



RENEWABLES NOW

# RENEWABLES GLOBAL STATUS REPORT 2023 COLLECTION

ENERGY DEMAND MODULES



REN21 Secretariat

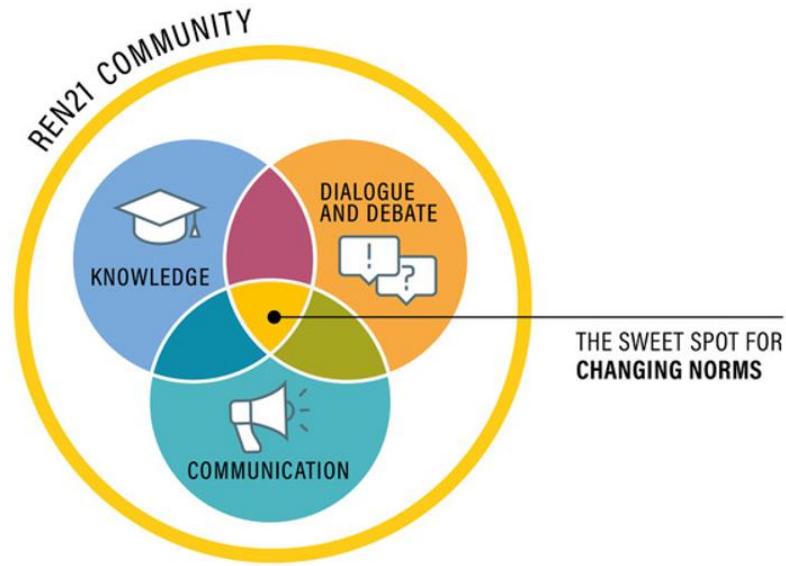




## WHO WE ARE

# OUR APPROACH TO DRIVE CHANGE

## REN21 PILLARS



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

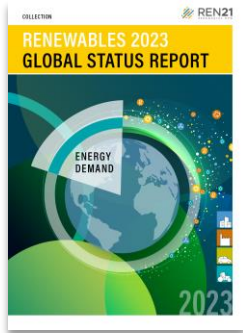
# TRACKING RENEWABLE ENERGY TRENDS

CROWD-SOURCED DATA SINCE 2005



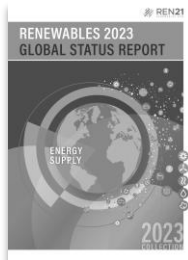
# THE ANNUAL GSR COLLECTION

REPORTING ABOUT THE BUILDING BLOCKS OF THE RENEWABLES SYSTEMS



## Renewables in Energy Demand

- Buildings
- Industry
- Transport
- Agriculture



## Upcoming Modules:

- Renewables in Energy Supply
- Energy Systems and Infrastructure for Renewables
- Economic and Social Value Creation with Renewables
- Global Overview



# RENEWABLE ENERGY IN END-USE SECTORS

THE STARTING POINT : WHY THIS FOCUS?

# THE ENERGY TRANSITION IS NOT HAPPENING FAST ENOUGH

## RENEWABLES UPTAKE UNEVEN ACROSS END USE

 Renewable Energy in Total Final Energy Consumption, by Final Energy Use, 2019



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

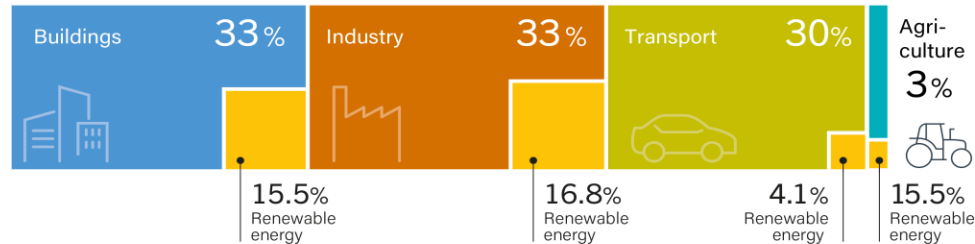
Most focus is on the power sector, but the greatest **urgency is on the energy consuming sectors**



# THE ENERGY TRANSITION IS NOT HAPPENING FAST ENOUGH

## RENEWABLES UPTAKE UNEVEN ACROSS SECTORS

 **Total Final Energy Consumption and Total Modern Renewable Energy Consumption, by Sector, 2020**



**Total renewable energy consumption in all 4 demand sectors grew 4.7% per year on average between 2010 and 2020**



# **POLY-CRISES OR MOMENTUM?**

FROM A POLY-CRISES TO A MOMENTUM

## WHAT CHANGED IN 2022?



Energy Crisis was further exacerbated by Russian Federation invasion of Ukraine in February 2022



Energy prices reached their highest levels since 2008, impacting all energy-consuming sectors

Starting in October 2021, rapid economic rebound following COVID-19 led to tighter energy markets



High inflation became a global phenomenon during 2022



# GLOBAL ENERGY TRENDS

RENEWABLE AS AFFORDABLE AND SECURE SOLUTION IN RESPONSE TO POLY-CRISIS

**Renewable Energy:**

7.23M

↑ 170%

**Energy Crisis:**

3.75M

↑ 2398%

**Climate Change:**

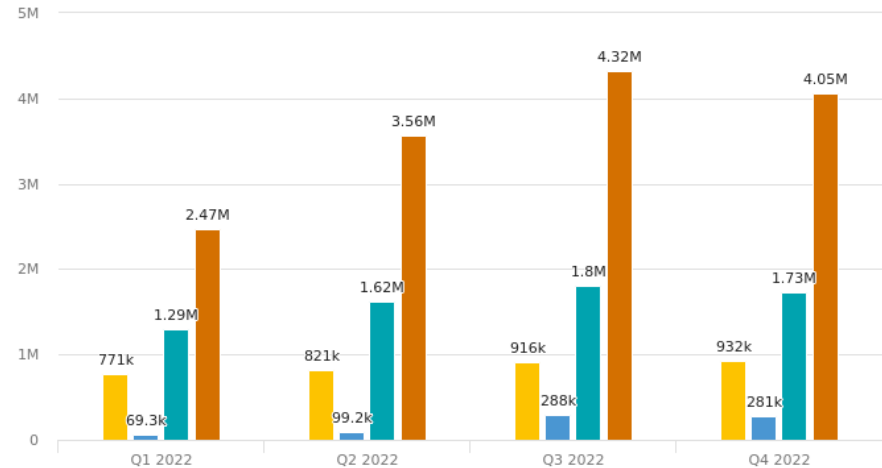
34.2M

↑ 449%

**Inflation:**

89.2M

↑ 1583%



Media coverage by trend (2022)



# RESPONSE OF ENERGY CONSUMERS

# RENEWABLE ENERGY RESPONSE IN ENERGY DEMAND SECTORS

MEDIA ANALYSIS FROM 2021-2022

**RE in Buildings:**

**166k**

↑ 124%

**RE in Industry:**

**465k**

↑ 91%

**RE in Transport:**

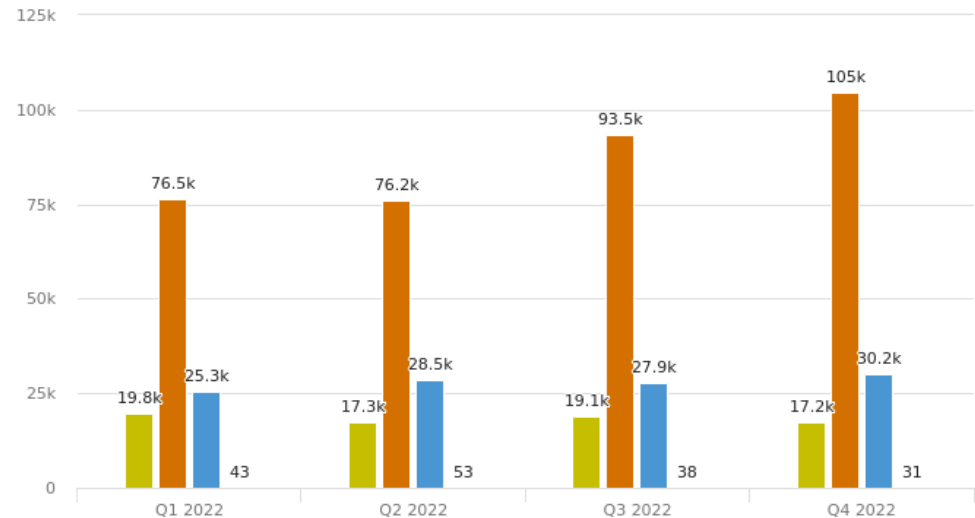
**112k**

↑ 56%

**RE in Agriculture:**

**165**

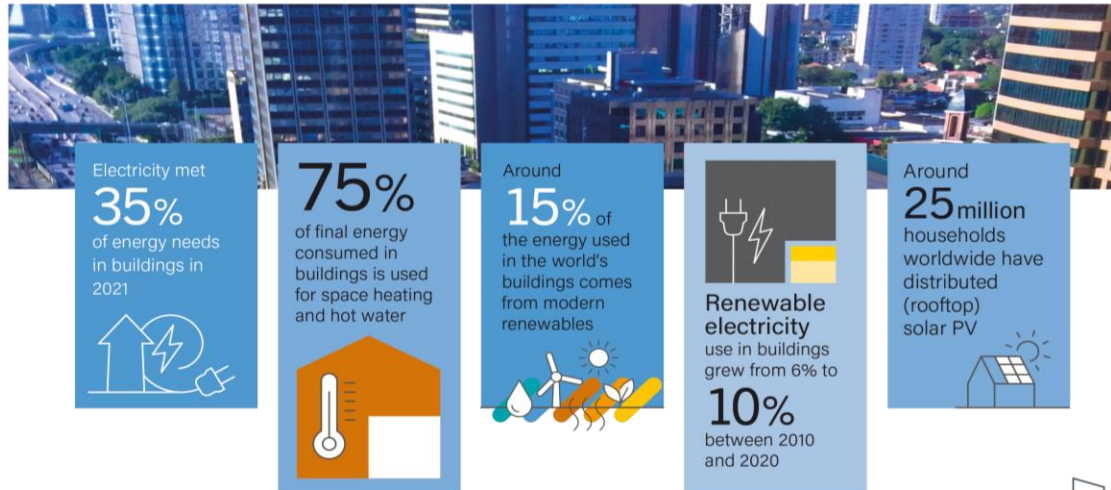
↓ 45%



Media coverage by sector (2022)

# RENEWABLE ENERGY IN BUILDINGS

ONE THIRD OF THE WORLD'S ENERGY CONSUMPTION IS USED IN BUILDINGS

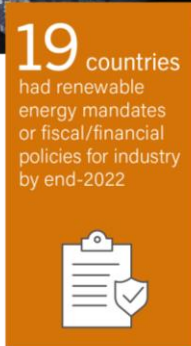
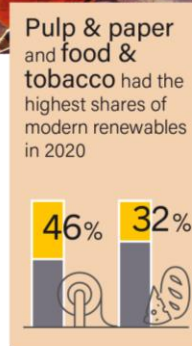
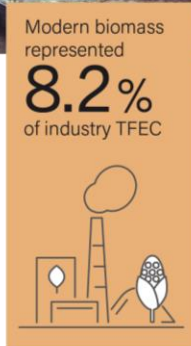
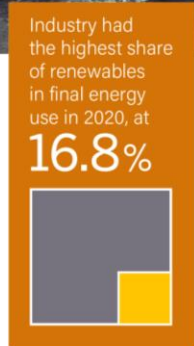

**Buildings in Focus**


In 2020, **renewables** provided **15.5%** of the energy used in buildings.



# RENEWABLE ENERGY IN INDUSTRY

## INDUSTRY AFFECTED MOST IN ENERGY CRISIS


**Industry in Focus**


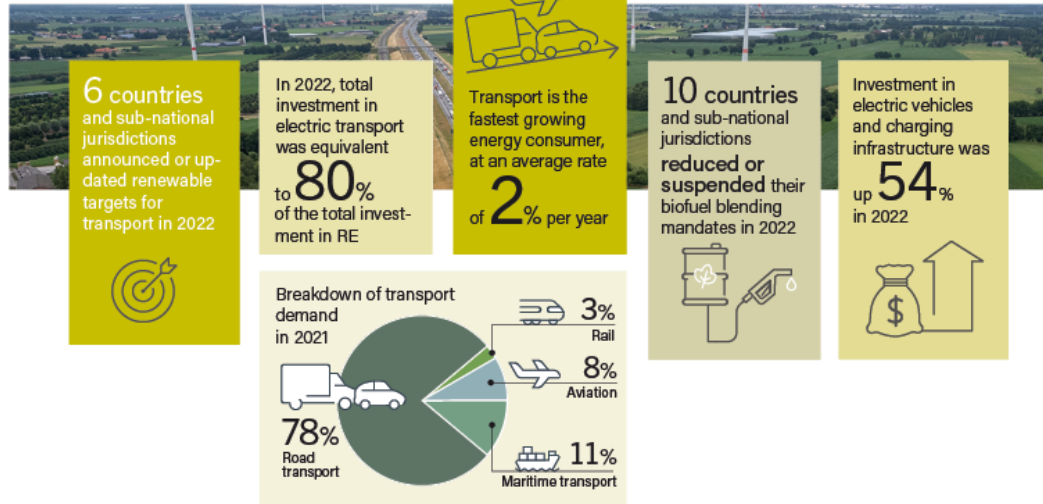
Industry contributes to **25% of global GDP** and employs **25% of the global workforce.**

Note: TFEC = Total Final Energy Consumption



# RENEWABLE ENERGY IN TRANSPORT

FASTEST-GROWING ENERGY CONSUMPTION, BUT RENEWABLES STILL BEHIND



**Transport in Focus**


Transport contributes to **7% of global GDP** and employs **5.6% of the global workforce.**




# RENEWABLE ENERGY IN AGRICULTURE


MAIN REASONS: ENERGY SAVINGS, FUEL COST REDUCTION, AND ACCESS TO ENERGY


**Agriculture in Focus**



**14 countries** had renewable energy targets or policies for agriculture in 2022




By end-2022, around 15 countries were using **geothermal greenhouse heating** to grow vegetables, fruits and flowers




The **EU** launched a tender in 2022 for the incorporation of renewables in agriculture and forestry



The use of biogas in agriculture **doubled** during 2010-20, while the use of liquid biofuels grew **9.4 times**



**7 countries** had financial incentives for the use of renewables for irrigation as of end-2022



The agriculture sector contributes to **USD 4.2 trillion** of global GDP and employs **26% of the global workforce.**




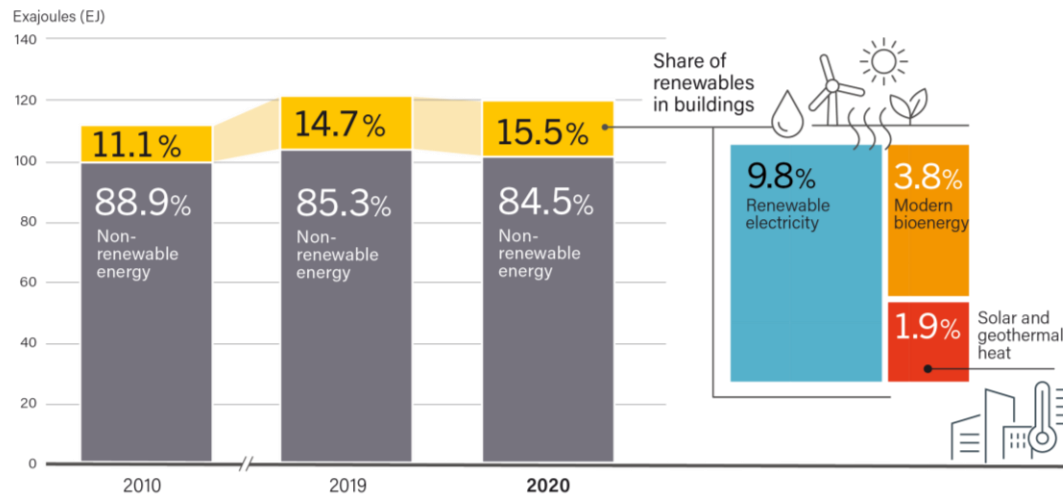


## **KEY TRENDS FROM THE ENERGY CONSUMING SECTORS**

# RENEWABLES IN BUILDINGS GROWING SLOWLY

THE SHARE OF RENEWABLES IN BUILDINGS SLOWER THAN GLOBAL RENEWABLE ENERGY SHARES


 **Renewable Share of Total Final Energy Consumption in Buildings,**  
2010, 2019 and 2020

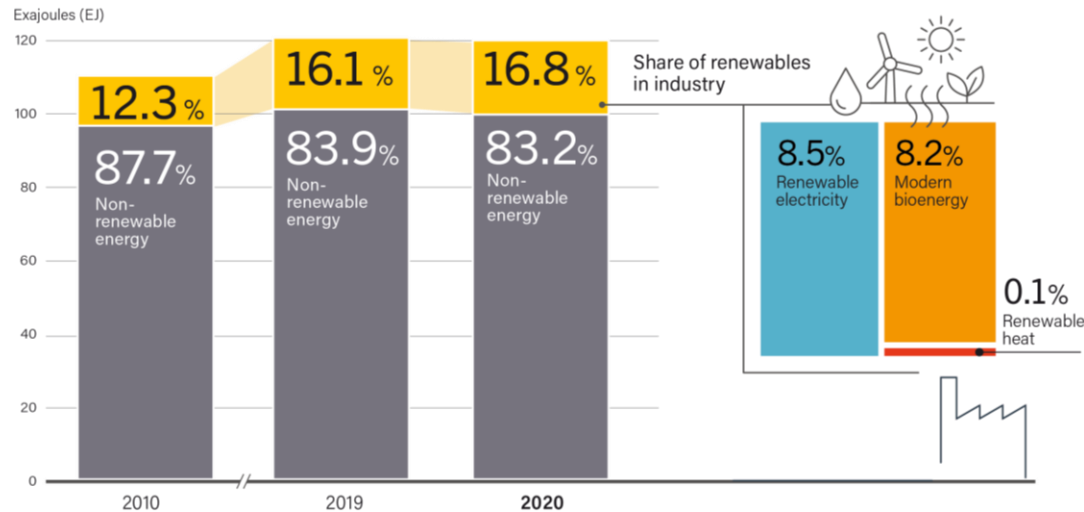


**Buildings** is the largest energy consuming sector, accounting for 33% of total final energy consumption.

# RENEWABLE ENERGY IN INDUSTRY GROWING SLOWLY

ELECTRIFICATION LEADS TO GROWING SHARE OF RENEWABLES IN INDUSTRY

 **Renewable Share of Total Final Energy Consumption in Industry, 2010, 2019 and 2020**



Note: Modern bioenergy includes heat supplied by district energy networks.

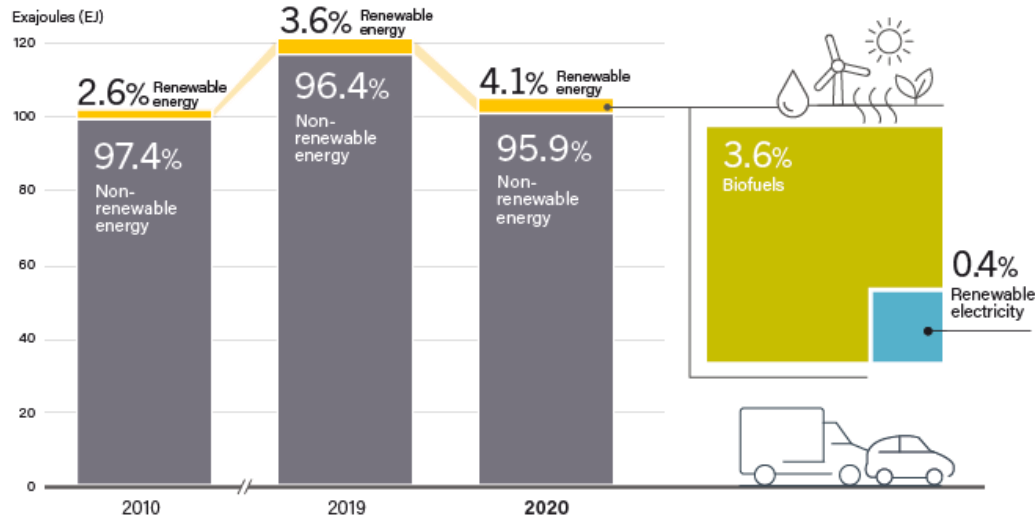
**Energy intensive industries** were hit the hardest in 2022, (cutting production or forcing to relocate). In 2022, **Corporate PPAs** in Europe witnessed 21% y-y growth rates.

# RENEWABLE ENERGY IN TRANSPORT LAGGING BEIND

LOWEST RENEWABLE ENERGY SHARE AMONG SECTORS



**Renewable Share of Total Final Energy Consumption in Transport, 2010, 2019 and 2020**



**Transport energy demand increased 7.8% in 2021 but was still 6.6% below pandemic level.**

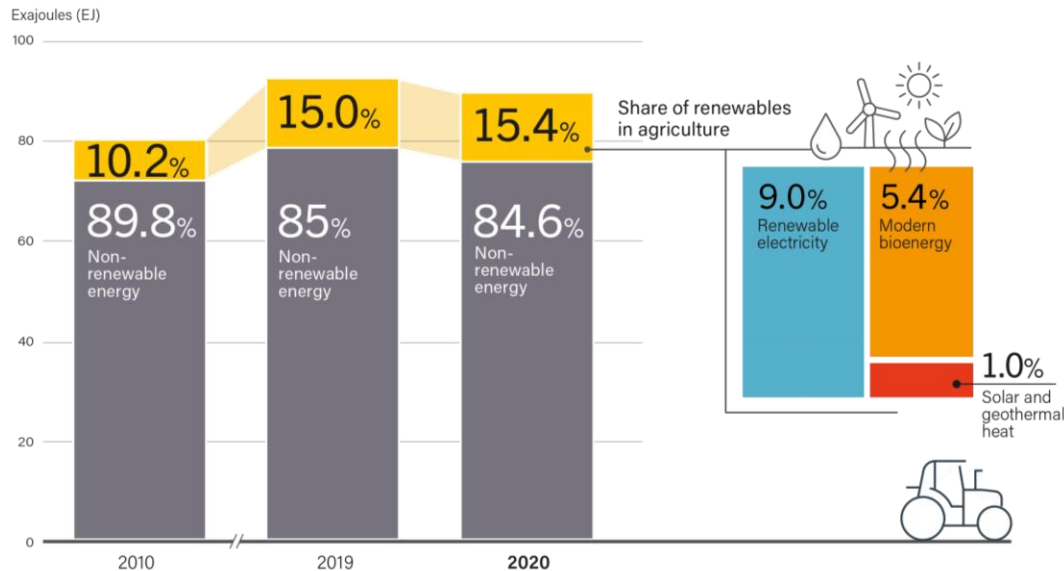
The use of **renewable electricity** grew by **7.1% in 2021** exceeding pre-pandemic level by **11.9%**

# RENEWABLES IN AGRICULTURE GAINING MORE INTEREST

LACK OF ACCESS IN RURAL AREAS DRIVING THE UPTAKE OF RENEWABLES



**Renewable Share of Total Final Energy Consumption in Agriculture, 2010, 2019 and 2020**



**Agriculture** had the fastest increase in **electrification** in the past decade, rising from **19% in 2010 to 26% in 2020**.



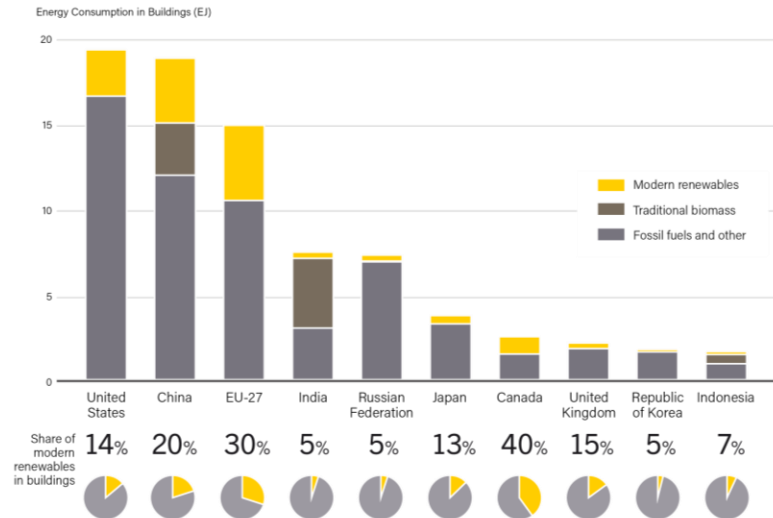
## **REGIONAL AND SECTORAL TRENDS**



# ENERGY CONSUMPTION IN BUILDINGS VARIES GREATLY AROUND THE WORLD

COUNTRIES WITH HIGH SHARES OF RENEWABLES IN BUILDINGS RELY ON ELECTRICITY FOR HEATING

 **Energy Consumption in Buildings by Major Country/Region, 2020**



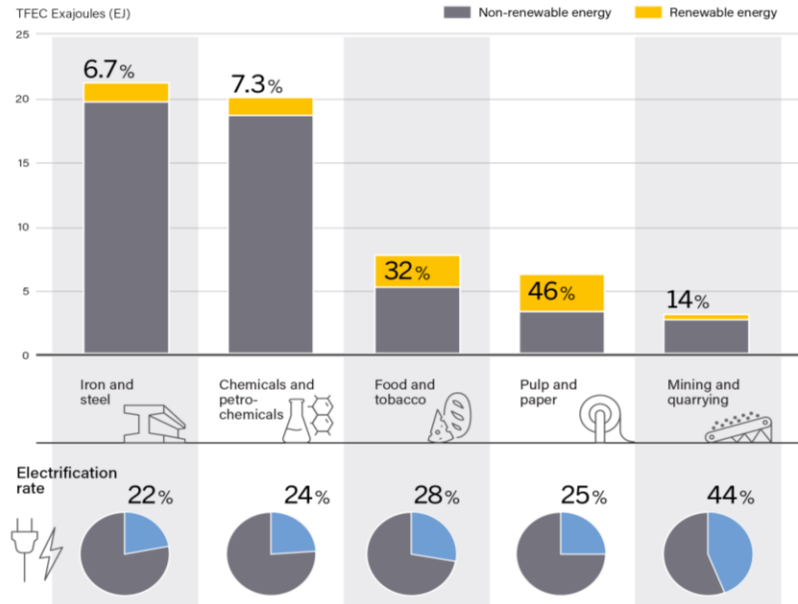
The top ten energy-consuming countries represent **67%** of the global energy consumption in buildings.

# RENEWABLE ENERGY IN INDUSTRY SUB-SECTORS VARIES GREATLY

ELECTRIFICATION DOES NOT ALWAYS LEAD TO GROWING SHARE OF RENEWABLES



**Renewable Energy Share and Electrification Rates in Selected Industry Sub-Sectors, 2020**



**Iron and Chemical industries consume 32% of industrial energy demand.**

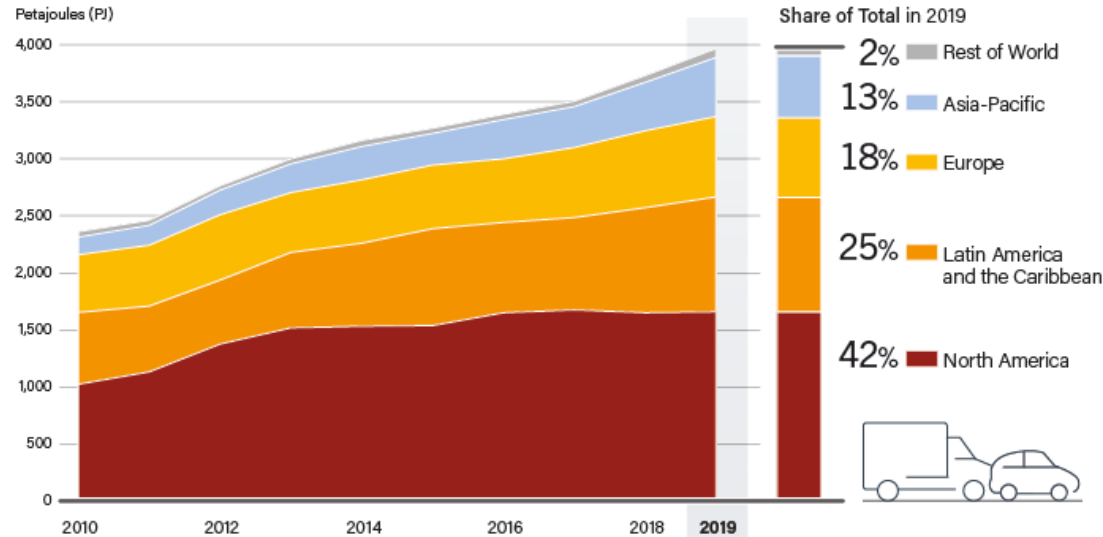
**Tailoring policy to the needs of industries sub-sectors as renewable energy shares and energy intensities vary greatly.**

# RENEWABLE ENERGY IN TRANSPORT

## REGIONAL DIFFERENCES IN RENEWABLE TRANSPORT



**Renewables in Transport, by Region, 2010-2019**



**Asia-Pacific** is the fastest growing region of renewable energy in transport with **13% y-y growth** followed by **Latin America and the Caribbean** with a **5.8%**

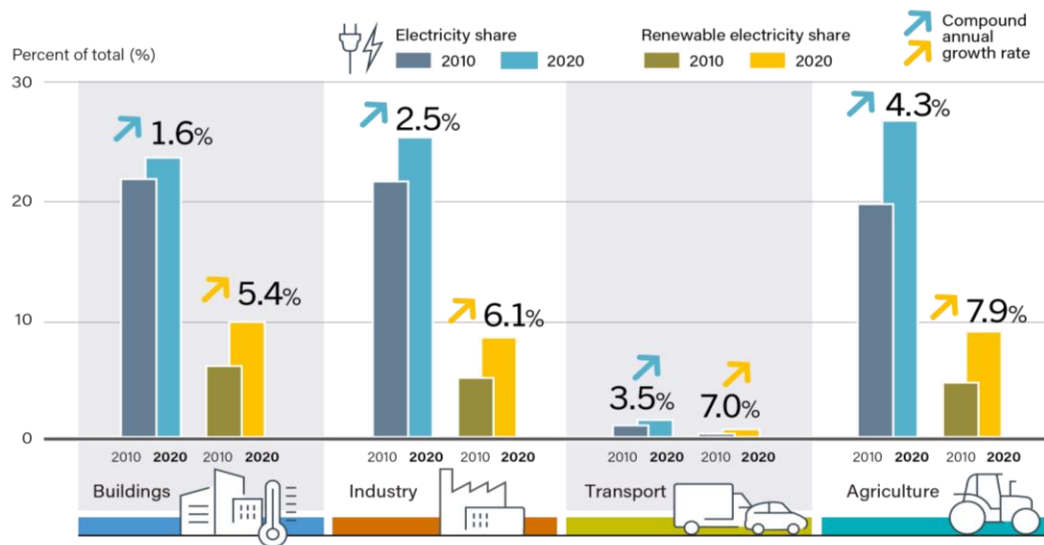


**ELECTRIFICATION A KEY TREND IN ALL SECTORS**

# RENEWABLES TRENDS IN ENERGY DEMAND

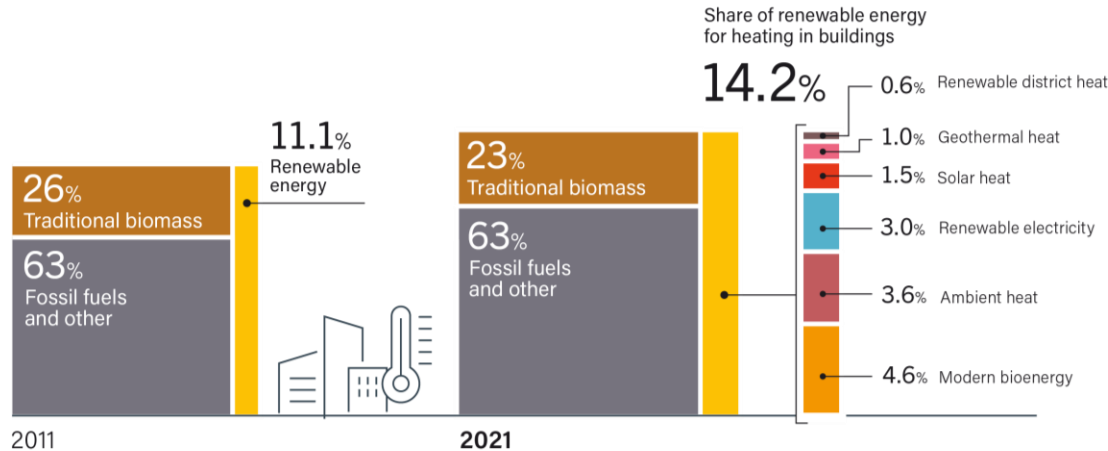
## ELECTRIFICATION OFFERS SOME CROSS-CUTTING ANSWERS

 **Electricity and Renewable Electricity Shares of TREC by Sector, 2010 and 2020**



In general, increasing the uptake of renewables for **heating and transport** is more challenging than deploying renewables for **electricity**.

# MODERN BIOENERGY FOR HEATING IS THE LARGEST END-USE OF RENEWABLES IN BUILDINGS

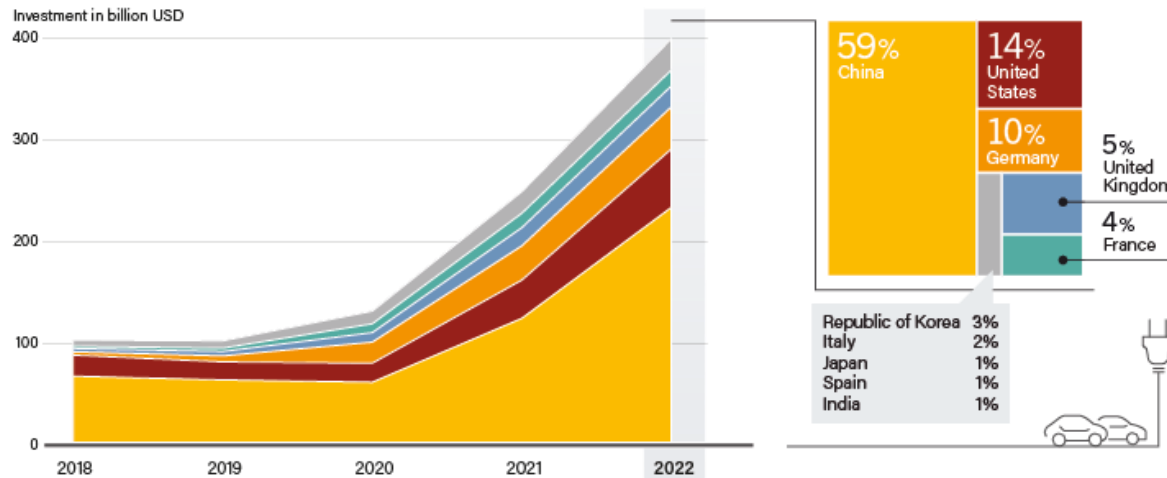

**Energy Consumption for Heating in Buildings, by Source, 2011 and 2021**


Record growth for **Heat Pump** installations in 2022 with global y-y growth of 10% and 38% in Europe.

# RENEWABLE ENERGY IN TRANSPORT

ELECTRIFICATION LEADS TO GROWING SHARE OF RENEWABLES IN TRANSPORT

 **Investment in Electric Vehicles by Major Country, 2018-2022**



**Investment** in electric vehicles and charging infrastructure grew by **53.6%** in 2022 to reach **USD 466.1 billion**.




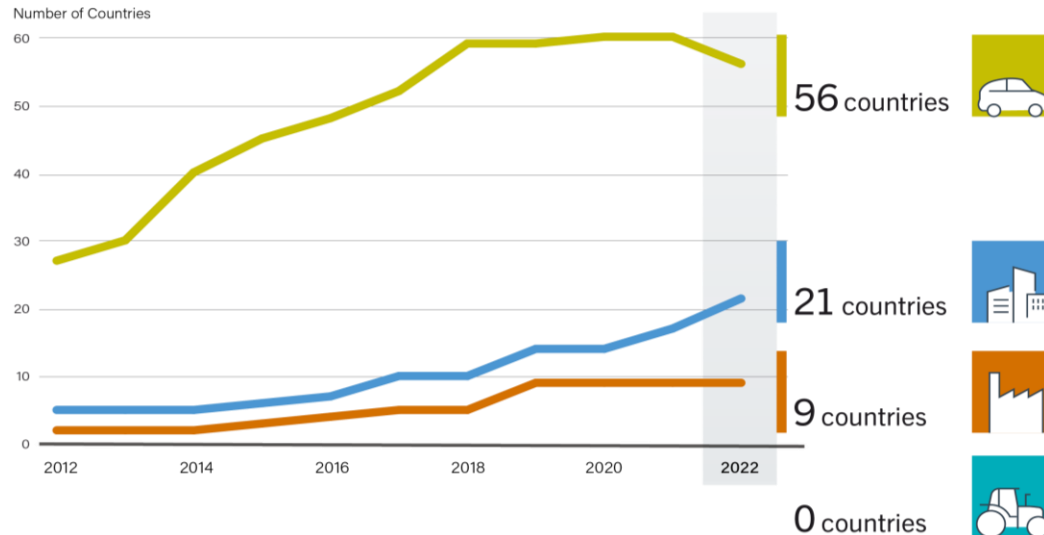
**THE ANSWER OF GOVERNMENTS**



# MIXED SIGNALS

## MORE POLICY DEVELOPEMENT REQUIRED


 **Number of Countries with Renewable Energy Regulatory Policies and Mandates, by Demand Sector, 2012-2022**



Fossil fuel subsidies worldwide soared in 2022, rising above **USD 1 trillion** for the first time – an **85% increase** compared to 2021. Exploration of new oil and gas and new infrastructure.


## MIXED SIGNALS

MORE POLICY DEVELOPEMENT REQUIRED




As of 2022,  
**94** countries  
have either a RE  
policy or target in  
at least one  
demand sector

As of 2022,  
**3** countries  
had a RE targets  
or policies in  
**all** demand  
sector



The **Inflation  
Reduction Act**  
dedicated  
**USD 370 billion**  
for energy  
and climate



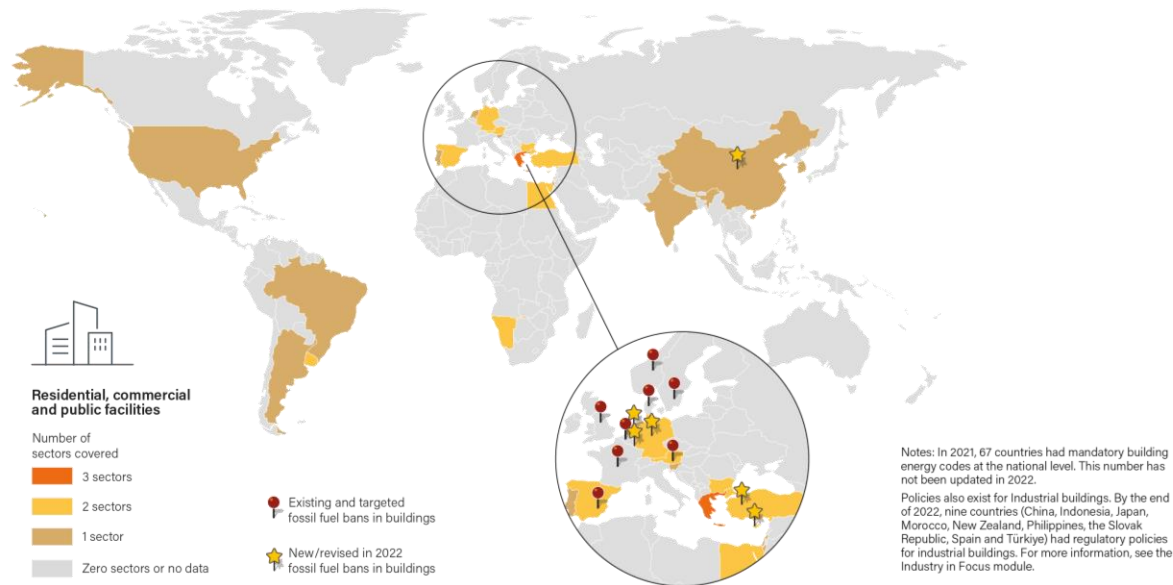
The **REpowerEU**  
dedicated  
**USD 222 billion**  
to reduce fossil  
fuel dependency

**80 new  
renewable** energy  
policies (mostly in the  
form of fiscal and  
financial incentives)  
were announced in  
2022.

# REGULATIONS IMPACT HOW RENEWABLE ENERGY IS USED IN BUILDINGS

ONLY 40% OF COUNTRIES HAD MANDATORY BUILDING ENERGY CODES IN 2022


 **Regulatory Policies in Buildings, by Building Type, as of End-2022**

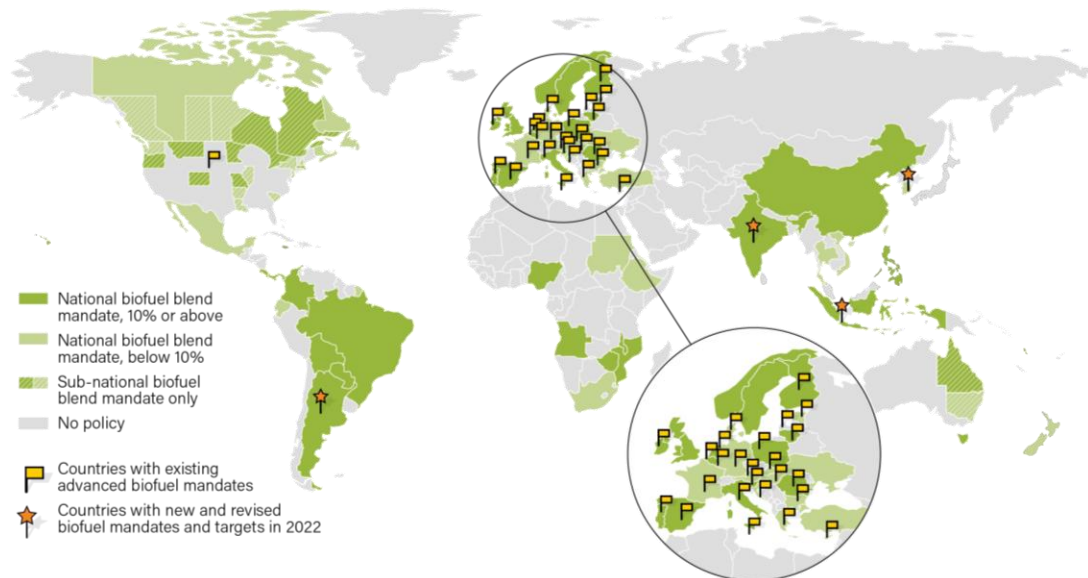


At least **21 countries** announced new or revised regulatory policies for buildings by the end of 2022.

# THE NUMBER OF COUNTRIES WITH BIOFUEL MANDATES DECREASED IN 2022

BIOFUEL MANDATES STILL MOST COMMON REGULATORY POLICY IN TRANSPORT


 **National and Sub-National Renewable Biofuel Mandates and Targets, as of End-2022**

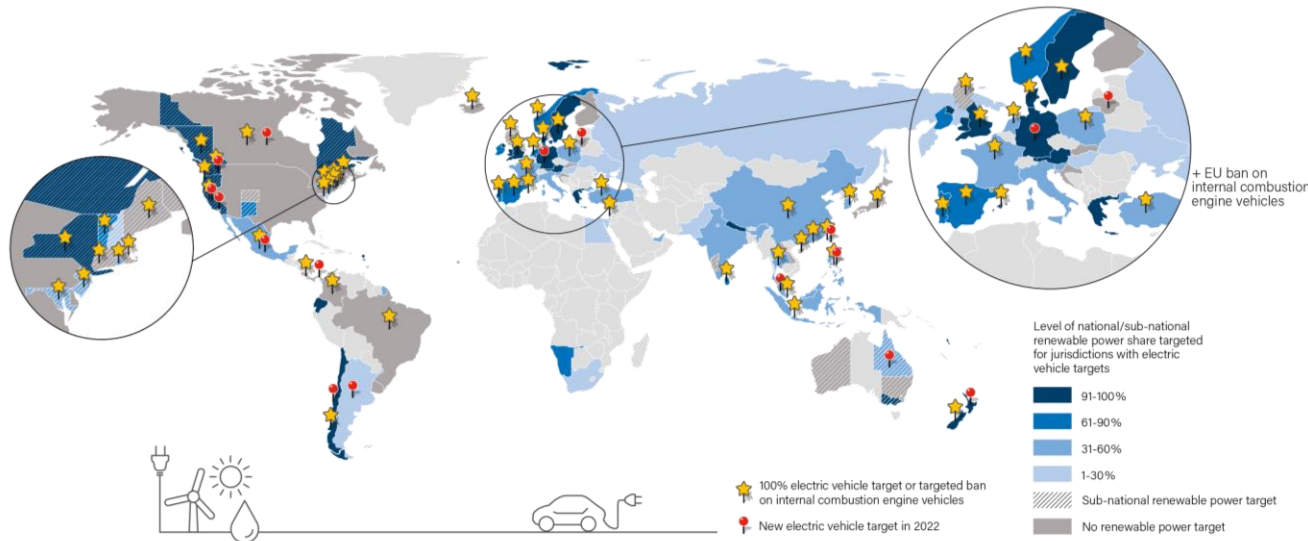


**4 countries** (Argentina, India, Indonesia and the Republic of Korea) **increased** their biofuel mandates in 2022.  
10 countries

# GROWING SUPPORT FOR ELECTRIC TRANSPORT


ELECTRIC VEHICLE TARGETS AND ICE BANS NEED RENEWABLE ENERGY TARGETS AND POLICIES

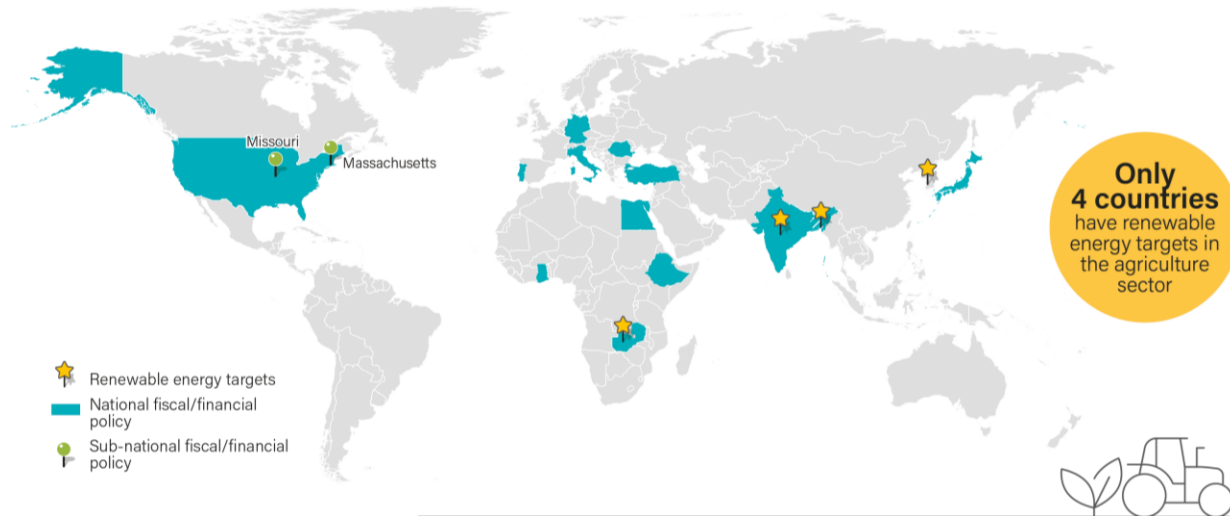
 **Targets for Renewable Power and Electric Vehicles, as of End-2022**



**5 countries (Chile, Denmark, New Zealand and the UK) had both a 100% ICE ban and 100% renewable power target.**

# FISCAL/FINANCIAL POLICIES FOR RENEWABLES IN AGRICULTURE INCREASED BUT NO REGULATORY POLICIES HAVE BEEN ANNOUNCED

 **National and Sub-National with Renewable Energy Targets and Fiscal/Financial Policies in the Agriculture Sector, as of End-2022**



## BUILDING ON THE MOMENTUM

### ENERGY DEMAND SECTORS NEEDS TAILORED ATTENTION

- Governments need to develop **sectoral targets, policies and roadmaps** for buildings, industry, transport and agriculture
- There is **no time for mixed messages**:
  - **Phasing out fossil fuel subsidies** for level playing field
  - Include support of use of renewables in **short term policy answers to crisis**
- **Electrification**
  - A low hanging fruit to increase the share of renewables in all energy consuming sectors
- Strategically link **energy, industrial, trade and climate policy**
- **Energy supply, energy systems and infrastructure** need to respond to the increase of **renewable energy demand** in all end-use sectors





**REN21 Secretariat**

[www.ren21.net](http://www.ren21.net)





The background is a clear, bright blue sky. On the left side, there are several dandelion seed heads. One is in sharp focus in the foreground, while others are blurred in the background. Some seed heads are still attached to their stems, while others are floating away, suggesting a breeze. In the upper right corner, there are several colorful abstract shapes: three elongated, rounded rectangles in teal, orange, and blue, and three solid circles in teal, blue, and yellow. The overall composition is clean and modern, with a focus on natural elements and vibrant colors.

RENEWABLES NOW