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Green infrastructure for sustainable development

Thank you for the excellent presentation this morning on The Next EPIC Challenge: Re-imaging Affordable Mixed-Use Development in a Carbon-Constrained Future.

I would like to propose another approach for inclusion in your current technology/strategy mix. This is the use of PROPERLY ENGINEERED green infrastructure, e.g., trees, which can provide multiple benefits at low/no marginal costs. Examples of these benefits include:

1. Annual energy (KWHr) savings of up to 15%
2. Peak reduction
3. GHG reduction
4. Lower ambient temperatures
5. Stormwater interception, especially with tree wells.
6. Overall improved quality of life, especially in disadvantaged communities.

Since trees are generally part of the landscape anyway, the marginal costs of realizing the above benefits can be quite low.

While these benefits have been well demonstrated scientifically and empirically, their large scale adoption has been handicapped by the lack of the right modeling, analytical, planning and management tools to "engineer" optimal solutions and produce reliable forecasts of the costs and benefits.

Our company, EcoLayers, Inc., is a pioneer and innovator in this area. An example of the shade tree energy model is attached. The technology and tools for its large-scale deployment are beyond the scope of these comments.

I request the CPUC to include this option in their technology/strategy mix for the proposed program. I will be happy to address your questions or concerns.

Additional submitted attachment is included below.

TREES FOR ENERGY CONSERVATION AND PEAK REDUCTION
ecoSmart Energy Model

BACKGROUND

The cooling effects of tree shade are well known. This cooling effect from the shade of trees planted adjacent to your house can reduce your electric bills (KWHrs) by reducing the energy consumed by the air conditioner to cool your house in summer.

General guidelines for the selection and placement of landscape trees for energy conservation have been around for several years. However, they cannot provide accurate values of current and future (trees grow!) energy savings for the specific locations, types and orientations of the building and trees on your property.

The EcoLayers software platform takes an innovative approach in bridging this gap. It provides simple, map-based tools for the selection and placement of trees to “optimize” energy savings for your specific property and landscape. This information is combined with the choice of tree species and location to simulate the growth of each tree, the combined shadow of multiple trees, the projection of this shadow on your building walls and roof, and its effect on air conditioner performance.

The simulation is performed by the energy model.

ecoSmart ENERGY MODEL

This is a *very* brief overview of the energy model, which was developed by the USDA Forest Service. The energy model consists of three sub-models:

Tree Growth Model calculates annual tree growth (e.g., height, canopy, diameter at breast height, and other parameters) for the estimated life of the tree. Results are based on empirical research by the USDA Forest Service for over 25 years covering more than 3200 species in all climate zones across the US.

Shadow Model calculates the shade on each wall and roof of the building based on the number, species and age of the trees you have selected, building size and orientation, the location of trees relative to the building walls (the tree planting plan), building size and address, local historical meteorological data, type of air conditioning currently in use, and other factors. The shadow model then quantifies hourly irradiance reductions (the reduced heat from the sun) on the building based on tree species, leaf density and season.

Building Model calculates the hourly energy required (heat run) to cool the building based on thermostat setting, building size and address, local historical meteorological data, type of air conditioning currently in use and other factors.

Annual energy savings are calculated from these hourly heat runs as the difference in energy required to cool the building with and without trees for each year of tree growth over the life of the tree.

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