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## The roofing of government

By **TIM KAUFFMAN**

April 28, 2009

Atop the seven-story Interior Department headquarters building in Washington, a 5,000-square-foot garden patch is helping to save the environment.

Tiny sedums dot the landscaped rectangle, which takes up half of one of the six wings that make up the New Deal-era building. Completed in December, it's one of the few green roofs topping federal buildings in D.C. and beyond.

But that's about to change.

Billions of dollars in stimulus funds are beginning to flow to federal agencies for building and energy projects, and some of that money will be used to replace or retrofit hundreds of federal rooftops with environmentally preferable alternatives.

The General Services Administration, which owns and manages more than 1,500 federal buildings nationwide, intends to use some of the \$4.5 billion it received to green federal buildings for roof replacements. So does the Pentagon, which received \$7.4 billion in stimulus funds for upgrading and maintaining military facilities.

"They're looking at all of the things they've never had money for and trying to tie that in to a sustainable, environmentally sound decision process," said Timothy Kehrl, director of government sales for Solar Integrated in Cerritos, Calif., which markets a roofing system that integrates solar panels and insulated roofs.

The combination of stimulus funds and green building requirements could translate into millions of square feet of federal roofs being outfitted with either vegetative roofs or solar-powered systems, Kehrl said.

"The federal government replaces building roofs every 15 years on average. If you take the total amount of federal roofing and just take one-fifteenth of that, it's millions of square feet," he said.

It's a good investment, said Michael Cyr, the Interior official who spearheaded development of the department's green roof.

A vegetative roof — such as those at Interior as well as the headquarters buildings of the [Census Bureau](#) and [National Oceanic and Atmospheric Administration](#) in Suitland, Md. — has both environmental and economic benefits. It can double or even triple the life of a roof, reduce the heat island effect that warms buildings during the summer months, and mitigate the effects of carbon emissions in the atmosphere — all the while saving the government energy and maintenance costs.

But perhaps the biggest benefit of a green roof is the ability to manage storm water runoff, which is a significant issue in Washington, Cyr said. During heavy rains, water that hits impervious surfaces such as buildings, roads and parking lots flows into city drains. The city's sewer system is unable to handle the excess water and ends up overflowing, releasing more than 1 billion gallons of raw sewage into surrounding rivers each year, he said.

"The green roof reduces rainfall runoff impact. It not only absorbs the water but it also prevents runoff. It filters it," said Cyr, division chief for facilities management services at Interior.

Interior's 4-inch-thick green roof will retain up to seven-tenths of an inch of rainfall, enough to retain 93 percent of the water from all storm events in Washington, Cyr said.

Interior's patch of green roof cost \$228,000 and was paid for with proceeds from department-wide recycling efforts. The agency is petitioning GSA to use some of its stimulus funds to extend the green roof across the entire surface area of the Interior building, which is about 100,000 square feet.

"I think it's been a huge success," Cyr said. "It's demonstrated that this kind of project could work on a historic building."

GSA is looking at three options for replacing federal building roofs: solar roof panels, vegetative roofs or insulated roofs that repel heat.

GSA's first preference is a technology called building integrated photovoltaic roof membranes, in which thin films of solar panels are laminated onto insulated roofs. Unlike the familiar solar panels that are installed on top of roofs, the integrated membranes combine both a new roof and a solar system, which ensures that the solar component doesn't degrade the quality of the roof.

The integrated systems, which came online about five years ago, have been installed on a handful of federal facilities to date. One of the largest tops the 143,000-square-foot National Archives and Records

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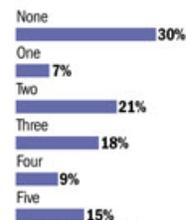
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Administration storage facility in Waltham, Mass.

The 375-kilowatt system generates nearly half of the building's power, said Kehrli of Solar Integrated, which installed the system two years ago.

Solar Integrated also has installed systems at seven military bases since 2005 and was awarded contracts in March for roofing systems at two others: the Naval Station in Guam and the Marine Corps Air Station in Yuma, Ariz.

Kehrli said integrating photovoltaic systems onto building roofs is more feasible and less expensive than installing vast solar arrays on empty land, since the infrastructure for distributing the solar power already exists.

"GSA and DoD have recognized if they use their existing rooftops, they're not having to make a choice about giving up the land to do something else on," he said.

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