parties to access any growth in load at the customer's site, and (B) not incurring costs for undertaking administrative tasks required of them to authorise the metering installation changes.

Proposed Regulatory Change III - Allow access to alternative meter installers than the distributor, if the premises occupant authorises it

At most small customer sites in the NEM, the distributor is the responsible person for the metering installations under the National Electricity Rules pertaining to type 5 and 6 meters. If a customer wishes to make changes to the metering installation at their premises – such as the addition of a new measurement element or meter for their EV charging load – they must both obtain the new meter from the distributor and pay the distributor for undertaking the installation. This requirement generally means that a minimum of two, usually three, separate visits from licensed electrical contractors are required to undertake the work. First step is the electrician from the distributor visiting the site to remove the existing meter. The second step is the electrician hired by the customer (or by their EV charge services provider like Better Place) undertaking changes to the meterboard. The third step is the electrician from the distributor returning to mount and wire-in the new metering configuration.

Having multiple electricians completing essentially the same job is very inefficient and imposes unreasonable costs on the customer:

- **Duplicated travel costs** - Two different electricians must incur travel time to visit the site to complete a job that could be completed on one visit by one of them. In Victoria, a third visit from a licensed electrical inspector must also occur.
- **Costs from double-handling** – With multiple electricians completing the job, inefficiencies and extra costs in labour time are incurred as one technician waits around for the other to arrive and/or complete their part of the job.
- **Customer delays** - There is wasted time for the customer who must be present during this unnecessarily lengthy process and therefore away from work or other commitments during business hours.

See Appendix II below for detailed case studies of the process of implementing metering changes at small customer sites in three distributor territories in Victoria.

In NSW, metering installations can be undertaken by any electrician who has been accredited for completing this type of work.[2] This significantly reduces the cost and delays involved. Better Place proposes that the same model be adopted in all other jurisdictions.

Proposed Regulatory Change IV – Direct distributors to offer a network tariff for small load sites that doesn't bundle metering services charges with network use of system (NUOS) charges

The cost of providing metering services for small customers in the NEM includes the provision of the meter hardware itself, the maintenance of this hardware, collection of the consumption data from the meter, validation of this data, and distribution of the data into the market via the AEMO MSATS system.

Most distributors performing metering services for small customers recover the cost of providing this service by bundling it into the overall network tariff they levy on the customer via their retailer. They bundle together metering services charges and the network use of system (NUOS) charges into a single tariff.

In Victoria and South Australia, customers who seek an alternative metering provider to the distributor are now able to access classes of network tariff which are purely NUOS - metering is unbundled from NUOS in these tariffs. This allows the small customer to choose their own AEMO-accredited metering service provider and pay for these services separately from their network tariff. (Note: In Victoria, small customers with less than 160 MWh of consumption per annum are not permitted to use another metering provider other than their distributor until 31 December 2013, under the AMI Program.)

However, in NSW and QLD, small customers do not have access to a network tariff which separates the metering charges from the NUOS charges. This means if a small customer in NSW and QLD seeks to use an alternative metering provider, they pay for metering twice: once from their metering provider and once in their network tariff. The absence of an unbundled network tariff for small customers which does not bundle in cost-recovery for metering, serves to effectively create a monopoly for distributors over metering for small customers.

Unbundling metering from network tariffs is important because it promotes a competitive, innovative market in metering services for small customer sites which have EV charging load. Further, innovation in metering enables innovation in business models for electricity services and EV charging services.

Proposed regulatory change V – Amend metrology regulations to support the use of on-market sub-meters at sites like apartment buildings and corporate office parks

At premises like apartment buildings and corporate office parks where vehicle parking facilities are located in basements or spread across a large campus, there are often significant costs in reaching unmetered supply to establish a new connection to the distribution network for the new EV charging appliance. The most cost-effective metering configuration is an on-market sub-meter for the EV charging load, with the accredited Meter Data Agent for the site taking responsibility for undertaking

[2] Details on the NSW Accredited Service Provider scheme are available here: http://www.trade.nsw.gov.au/energy/electricity/network-connections/contestable

the subtraction task and preparing separate datastreams for the EV charging load and the rest of the premises. The cost savings derive from:

- No costs associated in lengthy cable runs from the site of the EV charging load to the nearest point of unmetered supply – This can involve trenching, drilling through walls, hundreds of meters of cabling, and other complex structural work at large sites.
- No requirement to take the entire site off supply (which will inconvenience all occupants of the premises, not just the EV owner)
- No requirement to make changes to the existing meter panel and connection assets.

This metering configuration is currently only permitted in some parts of the NEM (not QLD or ACT) and, where it is permitted, it is hampered by a set of guidelines for embedded networks which are widely acknowledged by retailers, distributors and AEMO to be lacking clarity on key issues.[3]

We propose that changes to Chapter 7 of the National Electricity Rules be considered to establish a firm regulatory basis by which a customer can access the market and obtain a NMI for their load using an on-market, sub-metering configuration.

Questions - Role of cost reflective pricing

25. Would fully cost-reflective price signals enable the supply chain to act in a co-ordinated manner towards efficient DSP opportunities or would additional amendments be needed?

26. Would applying a network tariff scheme, similar to Orion's approach, be effective in the NEM?

EV charging load, under management by a party such as Better Place, is the type of flexible load which is well suited to be exposed to cost-reflective pricing with customer consent. We would like to see DNSPs offering dynamic network pricing of the type profiled in the Directions Paper with Orion New Zealand. Such a network tariff structure gives a load aggregator like Better Place substantial incentive to actively schedule our load in response to dynamic pricing signals from the DNSPs and to lower the underlying cost of providing battery charging services to our customers.

Question – Profit incentives on network businesses

36. Do you consider that the current regulatory arrangements could prevent network businesses from pursuing efficient DSP projects which contribute to achieving a more economically efficient demand/supply balance in the electricity market?

[3] For an overview of the issues with current regulation of embedded or exempt networks see AusGrid's submission to the AEMC Electric Vehicles Review from 12 March 2012, Page 6. (http://tinyurl.com/78fbyj9)

Current regulatory arrangements for network businesses do not provide them with sufficient incentives or rewards for initiatives which improve system load shape. A DNSP which is able manage its customers' load profiles so that it can defer or avoid capital expenditure does not enjoy as large a risk-weighted financial reward as a DNSP which simply undertakes the capital expenditure. We support reforms to the regulatory arrangements which remedy this problem and boost the rewards for those DNSPs who can bring about peak demand reductions.

Appendix I - Profile of Better Place

Better Place is the world's leading electric car charge network company and has raised over US$750M in equity financing in the last 3 years from investors including HSBC, GE, Morgan Stanley and UBS AG. The company works with all parts of the transportation ecosystem, including automakers, battery suppliers, energy companies, and the public sector and therefore has a detailed and up-to-date knowledge of global developments in this rapidly moving space.

To accelerate the mass adoption of electric cars, Better Place is building an intelligent network of plug-in charge spots at private homes, corporate and public car parks, which will provide most of the energy required. For extended range we will also deploy battery switch stations that allow the driver to swap their depleted battery for a full one in under five minutes and, where applicable, high-voltage quick charge outlets.

Better Place was founded in 2007. In 2008, Israel became the first country – and Renault the first car maker – to embrace the Better Place model of building open network infrastructure to enable mass adoption of electric vehicles and delivering transportation as a sustainable service. Denmark, Australia, California, Hawaii and Ontario have followed suit. Better Place recently announced its intention to expand the network from Denmark through Western Europe, and into China. Over 500 staff in eight countries are now employed by the Better Place group of companies. Better Place Australia employs 50 staff in offices in Melbourne and Sydney.

For more information visit www.betterplace.com.au

Appendix II – Victorian Government Electric Vehicle Trial - Report on Costs of Separate Metering

PROGRESS REPORT

Project to Establish Separate Metering and Billing for Electric Vehicle Charging at Victorian Homes

February 2012

Prepared by Better Place for the Victorian Government Electric Vehicle Trial

Contact: Tim Watts, Better Place (Australia) Pty Ltd | tim.watts@betterplace.com | +61 403 924 465

Summary

Establishing separate metering and billing for electric vehicle (EV) charging load at homes is critically important. First, the home is the location that cars spent the greatest amount of time parked, so this is where the majority of charging occurs.[4] Second, separate metering provides a series of benefits for drivers and for the efficiency of the electricity system:

- **Driver benefits** – Separate metering allows vehicle fuel costs to be separately priced and billed separately from the rest of the home. This allows application of off-peak rates for the car to lower drivers' fuel bills. It also ensures that employees with company cars or salary-packaged cars and small-business owners can ensure that their company, and not the employee, is billed for their vehicle fuel costs. More than 200,000 cars sold in Australia each year are company cars or salary-packaged cars.
- **Electricity system benefits** – As a range of studies by organisations like CSIRO have shown, there are significant benefits for the electricity system if EV charging takes place during off-peak periods. This outcome promotes improved utilisation rates of network and generation assets, lowering costs for all electricity consumers. Separate metering and billing of the EV charging load allows drivers to access EV-specific pricing to reward off-peak charging. It also allows drivers to use charge management service providers, such as Better Place, who actively manage the charging of their car battery into off-peak periods to minimise their fuelling costs.

The purpose of this project was to illustrate the challenges involved in establishing separate metering for EV charging loads at residential premises in Victoria. Sites in 3 different distributor territories have been tested so far and at each the costs and delays incurred were significant:

Site	Total costs[5]	Total delays
Edgevale Rd, Kew 3101	$3,202.56	18 weeks
Hillhouse Rd, Templestowe 3106	$3,677.05	8 weeks
Taylors Lane, Rowville 3178	$1,715.05	9 weeks

The three installations undertaken so far for this project have highlighted a range of issues with the current Victorian electricity industry processes for establishing separate metering for EV charging load at residential premises. These include:

1. **Overly complex processes with double-handling** – Establishing separate metering currently requires a sequence of 10 main tasks to be completed by 5 different parties: the electrician completing the installation of the EV charger, a Licensed Electrical Safety Inspector, the premises retailer, the retailer for the EV charging service provider, and the distributor. Each

[4] This has been confirmed by a range of trials and studies of EV driver behaviour. These include *Data Analysis Report of Ultra-low Carbon Vehicles from the CABLED Trial,* Aston University, June 2011; the *Mini-E Field Trial Report*, BMW North America, 2011.

[5] The costs cited here are only those related to establishing a separate meter with NMI for the EV charging load. The cost of the charging equipment for the EV and installing this charging equipment is not included.

task in the sequence can only start when the previous task in the sequence is complete. The number of parties involved makes communication difficult and leads to delays and misunderstandings. The process in other states, such as NSW, is much more streamlined and efficient.

2. **Duplication of service charges** – Service charges on both the premises owner and their EV charging services provider are levied by distributors when separate metering is established. One charge is levied for detaching and for reattaching the old meter. Another charge is levied for attaching the new meter for the EV charging load. These tasks are completed by the same technicians from the distributor on the same meterboard on the same day so the rationale for two sets of service charges is questionable.
3. **Uncertainty and inconsistent interpretations of Service and Installation Rules** – At these sites, we have encountered substantial differences of interpretation in the Victorian Service and Installation Rules (SIRS) between distributors, Licensed Electrical Inspectors and electricians. For example, can electricians isolate a site by removing and replacing the service fuse without requiring a distributor truck visit, under the VESI code of practice[6]? Or, can a 2nd meter be installed on a new meterboard adjacent to the existing meterboard, rather than the more costly option of replacing the old meterboard with a new one large enough to hold both the old and new meters?
4. **Lack of choice for small customers in connection and metering configurations –** Distributors have a monopoly on metering and connections for small customers in Victoria. A small number of 'standard' connection and metering configurations are offered by distributors for a price set by the Australian Energy Regulator. But customers seeking alternative meter configurations that deliver them lower costs or greater control of their electricity consumption face real barriers. For example, while a customer with electric hotwater or slab heating can access separate metering for this load from distributors, a customer seeking this configuration for a new electric car charger cannot. Under the terms of their licenses, distributors are expected to be responsive and cost-efficient when customers request connections to their networks. But the experience of this project so far is that they are not.

[6] Victorian Electricity Supply Industry *Code of Practice for Low Voltage Service Fuse Removal* (http://www.victoriansir.org.au/documents/POW01001A4.pdf)

The Current Process for Establishing Separate Metering

Figure 1 below summarises the key steps involved in establishing a separate meter at a residential premises in Victoria. The following abbreviations apply: REC: Registered Electrical Contractor (electrician). LEI: Licensed Electrical Inspector DB: Distributor. EWR: Electrical Work Request form.

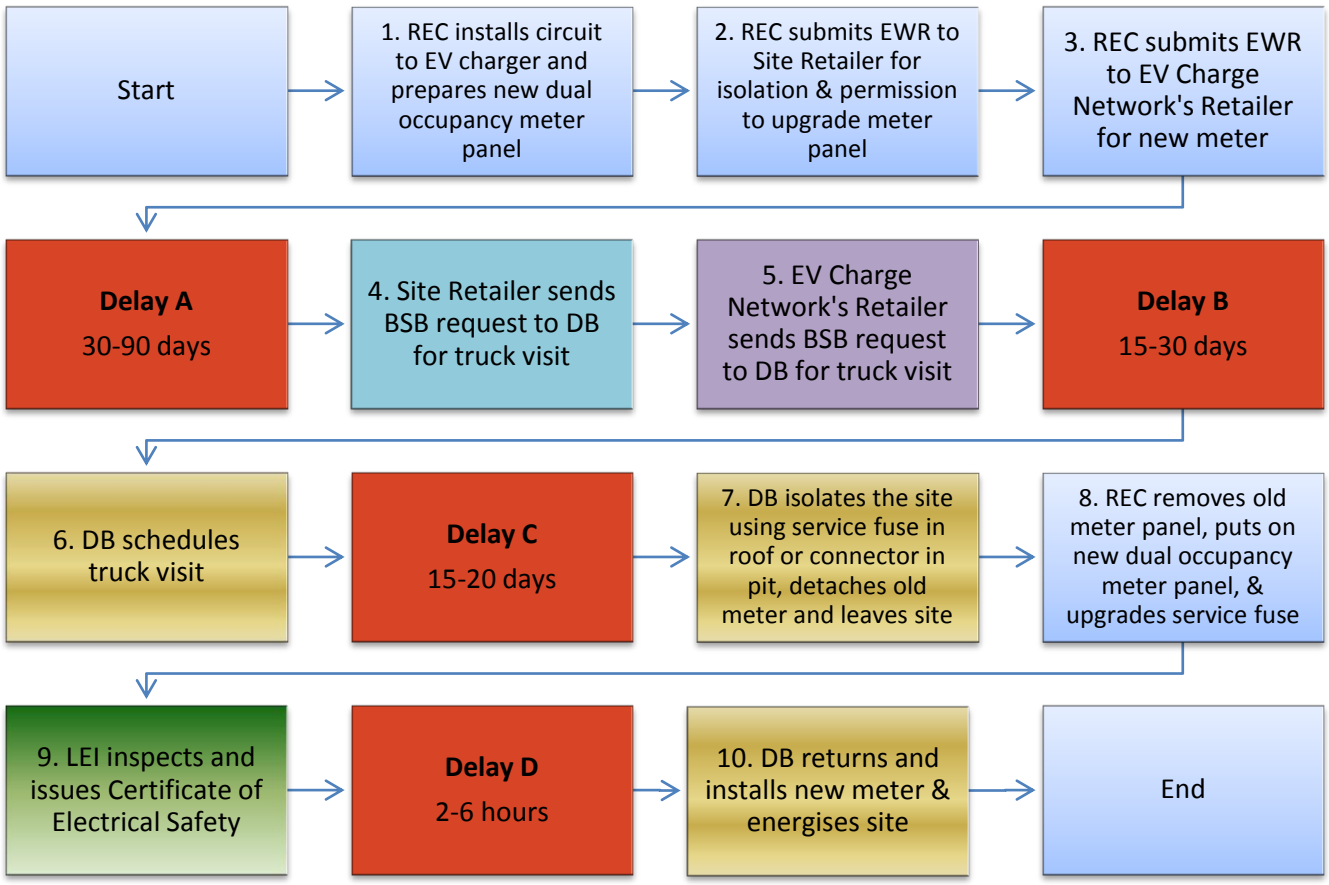

Figure 1 - Process for Establishing Separate Metering

Site reports

Site 1	Edgevale Road, Kew VIC 3101	
Distributor	Citipower	
Existing house retailer	AGL	
EV charge network's retailer	Powerdirect (It was necessary for Better Place to open a new account with AGL to get the Citipower truck visit scheduled. Once the truck visit occurred, we then switched our account back to Powerdirect.)	
Registered electrical contractor	Silcar Pty Ltd	
Licensed Electrical Inspector	Techsafe Pty Ltd	
Costs incurred	New connection fee to EV charge network: (This amount contains fees levied by Citipower and by retailer AGL for establishing the new connection point and meter.)	$603.39 (*Estimate: final amount to be billed in the months ahead)
	Service fee to home owner: (The Service Truck Visit fee to be billed by Citipower to the home owner via AGL for removing the existing meter from the meterboard and replacing it on the new meterboard.)	$143.90 (*Estimate: final amount to be billed in the months ahead)
	Silcar Pty Ltd • Install new meter panel. • Install new main switch. • Install new master control circuit breaker. • Complete and submit two EWR forms. • Two certificates of electrical safety.	$2,418.65
	TOTAL	**$3,202.56**
Delays experienced	**18 weeks** New connection request submitted: 21 July 2011 New connection established: 15 November 2011	

Site 2	Hillhouse Road, Templestowe, VIC 3106	
Distributor	United Energy	
Incumbent site retailer	Origin	
Charge network retailer	Powerdirect	
Registered electrical contractor	Twin Electrics	
Licensed Electrical Inspector	Techsafe Pty Ltd	
Costs incurred	New connection fee to EV charge network: (This amount contains fees levied by United Energy and by retailer Powerdirect for establishing the new connection point and meter.)	$605.00 (*Estimate: final amount to be billed in the months ahead)
	Service fee to home owner: (The Service Truck Visit fee to be billed by United Energy to the home owner via Origin for removing the existing meter from the meterboard and replacing it on the new meterboard.)	$109.75 (*Estimate: final amount to be billed in the months ahead)
	Twin Electrics • Remove old metal meter board • Install new Drav meter box combination circuit breaker board. • Install new master control breaker and new panel fuses. • Wire up panel and run in new earth cable. • Re-run power to EV charger unit. • Complete and submit two EWR forms. • Two certificates of electrical safety.	$2,962.30
	TOTAL	**$3,677.05**
Delays experienced	**8 weeks** New connection request submitted: 30 November 2011 New connection established: 23 January 2011	

Site 3	Taylors Lane, Rowville VIC 3178	
Distributor	SP AusNet	
Incumbent site retailer	TRUenergy	
Charge network retailer	Powerdirect	
Registered electrical contractor	Twin Electrics	
Licensed Electrical Inspector	Techsafe Pty Ltd	
Costs incurred	New connection fee to EV charge network: (SP AusNet service fee for establishing the new connection point and meter. Retailers also add administrative fees to this figure.)	$605.00 (*Estimate: final amount to be billed in the months ahead)
	Service fee to home owner: (SP AusNet Service Truck Visit fee to the home owner via TRUenergy for removing the existing meter from the meterboard and replacing it on the new meterboard.)	$159.05 (*Estimate: final amount to be billed in the months ahead)
	Twin Electrics • Install new meter panel. • Install new main switch. • Install new master control circuit breaker. • Complete and submit two EWR forms. • Two certificates of electrical safety.	$951.00
	TOTAL	**$1,715.05**
Delays experienced	**9 weeks** New connection request submitted: 30 November 2011 New connection established: 30 January 2011	

Issues Arising in the Installations

I. Overly complex processes with double-handling

Establishing separate metering currently requires a sequence of 10 main tasks to be completed by 5 different parties: the electrician completing the installation of the EV charger, the premises retailer, the retailer for the EV charging service provider, the distributor, and a Licensed Electrical Safety Inspector to issue a certificate of electrical safety once the job is complete. Each task in the sequence can only start when the previous task in the sequence is complete. The number of parties involved makes communication difficult and leads to delays and misunderstandings.

At all sites so far we have encountered difficulties at the stage in the process where the electrician has submitted EWR (electrical work request) forms to the retailer at the site and the new retailer for the electric vehicle charging load (Labelled Delay A in Figure 1 above). As we understand it, the next step is for these EWRs to be forwarded to the distributor via an established BSB protocol between distributor and retailers. However at each site retailers' new connections departments have been a bottleneck with confusion, uncertainty and queries back to the electrician, to the site owner and to Better Place about:

- The street addresses of the new connection for the EV charger – Some retailers administration systems do not appear to allow an account to be established for a second meter at the same address but for a different customer.
- The status of the new connection as a domestic or business customer account
- Whether or not two retailers can serve the same site in a multi-occupancy new connection
- What role the current site retailer needs to play in the new connection

For at least some retailers, it is not possible to get the request forwarded through to the distributor for the new connection unless the new account is being established with incumbent site retailer. At the 10 Edgevale Rd, Kew site where AGL was the incumbent retailer, it was necessary for Better Place to open a new account with AGL to get the Citipower truck visit scheduled. Once the truck visit occurred, we then switched our account back to our nominated retailer Powerdirect.

There are also delays once the retailers have submitted their EWR forms to the distributor. (Labelled Delays B and C in Figure 1 above.) Under distributors' licenses, they are obliged to complete a new connection request no more than 20 business days after the retailer has submitted the EWR. In 2 of the 3 sites, this deadline was not met and we have received no explanation why this occurred.

The process in other states, such as NSW, is generally much more streamlined and efficient. In NSW, an electrician with ASP accreditation (of which there are thousands)[7] simply visits the distributors depot, submits the EWR form for the new connection, and is supplied on the spot with the model of meter requested on the EWR form. He or she then visits the site of the new connection, establishes the new connection, installs the meter and notifies the distributor it is complete by email.

In the NSW model, 1 electrician completes the work. By contrast, at the Rowville site we had 4 different trucks visit the site during the day of the installation with 7 personnel from various organisations involved in completing work. Having so many different people performing different

[7] http://www.trade.nsw.gov.au/energy/electricity/network-connections/contestable

roles creates cost and delays. For example, Delay D in the Figure 1 above occurs because the distributor truck departs the site between detaching the existing meter and reinstalling the new meter to allow the electrician time to complete the meterboard replacement. This allows the distributor truck to go off to complete another job but means the electricians have to wait around for them to return, thereby costing the customer more in labour time.

II. Duplication of service charges

Service charges on both the premises owner and their EV charging services provider are levied by distributors when separate metering is established. One charge is levied for detaching and for reattaching the old meter. Another charge is levied for attaching the new meter for the EV charging load. These tasks are completed by the same technicians from the distributor on the same meterboard on the same day so the rationale for two sets of service charges is questionable.

III. Uncertainty and inconsistent interpretations of Service and Installation Rules

At the sites completed so far, we have encountered substantial differences of interpretation in the SIRS between distributors, Licensed Electrical Inspectors and electricians. For example, the Victorian Electricity Supply Industry *Code of Practice for Low Voltage Service Fuse Removal* (http://www.victoriansir.org.au/documents/POW01001A4.pdf) indicates that an electrician can de-energise or isolate a small residential premises for the purposes of undertaking work on the metering configuration for "increased industry efficiency and decreased costs by reducing the necessity of Electricity Distributor personnel site visits." Contrary to the published code of practice, distributors do not allow this practice and instead require an additional service truck visit to isolate a site for which they can charge a service fee of $100-$200.

Another area of uncertainty is the appropriate meterboard specifications for multi-occupancy metering installations. At two of the sites, it would have been more cost-effective to install the new meter for the EV charging load on a separate meterboard mounted immediately adjacent to the existing meterboard rather than replacing the meterboard with an larger one and wiring it for the two separate meters (the old meter for the house and the new meter for the home). This method appears to be permitted under clause 8.8.3 in the SIRS but was not supported by distributors at the project sites in this project.

IV. Lack of choice for small customers in connection and metering configurations

Distributors have a monopoly on metering and connections for small customers in Victoria. They each offer a range of standard connection and metering configurations and levy prices for them based on efficient cost calculations approved by the Australian Energy Regulator. Under the terms of their licenses, distributors are also expected to serve at efficient cost those customers on their networks seeking non-standard, alternative connection and metering configurations. But the experience of this project so far is that they are not.

For example, upgrading from a single element meter to a two element meter, with the electric car charger load being measured by the second element, could be a low-cost solution for a customer seeking to access electricity for their new EV from the same electricity retailer serving their home, but on different pricing terms. (For example time-of-use tariffs which offer cheap off-peak rates for

overnight charging of the EV). None of the three distributors engaged as part of this project to date can provide customers on their network with a 2 element meter.