

Burning Coal, Burning Cash

RANKING THE STATES THAT
IMPORT THE MOST COAL



Union of Concerned Scientists

Citizens and Scientists for Environmental Solutions

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Jeff Deyette
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Executive Summary

The cost of importing coal is a major drain on the economies of many states that rely heavily on coal-fired power. Thirty-eight states were net importers of coal in 2008—from other states and, increasingly, other nations. Eleven of those states spent more than \$1 billion on net coal imports (spending on coal brought into the state minus revenues from the coal that in-state mines exported).

Burning Coal, Burning Cash shows the scale of this annual drain on state economies, and suggests how they can keep more of those funds in-state through investments in energy efficiency and homegrown renewable energy.

Most of the nation's coal comes from just three states: Wyoming, West Virginia, and Kentucky. But one state, Wyoming, increasingly dominates the market. That state provided 40 percent of U.S. coal production in 2008 (up from just 18 percent in 1990). In 2008, Wyoming shipped coal to power plants in 34 states (up from 27 states in 2002)—some as far away as New York and Georgia.

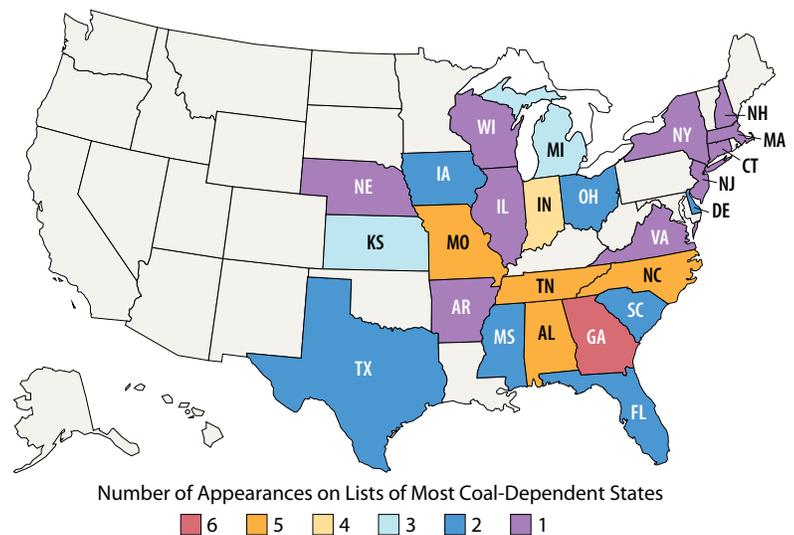
Many eastern states also import coal from other regions of the world, including South America and even Southeast Asia. Those trends—combined with rising

States can reap economic and environmental benefits by reducing their use of imported coal and investing in energy efficiency and local, renewable energy sources.

coal prices over the last several years—mean that many states spent dramatically more on imported coal in 2008 than they did just six years earlier.

In this report, we rank states' dependence on imported coal in each of six categories, and list the top 10 states on each measure. The six measures include net spending on imported coal, net weight of imported coal, per capita spending on imported coal, spending

FIGURE ES-1. The States Most Dependent on Coal Imports



These 25 states appear on at least one of our six lists of the 10 most-dependent states, based on different measures. The colors show how often each state appears on the lists.

on coal relative to the size of the state economy, reliance on net coal imports relative to total power use, and spending on international coal imports.

Twenty-five states appear on at least one of these six lists. Georgia ranks in the top 10 in all categories—the only state to do so (Figure ES-1). (The report profiles electricity production and opportunities for saving power in 24 of those states—all except Virginia, which, though it imports a lot of foreign coal, is not a net coal importer).

States in the Southeast and Midwest dominate our lists of the most-dependent states. That is because states in these two regions use considerable amounts of coal despite having limited—or in most cases no—local coal production. Several Northeast states, most of which are less dependent on coal, also appear on our lists because they import a surprisingly large share of their coal from other countries.

Every state has opportunities to cost-effectively reduce its coal use by boosting energy efficiency and developing in-state renewable resources.



Deploying homegrown renewable energy resources can help reduce a state's reliance on imported coal and stimulate the economy. In fact, producing electricity from renewable energy can create more jobs than relying on coal and other fossil fuels. That's because a larger share of spending on renewables goes to manufacturing, installation, and maintenance—all typically more labor-intensive than mining and transporting fossil fuels.

Energy efficiency is a clean, fast, low-cost way to meet consumers' energy needs while reducing dependence on coal. The United States has a tremendous reservoir of untapped energy efficiency potential. Years of experience with state and utility efficiency programs show that they can reduce electricity demand at average costs well below the retail cost of power in all the states that are most dependent on imported coal.

Some of these states have strong policies to reduce electricity use, such as ratepayer-funded energy efficiency programs, and standards requiring utilities to meet targets for saving energy. However, many of the states most dependent on imported coal lag far behind in adopting such policies.

States can also reduce their dependence on imported coal by investing in local renewable energy resources. While the potential and costs of renewable energy vary by region, all states—including those in the Midwest and Southeast—have clean energy resources they could more fully exploit.

Twenty-nine states have adopted renewable electricity standards requiring utilities to gradually increase their use of renewable energy. The states most dependent on

imported coal could reduce the funds that leave their economies by adopting or strengthening such standards. A strong federal standard would also help by setting a national floor for use of renewable energy across all states, including those in the Southeast.

Investments in clean energy bring well-documented economic benefits including new jobs, higher local tax revenues, and more income for farmers, ranchers, and rural landowners. Those benefits are even greater for states that now rely on imported coal, because such policies channel funds into local economic development—funds that would otherwise leave the state.

Of course, state reliance on imported coal for producing electricity creates more than economic problems. Burning coal also causes serious harm to public health, the global climate, and the overall environment. Indeed, coal plants are the nation's largest source of carbon dioxide, the main cause of global warming. State and federal policies promoting energy efficiency and renewable energy, and capping carbon emissions, are essential to protect our health, climate, and environment, and to accelerate the growth of a clean energy economy.

CHAPTER 1

States' Growing Dependence on Distant Coal Supplies

Coal has been the dominant source of electric power in the United States since the late 1800s, and still accounts for roughly half of the nation's electricity supply. All but two states (Vermont and Rhode Island) have coal-fired power plants, and nine states use coal to generate at least 75 percent of their power (EIA 2010a).

However, many states that rely heavily on coal to produce electricity mine little or no coal themselves. As a result, they import coal by rail or barge from other states—and, increasingly, other nations. Even some states that mine substantial amounts of coal spend hundreds of millions of dollars annually to buy coal from out of state. In fact, 38 states were net importers of coal in 2008: that is, they imported more coal than they exported. The funds that leave these states year after year to pay for imported coal are a major drain on state and local economies.

Most of the nation's coal comes from just three states: Wyoming, West Virginia, and Kentucky, which together account for more than 63 percent of U.S. coal production (Table 1). However, one state alone, Wyoming, increasingly dominates the market: it provided 40 percent of U.S.-produced coal in 2008, up from just 18 percent in 1990. Wyoming already accounts for more coal production than all of Appalachia, and more than the next six largest coal-mining states combined (EIA 2010b; EIA 2009a; EIA 1994).

The massive strip mines of Wyoming's Powder River Basin—some of the world's largest coal mines—produce coal at a much lower price per ton than the smaller mines with less accessible coal in the U.S. interior and Appalachian regions. Western coal is also lower in sulfur than most eastern coal, enabling owners of coal plants to comply with national air quality laws more easily. Together these major cost and environmental advantages have fueled a sustained westward shift in U.S. coal production (Figure 1, p. 4), and the Energy

TABLE 1. Top 10 Coal-Producing States (2008)

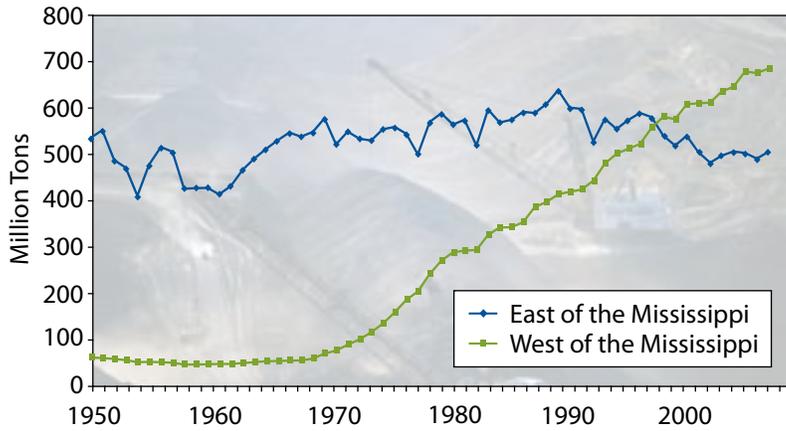
State	Coal Production (million tons)	Percent of Total U.S. Production
Wyoming	467.6	39.9%
West Virginia	157.8	13.5%
Kentucky	120.4	10.3%
Pennsylvania	65.4	5.6%
Montana	44.8	3.8%
Texas	39	3.3%
Indiana	35.9	3.1%
Illinois	32.9	2.8%
Colorado	32	2.7%
North Dakota	29.6	2.5%
U.S. Total	1,172 million tons	

Source: Energy Information Administration. 2008. *Annual coal report*.

Information Administration (EIA) projects this trend to continue in the decades ahead (EIA 2009b).

But while much of the nation's coal now comes from the West, most U.S. coal plants are in the East, near large population centers (Figure 2, p. 4). The shift toward western mines means that most coal-using states are ever more dependent on coal from outside their borders, and often from well outside their region. In 2008, Wyoming producers shipped coal to power plants in 34 states (up from 27 states in 2002)—as far as Oregon in the West and New York and Georgia in the East. Many power plant owners in eastern states also now import coal from overseas, including South America and even Southeast Asia.

FIGURE 1. Coal Production by Location, 1950–2008



Source: Energy Information Administration. 2009. *Annual energy review 2008*.

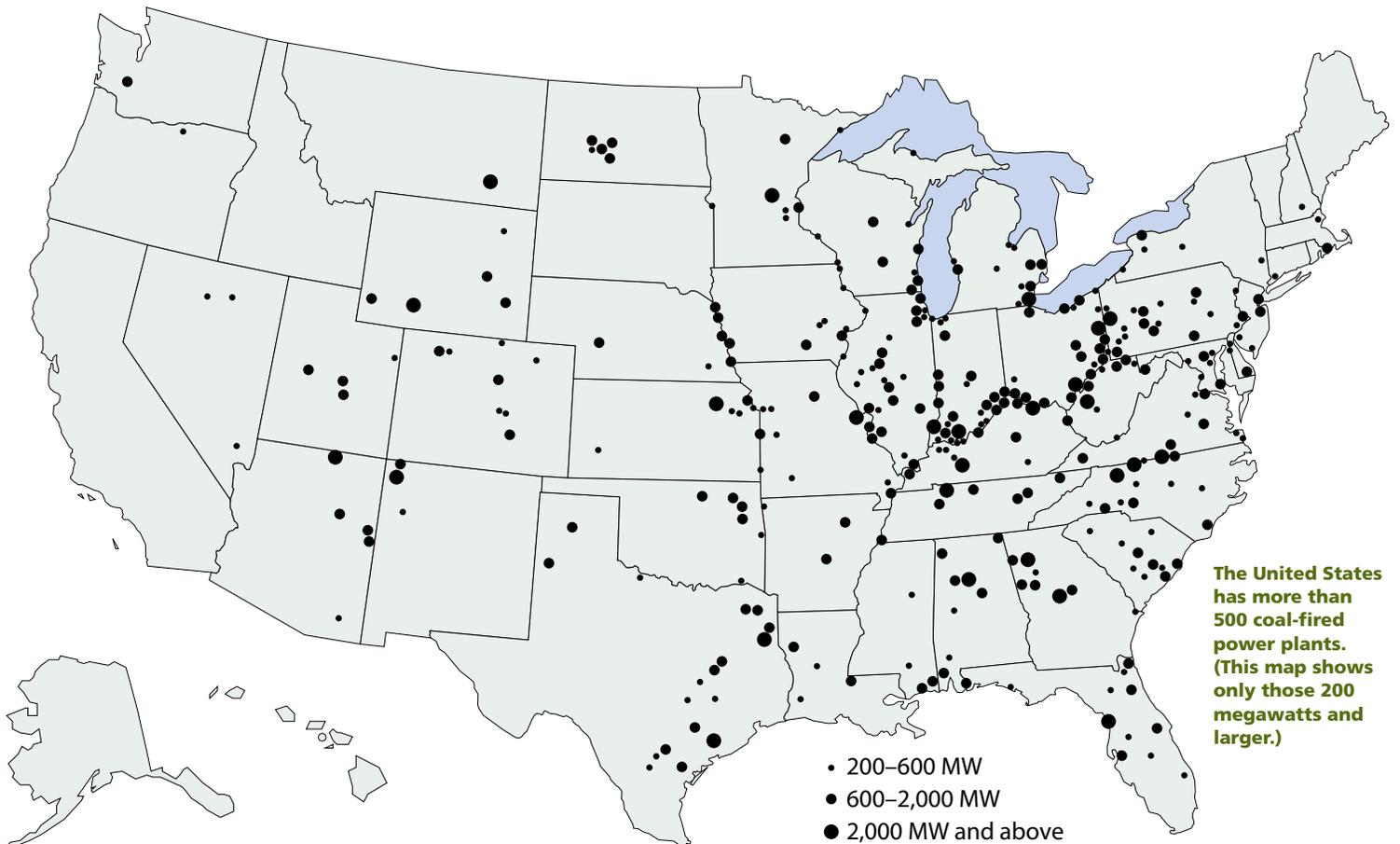
These trends, along with rising coal prices—particularly in the East but also in the West—mean that many power plant owners spent dramatically more on coal imports in 2008 than just six years earlier,

with statewide expenditures in some cases doubling or tripling.¹

Of course, direct financial costs are not the only ones states incur for using coal. They also pay a high price in damage to their air, water, health, and ecosystems, and coal use anywhere contributes to the destabilization of our climate. A recent report from the National Academy of Sciences found that U.S. coal plants caused \$62 billion in damages in 2005 alone, with the dirtiest causing more than \$575 million in damages *per plant per year*. Most of those costs reflect sickness and death from heart and lung disease linked to coal plant emissions (NRC 2009). And those estimates do not include the impact of carbon dioxide emissions from coal use on global warming, or many other effects (see Box 1).

Every state can cut its coal use cost-effectively by boosting the energy efficiency of homes and businesses, and by developing homegrown renewable power. These changes bring well-documented economic benefits,

FIGURE 2. U.S. Coal-Fired Power Plants



Source: Hydro-Quebec. No date. Original map (with additional, non-coal plants) is available at http://www.hydroquebec.com/sustainable-development/documentation/pdf/autres/carte_emissions.ppt#10.

BOX 1.

Environmental and Health Costs of Coal Use

Burning coal causes serious environmental damage to public health, the environment, and the global climate. Indeed, coal plants are the nation's largest source of carbon dioxide (CO₂), the main cause of global warming. Coal plants emit nearly one-third of all energy-related CO₂ emissions in the United States—far more than any other means of producing electricity, and as much as all forms of surface transportation combined.

The world must dramatically reduce its global warming emissions to avoid the worst effects of climate change, and curbing reliance on coal is among the cheapest ways to attain those reductions (Cleetus, Clemmer, and Friedman 2009).

But coal's environmental impacts go far beyond climate change. A new study from the National Academy of Sciences finds that sulfur dioxide (SO₂) emissions, nitrous oxide emissions, and particulates from U.S. coal-fired power plants caused \$62 billion in damages in 2005 (NRC 2009). That averages out to \$156 million in damages per plant in a single year—with the dirtiest 5 percent of plants creating harm costing between \$575 million and \$1.39 billion, depending largely on their SO₂ emissions.*

Those estimates are based almost entirely on sickness and premature deaths—particularly from heart and lung disease—caused by these pollutants (though

the estimates also reflect damage to crops, timber, and buildings, foregone recreation, and reduced visibility). Notably, the \$62 billion in annual damages does *not* include the global warming impact of CO₂ emissions from coal plants, or any of these effects:

- Creation of millions of tons of dangerous ash and other solid wastes. These wastes are dumped in massive impoundments that can suddenly rupture, flooding an area with waste (as occurred in Kingston, TN, in 2008), or slowly leak, contaminating groundwater and surface water.
- Emissions of toxic chemicals such as arsenic, cadmium, lead, and particularly mercury. The latter—a potent neurotoxin, and a threat to brain development in fetuses and young children—accumulates in bodies of water and renders fish unsafe for consumption.
- Impairment of local waterways caused by the release of pollutants or the withdrawal of huge volumes of water to cool power plants
- Damage to forest and aquatic ecosystems from emissions that contribute to acid rain
- Coal-mining costs including deadly mining accidents, the sinking of farmland from long-wall mining (removal of a single massive slice of underground coal), and the outright destruction of landscapes and ecosystems through mountaintop removal



Coal use creates many health and environmental costs not reflected in its price. These include: churning out millions of tons of dangerous ash each year, which is dumped in impoundments that can leak or even rupture and flood surrounding areas (such as Kingston, TN, in 2008, pictured); emitting massive quantities of air pollutants that cause increased sickness and death from heart and lung disease; and destroying landscapes and local ecosystems through mountaintop removal. Coal plants are also the top source of global warming pollution and a major source of toxic pollutants such as mercury.

* Plant-specific cost data provided to UCS by the National Research Council.



All states can cut coal use by deploying renewable energy resources. In New Jersey, for example, policies promoting clean energy helped finance the nation's largest single-roof solar project (at the Atlantic City Convention Center) as well as the Jersey-Atlantic Wind Farm, which produces enough electricity to power more than 2,000 homes.

including job growth, increases in local tax revenues, and new income for farmers, ranchers, and rural landowners (Navigant 2010; Pollin, Heintz, and Garrett-Peltier 2009; UCS 2009). These benefits are even greater for states that now import their coal, because they can channel funds into local economic development—funds that would otherwise leave the state. The boost to state economies that occurs when funds spent

on coal imports shift to local energy production and investments in energy efficiency is often overlooked in the consideration of competing state and federal energy policies.

This report sheds light on the annual drain on state economies from coal imports, and the potential benefits of investing more of those funds in clean, local energy options. We rank the 10 states that are most reliant on imported coal on each of six measures. Five of the measures reflect coal imported from all locations, while one measure reflects only international imports.² We then discuss how states can harness proven, cost-effective techniques to spur a shift to clean, in-state sources of electricity.

Appendix A profiles each of the 24 states that appear on one or more of our top-10 lists of the states most dependent on imported coal.³ Each profile includes a map showing how much the state's power producers spent on imported coal from various locations. (Of course, not all these funds will necessarily land in the state or nation where the mining occurs. Mine owners may divert the profits to other locations, for example.) Each profile also reveals how much power each state obtains from coal plants and other sources, and shows how that state can reduce its dependence on imported coal by investing in energy efficiency and renewable sources.

CHAPTER 2

The States Most Dependent on Imported Coal

We can measure a state's dependence on coal imports in many ways. The total cost of the coal each state imports, and its tonnage, are two obvious examples. However, those measures may not capture the dependence on imported coal of states with smaller populations and economies, and lower energy demand. Those two measures also do not reflect a state's dependence on domestic versus overseas coal imports, which can have important ramifications depending on the stability of the exporting countries.

To evaluate both the absolute and relative dependence of states on annual coal imports, we analyzed six different measures:



Expenditures on net coal imports



The total weight of net coal imports



Per capita expenditures on net coal imports



Expenditures on net coal imports relative to the size of the state economy



Net coal imports relative to the state's total electricity use



Expenditures on imports from outside the United States



Coal-fired power plants—like this one in North Carolina—account for about half of the United States' electricity supply. Like most others, the plant burns coal to generate the steam that turns the turbines used to create electricity. The plant uses large quantities of water from a nearby source and also releases large quantities of heat-trapping carbon dioxide (CO₂) into the atmosphere. In this photo, a stockpile of imported coal sits between the facility and a 50-acre slurry pond, which can store 450 million gallons of toxic coal ash waste.

To create our rankings, we used data from the U.S. Department of Energy's Energy Information Administration and the Federal Energy Regulatory Commission for 2008, the latest year available. Some coal-producing states both import and export coal. We account for this by reporting net imports—total imports minus total exports—for all the rankings except the final one on international imports.

Federal data show how much coal the power plants in each state burn to produce electricity. Some of that power flows through the interstate grid for use in other states. The profiles note which states produce much more or less power from all sources than they consume—which, in turn, suggests that those states may import or export significant amounts of coal-fired power. (See Appendix B for more on our methodology.)



**The Billion-Dollar Club:
10 States That Spend
the Most on Net Coal
Imports**

The 10 states that spend the most on net coal imports find themselves in an exclusive—though perhaps unwelcome—club: each drained at least \$1 billion from its economy in 2008 to pay for imported coal (Figure 3B). Georgia comfortably claims the worst spot in this billion-dollar club. That state shelled out more than \$2.6 billion to supply its fleet of coal-fired power plants—\$270 million more than its closest competitor. Southeastern states, as well as several midwestern states, dominate the list.⁴ (See Box 2,

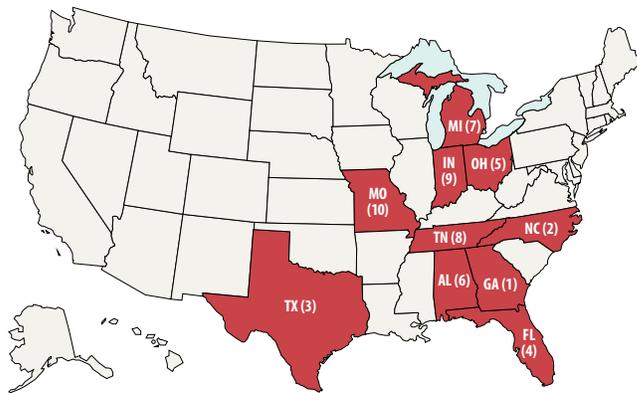
p. 14, for a ranking of America’s most coal-import-dependent power providers.)

Four of these 10 states—Georgia, North Carolina, Florida, and Michigan—produce no coal, and therefore import 100 percent of what they burn. Small mining operations in Missouri and Tennessee produce coal for both in-state use and export. However, both states import more than 99 percent of the coal they burn. Texas, Ohio, Alabama, and Indiana all mine considerable amounts of coal within their borders, but still rank among the top coal-importing states because they burn far more than they produce. Texas imports 63 percent of the coal its power plants burn, while Alabama, Ohio, and Indiana import 79 percent, 71 percent, and 51 percent, respectively.

Many states on this list saw expenditures on coal imports rise steeply from 2002 to 2008. For example, the federal database shows that Georgia spent 87 percent more on coal imports in 2008 than six years earlier, with expenditures growing by \$1.2 billion.⁵ Over those six years, North Carolina’s expenditures rose 88 percent (up \$1.1 billion), while Alabama’s jumped 170 percent (up \$875 million).

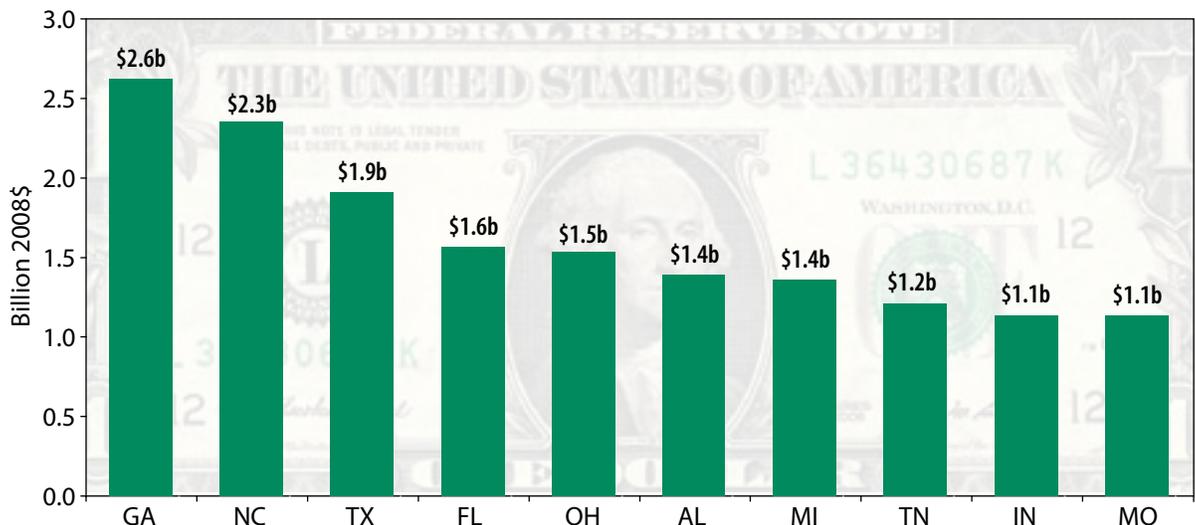
These increases reflect the fact that many states imported more coal in 2008 than in 2002 (see the next section). More importantly, however, they reflect the rising price of coal: average real prices across the nation grew 54 percent from 2002 to 2008 (EIA 2009c). Rising coal prices partly reflect higher transportation costs. But because coal is a global commodity, its price also reflects international events. Supply shortages

FIGURE 3A. The 10 Most Coal-Dependent States: Expenditures on Net Coal Imports

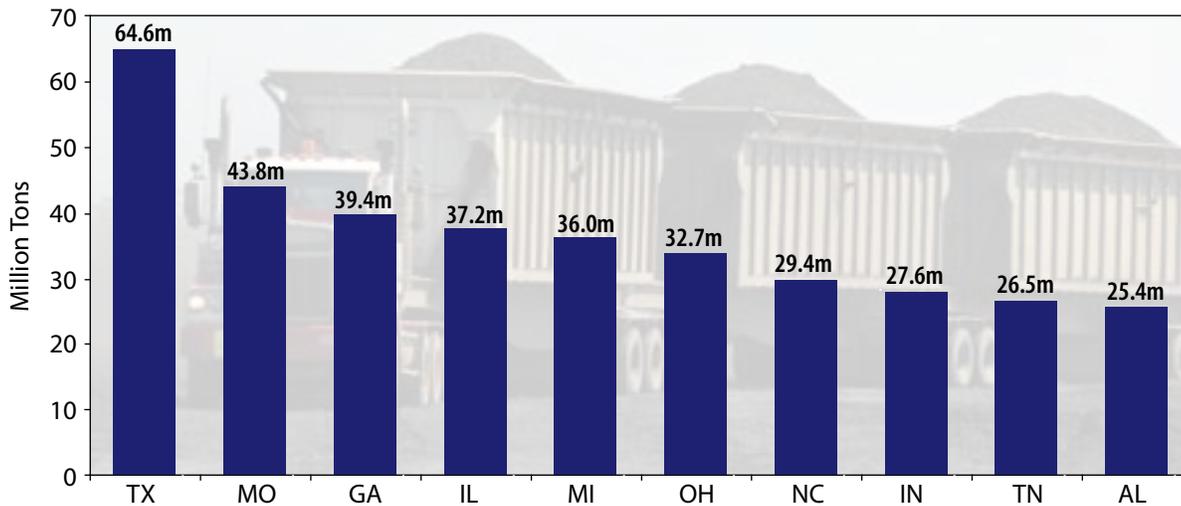


NOTE: State rankings appear in parentheses.

FIGURE 3B. The 10 Most Coal-Dependent States: Expenditures on Net Coal Imports (2008)



Source: Based on data from Energy Information Administration. 2010. *Form EIA-923 (Schedule 2)*. Online at <http://www.eia.doe.gov/cneaf/electricity/page/eia423.html>.

FIGURE 4A. The 10 Most Coal-Dependent States: Net Coal Imports by Weight (2008)

Source: Based on data from Energy Information Administration. 2010. *Form EIA-923 (Schedule 2)*.
 Online at <http://www.eia.doe.gov/cneaf/electricity/page/eia423.html>.

resulting from severe weather and transportation bottlenecks in Australia and China, two major coal-producing countries, in 2008—combined with growing global demand for electricity—contributed to higher prices at home as well (Wilenthe 2008).

The amount of coal burned in power plants nationwide dropped significantly in 2009 because of the recession, and probably because of clean energy policies in some states.⁶ In fact, the share of coal-fired power in the nation's electricity mix fell from 48.2 percent in 2008 to 44.7 percent in 2009 (EIA 2010a; EIA 2010e). The spot, or short-term, price of coal also dropped back from highs seen in 2008. Expenditures on net coal imports for most states therefore also likely dropped in 2009 (state-specific data for 2009 were not yet available).

However, states dependent on imported coal with no policies for advancing clean energy technologies should expect expenditures to rebound as the economy recovers, unless Congress approves comprehensive climate and energy laws. Spot prices for coal from the Powder River Basin rose by about half from December 2009 to April 2010, and the EIA forecasts that coal use by the electricity sector will rise 4.2 percent in 2010, absent policy changes (EIA 2010f; EIA 2010g).

Eleven states drained at least \$1 billion from their economies in 2008 to pay for imported coal.



Ten States That Import the Most Coal by Weight

Operators of coal-fired power plants buy their fuel by the ton. Each ton produces enough electricity to power

a typical home for just three to six months, depending on the quality of the coal. Low-sulfur, sub-bituminous coal from the West contains about one-third less energy, on average, than the bituminous coal typically found in the eastern United States. Plants that rely more heavily on western coal therefore require greater amounts. For example, a single commercial-size coal plant that could run on 1.4 million tons of eastern bituminous could require as much as 2.5 million tons of western sub-bituminous each year.⁷

FIGURE 4B. The 10 Most Coal-Dependent States: Net Coal Imports by Weight

Not surprisingly, then, Texas ranks as the state most dependent on imported coal in terms of net quantity. In 2008, the state brought in more than 64 million tons of coal—48 percent more than Missouri, in the second slot (Figure 4A). Texas does have significant in-state supplies, but they are largely lignite, the kind with the lowest energy content. Nearly all the state’s coal imports came from Wyoming, which accounted for 63 percent of the total coal supply in Texas in 2008. The size of the state’s overall demand for electricity, by far the highest in the country, and its large fleet of 40 coal-fired generating units, contributes to the state’s import of massive amounts of coal each year.

Apart from Texas, southeastern and midwestern states once again dominate the list. In fact, nine states appear on both the weight and expenditure lists, although in different order. Illinois makes the list of 10 most-dependent states for tonnage of imports but not for expenditures, because almost all its imports come from relatively low-cost mines in Wyoming. Florida, in contrast, finds itself on the most-dependent list for coal expenditures but not for tonnage, because it relies heavily on more costly coal from Appalachia and overseas (EIA 2010c).

The 10 states that make this most-dependent list together imported a net 363 million tons of coal in 2008. That amount would fill a train of railcars nearly 36,500 miles long—enough to encircle the earth almost 1.5 times. That amount is also 29 percent higher than 2002 levels.

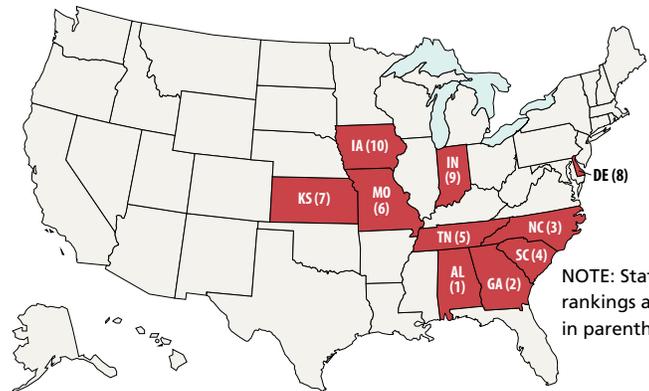
From 2002 to 2008, many states saw significant increases in the amount of coal they imported (contributing to the rise in import expenditures noted earlier). For example, net imports by weight rose 26 percent in Georgia, 18 percent in North Carolina, and 43 percent in Alabama from 2002 to 2008.



Ten States That Spend the Most on Imported Coal per Person

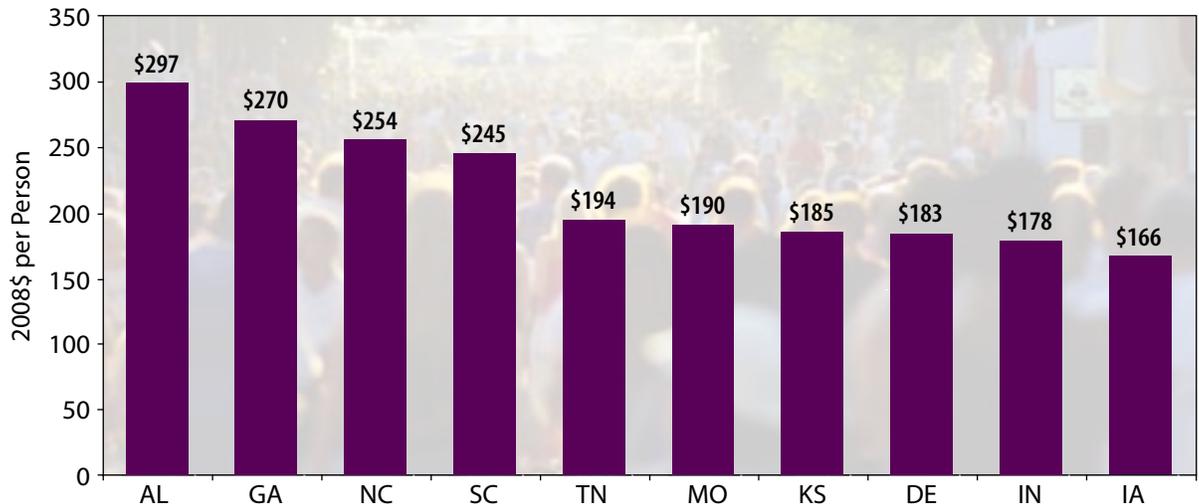
Measuring how much a state spends on coal imports per capita levels the playing field between states with large populations and those with small ones. Indeed, this ranking includes four states—Iowa, Delaware, Kansas,

FIGURE 5A. The 10 Most Coal-Dependent States: Expenditures on Net Coal Imports per Person



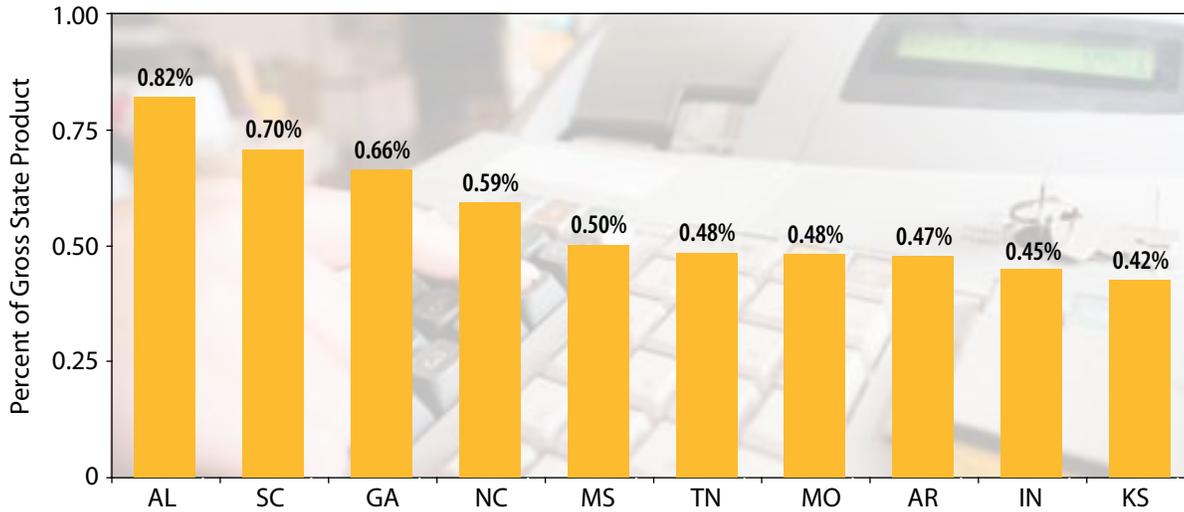
NOTE: State rankings appear in parentheses.

FIGURE 5B. The 10 Most Coal-Dependent States: Expenditures on Net Coal Imports per Person (2008)



Source: Based on data from Energy Information Administration. 2010. Form EIA-923 (Schedule 2). Online at <http://www.eia.doe.gov/cneaf/electricity/page/eia423.html>.

FIGURE 6A. The 10 Most Coal-Dependent States: Spending on Net Coal Imports Relative to the Size of the State Economy (2008)



Source: Based on data from Energy Information Administration. 2010. *Form EIA-923 (Schedule 2)*. Online at <http://www.eia.doe.gov/cneaf/electricity/page/eia423.html>.

All 10 states making the per capita list spent more than \$165 per resident on coal imports in 2008.

and South Carolina—that do not appear on lists for net import expenditures or weight (Figure 5B).

All 10 states making this list spent more than \$165 per resident on coal imports in 2008—or more than \$660 for a family of four.⁸ Alabama tops this list, spending nearly \$300 per person to pay for out of state coal. Georgia, the nation's ninth most populous state, ranks as the second most dependent on imported coal, at \$270 per person. By contrast, Delaware ranks forty-fifth in population but still spends \$183 per person annually on coal imports—eighth highest among all states.



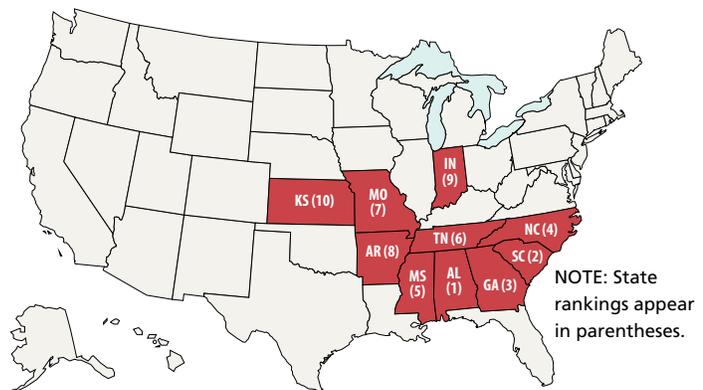
Ten States That Spend the Most on Imported Coal Relative to the Size of Their Economy

The size of a state's economy, measured by gross state product, is another useful barometer

for considering a state's dependence on imported coal. By this measure, Alabama depends more on coal imports than any other state.

Because coal imports drain away a larger share of the economic output of the 10 states on this list, reversing

FIGURE 6B. The 10 Most Coal-Dependent States: Spending on Net Coal Imports Relative to the Size of the State Economy



this outflow could have a relatively greater impact in spurring local economic development. Each dollar spent on clean, homegrown resources or energy efficiency improvements rather than imported coal will create direct jobs (providing income plus savings from lower energy costs), indirect jobs in industries such as finance and transportation, and induced jobs when residents spend the new income and savings in the local economy.

Eight states that make this list also rank as the most import-dependent per person (Figure 6A). And seven of the 10 most-dependent states based on import costs relative to the size of their economy are in the South or Southeast.



Ten States That Import the Most Coal Relative to Total State Electricity Use

As the state most dependent on coal imports relative to total in-state electricity use,

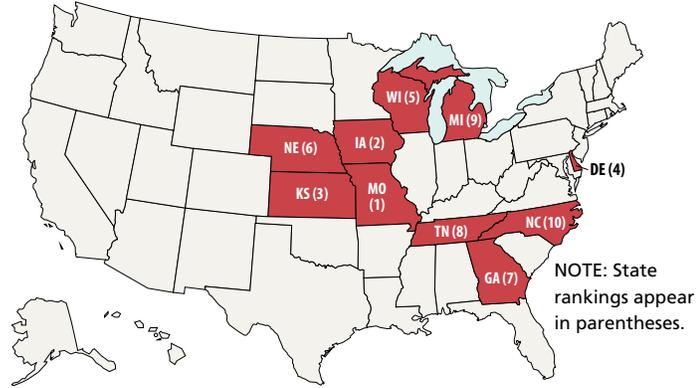
Missouri is similar to the other states on this list for two reasons. Coal-fired power dominates the electricity Missouri ratepayers consume, and the state produces little or no coal. The electricity grid in the states on this list is potentially more vulnerable to disruptions in fuel supply than that in states with more diversified and local power sources.

One such supply disruption occurred in 2005, when track problems and derailments interfered with shipments of Wyoming coal for several months. Spot prices for Powder River Basin coal doubled during the disruption (NRC 2007). Power plant operators who rely more heavily on the spot market rather than long-term contracts for coal are particularly vulnerable to such price spikes.

To evaluate states for this category, we converted tons of net coal imports into the amount of energy they contain, measured as British thermal units (Btu). We then divided total electricity use in 2008 (also in Btu) by this number.

The resulting percentage does not reflect the precise role of coal in each state’s electricity mix. That’s because some states that import coal for use in producing

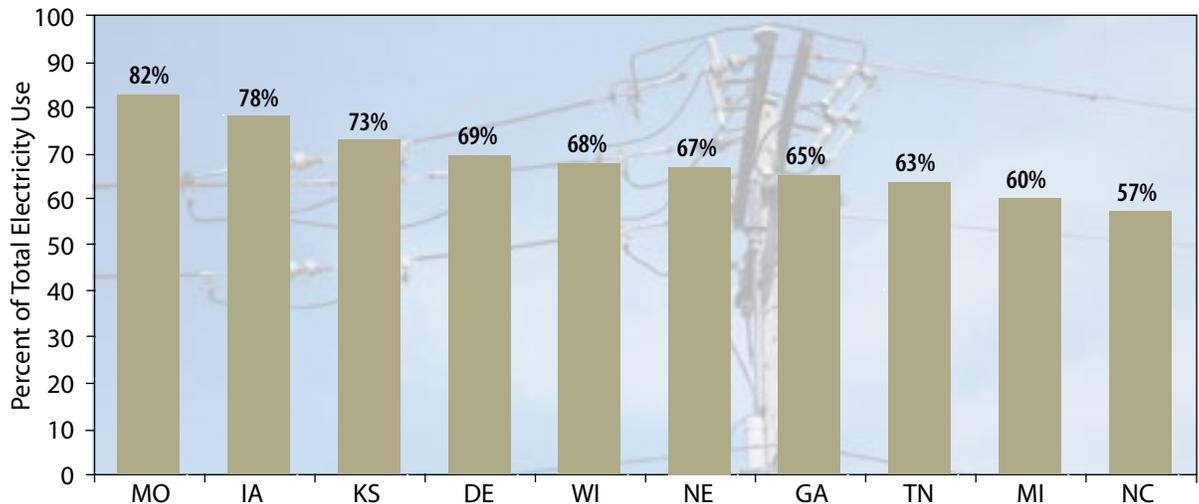
FIGURE 7A. The 10 Most Coal-Dependent States: Net Coal Imports as a Share of Total State Electricity Use



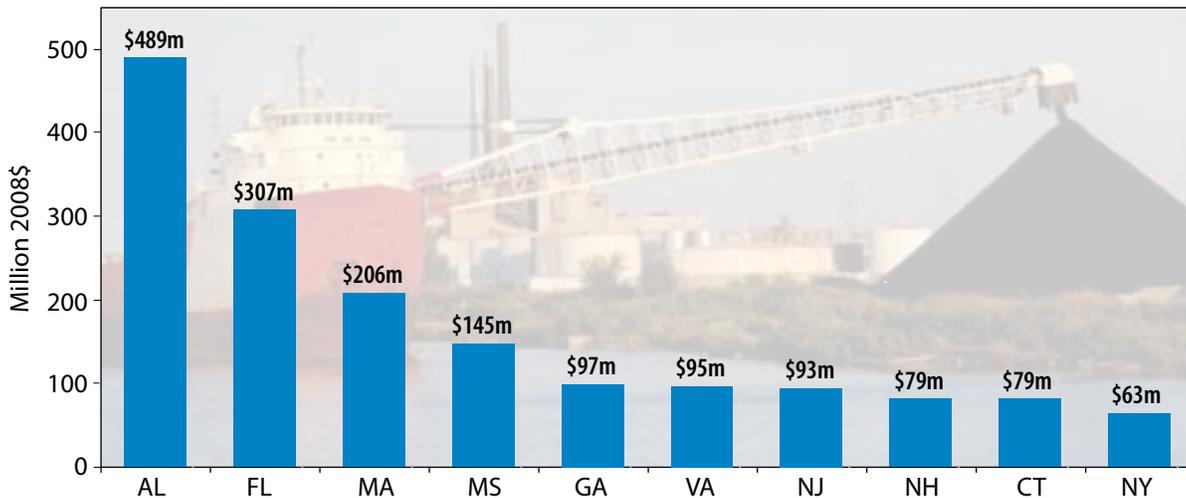
electricity also export some of that power to other states, and these interstate power flows are not tracked well across all states, or for any one power facility. The percentage therefore suggests an upper bound for the contribution of out-of-state coal to electricity use in states that are net exporters of coal-based power, and a lower bound for states that are net importers of coal-based power.

Coal imports account for nearly 60 percent or more of annual electricity use in the 10 states ranked most dependent by this measure (Figure 7B). Midwestern states make up the majority of the list, with only three Southeast states—Georgia, North Carolina, and Tennessee—cracking the top 10. Southeast states such as

FIGURE 7B. The 10 Most Coal-Dependent States: Net Coal Imports as a Share of Total State Electricity Use (2008)



Source: Based on data from Energy Information Administration. 2010. Form EIA-923 (Schedule 2). Online at <http://www.eia.doe.gov/cneaf/electricity/page/eia423.html>.

FIGURE 8A. The 10 Most Coal-Dependent States: Spending on International Coal Imports (2008)

Source: Based on data from Energy Information Administration. 2010. *Form EIA-923 (Schedule 2)*. Online at <http://www.eia.doe.gov/cneaf/electricity/page/eia423.html>.

Florida, Mississippi, and South Carolina, which show up on the most-dependent list in other categories, do import a lot of coal. However, their electricity mix depends more heavily on other fuels such as natural gas and nuclear power.



Ten States That Spend the Most on Coal Imports from Outside the United States

Despite the abundance of coal and other, cleaner energy resources in the United

States, 16 states purchased coal from overseas in 2008— together spending more than \$1.8 billion to import 25.4 million tons of coal. That is equivalent to nearly 1,700 oceangoing barges, or more than four arriving

in U.S. ports every day. Alabama leads the list of states that spent the most on foreign coal imports, shelling out \$489 million (Figure 8A). However, the mantle of *most* dependent in this category should perhaps go to Massachusetts. International shipments accounted for 82 percent of all coal imports in that state, and— because the state produces no coal—82 percent of its coal use.

All 10 states on the most-dependent list for international imports sit along the eastern seaboard, from New England to the Gulf of Mexico. Even Virginia—a coal-mining, net exporting state—spent \$95 million on coal from Colombia in 2008. Growing demand for low-sulfur coal, and the high cost of rail transport from Wyoming's Powder River Basin, impel East Coast power producers to buy coal overseas.

Colombia is the largest international source of coal shipped to the United States, providing more than 80 percent of these supplies. Imports also came from Venezuela, and from as far away as Indonesia, in 2008.

International imports still represent a small share of coal burned at U.S. power plants—about 3 percent—and the United States continues to export more coal to other nations than it imports. However, international imports more than tripled from 1999 to 2008, before dropping in 2009 (EIA 2009d; EIA 2001). Given coal production and cost trends in the eastern United States, international imports may well rise again in 2010 as the economy rebounds—except, perhaps, in states that steer energy investments toward cleaner, local sources of electricity.

FIGURE 8B. The 10 Most Coal-Dependent States: Spending on International Coal Imports

NOTE: State rankings appear in parentheses.

BOX 2.

America's Most Coal-Dependent Power Providers

Southern Company, one of the nation's largest energy firms, provides electricity to 4.4 million customers across four Southeast states. The energy giant—which includes Alabama Power, Georgia Power, Mississippi Power, and Gulf Power in the Florida panhandle—is also the U.S. power supplier most dependent on coal imports.

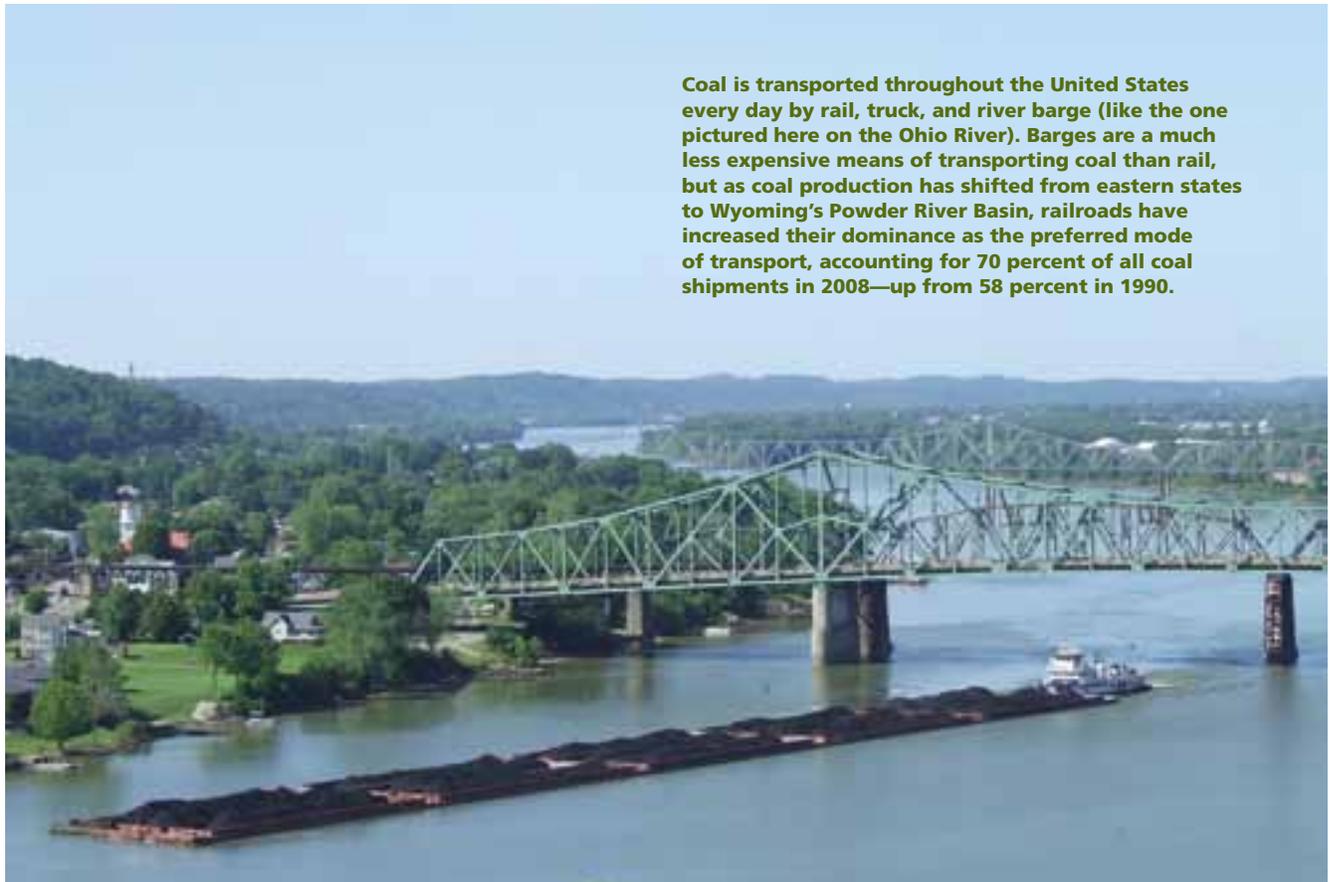
In 2008, its four utilities paid nearly \$4.2 billion to buy coal from outside their states. These funds represented 90 percent of the company's coal costs, and more than double the money spent by the next largest coal importer (Table 2). Half of the 10 most import-dependent U.S. coal plants belong to Southern Company—three in Georgia and two in Alabama.

Progress Energy, a company with service territories in Florida and the Carolinas, ranked fifth most dependent on imported coal among all U.S. electricity providers in 2008. However, a subsidiary, Progress Energy Carolinas, recently announced plans to retire several

TABLE 2. The Most Coal-Dependent Power Providers: Net Coal Expenditures (2008)

Power Provider	Expenditures
Southern Company	\$4.18 billion
Tennessee Valley Authority	\$1.95 billion
American Electric Power	\$1.87 billion
Duke Energy	\$1.83 billion
Progress Energy	\$1.50 billion

antiquated coal units at four plants in North Carolina by 2017 (Progress Energy 2009). Those retirements would shrink the company's coal-fired power plant fleet in that state by about 30 percent. Progress plans to replace much of that capacity with new natural gas facilities, which will be much cleaner but will still rely on imported fuel.



Coal is transported throughout the United States every day by rail, truck, and river barge (like the one pictured here on the Ohio River). Barges are a much less expensive means of transporting coal than rail, but as coal production has shifted from eastern states to Wyoming's Powder River Basin, railroads have increased their dominance as the preferred mode of transport, accounting for 70 percent of all coal shipments in 2008—up from 58 percent in 1990.

CHAPTER 3

Using Clean Energy to Curb Dependence on Imported Coal

The 38 states that were net importers of coal in 2008 share something in common: each has an abundance of local, clean energy resources that can help break its dependence on coal imports. In fact, every state in the nation has affordable opportunities to reduce its coal use by investing in energy efficiency and homegrown, renewable power sources such as wind, solar, and bio-energy. Effective state and federal policies can help hasten their deployment.

Tapping the Potential of Energy Efficiency

Investing in energy efficiency is a clean, fast way to meet consumers' energy needs and enable them to save money while reducing the nation's dependence on coal. The United States has a tremendous reservoir of untapped energy efficiency potential.

For example, a 2007 analysis by McKinsey & Company found that making buildings and industry more efficient could cut U.S. electricity demand 24 percent by 2030 (Creys et al. 2007). Nearly half of that potential is in the South—a region that figures prominently in our analysis. Indeed, a 2010 analysis from Georgia Tech and Duke University found that adopting energy efficiency policies in the South would not only cut electricity demand but also would, in 2020, reduce energy bills in the South by \$41 billion, create 380,000 new jobs, and increase the size of the region's economy by \$1.23 billion. These same policies would also conserve 8.6 billion gallons of fresh water in 2020 due to reduced cooling water needs at power plants (Brown et al. 2010).

Moreover, years of experience with efficiency programs in several states show that they can reduce electricity demand at costs ranging from 2.5 to 4 cents per kilowatt-hour (kWh) (Bell 2009; James et al. 2009; Kushler, York, and White 2004). That is well below the average retail cost of electricity in every state that made

at least one of our most-dependent lists: the cost in those states ranges from 6.6 to 17.8 cents per kWh. The price of curbing demand is also lower than the average cost of electricity nationwide: 9.7 cents per kWh (EIA 2010h).

Despite the well-documented potential and cost-effectiveness of energy efficiency measures, stubborn market, financial, and regulatory barriers limit their adoption. Sound policies and programs can help, and states and utilities around the country are adopting new ones or strengthening existing ones (Barbose, Goldman, and Schlegel 2009). Other states, though—



Simple, common-sense decisions often make a significant difference in the long run. Light-colored roofs, like this one at Atlanta's Energy and Environmental Resource Center, reflect sunlight, keeping buildings cooler, reducing demand for air conditioning, lowering electricity use, and saving money.

BOX 3.

The Many Faces of Energy Efficiency



Windows labeled “Low-E” keep buildings warmer in the winter and cooler in the summer. Energy Star labels help consumers identify the most energy-efficient products.



A blower-door test finds leaks that can be sealed, creating an airtight building with minimal heat and air-conditioning loss.



A properly sized HVAC system with centrally located ducts eliminates heat loss.



Programmable thermostats reduce energy use when residents are sleeping or not home.

including many featured on our lists—lag far behind in pursuing energy efficiency.

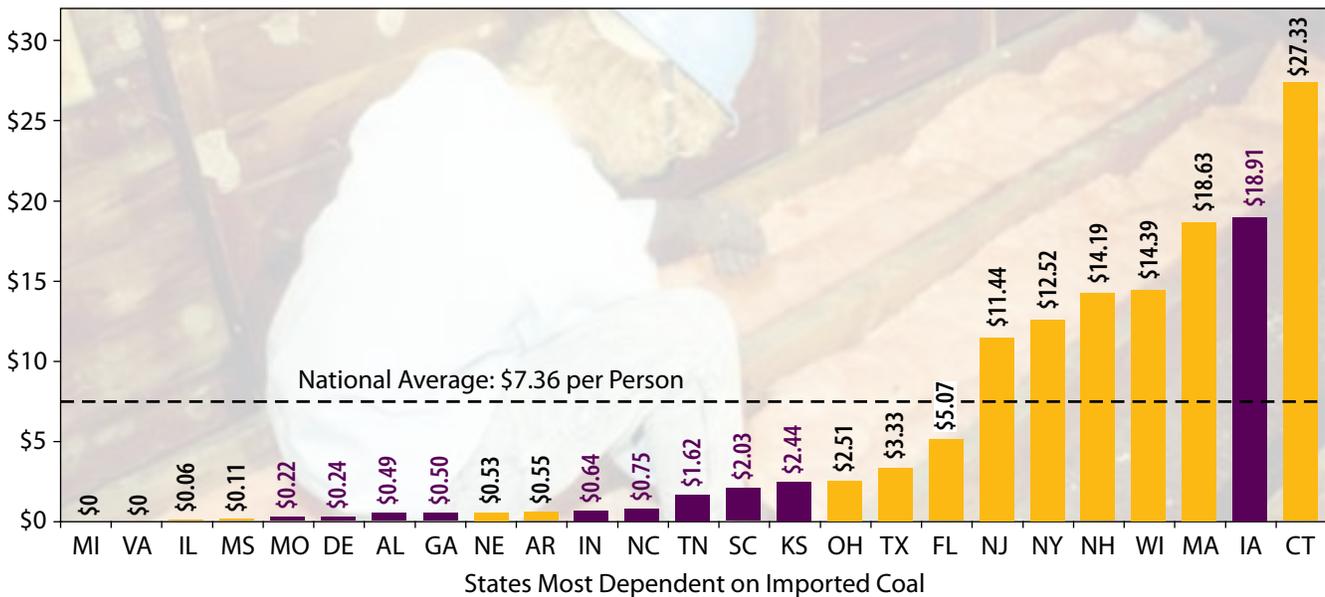
For example, most states have adopted some kind of ratepayer-funded energy efficiency program, administered by local utilities or other bodies. However, states vary widely in their spending on these programs, and their performance. A 2009 study by the American Council for an Energy-Efficient Economy found that the leading states spent \$12 to \$38 per person on ratepayer-funded energy efficiency programs in 2007, while the national average was slightly more than seven dollars per person (ACEEE 2009).

Most of the states on our lists spent markedly less on electricity efficiency programs (Figure 9). For example, of the 10 states with the highest per capita expenditures on coal imports in 2008, only Iowa spent more than \$2.50 per person on ratepayer-funded efficiency programs in 2007.⁹ Six states on the same list—Alabama, Delaware, Georgia, Indiana, Missouri, and North Carolina—spent less than one dollar per person. By contrast, these 10 states spent \$166 to \$297 per person on imported coal. In some states, spending on imported coal exceeded spending on efficiency by orders of magnitude. Georgia, for example, spent 540 times more on ratepayer-funded coal imports than on ratepayer-funded electricity efficiency measures.

Not surprisingly, the states that spend the least on efficiency programs have also cut electricity use by the smallest amounts. Several leading states have already cut annual retail sales of electricity by 1 to 2 percent through investments in efficiency (ACEEE 2009; Barbose, Goldman, and Schlegel 2009; James et al. 2009). Yet the states most dependent on imported coal report electricity savings from efficiency programs many times lower than that. For example, 14 of the states on our lists reported savings on retail electricity sales of 0.02 percent or less in 2007—50 to 100 times less than leading states (ACEEE 2009).

To ramp up investments in energy efficiency, the states most dependent on coal imports need only look to states that have pioneered and proven the effectiveness of a host of policies over the years. For example, 17 states use “public benefits” funds—supported by a small surcharge on each customer’s monthly electric bill—to finance rebates on efficient appliances and equipment, energy audits, weatherization, and other incentive programs.

Twenty-three states have also adopted “energy efficiency resource standards” (EERS)—market-based policies that require utilities to meet annual targets for reducing electricity use through whatever measures they

FIGURE 9. State Spending per Person on Electricity Efficiency Programs (2007)

Source: American Council for an Energy Efficient Economy. 2009. *The 2009 state energy efficiency scorecard*.

Most of the 25 states appearing on our lists of states most dependent on coal imports fell well below the national average in spending on ratepayer-funded electricity efficiency programs in 2007. Except for Iowa, the 10 states with the most spending on coal imports per person (marked in purple) ranked especially low in efficiency investments. Those same 10 states spent \$166 to \$297 per person on imported coal in 2008.

choose. The most aggressive state EERS policies require annual reductions in electricity use of 2 percent or more. Other successful efficiency policies include energy codes for new buildings, standards for appliances and equipment, performance incentives for utilities, mechanisms for compensating them for lost revenue (known as “decoupling”), and programs that deploy combined-heat-and-power systems (which recover waste heat from electricity production) (ACEEE 2009; Cleetus, Clemmer, and Friedman 2009).

Some states on our lists did take steps in 2008 and 2009 to reduce electricity demand—and dependence on imported coal—by launching new policies and programs to promote energy efficiency. These include Illinois, Michigan, North Carolina, and Ohio—states that have not historically had strong efficiency policies (Barbose, Goldman, and Schlegel 2009). Delaware, Indiana, Iowa, and Massachusetts have adopted new energy efficiency resource standards, and Florida passed a law that will greatly strengthen building codes over the next decade (ACEEE 2009). But many other states still lack any significant policy commitment in this arena.

The federal government can also play an important role in advancing energy efficiency and curbing coal use. Federal standards have already spurred significant



In west-central Missouri, Show Me Energy is turning crop residues and native perennial grasses into pellets, which Kansas City Power and Light and other utilities use to produce electricity, replacing some imported coal. Show Me farmers leave 30 percent of their crop residues in the field, to reduce erosion and maintain wildlife habitat and soil fertility. Owned by farmers, Show Me also recycles income within the community.

gains in the efficiency of numerous appliances and equipment—including refrigerators, air conditioners, and electric motors—over the past two decades. Climate and energy legislation now before Congress would build on that success by promoting a variety of efficiency measures. These include a combined renewable

BOX 4.

Renewable Energy Technologies



Wind

Land-based
Shallow offshore
Deep offshore



Solar

Distributed photovoltaics
Concentrating solar power



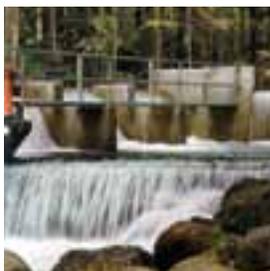
Bioenergy

Energy crops
Agricultural residues
Forest residues
Urban residues
Landfill gas



Geothermal

Hydrothermal
Enhanced geothermal systems
Co-produced with oil and gas



Hydropower

Existing conventional
New conventional
Wave
Hydrokinetic (tidal/in-stream)

energy and energy efficiency resource standard, improved building codes for new construction and retrofits, and new and strengthened appliance standards. Placing a mandatory cap on carbon emissions and letting the market set a price for them would also provide a new source of revenue for investments in energy efficiency.

Diversifying the Power Supply with Renewable Energy

States can also reduce their dependence on imported coal by encouraging investments in local renewable energy. Unlike coal plants, most renewable energy facilities have no fuel costs once they are installed. The exception is bioenergy, but that can be locally and sustainably sourced, and is widely available in most of the listed states.

The major renewable energy technologies—including wind, solar, geothermal, bioenergy, and small-scale hydropower—have the potential to produce more than 16 times the amount of electricity used nationwide in 2007 (Cleetus, Clemmer, and Friedman 2009).

These resources have also become more affordable. Advances in technology and economies of scale drove down their costs 50 to 90 percent from 1980 to 2005. The costs of all energy technologies rose somewhat in recent years, owing to higher costs for materials, labor, and fuel, but this trend is already beginning to reverse itself. Some renewable energy resources—such as wind and geothermal at good sites—can now compete with new coal- and natural-gas-fired power plants. Other renewable resources will become more cost-competitive as the renewable energy industry grows, supported by stable, long-term policies that help lower market barriers (Cleetus, Clemmer, and Friedman 2009).

While the potential and costs of renewable energy vary by region, all states could more fully exploit such resources, including states in the Midwest and Southeast—two regions that feature prominently in our rankings. The Midwest has some of the nation's best wind and bioenergy resources. Indeed, several states now dependent on coal imports have begun to develop these resources, spurred by aggressive policies in the region. Illinois, Iowa, and Minnesota, for example, have a combined total of more than 7,000 megawatts of installed wind capacity—about 20 percent of the U.S. total.

In the Southeast, bioenergy holds the greatest near-term potential among the region's diverse renewable resources. Mill wastes and other residues from the forest products industry, switchgrass, urban wood wastes, and agricultural residues are particularly useful in states

heavily dependent on coal imports. That's because coal plants can burn these materials directly, displacing up to 15 percent of the coal. Retrofitting coal plants and processing bioenergy resources to boost their energy density can allow power plants to burn even more such resources along with coal (Checkbiotech 2008).

The Southeast has a long history of using bioenergy resources to produce electricity, particularly at pulp and paper mills. However, the region is just beginning to develop these resources for co-firing with coal, and to build dedicated biomass facilities and combined-heat-and-power plants, which reduces the need to use coal, particularly in the forest products industry. Ironically, the region is exporting biomass pellets for use in European power plants while it imports coal from Colombia to burn in its own power plants (Kotrba 2009).

Non-hydro renewable energy sources provided just 3.1 percent of the U.S. electricity supply in 2008 (EIA 2010a). However, the Energy Information Administration projects that non-hydro renewable energy will grow to 11 percent of the U.S. power mix by 2030—owing largely to near-term federal tax incentives and long-term markets created by state policies (EIA 2009b). This projection reflects existing policies only; new state and federal policies can drive renewable resource development higher.

One of the most popular and proven tools for developing renewable energy is the renewable electricity

standard (RES). Also known as a renewable portfolio standard, the RES requires electric utilities to gradually increase the percentage of renewable-based electricity they sell to consumers and businesses. Some 29 states and the District of Columbia have adopted RES policies, with 17 states setting targets of 20 percent or higher. Fifteen of the states that appear on our most-dependent lists have implemented an RES, and power producers should curb their coal imports as the targets ramp up over time. Most states on our lists without an RES are in the Southeast: North Carolina is the only state in the region with a binding commitment to deploy renewable energy.

A strong federal RES would also help by setting a national floor for renewable energy across all states, including those in the Southeast. A 2009 UCS analysis shows that a national RES of 25 percent by 2025 is achievable, would save consumers a total of \$95 billion through 2030, and would displace 547 million tons of coal. Such a policy would also create 200,000 added jobs and induce other significant local economic benefits (UCS 2009). A more recent UCS study found that a national RES—combined with an economy-wide cap on carbon emissions and a strong energy efficiency resource standard—is a sensible and affordable approach to cutting carbon emissions, reducing coal use, and moving to a cleaner and safer energy supply (UCS 2010).



A strong federal renewable electricity standard would diversify the power supply, cut coal use, and create 200,000 jobs nationwide.

CHAPTER 4

Conclusion

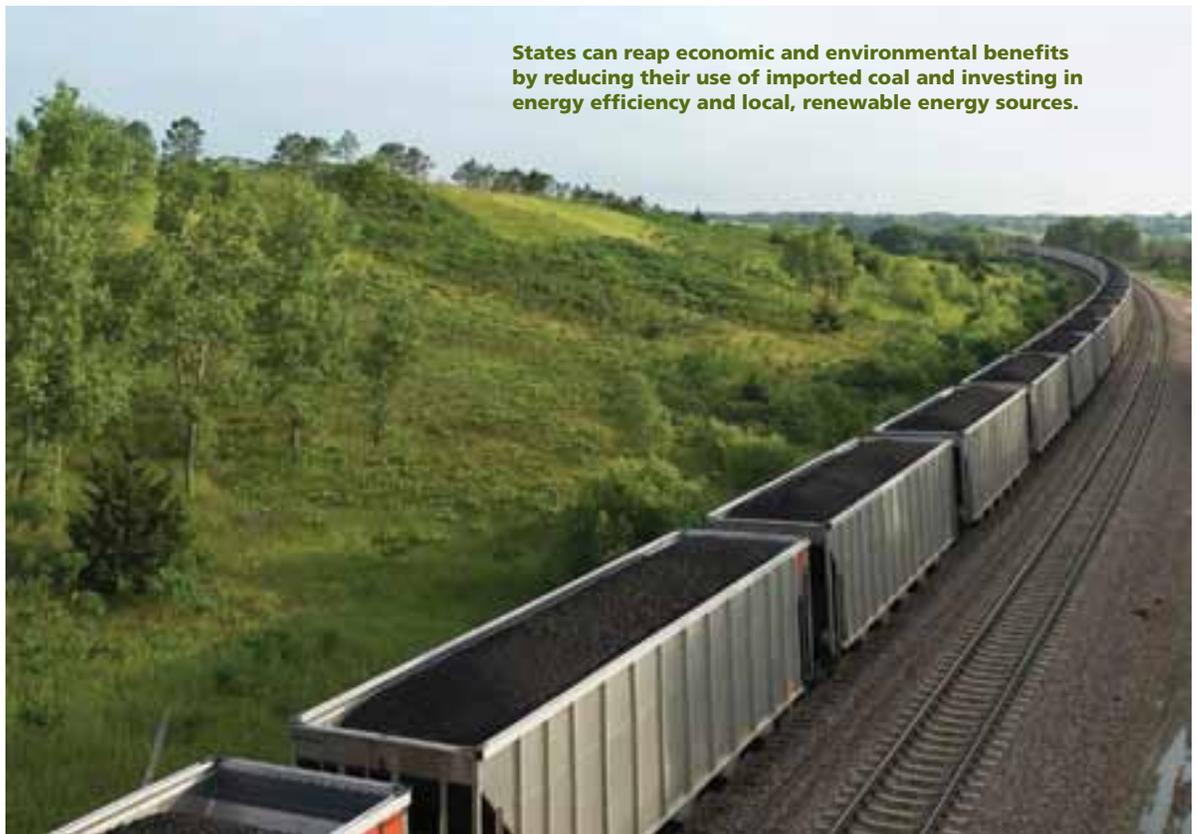
The cost of importing coal is a substantial but little-recognized drain on the economies of many states, with the annual outflow topping a billion dollars in 11 states in 2008. This drain has expanded considerably as coal mining has become more concentrated, coal prices have risen, and coal use in some places has grown.

Sending funds out of state to buy coal is a particular problem in the Southeast and Midwest—two regions that dominate our six measures of dependence on coal imports. But Northeast states, which are less dependent on coal overall, receive a surprisingly large share from other countries. States that import coal pay not just the direct cost but also indirectly in the form of degraded air, water, and health.

All states can reap economic and environmental benefits by reducing their coal use and investing in energy efficiency and local, renewable energy sources, but this is particularly true for states that depend heavily

on imported coal. Policies and programs promoting energy efficiency are a proven way to reduce dependence on coal-fired electricity. Such efforts stimulate state and local economies both when the investments occur and when consumers spend their energy savings on other goods and services. Investments in renewable energy can also reduce what a state spends on coal and stimulate state and local economies, in both rural and urban areas. Every state has enough renewable resources to greatly expand their contribution to the electric grid.

State and federal policies promoting energy efficiency and renewable energy and capping carbon emissions are essential for protecting our health, the overall environment, and the global climate. These policies also bring about a net increase in jobs and other economic benefits for the country. States that are heavily dependent on coal imports will get the extra economic benefits that come from keeping more money circulating in their economies.



States can reap economic and environmental benefits by reducing their use of imported coal and investing in energy efficiency and local, renewable energy sources.

APPENDIX A

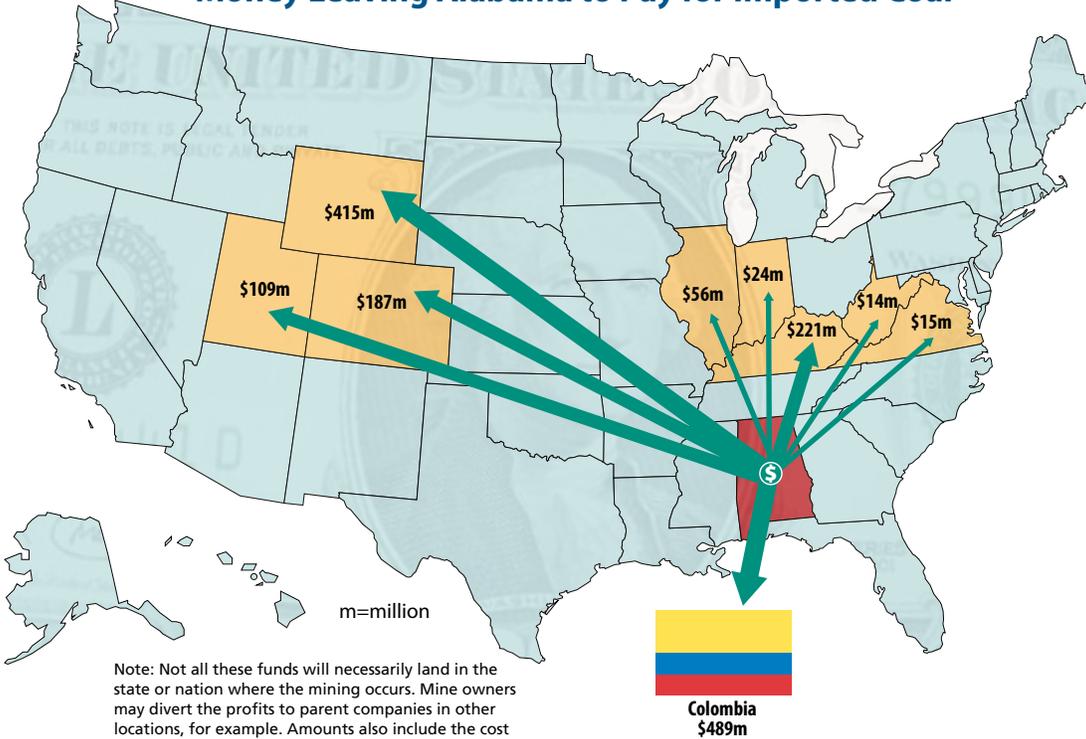
State Profiles

This appendix profiles 24 states that appear on one or more of our top-10 lists of the states most dependent on imported coal. Each profile shows how much the state's power producers spent on imported coal from various locations, how much power each state obtains from coal-fired power plants and other sources, and how that state can reduce its dependence on imported coal by investing in energy efficiency and renewable resources.

Alabama's Dependence on Imported Coal

In 2008, Alabama imported 79 percent of the coal it used. To pay for those imports, Alabama sent **\$1.53 billion** out of state, with the largest sums going to buy coal from Colombia and Wyoming. In-state mines not only supplied the rest of Alabama's coal but also exported coal worth \$141 million to other states. Alabama spent a net \$1.39 billion on imported coal.

Money Leaving Alabama to Pay for Imported Coal

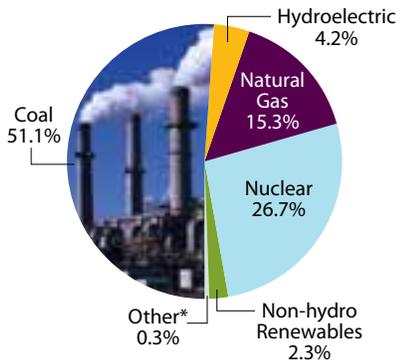


Note: Not all these funds will necessarily land in the state or nation where the mining occurs. Mine owners may divert the profits to parent companies in other locations, for example. Amounts also include the cost of transportation.

Compared with other states, Alabama:

- Spent the most on net imports per person: \$297
- Spent the most on net imports relative to gross state product: 0.82 percent
- Spent the most on international imports: \$489 million
- Spent the 6th most on net imports: \$1.39 billion
- Imported the 10th largest amount by net weight: 25.4 million tons

Alabama's Mix of Electricity Sources (2008)



Alabama relied on coal for more than half its in-state electricity generation, and imported 79 percent of that coal. The state produced 63 percent more electricity from all sources than retail customers bought. That suggests in-state coal plants may have exported some of their power.

* "Other" includes oil, municipal solid waste, tires, propane, or other manufactured and waste gases from fossil fuel.

Clean Energy Solutions Can Boost Alabama's Energy Independence

Investing in energy efficiency is one of the quickest and most affordable ways to replace coal-fired power while boosting the local economy. Yet Alabama spent just 49 cents per person on ratepayer-funded electricity efficiency programs in 2007—about 600 times less than it spent on imported coal.

Reducing the state's electricity use by 1 percent annually could save consumers \$50 million, and avoid the need to spend \$16.7 million on imported coal in the first year alone. Twenty-three states have adopted energy efficiency resource standards, most of which require utilities to achieve annual electricity savings of at least 1 percent (a target some states are already achieving). Leading states require annual cuts of 2 percent or more.

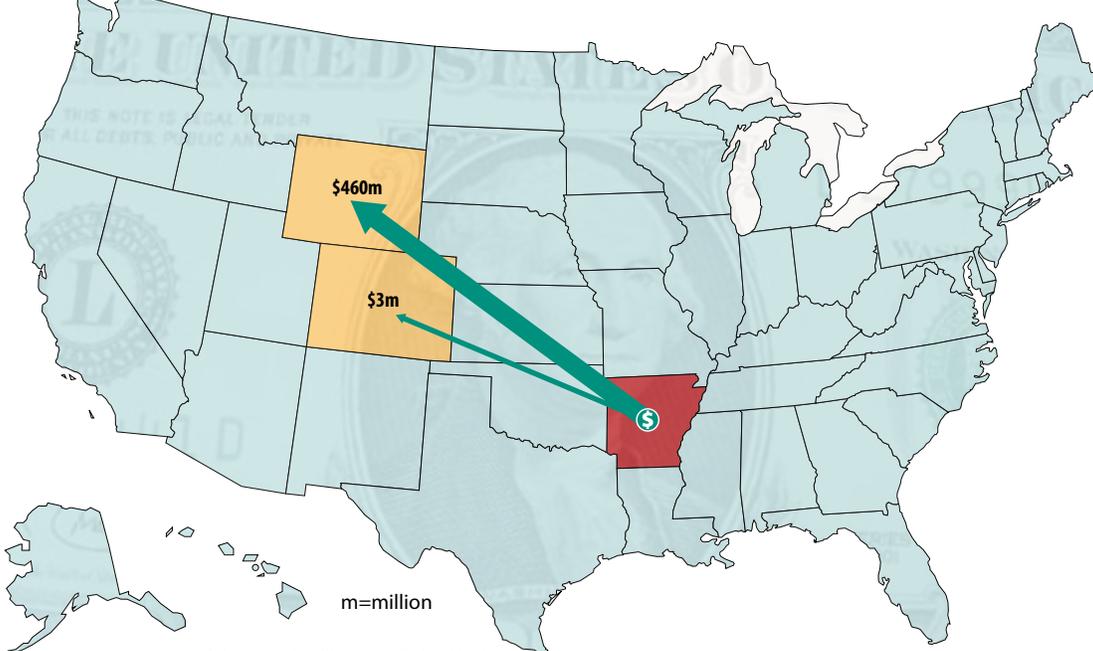
Alabama can also reduce its dependence on imported coal by tapping its own wealth of renewable energy resources, which could technically supply at least 56 percent of the state's 2008 power demand. Though economic and physical barriers may curb some of that potential, by-products from Alabama's forestry industry, and energy crops such as switchgrass, could be harvested in a sustainable manner for use in stand-alone power plants, or co-fired in plants that now burn only coal, replacing imported coal.

Alabama can also develop solar energy, small-scale hydropower, landfill gas, and geothermal—the latter co-produced at existing oil and gas wells. The state could spur deployment by adopting a renewable electricity standard, requiring utilities to gradually expand their use of renewable resources. Twenty-nine states and the District of Columbia have already adopted this effective and affordable policy.

Arkansas' Dependence on Imported Coal

Arkansas imported all the coal its power plants burned in 2008—with almost all the supplies coming from Wyoming. To pay for those imports, Arkansas sent **\$463 million** out of state.

Money Leaving Arkansas to Pay for Imported Coal

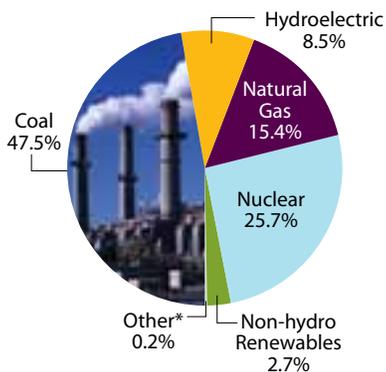


Note: Not all these funds will necessarily land in the state or nation where the mining occurs. Mine owners may divert the profits to parent companies in other locations, for example. Amounts also include the cost of transportation.

Compared with other states, Arkansas:

- Spent the 8th most on net imports relative to gross state product: 0.47 percent
- Spent the 11th most on net imports per person: \$162
- Is the 12th most dependent on net imports as a share of total power use: 50 percent

Arkansas' Mix of Electricity Sources (2008)



Despite having no in-state coal supplies, Arkansas relies on coal for nearly half the electricity it produces.

* "Other" includes oil, municipal solid waste, tires, propane, or other manufactured and waste gases from fossil fuel.

Clean Energy Solutions Can Boost Arkansas' Energy Independence

Investing in energy efficiency is one of the quickest and most affordable ways to replace coal-fired power while boosting the local economy. Yet Arkansas spent just 55 cents per person on ratepayer-funded electricity efficiency programs in 2007—nearly 300 times less than it spent on imported coal.

Reducing the state's electricity use by 1 percent annually could save consumers \$21 million, and avoid the need to spend as much as \$8 million to import coal in the first year alone. Twenty-three states have adopted energy efficiency resource standards, most of which require utilities to achieve annual electricity savings of at least 1 percent (a target some states are already achieving). Leading states require annual cuts of 2 percent or more.

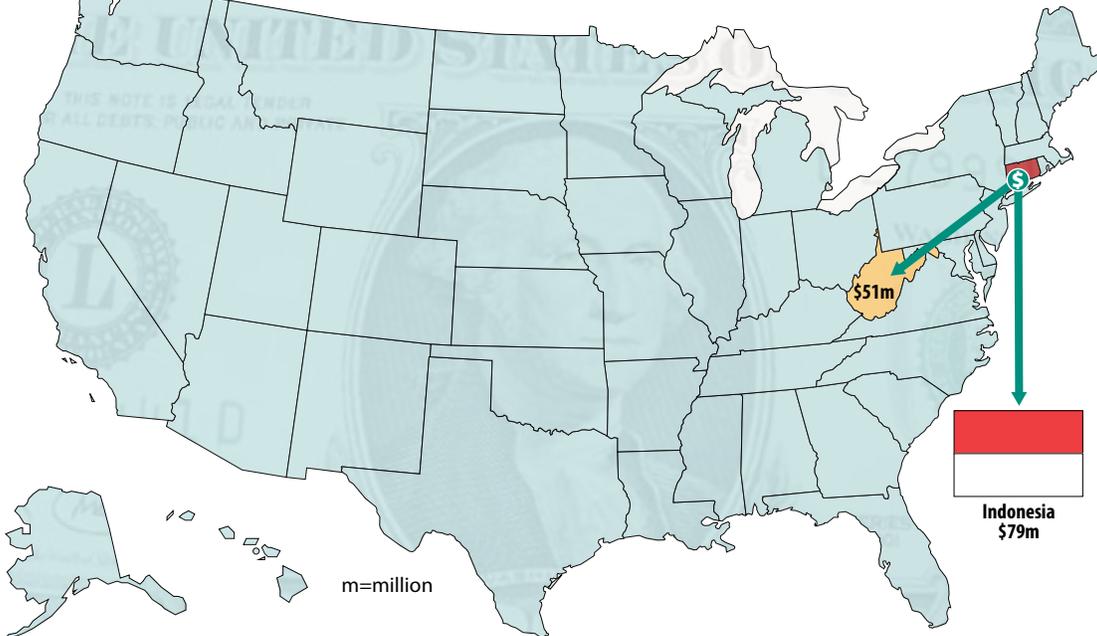
Arkansas can also reduce its dependence on imported coal by tapping its own wealth of renewable energy resources, which could technically supply at least 1.5 times the state's 2008 power demand. Though economic and physical barriers may curb some of that potential, by-products from Arkansas's forestry industry, and energy crops such as switchgrass, can be sustainably harvested for use in stand-alone power plants, or co-fired in plants that now burn only coal, replacing imported coal.

Arkansas also has excellent potential for developing wind power, solar power, small-scale hydropower, and geothermal co-produced from existing oil and gas drilling locations. The state could spur deployment by adopting a renewable electricity standard, requiring utilities to gradually expand their use of renewable resources. Twenty-nine states and the District of Columbia have already adopted this effective and affordable policy.

Connecticut's Dependence on Imported Coal

Connecticut imported all the coal its power plants burned in 2008—much of it from Indonesia. To pay for those imports, Connecticut sent **\$130 million** out of state.

Money Leaving Connecticut to Pay for Imported Coal

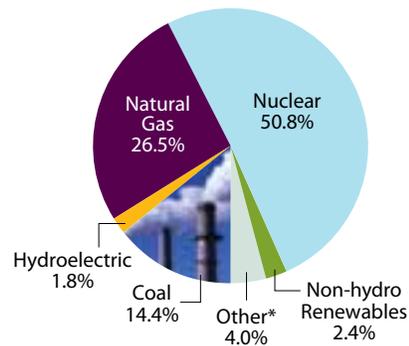


Compared with other states, Connecticut:

- Spent the 9th most on international imports: \$79 million

Note: Not all these funds will necessarily land in the state or nation where the mining occurs. Mine owners may divert the profits to parent companies in other locations, for example. Amounts also include the cost of transportation.

Connecticut's Mix of Electricity Sources (2008)



Connecticut relies on coal for just 14 percent of its in-state power generation—among the lowest percentages of our profiled states. However, Connecticut produces no coal, and more than half of its imports come from Indonesia.

* "Other" includes oil, municipal solid waste, tires, propane, or other manufactured and waste gases from fossil fuel.

How Connecticut Is Boosting Energy Independence with Clean Energy Solutions

Investing in energy efficiency is one of the quickest and most affordable ways to replace coal-fired power while boosting the local economy. Connecticut spent more than \$27 per person on ratepayer-funded electricity efficiency programs in 2007. That is one of the highest investments in the nation—but still less than the \$37 the state spent per person on imported coal.

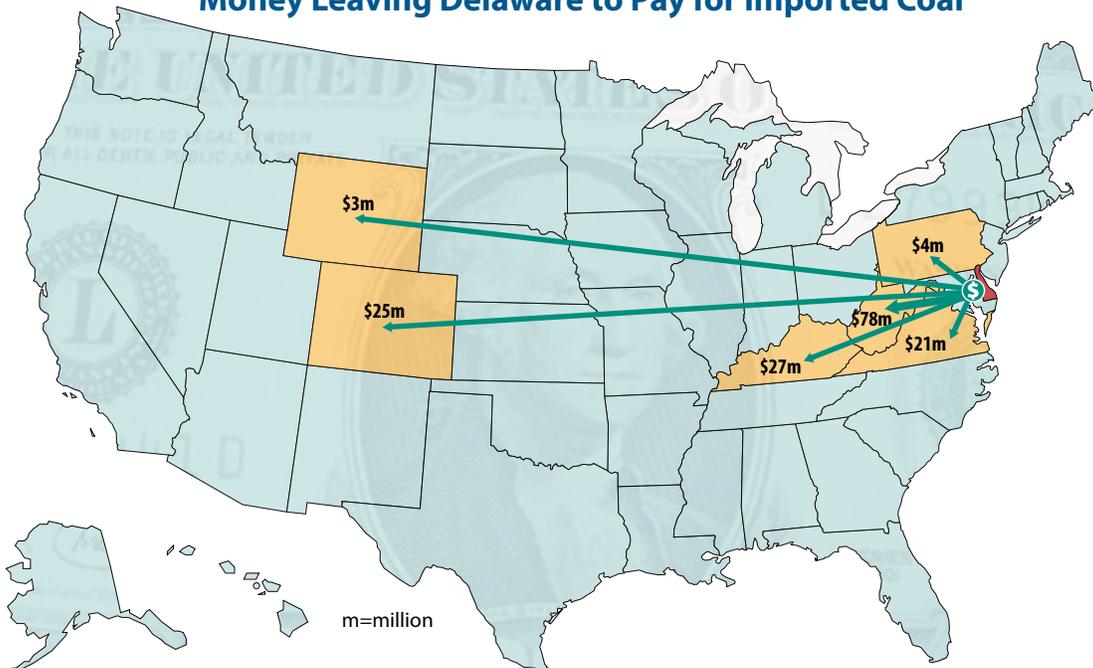
Connecticut cut electricity use 1.1 percent in 2007, and utilities must reduce demand 4 percent by the end of 2010. Twenty-two other states have adopted such energy efficiency resource standards, with several committing to annual savings of 2 percent or more.

Connecticut is also poised to reduce its dependence on imported coal by tapping its own wealth of renewable energy resources. The state could technically produce 37 percent of its 2008 electricity needs from in-state, land-based renewable energy, including solar, bioenergy, and small-scale hydropower. New England also has significant offshore wind resources, which could supply more than 24 times the region's power needs. Though economic and physical barriers may curb some of that potential, Connecticut has made a strong commitment to developing renewable energy. Utilities must rely on renewable resources to supply at least 23 percent of in-state power demand by 2020. Twenty-eight other states and the District of Columbia have adopted such renewable electricity standards.

Delaware's Dependence on Imported Coal

Delaware imported all the coal its power plants burned in 2008—some from as far away as Colorado and Wyoming. To pay for those imports, Delaware sent more than **\$161 million** out of state.

Money Leaving Delaware to Pay for Imported Coal

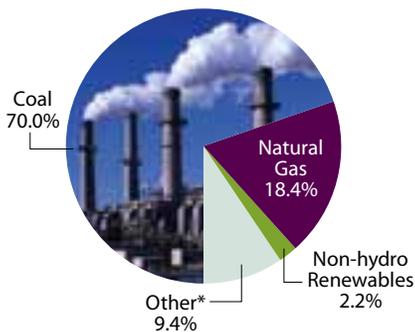


Note: Not all these funds will necessarily land in the state or nation where the mining occurs. Mine owners may divert the profits to parent companies in other locations, for example. Amounts also include the cost of transportation. In addition, the origin of coal imports worth \$3 million was not reported to the Energy Information Administration.

Compared with other states, Delaware:

- Is the 4th most dependent on net imports as a share of total electricity use: 69 percent
- Spent the 8th most on net imports per person: \$183

Delaware's Mix of Electricity Sources (2008)



Delaware relies on coal to produce 70 percent of its in-state power generation, despite the fact that it mines no coal. Delaware's retail electricity sales exceed in-state power generation by 56 percent. That means the state imports significant amounts of electricity—some of which is likely based on coal.

* "Other" includes oil, municipal solid waste, tires, propane, or other manufactured and waste gases from fossil fuel.

How Delaware Is Boosting Energy Independence with Clean Energy Solutions

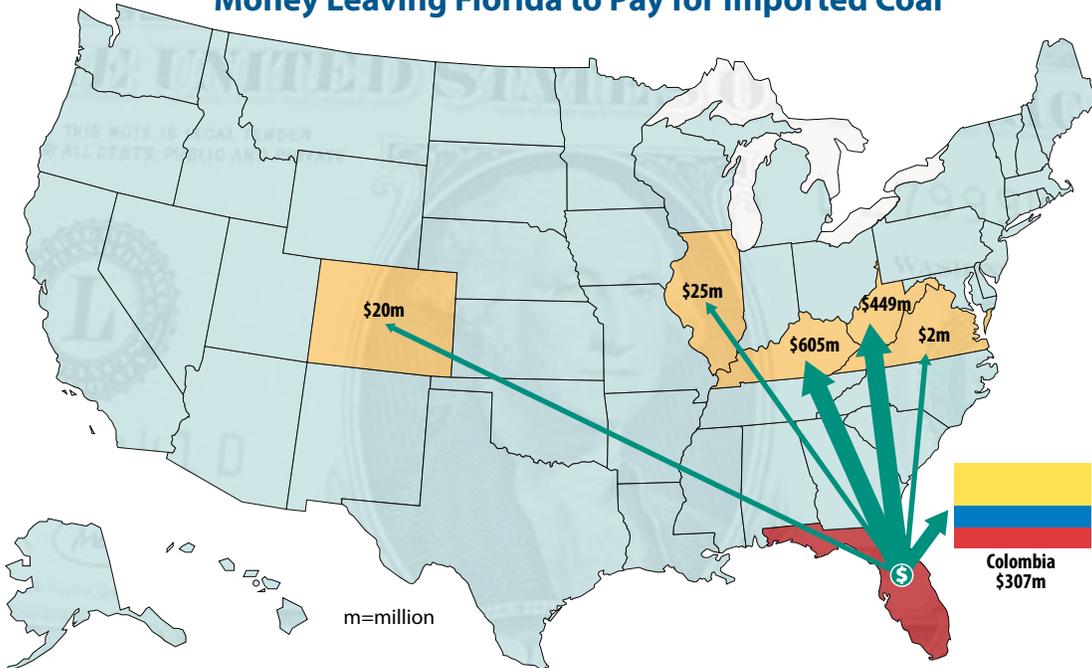
Investing in energy efficiency is one of the quickest and most affordable ways to replace coal-fired power while boosting the local economy. Yet Delaware spent just 24 cents per person on ratepayer-funded electricity efficiency programs in 2007—about 750 times less than it spent on imported coal. Fortunately, the state adopted one of the strongest energy efficiency resource standards in the country in 2009. Utilities must cut electricity use by an annual average of 2.5 percent from 2010 to 2015. Twenty-two other states have adopted such power-saving targets, with several committing to annual cuts of 2 percent or more.

Delaware is also poised to reduce its dependence on imported coal by tapping its own wealth of renewable energy resources. The state has the technical potential to generate 43 percent of its 2008 electricity needs from in-state, land-based renewable energy, including solar and bioenergy. Mid-Atlantic states also have significant offshore wind resources, which could supply 4.4 times the region's power needs. Though economic and physical barriers will curb some of that potential, Delaware has made a strong commitment to deploying renewable energy. Utilities must rely on renewable resources to supply 20 percent of the state's power by 2019. Twenty-eight other states and the District of Columbia have adopted such renewable electricity standards.

Florida's Dependence on Imported Coal

Florida imported all the coal its power plants burned in 2008—from as far away as Colorado and Colombia. To pay for those imports, Florida sent more than **\$1.56 billion** out of state.

Money Leaving Florida to Pay for Imported Coal

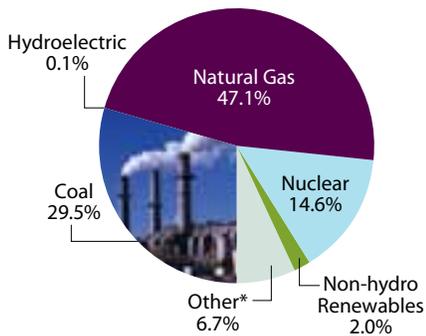


Compared with other states, Florida:

- Spent the 2nd most on international imports: \$307 million
- Spent the 4th most on total net imports: \$1.56 billion
- Imported the 13th most in net weight: 22.3 million tons

Note: Not all these funds will necessarily land in the state or nation where the mining occurs. Mine owners may divert the profits to parent companies in other locations, for example. Amounts also include the cost of transportation. In addition, the origin of coal imports worth \$156 million was not reported to the Energy Information Administration.

Florida's Mix of Electricity Sources (2008)



Despite having no in-state coal supplies, Florida relies on coal for nearly 30 percent of its in-state electricity generation.

* "Other" includes oil, municipal solid waste, tires, propane, or other manufactured and waste gases from fossil fuel.

Clean Energy Solutions Can Boost Florida's Energy Independence

Investing in energy efficiency is one of the quickest and most affordable ways to replace coal-fired power while boosting the local economy. Florida spent \$5.07 per person on ratepayer-funded electricity efficiency programs in 2007, achieving incremental cuts in power demand of 0.15 percent. That investment is about 17 times less than the state spent on imported coal.

The state has recently adopted a modest energy efficiency resource standard. Utilities must cut electricity demand by 3.5 percent over 10 years. Twenty-two other states have adopted such energy efficiency resource standards, most of which require utilities to achieve annual electricity savings of at least 1 percent (a target some states are already achieving). Leading states require annual cuts of 2 percent or more.

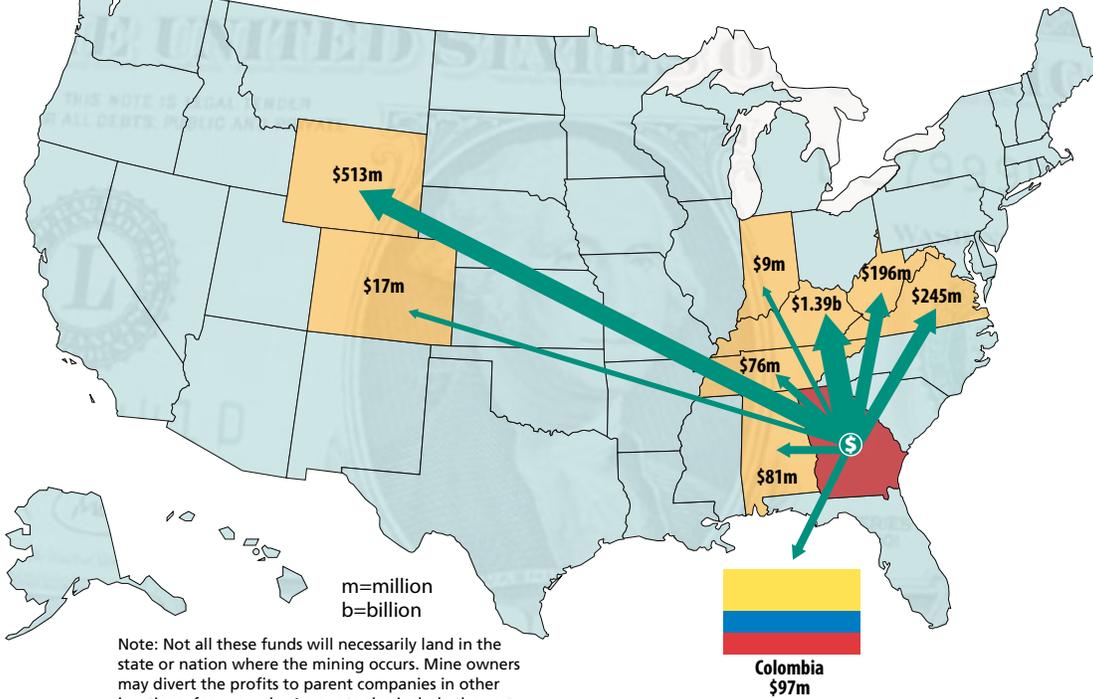
Florida can also reduce its dependence on imported coal by tapping its own wealth of renewable energy resources, which could technically supply at least 41 percent of the state's 2008 power demand. Though economic and physical barriers may curb some of that potential, by-products from Florida's forestry industry, and energy crops such as switchgrass, can be sustainably harvested for use in stand-alone power plants, or co-fired in plants that now burn coal, replacing imported coal.

Florida also has strong potential for developing solar power and offshore wind power. The state could spur deployment by adopting a renewable electricity standard, requiring utilities to gradually expand their use of renewable resources. Twenty-nine states and the District of Columbia have already adopted this effective and affordable policy.

Georgia's Dependence on Imported Coal

Georgia imported all the coal it used in 2008—some from as far away as Wyoming and South America. To pay for those imports, Georgia sent more than **\$2.6 billion** out of state—more than any other state.

Money Leaving Georgia to Pay for Imported Coal

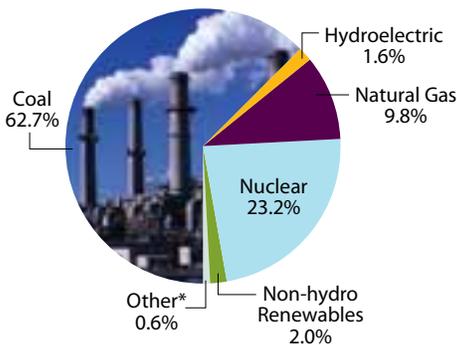


Note: Not all these funds will necessarily land in the state or nation where the mining occurs. Mine owners may divert the profits to parent companies in other locations, for example. Amounts also include the cost of transportation.

Compared with other states, Georgia:

- Spent the most on total net imports: \$2.62 billion
- Spent the 2nd most on net imports per person: \$270
- Spent the 3rd most on net imports relative to gross state product: 0.66 percent
- Imported the 3rd most in net weight: 39.4 million tons
- Spent the 5th most on international imports: \$97 million
- Is the 7th most dependent on net imports as a share of total power use: 65 percent

Georgia's Mix of Electricity Sources (2008)



Despite having no in-state coal supplies, Georgia relies on coal for more than 60 percent of its in-state electricity generation.

* "Other" includes oil, municipal solid waste, tires, propane, or other manufactured and waste gases from fossil fuel.

Clean Energy Solutions Can Boost Georgia's Energy Independence

Investing in energy efficiency is one of the quickest and most affordable ways to replace coal-fired power while boosting the local economy. Yet Georgia spent just 50 cents per person on ratepayer-funded electricity efficiency programs in 2007—about 540 times less than it spent on imported coal.

Reducing the state's electricity use by 1 percent annually could save consumers \$79 million, and avoid the need to send \$41 million out of state in the first year alone. Twenty-three states have adopted energy efficiency resource standards, most of which require utilities to achieve annual electricity savings of at least 1 percent (a target some states are already achieving). Leading states require annual cuts of 2 percent or more.

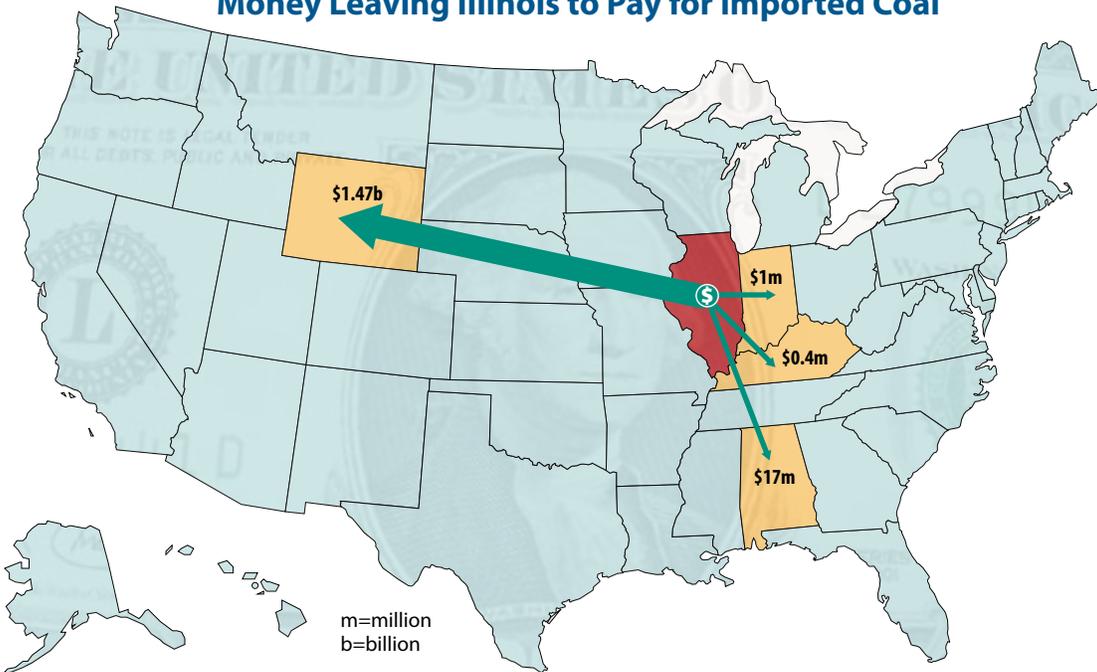
Georgia can also reduce its dependence on imported coal by tapping its own wealth of renewable energy resources, which could technically supply at least 84 percent of the state's 2008 power demand. Though economic and physical barriers may curb some of that potential, by-products from Georgia's forestry industry can be harvested in a sustainable manner for use in stand-alone power plants, or co-fired in plants that now burn only coal, replacing imported coal.

Georgia also has strong potential for developing solar power, small-scale hydropower, and offshore wind power. The state could spur deployment by adopting a renewable electricity standard, requiring utilities to gradually expand their use of renewable resources. Twenty-nine states and the District of Columbia have already adopted this effective and affordable policy.

Illinois' Dependence on Imported Coal

Illinois imported 94 percent of the coal burned in its power plants in 2008. To pay for that coal, it sent **\$1.49 billion** out of state—primarily to Wyoming. In-state mines supplied the rest of Illinois' coal and also exported coal worth \$806 million to other states. The state spent a net \$683 million on imported coal.

Money Leaving Illinois to Pay for Imported Coal

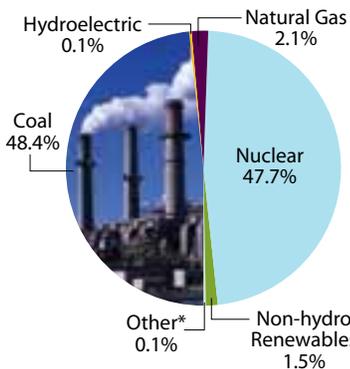


Compared with other states, Illinois:

- Imported the 4th most in net weight: 37.2 million tons
- Spent the 14th most on total net imports: \$683 million

Note: Not all these funds will necessarily land in the state or nation where the mining occurs. Mine owners may divert the profits to parent companies in other locations, for example. Amounts also include the cost of transportation.

Illinois' Mix of Electricity Sources (2008)



Illinois relied on coal for nearly half the electricity produced in the state in 2008, and imported more than 90 percent of that coal. The state generated 38 percent more electricity than the state's retail customers bought. That suggests in-state coal plants may have exported some of their power.

* "Other" includes oil, municipal solid waste, tires, propane, or other manufactured and waste gases from fossil fuel.

How Illinois Is Boosting Energy Independence with Clean Energy Solutions

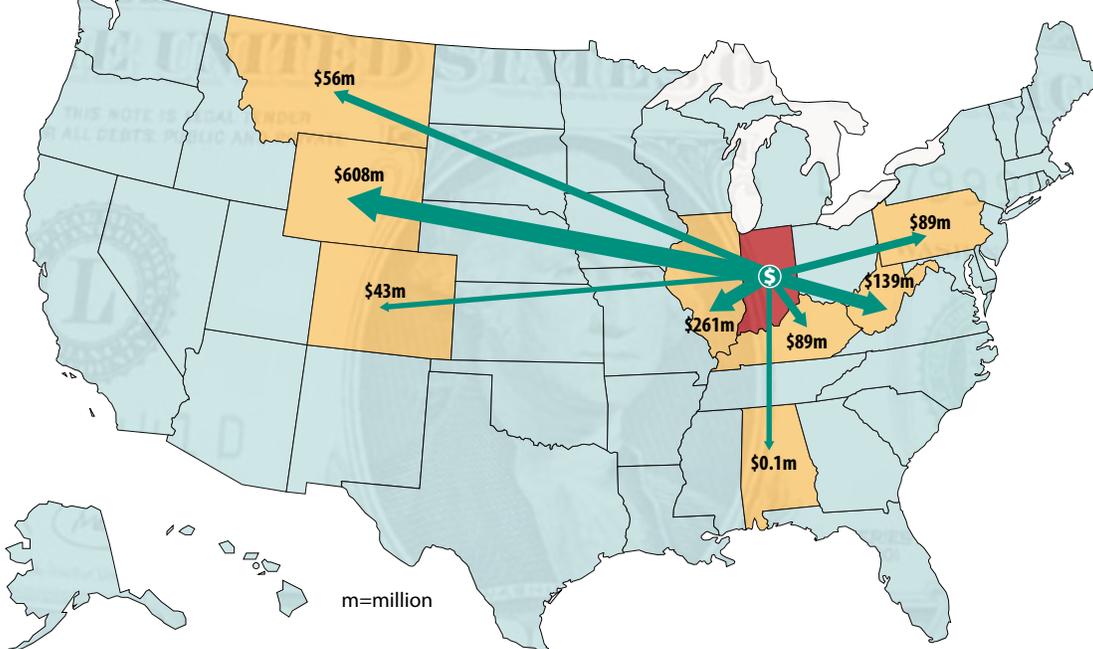
Investing in energy efficiency is one of the quickest and most affordable ways to replace coal-fired power while boosting the local economy. Yet Illinois spent just six cents per person on ratepayer-funded electricity efficiency programs in 2007—nearly 900 times less than it spent on imported coal. Fortunately, the state has recently adopted a strong energy efficiency resource standard. Utilities must achieve annual cuts in electricity demand that ramp up to 2 percent by 2015. Twenty-two other states have adopted such power-saving targets, with several committing to annual savings of 2 percent or more.

Illinois is also poised to reduce its dependence on imported coal by tapping its own wealth of renewable energy resources. The state has the technical potential to generate more than five times its 2008 electricity needs from renewable energy, led primarily by wind and bioenergy. Though economic and physical barriers will curb some of that potential, Illinois has made one of the nation's strongest commitments to renewable energy. Utilities must rely on those resources to supply 25 percent of the state's power by 2025. Twenty-eight other states and the District of Columbia have adopted such renewable electricity standards.

Indiana's Dependence on Imported Coal

Indiana imported a little more than half the coal it used in 2008—some from as far away as Montana and Wyoming. To pay for that coal, Indiana sent **\$1.29 billion** out of state. In-state mines not only supplied the rest of Indiana's coal but also exported coal worth \$151 million to other states. Indiana spent a net \$1.14 billion on imported coal.

Money Leaving Indiana to Pay for Imported Coal

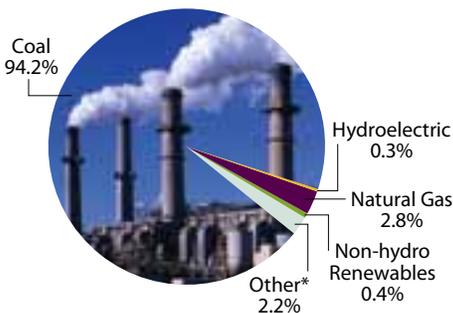


Note: Not all these funds will necessarily land in the state or nation where the mining occurs. Mine owners may divert the profits to parent companies in other locations, for example. Amounts also include the cost of transportation.

Compared with other states, Indiana:

- Imported the 8th most in net weight: 27.7 million tons
- Spent the 9th most on total net imports: \$1.14 billion
- Spent the 9th most on net imports per person: \$178
- Spent the 9th most on net imports relative to gross state product: 0.45 percent

Indiana's Mix of Electricity Sources (2008)



Indiana relies on coal for more than 94 percent of its in-state electricity generation—more than any other state we profiled. Indiana produces 21 percent more electricity than its retail customers buy. That means in-state coal plants export some of their power.

* "Other" includes oil, municipal solid waste, tires, propane, or other manufactured and waste gases from fossil fuel.

Clean Energy Solutions Can Boost Indiana's Energy Independence

Investing in energy efficiency is one of the quickest and most affordable ways to replace coal-fired power while boosting the local economy. Yet Indiana spent just 64 cents per person on ratepayer-funded electricity efficiency programs in 2007—about 280 times less than it spent per person on net coal imports.

Fortunately, the state has recently adopted an energy efficiency resource standard. Utilities must achieve annual cuts in electricity demand that start at 0.3 percent in 2010 and ramp up to 2 percent by 2019. Twenty-two other states have adopted such power-saving targets, with several committing to annual savings of 2 percent or more.

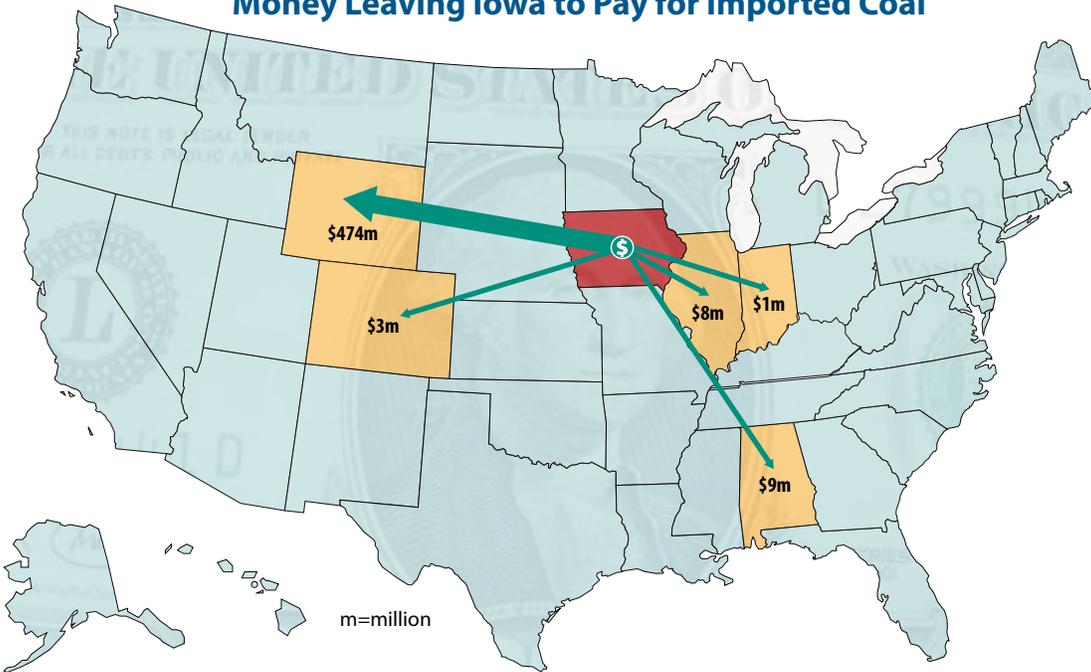
Indiana can also reduce its dependence on imported coal by tapping its own wealth of renewable energy resources. The state has the technical potential to generate four times its 2008 electricity needs from renewable energy—primarily from its robust wind and bioenergy resources. Though economic and physical barriers will curb some of that potential, Indiana has already made progress in using renewables.

Indiana brought more than 900 megawatts of energy online in 2009—posting one of the fastest growth rates in the nation. The state could reduce its reliance on imported coal even more by adopting a renewable electricity standard, which requires utilities to gradually increase their use of renewable resources. Twenty-nine states and the District of Columbia have adopted this effective and affordable policy.

Iowa's Dependence on Imported Coal

Iowa imported all the coal its power plants burned in 2008. To pay for that coal, Iowa sent **\$496 million** out of state—primarily to Wyoming.

Money Leaving Iowa to Pay for Imported Coal

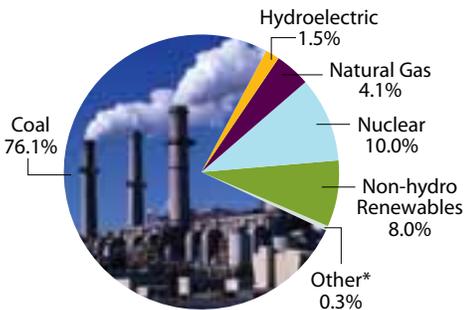


Compared with other states, Iowa:

- Is the 2nd most dependent on net imports as a share of total power use: 78 percent
- Spent the 10th most on net imports per person: \$166
- Spent the 11th most on net imports relative to gross state product: 0.37 percent
- Imported the 11th most in net weight: 25.3 million tons

Note: Not all these funds will necessarily land in the state or nation where the mining occurs. Mine owners may divert the profits to parent companies in other locations, for example. Amounts also include the cost of transportation.

Iowa's Mix of Electricity Sources (2008)



Iowa relies on coal for three-quarters of its in-state electricity generation, despite having to import all the coal it uses.

* "Other" includes oil, municipal solid waste, tires, propane, or other manufactured and waste gases from fossil fuel.

How Iowa Is Boosting Energy Independence with Clean Energy Solutions

Investing in energy efficiency is one of the quickest and most affordable ways to replace coal-fired power while boosting the local economy. Iowa spent nearly \$19 per person on ratepayer-funded energy efficiency programs in 2007, cutting electricity use by 0.7 percent. That is one of the highest investments in the nation, but still nearly nine times less than the state spent per person on imported coal.

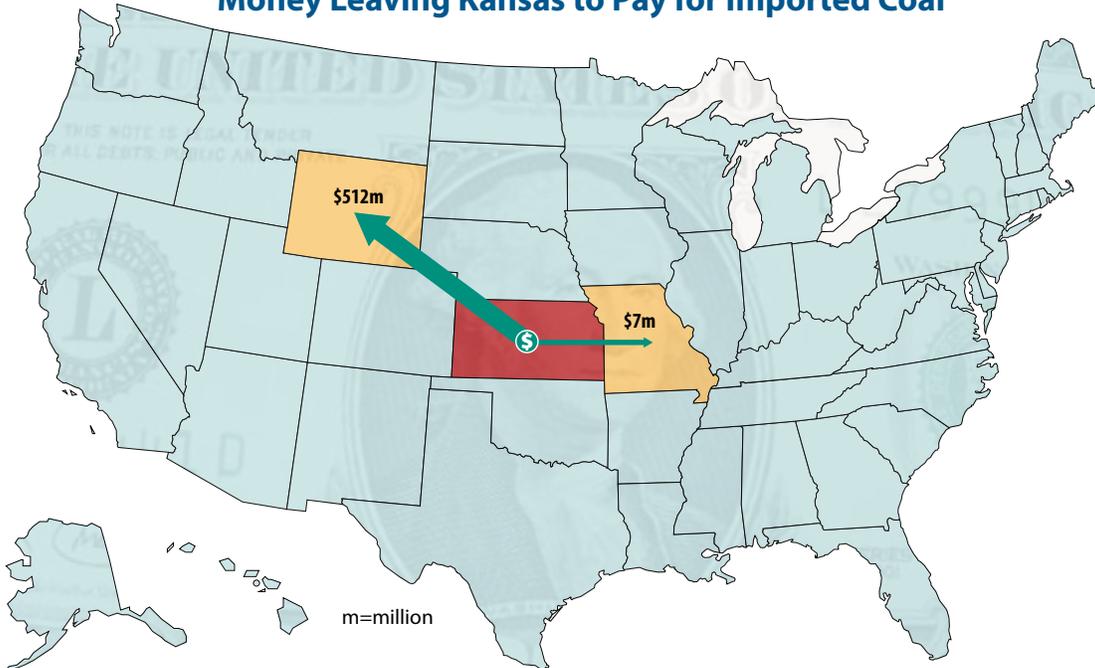
In 2008, Iowa required utilities to submit plans to curb power demand by 1.5 percent annually. Twenty-two other states have adopted such power-saving targets, with several committing to annual savings of 2 percent or more.

Iowa is also poised to reduce its dependence on imported coal by tapping its own wealth of renewable energy resources. The state has the technical potential to generate nearly 39 times its 2008 electricity needs from renewable energy, primarily from wind and bioenergy. Though economic and physical barriers will curb some of that potential, Iowa is already a national leader in deploying wind power, with more than 3,600 megawatts of installed capacity. That helps Iowa and other midwestern states meet their renewable electricity standards, which require utilities to gradually increase their use of renewable resources. Twenty-nine states and the District of Columbia have already adopted this proven policy.

Kansas's Dependence on Imported Coal

Kansas imported more than 99 percent of the coal its power plants burned in 2008—mainly from Wyoming. To pay for that coal, Kansas sent **\$518 million** out of state. In-state mines not only supplied the rest of Kansas's coal, but also exported coal worth \$2 million to other states. Kansas spent a net \$516 million on imported coal.

Money Leaving Kansas to Pay for Imported Coal

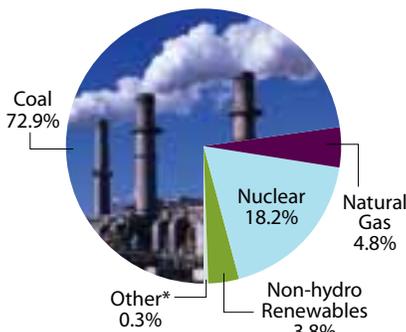


Note: Not all these funds will necessarily land in the state or nation where the mining occurs. Mine owners may divert the profits to parent companies in other locations, for example. Amounts also include the cost of transportation.

Compared with other states, Kansas:

- Is the 3rd most dependent on net imports as a share of total power use: 73 percent
- Spent the 7th most on net imports per person: \$185
- Spent the 10th most on net imports relative to gross state product: 0.42 percent

Kansas's Mix of Electricity Sources (2008)



Kansas relies on coal to produce 73 percent of its electricity, and imports virtually all the coal it uses.

* "Other" includes oil, municipal solid waste, tires, propane, or other manufactured and waste gases from fossil fuel.

Clean Energy Solutions Can Boost Kansas's Energy Independence

Investing in energy efficiency is one of the quickest and most affordable ways to replace coal-fired power while boosting the local economy. Yet Kansas spent just \$2.44 per person on ratepayer-funded electricity efficiency programs in 2007—about 75 times less than it spent per capita on net coal imports.

Reducing the state's electricity use by 1 percent annually could save consumers nearly \$18 million, and avoid the need to send as much as \$6 million out of state in the first year alone. Twenty-three states have adopted energy efficiency resource standards, most of which require utilities to achieve annual electricity savings of at least 1 percent (a target some states are already achieving). Leading states require annual cuts of 2 percent or more.

Fortunately, Kansas is beginning to tap its wealth of renewable energy resources to reduce dependence on imported coal. The state has the technical potential to generate nearly 79 times its 2008 electricity needs from renewable energy, led primarily by wind and bioenergy, though economic and physical barriers will curb some of that potential. Kansas utilities must rely on renewable resources to supply at least 20 percent of peak power demand by 2020. Twenty-eight other states and the District of Columbia have adopted such renewable electricity standards.

Massachusetts' Dependence on Imported Coal

Massachusetts imported all the coal its power plants burned in 2008—primarily from Colombia. To pay for that coal, Massachusetts sent **\$252 million** out of state.

Money Leaving Massachusetts to Pay for Imported Coal

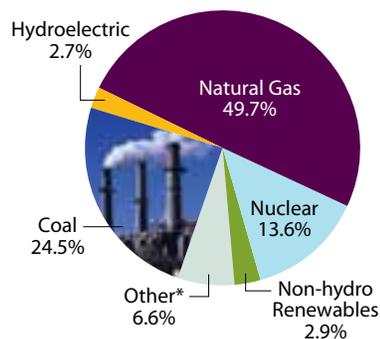


Compared with other states, Massachusetts:

- Spent the 3rd most on international imports: \$206 million

Note: Not all these funds will necessarily land in the state or nation where the mining occurs. Mine owners may divert the profits to parent companies in other locations, for example. Amounts also include the cost of transportation. In addition, the origin of coal imports worth \$3 million was not reported to the Energy Information Administration.

Massachusetts' Mix of Electricity Sources (2008)



Despite having no in-state coal supplies, Massachusetts relies on coal for one-quarter of its in-state electricity generation. Retail sales of electricity exceed the amount of power produced in Massachusetts by 24 percent. That means the state imports significant amounts of electricity—some likely produced from coal.

* "Other" includes oil, municipal solid waste, tires, propane, or other manufactured and waste gases from fossil fuel.

How Massachusetts Is Boosting Energy Independence with Clean Energy Solutions

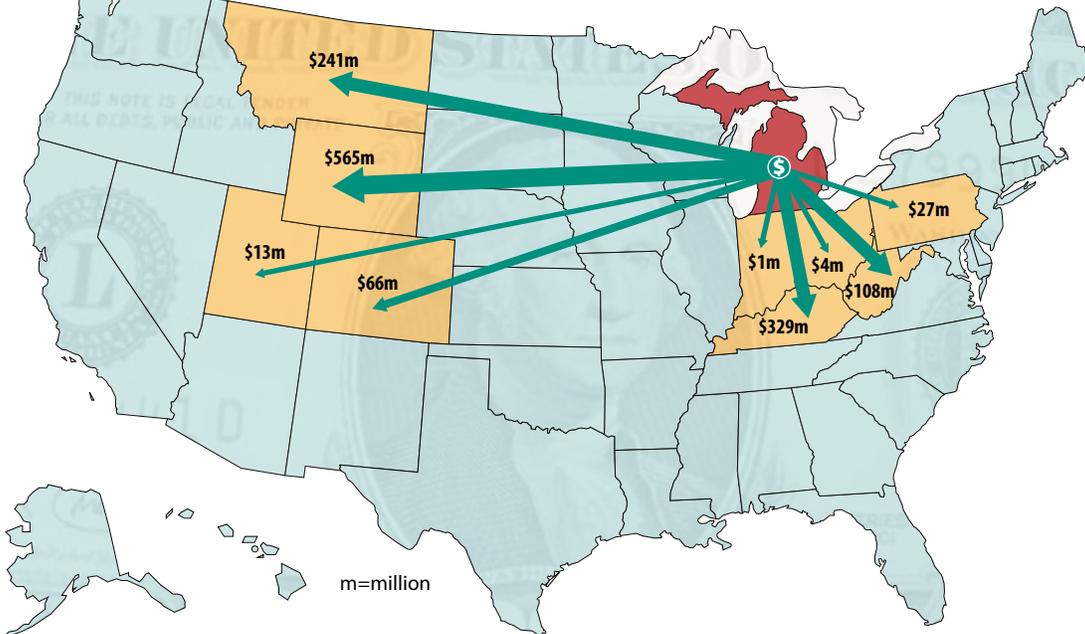
Through strong leadership, Massachusetts is showing how local, clean energy solutions can significantly reduce dependence on imported coal. Investing in energy efficiency is one of the quickest and most affordable ways of replacing coal-fired power while boosting the local economy. Massachusetts spent \$120 million on ratepayer-funded electricity efficiency programs in 2007, cutting power demand by 0.86 percent. Beginning in 2012, the state will require utilities to use efficiency measures to reduce electricity use by 2.4 percent each year. Twenty-two other states have adopted similar requirements, but Massachusetts has one of the nation's most aggressive targets.

Massachusetts is also poised to reduce dependence on imported coal by tapping its wealth of renewable energy resources. The state has the technical potential to generate 90 percent of its 2008 electricity needs from in-state renewable energy, led primarily by wind (land-based and offshore), solar, and bioenergy. Though economic and physical barriers will curb some of that potential, Massachusetts has made a significant commitment to deploying renewable energy. Utilities must rely on renewable resources to supply at least 20 percent of the state's power needs by 2025. Twenty-eight other states and the District of Columbia have adopted such renewable electricity standards.

Michigan's Dependence on Imported Coal

Michigan imported all the coal its power plants burned in 2008—mainly from Wyoming, Kentucky, and Montana. To pay for those imports, Michigan sent **\$1.36 billion** out of state.

Money Leaving Michigan to Pay for Imported Coal

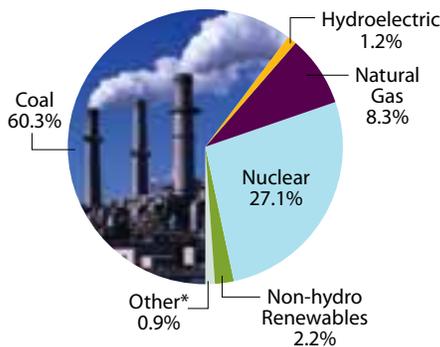


Compared with other states, Michigan:

- Imported the 5th most in net weight: 36 million tons
- Spent the 7th most on net imports: \$1.36 billion
- Is the 9th most dependent on net imports as a share of total power use: 60 percent

Note: Not all these funds will necessarily land in the state or nation where the mining occurs. Mine owners may divert the profits to parent companies in other locations, for example. Amounts also include the cost of transportation.

Michigan's Mix of Electricity Sources (2008)



Despite having no in-state coal supplies, Michigan relies on coal for more than 60 percent of its in-state electricity generation.

* "Other" includes oil, municipal solid waste, tires, propane, or other manufactured and waste gases from fossil fuel.

Clean Energy Solutions Can Boost Michigan's Energy Independence

Investing in energy efficiency is one of the quickest and most affordable ways to replace coal-fired power while boosting the local economy. Yet Michigan was one of only six states with no ratepayer-funded energy efficiency program in 2007. Fortunately, the state took an initial step in 2008 to exploit its efficiency potential by requiring utilities to reduce annual electricity use, ramping up to an annual savings of 1 percent by 2012. Twenty-two other states have adopted such power-saving targets, with several committing to annual savings of 2 percent or more.

Michigan is also on a path to reduce its dependence on imported coal by tapping its own wealth of renewable energy resources. The state has the technical potential to produce nearly twice its 2008 electricity needs from renewable energy, led primarily by wind and bioenergy, though economic and physical barriers will curb some of that potential. Michigan utilities must rely on renewable resources to produce at least 10 percent of the state's power needs by 2015. Twenty-eight other states and the District of Columbia have adopted such renewable electricity standards, with 17 states setting targets of 20 percent or more.

Mississippi's Dependence on Imported Coal

Mississippi imported nearly three-quarters of the coal its power plants burned in 2008—some from as far away as Colombia and Wyoming. To pay for those imports, Mississippi sent **\$457 million** out of state.

Money Leaving Mississippi to Pay for Imported Coal

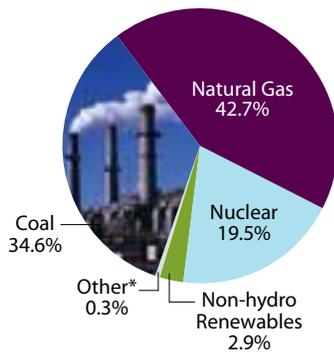


Note: Not all these funds will necessarily land in the state or nation where the mining occurs. Mine owners may divert the profits to parent companies in other locations, for example. Amounts also include the cost of transportation.

Compared with other states, Mississippi:

- Spent the 4th most on international imports: \$145 million
- Spent the 5th most on net imports relative to gross state product: 0.50 percent
- Spent the 12th most on net imports per person: \$155

Mississippi's Mix of Electricity Sources (2008)



Mississippi relies on coal for more than a third of its in-state electricity generation, and imports more than 70 percent of that coal.

* "Other" includes oil, municipal solid waste, tires, propane, or other manufactured and waste gases from fossil fuel.

Clean Energy Solutions Can Boost Mississippi's Energy Independence

Investing in energy efficiency is one of the quickest and most affordable ways to replace coal-fired power while creating local jobs. Yet Mississippi spent just 11 cents per person on ratepayer-funded electricity efficiency programs in 2007—about 1,400 times less than the amount it spent per person on imported coal.

Reducing the state's electricity use by 1 percent annually could save consumers \$18 million, and avoid the need to send as much as \$13 million out of state in the first year alone. Twenty-three states have adopted energy efficiency resource standards, most of which require utilities to achieve annual electricity savings of at least 1 percent (which some states are already achieving). Leading states require annual cuts of 2 percent or more.

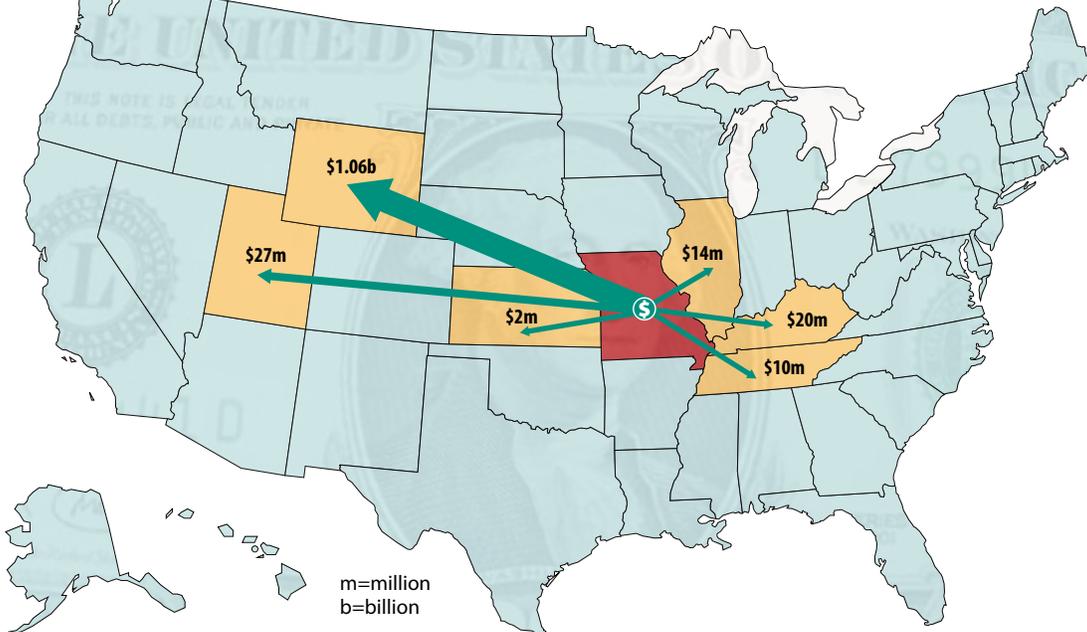
Mississippi can also reduce its dependence on imported coal by tapping its own wealth of renewable energy resources, which could technically supply more than 90 percent of the state's 2008 power demand. Though economic and physical barriers may curb some of that potential, by-products from Mississippi's forestry industry, and energy crops such as switchgrass, can be harvested in a sustainable manner for use in stand-alone power facilities, or co-fired in power plants that now burn only coal, replacing imported coal.

Mississippi could also develop solar energy, small-scale hydropower, and geothermal energy co-produced from existing oil and gas drilling locations. The state could spur deployment by adopting a renewable electricity standard, requiring utilities to gradually expand their use of renewable resources. Twenty-nine states and the District of Columbia have already adopted this effective and affordable policy.

Missouri's Dependence on Imported Coal

Missouri imported more than 99 percent of the coal its power plants burned in 2008—mainly from Wyoming. In-state mines supplied the remaining small fraction, and also exported coal worth \$7 million to other states. To pay for its coal, Missouri sent a net **\$1.13 billion** out of state.

Money Leaving Missouri to Pay for Imported Coal

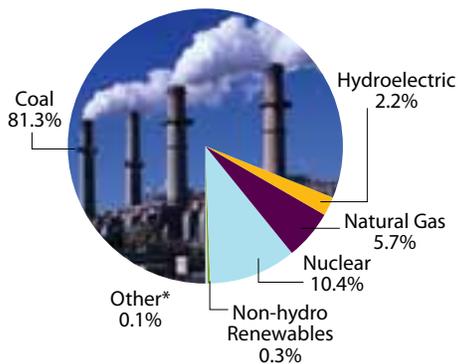


Note: Not all these funds will necessarily land in the state or nation where the mining occurs. Mine owners may divert the profits to parent companies in other locations, for example. Amounts also include the cost of transportation.

Compared with other states, Missouri:

- Is the most dependent on net imports as a share of total power use: 82 percent
- Imported the 2nd largest amount in total net weight: 43.8 million tons
- Spent the 6th most on net imports per person: \$190
- Spent the 7th most on net imports relative to gross state product: 0.48 percent
- Spent the 10th most on net imports: \$1.13 billion

Missouri's Mix of Electricity Sources (2008)



Missouri relies on coal for more than 80 percent of its in-state electricity generation, and imports more than 99 percent of that coal.

* "Other" includes oil, municipal solid waste, tires, propane, or other manufactured and waste gases from fossil fuel.

Clean Energy Solutions Can Boost Missouri's Energy Independence

Investing in energy efficiency is one of the quickest and most affordable ways to replace coal-fired power while boosting the local economy. Yet Missouri spent just 22 cents per person on ratepayer-funded electricity efficiency programs in 2007—850 times less than the amount it spent on imported coal.

Reducing the state's electricity use by 1 percent annually could save consumers \$30 million, and avoid the need to send as much as \$13 million out of state in the first year alone. Twenty-three states have adopted energy efficiency resource standards, most of which require utilities to achieve annual electricity savings of at least 1 percent (a target some states are already achieving). Leading states require annual cuts of 2 percent or more.

Fortunately, Missouri is beginning to reduce its dependence on imported coal by tapping its wealth of renewable energy resources. The state has the technical potential to generate nearly nine times its 2008 electricity needs from renewable energy, led primarily by wind and bioenergy, though economic and physical barriers will curb some of that potential. Missouri utilities must rely on renewable resources to produce at least 15 percent of the state's power needs by 2021. Twenty-eight other states and the District of Columbia have adopted such renewable electricity standards, with 17 states setting targets of 20 percent or more.

Nebraska's Dependence on Imported Coal

Nebraska imported all the coal its power plants burned in 2008 from Wyoming. To pay for those imports, Nebraska sent **\$198 million** out of state.

Money Leaving Nebraska to Pay for Imported Coal

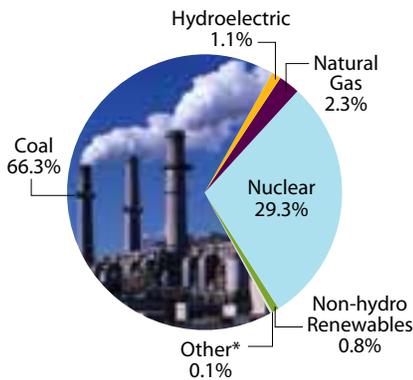


Note: Not all these funds will necessarily land in the state or nation where the mining occurs. Mine owners may divert the profits to parent companies in other locations, for example. Amounts also include the cost of transportation.

Compared with other states, Nebraska:

- Is the 6th most dependent on net imports as a share of total power use: 67 percent
- Spent the 18th most on net imports per person: \$111

Nebraska's Mix of Electricity Sources (2008)



Nebraska relies on coal to produce two-thirds of the electricity it generates, despite having no in-state coal supplies.

* "Other" includes oil, municipal solid waste, tires, propane, or other manufactured and waste gases from fossil fuel.

Clean Energy Solutions Can Boost Nebraska's Energy Independence

Investing in energy efficiency is one of the quickest and most affordable ways to replace coal-fired power while creating local jobs. Yet Nebraska spent just 53 cents per person on ratepayer-funded electricity efficiency programs in 2007—200 times less than it spends per capita on net coal imports.

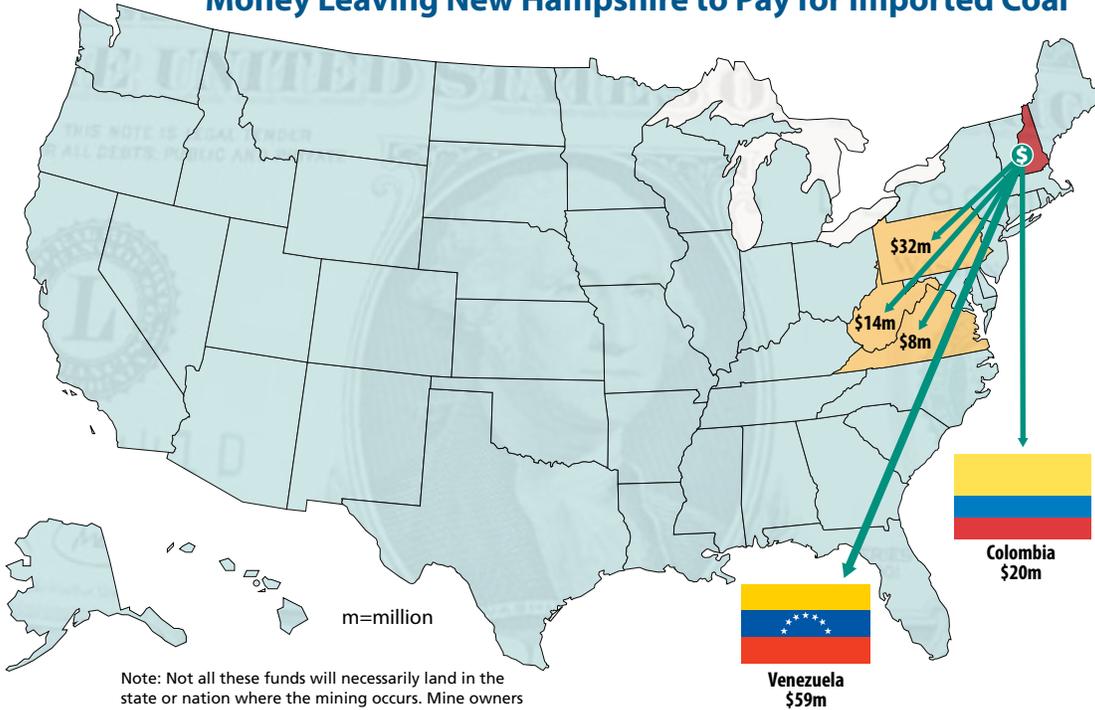
Reducing the state's electricity use by 1 percent annually could save consumers \$10 million, while avoiding the need to send as much as \$3 million out of state in the first year alone. Twenty-three states have adopted energy efficiency resource standards, most of which require utilities to achieve annual electricity savings of at least 1 percent (a target some states are already achieving). Leading states require annual cuts of 2 percent or more.

Nebraska can also reduce its dependence on imported coal by tapping its own wealth of renewable energy resources. The state has the technical potential to produce more than 100 times its 2008 electricity needs from renewable energy, primarily from its robust wind and bioenergy resources, though economic and physical barriers will curb some of that potential. Nebraska could spur deployment by adopting a renewable electricity standard, requiring utilities to gradually expand their use of renewable resources. Twenty-nine states and the District of Columbia have already adopted this effective and affordable policy.

New Hampshire's Dependence on Imported Coal

New Hampshire imported all the coal its power plants burned in 2008—much of it from South America. To pay for those imports, New Hampshire sent **\$133 million** out of state.

Money Leaving New Hampshire to Pay for Imported Coal

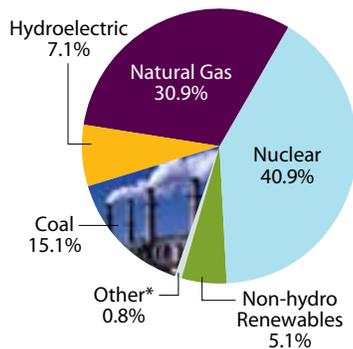


Compared with other states, New Hampshire:

- Spent the 8th most on international imports: \$79 million

Note: Not all these funds will necessarily land in the state or nation where the mining occurs. Mine owners may divert the profits to parent companies in other locations, for example. Amounts also include the cost of transportation.

New Hampshire's Mix of Electricity Sources (2008)



Despite having no in-state coal supplies, New Hampshire relies on coal for about 15 percent of its in-state electricity generation. New Hampshire produces twice as much electricity as retail customers buy. That suggests in-state coal plants may export some of their power.

* "Other" includes oil, municipal solid waste, tires, propane, or other manufactured and waste gases from fossil fuel.

Clean Energy Solutions Can Boost New Hampshire's Energy Independence

Investing in energy efficiency is one of the quickest and most affordable ways to replace coal-fired power while boosting the local economy. New Hampshire spent more than \$14 per person on ratepayer-funded electricity efficiency programs in 2007, reducing electricity use by 0.7 percent. That is well above the efficiency spending of most states—but still about seven times less than the state spends on imported coal.

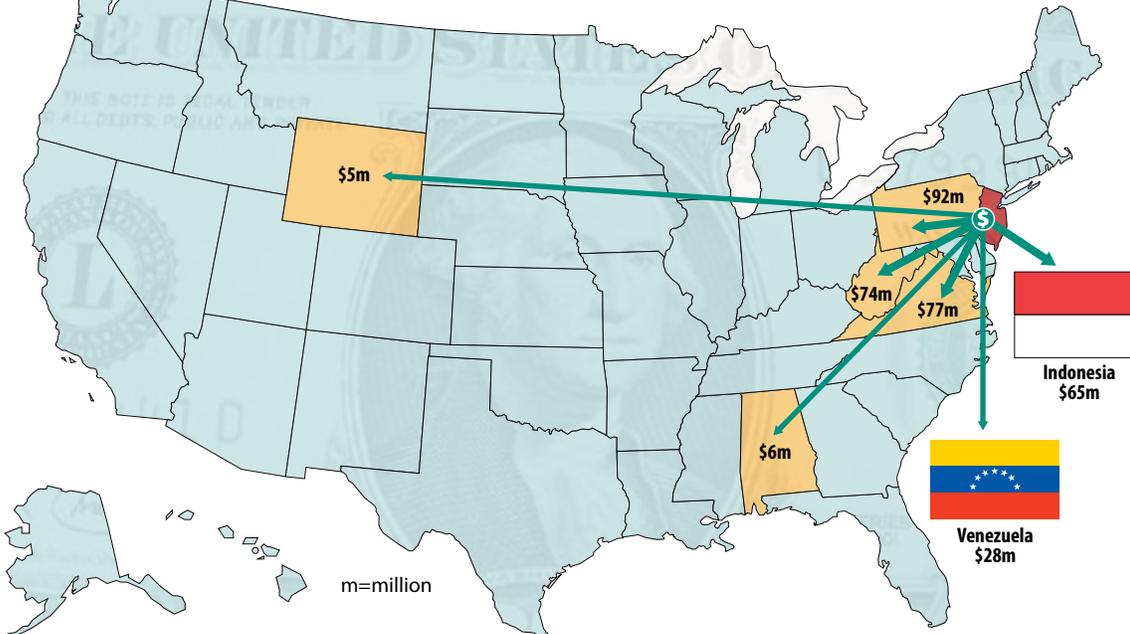
New Hampshire could expand its efforts by joining the growing list of states that have adopted energy efficiency resource standards, which require utilities to meet annual targets for saving electricity. Twenty-three states have adopted such standards, most of which require utilities to achieve annual electricity savings of at least 1 percent (a target some states are already achieving). Leading states require annual cuts of 2 percent or more.

Fortunately, New Hampshire is already poised to reduce its dependence on imported coal by tapping its wealth of renewable energy resources. The state has the technical potential to generate all its 2008 electricity needs from renewable energy, led primarily by wind and bioenergy. Though economic and physical barriers will curb some of that potential, New Hampshire has made a significant commitment to deploying renewable energy. Utilities must rely on renewable resources to supply about 24 percent of the state's power needs by 2025. Twenty-eight other states and the District of Columbia have adopted such renewable electricity standards.

New Jersey's Dependence on Imported Coal

New Jersey imported all the coal its power plants burned in 2008—some from as far away as Indonesia. To pay for those imports, New Jersey sent **\$347 million** out of state.

Money Leaving New Jersey to Pay for Imported Coal

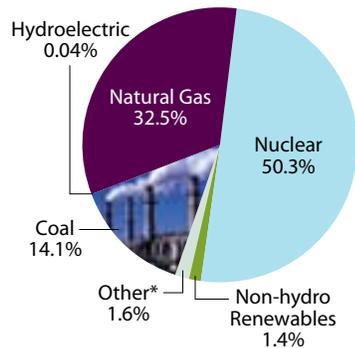


Compared with other states, New Jersey:

- Spent the 7th most on international imports: \$93 million

Note: Not all these funds will necessarily land in the state or nation where the mining occurs. Mine owners may divert the profits to parent companies in other locations, for example. Amounts also include the cost of transportation.

New Jersey's Mix of Electricity Sources (2008)



New Jersey relies on coal for about 14 percent of the electricity it produces in-state—among the lowest of our profiled states. However, retail customers buy 26 percent more power than New Jersey generates. That means the state imports significant amounts of electricity—some likely produced from coal.

* "Other" includes oil, municipal solid waste, tires, propane, or other manufactured and waste gases from fossil fuel.

Clean Energy Solutions Can Boost New Jersey's Energy Independence

Investing in energy efficiency is one of the quickest and most affordable ways to replace coal-fired power while boosting the local economy. New Jersey spent more than \$11 per person on ratepayer-funded energy efficiency programs in 2007, reducing electricity use by 0.3 percent. That is more than the efficiency spending of most states, but still about 3.5 times less than the state spends on imported coal.

New Jersey could expand its efforts by joining the growing list of states that have adopted energy efficiency resource standards, which require utilities to meet annual targets for saving electricity. Twenty-three states have adopted such standards, most of which require utilities to achieve annual electricity savings of at least 1 percent (a target some states are already achieving). Leading states require annual cuts of 2 percent or more.

Fortunately, New Jersey is already poised to reduce its dependence on imported coal by tapping its wealth of renewable energy resources. The state has the technical potential to produce 30 percent of its 2008 electricity needs from renewable energy, primarily through solar and bioenergy. Mid-Atlantic states also have significant offshore wind resources, which could supply 4.4 times the region's power needs. Though economic and physical barriers will curb some of that potential, New Jersey has made a significant commitment to deploying renewable energy. Utilities must rely on renewable resources to supply about 22 percent of the state's power needs by 2020. Twenty-eight other states and the District of Columbia have adopted such renewable electricity standards.

New York's Dependence on Imported Coal

New York imported all the coal its power plants burned in 2008—some from as far away as South America. To pay for those imports, New York sent **\$472 million** out of state.

Money Leaving New York to Pay for Imported Coal

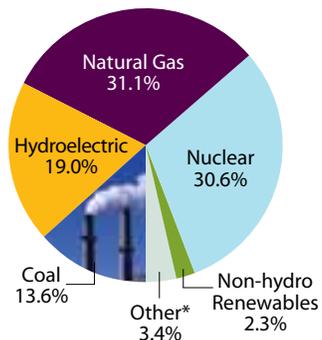


Compared with other states, New York:

- Spent the 10th most on international imports: \$63 million

Note: Not all these funds will necessarily land in the state or nation where the mining occurs. Mine owners may divert the profits to parent companies in other locations, for example. Amounts also include the cost of transportation. In addition, the origin of coal imports worth \$1 million was not reported to the Energy Information Administration.

New York's Mix of Electricity Sources (2008)



New York relies on coal for 14 percent of its in-state electricity generation, and imports all the coal it uses.

* "Other" includes oil, municipal solid waste, tires, propane, or other manufactured and waste gases from fossil fuel.

How New York Is Boosting Energy Independence with Clean Energy Solutions

Investing in energy efficiency is one of the quickest and most affordable ways to replace coal-fired power while boosting the local economy. New York spent about \$12.50 per person on ratepayer-funded electricity efficiency programs in 2007, saving 0.36 percent of electricity sales that year. That is more than the efficiency spending of most states, but still only about half as much as the state spent on imported coal. In 2008, New York adopted a strong energy efficiency resource standard, requiring utilities to reduce power demand by nearly 2 percent each year beginning in 2011. Twenty-two other states have adopted such targets, with several committing to annual savings of 2 percent or more.

New York is already poised to reduce its dependence on imported coal by tapping its own wealth of renewable energy resources. The state has the technical potential to produce 83 percent of its 2008 electricity needs from renewable energy, led primarily by wind, solar, and bioenergy. Though economic and physical barriers will curb some of that potential, New York has made a significant commitment to deploying renewable energy. Utilities must rely on renewable resources to supply 30 percent of the state's power needs by 2015. Twenty-eight other states and the District of Columbia have adopted such renewable electricity standards.

North Carolina's Dependence on Imported Coal

North Carolina imported all the coal its power plants burned in 2008—some from as far away as Wyoming and Colombia. To pay for those imports, North Carolina sent **\$2.35 billion** out of state.

Money Leaving North Carolina to Pay for Imported Coal

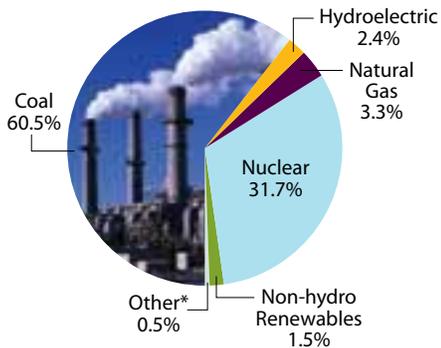


Note: Not all these funds will necessarily land in the state or nation where the mining occurs. Mine owners may divert the profits to parent companies in other locations, for example. Amounts also include the cost of transportation.

Compared with other states, North Carolina:

- Spent the 2nd most on total net imports: \$2.35 billion
- Spent the 3rd most on net imports per person: \$254
- Spent the 4th most on net imports relative to gross state product: 0.59 percent
- Imported the 7th most in net weight: 29.4 million tons
- Is the 10th most dependent on net imports as a share of total power use: 57 percent

North Carolina's Mix of Electricity Sources (2008)



Despite having no in-state coal supplies, North Carolina relies on coal for more than 60 percent of its in-state electricity generation.

* "Other" includes oil, municipal solid waste, tires, propane, or other manufactured and waste gases from fossil fuel.

Clean Energy Solutions Can Boost North Carolina's Energy Independence

Investing in energy efficiency is one of the quickest and most affordable ways to replace coal-fired power while boosting the local economy. Yet North Carolina spent just 75 cents per person on ratepayer-funded electricity efficiency programs in 2007—about 340 times less than it spent on imported coal.

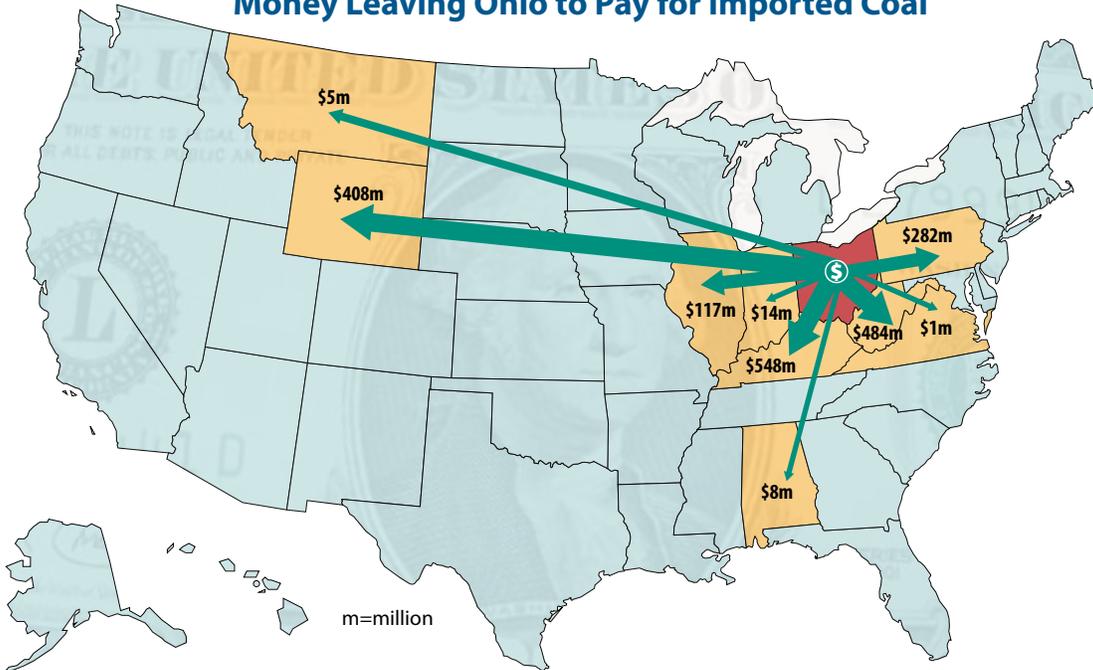
The state has taken a modest first step to more fully exploit its efficiency potential by adopting a renewable energy and energy efficiency portfolio standard. Utilities must expand their reliance on those resources to 12.5 percent of electricity demand by 2021 (efficiency can account for up to 5 percent). Twenty-two other states have adopted efficiency resource standards (though typically not combined with renewable energy standards), with several committing to annual electricity savings of 2 percent or more.

North Carolina's combined standard will also help the state reduce its dependence on imported coal by tapping its wealth of renewable energy resources, which could technically supply more than 2.5 times the state's 2008 power demand. Though economic and physical barriers may curb some of that potential, by-products from North Carolina's forestry industry can be harvested in a sustainable manner for use in stand-alone power facilities, or co-fired in power plants that now burn only coal, replacing imported coal. North Carolina could also develop solar energy, small-scale hydropower, and land-based and offshore wind power. Twenty-eight other states and the District of Columbia have already adopted renewable electricity standards, with 17 states setting targets of 20 percent or more.

Ohio's Dependence on Imported Coal

Ohio imported nearly three-quarters of the coal its power plants used in 2008—some from as far away as Montana and Wyoming. To pay for those imports, Ohio sent **\$1.87 billion** out of state. In-state mines supplied the rest of Ohio's coal and also exported coal worth \$381 million to other states. The state spent a net \$1.49 billion on imported coal.

Money Leaving Ohio to Pay for Imported Coal

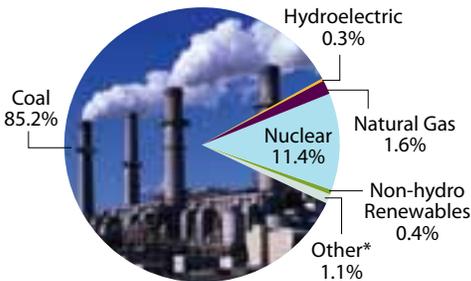


Compared with other states, Ohio:

- Spent the 5th most on net imports: \$1.49 billion
- Imported the 6th most in net weight: 32.7 million tons

Note: Not all these funds will necessarily land in the state or nation where the mining occurs. Mine owners may divert the profits to parent companies in other locations, for example. Amounts also include the cost of transportation.

Ohio's Mix of Electricity Sources (2008)



Ohio relies on coal to produce 85 percent of the electricity it generates—the second-highest percentage among the states we profiled.

* "Other" includes oil, municipal solid waste, tires, propane, or other manufactured and waste gases from fossil fuel.

Clean Energy Solutions Can Boost Ohio's Energy Independence

Investing in energy efficiency is one of the quickest and most affordable ways to replace coal-fired power while boosting the local economy. Yet Ohio spent just \$2.51 per person on ratepayer-funded electricity efficiency programs in 2007—about 51 times less than it spent to import coal. Fortunately, the state adopted a new energy efficiency resource standard in 2008. Utilities must reduce power demand by an average of 1.3 percent annually from 2009 to 2025. Twenty-two other states have adopted similar standards, with several requiring annual power savings of 2 percent or more.

Ohio is also poised to reduce its dependence on imported coal by tapping its wealth of renewable energy resources. The state has the technical potential to generate nearly 1.3 times its 2008 electricity demand from renewable energy, led primarily by wind and bioenergy. Though economic and physical barriers will curb some of that potential, Ohio utilities must rely on renewable resources to produce at least 12.5 percent of the state's power needs by 2025. Twenty-eight other states and the District of Columbia have adopted such renewable electricity standards, with 17 states setting targets of 20 percent or more.

South Carolina's Dependence on Imported Coal

South Carolina imported all the coal its power plants burned in 2008—some from as far away as South America. To pay for those imports, South Carolina sent **\$1.1 billion** out of state.

Money Leaving South Carolina to Pay for Imported Coal

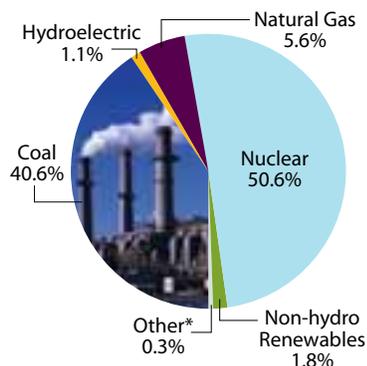


Compared with other states, South Carolina:

- Spent the 2nd most on net imports relative to gross state product: 0.70 percent
- Spent the 4th most on net imports per person: \$245
- Spent the 11th most on total net imports: \$1.1 billion

Note: Not all these funds will necessarily land in the state or nation where the mining occurs. Mine owners may divert the profits to parent companies in other locations, for example. Amounts also include the cost of transportation.

South Carolina's Mix of Electricity Sources (2008)



Despite having no in-state coal supplies, South Carolina relies on coal for 40 percent of its in-state electricity generation. The state produces 25 percent more electricity than its retail customers buy. That suggests in-state coal plants may export some of their power.

* "Other" includes oil, municipal solid waste, tires, propane, or other manufactured and waste gases from fossil fuel.

Clean Energy Solutions Can Boost South Carolina's Energy Independence

Investing in energy efficiency is one of the quickest and most affordable ways to replace coal-fired power while boosting the local economy. Yet South Carolina spent about two dollars per person on ratepayer-funded electricity efficiency programs in 2007—120 times less than it spent per capita on imported coal.

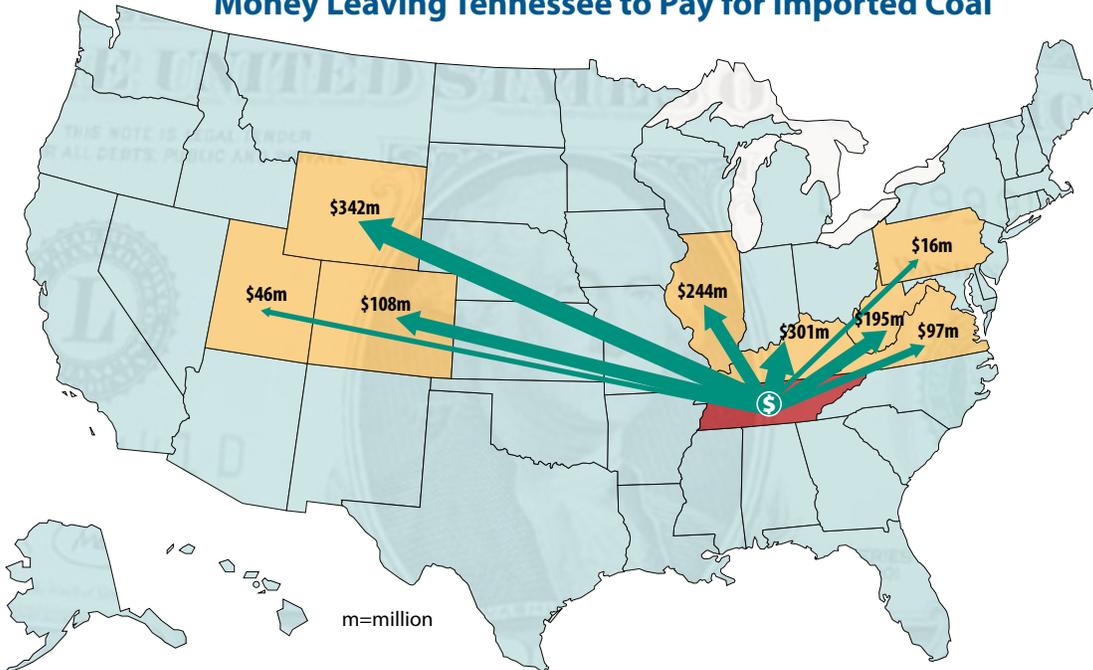
Reducing the state's electricity use by 1 percent annually could save consumers \$39 million, and avoid the need to send as much as \$21 million out of state in the first year alone. Twenty-three states have adopted energy efficiency resource standards, most of which require utilities to achieve annual electricity savings of at least 1 percent (a target some states are already achieving). Leading states require annual cuts of 2 percent or more.

South Carolina can also reduce its dependence on imported coal by tapping its wealth of renewable energy resources, which could technically supply more than 2.5 times the state's 2008 power demand. Though economic and physical barriers may curb some of that potential, by-products from South Carolina's forestry industry can be harvested in a sustainable manner for use in stand-alone power facilities, or co-fired in power plants that now burn only coal, replacing imported coal. South Carolina also has strong potential for developing offshore wind power, solar power, and small-scale hydropower. The state could spur deployment by adopting a renewable electricity standard, requiring utilities to gradually increase their use of renewable resources. Twenty-nine states and the District of Columbia have already adopted this proven policy.

Tennessee's Dependence on Imported Coal

Tennessee imported more than 99 percent of the coal its power plants burned in 2008—some from as far away as Utah and Wyoming. In-state mines supplied the remaining fraction and also exported coal worth \$139 million to other states. Tennessee spent a net **\$1.21 billion** on imported coal.

Money Leaving Tennessee to Pay for Imported Coal

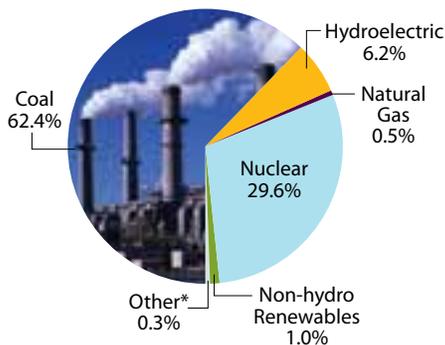


Note: Not all these funds will necessarily land in the state or nation where the mining occurs. Mine owners may divert the profits to parent companies in other locations, for example. Amounts also include the cost of transportation.

Compared with other states, Tennessee:

- Spent the 5th most on net imports per person: \$194
- Spent the 6th most on net imports relative to gross state product: 0.48 percent
- Spent the 8th most on total net imports: \$1.21 billion
- Is the 8th most dependent on net imports as a share of total power use: 63 percent
- Imported the 9th most in net weight: 26.5 million tons

Tennessee's Mix of Electricity Sources (2008)



Tennessee relies on coal for more than 60 percent of its in-state electricity generation, and imports more than 99 percent of that coal.

* "Other" includes oil, municipal solid waste, tires, propane, or other manufactured and waste gases from fossil fuel.

Clean Energy Solutions Can Boost Tennessee's Energy Independence

Investing in energy efficiency is one of the quickest and most affordable ways to replace coal-fired power while boosting the local economy. Yet Tennessee spent just \$1.62 per person on ratepayer-funded electricity efficiency programs in 2007—about 120 times less than it spent on net coal imports per capita.

A commitment to reduce the state's electricity use by 1 percent annually could save consumers \$54 million, while avoiding the need to send as much as \$22 million out of state the first year alone. Twenty-three states have adopted energy efficiency resource standards, most of which require utilities to achieve annual electricity savings of at least 1 percent (a target some states are already achieving). Leading states require annual cuts of 2 percent or more.

Tennessee can also reduce its dependence on imported coal by tapping its wealth of renewable energy resources. Wind, solar, small-scale hydropower, and several types of biomass could technically supply as much as 60 percent of Tennessee's 2008 power demand. Though economic and physical barriers may curb some of that potential, by-products from the state's forestry industry can be harvested in a sustainable manner for use in stand-alone power facilities, or co-fired in power plants that now burn only coal, replacing imported coal. To spur deployment, Tennessee could adopt a renewable electricity standard, requiring utilities to gradually increase their use of renewable resources. Twenty-nine states and the District of Columbia have already adopted this proven policy.

Texas's Dependence on Imported Coal

Texas imported nearly two-thirds of the coal its power plants burned in 2008—almost all from Wyoming. To pay for those imports, Texas sent **\$1.91 billion** out of state.

Money Leaving Texas to Pay for Imported Coal

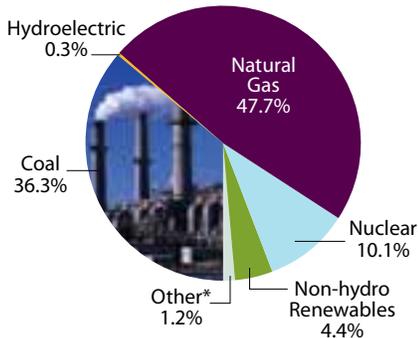


Note: Not all these funds will necessarily land in the state or nation where the mining occurs. Mine owners may divert the profits to parent companies in other locations, for example. Amounts also include the cost of transportation.

Compared with other states, Texas:

- Imported the most in net weight: 64.6 million tons
- Spent the 3rd most on total net imports: \$1.91 billion

Texas's Mix of Electricity Sources (2008)



Texas produces and consumes more electricity—and more coal-fired power—than any other state. It relies on coal for 36 percent of in-state electricity generation, and imports 63 percent of that coal.

* "Other" includes oil, municipal solid waste, tires, propane, or other manufactured and waste gases from fossil fuel.

Clean Energy Solutions Can Boost Texas's Energy Independence

Investing in energy efficiency is one of the quickest and most affordable ways to replace coal-fired power while boosting the local economy. Yet Texas spent just 3.33 cents per person on ratepayer-funded electricity efficiency programs in 2007—about 23 times less than it spent on imported coal.

In 1999, Texas became the first state to adopt an energy efficiency resource standard, which requires utilities to use efficiency to meet 10 percent of annual growth in power demand. The standard rose to 30 percent of demand growth in 2010. However, that target is still modest compared with the target in 22 other states with energy efficiency resource standards that focus on total demand, not just growth. Most of these states have committed to annual electricity savings of at least 1 percent (which some are already achieving), and leading states require annual cuts of 2 percent or more.

Texas can also reduce its dependence on imported coal by tapping its wealth of renewable energy resources. The state has the technical potential to generate more than 17 times its 2008 electricity needs from renewable energy, primarily from wind, bioenergy, and solar, though economic and physical barriers will curb some of that potential.

Texas is already the national leader in wind energy, with more than 9,400 megawatts (MW) of installed capacity, thanks in part to the state's renewable electricity standard. That standard—which the state has already achieved—requires utilities to rely on renewable resources to produce at least 5,800 MW (about 5.5 percent) of the state's power needs by 2015. Twenty-eight other states and the District of Columbia have adopted such a policy, with 17 states setting targets of 20 percent or more.

Wisconsin's Dependence on Imported Coal

Wisconsin imported all the coal its power plants burned in 2008 from nine different states, largely in the West. To pay for those imports, Wisconsin sent **\$853 million** out of state.

Money Leaving Wisconsin to Pay for Imported Coal

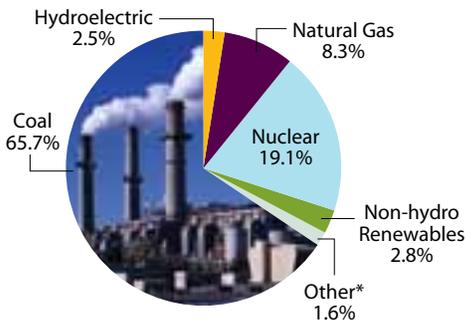


Note: Not all these funds will necessarily land in the state or nation where the mining occurs. Mine owners may divert the profits to parent companies in other locations, for example. Amounts also include the cost of transportation.

Compared with other states, Wisconsin:

- Is the 5th most dependent on net imports as a share of total power use: 68 percent
- Spent the 12th most on total net imports: \$853 million
- Spent the 12th most on net imports relative to gross state product: 0.35 percent
- Imported the 12th most in net weight: 25 million tons
- Spent the 13th most on net imports per person: \$152

Wisconsin's Mix of Electricity Sources (2008)



Despite having no in-state coal supplies, Wisconsin relies on coal for nearly two-thirds of the electricity it produces.

* "Other" includes oil, municipal solid waste, tires, propane, or other manufactured and waste gases from fossil fuel.

Clean Energy Solutions Can Boost Wisconsin's Energy Independence

Investing in energy efficiency is one of the quickest and most affordable ways to replace coal-fired power while boosting the local economy. Wisconsin spent more than \$14 per person on ratepayer-funded energy efficiency programs in 2007, cutting power demand by 0.66 percent that year. That is well above the efficiency spending of most states, but still 10 times less than the state spends to import coal. Wisconsin could expand its efforts by joining the 23 states that have adopted energy efficiency resource standards, most of which require utilities to achieve annual electricity savings of at least 1 percent (a target some states are already achieving). Leading states require annual cuts of 2 percent or more.

Fortunately, Wisconsin is poised to reduce its dependence on imported coal by tapping its wealth of renewable energy resources. The state has the technical potential to generate 4.2 times its 2008 electricity needs from renewable energy, led primarily by wind and bioenergy. Though economic and physical barriers will curb some of that potential, utilities must rely on renewable resources to supply 10 percent of the state's power by 2015. Twenty-eight other states and the District of Columbia have adopted such renewable electricity standards, with 17 states setting targets of 20 percent or more.

APPENDIX B

Methodology

Coal Imports

We based our analysis of imported coal primarily on data provided by power producers to the U.S. Energy Information Administration (EIA). This information appears on Schedule 2 of Form EIA-923, a monthly accounting of fuel receipts and fuel quality for power plants submitted by both regulated utilities and unregulated producers (EIA 2010i). Before 2008, the EIA used Form EIA-423 to collect data on power plants owned by entities other than utilities, while the Federal Energy Regulatory Commission used Form FERC-423 to collect data from regulated utilities.

The Form EIA-923 database includes information on each facility's name and location, as well as the name and location of the mine from which its coal came, and the company that supplied it. Purchases from coal mines outside the United States cite the country of origin. The database also reports the tonnage and heat content (measured in Btu per pound) of all coal purchases. Finally, the database includes the total delivered cost (measured in cents per million Btu) of each transaction for facilities owned by regulated utilities—including about three-quarters of all coal purchases in 2008. We estimated the price of coal purchases by non-utility power producers using state—and sometimes regional—data on average delivered prices from EIA's January 2010 report, *Cost and Quality of Fuels for Electric Plants 2007 and 2008* (EIA 2010c). Delivered costs include the costs of transporting coal to power plants.

Schedule 2 of Form EIA-923 includes incomplete data on a few coal purchases—primarily the location of coal mines. We determined the location of most of these mines from the name of the coal mine or supplier (when included), or by examining purchase data from previous years. We reported remaining purchases as of “unknown” origin.

To rank states based on net expenditures on coal and net weight of coal, we divided data from Schedule 2 of Form EIA-923 into three categories: imports, in-

state production and use, and exports. For the few states that mine coal for export, we subtracted exports from imports to determine net values. We conservatively assigned coal purchases of unknown origin to in-state production for states that mine even a small amount of coal, and to imports for states with no local coal resources.

We used data on each state's expenditures on net coal imports to rank their dependence based on per capita spending and size of the state economy. For these categories, we divided net expenditures by state popu-

**This report relies
primarily on data provided by
power producers to the U.S. Energy
Information Administration.**

lation (from the U.S. Census Bureau) and gross state product (from the U.S. Department of Commerce's Bureau of Economic Analysis) (U.S. Census Bureau 2009; BEA 2009). We based international imports on total expenditures determined by weight, Btu content, and price in Schedule 2 of Form EIA-923.

Finally, we calculated coal imports relative to a state's total electricity use by first converting tons of net coal imports into energy content (measured in Btu). We then divided that number by state-level electricity use (also in Btu). Information on state electricity use is from the EIA's recently released Form EIA-906, EIA-920, and EIA-923 Databases on Final 2008 Monthly Generation and Fuel Consumption (EIA 2010j).

Federal data—and thus our analysis—focus on interstate shipping of coal to power plants, not interstate transmission of coal-based power to consumers. This means that consumers in some states are somewhat more dependent on out-of-state coal than our report indicates, and that consumers in other states are somewhat less so. When EIA data show that a state produces substantially more electricity than retail customers buy

(EIA 2010h), our profiles note that the state may be importing or exporting significant quantities of coal-based power.

The EIA data indicate how much each importing state pays, but do not specify how much each exporting state receives, in any given transaction. Thus, while the maps in the state profiles show how much the importing state pays for coal from the location indicated, not all the funds necessarily land in the exporting state. Some of the importing state expenditures cover transportation of the coal. Moreover, in the case of non-resident companies that own or operate mines, profits or other revenues could be diverted to other locations. For example, Massey Coal, one of the largest U.S. producers, is headquartered in Virginia but owns mining operations in numerous states.

Energy Efficiency

Some of the state profiles in Appendix A estimate first-year consumer savings and avoided expenditures on coal imports from a 1 percent drop in electricity demand stemming from energy efficiency measures. We based those estimates on the EIA's state-level data on electricity sales, the average retail price of electricity, and coal-based power production in 2008.

We compared the average cost of producing 1 percent of electricity sales in each state with the cost of efficiency measures, assuming an average cost of three cents per kilowatt-hour (kWh). That is within the 2.5- to 4-cent-per-kWh range for the cost of efficiency programs found in several studies (Bell 2009; James et al. 2009; Kushler, York, and White 2004).

When estimating avoided expenditures on coal imports, we assumed that the 1 percent drop in electricity demand from energy efficiency measures would come entirely from coal-based power fueled by out-of-state resources. We made that assumption to show the potential of efficiency measures to reduce the need for imported coal. However, absent policy choices pairing energy savings with reduced coal use, efficiency measures would reduce demand on the margin at a given time, when power would likely come from both natural gas and coal.

Our state profiles also compare per capita spending on coal imports with per capita spending on ratepayer-funded energy efficiency programs. We obtained information on efficiency spending for 2007 from the American Council for an Energy-Efficient Economy (ACEEE 2009).



Renewable Energy Potential

The potential for renewable energy reported in our state profiles includes onshore and offshore wind, bio-energy, solar, geothermal, hydropower, and landfill gas resources.¹⁰

We based our estimates of onshore wind potential on a recent GIS analysis by the U.S. Department of Energy's National Renewable Energy Laboratory (DOE's NREL) and AWS Truewind, a consulting firm (EERE 2010). Those estimates include available windy land area with a gross capacity of at least 27 percent—that is, the area could produce maximum wind-based power at least 27 percent of the time—at a height of 80 meters. Our estimates also take into account several environmental and land-use restrictions.

Unfortunately, no similar comprehensive, state-by-state assessment of offshore wind resources is available. We therefore based our estimates of those resources on state-level studies, where available. For example, in the Southeast, we relied on an analysis by the Southern Alliance for Clean Energy, which reports feasible capacity and projects power production based largely on state-specific assessments by AWS Truewind and NREL (SACE 2009). In Massachusetts, an assessment of renewable energy potential by the state's Division of Energy Resources includes offshore wind (MA DOER 2008). When state-specific data were not readily available, we based our analysis on regional data on shallow offshore wind resources in the DOE's 2008 report on producing 20 percent of the nation's electricity from wind (O'Connell and Pletka 2007).



To estimate bioenergy resources, we used data from M&E Biomass, a consulting company, updating assessments from Oak Ridge National Laboratory (Walsh 2008). Biomass feedstocks include agricultural residues (corn stover and wheat straw), forest residues, unused mill residues, clean urban wood residues, and energy crops such as switchgrass. To minimize indirect effects on cropland from growing switchgrass, we excluded

50 percent of the potential supply of energy crops from our estimates.

U.S. solar resources are virtually limitless, as most locations can use solar energy to produce electricity. However, we based our estimate of photovoltaic resources on a 2004 study by Navigant Consulting that analyzes state-specific technical market potential in 2025 (Chaudhari et al. 2004). We based our estimate of concentrating solar power (CSP) resources on a study by the DOE's Office of Energy Efficiency and Renewable Energy (EERE 2007). Texas is the only state we profile with significant CSP resources.

Several of the states we profile have the potential to co-produce electricity from geothermal resources while drilling for oil and gas at existing locations, as high-temperature fluids are often present. A 2007 NREL study provides state-level estimates of this potential at temperatures of 180°C, 150°C, and 140°C (Petty and Porro 2007).

We based our estimates of state-level hydro-power resources on a 2006 study by the DOE's Office of Energy Efficiency and Renewable Energy, which analyzed opportunities for new small, low-power hydroelectric facilities (Hall et al. 2006). Finally, we based our estimates of the potential for producing electricity from landfill gas on data from the U.S. Environmental Protection Agency's Landfill Methane Outreach Program (EPA 2010).

APPENDIX C

State Rankings

This appendix ranks 49 states and the District of Columbia on each of six measures indicating dependence on imported coal. Alaska did not report data to the U.S. Energy Information Administration.

TABLE 3. Expenditures on Coal as Fuel for Power Plants (2008) (billion \$)

State	Total Imports	In-State Production	Exports to Other States	Net Imports	Rank
Georgia	\$2.62	0	0	\$2.619	1
North Carolina	\$2.35	0	0	\$2.348	2
Texas	\$1.91	\$0.84	0	\$1.908	3
Florida	\$1.56	0	0	\$1.564	4
Ohio	\$1.87	\$0.70	\$0.38	\$1.487	5
Alabama	\$1.53	\$0.51	\$0.14	\$1.389	6
Michigan	\$1.36	0	0	\$1.356	7
Tennessee	\$1.35	\$0.002	\$0.14	\$1.210	8
Indiana	\$1.29	\$1.11	\$0.15	\$1.135	9
Missouri	\$1.14	\$0.001	\$0.01	\$1.131	10
South Carolina	\$1.10	0	0	\$1.101	11
Wisconsin	\$0.85	0	0	\$0.853	12
Maryland	\$0.89	\$0.09	\$0.15	\$0.740	13
Illinois	\$1.49	\$0.15	\$0.81	\$0.683	14
Kansas	\$0.52	\$0.002	\$0.002	\$0.516	15
Arizona	\$0.50	\$0.28	0	\$0.499	16
Iowa	\$0.50	0	0	\$0.496	17
Oklahoma	\$0.49	\$0.02	0	\$0.494	18
Louisiana	\$0.49	\$0.10	\$0.0001	\$0.489	19
New York	\$0.47	0	0	\$0.472	20
Arkansas	\$0.46	0	0	\$0.463	21
Mississippi	\$0.46	\$0.08	0	\$0.457	22
Minnesota	\$0.45	0	0	\$0.450	23
New Jersey	\$0.35	0	0	\$0.347	24
Massachusetts	\$0.25	0	0	\$0.252	25
Washington	\$0.21	0	0	\$0.207	26
Nebraska	\$0.20	0	0	\$0.198	27
Nevada	\$0.18	0	0	\$0.178	28
Delaware	\$0.16	0	0	\$0.161	29
New Hampshire	\$0.13	0	0	\$0.133	30
Connecticut	\$0.13	0	0	\$0.130	31
South Dakota	\$0.07	0	0	\$0.070	32
California	\$0.07	0	0	\$0.069	33
Oregon	\$0.06	0	0	\$0.064	34
Hawaii	\$0.03	0	0	\$0.034	35
Maine	\$0.02	0	0	\$0.018	36
North Dakota	\$0.01	\$0.32	0	\$0.006	37
Idaho	0	0	0	0	38
Rhode Island	0	0	0	0	38
Vermont	0	0	0	0	38
Washington, DC	0	0	0	0	38
Virginia	\$0.61	\$0.26	\$0.63	(\$0.022)	42
New Mexico	0	\$0.56	\$0.24	(\$0.235)	43
Utah	\$0.10	\$0.43	\$0.41	(\$0.308)	44
Pennsylvania	\$0.62	\$1.66	\$1.11	(\$0.486)	45
Montana	0	\$0.27	\$0.75	(\$0.749)	46
Colorado	\$0.14	\$0.35	\$1.04	(\$0.902)	47
West Virginia	\$0.90	\$1.16	\$5.00	(\$4.105)	48
Kentucky	\$0.77	\$1.26	\$5.79	(\$5.016)	49
Wyoming	0	\$0.52	\$11.92	(\$11.918)	50

TABLE 4. Amount of Coal Used to Fuel Power Plants, by Weight (2008) (1,000 tons)

State	Total Imports	In-State Production	Exports to Other States	Net Imports	Rank
Texas	64,569	37,933	0	64,569	1
Missouri	43,929	19	168	43,761	2
Georgia	39,415	0	0	39,415	3
Illinois	54,161	3,750	16,999	37,163	4
Michigan	35,991	0	0	35,991	5
Ohio	40,483	16,211	7,752	32,731	6
North Carolina	29,409	0	0	29,409	7
Indiana	30,848	29,125	3,198	27,650	8
Tennessee	28,355	16	1,892	26,463	9
Alabama	28,198	7,531	2,788	25,410	10
Iowa	25,347	0	0	25,347	11
Wisconsin	24,969	0	0	24,969	12
Florida	22,327	0	0	22,327	13
Kansas	21,485	48	46	21,438	14
Oklahoma	21,407	559	0	21,407	15
Minnesota	15,807	0	0	15,807	16
Arkansas	15,534	0	0	15,534	17
South Carolina	15,436	0	0	15,436	18
Arizona	15,057	7,958	0	15,057	19
Nebraska	13,341	0	0	13,341	20
Louisiana	11,520	3,855	2	11,517	21
New York	8,313	0	0	8,313	22
Mississippi	7,013	2,678	0	7,013	23
Maryland	9,781	1,097	2,960	6,822	24
Washington	5,751	0	0	5,751	25
New Jersey	4,328	0	0	4,328	26
Nevada	3,765	0	0	3,765	27
Massachusetts	3,687	0	0	3,687	28
Oregon	2,655	0	0	2,655	29
South Dakota	2,335	0	0	2,335	30
Delaware	2,220	0	0	2,220	31
Connecticut	2,033	0	0	2,033	32
New Hampshire	1,459	0	0	1,459	33
California	1,385	0	0	1,385	34
Virginia	9,000	4,180	7,880	1,121	35
Hawaii	582	0	0	582	36
North Dakota	240	23,495	0	240	37
Maine	228	0	0	228	38
Idaho	0	0	0	0	39
Rhode Island	0	0	0	0	39
Vermont	0	0	0	0	39
Washington, DC	0	0	0	0	39
Pennsylvania	12,305	31,710	16,876	(4,570)	43
Utah	2,475	14,668	7,214	(4,740)	44
New Mexico	0	15,419	7,628	(7,628)	45
Colorado	7,264	10,352	17,482	(10,218)	46
Montana	0	10,654	25,989	(25,989)	47
West Virginia	15,853	20,957	72,382	(56,529)	48
Kentucky	15,438	25,126	80,676	(65,237)	49
Wyoming	0	26,008	416,157	(416,157)	50

TABLE 5. Spending on Net Coal Imports per Capita (2008)

State	Net Imports per Capita	Rank
Alabama	\$297	1
Georgia	\$270	2
North Carolina	\$254	3
South Carolina	\$245	4
Tennessee	\$194	5
Missouri	\$190	6
Kansas	\$185	7
Delaware	\$183	8
Indiana	\$178	9
Iowa	\$166	10
Arkansas	\$162	11
Mississippi	\$155	12
Wisconsin	\$152	13
Oklahoma	\$136	14
Michigan	\$136	15
Maryland	\$131	16
Ohio	\$129	17
Nebraska	\$111	18
Louisiana	\$110	19
New Hampshire	\$100	20
South Dakota	\$87	21
Minnesota	\$86	22
Florida	\$85	23
Texas	\$78	24
Arizona	\$77	25
Nevada	\$68	26
Illinois	\$53	27
New Jersey	\$40	28
Massachusetts	\$39	29
Connecticut	\$37	30
Washington	\$32	31
Hawaii	\$27	32
New York	\$24	33
Oregon	\$17	34
Maine	\$14	35
North Dakota	\$10	36
California	\$2	37
Idaho	\$0	38
Rhode Island	\$0	38
Vermont	\$0	38
Washington, DC	\$0	38
Virginia	-\$3	42
Pennsylvania	-\$39	43
Utah	-\$113	44
New Mexico	-\$118	45
Colorado	-\$183	46
Montana	-\$774	47
Kentucky	-\$1,170	48
West Virginia	-\$2,262	49
Wyoming	-\$22,361	50

TABLE 6. Spending on Net Coal Imports as a Share of Gross State Product (GSP) (2008)

State	Net Imports/ GSP	Rank
Alabama	0.82%	1
South Carolina	0.70%	2
Georgia	0.66%	3
North Carolina	0.59%	4
Mississippi	0.50%	5
Tennessee	0.48%	6
Missouri	0.48%	7
Arkansas	0.47%	8
Indiana	0.45%	9
Kansas	0.42%	10
Iowa	0.37%	11
Wisconsin	0.35%	12
Michigan	0.35%	13
Oklahoma	0.34%	14
Ohio	0.32%	15
Maryland	0.27%	16
Delaware	0.26%	17
Nebraska	0.24%	18
New Hampshire	0.22%	19
Louisiana	0.22%	20
Florida	0.21%	21
Arizona	0.20%	22
South Dakota	0.19%	23
Minnesota	0.17%	24
Texas	0.16%	25
Nevada	0.14%	26
Illinois	0.11%	27
New Jersey	0.07%	28
Massachusetts	0.07%	29
Washington	0.06%	30
Connecticut	0.06%	31
Hawaii	0.05%	32
New York	0.04%	33
Oregon	0.04%	34
Maine	0.04%	35
North Dakota	0.02%	36
California	0%	37
Idaho	0%	38
Rhode Island	0%	38
Vermont	0%	38
Washington, DC	0%	38
Virginia	-0.01%	42
Pennsylvania	-0.09%	43
Utah	-0.28%	44
New Mexico	-0.29%	45
Colorado	-0.36%	46
Montana	-2.09%	47
Kentucky	-3.21%	48
West Virginia	-6.66%	49
Wyoming	-33.75%	50

TABLE 7. Net Coal Imports as a Share of Total State Electricity Use (2008)

State	Net Imports/ Electricity Use	Rank	State	Net Imports/ Electricity Use	Rank
Missouri	82%	1	Louisiana	22%	26
Iowa	78%	2	Massachusetts	21%	27
Kansas	73%	3	New Jersey	17%	28
Delaware	69%	4	New Hampshire	17%	29
Wisconsin	68%	5	Connecticut	14%	30
Nebraska	67%	6	New York	13%	31
Georgia	65%	7	Hawaii	11%	32
Tennessee	63%	8	Washington	9%	33
Michigan	60%	9	Oregon	8%	34
North Carolina	57%	10	Maine	4%	35
South Dakota	53%	11	Virginia	3%	36
Arkansas	50%	12	California	2%	37
Oklahoma	50%	13	North Dakota	1%	38
Minnesota	48%	14	Idaho	0%	39
Ohio	46%	15	Rhode Island	0%	39
Indiana	40%	16	Vermont	0%	39
South Carolina	37%	17	Washington, DC	0%	39
Alabama	36%	18	Pennsylvania	-6%	43
Maryland	35%	19	Utah	-27%	44
Mississippi	34%	20	New Mexico	-39%	45
Texas	29%	21	Colorado	-52%	46
Illinois	26%	22	Montana	-150%	47
Florida	26%	23	West Virginia	-155%	48
Nevada	25%	24	Kentucky	-158%	49
Arizona	25%	25	Wyoming	-1,469%	50

TABLE 8. Expenditures on International Coal Imports (2008) (million \$)

State	Colombia	Indonesia	Venezuela	Total	Rank
Alabama	\$488.7	0	0	\$488.7	1
Florida	\$306.8	0	0	\$306.8	2
Massachusetts	\$206.4	0	0	\$206.4	3
Mississippi	\$145.4	0	0	\$145.4	4
Georgia	\$96.7	0	0	\$96.7	5
Virginia	\$94.9	0	0	\$94.9	6
New Jersey	0	\$64.7	\$28.3	\$92.9	7
New Hampshire	\$19.7	0	\$59.3	\$79.0	8
Connecticut	0	\$78.7	0	\$78.7	9
New York	\$9.7	0	\$52.8	\$62.5	10
South Carolina	\$56.6	0	0	\$56.6	11
North Carolina	\$34.4	0	0	\$34.4	12
Hawaii	0	0	\$34.2	\$34.2	13
Maryland	\$23.1	0	0	\$23.1	14
Maine	0	0	\$18.5	\$18.5	15
Louisiana	0	\$0.3	0	\$0.3	16

NOTE: No other states reported international coal imports.

Endnotes

- 1 In this report, coal “imports” refers to imports from other states as well as other nations. When focusing only on imports from other nations, we refer to “international” or “foreign” imports.
- 2 Appendix C lists the rankings for 49 states and the District of Columbia on all six measures. Alaska did not report data to the U.S. Energy Information Administration.
- 3 The exception is Virginia, which appears on our international imports list but is not a net coal importer so is not profiled.
- 4 South Carolina also claims a spot in the billion-dollar club, as it imported \$1.1 billion worth of coal in 2008. However, it ranks eleventh among all states, and therefore did not make our most-dependent list in this category.
- 5 We compare 2008 to 2002 where appropriate, because 2002 is the first year in which comprehensive data for both regulated and unregulated coal plants are available.
- 6 Coal use in the electricity sector was 9 percent less in 2009 than in 2008 (EIA 2010d).
- 7 This calculation is based on a new, supercritical 600-megawatt coal facility operating at an 85 percent capacity factor, with a heat rate of 9,200 Btu per kWh (such a plant would be more fuel-efficient than most existing coal plants). We also assume that the coal’s energy content is 8,700 to 12,000 Btu per pound—the broadest range for sub-bituminous and bituminous coal, the two most common coal varieties. A typical home that does not rely on electricity for heat uses about 600 kWh of electricity per month.
- 8 This result is the average spent per person per year indirectly through electricity rates. The actual amount varies according to each person’s electricity use.
- 9 That is the most recent year for which comprehensive data on state-level efficiency programs are available.
- 10 Our estimates of renewable energy potential included geothermal resources used in utility-scale power plants. However, none of the states that we profiled have reasonable access to that resource, which is most prevalent in western states.

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Burning Coal, Burning Cash

RANKING THE STATES THAT IMPORT THE MOST COAL

The cost of importing coal is a major drain on the economies of many states that rely heavily on coal-fired power. Thirty-eight states were net importers of coal in 2008—from other states and, increasingly, other nations. Eleven of those states spent more than \$1 billion on net coal imports.

Burning Coal, Burning Cash analyzes this annual drain on state economies, ranking the most import-dependent states using six different measures of dependence. The report also discusses how states can boost their economies and reduce their dependence on imported coal by investing in local energy efficiency and renewable energy resources. Individual profiles of the 24 most import-dependent states reveal how much they spend on imported coal, where that coal is coming from, and how they could redirect those funds into cleaner, job-creating investments.



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