



RENEWABLES NOW

# FINDINGS: RENEWABLES 2024 GLOBAL STATUS REPORT

Energy Supply



REN21 Secretariat  
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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.

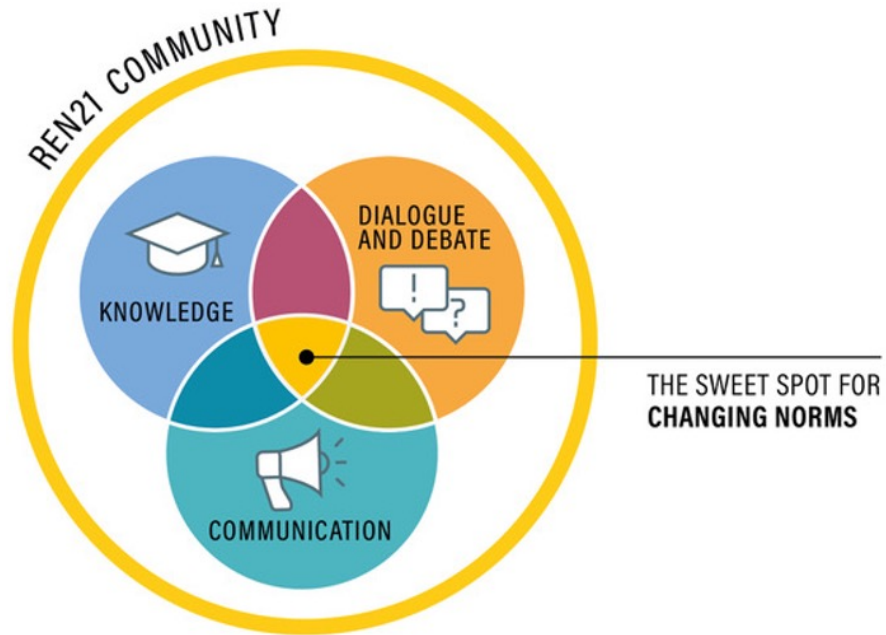
Our more than **4,000 community members** co-operate collecting information, changing norms and debating.



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

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

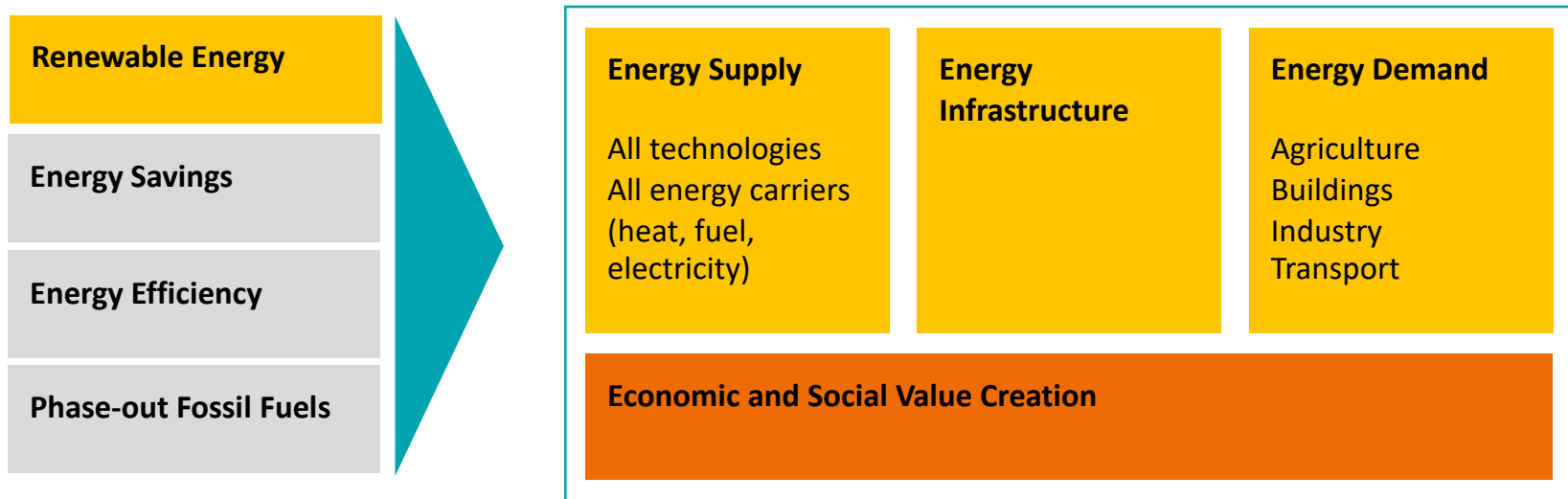
## OUR APPROACH TO DRIVE CHANGE



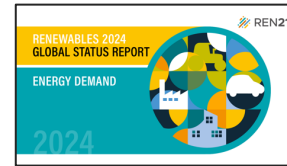
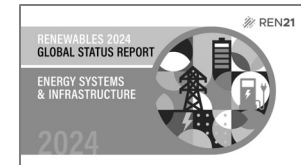
Position knowledge strategically, build on the REN21 community and their roles, **engage** with usual and unusual suspects to **change norms**.



## THE ENERGY TRANSITION IS MORE THAN A FUEL SWITCH



## 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

## MOMENTUM FOR RENEWABLES IN 2023



**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.

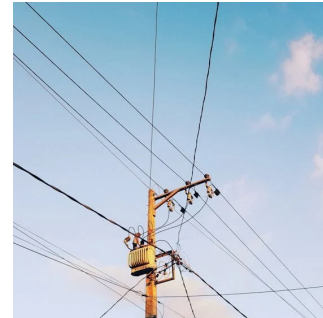
In 2023, global additions to **renewable power capacity increased an estimated 54%** to reach 536 GW.

**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.**

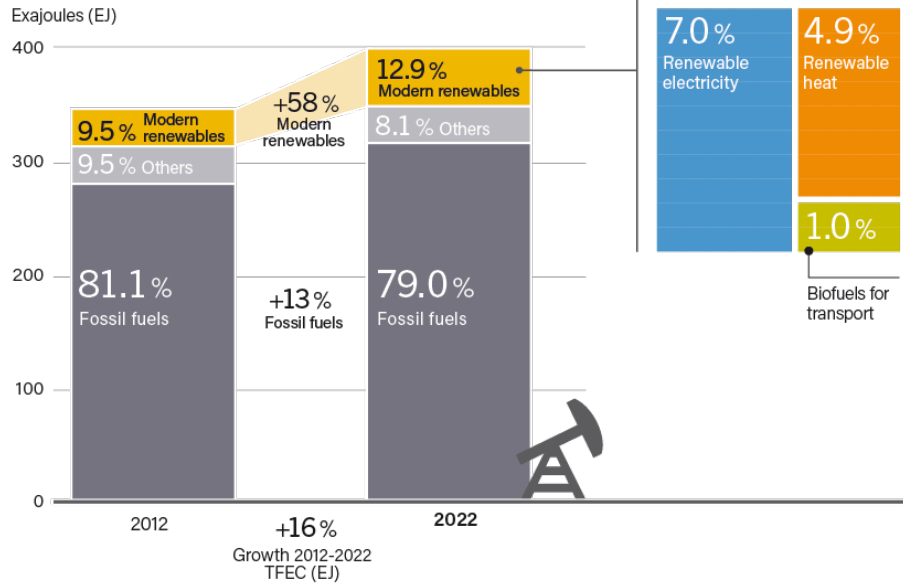


Investment in **global manufacturing** of renewable energy and enabling technologies **grew 70%** in 2023.




# WE ARE BURNING MORE FOSSIL FUELS THAN EVER

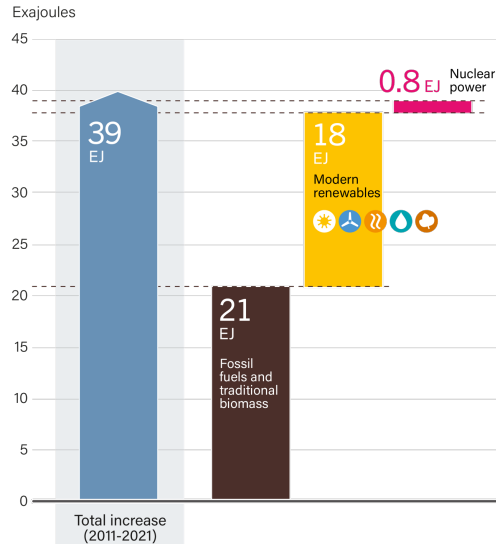
Total Final Energy Consumption by Source, 2012 and 2022



# RENEWABLES RISING, BUT...

OVER HALF OF DEMAND INCREASE MET WITH FOSSIL FUELS


 Increase in Energy Demand by Source, 2011-2021

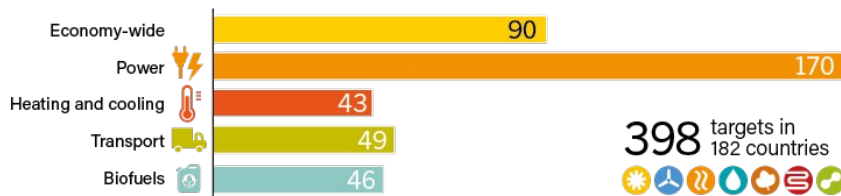
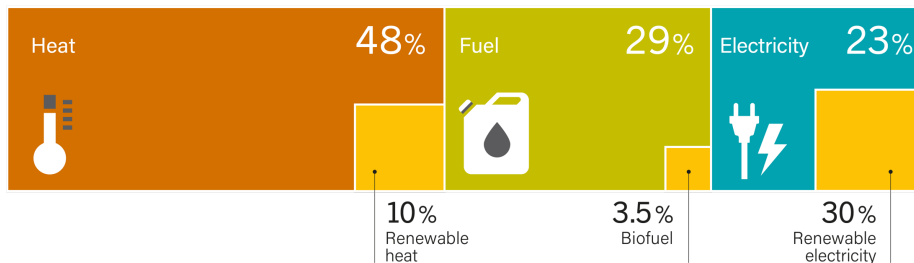


**Only 45% of the increase in energy demand between 2011 and 2021 was met by renewables.**

# 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.**



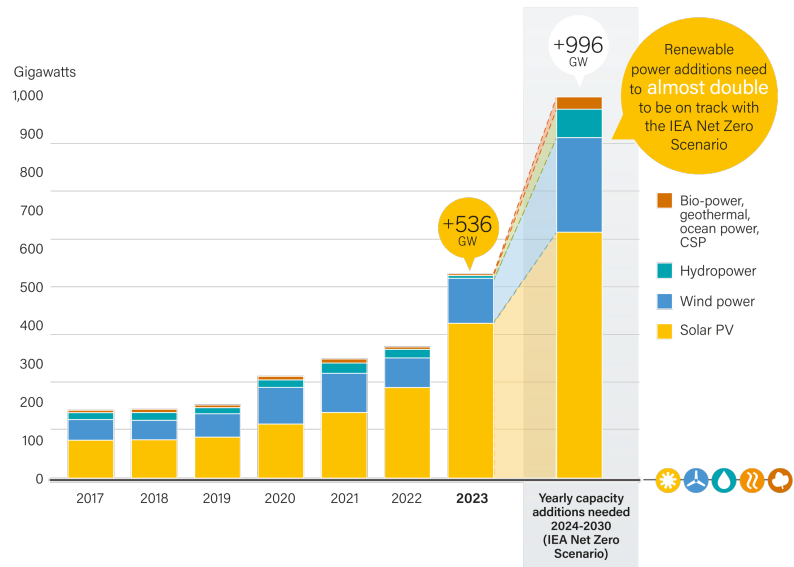
## **RENEWABLES IN POWER, HEAT & FUELS**



# 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

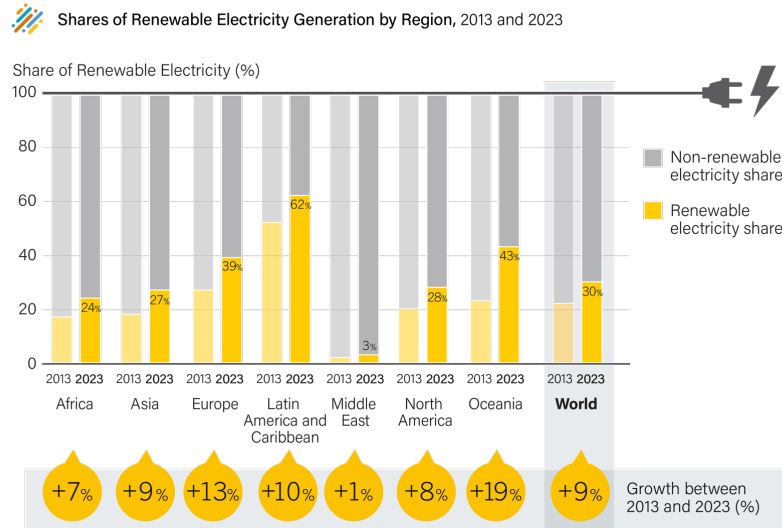


**Renewable power capacity additions grew by 54% in 2023, led by solar PV and wind power with 98% of the total.**

**Total Installed Capacity reached 4,034 GW in 2023.**

# DISPARITIES ACROSS REGIONS

SUBTITLE



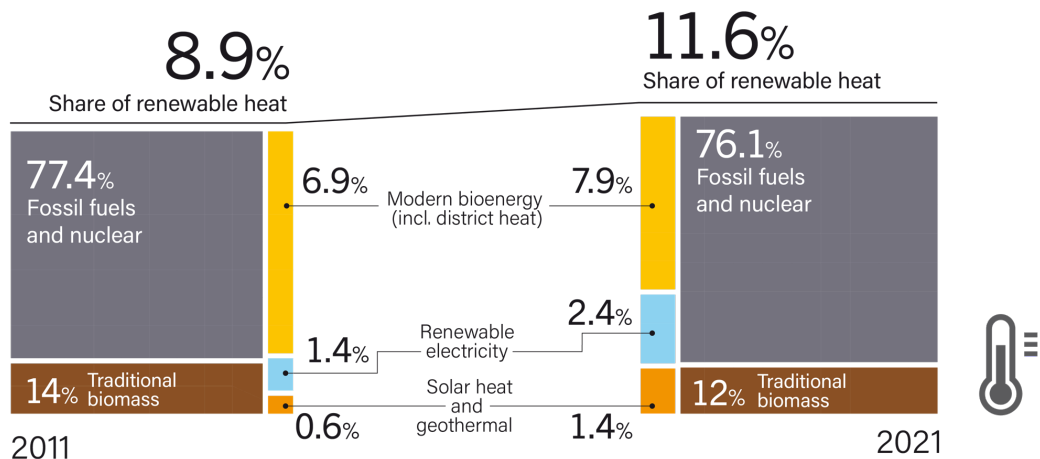
[Here](#) are the supply figures that Rana included in the Smarter E presentation

# SLOW GROWTH OF RENEWABLES FOR HEAT

FOSSIL FUELS AND TRADITIONAL BIOMASS CONTINUE TO DOMINATE




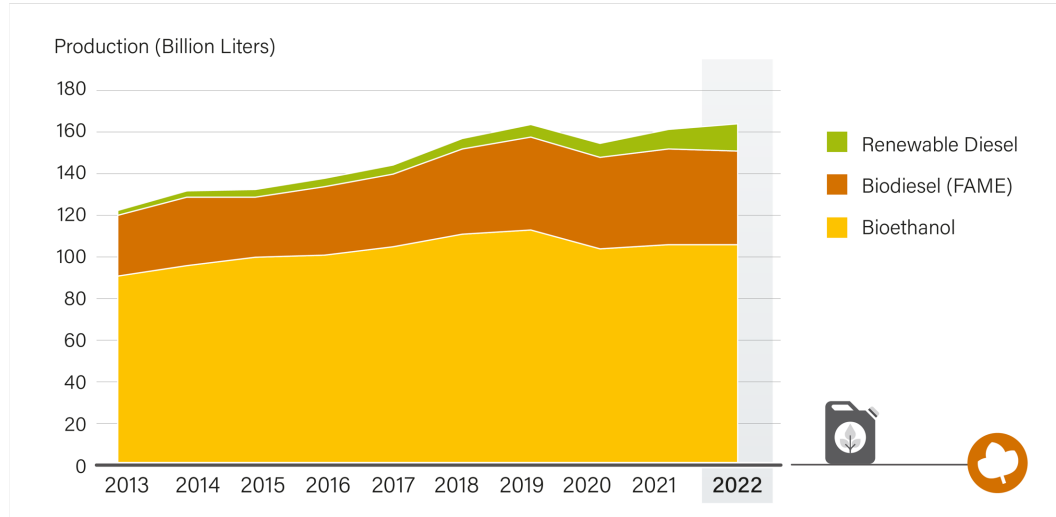
Share of Renewable Heat Production by Energy Source, 2011 and 2021



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%)**.

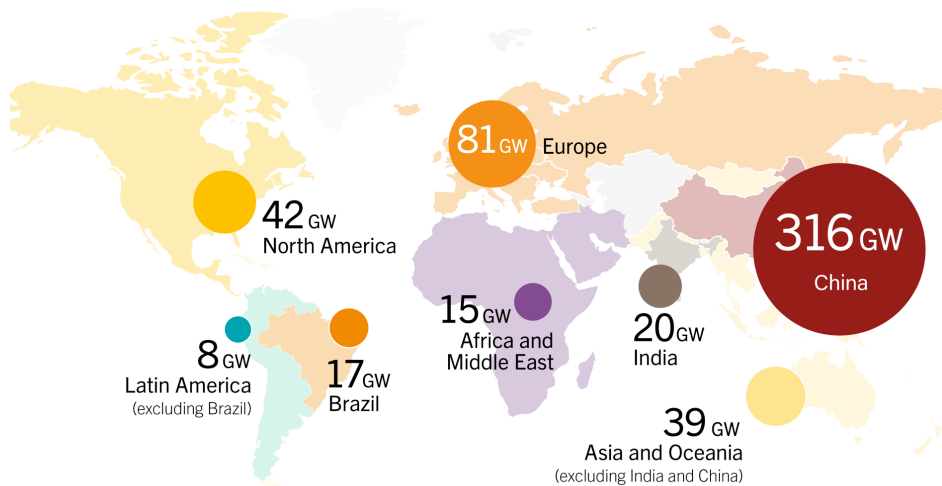


# DISPARITIES IN THE ENERGY TRANSITION

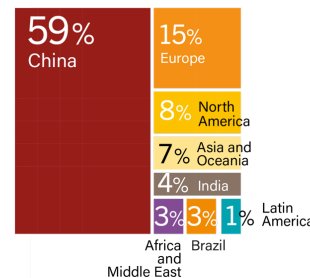
# UNEVEN RENEWABLE CAPACITY ADDITIONS

CHINA MAINTAINS HIGH GROWTH, BUT THERE IS SLOWDOWN IN MANY REGIONS

Renewable Power Capacity Additions, by Region/Country, 2023



Share of Renewable Power Capacity Additions



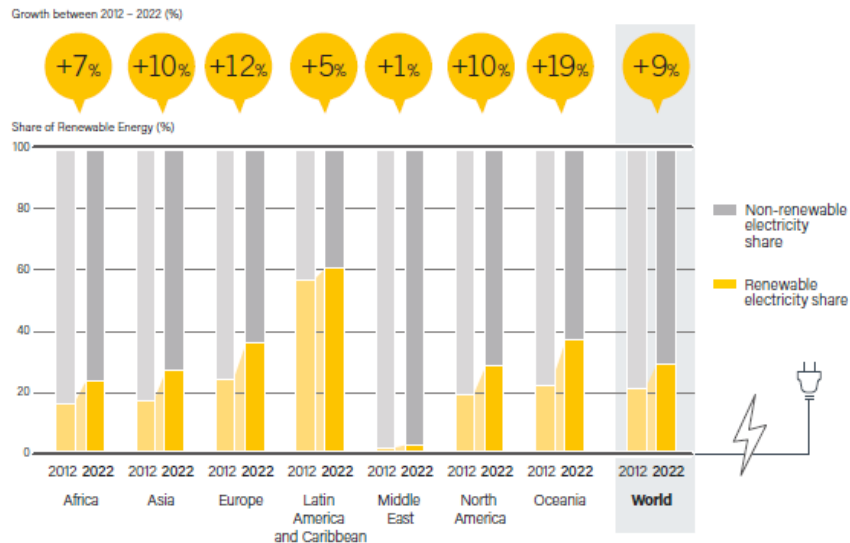
**China doubled capacity additions in 2023.**  
**Europe added 11% more capacity than in 2022, but the pace is slowing.**  
**The US rebounded with 5% growth.**

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

# RENEWABLE ELECTRICITY GENERATION

UNEVEN ACROSS GEOGRAPHIES, BUT EMERGING ECONOMIES SHOWING PROGRESS

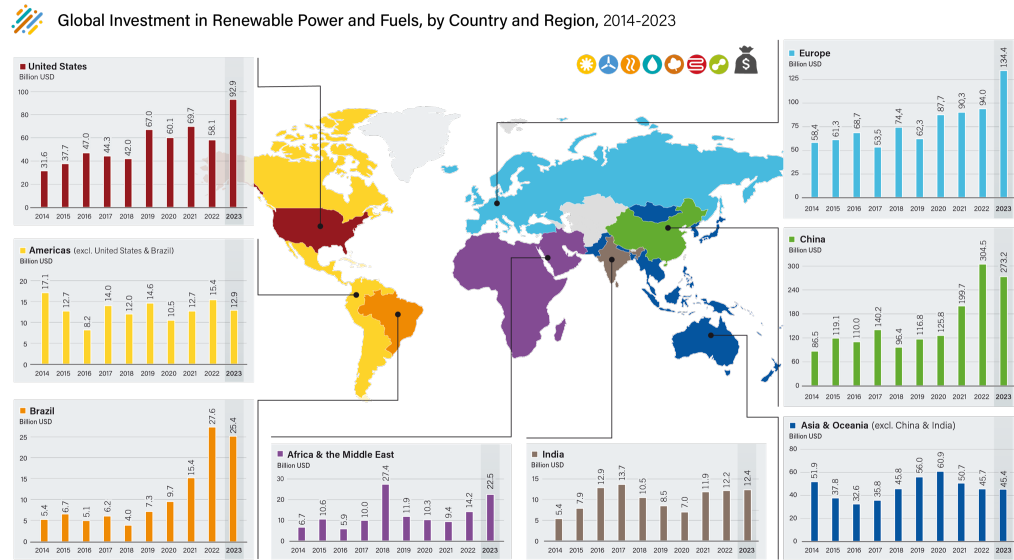
 Renewable Share of Electricity Generation, by Region, 2012 and 2022



**In 2022, Oceania had the highest year-on-year growth with 13%, followed by Asia and Africa with 11% each.**

# REGIONAL DISPARITIES IN FINANCIAL FLOWS

## INVESTMENT REMAINS INSUFFICIENT IN MANY REGIONS



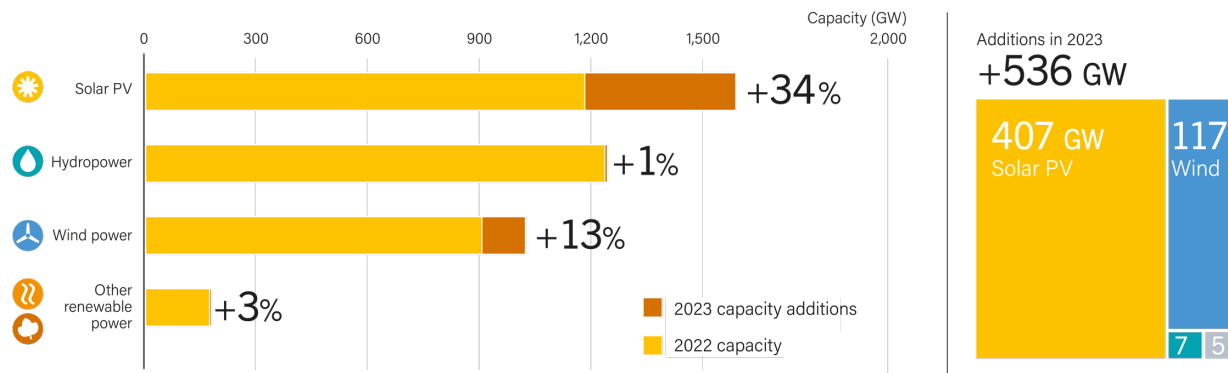
Investment continues to trend upwards in the US, Europe, and China; but **low and inconsistent investment** in the rest of Asia the Americas, Africa and the Middle East.



# DISPARITIES AMONGST TECHNOLOGIES

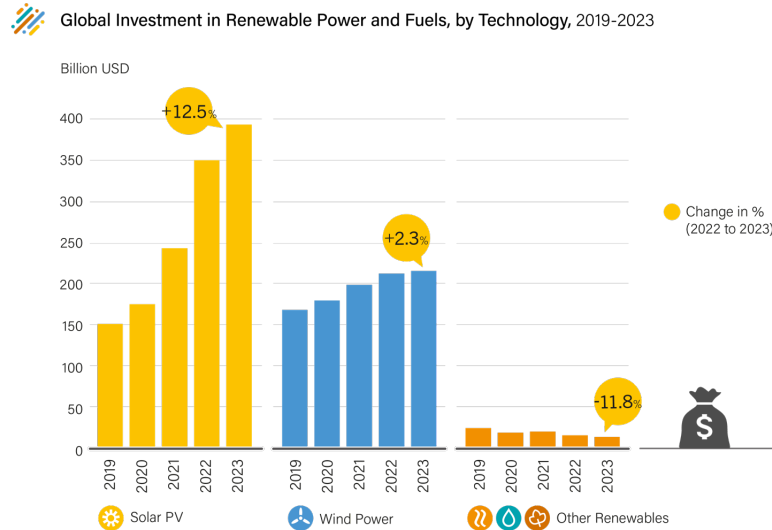
## SOLAR PV AND WIND GROWING FASTER THAN OTHER TECHNOLOGIES

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



# DISPARITIES AMONGST TECHNOLOGIES

## INVESTMENT IN SOLAR PV AND WIND ECLIPSES OTHER TECHNOLOGIES



Solar PV and wind attract the vast majority of investment. **Geothermal saw a significant increase in 2023; ocean power received record new public funding.**

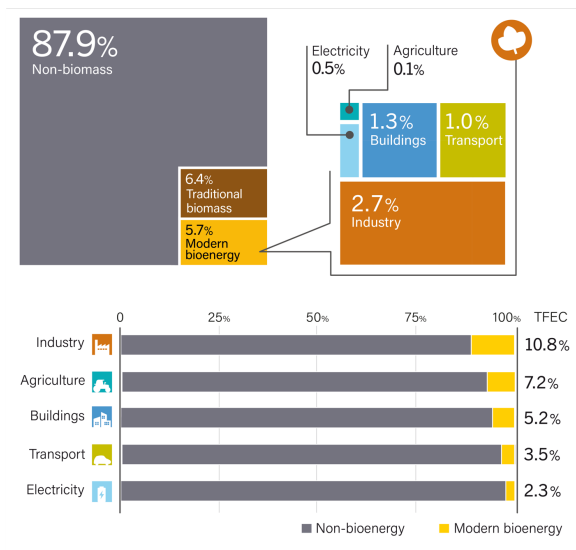


# RENEWABLE ENERGY DEPLOYMENT IN 2023

# BIOENERGY

## A VERSATILE SOLUTION FOR HEATING, FUELS AND ELECTRICITY

Share of Bioenergy in Total Final Energy Consumption (TFEC), by End-Use Sector, 2021



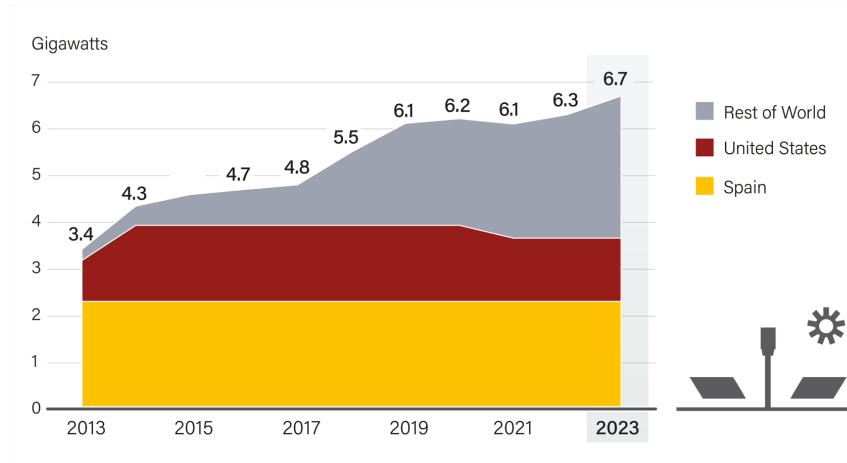
REN21 RENEWABLES 2024 GLOBAL STATUS REPORT - ENERGY SUPPLY

In 2021, **modern bioenergy** produced **1.3 EJ** of derived **heat**, as part of CHP plants or heat-only plants, a **9%** increase from 2020.

# CONCENTRATED SOLAR POWER

## SLOW GROWTH CONTINUES

 Concentrated Solar Thermal Power (CSP) Installed Capacity, by Country, 2013-2023

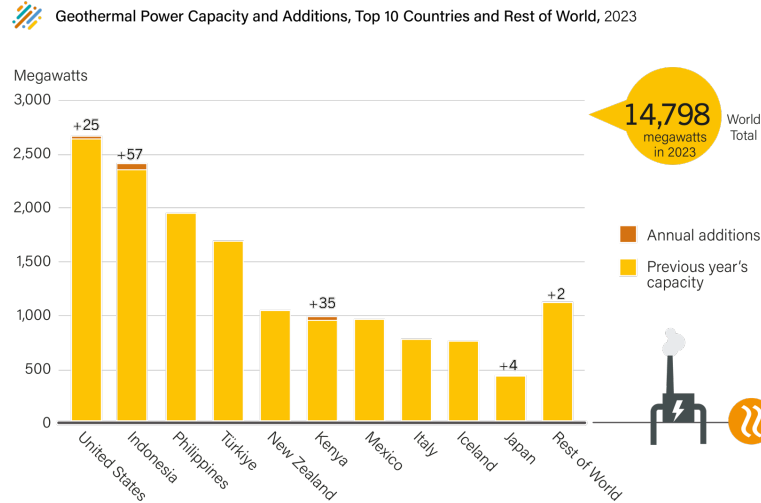


 RENEWABLES 2024 GLOBAL STATUS REPORT – ENERGY SUPPLY

The **United Arab Emirates** commissioned a **400 MW plant**, the only addition in 2023.

# GEOTHERMAL ENERGY

## SMALL POWER CAPACITY ADDITIONS IN DIVERSE COUNTRIES

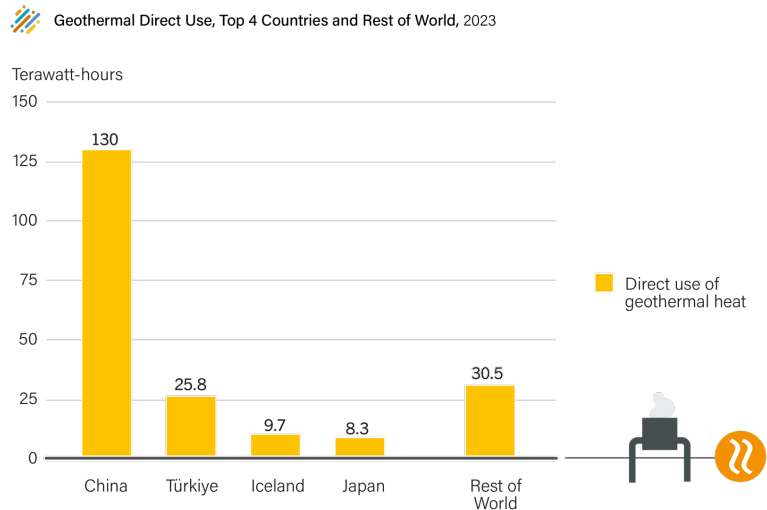


REN21 RENEWABLES 2024 GLOBAL STATUS REPORT - ENERGY SUPPLY

**US and Indonesia** leading on geothermal power generation. Capacity additions in 2023 were **below the 5-year average**.

# GEOTHERMAL ENERGY

## SMALL INCREASE IN DIRECT HEAT USE

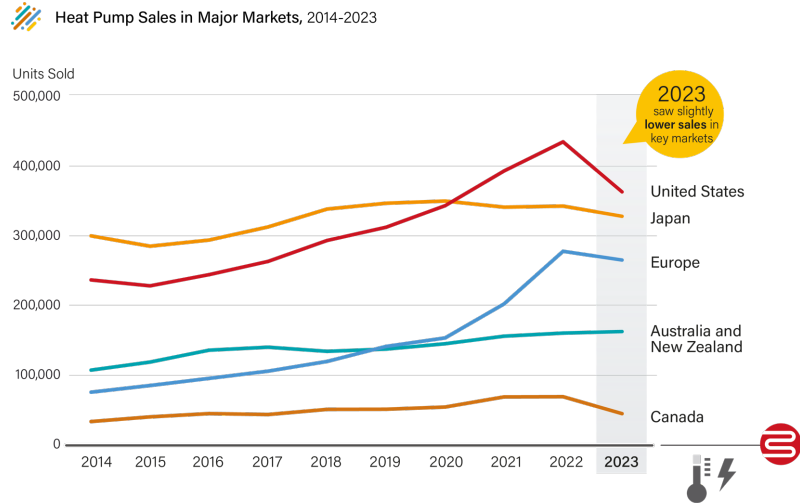


 RENEWABLES 2024 GLOBAL STATUS REPORT – ENERGY SUPPLY

**China and Türkiye** continue to lead on geothermal heat. Updated methodologies suggest **past growth has been underestimated.**

# HEAT PUMPS

KEY ENABLING TECHNOLOGY SEES STRONG SALES DESPITE SLUMP IN SOME KEY MARKETS



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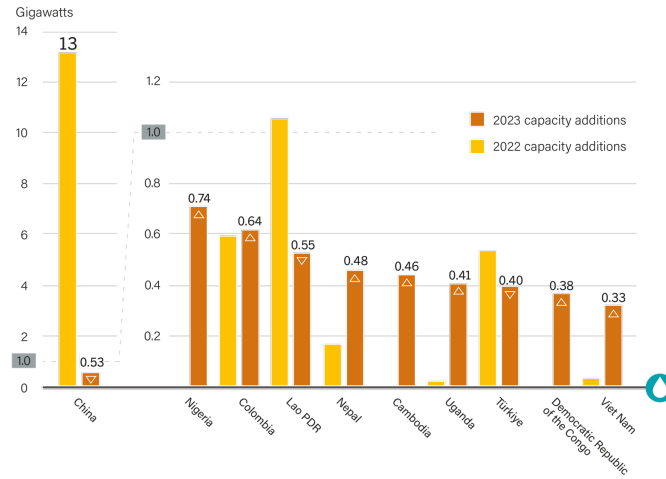
Heat pump sales slowed slightly in key markets amidst mixed policy signals and supply and installation issues. The Netherlands saw 53% market growth in 2023.



# HYDROPOWER

## SMALLER CAPACITY ADDITIONS FOLLOWING SURGE IN 2022

Top 10 Countries by Hydropower Capacity Additions in 2023 Compared to 2022 Additions




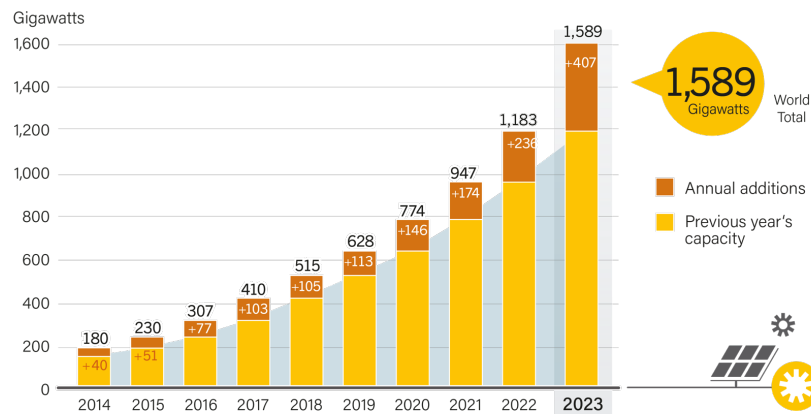
REN21 RENEWABLES 2024 GLOBAL STATUS REPORT – ENERGY SUPPLY

Hydropower capacity **grew 7.2 GW** in 2023, reaching **1,237 GW total**.  
Long project development time means high variance in yearly additions

# SOLAR PV CONTINUES TO DRIVE PROGRESS IN RENEWABLE ELECTRICITY

## RECORD CAPACITY ADDITIONS IN 2023

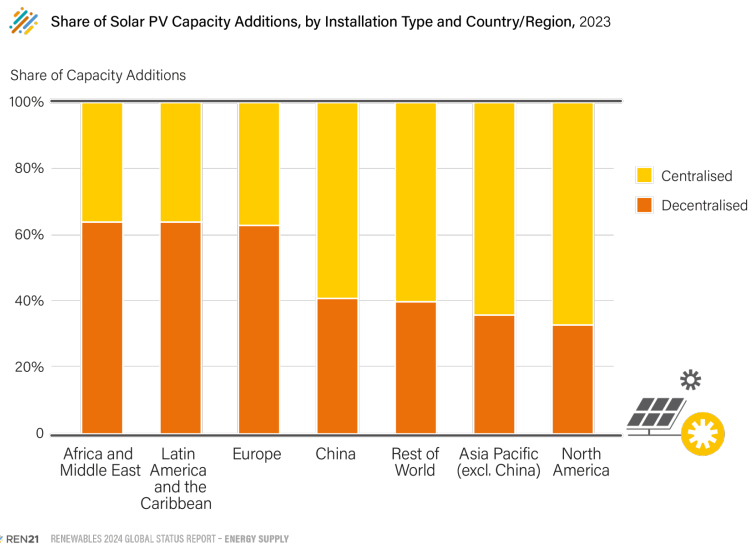
 Solar PV Global Capacity and Annual Additions, 2014-2023



Strong growth enabled by **low manufacturing costs**, increased **consumer demand** and policy-driven **incentives**.

# SOLAR PV CAPACITY ADDITIONS


## COUNTRIES CHOOSING DIFFERENT PATHS

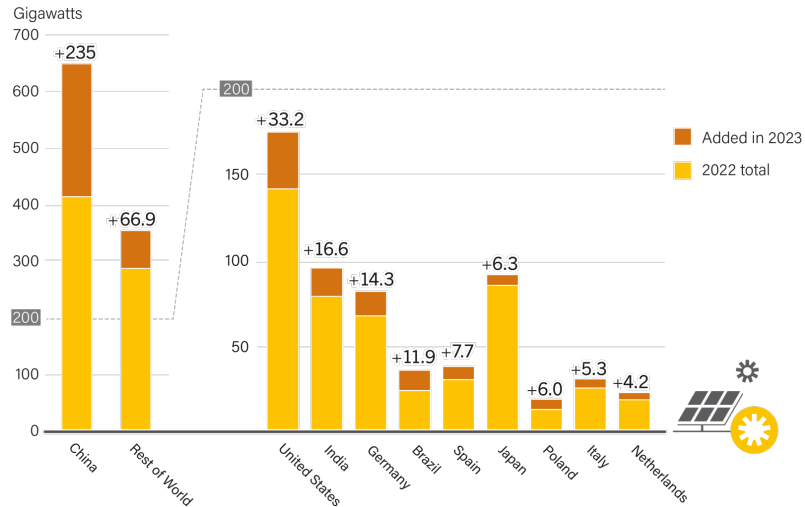


**Decentralised solar PV** accounts for over 60% of installations in Europe and some emerging markets.

# TOP COUNTRIES IN SOLAR PV ADDITIONS

## CHINA CONTINUES TO LEAD, WITH STRONG GROWTH IN THE US AND EU

 Solar PV Global Capacity Additions, Top 10 Countries and Rest of World, 2023

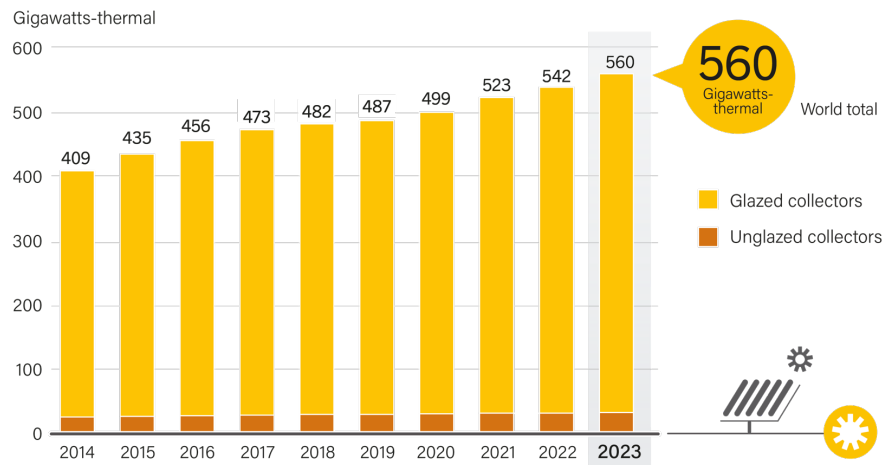


**China added over three times more capacity than the rest of the world; now accounts for 58% of global total installed solar PV capacity**

# SOLAR HEAT MARKETS SEE MIXED PROGRESS

THOUGH CONSISTENT ANNUAL GROWTH CONTINUES

 Solar Water Heating Collectors Global Capacity, by Type, 2014-2023




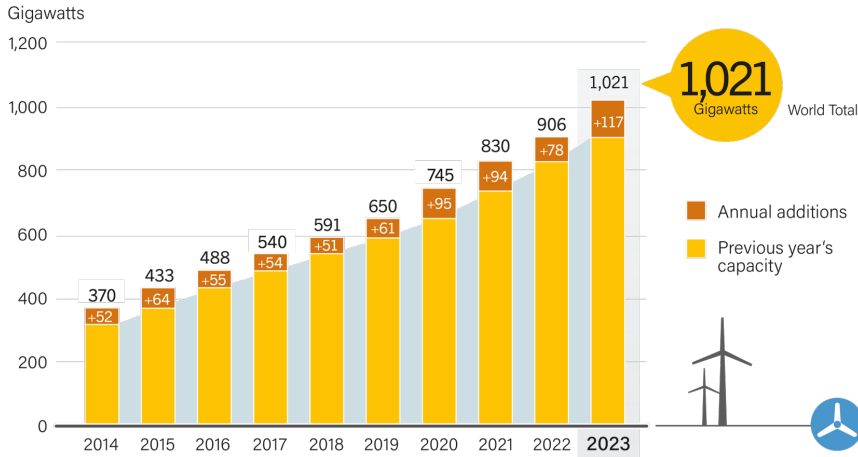
China down 8.5%, US down 33%, Germany down 46%.

India up 27%, UK up 65%.

# WIND POWER BOUNCES BACK

## TOTAL CAPACITY SURPASSES 1 TW


 Wind Power Global Capacity and Annual Additions, 2014-2023

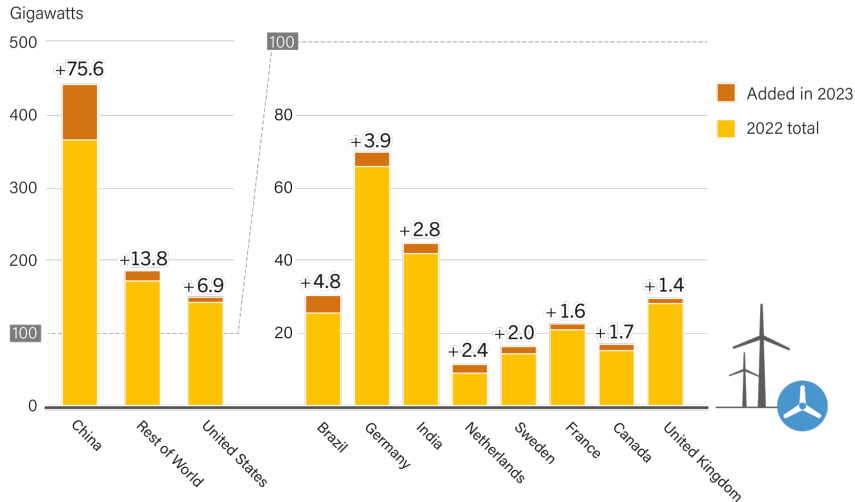


Annual additions rose **more than 50% over 2022**, with markets up in all regions except North America and Europe.

# CHINA LEADS IN WIND POWER CAPACITY ADDITIONS

## MORE THAN 50 COUNTRIES ADDED NEW WIND CAPACITY IN 2023

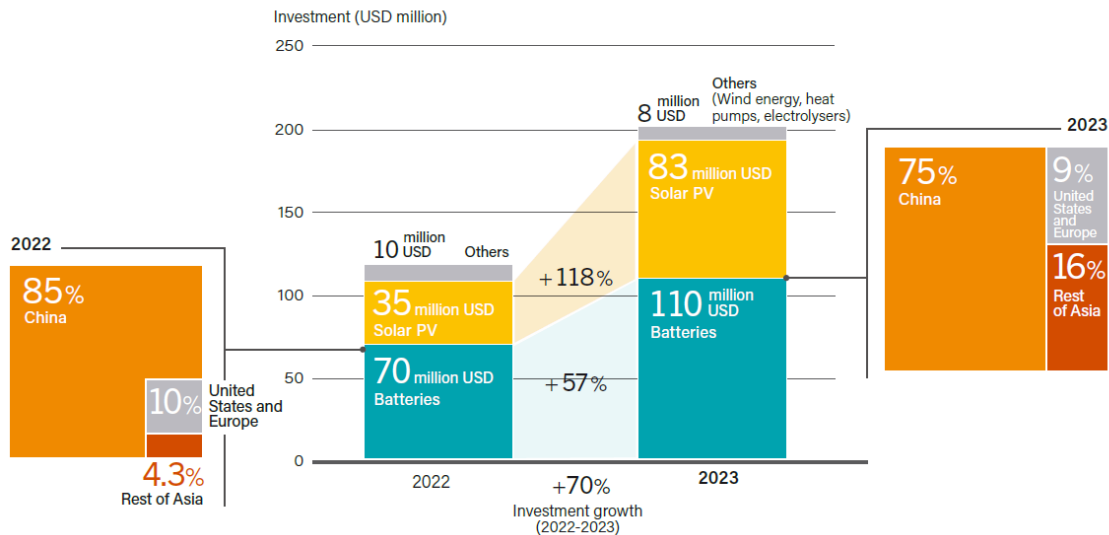
 Wind Power Capacity and Additions, Top 10 Countries and Rest of World, 2023



Asia was the largest regional market, with **70.3%** of added capacity (up from 55% in 2022), followed by **Europe** (15.2%), **North America** (7.3%) and **L.AC** (5.4%)

# 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.

**Investment in manufacturing of renewable energy and enabling technologies grew 70% in 2023, reaching USD 200 billion.**



## INTEGRATE, ACCELERATE, DIVERSIFY

### Energy is not just electricity

- Action needed to replicate the success story of power: targets, policies, technology development, investment
- Remove fossil fuel subsidies
- Accelerate the electrification of demand sectors

### Pick up the pace

- Need more than double annual investment – from 623 billion to 1.3 USD trillion
- Almost doubling yearly capacity additions – from 536 GW to 996 GW

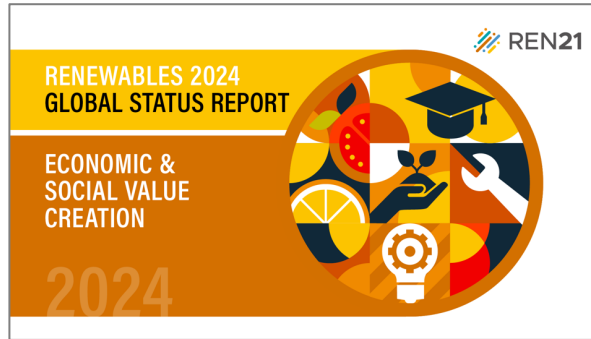
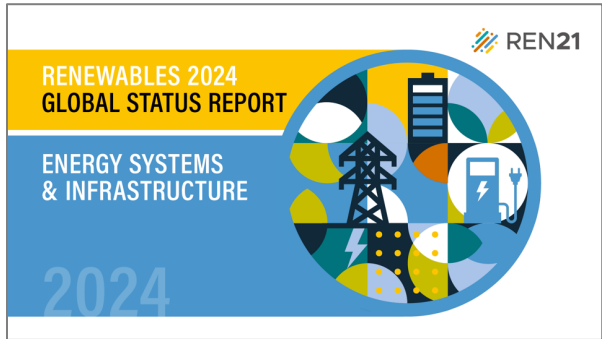
### Diversify

- Address disparities between technologies and regions
- Ensure access to technologies, finance and skilling everywhere



**THANK YOU!**

STAY TUNED FOR THE **UPCOMING MODULES**



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