

My colleague and co-blogger Cara Horowitz has just published a new report on the potential benefits of adoption of “smart roofs” throughout Southern California. [Looking Up: How Green Roofs and Cool Roofs Can Reduce Energy Use, Address Climate Change, and Protect Water Resources in Southern California](#), co-authored with UCLA Law alumnus Noah Garrison of NRDC, concludes that green roofs and cool roofs would save energy and money, reduce greenhouse gas emissions, and conserve water.

Cool roofs are constructed from reflective materials, and save energy by reflecting more of the sun’s energy than traditional roofs. They reduce energy use, lower the urban heat island effect, and reduce the demand for cooling of interior spaces. Green roofs are roofs covered with vegetation in a growing medium such as soil; they can decrease stormwater runoff volume and pollutant loading, improve air quality, and reduce the need for energy to cool building spaces. Both types of roofs offer significant environmental benefits, and can improve quality of life and reduce energy costs.

From [NRDC’s media release](#) about the report:

According to the report, “Looking Up: How Green Roofs and Cool Roofs Can Reduce Energy Use, Address Climate Change, and Protect Water Resources in Southern California,” if green roofs or cool roofs were installed on 50 percent of existing roof surfaces for residential, commercial, and government and public use buildings in southern California, it could save up to 1.6 million megawatt hours of electricity annually, enough energy to power more than 127,000 homes in California and save residents up to \$211 million in energy costs each year based on 2012 rates. The energy savings would cut carbon pollution by 465,000 metric tons annually.

Because green roofs absorb and evaporate rainfall, installing green roofs on 50 percent of the existing roof surfaces could reduce stormwater runoff by more than 36 billion gallons each year – enough to fill more than 54,000 Olympic-sized swimming pools – significantly reducing the volume of pollution reaching our local waters.

“The scale of these benefits is truly impressive, and justifies a much more aggressive set of policies and incentives to help advance the adoption of green roofs and cool roofs in our region,” said Cara Horowitz, the Andrew Sabin Family Foundation executive director of the Emmett Center on Climate Change and the Environment at UCLA School of Law. “If Los Angeles and other southern

California cities provided better incentives for residential and commercial building owners to install green roofs and cool roofs, we would have healthier, more sustainable neighborhoods and save money too.”

Ensuring new development projects install green and cool roofs can also provide tremendous savings. Installing green roofs and cool roofs on 50 percent of new construction and redevelopment would save up to one million megawatt-hours per year by 2035 and \$131 million in electricity costs during that time period, while cutting carbon pollution by 288,000 metric tons annually, which is the equivalent of taking more than 56,000 cars off the road each year. It would also result in a reduction of 20 billion gallons of stormwater runoff in southern California each year by 2035, significantly reducing the volume of pollution flowing to local rivers, lakes, and beaches.

Additionally, green and cool roofs can cut urban temperatures. Cities create their own heat islands—areas where surface and ambient air temperatures are higher than in surrounding undeveloped or rural land. The dark, paved surfaces in urban and suburban areas absorb and radiate heat back into the surrounding communities. These increased air temperatures worsen smog and other air pollution, and can result in increased heat-related illnesses. Installing green roofs and cool roofs across urban landscapes can help cool down neighborhoods, reducing temperatures in urban cores by as much as 3.5 degrees Fahrenheit, with air quality and human health benefits.

The report builds off of other recent research Cara has conducted on roofs and the environment, including last year’s Pritzker Brief #2, [Bright Roofs, Big City: Keeping L.A. Cool Through an Aggressive Cool-Roof Program](#), which analyzed the projected environmental benefits of cool roofs in the City of Los Angeles. The new paper expands the work from *Bright Roofs, Big City* by addressing a broader variety of alternative roofing concepts, and by analyzing the potential benefits of these roofs throughout Southern California. Both reports quantify the benefits of alternative roofs, and make policy recommendations for promoting their use. Cara’s work in this field (along with Noah’s) is making a significant contribution to our knowledge base and to our ability to create an urban environment that will consume fewer resources, address the causes and impacts of climate change, and be resilient in the face of challenges to our energy and water supply security.