

Episode 56WP August 7 2024 How Does Your State Make Electricity? New York Times. RAWSEP View RAWSEP looked at the 50 colored charts of percentage of electricity from an energy source for each of the 50 United States electrical energy in the 22 years from 2001 to 2023. The gray areas on the charts stand for biomass or wood burning energy source percentage by each state and the gray area increases and decreases over time for each individual state. What gray areas of wood burning as an energy source stand out on the charts? There are the largest gray wood burning percentages in the charts of the six states of California Hawaii Idaho Maine New Hampshire and Vermont. California. Biomass wood burning use for electricity generation has seemed to decline in California from 6 percent to 4 percent from 2001 to 2023. Maine. Biomass wood burning use for electricity generation has seemed to decline in Maine from 20 percent to 13 percent from 2001 to 2023. Vermont. Biomass wood burning use for electricity generation has seemed to increase in Vermont from 7 percent to 17 percent from 2001 to 2023. Smaller gray wood burning percentage areas are large enough to visibly appear on charts of Arkansas Connecticut Florida Georgia Indiana Louisiana Maryland Massachusetts Michigan Minnesota Mississippi Nevada New Jersey New York North Carolina Oregon Pennsylvania Rhode Island South Carolina Tennessee Texas Utah Virginia Washington and Wisconsin. There may be biomass burning for energy in the other 50 states but it may be too small a percentage to be visible on these simple charts. Unfortunately the word renewable is used for both clean renewables like wind and solar and polluting renewables like biomass wood burning.

Excerpts edited by RAWSEP for brevity and clarity and relationship to Residents Against Wood Smoke Emission Particulates a 501c3 nonprofit organization. August 2 2024. How the United States made electricity from 2001 to 2023 Natural gas surpassed coal as the country's top source of power in 2016 and renewables like wind and solar have grown quickly to become major players in the U.S. power system. But every state has its own story. In Nevada natural gas became the top source of electricity generation in 2005 earlier than in many other places. More recently solar power has surged there. Wind has taken off in Iowa over the past two decades beating out coal in 2019 to become the state's largest source of power generation. Even in Wyoming where coal still dominates alternative sources of power have made steady gains. Last year coal was the top electricity fuel in 10 states down from 32 states in 2001. Natural gas largely took over during that time but wind also emerged as a leading power source across the Midwest. Switching from coal to natural gas for power produces fewer CO2 emissions than burning coal. But fewer emissions is not the same as zero emissions. President Biden's 2022 Inflation Reduction Act aimed to turbocharge the growth of renewable wind and solar energy nationwide and to support other technologies that could reduce emissions from the power sector like nuclear energy advanced batteries and carbon capture and storage for gas plants. But Republicans promise to repeal many of its clean-energy provisions. What happens at the federal level is only part of the equation. States have the power to accelerate slow down or block new energy development too. We charted how electricity generation has changed in every state so far from 2001 to 2023 using data from the United States Energy Information Administration. Find your state below:

Page 1 Alabama Alaska Arizona Arkansas California and Colorado United States. How California made electricity from 2001 to 2023. Natural gas has been California's top electricity fuel since 2001 but more than half of the power produced in the state last year came from renewable energy and other carbon-free sources including solar wind geothermal hydro and nuclear. Solar power in particular has grown

rapidly over the past decade largely because of supportive state policies. At the same time nuclear power has declined. (One of the state's two nuclear plants closed in 2012. The other is now slated to retire in 2030.) California has often led the way on clean power using state policy to encourage the adoption of clean power technologies like solar panels and giant grid batteries. In 2018 the state set a goal for utilities to get all of their electricity from zero-carbon sources by 2045. State utilities and regulators are now wrestling with how quickly they can reduce dependence on natural gas while still maintaining a reliable power supply. California consumes more electricity than it generates within its borders and typically imports about one-third to one-fifth of the power it uses. (Imports are not reflected in the chart above.)

Page 2 Connecticut Florida Georgia Hawaii Idaho Illinois Indiana and Iowa How Hawaii made electricity from 2001 to 2023. Hawaii has relied heavily on imported oil to make electricity for the past two decades. But the state has an ambitious plan to generate all of its power from clean energy sources by 2045. In September 2022 Hawaii shut down its last coal-burning power plant a major milestone toward that goal. Last year there was no utility-scale coal generation in Hawaii for the first time since the early 1970s but delays in the deployment of new solar and battery projects meant oil-fired generation ticked up. The state recently opened a new large-scale battery storage facility as part of its strategy to replace the coal power that was retired. (Battery charging and discharging is not shown in the charts above which reflect net generation.) Solar generation mostly from small-scale rooftop panels has grown rapidly in the state over the past decade and provided nearly 20 percent of Hawaii's power last year. In total about 31 percent of the state's electricity was made by renewable sources in 2023. How Idaho made electricity from 2001 to 2023. Hydro generated the vast majority of Idaho's electricity during the 2000s and early 2010s. But in recent years drought conditions have pushed down the amount of hydroelectric power produced in the state. Idaho still makes the majority of its electricity from renewable sources with hydro providing 43 percent of in-state power generation last year and wind and solar together providing an additional 22 percent. But natural gas power has expanded significantly at the same time. Idaho also imports a sizable amount of power from out of state to meet its electricity needs. In the past much of this power has come from coal-fired generators in neighboring states but Oregon closed its last coal plant in 2020 and other nearby coal plants are scheduled to shut down over the next several years. (Imports are not shown on the chart.)

Page 3 Kansas Kentucky Louisiana Maine Maryland Massachusetts Michigan and Minnesota How Maine made electricity from 2001 to 2023. Most of the electricity generated in Maine last year came from renewable sources. Together hydroelectric dams wind turbines solar arrays and biomass plants which burn wood and other organic materials produced about 69 percent of the state's power. However the total amount of power generated in Maine particularly from natural gas and petroleum has declined significantly over the last two decades. The state now imports between 10 and 30 percent of its electricity each year from other nearby states and Canada. (Imports are not shown on the chart above.) Maine has a goal of getting 100 percent of its electricity from renewable sources by 2050.

Page 4 Mississippi Missouri Montana Nebraska Nevada New Hampshire New Jersey and New Mexico How New Hampshire made electricity from 2001 to 2023. The bulk of electricity generated in New Hampshire over the past two decades has come from the state's only nuclear reactor Seabrook Station. Natural gas has been the state's second-largest source of power since the early 2000s when two new

generating stations went online. The share of electricity supplied by coal has declined over the past two decades shrinking to about 1 percent in 2023 from 25 percent in 2001. New Hampshire currently generates about 16 percent of its electricity from renewable sources mostly hydro and biomass a type of energy that comes from burning wood and other organic matter. The state requires utilities to get 25 percent of the power they sell to customers from renewable sources by 2025 a target they can fulfill by purchasing renewable energy credits. New Hampshire produces more power than it consumes and sends the excess to other New England states and Canada. (Exports are not shown on the chart above.)

Page 5 New York North Carolina North Dakota Ohio Oklahoma Oregon Pennsylvania and Rhode Island

How Oregon made electricity from 2001 to 2023. Most of the electricity produced in Oregon in any given year comes from hydroelectric dams but the exact amount can fluctuate depending on precipitation. Power from natural gas typically increases during drought years and decreases in years with ample rain and snow. Over the past decade wind has grown to become the third-largest source of electricity generated in the state. In an effort to encourage more non-hydroelectric renewable power Oregon requires its large investor-owned utilities to get 50 percent of the electricity they sell to customers from new renewable energy sources by 2040. Other utilities are subject to lower standards. In most years Oregon exports some of its power to nearby states. (Exports are not included in the chart above.)

Page 6 South Carolina South Dakota Tennessee Texas Utah Vermont Virginia Washington West Virginia Wisconsin and Wyoming

How Vermont made electricity from 2001 to 2023. Most of the electricity generated in Vermont came from nuclear power until 2014 when the state's only nuclear plant Vermont Yankee closed down. Since then virtually all of the electricity produced in the state has come from renewable sources including hydropower biomass wind and solar. But Vermont now generates much less electricity in total than it did before the nuclear plant shut down and has to import a substantial amount of power from other New England states and Canada to satisfy demand. (Imports are not shown on the chart above.) Vermont recently strengthened its renewable energy standard to require that 100 percent of electricity sold in the state come from renewable sources by 2035.

United States Electricity Profile 2022

Name Average retail price (cents/kWh)

Alabama

11.59

Alaska

20.73

Arizona

11.31

Arkansas

9.91

California

22.33

Colorado

11.75

Connecticut

21.08

Delaware

11.83

District of Columbia

14.94

Florida

12.51
Georgia
12.00
Hawaii
39.72
Idaho
8.51
Illinois
11.94
Indiana
11.66
Iowa
9.57
Kansas
11.47
Kentucky
10.51
Louisiana
10.41
Maine
17.44
Maryland
13.32
Massachusetts
21.27
Michigan
13.20
Minnesota
12.04
Mississippi
10.36
Missouri
10.26
Montana
9.97
Nebraska
8.83
Nevada
10.94
New Hampshire
21.07
New Jersey
14.80
New Mexico
10.02
New York
18.33
North Carolina
9.60

North Dakota
8.42
Ohio
10.64
Oklahoma
10.05
Oregon
9.26
Pennsylvania
11.86
Rhode Island
19.30
South Carolina
10.74
South Dakota
10.44
Tennessee
10.89
Texas
10.16
Utah
8.80
Vermont
16.99
Virginia
10.75
Washington
9.05
West Virginia
9.74
Wisconsin
11.95
Wyoming
8.24