

DOCKETED

Docket Number:	15-IEPR-05
Project Title:	Energy Efficiency
TN #:	204406
Document Title:	Stephanie Pincetl Comments: California Center for Sustainable Communities (CCSC) at UCLA comments
Description:	N/A
Filer:	System
Organization:	Stephanie Pincetl
Submitter Role:	Public
Submission Date:	4/27/2015 8:57:04 PM
Docketed Date:	4/28/2015

Comment Received From: Stephanie Pincetl

Submitted On: 4/27/2015

Docket Number: 15-IEPR-05

California Center for Sustainable Communities (CCSC) at UCLA comments

The California Center for Sustainable Communities (CCSC) at UCLA's Institute of the Environment and Sustainability welcomes the opportunity to comment on the 2015 IEPR, and specifically the energy efficiency of existing building action plan. As Commissioner McAllister stated there is an enormous opportunity for significant energy savings in this sector of the built environment. We commend the CEC's draft Existing Building Energy Efficiency Action Plan. In particular, we support the Commission's efforts to identify and specifically call-out the need for data access and tools to improve decision-making across multiple levels of government in order to meet the State's energy goals.

Please see attached document for full comments.

Additional submitted attachment is included below.



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April 27, 2015

Comments from the California Center for Sustainable Communities (CCSC) at UCLA on the Lead Commissioner Workshop (April 14, 2015) on Strategies Related to Data for Improved Decisions in Existing Building Energy Efficiency Draft Action Plan (Docket number 15-IEPR-05).

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About the Center

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. The Center conducts work on topics important to the transition toward greater urban sustainability, bringing together the leading researchers and centers from across several campuses. CCSC provides research, insights, data, methods, models, case studies, tools and strategies to address land use and transportation challenges facing California communities, and serves as a resource for policy makers, stakeholders and the residents of the state. Our mission is to assist the state's communities in the transition to greater sustainability on multiple fronts

Comments on the Workshop

While rate payer and state funded energy conservation programs for existing buildings has been on-going (especially since 2002 state energy sector restructuring, investing over \$13 billion of rate payer funds) the State, counties and cities still have only approximated, modeled or self reported data to understand the effectiveness of the investments in energy programs. We support Ethan Elkind (of UC Berkeley's) comments during the workshop that efficiency dollars should be moved towards performance-based investment strategies (as opposed to implementing programs where rebates are received so long as a process is followed). In order to meaningfully implement this strategy, local governments and utilities themselves need data provided in a meaningful way that targets the drivers of energy consumption in existing buildings effectively.





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To meet Governor Brown's 2015 goal for doubling the efficiency savings in buildings through 2030, increase renewables to 50% by 2030, and reducing the use of gas and oil in the transportation sector by 20% by 2030, we need to be able to target programs more effectively. As Commissioner McAllister has stated, residents and building owners need simple access to understandable, reliable information as well as those funding and implementing programs.

We suggest that a first order requirement to meet the state's goals is better transparency regarding existing building energy use, in real time, across all categories of buildings, over time. Accomplishing this task does not need to impinge upon individual customer privacy, as our Energy Atlas effort is demonstrating.

The Energy Atlas: An example of data displayed as usable information with privacy protection

To better understand patterns of energy use, CCSC is mapping building energy consumption across Los Angeles County from 2006-2011. The CCSC Energy Atlas project links and maps monthly address level electricity and natural gas utility data with county assessor parcel data that describes age of building, size and use, aggregated to comply with the May 2014 PUC aggregation guidelines elaborated in Decision 14-05-016.

Such matching with actual consumption data using monthly billing data, allows the construction of a baselines of energy use, upon which can be added energy conservation and efficiency program information creating a baselines of energy use and program evaluation over time. It also enables the targeting by category or attribute, of buildings or building types in most need of improvement.

Applications of the Energy Atlas

The Energy Atlas is a platform that will provide local and state governments the ability to target their programs, including:

- Financing options for private capital to invest in the right building sectors for returns on investments,
- Targeting the sectors that most need energy advising and auditing,
- Creating the right building energy disclosure thresholds for each locality,
- Energy data tracking and analysis,
- Appropriate education, outreach and consumer support across sectors,
- Supporting workforce development by knowledge of what types of changes are needed in the built environment to make it more energy efficient, and
- Many other important efforts to target existing buildings' energy usage.

Efforts like our Energy Atlas provide the data and analysis necessary to support local and state government efforts to reduce energy use in buildings while protecting privacy standards set by the State.

The Energy Atlas will provide baseline data and trends of buildings within LA County for





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energy consumption by building use type, building size, and building age at the scale of neighborhoods, cities, council of governments, and county-wide. It will also provide distributions and link consumption to socio-demographic census information.

A Case for Data Access: Preliminary Findings and Data Analysis

As Commissioner McAllister noted, there are most likely great differences in energy use across building age and location. Developing the analytical tool to be able to determine this with precision requires precise data. County assessor data is very useful in describing building age and construction. This data can help determine whether, for example, all buildings of a certain type (say apartment buildings) built in a certain period perform similarly, or whether some built with different materials, may perform better or less well. Adding data about weather and climate further refines this understanding. Such granular information more specifically informs not only building owners, but also efficiency and conservation program implementers about priorities for investments.

Although the results of this project are not yet complete, our preliminary findings confirm that the drivers of energy use are not well understood. To improve the accuracy of energy efficiency programs, demand forecasting, etc., it is crucial that the Commission invests in research that disentangles the complex set of factors that drive energy use.

- Our work shows a strong correlation between wealth and residential energy consumption. While this is perhaps not surprising, it is critical to understanding energy use. The relationship between wealth and consumption 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.
- For industrial buildings, the addition of industrial classification codes will also help refine understanding of energy use across industrial buildings. In addition to age, climate zone, construction material, knowing the activities within the building by industrial type, also will help to refine the most helpful energy conservation or efficiency program type.
- These observations can be applied to commercial and institutional buildings as well, and developing careful baselines mapping and tracking can not only help compare similar building types in similar locations but across geographical space. Such power of analysis is truly the next step in advancing energy conservation and efficiency in California.

The CCSC Energy Atlas project is also experimenting with adding a layer that describes solar potential within its geographical area of mapping. This provides insight into what potential there may be for local solar energy production relative to current energy use. This analysis could be conducted across the state. Much needed will also be grid information, and grid capacity in order to evaluate and best target potential for solar energy provision in specific places.

These very preliminary findings confirm the importance of 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.





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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, not only is accuracy limited, but perhaps more importantly the utility of analysis is hampered. For these reasons, we strongly support continued research in this area and look forward to sharing our full results with the commission when they are complete.

Data Access

The CCSC Energy Atlas is a unique example, in that we have been able to acquire access to this granular level of data through non-disclosure agreements and the PUC decision D.14-05-016. Our access to this data is unprecedented in the State, and we recognize that not every local government or public-interest group has this access (or has connections to a group that has this level of access and can display the aggregated information). CCSC is one of many organizations that have participated in PUC proceedings about data access and privacy, and we are confident that these other organizations can substantively contribute to energy analysis, planning, and program implementation.

Data requests and release processes should be standardized across the state to better inform regional and state-wide policy, not on a case-by-case scenario left to each individual utility. We strongly support the comments during the workshop that the review of eligible entities that will be granted access to data should be determined by the PUC and not each utility. Based on State precedent and recent PUC rulings, it is not appropriate for utilities to have the right to determine at-large the data that is granted, and at what level of aggregation, for data requests.

We commend the Commission's efforts to address data access and identify variations in access between the utilities. We suggest the Commission continue to provide insight and work with the PUC in enforcing access to data under D.14-05-016.

In Conclusion

California has been at the forefront of energy efficiency and conservation. First in the very creation of the CEC, then in the development of energy codes. We are moving into the 21st Century, developing yet new cutting edge concepts, codes and programs, including Zero Net Energy Buildings, Building Energy Disclosure policies and more. One additional area that is needed is better baselines data of current building energy use. CCSC respectfully suggest that it has shown the potential of this approach through its current atlas project, and that such research can provide the necessary data and benchmarking to guide the next round of building energy investments in a parsimonious, intelligent and targeted manner.

For the state to continue to succeed, it needs to enter the era of big data, grounded in protecting customer privacy. Big data has the potential to revolutionize investments, save the rate and tax payers untold sums of unsuccessful or unnecessary investments, and continue to ensure the state leads the nation. Using actual energy billing data matched to the actual buildings, aggregated to protect individual customers, is a key in this next phase.

CCSC would suggest that data transparency is a critical first step in aggressively implementing





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the state's energy goals in a parsimonious and sophisticated manner. We hope that this need will be addressed and that funding will be available for this work. The Commission is making great progress in utilizing and enabling granular data to inform policy and decision-making. In addition to energy data, water billing data will be another important aspect of the data needs for an integrated approach in the state's efforts to reduce water and energy use in all urban sectors. It will also assist in better understanding the water-energy nexus.

Finally, we fully support the comments submitted by the LGSEC and work closely with the organization to supply local governments with energy data in Los Angeles County and hope that our efforts will be able to support other local governments in the state going forward. Such energy analysis initiatives require support, and we hope that the CEC's workshop and the IEPR will structure new funding streams for energy bench making possible over time.

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

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