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HEAT ISLAND REDUCTION INITIATIVE DOE EPA

# HIRI NEWS



# Cool roof retrofit incentives in CA; ICLEI to launch heat island website

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## California Bill Provides Incentives for Cool Roofs

Kris Kiehne, of the Sacramento Cool Community Program (SCCP) discussed the cool roof retrofit provision of California Assembly Bill (AB) 970. The bill, which provides rebates for installing reflective and emissive roofs, was passed to ease this summer's projected statewide energy demand.

The target for the cool roofs portion of the bill is to achieve peak demand savings of up to 30 MW at a cost of $10 million. Kris stated that rebates of between $0.05 and $0.15 are available to building owners, depending upon the pre-existing insulation level. The program is structured so that buildings with lower R-values receive higher award payments.

Kris also stated that, under AB 970, rebates are available for roofing retrofits, and not for new construction projects. As the law currently stands, cool roof retrofit projects must be completed by June 1st, with an exception for schools, where project completion must occur by August 31st. SCCP is hoping to get the June installation deadline pushed back to accommodate additional retrofit projects.

Specifically, SCCP is working as a contractor to the California Energy Commission, and is responsible for finding and recruiting applicants and eligible projects. Other contractors participating in the program include Sacramento Municipal Utility District (SMUD) and the San Diego Regional Energy Office.

In this capacity, SCCP is working to build support for the bill's roof retrofit provision. They have been active in two ways. First, they are raising awareness about the energy and temperature benefits of cool roofs and, second, they are conducting training sessions. Kris noted that SCCP is not, however, involved in pre-qualifying interested building owners.

So far at least 20 applications for retrofit projects have come in. Upon receipt of applications, SCCP staff does roof inspections to ensure that projects qualify. In order to be eligible for the program, retrofit projects must meet specific criteria. If they do, building owners can receive the

rebate award. Funds are dispersed after SCCP prepares an incentive agreement and project invoices are received.

To date, Kris says SCCP has received a good deal of press for the bill, and for their involvement. She may coordinate with the folks at LBNL to get monitors in place to document the post-retrofit energy savings.

## Eco-Friendly Parking Lot in Fair Oaks Village

The Village of Fair Oaks in Sacramento, CA installed a "cool" parking lot at Banister Park, a local greenspace. Andy Youngs of the California Cement Promotion Council joined us to discuss this innovative project.

The lot was completed in January 2001 as a joint endeavor between the SCCP and a utility (SMUD?) to demonstrate that parking facilities can achieve ecological goals while remaining cost-competitive. SCCP worked with the Fair Oaks Park and Recreation Department to design the lot, which replaced the existing gravel lot. The lot is constructed of pervious portland cement concrete, which mitigates storm water run-off and achieves first-flush pollution. The pavement also reflects more of the sun's heat than a traditional, dark-colored asphalt lot. By reflecting rather than absorbing sunlight, the surface temperature remains low and cars stay cool. This means that fuel tank evaporative emissions, and NOx emissions from start-ups, are decreased.

The project designers initially planned to include numerous shade trees along the perimeter of the lot. The trees are available at no cost through a donation from SMUD. Due to high landscaping costs, however, this area may instead be paved over. Andy is still investigating the possibility of going forward with the tree planting.

Following his presentation, Andy mentioned that pervious paving material make drainage systems – required for most parking lots – unnecessary. At the Banister Park lot, storm water flows directly through the pavement surface and into an adjacent river. As a result, the added cost of drainage infrastructure is avoided. This makes the overall price tag of the cool alternative nearly the as asphalt.

Andy elaborated on the water drainage capacity of pervious pavements. He said that one square foot of pavement allows 3-5 gallons of storm water to flow through per minute. In response to concerns that the surface could become clogged by leaves and other debris, Andy said that because the flow rate is so high, it rarely becomes impeded. If blockage did occur, the pervious surface could easily be washed or vacuumed.

The 16,400 square feet Banister Park lot cost $108,000 to install. Put in context, the first cost for an asphalt lot of similar size is $101,000, and light-colored asphalt construction costs $160,000. According to Andy, the price of asphalt is rising, and will continue to rise if energy costs remain high.

However, as long as the initial cost of dark-colored asphalt remains lower than alternatives, it will be preferred by most contractors. Buyers of asphalt pavement, on the other hand, can incur additional costs over the life-cycle of a paved surface. These may include repair and maintenance fees, which fall to the lot owner – and not the contractor – and can drive up the overall cost of paving. The contractor, therefore, has little incentive to clarify that a lower up-front price may cost property owners more over time.

A cool pavement project at a Sacramento school, for instance, demonstrated a 12%, or $50,000, savings over its lifetime. First costs for the cool pavement were only slightly higher than asphalt.

As the discussion closed , several participants expressed an interest in the albedo of the installed pavement surface. An albedometer reading has not yet been taken, though Andy says this is in the works.

## ICLEI Develops Outreach Materials

**Printed Documents**

Maria Sanders, from the International Council for Local Environmental Initiatives (ICLEI), reported on the progress of their heat island outreach materials. Two documents in particular, the fact sheet and model ordinance package – which were distributed for comments prior to the call – will be available soon in a single policy package.

The urban heat island fact sheet provides an explanation of the science behind the phenomena, its negative effects, as well as mitigation options. The document also includes results from existing projects and scientific studies, contact information, and a list of additional heat island-related resources. The final version will

include several graphics and will be appropriate for both the public, and state and local level planners.

The model ordinance package will also be printed soon. The ordinance package includes a sample heat island resolution, policy framework, and language for a model ordinance. The resolution provides a template for heat island mitigation policy in local and city government operations, and in private sector development. The policy framework provides information necessary to build key aspects of a heat island reduction policy, while the ordinance language describes modifications in planning, building codes, and landscaping that mitigate the heat island effect.

Maria expressed her appreciation for the group's comments on these documents and requested participants contact ICLEI with additional comments, and suggestions for distribution. The final versions will be sent to ICLEI's Cities for Climate Protection partners, which currently number almost 100 US cities and counties, and over 300 local governments worldwide.

**"Hot Cities" Website**

The outreach materials discussed above will be available on ICLEI's heat island website, www.hotcities.org. (Maria noted that "coolcities" was already taken by a music group). This domain will be accessible through ICLEI's homepage, www.iclei.org. (Since the call, ICLEI launched its hotcities website on April 30, 2001.)

The website will be used to organize, interpret, and provide access to model policy and program implementation documents that cities need to start and maintain heat island mitigation programs.

## EPA's HIRI Team Focuses On Modeling

**Streamlining**

Eva Wong discussed EPA's ongoing modeling work with Lawrence Berkeley National Laboratory (LBNL) and Tulane University. The effort focuses primarily on evaluating the impact of heat island reduction measures (HIRM) on local meteorology and air quality. Currently, the emphasis is on meteorological modeling.

Previous work by an EPA contractor identified areas that could serve as "homologues," or proxies, for areas that do not undergo meteorological and AQ modeling. These areas have meteorological and AQ characteristics (e.g., climate, geography, topography, proximity to water bodies) that are similar to the modeled region.

Theoretically, modeling results from one area could be applied to its homologue (the area that was not modeled). As a result, unmodeled areas would get a sense of how HIRM affects air quality without having to perform area-specific analyses. EPA calls this back-of-the-envelope process, "streamlining."

Eva noted that in addition to establishing the scientific basis for implementing reduction strategies, this work will help EPA and others determine how to effectively allocate future resources.

Currently, LBNL and Tulane are working with EPA's HIRI team and OAQPS to identify areas across the country for modeling. Areas of interest include those that have severe ozone problems, are geographically diverse (to enable comparisons of HIRM effects), are pursuing HIRM, and which are interested in working with LBNL, Tulane, and EPA.

Once the areas are selected, LBNL and Tulane will work with OAQPS and local air quality modelers to select historical ozone "episodes" to model..

Ideally, local air quality modelers would be able to use LBN/Tulane meteorological model outputs as inputs into their air quality models. Areas would then be able to determine how HIRM affect local ozone air quality, particularly in terms of compliance with EPA's Ozone National Ambient Air Quality Standard. EPA is working to establish a dialogue with relevant stakeholders to facillitate this process.

**State Implementation Plans**

Niko Dietsch discussed the potential for HIRM to assist states in meeting federal air quality standards. He said that as strategies for improving air quality at the state level become more and more expensive, states will be looking for new and innovative ways to achieve reductions.

Because heat island reduction measures have the potential to reduce temperature, they may reduce heat-dependent ozone-forming emissions and/or ozone levels. Therefore, an area currently in nonattainment for ozone, and experiencing a heat island problem, could consider HIRM for potential reductions.

Houston, TX, for example, has expressed interest in implementing HIRM. However, in order to achieve reductions in ozone-forming emissions and/or ozone levels, a significant HIRM penetration rate would have to be demonstrated. In addition, it would have to be demonstrated that those measures were directly responsible for a specific quantity of ozone reductions.

Granting SIP credit in Texas (or any state, for that matter) requires that an agreed-upon methodology is established early in the process. The connection between HIRM and ozone reductions must be made explicit.

This, of course, is a challenge on several fronts. It can be difficult to establish the scientific basis, and there are administrative hurdles to consider. For these reasons, EPA will be collaborating with OAQPS, state air quality planners, and city officials on future modeling work.

As for Houston, achieving and demonstrating reductions remains a work-in-progress. Modeling to the level of detail required for credit is a time-consuming process. And there is uncertainty surrounding the cost and feasibility of implementing HIRM on a large scale.

EPA will provide more information as it becomes available.

**The next conference call is TBD. Stay tuned for the date, call-in number, and access code.**