

# Sunny Predictions

*written by*  
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With solar power and hot water more cost-effective than ever, the future is bright for energy-efficient apartment buildings.





If you looked only at national news coverage, you could get the wrong idea about solar energy. With a brewing solar trade war between the U.S. and China, and the bankrupt solar company Solyndra being treated like a political football in Washington, you might conclude that solar's sunniest days were behind it. Yet the facts on the ground tell a different story. Here in San Francisco (and across the country) solar energy, quite simply, is booming. The amount of solar energy produced in San Francisco has more than doubled in the last three years alone, and has increased by more than 700% in the last six years.

There are numerous reasons for this bounty of solar energy. For starters, solar energy is more affordable than ever. In fact, the cost of installing solar in 2012 was half of what it was in 2002, and the prevalence of new financing methods that require little or no money up front are making solar energy even more accessible. In addition, as solar energy has become mainstream, more property owners are learning that solar not only helps the environment but can also save them money. Finally, important public policies and programs continue to open new opportunities to take advantage of solar.

In 2012, there were two important changes to policies and programs that should make solar energy at apartment buildings in San Francisco even more attractive. One change involves rules for sharing solar electricity at multifamily buildings; the other involves newly increased rebates for solar water-heating systems.

### **Sharing Solar**

Historically, installing solar photovoltaic panels at multifamily buildings has been challenging because the electricity produced only benefited the customer to whose electricity meter the solar system was directly wired. Practically, this meant that most multitenant building owners who installed solar

power put in smaller systems and connected them to serve only the common area electricity load. In some instances, landlords split up the solar panels, wiring them to separate apartments, effectively installing multiple solar systems on a single roof. Of course, that added costs and forever tied the solar energy to those particular apartments.

Since 2009, there has been an exception for affordable housing properties. Under a program known as virtual net metering (VNM), affordable housing properties were allowed to credit the electricity produced by a single solar system to the electricity bills of individual tenants. Welcome news came in June 2012 when, after a ruling from the California Public Utilities Commission, Pacific Gas & Electric finalized new rules allowing use of VNM at *all* individually metered multifamily buildings served by a single "service delivery point." (A "service delivery point" is where PG&E's wires end and a customer's electrical system begins.)

These new rules are a significant boon to multifamily apartment building owners who are interested in providing solar energy as a service to their tenants. Landlords simply provide PG&E with a list of tenants, including PG&E account numbers, and indicate the percentage of the solar system's total output that each tenant should be credited for on their bill. The Robinson family in apartment 2 might sign up for 15%, the Garcias in apartment 5 for 10%, and so on. Then, at the end of the month, each family's electricity usage (kWh) is offset by its share of solar energy, reducing the family's electricity bill. If a family receives more solar energy than is used in a given month, it receives a credit for the value of the difference. That credit is applied to another month's bill.

One benefit of this arrangement is that landlords can determine on their own what to charge tenants for the benefit of providing them with solar energy. For example, a tenant might agree to pay an



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extra \$100 per month to the landlord for a 20% share in the building's solar output. And unlike a solar system hard-wired to an apartment, the shares can be rearranged if a tenant moves out or decides she no longer wants the benefit of solar energy.

Because VNM for market-rate multi family housing is new, it may require a more hands-on approach from landlords to work through details with PG&E and their solar installer. Nonetheless, it is a great tool for property owners who want to add a valuable service for their tenants.

### Solar Thermal Heats Up

When most people think of solar energy, they think of solar panels that produce electricity. However, that's only half of the picture. Another type of solar technology is solar thermal, which directly uses the sun's energy to pre-heat water. These systems collect heat from the sun and transfer it, via water or another liquid, to a hot water storage tank. A building's conventional water heater then draws the pre-heated water out of storage—and boosts the temperature only if necessary—when there is a demand for hot water in the building. Solar water heating systems are a simple and reliable technology used around the world, and can typically reduce natural gas demand for water heating by 60% to 70% annually.

Solar water heating is an especially great fit for apartment building owners because so many multitenant buildings are served by a single hot water heater or boiler, unlike electricity which is more often metered to each individual apartment. In addition, solar thermal panels produce four to five times as much energy as solar photovoltaic panels of equal size. This is an important consideration for apartment buildings that want to maximize solar energy production on a small roof.

The good news is that the California Public Utilities Commission voted to increase rebates for installing solar water heating systems, making the financial benefits of using solar thermal even better. The California Solar Initiative bases its rebates



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on the number of therms of natural gas a system is expected to save annually. (The program also has rebates for buildings that use electricity to heat water.) The program now gives rebates of \$14.53 per therm of natural gas at market-rate multifamily properties and \$19.23 at low-income multifamily properties. These rebates knock off 30% and 40%, respectively, of the total installed cost. In addition to the state rebates, solar water-heating technologies are eligible for a 30% federal tax credit. Together, these financial incentives can dramatically increase the financial return on solar water heating systems.

Anyone interested in creating a quick estimate of the energy output and financial payback on a solar water heating system can visit the San Francisco

### SOLAR SAMPLES

Sometimes it's hard to understand the value of solar without concrete examples. So, let's say the owner of a 45-unit apartment building installs a 15 kW solar photovoltaic system that produces 24,000 kWh of electricity per year. The system costs \$90,000 to install, but with \$10,000 in local GoSolarSF incentives, \$3,000 in state incentives and \$24,000 in federal tax benefits (tax credit and accelerated depreciation), the net cost is \$53,000. The owner then sells percentage shares to tenants, earning income each month to offset the cost of the system.

Now, let's say the owner of a 24-unit apartment building installs 10 solar water heating collectors that reduce the building's natural gas bill by 1,400 therms annually. The system costs \$56,000 to install, but with \$20,000 in state rebates, plus another \$20,000 in federal tax benefits (tax credit and accelerated depreciation), the owner effectively pays \$16,000 to install the system. The system becomes cash positive after 12 years and earns a 6% internal rate of return over its expected 25 years of production.

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Department of the Environment's solar water heating calculator at [tinyurl.com/solarwatercalculator](http://tinyurl.com/solarwatercalculator).

### Here to Help

At the end of 2012, San Francisco had 3,500 solar photovoltaic systems installed across the city, producing enough electricity each year to power 7,000 San Francisco households. On top of that, there were about 400 solar water heating systems saving people money as well.

To date, most solar systems have been installed on single-family homes, even though more than two-thirds of San Francisco's residential units are in multifamily buildings. Fortunately, developments in virtual net metering, increased incentives for solar water heating and falling prices for solar photovoltaics should all make solar energy a more attractive investment for multitenant apartment building owners in the year to come.

As you consider adding solar to your buildings in 2013, remember that the San Francisco Department of the Environment is here to support you. Department staff can provide information on available incentives, financing options and certified installers. In addition, we can even help by evaluating the solar potential of your building. A good first step is to visit the SF Energy Map, [www.sfenergymap.org](http://www.sfenergymap.org), to look up the solar potential of any rooftop in the city and evaluate the economics of using solar at that site.

In addition to adding solar to your building, consider other energy-efficiency measures to save money. Learn more about the Department of the Environment's energy-efficiency services at [www.sfenergywatch.org](http://www.sfenergywatch.org). May 2013 be San Francisco's best year yet for solar energy.

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