

Net-Zero Homes, The Homes of Our Future

Primo Facchini

pfacchin@calpoly.edu

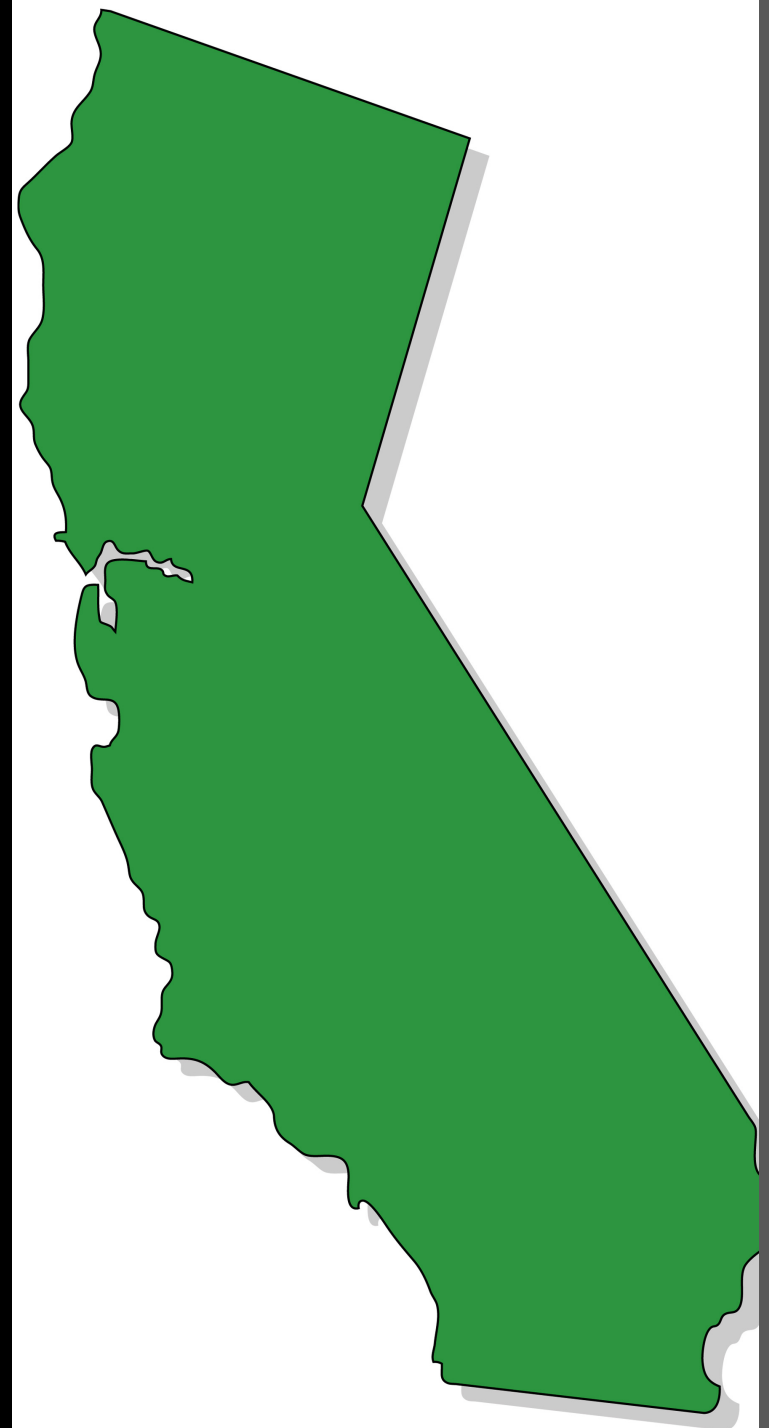


Abstract

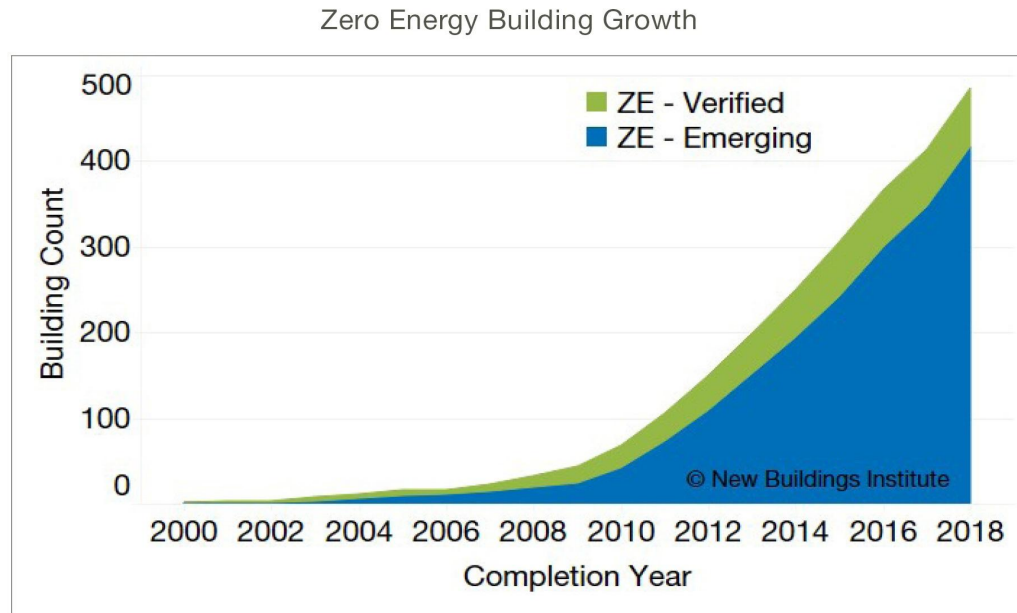
Net-Zero homes are the homes of the future. Net-zero homes rely on solar power to power them opposed to the power grid. California is blazing the trail for the rest of the United States and the world to follow with Net-Zero housing. The start of 2020 marked the first year that California would require all home building to be net-zero. The carbon emissions throughout the United States and the world have to be greatly reduced in order to save the environment. Net-zero is helping eliminate a massive amount of those emissions due to their clean energy usage. The case study will highlight the benefits that net-zero homes have on the environment and people. In the case study there is a cost analysis to educate people on why it is financially the better option in the long run.

Where It Started

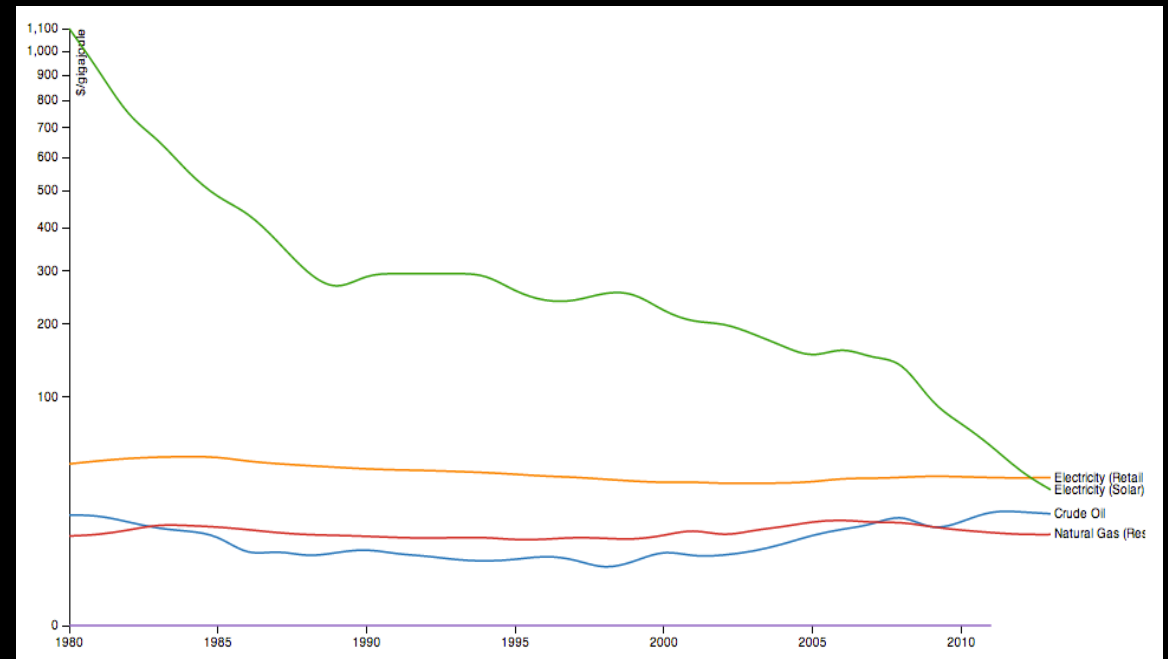
- California is the first state to require all new home building to be Net-Zero by 2020



Market Evolution



Net-Zero Building Increase



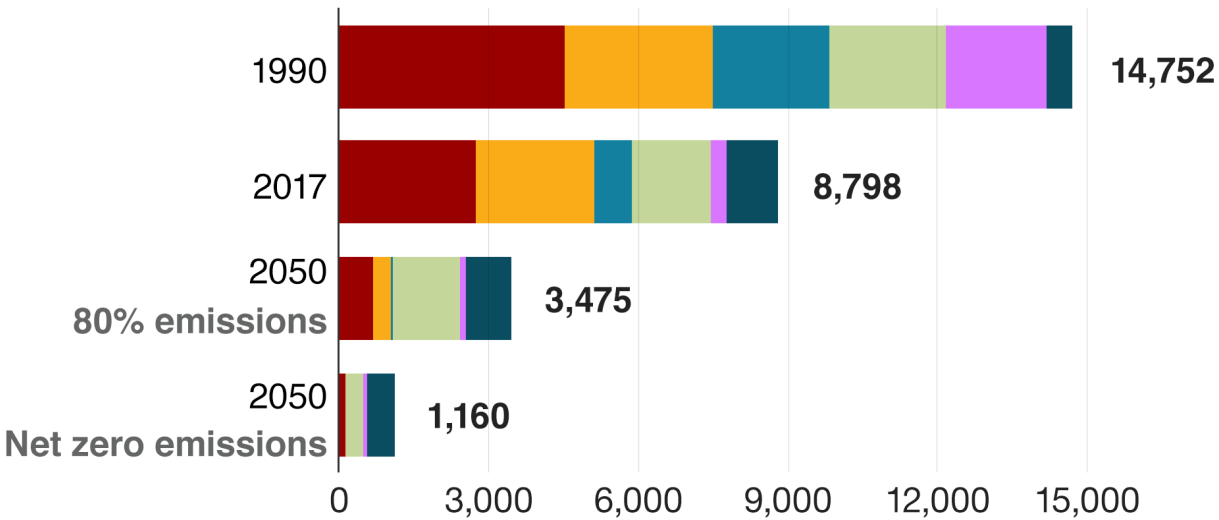
Solar Price Decline

Environmental Impact

Household emissions in 1990, 2017 and 2050

Annual emissions, kilogrammes of CO₂

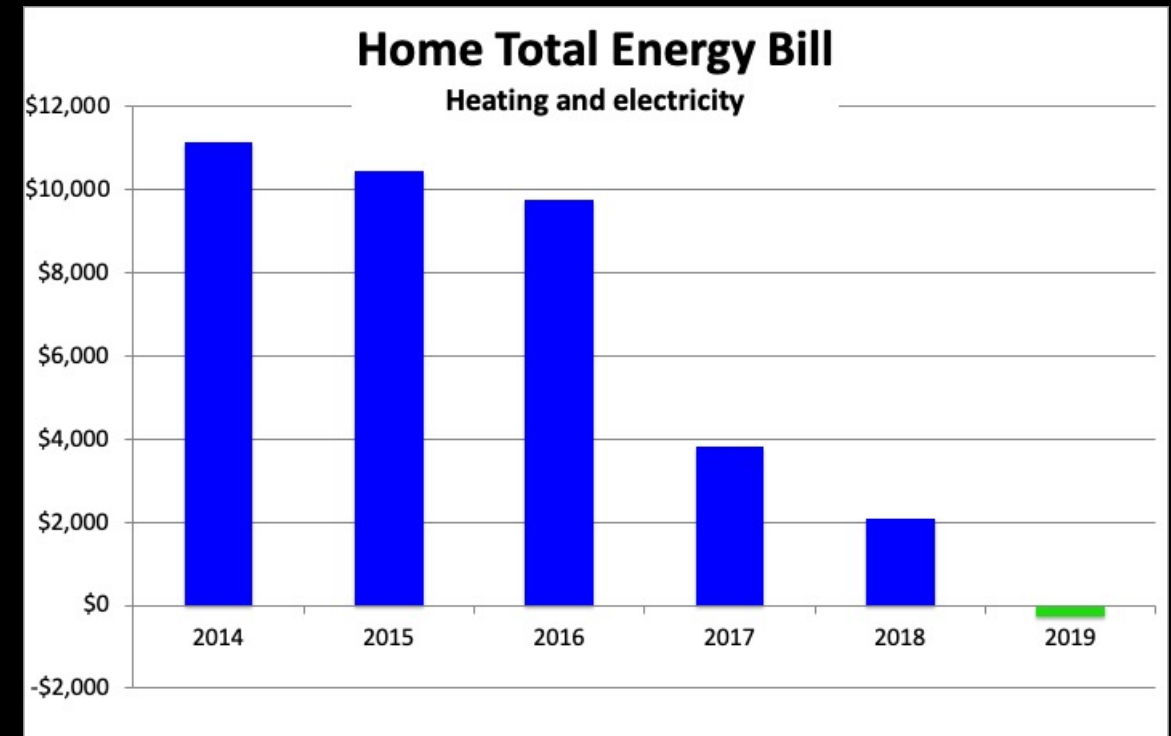
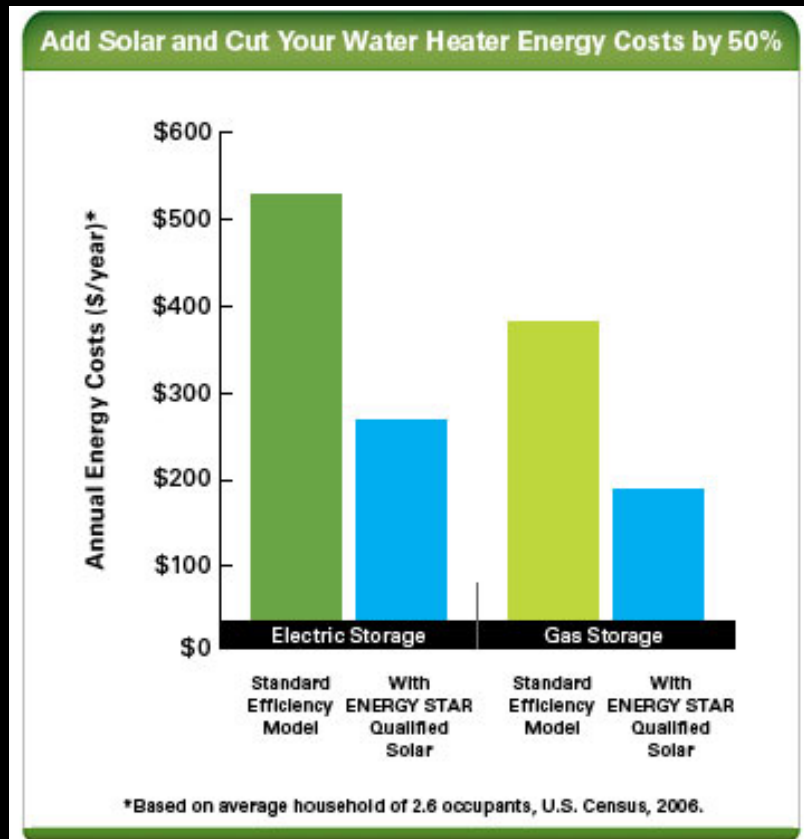
- Heating
- Transport
- Electricity
- Aviation
- Waste
- Diet / Agriculture



Source: Climate Change Committee/BEIS (2019)



Financial Impact



Health Impact

- Using Energy Star certified appliances helps ensure the least amount of toxins in the air.
- Switching to all electric stove tops to reduce the NO₂ in the air.

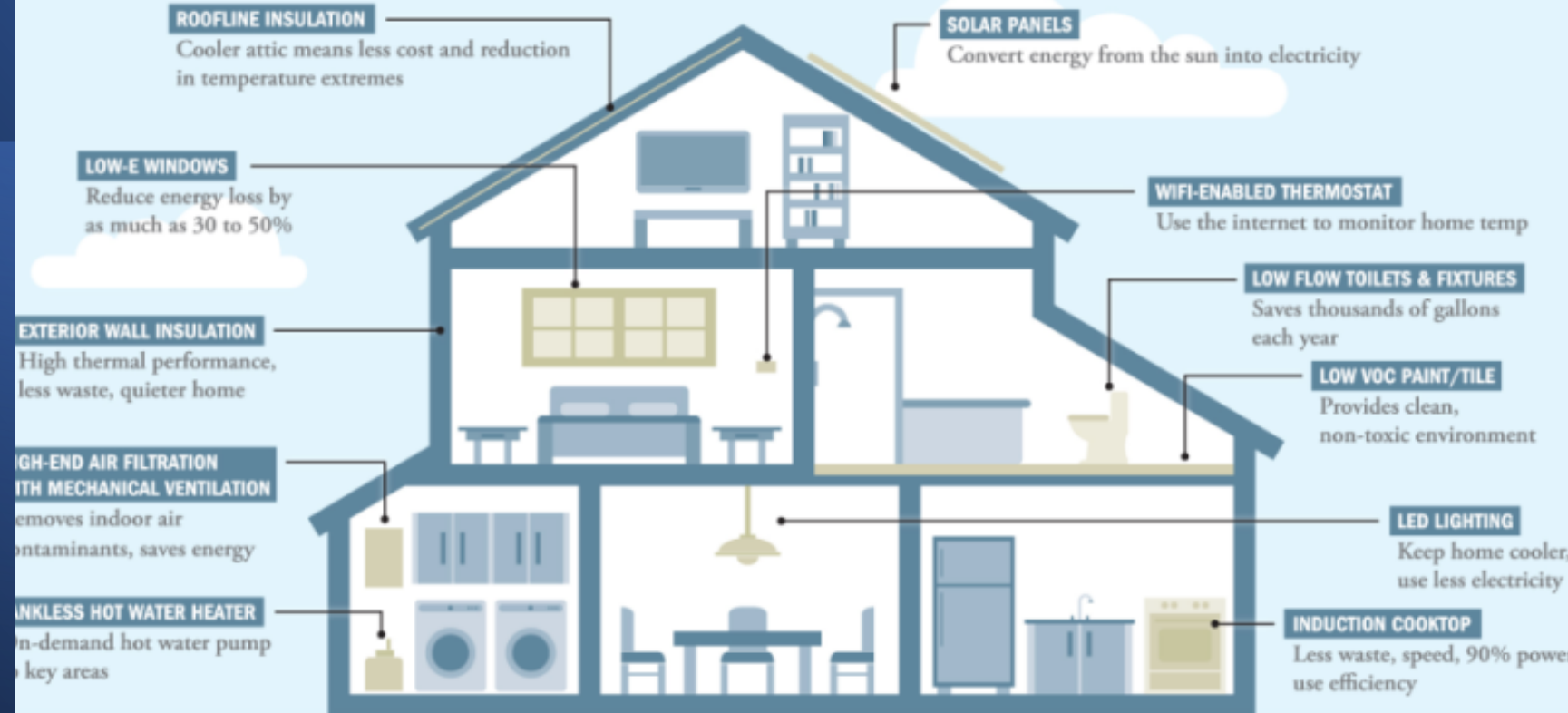


Measured NO ₂ Emissions from Gas Stoves	Peak (ppb)
Baking cake in oven	230
Roasting meat in oven	296
Frying bacon	104
Boiling water	184
Gas cooktop - no food	82–300
Gas oven - no food	130–546

How it's Done

PULTE ZERO NET ENERGY

A new home prototype for energy efficiency and green innovation



ABOUT THE PULTE ZNE PROTOTYPE

- Generates as much energy as it uses over the course of a year
- Collaboration with companies committed to energy efficiency and innovation
- Defining most efficient pathway to ZNE with balance of constructability, cost and quality

Click here for details: bit.ly/PulteZNE