

## DPA Implementation Plan

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### Introduction

The Defense Production Act (DPA), together with the Inflation Reduction Act of 2022 (IRA), creates a once-in-a-generation opportunity to reduce energy bills for everyday Americans, bolster national energy security, spur domestic clean energy manufacturing capacity, create good-paying jobs and deliver meaningful progress in the fight against climate change. If the Biden Administration leverages the DPA to its full potential, it can provide efficient American-made heat pumps to millions of homes that currently heat their homes with expensive, unreliable delivered fuels.

**The Biden Administration can and should leverage the initial \$500 million tranche of DPA funding in the IRA to spin up the flywheel of residential building decarbonization** and enable faster and more strategic deployment of IRA resources as a whole. This should be accomplished by **driving investment in up to ten new domestic heat pump manufacturing facilities**,<sup>1</sup> which will ensure that American manufacturing capacity can meet the increased demand for heat pumps that will result from IRA incentives.

**As more funding becomes available, the Department of Energy should place Advanced Market Commitments (AMCs) for heat pumps** that can be used to transition households with delivered fuels—among the most energy-burdened Americans—to clean, affordable electric heat. This is particularly important given the volatile and inflationary nature of fossil fuels that hits delivered fuel homes the hardest, as evidenced by this winter's projected heating costs.<sup>2</sup> AMCs will also help the market meet rising consumer demand as IRA investments such as the High-Efficiency Electric Home Rebates and Energy Efficient Home Improvement Tax Credit kick in.

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<sup>1</sup> Assumes \$500 million of DPA funding for heat pumps.

<sup>2</sup> Fuel oil heating costs are expected to rise to \$2,115 this winter: a 75 percent increase over two years. Propane heating costs are expected to rise to \$1,828 this winter: a 58 percent increase over two years. See [Home Heating Costs Reach Highest Level in More than 10 Years](#), NEADA, 2022.

## DPA for Domestic Manufacturing

Current DPA authority enables the Department of Energy (DOE) to provide financial assistance in two main ways: 1) grants, technical assistance and direct purchases and installation of process equipment for new or converted domestic facilities to produce heat pumps; and 2) advanced market commitments that are essentially large purchase orders for heat pumps. We estimate it will cost between \$50 million and \$150 million to build a new heat pump or component manufacturing line or to convert an existing central air conditioner line to heat pump production.<sup>3</sup> DPA is limited to covering up to 50 percent of costs, which suggests that if the average cost is \$100 million per facility, DOE could invest \$500M of DPA funding in exchange for approximately ten new heat pump manufacturing facilities across the U.S.<sup>4</sup> This investment would create 20,000 to 30,000 jobs in total.<sup>5</sup>

Once established, each of these new facilities would be able to roll approximately 100,000 products off their lines per year,<sup>6</sup> for a total of 1 million heat pumps annually. This would represent around 25 percent of current U.S. annual heat pump sales<sup>7</sup> and put the U.S. domestic manufacturing sector on sound footing to capture a large share of the growing market. By producing more products domestically, U.S. manufacturers will also generate new business opportunities for domestic suppliers of system components including compressors, heat exchangers, formed steel enclosures and electronics, further enhancing our domestic manufacturing capabilities. Together, these actions will enable the U.S. to be a global manufacturing leader for these critical technologies, shifting supply chains to North America from the current production leader, China.<sup>8</sup>

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<sup>3</sup> GE invested [\\$60 million](#) in a water heater manufacturing plant in South Carolina, and [\\$118 million](#) at a cooking products plant in Georgia. Schneider Electric invested [\\$100 million](#) in three new electronic product plants in North America.

<sup>4</sup> Assumes up to \$500M in DPA funding for FY2022 and FY2023. With more funding, more could be done to support domestic industry and jobs.

<sup>5</sup> Anticipating higher sales, Mitsubishi Electric Trane HVAC US Inc. plans to announce a new 2,000-worker factory by the end of the year. See [Makers of Heating, Cooling Systems Expect Climate Bill to Boost Sales](#), The Wall Street Journal, 2022.

<sup>6</sup> Based on estimates from Rewiring America's industry partners.

<sup>7</sup> Annual heat pump sales are currently around 4 million. See [AHRI Releases December 2021 U.S. Heating and Cooling Equipment Shipment Data](#), AHRI, 2022.

<sup>8</sup> Assumes air conditioner production capacity as a stand-in for heat pump production capacity. See [Mapping the Supply Chain for Room Air Conditioning Compressors](#), NREL, 2019.

The DPA is not the only federal funding mechanism available to establish or expand domestic manufacturing for manufacturers of heat pump systems or components. DOE's Loan Programs Office (LPO) and the Export-Import Bank's (EXIM's) Make More in America program can also be utilized to provide loan guarantees to manufacturers to build out or expand domestic facilities. These programs should be leveraged to the maximum extent possible to provide a diverse array of flexible financing tools to the manufacturers of heat pump systems and their key components. Notably, manufacturers can begin working with these existing loan programs today to prepare for the imminent increase in heat pump demand.

## DPA for Procurement

As more funding becomes available in future Congressional appropriations, DOE can fully leverage its DPA authority to fortify American energy security—both nationally and for the families that need it most. To facilitate an adequate supply of heat pump technology to American consumers, DOE should invest future DPA funding into a series of Advanced Market Commitments (AMCs) to procure heat pumps that can be deployed at reduced cost to the 4.65 million low-income American households that currently heat their homes with expensive delivered fuels. These AMC efforts will in turn provide three important benefits.

First, they will layer on top of the other residential electrification provisions of the Inflation Reduction Act (IRA)<sup>9</sup> to strengthen the demand signal for building electrification. Together, AMCs and IRA incentives will embolden policymakers and market actors—from manufacturers to distributors, HVAC contractors, electricians and consumers—to deploy heat pumps at speed and scale. The DPA is itself a mechanism for reinforcing that demand, enabling manufacturers to reissue priority DPA orders to their suppliers to prioritize the components and materials needed for production, alleviating any potential supply chain issues.

Second, AMCs will enable IRA funds to be deployed without delay. We anticipate that the IRA will rapidly increase heat pump demand, as has been the case in regional markets with

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<sup>9</sup> See [Go Electric! Rewiring America's Guide to the Inflation Reduction Act](#), Rewiring America, 2022.

incentive programs.<sup>10</sup> With a ready supply of heat pumps that are appropriate for target markets, American households won't be forced to wait due to a lack of available product supply.

Third, AMCs will enable our country's neediest households to electrify first and at the lowest upfront cost. The federal government can procure heat pumps at wholesale prices<sup>11</sup> and prioritize their distribution to high-need households at below-market prices. The IRA includes numerous incentives for households making less than 80 percent of their area median income—including heat pump rebates of up to \$8,000. By leveraging and consolidating the various federal investments available to these households, DOE can use DPA-procured products to enable electrification at zero cost.

By ordering the production of 7.5 million heat pumps (4.65 million heat pumps for space heating and cooling and 2.85 million heat pump water heaters), DOE will save recipient households approximately \$5.1 billion per year on their annual energy bills. (See Appendix B for alternative scenarios.)

We estimate that the funding needed for the federal government to purchase these machines would total approximately \$10.5B over three years.<sup>12</sup> We envision a tiered roll-out, whereby half of the orders would be placed in 2023 and fulfilled by 2026, and the remainder would be placed in 2024 and fulfilled by 2027.

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<sup>10</sup> Since the State of Maine increased heat pump incentives in 2019, Efficiency Maine has registered a 177 percent increase in heat pump installations. See [FY2021 Annual Report](#), Efficiency Maine, 2022.

<sup>11</sup> These orders would comply with AMC's 50 percent cost share requirement by buying the heat pumps at wholesale rates, roughly equating to 50 percent of the manufacturer suggested retail price.

<sup>12</sup> The funding figure takes into account a 50 percent public/private sector cost share for federal grants, an elimination of industry markups from distributor to installer and from installer to consumer (~50 percent of the sticker price altogether), national average heat pump MSRPs, as well as numerous conversations with industry and market experts as to costs for facility build-outs, etc. See [3H Hybrid Heat Homes: An Incentive Program to Electrify Space Heating and Reduce Energy Bills in American Homes](#) for more information on mark-ups through heat pump value chains.

## The Beneficiaries

American households bear compounding and ever more serious burdens from fossil fuels. Skyrocketing and volatile energy bills, fossil-fuel-driven inflation, continuing climate emissions and hazardous indoor air quality are putting more and more lives at risk with each passing day.

Some of the worst burdens are borne by the approximately 10 million households—in all 50 states—that are dependent on expensive delivered fuels for heating. These households increasingly face each winter under duress, with high energy bills threatening their health and economic well-being.

Of these 10 million households on delivered fuels, 4.65 million are occupied by very low- to low-income families.<sup>13</sup> The high price of delivered fuels means that low-income households face high average energy burdens of 9 percent (fuel oil) to 13 percent (propane) of their income.<sup>14</sup> These averages mask the extraordinary upper limits of what families with delivered fuels may pay: in 2020, delivered fuel households paid up to 22 percent of their disposable income on their energy needs, driven largely by winter heating needs.<sup>15</sup>

**Of these 10 million households on delivered fuels, 4.65 million are occupied by very low- to low-income families who pay up to 22 percent of their disposable income on energy needs.**

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<sup>13</sup> Classified here as households with incomes less than \$60,000 that use oil or propane for their water or space heating, per the U.S. Energy Information Administration's 2020 Residential Energy Consumption Survey. These households fall below the 2020 national median family income of \$79,900, as reported by the U.S. Department of Housing and Urban Development.

<sup>14</sup> See [DOE LEAD Tool](#), NREL, 2019.

<sup>15</sup> See [Background Data and Statistics on Low-Income Energy Use and Burden for the Weatherization Assistance Program: Update for Fiscal Year 2020](#), Oak Ridge National Laboratory, 2020.

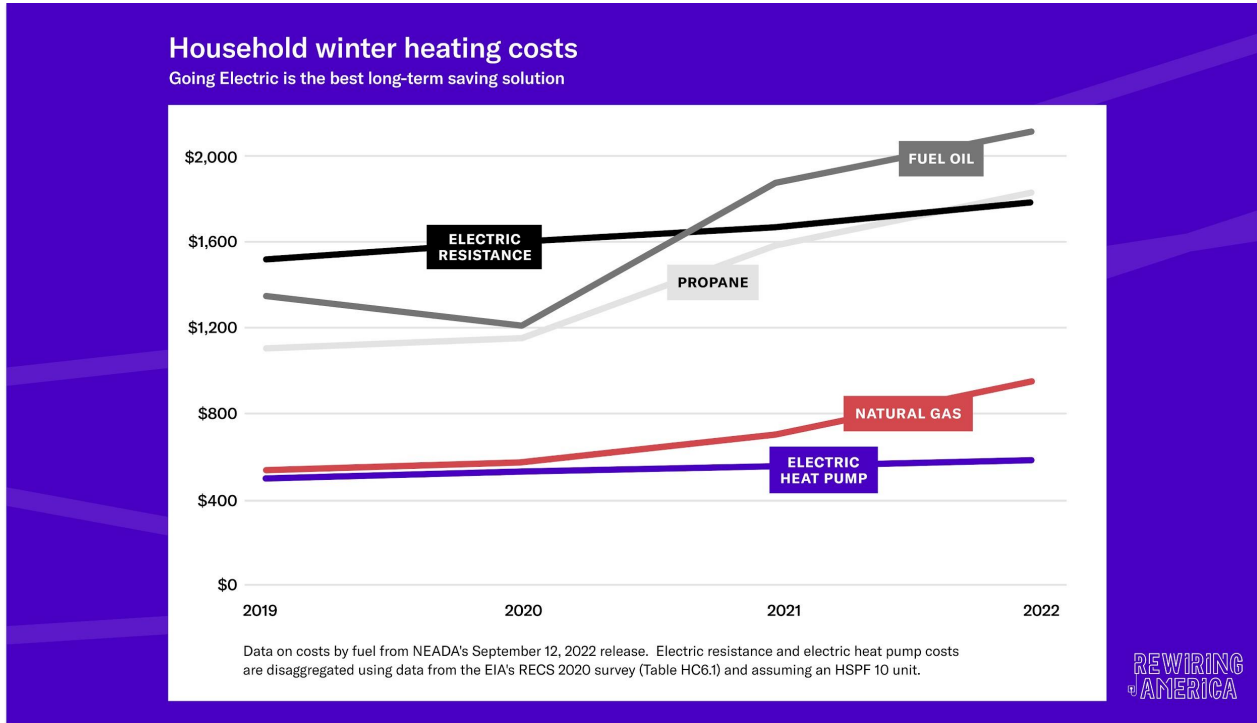


Figure 1: Household winter heating costs by fuel source from 2019 to 2022. Note that 2022 numbers are projections from the National Energy Assistance Directors Association (NEADA). [Source: NEADA 2022 [Report](#), with supplemental analysis from Rewiring America]

Winter heating has only grown more expensive since 2020, particularly for households on delivered fuels. Volatile fossil fuel prices were exacerbated in the winter of 2021-22 when oil and gas prices spiked, and they have become even costlier since Russia's illegal invasion of Ukraine. Indeed, homes with oil heat will pay \$903 more this winter than two years ago, and homes with propane heat will pay \$676 more.<sup>16</sup> This is a sum that most American households simply cannot pay: in 2022, 49 percent of Americans could not afford an emergency expense of just \$400.<sup>17</sup> As delivered fuel prices rise by that much or more, households will be forced to make dangerous trade-offs between fuel, food, prescription drugs and other necessities. According to the U.S. Government Accountability Office, a "\$100

<sup>16</sup> See [Home Heating Costs Reach Highest Level in More than 10 Years](#), NEADA, 2022.

<sup>17</sup> See [Economic Security Project Releases YouGov Public Opinion Research Signifying Striking Increase in Americans Unable to Cover Emergency Expenses Using Cash](#), Economic Security Project, 2022.

increase in median rent [energy costs included] was associated with a 9 percent increase in the estimated rate of homelessness.”<sup>18</sup> We can and must do better.

Greater than 70 percent (3.1 million) of low-income households that rely on delivered fuels live in buildings constructed before 1980 (see Figure 2), and many of these buildings require supplemental efficiency upgrades. In addition to electrification, these homes would benefit from ongoing federal investments in weatherization and efficiency improvements.

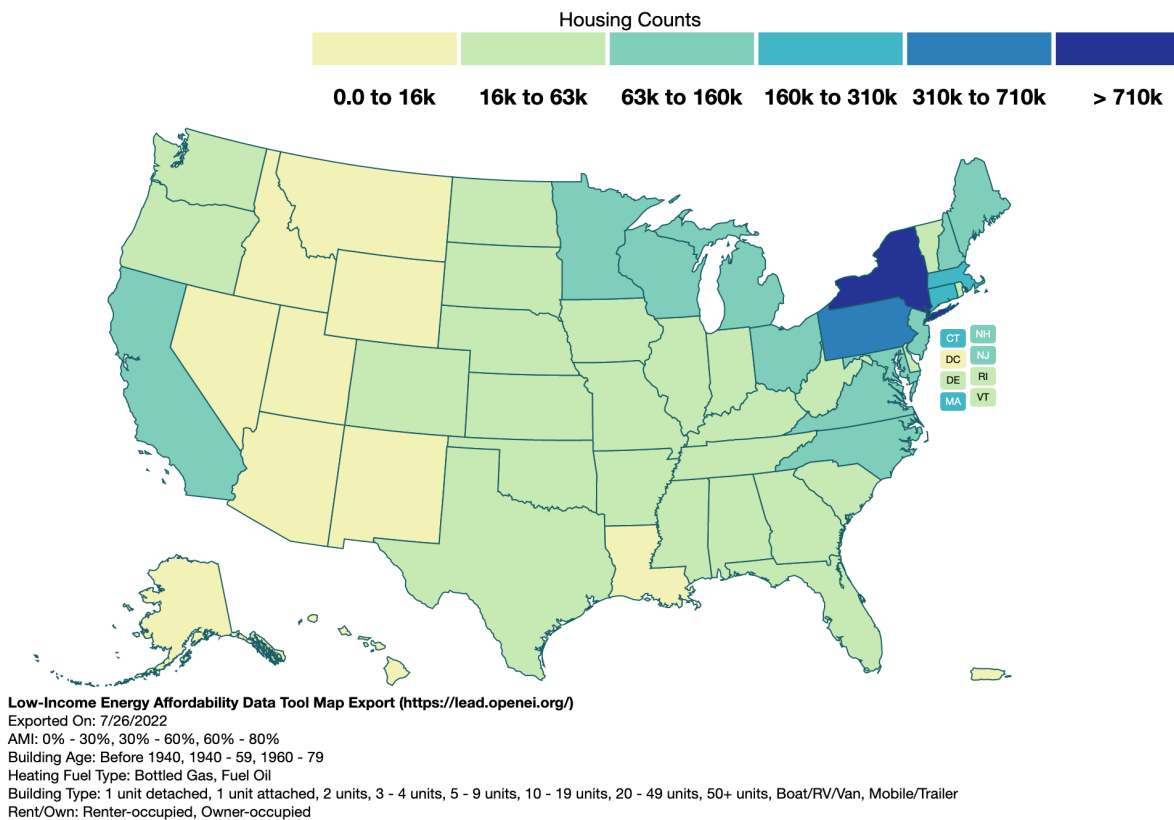


Figure 2: Distribution of 3.1 million low-income households in pre-1980 buildings with oil and propane heat in 2018. [Source: DOE LEAD Tool [Scenario](#)]

<sup>18</sup> See [How COVID-19 Could Aggravate the Homelessness Crisis](#), U.S. Government Accountability Office, 2020.

## Conclusion

With the implementation of the Defense Production Act for heat pumps, the federal government has a unique opportunity to kick-start the rapid electrification of the U.S. economy. These efforts will drive down energy bills for millions of low-income households across the U.S. In turn, America's energy security will be strengthened by reducing our reliance on volatile fossil fuels whose prices are set on global commodities markets. Further, our domestic economy will receive a substantial boost due to the creation of thousands of good-paying manufacturing and installation jobs across the country. And by bringing heat pump manufacturing onshore, American supply chains for these critical clean energy technologies will become more resilient and secure.

We each have a part to play. As the DOE consults industry and other stakeholders to finalize implementation details, Congress should fully support these efforts through future appropriations. And as soon as it is possible, DOE should release grants to manufacturers to build out domestic productive capacity for heat pumps or their key components. Then, as further funding becomes available, DOE should release a series of AMCs to maximize the opportunity to deploy heat pumps to the Americans who need them most. Heat pump manufacturers should supply helpful implementation guidance and explore available funding mechanisms to onshore capacity, which will ensure swift production once AMCs are announced and awarded.

There is no time to waste.



## Appendices

### Appendix A | Key stakeholders, roles & responsibilities

#### **Congress:**

- Appropriate additional maximum allowable funding to DOE to implement the DPA for heat pumps.

#### **Administration / Department of Energy:**

- Provide grants and/or directly supply necessary equipment for facilities to expand, stand up, or transform existing operations to heat pump manufacturing;
- Place AMCs to secure 4.65 million heat pumps for space heating and cooling and 2.85 million heat pump water heaters—half by the end of 2026 and the other half by the end of 2027;
- Assess agency authority and capacity to leverage existing programs, facilities, and purchases to support these efforts (e.g., community planning grants, technical assistance, workforce development programs, etc.);
- Continue discussions with stakeholders, including industry and community leaders, on how to most effectively leverage manufacturing grants and AMCs;
- Establish competitive selection criteria for communities to apply to receive DPA-funded heat pumps starting as early as 2025; and
- Map out the most effective deployment mechanisms, including partnering with established commercial distribution networks, nonprofits, local or state programs, or leveraging existing programs like the Weatherization Assistance Program.

#### **Manufacturers:**

- Prioritize site selection for domestic facilities and prepare bids for DPA grants; and
- Explore financing opportunities directly with LPO and EXIM to accelerate the establishment of domestic manufacturing plants, aligning with upcoming guaranteed demand.

#### **Interested Communities:**

- Identify high-need, high-potential households;
- Identify aligned funding (state, local, utility) and financing mechanisms;
- Begin building a local coalition (neighborhood groups, labor, utility, advocacy, faith, education, etc.); and
- Prepare for a bid!

## Appendix B | Impact and cost scenarios

	<u>20% of need</u>	<u>65% of need</u>	<u>100% of need</u>
<b><u>Low- and moderate-income households</u></b>			
Households (millions)	1.414	<b>4.65</b>	7.07
Household demographics	Low-income	<b>Low-income</b>	Low- and moderate-income
<b><u>Machines</u></b>			
Space heating machines (millions)	1.414	<b>4.65</b>	7.07
Water heating machines (millions)	0.906	<b>2.85</b>	4.53
Total machines (millions)	2.320	<b>7.50</b>	11.60
<b><u>Costs</u></b>			
Facility costs (\$ Billions, "\$B")	0.500	<b>0.500</b>	0.500
Purchase costs (\$B)	4.088	<b>10.462</b>	15.908
Total costs (\$B)	4.588	<b>10.962</b>	16.408
<b><u>Annual household savings</u></b>			
Total savings (\$B)	1.576	<b>5.135</b>	7.90