

Solar water heating for businesses



Together, Building
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Small and medium-sized businesses are always looking to increase efficiencies and reduce costs. However, many business owners and managers don't realize how much of their energy cost goes toward heating water. That's why solar water heating can be a smart consideration for some California businesses.

Solar water heating systems are an affordable and effective way to supplement existing, conventional water heating systems. They allow small and medium-sized businesses to reduce monthly energy costs and protect against expenses associated with natural gas shortages and price increases. On average, if you install a solar water heater, your cost to heat water can be reduced by 50 to 80 percent.¹

In addition, solar water heating systems provide long-term dividends. They are highly reliable, lasting up to 25 years, and require very little maintenance to function properly.

This guide was developed by PG&E to help demystify solar water heating for California businesses across a wide range of industries. It also provides essential information and resources that can help you finance solar water heating, including rebates, a federal tax credit and financing options.

In this guide, you'll learn:

- What types of businesses solar water heating is right for
- How these systems work
- How to successfully finance and implement solar water heating
- How to find and work with a qualified contractor

¹Pacific Gas and Electric Company, What You Need to Know About Solar Water Heating, [pge.com/en/mybusiness/save/solar/waterheating/faq.page](https://www.pge.com/en/mybusiness/save/solar/waterheating/faq.page)

Here are some additional factors to consider when evaluating your business's suitability for solar water heating.

Sun exposure: If your building has southern or southwestern exposure to the sun, you should be able to optimize the performance of a solar water heating system.

Temperature range: If the temperatures in your area dip below freezing, it's important to consider a system that provides freeze protection.

Solar collector space: The roof is the optimal location for solar collectors. However, if there isn't enough space or the roof is the wrong pitch, you can still install the system on the ground if the location receives sufficient sunlight.

Storage tank space: There must be sufficient room for an additional storage tank to hold water that's heated by the solar water heating system.

Reliability and durability: Solar water heating systems can last up to 25 years and require very little maintenance to function properly.

Is solar water heating right for your business?

Solar water heating works for virtually any business that uses hot water. However, these systems are most beneficial for businesses that use a **substantial** amount of hot water.

Businesses that depend upon hot water for essential applications can realize significant savings by installing solar water heating. These applications include:

- Manufacturing and production
- Restaurant and food service
- Heating and cooling buildings
- Industrial processing heat
- Laundering
- Dishwashing and sanitization
- Heating swimming pools

HELPFUL TIP



Smart first step:

Before installing a solar water heater, you can drive down the size and cost of the system by reducing your business's overall hot water consumption. This can be achieved through energy efficiency upgrades and measures.

To learn more, visit pge.com/drought.



How solar water heating systems work

Solar water heating systems work with your current water heater or boiler to preheat water for any application that requires hot water.

Hot water from solar water heating systems can also be used for space heating and cooling. Active solar space heating systems collect and absorb solar energy and use electric fans or pumps to transfer and distribute heat. This can dramatically reduce costs. Solar absorption cooling uses solar-heated water to drive an air conditioner. Solar desiccant cooling removes moisture from the air to decrease the relative humidity.

Here's an example of how one type of solar water heating system works.

1. A pump circulates a heat transfer liquid from the tank to the roof.
2. Solar collectors absorb the sun's thermal energy and heat the transfer liquid.
3. The transfer liquid enters a heat exchanger, warming the water in the storage tank.
4. When there's a demand, hot water flows to your existing boiler or water heater, which provides backup heating when needed.
5. Using the sun to heat water reduces the amount of energy your conventional water heater or boiler uses and increases cost efficiency.

SOLAR WATER HEATING CASE STUDY



Petaluma Clover Stornetta

What they did

Plant Operations installed 20 Cogenra Thermal/PV collectors, offsetting a portion of both their natural gas and electricity demand.

How much they saved*

\$25,355

CSI-THERMAL INCENTIVE

1,745 therms

ANNUAL GAS SAVED

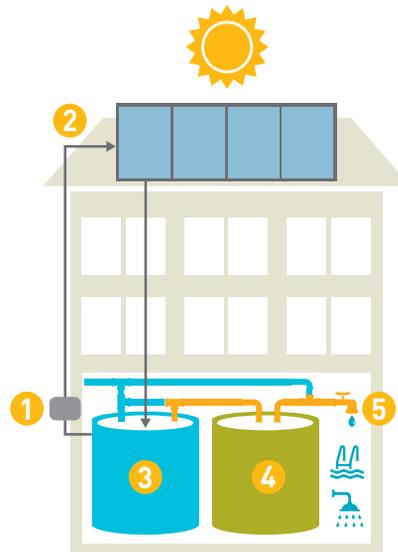
20,400 pounds

ANNUAL REDUCTION IN
CARBON EMISSIONS

*Estimated results derived from a simulation and through the on-site inspection of the completed system in 2013

“To keep our equipment clean and to process our milk, we use a significant amount of hot water every day. So anything we can do to generate hot water without using fossil fuels helps us to achieve our goals of sustainability.”

Michael Benedetti
Director of Plant Operations,
Clover Stornetta





How to finance solar water heating

California businesses are discovering that this is an optimal time to invest in a solar water heating system. That's because there are new, higher rebates and the federal tax credit is still available to help businesses finance their projects and optimize their efficiency. Here's an overview of these options:

Rebates

PG&E's California Solar Initiative (CSI) Thermal Program offers rebates of **up to \$800,000*** for installing a solar water heating system on a commercial or multi-family property. These rebates are available to PG&E customers who heat their water with natural gas.

The rebate amount is based on the size and performance of the solar water heating system, which determines how much natural gas or "therms" the system is expected to save annually.** In short, the more water a business heats using the solar water heating system, the larger the rebate can be.

The installation contractor is usually responsible for determining the rebate amount and submitting the rebate application. You'll find more information about working with solar water heating contractors on page 10.

The program is scheduled to end on December 31, 2017 and rebate amounts will decrease as participation in the program increases. The earlier you apply for a rebate for your business, the more you will be eligible to receive.

*Final rebate amount will be based on the estimated savings as determined by the contractor.

**Must currently heat water with a natural gas water heater or boiler. PG&E customers who heat their water with electricity or propane are not eligible.



SOLAR WATER HEATING CASE STUDY



Advanced Linen Service

What they did

The business worked closely with experts from the Solar Manufacturing Group and PG&E to harness renewable energy by installing a solar water heating system and participating in the rebate program.

How much they saved

\$354,859

PG&E REBATE

2.3 years

ESTIMATED PAYBACK PERIOD

17,576 therms

ANNUAL GAS SAVED

205,444 pounds

ANNUAL REDUCTION IN CARBON EMISSIONS

16 cars

EQUIVALENT CARS REMOVED FROM
ROADS FOR ONE YEAR

“We are a small business that looks at the big picture. Saving on carbon emissions today makes us a good neighbor, and we hope all of our energy efficient decisions going forward will contribute to the future for everyone.”

Gordon Hickman
co-owner and president,
Advanced Linen Service

Tax credits

A 30 percent federal tax credit may be available on the installed cost of a solar water heating system.

It's very important to take into consideration the length of time the installation process will take. Please note that the tax credit will be reduced after 2019. Be sure to discuss the federal tax credit with your solar water heating contractor and tax professional.

Financing

There are many ways to help finance the installation of a solar water heating system, including:

Loans: Financing via loans is obtained **through financial institutions and other third parties** offering up to 100 percent financing with varying payback periods and interest rates. Be aware that loans generally require a credit check and analysis, which involves a detailed and time-consuming underwriting process.

Leases: Financing via leasing is usually obtained **through the solar water heating contractor and their partners**. They offer up to 100 percent financing via capital or operating lease with varying payback periods and interest rates.

PACE (Property Assessed Clean Energy):

This is a financing loan obtained **through your local government**. It offers up to 100 percent financing and is off the balance sheet. PACE financing has varying payback periods and interest rates and repayment are tied to the property itself. PACE provides financing that is usually repaid as a property tax assessment.



SOLAR WATER HEATING CASE STUDY



Pleasanton Cheesecake Factory

What they did

They installed an active closed loop solar water heating system with rooftop solar collectors and an 800-gallon water storage tank.

How much they saved

\$47,485

PG&E INCENTIVE

3,704 therms

ANNUAL GAS SAVED

43,337 pounds

ANNUAL REDUCTION IN
CARBON EMISSIONS

*Represents results between 2009 and 2011

Understanding the financial details

Cost and payback

Here are two facts you should know about cost and payback. On average, if you install a solar water heater, your cost to heat water can be **reduced by 50 to 80 percent*** and with the new, higher rebate and tax credit, your payback can be as brief as a few years.

The cost of the system itself and how much you save depend on several factors:

- 1. Use:** The amount of hot water your business uses
- 2. System:** The type and size of the solar water heating system you select
- 3. Location:** Your business's geographic location and ability to capture the sun
- 4. Price:** The price of natural gas

A solar water heating contractor can help you get a better sense of cost and savings. The contractor will work with you to assess your hot water needs, design a system and calculate your rebate, tax credit and return on investment, as well as help you determine the best financing option.

“Our PG&E service representative and our contact at the PG&E Food Service Technology Center offered a wealth of knowledge and valuable resources. We always got helpful answers.”

Ed Bashay
Senior Energy Manager,
Cheesecake Factory

*Based on nationwide averages and may vary in California



Selecting and working with a contractor

Choosing the right contractor is one of the most important decisions for any project. Here are some of the considerations your business should know to help you select and work with a contractor to install solar water heating.

Finding an eligible contractor

The California Solar Initiative (CSI) Thermal Program has a database that allows businesses to search contractors by ZIP code. The database also allows you to filter results by the number of projects completed by the contractor or by distance to the location entered.

Here are some basic tips that will help you make an informed decision when choosing a contractor:

- **Interview** a minimum of three eligible contractors
- **Request references** from previous customers
- **Obtain written bids** from each contractor
- Make sure all bids are **based on the same type of system** and include a system warranty

HELPFUL TIP



Check the license

A contractor must hold an A, B, C-4, C36 or C46 license.

Verify that the contractor's business license is current and active at [cslb.ca.gov](https://www.cslb.ca.gov).



Making your choice

Choose a contractor based on the following factors:

- **Experience:** Years working in the business
- **Referrals:** Previous customer referrals
- **Bid:** Price for the project, though the lowest cost may not always be the best
- **Safeguards:** Make sure the contract includes the warranty on equipment and workmanship

Understanding the role of your contractor

Before work begins, it's important to know the role your contractor will have. Your contractor will usually be responsible for:

- **Ensuring** you complete an energy efficiency audit
- **Submitting** your rebate application to reserve incentive funds
- **Securing** the necessary permits
- **Installing** your solar water heating system properly
- **Requesting** the rebate payment when the installation is complete

Solar water heating:
A money and energy saving solution for a better bottom line.

Visit pge.com/findsolarcontractor to find a contractor in your area and get started.

Solar Water Heating Bid Comparison Form



Use this form when soliciting installation bids for your new Solar Water Heating system.

Find a contractor

Contractors are your key to getting the best information about Solar Water Heating technology and the system size that is right for your home or business. There is no obligation when getting a bid and it should provide estimated savings and expected costs. Follow these three easy steps to get started.

- Visit pge.com/findsolarcontractor for a map of qualified contractors in your area.
- Verify your chosen contractors have an active A, B, C-4, C-36 or C-46 contractor's license by visiting the Contractor State License Board website at cslb.ca.gov. You can also find information and tips about working with contractors on the CSLB website.
- During the contractor's initial visit, ask to see photo identification to verify their identity. If they are a contractor, you can also ask to see a copy of their CSLB pocket license, and sales representatives should carry their Home Improvement Salesperson registration card.

Choosing a bid

By utilizing this bid comparison form, you should be able to compare the total projected energy savings of the system along with the net cost of the system.

Take caution against automatically selecting the lowest bid and make sure to check the references for the contractor before making your final selection.

Signing a contract

A few key items to remember as you enter into the agreement:

- **Read the entire document carefully**—make sure you understand everything (costs, warranties, maintenance agreements).
- **Ensure all project details are in writing**—do not accept any verbal promises or quotes.
- **You should never pay more than \$1000 or 10 percent** of the contract price (whichever is less) for a down payment under California State Law.

	Item number (See descriptions on back)	Bid #1	Bid #2	Bid #3
System Description	1. Company Name			
	2. License Number			
	3. Solar Fraction			
	4. System Size in Collector Area Square Feet and Storage Volume (storage requirement)			
System Cost	5. Base System Cost			
	6. All "Adders"			
	7. Monitoring Cost (if applicable)			
	8. Estimated Permit Fees			
	9. Total Cost			
	10. Financial Rebates, Incentives and Tax Credits			
	11. Final Cost			
Other Factors	12. Expected Annual Energy Savings			
	13. Contractor Financing Options (if applicable)			
	14. Warranty Timeframe			

Item descriptions

1. **Company Name:** Name of the solar contractor who gives you the bid for the purchase and installation of the solar system.
2. **License Number:** Issued by the Contractor State License Board (CSLB). Confirm the information about the contractor or sales representative at cslb.ca.gov or 1-800-321-2752.
3. **Solar Fraction:** The solar fraction is the percentage of annual hot water provided by the solar water heating system.
4. **System Size in Collector Area Square Feet and Storage Volume (Storage Requirement):** Solar water heating systems come in different sizes. Contractors should determine the appropriate collector area and storage to meet 90 to 100 percent of your summer domestic hot water usage. The collector area is the panel area of the solar water heating system that is exposed to the sun and the storage volume is the amount of gallons your solar storage tank can hold.
5. **Base System Cost:** Some companies have a base system cost and then will add charges. Others will simply list total cost. Make sure you are clear on how the costs are listed and what those costs include.
6. **All "Adders":** Adders are extra charges for items such as roof costs and piping. Be clear on whether these have already been included in your bid, if applicable.
7. **Monitoring Cost (if applicable):** Monitoring provides the ability to view the system's production online (at an extra cost.) This may or may not be included in your bid.
8. **Estimated Permit Fees:** Permit fees should not vary between contractors. Each city or county jurisdiction sets their own permit charges.
9. **Total Cost:** This refers to the total price of the project, including materials, labor, taxes and any additional charges you have agreed to in the contract.
10. **Financial Rebates, Incentives or Tax Credits:** This should reflect deduction of any relevant financial rebates or incentives (local or state) and tax credits (state or federal), if applicable.
11. **Final Cost (After Rebates, Tax Credits):** This refers to your out-of-pocket costs, after all applicable rebates and credits have been deducted. Make sure the contractor is passing down these savings to you.
12. **Expected Annual Energy Savings:** The system will displace a certain amount of annual Therms or kWh's. Contractors should provide residential customers the energy savings from a system certified by the Solar Rating and Certification Corporation or the International Association of Plumbing and Mechanical Officials.
13. **Contractor Financing Options (if applicable):** Some contractors may offer financing methods, such as system leasing. If this is of interest to you, inquire with the contractor before soliciting a bid.
14. **Warranty Timeframe:** In order to qualify for the California Solar Initiative (CSI)-Thermal Program rebate, the system must come with:
 - A minimum ten-year warranty on the solar collectors.
 - 1-year warranty on installation labor and workmanship not otherwise covered by the manufacturer's performance warranty.
 - 10-year performance warranty to protect the purchaser against more than a 15 percent degradation of system performance over the 10-year period that may occur as a result of faulty installation.

For more information

To learn more about solar water heating and the available rebate, visit the following:

Residential: pge.com/solarwaterheating
Business: pge.com/solarhotwater

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This form is intended to be informational only. The California investor-owned utilities and Program Administrators do not guarantee the quality or performance of any contractor and are not responsible for any goods or services selected. Please see the most recent version of the CSI-Thermal Program Handbook for the most up-to-date information at www.csithermal.com. The CSI-Thermal Program is funded by California investor-owned utility customers and is administered by regional Program Administrators under the auspices of the California Public Utilities Commission.

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