Carson City Planning Division
2621 Northgate Lane, Suite 62
Carson City, Nevada 89706
(775) 887-2180
Plandiv@ci.carson-city.nv.us
www.carson-city.nv.us

MEMORANDUM

To: Historic Resources Commission **F-1**

From: Jennifer Pruitt, Principal Planner

Date: May 13, 2010

Subject: HRC-10-020
Renewable Energy Discussion

DISCUSSION:

This is a discussion only item, to evaluate the possibility of the Historic Resources Commission creating standards associated with Renewable Energy Projects in the Historic District.

Staff has assembled a packet of information that includes state law, the Carson City Municipal Code applicable sections, ITS Number 52 Incorporating Solar Panels in a Rehabilitation Project and relevant articles.

With the HRC's direction, the Planning Division staff will research and prepare draft standards related to renewable energy for the HRC's review and approval on the July 08, 2010 Historic Resources Commission meeting.

National Park Service
U.S. Department of the Interior
Technical Preservation Services

ITS Number 52

Interpreting The Secretary of the Interior's Standards for Rehabilitation

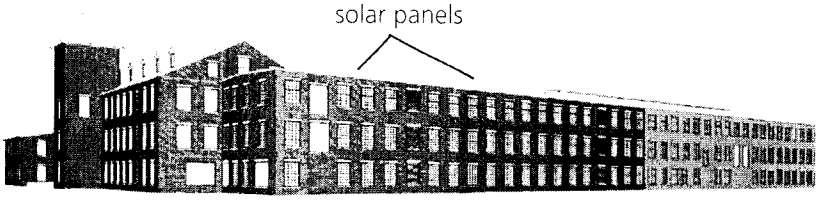
Subject: Incorporating Solar Panels in a Rehabilitation Project

Applicable Standards:
2. Retention of Historic Character
9. Compatible Additions/Exterior Alterations

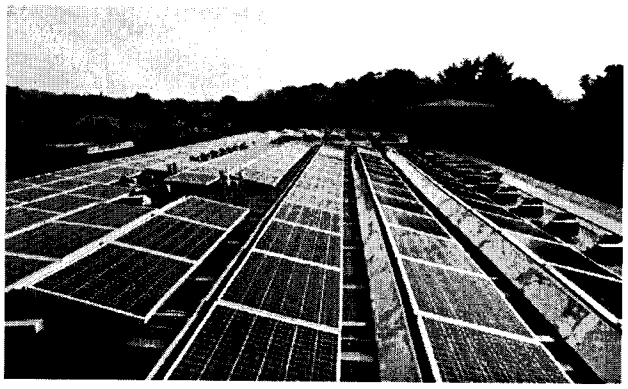
Issue: Enhancing the energy efficiency of a historic building is important. To that end, it is often possible to install features such as solar panels and photovoltaic cells provided they are installed in a sensitive manner. Because these elements must be positioned to take advantage of unobstructed sunlight, the roof of a historic structure is an obvious location. The roofline of a historic building is often a distinctive feature. Therefore, the installation of solar panels should conform to guidance regarding rooftop additions, i.e. that they be minimally visible, to avoid altering the historic character of the building. Historic buildings with a flat roof or parapet can usually accommodate solar panels because the panels will be hidden, while properties with a hipped or gabled roof are generally not good candidates for a rooftop solar installation. Solar panels on historic buildings should not be visible from the public right of way such as nearby streets, sidewalks or other public spaces.

In circumstances where solar collectors are not placed on rooftops, they should only be positioned in limited or no-visibility locations in secondary areas of the property. Vegetation or a compatible screen may also be an option to further reduce the impact of these features on a historic property. For some historic buildings, it may not be possible to incorporate solar panels and meet the Secretary of the Interior's Standards for Rehabilitation.

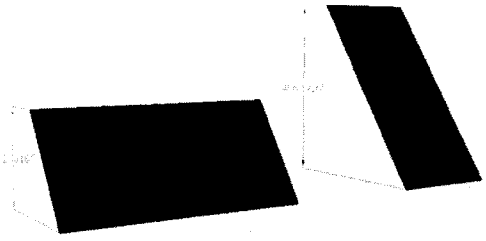
Application 1 (*Compatible treatment*): The rehabilitation of this mid-nineteenth century mill incorporated a large, roof-mounted photovoltaic installation. Although the historic building does not have a parapet wall at the roofline, the height of the building and the arrangement of the panels render the entire installation invisible from the ground. It is important to note that the panels are placed horizontally. Had the panels been installed with a vertical tilt, the angle required to maximize efficiency would have caused the panels to extend significantly higher above the roof. Simply changing the direction in which the panels are tilted can affect their visibility and reduce their impact on the character of the historic property.



Because of the size of this historic mill, a large array of solar panels could be installed on the flat roof without being seen from the ground.



Solar panels installed on the flat roof.

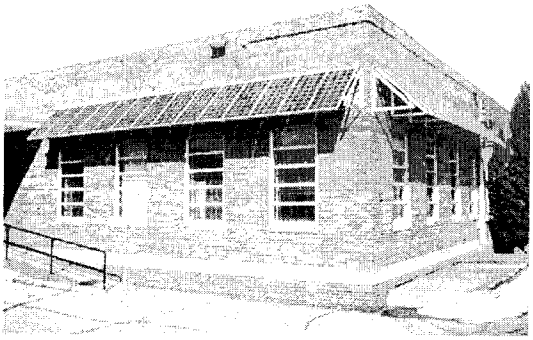


By placing the panels horizontally, the overall height of the installation and its visibility is reduced.

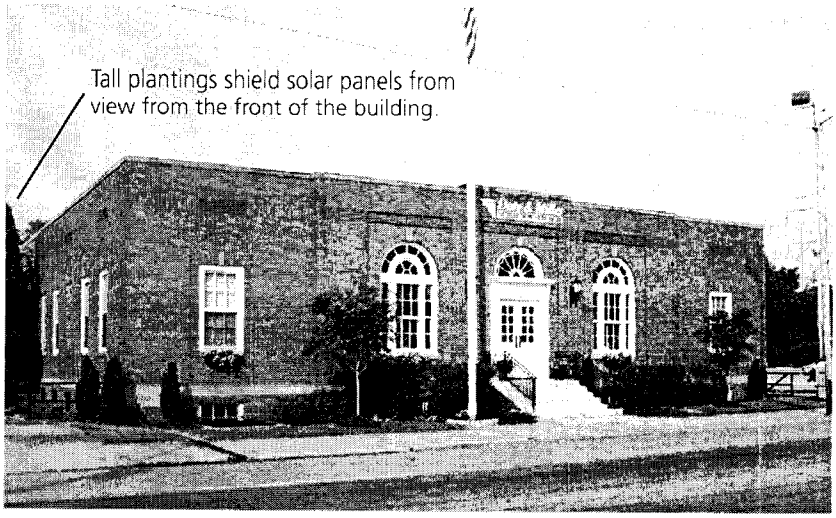
Application 2 (*Incompatible treatment*): During the rehabilitation of this late-nineteenth century commercial building, a conspicuous rooftop monitor with prominent solar panels and skylights was constructed on the one-story structure. The size and finish of this rooftop addition are incompatible with the historic character of the building. However, the building could have accommodated both skylights and solar panels if they had been installed differently. An alternative design that could have met the Standards would have included low-profile skylights and solar panels concealed behind the parapet wall.

The addition of a large rooftop monitor featuring skylights on the front slope and solar panels on the rear slope is not compatible with the historic character of this small, one-story commercial building.

Application 3 (*Compatible treatment*): The rehabilitation of this historic post office incorporated solar panels as dual-function features: generation of electricity and shading for south-facing windows. In this instance, the southern elevation of the building is also a secondary elevation with limited visibility from the public right of way. Additionally, because this area of the building is immediately next to the post office's loading dock, it has a more utilitarian character than the primary facades and, therefore, can better accommodate solar panels. Because the panels are in a suitable location at the rear of the property and are appropriately sized to serve as awnings, they do not affect the overall historic character of the property. Additionally, a screen of tall plantings shields the solar panels from view from the front of the building, further limiting their visibility.

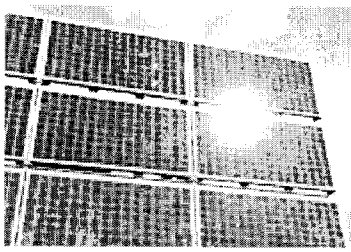


Above: Shown from the rear of the property, these solar panels serve a secondary function as awnings to shade south-facing windows. Because of their location at the back of the building immediately adjacent to a loading dock, the installation of these panels does not affect the historic character of the property.



Left: The solar panels are not visible from the front of the building. Additionally, even if the vegetation were removed, the installation would only be minimally visible along an alley at the rear of a secondary side elevation.

Jenny Parker, Technical Preservation Services, National Park Service



SOLAR AT HOME

THE TRIALS, TRIBULATIONS AND REWARDS OF GOING SOLAR

Mar 26, 2010 11:30 PM in Energy & Sustainability | 38 comments

Are old houses doomed? The conflict between historic preservation and energy efficiency

By George Musser

Editor's Note: Scientific American*'s George Musser will be chronicling his experiences installing solar panels in Solar at Home (formerly 60-Second Solar). Read his introduction here and see all posts here.*

As readers of this blog know, our family has done a huge amount to button up our Victorian-era house. Today when I hear the word "gun", I think caulk, not Glock. Our basement floor is littered with scraps of rigid foam board and drips of spray foam. But is it enough? Yesterday, listening to a panel discussion on climate change at the 2010 State of the Planet conference at Columbia University, I got the sinking feeling it's not. The U.S. needs to cut emissions by 80 percent and I doubt there's any way our house can do its part or even come close. Will old houses like ours be part of the low-carbon future? Or do they ultimately need to be torn down, leaving deep scars in our cities and towns?

My wife and I always wanted an old house. McMansions leave us cold -- although, after all the time, money, and sweat we've poured into our place, I'm beginning to see their attraction. Our efforts last year reduced air leakage by just over 10 percent, which was deflatingly meager. After more weatherizing, the house is comfier, with fewer drafts, a more uniform temperature, and a slower cooling-off rate in winter. But I still dread the day of the month when we get our heating bill.

Even our energy auditor says he's running out of ideas for easyish steps we could take. Upgrading appliances is hard to justify economically. Air-sealing the house to modern standards would mean ripping off the siding and wrapping the house from the outside. Replacing the gas boiler and steam radiators with a geothermal heat pump and forced air would run $68,800, of which state subsidies would cover about half. That estimate was the funniest thing I'd heard all day. And the sticker price wasn't the real shock. Rather, it was the fact that the system would lower our heating bill by only about a third.

Newer construction can give you a factor of 10 since it's easier to fit than retrofit. In our September 2005 issue, energy conservation pioneer Amory Lovins described his own house in Colorado. It is so superinsulated that it never needed central heat. In December I visited 41 Cooper Square, a LEED-certified classroom and laboratory building at Cooper Union, and was astounded by the sheer number of green features and design principles that are simply impossible to incorporate in any building after the fact.

In an essay last year, preservationist Sally Zimmerman of Historic New England argued that the demands of energy conservation threaten old houses. She cited one retrofit near Boston that cost $100,000. It had to be done with extreme care since old houses were designed to breathe, and reducing their air circulation can cause moisture buildup and mold growth. The homeowner has a fascinating blog that makes you realize how intimidating the endeavor is. Zimmerman wrote: "Perhaps the most likely outcome of a large-scale push toward deep-energy retrofits of older, less well-maintained homes is an increase in whole-house teardowns as owners and developers weigh the costs of new construction against these modifications."

I asked Lovins whether my house is hopeless and he reassured me it isn't. Having worked with him in the past, I know he's not a man to sugarcoat things, so if he says my house is salvageable, I tend to believe him in spite of my worries otherwise. In general, he says it should be feasible to cut an old house's energy use by a factor of two to four. His group, Rocky Mountain Institute, helped to retrofit a building for which historic preservation was paramount: 1600 Pennsylvania Avenue. True, cost wasn't much of an object. But Lovins says that new technologies and techniques are coming within everyone's reach. For instance, Serious Materials is working on an adaptive window glazing whose infrared emissivity would vary with temperature -- keeping in heat during the winter, keeping it out

during the summer.

As if my opposite numbers at *New Scientist* magazine had read my mind, they published an article today on how old houses not only can be saved, but have to be. It would take decades to turn over an entire nation's housing stock, and the rebuilding would itself consume energy. The article mentioned a promising new technology for retrofits: Spacetherm, an insulation panel with more than twice the insulation value of ordinary rigid foam boards.

Here are some other tips I've gathered:

- **Guiltlessly avail yourself of government subsidies.** Many respondents to my blog have complained that taxpayers shouldn't pay for energy retrofits or solar panels. I disagree. In addition to stimulating the economy, which benefits us all, subsidies correct a market failure: retrofits and renewables do pay for themselves, but many homeowners can't float the cost in the meantime. So the subsidies should be seen as an investment that we taxpayers will eventually recoup. President Obama's proposed HomeStar program would provide juicily large tax credits for weatherizing. Those who still have an aversion to subsidies can consider commerical alternatives such as solar-leasing programs and Property Assessed Clean Energy bonds, which, in effect, spread the cost of energy improvements over successive owners of a house.

- **Old houses can teach new tricks.** Not everything about old houses is un-green. Many of them were built with better materials and greater attention to natural air circulation. Our house's tin roof not only has survived one and a half centuries, but is better than most modern roofs at reflecting unwanted solar heat. Restored and coated white, it kept our house cool enough last summer that we didn't need to run our air-conditioners even a single minute.

- **Plug air leaks first.** Our energy auditor impressed on us that air infiltration is the single biggest energy sink, and James Brew, an architect at Rocky Mountain, agrees: "You are proper in addressing air leakage as a first priority in these vintage homes -- most assume it's insulation (slowing heat conduction), but the largest energy drain is infiltration and ex-filtration. With a very thorough approach to this, and your added insulation work, you should be able to reach a place where your actual peak demand is reduced enough to begin evaluating equipment sizing."

- **Preservationists need to take the long view.** Friends of ours wanted to install solar panels on their roof, but our town's historic preservation commission blocked them, saying the panels (unlike ours) would have been visible from the street. I admire the impulse: so much of our country's architectural heritage has been lost already. But if old houses can't be brought up to modern standards, their very survival is at stake. Saving them may mean bending preservation standards. Peter Troast of Energy Circle, a startup company that offers advice and sells products to reduce home energy use, recently

suggested that historic preservation guidelines could slow or stop the retrofits of millions of homes. "A hard line position that the exterior building envelope of historic structures can't be touched means they can never achieve deep energy reductions," he wrote. "That would effectively condemn our aging buildings to hospice."

I'd love to hear other people's experiences with retrofits and advice for what I can do to wring out more savings from my house.

George's home, courtesy of him

You Might Also Like

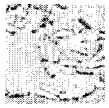

Over the Top: Data Show "Green" Roofs Could Cool Urban Heat Islands and Boost Water Conservation


The Persistent Prophet--Lester Brown's New-Found Optimism


Can Alternative Energy Save the Economy and the Climate?


Energizing Energy: How the Stimulus Bill Has Ignited Innovation in the Renewables Sector--A Q&A


Giving the Power Grid Some Backbone


Plastic Not-So-Fantastic: How the Versatile Material Harms the Environment and Human Health


A Plan to Power 100 Percent of the Planet with Renewables


Utility to Build First Power Plant with Greenhouse Gas Emissions Limits in California

Discuss This Article

Senate Bill No. 114–Senator Schneider

CHAPTER.....

AN ACT relating to energy; requiring the Director of the Office of Energy to make certain determinations relating to systems for obtaining solar energy; prohibiting certain restrictions on the use of systems for obtaining solar energy or wind energy; and providing other matters properly relating thereto.

Legislative Counsel's Digest:

Existing law sets forth a prohibition against covenants, restrictions or conditions contained in deeds, contracts or other legal documents which prohibit or unreasonably restrict an owner of property from using a system for obtaining solar energy on his property. (NRS 111.239, 278.0208) **Sections 2 and 3** of this bill include within the prohibition any such covenant, restriction or condition which has the effect of prohibiting or unreasonably restricting the property owner from using a solar energy system. **Sections 2 and 3** also describe an unreasonable restriction on the use of a system for obtaining solar energy as including: (1) the placing of a restriction or requirement that decreases the efficiency or performance of a system for obtaining solar energy by more than 10 percent of the amount that was originally specified for the system, as determined by the Director of the Office of Energy; and (2) the prohibition of a system for obtaining solar energy that uses components painted with black solar glazing.

Section 1 of this bill requires the Director, if requested to make a determination concerning the efficiency or performance of a system for obtaining solar energy pursuant to **section 2 or 3**, to make the determination within 30 days after receiving the request. If the Director needs additional information to make the determination, **section 1** authorizes the Director to request that information from the person requesting the determination and requires the Director to make the determination within 15 days after receiving the additional information.

Sections 1.5 and 2.5 of this bill set forth a prohibition against covenants, restrictions or conditions contained in deeds, contracts or other legal documents, and against local ordinances, regulations or plans, which prohibit or unreasonably restrict an owner of property from using a system for obtaining wind energy on his property. **Sections 1.5 and 2.5** describe an unreasonable restriction on the use of a system for obtaining wind energy as the placing of a restriction or requirement on the use of a system for obtaining wind energy which significantly decreases the efficiency or performance of the system and which does not allow for the use of an alternative system at a substantially comparable cost and with substantially comparable efficiency and performance. **Sections 1.5 and 2.5** do not prohibit reasonable restrictions: (1) imposed pursuant to a determination by the Federal Aviation Administration that the installation of the system for obtaining wind energy would create a hazard to air navigation; or (2) relating to the height, noise or safety of a system for obtaining wind energy.

THE PEOPLE OF THE STATE OF NEVADA, REPRESENTED IN SENATE AND ASSEMBLY, DO ENACT AS FOLLOWS:

Section 1. NRS 701.180 is hereby amended to read as follows:

701.180 The Director shall:

1. Acquire and analyze information relating to energy and to the supply, demand and conservation of its sources.

2. Utilize all available public and private means to provide information to the public about problems relating to energy and to explain how conservation of energy and its sources may be accomplished.

3. Review and evaluate information which identifies trends and permits forecasting of the energy available to the State. Such forecasts must include estimates on:

(a) The level of demand for energy in the State for 5-, 10- and 20-year periods;

(b) The amount of energy available to meet each level of demand;

(c) The probable implications of the forecast on the demand and supply of energy; and

(d) The sources of renewable energy and other alternative sources of energy which are available and their possible effects.

4. Study means of reducing wasteful, inefficient, unnecessary or uneconomical uses of energy and encourage the maximum utilization of existing sources of energy in the State.

5. Encourage the development of:

(a) Any sources of renewable energy and any other energy projects which will benefit the State; and

(b) Any measures which conserve or reduce the demand for energy or which result in more efficient use of energy.

6. In conjunction with the Desert Research Institute, review policies relating to the research and development of the State's geothermal resources and make recommendations to the appropriate state and federal agencies for establishing methods of developing the geothermal resources within the State.

7. Solicit and serve as the point of contact for grants and other money from the Federal Government and other sources to promote:

(a) Energy projects that enhance the economic development of the State;

(b) The use of renewable energy; and

(c) The use of measures which conserve or reduce the demand for energy or which result in more efficient use of energy.

8. Coordinate the activities and programs of the Office of Energy with the activities and programs of the Task Force, the Consumer's Advocate and the Public Utilities Commission of Nevada and other federal, state and local officers and agencies that promote, fund, administer or operate activities and programs related to the use of renewable energy and the use of measures which