



# Accelerating Alternative Energy Adoption

## Municipal PV Systems Summary

Total City PV production is estimated at roughly 200,000 kWh/yr, offsetting approximately 150 MTCO<sub>2</sub>e/yr.

### Senior Center

Completed LEED Gold certified Net Zero expansion project, including a 25kW solar photovoltaic system.

### NIX

Met LEED Certified Gold Standards with construction of the new NIX office building, including installing solar panels and using tubular skylights to increase natural lighting. The office building has a 6kW PV system and the shop has an 20 kW system.

### Museum of Discovery

Installed a 36kW photovoltaic collection system.

### Water Treatment Plant

Has an onsite photovoltaic generation system that produces 100kW.

### 215 N. Mason St.

Has a 5kW photovoltaic system.

### Aztlan Center

Has a 54 kW rooftop system.

## Highlights

- 6.4% total renewable energy (6.2% from wind resources and 0.2% from local solar). Hydro resources provided 18.3% for a total non-carbon emitting portfolio of 24.7% in 2014.
- 2015 citywide PV additions totaling 483 kW residential and 4,278 kW commercial for a total installed capacity in the community of 7,428 kW
- The Riverside Community Solar Project was completed in July 2015.

## Solar Programs

Fort Collins is leading the way to increased solar energy use through several programs. For residents the city offers a Rebate Incentive Program of \$1.00/Watt (\$0.50/Watt in 2016) up to 3 kW for PV installations on their home or a Home Efficiency Loan Program that offers no-money-down financing for up to 20 years for PV installations.

The Clean Energy Collective, partnering with the City, offers the opportunity for residents to purchase solar modules in a shared 620 kW solar array and receive corresponding utility bill credits. The resident can sell their modules or carry the bill credits to another Fort Collins Utilities account.

To increase their own solar electricity use Fort Collins has a solar purchasing program called "SP3" in which they procure new locally installed solar capacity. Currently there are 11 operational projects for SP3, totaling 3,700 kW. The energy output from these systems goes directly to the Utilities' electric grid.

## Triple Bottom Analysis



### Environmental Benefits

Lower carbon footprints results in lower NO<sub>x</sub>, SO<sub>x</sub>, and VOC levels.



### Social Benefits

Improved air quality reduces frequency of allergy and asthma events.



### Economic Benefits

Higher property values and reduced utility bills.



# Resources

## Green Energy Program

The Green Energy Program continues to offer customers the option to voluntarily subscribe to purchase clean, renewable energy for an additional 2.4 cents per kilowatt-hour (kWh). This option is for customers who are willing to pay a little more for their electricity to guarantee that it comes from clean energy sources. Learn more at [fcgov.com/green-energy](http://fcgov.com/green-energy).

## Photovoltaic Installation Permitting Process

- Obtain a PV installation building permit, issued at the Building Services office at 281 N. College Ave., Fort Collins. Additional information and Solar Permit Application Forms can be found at [fcgov.com/building/res-requirements.php](http://fcgov.com/building/res-requirements.php).
- Obtain an interconnection application from the Fort Collins Utilities at [fcgov.com/solar](http://fcgov.com/solar). Submit this application to [utilities@fcgov.com](mailto:utilities@fcgov.com). Utilities review and approval is part of the process to release the building permit.
- Find more information regarding possible “Expedited Permit Process” at [solarabcs.org/about/publications/reports/expedited-permit/pdfs/Example1-StandardStringSystem.pdf](http://solarabcs.org/about/publications/reports/expedited-permit/pdfs/Example1-StandardStringSystem.pdf). The City of Fort Collins will allow expedited reviews for residential flush roof mounted PV installations (information required for approval by Fort Collins Utilities needs to be submitted prior to, or concurrently with

the Building Services permit application). Using the “Expedited Permit” forms may negate the need for a professional’s stamp, but the installation will still need oversight by a City registered electrical contractor.

## Local Solar Contractors

- Alt E Wind and Solar: [altewindandsolar.com](http://altewindandsolar.com)
- Bella Energy: [bellaenergy.com](http://bellaenergy.com)
- Burnham-Beck & Sun: [burnhambeck.com](http://burnhambeck.com)
- Custom Solar: [customsolar.us](http://customsolar.us)
- Douglass Colony Group: [douglasscolony.com](http://douglasscolony.com)
- Endurance Solar and Engineering: [endurance-solar.com](http://endurance-solar.com)
- Hydrogen Electric LLC: [hydrogen-electric.com](http://hydrogen-electric.com)
- Independent Power Systems: [solarips.com](http://solarips.com)
- Namaste Solar: [namastesolar.com](http://namastesolar.com)
- SolarCity: [solarcity.com](http://solarcity.com)
- Southard’s Solar Energy and Construction: [southardsolar.com](http://southardsolar.com)

# Alternative Energy Terms

## Ground Source Heat Pumps (Utility Scale)

Ground source heat pumps tap geothermal energy to provide heating and cooling to homes. These systems exchange heat with the earth, concentrate it using refrigeration technology, then deliver either heating or cooling to the house. These systems can operate using roughly 25 to 50% less electricity than conventional systems and when coupled with on-site solar can reduce fossil fuel consumption substantially.

## Solar Electric Systems (Photovoltaics)

(“PV”) Solar cell modules convert light to direct current (DC) electricity. An inverter converts DC to alternating current (AC) electricity that can be directly used in the house or sold back to the utility company. These systems can be either off the grid, meaning that they are not

hooked up to a company that supplies electricity, or grid tied, where the electricity is drawn from or sold back to the utility.

## Solar Thermal Systems

These systems collect solar energy by connecting a water loop to a hot water storage tank delivering hot water and/or space heating. A backup system for solar thermal would be a hot water heater and/or boiler.

## Tubular Skylights

Cylinders are installed on roofs and come through to the ceiling below (like a skylight, or like the periscopes we’ve all seen in old movies with submarines) to bring natural light into homes, to help replace or add to electric lights. They’re also known by several other names, including sun pipes, sun scopes, solar tubes, light tubes, and daylight pipes.

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