



ENERGY STAR[®]
Products Partner Meeting

New ENERGY STAR Initiatives in HVAC Markets

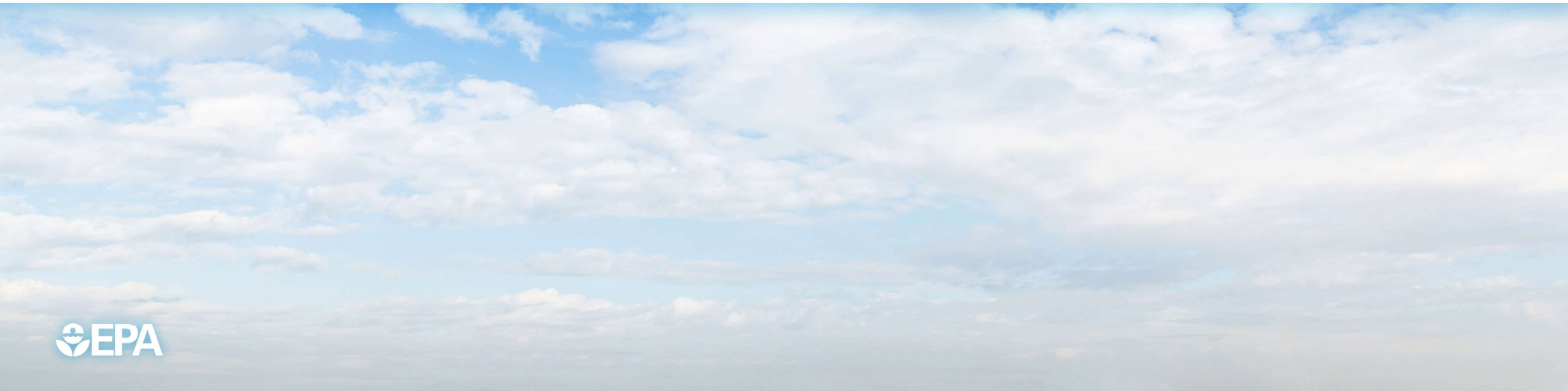
Dan Lawlor

Abigail Daken

U.S. Environmental Protection Agency



THE VALUE OF ENERGY STAR





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In American Households:



MORE THAN
90%

RECOGNIZE
THE ENERGY STAR[®]
LABEL



NEARLY
85%

UNDERSTAND
WHAT
IT MEANS



IN THE PAST YEAR
45%

PURCHASED
ENERGY STAR-LABELED
PRODUCTS

OF THESE PURCHASERS

74% were influenced by the label in their decision

80% are likely to recommend ENERGY STAR to a friend

2019 CEE
Survey Results
Now In!



Significant Enhancement to Partner Brand

- A 2017 study found partners' **JD Power** Customer Satisfaction indexes for ENERGY STAR partners increased significantly over time compared to non-partners, particularly in the areas of **Corporate Citizenship, Communications, and Customer Service.**





Significant Enhancement to Partner Brand

- Recent A/B testing conducted by Focus on Energy shows that using **ENERGY STAR logo** on ads drove a **60% increase in click-through-rate**.



+



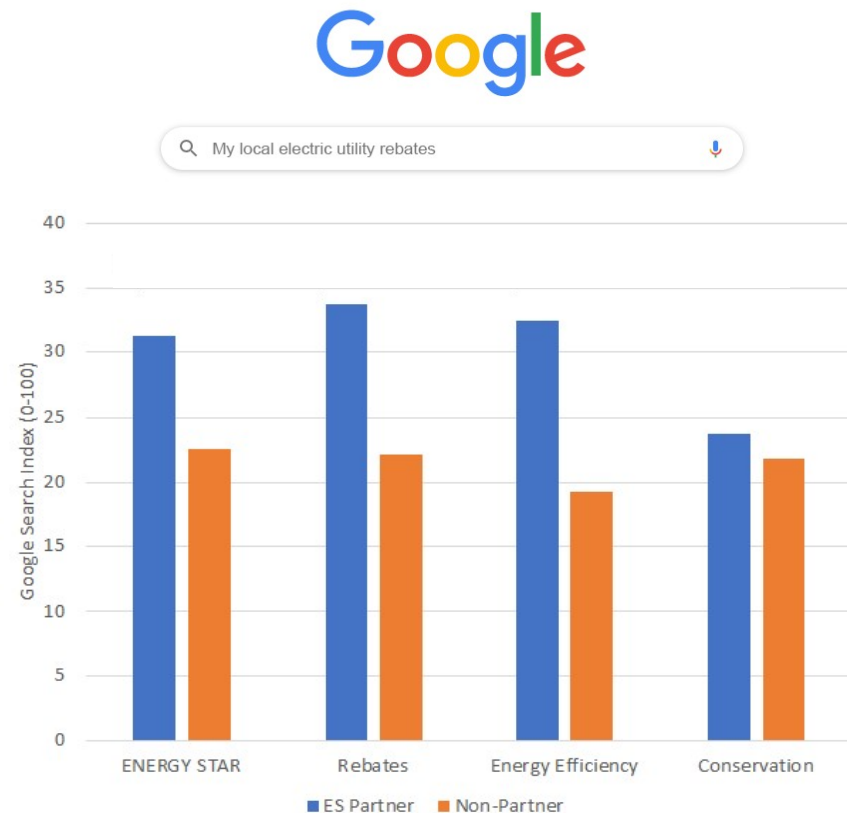
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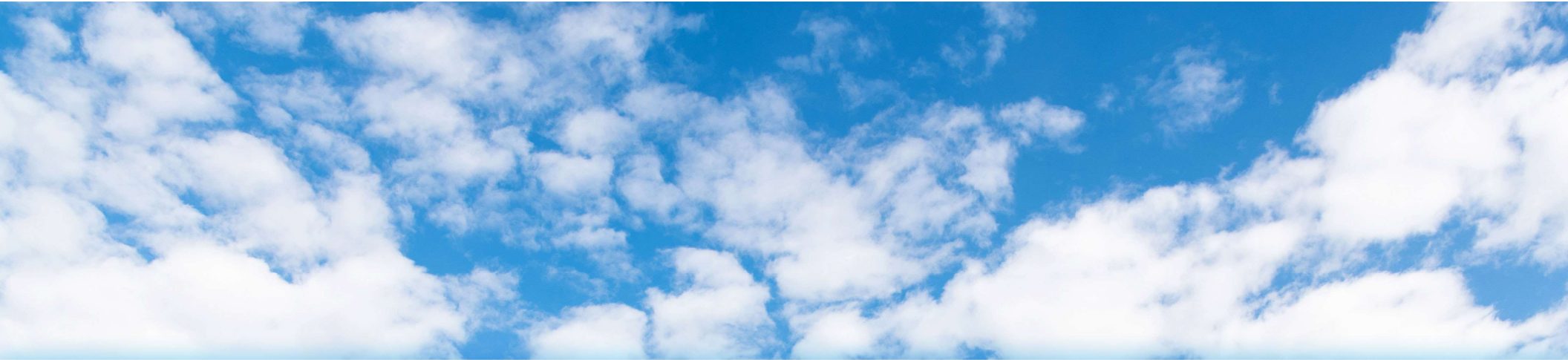




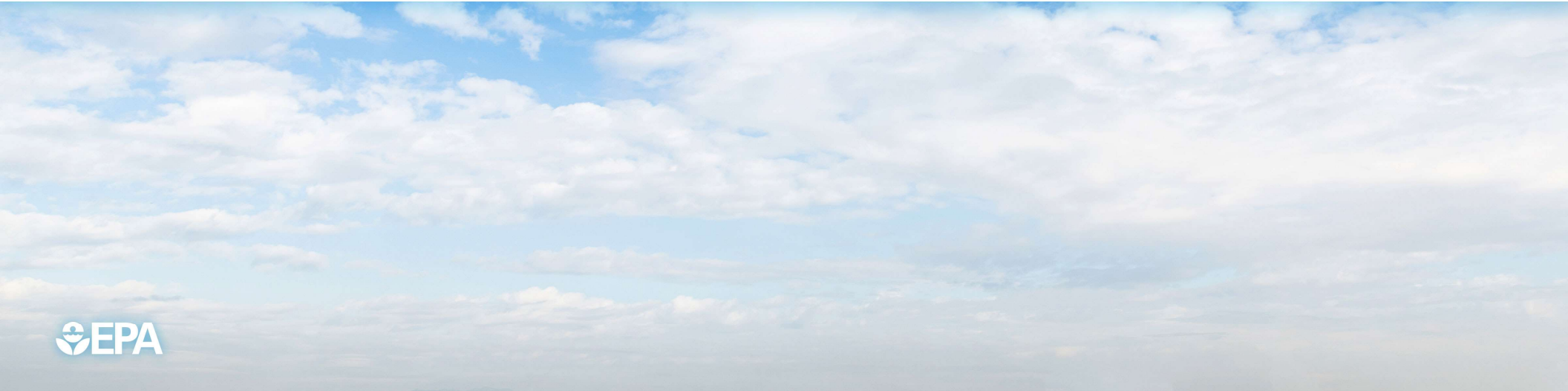
Mutually Beneficial Relationship

- 2017 study demonstrates that when a utility partners with **ENERGY STAR**, it results in **increases in Google searches** for related items.





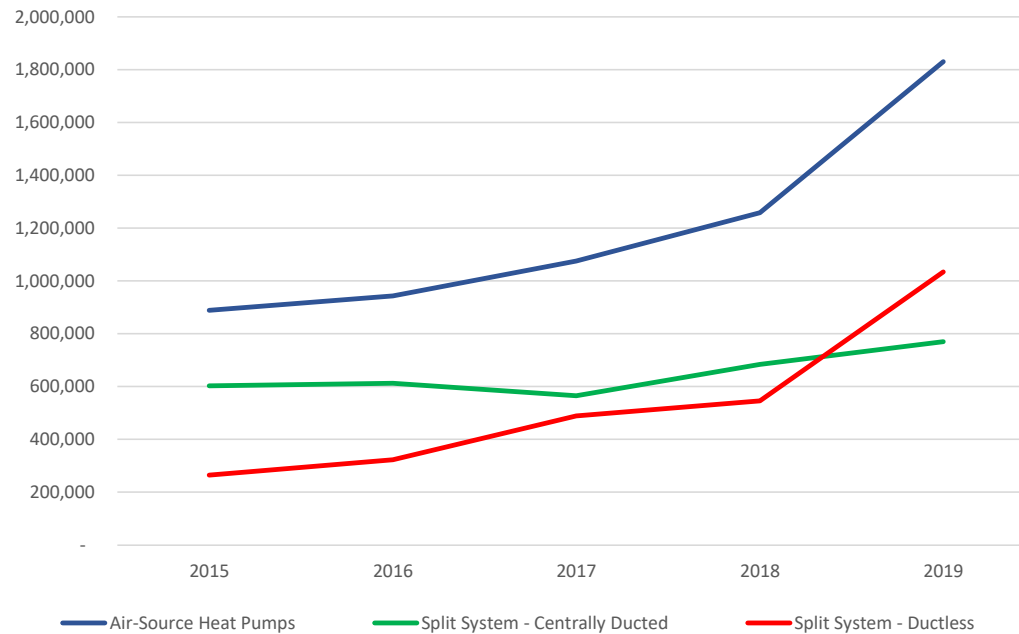
Increasing Demand: Why ENERGY STAR?





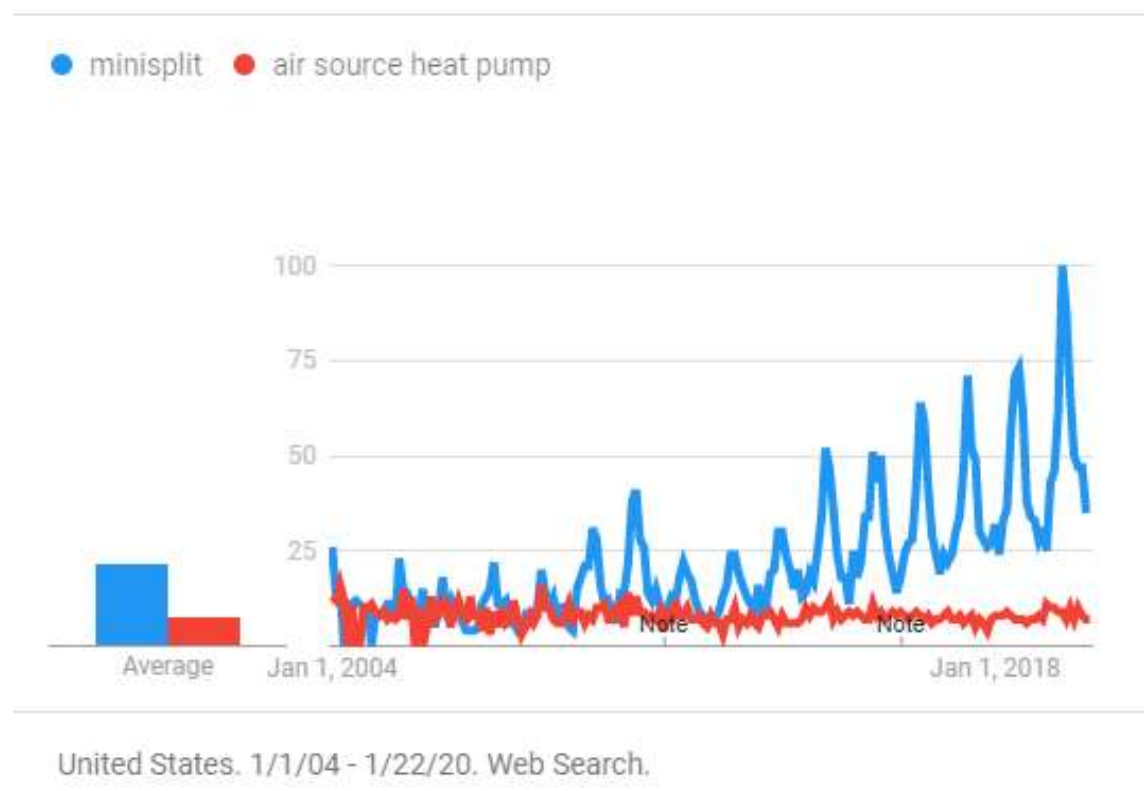
Market Overview

ENERGY STAR Shipments





Market Overview





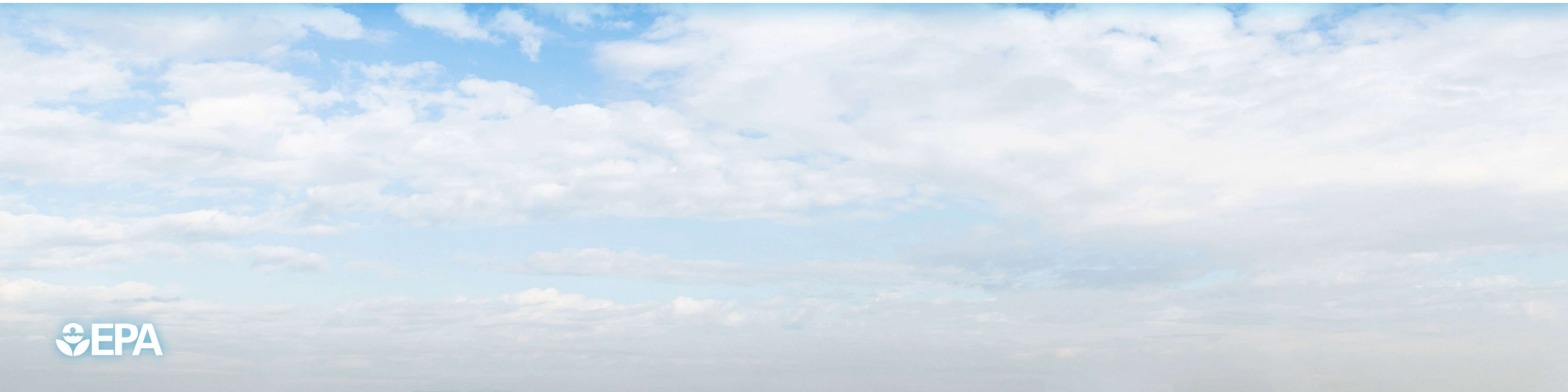
ENERGY STAR Heat Pump Benefits

- Heating and Cooling costs the average homeowner more than \$900 a year –nearly half the home’s total energy bill.
- An ENERGY STAR certified ASHP can provide heating for approximately 1/3 the cost of traditional electric baseboard heating, depending on where you live, and approximately 1/2 the cost of oil heat.
- ENERGY STAR certified mini splits use up to 60% less energy than standard home electric radiators.





Increasing Demand: Getting Consumers to Ask for ENERGY STAR HVAC





Address Barriers to Consumer Demand

- 1) Complexity and Cost**
Product/technology complexity and cost along with navigating the marketplace.
- 2) Product/Contractor Information**
Limited access to the right product and contractor information.
- 3) Consumer Awareness**
Lack of general awareness among consumers around the benefits of ASHPs vs traditional HVAC.



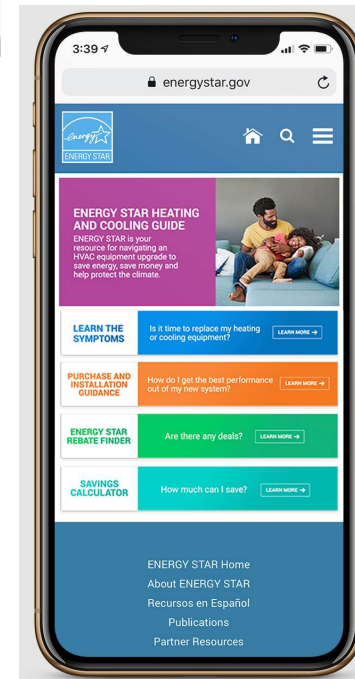
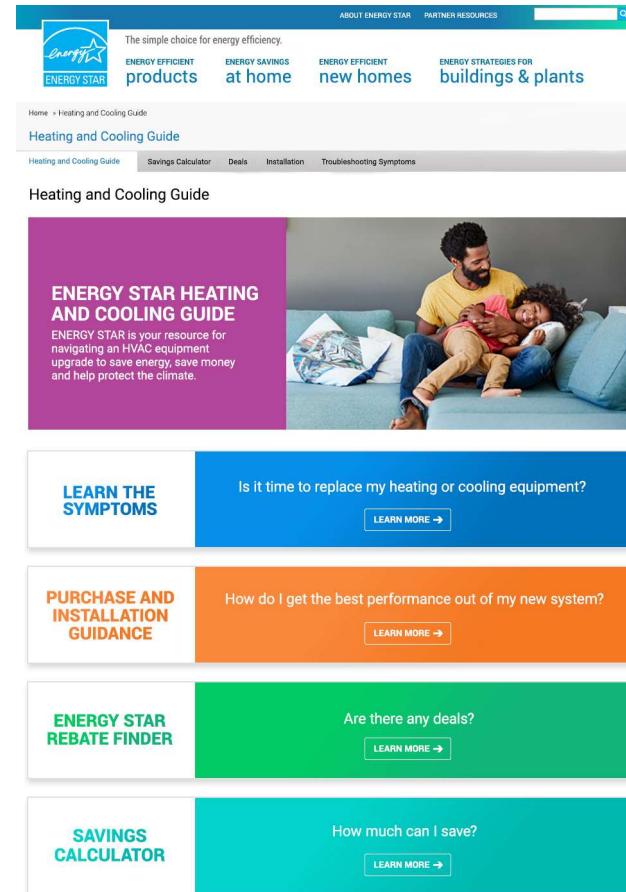


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1. Complexity and Cost Barrier

- Develop an ENERGY STAR Heating & Cooling Guide to give consumers access to the replacement guidance they need:
 - Information on equipment replacement
 - Purchase and installation guidance
 - Available Rebates
 - Replacement savings calculator





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The simple choice for energy efficiency.
ENERGY EFFICIENT products
ENERGY SAVINGS at home
ENERGY EFFICIENT new homes
ENERGY STRATEGIES FOR buildings & plants

Home » Products » Heating & Cooling » Heating & Cooling Guide » Learn the Symptoms

Energy Efficient Products

- SYMPTOMS
- GUIDANCE
- SEE DEALS
- SAVINGS



LEARN THE SYMPTOMS

IS IT TIME TO REPLACE YOUR EQUIPMENT?

It may be time for a change if:

- Your equipment is more than 10 years old or it needs frequent repairs and your energy bills are going up.
- The age and condition of your heating or cooling equipment may have caused it to become less efficient. Oversized units tend to have shorter lives due to "short-cycle" or turning on and off rapidly, which inflicts excessive wear and tear on the compressor. Consider replacing it with newer, more efficient ENERGY STAR certified equipment.
- Some of your rooms are too hot or cold (this could also be due to inadequate air sealing, windows or insulation).
[Learn more →](#)
- Your home has humidity problems, excessive dust or rooms that never seem to get comfortable (this could also be due to poorly insulated ductwork).
[Learn more →](#)
- You tend to leave your thermostat set at one constant temperature.
- You could be missing a great opportunity to let an ENERGY STAR certified smart thermostat adjust the temperature to save energy while you are asleep or away.
[Find deals →](#)

[← Home](#)

[Purchase and Installation Guidance →](#)

Energy Efficient Products

Products that earn the ENERGY STAR are independently certified to save energy, save money and protect the climate.

- SYMPTOMS
- GUIDANCE
- SEE DEALS
- SAVINGS



PURCHASE AND INSTALLATION GUIDANCE

GET THE BEST PERFORMANCE FROM YOUR NEW SYSTEM

What type of heating and/or cooling system are you thinking of purchasing?

- Central cooling and/or heating delivered through duct work and air vents (i.e. forced air)
- No existing ductwork

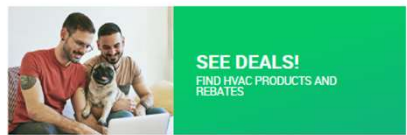
[← Home](#)

[Find Deals →](#)

Energy Efficient Products

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- SYMPTOMS
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- SEE DEALS
- SAVINGS



SEE DEALS!

FIND HVAC PRODUCTS AND REBATES

What type of heating and/or cooling system are you thinking of purchasing?

- Central air conditioning
- Heat pump (air conditioning and heat delivered through duct work and air vents, i.e. forced air)
- Gas furnace
- Ductless heat pump (air conditioning and heat without ducts)
- Boiler

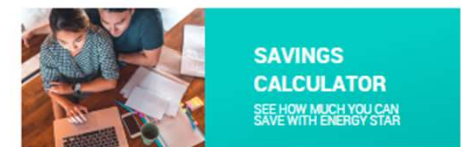
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[Savings Calculator →](#)

Energy Efficient Products

Products that earn the ENERGY STAR are independently certified to save energy, save money and protect the climate.

- SYMPTOMS
- GUIDANCE
- SEE DEALS
- SAVINGS



SAVINGS CALCULATOR

SEE HOW MUCH YOU CAN SAVE WITH ENERGY STAR

The average household spends more than \$2,200 a year on energy bills, with nearly half going to heating and cooling. HVAC equipment that earns the ENERGY STAR label is independently certified to save energy, save money and help protect the climate.

What type of heating and/or cooling system do you have in your home?

- Central cooling and/or heating delivered through duct work and air vents (i.e. forced air)

What type of heating and/or cooling system do you have in your home?

- Central air conditioning only
- Central air conditioning and heating delivered through duct work and air vents (i.e. forced air) using a heat pump

Split system or single package?

- Split System
- Single Package

Enter your zip code?

What is the current size (in tons or BTUs) of your existing system?

If you are unsure, what is the square footage of the space you are heating/cooling?

When was your existing system installed?

Do you currently have a smart thermostat with your existing system?

- Yes
- No

[submit](#)

[← Home](#)

[Learn the Symptoms →](#)



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2. Product/Contractor Information Barrier

- Developed a Product Finder that connects customers to brands and ENERGY STAR certified product lines that facilitate contractor support.
- Updated CEE/AHRI links on existing product finder with an ENERGY STAR-focused experience that caters more to the end-use consumer.

The screenshot displays the ENERGY STAR Product Finder for Heat Pumps (Ductless). The interface includes a search bar, navigation tabs for 'BUYING GUIDANCE', 'CALCULATE SAVINGS', and 'WHEN IS IT TIME TO REPLACE?', and a 'Filter Your Results' section. The filters include Brand Name (with sub-categories like Carrier, Goodman, etc.), Cooling Capacity (in BTUs), and Heating Capacity (in BTUs). The main content area shows a list of products with details such as 'Rebate in your zip code: 46077', 'Ductless Heat Pump (mini & multi split) Systems', and 'Mitsubishi Electric - 8-Series'.

- SEER®**
- 15.0+ (135)
 - 16.0+ (135)
 - 18.0+ (134)
 - 20.0+ (129)
 - Do not filter

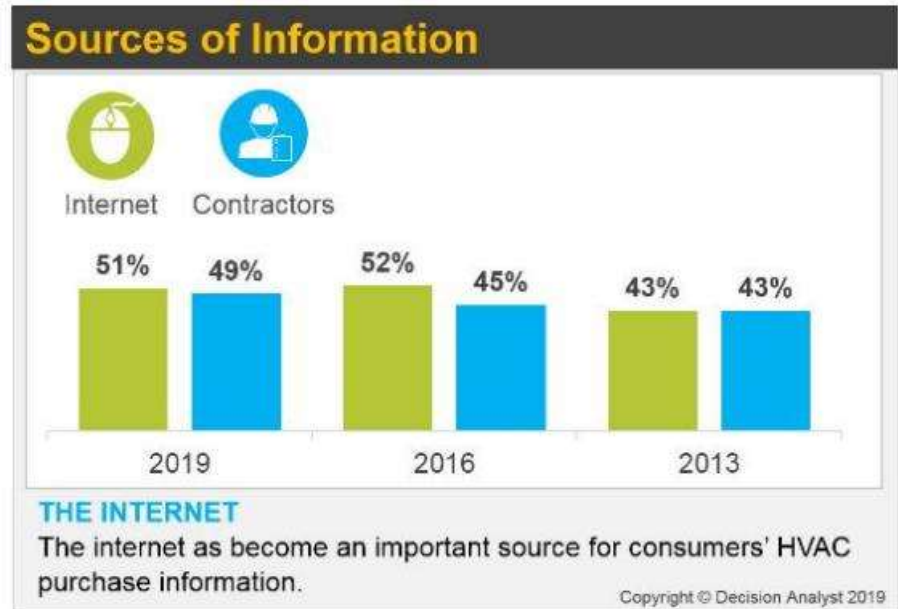
- EER®**
- 12.5+ (135)
 - 13.0+ (117)
 - Do not filter

- HSPF®**
- 8.5+ (135)
 - 9.0+ (135)
 - 9.6+ (131)
 - 10.0+ (130)
 - Do not filter



3. Consumer Awareness Barrier

- Implement awareness campaign that drives traffic to the HVAC Guide
- Connect consumer to rebates and contractor in their area.
 - Campaign highlights benefits of ENERGY STAR certified HVAC:
 - Energy bill savings
 - Comfort
 - Rebates & Tax Credits
 - Environmental benefits





ENERGY STAR HVAC Campaign



- **Goal:** Overcome barriers to generate consumer demand and adoption of ENERGY STAR certified HVAC systems, with a focus on ducted air source heat pumps and mini splits.



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Air Source Heat Pump and Mini Split Heat Pump Fact Sheets



A Highly Efficient, Tried-And-True Way to Comfortably Heat and Cool Your Home

Keeping your home at a comfortable temperature can be expensive. A typical household's energy bill is around \$2,000 annually, and almost half of that goes to heating and cooling! To cut these costs, an **air source heat pump (ASHP)** can be installed and connected to the conventional forced-air ductwork system that is typical of most American homes. (For homes without ductwork, see www.energy.gov/energysmart.) ASHPs that earn the ENERGY STAR label are independently certified to save energy, save money, and protect the climate.

What is an Air Source Heat Pump?

An ENERGY STAR certified ASHP provides highly efficient heating and cooling by extracting heat from outside into your home in winter and pulling the heat out of your home in the summer. For some, it may be helpful to think of a ducted ASHP as a central air conditioner that also works in reverse to provide whole-house space heating in winter. See Figure 1 below.

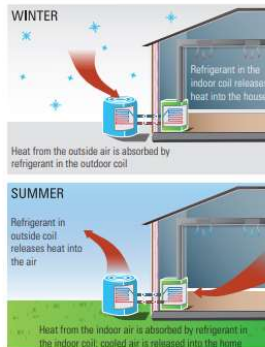


Figure 1. How an ASHP Works in Summer and Winter

Benefits of an Air Source Heat Pump

- **Cutting heating costs compared to conventional heating systems.** An ENERGY STAR certified ASHP can provide heating for approximately 1/3 the cost of traditional electric baseboard heating, depending on where you live, and approximately 1/2 the cost of oil heat. An ASHP is so efficient it can deliver up to three times more heat energy to a home than the electrical energy it consumes. This is possible because a heat pump moves heat rather than converting it from a fuel, as combustion heating systems do.
- **Reducing cooling costs compared to conventional room air conditioners.** During the summer months, a central ASHP automatically becomes a central air conditioner, and with ENERGY STAR, you will have reduced cooling bills due to its highly efficient operation.
- **Reducing greenhouse gas emissions.** An ASHP is good for your home and good for the planet. ENERGY STAR certified models avoid more than 4,500 lbs of greenhouse gas emissions, on average, over the course of their lifespan compared to standard systems.
- **Easy installation.** A central ASHP uses existing ductwork in your home to deliver heating and cooling. In most climate zones, an ASHP can be installed as a drop-in replacement when either a central air conditioner or a furnace needs replacement.
- **Heating and cooling in one system.** ASHPs offer highly efficient heating and cooling in one integrated system.



An Ultra Efficient Way to Comfortably Heat and Cool Your Home

Keeping your home at a comfortable temperature can be expensive. A typical household's energy bill is around \$2,000 annually, and almost half of that goes to heating and cooling! To cut these costs, an increasingly popular and highly versatile system called a **mini split heat pump** can be professionally installed to comfortably heat and cool your home. Mini split heat pumps that earn the ENERGY STAR label are independently certified to save energy, save money, and protect the climate.

What is a Mini Split Heat Pump?

Ductless heat pumps, or mini split heat pumps, are an alternative to radiator or baseboard heating, as well as a replacement for window units for cooling. No duct work is needed. Instead, a head unit, or multiple head units, are mounted on an interior wall or ceiling, with an accompanying unit outside (Figure 1). The outside unit extracts heat from the air, even when it's cold. Refrigerant carries the heat directly to the head(s) inside, which then delivers heated air to occupied space. In warmer months, the system works in reverse for quiet, efficient air conditioning.



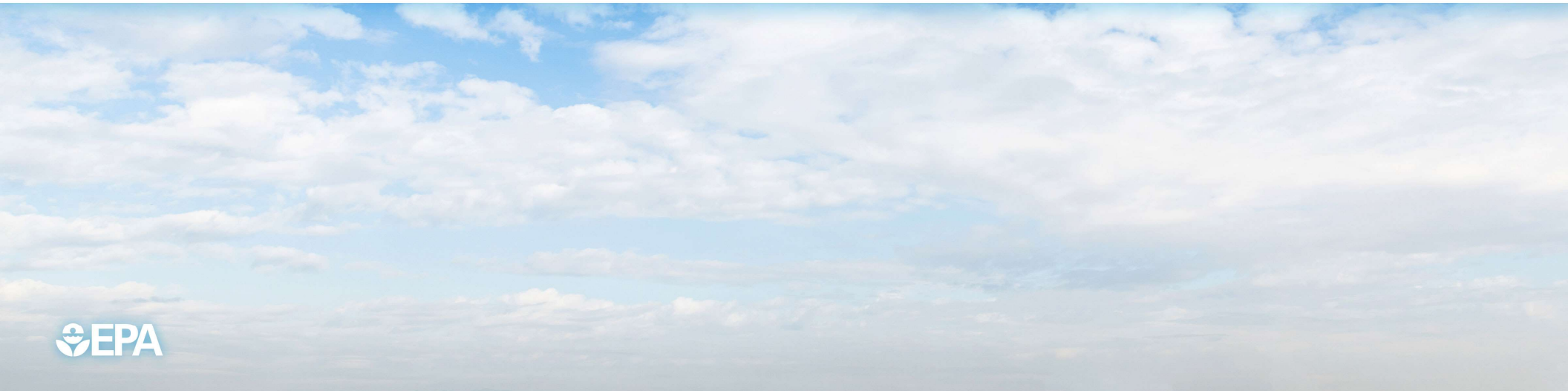
Figure 1. Ductless Mini Split Heat Pump Installed
Graphic courtesy of Mitsubishi Electric

Benefits of a Mini Split Heat Pump

- **Cut heating costs in half compared to conventional electric heating systems.** Because they transfer rather than generate heat, ENERGY STAR certified mini splits use up to 60% less energy than standard home electric radiators.
- **Provide quiet, high efficiency cooling.** ENERGY STAR certified mini splits use more sophisticated compressors and fans that can adjust speeds to save energy and money. They also cool directly from the unit, rather than passing through a network of fabricated ductwork, eliminating energy losses from ductwork which can account for more than 30% of a home's energy use for space conditioning.
- **Reducing greenhouse gas emissions.** A mini split is good for your home and good for the planet. ENERGY STAR certified systems used in a whole house setting avoid more than 4,500 lbs of greenhouse gas emissions, on average, over the course of their lifespan compared to standard systems.
- **Heating and cooling in one device.** Mini split heat pumps offer highly efficient heating and cooling in one integrated system.
- **Easy, ductwork-free installation.** Mini splits use narrow refrigerant lines positioned outside your home to deliver heating and cooling instead of conventional central heating and cooling which requires bulky, and often expensive ductwork. Only a three-inch hole in an outdoor wall is needed for the refrigeration lines to connect the outdoor unit to the indoor unit.
- **Custom comfort anywhere in your home.** Mini splits can maintain different customized temperatures in each room through control consoles (either wall-mounted or ceiling-invented), remote controls, and smart phone apps.



2020 Product Promotions





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Spring 2020 HVAC Promotion Plan

Goal

- Educate and encourage consumers in the market for HVAC to choose ENERGY STAR certified models for energy-savings, increased comfort, and environmental benefits.

Call to Action

- Drive consumers to the new Heating and Cooling Guide on energystar.gov.

A better way to 

A better way to heat
and 

A better way to heat
and cool your home
and help the 

A better way to heat
and cool your home
and help the planet.

Look no further.

Look no further.



**Get the Heating
& Cooling Guide** ▶

To Date: 5,717,678 Impressions, \$.38 CTC



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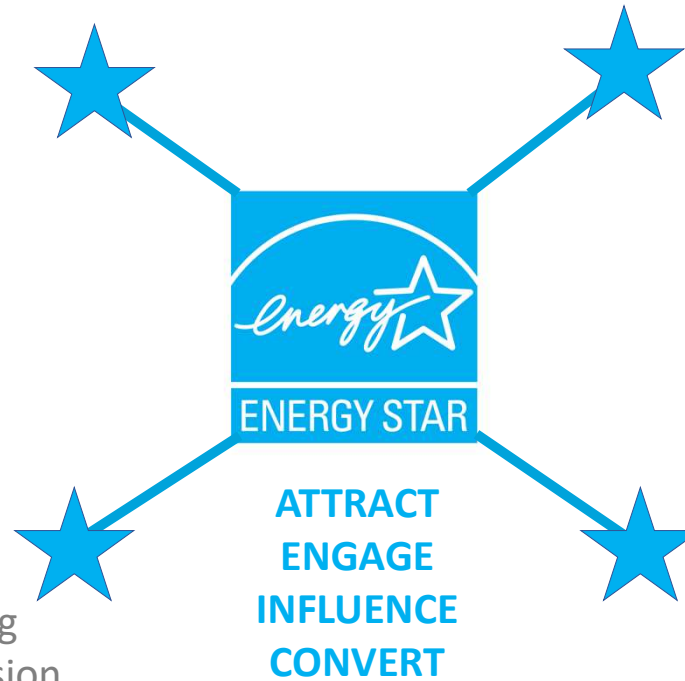
ENERGY STAR Product Promotions = Formula for Success

Manufacturers

- Top EE Products
- Promotions driving demand

Utilities

- Consumer connection
- Incentives driving demand/conversion



Retailers/Marketplaces

- POS driving traffic/conversion
- ENERGY STAR mark provides easy identification

EPA ENERGY STAR

- Facilitation/coordination
- Informative, expert, credible content
- Engaging messaging/creative
- Curate/build effective marcomm strategies



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2019 Campaign Impacts:



Product Finder pages had more than
1.3 MILLION
PAGEVIEWS

NEARLY
150 UTILITIES serving
43 MILLION
HOUSEHOLDS



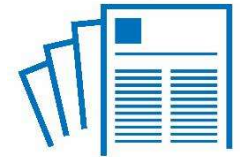
5 MILLION
VIDEO VIEWS



MORE THAN
732 MILLION
IMPRESSIONS in print,
social, and online
media in 2019

732000000

MORE THAN
17,900
PLACEMENTS
through NAPS
and Brandpoint



6.2 MILLION
newsletters delivered

Oath:
A Verizon company

Brandpoint

NAPS
NORTH AMERICAN PRECIS SYNDICATE



bob vila™

You Tube

SHARETHROUGH

Google Display Network



GroundTruth.
22



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ENERGY STAR[®] Central Air Conditioners & Heat Pumps Version 6.0: A New Vision ESPPM 2020





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Why Revise Now?

- Time: Version 5.0 effective 2015
- Increased interest in electrification & cold climate optimized heat pumps
- Developing consensus around grid services for CAC/ASHP

Estimated Market Share of ENERGY STAR Certified CAC/HPs		
	2018	2019
Overall	33%	41%
CACs	28%	30%
ASHPs	43%	59%

[2018 ENERGY STAR Unit Shipment and Market Penetration Report](#)

[2019 ENERGY STAR Unit Shipment and Market Penetration Report](#)

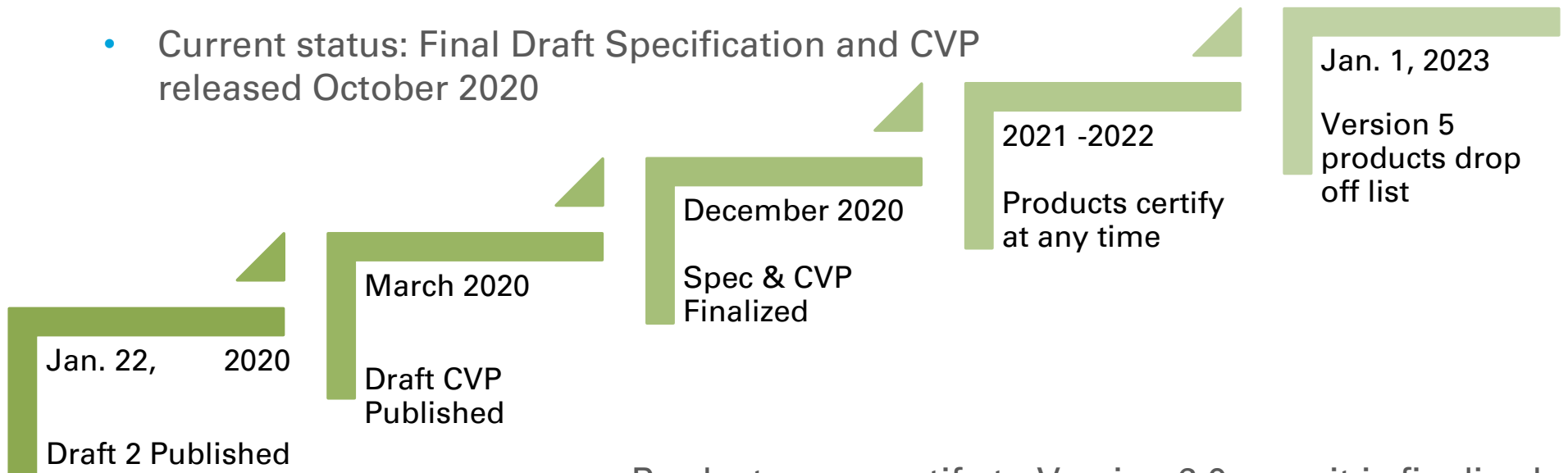




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Status and Timeline

- Current status: Final Draft Specification and CVP released October 2020



- Products may certify to Version 6.0 once it is finalized
- Early certification may get additional recognition
- Specification allows for path using current test method
- Expect bulk of V6.0 certification in 2022



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New Initiatives Reflected in V6.0 Specification

1. **Climate differentiated AHSP criteria and marks** help consumers and contractors easily identify units optimized for cold climates
2. **Installation capabilities** help ensure that excellent equipment will be installed well
3. **Optional connected criteria** focus on harnessing the potential of staged and variable capacity units to balance grid needs and consumer comfort



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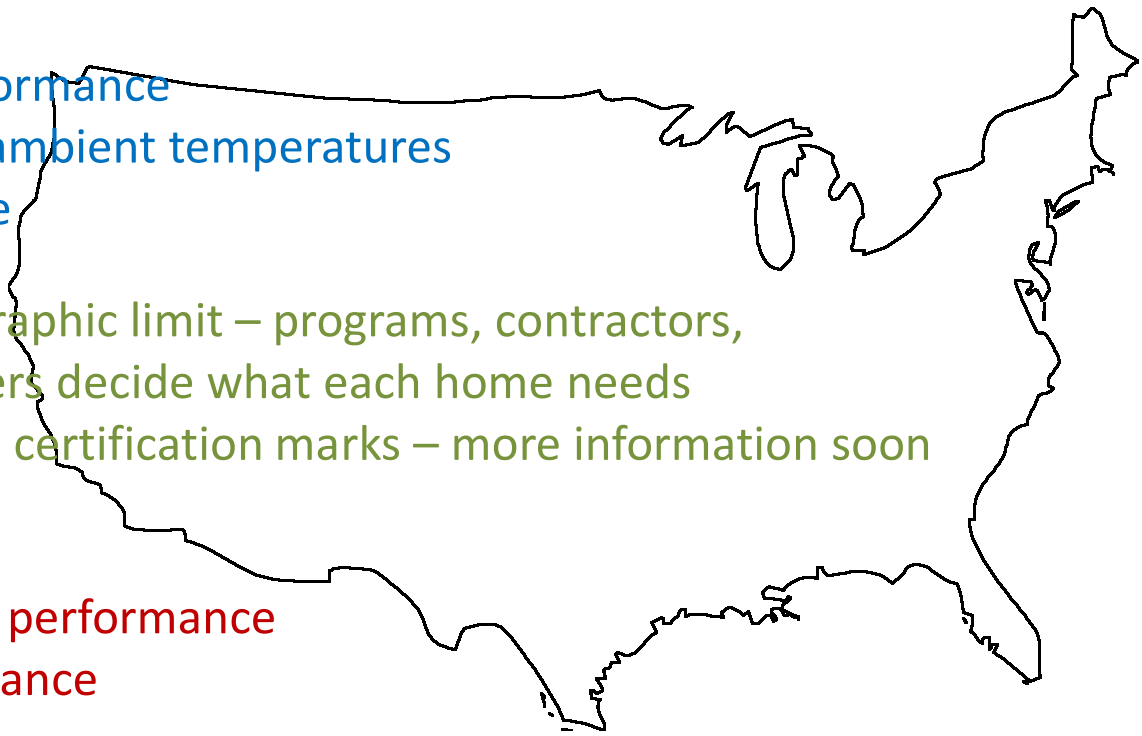
Air Source Heat Pumps: Different Climates, Different Needs

Cold Climate

- Excellent seasonal heating performance
- Maintains performance at low ambient temperatures
- Good peak cooling performance
- No geographic limit – programs, contractors, purchasers decide what each home needs
- Different certification marks – more information soon

Moderate and Hot Climate

- Excellent seasonal peak cooling performance
- Good seasonal heating performance





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CAC Certification Criteria

Product Type	2023 Test Method		Current Test Method	
	SEER2	EER2	SEER	EER
CAC Split Systems	15.2	12.0	16.0	12.5
CAC Single Package Equipment	15.2	11.5	16.0	12.0



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HP Criteria – Moderate & Hot Climate

- Maintain high SEER and EER levels, moderate HSPF

Product Type	2023 Test Method			Current Test Method		
	SEER2	EER2	HSPF2	SEER	EER	HSPF
HP Split Systems	15.2	12.0	7.8	16.0	12.5	9.2
HP Single Package Equipment	15.2	11.5	7.2	16.0	12.0	8.5



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HP Criteria – Cold Climate

- Reduced EER requirements, but higher HSPF than M&H climate

Product Type	2023 Test Method			Current Test Method		
	SEER2	EER2	HSPF2	SEER	EER	HSPF
HP Split Systems	15.2	11.0	8.5	16.0	11.5	10.0
HP Single Package Equipment	15.2	10.6	8.1	16.0	11.0	9.5



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HP Criteria – Cold Climate Low ambient performance

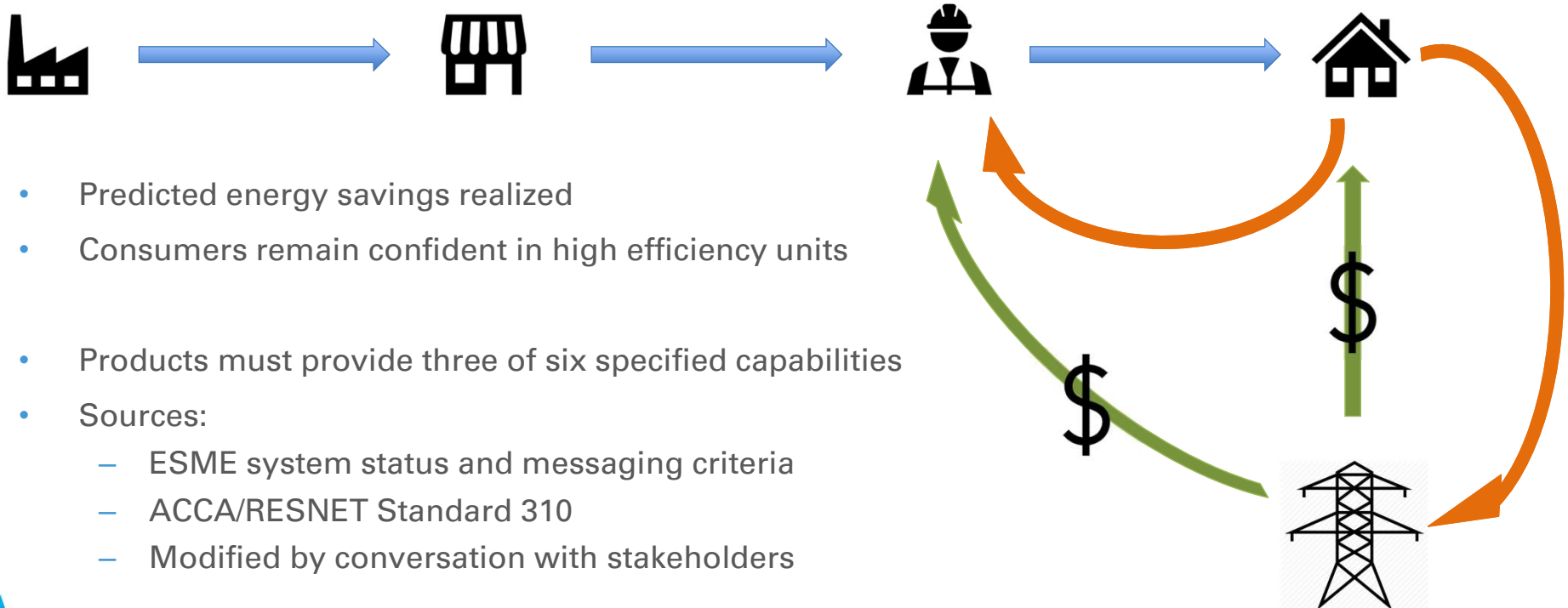
- COP @ 5 °F: Harmonized with NEEP ccASHP Specification
- Percentage of Heating Capacity: Minimize use of electric resistance backup
- Also must demonstrate COP and heating capacity achieved under native controls using a new Controls Verification Procedure (CVP) by effective date
- EPA may add additional methods to demonstrate low ambient performance in the future

Product Type	2023 Test Method		Current Test Method	
	COP @ 5°F	Percentage of Heating Capacity @ 5°F	COP @ 5°F	Percentage of Heating Capacity @ 5°F
HP Split Systems	1.75	70%	1.75	70%
HP Single Package Equipment	1.75	70%	1.75	70%



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Immediate Feedback Facilitates Good Installations



- Predicted energy savings realized
- Consumers remain confident in high efficiency units
- Products must provide three of six specified capabilities
- Sources:
 - ESME system status and messaging criteria
 - ACCA/RESNET Standard 310
 - Modified by conversation with stakeholders



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Optional Connected Criteria: The Why

- AC energy use is highly coincident with summer peaks
- As heating electrifies, heat pump energy use will be coincident with winter peaks
- Variable capacity – opportunity for higher value DR
 - Set the DR response by max energy use
 - Allows certainty for utilities
 - Allows HVAC system flexibility to deliver as much comfort as possible: about 85% of capacity with 75% of the energy use
- DR with 3rd party thermostats can't use these opportunities for variable capacity



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Optional Connected Criteria: The What

- Demand response based on AHRI 1380
 - CTA-2045 and/or OpenADR (cloud implementation allowed)
 - General curtailment, Grid emergency, Load up
 - Optional: price response, etc.
 - Interoperability is key, so commands and responses defined for required and optional functions in each protocol
- User amenity - including energy reporting





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The changing role of controllers

- Traditional thermostat not part of CAC/HP for testing/performance
- Market reality then: thermostats sold separately, mostly interchangeable (from the CAC/HP point of view)
- Market reality now:
 - Controls integrated into variable capacity ductless units are disabled for efficiency testing
 - Controllers for centrally ducted units critical to product performance
- In this spec: controls may be part of performance for connected and installation capabilities; must be included in low ambient performance



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Questions

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Stakeholders are encouraged to provide written comments for EPA consideration to CAC-ASHP@energystar.gov by Feb. 28th, 2020.

