

ADVANCED ENERGY REBUILD

CASE STUDY Lange Residence

PROJECT DETAILS

PROJECT NAME	Lange Residence
LOCATION	Paradise
CLIMATE ZONE	11
CONSTRUCTION COMMENCEMENT	September 2019

PROJECT TEAM

OWNER	Heidi Lange
HERS RATER	Energy Intent
ENERGY CONSULTANT	Techlogic Energy Consultants

PROJECT SUMMARY

Located in Paradise, California, this home is in the process of rebuilding following the Camp Fire in November 2018. The home is designed to be all-electric, meaning all mechanical equipment and appliances run fully on electricity.

This project leveraged the Advanced Energy Rebuild (AER) program to offset the additional costs of implementing aggressive energy efficiency measures. The homeowner chose the All-Electric Home Flexible Performance pathway, achieved a modeled compliance of 23.2 percent better than a standard code compliant home, and improved the energy design rating (EDR) by 7.

Under the All-Electric Home Flexible Performance pathway, the home reserved a total of \$12,500 in incentives. The owners installed above-code windows, a high performance attic, highly efficient ductless heat pumps for space conditioning and water heating, energy efficient appliances, and opted for various HERS verified measures to boost their code compliance such as High quality insulation installation (QII), verified EER/SEER, and duct sealing.

Following her enrollment in the AER program, the homeowner shared program information with the local school district to help spread awareness about the incentives in her community.



Figure 1. Street view of the original home



Figure 2. Street view of the rebuild under construction

"The AER incentive has helped offset the cost to make my new home more energy efficient. The program has been easy to navigate with help from everyone involved. I'm looking forward to getting back home and starting my next chapter in Paradise."

- Heidi Lange



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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.

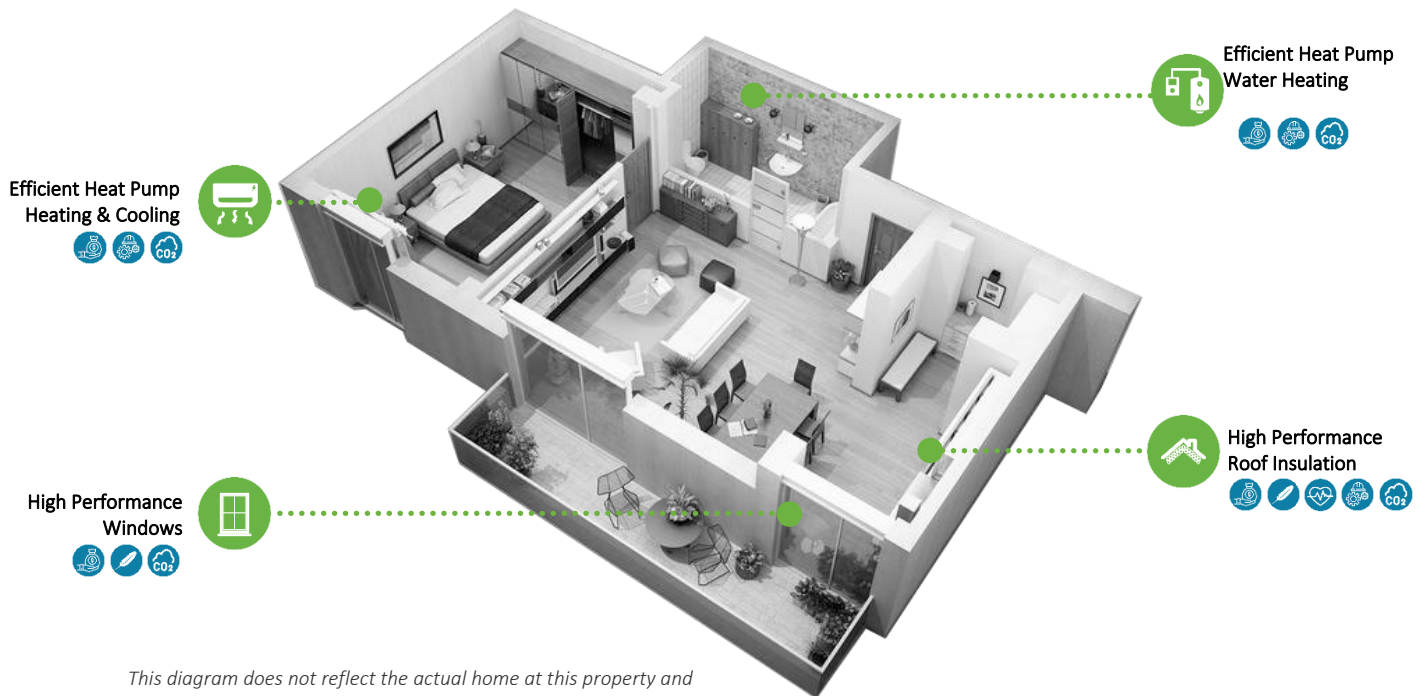


No Nuisances:
Less maintenance, repairs, noise, and odors.



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

IMPLEMENTED EFFICIENCY MEASURES



IMPLEMENTED EFFICIENCY MEASURES

Building Envelope



Ceiling: The home is designed to have a high-performance R-38 insulation at the ceiling paired with R-13 below roof deck insulation.

Walls: In the walls, the owners selected 2x6 framing, with 16" OC and high density batt R-21 insulation.

Fenestration: The owner installed 0.30 U-factor/ 0.23 SHGC for all windows. The lower U-factor reduces conduction through the glass and the low SHGC ensures lower cooling needs in the home.

Mechanical Systems



Water Heating: The owner installed a NEEA-rated electric heat pump water heater with an uniform energy factor of 2.9. This means that the energy output is 2.9 times higher than every unit of electricity delivered to the equipment.

Space Conditioning: The home is equipped with a high-efficiency ducted heat pump HVAC system: 17 SEER/ 13 EER and 9.5 HSPF, which caters to both the heating and cooling needs of the home. The HVAC system will be undergoing a suite of HERS verifications for fan watt-draw, proper airflow, and verified SEER and EER, all of which contribute to a higher compliance margin.

DETAILED PROJECT SPECIFICATIONS

Envelope	Standard Design (2016 T24)	Proposed Design (2016 T24)
Roof Insulation	R-38	R-38 + R-13 below roof deck
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-0.30 / S-0.23
Mechanical	Standard Design (2016 T24)	Proposed Design (2016 T24)
HVAC Type	Heat Pump	Heat Pump
Cooling Efficiency	SEER 14 / EER 11.7	SEER 17 / EER 13
Heating Efficiency	HSPF 8.2	HSPF 9.5
DHW	Tankless, 0.82 EF (Standard)	Heat Pump Water Heater, NEEA Rated Tier III
Whole House Fan	Not Required	Installed
Non-Mandatory HERS Measures	Standard Design (2016 T24)	Proposed Design (2016 T24)
Verified Refrigerant Charge	No	Yes
Verified EER	No	Yes
Verified SEER	No	Yes
High Quality Insulation Installation (QII)	No	Yes