SMUD™

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Re: Sacramento Municipal Utility District's Comments on 2013 Update to AB 32 Scoping Plan

SMUD appreciates the opportunity to comment on the 2013 Update to the AB 32 Scoping Plan (2013 Scoping Plan). SMUD understands that AB 32 requires the Air Resources Board (ARB) to prepare a Scoping Plan to achieve the carbon reduction goals of the legislation, and that ARB is required to update that Scoping Plan every five years. This is the first Scoping Plan update since AB 32 was enacted, and the first since the initial implementation of many measures/regulations pursuant to AB 32, including the groundbreaking market-based Cap-and-Trade Program.

SMUD supports the proposed elements of the 2013 Scoping Plan, as presented in the initial "kickoff" workshop on June 13, 2013. SMUD agrees that the Scoping Plan should include a climate science update, a description of progress toward the 2020 goal established by AB 32, and discussion of potential near-term measures to achieve that 2020 goal.

SMUD also supports an examination of Post-2020 goals and potential policies as part of the 2013 Scoping Plan. SMUD recognizes the imperative of reducing greenhouse gas emissions substantially over time. As a customer-owned utility, SMUD has a responsibility to protect our customers' long-term interests by avoiding their financial and physical exposure to climate change, as well as their short-term interests of ensuring delivery of affordable, reliable and clean electricity. To this end, the SMUD Board of Directors has adopted a 2050 goal for carbon emissions associated with serving our customer-owners with retail electric power service that aims to reduce these emissions to 10% of 1990 levels by 2050. This goal is consistent with Executive Order S-3-05 issued by Governor Arnold Schwarzenegger in 2005.

SMUD was pleased to see the degree of collaboration shown in the initial "kickoff" 2013 Scoping Plan workshop. We welcome the participation of representatives from the California Energy Commission, the California Department of Food and Agriculture, the State Water Resources Control Board, and CalRecycle. SMUD believes that this collaboration should be transparent and should be directed toward a comprehensive

assessment of AB 32 goals and flexibility as a standard component of potential policies. SMUD contends that the main purpose of AB 32 and Post-2020 goals is greenhouse gas reductions, and that this purpose is best served by simply making this overriding goal clear and allowing for flexibility among the affected stakeholders and market sectors to achieve this goal cost-effectively, as directed by the Legislature in AB 32. (Health & Saf. Code, § 38560.)

As the 2013 Scoping Plan is developed, care should be taken that the identified focus areas and agencies in charge of these areas continue to collaborate, rather than separating into separate branches of policy assessment and development. Understanding of the interactions among proposed policies in different areas and the relative costs and benefits across these areas must be kept in the picture.

In addition, it is essential that ARB update the Scoping Plan to create strategies encourage the federal government and other states to act to effectively to reduce GHG emissions. (Health & Saf. Code, § 38501(d).) The statewide collaboration illustrated in the kickoff workshop, as well as the forthcoming Cap-and-Trade linkage with the Canadian province of Quebec, should be the foundation for broadening GHG reduction efforts to other geographic and political entities as much as feasible. For example, the ARB and other California agencies should work to collaborate on such issues as: 1) Environmental Protection Agency (EPA) adoption of GHG control measures for new and existing sources (while preserving flexibility for California's current GHG-reducing measures), 2) EPA and Department of Energy (DOE) adoption of updated efficiency standards and voluntary protocols for energy-using appliances, and 3) electrification of transportation, especially, and other distributed fuel electrification as the nation's electricity grid is more and more de-carbonized.

Collaboration should not stop, however, at the United States border. SMUD believes that it is essential that ARB remain involved in international climate forums, and in particular engender greater international efforts by analyzing and including protocols to reduce emissions elsewhere, such as expanding offset protocols to larger geographic venues and adopting protocols that interact internationally, as with REDD+ offsets.

As the ARB inaugurates its 2013 Scoping Plan Update, SMUD recommends including analysis and recommendations in the following areas, elements, and measures.

I. The 2013 Scoping Plan Should Update Analysis Of The Impacts Of Current Adopted Measures, And Revised Economic Conditions.

The ARB should update estimates of the impacts of currently adopted measures, and include the latest emission inventory data. Also, California has, along with the rest of the country and the world, moved through a dramatic economic downturn since the original Scoping Plan. The ARB should provide stakeholders a clear and complete breakdown of how altered economic conditions have affected measure impacts and the additional

emission reductions that are needed to meet the AB 32 2020 target, as well as Post-2020 goals and efforts.

SMUD notes that the electric power sector shows a slight increase in percentage of GHG in California in the charts presented at the June 13th kickoff meeting, from 19% in 2011 to 20% in 2020. Given the strong policies in the electric power sector, including energy efficiency programs, standards, and targets, the million solar roofs initiative enacted by SB 1, the 33% Renewables Portfolio Standard enacted by SB2X 1, and California's Emission Performance Standard for new power plants enacted by SB 1368, SMUD believes that electric power sector's percentage contribution to overall GHG emissions in the state should be decreasing through 2020, at least in the absence of significant electrification. The ARB should revisit this estimate and provide a revised estimate or an explanation as to why the electric sector percentage contribution is expected to increase.

II. For The Electric Sector, The 2013 Scoping Plan Should Consider Flexibility And Understanding Of Current State Policies When Considering New Measures Or Targets.

Achieving SMUD's 2050 GHG goal will require additional investment in and development of low-carbon resources, including energy efficiency and renewable or other low-carbon generation sources beyond the 2020 33% renewables portfolio standard (RPS) level. At this time, however, SMUD believes that it is unclear whether there should be an intermediate target or RPS mandate, or how such a target should be implemented, as there are many questions and ongoing research regarding how renewables and other policies interact within the current electricity structure.

The significant changes currently occurring in the electricity system, largely driven by state policies but also by technological advancement, have been manageable but have raised some questions about how future state policies may be managed. The electricity sector is bound to a fundamental principle – physics. Electricity is not just a service provided via a market structure, but involves physical constraints and requirements that must be considered as the system undergoes these significant changes. Important questions need to be addressed about how resources such as wind and solar provide power to the grid differently from the perspective of basic physics than traditional steam or gas turbine generators – inertia and electromagnetic field flow issues with these new resources must be better understood with large scale development.

SMUD believes there is a need for a pause in new mandates or incentive programs in the short term, as the interactions among current policies are explored, and important questions are researched and answered. Much of this work is ongoing, but is not at the point where conclusions are available to point clearly to higher, short-term goals. Among some of the longer term policy questions to be examined are:

- How can demand response resources be best developed to contribute to the fast regulation services and other system changes needed for intermittent renewable development in large scale? How much potential for this is available, and how cost-effective is it? How can demand-side stakeholders – customers in particular – be best induced to contribute to this effort?

- How can storage resources be best developed to contribute meaningfully to the fast regulation services and other system changes needed for intermittent renewable development in large scale? Where are storage resources best developed in the grid – centrally, or distributed? What storage technologies are available and cost-effective? How are storage costs changing over time?

- How can new, flexible, thermal engines, turbines, boilers, and combined cycles be best developed to contribute to the fast regulation services and other system changes needed for intermittent renewable development in large scale? What capabilities do the existing fleet of such resources have for this purpose? How can these resources be developed or run with renewable fuels to best reduce GHG emissions?

- How can the state's goals for electric vehicles be best developed to contribute to the fast regulation services and other system changes needed for intermittent renewable development in large scale? How can energy efficiency contribute to this goal? When should EVs be available for optimal assistance to the grid and integration efforts?

- How can energy efficiency, peak shifting efforts, and potential general electrification efforts (for GHG reduction) be targeted to alter the shape of load to affect the need for these services? How will achievement of these goals affect post-2020 load growth?

- With the dramatic potential for distributed generation and significant reduction in solar costs, how can the grid be planned and developed to accommodate two-way flows of field, and to take advantage of the potential benefits of these resources? How are Smart Grid investments best targeted to assist in a transition to an electricity grid different than that built in the absence of these technologies? How are customers increasingly investing in their own part of the electricity grid be best included in a coordinated effort to keep the system robust and reliable?

III. The 2013 Scoping Plan Should Consider How The Cap And Trade Program May Continue After 2020, And How Current Cap And Trade Procedures Will Be Altered For That Period.

At the June 13th kickoff workshop, ARB staff stated for the first time that ARB envisions Cap-and-Trade continuing beyond 2020. It is unclear to SMUD how this can happen without legislative input, as ARB acknowledged, indicating that the intent was to develop a "game plan" for getting back to the legislature for post-2020 efforts.

If Cap-and-Trade is extended beyond 2020, SMUD contends that the current policy of administrative allocation of allowances to electric distribution utilities should also continue. SMUD does not believe that the rationale for this administrative allocation will disappear, as there will still be in place at least a 33% RPS and presumably significant energy efficiency efforts after 2020, continuing to send a price signal to electricity customers associated with measures that are intended to reduce GHG from the sector.

However, as SMUD has noted in previous comments, the current methodology for allocating administrative allowances will be difficult to continue beyond 2020. This methodology is dependent upon historical resource plan filings at the CEC of the electrical distribution utilities in California. This methodology worked well once, when none of the electrical distribution utilities knew that their resource plans would be a basis for the administrative provision of the asset of AB 32 allowances. Even then, several electric distribution utilities petitioned to update their plans, after realizing that their allowance allocations would be dependent on these filings. If electrical distribution utilities suspect that continued administrative allocations will be based on future resource plan filings, say in 2018, then there will be an incentive to craft resource plans with higher GHG resources than might otherwise be included, in order to receive a greater share of allowances.

SMUD believes that the ARB should signal that this incentive will not be contemplated post-2020. By that year, the differences among the relative GHG footprints of the various electrical distribution utilities will be significantly narrowed, by the 33% RPS, movement away from coal-fired power contracts, and retirement of older, inefficient natural gas facilities. Hence, SMUD suggests that the ARB signal a movement toward a "sales-based" allowance allocation methodology, which rewards and incentivizes those electrical distribution utilities that achieve the most success in reducing their GHG emissions per unit of electricity sold. The ARB has substantially adopted a similar methodology for most industries in the state, and should signal that it intends to move in that direction for the electric power sector.

IV. The 2013 Scoping Plan Should Consider How Electrification Of Energy Uses Currently Served By Distributed Combustion Of Fossil Fuels Can Contribute To 2020 and Post 2020 Goals.

SMUD is a strong supporter of electric vehicles and other transportation sector electrification as a powerful tool to reduce GHG emissions in the state, along with criteria pollutants that derive from the state's current mix of mobile emission sources. Current evaluations of the 2050 goal established by Governor Schwarzenegger suggest that achieving that goal may require not just substantial electrification of the transportation sector, but also electrification of most other distributed fossil fuel use, while continuing to de-carbonize the electric power sector. Specifically, the California Council on Science and Technology (CCST) found in their California's Energy Future study, published in 2011, that approximately 70% of natural gas space and water heating in buildings would need to shift to electricity to meet the long-term goals. Such a transition of building infrastructure and appliances will take time, as well as changes in state building code policy and carbon policies to recognize and encourage activities that help enable this long-term market transformation. Given the findings of the detailed CCST study, as well as a similar study by E3, SMUD believes that electrification should receive greater attention than it received at the June 13th kickoff workshop.

SMUD has been exploring some initial steps for electrification of our customers' fossil fuel use, where cost-effectiveness is becoming favorable due to technology enhancements. SMUD suggests that the 2013 Scoping Plan also examine where electrification may make sense as a GHG emission reduction measure, beyond the transportation sector.

In the near term, SMUD believes that the most potential for emission reductions from electrification is in the growing electric transportation sector. However, state policy must provide regulatory certainty to get automakers, utilities, and other stakeholders to invest in these emission reductions over time. Should electric vehicle incentive programs be stopped too soon, or be implemented in a manner where consumer incentives are uncertain from day to day, automakers and consumers will be significantly less committed to the nascent market. In addition, since utilities will see an increased carbon burden from electrification, that will clearly be more than offset by carbon reductions in the transportation fuel and distributed fuel sectors, ARB must find a way to administratively provide allowances to electric distribution utilities to cover this policy-driven, GHG-reducing, load growth.

V. The 2013 Scoping Plan Should Include Preliminary Analysis Of How A Smart Electricity Grid, Including Demand Response Measures, Can Contribute To 2020 and Post 2020 Goals.

At the June 13th kickoff workshop, demand response (DR) in the electricity sector was described under a slide referring to "challenges" with respect to electricity load reduction.

SMUD believes that demand response has a much broader role than "load reduction," and that there will be some but not highly significant load reductions associated with demand response.

First, the demand response being explored today at SMUD and elsewhere is focused more and more on ancillary grid services and renewable integration services rather than load reduction or even peak load contributions. Originally, demand response was investigated and implemented as another resource for meeting system peak demand on hot summer afternoons, with programs that reduced customer load when triggered by signals from system operators. Today, demand response value is not only being examined in that instance, but also for providing ancillary services such as regulation, ramping, and intermittent renewable integration.

Second, as demand response primarily moves customer load from one hour or minute to another, it is not primarily focused on "load reduction" in the same manner as energy efficiency programs. There will be some energy savings, through better matching of customer needs and system deliveries, enabled by the smart grid and demand response programs, such as savings from conservation voltage reduction programs. Providing customers with better information about their energy usage and enabling time of use rate structures will also tend to reduce energy usage overall, in addition to those times when system peak demands are high.

SMUD has made substantial progress in transforming the electricity grid in our service territory to a "smart grid", with automated metering infrastructure, distribution circuit automation, and back office systems to make use of substantially increased information about how the grid is operating on a minute to minute basis. SMUD is piloting demand response programs and time-differentiated rate structures aimed at learning the potential for these types of resources to provide critical services to meet minute to minute system needs and help to increase the efficiency of the system overall, thereby reducing GHG emissions.

The June 13th kickoff workshop presentation discussed moving away from natural gas power plants as a mechanism for integrating intermittent renewable generation. SMUD believes that demand response will eventually be a logical and potentially prominent substitute for construction of new natural gas power plants to provide integration services. Hence, SMUD encourages addressing the potential contributions of demand response and smart grid infrastructure toward GHG reduction goals in the 2013 Scoping Plan.

At the June 13th kickoff workshop, the presentation for the transportation sector mentioned the potential for the growing number of electric vehicles and other electric transportation sources to provide vehicle to grid services – in effect demand response. SMUD agrees that there is long-run potential in this area that should be explored. A few pilot projects to learn about this potential have begun around the country. There are also vehicle-to-home and vehicle-to-workplace potential benefits, and these latter may end up

being pursued and realized before vehicle-to-grid structures, laying the groundwork for the broader services. It should be clear, however, that a significant demand response contribution from electric transportation requires a significant penetration of electric vehicles. Again, for the promise of demand response from electric transportation to be realized in the long run, the state must provide the regulatory certainty needed at this stage in the market to foster growth through demand from consumers and clear policy to address the GHG impacts on fuel providers.

VI. The 2013 Scoping Plan Should Develop A Collaborative, Statewide Understanding Of The Benefits Of Bioenergy – Particularly Biomethane Sources.

The June 2013 kickoff workshop presentation stated that there were challenges to be addressed with respect to development of bioenergy resources. SMUD agrees that there are challenges in this area, both short term and long term. In the short run, challenges related to development of in-state bioenergy resources are in part being addressed by regulatory efforts pursuant to AB 1900. Further development and use of out-of-state bioenergy resources, however, has been effectively constrained by enactment of AB 2196. In the long run, research into the development of more biologically derived fuels and artificial photosynthesis may provide alternative pathways for those aspects of our societal energy use that cannot be easily or cost-effectively electrified.

SMUD believes that bioenergy resources are essential in the long run to achieve the state's GHG reduction goals, and so agrees with and urges ARB focus on the potential contributions of bioenergy in the 2013 Scoping Plan. For example, biomethane put into the existing pipeline infrastructure and designated for use in local power plants provides GHG free, renewable, dispatchable power to serve system needs, while utilizing existing infrastructure that would otherwise eventually be underused as we move toward the 2050 GHG target. Consumers using the extensive natural gas infrastructure in the state should be able to target their energy dollars voluntarily to designated use of pipeline bioenergy at their homes and businesses (larger customers can already do this, to some extent), in order to reduce their GHG contributions and contribute thereby to the state's goals.

In addition, distributed in-state bioenergy use is currently unfairly constrained by criteria pollutant emission restrictions. The criteria pollutant regulations for distributed generation are in place for an important reason – these pollutants are harmful if above stated limits. However, there is no recognition in these restrictions of the unique benefits of distributed bioenergy use – the reduction of GHG emissions, remediation of local water and odor impacts, and the avoided emissions from flaring.

ARB should work with other implementing agencies to remove existing barriers to expanded bioenergy use, both through the existing pipeline infrastructure from in-state and out-of-state sources and in local, distributed generation situations.

VII. The 2013 Scoping Plan Should Analyze And Propose Measures To Address Three Less Developed Areas of GHG Emissions And Potential Reductions.

At the June 2013 kickoff meeting, there were several "less-developed" areas of GHG emissions and potential reductions that were discussed. For example, emissions from high global warming potential gases (GWP) and the significant agricultural sector were covered in the workshop. Other "less developed" areas were not clearly included, such as new research on the effects of black and brown carbon and on methane leaks. SMUD recommends that these less developed areas be further explored in the 2013 Scoping Plan, and touches briefly on these areas below.

High GWP Gases Are Expected To Double In Impact By 2020

In the June 2013 Scoping Plan kickoff workshop, ARB presented an estimate of the percentage of GHG emissions from various high-level sources and sectors, as the 2020 target of 427 MMTCo2e is met overall. Compared to 2011, most sectors saw slight declines in the percentage of emissions from 2011 to the 2020 estimate. However, high Global Warming Potential (GWP) gases increased from 3% of the 2011 emissions to 7% of the 2020 emissions, more than doubling in the nine years. SMUD believes that ARB should focus some concentrated, near-term effort on this small but clearly rapidly growing sector of GHG emissions. Dramatically reducing the growth in high-GWP emissions will help to achieve the 2020 goal and have impacts beyond that year. Achieving cost-effective emission reductions here will reduce pressure on other sectors.

There Is Significant Potential For GHG Reduction, Sequestration, And Removal In The Agricultural Sector

At the 2013 kickoff workshop, the ARB stated that one of the focus areas for the 2013 Scoping Plan was the agricultural sector. SMUD agrees that the agricultural sector has great promise for reducing and sequestering GHG. SMUD supports this focus area for the 2013 Scoping Plan.

There Are New Estimates Of The Climate Change Benefits Of Reducing Black and Brown Carbon Emissions.

The June 13 kickoff workshop did not include substantial discussion of the potential for reductions in black and brown carbon and methane emissions to help address the problem of and impacts of climate change. The workshop did discuss a "climate science update," without much detail about what may be included in the update. New research

from the Scripps institute featured at ARB in July indicated that efforts to reduce black and brown carbon emissions have a greater GHG-reducing impact than previously thought.

There Is New Information About The Potential Contribution Of Methane Leaks

The June 13th kickoff workshop described energy sector challenges, including for traditional energy sources such as natural gas (commenting on the need for natural gas carbon capture and storage) and nuclear energy. Another topic that has been raised recently is the question of fugitive emissions from natural gas production and distribution operations and the significant climate change impacts that this leaked methane can have. Additional fracking in California has the potential to exacerbate leaks of methane. As natural gas is a key fuel at present for keeping energy costs low and for the reliability of the electricity system, providing much of the ramping and integration services for the system, the ARB should get a handle on the methane leakage question, in addition to considering the question of post-combustion capture and storage of CO2. There should be no surprise turn in policy that deemphasizes natural gas use after long considering the fuel as a way to reduce GHG emissions by moving away from coal and other fossil fuel resources.

SMUD again appreciates the opportunity to comment on the 2013 Scoping Plan.

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cc: Corporate Files