

THE U.S. HEAT PUMP MARKET: THEY'RE COMING IN HOT

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Better Building Residential Network



A DC-based policy tech firm established 2015

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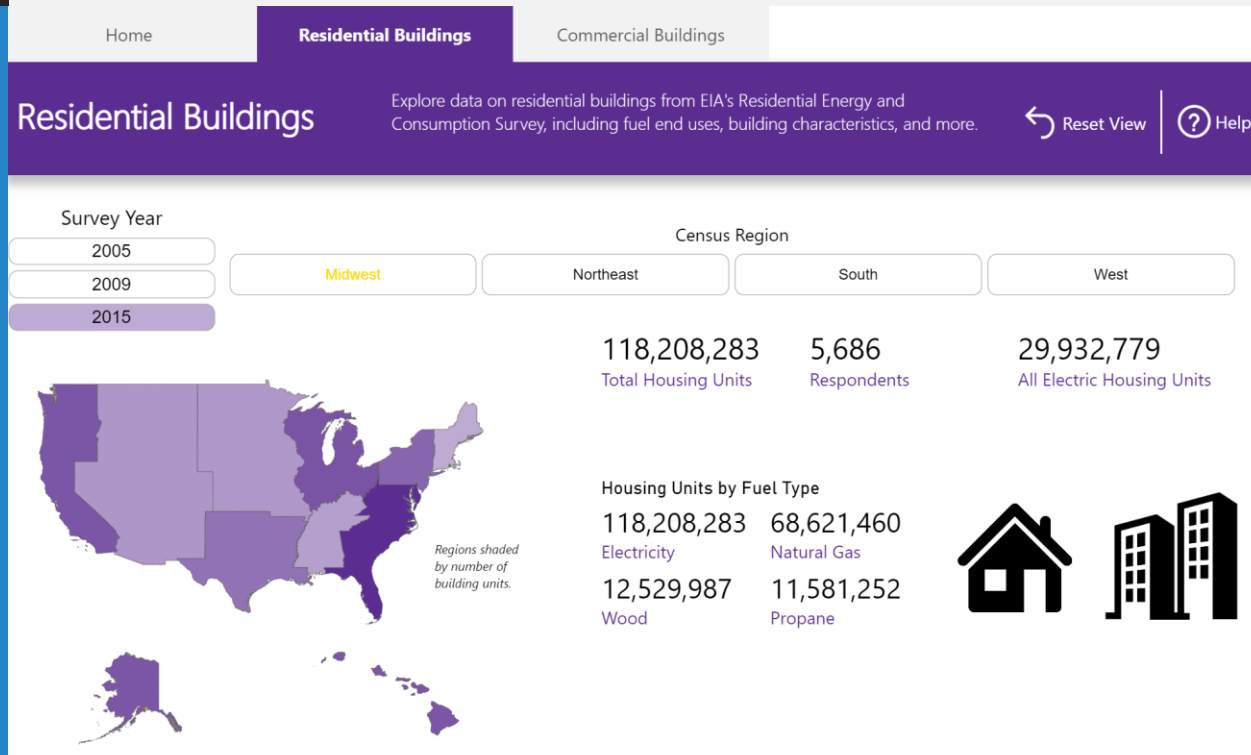
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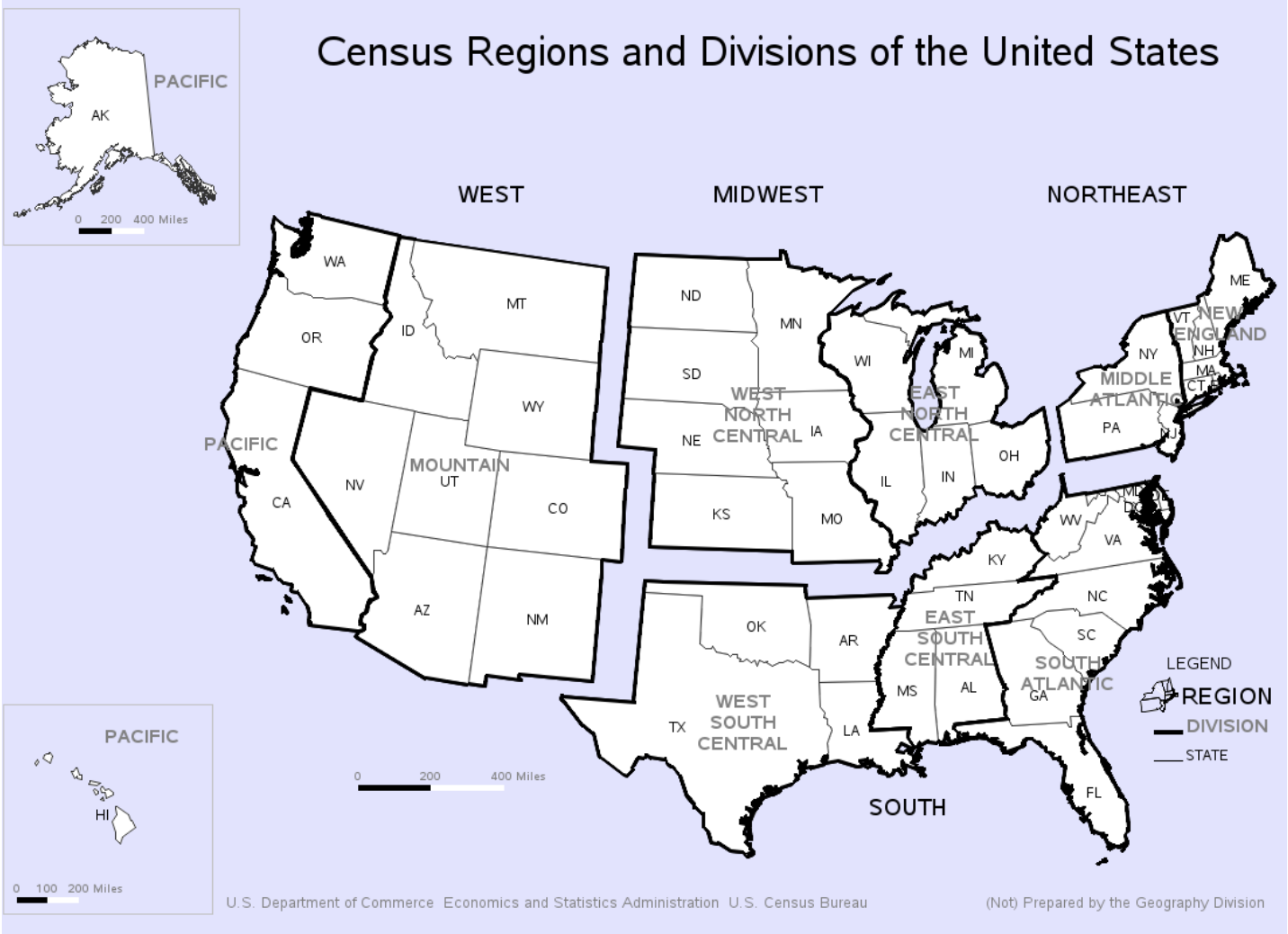
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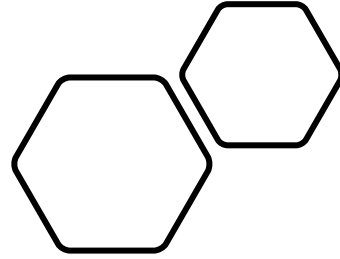
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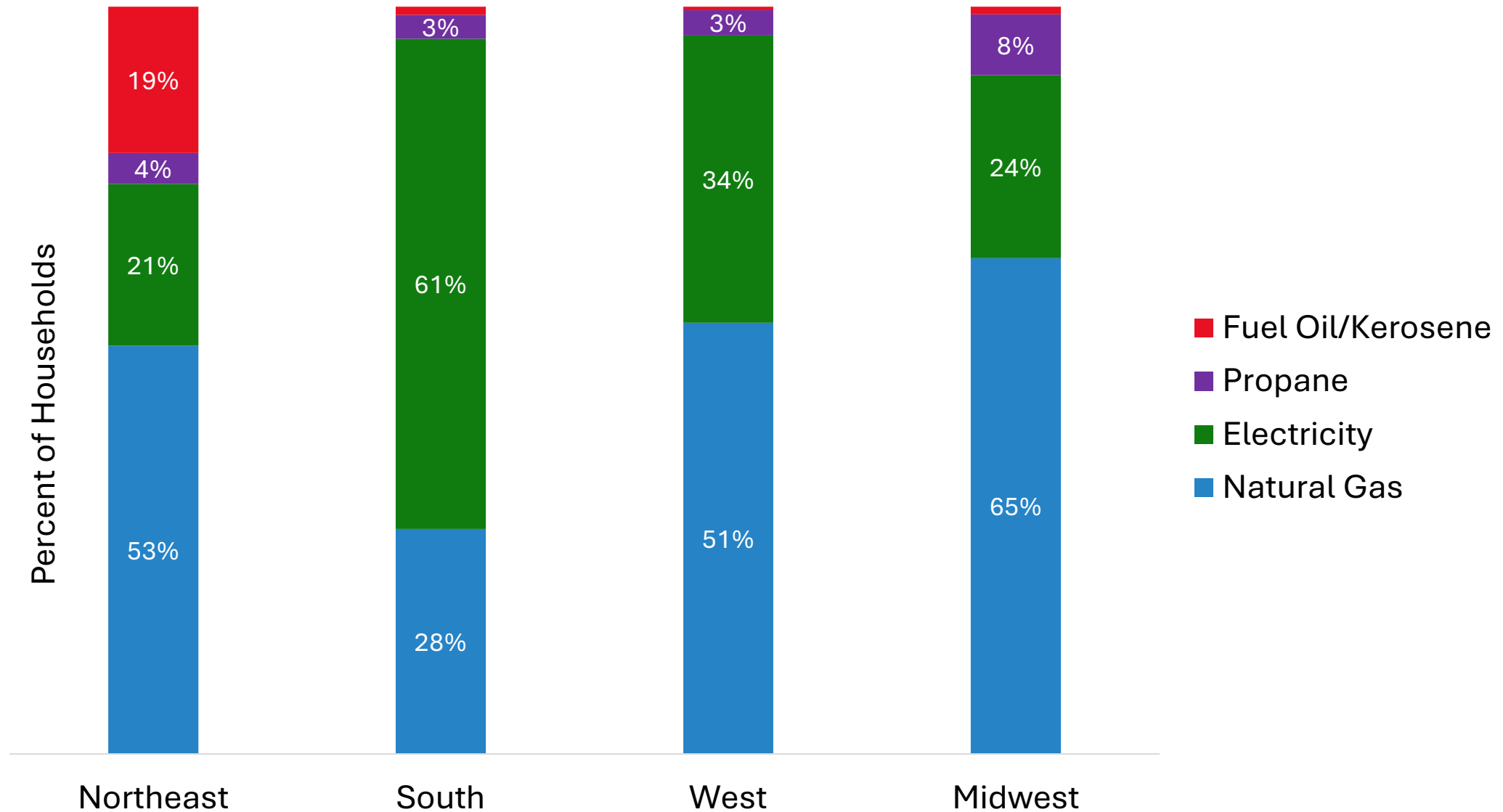
U.S. CENSUS REGIONS USED IN RECS SURVEY DATA



NATIONAL HOME HEATING OVERVIEW

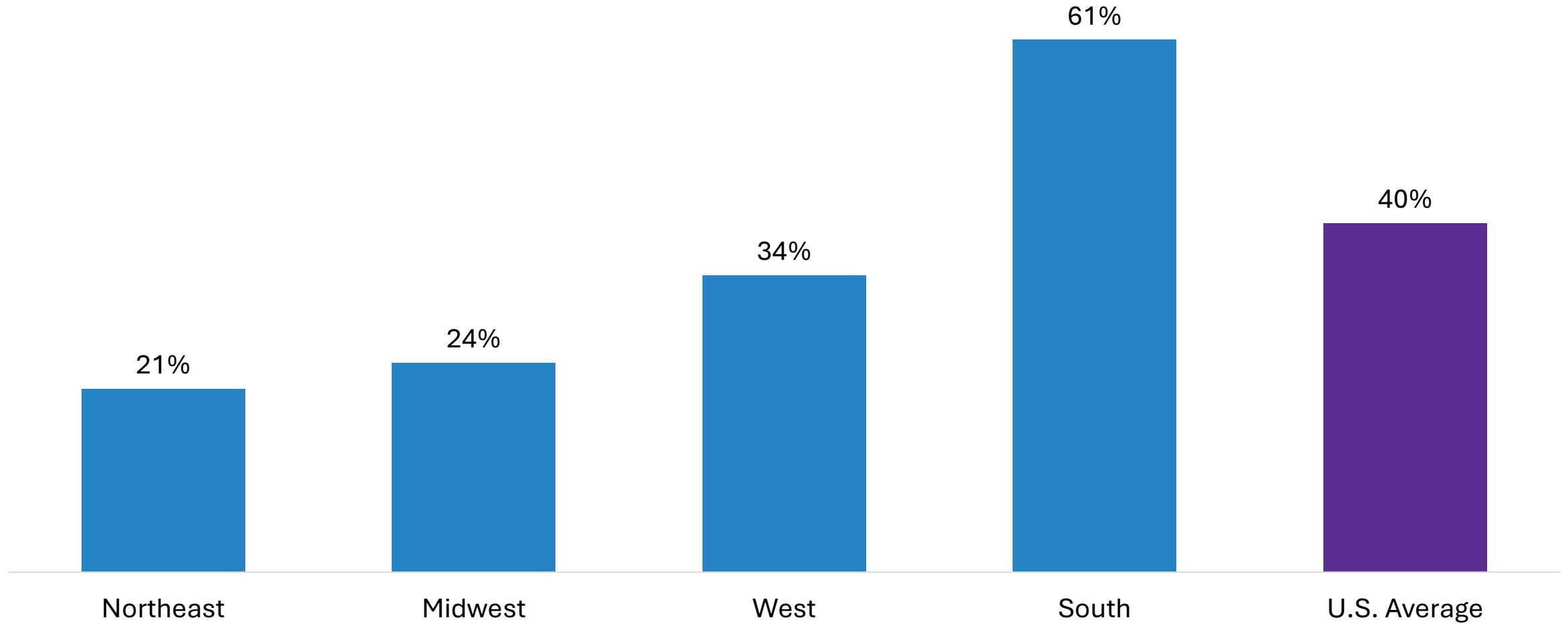


Primary Home Heating Mix by Fuel and Census Region (2020)



Two out of five U.S. households use electricity for primary space heating

Percent of region households with primary electric heating (2020)

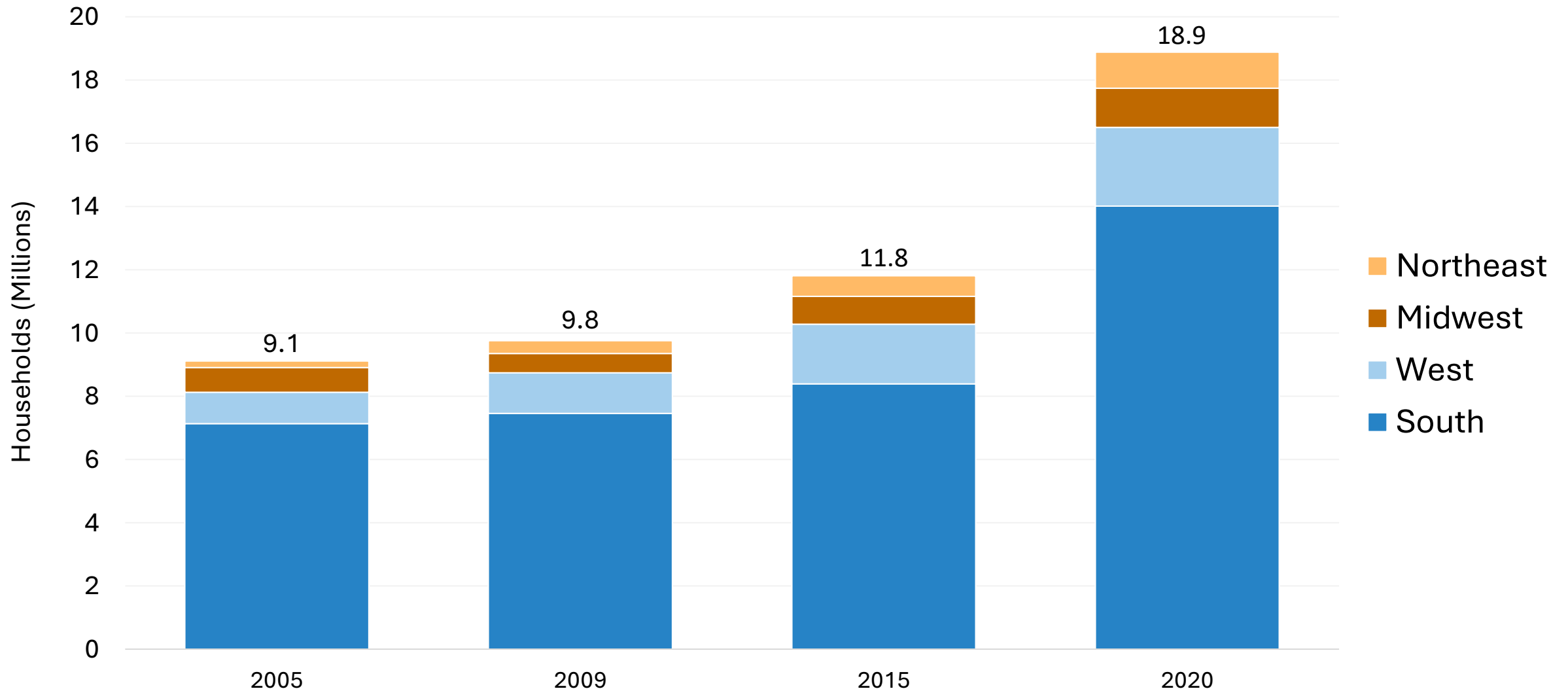


The background features a complex, abstract pattern of overlapping blue polygons in various shades, ranging from light to dark. A prominent white curved line sweeps across the lower right portion of the image, separating the geometric pattern from the text area.

NATIONAL HEAT PUMP OVERVIEW

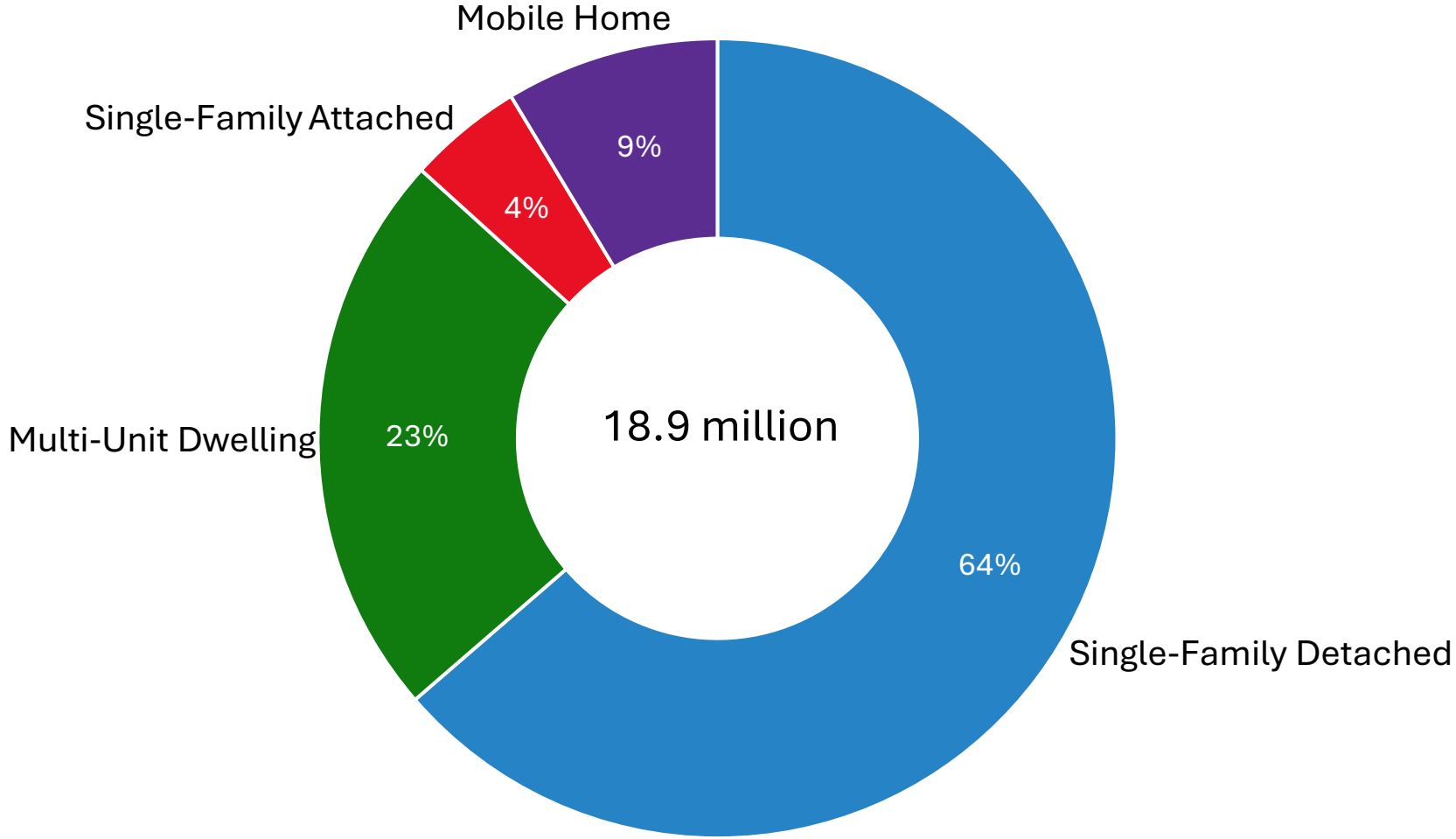
Number of U.S. households with primary heat pumps doubled over 15 years

Households with heat pumps as main heating equipment by region between 2005 and 2020 (millions)



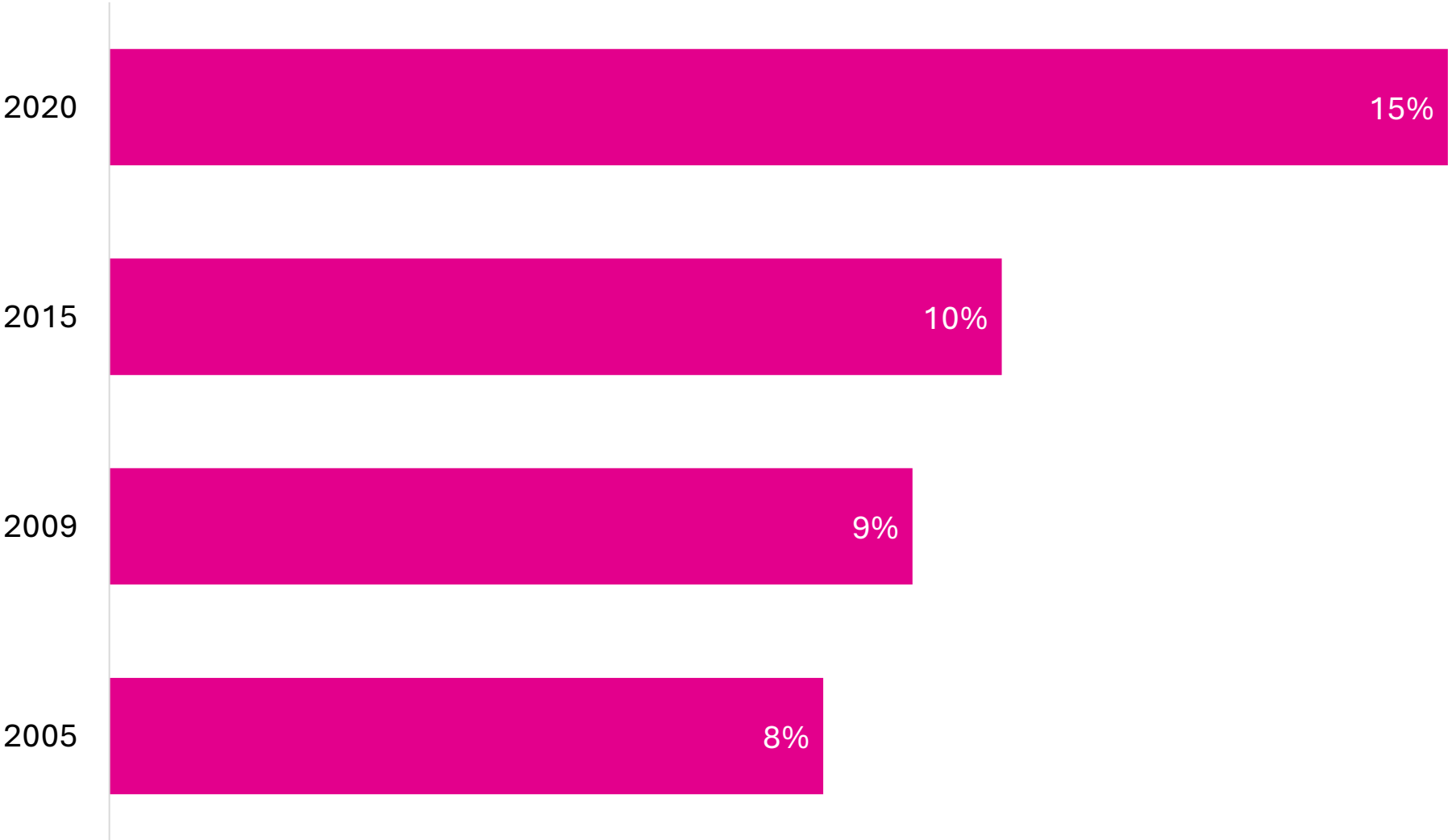
Two-thirds of heat pumps in stand-alone, single-family homes

Share of U.S. households with primary electric heat pumps, by housing type



Source: EIA RECS Survey 2020 | Analysis: Atlas Public Policy

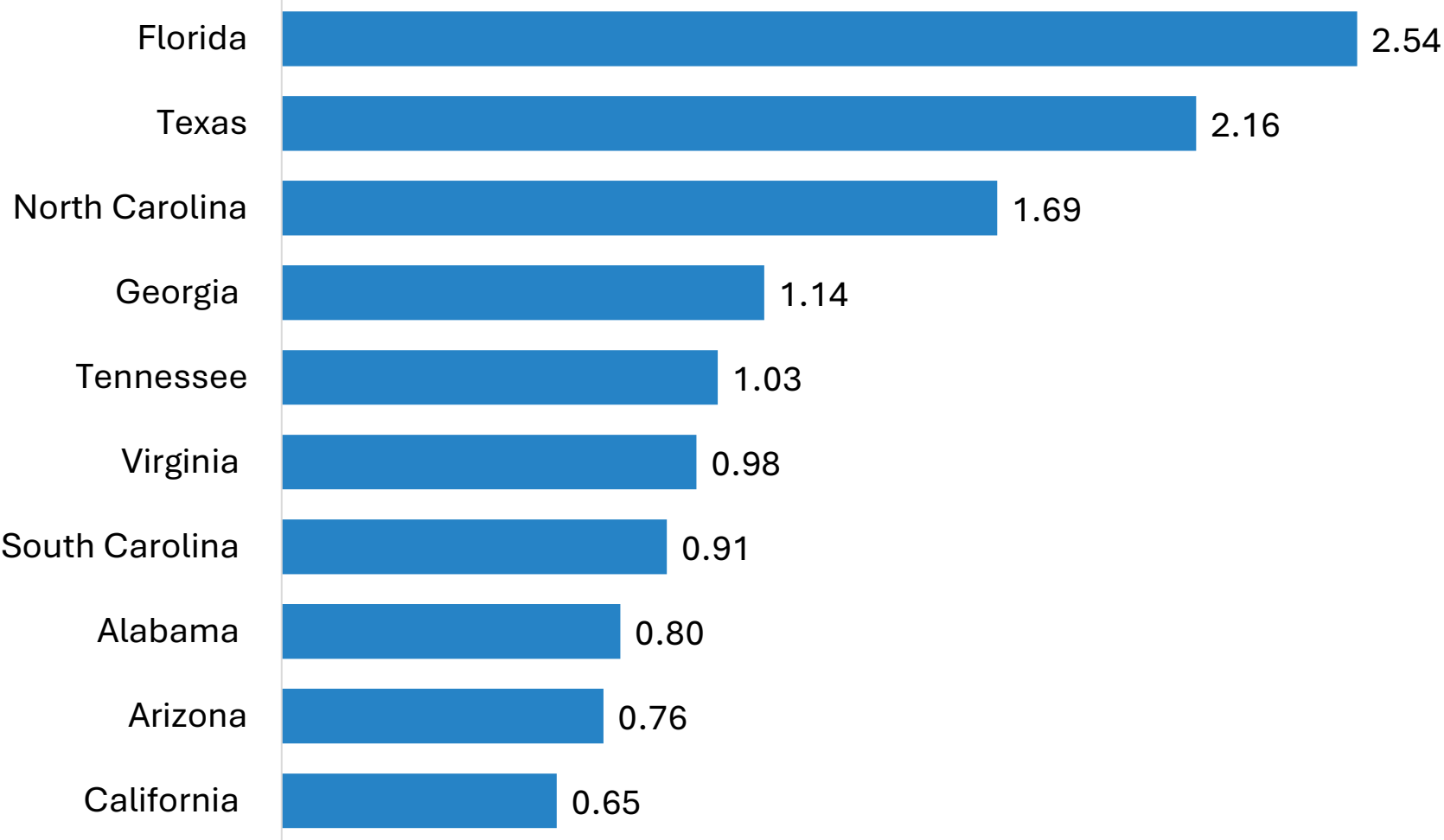
Percent of U.S. Households with Primary Electric Heat Pumps (2005-2020)



Source: EIA RECS Survey | Analysis: Atlas Public Policy

Southern states sweep heat pump deployments in absolute numbers

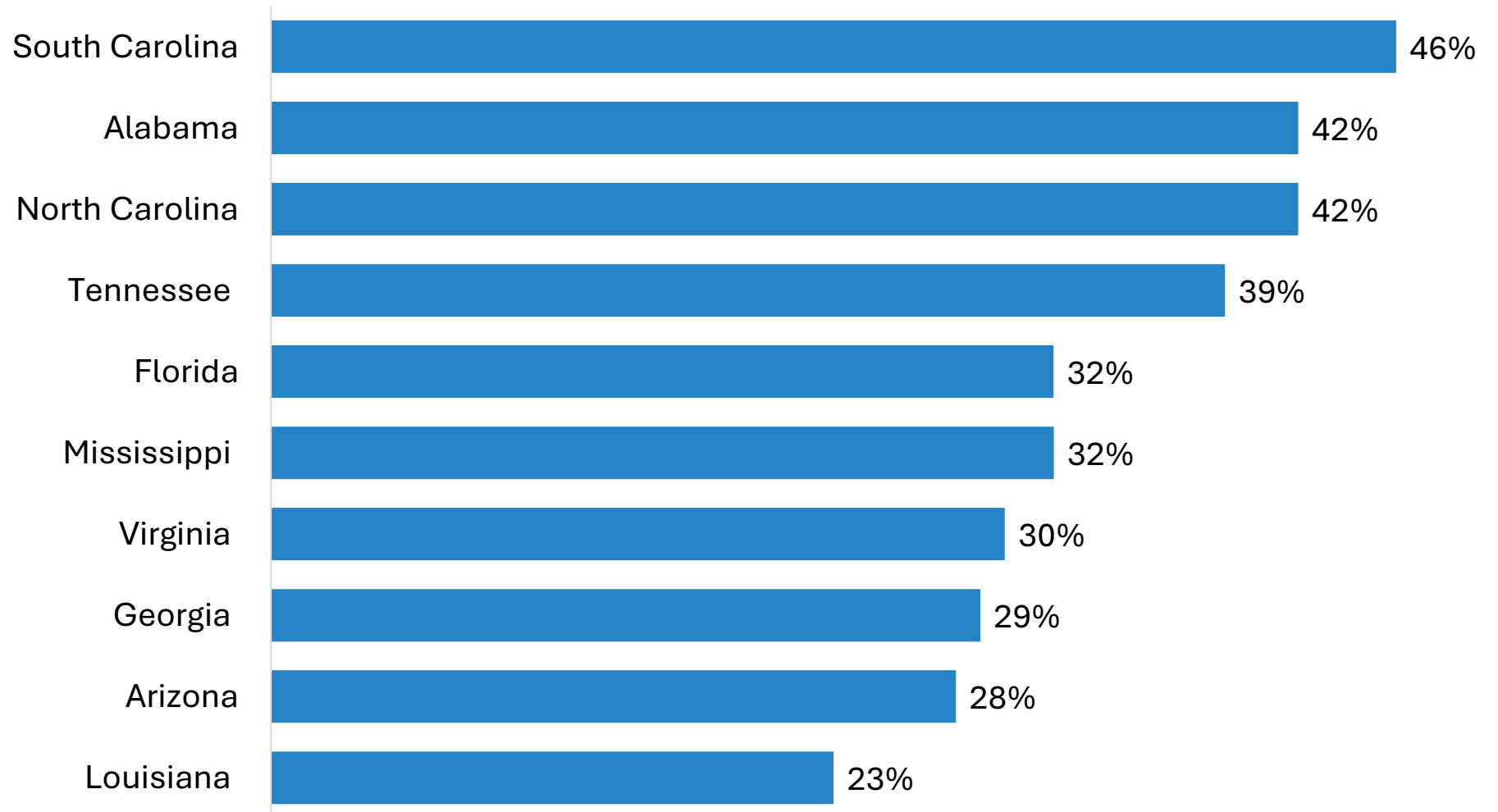
Households with central heat pumps as primary space heating equipment by state in 2020 (millions)



Source: EIA RECS Survey 2020 | Analysis: Atlas Public Policy

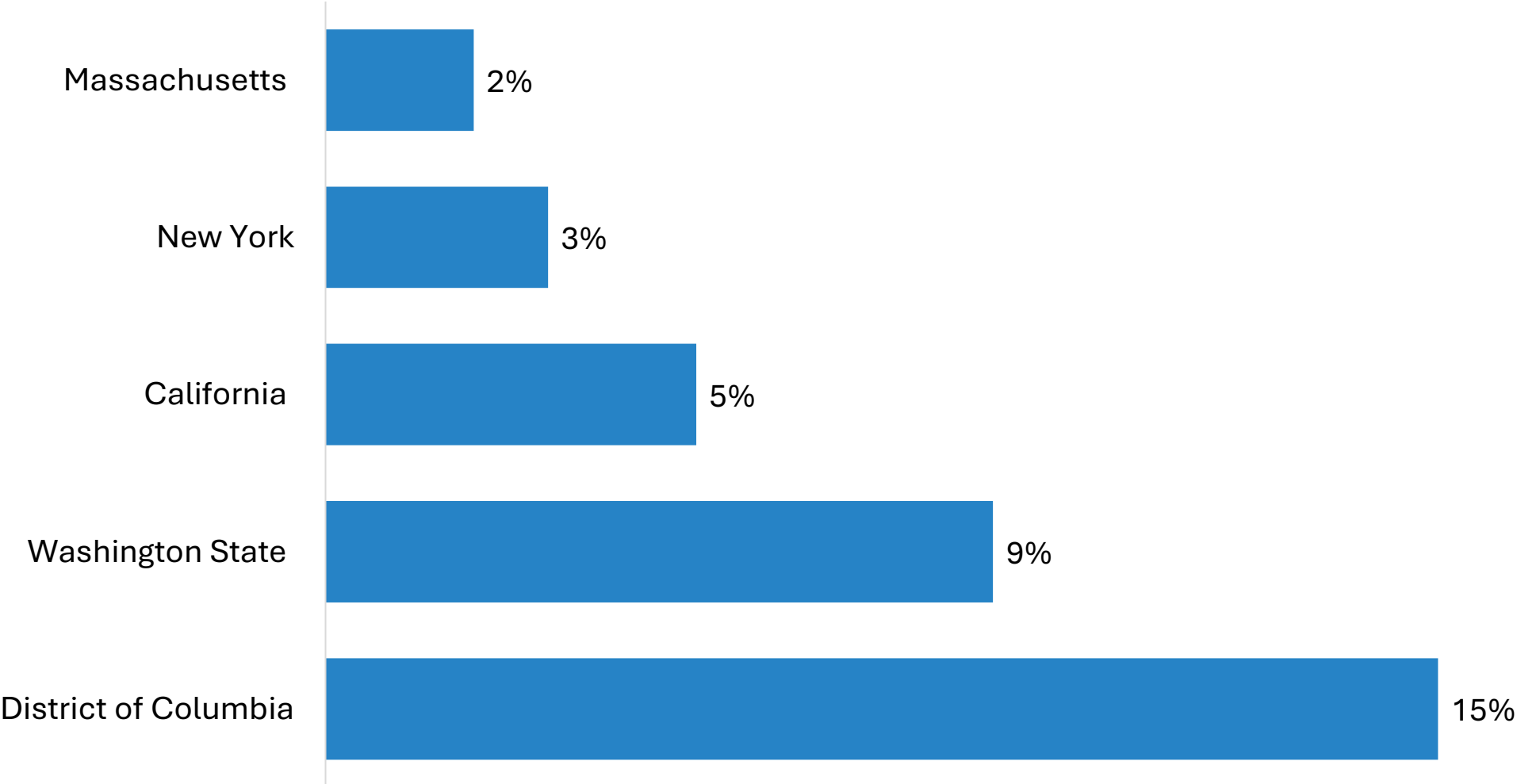
Southern states have highest residential heat pump uptake

Share of state households with primary central heat pumps for space heating (2020)



Policy-Forward Electrification States Lag Behind in Heat Pump Deployment

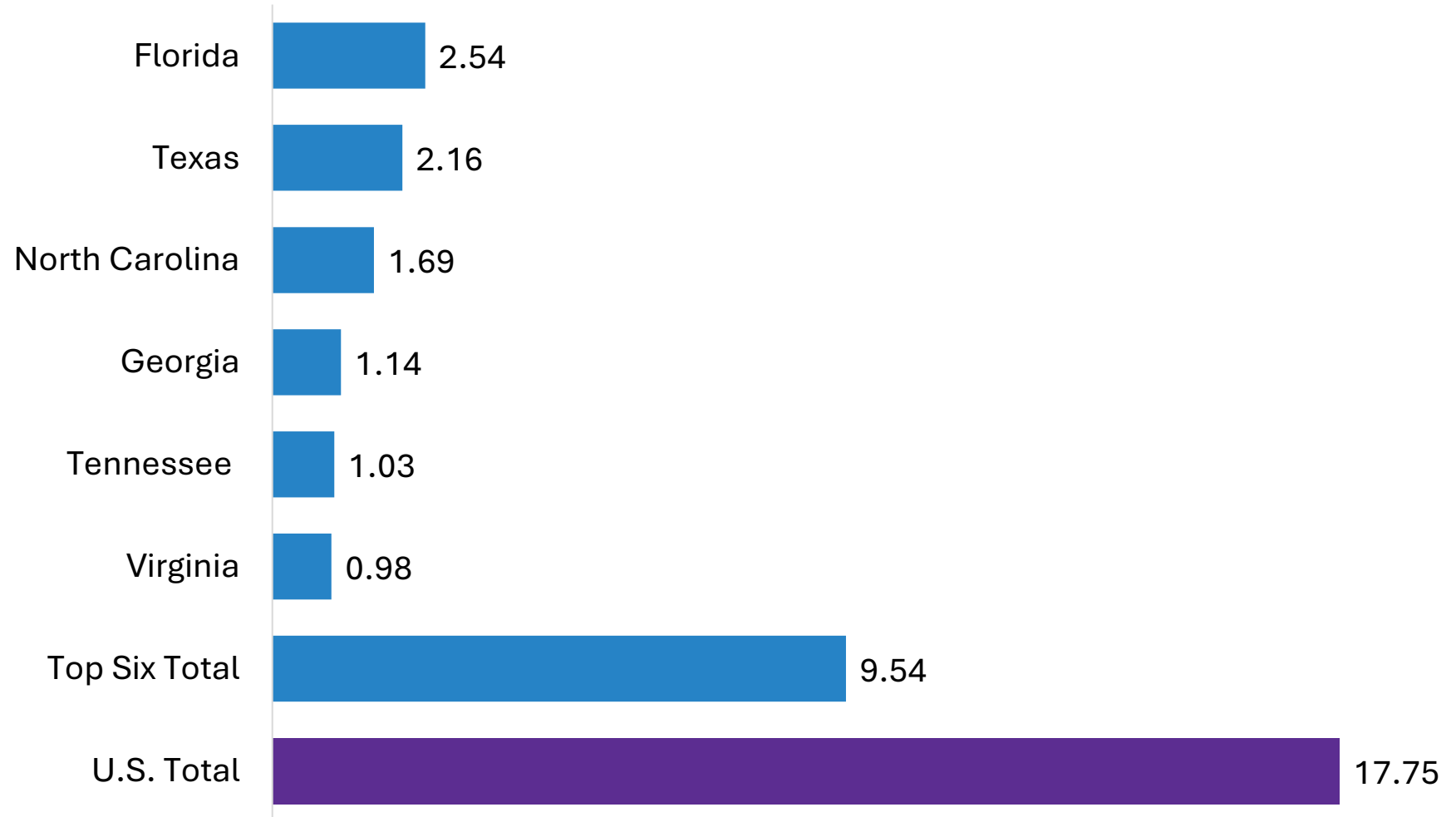
Share of state households with primary central heat pumps for space heating (2020)

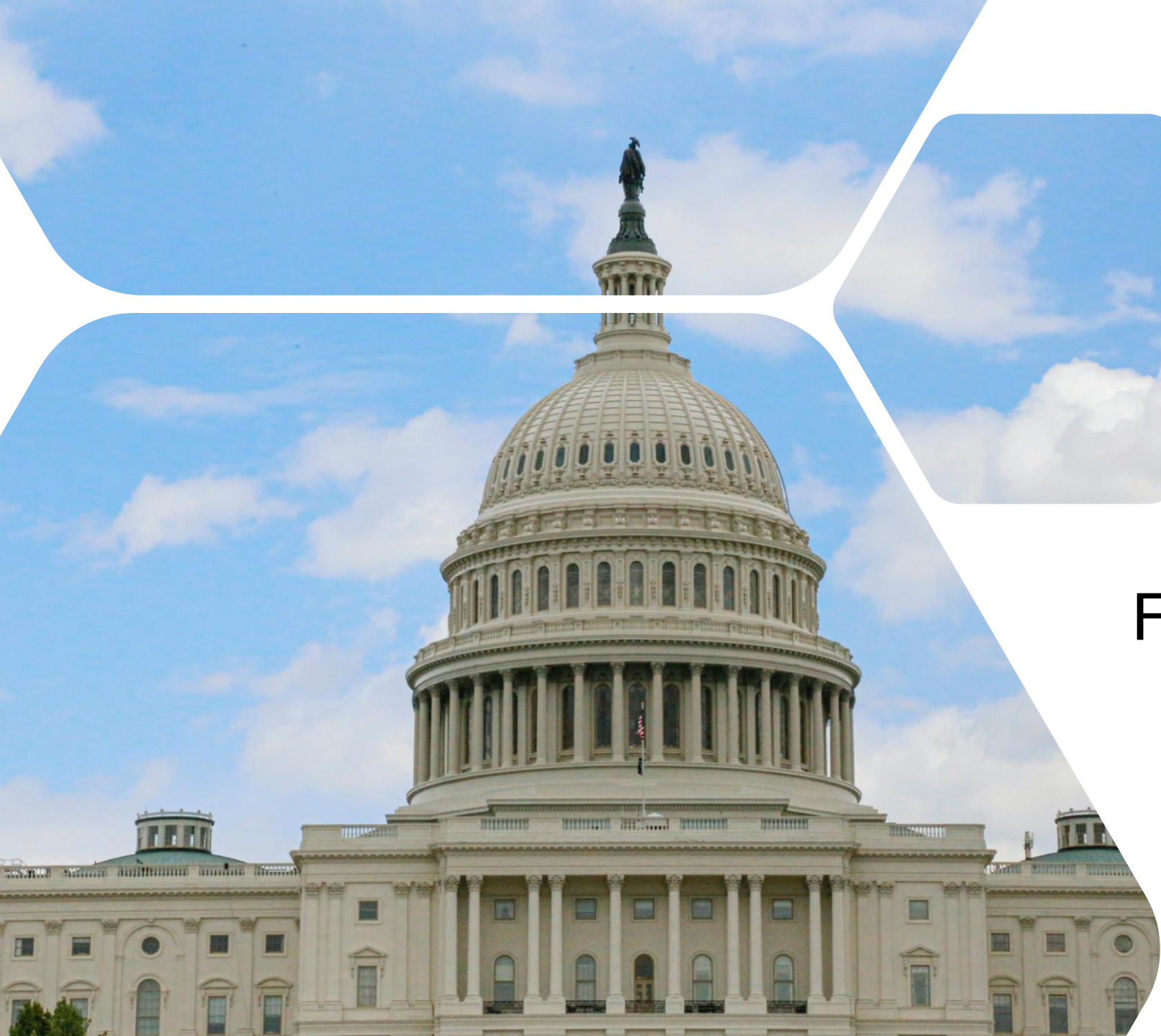


Source: EIA RECS Survey 2020 | Analysis: Atlas Public Policy

Over half of central heat pumps in U.S. concentrated in six states (2020)

Households with central heat pumps as main space heating equipment by state (millions)





FEDERAL POLICIES AND PROGRAMS

Photo: Unsplash/Syed F Hashemi

DEFENSE PRODUCTION ACT

President Biden Issued an Executive Order in June 2022 to invoke Defense Production Act, which will accelerate production of five key clean energy technologies, notably heat pumps and insulating material

\$250 million specifically allocated in Inflation Reduction Act to implement Defense Production Act; will support rapid production of heat pumps in conjunction with the Executive Order

DEPARTMENT OF ENERGY REGULATIONS

- Federal Building Performance Standard (30% electrification by 2030)
- DOE proposed new gas furnace efficiency standard of >95% for 2029, which would encourage adoption of heat pump technology
- First update to gas furnace efficiency standard since 1987
- DoE updated mobile home efficiency standards, particularly pertaining to insulation and sealing



RECENT DEPARTMENT OF ENERGY GRANT PROGRAMS

Community Geothermal
Heating/Cooling Design &
Deployment
(\$13 Million, Applications
Closed October 2022)

Clean Energy Technology
Deployment on Tribal
Lands
(\$20 Million, Currently
Open)

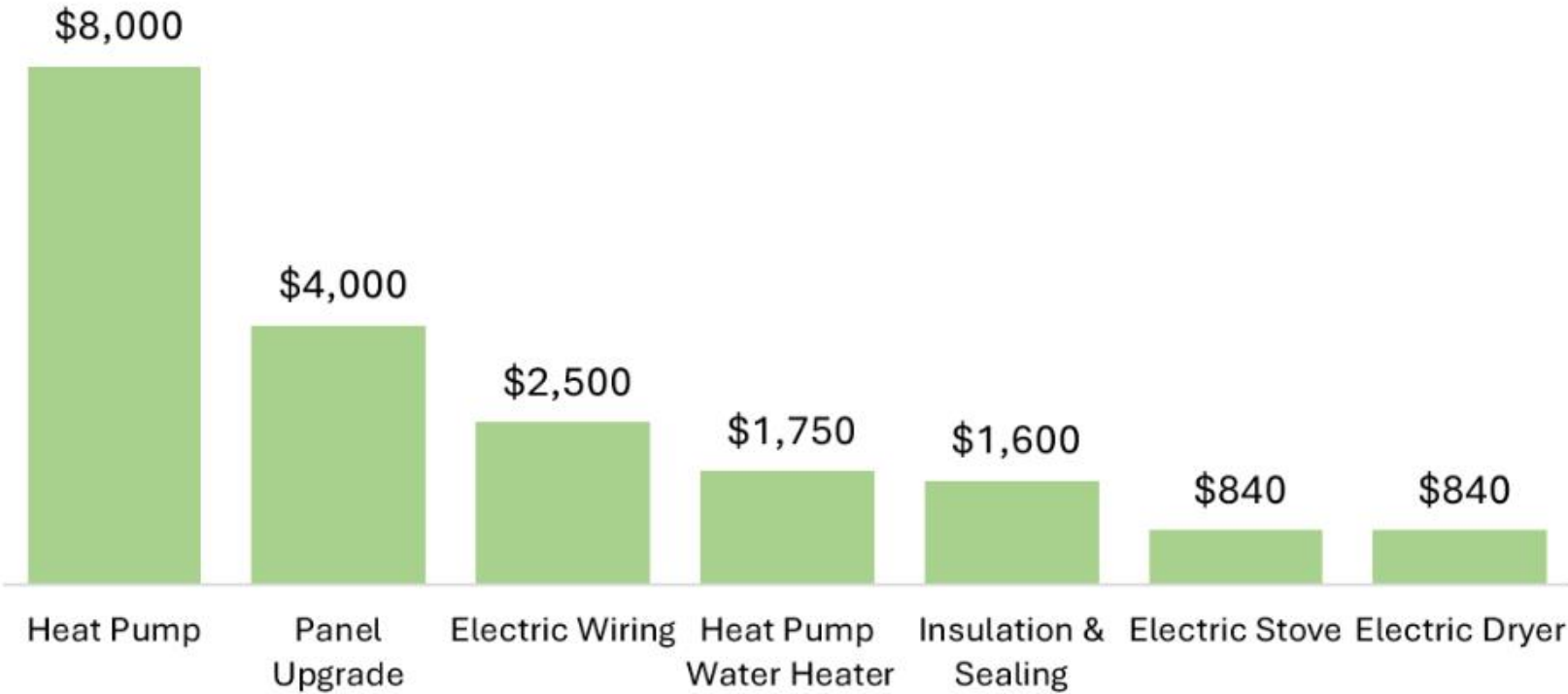
INFLATION REDUCTION ACT

Tax Credits

- **Residential Clean Energy Credit (25D)**
 - 30% subsidy on purchase and installation of geothermal heat pump
 - Credit is annual over 10-year period, but not refundable
- **Nonbusiness Energy Property Credit (25C)**
 - Provides up to \$1,200/year for efficiency improvements (windows, doors, sealing, panel upgrades) at \$600 per project
 - Provides \$2,000 for air-source heat pump or HPWH
 - Credit is annual over 10-year period, but not refundable
- **New Energy-Efficiency Home Credit (45L)**
 - Provides developers between \$2,500 – \$5,000 to construct energy-efficient single-family homes
 - Between \$500-\$1,000 per multifamily unit (\$2,500-\$5,000 with prevailing wage adder)

HIGH-EFFICIENCY ELECTRIC HOME REBATE ACT (HEEHRA)[\$4.275 BILLION]

Max Point-of-Sale Rebate Amounts Per Upgrade (Dollars)



- Point-of-sale electrification rebate program expiring in 2031
- Specifically for low- and middle income homeowners and renters; applies to single and multifamily households
- Covers 100 percent of costs for low-income earners, 50 percent for middle income (includes installation costs)
- Maximum rebate per household is \$14,000
- Contractors entitled to \$500 rebate

Source: Inflation Reduction Act Section 50122 | Analysis: Atlas Public Policy

ELIGIBLE FEDERAL GRANT FUNDING FOR RESIDENTIAL ELECTRIFICATION

Total: \$49 billion

Inflation Reduction Act: \$35.6 billion

Infrastructure Investment and Jobs Act: \$2.8 billion

FY22 Annual Appropriations: \$10.6 billion

PANEL UPGRADES LIKELY NECESSARY FOR MOST HOMES

HVAC appliance replacements have second-highest load impact on home capacity, after electric vehicles

200-amp panel necessary to fully electrify home; average all-fossil home panel is 100 amps

35-40 million homes in the U.S. can electrify everything without a panel upgrade; 48 million homes will require a larger panel



STATE & LOCAL DEVELOPMENTS

2022 WAS A WATERSHED YEAR FOR ELECTRIFICATION ORDINANCES

Statewide Electrification Ordinances:

Washington State, California,
[Washington, DC]

Local Electrification Ordinances:

New York City, Los Angeles,
San Diego, Marin County,
Montgomery County, 10-City
Mass Pilot, Crested Butte

These policies authorize jurisdictions to prohibit the use of gas or delivered fuels in new construction, or otherwise require electric appliances be installed in new builds starting at specified enactment dates. This could apply to space heating, water heating, cooking, or any combination.

STATE EFFORTS TO DEPLOY RESIDENTIAL HEAT PUMPS

WA: Building Electrification [Grant Program](#) (\$9.7 million)

CO: Property/Sales Tax Exemptions for Heat Pumps; High Efficiency Electric Heating and Appliances [Grant Program](#) (\$10.85 million); Geothermal Energy [Grant Program](#) (\$12 million)

NY: Geothermal Heat Pump [Tax Credit](#) (25%, Up to \$5,000)

CA: California Electric Homes [Program](#) (\$75 million); [BUILD](#) program (\$80 million)

MA: Triple Decker [Retrofit Pilot](#) (\$2.2 million)

UTILITY REBATES PLAY MAJOR ROLE IN RESIDENTIAL ELECTRIFICATION

[Consolidated Edison](#) (Structure to change): Up to \$25,000 for 5-ton geothermal system (\$5k/ton, +30% in West Chester)

[MassSave](#): \$10,000 for air source/\$15,000 for groundsource

[Commonwealth Edison](#): \$6,000 for groundsource heat pump/\$2,000 for air source

[LA Dept of Water & Power](#): Up to \$3,000 for central heat pump

[Efficiency Trust Maine](#): Up to \$2,400 for heat pumps

[Puget Sound Energy](#): \$1,500 for air-source heat pump

WORKFORCE DEVELOPMENT CRUCIAL TO NATIONWIDE BUILDING ELECTRIFICATION



Without skilled heat pump workforce, full-scale electrification will be challenging



Key leaders: Elevate, Dandelion Energy, BlocPower, Egg Geothermal, Sealed



Estimated \$11.2 billion eligible through IRA and IIJA to build green building workforce



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