



July 12, 2013

**Comments from the California Center for Sustainable Communities on June 28, 2013
Staff Workshops on The Comprehensive Energy Efficiency Program for Existing
Buildings Draft Action Plan (Docket # 12-EBP-1)**

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 improve the energy efficiency of existing buildings as a strategy for achieving energy conservation and GHG gains. Energy efficiency savings are an important strategy for offsetting the need for future generation capacity. The workshops and the draft AB 758 Action Plan identified a number of potential approaches that will be employed, including no regrets strategies, voluntary pathways, and mandatory pathways. We strongly support the proposed strategies and pathways. Issues related to heterogeneity in building energy performance across space, developing standardized tools for assessing energy performance, and access to energy data are particularly relevant to our current work and we provide comments on them below.

There is significant heterogeneity in building energy consumption across space in California, in large part driven by factors beyond the characteristics of buildings and installed appliances. To better understand these drivers, 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. "Explanatory" variables include building size, materials and age, land use patterns, resident income and other socio-demographic characteristics, climate patterns, and economic sectors (NAICS codes), among others. 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 California's ability to target effective interventions, it is crucial that the Commission invests in research that disentangles these factors. Such "baselines" of energy consumption and their correlates provide unmatched insights in to the energy-use landscape and are invaluable for identifying opportunities for achieving the

goals of AB 758.

Recent research has identified the importance of the behavioral component to energy consumption in buildings. Kahn, Kok, and Quigley identify that in commercial buildings: “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.”¹ Our preliminary work supports these findings, suggesting that the “rebound effect” (as an example of a behavioral response) must be considered for building energy efficiency policy to be successful. This may require complementary measures, such as redesigning electricity rate tariffs to curtail additional consumption in response to cheaper building energy services.

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 California’s future economic vitality and environmental resilience. Access to granular data provides an immediate and fruitful avenue for improving tools for assessing and modeling building energy performance, and can address the lack of recent survey data for energy consumption by economic sector. Yet despite its immense potential, there are significant barriers to data access, particularly to customer-specific data, which must be resolved for building energy conservation objectives to be realized.

Finally, we must look beyond just the operations phase of building energy consumption to understand and assess total environmental impacts. Life cycle analysis tools must be employed to assess energy, water, and other resource implications across building construction, operation, renovation, and disposal phases to ensure policy interventions do not have unintended consequences. Such work is currently underway in Europe through the Energy Performance of Buildings Directive, and a report is forthcoming.

¹ Kahn, M., Kok, N., & Quigley, J. (2012). Commercial building electricity consumption: The role of structure quality, management, and contract incentives. Available at: <http://www.environment.ucla.edu/media/files/KKQ-Commercial-010513-i2-xul.pdf>.

Recommendations:

- Modeled building energy savings must be verified with real data to improve modeling tools.
- Building shell performance must be analyzed comparatively by age of building, for example starting in 1920, as building shells and design parameters have changed over time.
- Life cycle analysis tools should be used to understand the full set of tradeoffs of building retrofits versus new buildings (including infill redevelopment versus greenfield development), including energy, water, and other resources.
- The social impacts of building retrofits versus new construction should also be studied, particularly paying attention to issues of affordability, gentrification, transportation, and access to schools and jobs.
- High-resolution baselines of energy consumption across the state should be created to improve our ability to understand and quantify behavioral responses such as the rebound effect.

CCSC is grateful for the Commission's work on this important topic and for the opportunity to provide public comment. A copy of a press release related to the European Commission's Energy Performance of Buildings Directive is attached.² For further information or questions regarding these comments, please contact:

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² A wider view: Shifting paradigms in the buildings sector. June 26, 2013. Available at:

<http://www.euractiv.com/special-report-building-way-cris/wider-view-shifting-paradigms-bu-news-528867>.

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Published on *EurActiv* (<http://www.euractiv.com>)

Source URL: <http://www.euractiv.com/special-report-building-way-cris/wider-view-shifting-paradigms-bu-news-528867>

A wider view: Shifting paradigms in the buildings sector

Published: 26 June 2013

SPECIAL REPORT / The debate on what kinds of buildings we should live and work in is shifting, with construction experts and EU policymakers moving away from focusing simply on energy efficiency to a broader appreciation of sustainable buildings, taking into account their environmental, social and economic impact.

Background

EU nations have signed up to a voluntary objective of reducing the EU's primary energy use by 20% by 2020, measured against 2005 levels. Such savings would slash the EU's CO₂ emissions by an estimated 780 million tonnes and save €100 billion in fuel costs.

One of the EU's main policy tools to achieve this objective is the Energy Performance of Buildings Directive, which was initially supposed to reduce the EU's energy consumption by up to 6%.

The directive was recast in 2010 to cover residential and non-residential buildings. All new structures in the EU were required to be nearly zero-energy buildings by 2021, with a 2019 target for the public sector.

>> Read our Links Dossier: Energy Performance of Buildings Directive

On the European policy-making level, this change in emphasis is being led by the European Commission's environment department, which is currently working on a new policy paper (Communication) on Sustainable Buildings.

Speaking at an event on 25 June during EU Sustainable Energy Week, Pavel Misiga, a head of unit at the Commission's environment division, announced that the Communication, which is still in its early stages, would focus on resource use in both residential and non-residential sectors (excluding industrial buildings and infrastructure).

It will focus on how to improve the environmental sustainability of buildings – moving beyond the current policy debates on energy efficiency – to look at embodied energy in buildings, water usage, construction materials and waste. Embodied energy takes account of all the energy required to produce a product, which helps to determine its impact on climate change.

“The objective is to reduce the environmental impacts of buildings, and we expect economic benefits for society and for the construction sector,” said Misiga.

Looking at the whole lifecycle of buildings

When it comes to emissions, which is a key EU policy priority for 2020 and beyond, the choices over which materials are used in buildings can have a major impact beyond energy efficiency. For example, an investment of €100,000 would save 75 tonnes of CO₂ over 20 years, while the same investment in low carbon concrete would save 663 tonnes of CO₂ immediately.

The difficulty facing both construction companies on the supply side and consumers on the demand side is knowing how to choose between the many technologies and materials, and what is the best choice for sustainability.

“We need knowledge and tools to decide what the right materials are to use in buildings,” affirmed Misiga.

Companies in the sustainable construction sector are also pushing for a wider perspective when it comes to the buildings of the future, and would like policymakers to take into account other issues such as the air quality in buildings, or the amount of daylight that can be harnessed. Supporters of such measures argue this would lead to better health and wellbeing for buildings’ occupants, given that in OECD countries, people spend about 90% of their lives inside buildings.

“The holistic approach is gaining more and more ground. We have to look at the whole lifecycle [of buildings]”, Lone Feifer, programme director for Sustainable Living in Buildings at Velux, the roof window manufacturer, told EurActiv.

Velux argues that looking only at energy-efficiency at the expense of other approaches in sustainable buildings is “one-sided”.

Feifer said that within the last one to two years there has been more interest in looking at buildings from a whole lifecycle perspective. “We feel as manufacturers that we get asked about that a lot more”, said Feifer, who adds that “some very-forward looking public procurement agencies” are already taking such factors into account when it comes to buildings, as are some environmental impact assessments of buildings.

Feifer would like to see this perspective incorporated into the CEN/TC 350, a common European standard for sustainable construction works.

Mixed reactions to Commission plans

Misiga told EurActiv that the public consultation on the new communication on sustainable buildings would be launched on 1 July, and that he hoped it would be ready by the first quarter of 2014. He conceded that so far, reaction from industry to this new initiative was mixed:

“It’s mixed, because part of the industry says [it is] another initiative [they will] have to comply with it. It will involve costs and changes, so we certainly don’t need it now. There are other stakeholders who are very positive. We have support from member states and from investors,” said Misiga, who formerly worked with the environment minister of his native Slovakia.

He argued that it was important to develop a standard framework for sustainable buildings to reduce risks for investors, who see the overall move to sustainability in buildings but risk investing in a product now that nobody wants in 20 years’ time.

EuroACE, the European Alliance of Companies for Energy Efficiency in Buildings, agrees that investors would benefit from a more holistic approach towards sustainable buildings across the EU.

“I do support the DG Environment view that a holistic approach to buildings should be taken. The building is a system of products and components put together: the design and conception of the building, its orientation, how it is constructed, and how the components and the equipment in the building work together”, Adrian Joyce, secretary-general at EuroACE, told EurActiv.

Joyce echoed industry sentiment that the current glut of different EU regulations was strangling innovation in the construction sector.

“Many regulations work against each other...the construction sector is among the most highly regulated in Europe, and our members suffer from the high number of different regulations at the national and European level,” said Joyce.

“When a new product comes to market, they have to go through a number of different certification schemes, that’s a big cost. Many good products are not reaching certain markets. It would be much better to have a European system that somehow took account of different climatic zones, but that it was one approach, and only one fee [to be paid by manufacturers],” he said.

Next Steps

- **First quarter of 2014:** European Commission (DG Environment) expected to publish new policy paper (Communication) on Sustainable Buildings.