



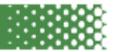
California Energy Commission <b>DOCKETED</b> <b>13-IEP-1C</b>
TN 71202 JUN 10 2013

June 10, 2013

**Comments from the California Center for Sustainable Communities on May 30, 2013 Lead Commissioners Workshop on Preliminary Electricity and Natural Gas Demand Forecasts 2014 – 2024 (Docket #13-IEP-1C)**

The California Center for Sustainable Communities (CCSC) is a statewide University of California collaboration, funded and supported by the Public Interest Energy Research Program of the California Energy Commission. CCSC conducts work on topics important to the transition toward greater urban sustainability, bringing together leading researchers from across several campuses. CCSC provides research, methods, tools and strategies to address land use, energy, and transportation challenges facing California communities, and serves as a resource for policy makers, stakeholders and the residents of the state.

We commend the Commission’s efforts to develop electricity and natural gas demand forecasts that account for the potential of energy efficiency and demand response to offset the need for future generation capacity. The workshop noted efforts to disaggregate such forecasts (or components of forecasts) to climate zones, metropolitan planning organizations, and census tracts. We strongly support such disaggregation efforts. Our research confirms that energy consumption varies considerably across space, and therefore, understanding spatial differences in energy consumption, as well as drivers of those differences, is critical for forecasting future demand and for effectively and equitably reducing future consumption. Disaggregation to climate zones represents an important first step, but much greater disaggregation will be essential to fully understand energy use patterns. As Commissioner McAllister mentioned, there is no substitute for



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increased local knowledge and access to granular data.

To better understand patterns of energy use, CCSC is mapping account-specific building energy consumption across Los Angeles County from 2006-2011 and analyzing these patterns against detailed data characterizing people and place, such as building size, materials and age, land use patterns, and resident income. Although the results of this project will not be available until late 2014, our preliminary findings confirm that the drivers of energy use are numerous, complex, and intertwined. To improve the accuracy of demand forecasting, it is crucial that the Commission invests in research that disentangles the complex set of factors that drive energy use. Such “baselines” of energy consumption and their correlates provide unmatched insights into the energy-use landscape and therefore can improve understanding of future demand as well as the potential for efficiency and demand response to help achieve conservation objectives.

As Commissioner Weisenmiller noted, California’s economic recovery has exhibited notable differences across the state, with a relatively robust recovery in coastal areas but not in central valley. The strong correlation between wealth and energy use serves as a salient example of the need for more disaggregated forecasting because it means that even in times of an overall economic decline, consumption is likely to continue to increase (or increase at a greater rate) in areas with high concentrations of wealth.

Recent research (2012: Kahn, Kok, Quigley) has shown the inadequacy of energy efficiency as a policy objective for achieving energy savings. In commercial buildings:





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*Technological progress may reduce the energy demand from heating, cooling and ventilation, but the behavioral response of building tenants and the large-scale adoption of appliances more than offset these savings, leading to increases in energy consumption in more recently constructed, more efficient structures.*

Our preliminary work supports these findings, demonstrating that energy efficiency should be considered a means to an energy conservation ends, not an end in itself. Without pricing or other measures to help curtail a “rebound effect,” efficiency gains will not aid California in achieving its true energy objectives, including greenhouse gas mitigation. Further, our early analysis shows that energy consumption per dollar of economic output is increasing over time. If our final analysis validates this, there are two important ramifications, 1) energy efficiency efforts are not being guided by good information and data, and the state may be investing in inappropriate efficiency or conservation programs and initiatives; and 2) demand forecasts could be underestimating the impact of future economic growth.

### Recommendations

Our efforts to establish a baseline of energy consumption patterns in Los Angeles County would not be possible without access to highly disaggregated energy consumption data. Such analysis is critical to the future security of California’s energy systems, economic vitality and environmental resilience. In addition, it provides a fruitful avenue for improving both end-use and econometric modeling, noting the current weaknesses in each (including lack of recent survey data for undergirding end-use models and lack of disaggregation of important parameters such as economic sectors). To enhance the State’s forecasting and energy planning activities we recommend the following:

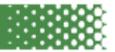
1. Establishment of Regional Energy Baselines over time: Map and analyze highly disaggregated energy consumption data in conjunction with information on population, income, building characteristics, climate and other



key variables for all of California regions on a regular bi-annual basis. This will provide important ground-truthing for the models and will help to uncover important drivers of energy use.

2. Ground-up Energy Efficiency Assessments: It is widely accepted that the relationship between energy efficiency gains and overall consumption decreases is not linear (and at times may in fact be an inverse relationship). We have selected a sample of LADWP efficiency investments and will analyze actual changes in consumption over time. We recommend that the Energy Commission invest in similar studies throughout the state to better quantify and understand the real impacts of energy efficiency investments.
3. Ground-up Distributed Generation and Electrical Vehicle Adoption: Two key factors in future energy demand are increasing adoption of solar photovoltaic panels and electric vehicles. Because these two technologies are still developing, behavior patterns and the resulting energy impacts are not well understood. Quantifying and analyzing the ground-up adoption and effects of these new technologies will provide important information for future forecasts as well as future policy development

There is an urgent need to achieve energy conservation while minimizing economic and equity impacts. Meeting this need requires a long-term investment in disaggregated analysis of energy use across space and time. Such investments will help decision-makers better understanding differences in energy use between regions, the energy-water nexus and the relationships between natural gas consumption and electricity consumption. The high-level forecasts are helpful for understanding broad trends, but they are likely missing critical pieces of the picture. Our work clearly shows that without detailed, granular analysis, and longitudinal data, not only is accuracy limited, but perhaps more importantly the utility of analysis is hampered. For these reasons, we strongly support the establishment of energy baselines across



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California and look forward to sharing our full results for Los Angeles County with the Energy Commission when they are complete.

**For further information or questions regarding these comments, please contact:**

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Source: 2012: Kahn, Matthew; Kok, Nils; Quigley, John M., *Commercial Building Electricity Consumption: The Role of Structure Quality, Management, and Contract Incentives*. A White Paper. <http://www.environment.ucla.edu/media/files/KKQ-Commercial-010513-i2-xul.pdf>

