

Global Renewable Energy Leaders in 2023

Arisara Therdthianwong Quanyu Qian Dhruv Kaushal Gal

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Executive summary

This report investigates the top 10 countries with the highest renewable energy share in 2023 and global trends in energy transitions. It further analyzes the sources of renewable energy in the leading country. The analysis is conducted using reliable data from Our World in Data. Among these countries, Norway stands out as a global leader with 72.09% of its primary energy coming from renewable sources. The findings offer valuable insight to effectively implement national approaches that could transform sustainable energy transitions worldwide.

Introduction

The global energy landscape has transformed rapidly in the last few decades. Many countries are undergoing a major shift toward adopting renewable sources such as hydropower, wind, and solar in response to the challenges of climate change and resource sustainability. Renewable energy now plays an important role as an alternative source that helps to reduce reliance on fossil fuels and mitigate greenhouse gas emissions.

Throughout the report, global renewable energy trends are identified, with a focus on the top 10 countries with highest proportion of renewable energy in total energy consumption in 2023. Norway leads the way, with roughly 72% of primary energy sourced from renewable. Sweden and Brazil are also undergoing significant transitions, with 53.9% and 50.3% renewable shares, respectively.

A deeper analysis on Norway has been conducted to better understand how a developed country manages its energy infrastructure achieving a high level of renewable integration. Understanding these factors behind Norway's performance can be beneficial for planning and improving renewable energy policies and strategies that could be adapted to different regional and national contexts. This analysis aims to provide a useful insight that can guide future energy transitions globally.

Methodology

To identify the global leaders in renewable energy share, we used the publicly available dataset from Our World in Data, which includes annual records of renewable energy share by country from 1965 to 2023.

We filtered the dataset to focus exclusively on 2023 and excluded aggregated regions (e.g., World, Europe, Asia), allowing us to rank individual countries by their share of primary energy from renewables.

Table 1 lists the top 10 countries with the highest renewable energy share in 2023, and Figure 1 presents a bar chart for direct visual comparison.

To understand why Norway ranks highest globally, we analyzed its national renewable energy composition using a second dataset on electricity generation by source. We examined hydropower, wind, solar, and bioenergy to assess their respective contributions. This breakdown (Table 2 and Figure 2) shows Norway’s strong dependence on hydropower, which contributes over 90% of its renewable electricity output.

To complement Norway’s national breakdown, we further compared its hydropower generation to other global producers. Although Norway relies heavily on hydropower as a share of its energy mix, Figure 3 reveals that its total generation is also globally significant—enabling a clearer comparison between scale and proportion in renewable leadership.

Top 10 Countries by Renewable Energy Share in 2023

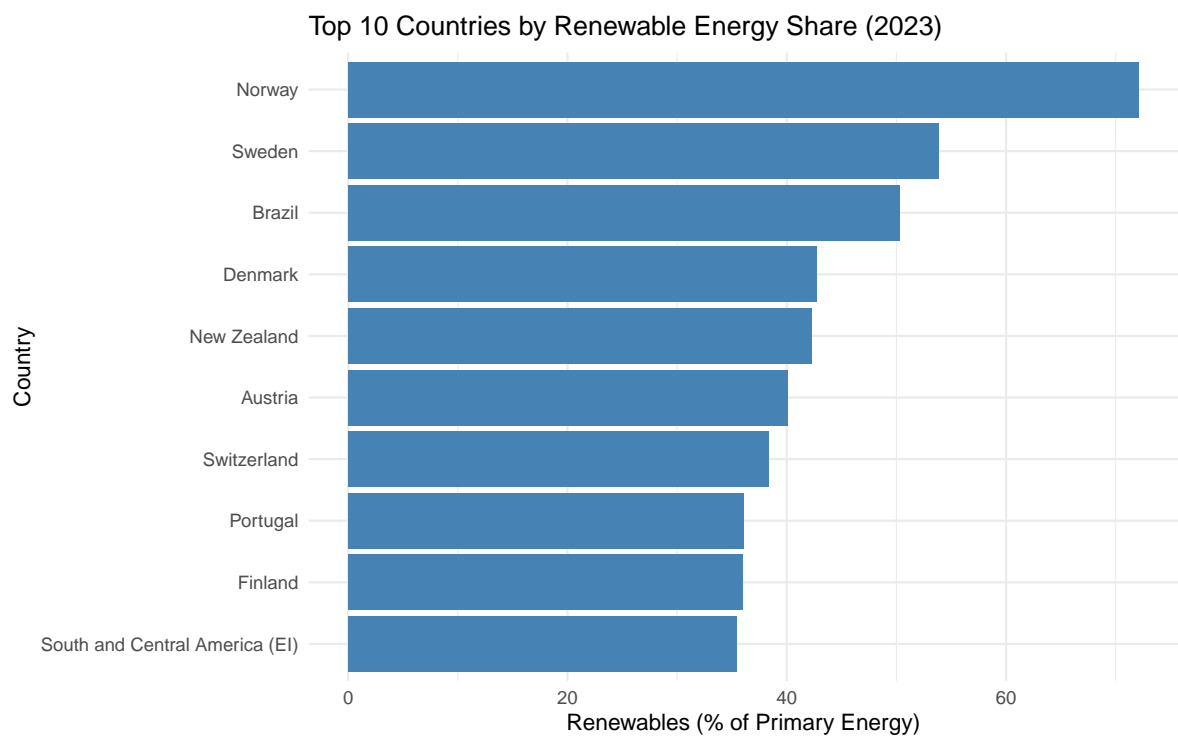
We filtered the dataset to include only the year 2023. The processed data identifies the top 10 countries with the highest share of renewable energy.

Table 1 lists these countries; Figure 1 visualizes the comparison.

Table 1: Top 10 Countries by Share of Renewable Energy in 2023

Country	Code	Year	Renewables (%)
Norway	NOR	2023	72.09110
Sweden	SWE	2023	53.89018
Brazil	BRA	2023	50.33141
Denmark	DNK	2023	42.73486
New Zealand	NZL	2023	42.26695
Austria	AUT	2023	40.08019
Switzerland	CHE	2023	38.32534
Portugal	PRT	2023	36.04341
Finland	FIN	2023	35.93626

Figure 1: Top 10 Countries by Renewable Share in 2023



Which country leads in renewable energy share in 2023?

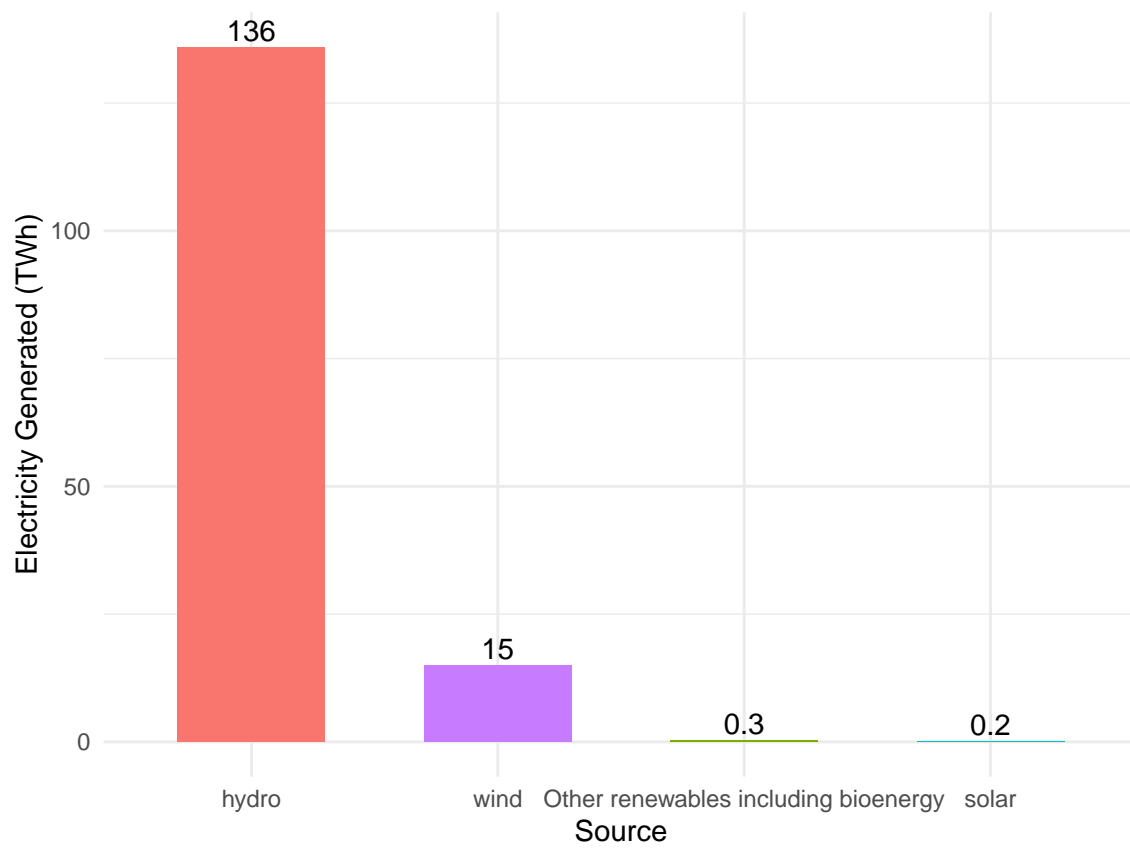
Norway ranked first in 2023 by renewable energy share.

To explore why Norway ranked first, we filtered its national records to analyze its renewable energy sources.

Table 2: Norway’s Renewable Electricity Generation by Source in 2023 (TWh)

Source	TWh
wind	14.96
hydro	135.96
solar	0.17
Other renewables including bioenergy	0.26

Figure 2: Breakdown of Norway's Renewable Energy Generation in 2023



As shown in Figure 2, Norway's renewable electricity in 2023 is dominated by hydropower, which accounts for approximately 136 TWh, making up more than 90% of its total renewable output. In comparison, wind energy contributed around 15 TWh, which is only about 10% of the total. Both solar energy and other renewables including bioenergy made negligible contributions, with values of 0.17 TWh and 0.26 TWh, respectively.

The limited output from wind and solar indicates that while Norway has made some effort to diversify, its renewable success is not based on technological breadth, but rather on natural geographic advantages.

This clear energy profile lays the foundation for further analysis in the Results section, where we explore the historical, policy, and environmental factors that have enabled Norway's exceptional performance in renewable integration.

Why Norway ranks highest globally in renewable energy share?

To further explain why Norway ranks highest globally in renewable energy share, we compare its energy source composition with that of other top-performing countries.

Figure 3: Global Hydropower Generation (TWh) in 2023 by Country

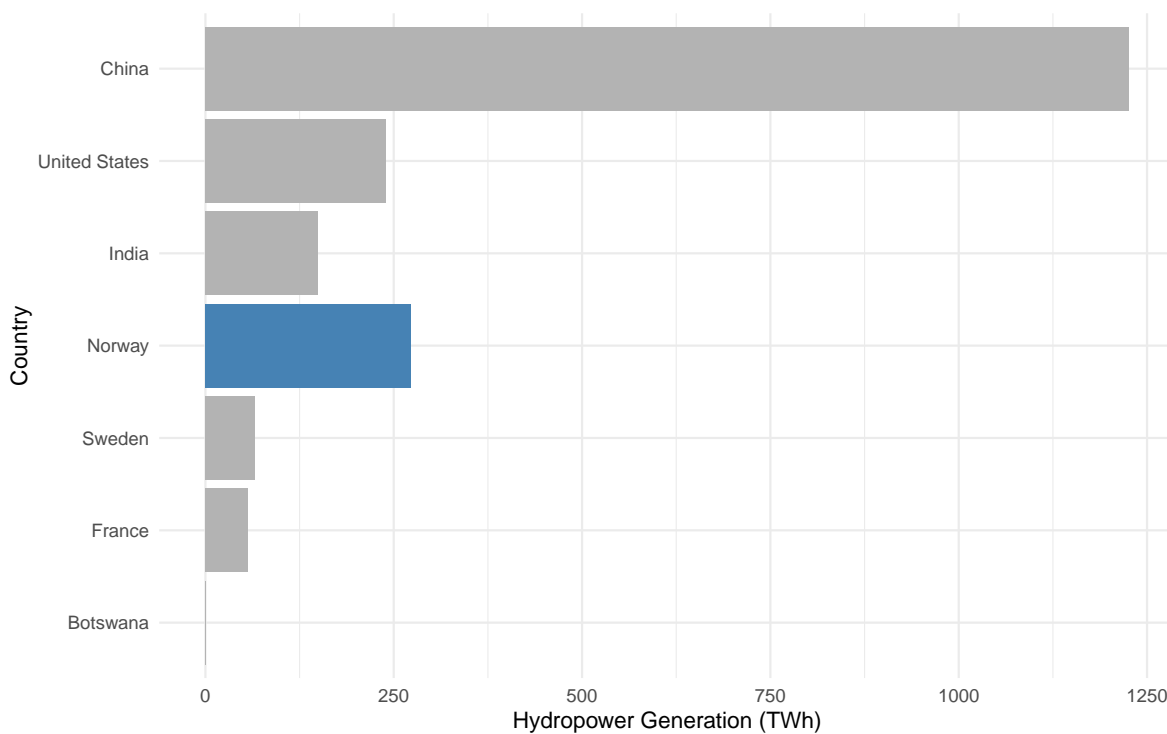


Figure 3 compares total hydropower generation in 2023 across selected countries. While China leads with over 1,200 TWh, Norway still ranks among the global top producers with approximately 270 TWh — despite its relatively small population and geographic size. This reinforces the idea that Norway’s dominance in renewable energy share is not just a percentage artifact, but supported by substantial hydropower infrastructure and generation capacity. Norway’s natural topography has enabled it to produce a significant amount of clean energy with low variability.