Submission to the 'Power of Choice – Stage 3 DSP Review'

26 August 2011

Australian Energy Market Commission

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Contents

Executive Summary

1. Electric car charging is one of the best sources of demand-side participation (DSP)

- We expect rapid growth in sales of electric cars and electricity consumption from electric car charging from 2012.
- Demand from electric car charging is by its nature very flexible and ideally suited to being shifted in time to respond to signals from the market.

2. The benefits of DSP from electric car charging could be very substantial

- Aggregators like Better Place can provide large scale, fast-response and geographically targeted demand-side response, with the right market conditions.

3. Electric vehicle charging without DSP will create problems for the electricity sector

- Without action from the AEMC, electric car charging will worsen load shape and increase the burden of investment in distribution networks and new generation.

4. The market conditions which are needed for DSP from electric car charging to occur

- Availability of cost-effective and quick-to-implement metering and NMI allocation for each electric vehicle charger at drivers' homes and workplaces.
- Availability of energy and network tariff structures which incentivise active demand-side participation from electric car charging.

5. Why these market conditions are not in place

- Establishing metering and a NMI for electric car chargers at workplaces and residences under current rules is very expensive and takes a very long time.
- New metering protocols for electric car chargers such as submetering need to be developed.
- Retail tariff regulations prevent optimal tariffs being applied to electric vehicle charging load.

Questions from the Issues Paper that this Submission addresses

#	Question from AEMC
Market conditions required for efficient DSP outcomes	
9	What are considered the relevant market conditions to facilitate and promote consumer take up of cost effective DSP?
10	Are there any specific market conditions which may need to be in place to enable third parties to facilitate consumer decision making and capture the value of flexible demand? Please provide examples and evidence as appropriate.
11	What market conditions (technologies, processes, tariff structures, information etc) are needed, that are not currently employed in the electricity market, to make other DSP options available to consumers?

1. Electric car charging is one of the best sources of demand-side participation (DSP)

The National Electricity Rules have served the market well for over a decade. However with changes in technologies and consumer behaviour, and with the emergence of complex problems such as carbon abatement and the deteriorating load shape, the rules need to be adapted to ensure they continue to produce positive results.

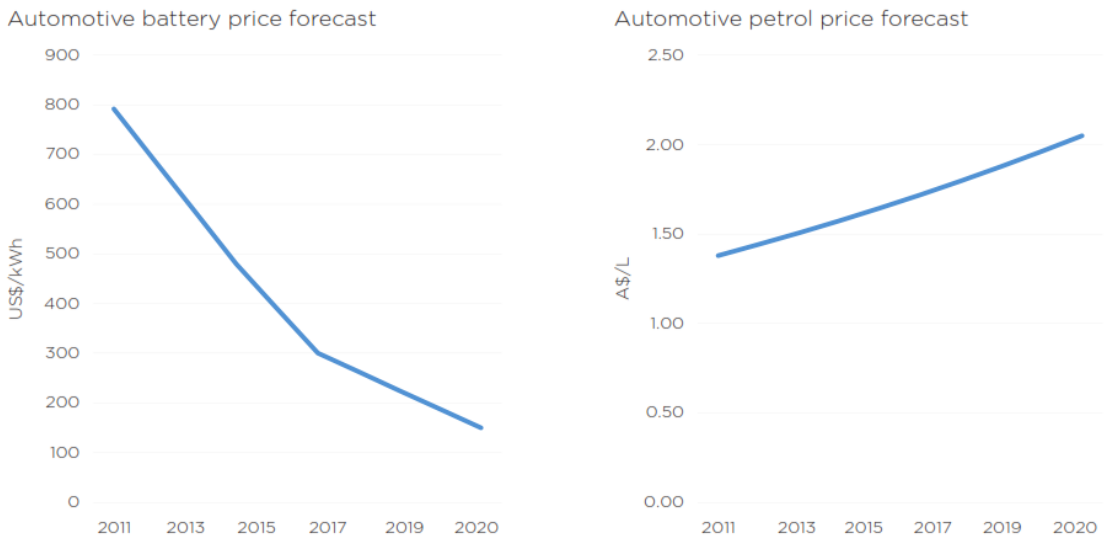
The arrival of mass-market electric cars is a big new challenge for the Australian electricity sector. The question for the AEMC is how demand from electric car charging will be integrated into the NEM. If the AEMC puts the right policy and regulatory settings in place now, electric car charging can be harnessed to improve the efficiency of the grid and the generation sector, and to help put downward pressure on power bills rather than worsening load shape and further pushing up electricity prices.

1.1 Electric cars are coming

A wide range of high-quality, affordably-priced electric cars from established car makers including Nissan, Mitsubishi, Renault, Holden, and Ford are expected to be available in Australia in the next 3 years. (See Appendix for details.) These vehicles have a very strong value proposition for drivers when compared with petrol competitors:

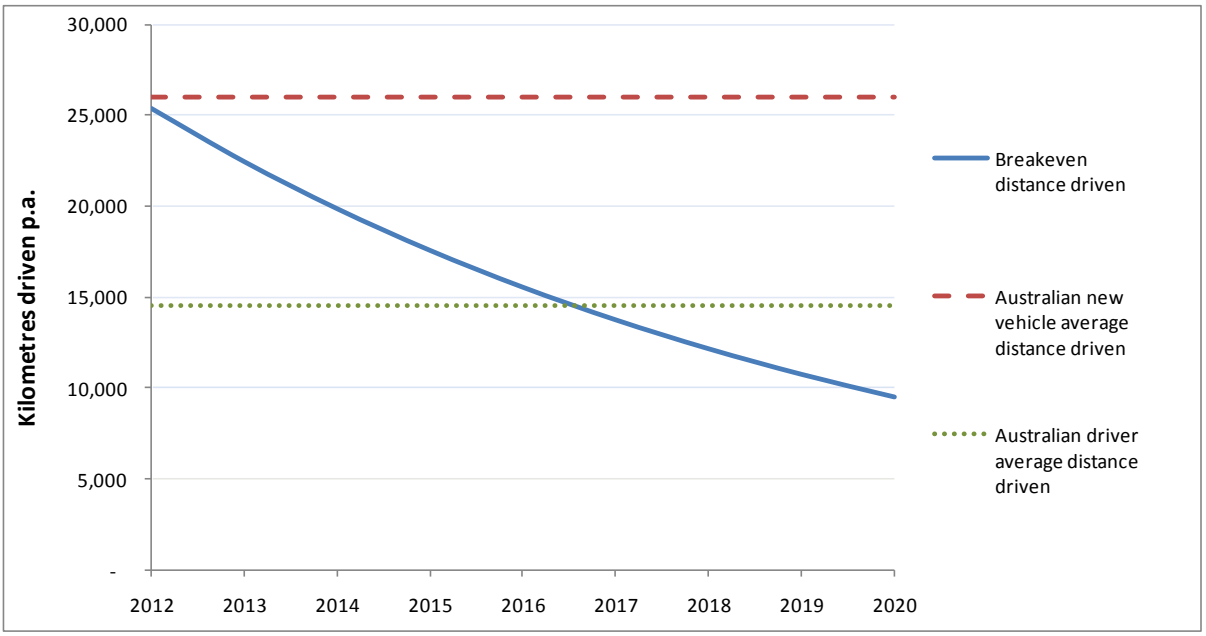
A. **Lower total cost of ownership** compared to petrol vehicles for many drivers – As *Figure 1* and *Figure 2* below show, with the continuation of the reductions in battery prices and the long-term trend of increasing petrol prices, more and more drivers will save money by switching to electric cars.
B. **Zero emissions motoring** when powered by 100% renewable electricity
C. **The convenience** of leaving home every morning with a full battery
D. **Superior driving performance** and quietness compared to similarly priced petrol vehicles

Figure 1: Battery prices going down, petrol prices going up



Sources: US Department of Energy battery price forecast. Petrol prices are assumed to increase at 4.5% p.a. from 2011.

Figure 2: Annual mileage at which it is cheaper to switch to an electric car



Note: Compares cost of running a petrol car to cost of running an electric car. For the purposes of this analysis, electric car running costs include electricity, battery, and the per vehicle share of capital and operating costs for an electric car charging network like Better Place

1.2 Electric car market penetration and resultant electricity consumption

One million new vehicles are sold in Australia each year. We expect rapid growth in the market share of electric cars over the next decade as the cost advantages of these cars become a reality for more and more drivers, and the range of brands and vehicle formats expands. Every one of the world's largest 20 carmakers now has an electric model in production or coming into production. A wide range of electric models for different consumer segments will be available, including SUVs, luxury saloons, light commercial vehicles, people movers and sports cars. (See Appendix II.)

Australians spend $35 billion each year on petrol.[1] Right now, 40% of this market would save money by switching to an electric car. By 2020, we expect this proportion will be over 85%.

Market penetration forecasts for electric cars vary according to assumptions made on parameters such as battery prices, battery life, availability of charge infrastructure, and so on. However there can be no doubt that these cars will be produced at high volumes and be very serious competitors in the automotive marketplace given the billions of dollars of capital investment in electric car manufacturing, battery manufacturing and charge networks which has now been made globally from successful, proven players such as Renault-Nissan, GM, Ford, General Electric, Siemens, NEC and Toshiba.[2] Recent announcements include:

- The Chinese government decreed in 2010 that 5 million electric cars will be on the road in that country by 2020.[3]
- GM will increase US production of the Chevrolet Volt to over 45,000 per year by 2012.[4]
- General Electric has committed to purchase 25,000 electric vehicles by 2015.[5]
- Better Place has ordered 115,000 Fluence ZE electric cars from Renault.
- PSA Peugeot-Citroen has ordered 100,000 electric vehicles from Mitsubishi for sale under its brands in the European market.[6]

Electric vehicle charging will increase demand for electricity in Australia. A mid-sized electric car such as the 2012 Renault Fluence ZE or 2012 Nissan Leaf will require about 3 to 5 MWh of electricity consumption per annum, depending on the driver's mileage, driving style and the mix of city-highway journeys. Chargers provided by suppliers such as Better Place for these 2012 vehicles draw a maximum of 3.7 kW, but faster home and workplace charging is coming. Chargers for the 2013 electric cars from Ford and BMW will draw up to 7.4 kW. Three-phase chargers drawing 10 kW or more are likely to emerge from 2013. This compares to the maximum demand from a typical

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[1] ABS, Motormouth.

[2] The investment in China alone in the electric vehicle value chain is estimated at $17 billion (Dumaine, B., 'China Charges into Electric Cars, *Fortune*, 19 October 2010.) Renault-Nissan has committed $5.6 billion in its vehicle electrification program (Squatriglia, C., "Renault-Nissan CEO Pledges $5.6 Billion for EVs", *Wired,* 16 June 2011.

[3] Dumaine, 2010.

[4] Centre for Automotive Research, Ann Arbor, Michigan, *Deployment Rollout Estimate of Electric Vehicles 2011-15*, January 2011.

[5] Ibid

[6] Hammerton, R., 'Mitsubishi left at the altar – again', *GoAuto,* 10 March 2010.

household connection of around 15-20 kW. It is clear that when the car charger is running, it will represent a substantial share of the average household load.

1.3 Why electric car charging is ideally suited to DSP

Unlike many other common types of residential and workplace electricity consumption such as lighting, heating, cooling, and IT systems, demand from electric car charging is by its nature very flexible and ideally suited to being shifted in time to respond to signals from the market. This is because:

I. Unlike other appliances, electric cars store power in their batteries for use at a different time.
II. Cars are parked and plugged-in for periods much longer than the length of time typically required to fill their batteries. As a result there is a lot of flexibility in when they charge
III. Charging providers, such as Better Place, are building remotely-managed networks of chargers in customers' homes, workplaces and public carparks so can offer the market aggregated demand-response.

I. Unlike other appliances, electric cars store power in their batteries for use at a different time

Electric cars have battery storage. This means that unlike nearly all other types of residential and workplace appliances the drawing of power from the electricity network (i.e. charging) does not occur simultaneously with the consumption of power for consumer benefit (i.e. driving). This separation forms the basis of the significant load-shifting capability of electric car charging.

II. Cars are parked and plugged-in for periods much longer than the length of time typically required to fill their batteries. As a result there is a lot of flexibility in when they charge

Most cars spend a substantial proportion of each day parked – 20 hours or more on average. Not surprisingly, homes and workplaces are the two locations where cars are parked the longest. Better Place's engagement with prospective purchasers of electric cars in Australia suggests that these are two locations where drivers expect to charge their cars. Data from the UK's largest trial of electric cars, the CABLED Project indicates that peaks for charging were observed between 7-9am and from 6-7pm which can most likely be attributed to arrival at work and at home - locations that accounted for 85% of charging time by participants in the trial.[7]

While filling an average electric car battery from empty takes 6-8 hours[8], the vast majority of plug-ins will occur at times when the car battery is almost full and requires just a 'top-up' charge. Australian motor vehicle use data shows that that 90 percent of trips are less than 25 kms in length.[9]

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[7] CABLED Consortium, Press Release: *First year's findings*, July 2011 [Online] Accessed 11 August 2011. Available at: http://cabled.org.uk/news/first-years-findings

[8] For example a Renault Fluence ZE which has 22 kWh of usable storage can be recharged from empty by a Better Place 3.7 kW charger in 6-8 hours.

[9] Based on Victorian and NSW data: The Victorian Integrated Survey of Transport Activity (VISTA) 2007/08 from the Victorian Department of Transport. NSW Household Travel Survey 2000/01 to 2008/09, NSW Department of Transport.

The fuel economy of cars such as the Nissan Leaf and the Renault Fluence ZE is around 6 to 8km per kWh, depending on driving style, city-highway mix and vehicle size. A home or workplace charger for these vehicles delivers a maximum 3.7 kW. (Factors such as the state-of-charge of the battery and battery temperature can reduce the rate of charging to below the maximum.) So, after a trip of say 25 kms, the battery will require just 1-2 hours of charging until it is full. Given a typical car is parked for 20 hours a day, there is a lot of flexibility in when this 1-2 hours of top-up charging occurs.

Better Place's guidance to its customers is to plug-in whenever they park their car. We find that once the habit of plugging in is ingrained it becomes second nature and an automatic step for drivers when they arrive at home or work. Plugging the car in does not automatically commence charging. Charging is scheduled to ensure the customer's driving needs are met. (See Section 1.4 below for more detail.)

III. Charging providers, such as Better Place, are building remotely-managed networks of chargers in customers' homes, workplaces and public carparks so can offer the market aggregated demand-response

Better Place is building a network of remotely-managed electric car chargers to serve drivers. To date in Australia, we have installed remotely-managed chargers at more than 50 sites in 4 states including homes, workplaces and public locations on the road network.

The operation of the NEM is highly dynamic and is influenced by the real-time interaction of a range of factors including time of day, weather conditions, wind conditions, maintenance scheduling for specific generators, and outages in the transmission or distribution network. For an individual consumer, the transaction costs involved in tracking these factors and responding to them by time-shifting consumption will typically be prohibitive. The presence of aggregators in the electric vehicle charging market such as Better Place helps lower per-event transactions costs and provides the opportunity for meaningful scale in the NEM.

1.4 Case Study - DSP in the NEM from an electric car charge network

Below is a description of how an electric car charge network operator (in this case Better Place) would operate as a demand-side participant in the NEM.

Business model

Better Place serves any car with a plug, both fixed battery and switchable battery cars. Our core offer to drivers and fleet operators is a subscription-based package which includes:

1. **Batteries** – Usage of a battery for your car and unlimited access to fresh batteries from our network of roadside battery switch stations via a less than 5 minute automated swap process.
2. **Charger** installed at your home and/or workplace car park. Chargers contain a SIM card and are remotely managed from the Better Place network operations centre.
3. **All the 100% renewable electricity you require for your driving needs.** The electricity consumed by the Better Place chargers which are installed in drivers' homes or workplace car parks is planned to be separately metered, have its own NMI and tariff structure, and be billed directly to Better Place not to the driver or site owner.

Subscriptions are paid monthly and are priced based on maximum kilometres driven per annum. For example, a maximum 15,000kms Per Year Plan, a higher-priced 25,000kms Per Year Plan and so on. (Our Australian subscription pricing will not be publicly announced until closer to our launch date in 2012.) The volume of electricity consumed by Better Place chargers does not influence the pricing charged to subscribers. 'Kilometres driven' is the parameter which impacts the price paid by the subscriber and this is measured and reported by a telemetry unit in the car.

Demand response capability

At each site (including residences and workplaces) where a Better Place electric car charger is installed, Better Place is the NEM customer for the kWh consumed by the charger and we select our own retailer. We remotely manage when the charger is activated and the rate of the charger's electricity consumption via a wireless communications module inside the charger. When a subscriber's car is plugged into a Better Place charger in their driveway, garage or carpark, the timing and rate of charging provided is managed by our network operations centre to ensure that the subscriber receives all the charge they require for their driving needs. We assess drivers' needs in real-time based on a range of parameters including:

- The state-of-charge of the individual subscribers' car batteries
- Individual subscribers' vehicle usage patterns including:
    - Journey timing
    - Duration of journeys
    - Fuel economy attained on journeys

At any given point in time, a very high proportion of subscribers do not require immediate charging to meet their driving needs. (See Section 1.3 above for more detail.) As a result, Better Place has significant discretion to time the electricity demand from its portfolio of chargers across the NEM in order to respond to financial incentives offered by retailers and by distribution network operators. Such financial incentives can include time-of-use energy and network tariffs, critical peak tariffs for energy and network services, and payments for demand-reduction provided on-call.

2. The benefits of DSP from electric car charging could be very substantial

Below is an indication of the size of demand-side response that an electric car charge network like Better Place can provide for a given number of electric car chargers under management.

Number of electric car chargers under management	**Aggregate maximum demand[10]**	**Indicative size of demand side response available at any point in time[10]**
1,000	3.7 MW	1.4 - 3.0 MW
100,000	370 MW	140 – 300 MW
1,000,000	3,700 MW	1,400 – 3,000 MW

[10] These figures are based on the capacity of today's chargers. This will increase in the future as explained above in Section 1.3.

The demand-side response that Better Place can offer the market has the following features:

- **Rapid response time** – Our network operations centre software has been built to allow us to respond to signals from counter parties in the market in seconds.
- **Capacity to offer repeated demand response actions in a short period** – Unlike some large industrial power users such as smelters or manufacturing plants with high start-up cost and fixed overheads, we have the flexibility to reduce our demand multiple times over a short time period.
- **Geographically targeted demand response for each zone in the distribution network** – The precise location of each charger in the Better Place portfolio in the distribution network is defined when it is installed and activated. This means we can reduce our load in a specific zone in the distribution network if requested by a distribution network operator.

3. Electric vehicle charging without DSP will create problems for the electricity sector

The arrival of mass-market electric cars is a big opportunity for the Australian electricity sector. The question for the AEMC is how demand from electric car charging will be integrated into the NEM. If the AEMC puts the right policy and regulatory settings in place now, electric car charging can be harnessed to improve the efficiency of the grid and the generation sector, and to help put downward pressure on power bills rather than worsening load shape and further pushing up electricity prices.

The choice that the AEMC faces with regard to electric car charging is between two possible future scenarios.

Future Scenario 1 – Electric car charging worsens load shape and increases the burden of investment in network augmentation and additional generation	
Detail	In this scenario, electric car chargers are purchased as an appliance based on price and performance from traditional appliance retailers such as Bunnings, Harvey Norman and so on. Drivers install chargers at their homes and workplaces and are billed by retailers for the electricity they use in charging their cars under the same tariff structure which applies to the rest of their home or workplace. This tariff is typically flat or a moderate peak/off peak structure. Most consumers do not want too heavy penalties for electricity consumption at peak times because their lighting, heating, cooking and IT system use is hard to time-shift without impacting their amenity. Under this scenario, electric car owners will plug-in and immediately commence charging when they arrive at home or work due to its convenience. A small number may elect to use timers to delay their charging but, in general, charging will commence when the driver arrives at work or gets home in the evening. The result is that this charging will add to peak demand levels. Higher peak demand levels will require capital expenditure by distribution networks on network augmentation and higher network tariffs to pay for this expenditure. Higher peak demand will also tighten the supply-demand balance in the wholesale market resulting in increases in the average cost of energy.
Precedent	Air conditioners:

	• The worsening of the load shape in the NEM due to the market penetration of air conditioners over the past decade is well documented. • Under this scenario, electric car chargers would have similar results to air conditioners, but perhaps even stronger effects given car chargers have a higher (and increasing) rate of maximum demand.

Future Scenario 2 – Electric car charging promotes efficiency in NEM	
Detail	In this scenario, electric car charging is separately metered and exposed to different tariff structures than the rest of the home or workplace consumption. Customers such as charge network operators like Better Place or individual drivers who have secured their own 'EV tariff' from a retailer, schedule car charging to align with off-peak periods and in response to dynamic signals from the market such as critical peak prices or demand response payments. The net result is that as the overall load from electric car charging grows, the scheduling of this load serves to improve load shape, put downward pressure on network tariffs and shaves peaks in the wholesale spot market.
Precedent	Electric hot water systems: • These hot water systems were introduced into the market at volume from the 1950s and state-owned electricity corporations imposed compulsory load control, separate metering and discounted off peak tariff structures which resulted in improvements to system load shape. • We are **not** advocating for this 'command-and-control' approach to management of electric car chargers from 2012. Consumers require more flexibility in their use of electric car chargers than hot water systems. As well, we now have access to information and communications technologies (such as those developed by Better Place) which enable dynamic balancing of customers charging needs with grid constraints. These technologies were not available in the 1950s. • However, this precedent does provide an example of how a new consumer appliance can be introduced into the electricity market in a manner which promotes more efficient use of generation and grid assets.

4. The market conditions which are needed for DSP from electric car charging to occur

Electric vehicle charging can be harnessed to improve the efficiency of utilisation of the distribution network and the generation sector, and put downward pressure on power bills for all consumers, but only if the following two market conditions are in place.

4.1 Availability of cost-effective and quick-to-implement metering and NMI allocation for each electric vehicle charger at drivers' homes and workplaces

We estimate that 90% of electric car charging will occur at home and workplaces, with kerbside or public charge spots and battery switch stations providing range extension on the less-frequent, longer than usual trip. As flagged in Section 1 above, a high proportion of this charging can be time-shifted away from peak demand periods without inconveniencing the driver.

However, this won't occur unless this load is separately metered with a NMI. Without a separate meter and NMI, electric vehicle charging load will be bundled in with other non-discretionary, non-timeshiftable workplace or household loads such as lighting, heating/cooling and IT systems for which consumers have a strong preference for flat tariffs or reasonably flat peak/off-peak tariff structures. This will mean there is little incentive for time-shifting of electric vehicle charging and result in further worsening of system load shape and exacerbating the peaks.

With a separate meter and NMI for each electric car charger at homes and workplaces, this load can be exposed to strong incentives such as steep time-of-use energy and network tariffs and dynamic critical peak pricing plans which involve real-time signalling to the consumer by the retailer or distributor during periods of high demand or network stress.

Drivers and fleet operators also express a strong interest in separately metered electric vehicle charging. Better Place has met with 110 of Austalia's largest fleet managers in the past year. We have also engaged with a large number of individuals considering making their next car electric. They cite a range of reasons for needing separately metered electric car charging:

- **Renewable energy accountability** to prove zero emissions motoring. For example, many corporate and government fleets have CO_2 abatement objectives. Metering of their electric car fleet's charging is needed to ensure it is from 100% renewable electricity.
- **Vehicles provided to employees for work purposes** (eg – sales reps, couriers) are commonly parked at their homes at night. The employer needs to be billed for the EV charging not the employee.
- **Vehicles provided to employees as part of salary package** typically include fuel too. The employer needs to be billed for the EV charging at the employee's home, not the employee. Important for FBT reporting too.
- **Self-employed people** need to be able to separate vehicle fuel costs from their home electricity costs for tax purposes.
- **Employees bringing their own EVs to work** and wishing to charge them at their employers' office or factory carpark. The employee needs to be billed for the EV charging not the employer.

For these drivers and fleet operators, it is a major barrier to adoption of electric cars if cost-effective, quick-to-implement metering for electric car chargers is not available.

4.2 Availability of energy and network tariff structures which incentivise active demand side participation from electric car charging

The second market condition which needs to be in place is tariff structures from retailers and from network businesses which incentivise the dynamic timeshifting which electric car charging can

provide. Such tariffs could include time-of-use tariffs, critical peak tariffs and other dynamic tariff or payment structures.

5. Why these market conditions are not in place

5.1 Establishing metering and a NMI for electric car chargers under current rules is very expensive and takes a very long time

Across the NEM, the cost to establish a new meter and NMI for each electric car charger is **$1,000 to $8,000 per workplace or residence** and frequently takes **2- 4 months**. We believe that these costs and delays are not reasonable and do not reflect the underlying economic cost of the service customers need from distributors as regulated, monopoly businesses. As a customer in the NEM, we believe we have a right to access the market (i.e. to secure a meter and NMI) in a cost-effective, timely manner. This is not the case at present.

The specific steps which must be followed to establish a meter and NMI vary state by state. The Figure below outlines the process in Victoria and illustrates the extent of the inefficiencies involved.

Figure 3: The process of establishing a new meter and NMI for an electric car charger in Victoria

Step	Notes
1. Registered Electrician (RE) installs wiring for electric car charger to switchboard at the site but does not energise.	
2. Better Place enters into a supply agreement with its chosen Retailer for the site (Retailer A)	
3. RE completes and sends an Electrical Work Request (EWR) form to Retailer A	
4. RE completes and sends an second EWR form to the Retailer for the residential or commercial customer at the site (Retailer B)	Both the existing meter and new meter will share the same service line to the premises so existing meter customer will be deenergised in the process of establishing the new meter. Retailer B must be sent an EWR so it can formally instruct the Distributor to deenergise the site.
5. The Retailer A sends the EWR form to the Distributor	
6. Retailer B sends the EWR form to the Distributor.	
7. RE arranges for an Energy Safe Victoria accredited inspector to visit the site to inspect wiring and issue Certificate of Electrical Safety (COES).	Inspections cost an average of $285.
8. Inspector and RE meet at the site to complete the inspection, and the Inspector provides the RE with the COES.	
9. RE sends the COES to Retailer A	
10. Retailer sends COES to the Distributor	
11. Distributor schedules first truck visit to the site and communicates this date to Retailer A who then	It takes 4-6 weeks between provision of EWR and CES forms to Retailer and

Step	Notes
communicates the date to the RE.	Retailer B and the date of the truck visit from Distributor is scheduled.
12. Distributor truck visit occurs and the RE is present when the truck arrives. If the meter board and meter panel at the site are deemed by the Distributor's service technician to be non-compliant for a second meter the RE must upgrade the meterboard first, before the Distributor can install the new meter and fuse. The Distributor service technician de-energises the site using the service fuse.	Some distributors just nominate the date of the visit and state the visit will occur sometime between 8am and 4pm on that date. Some distributors offer a shorter 4 hour window in which their visit may occur. The RE must be at site waiting for the arrival of the Distributor trucks during these 4 and 8 hour windows, which is costly. At 90% of Victorian sites Distributors require upgrades to the meter board and meter panels.
13. While the site is deenergised, the RE upgrades the meterboard and meter panel.	Upgrading of a meter board and meter panel costs around $1000 in parts and labour. Distributor truck appointments are billable in 15 minute increments.
14. RE schedules a second distributor truck visit	
15. Second Distributor truck visit occurs to install the new meter, disconnection fuse and reenergise the site. RE must be present at the visit.	Average cost of meter installation and meter test is $550.
16. Distributor allocates a National Metering Identifier (NMI) to the newly installed meter and communicates this NMI to the Retailer.	Turnaround time is 1-2 weeks.
17. Retailer commences billing cycle for customer on the new NMI.	
TOTAL COST AND DELAYS	**$1000-$8000 in costs and 2-4 months.** This cost includes only the fees, material costs and labour costs which are required to secure a separate meter and NMI. It does not include costs of wiring for the electric car charger on site.

At some commercial sites we have found we cannot establish a new meter at all. The reasons for this are:

1. *Local distribution network capacity constraint* – At some sites, the distributor will not authorise the installation of a new meter and NMI for an electric car charger without a very costly upgrade to the capacity of the local distribution network and the service line to the building. Installation and use of the charger without the new meter and NMI would **not** require the upgrade.
2. *No access to unmetered supply due to design of main switch room* - In some commercial premises, the main switch room has been configured without accessible unmetered supply. Amendments to the main switch room design to open up access to unmetered supply in a large corporate premises typically cost upwards of $10,000.

3. *Connection and metering configuration at the site* – At some commercial premises, we are advised by the local distributor that a new meter cannot be installed without de-energising an entire high-rise building. This effectively means it is not possible to install a meter because of the significant disruption to the business operations of the multiple occupants of the site this would cause.

The high costs and lengthy delays involved in establishing a new meter and NMI for an electric vehicle charger in the NEM today do not appear to reflect the genuine costs and complexity involved in the task. Instead, they seem to result from the fact that current procedures, protocols and work practices which are followed by distributors are not responsive to customer needs and certainly not effective or efficient for electric vehicle owners or their service providers.

More cost-effective and fast-to-implement metering approaches than are currently used in the NEM by distributors are available. One such option is submetering or parent-child metering. Below is a diagram outlining how subtractive or parent-child metering is configured in the case where an electric vehicle charge network such as Better Place installs a charger at a customer's residence as part of an 'electricity included' bundled subscription package. Two NMIs – a parent and child NMI – are in place with the electric car charge network being the customer for the EV charger consumption and the resident being the customer for all other load at the site.

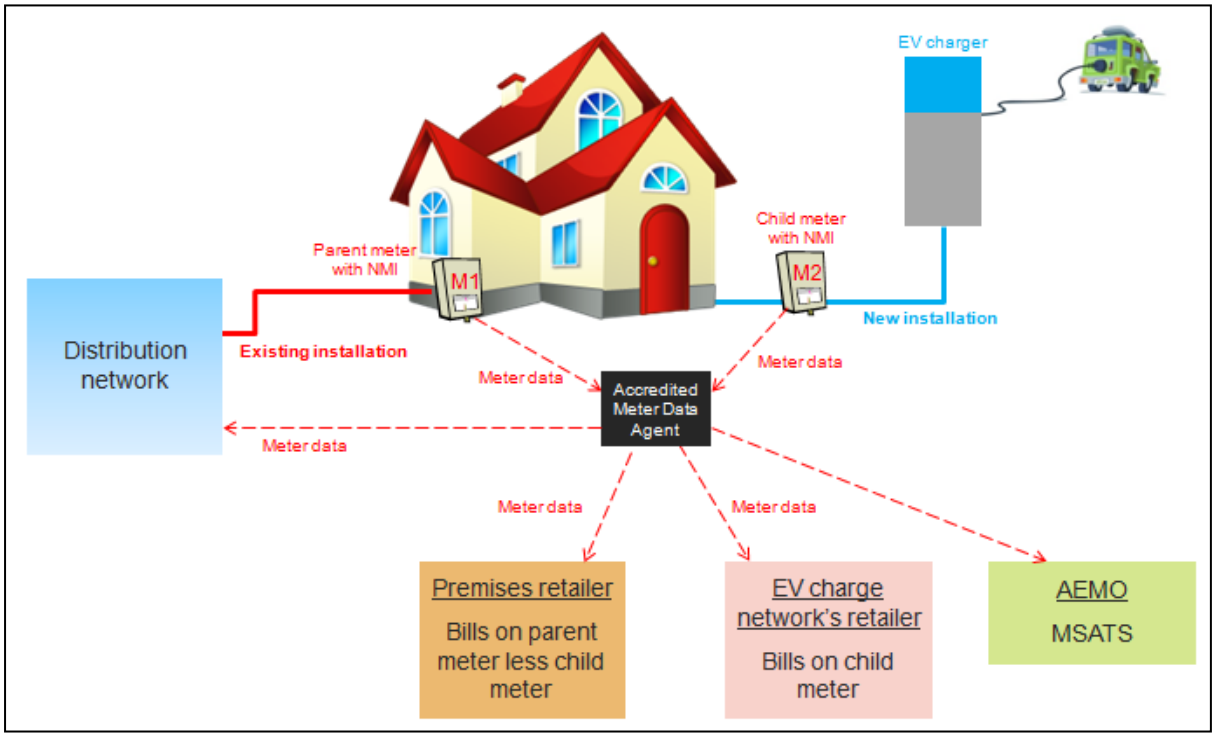

Figure 4 – Submetering configuration with parent and child NMIs

The advantages of the submetering approach include:

- Lower cost and quicker to implement than traditional metering model:
    - No need to establish a new physical connection point to the distribution network with all the attendant costs and delays. The existing connection point is shared by the new child meter customer, and tracking of consumption for settlement and

billing purposes is achieved via an automated subtraction of the two meter data streams.
    - Wiring work and meter installation can be undertaken on a single visit by a Registered Electrician.
- Already permitted by AEMO metering rules[11]
    - While it is permitted by the rules, a submetering configuration with a Parent NMI and Child NMI cannot be established at a site unless the distributor and the current site retailer consent. Better Place's experience is that all distributors in the NEM do not support it and several major retailers do not support it either.
- Supported by international precedent - California's Public Utilities Commission recently recommended that a sub-metering protocol be developed in that jurisdiction to support metering of electric vehicle chargers.[12]
- Compatible with many brands of electric car chargers which are built with utility-grade meters inside them (examples include products from GE, ChargePoint, ECOtality, Leviton and Better Place)

Rules changes are required

As the July 2011 California Public Utilities Commission report on overcoming barriers to electric cars made clear, metering protocols for electric car charging is a critical area for reform as this new market develops.[13] We recognise that metering is an area of technical and regulatory complexity. In light of this, we ask the AEMC to carefully examine the options for rules changes which promote choice for the consumer in consultation with distributors, retailers and the electric car industry.

Specific regulatory instruments that may warrant attention from AEMC in this area include:

- AEMO Metrology Procedure
- AEMO Embedded Network Guideline
- Each State's service and installation rules which govern business process and technical protocols for establishing connections to the distribution network and for metering
- Each State's licensing regime for operators of distribution networks. These contain obligations regarding service levels and response times for license holders.
- State legislation and clauses in the National Electricity Rules which provide a monopoly on metering services for small customers in the NEM to distribution businesses.

[11] See: AEMO Submetering or Embedded network establishment guidelines. http://www.aemo.com.au/electricityops/640-0169.html AEMO Submetering or Embedded network MSATS code allocation procedure, http://www.aemo.com.au/electricityops/0640-0003.pdf

[12] California Public Utilities Commission, Phase 2 Decision Establishing Policies to Overcome Barriers to Electric Vehicle Deployment, 25 July 2011. See Attachment 1 to this submission.

[13] Ibid.

5.2 Retail tariff regulations prevent optimal tariffs being applied to electric vehicle charging load

When a meter and NMI for an electric car charger are established, there are challenges in obtaining optimal tariffs for this load from retailers and distributors. In most jurisdictions, regulators impose constraints on the type of tariff which can be offered to small customers with the objective of protecting hardship customers such as pensioners. These apply to both energy and network tariffs. However, unless these constraints are removed for electric car charging, it will not realise its potential as a source of efficiency-promoting demand side participation. Electric car charging needs to be recognised as an especially flexible and dynamic form of load well suited to time-of-use tariffs, critical peak pricing tariffs and other forms of pricing structure which reward real-time demand-side participation in the market. Many customers with this load, including charge networks such as Better Place, will choose these tariff structures if they are available and will actively timeshift car charging for their own benefit, and in so doing improve the overall efficiency of the market.

Appendix I - Profile of Better Place

Better Place is the world's leading electric car charge network company and has raised over US$700M in venture capital in the last 2 years – most recently from a consortium of leading global banks led by HSBC. 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.

Australia is the third country in which the Better Place solution will be deployed (including Denmark and Israel), while publicly announced partial deployments in Japan, the US and Canada presage wider implementation shortly afterwards. As such, Australia is well positioned to be at the forefront of the transformation from petrol to electric cars.

Better Place will begin rolling out the necessary charging infrastructure by the end of 2011 in Canberra, with the national rollout commencing in 2012. We are also already participating in trials and rolling out tailored charging solutions for early adopters in Australia.

For more information visit www.betterplace.com.au

Appendix II - Electric cars available in Australia in 2011-12 and models likely to be available from 2013

Driven by widespread customer interest, significant government subsidies in many countries, and big improvements in battery performance and price, carmakers globally have invested many billions of dollars in new electric car models. Every major carmaker now has an electric model in production or development. Below are the specific models currently available in Australia in 2011 and some models likely to be available in Australia in the next 3-4 years.

Mitsubishi iMiEV

Mitsubishi have already supplied 110 of these compact city-cars, built on the Colt platform, to the Australian market. iMiEVs will be available in Australia at volume from August 2011. All 110 vehicles delivered to date have been secured by 'foundation customers' such as Google, AGL, Victorian Government, and Better Place. Peugeot Citroen has signed a deal for 100,000 iMiEVs to be distributed in the EU under Peugeot Citroen branding.

Nissan Leaf

Nissan have supplied a demonstrator fleet of Leafs to the Australian market in 2011, and has announced that the Leaf will be available for Australian consumers in mid-2012. It is manufactured in Japan, US and UK facilities, with specifications and performance to compete with the Toyota Corolla or Hyundai i30. In the US, the car is priced at US$32,500.

Renault Fluence ZE

Renault Australia have confirmed that the Fluence ZE will be available in Australia in 2012. A mid-size family sedan with performance and features to compete with the Toyota Camry and Mazda 6 sedan, and switchable battery for unlimited range. The Fluence ZE is built on the same platform as the Renault Megane, Renault Scenic, Nissan Dualis and X-Trail. Better Place globally has a contract for over 100,000 Fluence ZEs from Renault. The European list price for the Fluence ZE is just €26,000.

Renault Zoe ZE

The Zoe ZE is a mid-size hatch, 4.10 metres in length and powered by a 60 kW motor, with a switchable battery for unlimited range. Renault expects this car to be the highest

selling electric car in the world. Renault plans to produce the Zoe ZE in very large volumes (especially for the European market) at very a competitive price.

Renault Kangoo ZE and Kangoo Maxi ZE

Renault Kangoo Express ZE and Renault Kangoo Maxi ZE are light commercial vehicles aimed at business users. They will be released in Europe in 2011, with Australian availability expected in around 2013. The vehicle is available in 2 or 5 seater form, with the Kangoo ZE including 3.5m^3 of carrying space and the Kangoo Maxi ZE 4.6m^3 of carrying space. The 22 kWh battery sits underneath the floorpan of the vehicle and provides 170 kilometres of range.

Chevrolet Volt

Chevrolet Volt is the General Motors (GM) mass market range extension mid-size electric car. Launched in 2010, it is already selling in the US and will be released in Australia as the Holden Volt in mid-2012. The vehicle has a 16 kWh battery which is used to drive an electric motor for up to 80 km. It is estimated that GM has invested over $1 billion in development and tooling of the Volt which has similar features to the GM Cruze. In 2011, Volt won both North American Car of the Year and Green Car of the Year awards.

Toyota Plug-In Prius

Toyota has been the market leader in hybrid vehicles for over a decade, with 2 million units of the Prius sold globally. The Prius Plug-in Hybrid EV is the next generation and will be released in a variety of models including an extended hatchback wagon and a 7-seater for Europe. The Prius Plug-in Hybrid EV will go on sale globally in 2012. Previously using older Nickel Metal Hydride technology, Toyota has moved to Lithium Ion batteries for its current generation vehicles. A higher specification “i-Tech” model features sav-navigation, leather seating and remote climate control.

Tesla Roadster & Model S

Tesla successfully launched the Roadster in Australia in 2010 as a low volume super-car matching traditional petrol vehicles in performance and style. Tesla will launch the Model S family sedan in 2013 to compete directly with BMW 5-Series and Mercedes E-Class. The Model S is the first fully electric sedan with a very innovative 7 seat configuration. It has a fully removable battery, and Tesla will offer a variety of battery options giving the car a range of up to 480 km. The Model S

also features the largest touch-screen telematics and multimedia unit (at 17 inches), which replaces the traditional vehicles instrument panel layout.

Ford Focus EV

Virtually identical in appearance to the petrol-powered Focus, the electric variant has a 91 kW motor and a 23 kWh battery which delivers 160 km of range. Ford has actively promoted the vehicle's low servicing costs, and estimates that savings on maintenance and parts will be $1000-$1200 over the life of the vehicle. Service items required in the petrol Focus that are not required in the electric model include oil and filter changes, spark plugs, and drive belt replacement.

Volvo DRIVe C30

Based on the petrol C30, the two- door electric coupe has a range of 150 km and was one of the first electric cars to achieve excellent safety results in crash testing. This included safely de-coupling the battery from the powertrain on impact. With the batteries situated underneath the vehicle, the coupe retains all its previous luggage space. Production began in June 2011 with the US targeted as the first market. It is anticipated that the C30 will be launched in Europe in 2012 followed by Australia, alongside larger electric Volvo models.

Hyundai BlueOn i10

Hyundai has been developing their bestselling small car as an electric car for the past two years and is currently testing pre-production vehicles in South Korea. With a 16.4 kWh battery, Hyundai's first electric production car will have a range of 140 km. Sales will be limited to the Korean market in 2012 before being released globally in 2013.

Mercedes E-Cell A-Class

Mercedes have launched the E-Cell sub-brand for their electric cars. They have announced production of no less than 7 hybrid versions of their vehicles. The SLS AMG Gullwing E-Cell super-car will debut the range in limited production numbers before global release of more affordable versions based on A & B Class vehicles. In Australia, Mercedes will launch the compact ED Smart before the anticipated introduction of the A-Class in 2014.

Toyota RAV4

In conjunction with technology partner Tesla, Toyota has begun the program for production of the RAV4 as an electric compact SUV. The vehicle will use carry-over technology from previous Tesla and Toyota programs and is reminiscent of the original EV – the Toyota RAV4 of the early 1990s. It is anticipated to follow the Prius PHEV into global markets.

Volkswagen Golf

The third best-selling car in history, the Volkswagen Golf will be manufactured in two electric versions; a pure EV (Blue-e-motion) and a PHEV (TwinDrive). Both variants are anticipated to be launched in Europe in 2013 followed by other markets. The Blue-e-motion hatch is powered by a 26.5 kWh battery, has a range of 150 km and is already in field testing in Germany.

Audi E-Tron R8, A3, & A1 PHEV

Like Mercedes, VW's Audi brand has announced a pure electric sub-brand called E-Tron, which currently features three vehicles. The super-car R8 based E-Tron is under production development and will feature two electric motors attached to the rear wheels, with power output that will drive the vehicle from 0-100kph in less than 6 seconds. The more mainstream A3 E-Tron production design was recently launched and will contain all features associated with the luxury Audi brand. A PHEV version of the A1 is in field testing in Germany and will be the first electric Audi to reach the Australian market.

Decision 11-07-029 July 14, 2011

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking on the Commission's own motion to consider alternative-fueled vehicle tariffs, infrastructure and policies to support California's greenhouse gas emissions reduction goals.	Rulemaking 09-08-009 (Filed August 20, 2009)

PHASE 2 DECISION ESTABLISHING POLICIES TO OVERCOME BARRIERS TO ELECTRIC VEHICLE DEPLOYMENT AND COMPLYING WITH PUBLIC UTILITIES CODE SECTION 740.2

TABLE OF CONTENTS

Title **Page**

TABLE OF CONTENTS
(Cont'd)

Title **Page**

TABLE OF CONTENTS
(Cont'd)

Title **Page**

PHASE 2 DECISION ESTABLISHING POLICIES TO OVERCOME BARRIERS TO ELECTRIC VEHICLE DEPLOYMENT AND COMPLYING WITH PUBLIC UTILITIES CODE SECTION 740.2

1. Summary

In accordance with Senate Bill 626 (Kehoe, Stats. 2009, c. 355, § 1), which added Pub. Util. Code § 740.2,[1] today's decision furthers the Commission's efforts to evaluate policies to develop infrastructure sufficient to overcome barriers for the widespread deployment and use of plug-in hybrid and electric vehicles (Electric Vehicles or PEVs) in California. Our decision today is an integral part of efforts by state agencies to achieve California's goal of greenhouse gas emission reduction established by the California Global Warming Solutions Act of 2006, Assemble Bill 32 (Núñez, Stats. 2006, c. 488). To achieve the State's emission reduction goal, significant progress in the transportation sector is critical. Today's decision specifically achieves the following:

- Directs electric utilities to collaborate with automakers and other stakeholders to develop an assessment report to be filed in this proceeding to address a notification processes through which utilities can identify where Electric Vehicles charging will likely occur on their electric systems and plan accordingly;

- Affirms that, with certain exceptions, the electric utilities' existing residential Electric Vehicle rates are sufficient for early Electric Vehicle market development, and, similarly, that existing commercial and industrial rates are sufficient in the early Electric Vehicle market for non-residential customers. The decision also sets out a process to re-examine Electric Vehicle rates in 2013;

[1] All statutory references are to the Public Utilities Code unless otherwise noted.

- Considers opportunities to migrate toward new and lower cost metering technologies for Electric Vehicle charging and sets out a process to develop an Electric Vehicle metering protocol to accommodate increased Electric Vehicle metering options, such as submetering;
- Determines that, on an interim basis, until June 30, 2013, the costs of any distribution or service facility upgrades necessary to accommodate basic residential Electric Vehicle charging will be treated as shared cost;
- Defines the role that utilities may play in education and outreach related to Electric Vehicles;
- Requires utilities to perform load research to inform future Commission policy; and
- Addresses utility ownership of electric vehicle service equipment.

The proceeding remains open for receipt of compliance filings and to monitor efforts by stakeholders to further refine the issues identified herein.

2. State Policy – Greenhouse Gas Emission Reduction & Transportation

California is the fifteenth largest emitter of greenhouse gases, representing about 2% of worldwide emissions, and California's transportation sector is the largest contributor, consisting of 38% of the State's total greenhouse gas emissions.[2] Passenger vehicles alone are responsible for almost 30% of California's greenhouse gas emissions.[3] To address these vehicle emissions, the

[2] *Climate Change Scoping Plan, A Framework for Change, Pursuant to AB 32, the California Global Warming Solutions Act of 2006* (herein ARB's 2008 Scoping Plan) at 11, adopted by the California Air Resources Board on December 11, 2008. The ARB 2008 Scoping Plan is available at: http://www.arb.ca.gov/cc/scopingplan/document/scopingplandocument.htm.

[3] ARB's 2008 Scoping Plan at 38.

California Air Resources Board proposed a comprehensive three prong strategy, which includes the following: reduce greenhouse gas emissions from vehicles, reduce the carbon content of the fuel vehicles use, and reduce the miles vehicles travel.[4] Electrification of vehicles is a critical component of this strategy.

Other programs intended to reduce greenhouse gas emissions from California's transportation sector include (1) the Pavley greenhouse gas vehicle standards (Assembly Bill (AB) 1493 Pavley, Stats. 2002, c. 200) to achieve near-term vehicle emission reductions to the maximum extent technologically feasible; (2) the Zero-Emission Vehicle (ZEV) program to transform the future vehicle fleet by placement of increasing numbers of ZEVs (including hydrogen fuel cell and battery electric vehicles) and thousands of near-zero emission vehicles (plug-in hybrids, conventional hybrids, compressed natural gas vehicles) in California; and (3) the Alternative and Renewable Fuel and Vehicle Technology Program (AB 118 Núñez, Stats. 2007, c. 750) to, among other things, develop, demonstrate, and deploy innovative technologies to transform California's transportation fuel and vehicle types. AB 118 also creates the opportunities for investment in technologies and fuels that will help meet the Low Carbon Fuel Standard established by the California Air Resources Board. The Low Carbon Fuel Standard seeks to reduce the carbon intensity of transportation fuels consumed in California. The California Energy Commission and the California Air Resources Board are coordinating closely in the implementation of AB 118.

We further acknowledge the coordinated efforts of numerous stakeholders. These efforts are needed if California's Electric Vehicle market is to progress beyond this initial stage. Utilities, electric vehicle service providers,

[4] ARB's 2008 Scoping Plan at 38.

automakers, automobile dealers, academic and research institutions, and government at all levels must work collaboratively to smooth the way for success.

As part of the process to facilitate a collective effort, the Commission is an active participant in the California Plug-In Electric Vehicle Collaborative, a broad-based stakeholder group established in 2010. Last year, representatives of the Commission assisted the California Plug-In Electric Vehicle Collaborative to develop a strategic plan. The plan, entitled *Taking Charge: Establishing California Leadership in the Plug-in Electric Vehicle Marketplace*,[5] provides a roadmap for Electric Vehicle market growth consistent with California's transportation, energy, environmental and economic goals. Representatives of the Commission are currently participating in working groups created by the California Plug-In Electric Vehicle Collaborative to implement the strategic plan's recommendations.

In adopting prospective policies for Electric Vehicles today, we have looked to the goals of this strategic plan. These goals, if achieved, should propel the Electric Vehicle market forward. They include the following:

1. Ensure that consumer experiences with Electric Vehicles are overwhelmingly positive;

2. Promote Electric Vehicle cost reductions such that they are cost competitive with conventional vehicles;

[5] Plug-in Electric Vehicle Collaborative, Taking Charge: *Establishing California Leadership in the Plug-in Electric Vehicle Marketplace*, December 2010 (herein "Strategic Plan"). http://www.evcollaborative.org/evcpev123/wp-content/uploads/2010/07/Taking_Charge_final2.pdf.

3. Integrate Electric Vehicle charging smoothly into an increasingly clean, efficient, reliable, and safe electricity grid;

4. Advance energy security, air quality, climate change, and public health goals;

5. Take early strategic action to promote Electric Vehicle-related job creation and economic benefits in California; and

6. Facilitate mainstream adoption of Electric Vehicles.

We believe these are sound principles to guide us in developing policies for Electric Vehicles. Of course, we also weigh prospective policies for Electric Vehicles in the context of our responsibility to ensure just and reasonable utility rates.

As Californians increasingly adopt Electric Vehicles, the electric utilities that the Commission regulates, including Pacific Gas and Electric Company (PG&E), Southern California Edison Company (SCE), and San Diego Gas & Electric Company (SDG&E),[6] will take on a critical role in the transportation sector to procure, deliver and supply transportation fuel, in this case electricity. Therefore, with input from a wide range of stakeholders, today we address the most critical and time-sensitive issues to support California's Electric Vehicle market from now through approximately 2013.

At this time many uncertainties surround the evolving market for Electric Vehicles and charging services. Business models are evolving and technologies are in flux. Consumer acceptance of the new generation of Electric Vehicles is unproven and charging behavior is unknown. In particular, the extent to which

Electric Vehicle owners will charge off-peak versus on-peak and how Electric Vehicle owners will respond to various time-of-use rate designs are speculative.

Today's decision adopts policies for the initial phase of the Electric Vehicle market's evolution. We have elected to pursue a minimally prescriptive approach in order to stimulate innovation, encourage entry, and promote customer acceptance, while maintaining safe and reliable utility service. Given today's fluid market conditions we seek to learn from experience and avoid foreclosing options. For example, we decline to make significant changes to existing Electric Vehicle rates or mandate specific equipment requirements at this time. We also seek to narrow uncertainties and build a sound empirical basis to support policy formation for subsequent stages of Electric Vehicle market development.

Today's decision also builds upon our policies set forth in the first decision issued in this proceeding, Decision (D.) 10-07-044,[7] where we found that the provision of electric vehicle charging services does not make an entity a public utility and that electric vehicle service providers[8] are, with certain exceptions, end-use customers of a regulated utility.[9] Within this context, we seek to establish a process to notify utilities of the purchase of Electric Vehicles so that utilities can plan infrastructure upgrades accordingly. We also address Electric

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[6] The named electric utilities, in addition to gas utilities, are respondents to this rulemaking.

[7] Applications for Rehearing of D.10-07-044 were filed by TURN and PG&E. These applications are pending before the Commission.

[8] Electric vehicle service providers or EVSPs are providers of electric vehicle charging services and could include owners of stand alone electric vehicle charging spots. (D.10-07-044 at 3.)

[9] D.10-07-044 at 20.

Vehicle rate design principles, related cost recovery issues, Electric Vehicle metering options, utility-Electric Vehicle education and outreach, and the use of smart charging technologies for Electric Vehicles.

Generally speaking and for the purpose of this decision, "near-term goals" refers to those needing attention by the end of 2012. We anticipate revisiting the longer-term goals identified in the decision after obtaining data that we require utilities to collect based on real-life experiences with Electric Vehicles and from the utilities' Electric Vehicle load research.

3. Procedural History - Phase 2

Consistent with the January 12, 2010 Assigned Commissioner's Scoping Memo, the Administrative Law Judge (ALJ) on August 3, 2010 issued a ruling setting forth the substantive issues to be considered and the schedule for Phase 2 of this proceeding. In addition, on August 30, 2010, Energy Division issued a Staff Workshop Issues Paper, entitled *The Utility Role in Supporting Plug-in Electric Vehicle Charging* (Utility Role Staff Paper). Energy Division issued a second Staff Workshop Issues Paper on September 10, 2010, entitled *Revenue Allocation and Rate Design: Facilitating PEV Integration* (Rates Staff Paper).

Parties were invited to file opening and reply comments to both of these papers. The following parties filed comments during phase 2 of this proceeding: Better Place, California Air Resources Board, California Department of Food and Agriculture, Californians for Renewable Energy, Inc. (CARE), Clean Energy Fuels Corporation (Clean Energy), Consumer Federation of California (CFC), Coulomb Technologies, Inc. (Coulomb), Division of Ratepayer Advocates (DRA), Environmental Defense Fund, EVSP Coalition (including Better Place, Coulomb Technologies, Inc., and Ecotality, Inc.), Friends of the Earth, General Motors Company (GM), Greenlining Institute, Green Power Institute, International Council on Clean Transportation, Interstate Renewable Energy Council, Natural

Resources Defense Council (NRDC), North Coast Rivers Alliance, PG&E, SDG&E, Sam's West, Inc. and Wal-Mart Stores, Inc. (Sam's West/Wal-Mart), SCE, Sacramento Municipal Utility District (SMUD), The Utility Reform Network (TURN) and Western States Petroleum Association (WSPA).

Energy Division convened all-party workshops to discuss matters set forth in the Staff's Workshop Issues Papers. Workshops were held on September 27, 29, and 30, 2010. Following the workshops, the ALJ issued a ruling on October 27, 2010 seeking additional information on various topics. Parties responded to this ruling on November 12, 2010 and December 3, 2010. [10]

This proceeding remains open for receipt of compliance filings and to monitor progress by stakeholders to further refine issues identified herein.

4. Utility Notification – Electric Vehicle Market Growth Data and Electric System Upgrades

Because transportation is the largest single source of greenhouse gas emissions in California, we support new innovative strategies to promote the seamless transition of the transportation sector to increased reliance on Electric Vehicles. In preparation for this transition, electric utilities and other parties identified a need for a process to alert utilities when customers purchase Electric Vehicles. The utilities explained that they need to know the location where the Electric Vehicle charging will likely occur in order to thoroughly prepare for Electric Vehicle charging in their service territories and avoid adverse impacts to the electric grid. The California Plug-In Electric Vehicle Collaborative identified a similar need.[11]

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[10] The majority of the record for this proceeding is available online at www.cpuc.ca.gov at the link, *Docket Card*.

[11] Strategic Plan at 47.

In some instances, an Electric Vehicle buyer might voluntarily inform the utility of the physical location of charging. Electric Vehicle buyers are motivated to contact utilities to, for example, obtain service under an Electric Vehicle electric rate schedule. Electric Vehicle buyers have little motivation, however, to contact a utility for the purpose of notifying utilities of the location of the Electric Vehicle charging. In addition, no formal standardized notification program exists so that a utility can identify all Electric Vehicles being introduced into their service territories.

Utilities pointed to a number of benefits of some type of notification process. Most critically, if a utility knows an Electric Vehicle customer plans to charge at home, then the utility can study the adequacy of the local distribution system in advance and upgrade the infrastructure if needed. Obtaining information concerning the identity of the Electric Vehicle customer has other benefits as well. If a utility can identify Electric Vehicle owners, then the utility can target consumer education and outreach to appropriately advise the Electric Vehicle owners of the benefits of time-of-use rates that reflect the cost of charging on-peak and on the economics of Electric Vehicle ownership and operation. In other words, with timely notification to the utility that an Electric Vehicle will be charging in its service territory, the utility can address potential reliability problems, keep infrastructure costs down, and assist, as appropriate, with ensuring that Electric Vehicle owners have positive experiences with Electric Vehicles and maximize the benefits of these vehicles.

Other parties also noted the importance of a utility notification process and explained ongoing efforts to establish such a process. For example, as of December 2010, GM implemented a voluntary utility notification system. GM also pointed out that any notification system must be flexible enough to allow for refinements during early Electric Vehicle commercialization and projected

growth. SCE, PG&E, and SDG&E proposed a statewide notification process, referred to as a data clearinghouse, to help notify utilities of customer purchases of Electric Vehicles, thereby giving utilities more time to adjust their electrical systems to meet Electric Vehicle load growth. In connection with this proposal, SCE, PG&E, and SDG&E requested Commission approval of initial funding to support the evaluation of the data clearinghouse.

NRDC expressed support for a notification process. CFC requested Commission scrutiny of data-related privacy issues. DRA urged the Commission to reject funding on the basis that ratepayers should not bear the cost of the initial evaluation for the utilities' Electric Vehicle data collection.

The merits of a notification process and the utilities' request for cost recovery are addressed below

4.1. Assessment Report

We conclude that, given the importance we place on avoiding adverse impacts to the electric system, ensuring safety, and efficiently managing the grid, the proposals for a notification system could prove to be solution to the challenge of Electric Vehicle growth, provided privacy concerns are adequately addressed. We are encouraged that, while no formalized standardized information exchange program currently exists, utilities are presently exploring bilateral agreements with auto manufacturers, such as GM, to establish voluntary arrangements that would provide utilities with notice when customers in their service territories purchase Electric Vehicles. As GM explained, it currently employs an opt-out style questionnaire seeking permission to share address level data with utilities to ensure grid reliability. Since December 2010, it has shared hundreds of addresses with California investor-owned utilities and publicly-owned utilities. This system could, perhaps, be a model to build upon for an

expanded notification system and we are encouraged by the progress of GM, the utilities, and others in this regard.

We want to ensure that stakeholders continue their progress in the development of a notification system. Accordingly, we direct SCE, PG&E, and SDG&E to collaborate with stakeholders, perhaps relying on existing forums established by the California Plug-In Electric Vehicle Collaborative, to further develop such a system. To enable the Commission to monitor progress in this area, we direct the utilities to prepare an assessment report that sets forth potential notification options, the merits and projected costs of these options, and implementation scenarios. The assessment report must also recommend a preferred option going forward and explain how other stakeholders, if any, will participate in the notification system. The options detailed in the report may require participation by the Department of Motor Vehicles (DMV) or other government agencies to identify and address any privacy concerns that may arise due to the sharing of relevant information.[12] Options may include, but are not limited to, reliance on statewide stand-alone organizations. Other potentially lower cost options could incorporate a Graphic Information System with a mapping function and other low cost automated approaches.

This assessment report must be filed by utilities as a compliance report in this proceeding. The timeline for filing this report is set forth below.

[12] Proposed legislation, (Senate Bill (SB) 859 Padilla (2011-2012 Reg. Sess.), as introduced on February 18, 2011) would allow the Department of Motor Vehicles to release an Electric Vehicle owner's residential address to an investor-owned utility, publicly-owned utility, and their respective agents if that utility uses the information only for the purpose of tracking electric vehicle charging points.

4.2. Privacy Concerns

Parties raised concerns about privacy implications associated with the creation of a notification system. Any data made available via a notification system must be consistent with all applicable privacy laws. Due to privacy and customer consent concerns, we do not necessarily envision this system to be employed as a marketing or promotional tool for Electric Vehicles. The goal of this notification system remains safe, reliable, and efficient management of Electric Vehicle integration into the electric grid. The assessment report to be filed in this proceeding must address how utilities will handle privacy concerns.

4.3. Costs

We deny the requests by SCE, PG&E and SDG&E to authorize additional funding through this decision to cover the costs of the development or implementation of a notification system. Our expectation is that utilities will not require incremental funding to develop and participate in a notification system. However, utilities are not precluded from seeking recovery of reasonable costs of any utility notification systems in future rate cases.

4.4. Timeline – Assessment Report

To ensure this notification system develops in a timely fashion, the utilities must jointly file the assessment report in this proceeding within 150 days of the effective date of this decision. During this 150 day period, utilities must seek the involvement of the Commission's Energy Division Staff and provide regular updates to Energy Division Staff on a schedule to be determined by Staff.

4.5. Future Goals

We agree with GM that a national notification system, rather than a California-specific data system combined with various regional data systems, may ultimately be preferable. In the absence of a national notification system, it will likely be more difficult for utilities to effectively adjust their electric systems

to account for Electric Vehicle load growth. By establishing a path toward a California statewide notification system, we seek to support the development of a national notification system.

5. Electric Vehicle Rate Design Principles

Rate design is our primary means to influence the Electric Vehicle owners' charging behavior. Encouraging customers to charge their vehicles during off-peak periods is a central objective of Electric Vehicle rate design. Properly designed rates also align revenue collection with cost causation. Simply put, rate structures can convey the costs and environmental impacts of the supply and demand of electricity to consumers, providing incentives for individuals to make choices consistent with the collective good.

The benefits of off-peak Electric Vehicle charging are manifold and accrue to the Electric Vehicle owners and non-Electric Vehicle owners alike. Off-peak charging places less strain on the distribution system, avoiding adverse impacts to the electric grid and reducing the need for costly infrastructure upgrades. Concentrating Electric Vehicle charging in off-peak periods will also dampen increases in energy procurement costs resulting from the addition of this new load: not only is energy more expensive during peak periods, but significant levels of on-peak charging could actually increase *incremental p*rocurement costs by exerting upward pressure on peak-time wholesale energy prices. Spreading fixed capacity costs over a larger volume of energy sales has the beneficial effect of lowering the average cost of providing electricity service for all customers.

Off-peak charging also delivers greater environmental benefits since substituting electricity for petroleum-based transportation fuels yields greater reductions in emissions of CO2 and other pollutants during off-peak periods. This is because the marginal generating units available during off-peak hours tend to be cleaner and/or more efficient than peaker plants. Finally, night-time

charging facilitates' integration of wind energy by using the storage capacity of the Electric Vehicles' batteries transform California's predominantly nocturnal wind power resources into transportation fuel for daytime driving. Currently much of the wind capacity in California generates electricity off-peak. In addition to being low emission, wind generation is not designed to ramp down to accommodate additional wind output. By creating a new use for off-peak generating resources, off-peak Electric Vehicle charging could help address challenges posed by wind generation.

Time-of-use rates provide a potent incentive to encourage off-peak charging. We find that time-of-use rates are appropriate for Electric Vehicles because the time-of-use aspect of the rate better reflects cost causation principles than a non-time-differentiated rate and encourages Electric Vehicle charging when the costs imposed on the system are lowest and environmental benefits are greatest. In today's decision we assess the adequacy of time-of-use rate structures in existing rates designed expressly for Electric Vehicles or for which Electric Vehicle owners and/or electric vehicle service providers may be eligible.

Although our goal is to maximize off-peak charging, we appreciate that, at times, Electric Vehicle owners will need to charge their vehicles during peak periods or may simply find it convenient to do so. To ensure broad consumer acceptance of Electric Vehicles, it is crucial to accommodate the Electric Vehicle owners' charging needs and preferences and to attract private capital to support development of the necessary charging infrastructure. We are aware that several companies are exploring a variety of business models for Electric Vehicle charging in California, and we wish to avoid placing unnecessary constraints on them. At same time, we recognize that, to the extent Electric Vehicle charging occurs on-peak, it will place new demands on the grid. Rates designed for Electric Vehicle charging should reflect these incremental costs.

Demand charges may be used along with or instead of time-of-use rates to reflect the capacity costs a given customer imposes on the system. A typical demand charge is a rate component enumerated in dollars per kilowatt that is multiplied by a customer's maximum kilowatt electricity usage during a billing period. Demand charges are a common component of the utilities' medium and large commercial and industrial rates. We consider here whether it is appropriate to incorporate demand charges into Electric Vehicle rate schedules for residential and small commercial customers.

We note that our consideration of rates for electric vehicle charging occurs against the backdrop of an ongoing, gradual transition to default dynamic pricing (including time-of-use rates) for all utility customers. The smart meters that utilities are currently installing throughout their service territories have the capability to support time-of-use pricing, as they can record and transmit energy usage data at intervals of an hour or less. To take full advantage of this infrastructure investment and to help achieve our goal of making energy demand more responsive to wholesale market conditions, the Commission in D.05-11-009 ordered each utility to include proposals for time-of-use tariffs for all customers, including residential and small and medium commercial and industrial customers, in its next comprehensive rate design proceeding. Large commercial and industrial customers are already subject to default time-of-use rates.

The Commission is transitioning small and medium commercial and industrial customers to time-of-use tariffs. We anticipate that these tariffs will be rolled out through 2013, when the last of the three investor-owned electric utilities, SDG&E, completes its rate design proceeding, A.10-07-009. We find, however, that the general application of time-of-use rates for Electric Vehicle charging should not be slowed by the gradual pace at which the broader shift to

universal time-of-use rates is occurring. We note that the movement toward universal time-of-use pricing is consistent with our view that electric rates for Electric Vehicle charging should be strongly time differentiated.

Below we apply these rate design principles to Electric Vehicle rate options for the residential and non-residential sectors. We also consider the adequacy of existing rates and provide direction for future review of Electric Vehicle rates.

5.1. Electric Vehicle Residential Rates

The task of designing Electric Vehicle rates for residential customers is complicated by the prevalence of inclining block or tiered rates for this customer segment. Tiered rates increase as a customer's cumulative usage increases during a billing period and are intended to promote energy conservation. Electric Vehicle charging is incremental to existing household load, and, therefore, if included with other household load via a single meter, may push the customer into the highest rate tiers. Because tiered rates climb steeply in all three of the utilities' residential rate structures, the bill impact for the Electric Vehicle purchasers could be significant. Some parties have contended that exposing the Electric Vehicle owners to tiered rates will raise charging costs enough to discourage prospective Electric Vehicle purchasers. For Electric Vehicle owners, tiered residential rates may also discourage overnight charging of Electric Vehicles at home, perversely encouraging on-peak charging at the workplace or other non-residential settings. Such an outcome would frustrate California's goals of promoting rapid customer adoption of Electric Vehicles while minimizing incremental infrastructure costs and maximizing environmental benefits.

Measuring energy consumption for the Electric Vehicle charging on a separate meter makes it possible to apply different rate schedules for charging versus other household loads. Alternatively, the expense of installing an

additional meter can be avoided if customers are offered a non-tiered, single meter Electric Vehicle rate. Currently, each utility offers at least two Electric Vehicle rate schedules to residential customers seeking to charge their Electric Vehicles.[13] Residential customers of each utility may choose between Electric Vehicle rate schedules that require Electric Vehicle electricity usage to be measured with a separate meter or whole house time-of-use rates that combine Electric Vehicle usage with all other electric usage on a single residential meter. While meter and rate issues, at times, overlap, meter issues are specifically discussed in Section 6.

[13] SCE Electric Tariff Rate Schedule TOU-EV1 (2 meters) at: www.sce.com/NR/sc3/tm2/pdf/ce114-12.pdf; SCE Electric Tariff Rate Schedule TOU-D-TEV (1 meter) at: www.sce.com/NR/sc3/tm2/pdf/CE324.pdf; PG&E Electric Tariff Rate Schedule E-9a (1 meter) at: www.pge.com/tariffs/tm2/pdf/ELEC_SCHEDS_E-9.pdf; PG&E Electric Tariff Rate Schedule E-9b (2 meters) at: www.pge.com/tariffs/tm2/pdf/ELEC_SCHEDS_E-9.pdf; SDG&E Electric Tariff Rate Schedule EV-TOU (2 meters) at: www.sdge.com/tm2/pdf/ELEC_ELEC-SCHEDS_EV-TOU.pdf; SDG&E Electric Tariff Rate Schedule EV-TOU2 (1 meter) at: www.sdge.com/tm2/pdf/ELEC_ELEC-SCHEDS_EV-TOU-2.pdf.

Table No. 1

Residential Rate Schedules

Utility	Tariff	TOU	Tiered	Meters	Meter Charge (mo./day)	Summer On-to-Off Peak Ratio
PG&E	E-9 (A)[1]	Y	Y	1	$0.21881m	5.76
	E-9 (B)[1]	Y	Y	2	$0.21881m	5.01
SCE	TOU-EV-1	Y	N	2	$0.029d	2.24
	TOU-D-TEV[1,2]	Y	Y	1	$0.00	2.24
SDG&E	EV-TOU[2,3]	Y	N	2	$0.00	4.14
	EV-TOU-2[2,3]	Y	N	1	$0.00	4.14

1. Baseline (Tier 1)
2. Super-Off-Peak
3. Rates given reflect EECC. Retrieved from: http://www.sdge.com/tm2/pdf/ELEC_ELEC-SCHEDS_EECC.pdf

Note: No demand charges exist in the residential context

As shown in Table 5.1, all existing residential Electric Vehicle rate schedules include time-of-use rates with relatively higher prices during daytime, peak periods and relatively lower prices during off-peak periods. Some residential Electric Vehicle rates are non-tiered while in other instances time-of-use price differentials are superimposed on the underlying tiered structure.

We agree with the majority of parties that, with limited exceptions, the existing residential Electric Vehicle rates are sufficient for the early market. Our concerns regarding specific single and separately metered rates are discussed in Sections 5.1.1 and 5.1.2, respectively.

We find that the Commission should revisit the suitability of the utilities' Electric Vehicle residential rate schedules in 2013-2014. By then the Commission will have a better understanding of customer charging behavior and more Electric Vehicle load profile data to inform future rate design. The load research studies that we direct the utilities to undertake in Section 9 will provide insight

into utility costs associated with Electric Vehicle infrastructure and service. Studies being conducted by Coulomb and Ecotality will also help us understand installation costs associated with electric vehicle service equipment. In addition, restrictions placed on residential rates by AB 695 (Kehoe, Stats. 2009, c. 337) will have expired,[14] giving us more latitude in authorizing potential rate options for Electric Vehicle residential customers. For these reasons, we will target early 2013 to revisit Electric Vehicle residential rates. More details on our intention to revisit Electric Vehicle rates in 2013 are set forth in Section 5.4.

In keeping with our preference for affording customer choice, we also conclude that residential customers should be able to choose which Electric Vehicle rate best suits their needs. Residential Electric Vehicle rates should be offered on an opt-in (i.e., voluntary) basis. Staying on their pre-existing, non-Electric Vehicle rate should also be a permissible option, although as discussed in Section 10, we urge the utilities to educate Electric Vehicle owners about the possible savings they may realize from switching to time-differentiated Electric Vehicle rates.

5.1.1. Residential Single Meter Electric Vehicle Rates

A residential single meter Electric Vehicle rate, while specifically designed for Electric Vehicle charging, is applied to a residence's entire electricity usage. Single meter rates are also sometimes referred to as whole-house rates. As shown in Table 1, above, SCE's and PG&E's single meter Electric Vehicle rates

[14] SB 695, effective October 11, 2009 as an urgency measure, amended, among other sections, § 80110 of the Water Code and § 745 of the Pub. Util. Code to permit the Commission to authorize limited rate increases on 130% of the then existing baseline quantities but prohibits the Commission from authorizing mandatory or default time-of-use with or without bill protection for residential customers prior to January 1, 2013. Legislative restrictions ease on mandatory time-of-use pricing staring January 1, 2013.

are tiered, while SDG&E's are not. All of the utilities' single meter rates are optional (opt-in), meaning a residential customer must make a proactive voluntary decision to go onto the Electric Vehicle rate.

The challenge of single meter Electric Vehicle rate design, as summarized by SCE, is to structure a simpler, cost-based, time-of-use rate that avoids the disincentives for Electric Vehicle use associated with tiered rates but still recovers, at a minimum, the incremental cost to serve Electric Vehicles. (SCE December 6, 2010 comments at 12.) SCE is currently exploring the feasibility of offering a single meter non-tiered time-of-use rate for residential Electric Vehicle customers.

NRDC and the EVSP Coalition note that the existing single meter Electric Vehicle rates effectively place the customer into the upper tiers of the rate structure due to the increased electric usage resulting from the customer's Electric Vehicle load. As a result, such rates subject Electric Vehicle load to what these parties describe as high vehicle mileage costs. While removing the tiers from the single meter rate would address this issue, NRDC also expressed concern that switching Electric Vehicle charging from a tiered single meter rate to a non-tiered single meter rate could eliminate the conservation signals provided by the tiers.

Because a single meter Electric Vehicle rate motivates a customer to better manage the peak impacts of the entire household's electricity usage, not just the energy used for Electric Vehicle charging, we will not prohibit single meter Electric Vehicle residential rates. We hope that when we revisit rates for Electric Vehicles in 2013, inexpensive submetering technology will be readily available, obviating the need for such rates. As this outcome is not certain, we encourage SCE to continue exploring the feasibility of a non-tiered single meter rate, and we direct PG&E to do likewise. The load research that SCE and PG&E conduct

pursuant to our directives in Section 9 should be designed to support this undertaking.

5.1.2. Residential Separate and Submetered Electric Vehicle Rates

With separate metering or submetering, it is possible to avoid the potential disincentives tiered rates may create to residential Electric Vehicle charging while transmitting a pure time-of-use price signal to encourage off-peak charging. We find that Electric Vehicle residential rates should be opt-in, non-tiered and time-of-use for separately metered customers. We agree with DRA that these rates should be strongly time-differentiated (including delivery rate components), and that "to the extent that existing Electric Vehicle rates do not conform to these attributes, they should be changed" in the near term. (DRA September 24, 2010 comments at 13.)

As shown in Table 1, above, SDG&E and SCE already offer separately metered Electric Vehicle rates that are opt-in, non-tiered, and time-of-use. In contrast, PG&E's E-9b rate is a separately metered, opt in, time-of-use rate, that is tiered.[15] Therefore, we direct PG&E to file an advice letter to modify Electric Rates Tariff Schedule E-9b to eliminate the tiers. This advice letter shall be filed as a Tier 2 advice letter within 60 days of the effective date of today's decision.

5.1.3. Residential Electric Vehicle Demand Charge

Some stakeholders have suggested that demand charges should be included in Electric Vehicle residential rates as an additional incentive to off-peak charging and to recover costs of upgrades to the distribution system

[15] PG&E's E-9 rate was also a mandatory rate, not opt-in. However, in PG&E Advice Letter 3751-E, filed November 2, 2010, PG&E requested a modification of Electric Schedule E-9 to make the rate optional for customers. Advice Letter 3751-E was approved by the Commission effective December 2, 2010.

needed to accommodate Electric Vehicle charging. Accordingly, we asked parties whether demand charges should be added to Electric Vehicle residential rates.

Demand charges are not currently a component of residential rates. Instead, in the residential setting, capacity costs are recovered through volumetric charges. In the context of residential Electric Vehicle rates, a demand charge could be included as a rate component so that Electric Vehicle customers who place higher costs on the electric system by, for example, charging on-peak or at higher voltages, are assessed rates based on the maximum demand they impose on the distribution circuit.

Some parties, including SCE, DRA, NRDC and Green Power Institute, stated that residential demand charges may not be necessary since time–of-use rates can accomplish capacity cost recovery. SCE also noted that costs associated with a particular customer class could be more easily recovered through a simple customer charge. Nevertheless, some of these same parties acknowledged that demand charges are a more precise tool for recovering demand-related costs. In contrast, SDG&E stated that increasing the time-of-use differentials could lead to the potential under recovery of the costs to serve a growing Electric Vehicle customer group. SDG&E suggests this argues for the need to introduce fixed and demand charge components to the Electric Vehicle rate structure.

We are persuaded that adding demand charges to residential Electric Vehicle rates would be too great a change to residential rates at this time. Instead, we direct each utility to re-evaluate the feasibility and benefits of an Electric Vehicle residential demand charge in its next review of Electric Vehicle rates, described below in Section 5.4.

5.1.4. Inter-Utility Electric Vehicle Residential Rates

In the August 20, 2009 OIR, we asked parties whether special arrangements were necessary for a residential customer to pay for electricity when charging an Electric Vehicle in another utility's service territory. For example, should the utilities establish a single billing procedure to link all Electric Vehicle electric usage, regardless of the service territory within which the Electric Vehicle charging occurs, to a customer's home utility. In the Staff's Rates Issue Paper, this issue was referred to as inter-utility billing. (Rates Issue Paper at 38.)

SCE and SDG&E were opposed to implementing inter-utility billing. SCE stated that a special rate for inter-utility billing could cause some utilities to over-collect and others to under-collect because wholesale energy prices and costs to serve customers differ between service territories. (SCE September 24, 2010 comments at 16.) In contrast, Green Power Institute and NRDC stated that the Commission should not foreclose any options regarding inter-utility billing at this time.

We find that it is premature for the Commission to direct the utilities to implement inter-utility billing. We leave open the possibility that further development of this concept may be useful in the future.

5.1.5. Electric Vehicle Service Provider Rates in Residential Settings

During this proceeding, several parties highlighted situations in which electric vehicle service providers might operate in a residential location. For example, an electric vehicle service provider may provide all the equipment required to charge an Electric Vehicle at a home together with a charging service, in which the electric vehicle service provider separately charges customers for the electricity used to charge their vehicle. In this case the electric vehicle service provider, not the homeowner, would be the utility's customer. Parties asked that

the Commission clarify what rates electric vehicle service providers are eligible for in such a situation.

SCE recommended that all electric vehicle service providers be placed on commercial rates, regardless of the location. Under SCE's recommendation, electric vehicle service providers would only be eligible for commercial Electric Vehicle rates, even if the electric vehicle service provider obtained service in a residential location. (SCE September 24, 2010 comments at 2.) Other parties suggested that existing residential rates are sufficient for electric vehicle service providers in the near term and that any additional rate restrictions on electric vehicle service providers will unduly limit market growth.

We find that in order to preserve equitable, cost of service treatment and maintain a level playing field between utilities and electric vehicle service providers, existing residential Electric Vehicle rates should apply to electric vehicle service providers operating in the residential setting. Electric vehicle service providers should only be eligible for residential rates designed to serve Electric Vehicle load and, therefore, would not be eligible for non-time-of-use general service rates in the residential context. We adopt this limitation to ensure that electric vehicle service providers have appropriate rate incentives in the provision of their services in the residential setting to encourage off-peak charging. This finding is also consistent with D.10-07-044.

5.2. Electric Vehicle Non-Residential Rates

We now address which electric rate schedules should apply to Electric Vehicles charging at a non-residential customer premises, such as workplaces or retail locations. Our analysis of this issue is structured around a number of policy objectives associated with Electric Vehicles charging in non-residential settings. A chart of the existing non-residential rates available to customers is attached at Appendix 1.

These policy objectives include the following: (1) ensure net cost recovery for Electric Vehicle load at non-residential locations, taking into consideration that these costs may change over time as the Electric Vehicle market develops and the charging behavior for a larger market of Electric Vehicle drivers emerges; (2) simplify rate attributes for early market Electric Vehicle charging facility hosts; (3) enable customer choice with respect to rate options and metering arrangements; and (4) provide a transparent, dynamic price signal to electric vehicle service providers that reflects the higher costs of service for Electric Vehicles charging during hours of peak demand and the lower costs of service for Electric Vehicles charging during hours of reduced demand.

Currently, when a non-residential customer installs an electric vehicle charging facility, the electricity consumed at the charging station is measured along with all other usage that is connected to the same meter and all the electricity usage at the meter is subject to the same rate schedule. (SCE November 12, 2010 comments at 19; SDG&E November 12, 2010 comments at 12; PG&E November 12, 2010 comments at 6.) In the non-residential setting, one utility, SCE, also offers two separately metered time-of-use non-residential charging facility rates, rate schedules TOU-EV-3 and TOU-EV-4.

Based on the objectives noted above and the comments by parties, we find that, in the near term, charging equipment located at a non-residential customer premises should take service under the non-residential tariffs for which that customer would otherwise qualify. The only exception to this is PG&E's Schedule A-1(A) and A-1(B). These rate schedules include a relatively high usage limit of 200 kW. In addition, neither rate schedule includes a demand charge and, while schedule A-1(B) includes time-of-use rates, the rate differential is minimal. As a result, these two rate schedules fail to achieve the policy objectives noted above, most notably, reflecting the higher costs of service for

charging Electric Vehicles during hours of peak demand. Therefore, unless modified, PG&E's Schedule A-1(A) and A-1(B) will not be available to electric vehicle service providers.

We understand that different entities may own the charging equipment located on a non-residential customer's premises. (SCE December 3, 2010 comments at 5; SDG&E November 12, 2010 comments at 12.) In the event that the owner of the charging equipment is an electric vehicle service provider, we find that the utility should treat the electric vehicle service provider offering charging services no differently than other similarly situated non-residential customers. By way of clarification, however, we note that curbside charging facilities, i.e., charging facilities located at street curbs and in areas close to public street lamps, are not eligible for street lighting rates, per existing tariff terms of service.

NRDC recommends that the Commission require, as a precondition of service, that an electric vehicle service provider's customers be informed of the costs of the electricity portion of the services provided by an electric vehicle service provider. NRDC is concerned that unless Electric Vehicle owners know the cost of electricity when re-charging their vehicles at a location operated by an electric vehicle service provider, they will not respond to the price signals and thus will not face appropriate incentives to charge their vehicles off-peak. For the reasons set forth below, we decline to adopt NRDC's recommendation at this time.

As explained in D.10-07-044, "the rate that an electric vehicle charging provider pays to the utility will be a cost of doing business that the charging provider may pass on to its customers or absorb. The charging provider will have a strong incentive to operate its business in a manner that is compatible with the needs of the electric grid." (D.10-07-044 at 27.) We find this incentive is

sufficient for Electric Vehicle load and other load and do not find it is necessary to explicitly require electricity costs be precisely passed through to the vehicle owner using the electric vehicle service provider's charging services.

Moreover, the time-of-use price embedded in existing non-residential rate schedules are designed to send an appropriate price signal to a customer for electric usage at the non-residential premises, including when charging an Electric Vehicle with a non-residential customer's charging equipment. As a result, on-peak charging, to the extent it occurs, will be priced to recover the underlying cost of providing service at peak times. Similarly, to the extent that demand charges apply, they also convey price signals regarding infrastructure costs, and ensure cost recovery from those responsible for creating those costs.

In addition, we seek to ensure that charging-related infrastructure costs are shared by bundled and unbundled electric customers. To achieve this goal, we continue to employ cost-of-service ratemaking in setting the rate components for all the utilities' distribution customers, including Electric Service Providers and Community Choice Aggregators. Rate design should reflect any additional distribution system costs that result from peak Electric Vehicle charging that impose demands on any distribution-constrained facilities (including, potentially, time-variant distribution charges). For example, it may also be appropriate to revise demand charges in the non-residential setting to more accurately reflect costs imposed on the electric system by Electric Vehicle load.

For all these reasons, we find that utilities should treat electric vehicle service providers who offer charging services to the public, subject to the specific exceptions identified herein, no differently than other non-residential customers, including charging facility hosts that offer Electric Vehicle charging services to private tenants or employees.

5.3. Rate for Non-Residential "Quick Charging"

The August 20, 2009 OIR noted that Electric Vehicle consumers can choose from several different voltage options for Electric Vehicle charging. The voltage options differ from each other with regard to the amount of power that the electric vehicle service equipment draws from the electric system, which, in turn, impacts the amount of time it takes to provide an Electric Vehicle battery with a full charge. The different voltage options include Level 1 charging, which occurs at 120 volts and relies on a standard 120 volt outlet, and Level 2 charging, which occurs at 240 volts and typically draws 7.2 to 9.6 kilowatts depending on the amperage. Level 2 could draw as much as 19 kilowatts but this scenario is not expected to be typical.[16]

Another Electric Vehicle charging voltage option is referred to as "quick charging." Quick charging facilities, also known as direct current charging facilities, are designed to charge an electric vehicle battery to 80 percent capacity in approximately 30 minutes by drawing as much as 20 to 200 kilowatts or even more, 50 to 250 kilowatts. As a result, quick charging facilities place a considerably higher kilowatt demand on the electric system than even the fastest Level 1 or Level 2 charging. It is expected that quick charging will most commonly be available at non-residential sites or electric vehicle service provider charging spots and will function similarly to a gasoline filling station.

SCE and PG&E stated that quick charging facilities should be eligible for existing non-residential rate schedules. NRDC stated that such facilities will place a greater stress on the electrical grid and emphasized the importance of assuring that terms of service be imposed to prevent price signals from being

[16] Additional information on Level 1 and Level 2 charging is found in the August 20, 2009 OIR at 10-11 and the Rates Staff Paper at 21.

masked. (NRDC September 24, 2010 comments at 17.) SDG&E stated that differing rates should apply to facilities, such as quick charge facilities, that place a higher kilowatt demand on the system and, specifically, that quick charging facilities should incorporate monthly fixed charges and both on-peak and non-coincident demand charges that appropriately reflect kilowatt demand. (SDG&E September 24, 2010 comments at 10.)

At this time, we do not see a reason to treat non-residential electric vehicle charging differently from other types of non-residential electricity usage. We find that, at this early market stage, any additional costs placed on the system are adequately reflected in existing rates applicable to non-residential customers. Therefore, no need exists to develop rates specifically for customers with quick charge facilities. Notably the tariffs now available in the commercial and industrial context are characterized by a number of design features and eligibility requirements that serve to ensure that electric vehicle service providers bear the costs appropriate to their impacts on the electric system. These include all or some combination of time-of-use rates, demand charges, and/or eligibility criteria that limit the capacity under a given tariff to a pre-defined maximum.

5.4. Future Review of Rates

Many parties supported addressing Electric Vehicle rate design issues in the next general rate case cycle for each utility. DRA stated, "the Commission should revisit Electric Vehicle rate design in 2013 to evaluate whether changes are needed to facilitate Electric Vehicle adoption and/or ensure that Electric Vehicle-related cost responsibilities are equitably assigned. The Commission should direct the utilities to reflect the guidance from a 2013 Electric Vehicle rate design proceeding in their next GRC phase 2 rate design proceeding(s)." (DRA November 12, 2010 comments at 5.) The EVSP Coalition stated that the Commission should revisit existing Electric Vehicle rates after it has obtained a

sufficient understanding of consumer Electric Vehicle usage and charging by early adopters. Two studies that will yield instructive results are Ecotality's Electric Vehicle Project and Coulomb's ChargePoint America. (EVSP Coalition November 12, 2010 comments at 7-8.)

We agree that Electric Vehicle rate design should be revisited. We find 2013 - 2014 to be a reasonable time frame to review the utilities' Electric Vehicle rates. By 2013, additional information will exist about Electric Vehicle charging load profiles, the costs and benefits of Electric Vehicle charging, and consumer response to Electric Vehicle time-of-use price differentials. The Commission will also have more information on the extent to which all commercial customers must take service under time-of-use rates.[17] The expiration of the restrictions placed on the permissible options for residential customers for mandatory time-variant rates by AB 695 will also start to expire in 2013 and, as a result, open up more rate design possibilities.

Based on the utilities' current general rate case schedules set forth in D.89-01-040, as modified, PG&E will file phase 2 (rate design) of its 2014 General Rate Case in early 2013. SCE and SDG&E will be filing their 2015 General Rate Cases in early 2014. To put the review of Electric Vehicle rate design on approximately the same schedule for all three electric utilities, we direct PG&E to include Electric Vehicle rate design proposals in its 2014 General Rate Case and direct SCE and SDG&E to file Electric Vehicle rate proposals in Rate Design

[17] Time-of-use rates are in most instances mandatory for commercial customers registering over 500 kW of monthly demand. Demand charges are typically associated with these time-of-use rates. For commercial customers registering monthly demand under 500 kW, time-of-use rates are currently optional.

Window applications in 2013, as provided for and in accordance with the schedule in D.89-01-040. (D.89-01-040, 30 CPUC2d 576, 579.)

In these filings, each utility is directed to include analysis of Electric Vehicle charging load profiles, the costs and benefits of Electric Vehicle integration and charging, and consumer response to time-of-use price differentials.

6. Electric Vehicle Metering

We now identify the metering arrangements available to Electric Vehicle customers, adopt policy guidelines to assist us in evaluating the merits of various Electric Vehicle metering arrangements in the residential and nonresidential setting, and review the interplay between Electric Vehicle meters and customer-side photovoltaic (PV) generation. Lastly, we address one of the more controversial issues in this proceeding, utility ownership of electric vehicle service equipment.

6.1. Metering Options

The Utility Role Staff Paper explored available and future metering options for Electric Vehicles and identified three categories of metering arrangements for Electric Vehicles:

(1) Single metering - Single metering arrangements which measure and bill Electric Vehicle load as part of the total customer load using the pre-existing meter.

(2) Separate metering - Separate metering arrangements requiring an additional meter dedicated to measuring Electric Vehicle load. This arrangement measures Electric Vehicle load as if the load were a separate service account, and enables the Electric Vehicle load to be billed separately from other non-Electric Vehicle load served on the premises.

(3) Submetering – Submetering arrangements in which a submeter measures Electric Vehicle charging apart from

> the primary meter. This is similar to separate metering in that it uses a dedicated meter for the Electric Vehicle load. However, the submeter is typically located on the customer's side of the primary meter, making it possible to bill Electric Vehicle load and the remaining household load on different rate schedules. At the present time, submetering is not an available option. In order to facilitate timely development of cost-effective submetering equipment, we direct the utilities to collaborate with other stakeholders to craft a submetering protocol in Section 6.7.

6.2. Metering Policy Goals

The record in this proceeding supports the Commission's consideration of the following specific policy goals for Electric Vehicle metering: (1) customer choice, (2) adequate data and technological functionality, (3) innovation and accommodating technological advances, (4) common technology standards, and (5) minimizing costs. Notably, these goals are generally consistent with the broader goals of the California Plug-In Electric Vehicle Collaborative's strategic plan.

Parties overwhelmingly favor customer choice as the primary policy goal in utility metering. We agree and adopt a metering policy that promotes customer choice and does not foreclose options for customers as the Electric Vehicle market develops. This flexibility will best support customer investment in metering technological and infrastructure. Our policy will both allow customers to identify options that best serve their needs, ensure consumer experiences with Electric Vehicles are positive, and help support the on-going development of metering technology and services to improve Electric Vehicle charging.

Within the Electric Vehicle metering context, we find that achieving adequate technology functionality is important to ensure that meters meets specific minimum standards to ensure the smooth integration of Electric Vehicle charging into the electric grid. More advanced metering functions, such as demand response, can be achieved through a variety of existing technologies but these functions go beyond what is, at a minimum, needed today. As such, we will not require meters to incorporate these more advanced functions now. We note, however, that numerous components of the Electric Vehicle charging process – including the vehicle, the electric vehicle service equipment, and Home Area Networks[18] (HAN) – may in the near future be able to perform additional and more advanced communication and measurement functions consistent with the utilities' obligation to ensure that meters are Advanced Metering Infrastructure (AMI) and HAN enabled. (See, e.g., Smart Grid Rulemaking, R.08-12-009.)

We encourage innovation in metering functionality with flexibility to take advantage of emerging Electric Vehicle technologies. Accommodating future data needs and yet-to-be-developed technologies could present opportunities to reduce costs and improve the ability of Electric Vehicle meters to advance environmental and social goals, such as climate change. However, some specific future data needs, such as potential tracking of road taxes and California Air Resources Board's Low Carbon Fuel Standard[19] credits, have yet to be clearly

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[18] Home Area Network devices enable communication between various devices and the customer's electric meter.

[19] More information about the California Air Resources Board's Low Carbon Fuel Standards are available at www.arb.ca.gov. The Low Carbon Fuel Standards are defined in Title 17 of the California Code of Regulations §§ 95480 et seq. and, generally,

Footnote continued on next page

defined. Therefore, we cannot assume that a specific grade of meter, such as a meter that produces data accurate and detailed enough to be used for billing purposes (referred to as a "revenue-grade" meter), will be required for these purposes. Nevertheless, overall, we seek to encourage innovation in metering functionality. As data is collected and metering functionality improves, the Commission will continue to collaborate with the California Air Resources Board on topics that overlap with greenhouse gas emission reduction and electric vehicles, including the Low Carbon Fuel Standard, to ensure that ratepayer benefit is maximized through the electric vehicle market.

The Commission noted the importance of interoperability standards for the Electric Vehicle market in the January 12, 2010 Assigned Commissioner's Scoping Memo. Additionally, in the Smart Grid Rulemaking, R.08-12-009, Commission initiated a review of standardization issues generally. In short, we recognize the vital importance of national standardization in keeping equipment costs down.[20] (D.10-06-047 at Conclusion of Law 5.) R.08-12-009 will continue to serve as the forum for the Commission's consideration for national interoperability of Electric Vehicles and the charging equipment with other parts of the electric system.

6.3. Metering Options - Residential Locations

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its purpose is to implement a low carbon fuel standard which will reduce greenhouse gas emissions by reducing the full fuel-cycle, carbon intensity of the transportation fuel pool used in California.

[20] The National Institute of Standards and Technology and the Federal Energy Regulatory Commission are charged by the U.S. Congress to coordinate development and adoption of interoperability standards.

In evaluating whether utilities should continue to make available all existing metering options to Electric Vehicle customers, we are guided by the above policy goals.

The Utility Role Staff Paper suggested that, in the short-term, utilities encourage residential customers to use single metering (whole-house metering), i.e., no separate Electric Vehicle meter or submeter. Staff's recommendation was based on its conclusion that Electric Vehicle-specific metering functionality requirements were still forming so until all Electric Vehicle metering and data requirements are better understood, utilities should encourage customers to use a single meter arrangement for Electric Vehicles to avoid potential stranded costs. (Utility Role Staff Paper at 36.) Staff also expressed concern that separate Electric Vehicle meters installed in the near-term might become redundant and unnecessary as relatively inexpensive and fully functional submetering technology becomes available.

During workshops and in comments, parties generally recommended that the various metering arrangements be made available to all customers. (PG&E September 20, 2010 comments at 1-2.) Some parties disagreed with the Staff recommendation that single metering be encouraged by utilities in the short-term. These parties contend that a policy that promotes single metering will place utilities in a more advantageous position versus electric vehicle service providers because Electric Vehicle customers will become accustomed to interacting with the utility on Electric Vehicle meter topics and customers will need to incur additional costs to move to a different arrangement, which might include a submeter or separate meter. (WSPA September 20, 2010 comments at 3.)

We find that the utilities should continue to make available all existing metering options to customers. Our finding emphasizes the importance of

preserving customer choice in metering arrangements at this early stage of Electric Vehicle market development as a means of promoting customer satisfaction, encouraging technological advancement, and creating a level playing field for electric vehicle service providers. For these reasons, we conclude that, despite the benefits of single metering in terms of keeping initial equipment costs low, we will not direct the utilities to encourage single metering options as the preferred approach in the near-term. To facilitate additional metering options, we seek to actively promote development of submetering options and establish a process to create an Electric Vehicle submeter protocol in Section 6.7.

6.4. Metering Options - Multi-Dwelling Units and Non-Residential Locations

In the multi-dwelling unit (MDU) setting and non-residential locations, in contrast to the residential setting, the Electric Vehicle owner may not be the utility's electric customer. SCE and Coulomb described examples in the MDU setting, such as apartment complexes, and in the non-residential setting, such as office buildings, in which multiple Electric Vehicle owners use the same charging equipment. These parties raised questions about appropriate metering arrangements and the potential advantages of submetering is such settings. We find that submetering at MDUs and workplaces requires additional evaluation to determine what protocols and policies, if any, are needed to support these options, and we direct that MDU and non-residential metering issues be included among the submetering issues addressed in the Electric Vehicle submeter protocol process, which we discuss in Section 6.7.

6.5. Metering and Photovoltaics

We recognize that some Electric Vehicle owners will also have PV panels installed on their premises. We asked parties to consider whether this situation

raised metering issues that require our specific consideration. In response, parties indicated that any of the three metering options could be utilized by PV customers who also own Electric Vehicles. (Utility Role Staff Paper at 20.) We find that PV customers should be provided with the ability to choose from a range of metering options to accommodate their data requirements. Because any of the existing metering categories can meet PV data requirements, we decline to adopt any further requirements on the integration of Electric Vehicles and PV metering at this time.

6.6. Ownership of Meters

Within the evolving Electric Vehicle market, the Utility Role Staff Paper identified two key customer-utility boundary issues related to metering: ownership of the electric vehicle service equipment and ownership of an Electric Vehicle submeter. The customer-utility boundary, which determines ownership, has generally been defined in the single-meter ssetting. The meter that is used to measure a customer's billable usage and the equipment on the utility's side of the meter is owned by the utility, while equipment located on the customer's side of the meter is owned by the customer.[21] (Utility Role Staff Paper at 27-28.)

Our analysis is guided by two prior Commission decisions adopted in 1993 and 1995. In D.93-07-054, the Commission provided policy guidance for low and zero emission vehicles and identified four criteria for determining whether utility investments in low emission vehicle refueling infrastructure are consistent with the interest of ratepayers. These criteria included the following: 1) whether the investments contribute to reliable and efficient utility service; 2)

[21] The Utility Role Staff Paper identifies several exceptions to this general rule. For example, a Direct Access customer or the Direct Access customer's Energy Service Provider can own the meter used for billing.

whether the investments provide safe service; 3) whether the investments provide environmentally and socially responsible utility service; and 4) whether the investments maintain reasonable rates.
(D.93-07-054 at 19-24.)

In D.95-11-035, the Commission relied on the criteria adopted earlier in D.93-07-054 to deny requests by utilities for Commission approval of additional ratepayer funding to support the deployment of low emission vehicle equipment, including electric vehicle service equipment. In denying the utilities' request for funding, the Commission found that because low emission vehicles – as opposed to utility infrastructure to support these vehicles – are not a monopoly, utility participation in the low emission vehicle market should not be as a protected monopolist. The Commission also found no clear ratepayer benefit stemming from a utility's ownership of electric vehicle service equipment. In short, the Commission found that utility shareholders should bear the costs of any electric vehicle service equipment and no reason existed for a utility to be the sole provider of the electric vehicle metering and recharging equipment. (D.95-11-035 at 15-19.) The Commission also prohibited regulated utilities from using ratepayer funds for charging infrastructure investments. (D.95-11-035 at 35.)

In this proceeding, Staff suggested that customer ownership of meters would allow customers to respond to technology changes and to directly incur the costs and, likewise, receive the benefits of adopting innovations in metering. Staff suggested that the effect of competition for meters could produce cost savings for customers. Staff also pointed to several disadvantages to customer-owned meters, including the potential for lack of standardization of metering functionality, the need to have a governmental agency verify meter performance, and elimination of the opportunities to reduce costs through utility economies of

scale. Staff concluded that utilities should own the meters in the case of single or separate metering, but that the customer should be given the option to own the meter in the case of Electric Vehicle submetering. (Utility Role Staff Paper at 37.)

With the guidance provided by D.93-07-054 and D.95-11-035, together with the information provided by the Utility Role Staff Paper, we evaluate the ownership issues of Electric Vehicle meters and electric vehicle service equipment by turning to the previously identified metering policy goals: fostering customer choice, achieving specified minimum data and technological functionality, allowing for future technological advances, recognizing common technology standards, encouraging innovation, and minimizing cost. Our analysis follows.

6.6.1. Ownership of Single and Separate Electric Vehicle Meters

In the case of single and separate Electric Vehicle metering, we continue to designate the meter as generally on the utility side of the customer-utility boundary. Changes to the ownership of single and separate meters used for Electric Vehicles would represent a change in general metering policies. Based on parties' comments, we do not find sufficient justification to adopt this approach for single or separate Electric Vehicle meters at this time. In the longer term, however, technological and communication advances may support customer-owned meters used for separate Electric Vehicle metering that is more consistent with our policy goals. Thus, we remain open to re-evaluating customer ownership of separate meters should the appropriate technology develop to reduce costs associated with customer-owned separate meters.

6.6.2. Ownership of Electric Vehicle Submeters

In the case of ownership of Electric Vehicle submeters, we find that customer-ownership of submeters is consistent with all of our above-noted Electric Vehicle metering goals, especially those policy goals related to customer

choice, supporting technological innovation and minimizing cost. For example, we anticipate that customer ownership of submeters will allow customers to take advantage of new metering technologies to support new billing methods. Therefore, we find that Electric Vehicle submeters should be treated consistent with the treatment of any other equipment located on the customer side of the meter.[22]

The primary meter, as opposed to the Electric Vehicle submeter, will remain under the ownership of the utility. A submeter would measure Electric Vehicle load and be used by the utility in its billing calculations. This arrangement will provide utilities with control over the total billing level and limit opportunities for fraud or meter tampering. Most likely, incidences of fraud would be limited to tampering with the submeter's calculation of the Electric Vehicle subload, which does not impact the utility calculation of the total load at the primary meter.

While some parties, including SMUD, PG&E, and SCE, identified several potential benefits of utility ownership, such as increased access and oversight of submeters, efficiency, and permitting access to the submeter market, we find that such benefits do not outweigh the above-noted benefits of customer ownership of submeters.

6.7. Electric Vehicle Submeter Protocol

As part of this proceeding, we asked parties whether an Electric Vehicle submeter protocol is needed to determine rules for customer-owned Electric Vehicle submeters and, if so, to identify stakeholders to be involved in the

[22] Parties and Staff identified two potential submetering options: electric vehicle service equipment-embedded meters and on-board vehicle metering. It is not clear how these options could be facilitated under a system in which utilities own the submeter.

development of such a protocol, the issues to be addressed, and whether we might learn from our experiences in other Commission proceedings, such as the Direct Access metering protocol adopted in D.98-12-080.

Parties generally agreed that a need exists for an Electric Vehicle submeter protocol to determine rules for customer-owned meters. Parties suggested that some of the goals in establishing an Electric Vehicle submeter protocol should be to establish minimum functionality and communication requirements for any submeter used to measure Electric Vehicle load. Such a requirement would enable manufacturers and customers to be sure that the meters, whether purchased separately or included in the vehicle or as electric vehicle service equipment, are compatible with the utility billing and communication system. In addition, NRDC and PG&E stated that the process to develop an Electric Vehicle submeter protocol should include a range of stakeholders, including electric vehicle service providers, utilities, and government agencies. Parties also suggested that the California Department of Food and Agriculture will play a key role in any submeter process as the regulator of non-utility measurement devices used in commercial transactions.

We agree that a process is needed to develop an Electric Vehicle submetering protocol. We also agree with NRDC that the Electric Vehicle submeter protocol should create a framework that can incorporate emerging metering technologies and encourage innovation. The submetering category as defined here remains broad, and any Electric Vehicle submeter protocol should support the use of submeters in various physical locations, such as standalone customer-owned submeters, or in electric vehicle service equipment or a vehicle. We also agree that the California Department of Food and Agriculture will play a key role in regulating non-utility measurement devices so its participation in the Electric Vehicle submeter protocol process is crucial.

In this process, stakeholders should also examine mobile detachable meters[23] as described in SDG&E's September 20, 2010 comments. The California Air Resources Board expressed a concern that on-board vehicle metering will be expensive, but others, including GM, found this conclusion premature. GM further suggested that on-board vehicle metering "could provide the most cost effective, communications capable, regulatory compliant and utility/customer friendly solution for measuring and recording" Electric Vehicle electricity consumption. (GM December 1, 2010 comments at 2.)

For this and other reasons, we are interested in the creation of an Electric Vehicle submetering protocol that does not prejudge the merits or functionality of future technology developments.

We agree with PG&E that a central purpose of the Electric Vehicle submeter protocol is to certify the accuracy of the devices used for utility billing of vehicle electricity consumption. The protocol need not address HAN devices unrelated to utility billing. While submeters may be HAN-enabled, establishing an Electric Vehicle submeter protocol that applies to HAN-enabled Electric Vehicle submeters does not affect the utility's separate and distinct role in authenticating or certifying the accuracy of other HAN devices.

In response to Coulomb's request that we consider a "lightweight" certification process for submeters, we defer to the California Department of Food and Agriculture. The comments submitted by California Department of Food and Agriculture recognized that the regulation of customer-owned meters generally falls under its purview. For this and other reasons, we strongly

[23] Mobile detachable meters include technology for a meter that can be physically separated from the Electric Vehicle but also travel with the vehicle.

support the California Department of Food and Agriculture's participation in the Electric Vehicle submeter protocol process.

Finally, parties suggested that a protocol be developed quickly. We agree and direct the utilities to cooperate with stakeholders to form a working group to develop an Electric Vehicle submeter protocol that could be adopted by the Commission as revisions to PG&E and SCE Tariff Electric Rule 18 and SDG&E Tariff Electric Rule 19.

The utilities are to include in the working group, at a minimum, Commission Staff, California Department of Food and Agriculture, automakers, and electric vehicle service providers. The utilities shall hold at least one publicly noticed workshop and shall issue a public report following the workshop. The report shall be filed in this proceeding within 15 days of the workshop. The filing of the report will be a compliance filing in this proceeding.

On or before July 31, 2012, the utilities are directed to jointly file a Tier 2 advice letter proposing a submetering protocol. The filed protocol must achieve, at a minimum, the following: (1) support the use of submeters located in electric vehicle service equiment or on a vehicle, including mobile detachable meters, as described in SDG&E's comments on the Utility Role Staff Paper; (2) determine the technical performance requirements for any submeters; (3) identify the minimum communication functionality and standards; (4) describe how submeter data management will support and protect the security and privacy of Electric Vehicle user data collected by utilities and third party entities; (5) provide a methodology for settling disputes; (6) identify and adhere to all existing and applicable national standards for measurement

and communication functions; and (7) develop rules for incorporating subtractive billing into submetering tariffs.[24]

We also recognize that the submeter protocol will likely rely on technology standards related to smart grid communications, including HAN communication standards, that have not been finalized. The submeter protocol process involves a diverse set of stakeholders and will likely raise new issues that would benefit from stakeholder input. To facilitate the development of a comprehensive protocol, the utilities must jointly submit to the Commission, on or before October 31, 2011, a report that will allow the joint implementation of comprehensive protocol by July 31, 2012. The report will detail how the protocol will be informed by relevant ongoing standard development processes and include the specific issues that the protocol will address.

6.8. Separate Meter Costs

Addressing cost allocation and recovery for utility-owned separate Electric Vehicle meters is important because a separate meter is presently the only viable option to physically segregate Electric Vehicle usage from household usage. Additionally, a separate meter is currently needed for certain Electric Vehicle time-of-use rates. At present, no uniform utility treatment of separate meter

[24] Subtractive billing refers to the process through which a utility can bill Electric Vehicle usage separately from other usage. All usage is first measured through the primary meter, while the Electric Vehicle usage is also measured by a dedicated submeter. The Electric Vehicle usage can be subtracted from the usage measured by the primary meter to bill the house consumption and the Electric Vehicle consumption separately. This subtractive billing is accomplished by back office billing software that links the meter data from the two meters and separately calculates the charges. (Utility Role Staff Paper at 18.)

costs exists. PG&E assesses a "per meter charge"[25] to establish a service point for a second meter. In addition, PG&E's existing optional Schedule E-9b for Electric Vehicle customers includes a monthly recurring meter charge of $0.21881, unless a customer has a Smart Meter. SCE also includes a customer charge to recover the cost of services for a utility-owned separate meter.[26] In contrast, SDG&E does not have a separate meter charge for customers with separate Electric Vehicle meters, but recovers the cost of these meters through general distribution charges borne by all SDG&E ratepayers.[27] During this proceeding, parties questioned whether the costs of separate utility owned meters to be used for Electric Vehicle charging should be borne by all ratepayers or the Electric Vehicle customer. We address this question below.

DRA and TURN noted that the basic provision of utility service to a standard single residential account does not include a second meter. (DRA December 3, 2010 comments at 3; TURN December 3, 2010 comments at 1.) As a result, the standard allowance for residential account service installations, borne

[25] Approved and implemented under PG&E Advice Letter 2552-G/2517-E. (PG&E January 7, 2011 Response to Energy Division Data Request.) PG&E points out that this charge is intended to off-set the administrative, back-office costs associated with establishing the service point and that this charge is unrelated to both the capital cost of the meter itself and the ongoing expense of maintaining a second meter.

[26] SCE states that its separately metered TOU-EV-3 and TOU-EV-4 commercial Electric Vehicle rates have the same customer charges, including separate meter charges, as GS-1 and GS-2 customers, respectively. However, regarding the separately metered residential SCE TOU-EV-1 rate, this separate meter charge was set equal to zero as part of the 2009 general rate case phase 2 settlement. For SCE's residential customers, the uncollected metering cost is now collected via an adder to the volumetric rate. (SCE January 7, 2011 Response to Energy Division Data Request.)

[27] SDG&E states it removed the separate meter charge pursuant to a revenue allocation agreement in the AMI settlement, D.07-04-043. (SDG&E November 12, 2010 comments at 3.)

by all ratepayers, does not typically include the cost of a second meter to segregate a particular customer load.[28] PG&E pointed out, however, that a second meter may be part of the costs subject to allowances under Tariff Rules 15 and 16 and proposes to include the cost of the separate meter in the rate-based standard installation allowance pursuant to these Rules.

We find PG&E's approach to be inconsistent with current practice regarding allowances for typical residential accounts. While this decision adopts a narrow modification to the costs addressed in Rules 15 and 16, this decision does not intend those changes to modify the existing cost allocation associated with separate Electric Vehicle meters. The intent of the narrow tariff modification is to facilitate the transition to an Electric Vehicle market by allocating certain upgrade costs to the general body of ratepayers. These costs should be those strictly limited to those on the utility side of the meter and that are necessary to establish a basic Electric Vehicle charging capability. This narrow modification to Tariff Rules 15 and 16 is discussed further in Section 8.

We further find that placing the costs of existing separate Electric Vehicle meters on the general body of ratepayers may result in an unfair advantage for utilities relative to the non-utility electric vehicle service providers. In making this finding, we agree with the competitiveness concerns raised by the EVSP Coalition and Green Power Institute. We also rely on Pub. Util. Code § 740.3(c), which establishes that the Commission's policies shall "… ensure that utilities do not unfairly compete with nonutility enterprises."

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[28] The Rates Staff Paper described the standard allowance, per Tariff Rule 15, as "a prepayment of future rate base expenditures to be paid over time by all ratepayers" provided to the customer "for the cost of upgrades for new load. The allowance for residential load is a fixed amount. The allowance for non-residential load is based on forecast consumption."

NRDC supported spreading the costs of separate Electric Vehicle meters over the larger body of ratepayers because a customer's choice to avoid the increased meter costs associated with a separate Electric Vehicle meter at the point of purchase of an Electric Vehicle might create greater overall system costs in the long term. NRDC suggests that, in the absence of a separate Electric Vehicle meter, customers may be less likely to charge their Electric Vehicle off-peak. However, because SCE, PG&E, and SDG&E customers do not pay a substantial one-time charge for a separate meter, we find NRDC's concern unlikely to arise.

Other parties suggested that initial capital outlays for separate Electric Vehicle meters could be mitigated by on-bill financing.[29] However, on-bill financing is typically for customer-owned, non-residential facilities. Program eligibility restrictions may complicate this as a near-term option for residential customers. (SDG&E December 3, 2010 comments at 3.) For these reasons, on-bill financing is not a viable option for utility owned residential separate meters at this time.

Accordingly, we agree that if the individual utility customer chooses a separate metering option to obtain a particular Electric Vehicle rate, the customer (rather than all ratepayers) should bear the cost of the separate meter. We further support the use of monthly recurring charges to spread separate meter costs over time. In this manner, costs will not unduly discourage separate metering, and potential on-bill financing program restrictions are avoided. Lastly, we confirm that the utility retains ownership of the separate meter.

[29] On-bill financing refers to a loan program providing zero percent (0%) interest financing to qualified customers towards the purchase and installation of new energy efficient measures or equipment at the customer's premises.

7. Utility Ownership of Electric Vehicle Service Equipment

We now turn to whether utilities should be permitted to own electric vehicle service equipment. We take into consideration our finding in D.95-11-035 that utilities could not recover costs related to electric vehicle service equipment from ratepayers. We also consider the benefits of utility ownership of electric vehicle service equipment. For example, NRDC and SDG&E suggested utility ownership of this equipment could provide safety advantages, reduce customer cost, and support utility notification of location where vehicles will be charged.

We do not find convincing evidence that utility ownership of electric vehicle service equipment will result in safety advantages over electric vehicle service equipment owned by customers or other entities. Municipal governments already have permitting requirements that review project installations for their safety merits. Additionally, national standards on electric vehicle service equipment couplers and other equipment features ensure manufacturers' adherence to safety standards.

We also find speculative the assertion that utility ownership of electric vehicle service equipment will reduce customer costs. Although the utilities could benefit from economies of scale by purchasing electric vehicle service equipment in large numbers, the utilities are not the only entities that could make large scale purchases. Furthermore, the potential costs savings of a "single buyer" approach would, in all likelihood, limit customer choice and, perhaps, even dampen the competition that may yield cost reducing innovation. As such, we do not find that the benefits of utility ownership of electric vehicle service equipment outweigh the potential for competitive limitations resulting from utility ownership. However, utilities may continue to own electric vehicle

service equipment used to charge their own electric vehicle fleets or provide workplace charging for utility employees.

At the September 27, 2010 workshop, the utilities expressed a concern that prohibiting utility ownership of electric vehicle service equipment at this early stage of market development may result in underserved markets or market failure. Should utilities present evidence in an appropriate proceeding of underserved markets or market failure in areas where utility involvement is prohibited, we will revisit this prohibition. Should the Commission revisit this issue, we will revisit the concerns outlined above, among others, including the potential cost-subsidization implications of any utility proposal to own public electric vehicle service equipment.

To the extent that SDG&E is requesting funds to support its Public Access Charging Facilities in A.10-12-005, SDG&E's general rate case proceeding, SDG&E must provide convincing evidence that our prohibiting SDG&E ownership of electric vehicle service equipment at this early stage of Electric Vehicle market development would result in underserved markets or market failures in areas where non-utility entities fail to properly serve all markets.

8. Utility Cost Recovery Policy for Residential Upgrades and Extensions

The utilities anticipate the need to make infrastructure upgrades to accommodate the added load from residential Electric Vehicle charging. For example, if a residential customer installs electric vehicle service equipment, the utility may determine that the distribution transformer, a service panel, or other equipment needs to be upgraded to facilitate vehicle charging.

We now address the issue of who pays for service upgrades or extensions to accommodate basic Electric Vehicle charging in the residential setting. In considering this issue, we look to the existing tariff rules on residential upgrades and extensions in light of the State's policy goals under AB 32 to reduce

greenhouse gas emissions and the related ARB 2008 Scoping Plan, which includes a comprehensive strategy to reducing greenhouse gas emissions from the transportation sector.[30] Electrification of vehicles is a critical component of the ARB's 2008 Scoping Plan.

We are also guided by other programs intended to reduce greenhouse gas emissions from California's transportation sector, including (1) the Pavley greenhouse gas vehicle standards AB 1493 Pavley, Stats. 2002, c. 200) to achieve near-term vehicle emission reductions to the maximum extent technologically feasible; (2) the ZEV program to transform the future vehicle fleet by placement of increasing numbers of ZEVs (including hydrogen fuel cell and battery electric vehicles) and (3) the Alternative and Renewable Fuel and Vehicle Technology Program (AB 118 Núñez, Stats. 2007, c. 750) to, among other things, develop, demonstrate, and deploy innovative technologies to transform California's transportation fuel and vehicle types.

In addition, we are guided by the directive in § 740.2(a) to adopt rules to address, among other things, "infrastructure upgrades necessary for widespread use" of Electric Vehicles. (Pub. Util. Code § 740.2(a).) Lastly, we are mindful that early adopters' experiences with upgrade costs related to Electric Vehicle charging may have an overall influence prospective Electric Vehicle buyers' perceptions of the cost of vehicle ownership.

8.1. Existing Policy -- Tariff Rules 15 and 16

The existing policy concerning electric grid upgrades due to increased new and permanent customer load is set forth in two Electric Tariff Rules--Rule 15 (Distribution Line Extensions) and Rule 16 (Service Line Extensions). Tariff

[30] ARB's 2008 Scoping Plan at 38.

Rule 15 generally pertains to grid equipment used by multiple customers, for example, a transformer serving multiple homes. Rule 16 generally pertains to network equipment used by just one customer.

According to Rule 15, an upgrade to equipment serving multiple customers is generally considered a utility expense and the associated cost is borne by the general body of ratepayers. Thus, if in conjunction with a customer's addition of Electric Vehicle charging, the utility determined that a transformer serving that customer and the surrounding neighbors needed to be upgraded, the cost of that upgrade would be borne by the general body of ratepayers, not just by the Electric Vehicle customer or just by the group of neighbors being served by the transformer.

The cost allocation of upgrades to equipment serving a single customer, which is governed by Tariff Rule 16, is more complex. For equipment upgrades due to increased electricity usage designated as "new and permanent load," the customer is provided an "allowance" to off-set the costs of the upgrade. The allowance is a fixed dollar amount for all residential customers within a utility service territory. Generally, any upgrade costs up to the dollar amount of the allowance are paid for by the general body of ratepayers and any costs in excess of the allowance are paid for by the specific customer served by the equipment. The utilities' interpretation of these rules varies and as a result, each utility has slightly different types and levels of allowances. [31]

[31] PG&E recommended that the Commission approve alignment of its tariff interpretation with SCE's and SDG&E's. (PG&E April 5, 2011 comment at 12.) We decline to address this matter.

For example, according to PG&E, under Tariff Rule 15, the cost to replace a shared distribution transformer would be considered a total system asset and, as a result, be included in rate base (without any need for assessment of an allowance under Tariff Rule 15). On the other hand, the cost to replace an existing customer-specific service transformer would be at the customer's expense. No allowance would apply. However, under Tariff Rule 16, a new residential customer (i.e., with or without Electric Vehicle load) would be given the current fixed allowance for hookup as determined by PG&E Electric Tariff Rule 15(C)3 ($1,918 per meter or residential dwelling unit) as well as for upgrades to existing facilities as determined by Tariff Rule 16(F)1 (Service Reinforcement). SCE and SDG&E may apply these rules in a manner that does not result in any allowance for new or existing customers

8.2. Electric Vehicle Load as New and Permanent Under Tariff Rules 15 and 16

Before determining how the allowances provided for in Rules 15 and 16 apply to upgrades or extensions related to Electric Vehicle load, we first address whether Electric Vehicle load constitutes new and permanent load under those rules. Parties took a variety of positions on this issue.

PG&E, SCE, SDG&E, NRDC, and Coulomb suggested that Electric Vehicles should be categorized as new and permanent load and that, as a result, the tariff allowance should apply to Electric Vehicle upgrades. These parties point out that the Electric Vehicle load is supported by the State's transportation policy goals set forth in AB 32 (related to greenhouse gas emission reductions) and that by designating this load as temporary, Electric Vehicle customers would be penalized because allowances would not apply. These parties argue that this result would ultimately not serve the State's goals.

In contrast, TURN argued that Electric Vehicles do not fit within the definition of permanent load. TURN's principle argument is that residential upgrades resulting from Electric Vehicle load will result in stranded infrastructure costs. For example, TURN points out that the average life of an Electric Vehicle is shorter than the useful life of any potential service upgrade facilities. An Electric Vehicle could be sold or suffer irreparable mechanical problems, or the Electric Vehicle owner could move to a different utility service territory. According to TURN, the Commission should not designates Electric Vehicle load as permanent because a single Electric Vehicle may not be used long enough for the general body of ratepayers to be made whole from revenues generated by that Electric Vehicle's energy consumption.

Based on the similarity of Electric Vehicle load to the load created by other large residential appliances, such as large portable air conditioners,[32] and based on the State's goal to reduce greenhouse gas emissions through the electrification of the transportation sector, we find it appropriate to designate Electric Vehicle load as new and permanent. This designation reflects the goal of the State to fully integrate Electric Vehicles into the transportation sector.

While it is too early to say with any degree of certainty whether Electric Vehicles will become a mainstream feature of California's vehicle fleet or a given customer's fleet of vehicles, we want the policies we adopt today to create an environment to facilitate customers' positive initial experiences with Electric Vehicles and, as a result, greatly improve the likelihood that Electric Vehicles will become a permanent feature of California's vehicle fleet. In this way, we will reduce the risk of stranded costs.

[32] PG&E November 12, 2010 comments at 10.)

To the extent TURN's cost allocation arguments reflect the fact that historically Rules 15 and 16 probably did not contemplate how to incorporate residential transportation load onto the electric grid, we agree that the State's policy to encourage the electrification of the transportation sector is requesting that we stretch our application of these rules.

Moreover, while TURN's arguments focus on the immediate infrastructure costs created by individual residential Electric Vehicles, we choose to weigh the costs and benefits from a broader perspective. Individual Electric Vehicles may initially place more costs on ratepayers than recovered through revenue generated from charging the vehicle. However, we also recognize that incremental Electric Vehicle load on a larger scale has the potential to yield improved electricity system asset utilization in the long-term. (SCE Oct. 5, 2009 comments at 40; SDG&E Oct. 5, 2009 comments at 25). We further recognize that on a large scale Electric Vehicle charging occurring during off-peak periods could actually reduce the price of energy for all ratepayers, by increasing the electricity system's asset utilization. As such, in applying Rules 15 and 16 to Electric Vehicles, we are creating the foundation for a shift in the transportation sector. Our goal is to create a future where residential Electric Vehicle charging will be the norm. As we approach this goal, we anticipate that Electric Vehicle load will carry an increasing portion of the related infrastructure costs.

TURN's argument related to the average life of an Electric Vehicle relative to the projected life of an Electric Vehicle service extension facility is unpersuasive. As discussed above, the argument fails to take into consideration the State's policy goal. Furthermore, when a customer installs charging equipment at their premise that requires a service panel upgrade, the panel upgrade is a new and permanent capacity addition at the customer premise. The utility sizes the distribution system to accommodate peak customer loads

irrespective of the customer's actual usage and the goal is for peak load not to increase with the use of Electric Vehicles.

Additionally, contrary to TURN's position, the longevity of a given vehicle is not particularly germane to the question of whether the load the vehicle represents is new and permanent. The more critical question is whether the infrastructure deployed to serve an Electric Vehicle will continue to be used over its useful life to serve load anticipated from Electric Vehicles, regardless of whether that load is from an initial Electric Vehicle or subsequent Electric Vehicles charged at that premises or even other appliances.

In short, TURN's description of Electric Vehicles fails to fully reflect the State's goals to encourage the electrification of the transportation sector as a means of reducing overall greenhouse gas emissions. Working with other state agencies, we seek to create a future that includes Electric Vehicles as a critical and mainstream component of the State's transportation sector. By designating Electric Vehicle load as new and permanent, we are creating the foundation needed to integrate Electric Vehicles into California's transportation sector. Evaluating Electric Vehicles from this perspective and taking into consideration the anticipated growth of California's Electric Vehicle fleet rather than the transient lifecycle of any single electrical appliance, including the individual Electric Vehicle, we find it reasonable to designate Electric Vehicles as new and permanent load under Tariff Rules 15 and 16.

8.3. Tariff Rules 15 and 16 Standard Allowance for Electric Vehicles

Based on the designation of Electric Vehicle load as new and permanent under Rules 15 and 16, we now turn to the issue of whether residential customers should be afforded the standard Rule 16 allowance to cover the costs

of any required customer facilities upgrades or extensions to accommodate Electric Vehicle load.

Historically, the standard Rule 16 allowance seeks to apply a revenue-based justification for costs created by upgrades or extensions. As we state above, however, the immediate infrastructure costs created by Electric Vehicles may exceed the revenues generated through the corresponding load. In this sense, the allowances provided for under Rules 15 and 16 do not contemplate the more complex scenarios created by a State policy based on the electrification of the transportation sector. Rules 15 and Rule 16 may need to be refined to better reflect cost allocation principles underlying our State's policy. To the extent needed, we welcome the opportunity to improve the application of the cost principles underlying these rules in the near future.

Nevertheless, today we seek to balance the goal of reasonable cost allocation with the goal of supporting Electric Vehicle market growth. Our decision reflects the desire to ensure positive early consumer experiences with Electric Vehicles and relies on the § 740.2(a) directive to adopt rules to address, among other things, "infrastructure upgrades necessary for widespread use" of Electric Vehicles. Most importantly, however, our decision is based on the policy set forth in AB 32 and ARB's 2008 Scoping Plan to encourage the electrification of the transportation sector as a means of reducing overall greenhouse gas emissions.

For these reasons, we find that the standard allowances under Rules 15 and 16 apply to upgrades and extensions resulting from Electric Vehicle charging.

8.4. Interim Policy – Residential Upgrades or Extensions in Excess of Utility Allowances

In some instances, the costs of residential upgrades to enable Electric Vehicle changing will exceed the allowances provided under Rules 15 and 16. We now address whether to allocate such excess costs to the general body of ratepayers. In evaluating this issue, we are again guided by the policy set forth in AB 32 and ARB's 2008 Scoping Plan to encourage the electrification of the transportation sector as a means of reducing overall greenhouse gas emissions.

As referenced in the Rates Staff Paper, there exists a great deal of variability with respect to the forecasted costs of different Electric Vehicle charging scenarios depending on whether residential customers will respond to incentives to charge off-peak. A preliminary PG&E analysis suggests "distribution upgrade costs to accommodate charging for residential circuits may be as much as five to twenty times greater on-peak as compared to off-peak." Given this variability, Better Place recommends the Commission may want to consider establishing allowance pools for each investor-owned utility's customers rather than employing individual residential allowances to optimize Electric Vehicle adoption. In this way, Better Place explains, existing allowances do not act as a disincentive to Electric Vehicle adoption and the costs are tracked on a system-wide IOU basis. (Better Place September 24, 2010 comments at 3.)

We acknowledged, above, that Electric Vehicle load is similar to other large residential appliances. We also acknowledged that Electric Vehicle load offers benefits beyond the typical electric appliance in terms of the potential to reduce overall greenhouse gas emissions. Therefore, in light of the policy set forth in AB 32 and ARB's 2008 Scoping Plan to encourage the electrification of the transportation sector as a means of reducing overall greenhouse gas emissions, we adopt special interim cost treatment for service upgrade costs

resulting from Electric Vehicle charging that exceed the Rules 15 and 16 residential allowances. Our decision today is also supported by the directive in § 740.2 to reduce barriers to Electric Vehicle adoption and our goal to encouraging early adopters.

Between the effective date of this decision and June 30, 2013, service facility upgrade costs to enable basic Electric Vehicle charging that exceed the residential allowance will be treated as common facility costs rather than being paid for by the individual Electric Vehicle charging customer. This policy will not apply in the non-residential context, nor does it apply to certain costs that are currently the customer's responsibility and not subject to allowances or refunds, such as "excavation…, conduit and substructures…and protective structures" or incremental costs associated with so-called "Special or Added Facilities."[33]

TURN and DRA expressed the concern that this approach will create an incentive for some customers to gold-plate their charging equipment or undertake extensive electrical upgrades at the same time as they install electric vehicle service equipment. It is not our intent to require the general body of ratepayers to subsidize elaborate or unrelated service upgrades. For this reason, we apply this policy only to "basic" charging arrangements only. While the interpretation of this term is flexible to a certain degree, we provide guidance that it is intended, generally, in most cases to encompass Level 1 and 2 charging for at least one vehicle.

[33] See, for example, PG&E Tariff Electric Rules 16.D.1.a and 15.D.5.d and 16.A.5. In the case of an Electric Vehicle charging station, an example of a special facility might be the installation of a 480 Volt transformer for a fast-charging station where the customer's load does not meet the Tariff Rule 2 minimum load limit for a 480 Volt service. In such cases, the special facility would be paid for by the individual customer. See, also, SCE Rule 16.D.1 "Applicant Responsibility" (costs of conduits, structures, and trenching")

We expect the utilities' cost tracking and load research plans described in Section 9 to track costs in excess of the standard residential allowance that result from the interim policy adopted herein. In January 2013, several months before the expiration of this June 30, 2013 deadline, the utilities will have completed the Electric Vehicle-related load research discussed at Section 9. This load research will inform the Commission of the nature of the load impacts, upgrade costs and potential system benefits from Electric Vehicle charging, including treating the facility upgrade costs in excess of the residential allowance as common facility costs. Utilities shall propose a policy to address these upgrade costs in their January 2013 reports, and a procedural mechanism for the Commission to address these costs, if needed.

In summary, in recognition of the fact that Electric Vehicles are uniquely positioned to contribute toward the policy goals set forth in AB 32 and ARB's 2008 Scoping Plan to encourage the electrification of the transportation sector as a means of reducing overall greenhouse gas emissions, we designate Electric Vehicles as new and permanent load and also adopt this special interim cost treatment for costs in excess of the allowances provided for under Rules 15 and 16. We also acknowledge that the historic cost allocation principles underlying Rules 15 and 16 may need to be refined to fully reflect new types of load, such a Electric Vehicles, that present environmental benefits that, to date, have not be quantified under costs principles of these rules.

9. Cost Tracking and Load Research

Additional research is needed to inform policies for the next stages of Electric Vehicle market development. Presently, many uncertainties surround the evolving market for Electric Vehicles and charging services. Among these uncertainties are the extent to which consumers will charge vehicles off-peak versus on-peak and consumer response to various time-of-use rate designs and

metering arrangements. It is also unclear whether consumers in the residential context will react to time-of-use rates differently compared to consumers in the MDU context. While the impact of quick charging on Electric Vehicle adoption is projected to be positive, its impact on peak demand and distribution infrastructure is uncertain. In addition, business models and technologies are in flux.

The need for additional research was noted in the August 20, 2009 OIR, which stated that "quantifying the social benefits and system costs associated with Electric Vehicles could assist in the development of modified Electric Vehicle tariffs that reflect related costs and benefits."[34] In addition, the California Plug-In Electric Vehicle Collaborative's strategic plan envisions an Electric Vehicle data-driven master plan as critical to guiding infrastructure rollouts needed to support Electric Vehicles and maintaining grid reliability.[35] Furthermore, as explained in the Rates Staff Paper, "after identifying the costs and benefits associated with the additional Electric Vehicle load and determining which of these costs are appropriately borne by the individual customer, the resulting revenue requirement can be determined." (Rates Staff Paper at 10.)

We appreciate that separately identifying and tracking residential Electric Vehicle-related costs could be challenging. Nevertheless, we find utilities should attempt to collect such data to inform future Electric Vehicle policy development. Based upon stakeholder input, we identify the following Electric Vehicle issues that, at a minimum, must be the subject of utility research:

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[34] August 20, 2009 OIR at 14.

[35] The California Plug-in Electric Vehicle Collaborative, *Taking Charge: Establishing California Leadership in the Plug-in Electric Vehicle Marketplace*, December 2010 at 28.

(1) Track and quantify all new load and associated upgrade costs in a manner that allows Electric Vehicle load and related costs to be broken out and specifically identified. This information shall be collected and stored in an accessible format useful to the Commission.

(2) Evaluate how metering arrangements and rate design impact Electric Vehicle charging behavior.

(3) To the extent relevant, determine whether participation in demand response programs impacts Electric Vehicle charging behavior.

(4) Determine how charging arrangements, including metering options and alternative rate schedules impact charging behavior at MDU.

(5) Evaluate whether distribution costs are increased by different charging levels, i.e., Level 1, Level 2, and quick charging, in public locations.

(6) Separately track costs associated with Electric Vehicle-related residential service facility upgrade costs and treated as "common facility costs" between the effective date of this decision and June 30, 2013, and propose a policy and procedural mechanism to address these residential upgrade costs going forward.

We direct the utilities to jointly prepare an Electric Vehicle load research plan to track Electric Vehicle-related costs and address the other issues identified above. We expect that utilities will prepare the plan in consultation with relevant stakeholder experts, including working groups of the California Plug-In Electric Vehicle Collaborative. The Electric Vehicle load research shall be completed by January 1, 2013 so it can inform the Electric Vehicle rate design recommendations submitted with PG&E's 2014 General Rate Case (rate design phase) and SCE's and SDG&E's rate design window applications in 2013. This research should also help the Commission's consideration of issues in the next market phase for Electric Vehicles. This load research shall include a publicly noticed workshop to

allow stakeholders to evaluate and provide input. The Commission staff shall be provided regular updates, at least quarterly, on the substance and the progress of the research. The utilities shall file their load research as a compliance filing in this proceeding.

10. Education and Outreach

Realizing the ambitious goals for Electric Vehicles in California requires effective education and outreach to increase consumer awareness and demand for Electric Vehicles. Education and outreach is particularly important in this market because lack of consumer experience with Electric Vehicles may repress demand. Education and outreach can inform consumers, maximize consumer satisfaction, facilitate installation of home charging equipment, and, in concert with time-of-use rates, further encourage off-peak charging of Electric Vehicles. For these reasons, the August 20, 2009 OIR requested parties to comment on what entities and programs could best facilitate convenient and timely installation of electric vehicle service equipment and educate Electric Vehicle owners about the economic and environmental benefits of off-peak charging.[36]

10.1. Collaboration

In response to this question, parties generally agreed that a collaborative approach on education and outreach between all those involved, including Electric Vehicle manufacturers, dealers, charging equipment manufacturers, installers, local inspectors, Electric Vehicle service providers, utilities, state agencies and local government, was needed. Education and outreach programs will be more effective if customers receive similar messages from multiple sources. Accordingly, we expect utilities to work collaboratively with all

[36] August 20, 2009 OIR at 27.

relevant stakeholders to deliver consistent messages to potential and existing Electric Vehicle users.

10.2. Utility's Role

Parties also agreed that of the many different entities involved in the Electric Vehicle industry, utilities could play a unique role in communicating information to potential and existing Electric Vehicle owners Some parties suggested that, because of the utilities' ongoing customer communications programs, utility participation could minimize the cost of Electric Vehicle education and outreach. (Environmental Coalition November 12, 2010 comments at 4; CFC November 12, 2010 comments at 11.)

In response, utilities agreed that they could play an important role in education and outreach, and they urged the Commission to permit proactive customer education on charging equipment options, load management, and Electric Vehicle rate options. (SCE October 5, 2009 comments at 56.) Utilities did not all endorse the Commission's adoption of specific guidelines to define the scope of the utility role. PG&E, for example, cautioned against limiting their role on education and outreach too early in the developing Electric Vehicle market. (PG&E November 12, 2010 comments at 5.) Instead, PG&E encouraged the Commission to address guidelines after further market development has taken place to avoid discouraging utility communication on Electric Vehicle issues. (PG&E December 3, 2010 comments at 5-6.) To a certain extent, SDG&E concurred. (SDG&E December 3, 2010 comments at 6.)

CFC acknowledged the utility's key role in conducting Electric Vehicle education and outreach but suggested that an independent entity free from potentially conflicting business interests, such as the Commission, would be more appropriate. (CFC November 12, 2010 comments at 11.) TURN expressed concern that utilities might spend excessively on the mass-marketing of the

societal and environmental benefits of Electric Vehicles to the general public. (TURN December 3, 2010 comments at 4.)

Regarding the utilities' role in education and outreach, we agree with those parties that suggest that utilities have an important role to play in customer education and outreach. As the Electric Vehicle market develops, utilities in collaboration with other stakeholders will need to provide proactive and targeted customer education on certain charging equipment issues, including load management and Electric Vehicle rate options.

We direct the utilities to proactively collaborate with other stakeholders to develop an approach to customer outreach and education. Customers should be aware of the availability, cost, and environmental impacts of Electric Vehicles and available metering options, rate plans, and charging options before they make their service selections.

We also direct the utilities to pursue a targeted outreach policy, meaning we do not support mass marketing efforts but, to control costs, expect the utilities to target customers with an interest in Electric Vehicles.

We also find that now is the appropriate time to adopt guidelines to define the scope of the utilities' role in education and outreach as these guidelines are critical in initiating a collaborative process, overseeing ratepayer costs, and providing clarity concerning the roles of the various stakeholders and the utilities in the new Electric Vehicle market.

10.3. Neutrality & Integration with Utility's Primary Responsibilities

In furtherance of defining the scope of the utilities' role, the assigned ALJ issued a ruling seeking comments on proposed guidelines. (ALJ Ruling October 27, 2010 at 4-5.) Our adopted guidelines are set forth in Section 10.4. These guidelines are based on comments by parties in this proceeding, our

obligations under § 740.2, and our prior experience with similar guidelines in the low emission vehicle context.

Based on parties' comments, broad consensus existed on the scope and tone of the utilities' role in education and outreach. Parties generally agreed that utilities should not express preferences for vendors, installation providers, Electric Vehicle service providers and vehicles or vehicle types. We agree. Regarding these and similar topics related to Electric Vehicles, utility communications must be neutral. Regarding safety, reliability, and off-peak charging, neutrality is not required.

Parties also generally agreed that utilities should undertake education and outreach as part of their broader responsibilities to ensure the Commission's goals of grid reliability, safety, load management, and greenhouse gas emission reduction and other AB 32-specific environmental goals.

NRDC suggested that the scope of communication should "direct utilities to play a role in ensuring that customers understand the environmental, energy efficient, financial, and system benefits of PEVs" because these issues are consistent with the "traditional responsibilities" of a utility. (NRDC December 3, 2010 comments at 3-4.)

In contrast, the EVSP Coalition raised concerns that the utilities' education and outreach programs may result in an unfair competitive advantage over Electric Vehicle service providers. The EVSP Coalition recommended restricting any utility communication to utility-specific information. (EVSP Coalition December 3, 2010 comments at 5-6.) Similarly, as mentioned above, CFC raised concerns that utilities' work in this area may result in conflict of interests.

In comments on this topic, SCE clarified that the goal of Electric Vehicle-focused education and outreach was not to support utilities' preferences. (SCE reply comments December 3, 2010 at 6-8.) We agree with SCE's clarification on

this matter. The utilities' role in Electric Vehicle education and outreach is part of their broader responsibilities but is not to express preferences.

Moreover, we find that the guidelines we adopt today are consistent with our obligations under § 740.2 and the earlier enacted legislation set forth in §§ 740.3 and 740.8.[37] To promote the directives set forth in theses statutes, we adopt education and outreach guidelines that seek to engage utilities in reducing barriers to the widespread deployment of Electric Vehicles while at the same time directing utilities to conduct education and outreach efforts on the safety and reliability of the electric system and on cost reduction, including through environmental initiatives, such as equipment charging options, load management, and Electric Vehicle rate options. (Pub. Util. Code § 740.2.) These guidelines do not address other topics addressed by §§ 740.3 and 740.8, including costs for development of "equipment or infrastructure" and the extent of ratepayers' interest in such policies. (Pub. Util. Code §§ 740.3(c) and 740.8.)

The guidelines we adopt today are also generally consistent with prior Commission precedent in the area of low emission vehicles. In D.05-05-010,[38] the Commission determined that it would support reasonable funding for the utilities' low emission vehicle customer education programs, provided that the

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[37] Pub. Util. Code § 740.8 provides, in full, as follows: As used in Section 740.3, "interests" of ratepayers, short- or long-term, mean direct benefits that are specific to ratepayers in the form of safer, more reliable, or less costly gas or electrical service, consistent with Section 451, and activities that benefit ratepayers and that promote energy efficiency, reduction of health and environmental impacts from air pollution, and greenhouse gas emissions related to electricity and natural gas production and use, and increased use of alternative fuels.

[38] *Opinion on Contents of Utility Low Emission Vehicle Program Application*, Application 02-03-047 (SDG&E), Application 02-03-048 (SCE), and Application 02-03-049 (PG&E) effective May 10, 2005 (addressing Low Emission Vehicle programs and contents of future applications for seeking funding of such programs).

customer education programs primarily furthered the goals of ratepayer safety and reliability of electric and natural gas systems, controlled ratepayer costs, and informed customers about related load impacts and methods for mitigating them in a manner that is responsive to their and the public's needs. (D.05-05-010 at 12, 14, and 16.) However, in D.05-05-010, education and outreach regarding related social and environmental matters were limited to those communications that were "incidental" to those communications primarily focused on safety, reliability and cost reductions. We find this limitation too restrictive today, given our efforts to promote policies in this decision to actively support reduction of greenhouse gas emissions through Electric Vehicle adoption and deployment.

10.4. Guiding Principles - Utility Education and Outreach

Based on the prior discussion, we adopt the following principles and requirements to guide utility education and outreach:

a. Each utility has an obligation to use funds to provide its customers with information regarding the choices available for metering arrangements, rates, demand response programs, Electric Vehicle service equipment, equipment installation, safety, reliability, and off-peak charging.

b. Each utility has an obligation to use funds for targeted Electric Vehicle education and outreach to educate customers about the environmental and societal benefits of Electric Vehicles consistent with the state's policy goals related to the reduction of greenhouse gas emissions set forth in AB 32.

c. Due to the potential for conflicts of interest, the types of information described in (a) and (b) must be communicated in a competitively neutral manner without value judgments or recommendations.

d. Regarding safety, reliability, and off-peak charging, utilities may present information and make value judgments and recommendations. The neutral

> communication requirement does not apply because safety and reliability are primary utility responsibilities, and information on safety, reliability, and off-peak charging is unlikely to raise conflicts of interest or anti-competitive behavior.

We direct Energy Division to monitor the utilities' use of education and outreach funds and to identify any examples of utility violations of the Electric Vehicle communication principles and requirements above. As time goes on, we may revisit the parameters of utility Electric Vehicle education programs in response to new market conditions and revise these guiding principles and requirements accordingly.

10.5. Costs of Utility Education and Outreach

Currently, the utilities' costs related to Electric Vehicles are supported by their low emission vehicle programs. While we acknowledge parties' comments about appropriate customer education funding levels, we will not address funding in this rulemaking. We agree with SCE that "[a]ttempting to set spending limits in the context of this rulemaking is inappropriate" and this request instead belongs in general rate cases, where low emission vehicle programs funding levels are currently set. (SCE December 3, 2010 comments at 8.) Likewise, utilities should implement the required education and outreach guidelines despite the unavailability of additional funding now. Consistent with the Commission's practice, the utilities should request approval for funding for ongoing or future education and outreach costs within their general rate cases or at another appropriate time. In such requests, costs of Electric Vehicle education and outreach must be separately identified from any future costs associated with a utility-Electric Vehicle notification process.

11. Demand Response and Load Management Technology

The October 27, 2010 ALJ ruling requested that parties consider whether the Commission should direct utilities to include cost-effective load management functions to target Electric Vehicle charging as part of their on-going demand response programs. Focusing on the capabilities of the Electric Vehicle service equipment, rather than the utilities' demand response programs, NRDC proposed the Commission require that Electric Vehicle service equipment include communications and controls so that Electric Vehicle charging could respond to load management signals to limit grid impacts. (NRDC November 12, 2010 comments at 9.) Notably, the California Plug-In Electric Vehicle Collaborative's strategic plan also identified the potential value of Electric Vehicle load management or smart charging programs, stating that:

> Emerging technologies and communications between the grid and PEVs could enable customers to opt into programs that allow for demand response from PEV charging. Under such scenarios, charge rates could increase or decrease to match intermittent renewable generation and optimize the use of power plants and local electricity distribution systems. These demand response programs, which might allow consumers to charge their PEVs based on utility price signals, can provide load predictability, which may help to balance intermittent wind generation, optimize use of thermal power plants, and may have net cost benefits.[39]

Electric Vehicle demand response and load management technology, generally, offers the potential to more efficiently utilize grid resources, including the integration of renewables.

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[39] The California Plug-in Electric Vehicle Collaborative. *Taking Charge: Establishing California Leadership in the Plug-in Electric Vehicle Marketplace*, December 2010 at 58.

We consider here the merits of additional Commission involvement in areas related to the utilities' demand response programs and Electric Vehicle service equipment to encourage Electric Vehicle charging to respond to load management signals.

11.1. Load Management Technology

NRDC's proposed that the Commission require Electric Vehicle service equipment to include communications and controls so that charging can respond to load management signals to limit grid impacts.

In response to this proposal, the EVSP Coalition stated that charging equipment capable of supporting demand response and smart charging is readily available today. More broadly, parties noted that smart charging of Electric Vehicles includes hardware and software technologies that relate to several areas, such as load shaping, remote utility operation, HAN interaction, Vehicle 2 Grid (V2G), demand response, renewable generation integration, ancillary services, and more. (DRA November 10, 2010 comments at 9.) DRA, however, was unaware of any technology ready for wide-scale deployment. (EVSP Coalition December 3, 2010 comments at 10; DRA November 10, 2010 comments at 10.) SCE replied that the market for charging equipment is new and a service precondition for a load management device on the customer side of the meter may subvert customer choice. (SCE December 3, 2010 comments at 11.)

While we support the intent of NRDC's proposal, we decline to require that load management technology (demand response) be part of Electric Vehicle service equipment at this time. We view preservation of customer choice as an important policy objective aimed at encouraging maximum early market growth. Customers should be able to choose whether or not to use equipment with load management capabilities. Even though such technology offers potential

environmental benefits by encouraging more efficient Electric Vehicle charging, the Commission also finds that, because widely accepted standards for communications and controls related to Electric Vehicle charging are still under development, it is premature to adopt specific requirements at this time. Existing Electric Vehicle rates, which are generally non-tiered and time-of-use, are designed to induce customers to charge in a manner that achieves maximum environmental benefits without adverse impacts to the electric grid. To the degree customers elect to charge at sub-optimal times, they should bear the costs.

11.2. Electric Vehicle Demand Response

We now consider the merits of additional Commission action in areas related to the utilities' demand response programs to further encourage Electric Vehicle charging to respond to load management signals.

Current demand response programs incorporate price signals to encourage efficient use of grid resources. For example, existing optional time-of-use rates enable price-based demand response from end-use customers who charge Electric Vehicles. However, the extent to which demand response price signals influence Electric Vehicle charging behavior is unclear.

We agree with DRA and TURN that utilities should demonstrate sufficient need for and feasibility of incentive-based smart charging programs before we order such programs be provided by the utilities. (DRA November 10, 2010 comments at 9; TURN November 12, 2010 comments at 12.) We also agree with NRDC that the potential benefits of enabling demand response for Electric Vehicle charging offers benefits that include lowering energy procurement costs and supporting integration of intermittent renewables resources.

For Electric Vehicles to provide grid support services and demand response at an economic scale, there must first be a sufficient Electric Vehicle market. At this early market stage, we view demand response applications for

the 2012-2014 cycle as the appropriate forum to consider utility requests for pilot funding for Electric Vehicle demand response programs. We note there are currently no demand response incentive-based programs tailored to residential Electric Vehicle customers that would enable smart charging goals.[40] We intend to consider broader retail smart charging programs after establishing the 2012-2014 demand response programs.

Moreover, if utilities did not address "unnecessary duplication" for any requested funding for Electric Vehicle demand response programs in their demand response applications for the 2012-2014 cycle, utilities must seek the approval of the presiding officer to submit supplemental testimony in their application proceedings addressing this matter. The requests to the presiding officer should be made within 15 days of the effective date of this decision. Supplemental testimony should be submitted 30 days after approval is obtained unless otherwise determined by the presiding officer.

12. Remaining Issues in Scoping Memo

We now address the remaining matters identified in the January 12, 2010 Assigned Commissioner's Scoping Memo.

12.1. Natural Gas Vehicles

The January 12, 2010 Assigned Commissioner's Scoping Memo included natural gas vehicle (NGV) issues in the scope of this proceeding in recognition of the fact that such vehicles play an important role in the Commission's overall goal of reducing greenhouse gas emissions. The Commission understands that the need may exist to reconsider policy to enhance NGV market development.

[40] PG&E response to December 2, 2010 Energy Division data request.

In this rulemaking, Clean Energy argued that the Commission should initiate a periodic, perhaps biennial, statewide Alternative-Fueled Vehicle (AFV) proceeding similar to the Low Emissions Vehicle Proceeding that was in place during the 1990s and continued until 2005. Clean Energy argued that the current approach of considering NGV issues in General Rate Cases and Biennial Cost Allocation Proceedings does not allow the Commission to develop consistent statewide policy, which results in NGV issues receiving less attention from senior utility management. (Clean Energy November 12, 2010 comments at 6-7.)

We agree with Clean Energy that existing proceedings fail to provide a comprehensive forum for reviewing and implementing statewide rules that could facilitate increased NGV market development. We remain open to conducting a workshop to examine the current status of NGV and alternative fuel vehicles and do not foreclose the possibility of a separate rulemaking on these issues.

12.2. Low Carbon Fuel Standard

At its April 23, 2009 public hearing, the California Air Resources Board adopted the California Code of Regulations, Title 17, §§ 95480, 95480.1, 95481, 95482, 95483, 95484, 95485, 95486, 95487, 95488, 95489, and 95490. The approved sections comprise a regulation for implementing the Low Carbon Fuel Standards. The Low Carbon Fuel Standard regulations apply to any transportation fuel, as defined in the regulation, which includes electricity used as a transportation fuel. The scope of this Commission proceeding does not include a review of the Low Carbon Fuel Standard regulations themselves but the January 12, 2010 Assigned Commissioner's Scoping Memo indicated that we would consider addressing the disposition of any revenues that utilities receive from the sale of Low Carbon Fuel Standard credits. On March 30, 2011, the Commission opened a proceeding, R.11-03-012, to address utility cost and

revenue issues associated with greenhouse gas emissions. The Commission's stated in this proceeding that a primary focus will be "the use of revenues that electric utilities may receive from the sale of Low Carbon Fuel Standard credits they may receive from the California Air Resources Board (ARB)."[41] As this issue is being expressly considered in R.11-03-012, we do not address it here.

12.3. Impact of Electric Vehicles on Greenhouse Gas and Renewable Energy Policy

As the January 12, 2010 Assigned Commissioner's Scoping Memo noted, Pub. Util. Code § 740.2(f) requires the Commission to consider what impact the widespread use of Electric Vehicles could have on the state's greenhouse gas emissions reduction goals and renewable portfolio standard program and whether steps should be taken to address the "shifting of emissions reductions responsibilities from the transportation sector to the electrical industry." The Scoping Memo suggested that we may determine that any specific recommendations or rules are best considered and adopted in a Commission proceeding that is specifically focused on greenhouse gas policy or the renewable portfolio standard.

We affirm the suggestion in the Scoping Memo. Given the early stage of the Electric Vehicle market, any conclusions concerning whether or how increased penetration of Electric Vehicles requires changes to greenhouse gas or renewable portfolio standard policies would be speculative and premature. More importantly, we find that the shifting of emissions reductions responsibilities from the transportation sector to the electrical industry should be examined in a broader context. Therefore, we conclude that this issue should be

[41] R.11-03-012 Order Instituting Rulemaking at 2.

addressed through the broader greenhouse gas and renewable energy forums, which could include ongoing or future proceedings at the Commission or at the California Air Resources Board.

13. Comments on Proposed Decision

The proposed decision of the Assigned Commissioner in this matter was mailed to the parties in accordance with § 311 of the Pub. Util. Code and comments were allowed under Rule 14.3 of the Commission's Rules of Practice and Procedure. Comments were filed on April 5, 2011 and reply comments were filed on April 11, 2011. To the extent required, revisions have been incorporated to reflect the substance of these comments.

14. Assignment of Proceeding

Michael R. Peevey is the assigned Commissioner and Regina M. DeAngelis is the assigned ALJ in this proceeding.

Findings of Fact

1. If the utility obtains timely notification that an Electric Vehicle will be charging in its service territory, the utility can address potential reliability problems, keep infrastructure costs down, and assist, as appropriate, with ensuring that Electric Vehicle owners have positive experiences with their vehicles.

2. The goal of single meter Electric Vehicle rate design is to structure a simpler, cost-based, time-of-use rate that bypasses the disincentives for Electric Vehicle use associated with tiered rates but still recover, at a minimum, the incremental cost to serve Electric Vehicles.

3. SDG&E and SCE offer residential Electric Vehicle rates that are opt-in, non-tiered, and time-of-use. In contrast, PG&E's E-9b rate is a separately metered, opt in, time-of-use rate, that is tiered.

4. A demand charge as a rate component for residential Electric Vehicle rates could reflect the higher costs placed on the electric system by Electric Vehicle customers charging on-peak or at higher voltages.

5. Inter-utility billing could cause some utilities to over-collect and others to under-collect because costs to serve customers and wholesale energy prices differ between service territories.

6. In the residential setting, Electric Vehicle service providers should be eligible for existing residential rates that are time differentiated to encourage off-peak charging, preserve equitable cost of service treatment and maintain a level playing field between utilities and third party electric vehicle service providers.

7. In the near-term, charging equipment located at non-residential customer premises is eligible for the non-residential rates for which that customer would otherwise qualify, for PG&E's Schedule A-1(A) and A-1(B).

8. As a result, quick charging facilities place a considerably higher kilowatt demand on the electric system than even the fastest Level 1 or Level 2 charging.

9. It is expected that quick charging will most commonly be available at non-residential sites or electric vehicle service equipment charging spots and will function similarly to a gasoline filling station.

10. No need exists to develop rates specifically for customers with quick charge facilities because existing rates are characterized by a number of design features and eligibility requirements that serve to ensure that electric vehicle service providers bear the costs appropriate to their impacts on the electric system.

11. In approximately 2013, Electric Vehicle rate design should be revisited because additional information will exist about Electric Vehicle charging load profiles, the costs and benefits of Electric Vehicle charging and

information concern how consumer charging behavior responds to Electric Vehicle time-of-use price differentials.

12. A metering policy should allow customers to identify options that best serve their needs and ensures that consumer experiences with Electric Vehicles are positive.

13. A metering policy that achieves adequate technology functionality is important so that meters meets specific minimum standards and for the smooth integration of Electric Vehicle charging into the electric grid.

14. Promoting Innovation in metering functionality with flexibility to take advantage of emerging Electric Vehicle technologies is important but requiring stakeholders to accommodate future data needs is speculative.

15. A metering policy that encourages off-peak charging could reduce overall costs associated with Electric Vehicle adoption.

16. Despite benefits of single metering in terms of keeping initial equipment costs low, utilities should continue to make available all existing metering options to customers as it is importance to preserve customer choice in Electric Vehicle meter arrangements at this early market development stage as a means of promoting customer satisfaction, encouraging technological advancement, and creating a level playing field for electric vehicle service providers.

17. Electric Vehicle submetering is not yet available for residential customers.

18. Submetering issues at MDU and workplaces requires additional evaluation to determine what protocols and policies, if any, are needed to support this option.

19. Further requirements on the integration of Electric Vehicles and PV metering at this time is not necessary because PV customers should be able to choose from a range of metering options to accommodate their data requirements and existing metering options can meet PV data requirements.

20. In the case of single and separate Electric Vehicle metering, the meter will generally be designated on the utility-side of the customer-utility boundary.

21. Customer-ownership of submeters is consistent with the Electric Vehicle metering policy goals, especially those policy goals related to customer choice, technological advances, and minimizing cost.

22. Certain benefits of utility ownership of electric vehicle service equipment may exist, but these benefits are speculative and do not outweigh the competitive limitations that may result from utility-electric vehicle service equipment ownership.

23. A need exists for an Electric Vehicle submeter protocol to determine rules for customer-owned meters and create a framework that can incorporate new emerging metering technologies and encourage innovation.

24. Electric Vehicle load is designated as new and permanent load under Tariff Rules 15 and 16 and customers should be afforded the standard Tariff Rule 16 allowance to cover the costs of any required customer specific facilities upgrades.

25. In some instances, the costs of residential upgrades to enable Electric Vehicle changing will exceed the allowances provided under Tariff Rules 15 and 16.

26. Value exists in tracking and differentiating costs for all Electric Vehicle load in an effort to inform future revenue allocation and rate design.

27. Utilities have a role in education and outreach consistent with their primary responsibilities and the State is environmental goals.

28. While it is currently unclear whether sufficient need exists for and the feasibility of an incentive-based smart charging program, intelligent load management and smart charging have the potential to lower costs for all customers and facilitate the integration of renewable energy.

Conclusions of Law

1. Given the priority we place on avoiding adverse impacts to the electric system, ensuring safety, and efficiently managing the grid, the proposals for a notification system could prove to be a long-term solution to the challenge of efficiently assessing grid reliability and safety in areas of Electric Vehicle growth, provided privacy concerns are adequately addressed

2. We deny the requests by SCE, PG&E and SDG&E to authorize additional funding through this decision to cover the costs of the notification system.

3. Utilities are not precluded from seeking recovery of reasonable costs of any utility notification systems in future rate cases but our expectation is that utilities will not require incremental funding to develop and participate in a notification system at this time.

4. With limited exceptions, the existing residential Electric Vehicle rates which include time-of-use rates with relatively higher prices during daytime, peak periods and relatively lower prices during off-peak periods are sufficient for the early Electric Vehicle market.

5. Residential customers on single-meter service should be able to choose which Electric Vehicle rate best suits their needs and should be offered an opt-in (i.e., voluntary) time-of-use, non-tiered rate. Staying on the pre-existing, non-Electric Vehicle rate is also an option.

6. The rates for Electric Vehicle residential separately metered customers should be opt-in, non-tiered and time-of-use.

7. The Commission should revisit the suitability of the utilities' Electric Vehicle residential rate schedules in 2013-2014.

8. Adding demand charges to residential Electric Vehicle rates would be too great a change to residential rates at this time but each utility should re-evaluate

the feasibility and benefits of an Electric Vehicle residential demand charge in its next review of rates.

9. It is premature for the Commission to direct the utilities to implement inter-utility billing.

10. With limited exceptions, existing residential Electric Vehicle rates should apply to electric vehicle service providers operating in the residential setting.

11. Charging equipment located at non-residential customer premises is eligible for the non-residential rates for which that customer would otherwise qualify, except for PG&E's Schedule A-1(A) and A-1(B).

12. Existing rates are adequate for customers with quick charge facilities.

13. To put the review of Electric Vehicle rate design on approximately the same schedule for all three electric utilities, PG&E should include Electric Vehicle rate design proposals in its 2014 General Rate Case, and SCE and SDG&E should to file Electric Vehicle rate proposals in Rate Design Window applications in 2013, as provided for and in accordance with the schedule in D.89-01-040.

14. In these rate design filings, each utility should to include an analysis of Electric Vehicle charging load profiles, the costs and benefits of Electric Vehicle integration and charging, and consumer response to Electric Vehicle time-of-use price differentials.

15. Metering policy should support customer choice, adequate data and technological functionality, innovation, common technology standards, and minimization of costs. These goals are generally consistent the broader goals of the California Plug-In Electric Vehicle Collaborative's strategic plan.

16. Utilities should continue to make available all existing metering options to customers.

17. The Electric Vehicle submeter protocol process should address, among other issues, submetering issues at MDU and workplaces.

18. To the extent that the implications of the use of PV with various Electric Vehicle metering and tariff rate structures is unclear, these issues may be appropriate in a distribution generation-related proceeding.

19. To remain generally consistent with existing metering policies on the ownership of single and separate meters, single and separate Electric Vehicle meters should be designated as on the utility-side of the customer-utility boundary.

20. The benefits of utility ownership of electric vehicle service equipment do not outweigh the competitive limitation that may result from utility ownership, with the exception of electric vehicle service equipment used to charge their own electric vehicle fleets or provide workplace charging for utility employees.

21. Utilities should cooperate with other stakeholders to form a working group to develop a Electric Vehicle submeter protocol to be adopted as revisions to the utilities' electric tariffs.

22. Designating Electric Vehicle load as new and permanent load under Tariff Rules 15 and 16 reflects the State's goal under AB 32 to encourage the electrification of the transportation sector as a means of reducing overall greenhouse gas emissions, even though increased Electric Vehicle penetration will raise electricity consumption and most likely increase electric demand.

23. For service upgrade costs resulting from Electric Vehicle charging that exceed the residential allowance, a special interim cost treatment is appropriate in light of the directive in § 740.2 to reduce barriers to Electric Vehicle adoption, to avoid discouraging early adopters, and given that Electric Vehicle load is expected to help the State achieve its greenhouse gas emission reduction goals.

24. Collecting more load and behavioral data is necessary before making a number of longer-term policy decisions regarding the integration of large numbers of Electric Vehicles onto the electric grid.

25. The utilities' role in Electric Vehicle education and outreach is part of their broader responsibilities but utilities should also not express preferences, consistent with D.05-05-010 and § 740.2 and the earlier enacted legislation set forth in §§ 740.3 and 740.8.

O R D E R

IT IS ORDERED that:

1. Pacific Gas and Electric Company, San Diego Gas & Electric Company, and Southern California Edison Company shall collaborate with stakeholders to prepare an assessment report that sets forth the notification options to track the location and re-location of plug-in hybrid and electric vehicle charging on the electric grid, the merits of each option, the projected costs of these options, and implementation scenarios. The assessment report must also recommend a preferred option going forward. Pacific Gas and Electric Company, San Diego Gas & Electric Company, and Southern California Edison Company shall jointly file the assessment report in this proceeding within 150 days of the effective date of this decision. During this 150 day period, Pacific Gas and Electric Company, San Diego Gas & Electric Company, and Southern California Edison Company shall seek the involvement of the Commission's Energy Division Staff and provide regular updates to Energy Division Staff on a schedule to be determined by Staff. The filing of this report will be a compliance filing in this proceeding.

2. Pacific Gas and Electric Company shall file an advice letter to modify Electric Rates Tariff Schedule E-9(B) to eliminate the tiers but retain time-variant pricing. This advice letter shall be filed as a Tier 2 advice letter within 60 days of the effective date of today's decision.

3. Pacific Gas and Electric Company shall file a plug-in hybrid and electric vehicle rate design proposal in the rate design phase of its 2014 General Rate Case. San Diego Gas & Electric Company and Southern California Edison Company shall file plug-in hybrid and electric vehicle rate design proposals in Rate Design Window applications in 2013 as provided for and in accordance with the schedule in Decision 89-01-040. These plug-in hybrid and electric vehicle rate design proposals shall include an analysis of plug-in hybrid and Electric Vehicles charging load profiles, the costs and benefits of plug-in hybrid and electric vehicle integration and charging, and consumer responses to plug-in hybrid and Eectric Vehicles time-of-use price differentials. These rate design proposals shall also include an evaluation of the feasibility and benefits of plug-in hybrid and electric vehicle demand charges in the residential and commercial context.

4. Pacific Gas and Electric Company, San Diego Gas & Electric Company, and Southern California Edison Company shall form a working group to develop a plug-in hybrid and electric vehicle submeter protocol and are directed to cooperate with stakeholders to form this working group. This working group shall develop a submeter protocol to be adopted by the Commission as revisions to the Electric Tariffs of Pacific Gas and Electric Company, San Diego Gas & Electric Company. Pacific Gas and Electric Company, San Diego Gas & Electric Company, and Southern California Edison Company shall include in the working group, at a minimum, Commission Staff, California Department of Food and Agriculture, automakers, and electric vehicle service providers and

shall hold at least one publicly noticed workshop with a report documenting the workshop. The report shall be filed in this proceeding within 15 days of the workshop. The filing of the report will be a compliance filing in this proceeding. To facilitate the development of a comprehensive protocol, Pacific Gas and Electric Company, San Diego Gas & Electric Company, and Southern California Edison Company shall jointly submit to the Commission on or before October 31, 2011 a report that will allow the joint implementation of a comprehensive protocol by July 31, 2012. The report will detail how the protocol will be informed by relevant ongoing standard development processes and include, at a minimum, the following specific issues:

a. Support the use of submeters in various locations, such as in electric vehicle service equipment or mobile detachable meters, as described in San Diego Gas & Electric Company's comments on the Utility Role Staff Paper.

b. Determine the technical performance requirements for submeters.

c. Identify minimum communication functionality and standards.

d. Describe how submeter data management will support and protect the security and privacy of plug-in hybrid and Electric Vehicles user data collected by utilities and third party entities.

e. Provide a methodology for settling disputes.

f. Identify and adhere to all existing and applicable national standards for measurement and communication functions.

g. Develop rules for incorporating subtractive billing into submetering tariffs.

5. Between the effective date of this decision and June 30, 2013, all residential service facility upgrade costs in excess of the residential allowance shall be treated as common facility costs rather than being paid for by the individual plug-in hybrid and electric vehicle customer. This policy shall not apply in the non-residential context. Pacific Gas and Electric Company, San Diego Gas & Electric Company, and Southern California Edison Company shall propose a policy and procedural mechanism to address these residential upgrade costs in the January 1, 2013 reports regarding load research to be filed in this proceeding.

6. Pacific Gas and Electric Company, San Diego Gas & Electric Company, and Southern California Edison Company shall jointly prepare a load research plan and undertake load research to accomplish the following:

(1) Track and quantify all new load and associated upgrade costs in a manner that allows PEV load and related costs to be broken out and specifically identified. This information shall be collected and stored in an accessible format useful to the Commission.

(2) Evaluate how metering arrangements and rate design impact PEV charging behavior.

(3) To the extent relevant, determine whether participation in demand response programs impacts PEV charging behavior.

(4) Determine how charging arrangements, including metering options and alternative rate schedules impact charging behavior at MDU.

(5) Evaluate whether distribution costs are increased by different charging levels, i.e., Level 1, Level 2, and quick charging, in public locations.

(6) Separately track costs associated with PEV-related residential service facility upgrade costs and treated as "common facility costs" between the effective date of this decision and June 30, 2013, and propose a policy and procedural mechanism to address these residential upgrade costs going forward.

7. Pacific Gas and Electric Company, San Diego Gas & Electric Company, and Southern California Edison Company shall complete the load research required by the preceding Ordering Paragraph by January 1, 2013. The load research shall include a publicly noticed workshop. Pacific Gas and Electric Company, San Diego Gas & Electric Company, and Southern California Edison Company shall provide the Commission staff with regular updates, at least one per quarter, on the substance and the progress of the research. Pacific Gas and Electric Company, San Diego Gas & Electric Company, and Southern California Edison Company shall file their load research as a report in this proceeding by January 1, 2013. The filing of this report will be a compliance filing in this proceeding.

8. The following principles and requirements apply to the education and outreach of Pacific Gas and Electric Company, San Diego Gas & Electric Company, and Southern California Edison Company (herein "utilities") regarding plug-in hybrid and Electric Vehicles (herein "PEVs").

a. Each utility has an obligation to use funds to provide its customers with information regarding the choices available for metering arrangements, rates, demand response programs, charging equipment, installation, safety, reliability, and off-peak charging.

b. Each utility has an obligation to use funds for targeted PEV education and outreach to educate customers about the environmental and societal benefits of PEVs consistent with the state's policy goals related to the reduction of greenhouse gas emissions set forth in AB 32.

c. Due to the potential for conflicts of interest, the types of information described in (a) and (b) must be communicated in a competitively neutral manner without value judgments or recommendations.

d. Regarding safety, reliability, and off-peak charging, utilities may present information and make value judgments and recommendations. The neutral communication requirement does not apply because safety and reliability are primary utility responsibilities, and information on safety, reliability, and off-peak charging is unlikely to raise conflicts of interest or anti-competitive behavior.

The Commission's Energy Division shall identify and bring to the Commission's attention any examples of utility violations of these principles.

9. If Pacific Gas and Electric Company, San Diego Gas & Electric Company, and Southern California Edison Company did not addressed in their March 1, 2011 demand response applications, Application (A.) 11-03-001 (PG&E), A.11-03-002 (SDG&E), and A.11-03-003 (SCE), how any utility requested ratepayer funding for plug-in hybrid and electric vehicle demand response programs does not "unnecessarily duplicate research currently, previously, or imminently undertaken by other electrical or gas corporations or research organizations," the utility should seek the approval of the presiding officer assigned to their demand response application to submit supplemental testimony in their application proceedings addressing this matter. The requests to the presiding officer should be made within 15 days of the effective date of

this decision. Supplemental testimony should be submitted 30 days after approval is obtained unless otherwise determined by the presiding officer.

10. Rulemaking 09-08-009 remains open.

This order is effective today.

Dated July 14, 2011, at San Francisco, California.

MICHAEL R. PEEVEY
President
TIMOTHY ALAN SIMON
MICHEL PETER FLORIO
CATHERINE J.K. SANDOVAL
MARK J. FERRON
Commissioners

I concur.

/s/ MICHEL PETER FLORIO
Commissioner

I reserve the right to file a concurrence.

/s/ TIMOTHY ALAN SIMON
Commissioner

I reserve the right to file a concurrence.

/s/ MARK J. FERRON
Commissioner

APPENDIX 1

Commercial and Industrial Rates

dustrial (C&I) Rate Schedules

Utility	Tariff	TOU	kW Range	Demand Charge	Summer Peak	Summer Off-Peak	Winter Part-Peak	Winter Off-Peak	Summer	Winter
PG&E	A-1 (A)	N	< 200kW (pending A.10-03-014 -> 75kW)	N	$0.19712		$0.14747			
	A-1 (B)	Y	< 200kW (pending A.10-03-014 -> 75kW)	N	$0.22231	$0.18101	$0.15284	$0.14179	1.23	1.08
	A-6	Y	< 200kW	N	$0.44703	$0.12183	$0.16794	$0.12503	3.67	1.34
	A-10 (A)[1]	N	200-500kW	Y	$0.13666		$0.10643			
	A-10 (B)[1]	Y	200-500kW	Y	$0.15633	$0.12536	$0.11110	$0.10182	1.25	1.09
	A-15	N	Direct-Current	N	$0.19712		$0.14747			
	E-19[1]	Y	500-1000kW; < 500kW Voluntary	Y	$0.14581	$0.08611	$0.09345	$0.08372	1.69	1.12
	E-20[1]	Y	> 1000kW	Y	$0.13965	$0.08351	$0.09056	$0.08125	1.67	1.11
	E-ESP	n/a	Direct Access	n/a	n/a	n/a	n/a	n/a		
SCE	GS1	N	< 20kW	N	$0.25239		$0.18480			
	GS2	N	20-200kW	Y	$0.13828		$0.11974			
	GS2 (A)	Y	20-200kW	Y	$0.47161	$0.10669	$0.13556	$0.10298	4.42	1.32
	GS2 (B)	Y	20-200kW	Y	$0.19884	$0.10669	$0.13556	$0.10298	1.86	1.32
	GS2 (R)	Y	20-200kW; CSI/SGIP	Y	$0.49147	$0.12655	$0.15542	$0.12284	3.88	1.27
	TOU-EV-3	Y	< 20 kW	N	$0.37728	$0.15445	$0.21484	$0.14840	2.44	1.45
	TOU-EV-4	Y	20 - 500kW	Y	$0.36431	$0.10796	$0.18649	$0.10210	3.37	1.83
	TOU-GS-1	Y	< 20 kW	N	$0.50412	$0.15249	$0.18289	$0.14848	3.31	1.23
	TOU-GS-3	Y	200 - 500kW	Y	$0.17898	$0.11214	$0.11716	$0.09934	1.60	1.18
	TOU-GS-3 (A)	Y	200 - 500kW	Y	$0.36358	$0.11844	$0.12393	$0.10447	3.07	1.19
	TOU-GS-3 (B)	Y	200 - 500kW; CPP	Y	$0.17898	$0.11214	$0.11716	$0.09934	1.60	1.18
	TOU-GS-3 (R)	Y	200 - 500kW; CSI/SGIP	Y	$0.38202	$0.13688	$0.14237	$0.12291	2.79	1.16
	TOU-GS-3-SOP	Y	200 - 500kW; Super-Off Peak	Y	$0.21149	$0.09041	$0.12179	$0.09044	2.34	1.35
	TOU-8[2]	Y	> 500kW	Y	$0.20206	$0.10874	$0.13310	$0.10476	1.86	1.27
	TOU-8 (A)[2]	Y	> 500kW; PLS	Y	$0.44529	$0.10874	$0.13310	$0.10476	4.09	1.27
	TOU-8 (B)[2]	Y	> 500kW; CPP	Y	$0.20206	$0.10874	$0.13310	$0.10476	1.86	1.27
	TOU-8 (R)[2]	Y	> 500kW; CSI/SGIP	Y	$0.46061	$0.12406	$0.14842	$0.12008	3.71	1.24
	TOU-8-RBU[2]	Y	> 500kW; Reliability Back-Up	Y	$0.20206	$0.10874	$0.13310	$0.10476	1.86	1.27
	RTP-2	real-time	Eligible only if on TOU-8 Large	Y	variable	variable	variable	variable		
SDG&E	A[1,3]	N	< 20kW or < 12000kWh	N	$0.18796		$0.14904			
	AD[1,3]	N	20 - 500kW; CLOSED	Y	$0.19283		$0.19496			
	A-TOU	Y	< 40kW; CLOSED	N	$0.26277	$0.14203	$0.16976	$0.14278	1.85	1.19
	AL-TOU[1]	Y	> 20kW; <20kW Voluntary	Y	$0.10042	$0.06230	$0.09682	$0.06774	1.61	1.43
	AL-TOU-DER	Y	> 20kW; Distributed Energy	Y	$0.10042	$0.06230	$0.09682	$0.06774	1.61	1.43
	AY-TOU[1]	Y	< 500kW; CLOSED	Y	$0.10060	$0.06256	$0.09803	$0.06800	1.61	1.44
	A6-TOU	Y	> 500kW; Optional	Y	$0.09463	$0.05926	$0.09183	$0.06460	1.60	1.42
	DG-R[1]	Y	< 2MW; Distributed Renewable	Y	$0.18609	$0.09369	$0.13277	$0.09913	1.99	1.34

1. Secondary Voltage
2. Service Metered and Delivered at Voltages Below 2KV
3. Rates given reflect EECC. Retrieved from: http://www.sdge.com/tm2/pdf/ELEC_ELEC-SCHEDS_EECC.pdf

(END OF APPENDIX 1)

Concurrence of Commissioner Michel Peter Florio on Item 46 [D.11-07-029] Phase 2 Decision Establishing Policies to Overcome Barriers to Electric Vehicle Deployment and Complying with Public Utilities Code Section 740.2

I will vote in favor of Item 46, a decision which cements this agency's support of air pollution and greenhouse gas emission reductions through increased electrification of the transportation sector.

This decision provides a thorough, careful approach to electric vehicles in California, reducing barriers to entry for consumers while positioning utilities to efficiently serve the new load.

The advantages of electric vehicles, such as GHG reduction, reduced air pollution in urban areas, decreased dependence on foreign oil, and making use of low-cost off-peak energy have been well documented for many years, and I will not venture to restate all of them here. I am sure that many of you have seen the documentary "Who Killed the Electric Car?" My goal is that this Commission will be featured in a new documentary: "Who Saved the Electric Car?"

However, I did wish to point out one morsel of information presented by the California Plug-in Electric Vehicle Collaborative in their recent report, "Taking Charge:"

> Electric vehicles have the potential to save Californians a substantial amount of money at the pump. Assuming $3 per gallon for gasoline and average fuel efficiencies, it costs consumers roughly $11 dollars to travel 100 miles in a conventional vehicle. Using a plug in electric hybrid vehicle fueled in part by electricity that costs 10 cents per kilowatt-hour, the cost is reduced to $5.75. If we can persuade customers to charge off-peak when 10 cents a kWh is realistic and the cost to not participating customers is negligible, this fuel will provide participating Californians substantial savings relative to conventional fuels. This is a critical advantage that we must not overlook as we consider the costs and benefits of supporting EV's through our regulatory policy.

Speaking of the costs, I did have one primary concern on the question of who should pay for basic service upgrades or extensions to accommodate electric vehicle charging in the residential setting.

The upgrades and extensions that we're talking about here include distribution transformers, service panels, and other equipment needed to facilitate vehicle charging.

Such upgrades are typically governed by the Commissions Rule 15 and 16. According to Rule 15, an upgrade to equipment serving multiple customers is generally considered a utility expense and the associated cost is borne by the general body of ratepayers.

The cost allocation of upgrades to equipment serving a single customer, which is governed by Tariff Rule 16, is more complex. For equipment upgrades due to increased electricity usage designated as "new and permanent load," the customer is provided an "allowance" to offset the costs of the upgrade. Generally, upgrade costs up to the dollar amount of the allowance are paid for by the general body of ratepayers, and any costs in excess of the allowance are paid for by the specific customer served by the equipment.

The decision finds it appropriate to designate electric vehicles as "new and permanent load," entitling participating customers to the corresponding service extension allowance. But it doesn't stop there. As an interim policy this decision also allows upgrade costs which exceed the allowance to be borne by the general body of ratepayers. This interim policy will be in place until at least June 30, 2013.

In my view, the assertion that an electric vehicle is "permanent" new load is a stretch. And, even if it weren't, the amount of load required to power an electric vehicle would normally not be sufficient to justify, on a future distribution revenue basis, a full residential line extension allowance. I think we're shoehorning electric vehicles into the existing line extension rules and the fit leaves something to be desired. On the other hand, the penetration of EVs in the next few years covered by this decision is not expected to be so large as to create an excessive cost burden on ratepayers due to the provision of this modest incentive for early EV adopters. Indeed, by making it a little cheaper to own and operate an EV, we hopefully will make possible for more people with moderate incomes to become early adopters themselves.

Going forward, I am planning to introduce an Order Instituting Rulemaking that will reconsider Rules 15 and 16. Currently those rules effectively encourage consumption of energy, by awarding larger allowances for greater expected end use loads. I believe that a better approach would be to award larger allowances for more efficient and/or GHG reducing facilities, and smaller or no allowances for those that do not exhibit enhanced efficiency or GHG reduction features. This would provide an incentive for developers to install more efficient buildings in the first place, and could additionally be structured to reward zero net energy structures or those employing rooftop solar panels with greater allowances. GHG reducing technologies, such as EV charging capability, would be granted larger allowances under this approach

Like the elimination of declining block energy rates over 35 years ago, this type of reform to our line extension rules will modernize an outdated policy that is inconsistent with the needs of the 21st Century. Because the Proposed Decision's treatment of line extension costs for residential EV charging is consistent with my longer term energy and environmental policy vision, I am comfortable supporting it today despite my reservations regarding its interpretation of the current line extension rules.

Dated July 14, 2011 at San Francisco, CA.

/s/ Michel Peter Florio
Commissioner

Concurrence of Commissioner Timothy Alan Simon on Item 46 [D.11-07-029] Phase 2 Decision Establishing Policies to Overcome Barriers to Electric Vehicle Deployment and Complying with Public Utilities Code Section 740.2

I concur with this decision as a necessary step towards the sensitive balance of reliability and competition in the support of a specific mode of alternative fuel vehicles, the electric plug-in vehicle, plug-in hybrid and the critical infrastructure of the competitive vehicle charging market. This decision also moves California closer to our national energy security obligation of reducing dependence on foreign oil and bringing our state closer to the goals of the California Global Warming Solutions Act of 2006 (AB32 Nunez/Pavley).

This is a concerted effort of many segments of this burgeoning industry, including electric vehicle service providers, auto makers, automobile dealers, academic research institutions, government agencies and investor owned utilities. This collaboration should give the impetus to a swift and orderly deployment of the designated electric alternative fuel vehicles. What the decision lacks is any meaningful treatment of other alternative fuel vehicles, including natural gas, compressed natural gas and bio fuel alternatives. It begs the question as to whether this decision picks a winner in competing technologies. I am sympathetic to this concern and urge my fellow commissioners to grant equal time to the evaluation and recognition of a diversity of consumer vehicle choices, including the environmental and performance benefits of natural gas and biofuel powered vehicles, which have greater benefits on reducing California's carbon footprint[42]. California is better served if these clean vehicular technologies are incorporated into our smart grid infrastructure.

I note the concerns of certain utilities that they have been banned from the recharging market. I consider this a simplistic exaggeration. I take this position because the decision instructs the detection of market failures as a prerequisite to market entry. This balanced approach will allow new entrants to a marketplace leveled by a market mechanism necessary to prevent market failures previously

[42] Decision 91-07-018 at 12; Decision 93-07-054 at 13.

experienced in the natural gas fueling Decisions[43]. While I am sensitive to the concerns expressed by San Diego Gas and Electric (SDG&E)[44] and the Natural Resource Defense Council[45], I recognize their efforts with the University of California San Diego on the Smart City San Diego Initiative reflect investments made before this Decision as addressed by Commissioner Ferron and President Peevey. These parties should follow course and demonstrate how SDG&E's participation will not act as a barrier to competition, but as an effort to prevent a recognized market failure. Otherwise, we will spoil another opportunity to promote retail choice in the California energy markets.

Accordingly, I concur with this decision and will determine if a separate proceeding is required to capture other critical transportation technologies.

Dated July 14, 2011 at San Francisco, CA.

/s/ Timothy Alan Simon
Commissioner

[43] Decision 95-11-035 at 68-73

[44] Comments by San Diego Gas & Electric to the Proposed Decision, Apr. 5, 2011, at 2-9.

[45] Comments by the Natural Resources Defense Council to the Proposed Decision on Phase Two Issues, Apr. 5, 2011, at 5-8.

Concurrence of Commissioner Mark J. Ferron on Decision discussing Alternative Fuel Vehicles, Item #46 (D11-07-029)

As some of you may know, I was an early adopter of EVs like President Peevey. I owned and commuted using a first-generation all electric vehicle when I lived in London. (REVAi, AKA the G-wiz, a four-seat quadricycle equipped with lead-acid batteries, which has a nominal range of 80 km (50 mi) per charge and a top speed of 80 km/h (50 mph).). I am extremely interested in progressing the market for electric and other alternative fueled vehicles. I will support this decision, but I do have one concern that I would like to highlight.

In building a new market such as this, we, as regulators, need to find the appropriate balance between protecting the interests of ratepayers against the desire to encourage the growth of this new market until is is able to sustain itself. This decision appropriately balances several key issues, including the extent to which we socialize the costs of line upgrades, the ownership model of the meter, the data that we gather to streamline the process of the EV deployment. But this is a very new market that will evolve rapidly, and we must be prepared to revisit this decision as the market matures.

I am very concerned about one particular aspect of this proposed decision.

Recently, I had the chance to meet with Smart City San Diego, a broad public-private collaboration comprising the City of San Diego, General Electric , the University of California San Diego, CleanTECH and San Diego Gas & Electric. This group is creating NOW the infrastructure for electric vehicles for use in and around the campus of UCSD. This group is TODAY producing a fully-functional prototype is a on a scale which is big enough to flesh out the future issues that the rest of the state will soon address - - e.g., Grid reliability, the impact of Distributed Generation, the use of micro-grids and smart grid technology, measuring consumer behavior toward private and public charging, integrating storage and solar to vehicle charging etc.

It is evident that SDG&E is a true partner in this effort and without their enlightened and substantial contribution, there is little doubt that this very

important prototype would not exist. I applaud the management and staff involved at SDG&E.

As President Peevey pointed out, this decision prohibits a regulated utility from owning public charging equipment (except for the use to charge its own fleet as now reflected in the final version on the Escutia table) and does so out of a number of concerns. In principle, I agree that we must be careful that we do not create an unfair competitive advantage to utilities in this emerging market place.

However, I am concerned that a full prohibition of utility ownership of public charging infrastructure may act to discourage the kind of partnership witnessed in Smart City San Diego and that we may be removing from the outset a viable participant in a future competitive market. I am comforted by the language in the Decision which that states the Commission will revisit this prohibition should utilities present evidence of underserved markets or market failure as a result. We should be alert to evidence of such a market failure and should be prepared to act accordingly.

I wish to thank Judge DeAngelis and the staff for all of their hard work. With that, I will support this item and reserve my right to file a concurrence.

Dated July 14, 2011 at San Francisco, CA

/s/ Mark J. Ferron
Commissioner