



ASSOCIATION FOR  
**ENERGY AFFORDABILITY** INC.

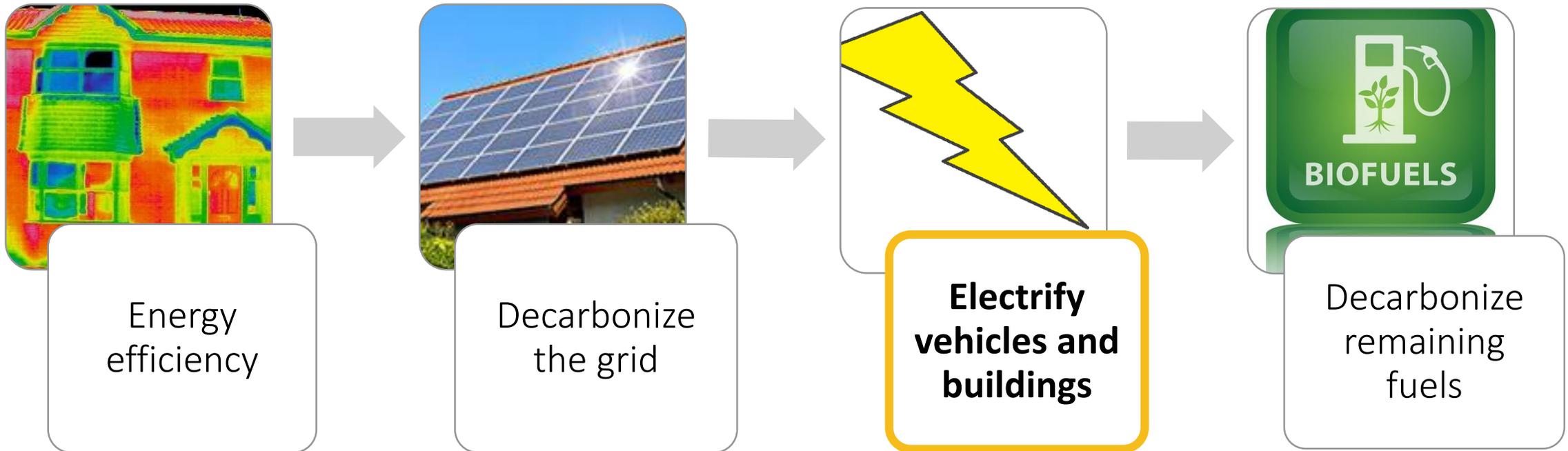
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# Zero-Carbon All-Electric Multifamily

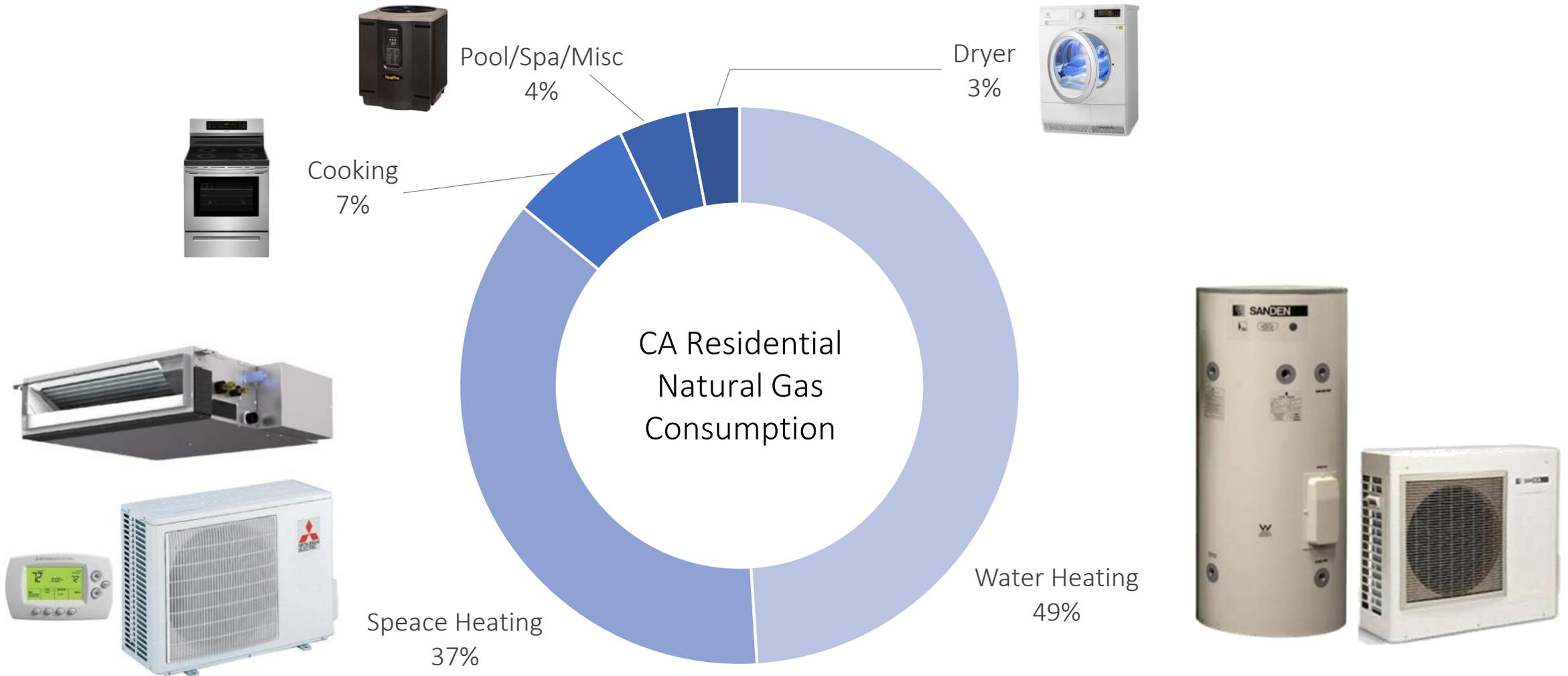
How to do it

Nick Young  
June 13, 2019

# We Must Electrify



# How to Do It

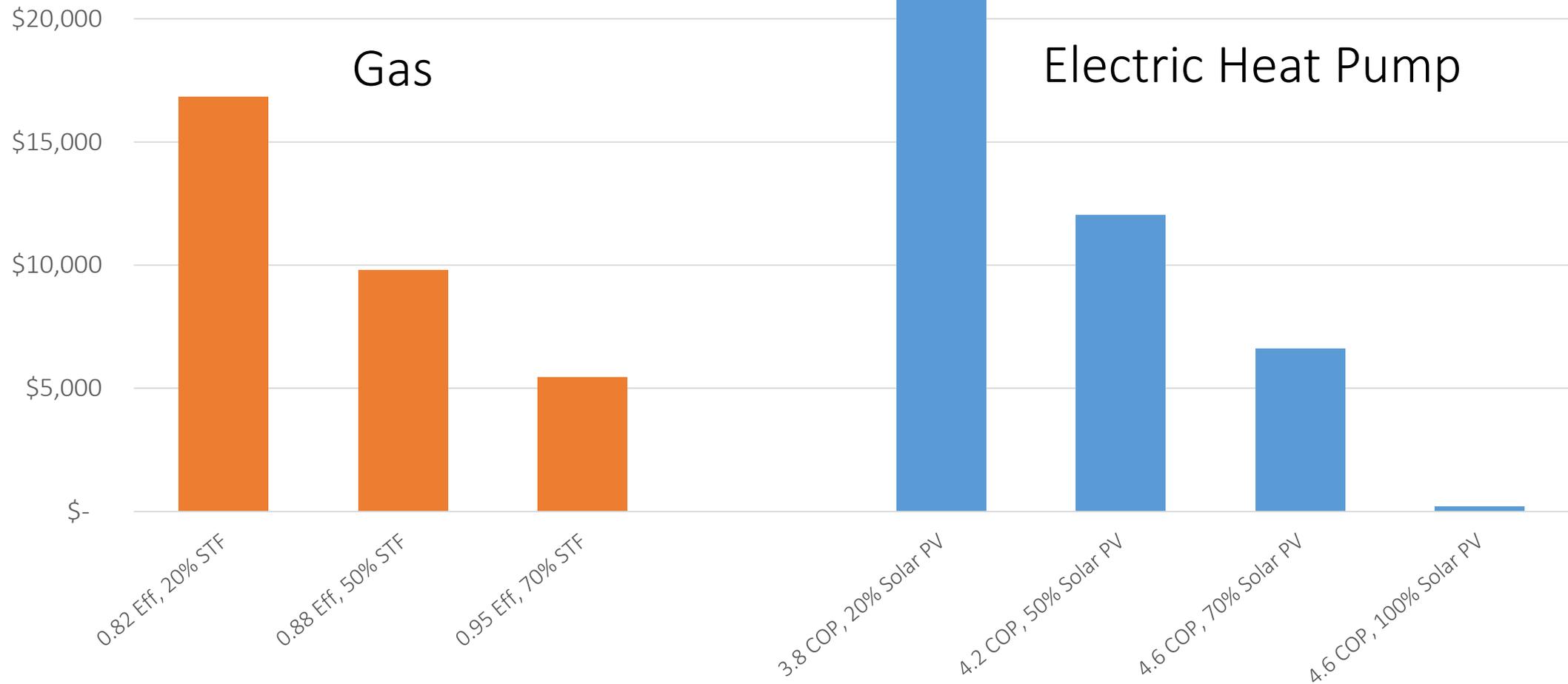


# What Changes with All-Electric

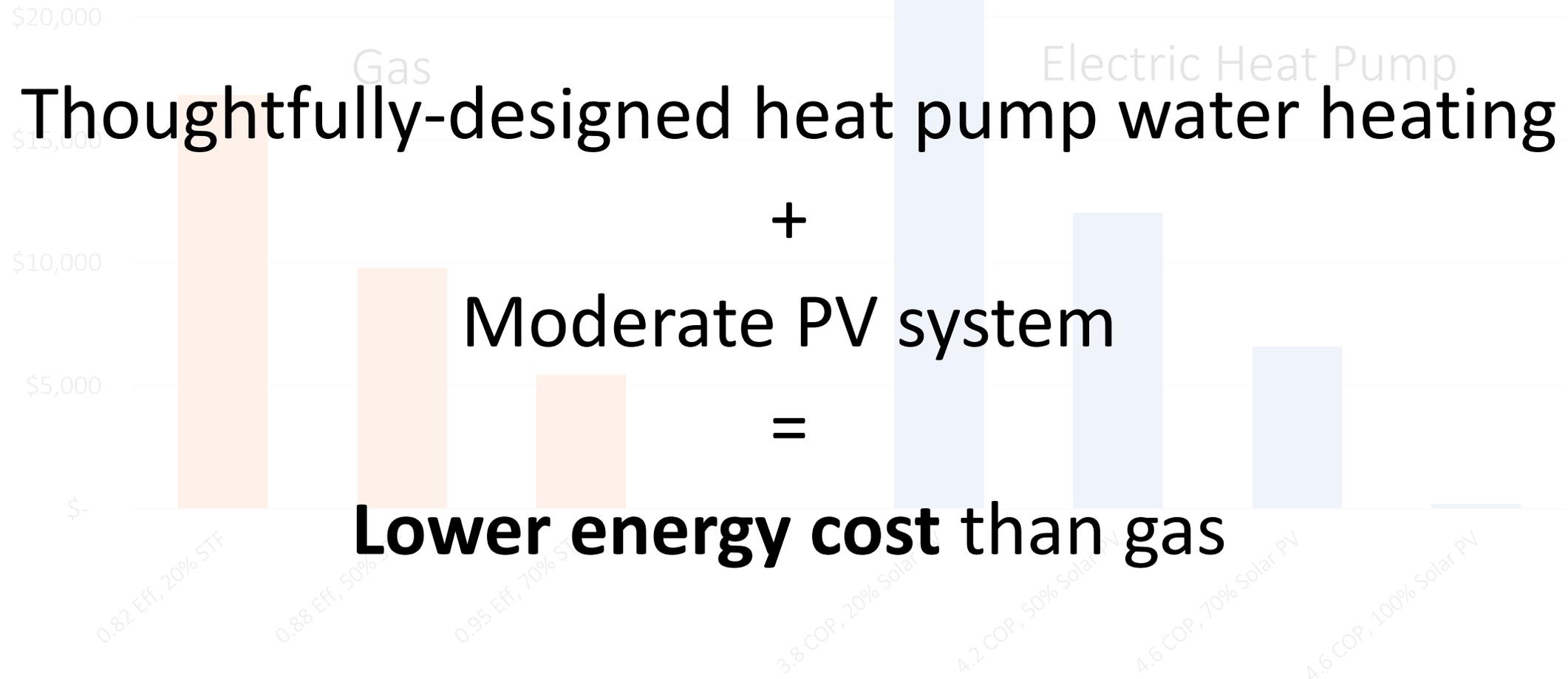
System	Standard Gas Design	All-Electric Design
Gas Service	Gas connection & meter	No gas connection or meter
Electric Service	Electrical service to building	Larger electrical service to accommodate water heaters and electric dryers
Water Heaters	Gas water heaters	Heat pump water heaters
Renewables	Photovoltaic + thermal	Photovoltaic only
Clothes Dryers	Gas dryers	Electric dryers
BBQ Grills (?)	Gas grills	Charcoal or propane tank grills
CO Alarms	Required throughout building	May not be required since there would be no combustion equipment in the building



# Annual DHW Energy Cost – 150 Unit MF



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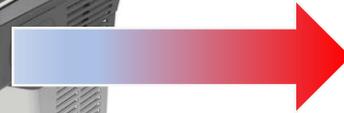
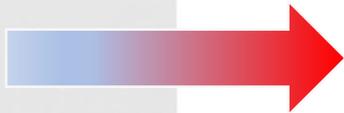
# How a Heat Pump Works

It **moves heat** from one place to another using **refrigerant**.

Just like an air conditioner or refrigerator.



# How a Heat Pump Works



# What's so great about heat pumps?

- Are hyper-efficient (4-5x equivalent gas products)
- Enable Zero Emissions Buildings via carbon-free renewable energy
- Can utilize on-site solar and act as a thermal battery
- Improve air quality – no local emissions
- Improve safety – no gas lines in building

