BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking to Implement the Commission's Procurement Incentive Framework and to Examine the Integration of Greenhouse Gas Emissions Standards Into Procurement Policies.	R.06-04-009 (Filed April 13, 2006)

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In The Matter Of, AB 32 Implementation – Greenhouse Gas Emissions.	Docket 07-OIIP-01

COMMENTS OF SOUTHERN CALIFORNIA EDISON COMPANY (U 338-E) ON ADMINISTRATIVE LAW JUDGES' RULING UPDATING PROCEEDING AND REQUESTING COMMENTS ON EMISSION ALLOWANCE POLICIES AND OTHER ISSUES

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I.

INTRODUCTION

Pursuant to the Administrative Law Judges' Ruling Modifying Schedule and Correcting Suggested Outline for Comments and Reply Comments, issued May 20, 2008, Southern California Edison Company ("SCE") submits the following proposals and comments on allowance allocation, flexible compliance, combined heat and power ("CHP"), non-market-based emissions reduction measures and emissions caps, and modeling issues. Although SCE has attempted to set forth its current thinking on the various questions posed by the four rulings of the California Public Utility Commission ("CPUC"), SCE has not addressed each question raised by those rulings. SCE intends to address certain of those questions in response to parties' opening proposals.

II.

SCE'S PREFERRED ALLOWANCE ALLOCATION APPROACH

A. Description of SCE's Preferred Allowance Allocation Approach

Imposition of a greenhouse gas ("GHG") reduction program will cause some entities substantial economic harm. Other entities will not be affected or will be positively affected. In order to most effectively achieve the State's emissions reduction goals, SCE suggests allowance allocation efforts should be based on mitigating the economic harm caused by implementation of Assembly Bill ("AB") 32. Accordingly, SCE proposes that allowances be allocated to those entities that experience economic harm due to the implementation of a GHG reduction program.

Economic harm is the difference in an entity's economic outcome under a cap-and-trade system as opposed to that entity's economic outcome under business as usual conditions. By identifying entities suffering economic harm and allocating allowances to such harmed entities, California can develop a cap-and-trade approach that produces emissions reductions at the lowest possible cost, and this cost will be borne equitably, as required by AB 32.[1] To do otherwise would mean that capital investments made prior to the enactment of AB 32 under law and rules that did not require pricing of GHG emissions would have to be abandoned prematurely to some extent. This would raise questions of equitable treatment,[2] as well as impose significant cost to the California economy. Distributing allowances on the basis of economic harm also ensures that windfall profits are not created because entities that have low GHG emissions, or that will receive increased revenue to offset their emissions costs, will receive allowances only to the extent they are harmed.

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[1] *See* Cal. Health & Safety Code §§ 38562(a) ("[T]he state board shall adopt greenhouse gas emission limits and emission reduction measures by regulation to achieve the maximum technologically feasible and cost-effective reductions in greenhouse gas emissions."); 38562(b)(1) ("In adopting regulations . . ., the state board shall . . . [d]esign the regulations, including distribution of emissions allowances where appropriate, in manner that is equitable, seeks to minimize costs and maximize the total benefits to California, and encourages early action to reduce greenhouse gas emissions.") (emphasis added).

[2] AB 32 requires allowances to be distributed in an equitable manner. *See* Cal. Health & Safety Code § 38562(b)(1).

In the case of the electricity sector there are several major sources of economic harm.

Independent generator economic harm. In the California Independent System Operator ("CAISO") wholesale electricity market, the marginal, or next most costly, generating unit sets the market clearing price or the price paid to all generating units at a given point in time. Economic harm occurs when an independent generator has an emissions rate that is higher than the emissions rate of the marginal unit, which sets the market clearing price in the market where the generator transacts. In such a circumstance, the independent generator will incur emissions costs greater than the revenue its receives. The dollar value of economic harm such generators will suffer will be determined by the difference in emissions rates between the generating unit's emissions and the market price-setting unit's emissions, multiplied by the price of emissions in the market, multiplied by the volume of power sold. In equation form this is expressed as:

$$\$_{IPP} = (E_{GEN} - E_{MKT}) \times P_{GHG} \times Q_{SOLD}$$

Where,

$\$_{IPP}$ is the economic harm suffered by an independent power producer ("IPP") selling into the market

E_{GEN} is the generation unit's emissions rate

E_{MKT} is the emissions rate of the marginal unit setting market prices

P_{GHG} is the price of GHG emissions allowances as determined by the market clearing price from allowance trading

Q_{SOLD} is the quantity of energy sold into the market by the IPP

Load-serving entity economic harm from its portfolio. Economic harm will also occur when a load-serving entity ("LSE") owns generation that has GHG emissions or when that LSE is responsible for the emissions costs of generation it has purchased by contract. In such a circumstance, the generation does not receive any market revenues, because it directly serves load.[3] This means that all of the emissions costs associated with operating the generator –

[3] Under the CAISO's Market Redesign and Technology Upgrade ("MRTU"), utility-owned generation will bid into the market and receive the higher market price. However, the utility will then purchase that energy at the

Continued on the next page

emissions costs which did not exist, but for the GHG reduction program – must be recovered from somewhere. The recovery will be from the LSE's customers. The LSE's inability to recover these costs from the market creates economic harm. The magnitude of the harm is expressed as:

$\$_{PORT} = E_{GEN} \times P_{GHG} \times Q_{GEN}$

Where,

$\$_{PORT}$ is the economic harm suffered by the LSE with GHG-emitting generation in its portfolio

Q_{GEN} is the quantity generated by the emitting generation in the portfolio

P_{GHG} is the price of GHG emissions allowances as determined by the market-clearing price from allowance trading

E_{GEN} is the generation unit's emissions rate

LSE economic harm from market purchases. Economic harm can also be suffered by an LSE (or its customers, typically, as the LSE passes on its costs to its customers in the form of higher rates) when the LSE purchases power from the market to meet its customers' needs, but the market price has increased as a result of GHG regulation.

A competitive electricity market will yield prices equal to the marginal cost of the last unit needed to clear the market. Absent GHG regulation, these marginal costs are typically determined by the generating unit's operating efficiency, fuel costs for this unit (typically natural gas for California), and any variable operations and maintenance costs incurred by operating the unit. As a result of GHG regulations, if the generating unit is responsible for acquiring allowances associated with its GHG output, then an additional marginal cost component will be the product of the marginal unit's GHG emissions rate and the market price of GHG allowances. This higher marginal cost will likely be reflected in market-clearing prices. Thus, the economic harm suffered by an LSE purchasing from the market is the increased cost component related to

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higher market price. Therefore, the ratepayer harm will be equivalent to that incurred before MRTU was implemented.

GHG allowances reflected in market-clearing prices. The magnitude of this economic harm can be expressed as:

$$\$_{MKT} = (MC_{WITH} - MC_{WITHOUT}) \times Q_{PURCHASED}$$

$$= E_{MKT} \times P_{GHG} \times Q_{PURCHASED}$$

Where,

$\$_{MKT}$ is the economic harm suffered by an LSE buying power from the market

MC_{WITH} is the marginal cost of the market with GHG rules in place

$MC_{WITHOUT}$ is the marginal cost of the market without GHG rules in place

$Q_{PURCHASED}$ is the quantity purchased from the market

And,

$\$_{UTIL}$ is the economic harm suffered by an LSE that buys power from the market and has a portfolio of GHG emitting resources. This is basically the sum of the economic harm components for emitting generation in an LSE's portfolio and the economic harm resulting from the LSE's market purchases. This can be expressed as:

$$\$_{UTIL} = (E_{GEN} \times P_{GHG} \times Q_{GEN}) + (MC_{WITH} - MC_{WITHOUT}) \times Q_{PURCHASED}$$

$$= E_{GEN} \times P_{GHG} \times Q_{GEN} + E_{MKT} \times P_{GHG} \times Q_{PURCHASED}$$

Generator economic harm from long-term contract restrictions. Lastly, economic harm is also suffered by an IPP to the extent it has sold its output forward into the period of GHG reduction regulation without any contractual provisions to recover new GHG costs. In such circumstances, GHG emissions from the generator must be covered by the cost of acquiring allowances for those GHG emissions, but unlike the market-sale case described above, there is no assumed increased revenue to offset some or all of the increased GHG allowances costs.

B. SCE's Response to Staff Paper on Allowance Allocation Options and Allocation Recommendations

1. Returning of Auction Revenues

If the California Air Resources Board ("CARB") chooses to distribute allowances using an auction, the proceeds from such an auction should be distributed according to the economic harm-based allocation method outlined above. Under such a system, harmed entities would be assigned auction revenue rights ("ARRs") according to a harm-based allocation process. In practice, this means that immediately following the allowance auction, all auction revenue would be distributed to entities holding ARRs. By identifying harmed entities during the allocation process, ARRs become a means by which harmed entities can mitigate the economic dislocation that will occur as a result of the implementation of a cap-and-trade mechanism. This approach is consistent with AB 32's requirement that CARB design regulations that "minimize costs and maximize the total benefits to California."[4]

2. Pros/Cons of Using the Funds to Augment Energy Efficiency and Renewables Investment or Use to Maintain Affordable Rates

a) How much should be used for energy efficiency and renewables?

Under market-based emissions regulations, specific additional expenditures on energy efficiency ("EE") or renewables are unnecessary. Under a deliverer or source-based cap-and-trade regulation, generator bids will include emissions costs and will be higher than they would have been without an emissions cap. Market prices will therefore rise by the emissions cost of the market's marginal generator. This increase in market prices will make greater levels of EE and renewable energy projects cost-effective compared to business as usual without a GHG reduction program. Accordingly, no special carve-out of allocation funds is necessary to

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[4] Cal. Health & Safety Code § 38562(b)(1).

augment incentives for investing in EE and renewables under AB 32. Such incentives will be created automatically as a result of higher bid prices under a cap-and-trade system.

b) If auction revenues are used to maintain affordable rates, should they be used to lower retail providers' overall revenue requirements, returned directly to consumers, used to target relief to low-income customers, or other?

Under a harm-based allocation mechanism, a significant proportion of allowances (or ARRs) will be allocated to retail deliverers to help mitigate the economic burden of GHG regulation on their ratepayers. This distribution will mitigate increases in the revenue requirement resulting from an emissions cap. The precise distribution of auction revenues by customer class, however, is a matter better determined by the CPUC during an investor-owned utility's ("IOU") cost recovery proceedings.

3. SCE's Comments On The Allowance Allocation Proposals Presented In The Staff Paper

SCE does not support the use of a single allowance allocation scheme. In order to meet the objectives of minimizing consumer cost, equity, simplicity and accommodation of new entrants, SCE urges the CPUC and California Energy Commission ("CEC") to support the use of a combination of proposals which are all used to mitigate economic harm as described in section II.A above. SCE's specific criticisms of each of the allowance allocation mechanisms set forth in the "Joint California Public Utilities Commission and California Energy Commission Staff Paper on Options for Allocation of GHG Allowances in the Electricity Sector," dated April 16, 2008 ("Staff Paper"), are set out below.

a) SCE's Comments on the Emission-Based Allocation Proposal

SCE agrees that if an emissions-based allocation scheme does not reduce the allocation value by the increased market price for generation, some generators will receive an unearned windfall. Such an allocation proposal can create windfall profits for independent generators with

emissions rates at or below the marginal unit (primarily gas units). These windfalls come at the expense of consumers. However, it is important to note the distinction between increased profits and windfall profits. Under any regulatory scheme that creates scarcity for carbon emissions, generators with emissions rates lower than the marginal unit will realize increased profits. This result is unavoidable, and is arguably desirable, in that it creates incentives to build additional low emission generating units. Allocating allowances to the generators that are already experiencing increased profits, however, results in windfall profits at the expense of consumers.

Unfortunately, because the GHG Calculator ("Calculator") created by Energy and Environmental Economics, Inc. ("E3") only models the impact of allocation proposals on LSEs, the effect of windfall profits to generators is not readily apparent. One indication of the magnitude of windfall profits can be discerned by the magnitude of the net cost of carbon dioxide ("CO_2") for SCE and Pacific Gas and Electric Company ("PG&E") (both purchasers of significant amounts of power from the market) in the Calculator's Scenario 1. In 2012, the combined cost for both utilities is nearly $1.2 billion, increasing to $1.6 billion in 2020. These costs include several factors, but it is notable that a significant portion can be attributed to the windfall profits gained by independent generators.

b) SCE's Comments on the Output-Based Allocation Proposal

The output-based allocation proposal cannot be modeled using the Calculator and should be removed from consideration. Whereas other proposals merely distribute allowance value, the output-based proposal has implications for market dynamics and bidding behavior. Such dynamics are not captured by the PLEXOS least-cost dispatch mechanism used by the Calculator. Accordingly, the Calculator does not reflect behavioral changes that occur under an output-based allocation system. The "fix" used by the Calculator to address this shortcoming is an option to reduce the impact of CO_2 costs in the market price (*i.e.*, Tab: "CO2Market"; Cell: "G30"). This fix does not adequately capture the dynamic impact of the output-based approach. Because the model cannot explain the complex impact of an output-based approach on bidding

behavior, neither the CPUC nor the CEC should consider this option until a more robust modeling analysis can be completed on this proposal.

Additionally, SCE disagrees with the assumption that market clearing prices will not increase under an output-based approach. This assumption ignores the fact that despite receiving allowances as a function of generation output (measured in MWh), a marginal unit (which sets the market-clearing price) will never be able to receive allowances that will be sufficient to cover the entirety of its emissions.

The marginal unit will not receive enough allowances for two reasons. First, because allowances are being allocated to non-emitting resources, there will be a shortfall of allowances. According to the Staff Paper, a gas combustion turbine unit will be short 100 kg CO_2 per every MWh generated. Second, the allowance cap is declining each year. Therefore the number of allowances available for allocation will be less than the total volume of emissions from the previous year. Generators will be forced to increase their bids to recover this shortfall in allowances. Generators will also increase their bids to cover the risk uncertainty related to the number of allowances they receive. Generators only receive allowances based on their percentage of the State's total generation. Because the State's total generation fluctuates each year entities may receive fewer allowances depending on variables such as temperature and hydro levels.

Further, because entities can alter their allowance allocation through current or future behavior under the output-based approach, an output-based approach to allowance allocation will be less than efficient. Efficiencies are achieved through a cap-and-trade program, which results in a price for GHG emissions that is determined by the intersection of the demand and supply curves for allowances under a cap-and-trade program. These efficiencies are unaffected by who gets allowances, however, since that determination was based on historical data, which cannot be altered by current or future behavior. This is not the case, however, for the output-based approach, which depends on current and future behavior such that there are efficiency implications. Accordingly, SCE views the greatest efficiencies to be those obtained from a

market structure which derives its prices from the intersection of supply and demand curves at a market clearing price. Any attempt to achieve "additional" efficiencies through an allocation mechanism is doomed to reduce the efficiency of such a solution because the maximum efficiency would have already been achieved through a well-functioning market outcome. Any allocation mechanism that alters a market solution would thus be sub-optimal, or at least not better than or equal to the efficiency of the solution from an allocation that does not alter behavior. In this respect, the Staff Paper accurately diagnoses that the output-based approach will create a perverse incentive to increase power consumption.

Another shortcoming of the output-based proposal is its wealth transfer from high-emitting resources to low-emitting resources. Such a wealth transfer is unwarranted and does not help high-emitting resources receive the allowances necessary to transition to a carbon-constrained economy.

The preferred output-based approach (which allocates to fossil-fuel generators only) is similarly flawed. Contrary to the Staff Paper's assertion that natural gas units will bid lower under an output-based approach, the preferred approach will, in fact, create windfall profits for natural gas generators. Under the preferred output-based approach, natural gas generators will receive more allowances than will be required to cover their emissions and will benefit from increased market prices. As the Staff Paper notes, this approach will encourage contract shuffling.

The Staff Paper also provides a third variant on the output-based approach. This variation includes fuel-differentiation (*e.g.*, coal generators receive twice as many allowances as natural gas generators). Such a proposal essentially creates a more complicated version of the emissions-based proposal also discussed in the Staff Paper. Under this third variant, natural gas and coal generators/deliverers receive roughly the same number of allowances as they would under an emissions-based approach. For the reasons set forth in section II.B.3.a., above, this approach should not be implemented.

4. SCE's Comments on a Pure Auction Allocation Approach

SCE would only support an auction-based approach to allocating allowances in the electricity sector if the revenue created by such an auction is distributed to the electric sector in a manner that mitigates economic harm as described above.

5. SCE's Comments on the Proposal to Conduct an Auction with ARRs Returned to LSEs Based on Sales (MWh)

SCE agrees with the Staff Paper's finding that this would create an unacceptable wealth transfer.

III.

SCE'S COMMENTS ON FLEXIBLE COMPLIANCE WHITE PAPER

A. SCE's Proposal For Flexible Compliance Rules

There are a variety of cost containment mechanisms that can protect electricity ratepayers and the economy from unforeseen interactions between the electricity and allowance markets. SCE encourages the CPUC, CEC, and CARB to continue consideration of all such cost containment mechanisms. SCE believes there is ample direction in AB 32 to do so.[5] Additionally, SCE urges the CPUC, CEC, and CARB to recognize that obligated entities are best equipped to select the most appropriate means for minimizing compliance costs for their

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[5] *See, e.g.*, Cal. Health & Safety Code §§ 38501(h) ("It is the intent of the Legislature that the State Air Resources Board design emissions reduction measures to meet the statewide emissions limits for greenhouse gases established pursuant to [AB 32] in a manner that minimizes costs and maximizes benefits for California's economy. . . .") (emphasis added); 38560, 38561(a), 38562(a) (requiring CARB to adopt a scoping plan and rules and regulations to achieve the "maximum technologically feasible and cost-effective" reductions in GHG emissions) (emphasis added). *See also id.* §§ 38562(b)(1) (stating that CARB shall design the regulations, including distribution of allowances where appropriate, in a manner that "seeks to minimize costs"); 38562(b)(5) (requiring that CARB "[c]onsider [the] cost-effectiveness of these regulations"); 38562(c) (providing that CARB may establish a system of market-based declining annual aggregate emission limits that CARB determines "will achieve the maximum technologically feasible and cost-effective reductions in greenhouse gas emissions"); 38564 (requiring CARB to consult with other states, the federal government, and other nations "to facilitate the development of integrated and cost-effective regional, national, and international greenhouse gas reduction programs").

customers and the economy as a whole. To this end, the CPUC, CEC, and CARB should consider the following cost containment mechanisms:

- Allowance Banking and Borrowing. Obligated entities should be allowed to manage their compliance across compliance periods in a way that minimizes the economic impact of compliance over the long-term while allowing California to achieve its emission reduction goals. Technology and offset projects often require several years to come on-line. The ability to borrow or bank forward would give obligated entities the flexibility needed to meet long-term emission reduction goals at the lowest possible cost.
- Multi-Year Compliance Periods. The electricity sector is characterized by dynamic changes in weather patterns, leading to both changes in electricity demand and available generation. Multi-year compliance periods will help minimize such variability and reduce the volatility of the compliance burden.
- Rolling and Flexible Compliance Periods. Because of the binding nature of the AB 32 GHG emissions cap, regulated sectors as a whole will be short allowances. A single compliance period that ends at one date for all obligated entities will create wild peaks in allowance prices. By contrast, a rolling compliance period, in which compliance end-dates are staggered, will mitigate the tendency for price spikes at the end of a compliance period. However, due to the regulated nature of the electricity industry, that sector's compliance obligation will be known by entities that may be able to manipulate the market for allowances. To prevent such negative consequences, the CPUC and CEC should make a recommendation to CARB that is supportive of a flexible compliance period, in which individual obligated entities have the option of choosing to end their current compliance period early. Such action might mitigate the tendency for manipulation of emissions markets.
- Safety Valve. Emissions allowance and electricity markets can interact in unforeseen ways. To mitigate the consequences of such interactions, the CPUC and

CEC should recommend that CARB retain the option of offering additional allowances at a predetermined price in the event that these markets demonstrate economically burdensome price swings. Such additional allowances could be offered in addition to any borrowing allowed under adopted cost containment rules.

In addition to the foregoing, SCE strongly urges the CPUC and CEC to recommend that CARB incorporate a robust offsets program into its approach to reducing GHG emissions. Offsets present an important cost containment mechanism because they give obligated entities the incentive to seek out the lowest cost emissions reduction opportunities, both within and outside California. Additionally, it is critical that the CPUC and CEC remind CARB that the purpose of achieving GHG reductions is to obtain a beneficial reduction in the risk of global warming. Without substantial reductions in GHG emissions in the rest of the United States and worldwide – especially in developing countries that are currently resisting committing to reductions – California's efforts will not significantly affect the worldwide risk of global warming. Inclusion by CARB of a strong offset program without geographic restrictions also gives CARB the opportunity to:

- Achieve significant cost savings for obligated entities and the California economy;
- In conjunction with the cost savings from offsets, reduce the potential for emissions and economic leakage when enterprises move from within California to areas lacking GHG caps;
- Encourage early reductions in GHG, which are ton-for-ton more valuable than later reductions, from a global warming perspective; and
- Encourage innovative GHG reduction technology and practice and transfer these to areas of the globe that have not yet embraced such technology and practice. As other parts of the world receive the benefits of EE technology, among other things, they will be able to devote effort to adopting more effective low- or zero-emissions technology without locking in high-emitting transition technologies.

B. SCE's Responses to Questions Regarding The Scope of The Market And Related Issues

1. Discuss how your proposal would affect the environmental integrity of the cap, California's ability to link with other trading systems, and administrative complexity.

The cost containment mechanisms outlined above can be implemented without challenging the environmental integrity of AB 32, but their ability to support the State's longer-term abatement goals depends on continued public support for emission reductions. In order to achieve this support, AB 32's 2020 level of emissions reductions must be achieved at the lowest possible cost to ratepayers and the California economy as a whole. California has experienced unforeseen circumstances in dynamic, aggressive regulatory changes within the electricity sector and has similarly witnessed an erosion of public support for such regulatory changes as a result of the unanticipated high cost of such changes. Accordingly, SCE fully supports the emission reduction goals of AB 32 and will support the State's implementation of any and all cost containment mechanisms that will support the State achievement of it long-term goals.

Additionally, SCE supports adoption of the most geographically and economically broad GHG-reducing regulatory umbrella possible. Global warming is a global challenge and although California is a large economy, needed reductions cannot be achieved in California alone. Accordingly, linking to other regional, national, or international programs becomes, not only a cost containment mechanism, but also a means to improve the overall environmental worth and integrity of the joint regulatory program.

The most simple and straightforward manner by which California can develop a regulatory link to other regions is to allow unrestricted validated offsets from a broad set of sectors and geographic regions. Doing so will bring cost-effective emissions abatement projects under the umbrella of the California cap-and-trade program, allowing California to promote and recognize real, verifiable, and permanent reductions wherever they may occur.

2. Address how your various recommendations interact with one another and with the overall market and describe what kind of market you envision being created.

Obligated entities are in the best position to choose which available cost containment mechanisms will best serve their customers and most efficiently allow them to achieve the 2020 goals. Many of California's utilities have decades of experience in serving their customers' electricity needs. The set of cost containment mechanisms set out above are designed to empower obligated entities to utilize any number or combination of tools available to facilitate AB 32's 2020 emissions goals at the lowest possible cost.

3. Describe and specify how unique circumstances in the electricity market may warrant any special consideration in crafting flexible compliance policies for a multi-sector cap-and-trade program.

The electricity industry, particularly the IOU sector, is uniquely equipped to represent its customers without undue concern about unwarranted windfall profits being captured by investors. IOU cost containment activities are undertaken completely on behalf of their customers. Cost containment actions undertaken within the IOU sector cannot be utilized to protect shareholder profits, but rather to protect customers' economic interests. Additionally, under the deliverer point of regulation, the electricity sector cannot create economic leakage by moving the production of resources out of state. As a result, the electricity sector is not only fully committed to serving California, but also fully exposed to potentially unforeseen market and regulatory interactions. While SCE suggests that cost containment mechanisms be investigated for all obligated sectors, the regulated structure within which the IOU-sector operates renders cost containment mechanisms of paramount importance.

4. If your recommendations are based on assumptions about the type and scope of a cap-and-trade market that ARB will adopt, provide a description of the anticipated market including sectors included, expected or required emission reductions from the electricity sector, and the role that flexible compliance mechanisms serve in the market, e.g., purely cost containment, catalyst for long-term investment, and/or protection against market failures.

In these comments, SCE presumes that the deliverer point of regulation, as adopted by the CPUC in Decision No. 08-03-018, will be adopted by CARB as it moves forward on designing regulations which implement AB 32 within the electricity sector. Under such a system, SCE supports a broad, economy-wide cap-and-trade approach to implementing AB 32, which also includes the transportation sector. Under a broad, economy-wide cap-and-trade program, the most cost effective emission reduction opportunities will be implemented.

Flexible compliance mechanisms serve all three of the goals identified in this question. Because a cap-and-trade system implemented pursuant to AB 32 would be the first large-scale emissions cap-and-trade system legislated on a state-wide level, SCE remains concerned about the potential for unforeseen interactions between regulatory systems and the electricity market. Due to the nature of the emissions challenge, long-term flexible compliance mechanisms can be implemented without harming the environmental integrity of the regulation. Additionally, the electricity sector is characterized by long-term generation investments. In order to promote continued investment in the electricity sector, it is critical that regulations not needlessly reduce the economic value of current investments. The electricity sector cannot afford for the investment community to receive such a signal. Continued investment in research and development within the electricity sectors depends on the continued existence of a viable market for generation assets. Because there is considerable uncertainty in investments in new technology ventures, investors must be confident that successful research investment will lead to economically valuable productive activity. However, regulation that reduces the economic value

of existing technological investment does not create the confidence needed to promote continued investment in research and development.

5. **To what extent should recommendations to CARB for flexible compliance in the electricity sector depend on the ultimate scope of the multi-sector cap-and trade program and other market design issues such as allocation methodology and sector emission reduction obligations? Can the Commissions make meaningful recommendations on flexibility of market operations when the market itself has not yet been designed? Why or why not?**

The harm-based allocation mechanism suggested above is an important tool for mitigating the economic burden of a cap-and-trade program, while simultaneously maintaining the role of the emissions price. However, the flexible compliance mechanisms outlined above apply to a market regardless of the allocation mechanism. If CARB were to choose to fully auction allowances, without returning all of the allowance proceeds according to a harm-based approach, the cost containment value of these flexible compliance mechanisms will become much more important. Under such an auction regime, ratepayers will be burdened immediately with a large expense related to the introduction of emissions allowances into the market, in addition to the cost of funding real emissions reductions. As a result, flexible compliance mechanisms will occupy an even more important role in the market.

6. To what extent should recommendations to CARB for flexible compliance in the electricity sector depend on the ultimate scope of the multi-sector cap-and-trade program and other market design issues such as allocation methodology and sector emission reduction obligations? Can the Commissions make meaningful recommendations on flexibility of market operations when the market itself has not yet been designed? Why or why not?

A broad cap-and-trade market in emissions will go a long way toward promoting lowest-cost emissions reduction opportunities. By implementing the flexible compliance mechanisms outlined above, California will create a structure for cost containment mechanisms that will protect obligated entities under any market-based regulation. While SCE fully supports a market-based structure, SCE urges the CPUC, CEC, and CARB to consider the use of flexible compliance mechanisms in the event the State decides to implement additional command and control regulations in combination with, or instead of, market-based solutions.

The specific flexible compliance mechanisms that will best supplement command and control options will depend on the specific programmatic regulations implemented and can include emissions offsets, banking and borrowing, or price safety valves. Such mechanisms are commonly used by CARB and other agencies in connection with other types of regulation not related to GHG emissions under the label of alternative compliance mechanisms. SCE encourages the CPUC, CEC, and CARB to fully evaluate all flexible compliance opportunities available under either regulatory structure.

C. SCE's Comments on Price Triggers and Safety Valves

1. Should California incorporate price triggers or other safety valves in a cap-and trade system? Why or why not? Would price triggers or other safety valves affect environmental integrity and/or the ability to link with other systems? Address options including State market intervention to sell or purchase GHG emission allowances to drive allowance prices down or up; a circuit breaker or accelerator which either slows down or speeds up reductions in the emission cap until allowance prices respond; and increasing or decreasing offset limits to increase or decrease liquidity to affect prices. Address how these various strategies would be utilized in conjunction with other flexible compliance mechanisms.

Cost containment mechanisms, such as offsets, should not be subject to an emissions price trigger. A price trigger will unnecessarily complicate the market for allowances and emissions abatement opportunities and will increase the cost of compliance as compared to a structure without price triggers. Consider, for example, an offset project that could provide real, approved emission reductions at $10 per metric ton CO_2e reduced. If California imposes an allowance price restriction, or price trigger, of $25 per metric ton, then emissions reductions from the offset project will not become eligible until the allowance market price reaches $25. This creates a complicated scenario where it may be in the best interest of some obligated entities to drive the market price of allowances up to the trigger price in order to make the $10 offset project eligible for AB 32 compliance.

In addition to providing a potential incentive for market manipulation, a price trigger can also cause real, verifiable, and cost-effective emissions reduction opportunities to be ignored solely because of an arbitrary price trigger. The purpose of cost containment is to allow for the lowest-cost, efficient emissions reduction and compliance opportunities to be utilized. A price trigger thus defeats the purpose of cost containment.

2. Should California create an independent oversight board for the GHG market? If so, what should its role be? Should it intervene in the market to manage the price of carbon? If such an oversight board were created, how would that affect your recommendations, e.g., would the oversight board obviate the need to include additional cost containment mechanisms and price-triggered safety valves in the market design?

There is potential value in a market oversight group, modeled after the Federal Reserve Bank. However, too little is known about the interaction or structure of such a group at this time to adequately consider its regulatory value. Moreover, the legal authority for creating such an oversight group should be considered. Such an institution should not reduce the need for other flexible compliance mechanisms and should serve as a backstop oversight board to ensure the continued viability of the emissions market and protect the economy and regulated sectors against unforeseen circumstances not addressed by the flexible compliance mechanisms. Under a broad, economy-wide cap-and-trade program that includes the programs outlined above, the need for such an institution should be minimal. However, SCE looks forward to continued discussion of this topic.

D. SCE's Comments on Linkage

1. Should California accept all tradable units i.e., GHG emission allowances and offsets, from other carbon trading programs? Such tradable units could include, e.g., Certified Emission Reductions, Clean Development Mechanism ("CDM") credits, and/or Joint Implementation credits.

SCE encourages the CPUC, CEC, and CARB to fully evaluate the potential for trading allowances across programs, as well as authorizing the use of international emission reduction opportunities for purpose of AB 32 compliance. Any efforts to broaden the geographic and economic scope of a cap-and-trade program will reduce the costs of reducing emissions and meeting the State's emission reduction goals.

2. **If so, what effects could such linkage have on allowance prices and other compliance costs of California Obligated entities? Under what conditions could linkage increase or decrease compliance costs of California obligated entities? To what extent would linkage subject the California system to market rules of the other systems? What analysis is needed to ensure that other systems have adequate stringency, monitoring, compliance, and enforcement provisions to warrant linkage? What types of verification or registration should be required?**

By linking to other programs and authorizing the use of allowances and emission reductions from other sectors for AB 32 compliance, California can reduce the cost of compliance with AB 32. Appropriate regulatory and reporting oversight will be required and SCE suggests that the CPUC, CEC, and CARB consider a joint forum for evaluating and identifying appropriate verification or registration processes.

3. **If linkage is allowed, should it be unilateral (where California accepts allowances and other credits from other carbon trading programs, but does not allow its own allowances and offsets to be used by other carbon trading programs) or bilateral (where California accepts allowances and other credits from other carbon trading programs and allows its allowances and offsets to be used by other carbon trading programs)?**

Any allowances used for AB 32 compliance should not be permitted for use in any other GHG compliance program. In order to maintain the integrity of the compliance programs, each allowance must only be counted once, and only once, for purposes of compliance. The environmental integrity of California's GHG cap would be significantly eroded if an allowance for one ton of GHG emissions were retired in multiple compliance programs. Under such a circumstance, the total emissions from the compliance programs in question would increase by one ton for each allowance counted multiple times. However, the means by which California

can prevent other programs from accepting California's allowances for regulatory or voluntary program compliance are not evident.

As part of the AB 32 reporting and compliance regulations, California will need to identify allowances that are used for compliance with other programs, and then preclude such allowances from compliance eligibility within California's AB 32 regulation.

4. If linkage is allowed, should allowances and other credits from other carbon trading programs be treated as offsets, such that any limited applied to offsets would apply to such credits? If not, how should they be treated?

Once emission reductions are identified, verified, and approved, they operate as genuine emissions reductions which can be traded bilaterally as market forces dictate. Under such a structure, no additional special treatment is necessary.

E. SCE's Comments on Compliance Periods

1. What length of compliance periods should be used? Should compliance periods remain the same throughout the 2012 to 2020 period? Should compliance periods be the same for all entities and sectors? Should dates be staggered so that not all obligated entities have the same compliance dates?

The CPUC, CEC, and CARB must consider technical needs when determining the length of any proposed compliance period. In the electricity sector in particular, development of new lower-emission generating assets and creation of emissions-reducing offset projects cannot happen overnight. Additionally, weather variations, both as they affect hydroelectric generation supply as well as energy demand, vary over periods extending many years. Any contemplated compliance period must take into account such technical, regulatory, and engineering restrictions and the manner in which they may limit obligated entities' temporal flexibility.

Additionally, SCE supports the idea of a rolling and flexible compliance period**.** Because of the binding, declining nature of the AB 32 GHG emissions cap, the regulated sectors as a whole will be short allowances. A single compliance period that ends at one date for all

obligated entities may create peaks in allowance prices. By contrast, a rolling compliance period, in which compliance end dates are staggered, will mitigate any tendency for prices to spike at the end of a compliance period. However, due to the regulated nature of the electricity industry, that sector's compliance obligation will be known by entities that may be able to manipulate the market for allowances. SCE therefore suggests that the CPUC, CEC, and CARB consider how a flexible compliance period, in which individual obligated entities have the option to end their current compliance period early, might mitigate any tendency for manipulation of the emissions market.

2. Should compliance extensions be granted? If so, under what circumstances?

Under a system containing flexible compliance tools, such as borrowing of emission allowances, extension of compliance periods will be unnecessary. However, if CARB does not adopt a system that permits allowance borrowing, extended compliance periods could be necessary to protect California's economy against severe burden.

F. SCE's Comments on Banking and Borrowing

1. Should entities with California compliance obligations be allowed to bank any or all tradable units, including allowances, offsets, or credits from other carbon trading programs? Should entities that do not have compliance obligations be able to bank tradable units? If so, for how long and with what other conditions? Should allowances, offsets, or credits from other carbon trading programs banked during the program between 2012 and 2020 be recognized after 2020? If the California system joins a regional, national, or international carbon trading program, how should unused banked allowances, offsets, or credits from other carbon trading programs be treated?

Market-makers could have a valuable place in the allowance market. However, strict oversight of the non-regulated sector will be required in order to protect regulated sectors and

California's economy against potential market manipulation. This function could be undertaken by an Emissions Oversight Board.

2. **Should limitations be placed on banking aimed at preventing or limiting market participants' ability to "board" allowances and offsets or distort market prices?**

An Emissions Oversight Board would be an appropriate mechanism through which to review the banking actions of obligated entities.

3. **Should entities with compliance obligations be allowed to borrow allowances to meet a portion of their obligation? If so, during what compliance periods and for what portions of their obligation? How long should they be given to repay borrowed allowances? Should there be penalties or interest payments? Should there be other conditions on borrowing, such as limitation on the ability to borrow from affiliated entities? Also address the extent to which borrowing might affect environmental integrity and emission reductions?**

Obligated entities should be allowed to manage their compliance across compliance periods in a manner that minimizes the economic impact of such compliance over the long-term, while also allowing California to achieve its emissions reduction goals. Technology and offset projects often require multiple years to come on-line. The ability to borrow will give obligated entities the flexibility needed to meet long-term emissions reduction goals at the lowest possible cost. If properly implemented, a system of allowance borrowing will not affect the environmental integrity of AB 32 compliance. Any allowances borrowed will not be available for allocation in future periods, thus there should be no opportunity to violate the 2020 cap.

Additionally, cost containment mechanisms should be available for use by obligated entities as a way of mitigating compliance costs to their customers and the California economy. Implementing suggestions that penalize the use of cost containment mechanisms, such as an interest rate on borrowing allowances or other monetary penalties for utilizing cost containment

mechanisms, directly contradicts the goal of such mechanisms. For these reasons, SCE encourages the CPUC, CEC, and CARB to evaluate mechanisms that will promote lowest cost of achieving the State's emission reduction goals.

G. SCE's Comments on Penalties and Alternative Compliance

1. Should there be penalties for entities that fail to meet their compliance obligations? If so, how should the penalties be set? If not, what should be the recourse for non-compliance?

The CPUC, CEC, and CARB must look to promote real emissions reductions at the lowest possible cost. However, if insufficient real emissions reductions are reasonably achievable, it would be unfair to penalize obligated entities. Instead, SCE advocates for an alternative compliance payment approach that can serve to provide a relief valve for obligated entities in the situation where not enough real reductions can reasonably be found, recognizing that the alternative in the electricity sector is the inability to serve firm electric load.

2. Instead of penalties, should there be alternative compliance payments? What would be the distinguishing attributes of alternative compliance payments versus penalties? How would the availability of alternative compliance payments affect the environmental integrity of the cap?

Of course, the best possible outcome will occur if real emissions reductions can be implemented. However, given the long-term nature of the program, a situation may arise where no additional, real reductions may reasonably be found. It may be that, due to constraints beyond the obligated entities' control, the industry may be waiting for new technology to be created or other constraints to be lifted. Therefore, SCE supports alternative compliance payments as a last resort of compliance.

3. Would penalties and/or alternative compliance payments allow obligated entities to opt out of the market? Would this add to much uncertainty for other market participants?

A well-designed alternative compliance payment system will assure that any funds collected would advance the goals of AB 32. Therefore, this scenario should not be considered an "opt out" per se, but rather an additional way for the State to satisfy AB 32.

4. How should California use the money that would be generated by penalties and/or alternative compliance payments?

In the event that the State collects alternative compliance payments from obligated entities, this revenue should be used to satisfy the goals of AB 32.

H. SCE's Comments on Offsets

1. Should California allow offsets for AB 32 compliance purposes?

SCE strongly endorses the implementation of a robust offsets program to reduce GHG emissions under AB 32. It is critical to bear in mind that the purpose of achieving GHG reductions is to obtain a beneficial reduction in the risk of global warming. Without substantial reductions in GHG in the rest of the United States and worldwide, and especially in developing countries that are resisting committing to reductions, the Intergovernmental Panel on Climate Change forecast path of significant climate damage is inevitable. Inclusion of a strong offset program under AB 32, without geographic restrictions, gives California the opportunity to:

- Achieve significant cost savings;
- In conjunction with cost savings from offsets, reduce the potential for leakage when enterprises move from within California to areas lacking GHG caps;
- Encourage early reductions in GHG. Early reductions are ton-for-ton more valuable than later reductions, from a global warming perspective; and

- Encourage innovative GHG reduction technology and practices and transfer these to areas of the country and world that have not yet embraced such technology and practices. As other parts of the world receive the benefits of energy efficiency technology, among other things, they will be able to devote greater efforts to adoption of more effective low- or zero-emissions technology without entrenching high-emitting transition technologies.

2. <u>If offsets are permitted, what types of offsets should be allowed? Should California establish geographic limits or preferences on the location of offsets? If so, what should be the nature of those limits or preferences?</u>

California should not establish geographic limits or preferences on the location of offsets. SCE understands the strong temptation to insist that projects be located within California, however, the main arguments put forth for such a restriction (*i.e.*, that such a restriction will yield "green jobs" for the region and provide co-benefits in the form of improvement in air or water quality) are not supportable when viewed in light of all available evidence.

Instead, geographic or quantitative restrictions on offsets are more likely to lead to overall increases in the cost of meeting defined GHG reduction targets and timetables. When such increased costs are taken into account, the economic well-being of the region's citizens suffers and GHG leakage increases. For this reason, all offset projects, whether located within California or not, should be subject to comparable rigorous oversight, validation, verification, and enforcement. Additionally, systems must be implemented to assure that offset projects located outside of California meet the same standards as those projects located within California. Upon implementation of an offset program that states a preference for offsets within the State, but which also allows valid offsets from outside the state, entities will begin to develop their offsets programs.

SCE's experience in crafting a Voluntary Early Action ("VEA") GHG reduction proposal for submission to CARB leads it to conclude that seekers of offsets will look first to reasonable

projects, located nearby, which yield GHG reductions at a reasonable dollar-per-metric-ton reduced cost, as opposed to seeking the absolute lowest-possible-cost project portfolio.

SCE's own VEA portfolio proposal to the CARB follows this course. A majority of the projects in the portfolio are within California, with some out-of-state projects that are of extremely high quality (additional, measurable, and enforceable) and have low costs per ton reduced.

While there is currently no bar to offering offset projects outside California, SCE understands that AB 32 strongly encourages seeking out co-benefits within the State. Accordingly, SCE is committed to responding positively to that preference. But SCE urges the CPUC, CEC, and CARB to resist that temptation to establish upfront restrictions on offsets. Instead, time should be allowed to gain experience by establishing clear validation standards for all offset projects, including out-of-state projects. If, upon experience, applicants for offset validation submit projects that do not respond to the overall intent of AB 32, CARB can then establish carefully considered and informed restrictions.

3. Should voluntary GHG emission reduction projects, i.e., projects that are not developed to comply with governmental mandates, be permitted as offsets if they are within sectors in California that are not within the cap-and-trade program? In particular, should voluntary GHG emission reduction projects within the natural gas sector in California be permitted as offsets, if the natural gas sector is not yet in the cap-and-trade program?

Voluntary GHG emission reduction projects should be permitted as offsets if they are within sectors in California that are not within the cap-and-trade program and if they comport with CARB's adopted voluntary early action policy. However, once offset rules are established in the final implementation rules, any reduction seeking compliance credit should be required to meet the adopted standards. To the extent that the natural gas sector is not included in a cap or subject to command and control regulation, offset projects within that sector should be permitted provided they conform to the implementation rules. As previously mentioned, offsets are a way

to address sectors that are not implicated under eventual AB 32 implementation, as well as a way to address other states and countries that are not subject to GHG emission reduction requirements.

4. Should there be limits to the quantity of offsets? If so, should the limits be determined?

There should be no limit on the quantity of offsets a party can employ. Arbitrarily limiting offsets works against cost-saving and thus limits an obligated entity's financial capacity to invest in the innovative technological changes that will be required to meet the long-term GHG reduction goals necessary to deal effectively with the threat of global warming.

5. How should an offsets program be administered? What should be the project approval and quantification process? What protocols should be used to determine eligibility of proposed offsets? Are existing protocols that have been developed elsewhere acceptable for use in California, or is additional protocol development needed? Should offsets that have been certified by other trading programs be accepted? Should use of the CDM or Joint Implementation credits be allowed?

The offset program should be administered by CARB. The establishment of criteria for the validation of offsets and the administration of such criteria is clearly a governmental function included within AB 32's mandate to CARB. It is an authority that must be exercised by the agency if the offsets are to be used to demonstrate compliance with AB 32's obligations.[6]

The program's administration should also be efficient and transparent. To this end, CARB should focus on developing practical, efficient criteria and processes for validating offsets. A wide array of protocols should be considered for offsets assuming that the protocols

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[6] Cal. Health & Safety Code § 38562(a) ("On or before January 1, 2011, the state board shall adopt greenhouse gas emission limits and emission reduction measures by regulation to achieve the maximum technologically feasible and cost-effective reductions in greenhouse gas emissions in furtherance of achieving the statewide greenhouse gas emission limit, to become operative beginning on January 1, 2012.").

conform to AB 32's requirements. These protocols should include, but not be limited to, those proposed to CARB by the California Climate Action Registry. Offsets from other trading programs should also be considered and then accepted, assuming that they meet AB 32's requirements and conform to the rules adopted by CARB. CDM and Joint Implementation offsets credits should be allowed to demonstrate AB 32 compliance.

6. Should California discount credits (i.e. make the credits worth less than a ton of CO_2e) from some offset projects or other trading programs to account for uncertainty in emission reductions achieved? If so, what types of credits would be discounted? How would the appropriate discount be quantified and accounted for?

Offsets that meet AB 32's requirements should be fully fungible on a one-to-one basis, regardless of where emissions reduction occurs. Any uncertainty in the eventual creation of an offset should be accounted for in the market transaction between the buyer and the seller. In any event, offset credits will need to be verified to assure that they represent actual emissions reductions. Once such verification occurs, the offsets should not run the risk of being discounted and should be fully fungible on a one-to-one basis.

IV.

SCE'S COMMENTS ON TREATMENT OF CHP

A. SCE's Comments on Regulation of CHP GHG Emissions

1. Should GHG emissions from CHP systems be regulated in one sector? If so, which one? How?

GHG emissions from CHP systems should be regulated in the natural gas sector. All GHG emissions from CHP systems are created by combustion of fuel. It is therefore logical to attribute these emissions to the fuel source, which in California is predominately natural gas. One programmatic method to reduce emissions from natural gas is to increase its utilization

efficiency. To the extent CHP can increase the utilization efficiency of natural gas, there should be a mechanism created to award CHP owners with GHG allocations that represent such savings.

One way to create such allocations is to use a "double benchmark" method. For a CHP system that creates two output products, such as heat and electric power, this means that benchmarks for both technology and efficiency are established. The alternative – not enforcing efficiency standards – will be counterproductive to the State's goals. Inefficient CHP will burn natural gas unnecessarily and produce more emissions than if heat and electricity were generated separately. This outcome is not in the State's interest.

SCE recommends a modern high-efficiency boiler with a minimum efficiency of 85% to an efficiency as high as 95% as the benchmark for heat. It recommends a modern high-efficiency Combined Cycle Gas Turbine ("CCGT") with a maximum heat rate of 7,200 BTU per net kWh to a minimum heat rate of 6,826 as the benchmark for electric power. A modern electrically-driven chiller that complies with current CEC-recommended efficiency standards should serve as the benchmark for chilled water production. The natural gas displaced for chilling should assume the CCGT technology supplied the electric power for the displaced chiller.

The allocations awarded to the CHP system for efficiency should be made fungible so they can be traded across sectors and therefore provide an opportunity for cost recovery for the extra expense of CHP systems relative to the separate equipment required to provide CHP system's output products.

2. **For in-state CHP systems, should all of the GHG emissions (i.e., all of the emissions attributed to the electricity generation and to the thermal uses) be regulated as part of the electricity sector? If so, for the electricity that is delivered to the California grid, should the deliverer as defined in D.08-03-018 be the point of regulation? And, what entity(ies) should be the point(s) of regulation for thermal usage and electricity that is not delivered to the California grid if those uses are included in the electricity sector for GHG regulation purposes?**

As noted in the response above, the emissions should be regulated as part of the natural gas sector. However, should SCE's recommendation not be adopted, SCE urges the CPUC and CEC to recommend that CHP system emissions be assigned to the CHP unit as the deliver of multiple products to multiple customers. The division of emissions among the output products of CHP systems should be performed using CARB's "efficiency" and "detailed efficiency" methods. These will need to be reviewed and revised for CHP systems that have multiple output products beyond the current reporting methods that can only divide emissions between heat and electric power.

3. **For out-of-state CHP systems, how should GHG emissions attributed to the electricity delivered to the California grid be regulated? If part of the electricity sector, should the deliverer of the CHP-generated electricity delivered to the California grid be the point regulation? (These questions are based on our view that, for out-of-state CHP systems, only emissions attributed to electricity delivered to California, and not attributed to other electricity or the thermal output, are subject to AB 32.)**

Out-of-state CHP should be regulated within the electricity sector with the emissions divided using CARB's reporting rules.

4. Should CHP units be placed in different sectors based on CHP unit capacity size?

No.

5. Should the type of GHG regulation (i.e., cap and trade or direct regulation) be different for a topping-cycle CHP unit versus a bottoming-cycle unit?

See response to IV.A.1, above.

6. Should the sectors used for GHG regulation be different for topping cycle and bottoming cycle CHP units?

No, both should be in the natural gas sector.

7. Should CHP be part of a cap-and-trade program or not? If so, should the entire unit or certain CHP outputs be part of the cap and trade program?

CHP should be part of a multi-sector cap and trade program. The extra allowances that an efficient CHP could be awarded based on the double benchmark should be fungible. The double benchmark methodology for allowance allocation can be designed to create allowances based upon the total output of products created by the CHP and traded across sectors or if such cross sector trading is not permitted, the difference in actual emissions and the double benchmark's emissions could be divided utilizing CARB's reporting rules.

8. Should electricity delivered to the California grid by a CHP unit be regulated under the deliverer point of regulation established in D.08-03-018? Why or why not?

Regulated at the fuel supply.

9. Should electricity generated by in-state CHP systems for on-site use be subject to the same regulatory treatment as CHP electricity delivered to the California grid? Why or not?

Yes, see answer provided to IV.A.8.

10. If CHP is treated separately from the electricity sector, but is still included as part of a cap-and-trade program, how should allowance allocation to CHP units be handled?

Using the double benchmark as explained above.

11. If allowances are allocated administratively to CHP units, should the allocations take into account increased efficiency of CHP? If so, how?

The fundamental principle that should be applied to allocating allowances to CHP should be the same as SCE described above: allowance allocations should go to those entities that will suffer economic harm as a result of the imposition of GHG reduction regulations. Once the details for addressing CHP have been determined, then an assessment of whether and the degree to which CHP owners may suffer economic harm should determine the degree to which they should receive allowances.

SCE does not agree that CHP is inherently more efficient than the separate generation of electricity and heat. Whether it is or is not depends upon how the CHP unit is operated and to what it is compared. SCE has thousands of unit-years of data to support this conclusion.

All CHP is operated differently. For example, the 2003 Qualifying Facility Efficiency Monitoring ("QFEM") program data for gas-fueled topping-cycle cogeneration facilities has a total efficiency range of 34% to 88%. The simple "average" efficiency is 60%. Within this data set, there are four very large facilities that would dominate the data if one uses an energy weighted calculation to determine the average. Four large facilities are not representative of the 59 facilities in this particular data year.

However, significant fuel savings can be realized if CHP is operated with efficiency as an important aspect of the facility design and operation. For example, the highest efficiency CHP facilities reporting for 2003 were an oil refinery, a swimming pool heater, and two total energy plants. In other reporting years, the exact same swimming pool heater, and total energy plants have been some of the lowest efficiency projects. The difference is entirely due to changes in operation.

In high-efficiency years, these projects are operated to meet the thermal requirements and shut down or throttled back when the thermal need is satisfied. In low-efficiency years, these projects are operated in a baseload fashion and the thermal energy is dumped into a radiator system or vented directly to the atmosphere. These operational choices were entirely rational based on the relative costs of natural gas fuel and purchase of electric power for a particular year. Therefore, it should not be assumed that CHP will be operated to its efficiency potential. It will be operated to obey the rules (such as the Public Utility Regulatory Policies Act ("PURPA")) and to maximize the monetary benefit to the owners.

The "benchmark" to which CHP performance is compared will determine if it is considered to be "efficient." A typical benchmark used within California is a CCGT firing natural gas fuel for electric generation. The range of heat rates for a modern CCGT can vary depending on the vintage of technology and the operational requirements. Baseload high-efficiency units are about 6,826 BTU per kWh and load cycling units are about 7,200. The benchmark in another state might be a pulverized coal-fired steam plant with a heat rate range of about 10,000 BTU per kWh for an older plant and about 8,750 BTU per kWh for a mid-1980's vintage supercritical plant. The typical benchmark used just about everywhere for thermal generation is a boiler; however a boiler's fuel varies.

Within Southern California, the typical modern efficient boiler is optimized to fire only natural gas fuel and therefore has a greater amount of heat recovery than a boiler firing oil or coal. This means the benchmark efficiency for a boiler firing only natural gas should be set at a minimum of 85% and with a condensing unit could achieve 95%.

Outside California, a typical boiler would fire multiple fuels so that it could operate using the least cost fuel. The boiler efficiency for fuels containing more carbon than natural gas typically results in a higher efficiency because less water vapor is formed during combustion. However, the limitations on heat recovery caused by concerns over sulfur acid corrosion tend to make multiple fuel boilers less efficient. The "typical" value used is 80%. Therefore, it is essential to define the specific "benchmarks" to which the efficiency of a CHP facility is being compared.

12. Are there advantages to having all emissions from in-state CHP regulated as part of the electricity sector under cap and trade (and therefore with the need for only a single set of allowances?) How should this be accomplished?

No. CHP creates two or more products and its emissions must be divided among those products. If emissions associated with the products are regulated under different protocols, it will be essential that allowances be fungible so they can be traded across sectors.

13. What is the best approach to regulation of CHP emissions to minimize the potential for disincentivizing new installations of CHP and why is that the best approach?

Efficiently operated CHP has a tremendous economic advantage over separate production of electricity and heat. It does not need any incentives. It should compete along with all other sources of electric power and thermal energy. It is also essential that the thermal customer of the CHP not be subsidized through above-market priced electric power sales mandated by state or federal entities. Electric customers should not be forced to subsidize a few select industrial thermal customers. To the extent that CHP is considered a fuel efficiency measure for reduced natural gas consumption, any incentives should be paid by natural gas customers.

14. Would including all of CHP in cap and trade create a disincentive if natural gas is not regulated under cap and trade?

Yes.

B. SCE's Comments on CHP As An Emission Reduction Measure

1. Should CHP be considered an emission reduction measure under AB 32? Why or why not?

As the Joint CPUC and CEC Staff Paper on GHG Regulation for CHP, issued May 1, 2008 ("CHP Staff Paper") notes, it is possible for efficient CHP to reduce emissions associated with separate production of electricity and heat, however local emissions will increase if the displaced generation was fuel-fired and less efficient. However, today there is no need to fire any fuel to generate electricity on-site. There are GHG generation technologies that can be deployed in a distributed fashion and readily scalable. Southern California is especially blessed with abundant solar energy that is easily converted to either electricity or heat. There are also locations within the state that enjoy geothermal resources. For example, San Bernardino has a geothermal-based district heating and absorption chilling network. There is no reason other communities could not deploy similar technology.

2. Should CARB and/or the Commissions consider policies or programs to encourage installation of CHP for GHG reduction purposes? Why or why not?

See response to IV.A.12.

3. Should CHP have an efficiency threshold in order to qualify as an emission reduction measure? If so, why?

Yes. Efficiency is the key to reduced fuel consumption and therefore reduced emissions. The benchmarks against which the efficiency of CHP is to be compared must be established in an open and transparent proceeding. These benchmarks must represent new modern technology so that any efficiency gains are real from a global perspective. If the total fuel consumption is not reduced, as the CHP Staff Paper points out, the emissions have just been relocated.

4. Which of the proposed methods best achieves the objectives of an efficiency threshold and why is it the best? Is there a superior method not proposed by staff and why is it superior?

As SCE has discussed above, there are many different benchmarks that could be established for both the electric product and thermal product of CHP. SCE recommends a "displacement" double benchmark method. Is the CHP unit more efficient than the "but for" technology?

For thermal energy, the "but for" fuel-fired technology should be a modern high-efficiency natural gas-fired boiler with a minimum efficiency of 85%. However, if the CHP site can support solar or geothermal heat utilization, one could argue that the "but for" technology is essentially GHG free and the CHP must therefore obtain allowances to zero its emissions associated with the thermal product.

For electric energy, the "but for" fuel-fired technology could be a modern CCGT or a different technology depending upon the fuel being fired or the location of the CHP relative to the source it displaces. For example, within California, the likely source would be a baseload CCGT. Within, for example, Wyoming, the displaced technology would be a Power River Basin pulverized coal-fired steam plant. SCE recommends that for benchmark purposes, the benchmark heat rate to which CHP is compared should be established by using a market-based heat rate. A market-based heat rate can be calculated using the weighted average annual statewide price of electricity divided by the weighted average annual statewide price of natural gas. This market based heat rate would be compared to the incremental heat rate or "fuel chargeable to power" (sometimes mistakenly called "net heat rate") of the CHP facility. The GHG emissions allowance attributed to the electric product benchmark would determined by calculating the emissions using the actual fired-fuel emission factor and the actual CHP incremental heat rate, minus emission, calculated using the market heat rate and natural gas emission factors. A market heat rate best reflects the "but for" resource within California, but acknowledges that the marginal unit is normally natural gas-fired.

5. What should the minimum efficiency threshold be (in terms of % savings) to qualify as an emissions reduction measure and why is that the appropriate minimum efficiency threshold?

SCE has advocated an overall efficiency requirement of 80% for CHP in many different state and federal forums. An efficiency requirement of 80% has generally created a fuel savings when compared to separate generation of electricity and heat using natural gas fuel.

6. Should the Commissions pursue policy or programmatic measures to overcome some of the barriers to CHP deployment?

See response to IV.A.12. The major barrier to increased deployment of CHP is the general lack of any requirements for users of thermal energy to make a showing that their technology choice for supply of that energy is more efficient than CHP or that a process efficiency improvement may reduce the need for any thermal energy. The electric interconnection process is not a barrier to CHP. The interconnection process for generators is very neutral and strictly controlled by Federal Energy Regulatory Commission ("FERC") guidelines. To the extent that any requirements are imposed on generators, they are non-discriminatory; every generator must comply with the requirements.

A more common barrier is that created by the multiple and overlapping permitting processes within the state of California. Any streamlining of these processes would be beneficial to all electricity generation and one technology should not be favored over another. SCE currently has several pathways along which various sizes of renewable CHP can obtain interconnection and power purchase agreements. SCE does not think adding another program would be beneficial. SCE also has several pathways along which various sizes of non-renewable fueled CHP can obtain interconnection and power purchase agreements. SCE does not think adding another program, especially one for fossil-fueled resources, would further the State's GHG goals. A lack of power purchase agreements is driven more by CHP economics and the need for thermal energy, than by a lack of electricity buyers.

V.

NON-MARKET BASED EMISSION REDUCTION MEASURES (OTHER THAN CHP) AND EMISSION CAPS

A. SCE's Comments on Electricity Emission Reduction Measures

1. What direct programmatic or regulatory emission reduction measures, in addition to current mandates in the areas of energy efficiency and renewables, should be included for the electricity and natural gas sectors in CARB's AB 32 scoping plan?

If a broad-based cap-and-trade mechanism is implemented, additional EE or renewable mandates will be unnecessary. As noted earlier in this document, under deliverer-based regulations, the higher market price for electricity will provide greater incentives for EE and renewable energy development. Accordingly, SCE encourages the CPUC, CEC, and CARB to implement a broad-based cap-and-trade system.

2. Are there additional regulations that CARB should promulgate in the context of implementing AB 32, that would assist or augment existing programs and policies for emission reduction measures in the electricity and natural gas sectors?

As stated above, a broad-based cap-and-trade approach, which includes the natural gas sector, will create an optimal level of incentives for additional investment in low-emission technology. Additional programmatic regulations are unnecessary in the presence of a broad-based cap-and-trade approach.

3. What percentage of emission reductions in the electricity sector should come from programmatic or regulatory measures, and what percentage should be derived from market-based measures or mechanisms? What criteria should be used to determine the portion from each approach? By what approach and in what timeframe should this question be resolved?

Under a broad-based cap-and-trade approach, which is applied economy-wide within California, efficient levels of emission reductions will be created at the sector level. For this reason, the CPUC, CEC, and CARB should avoid specifically apportioning programmatic measures and results driven by a market-based approach. In order to reach AB 32's goals, a broad-based, economy-wide cap-and-trade approach will to allow California to achieve its emission reductions goals in an optimal manner.

B. SCE's Comments on Natural Gas Emission Reduction Measures

1. What direct programmatic or regulatory emission reduction measures, in addition to current mandates in the areas of energy efficiency and renewables, should be included for the electricity and natural gas sectors in CARB's AB 32 scoping plan?

As discussed above, a broad-based cap-and-trade system, which includes the natural gas sector, will create the optimal level of incentives for additional investment in low emitting technology and eliminate the need for additional programmatic measures. If, however, the natural gas sector were not included in the cap-and-trade system, solar water heating to displace natural gas-fueled heating should be encouraged. Solar space heating should be encouraged.

A renewable fuel standard should also be considered for the natural gas sector. Why must electricity customers be the only beneficiaries of renewable energy? Direct replacement of natural gas with substitute natural gas ("SNG") created by increased use of biogas that has been processed to meet pipeline requirements would recycle the carbon dioxide in the environment. Another major source of SNG could be the gasification and processing to pipeline quality of

post-recycled municipal solid waste (waste that is leftover after recyclable materials have been removed). This would recycle carbon from the manufactured and discarded materials that are currently entombed within landfills in California by displacing the natural gas that is used to create the products. The other economic benefit of SNG is that is recycles the very significant existing natural gas infrastructures that exists within California and the Western Interconnection. As larger numbers of older high heat rate natural gas fired plants are retired and replaced by modern high efficiency CCGT plants, this SNG can be converted into electricity at a significantly higher average efficiency than the typical landfill gas or digester gas-fired internal combustion engine, gas turbine or small Rankin cycle steam plant.

VI.

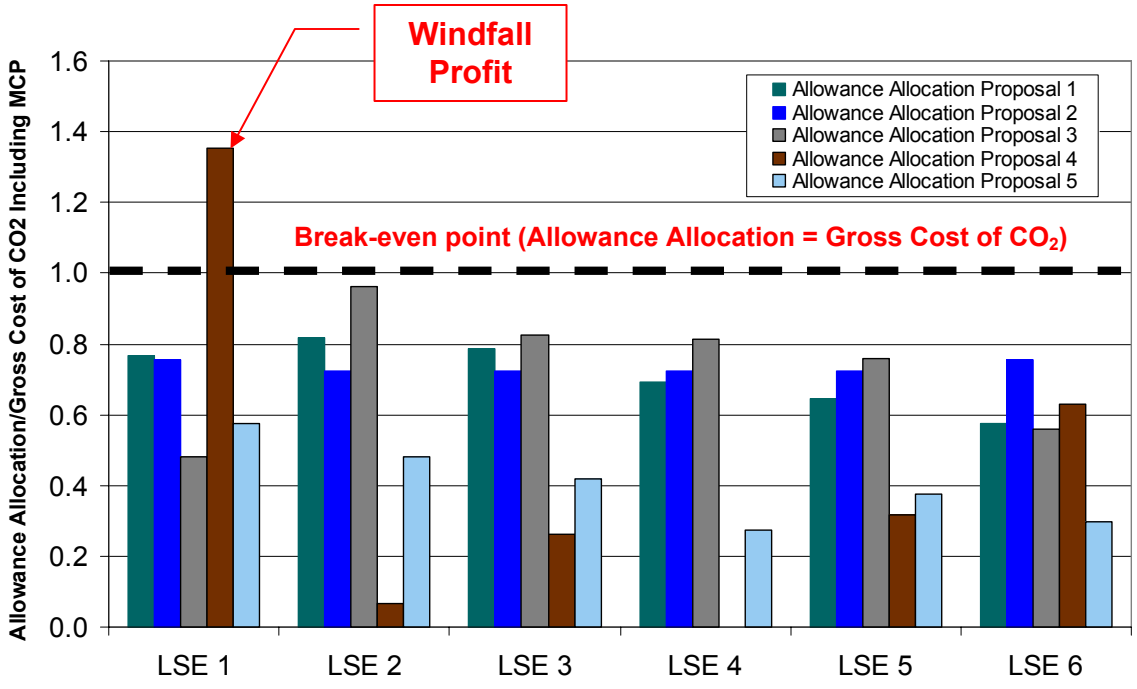
SCE'S COMMENTS ON E3 MODELLING

A. Address the performance and usefulness of the E3 model. Is it sufficiently reliable to be useful as the Commissions develop recommendations to ARB? How could it be improved?

E3 should add the following graph to its report so that users can compare various allowance allocation proposals side by side. This graph also helps to normalize the impact of allowance allocation for LSEs of different sizes. This graph allows users to evaluate the relative equity of various proposals by comparing the impacts to individual LSEs. For example, in the graph below, Allowance Allocation Proposal 2 appears to allocate allowances evenly to all six LSEs, and would be considered a more equitable proposal relative to the other four proposals. Allowance Allocation Proposal 4, however, overallocates allowances to LSE 1 at the expense of LSE 4, creating windfall profits.

The graph below is a variation of the existing graph titled "Net cost of CO2 by LSE Including Increase in Market Price" on the Tab titled "CO2Market." However, instead of calculating net cost by taking the difference between allowance allocation and gross cost of CO_2

for each entity, SCE proposes calculating the net cost by looking at the ratio between allowance allocation and the gross cost of CO_2.



B. Address the validity of the input assumptions in E3's reference case and the other cases for which E3 has presented model results. If you disagree with the input assumptions used by E3, provide your recommended input assumptions.

1. SCE's Comments on EE Inputs

a) The EE Estimates Used in Phase 2 Represent an Improvement Over Phase 1 Estimates

Phase 2 of E3's GHG modeling uses data developed in Itron Inc.'s report to the Energy Division, Assistance in Updating the Energy Efficiency Savings Goals for 2012 and Beyond.[7] This update required significant effort by the Energy Division and Itron and represents the most effective attempt, to date, to thoroughly and rigorously quantify EE potential and translate the

[7] Assistance in Updating the Energy Efficiency Savings Goals for 2012 and Beyond, Itron, Inc., March 24, 2008.

estimates of potential into meaningful goals. The scenario results developed in the Itron Goals Report represent a significant improvement in analytical rigor over the EE input values used in the Phase 1 GHG modeling which were based on 75% and 100% of economic potential. Analyses performed by Michael Rufo of Itron related to AB 2021 showed that achievement of energy efficiency goals approaching 80% or above of economic potential are highly unlikely, even under mandatory codes and standards.[8] The Itron EE estimates used in the Phase 2 modeling reflect EE savings achievable through all reasonably measurable delivery channels, and represent EE levels that are more likely to be achievable for GHG reduction than those used in the Phase 1 modeling.

b) The Full Market Potential Scenario Underlying the Itron's Mid and High Cases is Not Supported by Real World Experience

While the EE estimates used in E3's Phase 2 modeling are more realistically attainable than those used in Phase 1, SCE has concerns about the assumptions underlying the Mid- and High-cases contained in Itron's Goals Report. Both of these cases assume an estimate of EE potential achievable through the use of incentive programs based on 100% of incremental measure cost.

However, the Itron report acknowledges that there are limited empirical data on the effectiveness of using full incremental measure cost rebates outside of a few measures and segments. Further, the report states that no utility has ever maintained an entire portfolio of 100% incentive direct install type programs in the past, let alone over 12 years. The Itron report suggests that it may be possible to achieve adoption levels similar to the full incentive scenario through a combination of highly effective future program efforts that do not necessarily use incentives set at full incremental cost, but it provides no examples of these programs.[9] Rather

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[8] Comments on CEC Draft Goals: Statewide Energy Efficiency Potential Estimates and Targets for California Utilities, Michael W. Rufo, dated September 14, 2007. It should be noted that Rufo's comments represented his personal opinions and not those of his employer or clients.

[9] Assistance in Updating the Energy Efficiency Savings Goals for 2012 and Beyond, Itron, Inc., March 24, 2008, at 43.

than moving immediately to goals based on a largely untested approach, SCE urges the CPUC and CEC to recommend that California gain additional real world experience during the 2009-2011 program cycle, thus testing a limited number of programs based on 100% incentive levels. Until the 100% incentive approach is proven, E3's modeling should use Itron's estimates of EE potential based current incentive levels.

c) Additional Documentation is Needed Regarding E3's Use of Itron's Estimates of EE Potential

SCE attempted to compare the EE inputs used in E3's Phase 2 calculator to those in the Itron Goals Report. While some of the values match exactly (*e.g.*, the values for the Huffman Bill and Codes & Standards), others are different and no documentation is provided to explain the discrepancies (*e.g.*, Utility Programs and Big Bold Energy Efficiency Strategies ("BBEES") Initiatives). Before SCE can comment on the model inputs in detail, more complete documentation regarding EE input values is needed.

2. Demand Response Levels Should be Those Included in SCE's Adopted Long-Term Procurement Plan

The E3 GHG model currently assumes demand response ("DR") programs will reduce five percent of system peak demand. SCE expects that this level of demand reduction will ultimately be achievable as SCE's Advanced Metering Infrastructure, EdisonSmartConnect™, is deployed. However, deployment of EdisonSmartConnect™ will not begin until 2008, and will not be completed until 2012. Accordingly, SCE recommends that the DR levels used in E3's GHG modeling should be the values included in SCE's 2006 Long-Term Procurement Plan ("LTPP") and approved in Decision No. 07-12-052 which the CPUC found to be acceptable estimates of firm DR reductions.[10]

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[10] D.07-12-052 at 63.

3. E3's RPS Modeling Should Account for Solar Photovoltaic Technology

Under the "RPS Supply" and "Gen Cost" tabs contained in E3's GHG model, SCE recommends that another category be added to include Solar Photovoltaic ("Solar PV") technology. Currently, only Solar Thermal technology is represented in the model. Solar Thermal and Solar PV are different types of solar technologies and Solar PV should be reflected separately in terms of both cost and performance. Solar PV should not be limited in the model to Senate Bill 1 under the California Solar Initiative, as such a scenario would only reflect the technology at the small-scale, distributed-generation level. Solar PV should be recognized on a generation scale.

Overall, as noted in SCE's Stage 1 comments, the information regarding renewable portfolio standards in various areas in the Western Electricity Coordinating Council ("WECC") is accurate and the assumptions made are reasonable. SCE again suggests that E3 consider some discount to the 20% and 33% by 2020 assumptions as municipal utilities are not regulated by the CPUC and therefore may not reach the goals projected by the calculator.[11]

4. E3's CHP Assumptions Should Be Revised to Reflect the Rules Under Which CHP Operates

SCE recommends that assumptions concerning the operating characteristics of the existing and future CHP facilities be revised to reflect the rules under which CHP operates within California and outside California. Within California, there are many rules that govern the operation of CHP. These rules address, among other things, the required minimum amount of useful thermal output and required, but outdated, minimum FERC efficiency. The most commonly applied rules are those created by the FERC to implement PURPA back in 1978.[12]

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[11] SCE also notes that 33% renewables by 2020 is not required under current law.
[12] These will be referred to as Qualifying Facility Rules ("QF Rules") hereafter.

Another set of rules were created specifically to define cogeneration within California under California Public Utilities Code Section 216.6.[13]

QF Rules apply to CHP facilities that export electricity to the grid. CC Rules generally apply to CHP installed under the state's Self Generation Incentive Program ("SGIP"). SGIP-funded CHP is not allowed to export electricity. There are also many CHP facilities that operate under QF Rules, but choose not to export electricity. The assumptions used by E3 for existing CHP under a PURPA contract should be changed to reflect a topping cycle cogeneration facility that obeys the QF Rules. The assumptions used for existing CHP installed under the SGIP should assume compliance with the CC Rules, although many SGIP Impact Studies have found that most CHP facilities actually do not comply. This nuance need not be included in the model. These operating characteristic changes are necessary to make the model reflect that most installed CHP operates no better than what is required by applicable rules. Table 1, below, summarizes the characteristics required by applicable rules.

SCE's conservative recommendation is based upon thousands of unit-years of operating and efficiency data collected under the QFEM program. This program has collected data on SCE's PURPA contracts since 1988. In the alternative, the model can be altered to reflect "average" characteristics as illustrated by the table entries for 2003 Average Qualifying Facility or SGIP 5 Year. However, it has been SCE's observation that CHP units many times operate to the minimum, outdated FERC requirements.

Model assumptions for future CHP should also be revised to reflect the most likely rules that will apply to new CHP. New CHP within California will likely operate to different rules that depend upon the size of the facility. CHP of 20 MW or less will operate to the parameters laid out in AB 1613. CHP will comply with the minimum 60% total efficiency requirement of AB 1613 and have a minimum electrical efficiency of 40%.

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[13] These will be referred to as California Cogeneration Rules ("CC Rules") hereafter.

Another issue to consider is the size of break points contained in the model. Currently there is one break point, set at 5 MW. The actual development cycles of CHP tend to follow break points that depend on incentive programs and permitting. SCE recommends the use of two main size ranges. The first size range is for small CHP built to the SGIP limit of 5 MW. The second size range would be 5 to 20 MW based on CHP that complies with AB 1613.

Table 1 below illustrates SCE's recommended characteristics for GHG modeling purposes and also includes the current E3 model and the CAC/EPUC values with all compared using a common method.

Table 1
SCE Recommended Characteristics of CHP For Model Purposes Versus E3 Model And CAC/EPUC Filed Comments

Rule or Model	Fuel Units	Electricity Units	Heat Units	% Output as Heat	Heat Rate BTU/kW	Total Efficiency*	FERC Efficiency**
Existing CHP Characteristics if Operating to Minimum Rules							
QF 5%	100	39.5	2.1	5.0	8,649	41.5	45.0
QF 15%	100	35.1	6.2	15.0	9,710	41.4	42.5
CA Cogen	100	37.3	2.0	5.0	9,158	39.2	42.5
Average Characteristics from Operating Data							
2003 Ave QF	100	25.5	34.9	57.8	13,384	60.4	47.7
SGIP 5 Year	100	24.9	20.4	45.0	13,702	51.0	39.0
Future CHP Characteristics for California to 20 MW							
AB 1613 + 75/25 + New QF 50/50	100	40.0	20.0	33.3	8,533	60.0	55.6
E3 Model Assumptions							
E3 < 5 MW	100	39.0	36.5	48.4	8,750	75.6	63.6
E3 > 5 MW	100	38.5	34.1	46.9	8,865	72.6	61.7
CAC/EPUC Values							

Small ICE	100	39.2	35.8	47.7	8,707	75.0	63.4
Gas Turbine	100	36.5	37.1	50.4	9,351	73.6	61.2
CCGT w/ Extraction for Steam	100	39.2	35.5	47.5	8,707	74.7	63.3
Note: *Due to rounding errors, not all values perfectly sum. **All values are HHV basis except for FERC efficiency that uses LHV.							

Finally, SCE strongly recommends the model utilize CARB reporting rules to determine the division of CHP emissions between the electricity and heat output products. By applying CARB's reporting rules for CHP and above, it will be possible to define GHG emissions of CHP for modeling purposes.

VII.

SCE'S MODELING WORKSHOP COMMENTS

A. Energy Efficiency

As described in Section VI, the EE values proposed for use in Phase 2 of the GHG modeling are more realistically achievable than the EE levels used in Phase 1. However, SCE has concerns about EE levels used in E3's Mid and High Cases because these cases assume utility incentive programs based on 100% of incremental cost, an approach that has never been used on a comprehensive basis in the real world. Use of a scenario based on current incentive levels would be a more realistic assumption until the efficacy of the 100% can be demonstrated based on empirical results.

B. Demand Response

As stated in Section VI, a demand response level based on five percent of system peak that is assumed in Phase 2 modeling is not realistically achievable until Advanced Metering Infrastructure is deployed. During the AMI deployment process, the GHG modeling should be based on the demand response levels included in the IOUs' 2006 LTPPs and approved in D.07-12-052.

VIII.

CONCLUSION

SCE thanks the CPUC and CEC for their diligent efforts in attempting to address the various issues raised by AB 32 implementation. SCE urges both Commissions to recommend regulations which are in line with the principles SCE set forth herein.

Respectfully submitted,

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June 2, 2008

CERTIFICATE OF SERVICE

I hereby certify that, pursuant to the Commission's Rules of Practice and Procedure, I have this day served a true copy of COMMENTS OF SOUTHERN CALIFORNIA EDISON COMPANY (U 338-E) ON ADMINISTRATIVE LAW JUDGES' RULING UPDATING PROCEEDING AND REQUESTING COMMENTS ON EMISSION ALLOWANCE POLICIES AND OTHER ISSUES on all parties identified on the attached service list(s). Service was effected by one or more means indicated below:

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Executed this **2nd day of June 2008**, at Rosemead, California.

/s/ Raquel Ippoliti
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