Comments of Southern California Edison Company on the California Public Utilities Commission Staff's White Paper, *Light-Duty Vehicle Electrification in California: Potential Barriers and Opportunities*, dated May 22, 2009.

I. Introduction

Southern California Edison Company ("SCE") thanks the California Public Utilities Commission ("Commission") Staff for the opportunity to review and comment on the May 22, 2009 White Paper, *Light-Duty Vehicle Electrification in California: Potential Barriers and Opportunities* ("White Paper"). SCE agrees with the White Paper's conclusion that light-duty vehicle ("LDV") electrification is an important topic warranting the Commission's immediate attention. Although facets of electric transportation ("ET") are being considered within the Commission's on-going Smart Grid OIR (R.08-12-009), SCE believes that the number, complexity, and importance of ET issues necessitate a separate devoted proceeding. As such, SCE supports the White Paper's recommendation for a dedicated process to address transportation electrification.

The White Paper contains a broad and well-considered examination of LDV electrification and recommendations to other state agencies on a number of issues. The White Paper creates a springboard for stakeholders to discuss and begin to resolve many of the issues surrounding ET. SCE looks forward to working with the Commission and other parties on these issues and to actively participating in any future ET proceeding.

In order to provide input on potential LDV electrification policies for further Commission consideration,[1] SCE's comments identify and discuss four key principles that should guide a future Commission rulemaking on ET issues. For each of these principles, SCE specifies the topics that should be considered by the Commission – including those already identified in the White Paper and additional topics not expressly stated in the White Paper. Our comments also separately identify the topics discussed in these comments that are directly relevant to the Commission's Smart Grid OIR. Finally, SCE has identified certain portions of the White Paper that should be modified or supplemented for completeness and accuracy. These corrections/modifications are provided as an Appendix to these comments.

II. Key Principles of an ET Rulemaking

The Executive Summary of the White Paper identifies certain topics that could be included in a future Commission rulemaking on policy opportunities to support plug-in electric vehicles.[2] As discussed below, SCE supports the inclusion of many of these topics. However, in order to develop a comprehensive list of issues that should be considered in a future ET proceeding, SCE recommends that the Commission focus on four key principles to guide policy determinations regarding the implementation of ET in California:

[1] White Paper, at 8.
[2] *Id.*, at 10.

- An orderly, timely, and seamless transition for California consumers from reliance solely on fossil fuel to reliance on a combination of electric fuel and fossil fuel systems;

- Maintaining safe, reliable, and environmentally responsible electric service with the increasing presence of ET;

- Proper identification and allocation of the costs and benefits associated with increasing ET market penetration and the development of appropriate and reasonable electric rates and incentives for ET; and

- Implementing effective customer education and outreach programs in preparation for the broad automotive industry market launch of ET.

Each of these key principles are discussed in more detail below, including the key topics associated with them that should be addressed in a future Commission proceeding regarding ET.

III. Topics Underlying the Key Principles of an ET Rulemaking

In order to address the four key ET rulemaking principles identified by SCE, the Commission and stakeholders will need to thoroughly consider certain topics associated with each principle. In this Section, SCE describes the key topics implicated by the four principles that should be within the scope of a future ET rulemaking. SCE identifies two sets of topics for each objective: (1) those topics already identified in the White Paper for Commission consideration, and (2) additional topics not included in the White Paper that should be considered in a future ET rulemaking (or other appropriate Commission proceeding as expressly noted below).

A. Orderly, Timely, and Seamless Transition for California Consumers from Reliance Solely on Fossil Fuel to Reliance on a Combination of Electric Fuel and Fossil Fuel Systems

Plug-in hybrid electric vehicles ("PHEVs") and battery electric vehicles ("BEVs") (collectively referred to in the White Paper as plug-in electric vehicles "PEVs") help support environmental and energy security goals through reduced CO_2 emissions, tailpipe emissions, and fossil fuel consumption. Currently there are many factors driving the electrification of transportation (state and federal policy, technological innovation, consumer demand, etc.). In the near-term, at least 10-15 new PEV models are expected to come to market in California by 2015, thus creating a great sense of urgency to ensure electric system infrastructure readiness to support ET. The long-term potential is very large, yet there are barriers to an orderly and seamless ET commercialization that need to be addressed.

1. Rulemaking Topics Identified in the White Paper that are Consistent with this Principle

(1) *Options for Developing Metering and Charging Infrastructure*. (White Paper, pp. 10, 37, 41-42, 44, 60, 65). The electrification of transportation requires not only that PHEVs and BEVs be produced, but also that adequate charging infrastructure is in place to ensure a successful transition from fossil fuels to electric fuel. The White Paper correctly identifies numerous issues associated with infrastructure development and readiness that should be further considered in a Commission rulemaking, including:

- Who will develop and pay for the necessary infrastructure, and how long will it take to develop? ET development will involve the construction of new charging stations, customer circuit panel upgrades, conduit, wiring and trenching, sub-metering, and load control/interface installations. Elements of the Smart Grid, such as energy storage and smart metering are also important investments related to efficient, controlled PEV charging. The Commission will need to examine how much of this infrastructure is needed, where it is needed, and what parties can and should be responsible for its development, operation, service, and management. The Commission should also evaluate how long the infrastructure will take to develop and the extent to which education on this time element is needed for customers and the EV industry.
- How can charging infrastructure be paid for in a way that protects ratepayers? Effective charging infrastructure will benefit a broad range of stakeholders, not limited solely to electricity customers. Thus, it is important to determine how costs will be allocated in light of the wide range of benefits that may incentivize increased electric fuel use.
- The importance of home and commercial/workplace PEV re-charging to take advantage of the existing electricity infrastructure.
- The need for national and international codes and standards so that PEV adoption reaches its full potential.

(2) *Options to streamline the permitting and inspection requirements and contractor installation process for residential and commercial PEV charging equipment.* (White Paper, p.10). This is especially critical for PEV customers requiring 240V charging circuits. Based on SCE's experience in the 1990s and recent EV demonstration programs, there are multiple steps and parties that impact the timing of residential charger installation and circuit activation. SCE is continuing to examine ways to manage the SCE-controlled aspects of the process, including customer interactions with call centers and utility service planners.

(3) *The importance of a functioning, healthy industry for recycling and secondary battery use.* (White Paper, p. 22). Robust and profitable recycling and secondary use programs for PEV batteries need to be encouraged and developed over time. While recycling and secondary use are important goals to help achieve battery "residual value," they are by their very nature, long-term strategies. Thus, while

SCE agrees this is an important issue, it does not need to be taken up in an ET rulemaking that focuses on near-term issues, but instead would be suitable for any subsequent Commission proceeding relating to long-term PEV issues.

(4) *Addressing consumer preference barriers to ET market penetration.* (White Paper, pp. 36-38). SCE agrees with the White Paper that "socio-technical" obstacles, rather than purely technical issues, will influence the extent of consumers' willingness to shift to PEVs. The White Paper focuses in this area primarily on charging time. However, another important socio-technical barrier that also warrants Commission consideration is "range anxiety." Range anxiety is the concern of consumers that they will not be able to drive as far as they need to with a PEV, which is a major barrier to market penetration. Solving the range anxiety problem typically leads to different solutions than would be considered by focusing solely on the charging time problem.

(5) *Linkage to other Commission initiatives and the role of other state agencies*. (White Paper, pp. 66-69). As the White Paper notes, there may be multiple linkages between the California Solar Initiative ("CSI") program and PEVs. SCE believes there may also be linkages to other initiatives such as the Renewables Portfolio Standard ("RPS") and Zero Net Energy Homes. ET commercialization will also be impacted by actions taken by other agencies, such as the CEC, CARB, and the Franchise Tax Board. We agree that the Commission will need to coordinate with these agencies.

2. Additional Rulemaking Topics Raised by this Principle

(1) *The ET rulemaking should be divided into two phases to address immediate issues associated with ET market launch issues and near-term issues related to ET growth*. As noted at page 11 of the White Paper, over 13 PHEV and BEV production programs have been established by the automotive industry for delivery beginning in the last quarter of 2010 and the first quarter of 2011. In order to reach resolution on key issues in a timely manner and to ensure electric system infrastructure readiness, SCE recommends that the Commission develop two phases for a future ET rulemaking to develop policies pertaining to: (1) ET market launch between 2010 and 2012, and (2) growth between 2012 and 2020. Each period presents a unique set of system impact and customer outreach issues that warrant individual treatment by the Commission and stakeholders. For instance, for immediate market launch, critical issues will include: standards development, distribution system impacts and simple load control. For growth between 2012 and 2020, the central issues will include: integration with Smart Grid build-out to implement more "intelligent charging" and sophisticated load management, among others.

(2) *Consideration of other ET technologies*. The White Paper in footnote 1 acknowledges that there are many other ET technologies beyond light-duty EVs with their own set of issues, costs, and benefits. There are over a dozen of these technologies from high-speed rail and dual-mode electric freight rail to heavy-duty PHEVs, and their

nationwide GHG reduction potential in 2050 is in the hundreds of millions of metric tons per year. There are also several stationary technologies where electrification can bring large reductions in greenhouse gases and contribute to other societal benefits. Because the electricity sector issues associated with these ET technologies are largely the same as those associated with LDVs, SCE recommends that the Commission also review these technologies and their implications.

(3) *Development of energy efficiency programs for ET.* PEVs can and should be used efficiently. Examples of potential programs include standards to reduce parasitic load or new rebates to encourage best-in-class, energy efficient forklifts, golf carts, buses, and cars. In addition, the Commission should explore using Public Purpose Program funds to promote energy efficiency in ET technologies.

(4) *Automotive-grade batteries for use in stationary storage of electricity* The Commission should also consider "first use" automotive-grade battery systems in utility applications as a way to provide services to utilities and improve the business case for battery manufacturers by reaching high volume production much sooner. Although this issue often comes up in the context of PEVs, SCE recommends that stationary battery applications be considered in the Smart Grid OIR.

B. Maintaining Safe, Reliable, and Environmentally Responsible Electric Service with the Increasing Presence of ET

Ensuring that the existing distribution system is able to fuel "early adopter" PEVs (which will likely be concentrated in certain neighborhoods) may demand upgrades to circuits not previously anticipated. In addition, utility back-office IT systems will need new functionality to accommodate the new requirements to support PEVs.

1. Rulemaking Topics Identified in the White Paper that are Consistent with this Principle

(1) *Options to incorporate PEV charging with renewable energy supply, including, but not limited to, photovoltaic ("PV") arrays over charging stations or off-peak charging that takes advantage of overnight wind resources expected in the utility resource portfolio.* (White Paper, pp. 10, 61, 63, 67). SCE agrees that it is important to consider the potential of PEV charging to help integrate intermittent renewable generation and maximize efficiencies on the grid, particularly during the off-peak period. ET load management might be able to increase customer use of renewable energy and also assist in controlling electricity costs. However, additional development of intelligent communicating chargers, inverters, and control software will also be needed.

(2) *The need for near-term investment in both existing and new electricity system infrastructure.* (White Paper, pp. 40-42, 45). The White Paper postulates that significant near-term investment in electricity system infrastructure will likely be needed to support PEV market growth, and identifies the problem of early market

clusters impacting the distribution system. SCE agrees that such investment will be needed and that the Commission should explore the extent of that need in the ET rulemaking (as discussed above in subsection A).

(3) *Consideration of an electrification scenario in a future Long-Term Procurement Plan ("LTPP") Proceeding*. (White Paper, p. 33-34). SCE agrees with the White Paper that a specific electrification scenario does not need to be included in the 2010 LTPP proceeding. However, an electrification scenario may be considered in the 2012 LTPP proceeding, depending on the projected kWh and MW projected impacts between 2020 and 2030.

2. Additional Rulemaking Topics Raised by this Principle

(1) *Other issues in meeting demand for increased energy*. Ensuring that customer demand is met is vitally important. SCE recognizes that this issue is more appropriate for a proceeding that generally addresses the manner in which LSEs will satisfy their load requirements, such as an LTPP or Resource Adequacy proceeding, rather than a future ET rulemaking. Accordingly, SCE is simply acknowledging in these comments that ET market penetration raises the issue of increased demand. We recommend that the Commission include this issue in an appropriate proceeding that focuses on how LSEs meet their load requirements. Constraints on generation, such as the potential mandated closure of "once-through-cooling" plants (currently 40% of California's generating capacity), and limits on new construction (as with the "priority reserve" lawsuit freeze on emissions permits for new generation) are potential threats to future reliability. Using new transmission as a reliability resource depends on the siting and licensing process, which is extremely time-consuming. Thus, it is difficult to reconcile increasing ET electrical demand with plant closures and other restrictions on generating and transmission capacity. These "non-ET issues" will need to be addressed in order to facilitate the Commission's full embrace of ET load.

C. Proper Identification and Allocation of the Costs and Benefits Associated with Increasing ET Market Penetration and Development of the Appropriate and Reasonable Electric Rates and Incentives for ET

In light of the significant costs and many longer-term benefits associated with ET, appropriate vehicle incentives and rate treatment for ET is crucial for the success of ET market penetration. SCE recommends a careful examination of these issues in the ET rulemaking.

1. Rulemaking Topics Identified in the White Paper that are Consistent with this Principle

a. Costs and Benefits

The White Paper includes an extensive discussion of potential costs and benefits (both economic and non-economic) associated with increasing ET market penetration. SCE expects that both of these categories of costs and benefits will be extensively analyzed by the Commission in a future ET rulemaking. Because the discussion in the White Paper in this area is so extensive, SCE has elected to highlight in this section only the key topics raised in the White Paper that SCE would like to supplement with additional information.

(1) *Infrastructure costs*. (White Paper, pp. 10, 37, 40-42, 44 60, 65). As discussed above in subsections A and B, the transition to ET will require significant investment in both existing and new infrastructure. The costs and benefits of (i) utility systems and infrastructure, (ii) charging infrastructure for homes, multi-family dwellings, and businesses, and (iii) public charging, are correctly noted in the White Paper as important issues for further Commission consideration.

(2) *Societal benefits and associated cost shifts due to electrification*. (White Paper, p. 16, 37). The White Paper correctly notes that the reduction of petroleum consumption through electrification will create numerous benefits for society, including but not limited to emissions reductions and greater domestic energy security. The process of realizing these societal gains, however, may create undue burdens for ratepayers, due to the likely cross-sectoral shift (from the transportation sector to the utility sector) of costs associated with greenhouse gas emissions and additional power procurement necessary to meet increased demand. An important part of the issue is determining who should be responsible for paying these costs. SCE believes that electric ratepayers and/or ET consumers should be, at the very least, held harmless for this cross-sectoral cost transfer, in light of the associated reduction in gasoline and diesel fueled transportation emissions.

(3) *The potential value of ancillary services provided by PEVs*. (White Paper, p. 33). SCE agrees that the potential use of PEVs to provide ancillary services and other market and grid support services should be explored. Stationary energy storage may also provide such ancillary services revenues. This is a long-term, complex issue that warrants further research by the IOUs before being explicitly addressed by the Commission. The ongoing Smart Grid OIR includes energy storage issues within its scope – SCE therefore recommends that this issue be addressed in the Smart Grid OIR.

(4) *Cost impacts of third-party subscription services to provide charging infrastructure, electricity, sub-meters and other services*. (White Paper, pp. 62, 68). SCE recommends that the Commission continue its review of potential subscription service entities to assess their cost impact to PEV owners and all ratepayers. The White Paper (at page 38) also correctly identifies the problem of the PEV owner being insulated from the price signal as a potential barrier to ET market penetration. Similarly, lack of price transparency for the PEV owner can be a problem in the context of third-party subscription services. In addition, the Commission should consider whether the proposed business models of the providers of "subscription

services" comply with the law concerning direct access transactions and sale-for-resale of electricity.

b. Electric Rates and Incentives

(1) *Rate design options, including the potential of a statewide electricity rate for PEVs.* (White Paper, pp. 10, 29-30, 61-64, 68). SCE supports thorough consideration of appropriate rate design options in the ET proceedings. Rate design analysis should include consideration of the following issues:

- *Interplay between ET and non-ET customers.* How should the costs and benefits of electrification be distributed between ET and non-ET customers/ratepayers both across and within IOU service territories? The White Paper describes a variety of federal, state, and utility programs designed to advance ET adoption. While the bulk of options described represent those sourced from the Commission, it is important to acknowledge that any subsequent program costs be fairly distributed among all benefiting California residents.
- *Current residential tiered rate structures discourage ET.* As the White Paper points out, IOUs are attempting to work around the disincentives of increasing block pricing (IBP) through separately-metered optional charging time of use ("TOU") rates. While the rate structures and TOU periods should be consistent across IOUs, there is no reason to expect that the rates themselves will be exactly the same, due to differences in cost structures.
- *Rates applicable to PEVs that travel to, and charge in, two or more utility service territories.* SCE envisions a PEV charging infrastructure that accelerates adoption of PEVs and installation of charging equipment based on a "pay at service" model. This approach will allow integration of PEVs in the short-term, while still providing vehicle communication enabling demand-side management. This approach may also lead to more advanced features as the market evolves. Given that roaming will likely entail "opportunity" charging (short durations and low transaction costs), fully developing and building out roaming capability and associated IT systems may be imprudent at this nascent stage of market development.
- *Impact of taxes*. The White Paper recognizes that the Commission and the Franchise Tax Board will have an important combined role to play in determining whether road taxes should be applied to electric rates applicable to PEV charging in the future. In considering this issue, the Commission and the FTB should take into account that other taxes are currently borne by electricity customers that do not apply to gasoline customers. For example, some cities charge utility users fees, and some exempt PEVs from those fees. In addition, there are utility franchise fees that can be based on kWh.
- *Other rate designs.* The White Paper recognizes other potential benefits to ratepayers and these may be turned into optional rates or possibly incentives. However, we caution that in most cases the technology first needs to be developed and demonstrated in order to capture the benefits of linking to the California Solar Initiative, ancillary service contracts, or

renewable integration. The White Paper is correct in recognizing the rate issues associated with public charging, two- and three-wheel EVs, and neighborhood EVs.

(2) *Vehicle incentives to encourage Californians to buy and operate PEVs*. (White Paper, pp. 10, 64-65). SCE also supports Commission consideration of consumer incentives for PEVs. Two important issues associated with such incentives are the following:

- *ET Incentives should be matched to address specific barriers to entry.* ET incentives generally fall into four categories: (i) vehicle buy-downs, (ii) infrastructure incentives, (iii) demand response incentives, and (iv) "below market cost" incentives. The future ET rulemaking should assess the ability of each incentive category to address specific barriers to entry. For example, if the ET operating costs associated with off-peak charging rates already compare favorably to the operating costs of gasoline powered vehicles, incentives should be focused on mitigating the high cost of initial vehicle procurement through vehicle buy-downs.
- *Should ET customers receive "below market cost" incentives to charge at certain times, and if so, who pays for this?* In general, SCE's incentive (or incremental sales) rates have always incorporated the notion of a marginal cost floor rate (energy and distribution plus non-bypassable charges). Rates designed in this manner provide incentives without allocating a subsidy to be paid for by remaining ratepayers. Any future ET rulemaking would benefit from specific cost and benefit studies to determine whether ET charging patterns justify reduced floor prices during off-peak periods. Translating the results of these studies into TOU rates and/or incentives could improve ET operating economics.

(3) *Development of sub-meter systems to ensure appropriate ratepayer pricing*. (White Paper pp 38, 43, 61, 65). SCE recommends a careful look at the policy and load management requirements that will drive the development and installation of sub-meter systems (for segregated PEV loads). The sub-meter will likely be part of the solution to load management and increasing block pricing issues, tax fairness issues, and designing a Low Carbon Fuel Standard ("LCFS") that works with other programs such as AB 32, RPS, and other charges.

2. Additional Rulemaking Topics Raised by this Principle

a. Costs and Benefits

(1) *Linkage between ET and energy storage*. There are various benefits (existing and to-be-developed) to using PEVs for energy storage. There are also benefits associated with stationary energy storage. More research and development is needed for both of these energy storage technologies and should be encouraged by the Commission.

D. Implementing Effective Customer Education and Outreach Programs in Preparation for the Broad Automotive Industry Market Launch of ET

Customer education and outreach programs will be a critical component of a timely and seamless transition to electrified transportation. Among other items, utilities and other parties should provide education on charging operations, infrastructure requirements, metering, tariffs, programs, and billing.

Furthermore, coordination among the California IOUs, non-CPUC jurisdictional utilities, automobile manufacturers, and other parties will be of paramount importance. The development and adoption of ET technologies will further necessitate the need for effective coordination and communications. As outlined below, the potential ET rulemaking should address industry-wide strategic issues by developing an appropriate customer-facing framework.

1. Rulemaking Topics Identified in the White Paper that are Consistent with this Principle

Although the White Paper discusses consumer preference barriers to ET market penetration and mentions the importance of customer education and outreach, SCE did not identify any specific recommendations in the White Paper for customer education and marketing programs.

2. Additional Rulemaking Topics Raised by this Principle

The potential ET rulemaking should encourage statewide collaboration with respect to customer education, marketing, and program development. Collaboration will be instrumental in developing a timely and seamless transition to electricity as transportation fuel. As indicated by the recommended topics below, the ET rulemaking should focus on general frameworks and industry-wide requirements for customer outreach – the IOUs should then be permitted in separate proceedings to develop utility-specific education and marketing programs consistent with the industry-wide requirements. Furthermore, collaboration on the customer outreach program framework should be encouraged with non-Commission jurisdictional utilities, Commission-jurisdictional utilities, automobile manufacturers, ET technology companies, and other key constituents. Topics for consideration in the ET rulemaking may include, but are not limited to, the following topics:

(1) *Education materials and messaging* (industry-wide framework).

(2) *General marketing* (industry-wide framework).

(3) *General program development, including potential consumer incentives.*

(4) *Coordination of pilot projects which focus on education, marketing materials, and program offerings.*

(5) *Adoption of consumer-related Smart Grid standards, including cyber-security and consumer-related ET metrics (e.g., enrollments, MW reductions, etc.).*

(6) *Adoption of easy to understand and administer customer programs to facilitate enrollments in EV-related utility programs.*

IV. Topics Directly Relevant to Smart Grid OIR

Commission Staff has requested that parties commenting on the White Paper separately identify in their comments any issues that are directly relevant to the Commission's ongoing Smart Grid proceeding (R.08-12-009). Accordingly, in this section SCE identifies the topics from the discussion in Section III above that are relevant to the Smart Grid proceeding. These topics are:

From Section III.A:

- Options for developing metering and charging infrastructure – specifically the development of energy storage and smart metering technology, and potential linkages to Zero Net Energy Homes or CSI.

- The need for national and international codes and standards, including smart grid and communication codes and standards, so that PEV adoption reaches its full potential.

- Potential use of automotive-grade batteries for stationary storage of electricity.

From Section III.B:

- Distribution system impact of PEVs (specifically, the potential for smart grid communications from PEV charging to reduce distribution system impacts, including allowing enough time for transformers to cool down).

- Options to incorporate PEV charging with renewable energy supply, including, but not limited to, PV arrays over charging stations or off-peak charging that takes advantage of overnight wind resources expected in the utility resource portfolio.

From Section III.C:

- The potential for stationary energy storage to provide ancillary services and receive ancillary services wholesale market revenues.

- Ensuring that third-party subscription services are consistent with state law and able to pass electricity price signals on to PEV owners.

- Potential development of "pay at service" charging stations to address charging in multiple service territories.

- Development of sub-meter systems to ensure appropriate ratepayer pricing for electricity used to fuel PEVs.

From Section III.D:

- Adoption of consumer-related Smart Grid standards, including cyber-security and consumer-related ET metrics (e.g., enrollments, MW reductions, etc.).

V. Conclusion

SCE welcomes the opportunity to work with the Commission and other stakeholders to shape and define the future of ET. We believe that if implemented properly, ET can produce immense benefits for both California residents and SCE ratepayers. SCE looks forward to working with the Commission in the near future to address and resolve key challenges facing ET.

APPENDIX OF RECOMMENDED WHITE PAPER MODIFICATIONS

In addition to the key principles and associated topics that SCE recommends above for inclusion in any future Commission proceeding regarding ET, there are certain portions of the White Paper that should be modified in order to ensure accuracy and completeness. SCE provides key recommended modifications to the White Paper in this Appendix, which are organized consistent with the major headings of the paper. This Appendix is not meant to represent a line-by-line edit of the White Paper, but rather a compilation of important changes that SCE strongly urges Staff to consider prior to finalizing the paper.

White Paper Introduction

Page 14: In regard to market penetration figures, Staff may want to consider modifying the numbers by incorporating additional studies, such as the State Alternative Fuels Plan adopted by CARB and the CEC. The TIAX LLC market projections that are currently being used are of some concern because they use numbers from 2005. While the high case from the TIAX study aligns with more recent analysis by SCE, the medium and low case numbers do not reflect the 2008 changes to the ZEV program, nor do they take into consideration the at least 10-15 PEV launches by 2015 that impact the low and medium case. SCE also recommends that Staff use the SCE analysis for low numbers because our analysis incorporates this new data.

Environmental Benefits and Costs of LDV Electrification

Page 16-17: In order to more clearly and accurately express the costs and benefits of LDV electrification, SCE recommends making the following modifications to the assumptions listed for Table 1:

1a. Reevaluation of the listed full-size BEV battery capacity: the 66 kWh figure listed does not align with the 27 kWh of the Rav4EV, the 23 kWh of the new Ford Focus BEV, nor the 26 kWh of the Ford Transit Connect BEV nor other BEVs.

1b. Clarification regarding the NEV to BEV capacity ratio for the low case: the text says that the NEV capacity is assumed 1/10 of BEV capacity, but footnote 8 says it is 1/5.

2. Inclusion of sources: the BEV and PHEV vehicle efficiency numbers do not have citations.

4. Use of side by side comparison: the assumption that PEV technology at 450 watthours per mile replaces a 30 mpg conventional vehicle ("CV") is controversial. Instead, SCE recommends the White Paper use side by side testing of CVs, PHEVs, and BEVs in order to determine the correct match of

mile per kWh and miles per gallon. Additionally, the 30 mpg CV may be a bit too optimistic. The average new vehicle has a fuel economy of approximately 20 mpg.

5. Use of well-to-wheels numbers: the 8.8 kg/gal figure for the carbon intensity of gasoline is a tank-to-wheels number rather than a well-to-wheels number, which would be much higher.

In addition to these modifications to the assumptions, SCE recommends that the Staff utilize and incorporate some of the additional studies that have already been done in this area. For example, studies that focus on California include analyses done by: TIAX 2008, EPRI-NRDC, SCE, CARB (Low Carbon Fuel Standard) and the State Alternative Fuels Plan. These studies may be used to review the table and to compliment the EPRI-NRDC bar chart that follows Table 1. We believe the numbers in Table 1 are low, as the SCE study found 1.6 million vehicles in 2020 would reduce 7.9 million metric tons per year of CO2.

Page 16: SCE recommends a review with CARB of the impact of transportation emissions on the state of California and consider the complete "well to tank" emissions analysis.

Pages 21-22: SCE recommends further analysis on water consumption by power generation versus fossil fuel. Marginal water use per kWh generation has decreased in recent years.

Page 21: The key point explaining how on-peak electricity delivery is associated with marginally increased emissions due to decreasing efficiency levels of marginal natural gas generation plants in the environmental costs section can be further strengthened by including a key SCE finding. SCE's recent analysis found that shifting from summer peak to off-peak fossil fuel plants can lead to as much as 1 million metric tons of GHG reduction per year by 2020 in SCE's territory (high case).

Page 22: Lithium is a critical raw material for advanced batteries. SCE recommends that staff request additional analysis on lithium availability, cost, and recycle capability.

Page 24: The Staff should expand their analysis on the important LCFS issue and show additional CARB analysis including the baseline petroleum numbers and the percent reduction by electric vehicles. This would show that CARB found electricity as a light duty transportation fuel to be about 64 percent less greenhouse gas intense than gasoline or diesel fuel.

Page 26: There are additional environmental policy drivers in California. SCE recommends that the White Paper be expanded to include IEPR, EAP 1 and EAP 2, and the State Implementation Plan (for the state and federal Clean Air Acts).

Economic Benefits, Costs, and Barriers to Entry

Page 27-28: As reflected in the White Paper, battery costs are critical to the initial cost of either a PHEV or BEV. Initial purchase price will drive the rate of vehicle market penetration and the infrastructure required to support these vehicles. SCE recommends a review of the many conference papers that define life cycle costs and the CARB expert panel report that provides battery cost projections based on volume. The information from these analyses will be a critical part of infrastructure planning, consumer outreach and education processes.

Page 30: The White Paper states that the cost of a second meter or sub-meter to separately meter electric transportation load would be borne by the customer because it is located on the "customer side" of the meter. This is not specifically correct. This second meter or sub-meter is potentially considered not to be on the customer side of the meter. It can be argued that these second meters or sub-meters (with TOU or other load management capability) should be treated like other load management devices, which provide benefits to all ratepayers, and therefore the costs of these second meters or sub-meters should be borne by all ratepayers.

Page 31: The White Paper implies that increased electricity usage driven by adoption of PEVs will produce incremental revenues above a utility's marginal costs, which can then be used to fund ET infrastructure improvements. However, IOU generation-related costs are essentially pass-through costs. Thus, any excess revenue collected in one year must be returned to ratepayers in the following year's Energy Resources Recovery Account ("ERRA") balancing account adjustment. Utilities cannot keep revenue imbalances for investment in infrastructure related to a specific class of customers. Infrastructure investment decisions should be made independently in the various utility General Rate Case ("GRC") proceedings. It should also be noted that to the extent that ET rates are discounted from the retail rate structures, there is less remaining "margin" to fund the PEV charging infrastructure. This point also holds true to a similar reference made regarding RPS costs on page 63.

Page 35: The White Paper states: "potential PEV nightly load and potential PEV storage capacity inherent in PEVs may stabilize renewable generation resources, in effect mitigating the cost of RPS compliance." While SCE agrees that properly-managed charging behavior has the potential to help integrate intermittent renewable generation, it is still unclear whether or not it will fully "mitigate" the cost of RPS compliance. The White Paper itself acknowledges that "…additional demand due to electrification will also raise the total renewable energy generation cost required to comply with the 20% RPS, and the proposed 33% renewable energy goal." SCE recommends the White Paper make clear that it is uncertain whether or not any cost mitigation will fully offset associated increased costs to meet RPS targets.

Existing and Pending Policies/Programs Supporting PEV Commercialization

Page 53: To more accurately reflect SCE's stance on current issues, SCE recommends the Staff change some of the information about SCE in the section regarding Utility LEV policies and programs that support LDV electrification. The Staff lists an SCE projection of $11.1 million per year for alternative fuel vehicle investments. This should be changed from a projection to instead reflect the expenditures that the Commission has approved.

Page 65: The White Paper suggests that the Commission consider a low-interest loan finance program for customer-site energy-related capital improvements. The primary legal issue connected with any on-bill financing program is the extent to which an IOU can function as a lending institution without running afoul of state and federal lending laws. The IOUs faced this problem previously in connection with the implementation of an on-bill financing program for energy efficiency programs. In that instance, the IOUs received very limited permission to offer on-bill financing for energy efficiency improvements, conditioned on specific program and eligibility criteria. (*See* California Department of Corporations Release No. 60-FS.) In light of the substantial limitations on the IOUs' ability to offer on-bill financing, the White Paper should state that consideration of this issue will require careful deliberation.

IOU Tariff Details – SCE Tariff

Page 64: The notion that charging rates should be reduced to consist strictly of off-peak marginal energy costs controverts an existing CPUC policy determination – found in Decision ("D.")07-09-016 – that incentive rates should at least contain all marginal costs (energy and distribution) plus non-bypassable charges.

Page 73: SCE requests that the discussion of SCE's Tariff in the White Paper include an express statement that SCE's Tariff will likely be modified in 2009 to reflect SCE's new EV rate design proposals currently before the Commission in Phase 2 of SCE's 2009 GRC. For example, in a 2009 GRC Settlement filing pending at the Commission, SCE proposed an EV-1 rate that significantly reduces the off-peak (charging) rate by restricting it to be the sum of off-peak marginal energy costs, marginal distribution costs, and non-bypassable charges. The proposed off-peak rates are roughly 33% below the average residential rate and 27% below the system average rate. The proposed EV-1 rate structure is:

TOU-EV-1		Current	Proposed
Energy Charge - $/kWh			
	Summer Season - On-Peak	0.23792	0.28431
	Off-Peak	0.15720	0.10481
	Winter Season - On-Peak	0.17966	0.20940
	Off-Peak	0.15997	0.10422