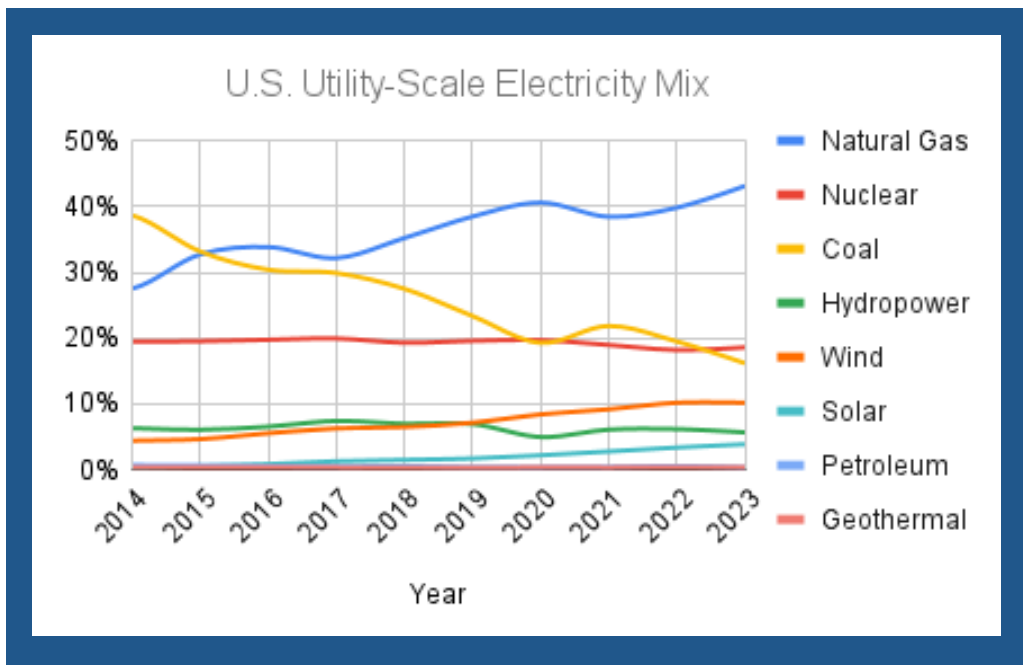


THE U.S. ELECTRICITY MIX

In 2023, the United States consumed 4.01 trillion kilowatt hours of electricity. Sources and methods of electricity generation vary by region and technological complexity. Most methods are fuel based and rely on commodities, while growth continues for technology-based methods harnessing the natural energy from wind, water, and sunlight. Together, these sources provide constant baseload power and are dispatched to meet peak energy demands. The price of home utility bills all the way to industrial manufacturing costs largely depend on what resources are used and how efficient they are. Learn more about each utility-scale method powering the United States Energy Grid.





Energy Spotlight

NATURAL GAS



Impact Snapshot

42.4%

Share of U.S. electricity mix

9.15%

Share of global electricity mix

+54%

U.S. 10-year change

+2%

Global 10-year change

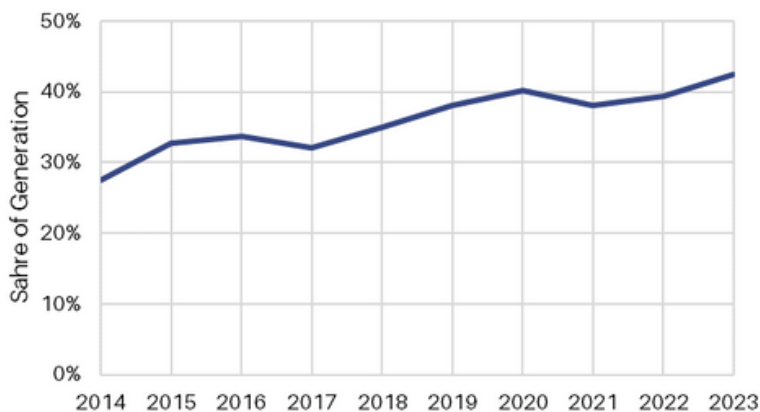
Type:
Hydrocarbon

Classification:
Commodity

Source:
Geologic

Flexibility:
Baseload,
Dispatchable

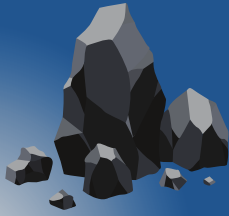
U.S. Natural Gas Share of Electricity Mix



What you need to know:

Natural gas is used to generate electricity, but can also be used for residential/commercial/industrial heat, transportation fuel, and to produce other fuels and chemicals.

When generating electricity, the lifecycle emissions of Natural Gas equal 486 grams of carbon dioxide equivalent per kWh and it has a median levelized cost of \$46.7/MWh.



Energy Spotlight

COAL

Impact Snapshot

15.9%

Share of U.S. electricity mix

35.5%

Share of global electricity mix

-59%

U.S. 10-year change

-12%

Global 10-year change

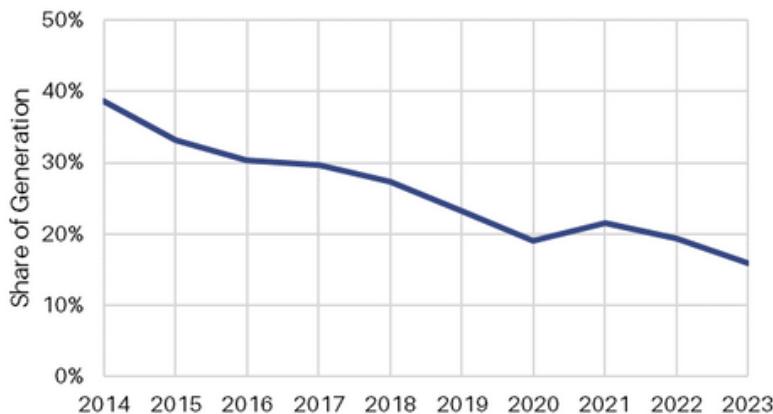
Type:
Hydrocarbon

Classification:
Commodity

Source:
Geologic

Flexibility:
Baseload,
Dispatchable

U.S. Coal Share of Electricity Mix



What you need to know:

Coal is used to generate electricity, but can also be used for industrial heat and to produce other fuels and chemicals.

When generating electricity, the lifecycle emissions of Coal equal 1,001 grams of carbon dioxide equivalent per kWh and it has a median levelized cost of \$98.4/MWh.



Energy Spotlight

NUCLEAR



Impact Snapshot

18.2%

Share of U.S. electricity mix

9.1%

Share of global electricity mix

-6%

U.S. 10-year change

-13%

Global 10-year change

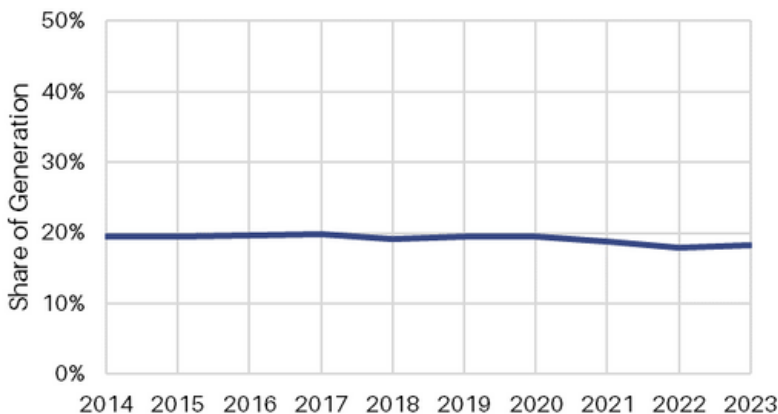
Type:
Nuclear
Fission

Classification:
Commodity,
Technological

Source:
Geologic

Flexibility:
Baseload,
Semi-dispatchable

U.S. Nuclear Share of Electricity Mix



What you need to know:

Nuclear is used to generate electricity, but can also be used for industrial heat which is also useful for producing other fuels and chemicals.

When generating electricity, the lifecycle emissions of Nuclear equal 13 grams of carbon dioxide equivalent per kWh and it has a median levelized cost of \$82.6/MWh.



Energy Spotlight

WIND



Impact Snapshot

10%

Share of U.S. electricity mix

7.8%

Share of global electricity mix

+126%

U.S. 10-year change

+163%

Global 10-year change

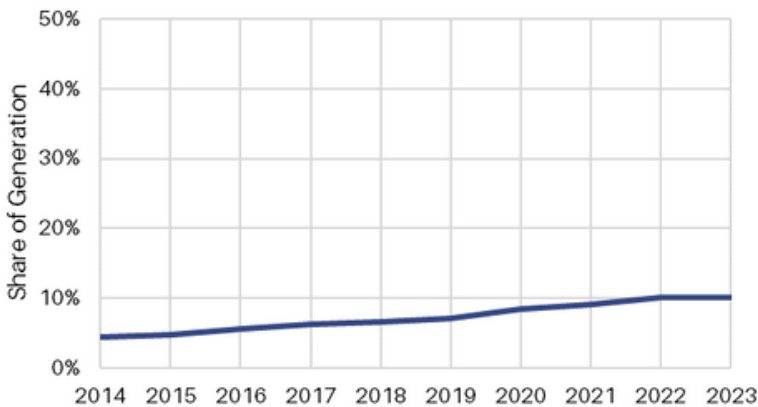
Type:
Renewable

Classification:
Technological

Source:
Wind

Flexibility:
Intermittent,
Non-dispatchable

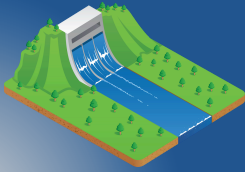
U.S. Wind Share of Electricity Mix



What you need to know:

Wind power is solely used to generate electricity.

The lifecycle emissions of Wind power equals 13 grams of carbon dioxide equivalent per kWh and it has a median levelized cost of \$66.5/MWh.



Energy Spotlight

HYDRO

Impact Snapshot

5.5%

Share of U.S. electricity mix

14.3%

Share of global electricity mix

-11%

U.S. 10-year change

-12%

Global 10-year change

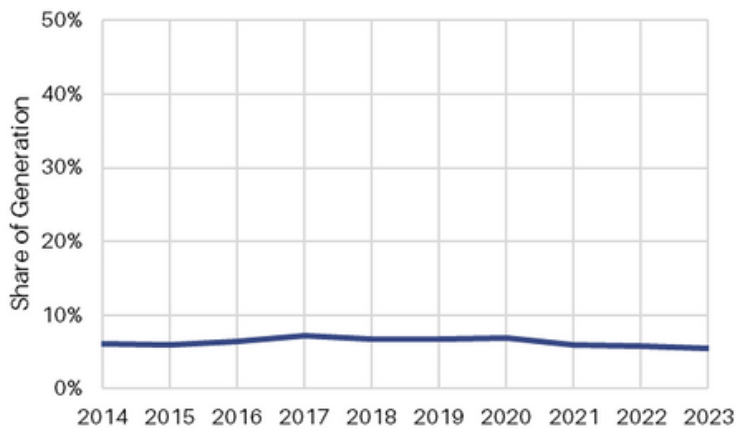
Type:
Renewable

Classification:
Technological

Source:
Water

Flexibility:
Baseload,
Semi-dispatchable

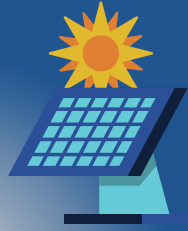
U.S. Hydro Share of Electricity Mix



What you need to know:

Hydropower is used solely to generate electricity.

The lifecycle emissions of Hydropower equals 21 grams of carbon dioxide equivalent per kWh and it has a median levelized cost of \$23.9/MWh.



Energy Spotlight

SOLAR

Impact Snapshot

5.6%

Share of U.S. electricity mix

5.5%

Share of global electricity mix

+694%

U.S. 10-year change

+564%

Global 10-year change

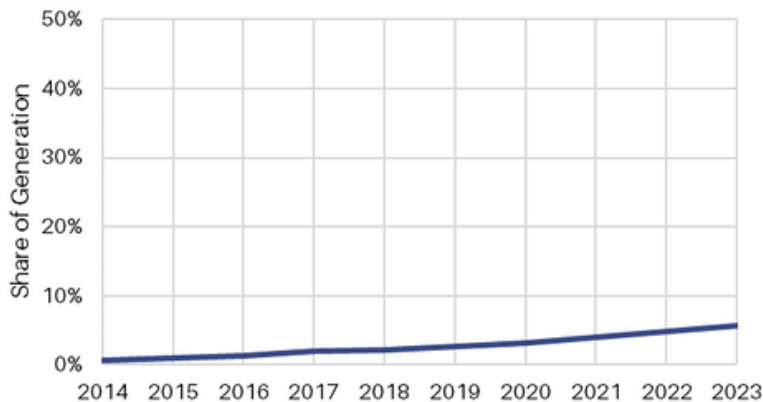
Type:
Renewable

Classification:
Technological

Source:
Sun

Flexibility:
Intermittent,
Non-dispatchable

U.S. Solar Share of Electricity Mix



What you need to know:

Solar power is used solely to generate electricity.

The lifecycle emissions of Solar equal 43 grams of carbon dioxide equivalent per kWh and it has a median levelized cost of \$53.8/MWh.



Energy Spotlight

PETROLEUM



Impact Snapshot

0.77% Share of U.S. electricity mix

2.7% Share of global electricity mix

-27% U.S. 10-year change

-43% Global 10-year change

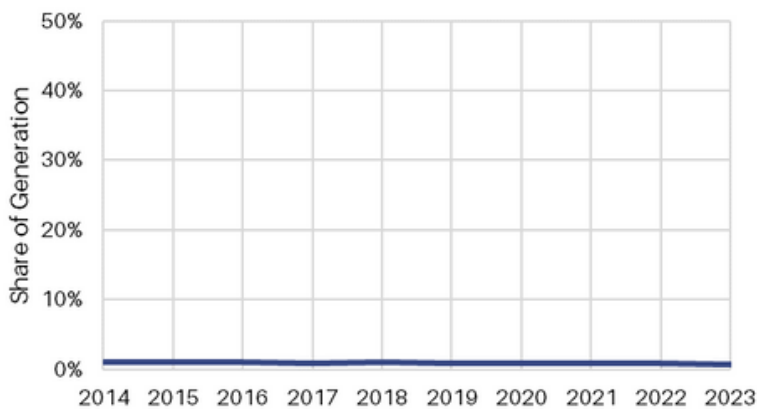
Type:
Hydrocarbon

Classification:
Commodity

Source:
Geologic

Flexibility:
Baseload,
Dispatchable

U.S. Petroleum Share of Electricity Mix



What you need to know:

Petroleum is used sparingly to generate electricity, but is predominantly used for industrial heat, transportation fuel, and to produce other fuels and chemicals.

When generating electricity, the lifecycle emissions of Petroleum equal 840 grams of carbon dioxide equivalent per kWh and it has a levelized cost exceeding \$300/MWh.



Energy Spotlight

GEOHERMAL



Impact Snapshot

0.4%

Share of U.S. electricity mix

0.34%

Share of global electricity mix

+30%

U.S. 10-year change

+33%

Global 10-year change

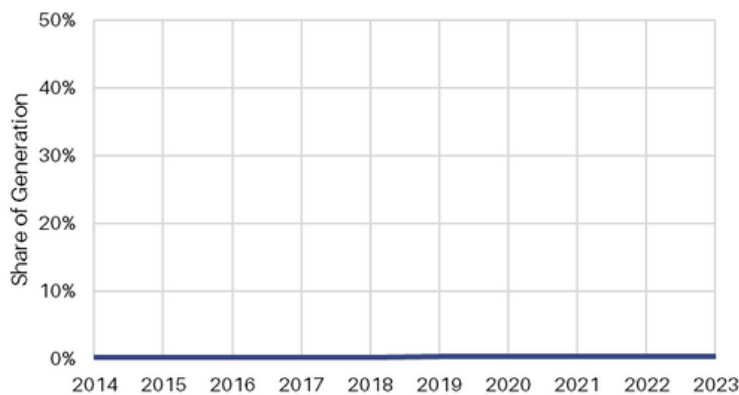
Type:
Renewable

Classification:
Technological

Source:
Geologic

Flexibility:
Baseload,
Semi-dispatchable

U.S. Geothermal Share of Electricity Mix



What you need to know:

Geothermal is used for some space heating applications, but is primarily used for generating electricity.

The lifecycle emissions of Geothermal equal 37 grams of carbon dioxide equivalent per kWh and it has a levelized cost of \$248.8/MWh.

Sources:

U.S. Energy Information Administration. (2023). Electricity explained Use of electricity. <https://www.eia.gov/energyexplained/electricity/use-of-electricity.php>.

U.S. Energy Information Administration. (2023). What is U.S. electricity generation by energy source? <https://www.eia.gov/tools/faqs/faq.php?id=427>.

National Renewable Energy Laboratory. "Levelized Cost of Energy," State and Local Planning for Energy, accessed 6/22/2023, <https://maps.nrel.gov/slope>.

National Renewable Energy Laboratory. "Life Cycle Greenhouse Gas Emissions from Electricity Generation: Update, accessed 6/22/2023, <https://www.nrel.gov/docs/fy21osti/80580.pdf>.

Statistical Review of World Energy. Energy Institute. (2024, June 20). https://www.energyinst.org/__data/assets/pdf_file/0006/1542714/EI_Stats_Review_2024.pdf



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About Aii

The Alliance for Innovation and Infrastructure (Aii) is an independent, national research and educational organization that explores the intersection of economics, law, and public policy in the areas of climate, damage prevention, energy, infrastructure, innovation, technology, and transportation.

The Alliance is a think tank consisting of two non-profits: the National Infrastructure Safety Foundation (NISF), a 501(c)(4) social welfare organization, and the Public Institute for Facility Safety (PIFS), a 501(c)(3) educational organization. Both non-profits are legally governed by volunteer boards of directors. These work in conjunction with the Alliance's own volunteer Advisory Council.

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