Are Federal Energy Grid Investments Meeting the Need?

A Review of Recent Federal Energy Grid Funding

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KEY FINDINGS

With some exceptions, funding from federal competitive energy grid programs has disproportionately been **concentrated in the western and northeastern US**.

Federal energy grid programs have invested 45 percent of their funds in counties with low incomes, which is higher than those counties' share of the national population.

Counties that won energy grants had, on average, **higher median household incomes, lower poverty rates, and lower shares of people of color** than counties that did not win grants.

States with **higher levels of energy-related administrative capacity** received a **disproportionate share of federal energy funding**.

The **ERA program** distributed more than **60 percent** of its overall funding **to disadvantaged counties**.

Energy production, reliability, and connectivity have long been priorities in federal spending. Now, climate change is straining the existing grid infrastructure and threatening energy access across the country. In particular, renters, people of color, and households with low incomes face higher energy burdens.[1] Recent federal investment initiatives have aimed to alleviate this by improving the capacity and sustainability of the country's energy grid.

In this summary, we evaluate how five large competitive federal energy grid programs that received funding from the 2021 Infrastructure Investment and Jobs Act and the 2022 Inflation Reduction Act were distributed in fiscal years 2022 and 2023, and whether they have addressed major energy needs.

SUMMARY OF MAJOR FEDERAL ENERGY GRID PROGRAMS

These energy programs fund projects intended to enhance grid flexibility, reliability, and efficiency. Most of the programs we studied are administered as part of the US Department of Energy's Grid Resilience and Innovation Partnerships Program (table 1). We also explored investments from two programs that targeted energy delivery needs in rural communities.[2]

TABLE 1

Major Competitive Federal Energy Grid Programs

Amount awarded in millions of dollars, fiscal years 2022 and 2023

Agency	Program name	Amount
DOE	Smart Grid Grants	$503.4
DOE	Grid Resilience Utility and Industry Grants	$424.0
DOE	Energy Improvements in Rural or Remote Areas	$290.9
DOE	Grid Innovation Program	$270.9
USDA	Rural Energy for America Program	$139.8
Total		**$1,629.0**

Source: Authors' analysis of award announcements as of June 2024.
Notes: DOE = US Department of Energy; USDA = US Department of Agriculture. Includes most major competitive programs focused on grid improvements that received Infrastructure Investment and Jobs Act or Inflation Reduction Act funding for fiscal years 2022 and 2023. Does not include programs related to carbon capture; battery, nuclear, or hydrogen infrastructure; household energy assistance programs, or energy programs distributed by formula. For more information on the programs we analyzed, see Yonah Freemark, Amanda Hermans, Gabe Samuels, Tomi Rajninger, Sam Lieberman, and Teddy Maginn, *Are Federal Infrastructure Investments Meeting the Need? Methodology Appendices*, (Washington, DC: Urban Institute, 2025).

WHERE WAS FEDERAL ENERGY GRID FUNDING DISTRIBUTED?

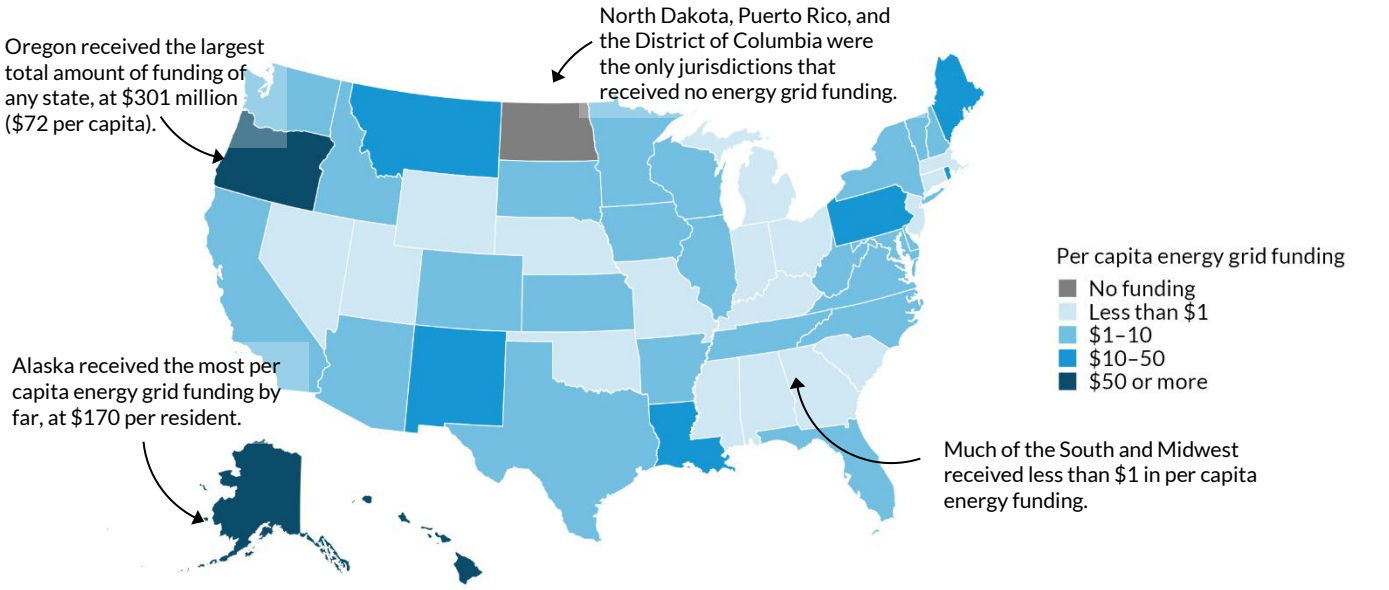
In fiscal years 2022 and 2023, the largest federal competitive energy grid programs tended to distribute more per capita funding in western and northeastern states than southern and midwestern states (figure 1). This trend is not a rule—for example, these programs financed Louisiana and West Virginia at higher per capita rates than Massachusetts and Nevada. Pennsylvania also received large amounts of total funding ($173 million, $14 per capita), second only to Oregon ($301 million, $72 per capita) and followed by California ($155 million, $4 per capita).

Alaska ($125 million total, $170 per capita) and Hawaii ($113 million total, $80 per capita) received high levels of per capita funding, which may stem from their isolation from the six large American-Canadian energy grids, likely making it more difficult to serve their needs.[3] In addition, two of the five programs we analyzed are dedicated to rural energy infrastructure—the Energy Improvements in Rural or Remote Areas (ERA) program and Rural Energy for America Program (REAP)—which may explain the overall emphasis on states with greater rural populations. Low levels of per capita funding in more population-dense areas may reflect that these funds often go toward projects that serve entire regions. In addition, there may be relatively higher costs of connecting areas with less-dense existing infrastructure. Research shows that northeastern, southern, and Appalachian states experience more power outages, yet many of these states received less than $1 per capita in funding (Do et al. 2023).

FIGURE 1

Most States Received Less than $10 per Capita in Federal Competitive Energy Grid Funding

Alaska, Hawaii, and Oregon are outliers with greater than $50 per capita in fiscal years 2022 and 2023



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Source: Authors' analysis of 2022 and 2023 program award announcements.
Notes: Includes funding from five competitive energy grid programs: the Grid Innovation Program, Grid Resilience Utility and Industry Grants, Smart Grid Grants, Energy Improvements in Rural or Remote Areas program, and Rural Energy for America Program.

Only 592 counties, accounting for 30 percent of the nation's population, had projects that received funds from competitive energy grid programs in fiscal years 2022 and 2023 (table 2). Most of the nation's counties contained no winning projects, either because submitted applications for projects from these counties did not win, or because no projects in these counties submitted applications; information on nonwinning applications for these programs was not made public. The fact that so few counties received project funding may mean that many areas of the country still have unmet energy grid needs. Winning projects were about evenly split between urban and rural counties.

TABLE 2

What Types of Counties Received Federal Energy Grid Grants?

2020 characteristics of median winning and nonwinning counties, fiscal years 2022 and 2023

	Number of counties	People of color	Median household income	Poverty rate
Urban	**1,208**			
Winning	290	21.6%	$60,035	12.4%
Nonwinning	928	29.6%	$55,520	13.8%
Rural	**2,014**			
Winning	302	10.0%	$55,816	12.0%
Nonwinning	1,702	12.8%	$49,756	14.7%

Sources: Authors' analysis of 2022 and 2023 program award announcements and 2016–20 five-year American Community Survey estimates.
Notes: Includes funding from five competitive energy grid programs: the Grid Innovation Program, Grid Resilience Utility and Industry Grants, Smart Grid Grants, Energy Improvements in Rural or Remote Areas program, and Rural Energy for America Program.

ARE ENERGY GRID PROGRAMS MEETING COMMUNITIES' NEEDS?

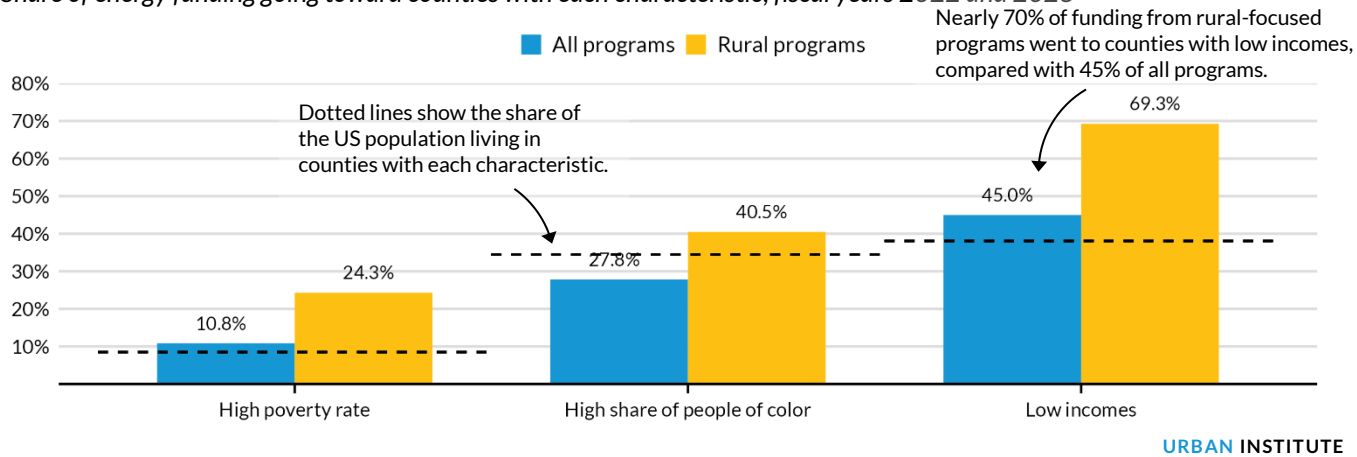
Next, we investigated whether funding from energy grid programs is supporting communities that are more likely to have experienced historic disinvestment, such as those with low incomes and higher shares of people of color.[4] Counties that won funding had, on average, lower poverty rates, lower shares of people of color, and higher median household incomes than those that did not (table 2).

We also found that federal energy grid programs funded counties with high shares of people of color at a lower rate than their population share would suggest, although the two rural programs sent significant shares of funding to counties with higher shares of people of color, people with low incomes, and people living in poverty (figure 2). Just under 40 percent of the US population lives in counties with low incomes—federal energy grid programs invested 45 percent of their funds in these counties; for rural programs, the figure was higher at 70 percent. Given that counties with low incomes are more likely to suffer from power outages and grid failures, this finding suggests that these programs—and especially the two rural programs—are investing funds where they are most needed (Do et al. 2023).

FIGURE 2

Rural Energy Grid Programs Delivered More Funding to Counties with High Poverty and More People of Color

Share of energy funding going toward counties with each characteristic, fiscal years 2022 and 2023



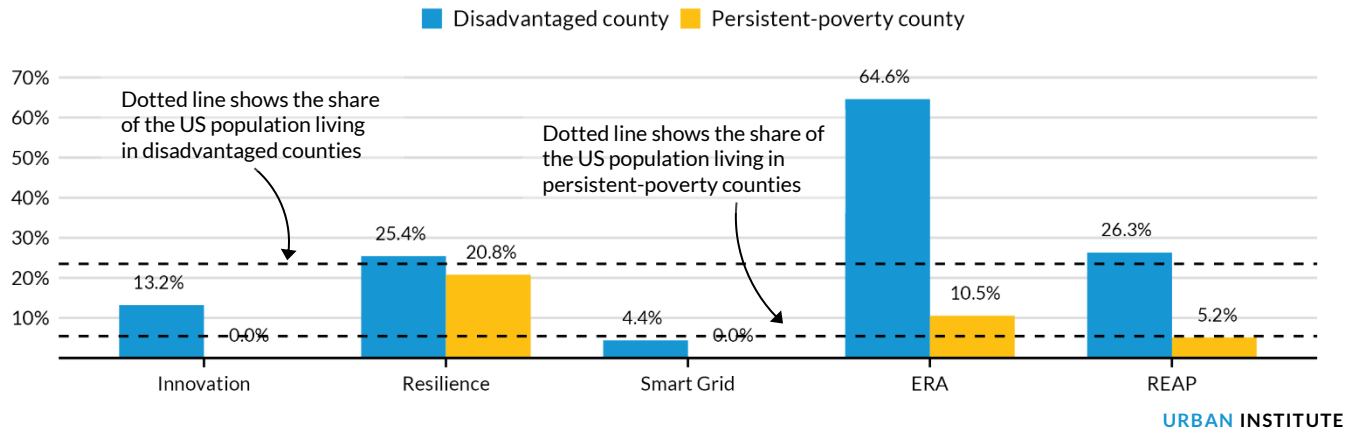
Sources: Authors' analysis of 2022 and 2023 program award announcements and 2016–20 five-year American Community Survey estimates.
Notes: The dotted lines represent the share of the US population living in each type of county. Includes funding from five competitive energy grid programs: the Grid Innovation Program, Grid Resilience Utility and Industry Grants, Smart Grid Grants, Energy Improvements in Rural or Remote Areas (ERA) program, and Rural Energy for America Program (REAP). Only ERA and REAP are included in the rural program calculations. High poverty rate counties = poverty rates above 20 percent. High share of people of color = greater than 50 percent of residents are people of color (Hispanic or nonwhite). Low income = median incomes under $60,000.

Figure 3 shows the share of funding that federal energy grid programs distributed to disadvantaged counties, based on the federal definition of disadvantaged used by the Biden administration to prioritize investment during the time this funding was awarded, and persistent-poverty counties, defined as those that have experienced high poverty levels for more than 30 years.[5] Federal energy grid programs vary significantly across these two metrics. The ERA program distributed more than 60 percent of its overall funding to disadvantaged counties, while the REAP program distributed more than a quarter of its funding to such counties. But the Smart Grid program awarded less than 15 percent of investments to disadvantaged counties, and both the Smart Grid and Grid Innovation programs funded no projects in persistent-poverty counties, despite these counties making up 23.5 and 5.5 percent of the US population, respectively. Meanwhile, the Grid Resilience Utility and Industry Grants program (referred to as the Grid Resilience program hereafter) contributed more funding to persistent-poverty counties (21 percent) than may be expected, based on national population share. ERA and REAP, which target spending in rural areas, both have distributed awards to persistent-poverty counties at a rate consistent with the US population share.

FIGURE 3

The ERA Program Delivered 65 Percent of Funding to Disadvantaged Counties

Share of program funding going to each type of county, fiscal years 2022 and 2023



Sources: Authors' analysis of 2022 and 2023 program award announcements, Climate and Economic Justice Screening Tool data from the White House Council on Environmental Quality, and persistent-poverty county data from the Department of Transportation.
Notes: Innovation = Grid Innovation Program; Resilience = Grid Resilience Utility and Industry Grants; Smart Grid = Smart Grid Grants; ERA = Energy Improvements in Rural or Remote Areas program; REAP = Rural Energy for America Program. Persistent poverty counties have had a poverty rate of 20 percent or higher for three decades. Disadvantaged counties have more than 50 percent of their census tracts designated as disadvantaged, or have more than 50 percent of the county population living in disadvantaged tracts, by federal definition. For more detail see Yonah Freemark, Amanda Hermans, Gabe Samuels, Tomi Rajninger, Sam Lieberman, and Teddy Maginn, *Are Federal Infrastructure Investments Meeting the Need? Methodology Appendices*, (Washington, DC: Urban Institute, 2025).

Next, we ranked and divided the nation's counties based on six indicators of need, including demographics and metrics related to energy capacity and use (e.g., population density and household energy costs) and then compared per capita energy spending in each quintile (e.g., the per capita spending from REAP for the 20 percent of counties with the highest household energy costs). We found the following:

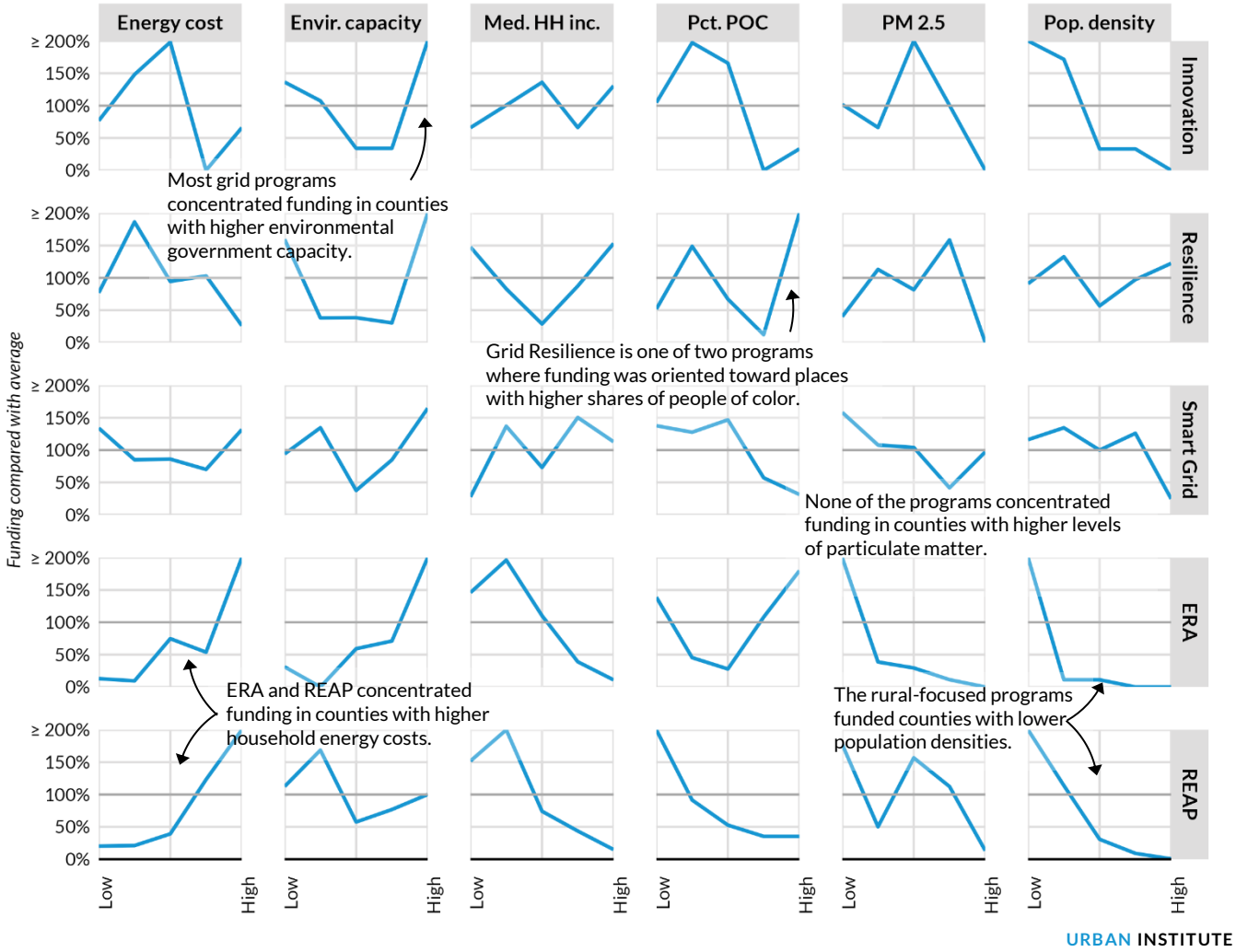
- Every program except for REAP awarded more funding, on average, to counties with greater environment-related administrative capacity, defined in terms of per capita local staff working in the policy area (which includes energy). This suggests that investment flows toward places with greater means to apply for, win, and direct funding, which may incidentally steer funds away from counties with the greatest need. This may also mean that the significant portion of counties that contained no funded projects was driven at least in part by limited capacity.

- As might be expected, the two rural-focused programs (ERA and REAP) disbursed larger-than-average funding to counties with low population density. The Grid Innovation program funding was also concentrated in counties with low population density.
- The rural-focused programs also awarded relatively high shares of funding to both counties with the highest household energy costs and counties with the lowest median household incomes, which may suggest they are oriented toward places with higher needs.
- The Grid Resilience and ERA programs were the only programs that sent larger-than-average funding to counties with higher shares of people of color.

FIGURE 4

Comparing Federal Energy Grid Spending with County Characteristics

Per capita funding for federal energy grid programs, per county, fiscal years 2022 and 2023



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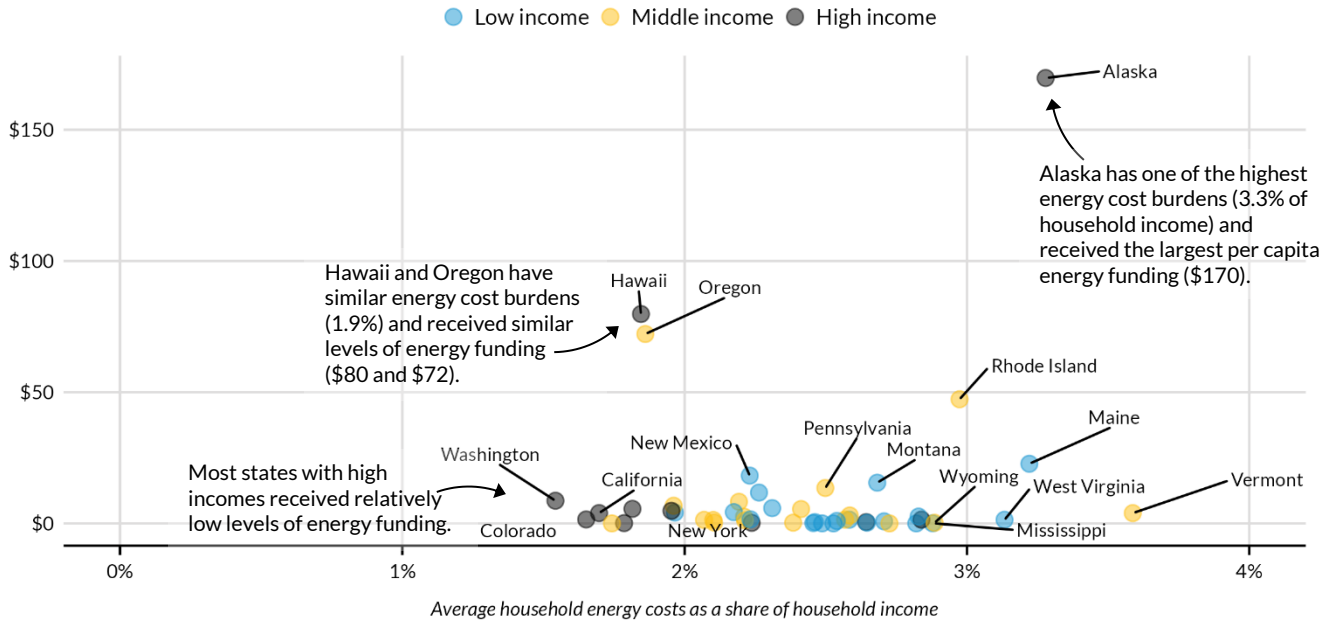
Sources: Authors' analysis of 2022 and 2023 program award announcements and data from the Department of Energy Low-Income Energy Affordability Data (LEAD) Tool, the US Census of Governments, the Environmental Protection Agency's Environmental Justice Screening and Mapping Tool, and 2016–20 five-year American Community Survey estimates.
Notes: Innovation = Grid Innovation Program; Resilience = Grid Resilience Utility and Industry Grants; Smart Grid = Smart Grid Grants; ERA = Energy Improvements in Rural or Remote Areas program; REAP = Rural Energy for America Program; Energy cost = average household annual energy costs as a share of the average household income; Envir. capacity = full-time equivalent government personnel working in environment (including energy), per capita; Med. HH inc. = median household income; PM 2.5 = annual average concentration of inhalable particles that are 2.5 micrometers or smaller, in micrograms per cubic meter; Pct. POC = share of population who are Hispanic or nonwhite; Pop. density = population density.

The Grid Resilience and Grid Innovation programs distributed less funding per capita than average to the counties with the highest energy costs, while the ERA and REAP programs provided more funding per capita (figure 4). This divergence may help explain why there is no clear correlation between per capita federal energy spending and household energy costs at the state level (figure 5). Among states where average household energy costs were greater than 3 percent of household income, only Alaska has received more than $30 per capita. Meanwhile, Vermont, the state with the highest household energy costs as a share of income, has received less than $10 per capita. States with lower relative household incomes also did not appear to receive higher shares of energy grid program awards, though they generally had higher energy cost burdens than states with higher incomes.

FIGURE 5

Energy Grid Funding Is Not Closely Tied to Household Energy Costs

State per capita energy funding, fiscal years 2022 and 2023



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Source: Authors' analysis of 2022 and 2023 program award announcements, data from the Department of Energy Low-Income Energy Affordability Data (LEAD) Tool, and 2016–20 five-year American Community Survey estimates.
Notes: Energy cost = average household annual energy cost as a share of the average household income. Includes funding from five competitive energy grid programs: the Grid Innovation Program, Grid Resilience Utility and Industry Grants, Smart Grid Grants, Energy Improvements in Rural or Remote Areas program, and Rural Energy for America Program.

RECOMMENDATIONS

The five competitive federal energy grid programs we surveyed vary in how they distributed funds in 2022 and 2023. The two rural-focused programs, ERA and REAP, distributed relatively higher levels of funding to places with historic disinvestment and those with higher energy costs. But overall, awardee counties had wealthier and whiter populations than counties that did not win funding, and many states with significant energy cost burdens and outage risks received some of the lowest levels of funding. Further, counties with more administrative capacity tended to win these competitive awards at much higher rates, indicating that many places may need administrative support to successfully apply for and win these grants.

- Substantial obstacles remain for places with low bureaucratic capacity, which may not have the resources necessary to invest in developing project applications and ensuring that they are of a high quality. As a

result, many areas of the country may be functionally excluded from the opportunity to win much-needed competitive energy grid funds. We recommend that federal agencies expand support for and reduce the burden of applying for these programs.

- Many areas of the country with higher energy cost burdens and lower incomes did not receive large amounts of energy grid funding. Federal agencies should continue to monitor annual trends in energy cost shares to ensure that funds are supporting energy users facing significant cost burdens. In particular, persistent-poverty counties should be considered more often when distributing energy grid funding.

NOTES

[1] Roxana Ayala and Amanda Dewey, "Data Update: City Energy Burdens," American Council for an Energy-Efficient Economy, September 11, 2024, https://www.aceee.org/policy-brief/2024/09/data-update-city-energy-burdens.

[2] For more information about the programs we analyzed, see our methodology appendix: Yonah Freemark, Amanda Hermans, Gabe Samuels, Tomi Rajninger, Sam Lieberman, and Teddy Maginn, *Are Federal Infrastructure Investments Meeting the Need? Methodology Appendices*, Washington, DC: Urban Institute, 2025.

[3] "U.S. Grid Regions," Environmental Protection Agency (EPA), last updated on January 15, 2024, https://www.epa.gov/green-power-markets/us-grid-regions.

[4] Yonah Freemark, Mel Langness, Amanda Hermans, Gabe Samuels, Tomi Rajninger, David C. Blount, "Is Federal Infrastructure Investment Advancing Equity Goals?" October 25, 2023, https://www.urban.org/research/publication/is-federal-infrastructure-investment-advancing-equity-goals.

[5] Three of the five programs analyzed here—the Smart Grid program, ERA, and REAP—were covered under the federal Justice40 Initiative, which directed that 40 percent of benefits from covered federal programs go to disadvantaged counties. The initiative was in place during the Biden administration, when these funds were distributed. The Trump administration does not use this definition of disadvantaged. For more details on the definition of disadvantaged county and persistent poverty county, see Yonah Freemark, Amanda Hermans, Gabe Samuels, Tomi Rajninger, Sam Lieberman, and Teddy Maginn, *Are Federal Infrastructure Investments Meeting the Need? Methodology Appendices*, Washington, DC: Urban Institute, 2025.

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