

Los Altos Hills: Building Energy Use

San Mateo County Energy Watch, in partnership with Pacific Gas and Electric Company (PG&E), has compiled the following data to illustrate the trends and impact of energy consumption in buildings. These graphs show the proportional and total use of natural gas versus electricity, and show consumption trends from both a collective and individual standpoint. At the bottom, we highlight the investments Los Altos Hills' community has made in generating clean energy from either energy efficiency and/or solar photovoltaic (PV) systems.

2010 Population: 7,942

Snapshot: Building Energy Consumption and Emissions

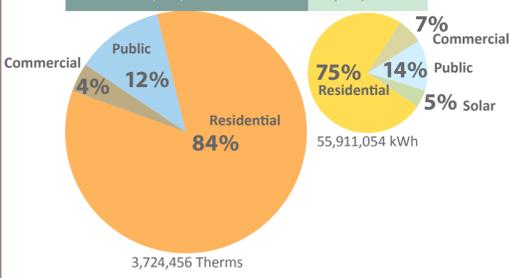
Los Altos Hills' energy consumption data includes both PG&E's energy sources and grid-tied solar installations. Each city will have slight differences in the percentages between their energy data and their greenhouse gas emissions because of two factors: 1) Emissions from PG&E's electricity mix change each year depending on influences like weather patterns and state mandates for increased renewables. 2) Currently, natural gas releases fewer emissions than PG&E's electricity mix. Solar doesn't release emissions.

Energy Consumption

563,214,145 kBtu
of energy is consumed by Los Altos Hills buildings in an average year

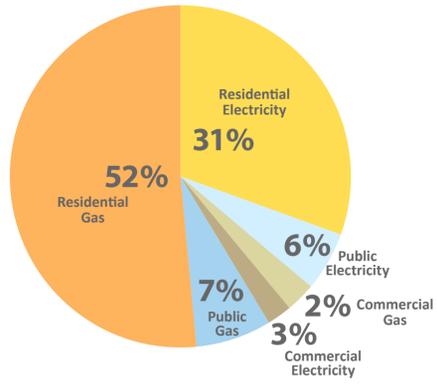
Natural Gas Electricity

66% 372,445,629 kBtu
34% 190,768,516 kBtu



Emissions

32,378 MtCO₂e
of greenhouse gas emissions are generated by Los Altos Hills buildings in an average year



Residential Gas, Residential Electricity, Public Buildings Gas, Public Buildings Electricity, Commercial Buildings Gas, Commercial Buildings Electricity, Total Solar Electricity

Natural Gas Consumption by Sector

Natural gas is used primarily to heat hot water, buildings, and food. In showing the trends below, we indicate both the percent change from year to year as well as the total percent change since 2005, which is commonly used by cities as a baseline.

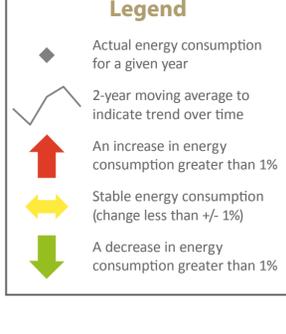
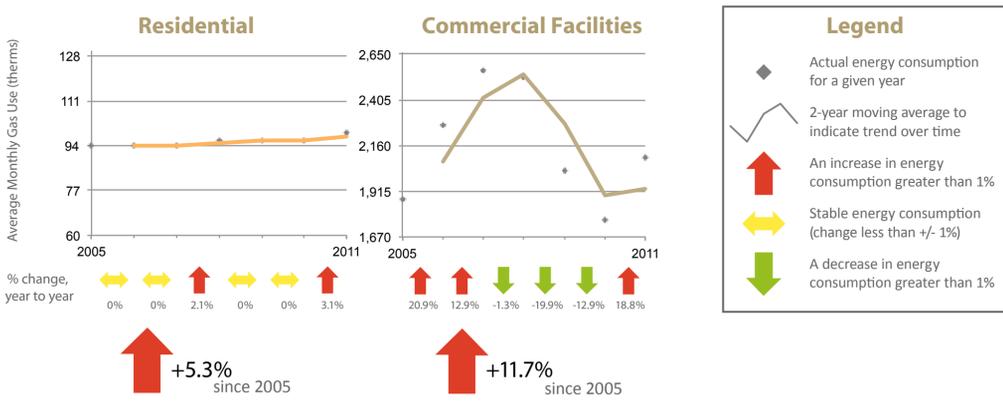
Community-Wide Totals

Community-wide natural gas trends are affected by winter weather and population levels. Total consumption for each building is dependent on the age of the building, how often and how many people use it, and how its heating and cooling systems operate. In addition, community-wide natural gas consumption may go up as population increases or new buildings are constructed.



Individual Impact

Sometimes community totals don't tell the whole story. The data below show the average monthly energy consumption for both residential and commercial facilities.

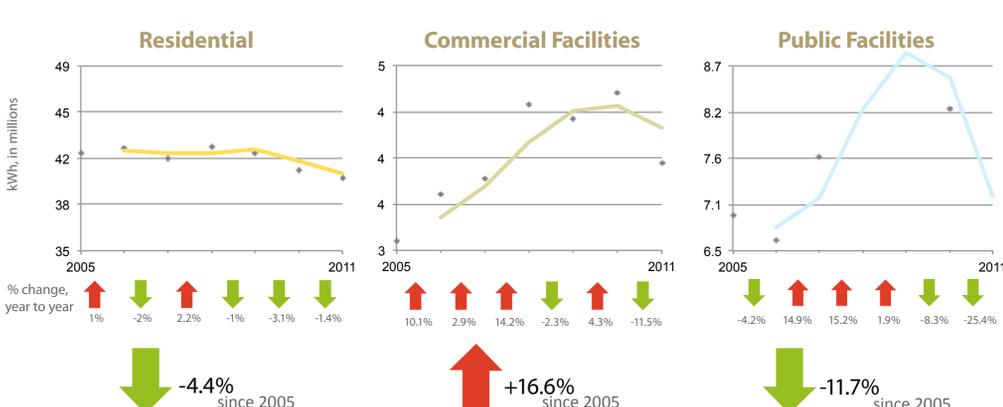


Electricity Consumption by Sector

Electricity is used primarily for lighting, refrigeration, ventilation, cooling, and appliances. In showing the trends below, we indicate both the percent change from year to year as well as the total percent change since 2005, which is commonly used by cities as a baseline.

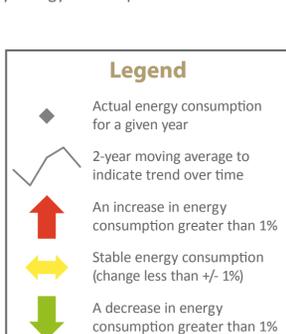
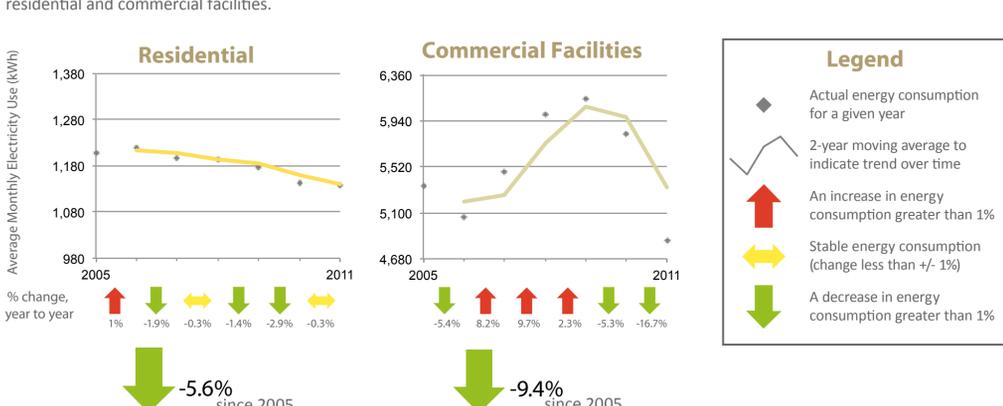
Community-Wide Totals

Community-wide electricity trends are affected by summer weather (if buildings have air conditioning) and population levels. Total consumption for each building is dependent on the age of the building, how often and how many people use it, its plug load, and how its heating and cooling systems operate. In addition, community-wide electricity consumption may go up as population increases or new buildings are constructed, or may go down if solar projects are constructed.



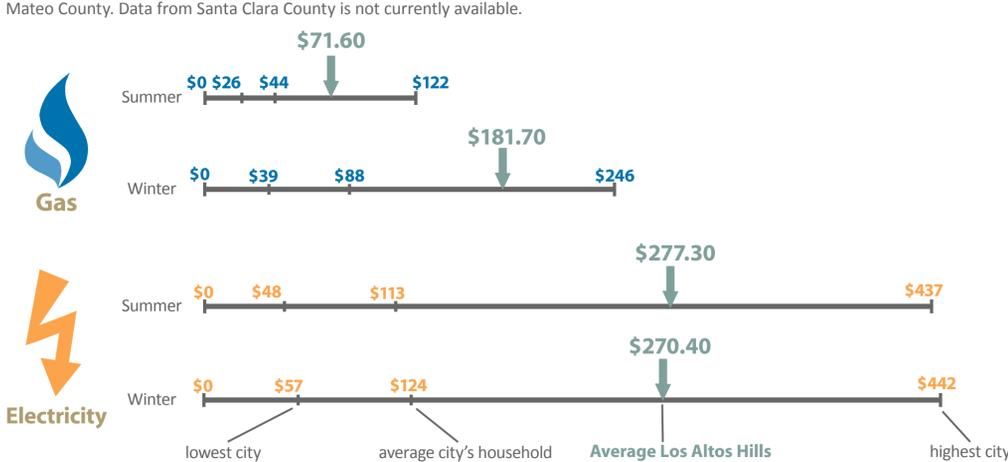
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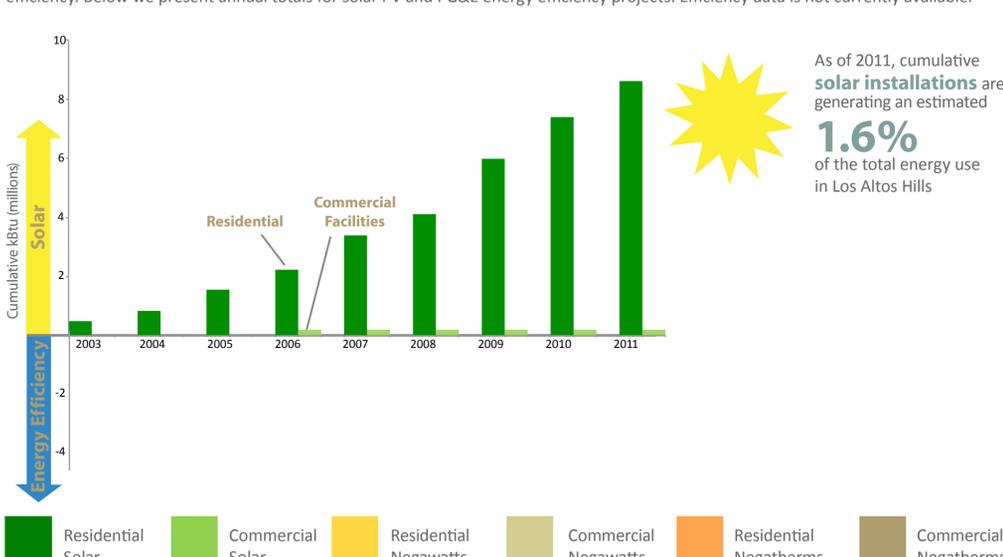
Average Monthly Household Utility Bills

We have calculated the average PG&E bill for a Los Altos Hills household for both summer (May - October) and winter (November - April). Using these averages, we can compare the average Los Altos Hills household with the average household in other cities in neighboring San Mateo County. Data from Santa Clara County is not currently available.



Zero Emission Energy Sources

To reduce emissions, individuals must either switch to a cleaner energy source (such as solar) or reduce their use through energy efficiency. Below we present annual totals for solar PV and PG&E energy efficiency projects. Efficiency data is not currently available.



Methodology

What is included in each sector?
Residential: Includes homes that are four units or less (large apartments and multi-family dwellings are included in the commercial sector).
Commercial Facilities: Includes both industrial and commercial facilities.
Public Facilities: Includes city and county facilities, junior colleges, schools, and special districts (such as SamTrans). Also includes government-owned residential units.

Where is the data from?
Energy data is entirely derived from the interconnected energy company account data. While this includes both net metered solar data and direct access accounts, it does not include other interconnected energy sources (cogeneration, wind, fuel cells, etc.) or energy bought from a different supplier. For direct access accounts (facilities directly buying energy from a supplier other than PG&E), we assumed the standard California emission factors for these sources (1501.34622 tonnes CO₂/kWh).
Population data is from the State of California, Department of Finance, E-5 Population and Housing Estimates for Cities, Counties and the State, 2010-2011, with 2010 Benchmark.
Employment data is from the Association of Bay Area Governments, Projections 2009: Population, Housing & Employment.

How is solar calculated?
 The solar data only includes PV panels tied to PG&E's grid as of April, 2012. Because PG&E only tracks kW (production capacity) installed, the kWh (actual energy production) was estimated by multiplying the California Energy Commission (CEC) adjusted kW data and the default conversion factor, 1446, for San Francisco at http://rredc.nrel.gov/solar/calculators/PVWATTS/version1/US/California/San_Francisco.html. The cumulative estimate does not include a degradation factor.

What is included in the energy efficiency numbers?
 The energy efficiency numbers represent the estimated first year savings from energy efficiency projects that can be attributed to PG&E's rebate program. And are derived from PG&E's official report to the California Public Utilities Commission. These numbers thus underestimate the actual scale of energy efficiency projects as they do not take into account projects outside of PG&E's rebate program.
 Energy efficiency estimate = Cumulative first year savings from 2005 to 2011 / (total energy use + cumulative savings).
 The kBtu from interactive effects, the phenomenon in which the reduction in heat output from replacing inefficient lights requires increased natural gas consumption for heating, are deducted from the electricity totals (negawatts), as opposed to being included in the natural gas totals.

How was the average monthly bill calculated?
 The average monthly bill essentially takes the total energy consumption for each sector and divides by the total number of bills for a given year.

What years are included in the average figures?
 All averages are calculated from the years 2005 to 2011.

What do all the abbreviations and terminology mean?

- kBtu:** One Thousand (1 k) British Thermal Units (BTU). BTU is used to describe the energy content of fuel.
- Therms:** The approximate energy equivalent of burning 100 cubic feet of natural gas. 1 Therm = 100 kBtu
- kWh:** kilowatt-hour is a unit of energy equivalent to one kilowatt (1 kW) of power equivalent for one hour (1 h) of time. 1kWh = 3,412 kBtu
- MtCO₂:** Metric Tonne (ton) Carbon Dioxide
- Negawatt:** Estimated annual electricity savings from efficiency projects
- Negawatt:** Estimated annual natural gas savings from efficiency projects