

**BEFORE THE PUBLIC UTILITIES COMMISSION  
OF THE STATE OF CALIFORNIA**

Order Instituting Rulemaking to Examine the Commission's  
post-2005 Energy Efficiency Policies, Programs,  
Evaluation, Measurement and Verification, and Related  
Issues.

**R. 06-04-010**

**Comments of Newport Ventures on Preliminary Energy Efficiency Strategic  
Plan**

Submitted March 24, 2008

Submitted by

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March 24, 2008

Dear Joint Utilities and CPUC:

This public comment is being submitted to address the Preliminary Energy Efficiency Strategic Plan, especially as it relates to the residential sector. Newport Ventures, a residential building consulting firm, recognizes that the residential energy conservation goals that CPUC has set for its utilities are aggressive and environmentally laudable. Overall, the utilities' draft strategic plan does well to address increasing plug loads through targeting home owner education. As building standards and appliance standards tighten, management of miscellaneous electrical loads becomes an increasingly important opportunity for residential energy conservation.

An oversight of the draft plan, however, is that the plan does nothing to address the new residential loads that will be introduced due to current developments within Title 24. These developments will introduce a requirement for mechanical ventilation systems in nearly all new low-rise residential construction built after the passage of the 2008 Title 24 standards. New loads that will result due to mechanical ventilation requirements for residences include fan loads for introduction and distribution of outdoor air (central fan, exhaust fans, or balanced system fans) and conditioning loads for conditioning make up air to room temperature. Based on its associated energy costs alone, it would seem reasonable to oppose the requirement for residential mechanical ventilation systems. However, mechanical ventilation becomes increasingly important to assuring indoor air quality in tight, high performance homes, especially as California pushes towards net zero energy homes.

A recent study conducted by LBNL and commissioned by the U.S. Department of Energy and the California Energy Commission has shown that expected energy use from introducing mechanical ventilation requirements for residential units is significant.<sup>1</sup>

Newport Ventures recommends that the strategic plan address these new loads in two ways:

- The strategic plan should request that the CEC draft building code language be structured to regulate the energy use of future residential mechanical ventilation systems. Comments to current 2008 Title 24 rule development can be submitted through following this link:  
<http://www.energy.ca.gov/title24/2008standards/rulemaking/>
- The strategic plan should call for incentives, such as utility-sponsored rebate programs, to encourage the specification of energy efficient mechanical ventilation equipment

### **Why Address the Energy Consumption of Residential Mechanical Ventilation Systems?**

The recent LBNL study on the energy consumption of California residential mechanical ventilation systems revealed that large disparities exist in the energy consumption and energy costs of acceptable mechanical ventilation systems across

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<sup>1</sup> Sherman, M. and Walker, I. 2007. "Energy Impact of Residential Ventilation Standards in California", LBNL 61282. Lawrence Berkeley National Laboratory, Berkeley, CA.

California's cold; mild; and hot, dry climates. Within the study, exhaust only systems, balanced heat recovery systems, supply only systems, and central fan integrated systems were all modeled to assess resultant energy use and associated costs. When ventilation, distribution, and conditioning energy were taken into account, it was revealed that annual ventilation energy consumption for acceptable systems was between 630 kWh and 4500 kWh beyond that of a non-mechanically vented base case. Based on the graphs provided by the study, end-use energy and cost premiums above the base case are summarized below:

Temperate climate: 900 kWh – 2100 kWh; \$70 - \$190/year  
Hot dry climate: 630 kWh – 3500 kWh; \$60 - \$425/year  
Cold climate: 2100 kWh – 4500 kWh; \$140 - \$410/year

It is very likely that the requirement for residential mechanical ventilation will be included in the 2008 version of Title 24. Currently, the Title 24 language addressing mechanical ventilation does nothing to regulate the energy efficiency of these systems. This oversight will dramatically effect the energy consumption of California homes and will make the PUC's goal of net zero energy homes more difficult to achieve. In Sacramento, for example, it takes approximately 0.6 – 1.5 kW of DC-rated solar PV capacity to simply offset the increase in energy use due to new mechanical ventilation requirements.<sup>2</sup>

The California Building Industry Association has forecasted that 128,400 new residential units will be built in 2008, which is expected to be a very slow year in residential construction.<sup>3</sup> If we assume conservatively that this level of production continues through 2020, then over 1.5 million residential units will be built by 2020. Based on LBNL's numbers for energy usage expected due to residential mechanical ventilation, this will represent 970 – 6900 GWh of increased annual energy consumption over 2008 levels by 2020.

### **What can be done within the Strategic Plan To Address the Energy Consumption of Mechanical Ventilation Systems?**

Options for reducing the energy consumption of residential mechanical systems include specifying efficient equipment and controls. The 2007 LNBL study showed that less efficient ventilation systems will use from two- to five-times the energy compared to more efficient systems (depending on climate). The details of energy efficient specifications are best worked out within building codes. A recommendation within this strategic draft plan for the California Energy Commission to address this issue would go far in ensuring that this new load is addressed within the low-rise residential sector and that the net zero energy home is a more achievable and affordable goal in the future.

Another recommendation that could be included within the strategic plan to address the future energy demands of residential mechanical ventilation systems is the recommendation that utilities establish pilot rebate programs or other programs to create demand for and incentivize builders to install energy efficient mechanical

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<sup>2</sup> NREL's PV Watts was used to calculate the expected kWh production of a roof-mounted solar PV array in the temperate climate of Sacramento, CA. Assumptions included a 0.77 derate factor for the system (suggested by NREL), a southern orientation (optimal for the system), and a tilt of 22.6 degrees (resulting from a 5/12 roof pitch). Production was calculated as 1402 AC kWh/kW DC.

<sup>3</sup> Nevin, Alan. California Building Industry Association 2008 Economic Forecast. January 3, 2008.

ventilation systems. Such a program could provide education to consumers and designers of residential mechanical ventilation systems, as well as encourage manufacturers to develop more efficient products. Given the number of California homes which will soon incorporate mechanical ventilation systems, the state's utilities also have the opportunity to significantly reduce energy consumption (peak as well as overall consumption) by encouraging more efficient residential systems.

Thank you for your consideration of these points.

Sincerely,

A handwritten signature in black ink that reads "Mike Moore". The signature is written in a cursive, slightly slanted style.

Mike Moore, P.E.