

Resource Management Commission Presentation

Implications of Electric Heat

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April 16, 2019

Thermodynamic Losses From Electric and Gas Water Heating

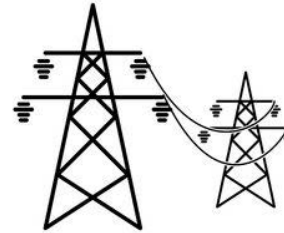
ELECTRIC



100%



33%



26%



25%

GAS



100%



99%



57%

HISTORY OF DOMESTIC WATER HEATING IN AUSTIN CODE

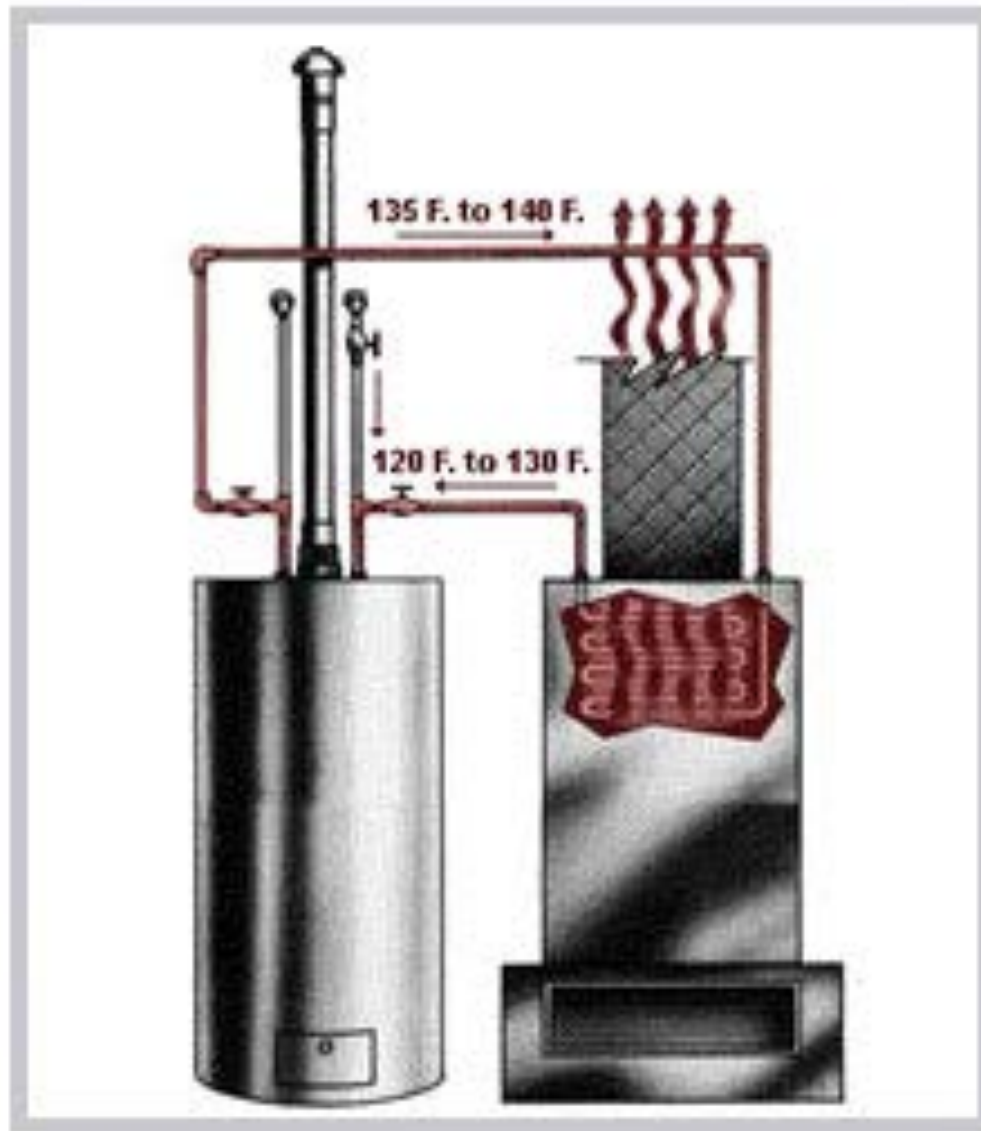
1977 – FIRST ENERGY BUILDING CODE

1984 – HEAT PUMPS REQUIRED FOR HOMES > 1,000 SF

1988 – HEAT PUMPS REQUIRED FOR HOMES > 500 SF

1989 – ALTERNATIVES TO STRIP WATER HEAT > 1,000 SF

1994 – ALTERNATIVES TO STRIP WATER HEAT > 500 SF



Combo Heater (Water and Space Heating)



CONTINUED CODE HISTORY IN AUSTIN

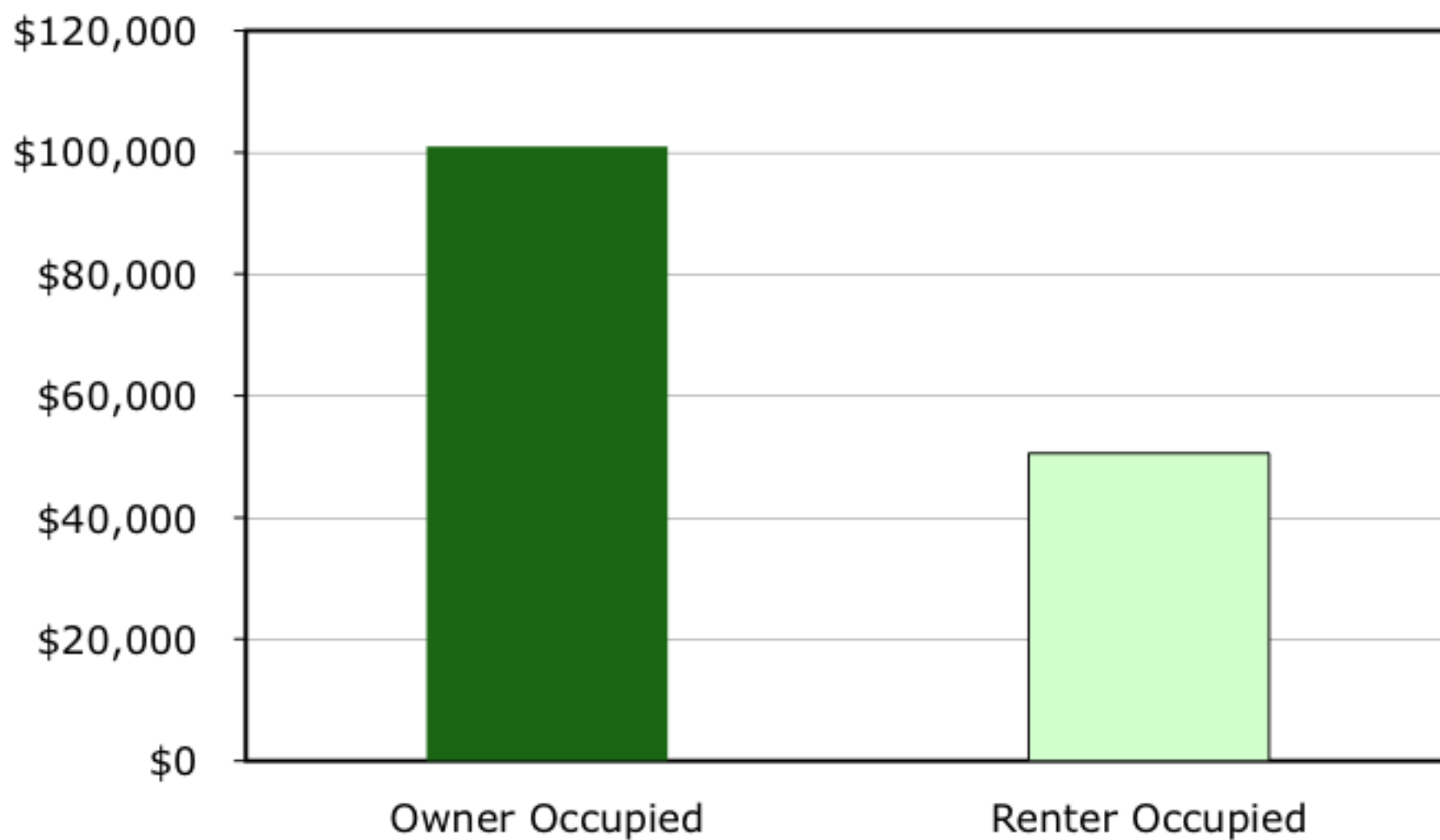
2010 – STRIP WATER HEATING REMOVED FROM CODE
EXCEPT FOR GAS ADJACENT TO BUILDINGS

2016 – CONSIDERATION OF REMOVAL OF GAS BUT NO
ALTERNATIVE OR ACTION

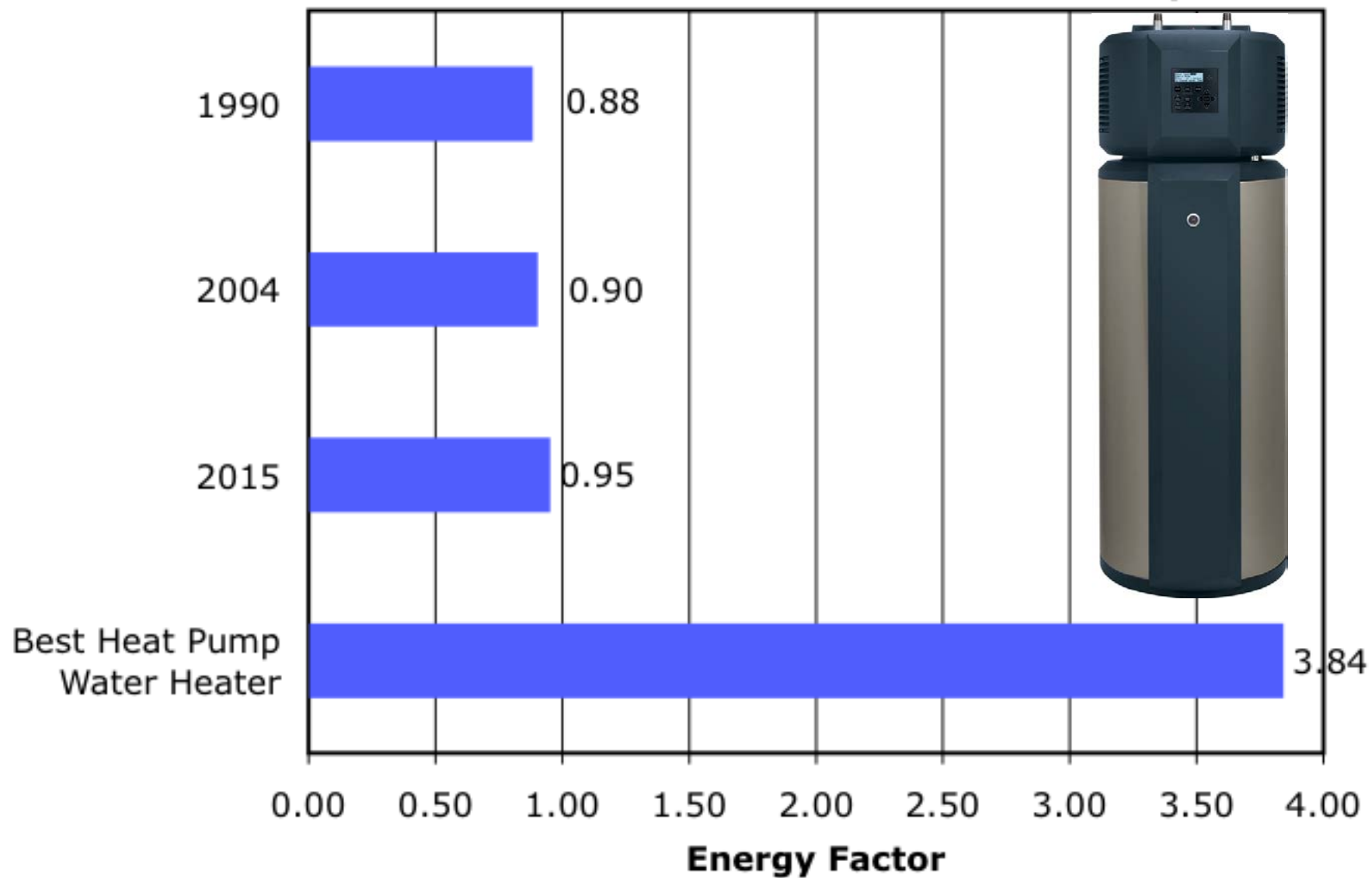
What the Building Code Requires if Natural Gas Is Adjacent to a Residence

- **Natural Gas OR**
- **(Presumed) Solar Hot Water OR**
- **(Presumed) Solar PV OR**
- **Hot Water Heat Pump OR**
- **Strip Heat 3,500 watt or less**

Austin Income By Tenure 2017

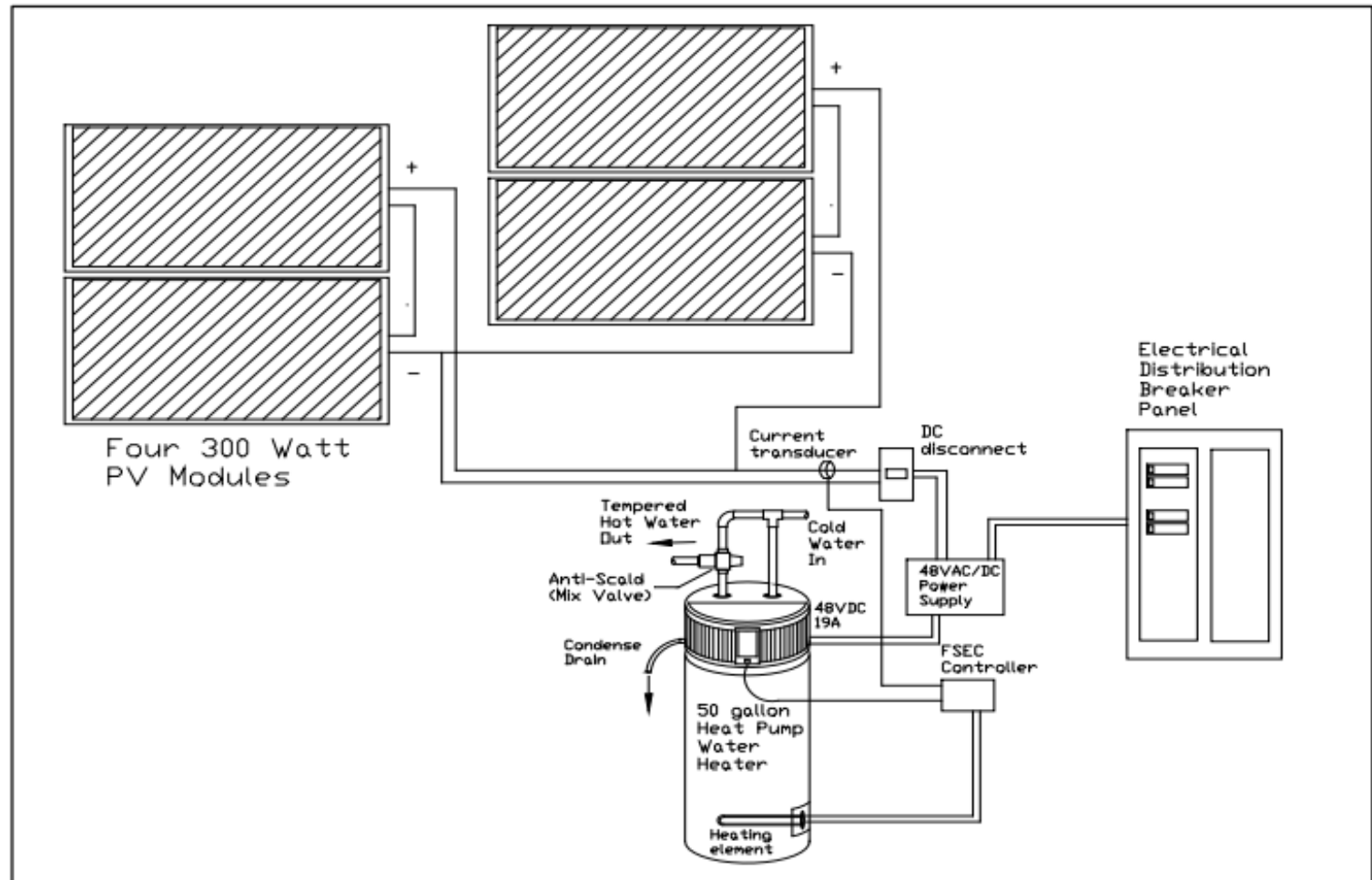


Historical Residential Electric Water Heater Efficiency



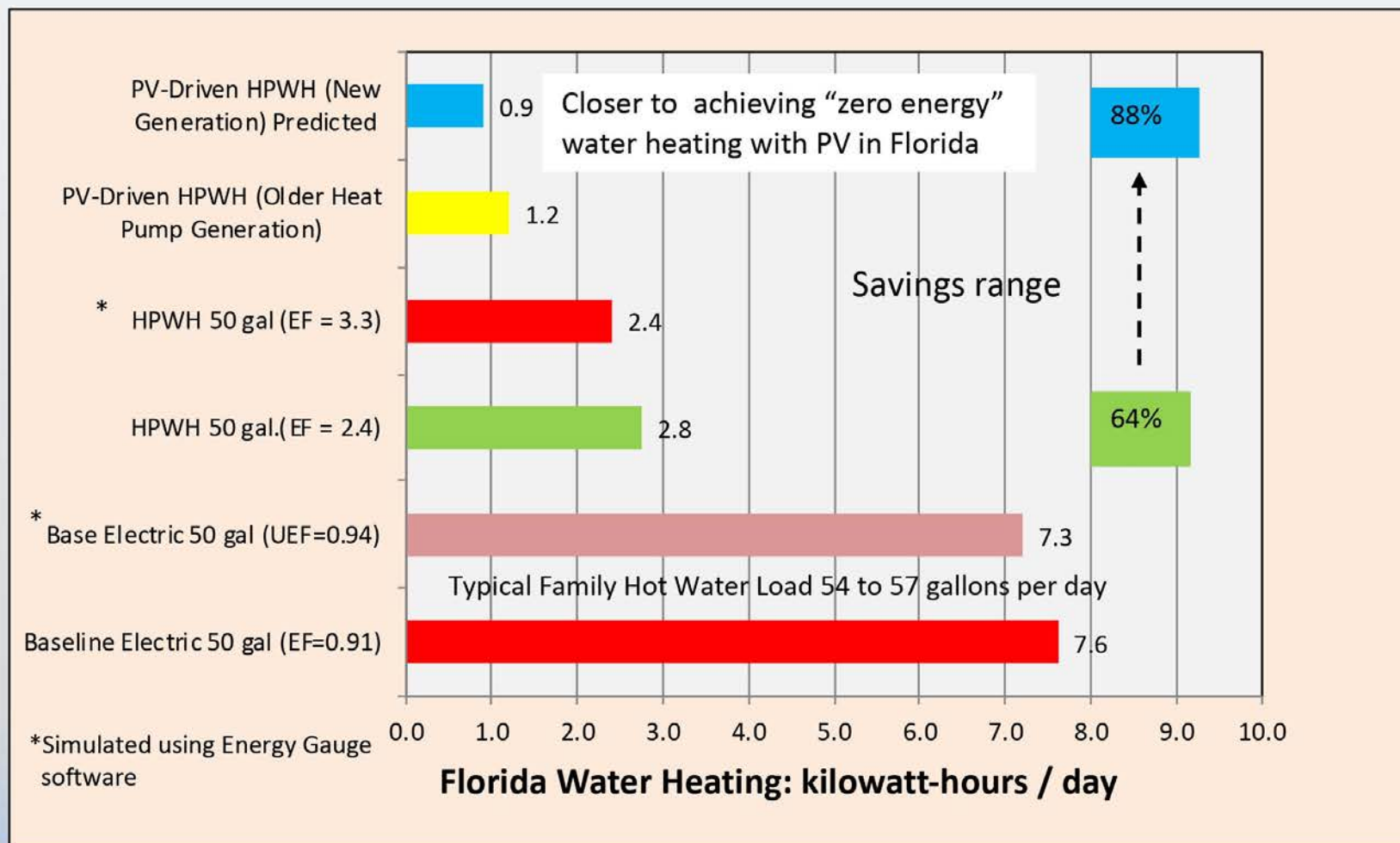


**NEW in US: Heat Pump Water Heater Split System
Draws Heat from Outdoors Instead of Inside Building**

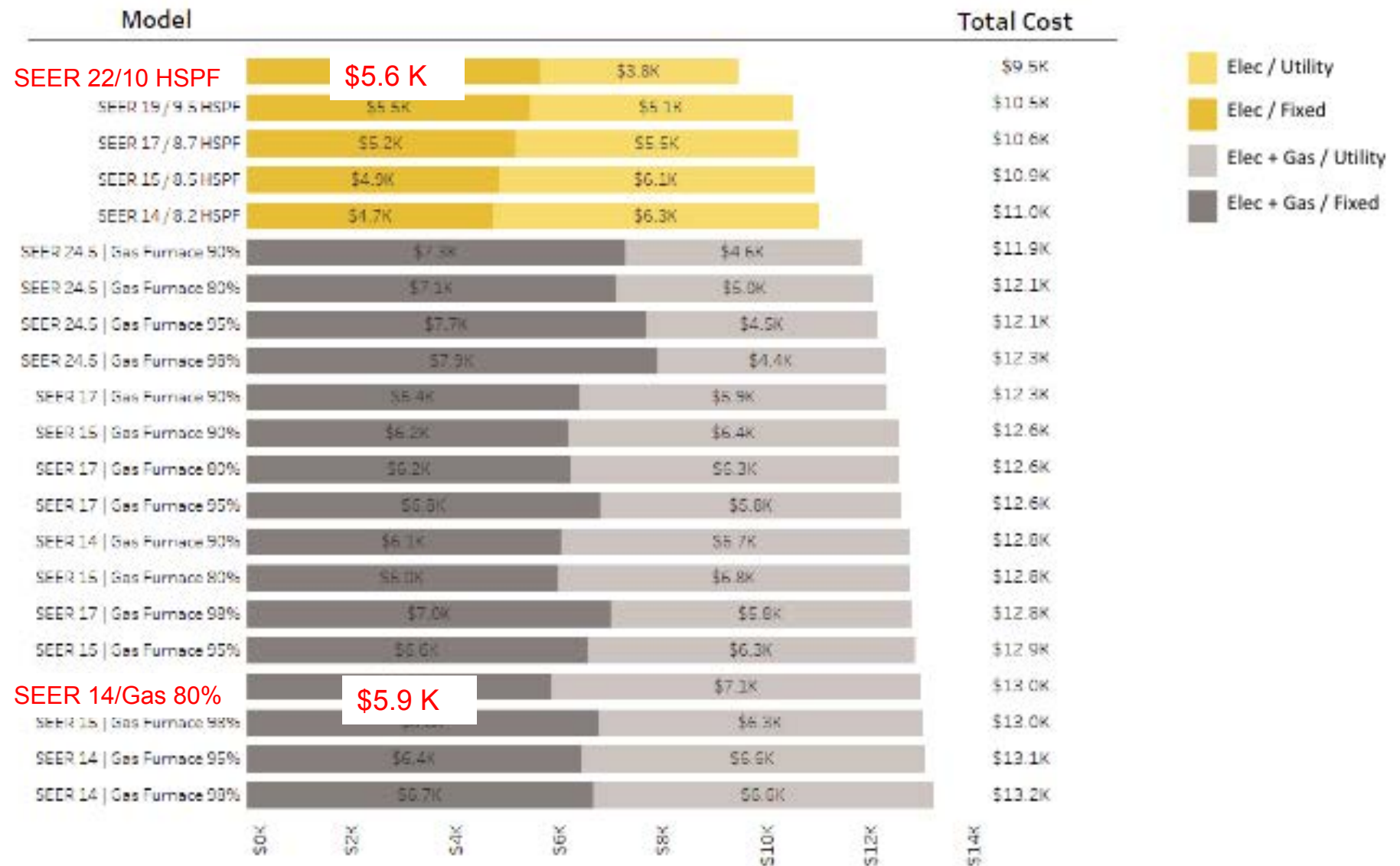


Solar PV With Heat Pump Water Heater

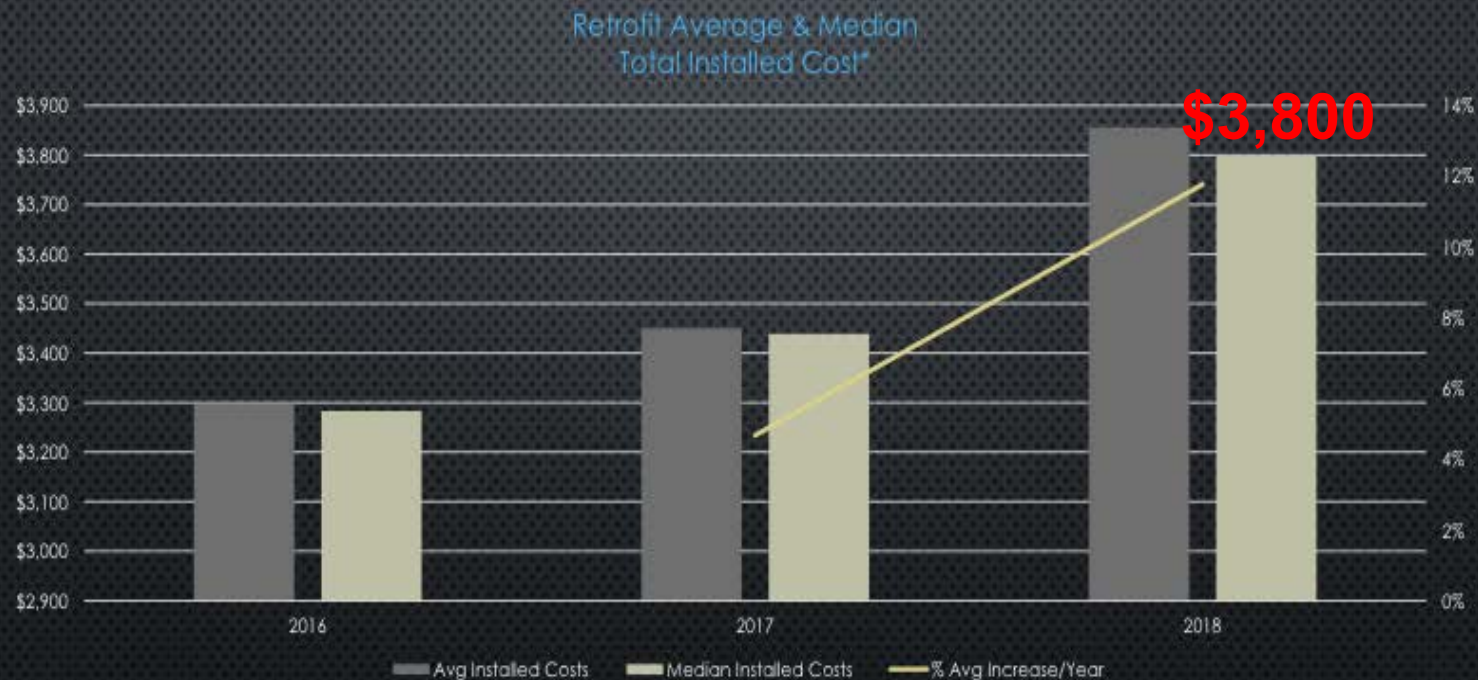
Standard Electric, Heat Pump vs PV Assisted Heat Pump Water Heating



Space Conditioning 15 Year Cost



HIGHER RETROFIT COSTS LIMIT ACCESS TO THOSE WHO CAN AFFORD THE PREMIUM



Residential Tankless Water Heater Costs

Cascade Natural Gas - 2019

From ACEEE 2019 Water Heater Forum



Is Electrification an Alternative to Global Warming?

Water Heating 20% Renewables

Gas

Cost: \$110

Carbon Emissions: 1,849 Pounds

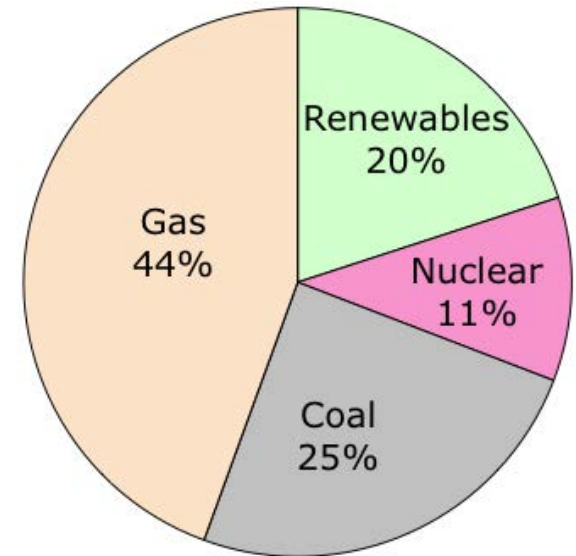
BTUs: 16.4 Million

Electric Strip Heat

Cost: \$276

Carbon Emissions: 2,920 Pounds

BTUs: 24.5 Million



Water Heating 30% Renewables

Gas

Cost: \$110

Carbon Emissions: 1,849 Pounds

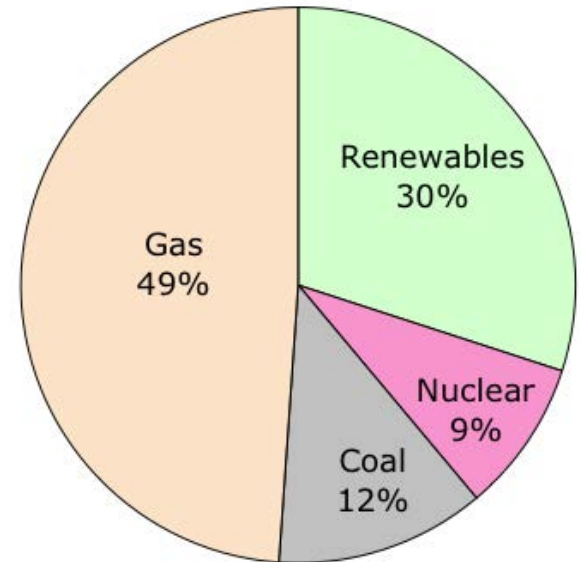
BTUs: 16.4 Million

Electric Strip Heat

Cost: \$276

Carbon Emissions: 2,196 Pounds

BTUs: 21.9 Million



Natural Gas Use in Texas

Electricity Generation – 41%

Residential and Commercial – 10%

Industrial – 49%

Policy

- 1. The goal should not be to ban gas heat
– it should be to ban strip heat**
- 2. Heat pump water heaters are currently
the best non-gas alternative**
- 3. Revise and correct study on
cost-effectiveness of all-electric homes**
- 4. Study larger grid implications**

History did not begin with you.

But it could end with you if you're not careful.