DOCKETED	
Docket Number:	21-IEPR-06
Project Title:	Building Decarbonization and Energy Efficiency
TN #:	238349
Document Title:	Presentation - CEC – IEPR Commissioner Workshop - Scale of Building Decarbonization in Calif, Equipment, and Supply Chain
Description:	Presentation by Josh Greene, VP, Govt and Industry Affairs, A.O. Smith
Filer:	Raquel Kravitz
Organization:	AO Smith
Submitter Role:	Public
Submission Date:	6/21/2021 2:14:14 PM
Docketed Date:	6/21/2021

CEC – IEPR Commissioner Workshop

Scale of Building Decarbonization in California, Equipment, and Supply Chain

(Heat Pump Water Heaters)

Joshua C. Greene
June 22, 2021

Overview

- A. O. Smith
- Market-Ready Technologies
- Supply Chain
- Market Projections
- Future State

A. O. Smith - Vision

Vision

To be a leading provider of **innovative** and energy-efficient products used to **heat, treat and conserve water**, providing value to our residential and commercial customers**.**

We will **create long-term value** for our stakeholders in a socially responsible manner and drive profitable growth by:

- Living our values
- Taking care of our customers
- Leading through innovation
- Investing in people
- Supplementing organic growth with strategic acquisitions

A. O. Smith - Values

Handed down from founding Smith family and embraced by all employees worldwide

We do business with uncompromising honesty and integrity

- A. O. Smith will achieve profitable growth
- A. O. Smith will emphasize innovation
- A. O. Smith will preserve its good name
- A. O. Smith will be a good place to work
- A. O. Smith will be a good citizen

Market Ready Technologies - Heat Pump Water Heaters

Standard Residential
240V HP

Residential New Construction

Multifamily

Residential Retrofit

Plug-in 120V

Heat Pump Technology

Commercial Split System

Commercial

Light Commercial

Unitary Commercial

Standard Residential – 240V

- **High Efficiency – 3.45 UEF**
  - Reduce water heating costs up to 73% compared to a standard electric
  - Reduce CO_2 emissions by more than 50% compared to a standard gas
- **50, 66, and 80 gallon models**
- **NEEA Tier 3 qualified**
- **Quiet Operation – 51 dBA**
- **Confined Space Capable –** Accessory ducting kit

JA13 Certified Residential – 240V

- Wi-Fi and Bluetooth connectivity
- Connect through free A. O. Smith app
- Time-of-use Schedules
  - Easily find your utility and push rate schedule to water heater in the app
  - Reduces operating costs by heating during low-cost periods and limiting operating during peak rate periods
- Demand Response Capable
  - OpenADR 2.0b VEN certified

Unitary Commercial

- ENERGY STAR® Qualified
- High Efficiency – 4.2 COP
- Integrated design for easy installation
  - 119-gallon tank enables heat pump to operate more frequently than backup electric elements to improve system efficiency
- 150 gallon First Hour Delivery
- HP + 12kW backup elements = 20 kW total heating capacity
- Multiple operating modes to balance efficiency and hot water delivery

Commercial Split Systems

- Packaged system solutions
- Air and Water Source Split System Heat Pumps
- Sized for Commercial and Multifamily Applications
  - 25,000 to more than 2,000,000 BTU/h heating capacities
  - Modular design
- Suitable for indoor and outdoor applications
- Double wall stainless steel condenser for potable water applications
- Compatible with Single-Pass or Multi-Pass systems

Heat Pump

Storage Tank

Residential – 120V Plug-In Applications

- Designed for homes that currently have a gas water heater
- Common challenges
  - Limited space
  - Home's electric panel may not have 30A available for a water heater
  - Expensive to hire an electrician to run a 240V dedicated circuit for a water heater and upgrade electric panel if necessary
- Homes upgrading from a standard electric water heater should use the standard 240V heat pump models

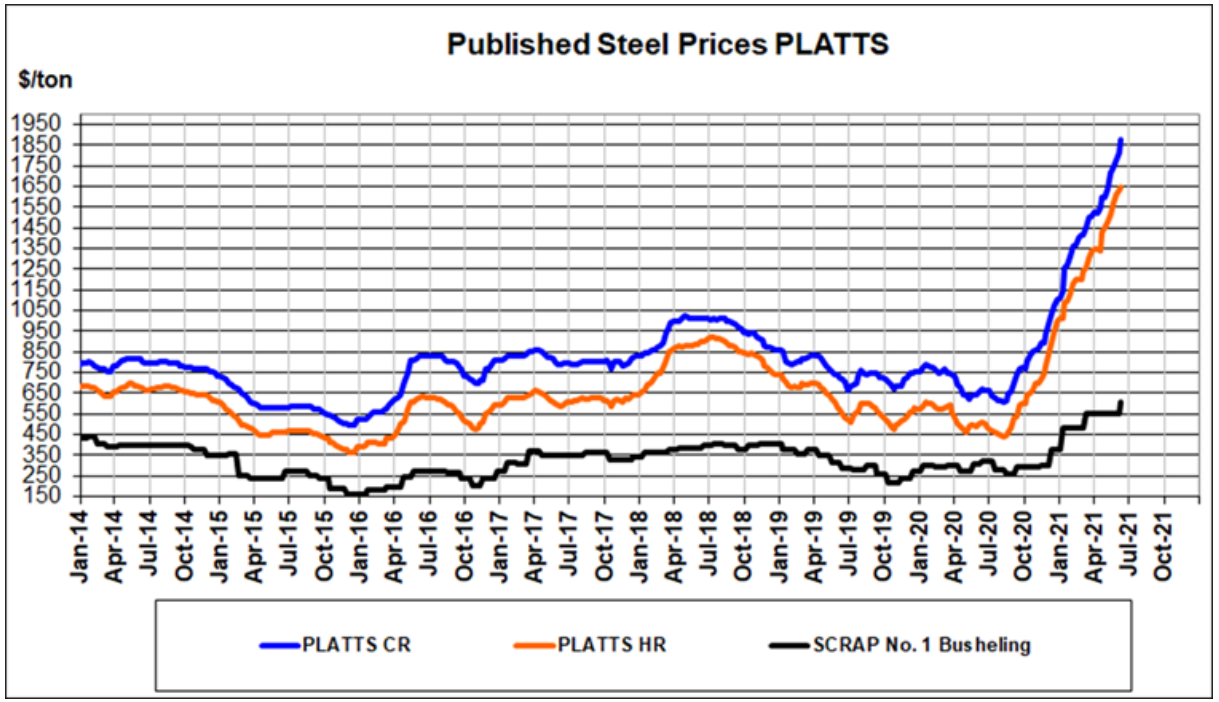
Residential – 120V Plug-In HPWH

COMING SOON

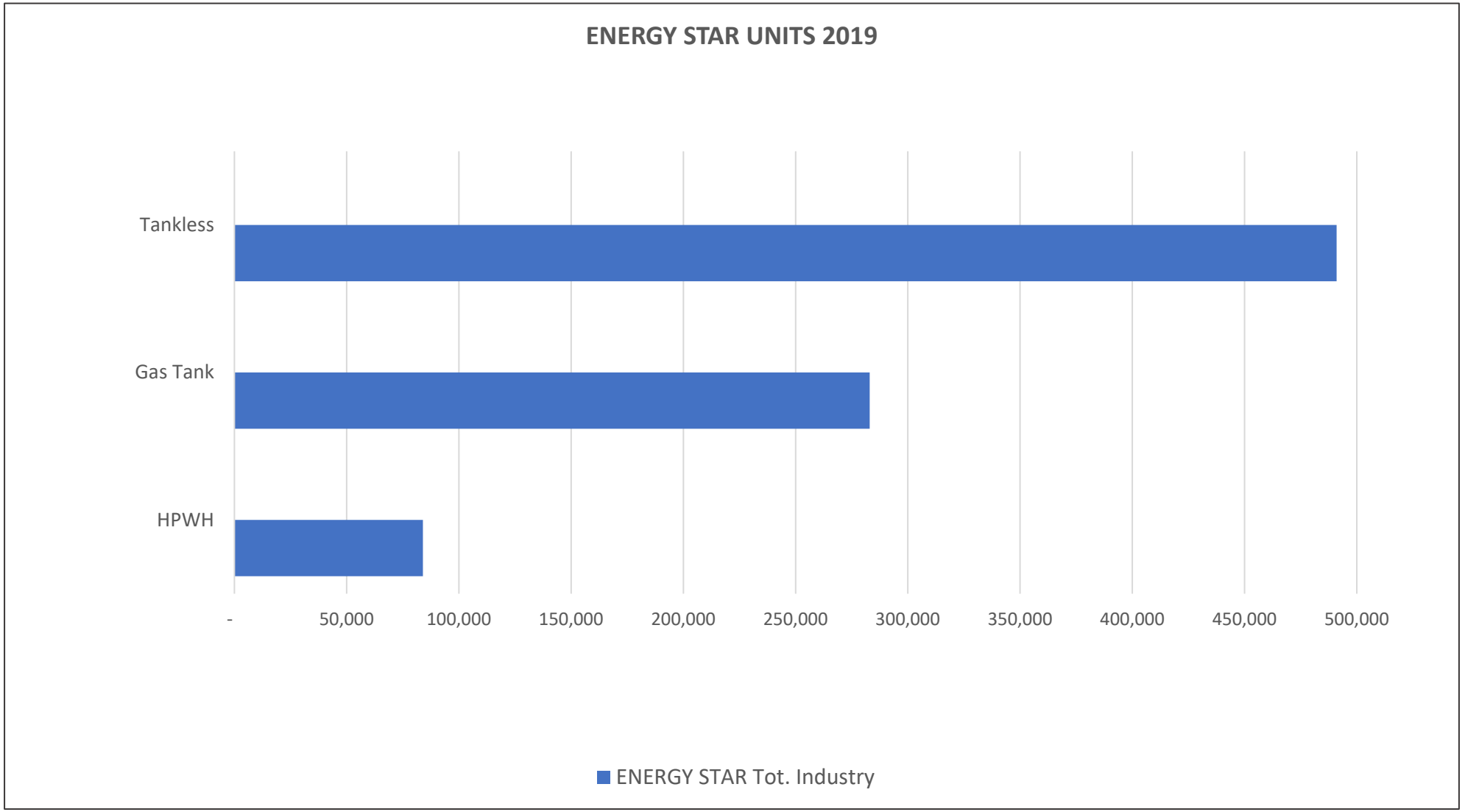
- Designed to meet NEEA AWHS v7.0 Plug-In specification
- Plugs into standard residential outlet (120 volt 15 amp shared circuit)
  - Work within a home's existing electrical system
  - One-trade or DIY instantiation
- 40-80 gallon model sizes
  - Options to fit within existing gas water heater installation footprints
- First Hour Ratings in line with UPC sizing requirements
- JA13 and CTA-2045 Capable
  - Time-of-use Rate Scheduling
  - Utility Demand Response ready

Supply Chain

- Materials
  - Steel
  - Compressors & Components
  - Electronics
  - Refrigerant Transition
- Manufacturing Capacity
  - Current demand covered
  - Additional capacity available
  - Broader HP adoption will place strains in global supply chains
  - 1M HPWHs in the installed base in CA by 2025?



Market Projections – Trends (Energy Star Units)



Market Projections - Trends

- CA New Construction – 2019 T24 Code
  - 53,000 tankless units 2020 (SF)
  - 3,000 unitary HP units 2020 (SF)
- CA New Construction – 2022 T24 Code
  - 110-120k new housing starts in 2023 (SF + MF)
  - 16,000 HPWH annually (2024) (SF + MF)
- CA Retrofit & Replacement (2020)
  - 147,000 tankless (SF)
  - 4,800 unitary HPWHs (SF)
- CA Retrofit & Replacement (2022 – 2024 annually)*
  - 132,300 tankless (SF)
  - 19,500 HPWHs (SF + MF)

*= TECH, BUILD, SGIP Incentives

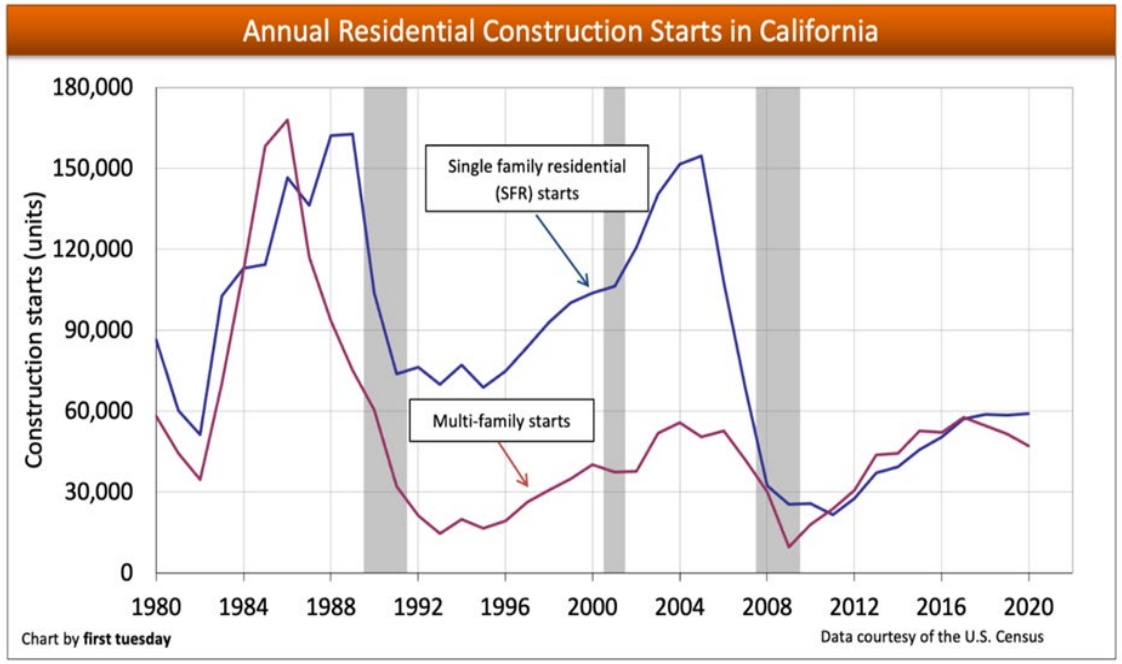


Chart update 05/18/21

	2020	2019	2018	2005 peak
SFR Starts	59,000	58,600	58,800	154,700
Multi-family Starts	47,000	51,600	54,700	50,300

Future State - Needs

- New Construction Programs
  - Easiest time to install a HPWH
  - Products already commercially available
- Instant Rebate Programs
  - Up-front cost is largest barrier for many customers
  - Downstream mail-in rebates have shown that they do not influence the purchase decision
  - Upstream or midstream programs for BOTH wholesale and retail channels to reach all potential customers
- R&R Incentive Programs
  - TECH, BUILD, SGIP ~ $250M in funding over next two years, but needs to be sustained
- Advertising
  - Drive proactive replacements when consumers can understand the value prop before an emergency
- Contractor Training
  - Stakeholder engagement with installer network, industry best practices
  - Demonstrate that HP operating costs in CA are lower than natural gas (may require TOU pricing)

Business certainty on regulations
Bespoke local natural gas bans
Air Districts


AO Smith®
Innovation has a name.