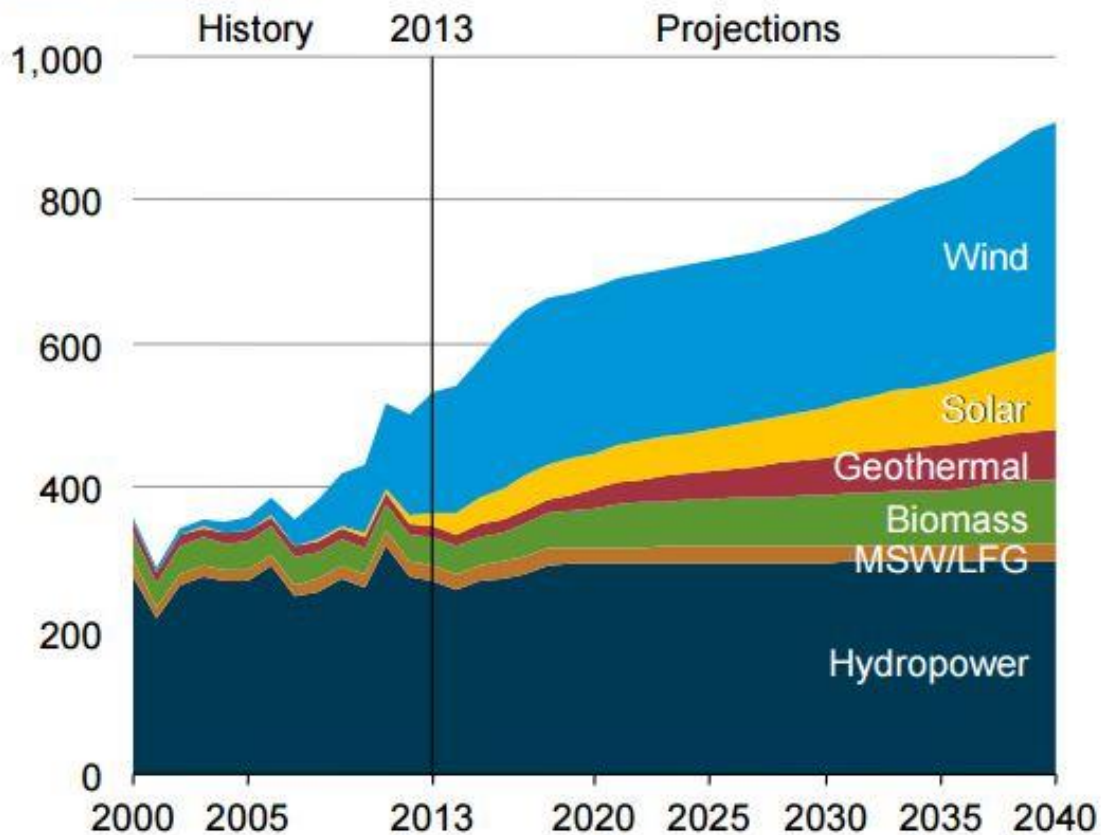


## What is Renewable Energy?

With greenhouse gas (ghg) emissions as the primary contributor to human-caused climate change, one countermeasure that can be taken to limit our impact on the climate is by replacing non-renewable energy sources, such as fossil fuels, with renewable energies that emit less ghg.

**Figure 34. Renewable electricity generation by fuel type in the Reference case, 2000-2040 (billion kilowatthours)**

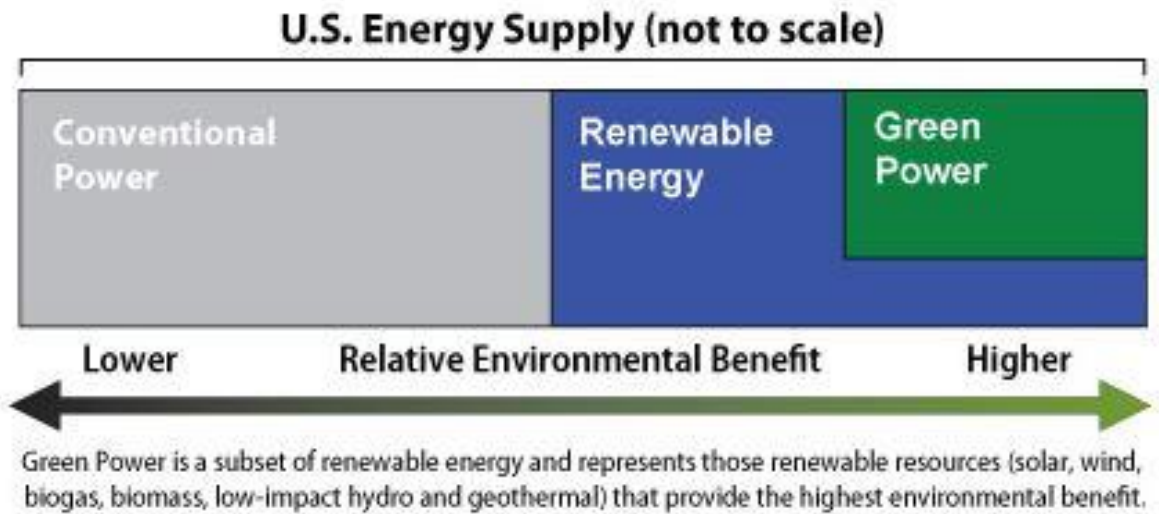


Renewable energy (RE) is any energy source that naturally replenishes and cannot be exhausted. Renewable energies include:

- Solar Power: Uses light energy from the sun to produce heat or electricity
  - Solar Photovoltaic Energy: Electricity converted directly from sunlight absorbed by solar panels or other photovoltaics
  - Solar Thermal Energy (STE): Thermal or electrical energy generated from the heat energy of the sun and collected using water, mirrors or lenses
- Wind Power: Uses kinetic energy from air flow to produce electricity

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- Hydropower: Uses kinetic energy from running or falling water to produce electricity
- Geothermal Power: Uses heat energy from the earth’s mass to produce thermal or electrical energy
- Biomass: Uses organic material from plants or animals, such as wood and animal manure, to produce thermal, chemical, or biochemical energy
- Biogas: Uses gases from the breakdown of organic waste material to produce thermal or electrical energy

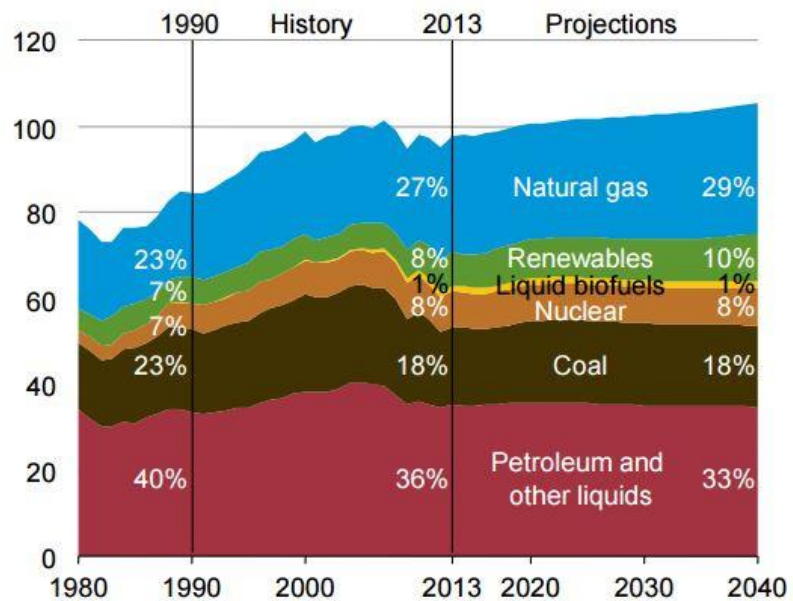


The environmental Protection Agency (EPA) defines Green Power as "a subset of renewable energy and represents those renewable energy resources and technologies that provide the highest environmental benefit."

## Who Uses Renewable Energy?

Most of the United States of America’s electricity is produced from fossil fuels, non-renewable sources of energy including coal, natural gas, and oil. In order to reduce our

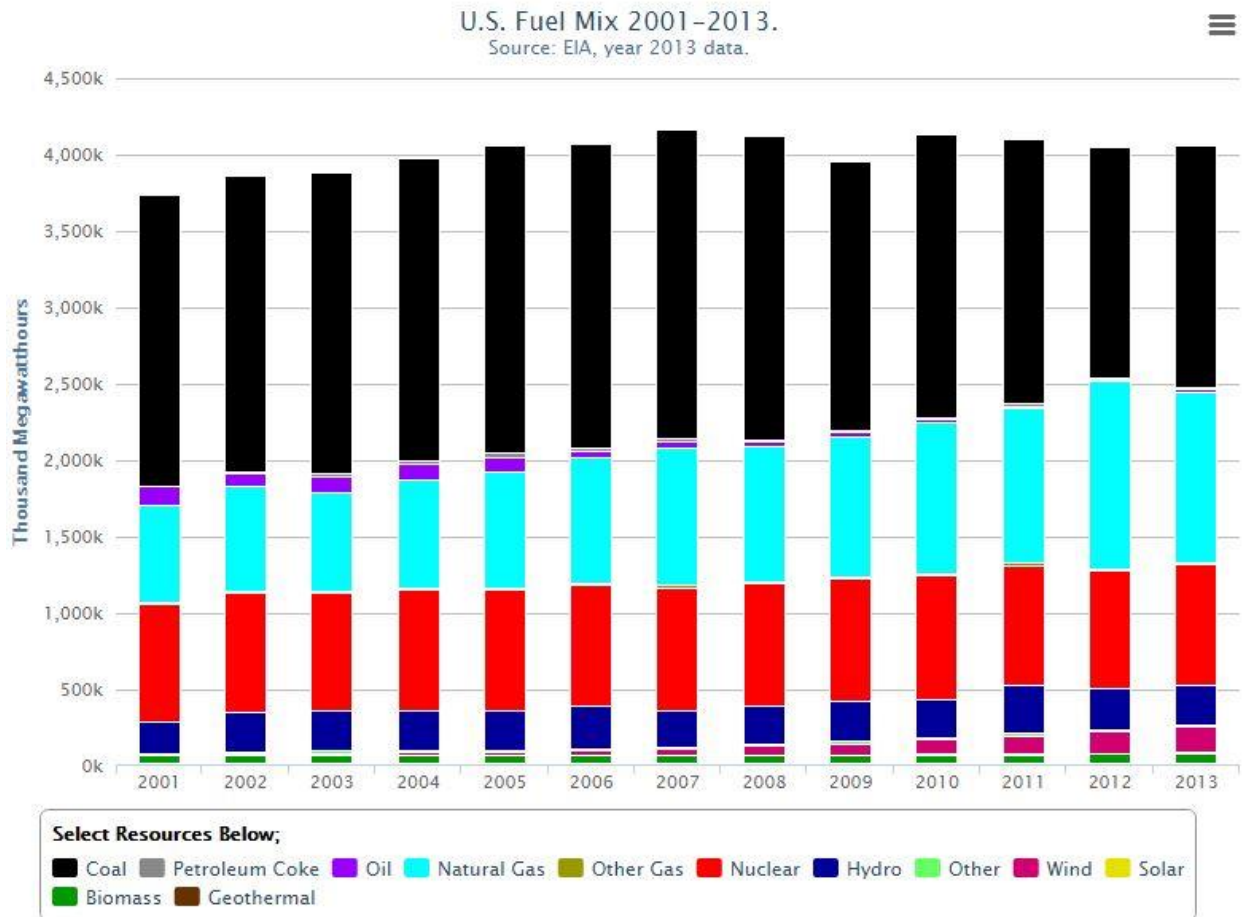
**Figure 18. Primary energy consumption by fuel in the Reference case, 1980-2040 (quadrillion Btu)**



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economic dependency on fossil fuels and our ghg emissions, it is important to diversify our sources of electricity by using renewable energy.

## Colorado and Renewable Energy



The following is from the 2014 Colorado State Energy Report:

### Traditional Energy:

“Fossil energy production is the bedrock of Colorado’s energy industry. With vast reserves of natural gas, oil and coal, Colorado saw an 89 percent increase in crude oil production and a 38 percent increase in marketed natural gas production from 2007-2012. These increases were largely due to advancements in unconventional extraction and production methods. In 2012, oil and natural gas extraction in Colorado produced more than \$12 billion in revenue, and created more than 35,000 new jobs from 2003-2013. Natural gas accounted for more than 20 percent of the total electricity generation in the state in 2012. Related sectors, such as petroleum refining, drilling, and natural

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gas distribution, produced billions more in revenue and tens of thousands of additional jobs. Additionally, Colorado has the largest reserve of coalbed methane in the nation, which contributes more than 40 percent of the state's total natural gas production. In 2013, 63 percent of Colorado's electricity came from coal. More than 50 percent of the coal produced in the state is exported, bringing in approximately \$1.3 billion in revenue from coal mining in 2012."

## Renewable Energy:

"Wind, solar, biomass, geothermal, small hydroelectric, and other renewable energy resources have been increasing in Colorado for the last decade, with substantial increases being due to Colorado's voter-led renewable energy standard and subsequent legislative expansions. Investor-owned electric utilities must provide 30 percent, and electric cooperatives 20 percent, of their generation from renewable energy resources by 2020. Wind is the largest source of renewable energy in the state and is rapidly growing. In 2013, wind provided 13.8 percent of Colorado's electricity. The Carousel Wind Farm in Kit Carson County brought 150MW of wind energy to Tri-State Generation and Transmission, providing new economic development and lowering the long-term costs of electricity in rural Colorado. Additionally, Colorado has become a hub for wind manufacturing, boasting nearly 4,000 jobs in 2013, and ranking 5th in the nation for wind energy-related jobs. Solar energy is also a rapidly growing sector in Colorado and has created new opportunities in electricity generation, R&D and manufacturing. Colorado's solar energy sector supported 328 companies and 3,600 jobs in 2013, making the state 9th in the nation for solar jobs, with the expectation for significant future growth.

"Other renewable resources, such as geothermal, small hydroelectricity, and biomass, have high potential in Colorado. Colorado ranks 4th among western states in the number of potential sites for geothermal power generation and has an estimated generational potential of 20MW. The town of Pagosa Springs is exploring the potential for Colorado's first geothermal power plant. Existing hydropower facilities have a total capacity of 1162 MW, with the potential for new opportunities through increased efficiency and investment in agricultural low-head hydro projects. Increased opportunities for biomass energy development and reduced forest fire risk come as millions of acres of Colorado's forests are impacted by pine and spruce beetle infestation."

## Green Pricing Utilities Programs

The following is a list of Green Pricing Utilities Programs in Colorado by provider:

### Colorado Springs Utilities

- Renewable Energy Certificates Program
- Green Power

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## Holy Cross Energy

- Local Renewable Energy Pool
- Wind Power Pioneers

## Platte River Authorities

- Nature's Energy

## Tri-State Generation and Transmission

- Green Power Program

## Xcel Energy

- WindSource
- Renewable Energy Trust

## Yampa Valley Electric Association

- Green Power Options

