10. Les énergies renouvelables

10.3 – REN21 Global Status Report

Mise à jour 2020

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Documentation à lire

- Références gratuites et obligatoires accessibles sur Moodle:
  - Cette présentation;
  - REN 21 - Key Findings of the Renewables 2020 Global Status Report;
  - IRENA - Renewable Power Generation Costs of 2019, section Highlights et Executive Summary. Environ **10 pages** sur les 144, pp 11-17 édition 2020;
  - IRENA - Renewable Power Generation Costs of 2019, résumé français, **2 pages**.

Rappel

Documentation à lire

- Références facultatives accessibles sur Moodle:
  - IRENA - Renewable Energy and Jobs (2019);
  - REN21 - Data pack, un fichier excel de toutes les données compilées.

Rappel


RENEWABLES NOW

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 2020 GLOBAL STATUS REPORT

COLLABORATIVE ANNUAL REPORTING ON RENEWABLES SINCE 2004

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
- Feature: Public Support for Renewables

RENEWABLE ENERGY CONTINUED TO GROW IN 2019

- **Total power capacity rose 8.4%**
  - 2,588 GW including hydropower
  - Non-hydropower: 14.7% increase
- **200 GW of renewable power additions**
  - Solar PV: 115 GW; Wind: 60 GW; Hydro: 16 GW
- **Renewable heat demand increased marginally**
- **5% growth in biofuel production**

Table 1. Renewable Energy Indicators 2019

		2018	2019
INVESTMENT			
New investment (annual) in renewable power and fuels[1]	billion USD	296.0	**301.7**
POWER			
Renewable power capacity (including hydropower)	GW	2,387	**2,588**
Renewable power capacity (not including hydropower)	GW	1,252	**1,437**
Hydropower capacity[2]	GW	1,135	**1,150**
Wind power capacity	GW	591	**651**
Solar PV capacity[3]	GW	512	**627**
Bio-power capacity	GW	131	**139**
Geothermal power capacity	GW	13.2	**13.9**
Concentrating solar thermal power (CSP) capacity	GW	5.6	**6.2**
Ocean power capacity	GW	0.5	**0.5**
HEAT			
Modern bio-heat demand (estimated)[4]	EJ	13.9	**14.1**
Solar hot water demand (estimated)[5]	EJ	1.4	**1.4**
Geothermal direct-use heat demand (estimated)[6]	PJ	384	**421**
TRANSPORT			
Ethanol production (annual)	billion litres	111	**114**
FAME biodiesel production (annual)	billion litres	41	**47**
HVO biodiesel production (annual)	billion litres	6.0	**6.5**

WHICH COUNTRIES LED THE WAY IN 2019?

Annual Investment / Net Capacity Additions / Production in 2019
Technologies ordered based on total capacity additions in 2019.

	1	2	3	4	5
Investment in renewable power and fuels capacity (not including hydropower over 50 MW)	**China**	United States	Japan	India	Chinese Taipei
Solar PV capacity	**China**	United States	India	Japan	Vietnam
Wind power capacity	**China**	United States	United Kingdom	India	Spain
Hydropower capacity	**Brazil**	China	Lao PDR	Bhutan	Tajikistan
Geothermal power capacity	**Turkey**	Indonesia	Kenya	Costa Rica	Japan
Concentrating solar thermal power (CSP) capacity	**Israel**	China	South Africa	Kuwait	France
Solar water heating capacity	**China**	Turkey	India	Brazil	United States
Ethanol production	**United States**	Brazil	China	India	Canada
Biodiesel production	**Indonesia**	United States	Brazil	Germany	France

As in past years, **China** led many key annual categories for renewable energy in 2019.

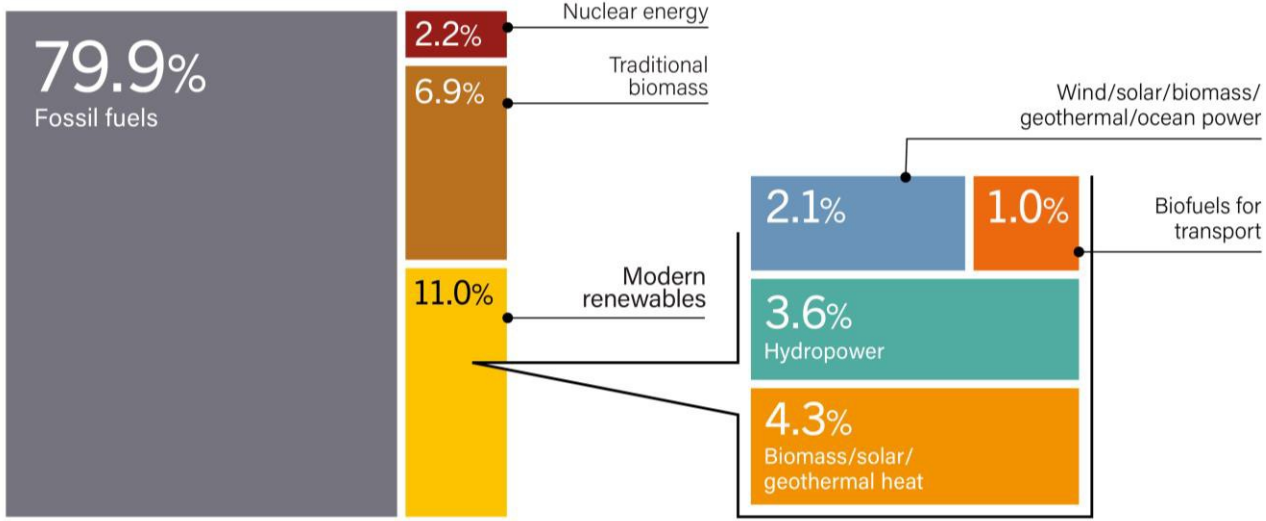
WHO WERE THE RENEWABLE ENERGY LEADERS AT THE END OF 2019?

Total Capacity or Generation as of End-2019
Countries in **bold** indicate change from 2018.

	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	United States	Brazil	**India**	**Germany**
Geothermal power capacity	United States	Indonesia	Philippines	Turkey	New Zealand
Hydropower capacity[2]	China	Brazil	Canada	United States	Russian Federation
Hydropower generation[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	**Morocco**	**South Africa**	**China**
Wind power capacity	China	United States	Germany	India	Spain
HEAT					
Solar water heating collector capacity[3]	China	United States	Turkey	Germany	Brazil
Solar water heating collector capacity *per capita*	Barbados	**Cyprus**	**Israel**	**Austria**	Greece
Geothermal heat output[4]	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.

ONLY MODERATE CHANGE IN RENEWABLE SHARE OF ENERGY DEMAND



Note: Data should not be compared with previous years because of revisions due to improved or adjusted data or methodology. Totals may not add up due to rounding.

Source: Based on IEA data.

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Estimated Renewable Share of Total Final Energy Consumption, 2017

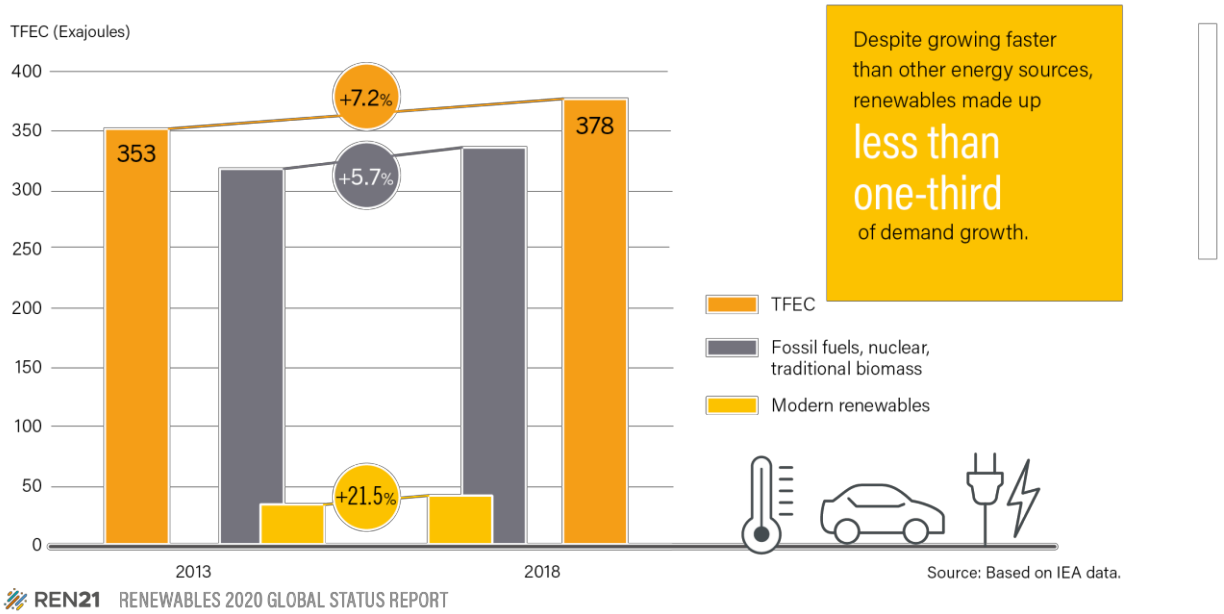
Renewable share grew from **9.6%** in 2013 to only **11%** in 2018.

ENR2020

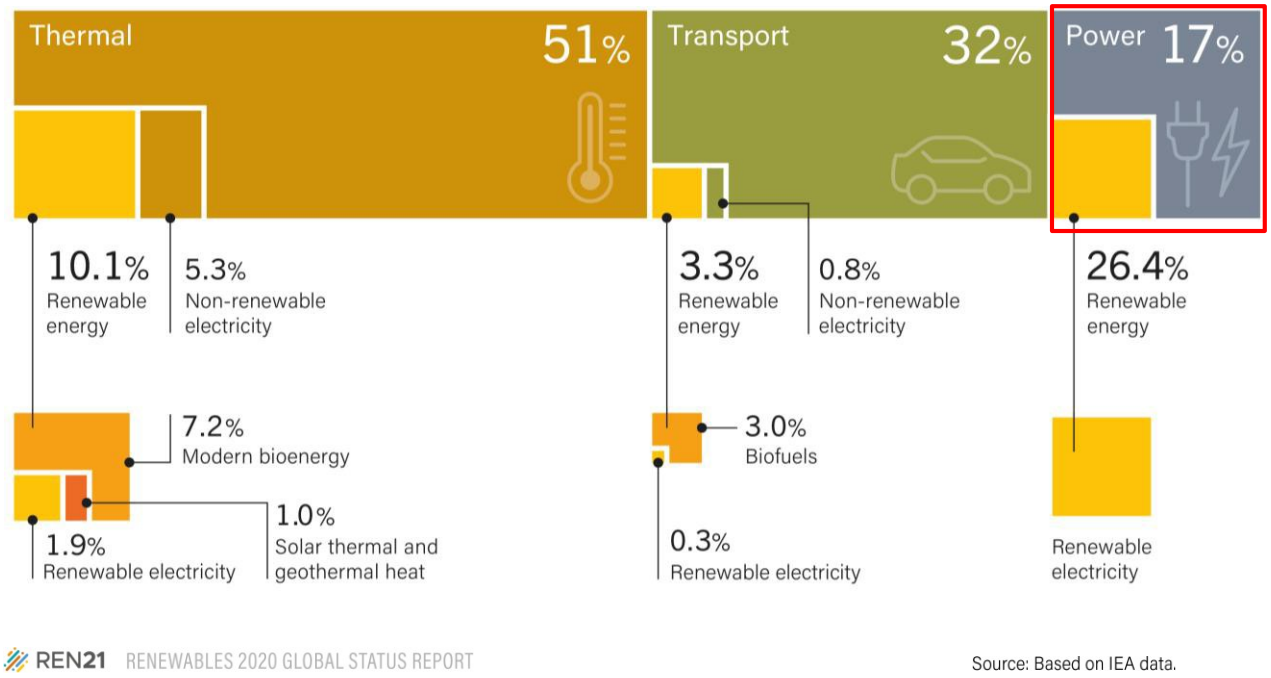
RENEWABLES ARE GROWING FAST... BUT NOT FAST ENOUGH

- Renewables grew three times faster than fossil fuels
- Renewable energy only accounted for 29% of demand growth
- Energy efficiency and renewables are complementary

Estimated Global Growth in Renewable Energy Compared to Total Final Energy Consumption, 2013-2018



MORE THAN 80% OF OUR ENERGY FOR HEATING, COOLING, TRANSPORT



Share of Electricity Generation from Variable Renewable Energy, Top Countries, 2019

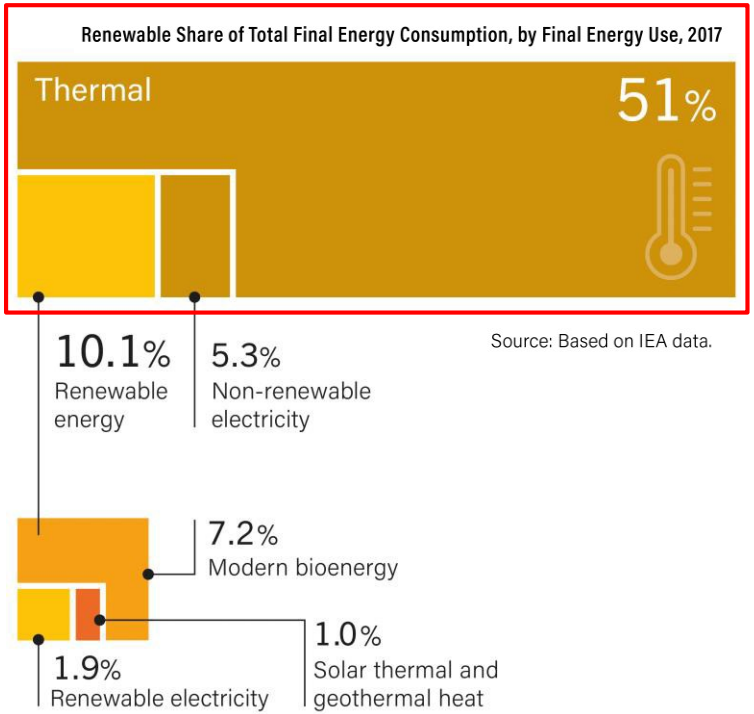
Most focus is on the power sector.

But the **greatest urgency** is in heating, cooling and transport.

SLOW GROWTH IN RENEWABLE HEATING AND COOLING

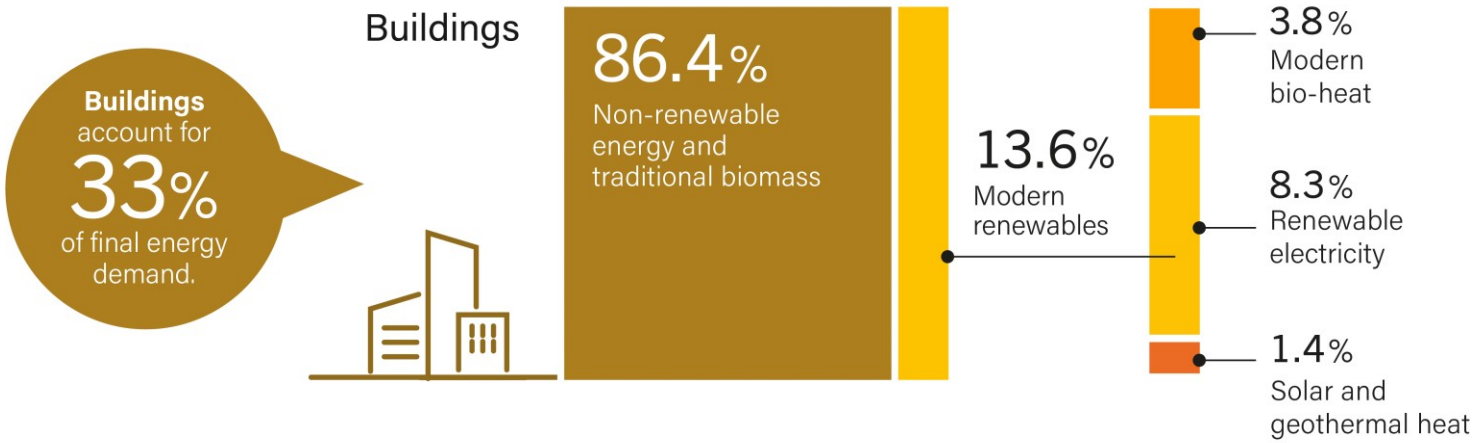
KEY BARRIERS

- Sector heavily relying on fossil fuel
  - fossil fuel subsidies – no level playing field
  - Upfront capital cost of RE
- Lack of supportive regulatory framework
  - No new H&C policies since 2017
  - for electrification
- Resource availability
- Investments in supporting infrastructure needed (e.g., district heating and cooling)
- Technological advances needed for high-temperature industrial processes



RENEWABLES WERE FASTEST GROWING ENERGY SOURCE IN BUILDINGS

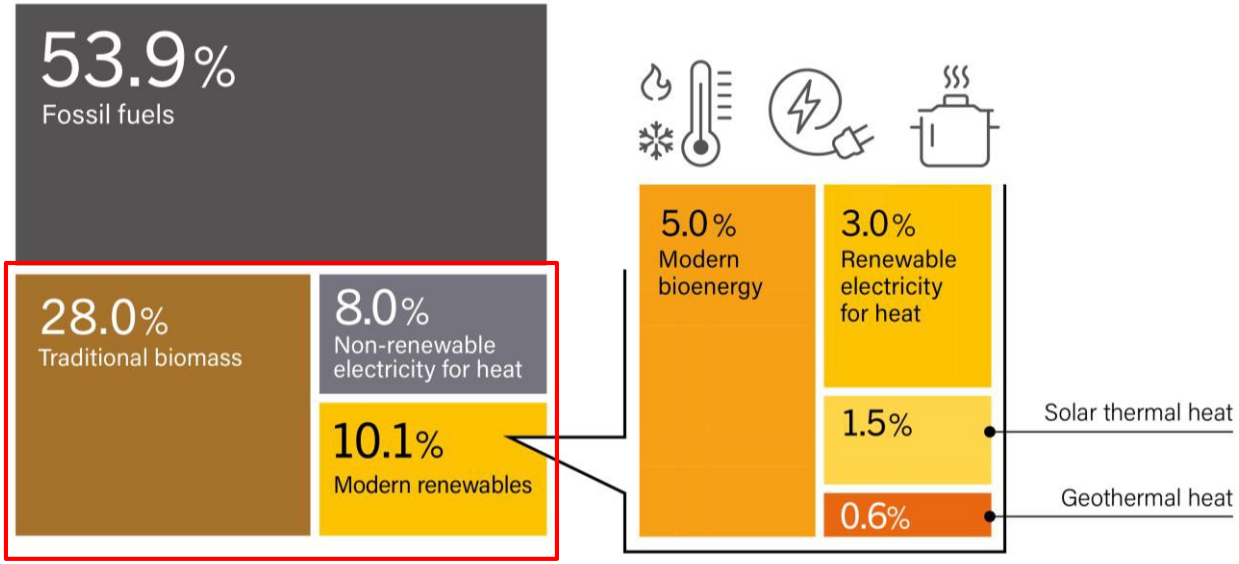
Renewable Share of Total Final Energy Consumption in Buildings, 2017



Note: Modern bio-heat includes heat supplied by district energy networks. Totals may not add up due to rounding.

Source: Based on IEA data.

RENEWABLE HEAT IS GRADUALLY GROWING IN BUILDINGS



Note: Includes space heating, space cooling, water heating and cooking.
Modern bioenergy includes heat supplied by district energy networks.

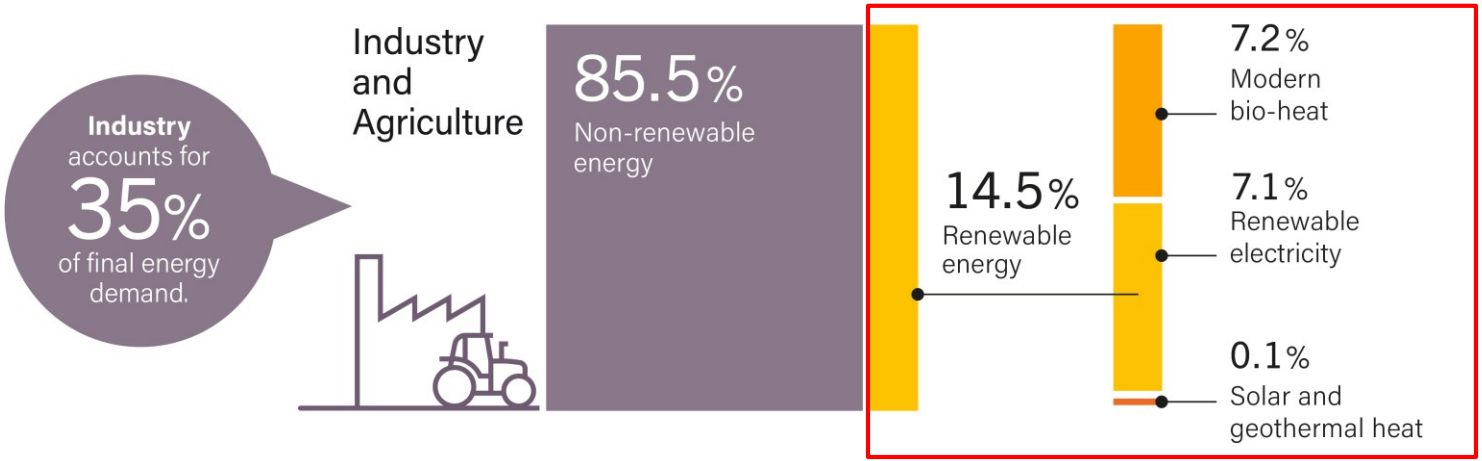
Source: Based on IEA data.

Estimated Renewable Share of Heating and Cooling in Buildings, 2018

The share of renewable heating and cooling in buildings grew from **8% in 2010** to more than 10% in 2018.

RENEWABLES IN INDUSTRIAL ENERGY USE REMAINS SMALL

Renewable Share of Total Final Energy Consumption in Industry and Agriculture, 2017



Note: Modern bio-heat includes heat supplied by district energy networks.
Totals may not add up due to rounding.

Source: Based on IEA data.

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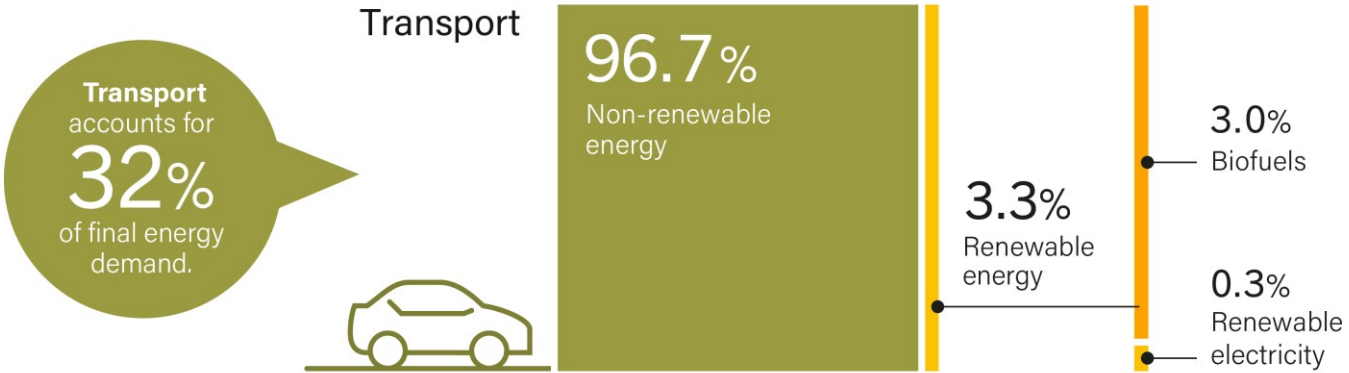
THE SHARE OF RENEWABLES IN TRANSPORT HAS NOT CHANGED

Renewable Share of Total Final Energy Consumption in Transport, 2017



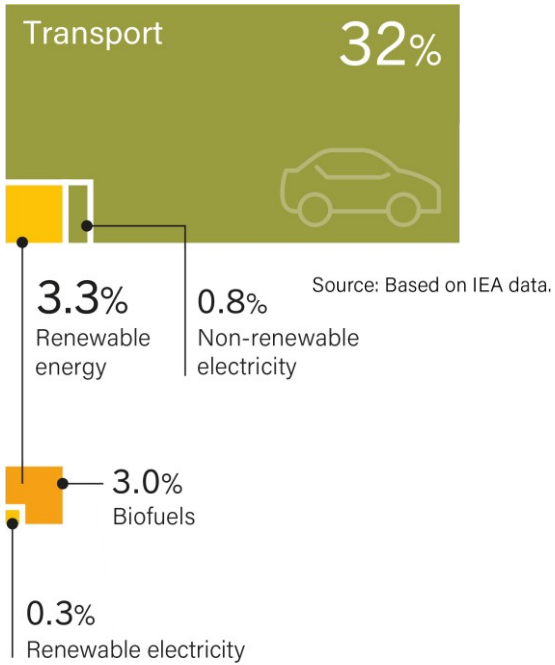
Source: Based on IEA data.

THE SHARE OF RENEWABLES IN TRANSPORT HAS NOT CHANGED

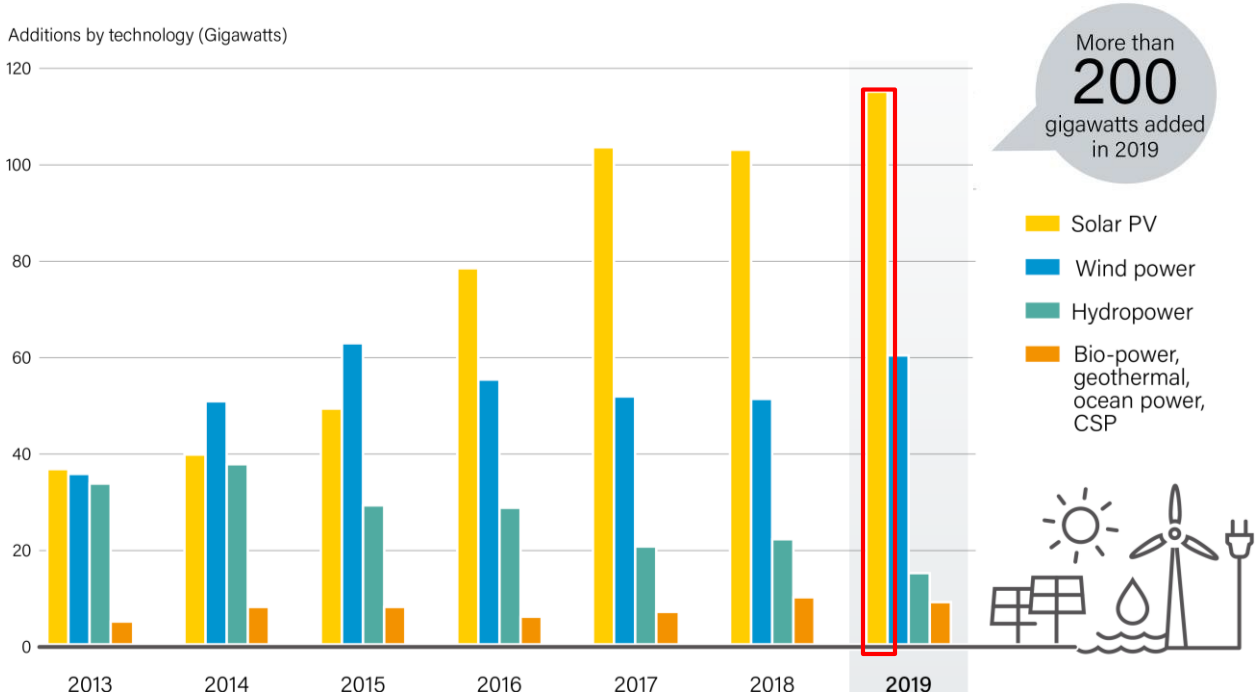
KEY BARRIERS

- Sector heavily relying on fossil fuel
  - Fossil fuel "centered" market structures
  - Fossil fuel subsidies – no level playing field
- Lack of strong policy support ❼ no new countries with biofuel blend mandates since 2017
- Exploding demand growth
- Only nine countries with advanced mandates
- Limited options in aviation and shipping

Renewable Share of Total Final Energy Consumption, by Final Energy Use, 2017



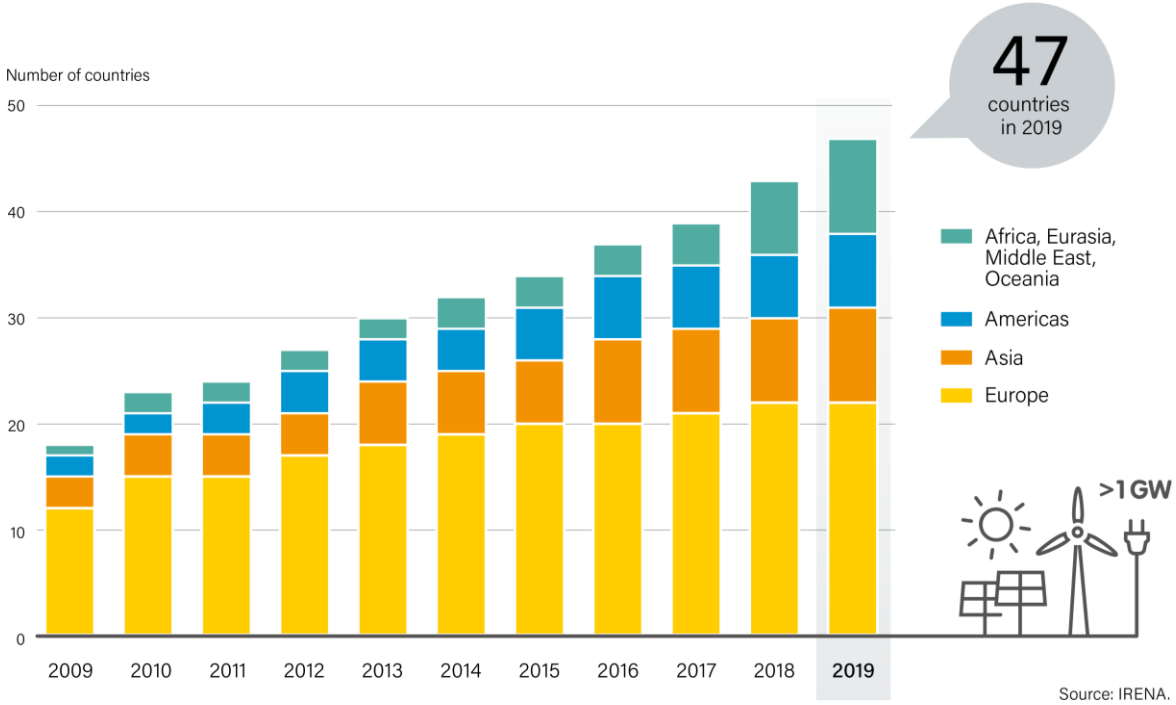
MORE THAN 200 GIGAWATTS OF RENEWABLE POWER ADDED IN 2019



Annual Additions of Renewable Power Capacity, by Technology and Total, 2013-2019

Although most of the additions were from **solar PV (115 GW)**, global markets for wind power and bio-power also grew during 2019.

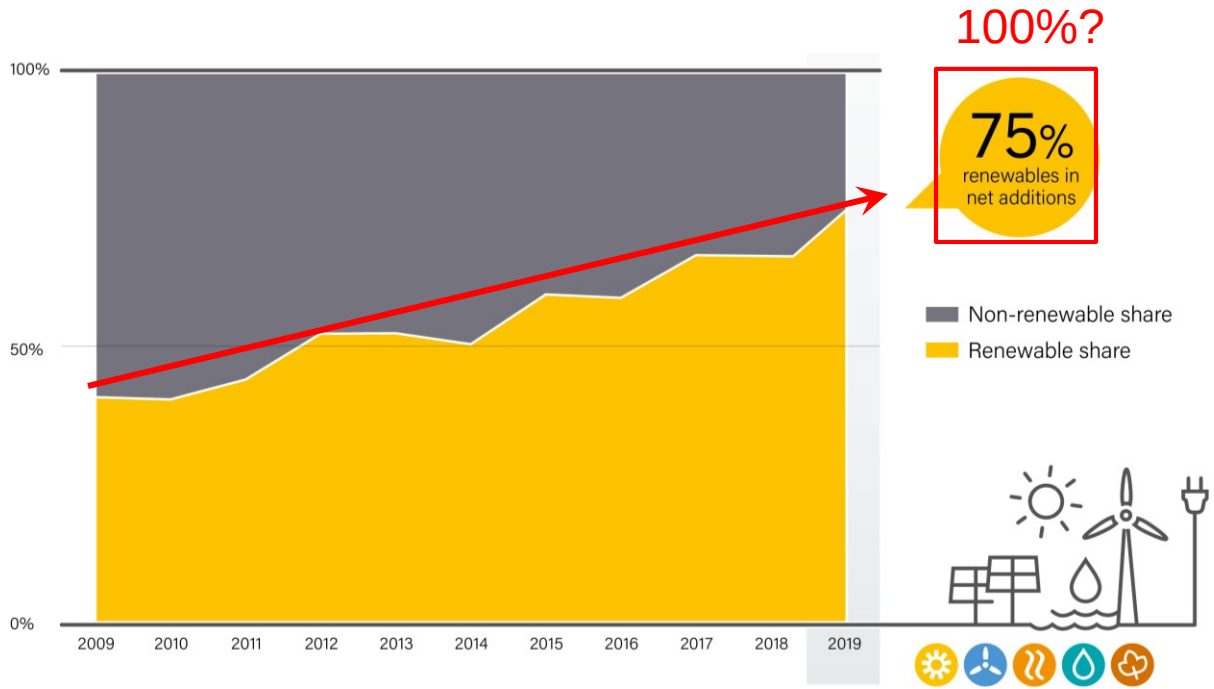
SOLAR PV AND WIND POWER ARE SPREADING AROUND THE WORLD



Number of Countries with More Than 1 GW of Solar PV and Wind Power, by Region, 2009-2019

47 countries had installed at least 1 GW of solar PV and wind power. compared to **18 countries** in 2009.

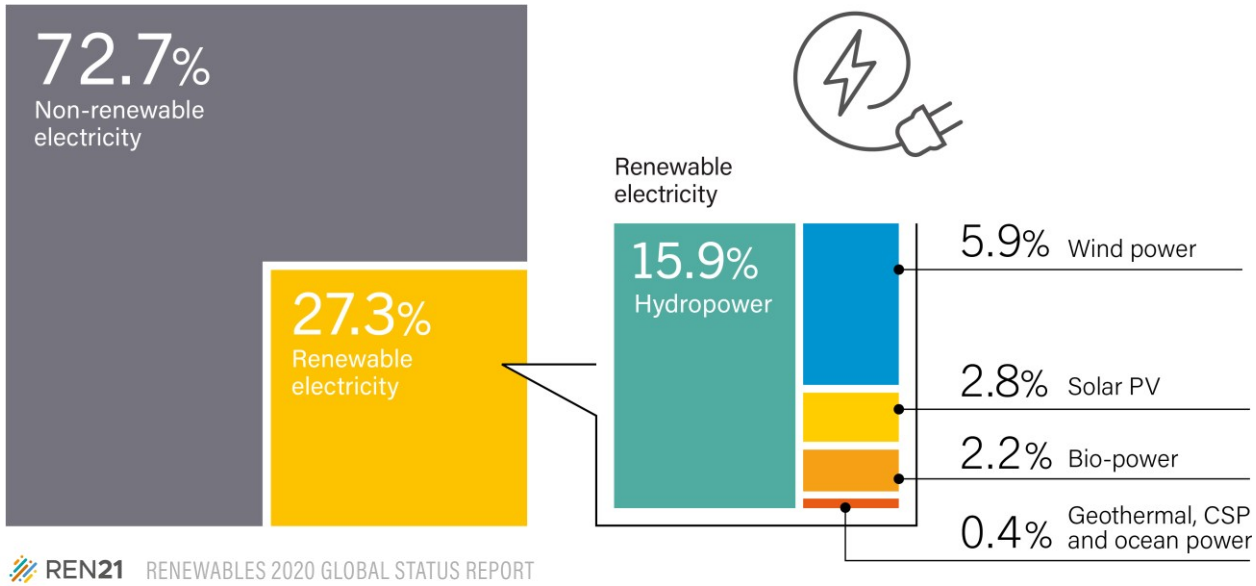
MORE RENEWABLE POWER ADDED THAN FOSSIL FUEL AND NUCLEAR



Renewable and Non-renewable Shares of Net Annual Additions in Power Generating Capacity, 2009-2019

For **the fifth year in a row**, net additions of renewable power generation capacity were higher than net installations of both fossil fuel and nuclear power capacity combined.

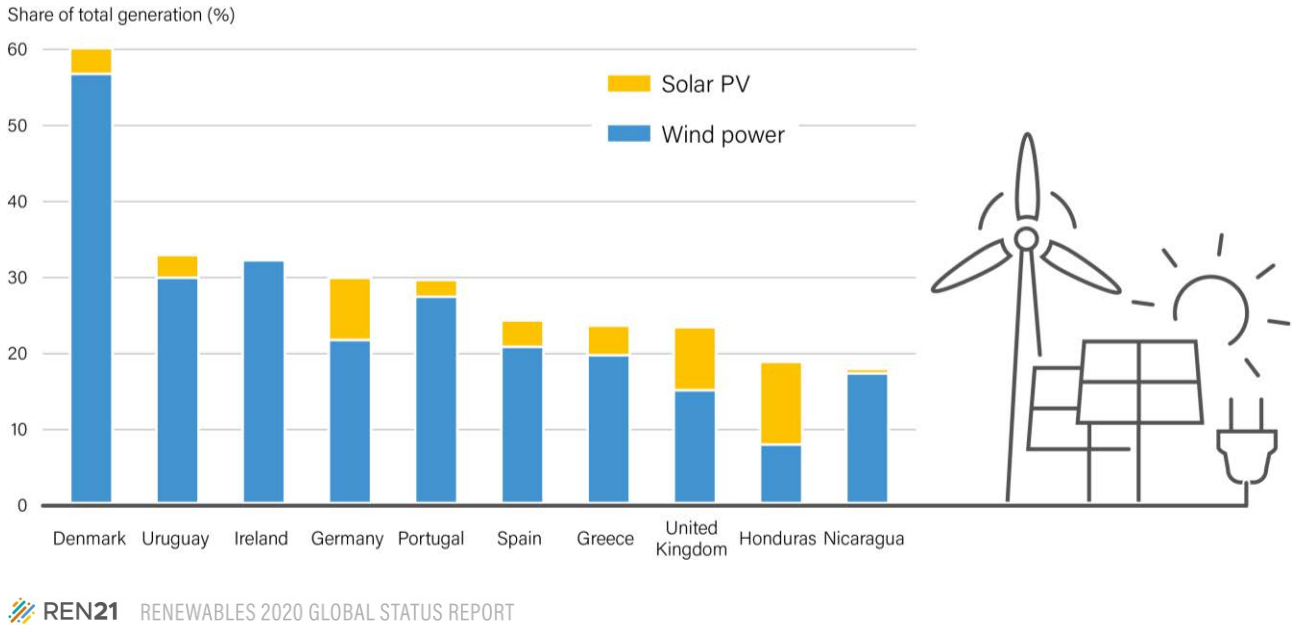
MORE THAN 27% OF GLOBAL ELECTRICITY IS NOW RENEWABLE



Estimated Renewable Energy Share of Global Electricity Production, End-2019

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

VARIABLE RENEWABLES REACHING HIGH SHARES IN MANY COUNTRIES

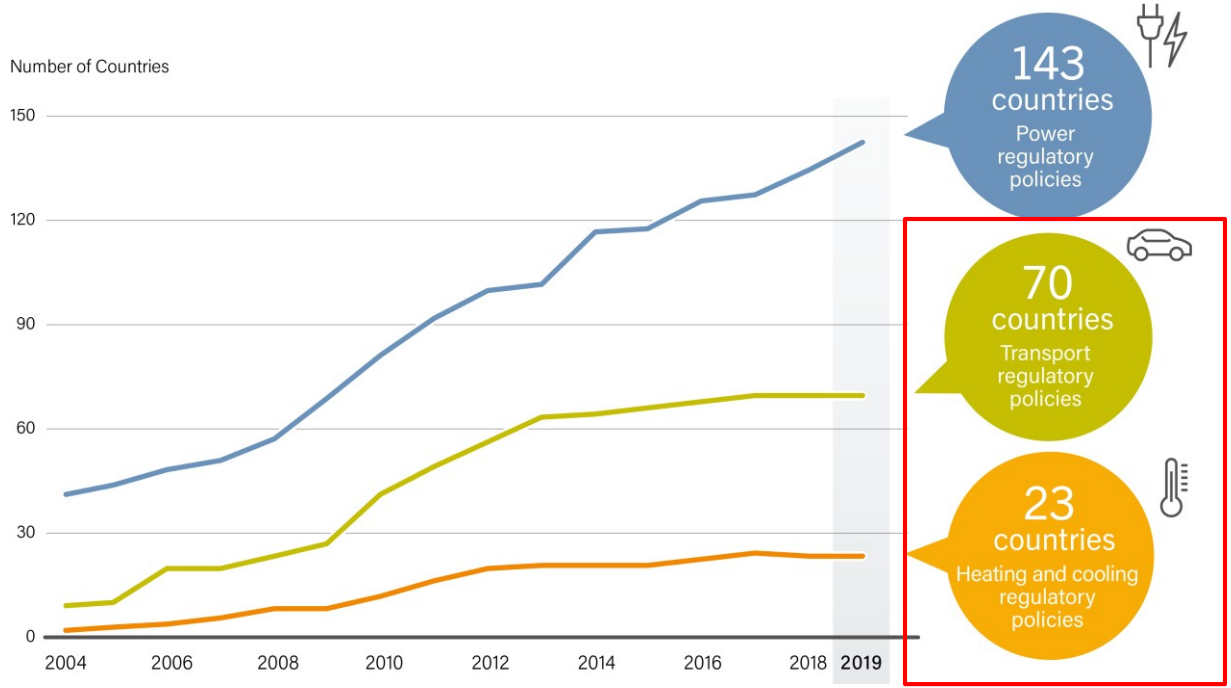


Share of Electricity Generation from Variable Renewable Electricity, Top Countries, 2019

At least four countries met **more than 30%** of their electricity generation from VRE in 2019 including **Denmark, Germany, Ireland** and **Uruguay.**

Policies & Targets

POWER SECTOR CONTINUES TO RECEIVE MOST POLICY ATTENTION



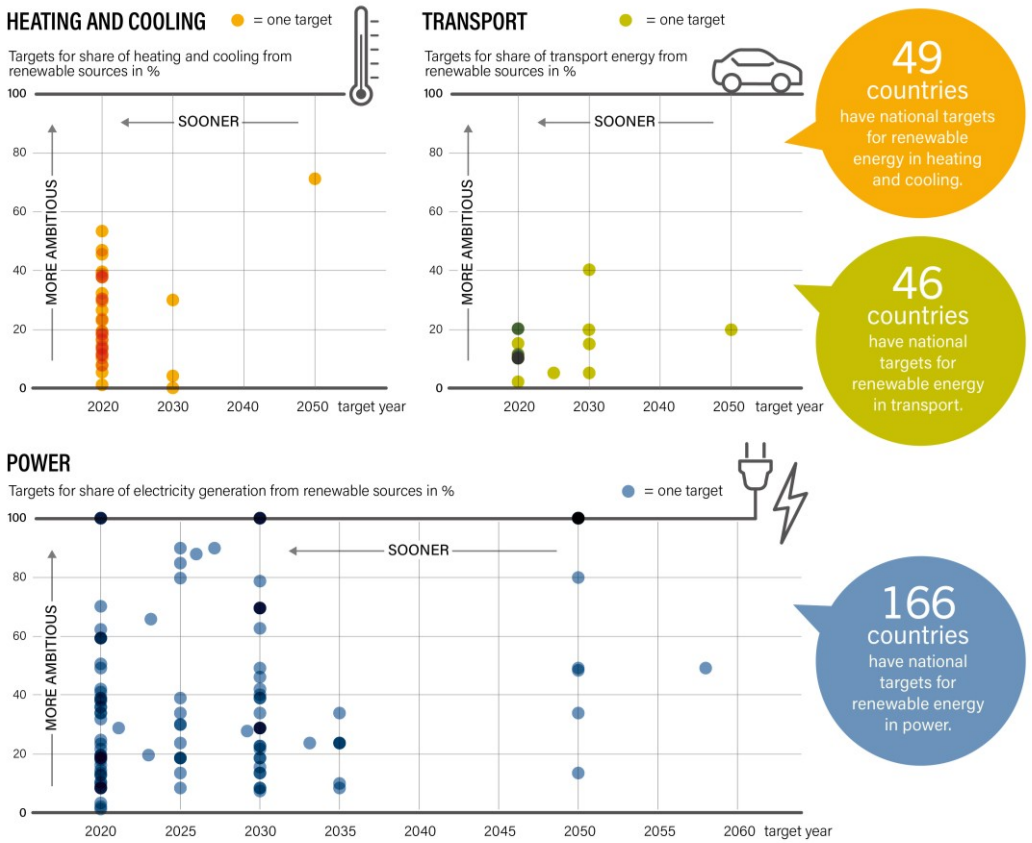
Number of Countries with Renewable Energy Policies, 2004-2019

Policies and targets **renewables in power** remain more ambitious and more numerous than those for other sectors.

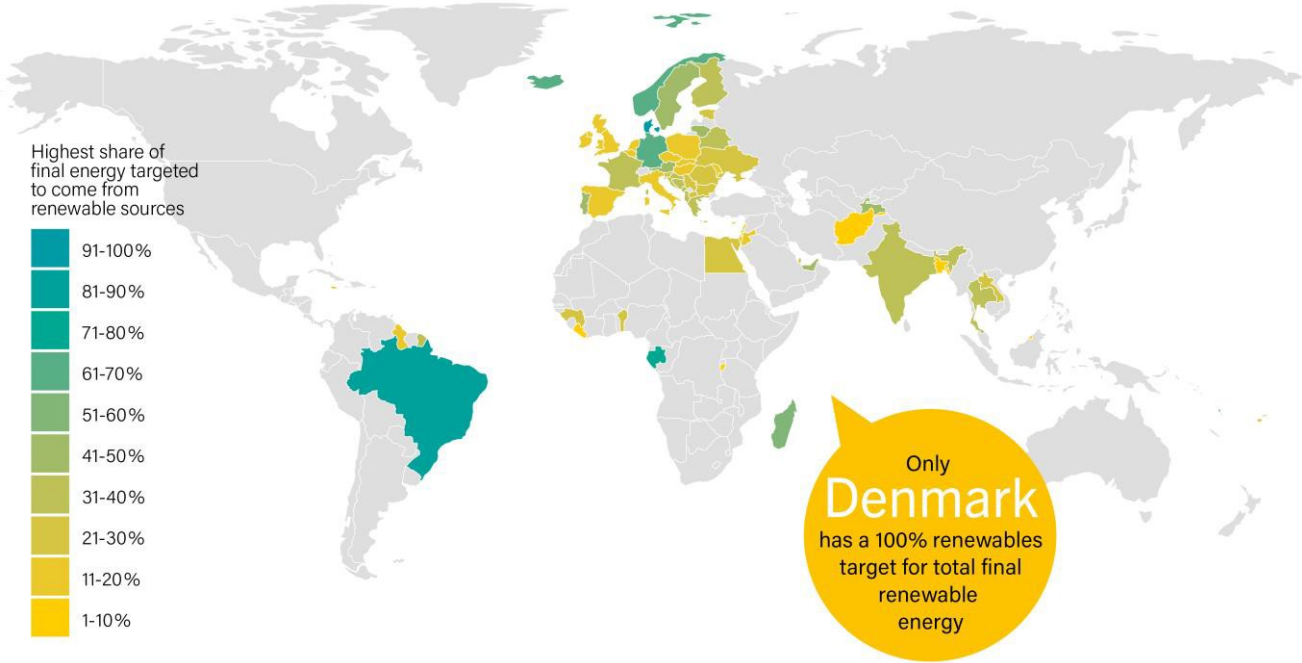
TARGET IMBALANCE

National Sector-Specific Targets for Share of Renewable Energy by a Specific Year, in Place at End-2019

Globally, most renewable energy targets are aimed exclusively at the **power sector**.



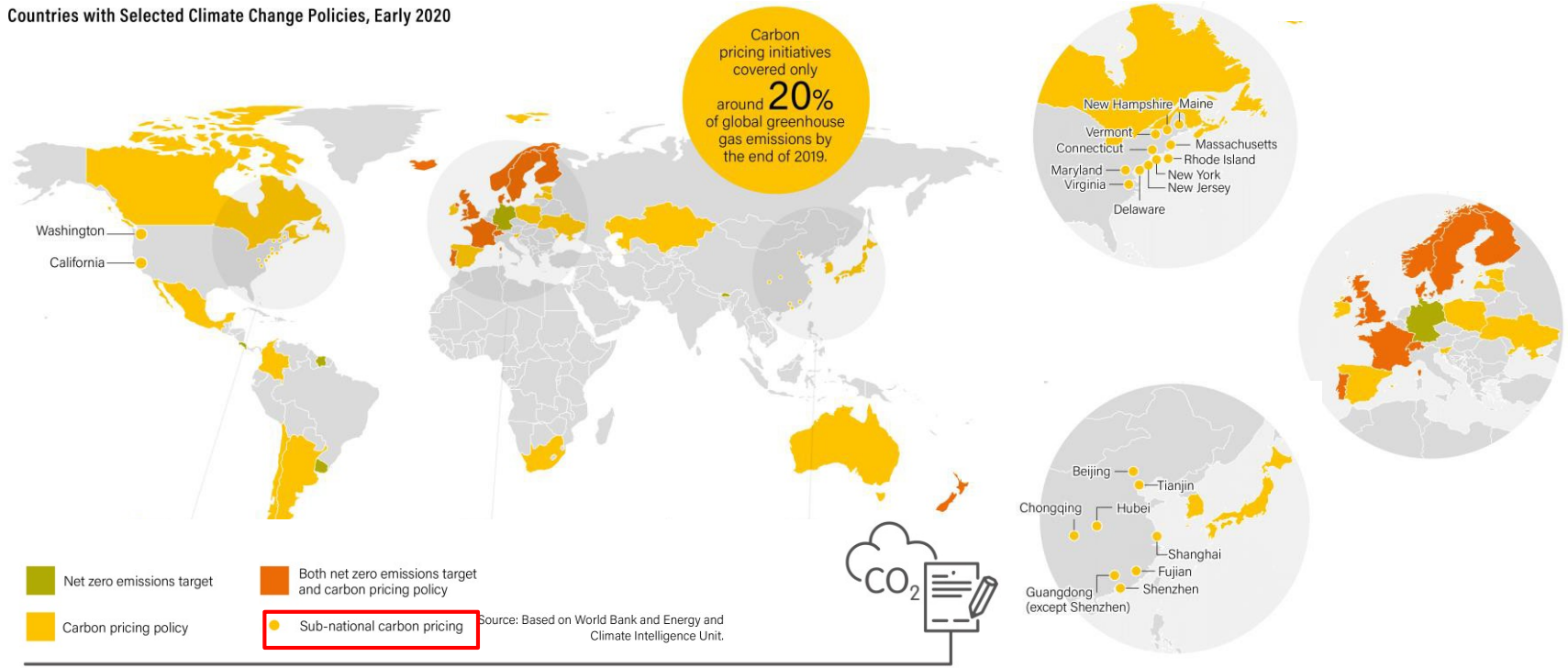
RENEWABLE ENERGY TARGETS AROUND THE WORLD



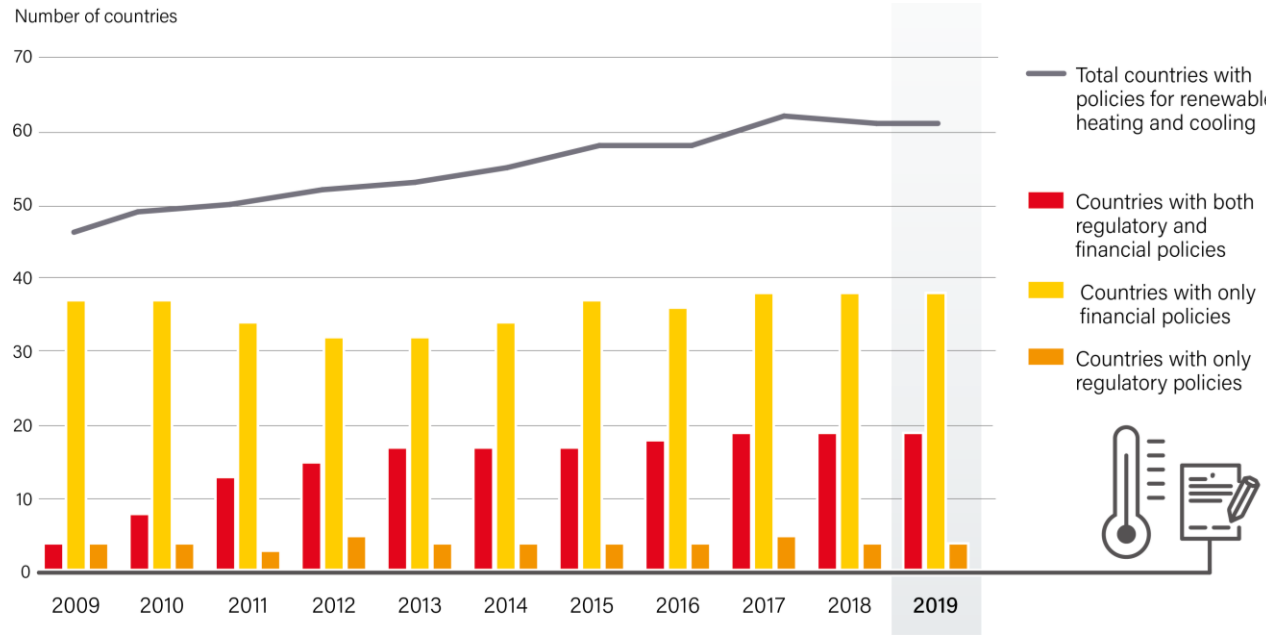
National Targets for Share of Renewable Energy in Final Energy, by a Specific Year, in Place at End-2019

Only one new country (Spain) adopted an economy-wide renewable energy target during 2019.

CARBON PRICING SLOWLY EXPANDING



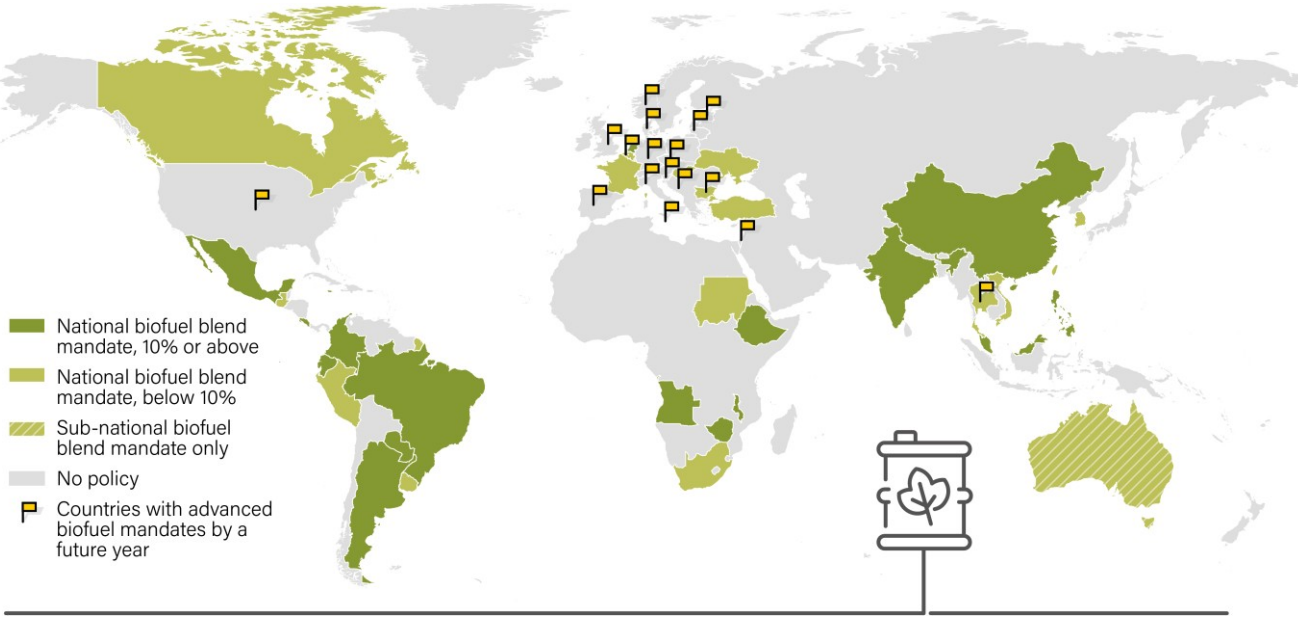
POLICY SUPPORT STAGNATING IN HEATING AND COOLING SECTOR



Countries with Policies for Renewable Heating and Cooling, 2009-2019

No new countries have adopted renewable energy financial support policies for heating and cooling since 2017.

POLICY SUPPORT REMAINS STATIC FOR TRANSPORT



National and Sub-National Renewable Transport Mandates, as of End-2019

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

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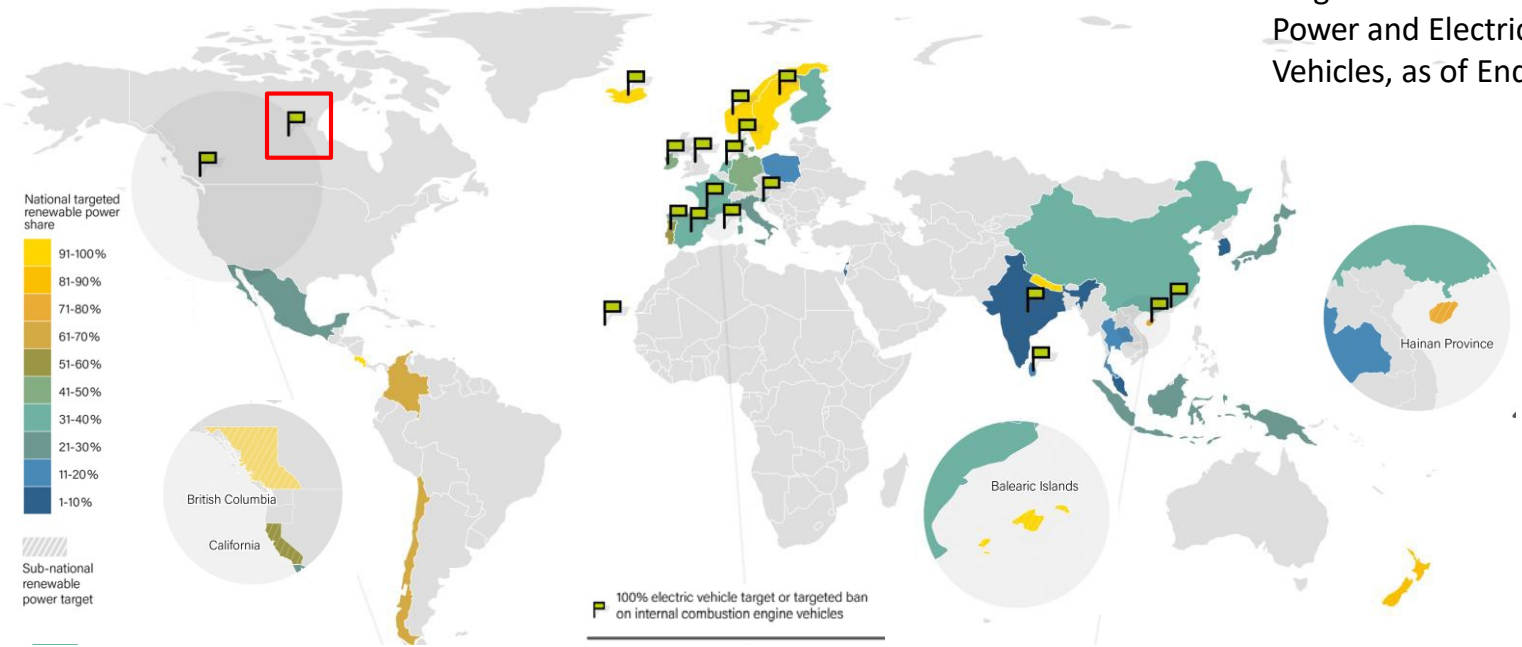
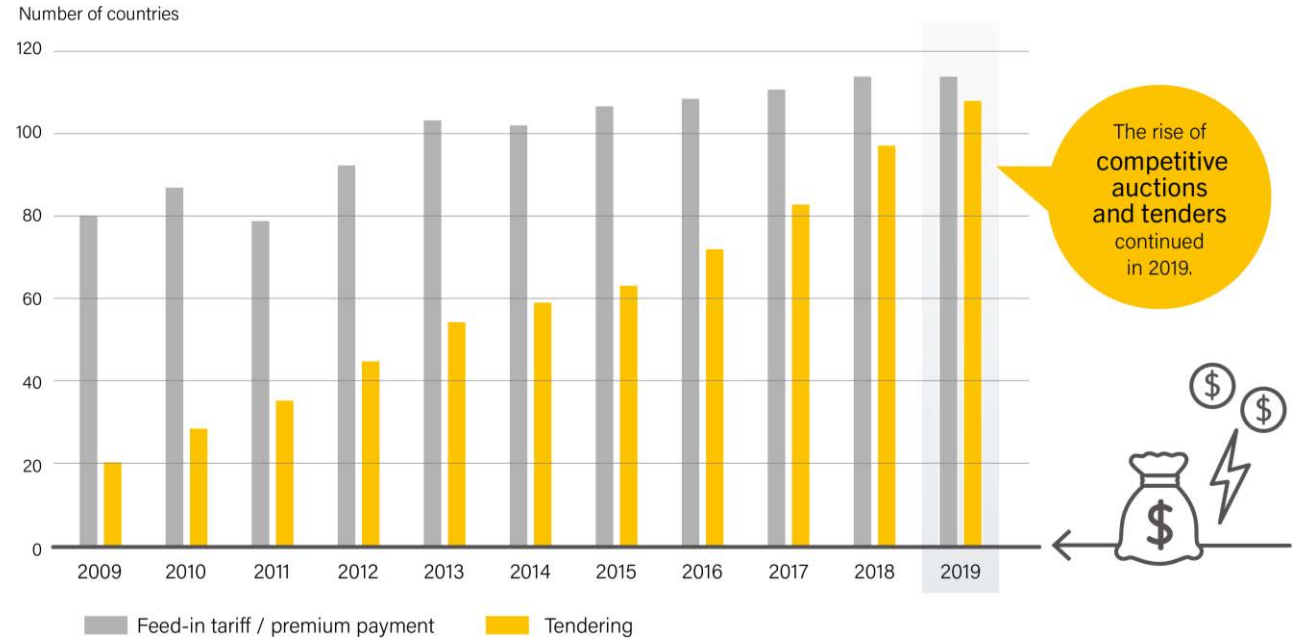
ONLY SEVERAL COUNTRIES HAVE TARGETS FOR EVS AND RENEWABLES

Targets for Renewable Power and Electric Vehicles, as of End-2019



THE RISE OF RENEWABLE POWER AUCTIONS CONTINUED



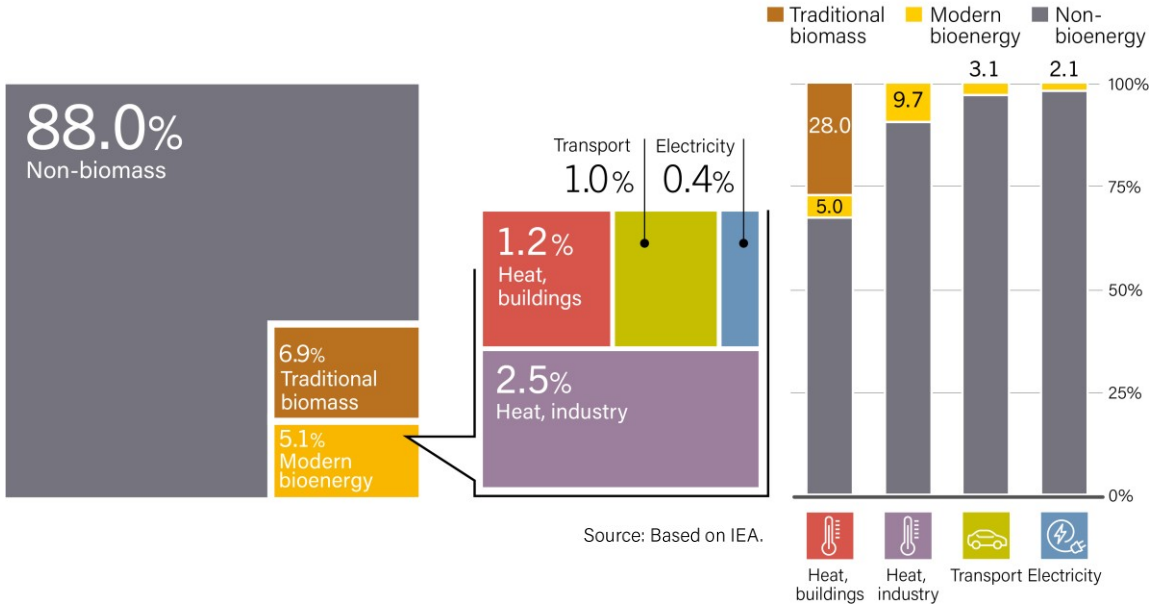
Cumulative Number of Countries with Feed-in or Tendering Policies, 2009-2019

109 countries had used auctions or tendering as of end-2019, up from 98 total countries in 2018.


RENEWABLES NOW
Technologies

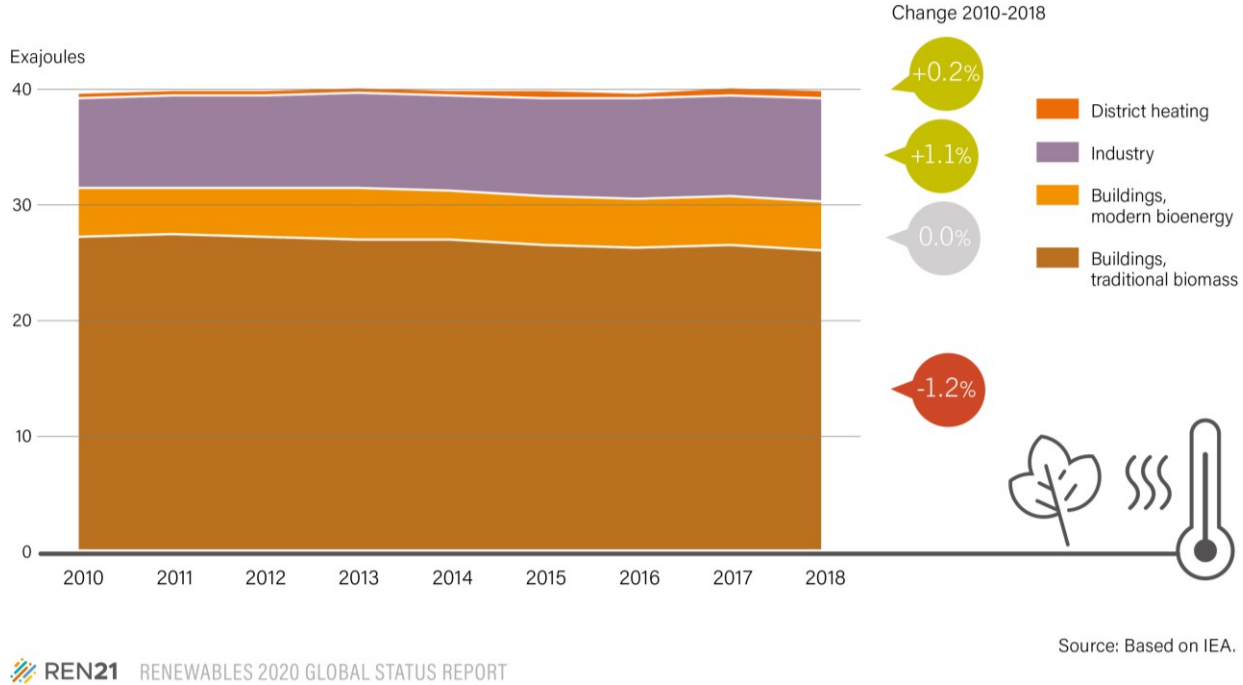
BIOENERGY MAKES LARGEST CONTRIBUTION TO RENEWABLE SUPPLY

Estimated Shares of Bioenergy in Total Final Energy Consumption, Overall and by End-Use Sector, 2018



Modern bioenergy supplies energy for heating, transport and electricity end-uses.

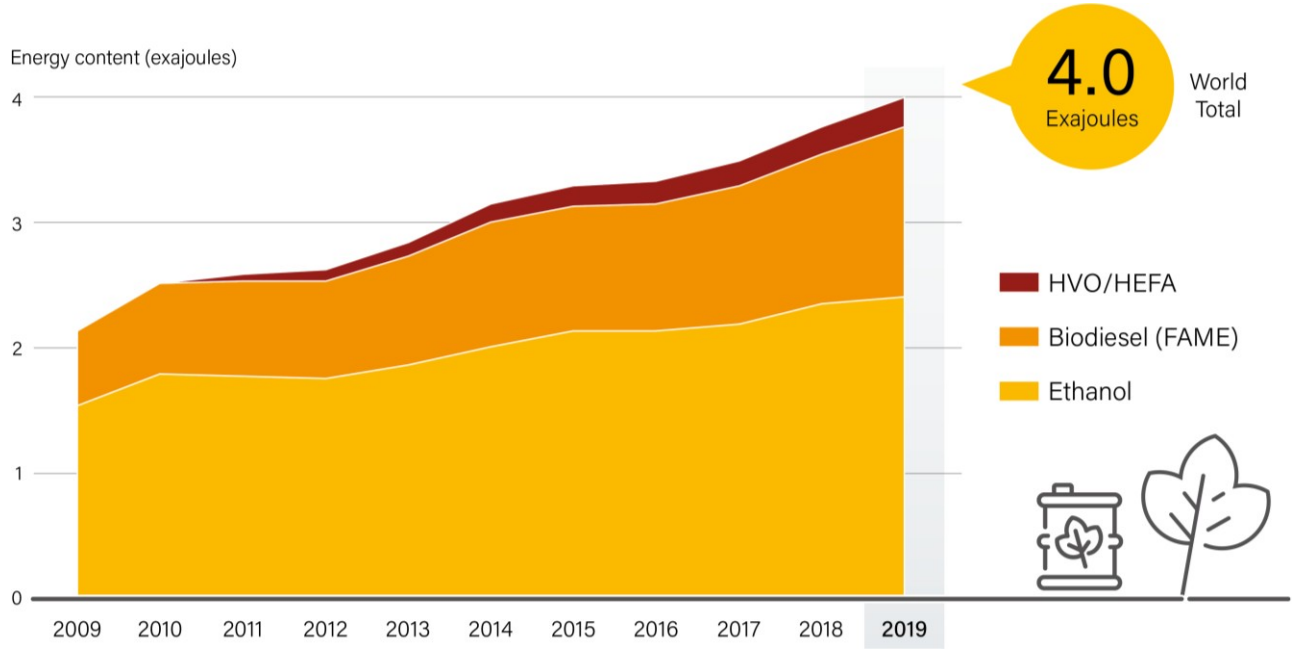
USE OF MODERN BIOENERGY IS INCREASING SLOWLY



Global Bioenergy Use for Heating, by End-Use, 2010-2018

Bio-heat is used in **buildings and industry**, and often supplied by district energy networks.

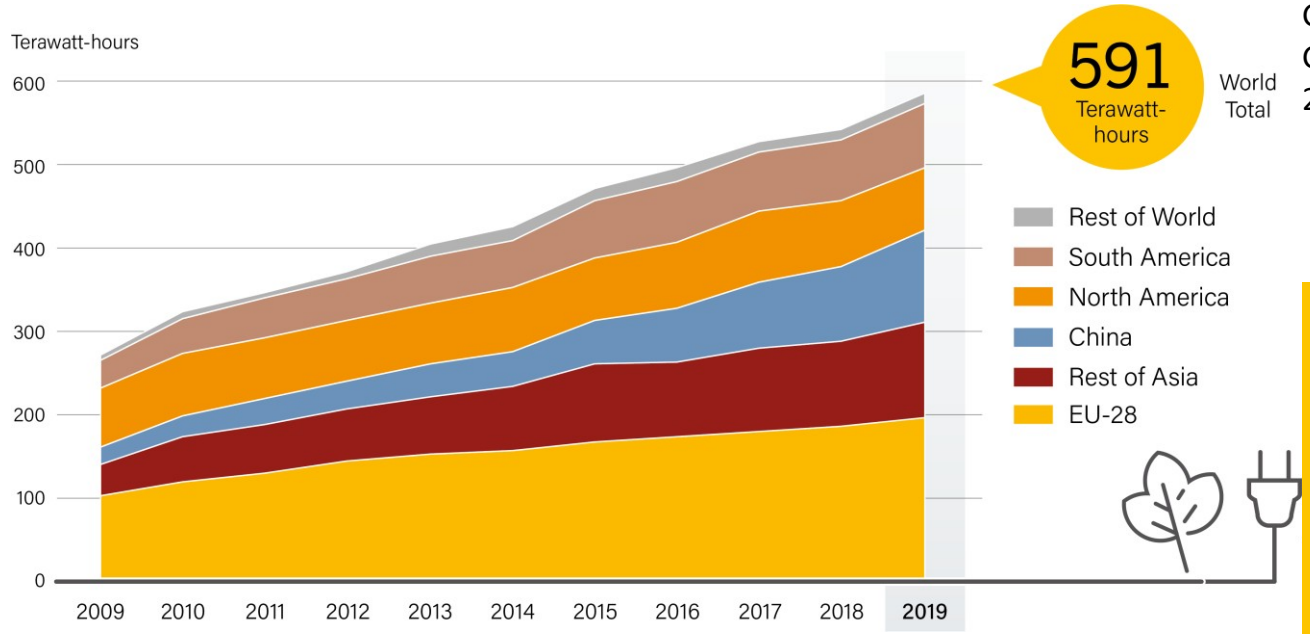
BIOFUELS PRODUCTION INCREASED, DOMINATED BY US AND BRAZIL



Global Production of Ethanol, Biodiesel and HVO/HEFA Fuel, by Energy Content, 2010-2019

The **United States** remained the leading biofuels producer, with a 41% share, despite declines in US production of both ethanol and biodiesel.

BIOELECTRICITY PRODUCTION HAS GROWN RAPIDLY

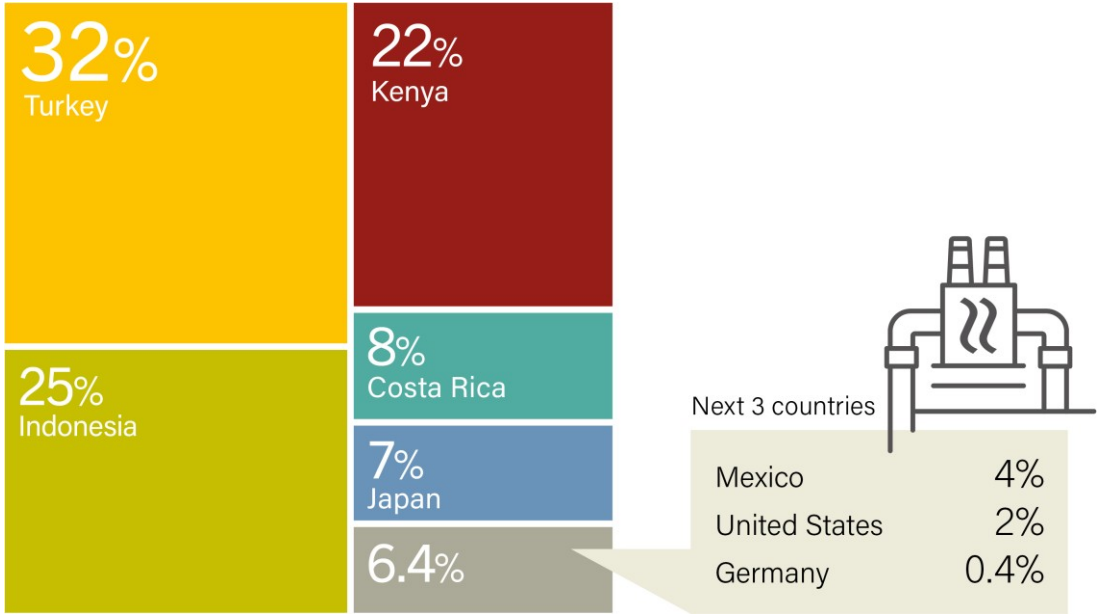


Global Bioelectricity Generation, by Region, 2009-2019

Bioelectricity generation increased **9% from 2018**, with the majority of gains in Asian countries including China.

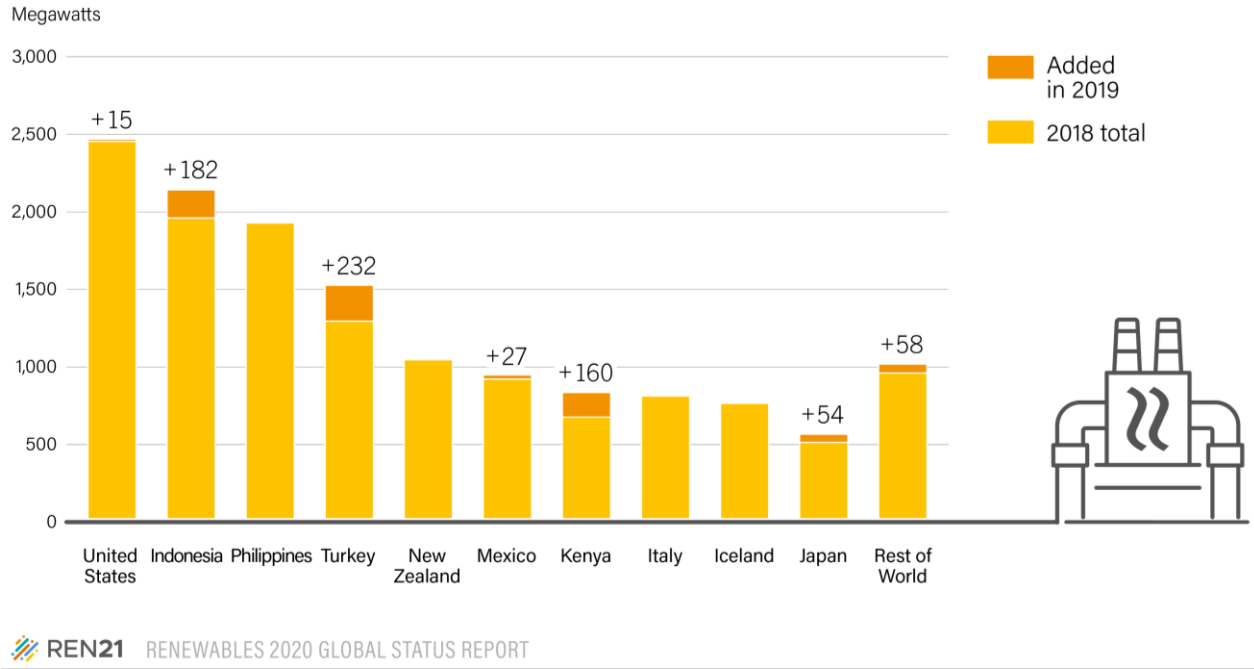
GEOTHERMAL POWER CAPACITY ADDITIONS MAINLY IN THREE COUNTRIES

Geothermal Power Capacity Global Additions, Share by Country, 2019



Installed geothermal power capacity grew by 5% in 2019.

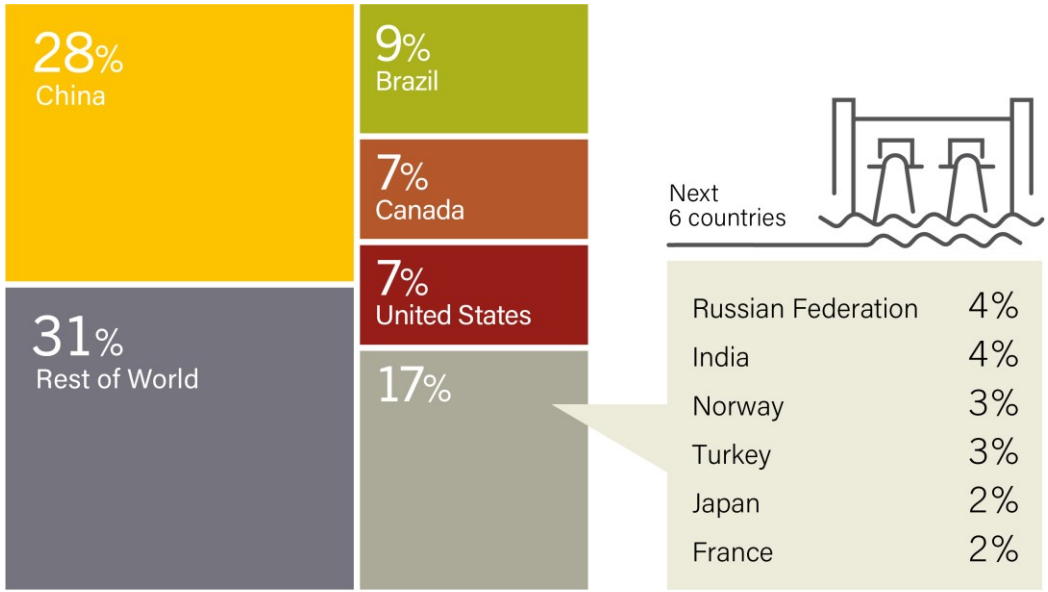
TURKEY AND INDONESIA LED NEW GEOTHERMAL POWER INSTALLATIONS



Geothermal Power Capacity and Additions, Top 10 Countries for Capacity Added and Rest of World, 2019

Turkey and Indonesia have been the most active geothermal power markets in recent years.

HYDROPOWER CHARACTERISED BY MARKET STABILITY



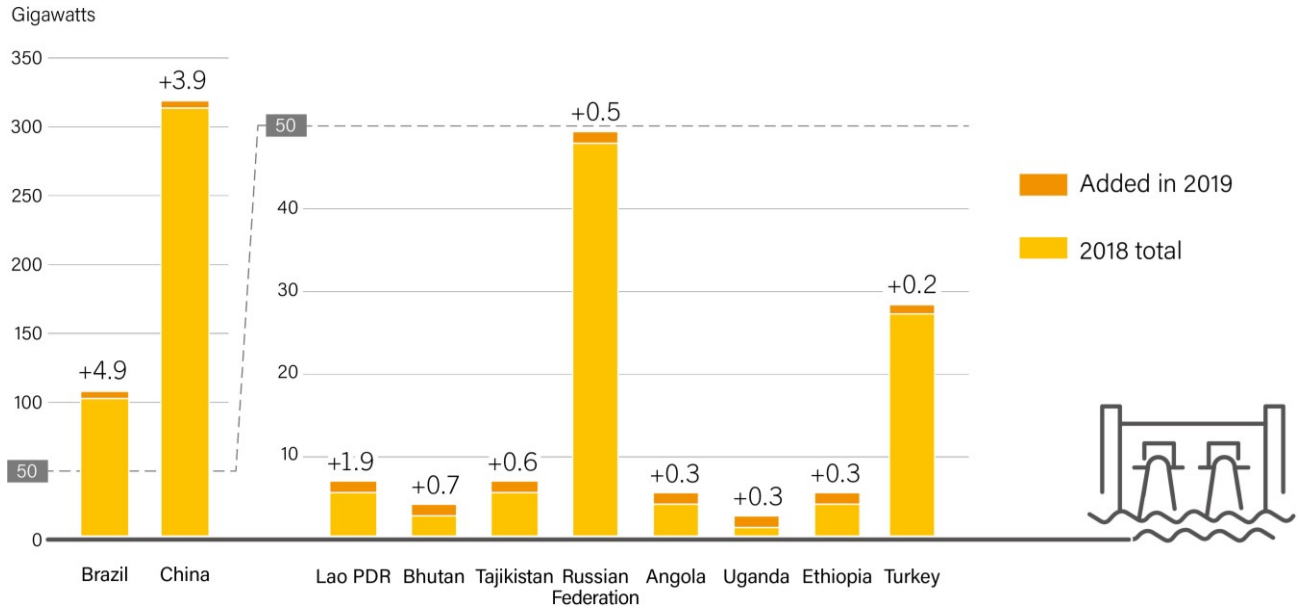
Hydropower Global Capacity, Shares of Top 10 Countries and Rest of World, 2019

Only 15.6 GW added in 2019, continuing a multi-year trend of market deceleration.

Note: Totals may not add up due to rounding.

Source: Global total from IHA.

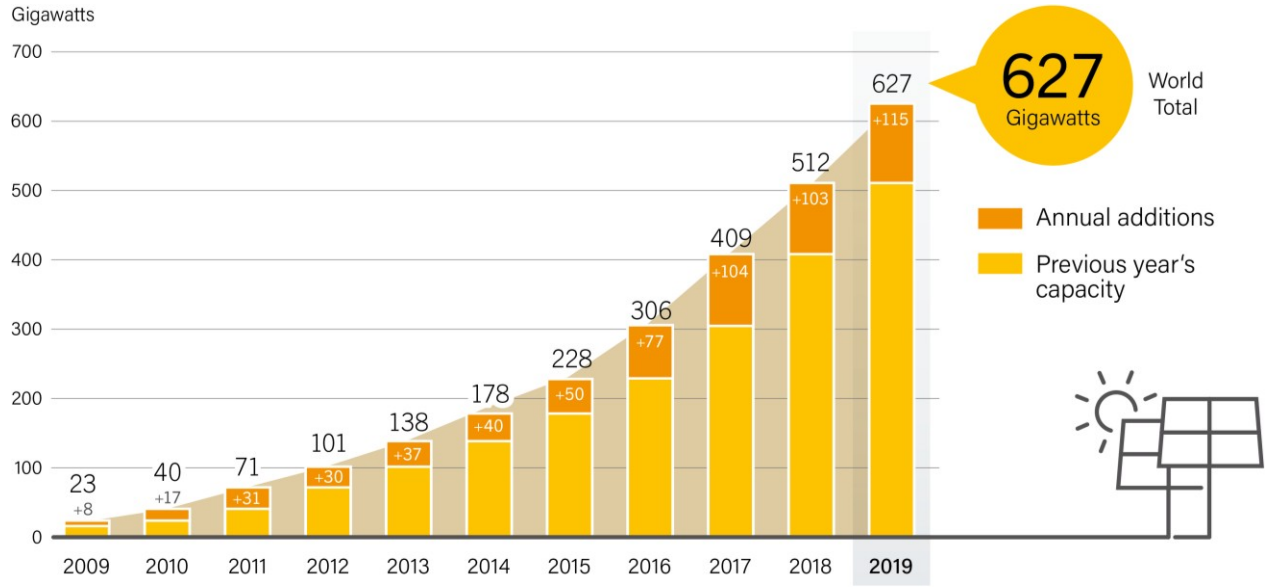
HYDROPOWER CAPACITY ADDED IN NEARLY EVERY REGION



Hydropower Capacity and Additions, Top 10 Countries for Capacity Added, 2019

Brazil installed the most new capacity, marking the first year since 2004 in which **China** did not maintain a lead over all other countries for new hydropower completions.

SOLAR PV CAPACITY ADDITIONS PASSED 115 GW MARK IN 2019



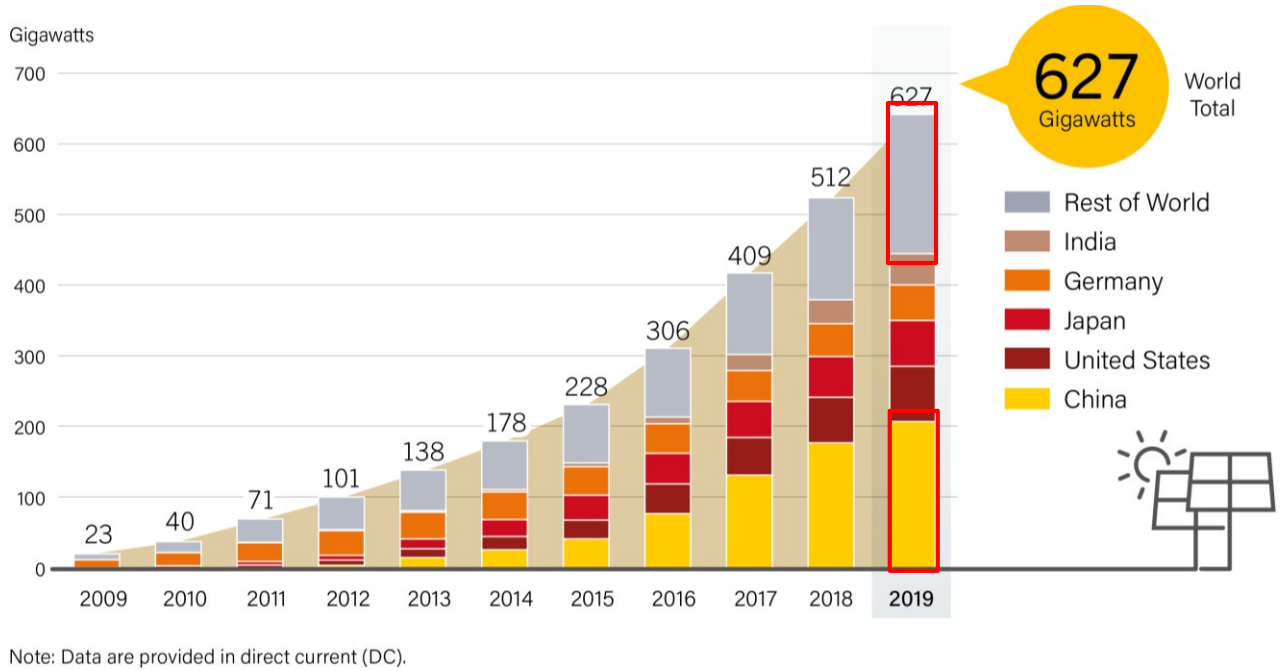
Note: Data are provided in direct current (DC).
Totals may not add up due to rounding.

Source: Becquerel Institute and IEA PVPS.

Solar PV Global Capacity and Annual Additions, 2009-2019

By the end of 2019, **22 countries** had enough capacity in operation to meet **at least 3% of their** electricity demand with solar PV.

SOLAR PV SPREADING TO NEW PARTS OF THE WORLD

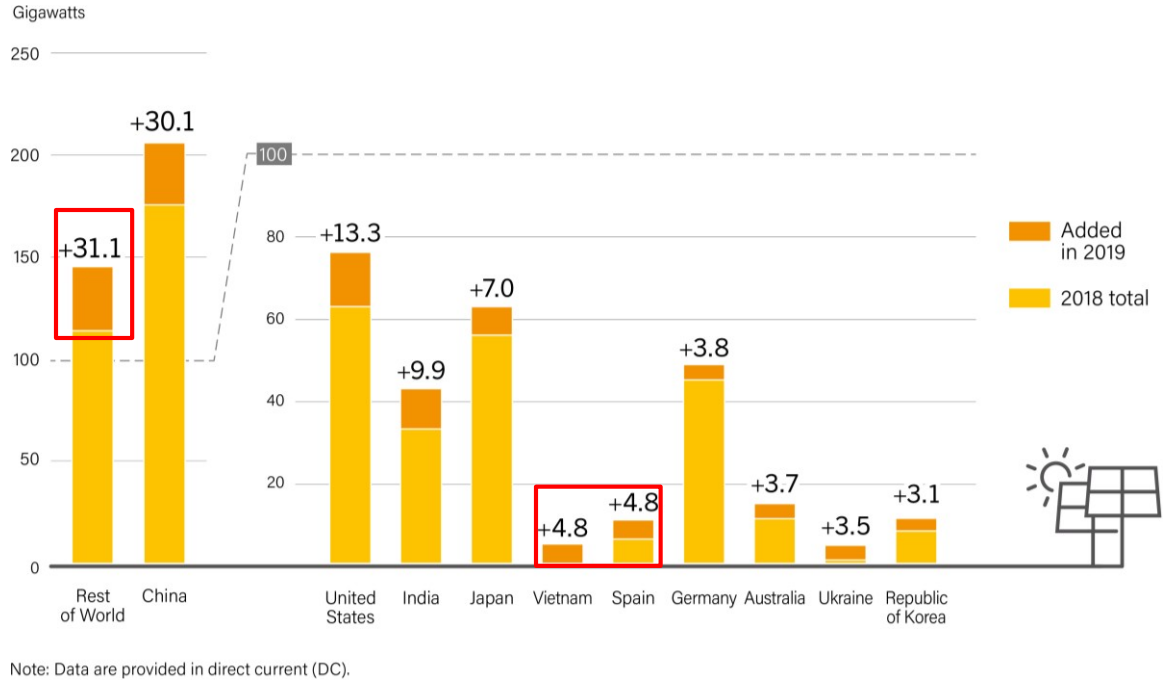


Note: Data are provided in direct current (DC).

Solar PV Global Capacity, by Country and Region, 2009-2019

For the seventh consecutive year, Asia eclipsed all other regions for new installations, **accounting for half of global additions.**

CHINA REMAINS LEADER IN SOLAR PV DESPITE DECLINE IN MARKET

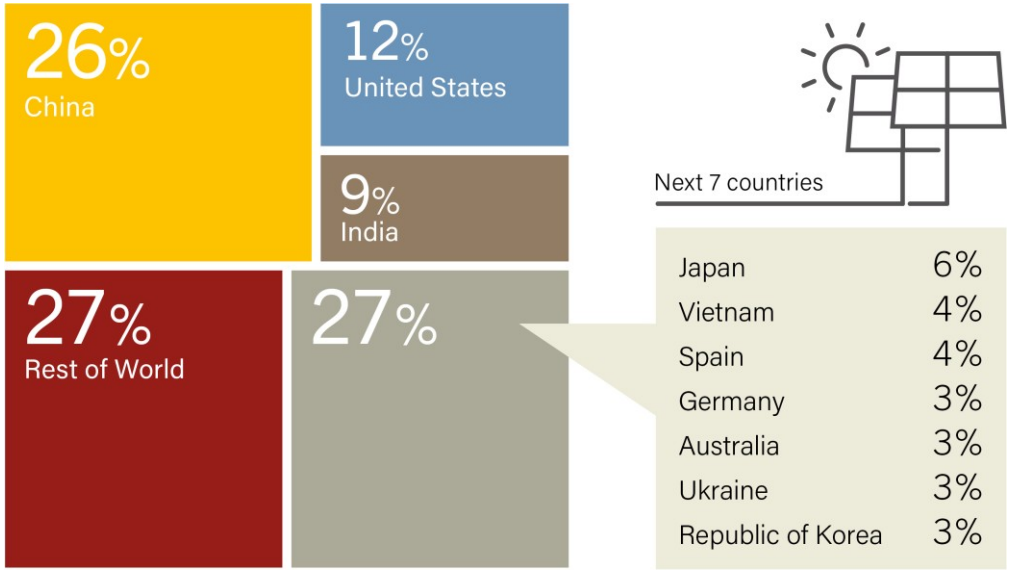


Note: Data are provided in direct current (DC).

Solar PV Capacity and Additions, Top 10 Countries for Capacity Added, 2019

China's market decline attributed to **policy uncertainty** following the removal of a feed-in tariff law in 2018.

ASIA: MAIN REGIONAL SOLAR PV MARKET FOR 7TH CONSECUTIVE YEAR



Solar PV Global Capacity Additions, Shares of Top 10 Countries and Rest of World, 2019

Asia accounted for half of global additions, despite declines in the region's top three markets (China, India and Japan).

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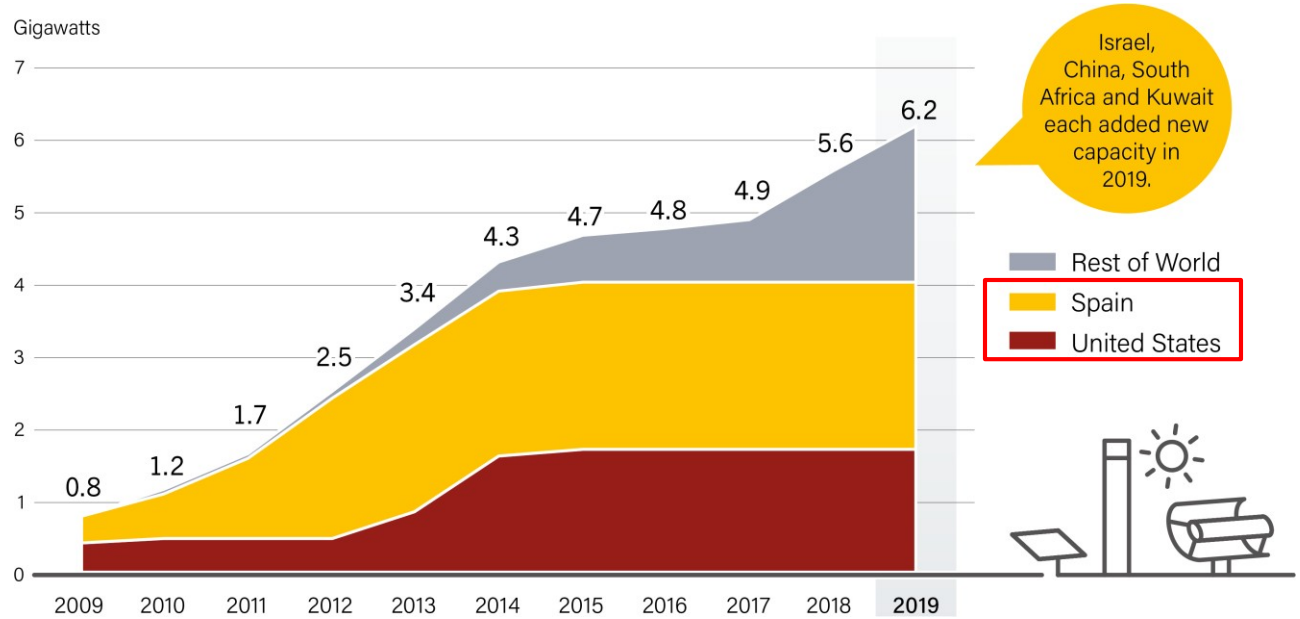
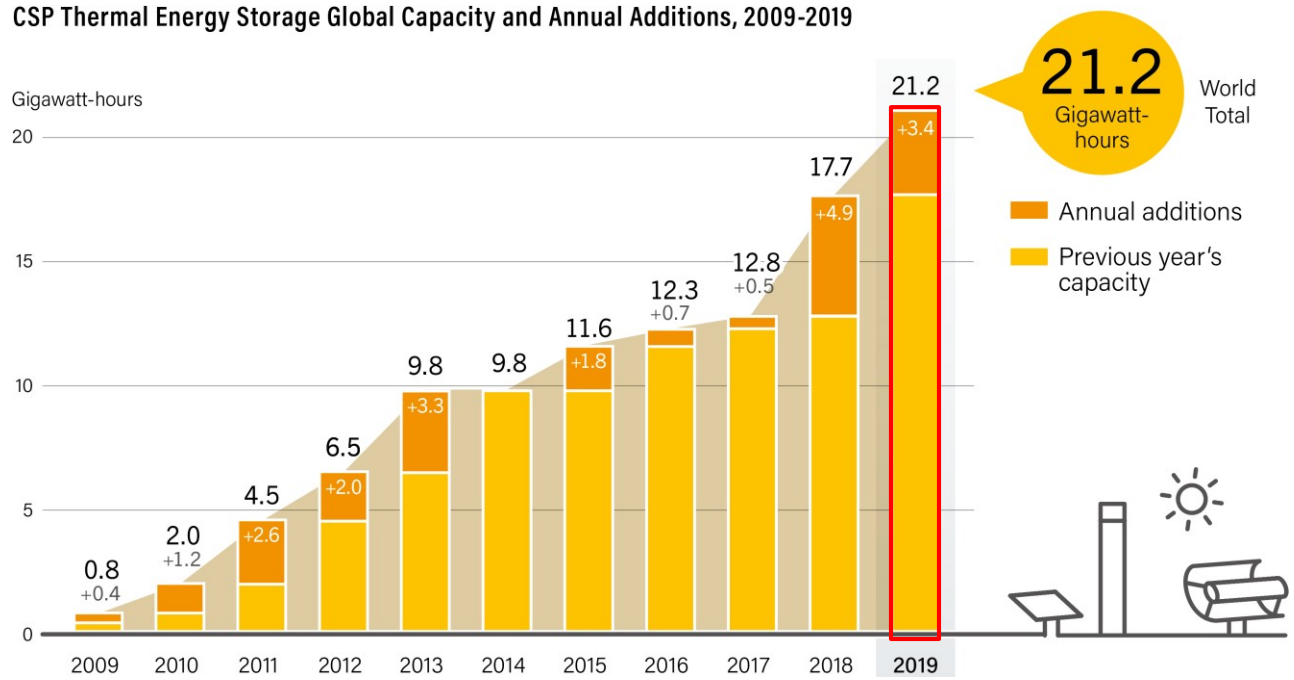
NEW CSP ADDITIONS EXCLUSIVELY IN EMERGING MARKETS



Concentrating Solar Thermal Power Global Capacity, by Country and Region, 2009-2019

Global CSP capacity **grew 11% in 2019**, with around 600 MW of capacity coming online.

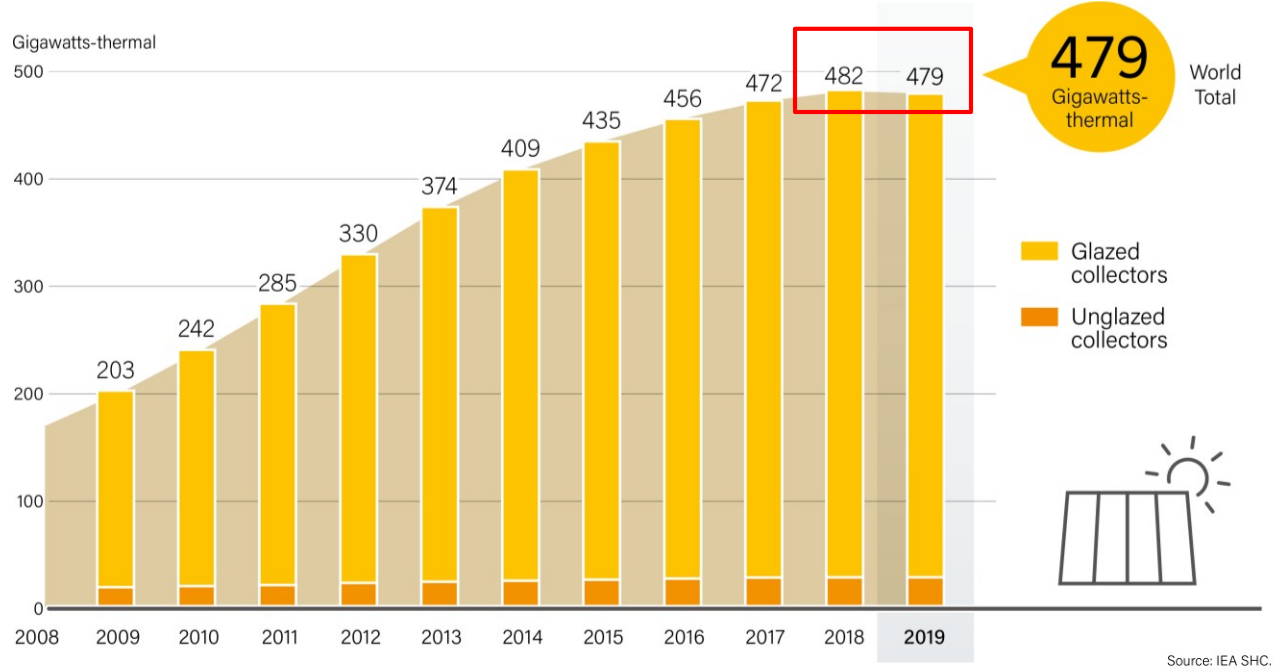
NEARLY ALL CSP PLANTS USE THERMAL ENERGY STORAGE



CSP Thermal Energy Storage Global Capacity and Annual Additions, 2009-2019

21 of the 23 CSP plants completed globally since the end of 2014 have incorporated thermal energy storage.

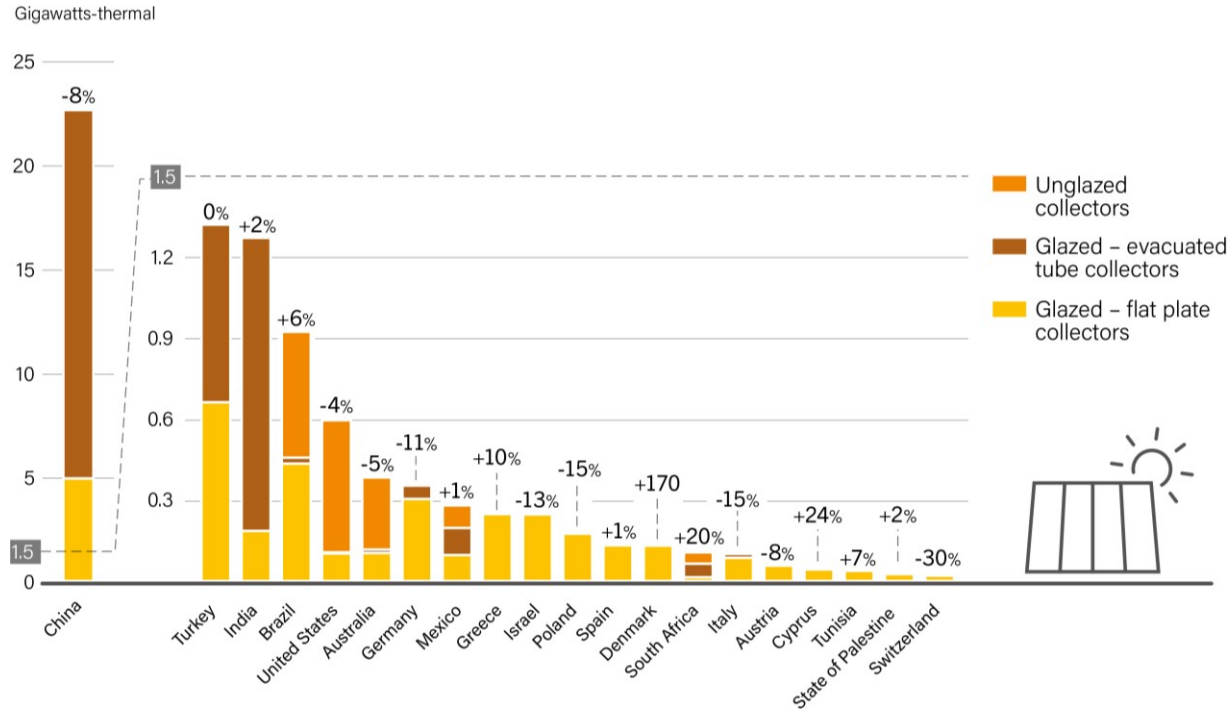
INSTALLED SOLAR WATER HEATING CAPACITY DECLINED



Solar Water Heating Collectors Global Capacity, 2009-2019

For the first time ever, global operating solar thermal capacity **declined**, down 1% from 2018.

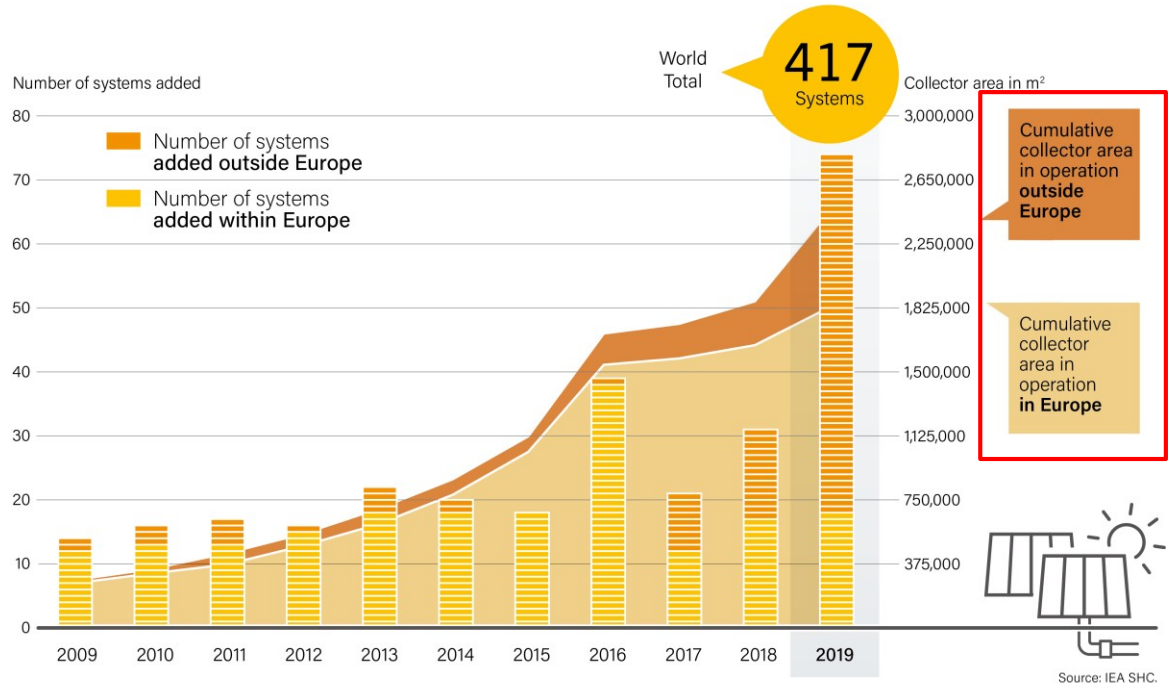
CONTRACTION IN SOME MARKETS, GROWTH IN OTHERS



Solar Water Heating Collector Additions, Top 20 Countries for Capacity Added, 2019

Outside China, new additions in the largest solar heating and cooling markets were stable, with **growth** in some markets **balancing declines** in others.

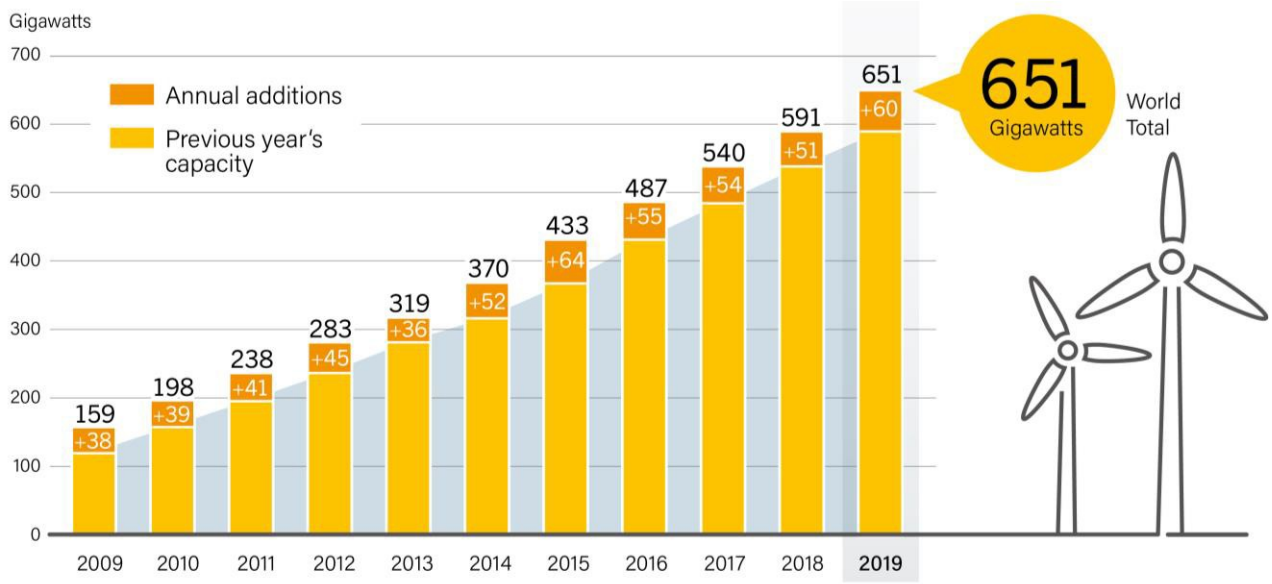
LARGE INCREASE IN SOLAR DISTRICT HEATING SYSTEMS



Solar District Heating Systems, Global Annual Additions and Total Area in Operation, 2009-2019

Leading markets for solar district heating were **Denmark, China and Germany.**

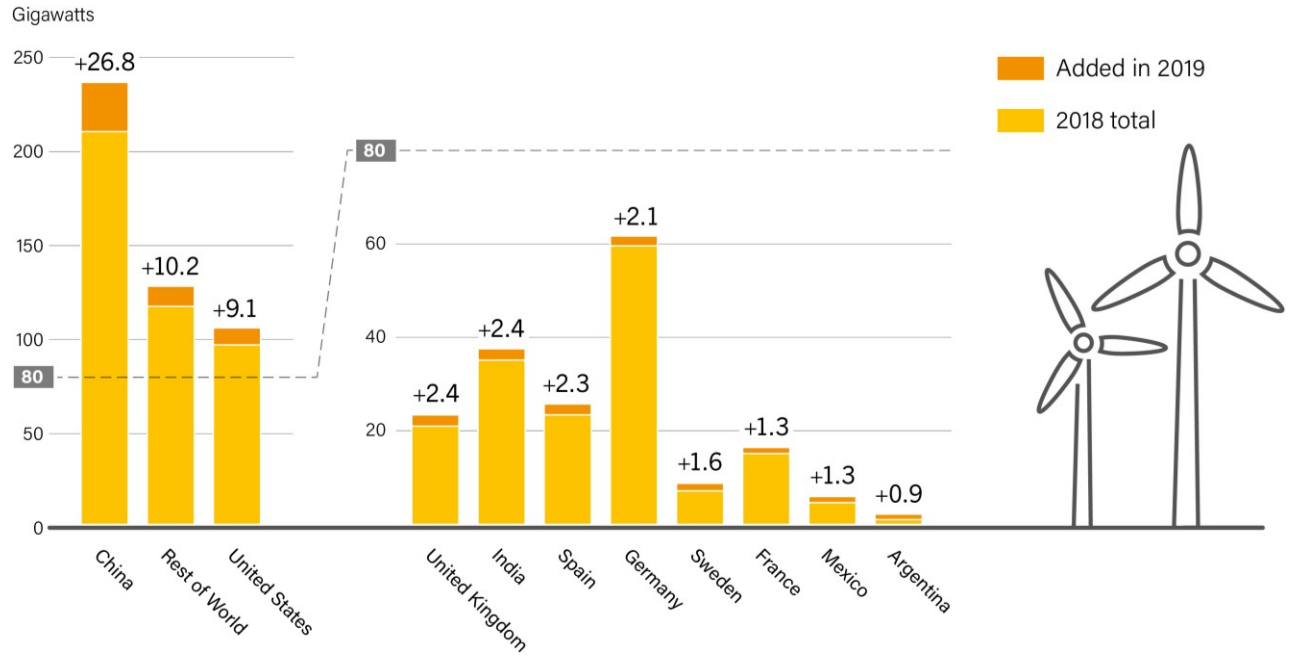
WIND POWER CAPACITY CONTINUES INCREASE STEADILY YEAR-ON-YEAR



Wind Power Global Capacity and Annual Additions, 2009-2019

The global wind power market saw its **second largest** annual increase in 2019.

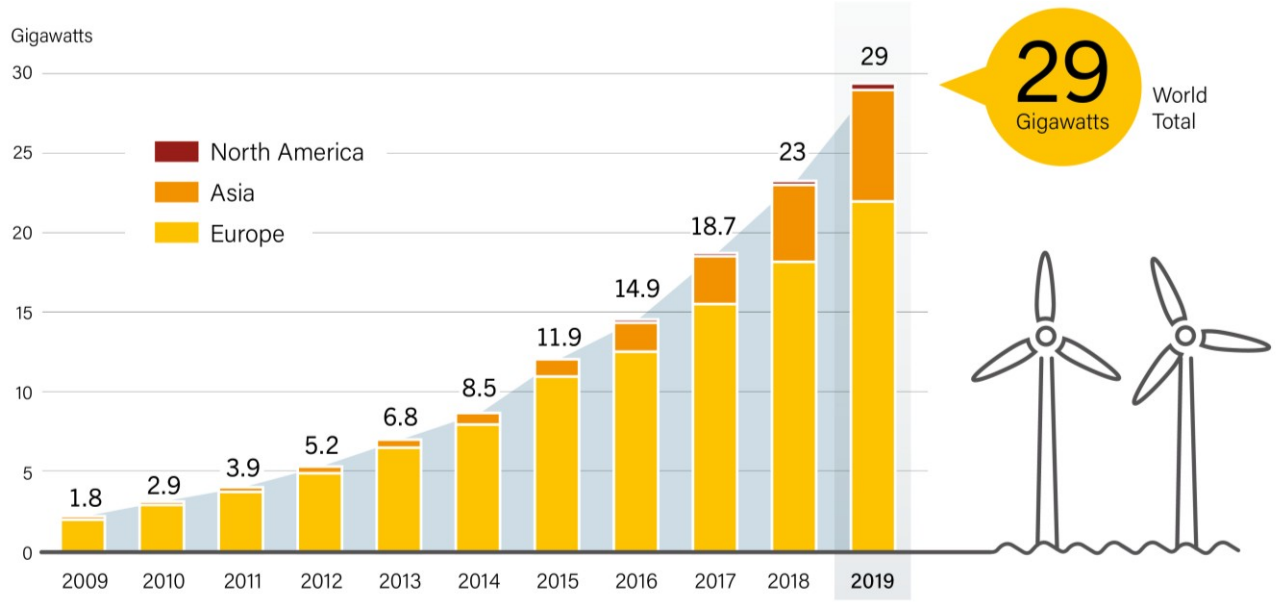
MORE THAN HALF OF NEW WIND POWER CAPACITY IN ASIA



Wind Power Capacity and Additions, Top 10 Countries, 2019

China again saw an increase in new installations (**up 22%**) during 2019, adding around 26.8 GW.

SUCCESS OF OFFSHORE WIND IN EUROPE SPARKED INTEREST ELSEWHERE



Wind Power Offshore Global Capacity by Region, 2009-2019

Offshore wind power accounted for a record **10% of wind power additions** in 2019.

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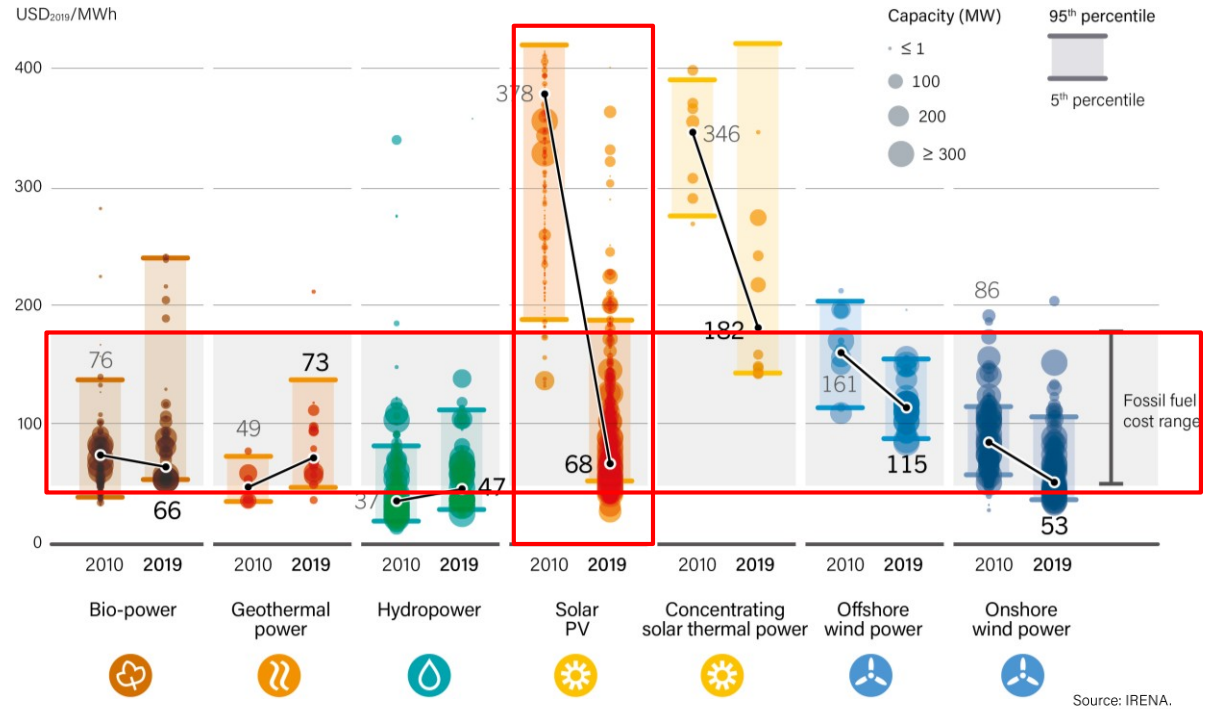
RENEWABLES NOW
Costs & Access

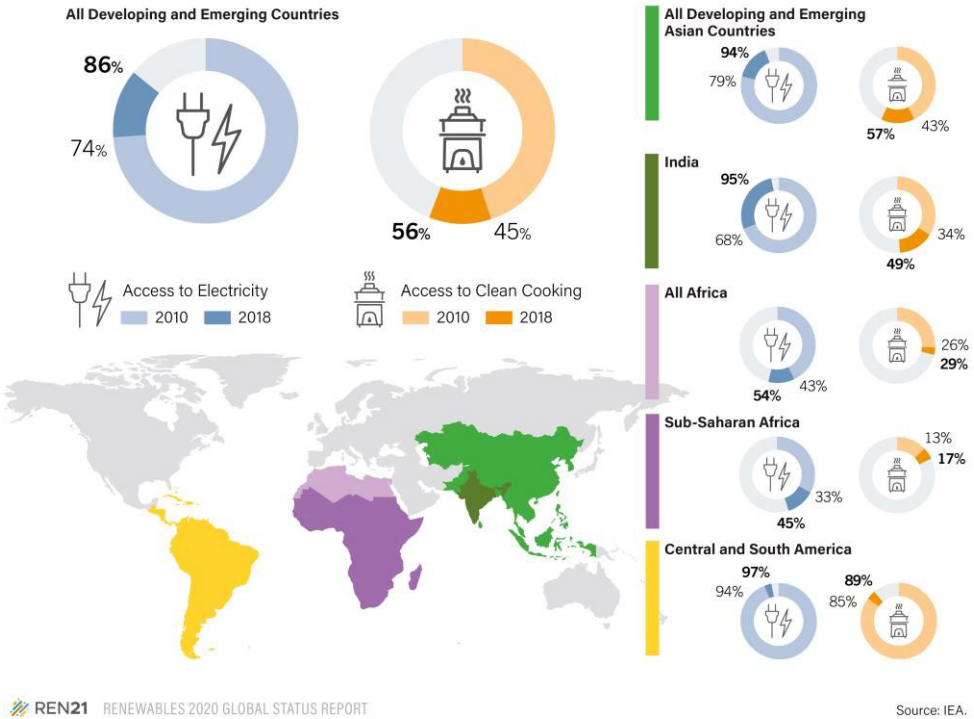
RENEWABLE POWER COSTS KEEP FALLING



Global Levelised Cost of Electricity from Newly Commissioned, Utility-scale Renewable Power Generation Technologies, 2010-2019

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

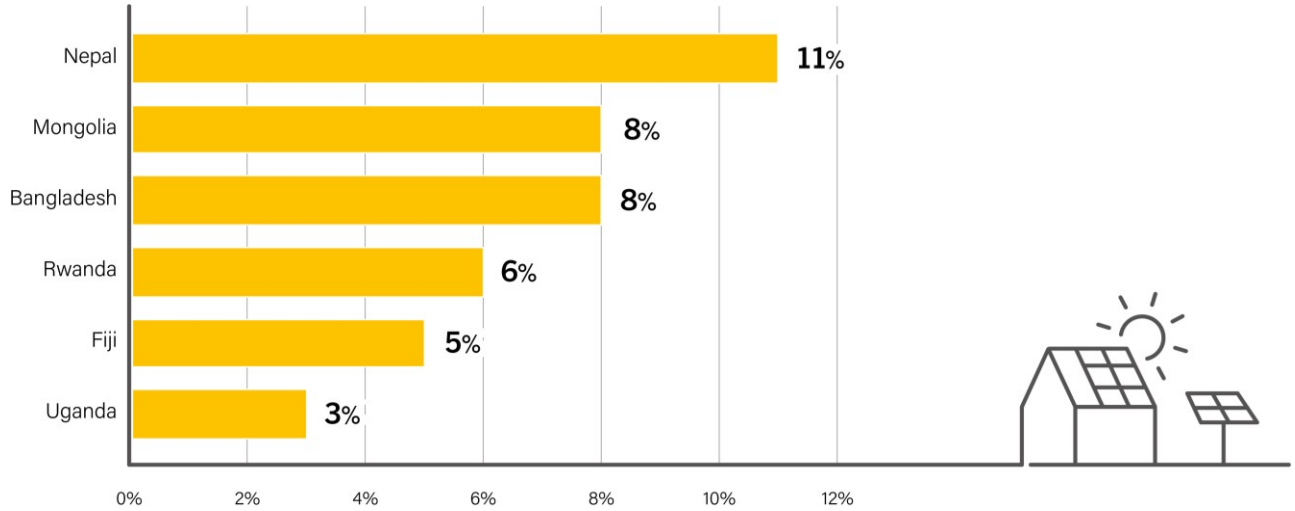
ACCESS TO ENERGY EXPANDS, ALBEIT UNEVENLY



Access to Electricity and Clean Cooking by Region, 2010 and 2018

By the end of 2018, the global population without access to electricity fell to **860 million**, while **2.65 billion** people lived without access to clean cooking facilities

DISTRIBUTED RENEWABLES: KEY SOLUTIONS TO PROVIDE ENERGY ACCESS



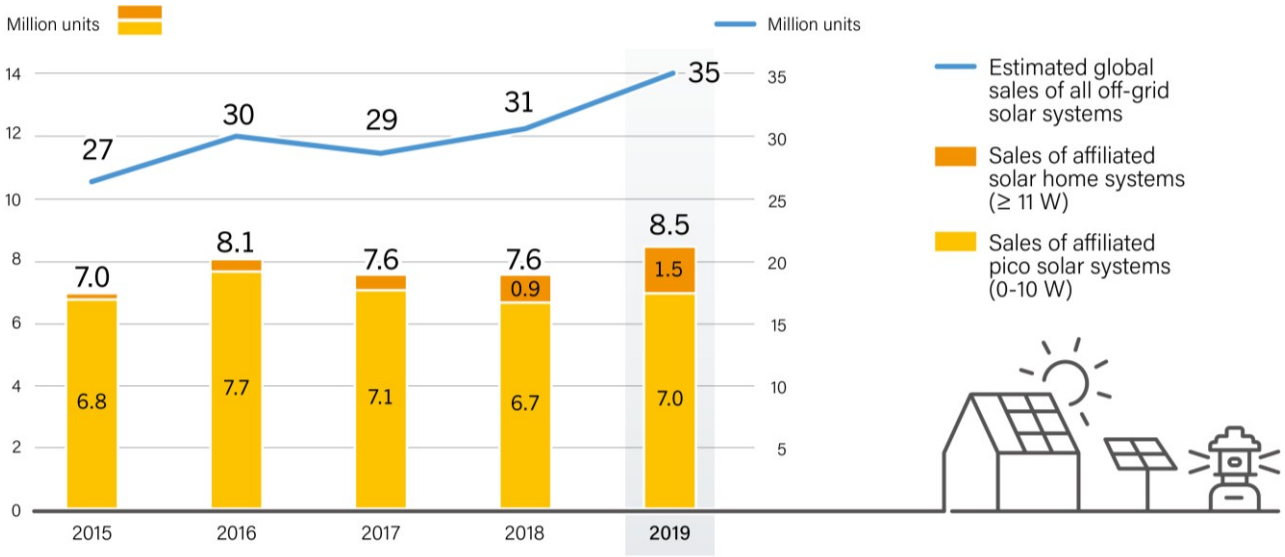
Note: Data in figure include solar home systems and mini-grids but exclude solar lights. Data are rounded to the nearest ones. Tier 1+ access technologies include small solar home systems (11-50 W), large solar home systems (>50 W) and mini-grids.

Source: World Bank.

Top 6 Countries with Highest Electricity Access Rate from Off-grid Solar Solutions (Tier 1+), 2017

Beyond the opportunity to accelerate energy access in many regions of the world, DREA systems offer **social, environmental and economic co-benefits**.

GLOBAL SALES OF OFF-GRID SOLAR SYSTEMS SEES STRONG GROWTH



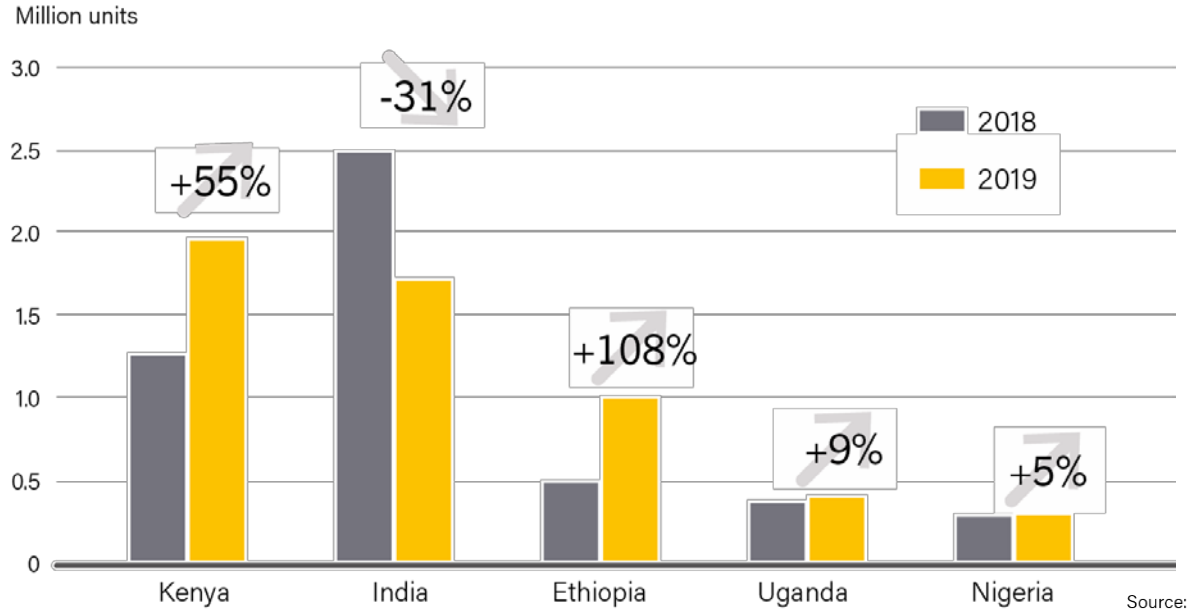
Note: Affiliated products are those sold by companies that are connected to any of the partner organisations involved in the semi-annual GOGLA sales data reporting process, including GOGLA members and companies selling products that meet Lighting Global Quality Standards.

Source: IFC and GOGLA.

Global Sales Volumes of Off-Grid Solar Systems, 2015-2019

The market for solar lighting systems and solar home systems **grew 13%** in 2019 – the highest growth of the past five years.

MARKETS FOR OFF-GRID SOLAR SYSTEMS EVOLVING

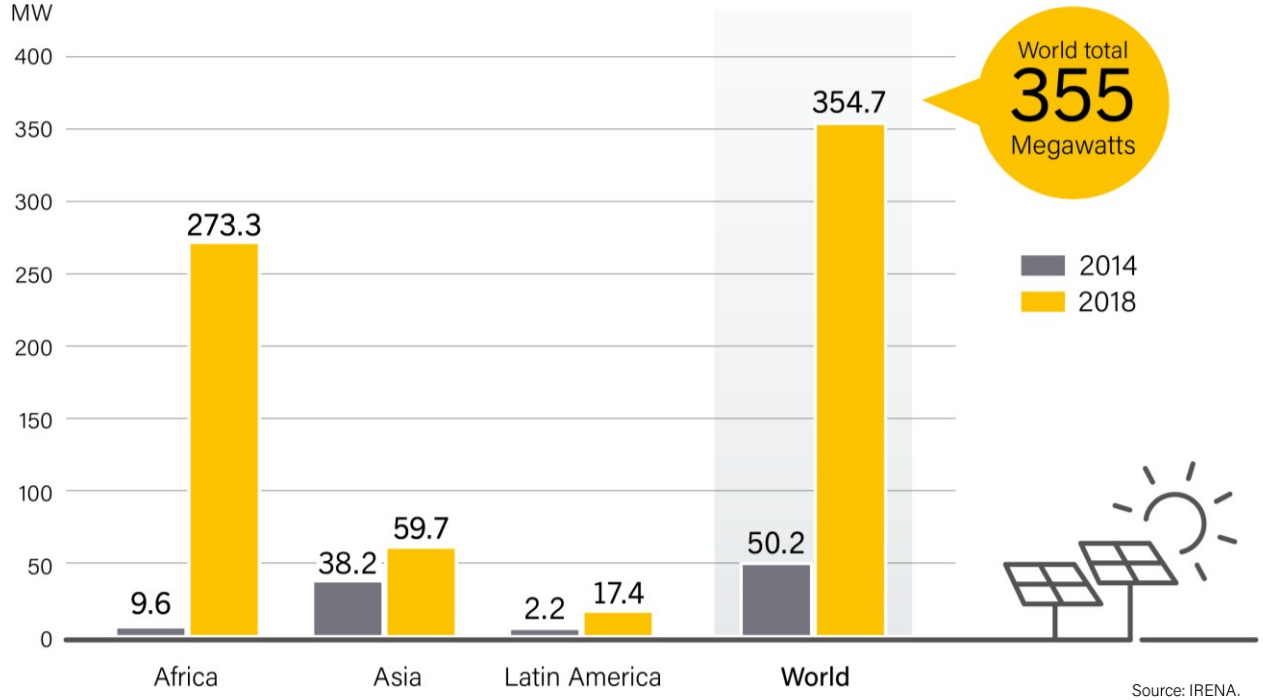


Source: GOGLA.

Sales Volumes of Affiliated Off-Grid Solar Systems in Top 5 Countries, 2018 and 2019

Sales of affiliated off-grid solar systems **expanded the most in Ethiopia and Kenya**, contrasting with a **drop in India.**

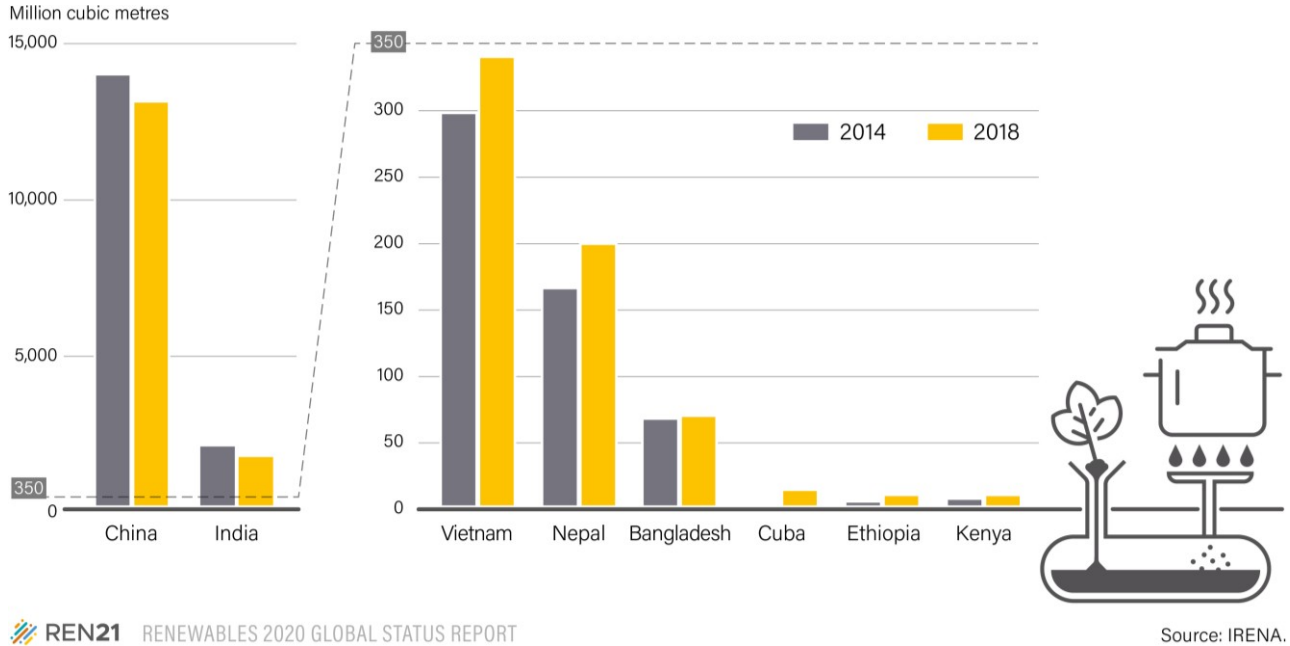
RENEWABLE ENERGY-BASED MINI-GRIDS GAIN MOMENTUM



Installed Capacity of Solar PV Mini-Grids, Selected Regions and World, 2014 and 2018

Solar PV mini-grids are increasingly the **preferred technology** for providing electricity access across Africa and Asia.

PRODUCTION OF BIOGAS FOR COOKING EXPANDS IN NEW MARKETS

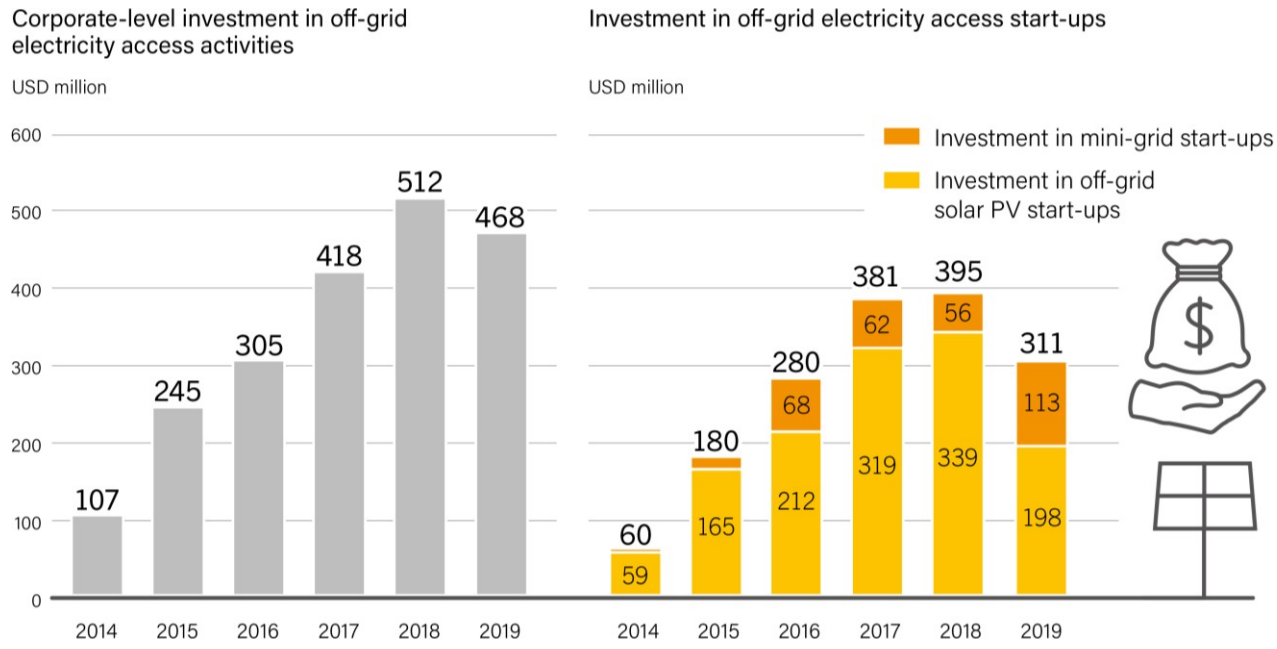


Production of Biogas for Cooking in Selected Countries, 2014 and 2018

An estimated **125 million** people worldwide used biogas for cooking in 2018.


RENEWABLES NOW
Investments

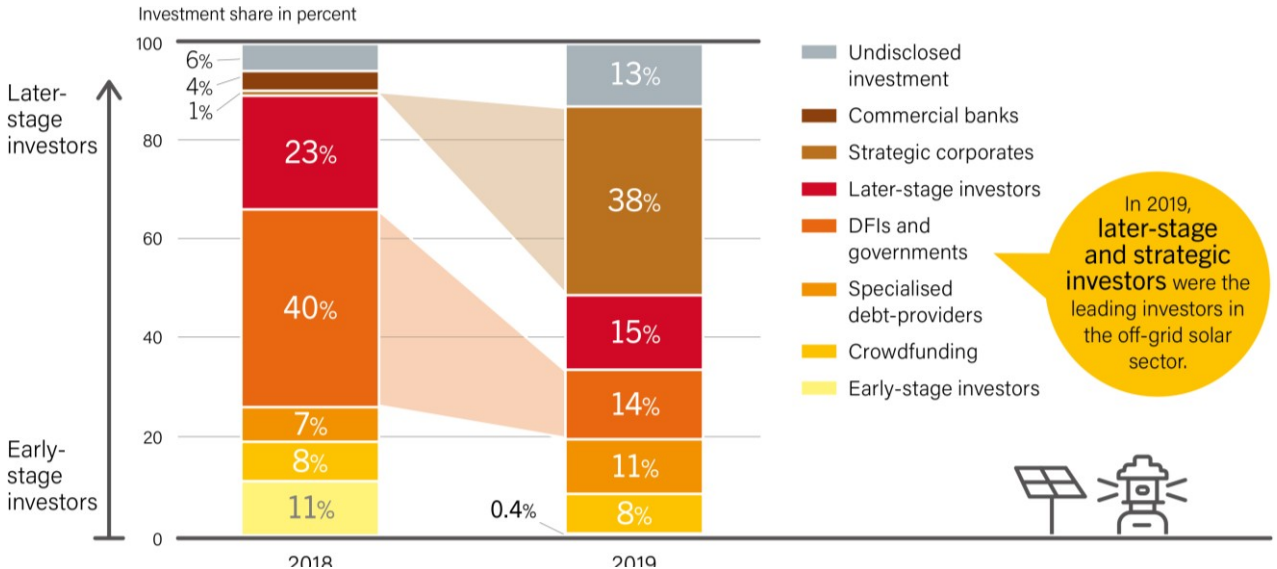
INVESTMENT IN OFF-GRID ELECTRICITY ACCESS FACED A DECREASE



Global Investment in Off-Grid Electricity Access Activities, 2014-2019

Investments in off-grid solar start-ups dropped 42%, whereas capital flows in mini-grid start-ups more than doubled to a record USD 113 million in 2019.

THE TYPE OF INVESTORS IN DREA MARKETS SHIFTED NOTABLY IN 2019



Share of Investment in Off-Grid Solar PV Companies, by Type of Investor, 2018 and 2019

Strategic corporate investors predominantly invested in off-grid solar companies.

Still, **DFIs and governments** continued to be the main investors in mini-grid start-ups.

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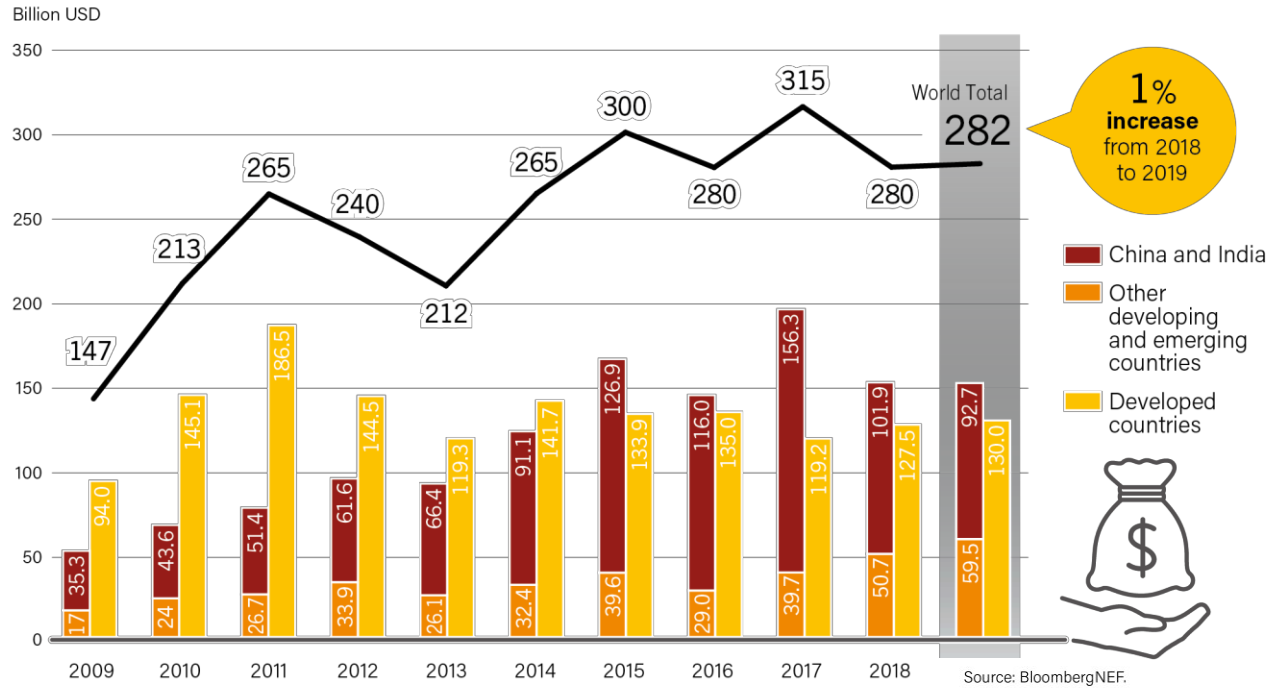
Source: IFC.

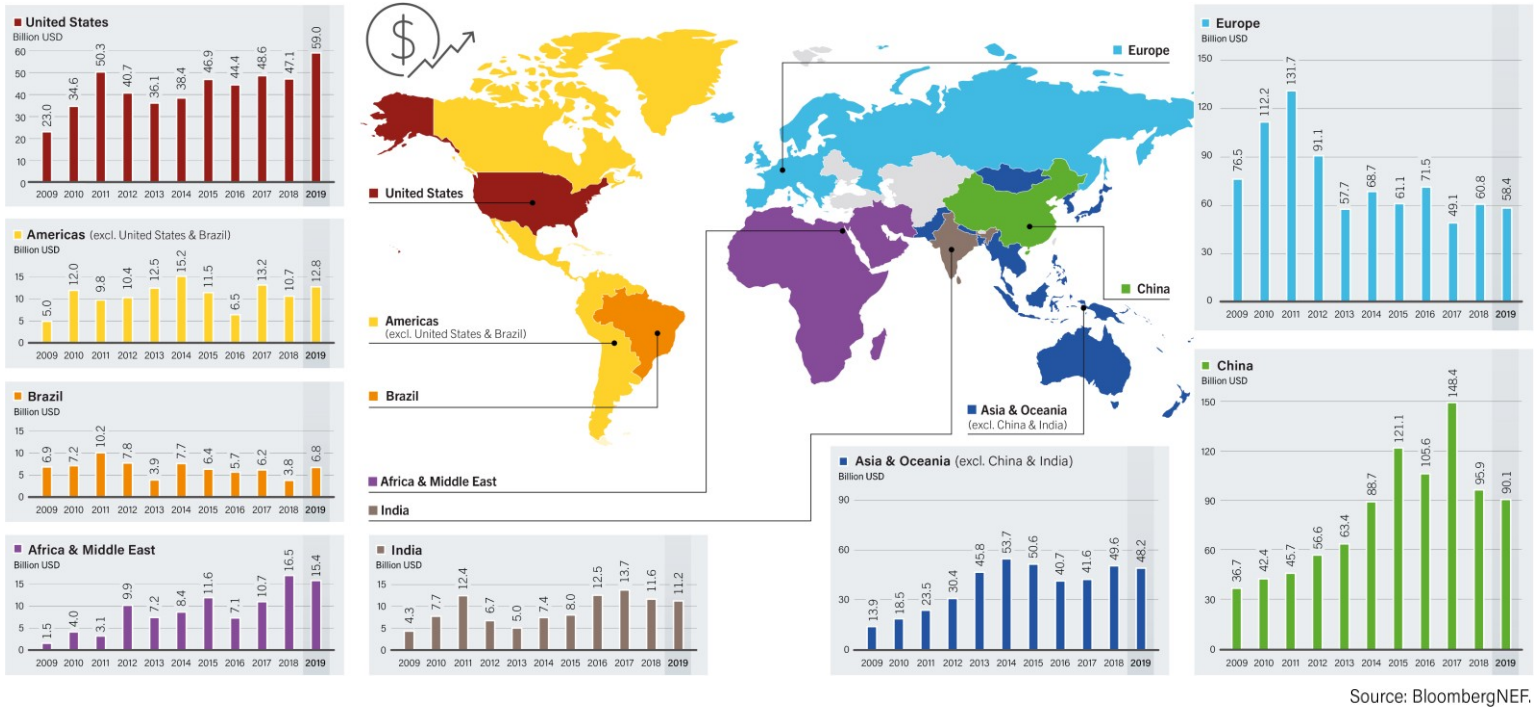
INVESTMENT IN RENEWABLES HAS BARELY GROWN



Global New Investment in Renewable Power and Fuel Capacity in Developed, Emerging and Developing Countries, 2009-2019

Developing and emerging economies surpassed developed countries in renewable energy capacity investment for the fifth year running, reaching USD 152 billion.

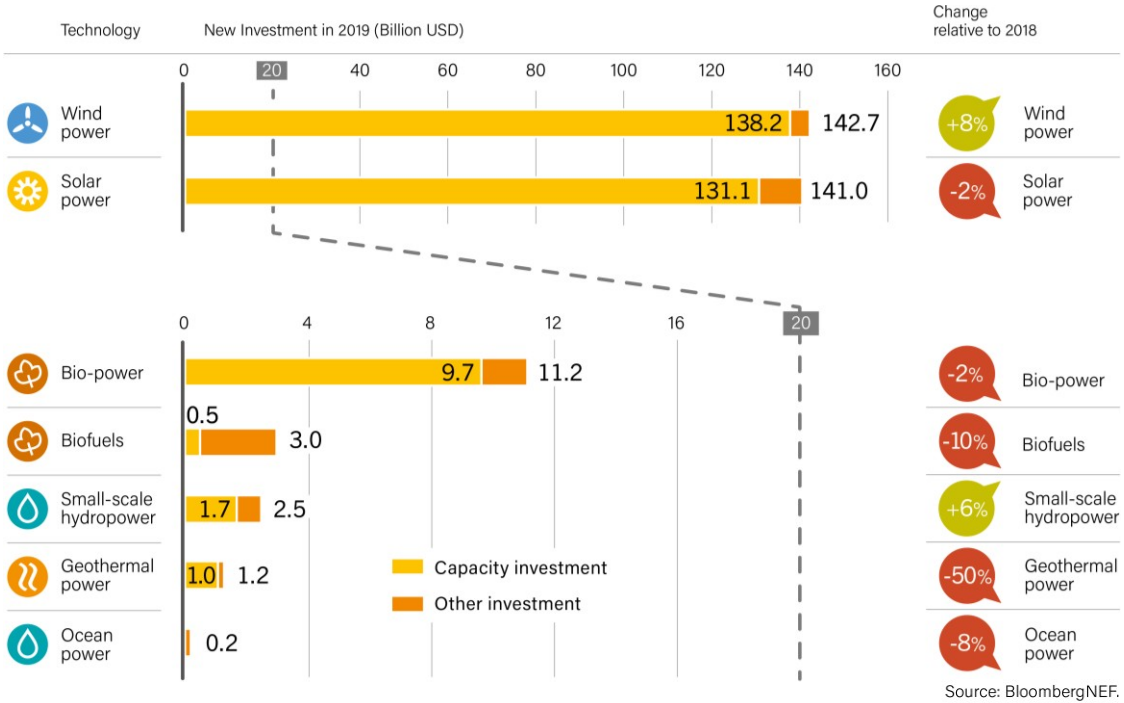
INVESTMENT GREW IN THE AMERICAS, BUT DECREASED ELSEWHERE



Source: BloombergNEF.

Global New Investment in Renewable Power and Fuels, by Country and Region, 2009-2019

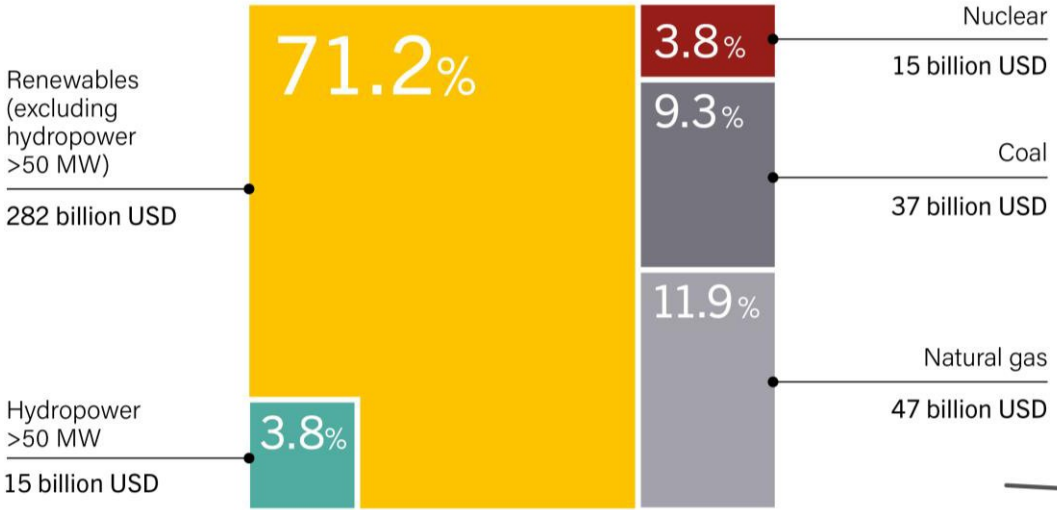
INVESTMENT IN SOLAR PV AND WIND POWER CONTINUE TO LEAD



Global New Investment in Renewable Energy by Technology, 2019

Wind power and solar PV continued to dominate new investment in renewable energy in 2019, each accounting for roughly 47% of the total.

3X MORE INVESTMENT IN RENEWABLES THAN IN COAL, GAS AND NUCLEAR



Note: Renewable investment data in figure exclude biofuels and some types of non-capacity investment.

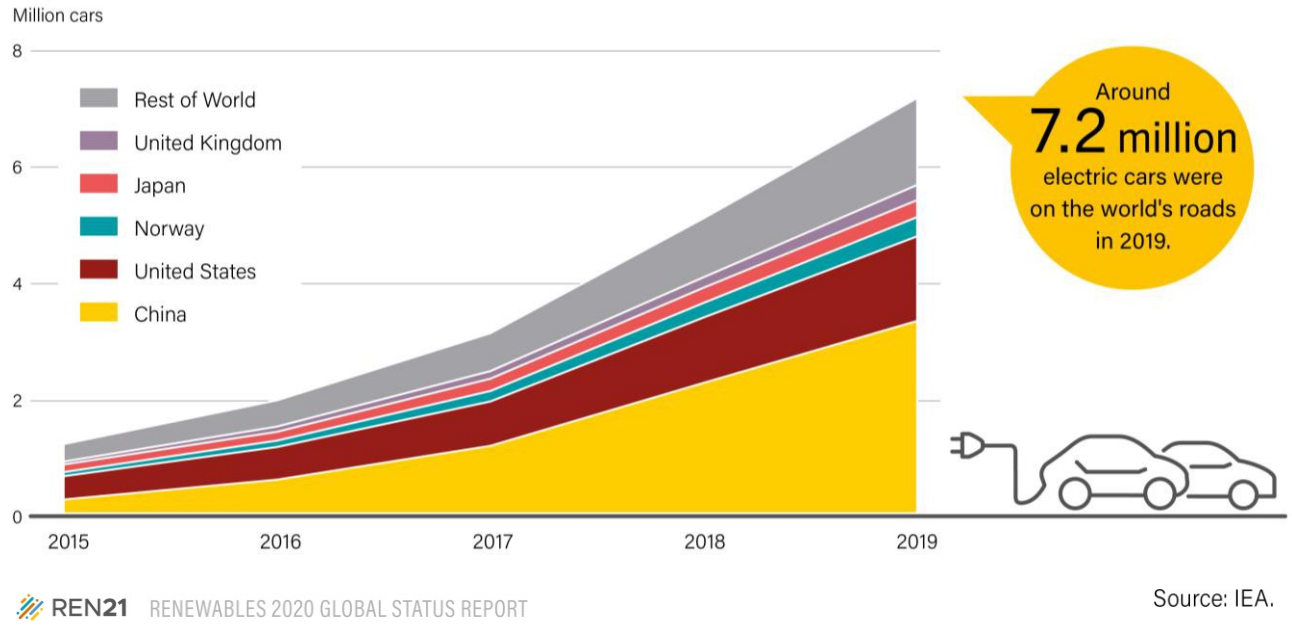
Source: BloombergNEF.

Global Investment in New Power Capacity by Type (Renewables, Coal, Gas and Nuclear Power), 2019

In 2019, **renewable power technologies continued to attract far more investment dollars** than did coal, natural gas or nuclear power generating plants.


RENEWABLES NOW
Cars, buses & batteries

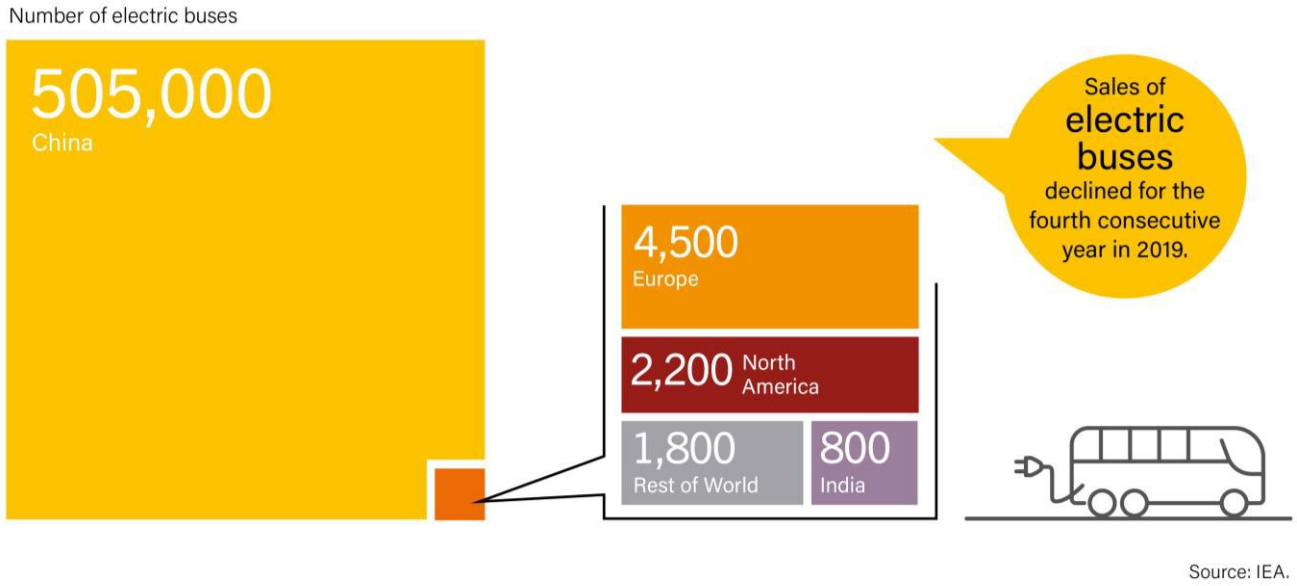
ELECTRIC CAR STOCK INCREASED 40% IN 2019



Electric Car Global Stock, Top Countries and Rest of World, 2015-2019

Share of electric cars in new car sales reached 2.5%, **a record high.**

VIRTUALLY ALL ELECTRIC BUSES ARE IN CHINA



Electric Bus Global Stock, China and Selected Regions, 2019

Sales of electric buses **declined** for the fourth consecutive year.

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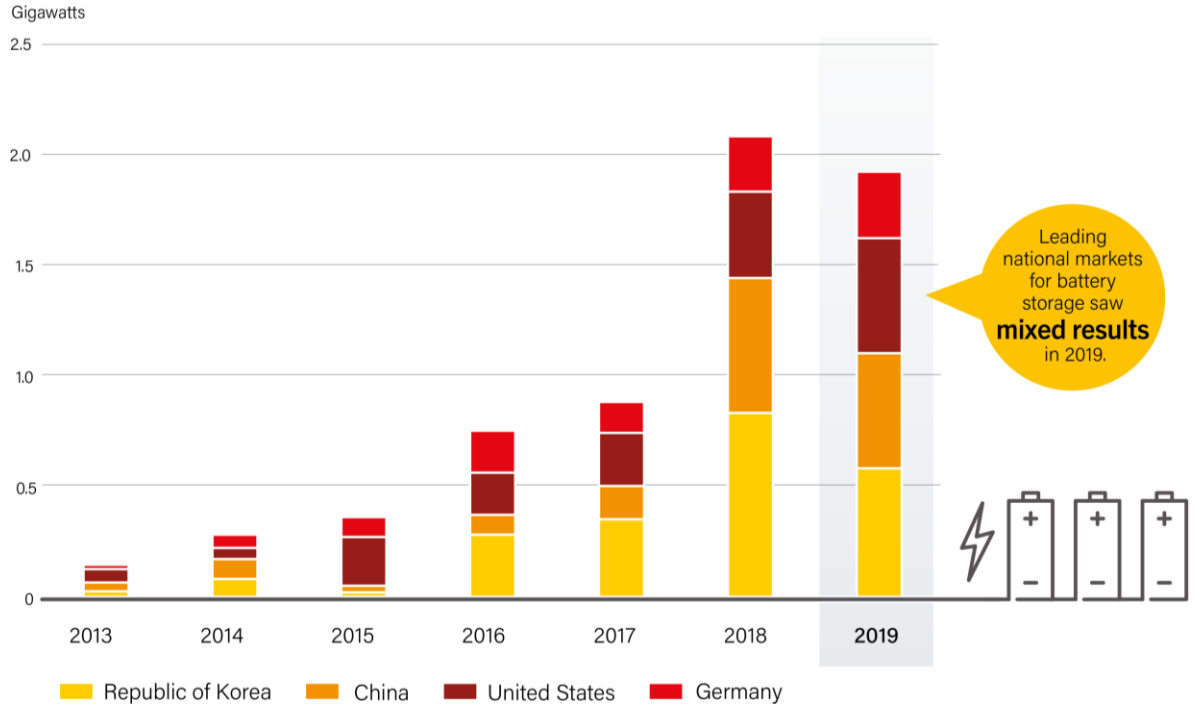
THE LEADING MARKETS FOR BATTERY STORAGE SAW MIXED RESULTS

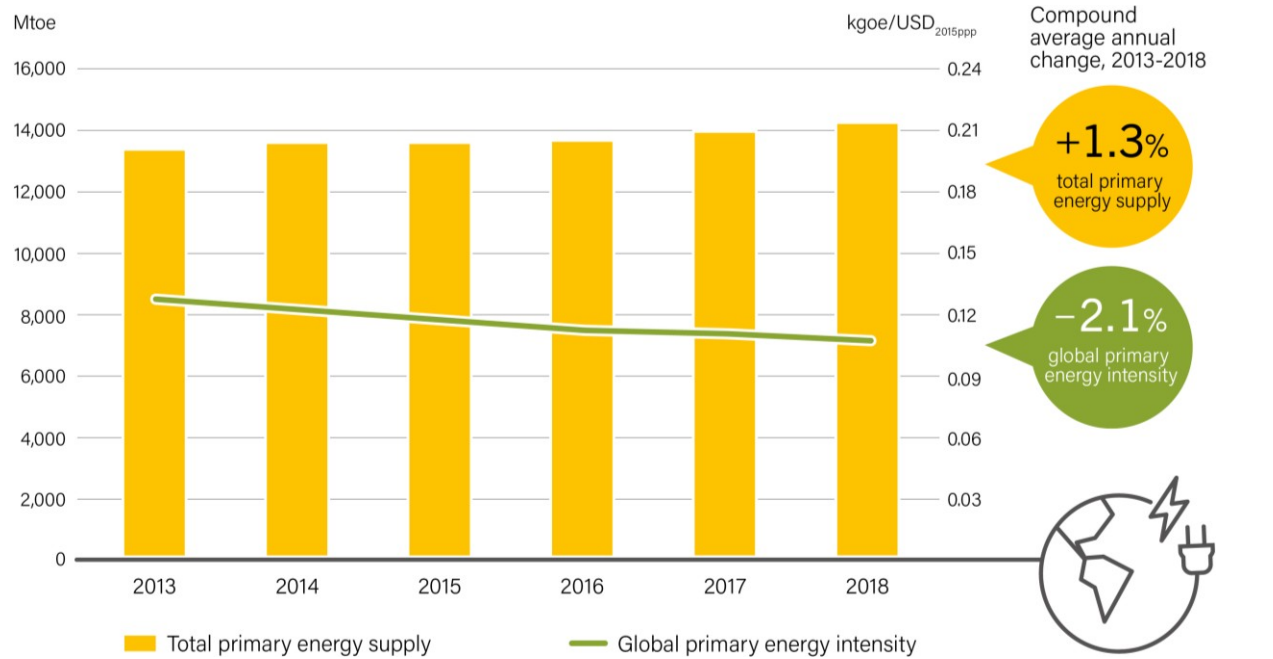


Battery Storage Annual Additions, Selected Countries, 2013-2019

Battery storage markets grew in the United States and Germany, but declined in Republic of Korea, China and Europe as a whole.

Energy intensity

GLOBAL PRIMARY ENERGY INTENSITY CONTINUES TO FALL

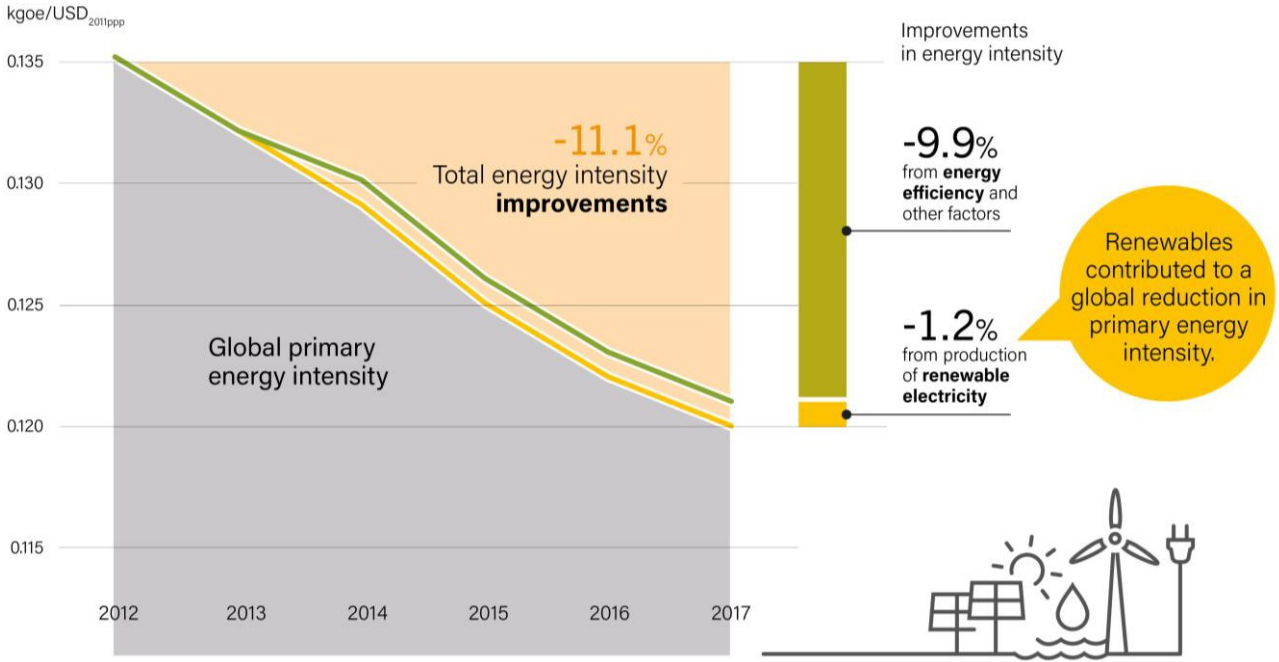


Source: Enerdata.

Global Primary Energy Intensity and Total Primary Energy Supply, 2013-2018

Global primary energy intensity decreased more than 10% during the five-year period between 2013 and 2018, **at an average annual rate of 2.1%.**

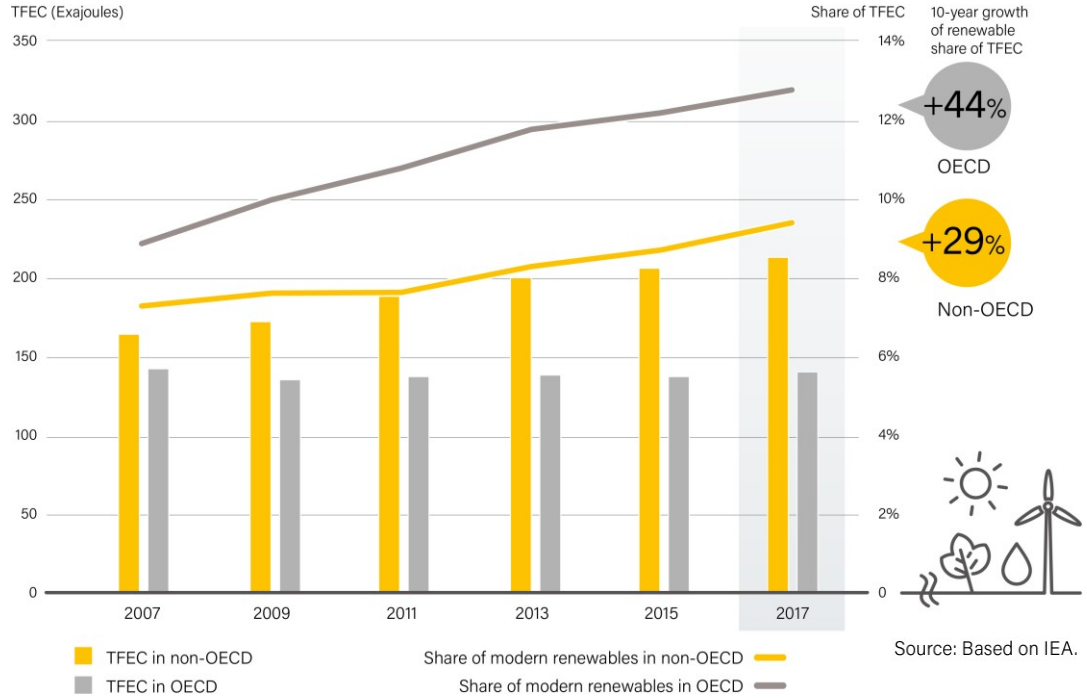
RENEWABLES CONTRIBUTE TO HIGHER ENERGY EFFICIENCY



Estimated Impact of Increased Renewable electricity Production on Global Primary Energy Intensity, 2012-2017

Increased renewable electricity production has been responsible for improvements in primary energy intensity.

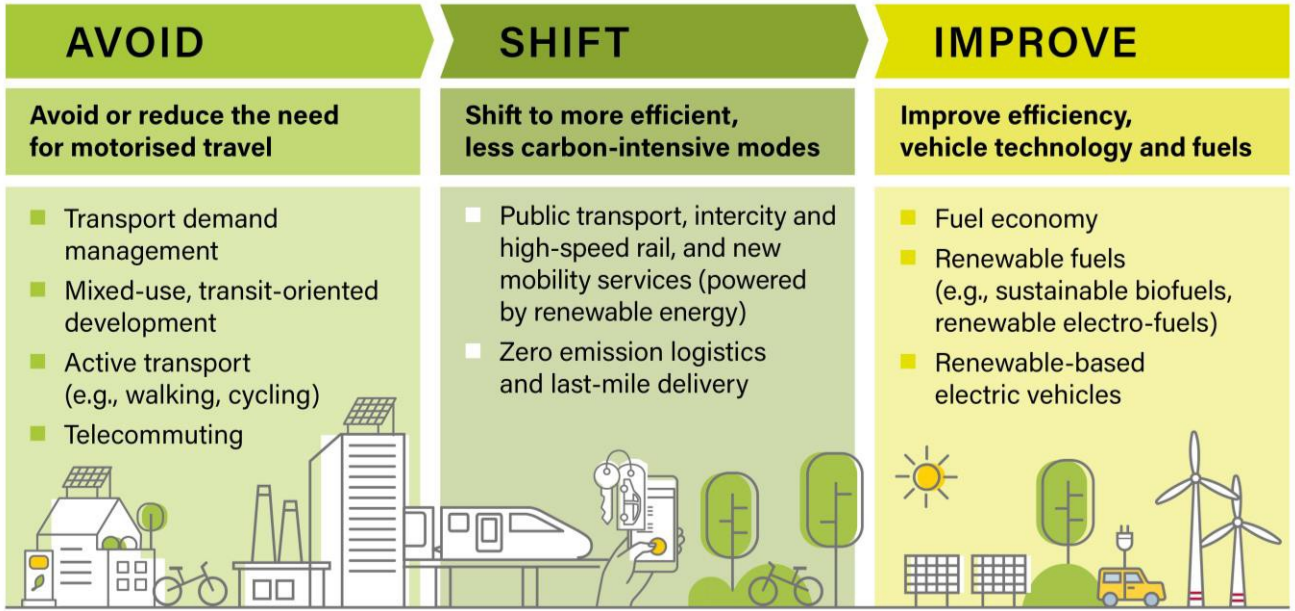
ENERGY DEMAND TRENDS VARY BASED ON COUNTRY



Total Final energy Consumption and Share of Modern Renewables in OECD and non-OECD countries, 2007-2017

Increases in final energy demand have been driven by economic growth and improved energy access in developing and emerging economies.

AVOID-SHIFT-IMPROVE TO REDUCE ENERGY DEMAND IN TRANSPORT

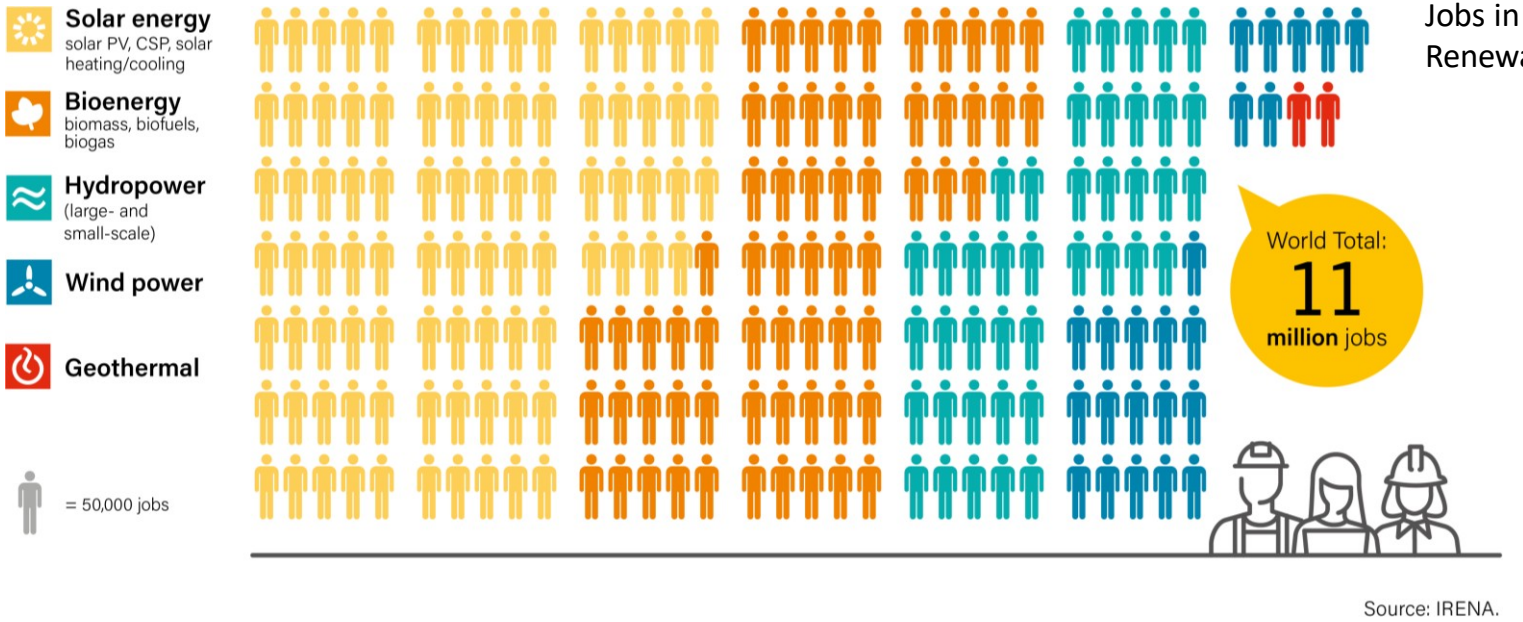


Avoid-Shift-Improve Framework in the Transport Sector

Renewable energy can benefit from **wider initiatives to decrease energy demand** in the sector, as this could help boost the renewable share.

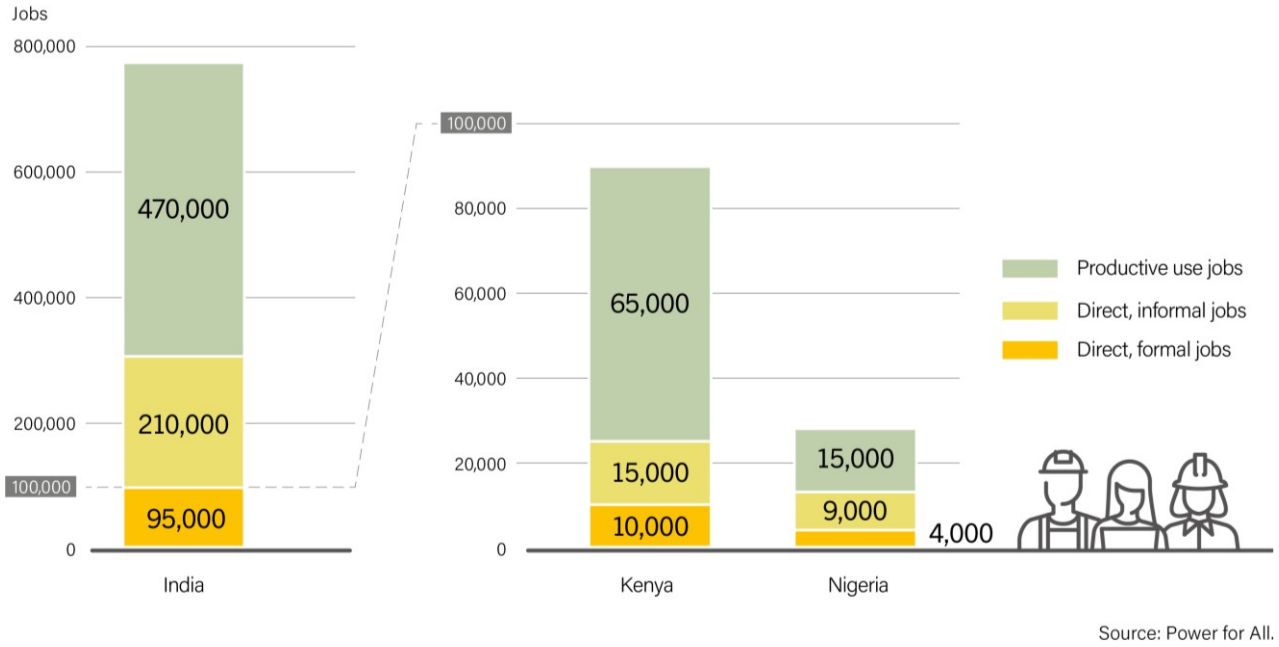

RENEWABLES NOW
Jobs

JOBS IN RENEWABLE ENERGY KEEP GROWING



Jobs in Renewable Energy, 2018

RENEWABLES PROVIDE DIRECT AND INDIRECT EMPLOYMENT



Formal, Informal and Productive Use Employment Estimates Related to Distributed Renewables for Energy Access in India, Kenya and Nigeria, 2017/18

Distributed renewables for energy access create jobs related to the **productive use of energy** in the developing world.

In summary

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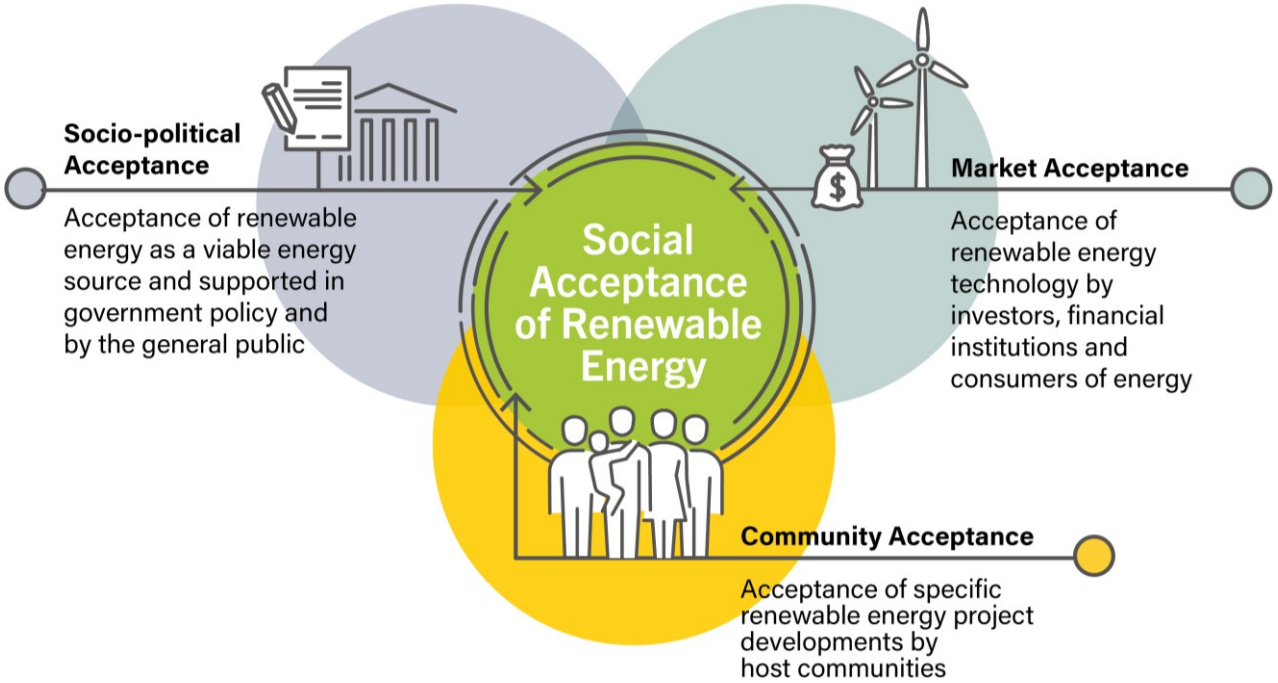
MANY EXISTING SOLUTIONS SHOULD BE URGENTLY IMPLEMENTED

ACTIONS TO BE TAKEN IN PARALLEL

- **Use policies to actively support renewables across all end-use sectors:**
  - Examples include mandates for renewable heat technologies and incentives to use EVs with RE
  - Create accessible market conditions
- **Make energy efficiency mandatory to decrease energy demand:**
  - Building retrofits and net zero energy codes
  - Promote walking/cycling and public transport
  - Fuel efficiency standards
- **Accelerate the phase-out of fossil fuels**
  - Remove fossil fuel subsidies
  - Divest from fossil fuels
  - Fossil fuel bans, in particular heating/transport
- **Accompany sectors to change:**
  - Integrate planning among all energy sectors
  - Reskilling
  - Public procurement of renewables

A **systemic problem** requires a **systemic solution**.

PUBLIC SUPPORT FOR RENEWABLES



Dimensions of Social Acceptance of Renewable Energy

Opinion polls suggest a widespread societal support for renewables but some people are still against local projects.

LEVERS TO BUILD PUBLIC SUPPORT AND ENCOURAGE ACTION

Governments have a wide range of measures at their disposal. Such as...

Awareness campaigns.

Policies encouraging public engagement with renewables.

Public participation, control and ownership.

All of these mechanisms are actively used to build public support.

SHIFTING TO RENEWABLES IN ALL SECTORS

- Renewables are growingly strong in the power sector, but slowly in heating, cooling and transport.
- Energy efficiency and renewables are both needed to reduce fossil fuel use.
- Policy and technology solutions already exist to shift to renewables in all sectors but political will is missing.
- Public support is important to spur renewable energy uptake to meet climate and development goals.

Merci de votre attention !

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Lorsque cette capsule de formation est présentée en asynchrone (PDF récupérable sur le site du cours), si vous avez des questions à formuler, veuillez les poser par écrit et spécifier le nom et le numéro de la présentation. Nous vous répondrons le plus rapidement possible.

Période de questions

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