Energy-Saving Home Improvements

Tips for successful projects

May 30, 2019

Presented by Building Division:

- Bruce Campbell
- Ron Davis
- Mike Davis

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

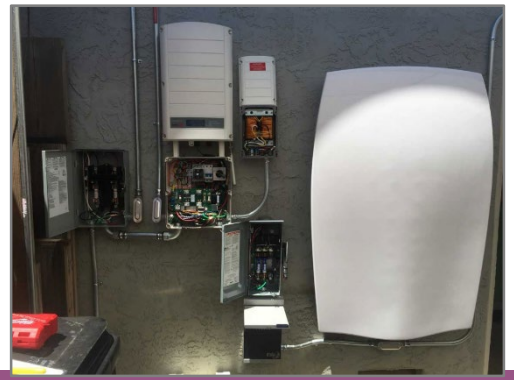
Planning, Building and Code Enforcement

Note: All Regulations are Subject to Change

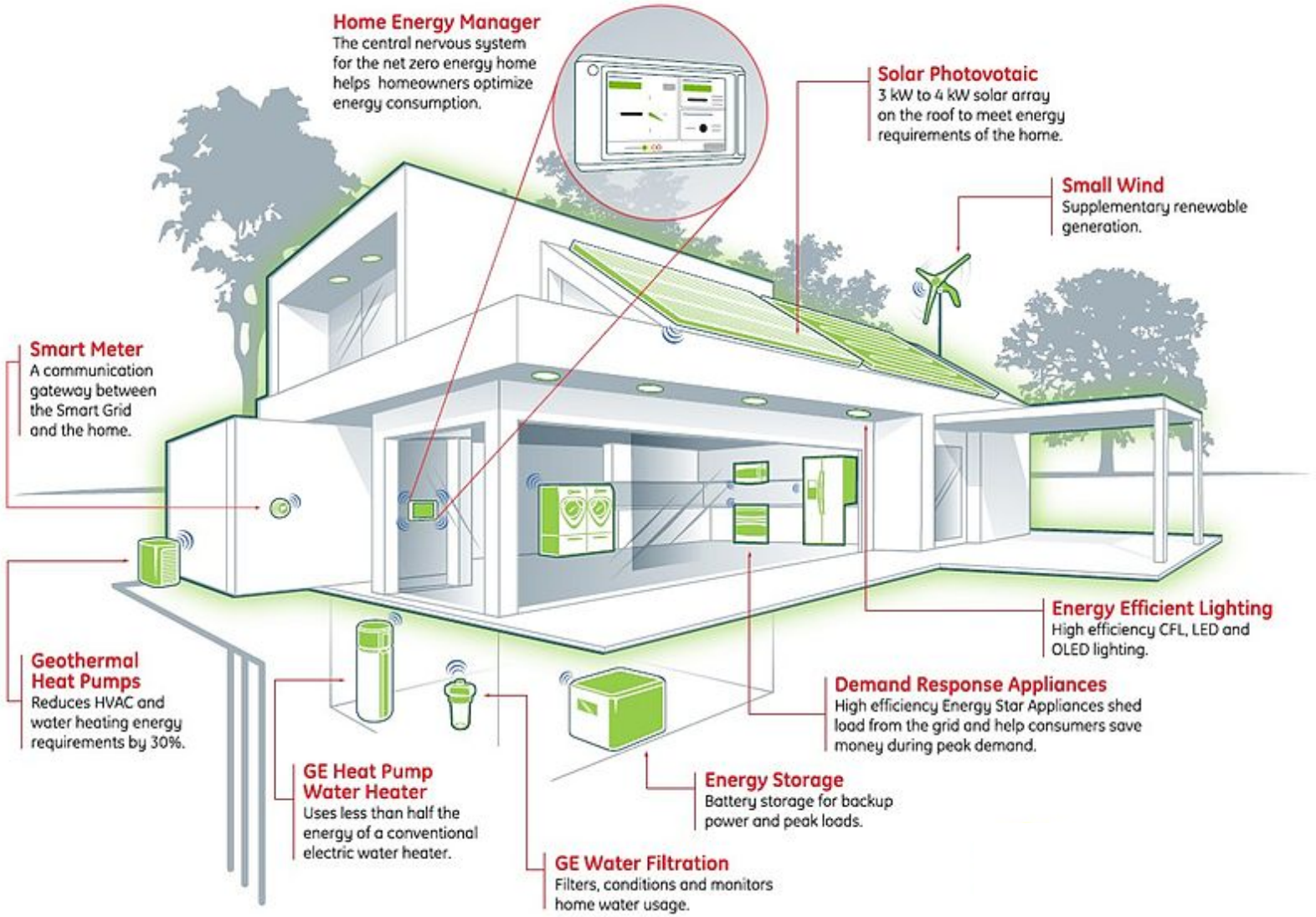
Overview

Energy-Saving Home Improvements

- Energy-Efficient Installations
- Heat Pump Water Heaters
- Solar Roof Installations
- Home Battery Storage Systems
- Electric Vehicle (EV) Charging Stations



High-Efficiency Appliances & Fixtures
Save energy and reduce carbon emissions



CLIMATE SMART SAN JOSE
LIVING BETTER TODAY FOR TOMORROW

See installations - Carbon Free Living trailer

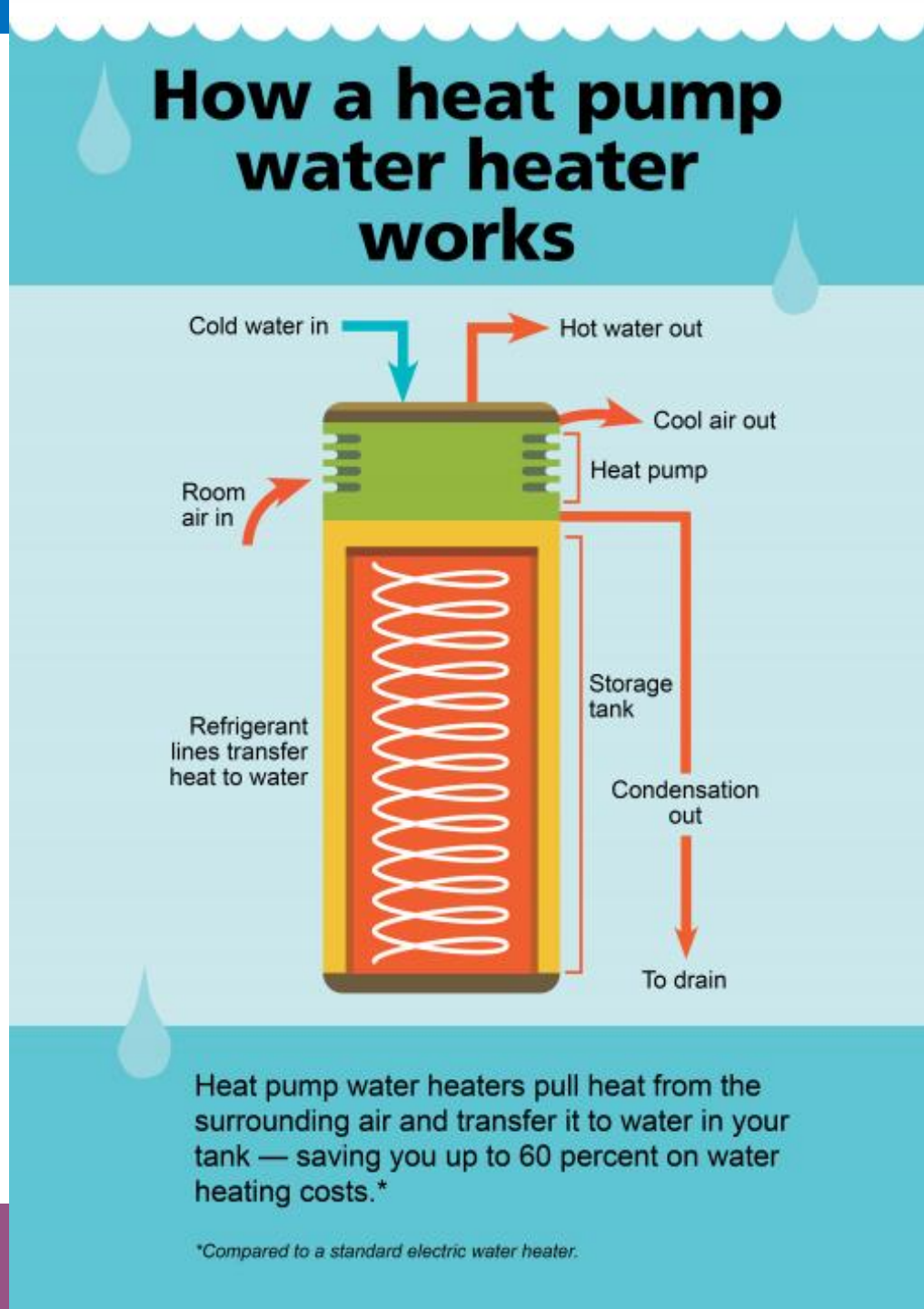
- Inside:
  - Heat pump water heater and HVAC
  - High-efficiency windows and appliances
  - Induction cooktop
  - Low-flow fixtures
  - Plus More!
- Learn about Zero Net Carbon buildings at www.sanjoseca.gov/ZNCBuildings

CLIMATE SMART
SAN JOSE
LIVING BETTER TODAY FOR TOMORROW

Heat Pump Water Heaters

Heat Pump Water Heaters

- Use electricity to move heat rather than generate heat
- 2 types of units:
  - Standard Unit
  - Split Unit



Heat Pump Water Heater - Tips

- May affect Electrical Service:
  - Most require a 240 Volt (V), 30 Amps (A) dedicated circuit
  - Some newer products require a 240V, 15A circuit -- considered a continuous load and may require load calculations for service of 125 A or less.
- Allowed for alterations, with specific conditions:
  - Efficiency rating, location, placement, and communication interface
- Also based on energy design criteria (Title 24 Documentation)

Electrify San Jose – Heat Pump Water Heater Incentive Program

- Incentives to replace existing natural gas with heat pump water heater
  - May include service panel upgrade
  - Additional incentives for income-qualified households
- Sign up to be informed when the program launches in Fall 2019
  - sjenvironment.org/electrifysanjose

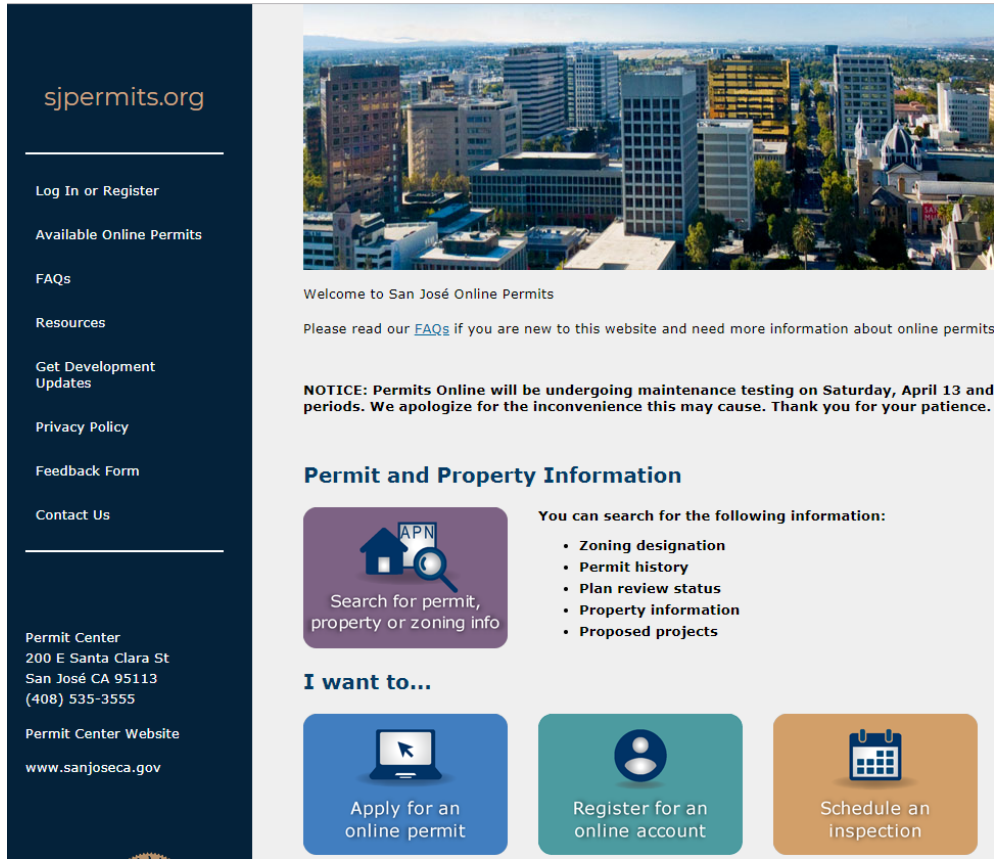
Solar Installations

Considerations Before You Install Solar

- See Bulletin #282 Solar Photovoltaic Installations
- Must meet development standards in San José Municipal Code Title 20 and must minimize visual impacts
- Electrical Service: Consider the amount of solar power you want and what you can install without having to increase electrical service
- Hire an experienced licensed contractor

Solar Roof Permit Process

- Tip: Save money & time - get your permit and schedule inspections online at www.sjpermits.org
- Plan Review: Solar plan review occurs in the field at time of inspection
- Installation Tip/Cost-saver: Solar panels installed higher than 18" above the roof may require additional plan review



Home Battery Storage Systems

Home Battery Storage Systems

- May store electricity produced by solar for use at a later time.
- May provide backup power during a utility outage OR to reduce demand during peak periods

Hybrid Solar Inverter Battery Storage System

- Hybrid solar inverters monitor and manage battery and PV system energy usage

ADVANTAGES	DISADVANTAGES
Economical, simple to install	Some LV DC in-string batteries cannot function/serve as a backup supply
Compact and modular	Generally not suitable for off-grid installations
Small cable size & lower losses size due to high voltage (HV 400V battery systems)	
Can be added or retrofitted to some existing solar installations	
High efficiency battery charging	

Alternating Current (AC) Battery Storage Systems

AC battery systems combine a Direct Current (DC)

ADVANTAGES	DISADVANTAGES
Generally simple to install	Some AC batteries cannot function as a back-up supply
Easy to retrofit – can be added to homes with or without an existing solar installation	Not designed to function in off-grid installations
Modular system that can be expanded	

Battery Storage System – Permit Requirements

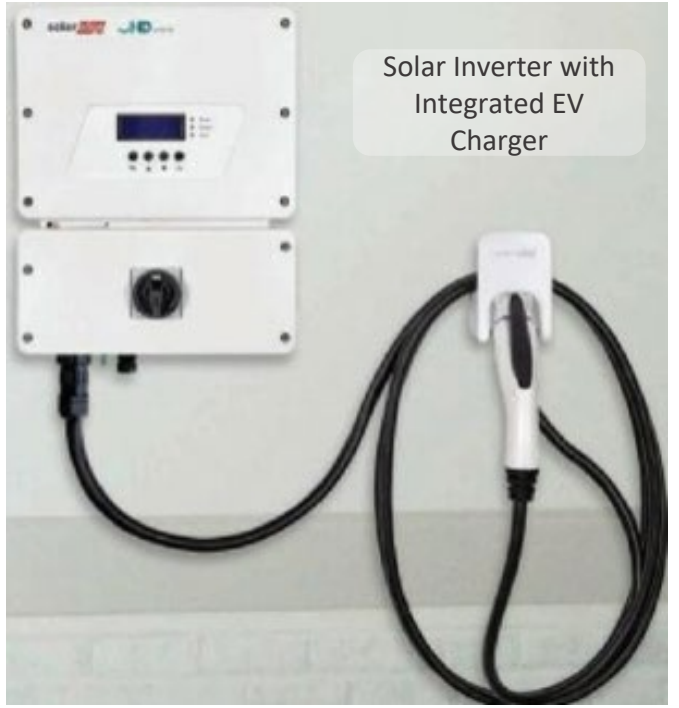
Requires:

- Building Plans with permit application (online permit not available)
- Plan review
  - Office Plan Review:
    - Structural component (anchorage) of batteries because these components can weigh between 274 and 850 lbs.
  - Field Plan Review of Electrical Plan:
    - Complete set of electrical plans must be provided to the Inspector, including a single line diagram, calculations, and all manufacturer data sheets and installation instructions.
- Must meet requirements of CEC 690.71.

Electric Vehicle (EV) Charging Stations

Levels of EV Charging Allowed for Residential Use

Charger Level	Volts	Charge Times
Level 1	120V AC Receptacle	Long Charge Times ~ 20 hours or ~ 5 miles per hour of charge
Level 2	240V AC Receptacle	Shorter Charge Times ~ 4 to 8 hours or ~ 10 to 25 miles per hour of charge



Applying for an EV Permit

- Level 1 does not need an EV permit, however, a new outlet requires an electrical permit.
- Level 2 requires an EV permit.
- Apply for these permits at www.sjpermits.org and save money.
- Plans are not required. During inspection, provide:
  - UL listing number
  - Panel rating, circuit size, and charging load
  - Indicate if installing a second meter for special rates for EV charging.
  - Locations of utility panel and Electrical Vehicle Supply Equipment (EVSE)
- For details, see Bulletin #263 Electric Vehicle Charging Stations

Thank you for attending our presentation!

We're here to answer your questions

- See last 2 slides containing Event Info and links to Resources
- Visit us in the Permit Center: www.sanjoseca.gov/permitcenter
- Find building permit info at: www.sanjoseca.gov/building
- Follow us @buildingsanjose

Homeowner Events

Healthy Cooking & Kitchens
July 16 | 6:30-8PM
Seven Trees Community Center

Zero-Energy Home Renovations
August 12 | 6:30-7:30 PM
Bascom Community Center

Electrification Expo
October 12 | 10AM – 3PM
The Tech Museum

Visit the Climate Smart table to reserve your spot!

For more see: sjenvironment.org/energytrainings

Information & Resources

- Financing options, rebates, and resources for home energy and water upgrades
  - sjenvironment.org/DocumentCenter/View/80936
- Sign up for Electrify San Jose, a heat pump water heater incentive program
  - sjenvironment.org/electrifysanjose
- Construction guides, tips, and information on zero net carbon buildings
  - sjenvironment.org/zncbuildings
- Energy trainings and events
  - www.sjenvironment.org/energytrainings
- Climate Smart San Jose – see upcoming meetings & resources on the City's climate action plan
  - sjenvironment.org/climatesmartsanjose
- Questions?
  - Email: energy@sanjoseca.gov
  - Call: 408-535-8550