



RENEWABLES NOW

24/7: Meeting Energy Demand With Renewables

The smarter E Europe

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WE DRIVE THE SHIFT TO RENEWABLES – NOW!

We are the **only global policy network** of renewable energy actors from science, academia, NGOs, governments, and industry.

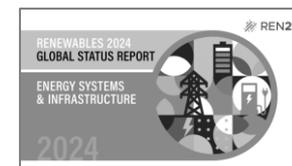
Our community of more than **4,000 experts** co-operates collecting information, changing norms and debating.



We build upon a **decentralised intelligence**, ensuring high responsiveness to an everchanging environment.

Our **annual publications** are probably the world's most comprehensive, crowdsourced reports on renewables.

THE RENEWABLES 2024 GLOBAL STATUS REPORT (GSR) COLLECTION



Energy Supply

- Global Trends, Policy and Investment
- Market Trends by Technology
- Challenges and Opportunities

Upcoming Modules

- Energy Systems and Infrastructure for Renewables (July 2024)
- Economic and Social Value Creation with Renewables (September 2024)

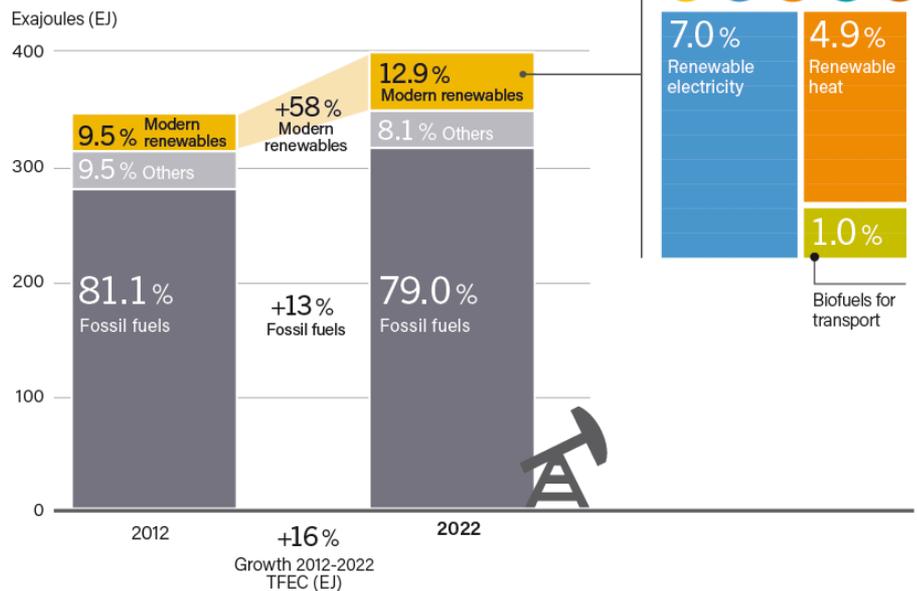


FRAMING THE ENERGY TRANSITION

WE ARE BURNING MORE FOSSIL FUELS THAN EVER



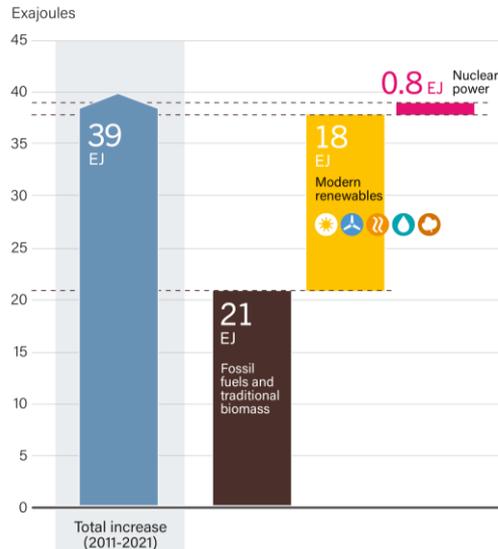
Total Final Energy Consumption by Source, 2012 and 2022



RENEWABLES RISING, BUT...

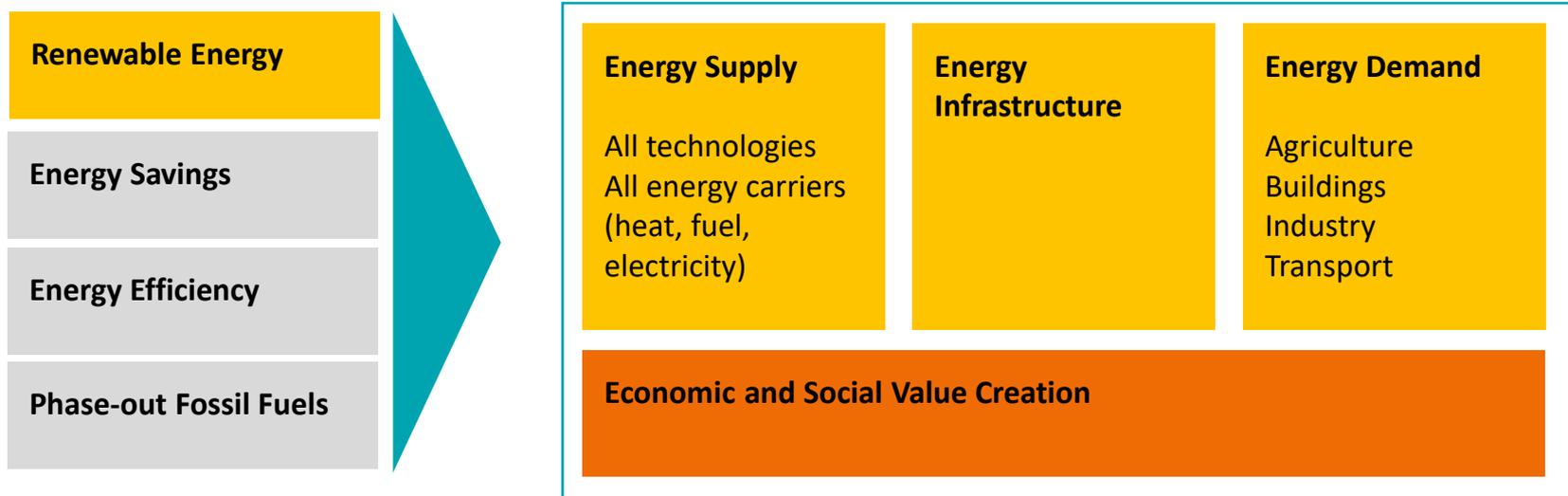
INCREASING ENERGY DEMAND MOSTLY BEING MET WITH FOSSIL FUELS

 Increase in Energy Demand by Source, 2011-2021



Only 45% of the increase in energy demand between 2011 and 2021 was met by **renewables**.

THE ENERGY TRANSITION IS MORE THAN A FUEL SWITCH





RENEWABLES IN ENERGY SUPPLY

THE 2023 MOMENTUM FOR RENEWABLES



Energy security concerns and **industrial strategies** are helping to boost renewables.

Trade and industrial policies support renewables. The EU, for instance, proposed the Net-Zero Industry Act.

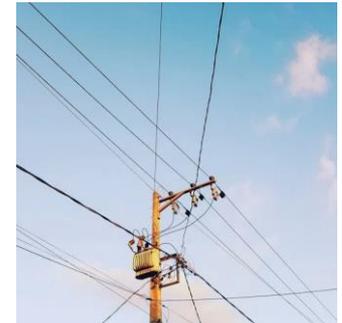
In 2023, global additions to **renewable power capacity increased an estimated 54%** in 2023 to reach 536 GW.

Employment in the renewables sector increased 8% in 2022 to reach 13.7 million jobs.

At COP28 countries pledged to **triple renewable energy capacity and double energy efficiency** by 2030.



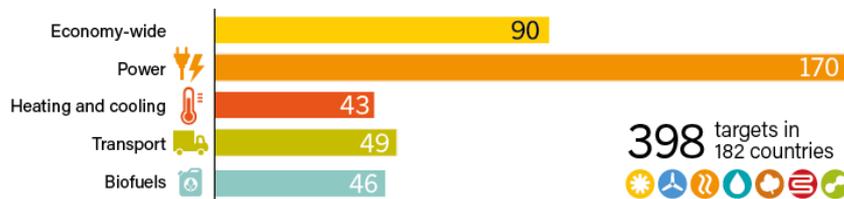
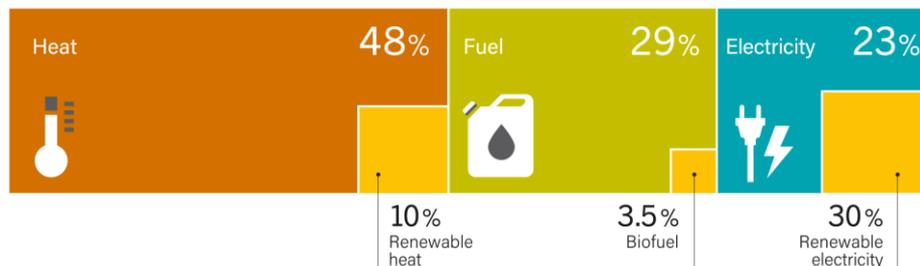
Investment in **global manufacturing** of renewable energy and enabling technologies **grew 70%** in 2023.



ENERGY IS MORE THAN JUST ELECTRICITY

RENEWABLE HEAT AND FUELS ARE NOT MATCHING THE PACE OF THE POWER SECTOR

 Total Final Energy Consumption and Share of Modern Renewables, by Energy Carrier, 2021

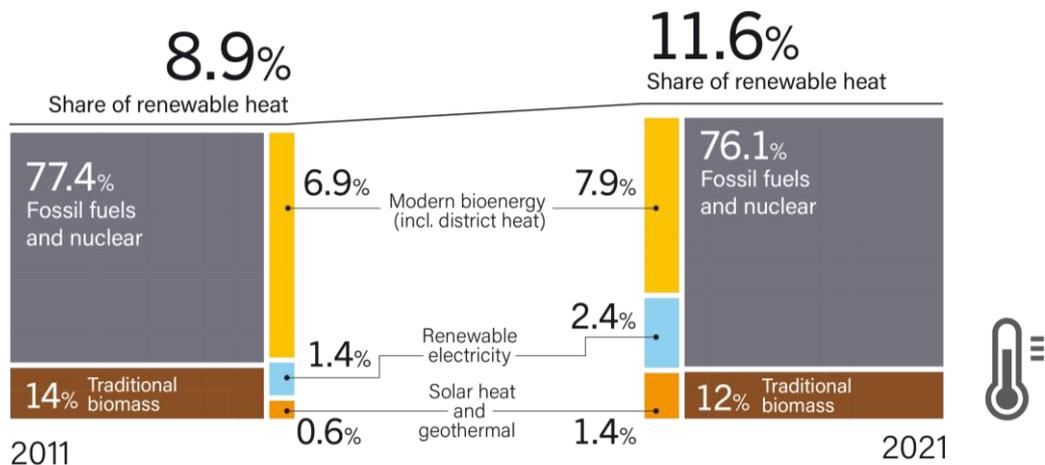


Renewables have surged in the power sector, supported by targets and policies. But **most countries still lack dedicated measures for heat and fuels.**

SLOW GROWTH OF RENEWABLES FOR HEAT

FOSSIL FUELS AND TRADITIONAL BIOMASS CONTINUE TO DOMINATE

 Share of Renewable Heat Production by Energy Source, 2011 and 2021

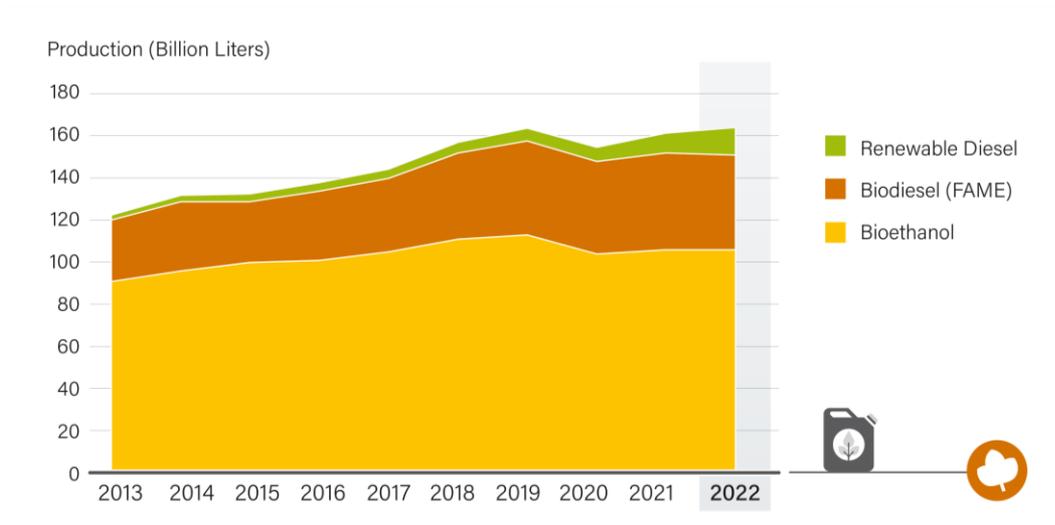


Modern bioenergy supplied 7.9% of heat in 2021, an increase of just 1 percentage point in a decade.

BIOFUELS GROWING SLOWLY

AMIDST MIXED POLICY SIGNALS AND FLUCTUATING MANDATES

 Global Production of Ethanol, Biodiesel (FAME) and Renewable Diesel, 2013-2022

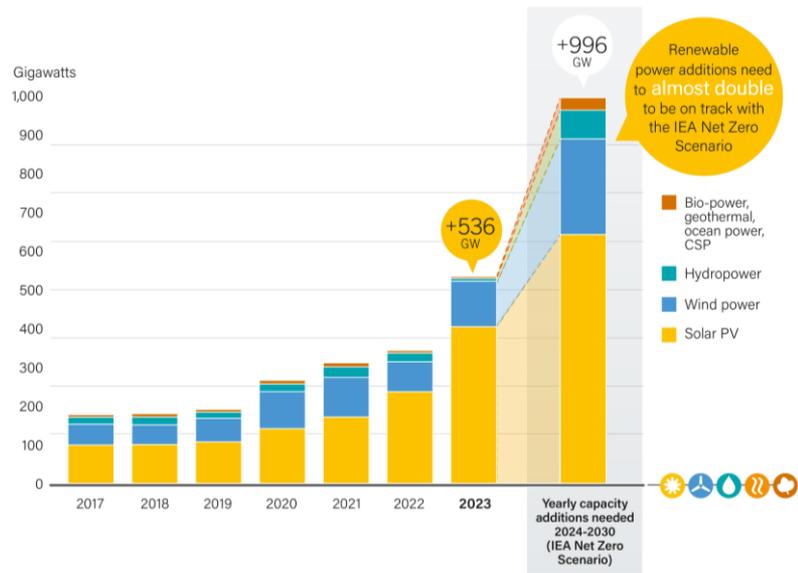


The **United States** supplied **40%** of the world's biofuels in 2022 followed by **Brazil (21%)** and **Indonesia (6.2%)**.

RECORD INCREASE IN RENEWABLE POWER CAPACITY

ANNUAL ADDITIONS STILL NEED TO RAMP UP TO MEET NET-ZERO AMBITIONS

Annual Additions of Renewable Power Capacity, by Technology, 2017-2023, and Yearly Additions Needed to Achieve the International Energy Agency's Net Zero Scenario by 2030

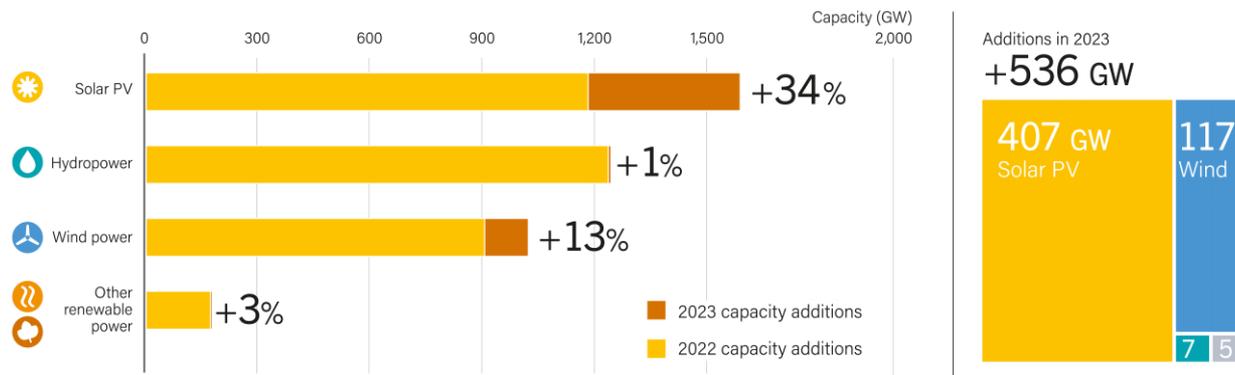


Renewable power capacity additions grew by **54%** in 2023, largely led by solar PV and wind power with **98%** of the total. Total Installed Capacity reached **4,034 GW** in 2023.

DISPARITIES AMONGST TECHNOLOGIES

SOLAR PV CAPACITY SURPASSED HYDROPOWER FOR THE FIRST TIME

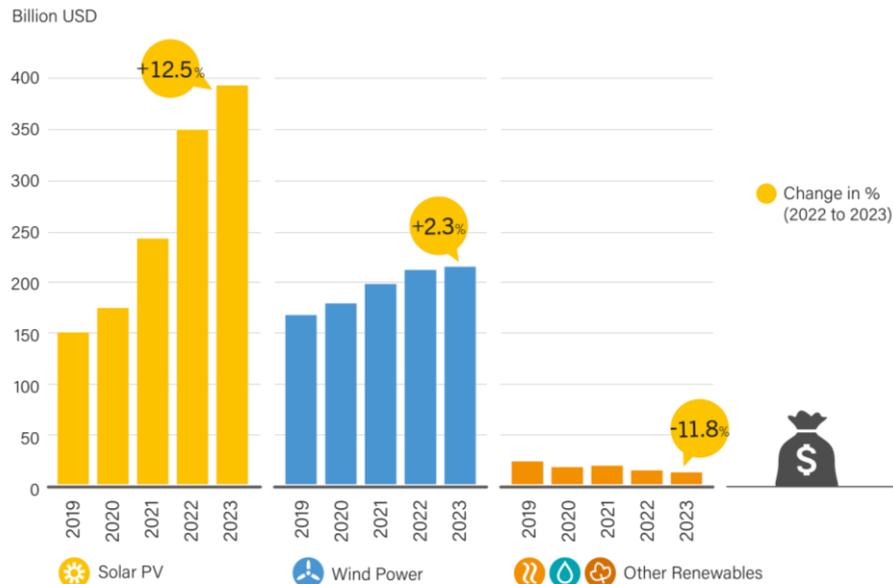
 Renewable Power Total Installed Capacity and Annual Additions, by Technology, 2023



UNEVEN INVESTMENT FLOWS ACROSS TECHNOLOGIES

URGENT NEED TO FINANCE RENEWABLE HEAT AND FUEL

 Global Investment in Renewable Power and Fuels, by Technology, 2019-2023

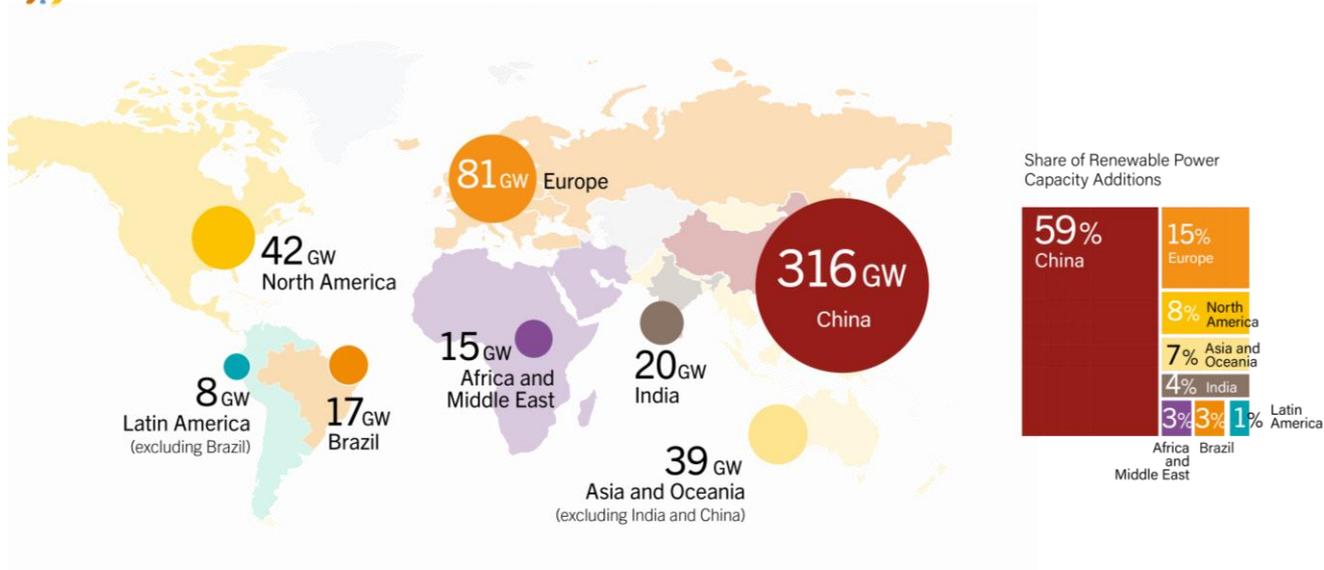


Solar PV and **wind** investment growth slowed in 2023, **geothermal** investment expanded, while investment in **bioenergy** and small **hydropower** contracted.

UNEVEN RENEWABLE CAPACITY ADDITIONS

CHINA MAINTAINING HIGH GROWTH, BUT SLOWDOWN IN MANY REGIONS

 Renewable Power Capacity Additions, by Region/Country, 2023

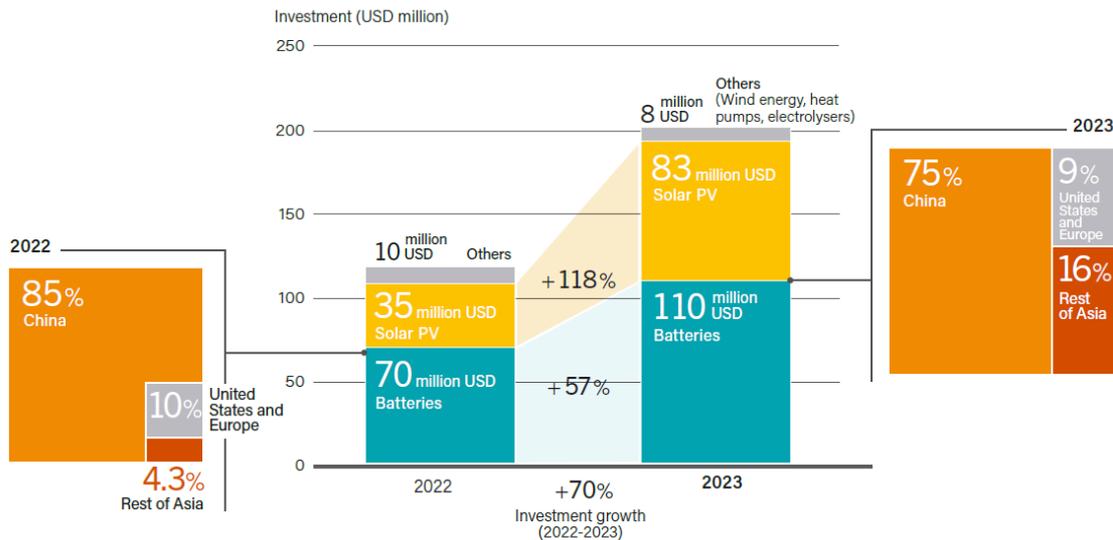


Note: Capacity may not exactly add up to 536 GW due to rounding.

China doubled capacity additions in 2023.
Europe added 11% more capacity than in 2022, but the pace is slowing.
The US rebounded with 5% growth.

BOOMING INVESTMENT IN MANUFACTURING CAPACITY BUT STILL HIGHLY CONCENTRATED IN A HANDFUL OF COUNTRIES

FIGURE 8.
Investment in Manufacturing of Renewable Energy and Enabling Technologies, 2022 and 2023



Note: Rest of Asia comprises India, Japan, the Republic of Korea and South-East Asia.

China hosted most of the investment in **wind** manufacturing. The **EU** and **US** together had a larger share of **electrolyser** and **heat pump** manufacturing than China.

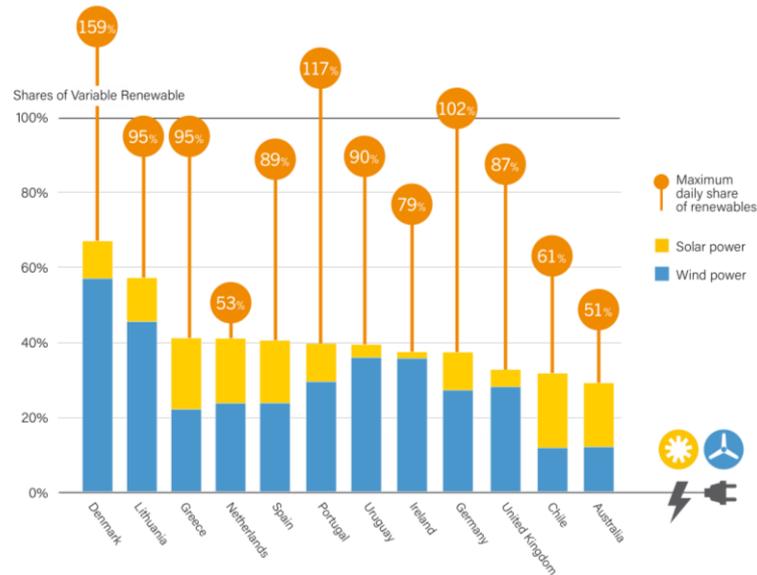


THE ENERGY TRANSITION IS MORE THAN A FUEL SWITCH

VARIABLE RENEWABLES IN ELECTRICITY GENERATION

SUCCESSFULLY INTEGRATING INCREASING SHARES

 Top Countries for Share of Variable Renewable Electricity Generation, and Maximum Daily Penetration, 2022



The **top countries** with high shares of variable renewables are mostly concentrated in **Europe**, with the notable exceptions of **Uruguay, Chile and Australia**.

GRIDS AND STORAGE

CRITICAL INFRASTRUCTURE TO ENABLE THE ENERGY TRANSITION

- **Grids** are a bottleneck
 - 1,500 GW of projects in advanced stages stalled in 2023 due to permitting and access issues
 - Investment: USD 300 billion in 2023 but not increasing; USD 4.8 trillion needed by 2030 (IRENA)
- **Battery storage** progressing
 - Investment: USD 36.3 billion in 2023, **+76.8% increase**
 - Utility-scale battery storage capacity **+65%**, reaching 29.2 GW
- **Pumped storage** slowing down
 - 6.48 GW added in 2023 – down 38% from the previous year – for a global total of 179 GW



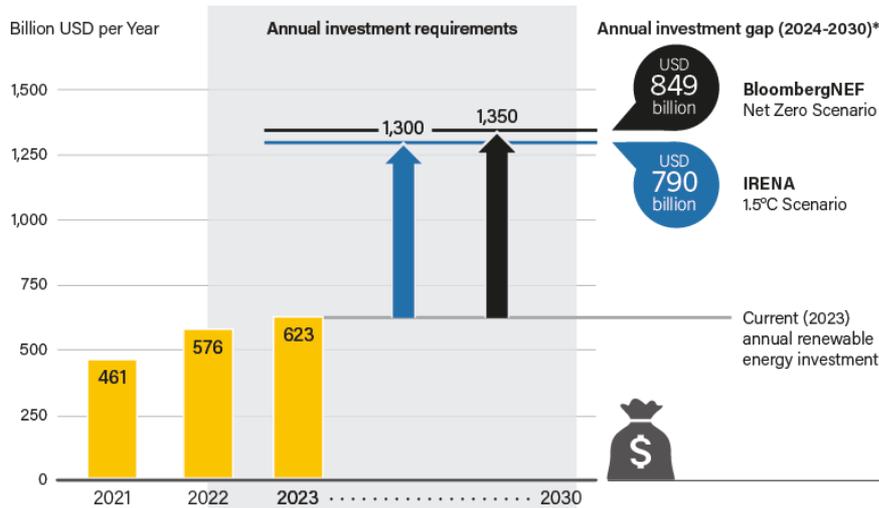


ARE WE ON TRACK FOR A RENEWABLES-BASED FUTURE?

MASSIVE INCREASE IN RENEWABLE ENERGY INVESTMENT NEEDED

AMBITIOUS ACTION NECESSARY TO CLOSE INVESTMENT GAP

Range of Annual Renewable Energy Investment Needed in Climate Change Mitigation Scenarios, Compared to Recent Investments



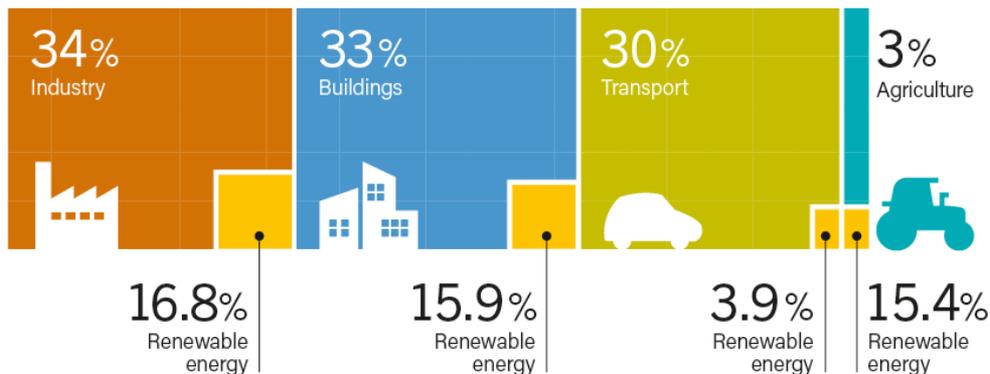
Around USD 1.3 billion needed annually to reach 2030 climate goals. Investment in 2023 was **less than half** of this figure, leaving a **USD 677-727 billion investment gap.**

Source: REN21 based on IRENA and BloombergNEF

BRIDGING SUPPLY AND DEMAND

FEW COUNTRIES HAVE COHERENT MEASURES ACROSS SECTORS

 Renewable Share of Total Final Energy Consumption, by Sector, 2021



Note: Total final energy consumption in the above figure does not account to military activity and energy use not elsewhere specified.

 REN21 RENEWABLES 2024 GLOBAL STATUS REPORT – ENERGY DEMAND

Only 13 countries have policies in place for all four demand sectors.

84 countries have no demand-side policies in place.

INTEGRATE, ACCELERATE, DIVERSIFY

- **The Winning Trio:** Renewables, energy efficiency and fossil fuel phase-out
- **Energy is not just electricity:** heat and fuels need urgent attention to replicate the renewable power success story
- **Pick up the pace:**
 - More than doubling yearly investment – from 623 to 1.3 USD billion
 - Almost doubling yearly capacity additions – from 536 GW to 996 GW
- **Integrated planning and policies:**
 - Put renewables at the heart of energy, climate, economic, industrial and trade policies
 - Connect supply with demand to build the right enabling environment
 - Integrate renewables with grids, storage and demand management through comprehensive energy planning
- **Strengthen regional supply chains and manufacturing capacity**





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