
RENEWABLES NOW

What's happening in the world of renewables?

September 28th 2021

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Research Direction, Renewables Global Status Report

REN21

THE ONLY GLOBAL RENEWABLE ENERGY MULTI-STAKEHOLDER COMMUNITY

GOVERNMENTS
Afghanistan, Austria, Brazil, Denmark, Dominican Republic, Germany, India, Mexico, Norway, Republic of Korea, South Africa, Spain, UAE, USA

NGOs
CAN-I, CLASP, CCA, Club-ER, CC35, Energy Cities, EHP, FER, Global 100%RE, GFSE, Greenpeace Intl, GWNET, ICLEI, IEC, ISEP, JVE, MFC, Power for All, REEEP, REI, RGI, SCI, SLOCAT, SEforAll, WCRE, WFC, WRI, WWF

SCIENCE & ACADEMIA
AEE INTEC, CEEW, Fundacion Bariloche, Higher School of Economics (Russia), IIASA, ISES, NREL, SANEDI, TERI

INTERGOVERNMENTAL ORGANISATIONS
ADB, APERC, ECREEE, EC, GEF, IEA, IRENA, IsDB, RCREEE, UNDP, UNEP, UNIDO, World Bank

INDUSTRY ASSOCIATIONS
ACORE, AMDA, ALER, ARE, APREN, CREIA, CEC, EREF, GOGLA, GSC, GWEC, IREF, IGA, IHA, RES4Africa, Solar Power Europe, WBA, WWEA

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MAKE THE SHIFT TO RENEWABLE ENERGY HAPPEN – NOW!

The only **global community** of renewable energy actors from science, academia, NGOs, governments, and industry.

Our more than **2,000 community members** co-operate collecting information, changing norms and debating.

We build upon a **decentralized intelligence,** ensuring high responsiveness to an ever changing environment.

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

RENEWABLES 2021 GLOBAL STATUS REPORT

COLLABORATIVE ANNUAL REPORTING ON RENEWABLES SINCE 2005

THE REPORT FEATURES:

- Global Overview
- Policy Landscape
- Market and Industry Trends
- Distributed Renewables for Energy Access
- Investment Flows
- Energy Systems Integration and Enabling Technologies
- Energy Efficiency, Renewables and Decarbonisation
- Feature: Business Demand for Renewables

WHICH COUNTRIES LED THE WAY IN 2020?

Annual Investment / Net Capacity Additions / Production in 2020
Technologies ordered based on total capacity additions in 2020.

	1	2	3	4	5
Solar PV capacity	China	United States	Vietnam	Japan	Germany
Wind power capacity	China	United States	Brazil	Netherlands	Spain or Germany
Hydropower capacity	China	Turkey	Mexico	India	Angola
Geothermal power capacity	Turkey	United States	Japan	-	-
Concentrating solar thermal power (CSP) capacity	China	-	-	-	-
Solar water heating capacity	China	Turkey	India	Brazil	United States
Ethanol production	United States	Brazil	China	Canada	India
Biodiesel production	Indonesia	Brazil	United States	Germany	France

As in past years, **China** led many key annual categories for renewable energy in 2020.

RENEWABLE ENERGY LEADERS AT THE END OF 2020

Total Power Capacity or Demand / Output as of End-2020
Countries in **bold** indicate change from 2019.

	1	2	3	4	5
POWER					
Renewable power capacity (including hydropower)	China	United States	Brazil	India	Germany
Renewable power capacity (not including hydropower)	China	United States	Germany	India	Japan
Renewable power capacity *per capita* (not including hydropower)[1]	Iceland	Denmark	Sweden	Germany	Australia
Bio-power capacity	China	Brazil	United States	Germany	India
Geothermal power capacity	United States	Indonesia	Philippines	Turkey	New Zealand
Hydropower capacity[2]	China	Brazil	Canada	United States	Russian Federation
Solar PV capacity	China	United States	Japan	Germany	India
Concentrating solar thermal power (CSP) capacity	Spain	United States	**China**	**Morocco**	**South Africa**
Wind power capacity	China	United States	Germany	India	Spain
HEAT					
Modern bio-heat demand in buildings	United States	Germany	France	Italy	Sweden
Modern bio-heat demand in industry	Brazil	India	United States	Finland	Sweden
Solar water heating collector capacity[2]	China	Turkey	India	Brazil	United States
Geothermal heat output[3]	China	Turkey	Iceland	Japan	New Zealand

Some countries changed places during the year, though in many cases **the leaders for total capacity and generation are well-established.**

2020 – A YEAR OF NEW NORMS

COVID-19 pandemic

Economic impacts

Governments mobilising

Net zero targets

Pressure from citizens, civil society, and courts

Businesses sourcing more renewable energy

MANY NET ZERO TARGETS ANNOUNCED IN 2020

New Net Zero Emission and Carbon-Neutral Targets Set
by Countries/Regions in 2020

Net zero emission targets

Country/region	2019 CO_2 emissions (kilotonnes)	2019 CO_2 emissions (% of world total)	Target year	Legal status
EU-27	**2,939,069**	7.73%	2050	Proposed
Austria	72,363	0.19%	2040[1]	In law/policy document
Canada	584,846	1.54%	2050	Proposed
Hungary	53,183	0.14%	2050	In law/policy document
Jamaica	7,442	0.02%	2050	Pledge
Lao PDR	6,783	0.02%	2050	Pledge
Maldives	913	<0.001%	2030[2]	Pledge
Mauritius	4,332	0.01%	2070	Pledge
Nepal	15,019	0.04%	2050	NDC
United Kingdom	364,906	0.96%	2050[3]	In law/policy document
The Vatican	N/A	N/A	2050	Pledge

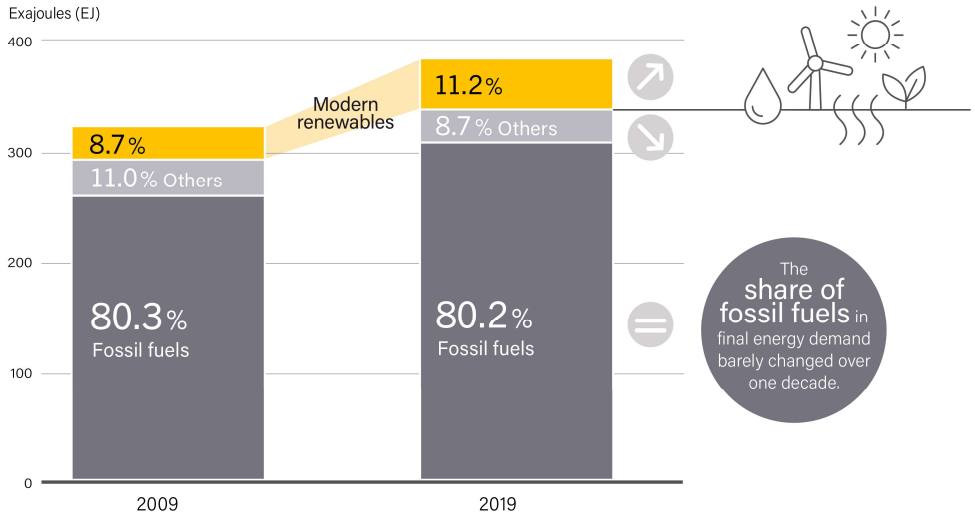
Carbon-neutral targets

Country/region	2019 CO_2 emissions (kilotonnes)	2019 CO_2 emissions (% of world total)	Target year	Legal status
Argentina	199,414	0.52%	2050	NDC
Barbados	3,827	0.01%	2030	In law/policy document[4]
China	11,535,200	30.34%	2060	Pledge
Japan	1,153,717	3.03%	2050	Pledge
Kazakhstan	277,365	0.73%	2060[5]	Pledge
Korea, Republic of	651,870	1.71%	2050	NDC
Malawi	1,616	<0.001%	2050	Pledge
Nauru	N/A	N/A	2050	Pledge
Slovenia	15,365	0.04%	2050	National plan/strategy
South Africa	494,862	1.30%	2050[6]	National plan/strategy

Only about one-fifth of all announced national net zero targets are actually **in law** or have been achieved.

INCREASING ENERGY DEMAND AND FOSSIL FUEL USE

Estimated Renewable Share of Total Final Energy Consumption
2009 and 2019

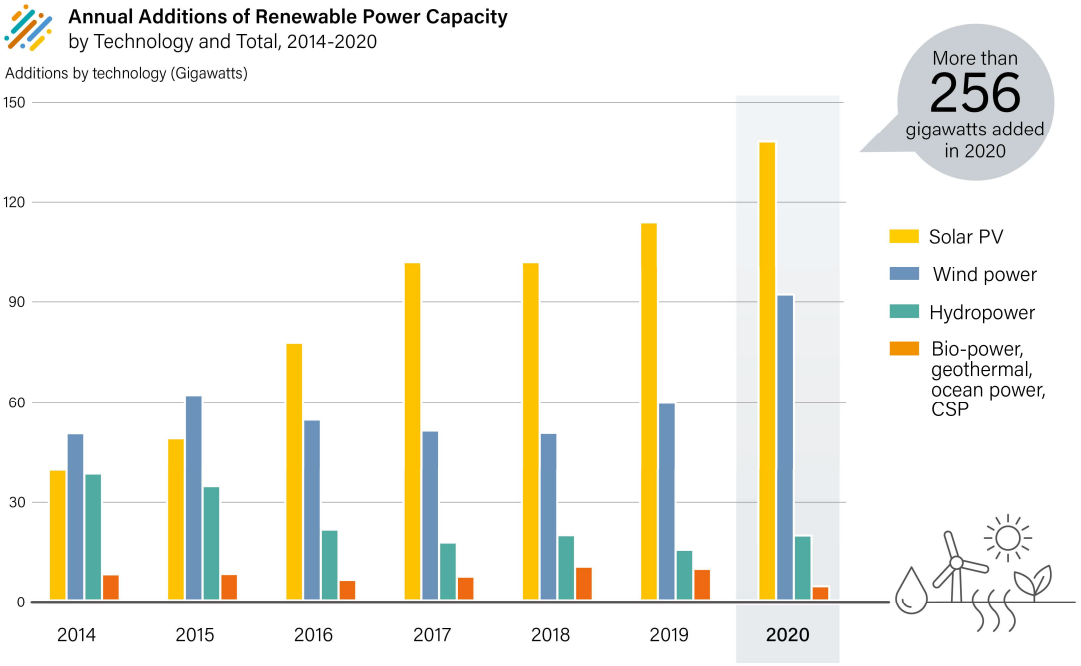


Note: Totals may not add up due to rounding. This figure shows a comparison between two years across a 10-year span. The result of the economic recession in 2008 may have temporarily lowered the share of fossil fuels in total final energy consumption in 2009. The share in 2008 was 80.7%.

Source: Based on IEA data.

The world is **burning more fossil fuels** than ever.

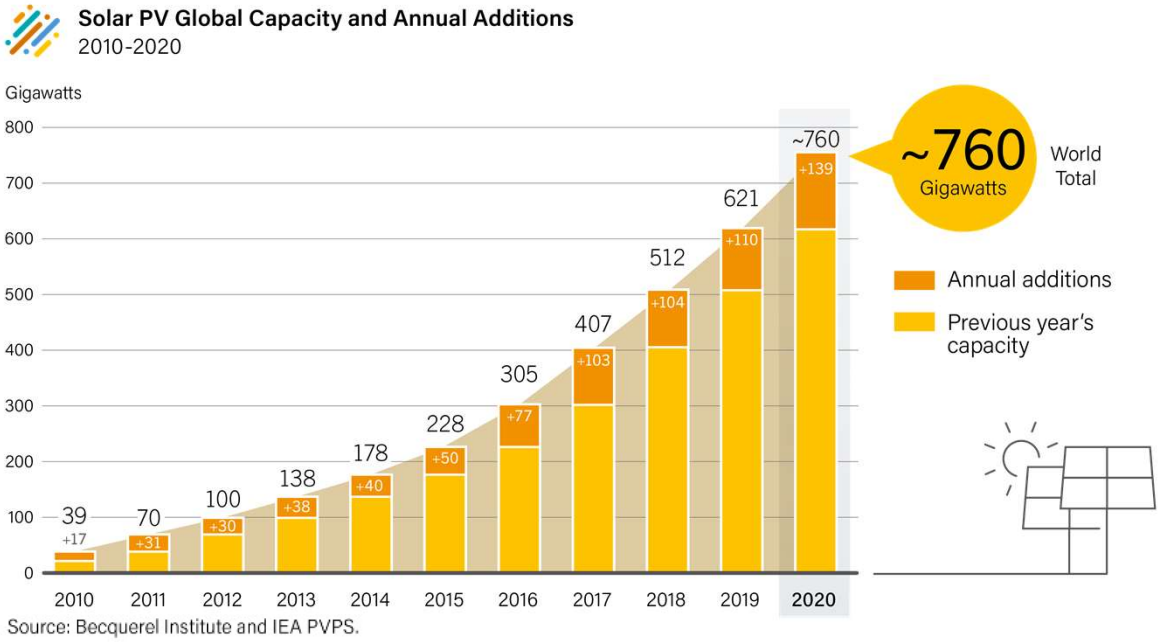
MORE THAN 250 GW OF RENEWABLE POWER ADDED



Note: Solar PV capacity data are provided in direct current (DC). Data are not comparable against technology contributions to electricity generation.

New renewable power capacity hit a **record increase** globally.

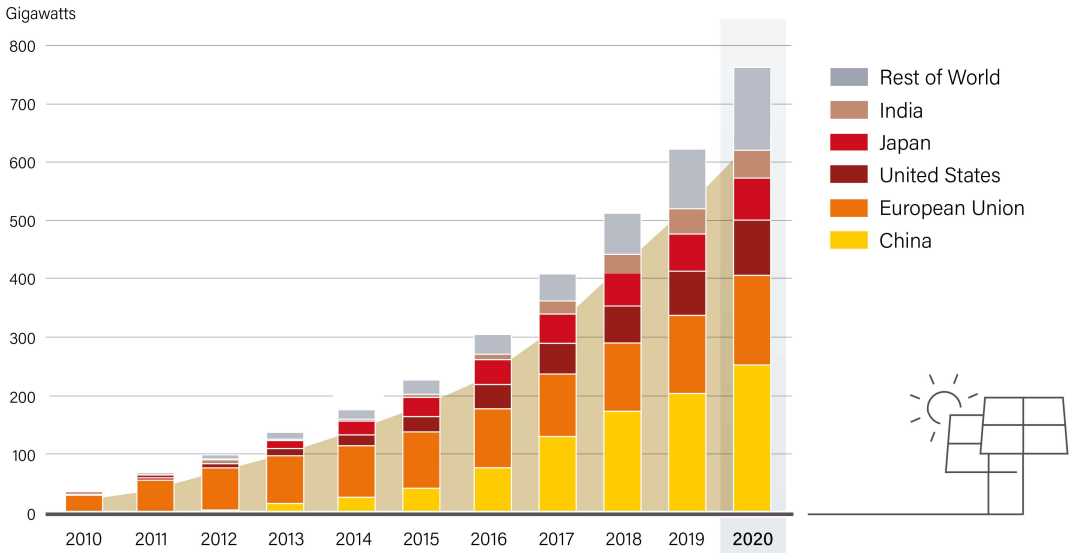
SOLAR PV CAPACITY ADDITIONS REACHED 139 GW



By the end of 2020, at least **15 countries** had enough capacity in operation to meet **at least 5% of their** electricity demand with solar PV.

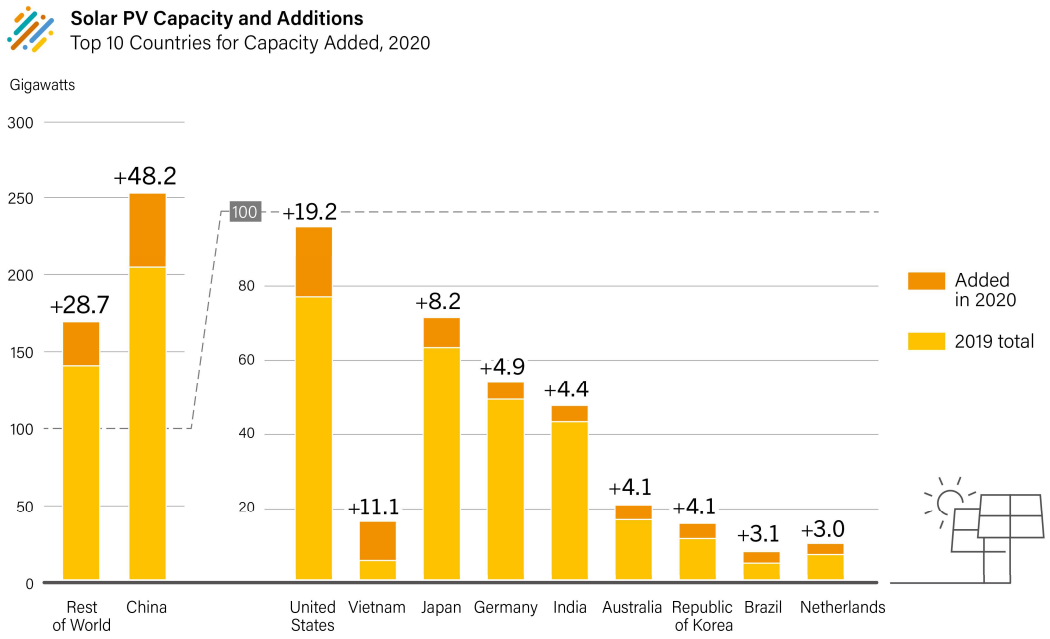
SOLAR PV SPREADING TO NEW PARTS OF THE WORLD

Solar PV Global Capacity, by Country and Region
2010-2020



For the eighth consecutive year, Asia eclipsed all other regions for new installations, **accounting for almost 60% of global additions.**

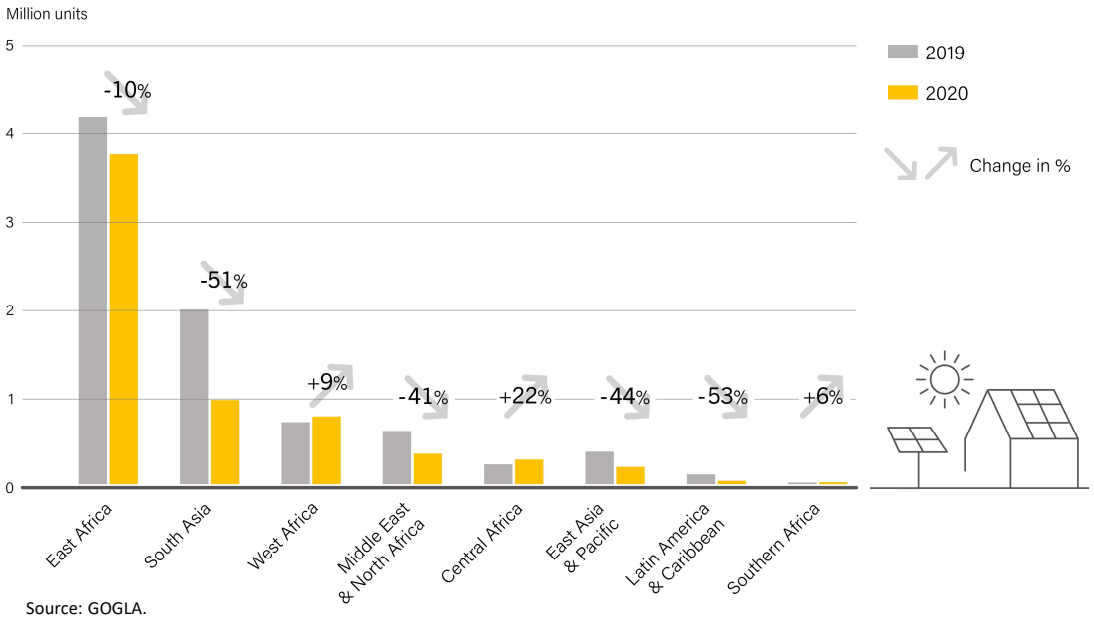
CHINA REMAINS LEADER IN SOLAR PV



Following two years of decline, **China's market increased 60%** – driven largely by pending changes to the country's FIT structure

OFF-GRID SALES DISRUPTED DUE TO COVID-19

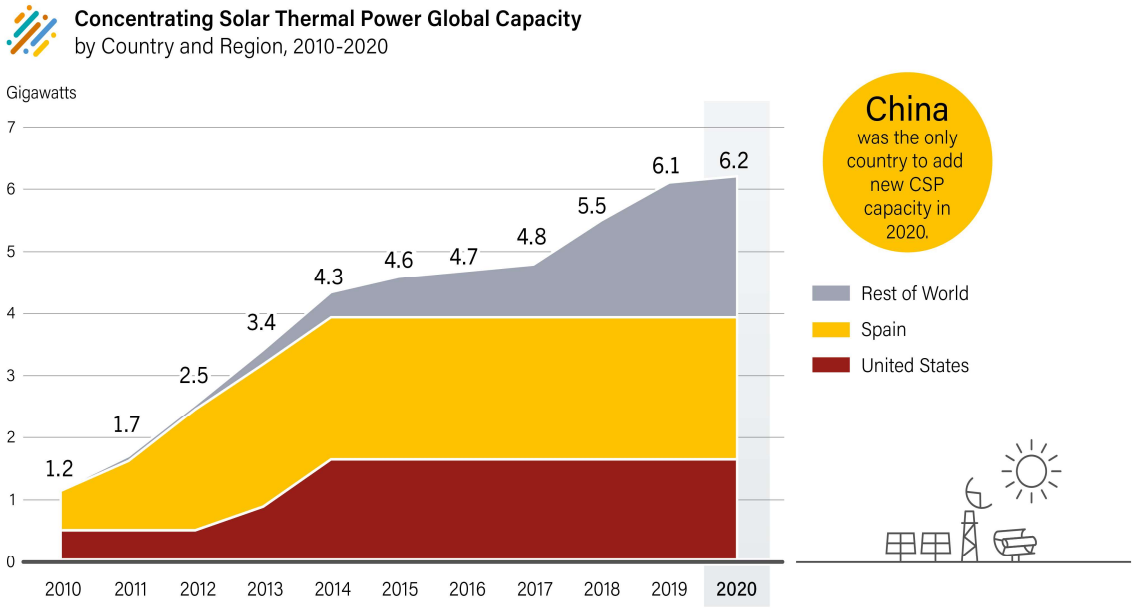
Sales Volumes of Affiliated Off-Grid Solar Systems
Selected Regions, 2019 and 2020



Source: GOGLA.

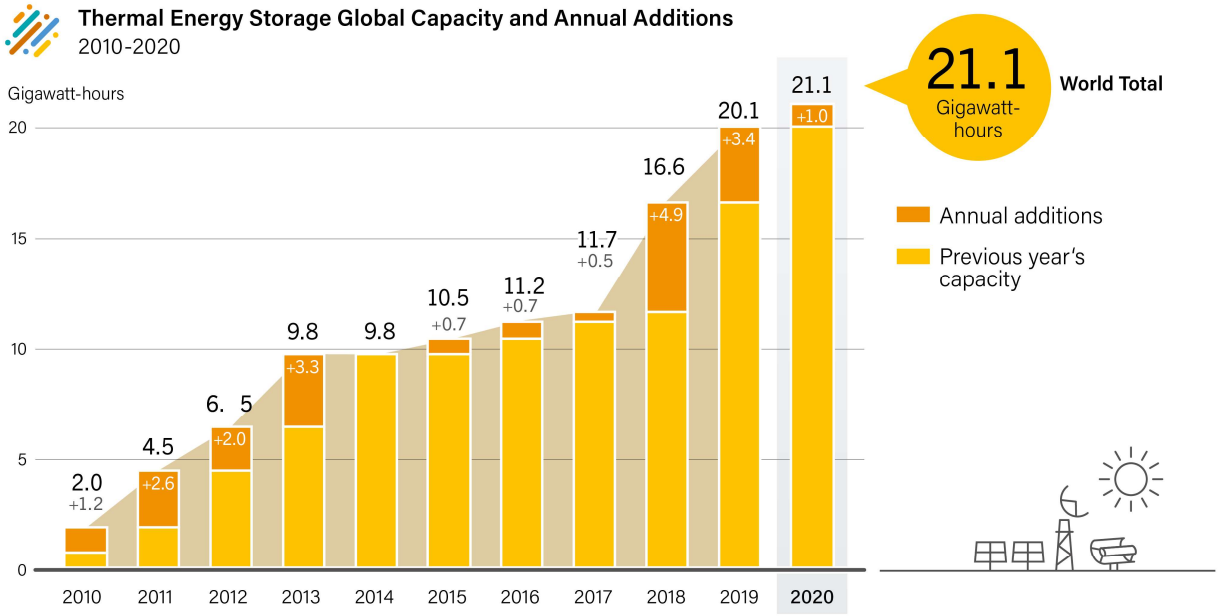
Sales of off-grid solar systems **fell 22%** compared to 2019, largely due to lockdown-related disruptions.

NEW CSP ADDITIONS EXCLUSIVELY IN CHINA



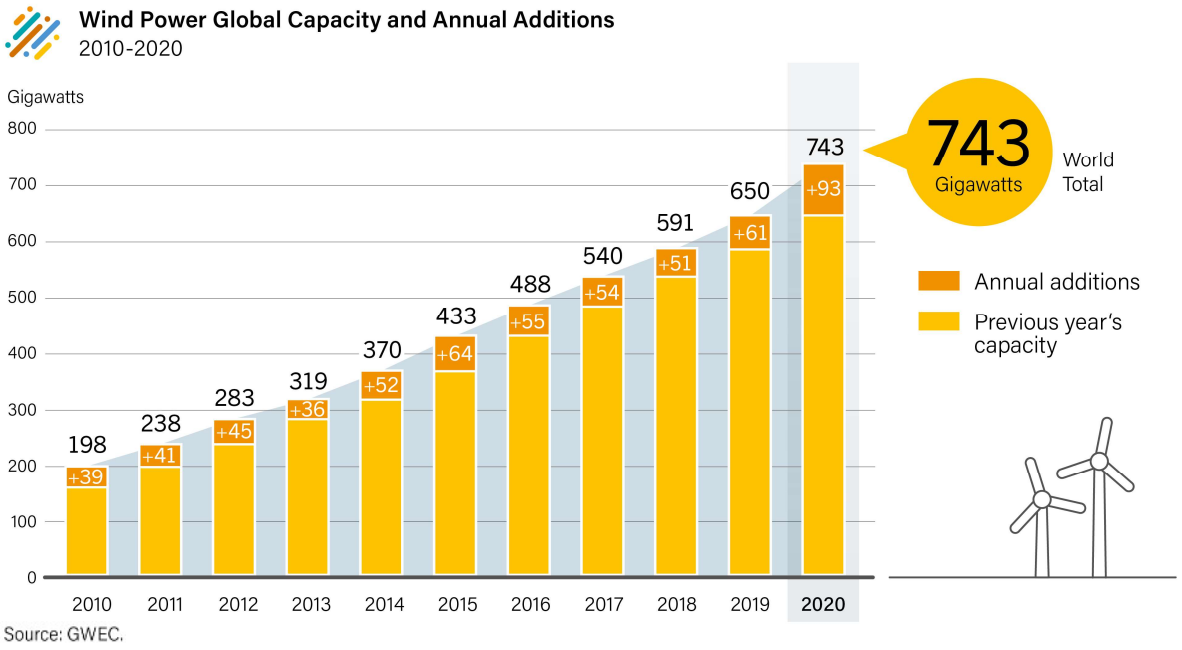
Global CSP capacity **grew 1.6% in 2020**, with a single 100 MW project coming online in China.

NEARLY ALL CSP PLANTS USE THERMAL ENERGY STORAGE



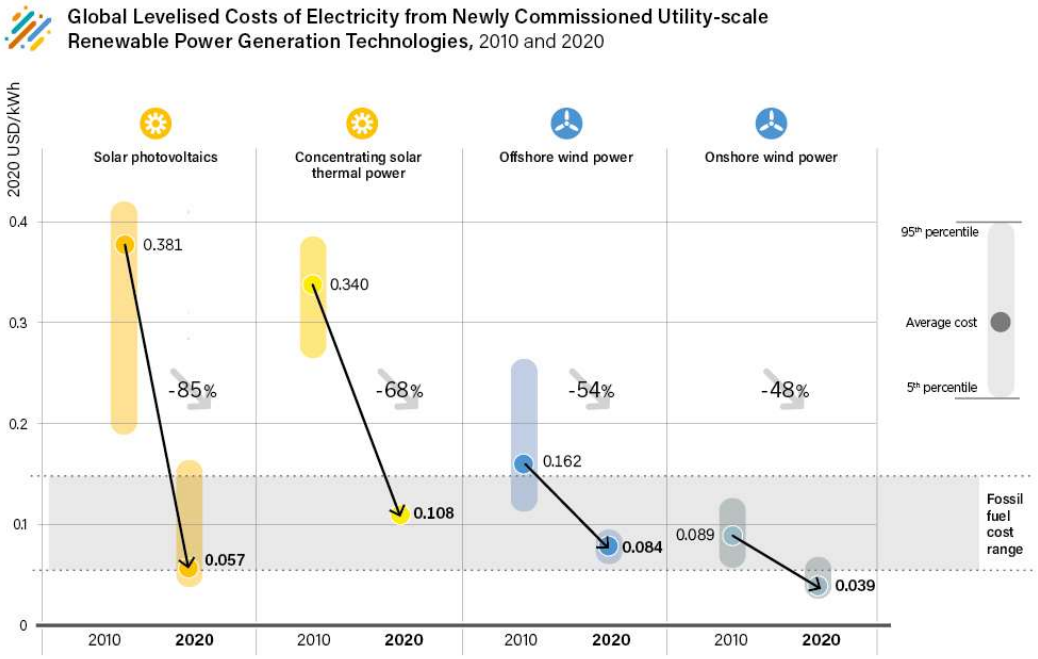
22 of the 24 CSP plants completed globally since the end of 2014 have incorporated thermal energy storage.

RECORD-BREAKING WIND POWER CAPACITY ADDED



At 93 GW added, the global wind power market was **45% higher** than its previous high in 2015.

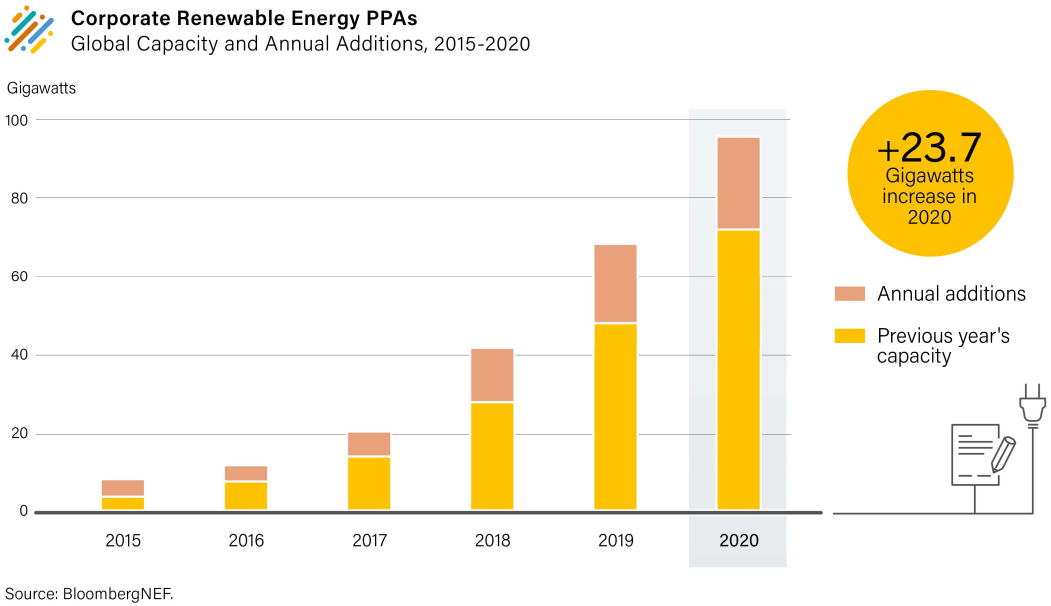
RENEWABLE ELECTRICITY COSTS KEEP FALLING



Source: IRENA.

Costs for solar PV and CSP as well as onshore and offshore wind have **fallen sharply over the past decade.**

CORPORATE RENEWABLE PPAS INCREASED

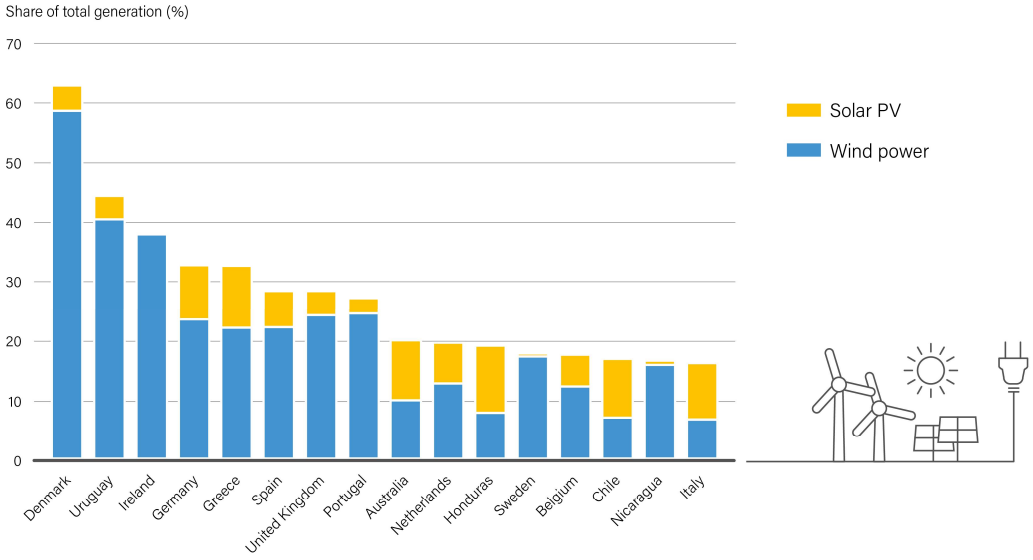


Source: BloombergNEF.

New renewable corporate power purchasing agreements **increased 18%** in 2020.

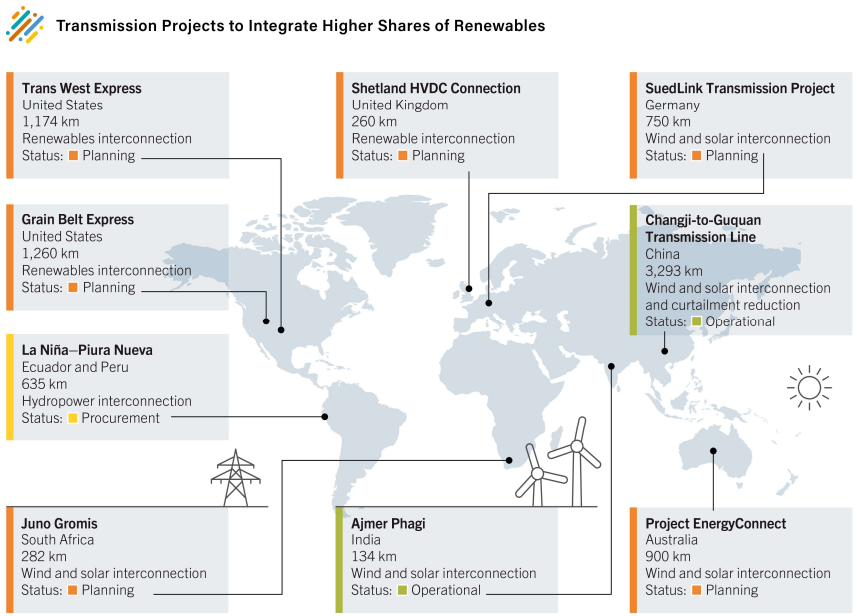
VARIABLE RENEWABLE ELECTRICITY CONTINUED TO RISE

Share of Electricity Generation from Variable Renewable Energy
Top Countries, 2020



At least **nine countries produced more than 20% of their electricity generation from VRE** in 2020

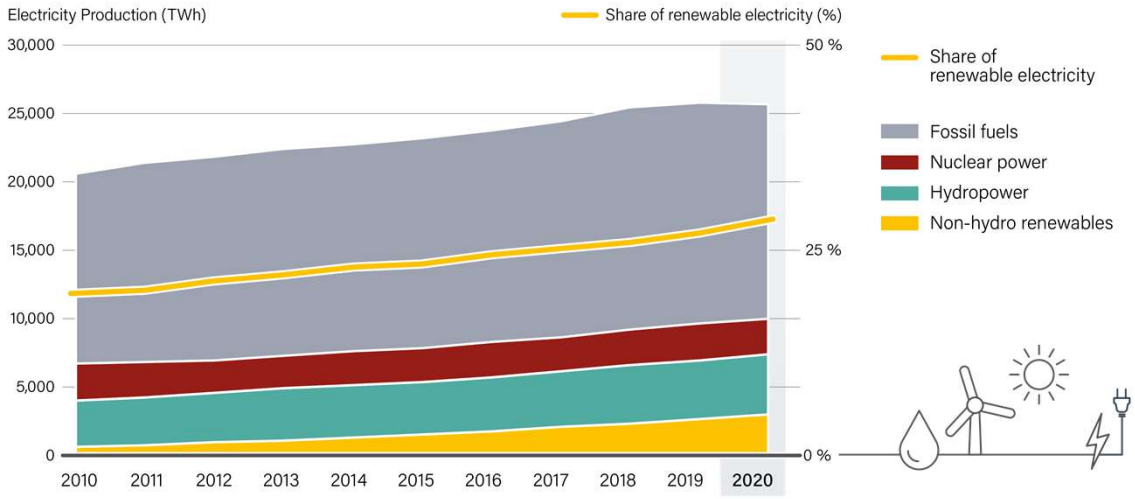
MAJOR TRANSMISSION PROJECTS ADVANCED IN 2020



Digital technologies are increasing the usable capacity of existing transmission infrastructure, often a barrier to wider VRE deployment.

29% OF GLOBAL ELECTRICITY IS NOW RENEWABLE

Global Electricity Production by Source, and Share of Renewables
2010-2020

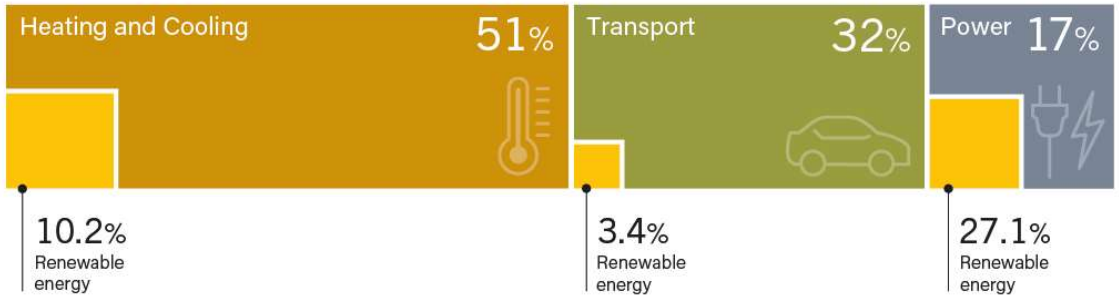


Source: Ember.

The share of renewables in electricity generation is **rising in many countries around the world.**

MORE THAN 80% OF ENERGY FOR HEATING & TRANSPORT

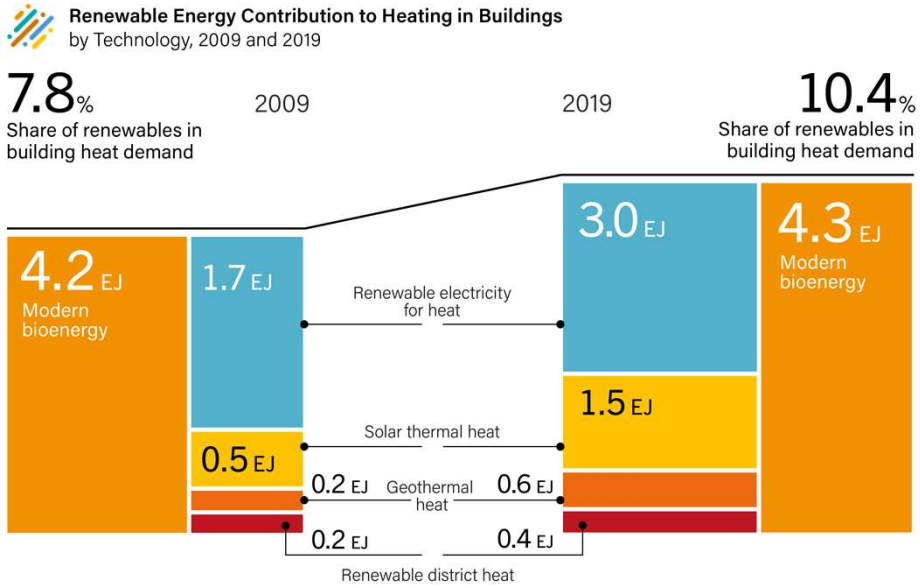
Renewable Energy in Total Final Energy Consumption
by Final Energy Use, 2018



Note: Data should not be compared with previous years because of revisions due to improved or adjusted methodology.
Source: Based on IEA data.

Most focus is on the power sector, but the **greatest urgency** is in heating and transport.

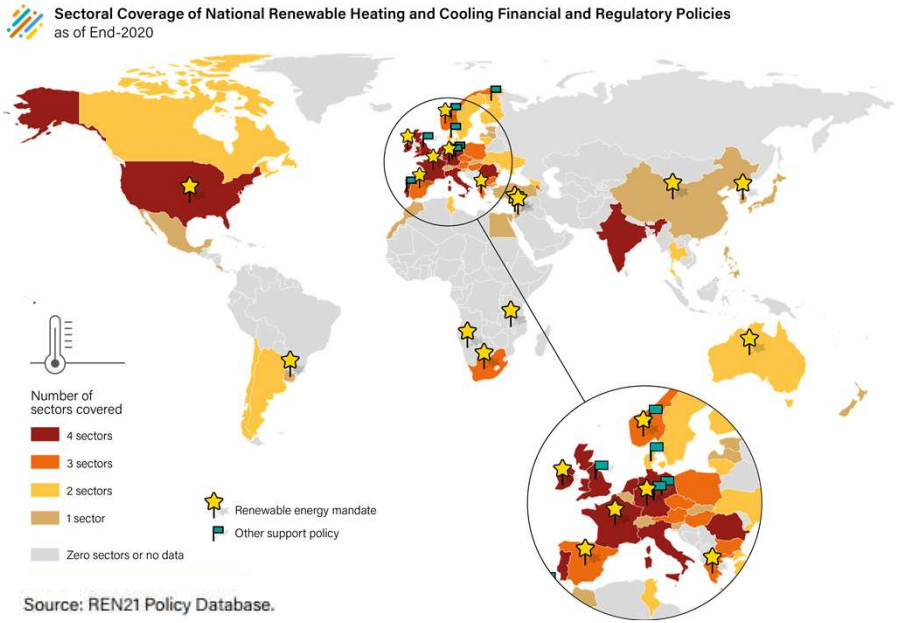
RENEWABLE HEAT IS GRADUALLY GROWING IN BUILDINGS



Source: Based on IEA data.

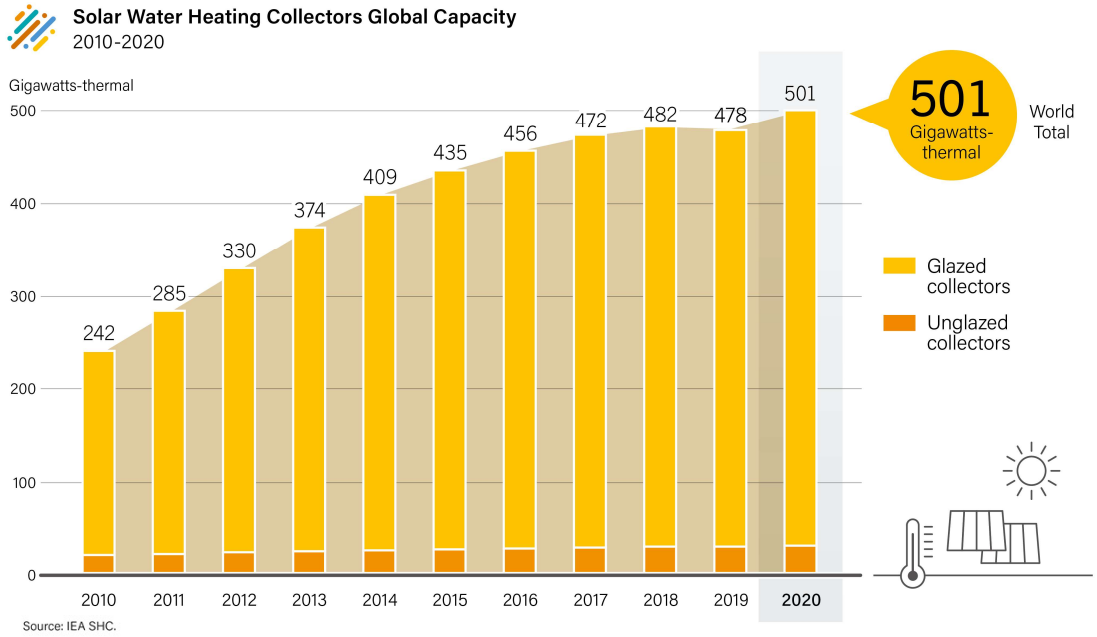
The share of renewable heating and cooling in buildings grew from 7.8% in 2009 to **more than 10% in 2019.**

POLICY SUPPORT LOW IN HEATING AND COOLING SECTOR



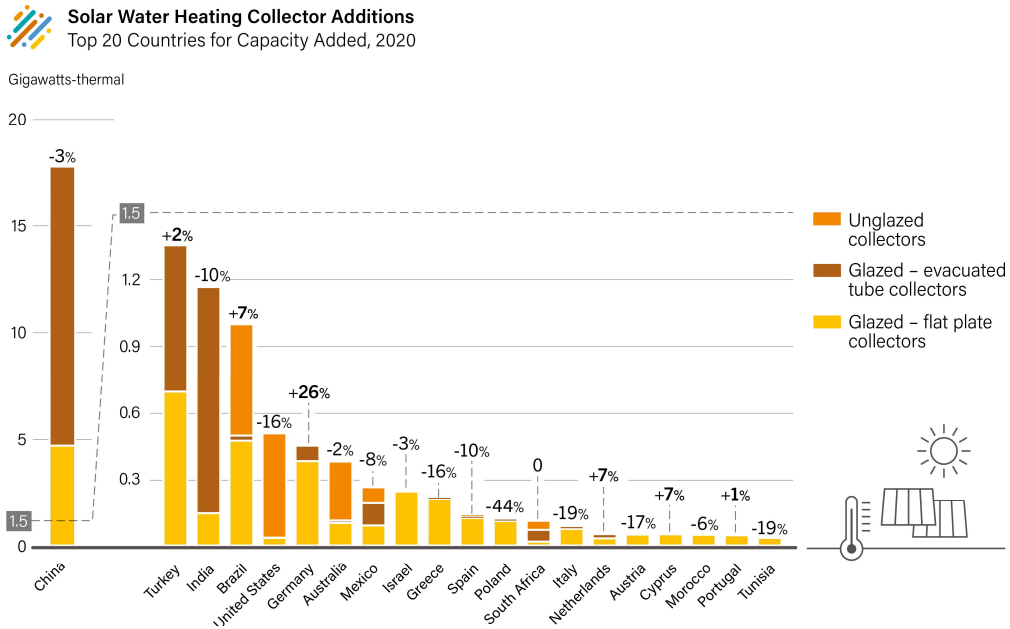
Only 10 countries had renewable heat support policies covering all sectors as of end-2020.

INSTALLED SOLAR WATER HEATING CAPACITY INCREASED



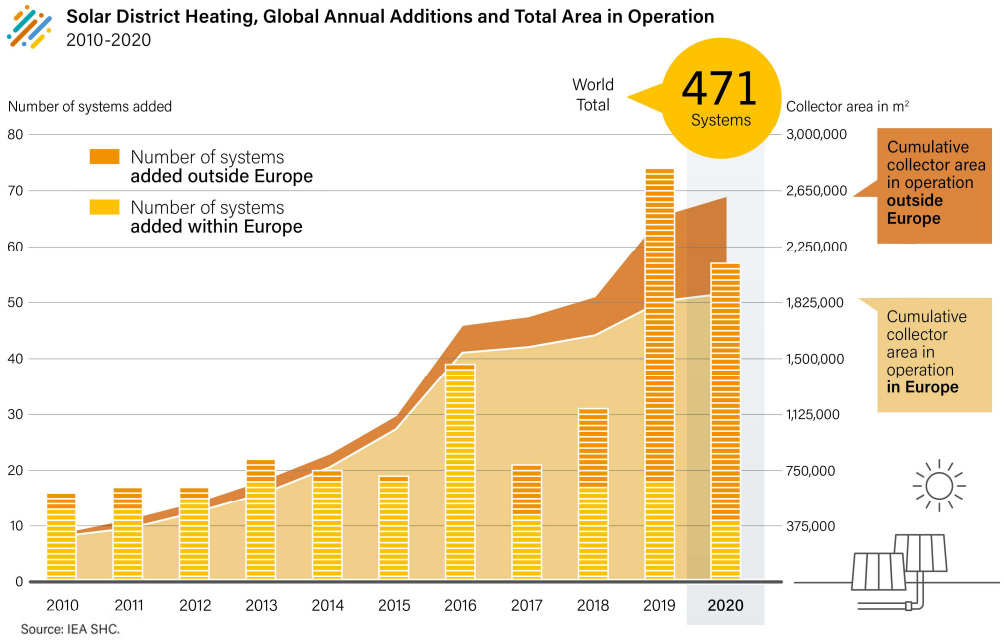
Global operating solar thermal capacity **increased 5%** from 2019.

CHINA DOMINATED SOLAR WATER HEATING COLLECTOR SALES



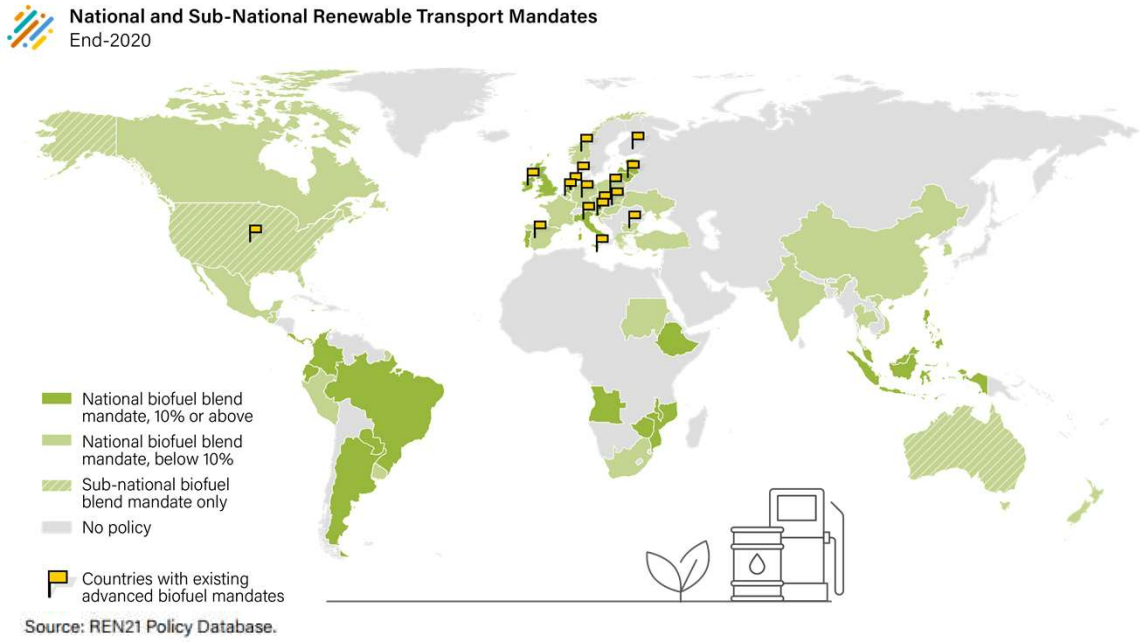
China accounted for 71% of new global sales in solar water heating collectors, followed by Turkey and India.

LARGE INCREASE IN SOLAR DISTRICT HEATING SYSTEMS



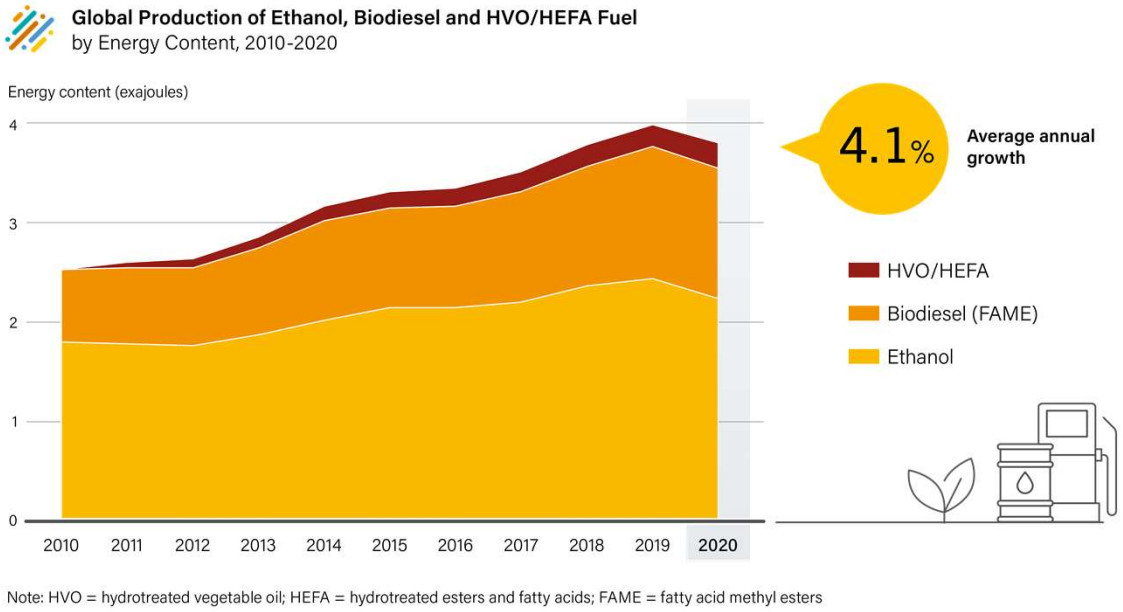
Leading markets for solar district heating were **Brazil, China and Turkey.**

POLICY SUPPORT REMAINS STATIC FOR TRANSPORT



Biofuel blending mandates remain the most widely adopted renewable energy support policy in the transport sector.

BIOFUELS PRODUCTION SUFFERED DURING PANDEMIC

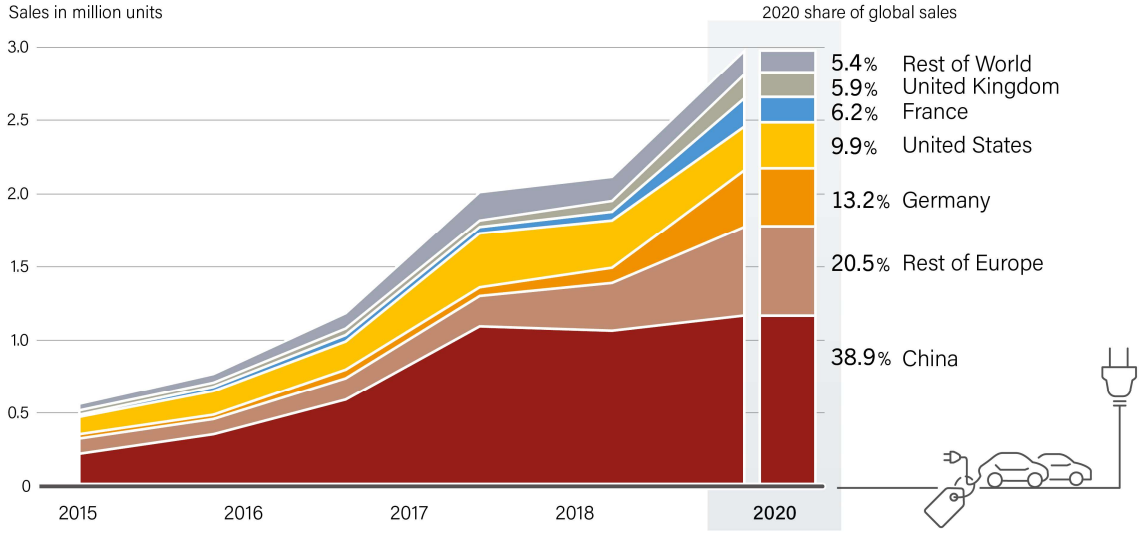


Note: HVO = hydrotreated vegetable oil; HEFA = hydrotreated esters and fatty acids; FAME = fatty acid methyl esters

The **United States** remained the leading biofuels producer, with a 51% share, despite declines in US production of both ethanol and biodiesel.

ELECTRIC CAR SALES INCREASED 41% IN 2020

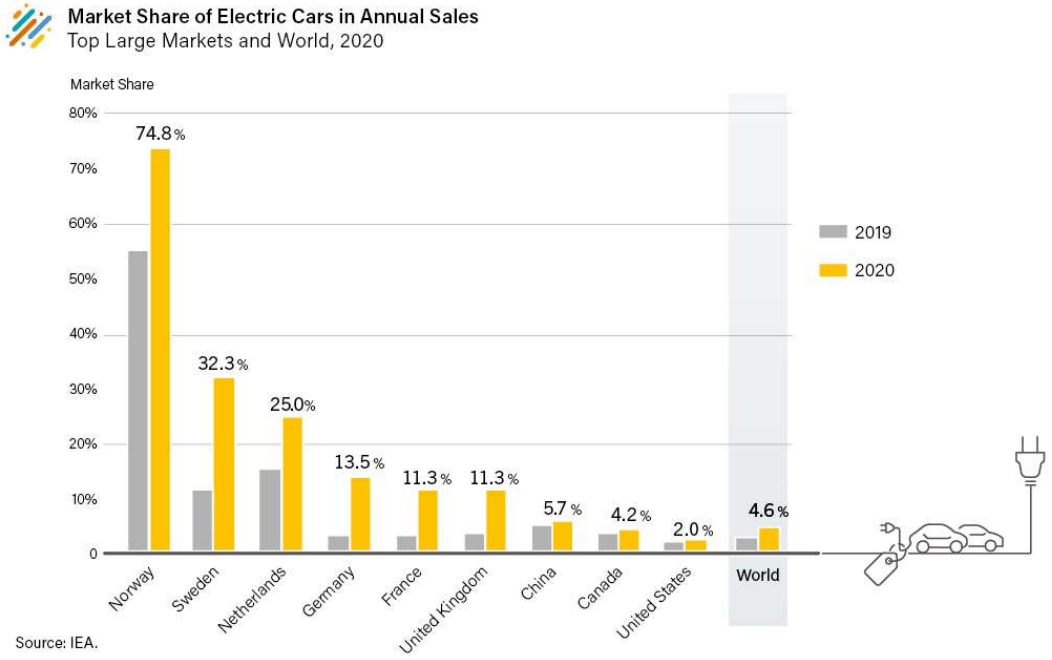
Electric Car Global Sales
Top Countries and Rest of World, 2015-2020



Source: IEA.

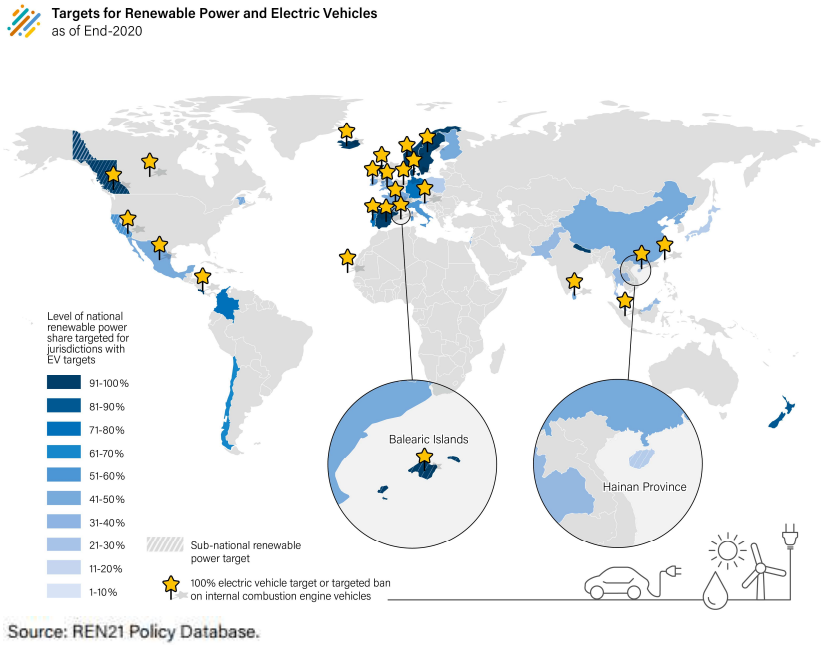
Share of electric cars in new car sales reached 4.6%, **a record high.**

ELECTRIC CAR MARKET SHARES INCREASED AROUND THE WORLD



Share of electric cars in new car sales reached 4.6%, **a record high.**

ONLY SOME COUNTRIES HAVE TARGETS FOR EVS AND RENEWABLES

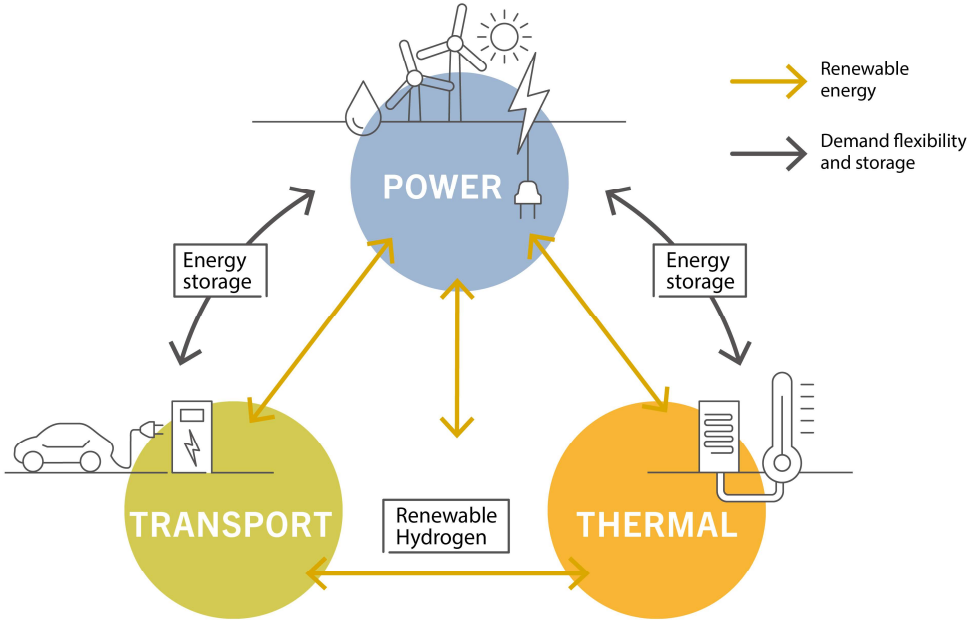


Source: REN21 Policy Database.

Only 8 countries with targeted bans on internal combustion engine vehicles have 100% renewable power targets

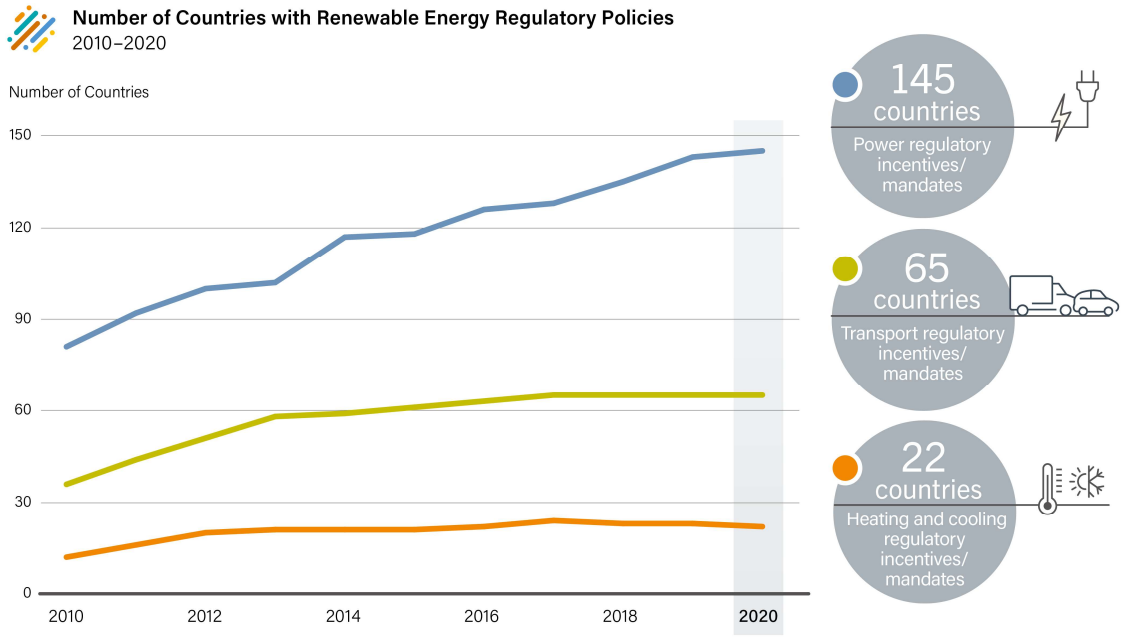
SECTOR COUPLING SUPPORTS INTEGRATION OF RENEWABLES

Coupling of the Power, Thermal and Transport Sectors



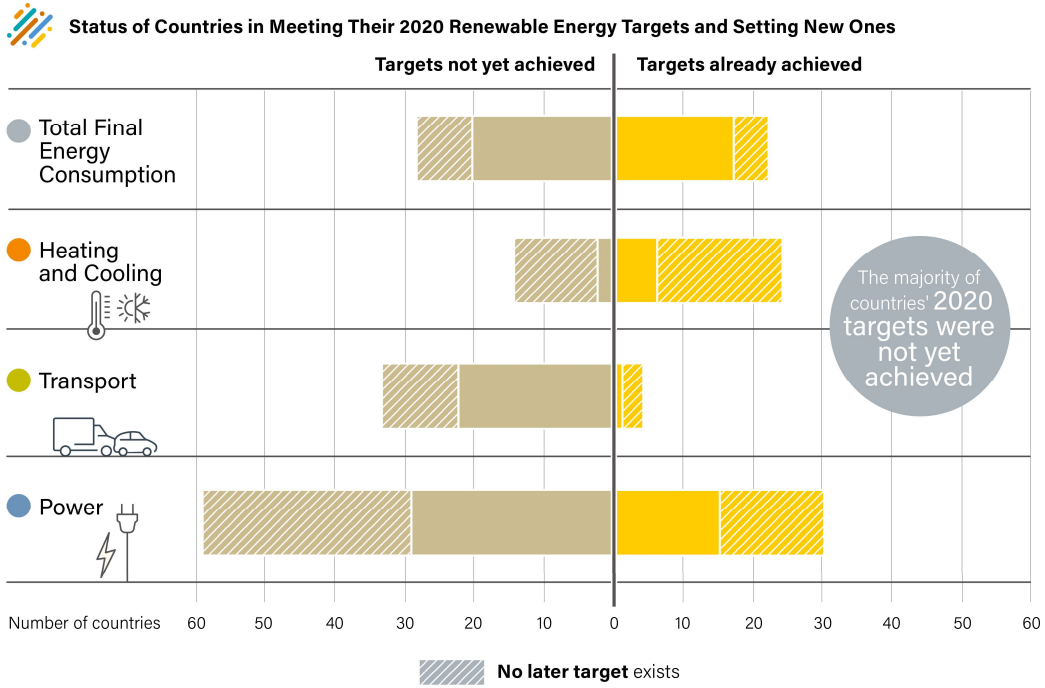
End-use technologies supporting the integration of renewables in power systems **experienced increased sales** in 2020 despite the onset of the COVID-19 pandemic.

MOST POLICY ATTENTION STILL FOR POWER SECTOR



For the first time ever, the number of countries with **renewable energy support policies did not increase**.

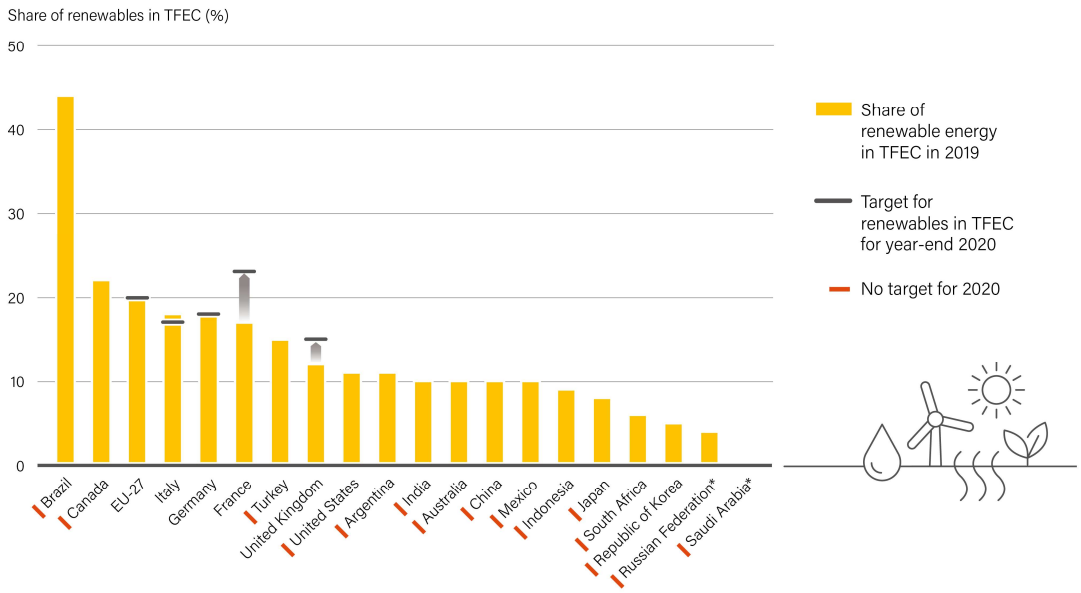
TARGETS NOT ACHIEVED OR FOLLOWED UP



The number of countries with **targets fell across all sectors**.

G20 COUNTRIES LACK TARGETS FOR RENEWABLES

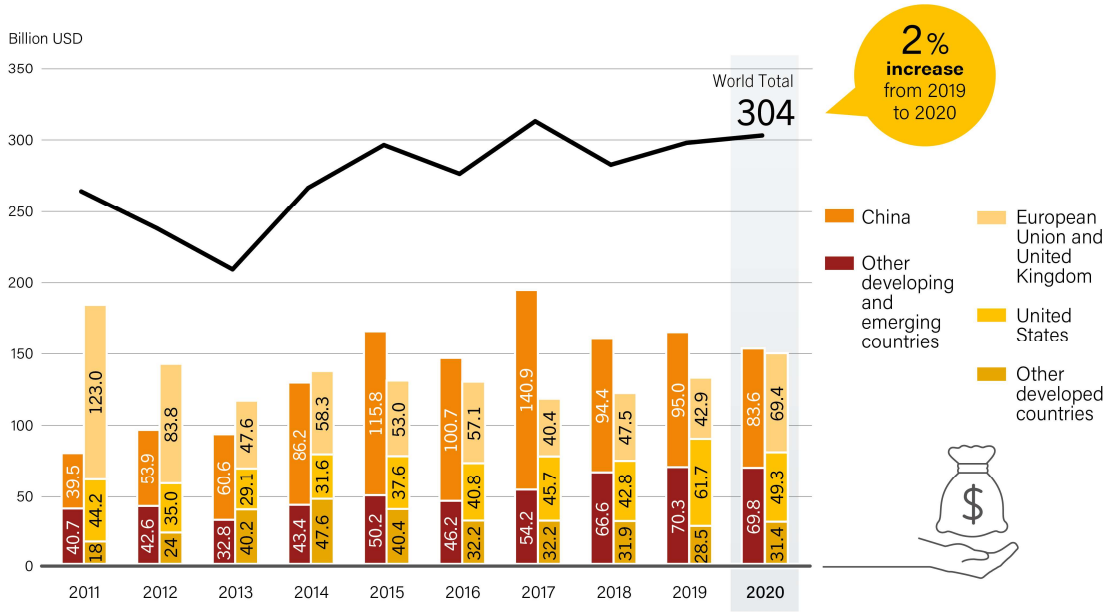
Renewable Energy Shares and Targets
G20 Countries, 2019 and 2020



Ambition lacking on **key performance indicator** of renewable energy share.

INVESTMENT IN RENEWABLES INCREASED SLIGHTLY

Global Investment in Renewable Power Capacity
Developed, Emerging and Developing Countries, 2010-2020

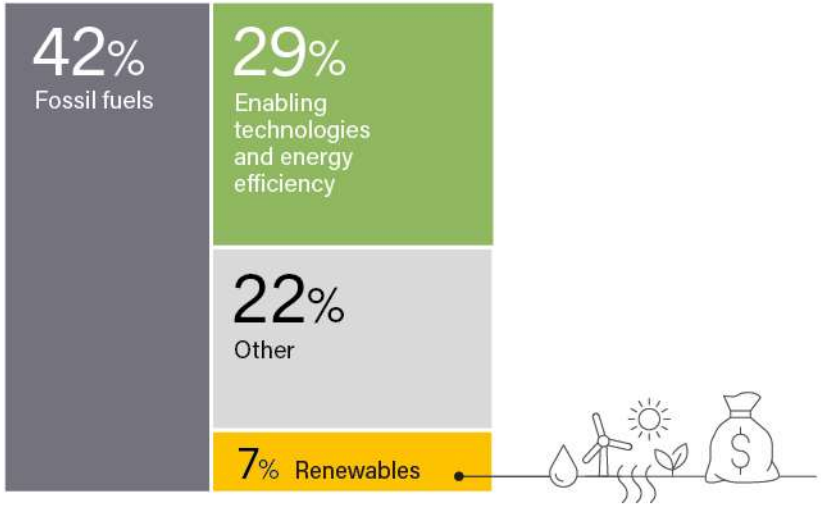


Source: BloombergNEF.

To reach global climate and sustainable development goals, annual **investment in renewables must at least triple** by 2030.

6X MORE RECOVERY FUNDING FOR FOSSIL FUELS

Energy Investments in COVID-19 Recovery Packages of 31 Countries
January 2020 to April 2021



As of early 2021, **only 7%** of COVID recovery spending was allocated to renewables.

Source: EnergyPolicyTracker.org.

STRUCTURAL SHIFT TO RENEWABLES REQUIRED

CALL TO ACTION

- **Rapid** transition needed from fossil fuels to a renewable energy-based system in **all societal and economic activities**
- **Setting net zero targets is not enough** considering the urgency of accelerating the transition
- **Measure progress** towards global climate and sustainable development goals with **the right indicator**: the share of renewable energy
- Integrate the renewable energy share as a KPI at **every level of decision making**

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