

ADVANCED ENERGY REBUILD

CASE STUDY Hirsch Residence

PROJECT NAME	Hirsch Residence
LOCATION	Santa Rosa
CLIMATE ZONE	02
CONSTRUCTION COMMENCEMENT	2018

PROJECT TEAM

OWNER	Barry and Marlena Hirsch
HERS RATER	California Living & Energy
ENERGY CONSULTANT	California Living & Energy

PROJECT SUMMARY

The Advanced Energy Rebuild Program reduced the incremental costs of implementing aggressive energy efficiency measures in the Hirsch Residence. This project chose the All-Electric Home path with the Solar + Storage bonus, achieved a modeled compliance of 35.6% better than a standard code compliant home, and improved the energy design rating by 7.

The home reserved a total of \$17,500 in incentives and showed -1009 kWh, -0.39 kW and 114 therm savings. The owners selected highly efficient heat pumps for space conditioning and water heating, all-electric energy efficient appliances, and opted for various HERS verified measures to boost code compliance, such as verified SEER/EER and duct sealing.

PROJECT DETAILS

Located in Santa Rosa, California, the property sits on the eastern edge of the picturesque Mayacamas Mountains. The home was affected by the October 2017 Northern California wildfires and was move-in ready by the October of the following year. This home is all-electric, which means no natural gas is being supplied to the home. All mechanical equipment and appliances run fully on electricity.



Figure 1. The new home was completed in 2018



Figure 2. Home's new all electric high-efficiency kitchen

"I became interested in building an energy efficient home after a presentation last December by Geof Syphers. The incentives helped to defray the initial investments, particularly the roof top solar and battery storage. I wanted to use this updated and uber efficient technology in the rebuild. It's exciting, innovative, and good for our environment. I learned a lot about energy efficient choices and I'm glad I went that way. I got lots of good input along the way from the team at Sonoma Clean Power."

- Barry Hirsch, Homeowner



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Energy efficiency translates to better living for you.



Lower Energy Bills
Pay less and save more.



Increased Comfort
Reduced drafts with an improved building shell



Healthier Air
Better air quality and safe temperature levels.

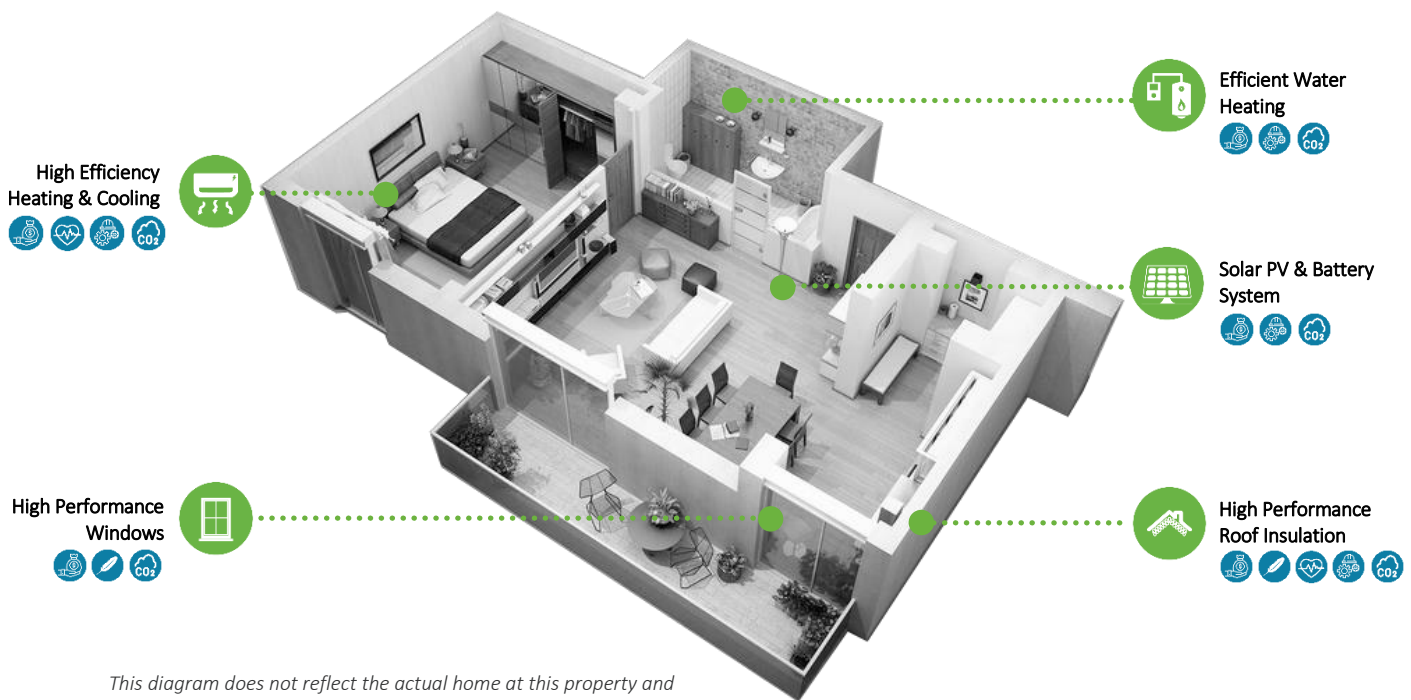


No Nuisances:
Less maintenance, repairs, noise, and odors.



A Better California
Lower your carbon footprint, for a better California.

IMPLEMENTED EFFICIENCY MEASURES



IMPLEMENTED EFFICIENCY MEASURES

Building Envelope



Ceiling: The home was designed to have a high-performance R-49 ceiling insulation.

Walls: The owner selected 2x6 16" OC framing with high density batt R-21 insulation.

Fenestration: The owner installed 0.28 U-Factor/ 0.21 SHGC for all windows. The lower U-factor reduces conduction through the glass and the low SHGC ensures lower cooling needs in the home.

Cool Roof: The home was designed to have a cool roof with a reflectance of 0.32 and an emittance of 0.82, enabling the roof to reflect more sunlight and absorb less heat than a standard roof.

Mechanical Systems



Water Heating: The owner installed a NEEA-rated electric heat pump water heater with an energy factor of 3.55. A 3.55 energy factor means that for every unit of electricity delivered to the equipment, the energy output is 3.55 times greater.

Space Conditioning: The home is equipped with a high-efficiency heat pump HVAC system: 17.5 SEER, 10.8 EER, and 9.7 HSPF, which supplies both the heating and cooling needs of the home. In addition, the HVAC system underwent a suite of HERS verifications for fan watt-draw, proper airflow, verified SEER & EER, and refrigerant charge testing, all of which contribute to a higher compliance margin.

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DETAILED PROJECT SPECIFICATIONS

Envelope	Standard Design (2016 T24)	Proposed Design (2016 T24)
Roof Insulation	R-38	R-49
Wall Insulation	R-19 Cavity + R-5 (U-0.051) Continuous	R-21 Cavity
Window Specs (U-factor/ SHGC)	U-0.32 / S-0.25	U-0.28 / S-0.21
Building Leakage	5 ACH50	5 ACH50
Cool Roof	Low-sloped: Not required	Reflectance - 0.32 Emittance - 0.82
Radiant Barrier	Yes	Yes
Mechanical	Standard Design (2016 T24)	Proposed Design (2016 T24)
HVAC Type	Heat Pump	Heat Pump
Cooling Efficiency	SEER 14 / EER 11.7	SEER 17.5 / EER 10.8
Heating Efficiency	HSPF 8.2	HSPF 9.7
Ducts	R-8, in ventilated attic	R-6, in ventilated attic
Duct leakage	Not verified	Sealed and tested
DHW	Tankless, 0.82 EF (Standard)	Heat Pump Water Heater, NEEA Rated Tier III
Fan power	0.58 W/cfm	0.58 W/cfm
Whole house fan	No	No
Non-Mandatory HERS Measures	Standard Design (2016 T24)	Proposed Design (2016 T24)
Verified SEER	No	Yes

