



# WORLD ENERGY TRANSITIONS OUTLOOK 2022

1.5°C PATHWAY

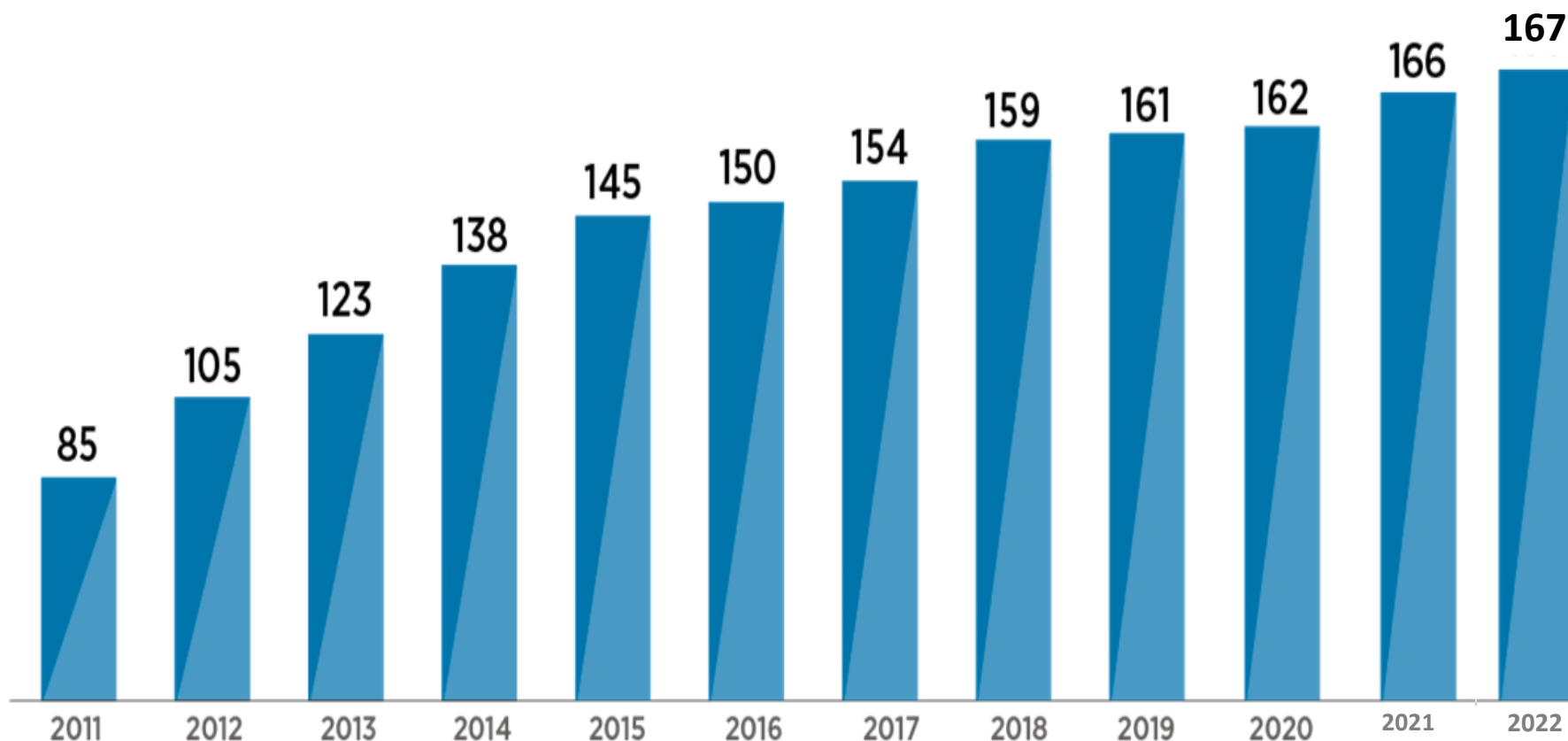
**Binu Parthan**  
Head of Regions

SIEW Global Launch • May 2022



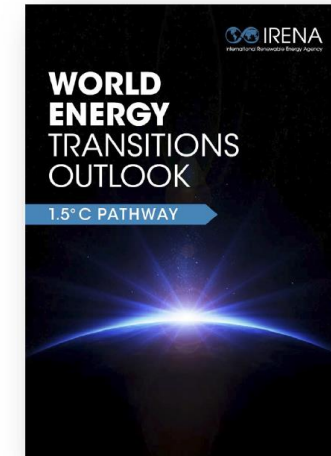
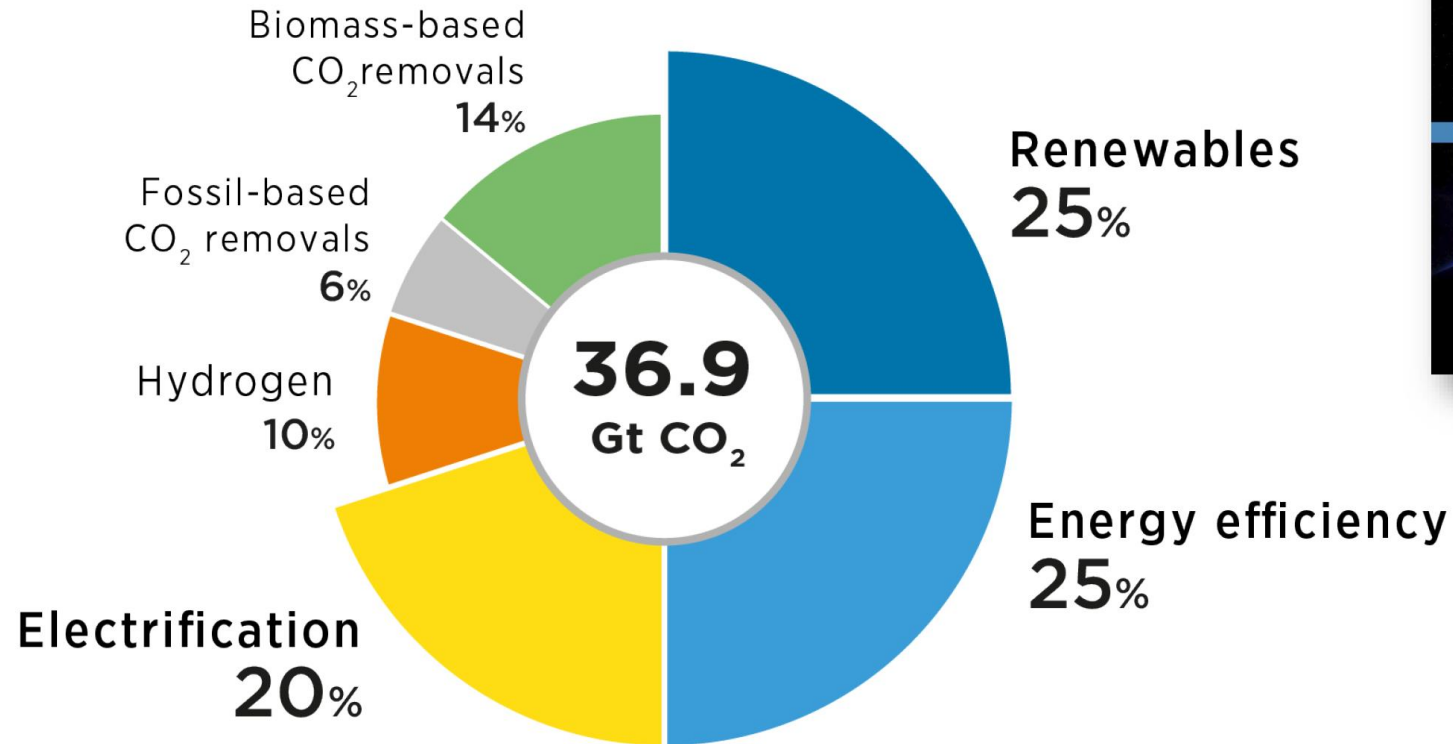
## About the International Renewable Energy Agency

- » Established in 2011. 184 Member states including 17 States in accession
- » Headquarters in Masdar City, Abu Dhabi, UAE, IITC Bonn, Germany, UN Permanent Observer, NY, USA



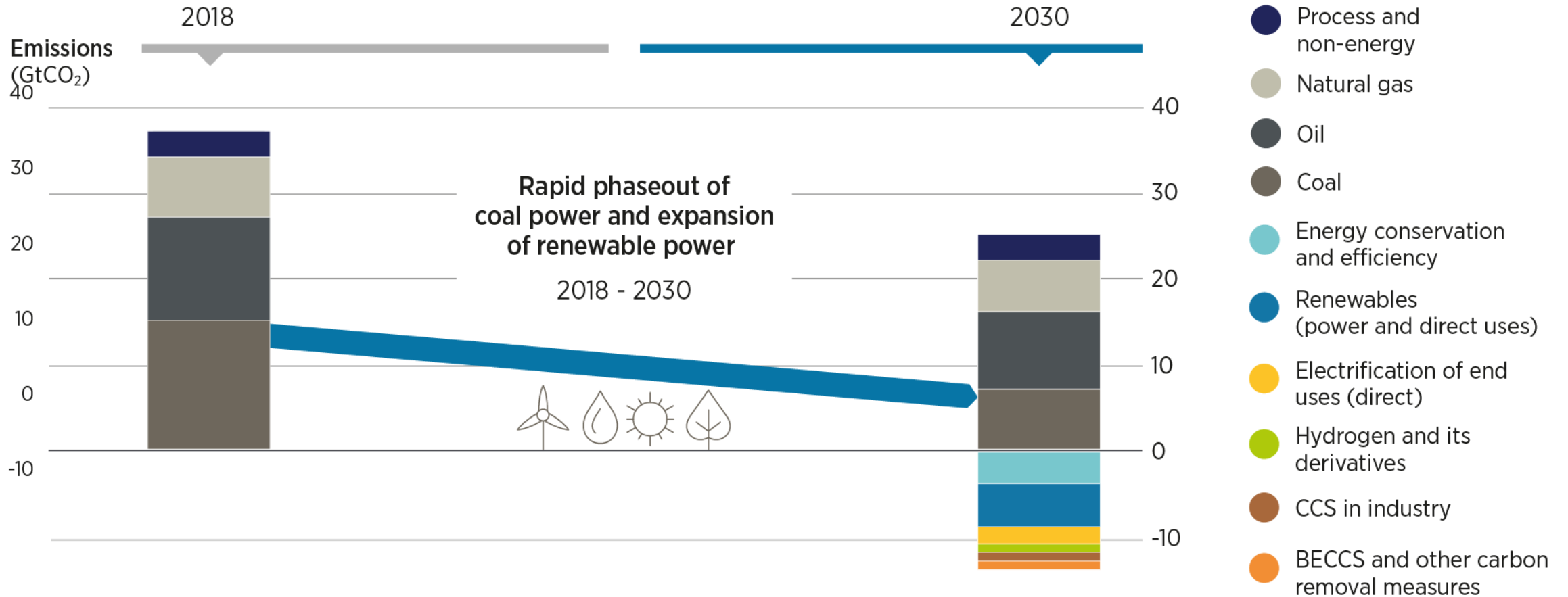
# Renewables, efficiency and electrification dominate energy transition

## Reducing emissions by 2050 through six technological avenues



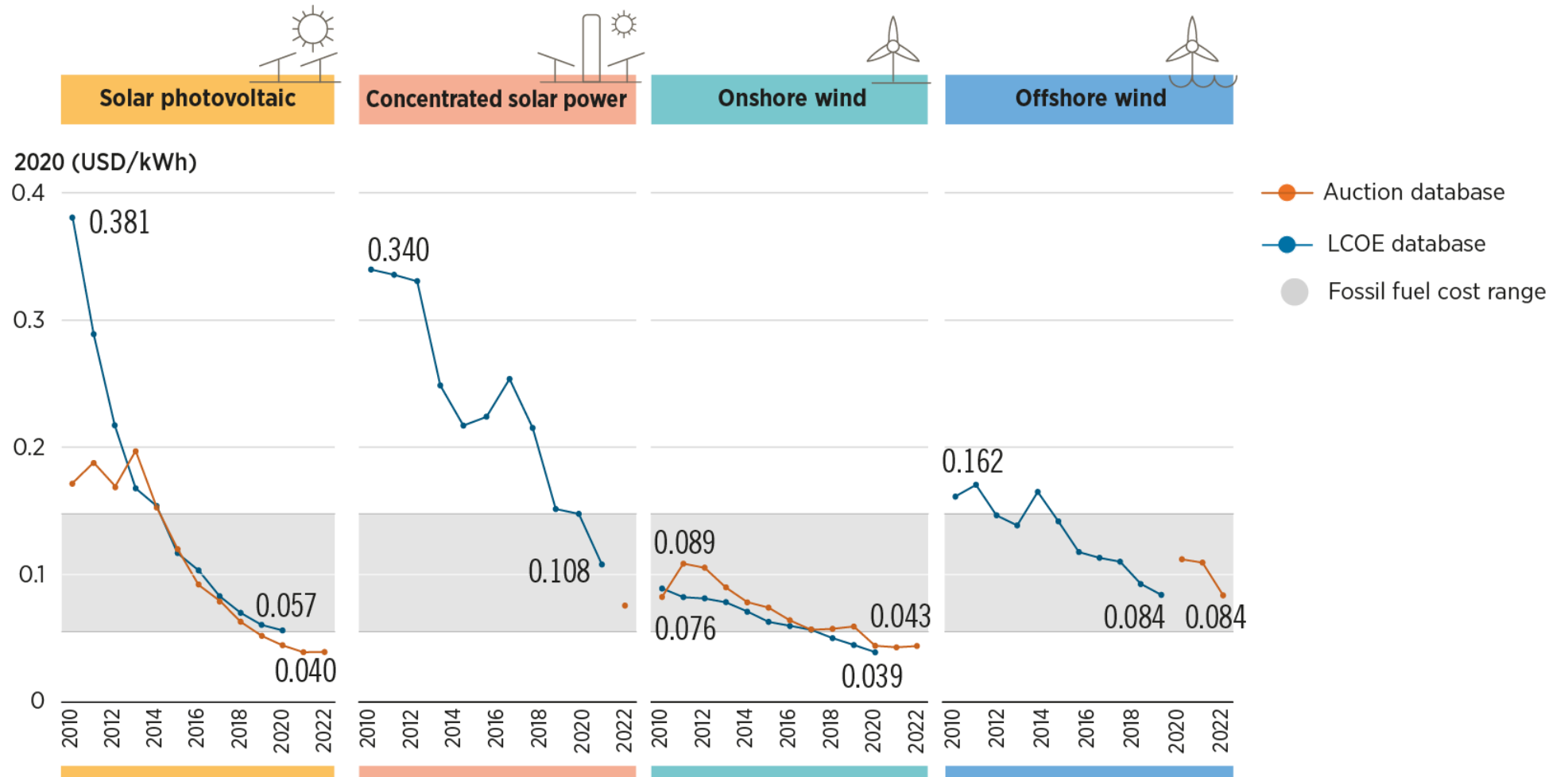
90% of all decarbonisation in 2050 will involve renewable energy through direct supply of low-cost power, efficiency, electrification, bioenergy with CCS and green hydrogen.

# Key milestones and actions for rapid emission reductions



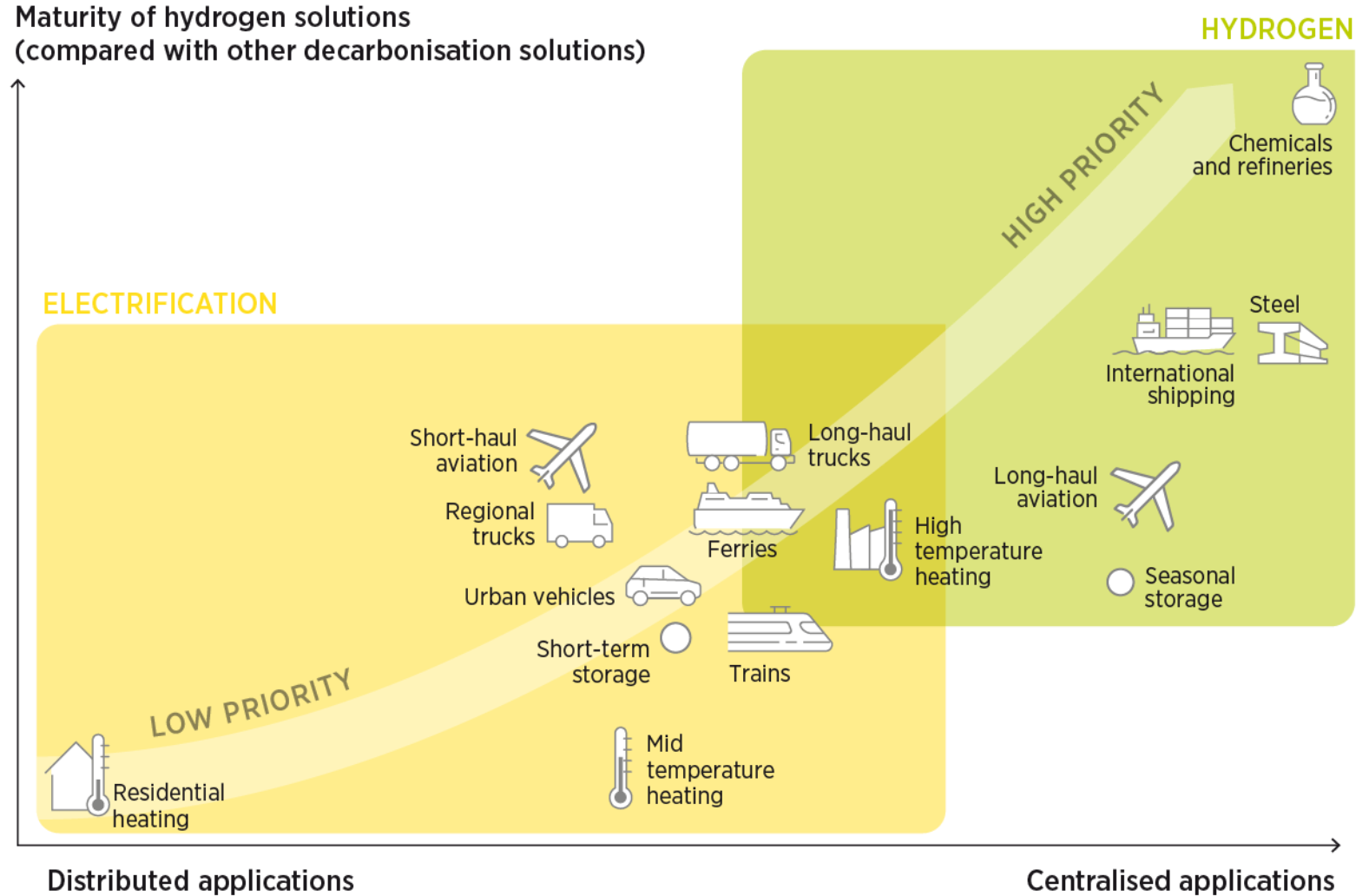
**Ramping up renewables**, together with an aggressive **energy efficiency** strategy, is the most realistic path toward halving of emissions by 2030.

# Renewables-based electricity is already the cheapest power option in most regions



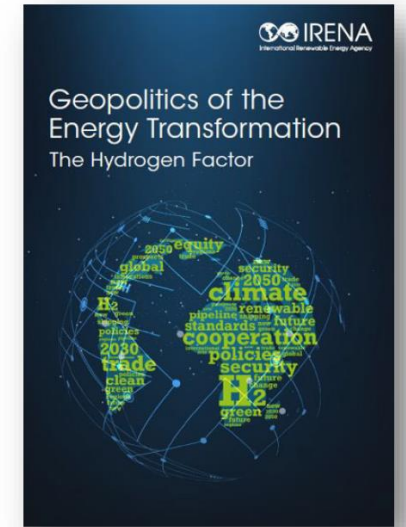
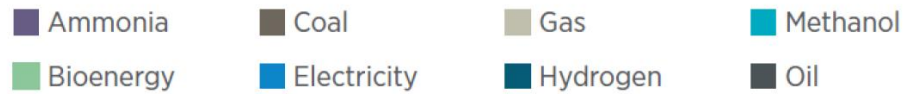
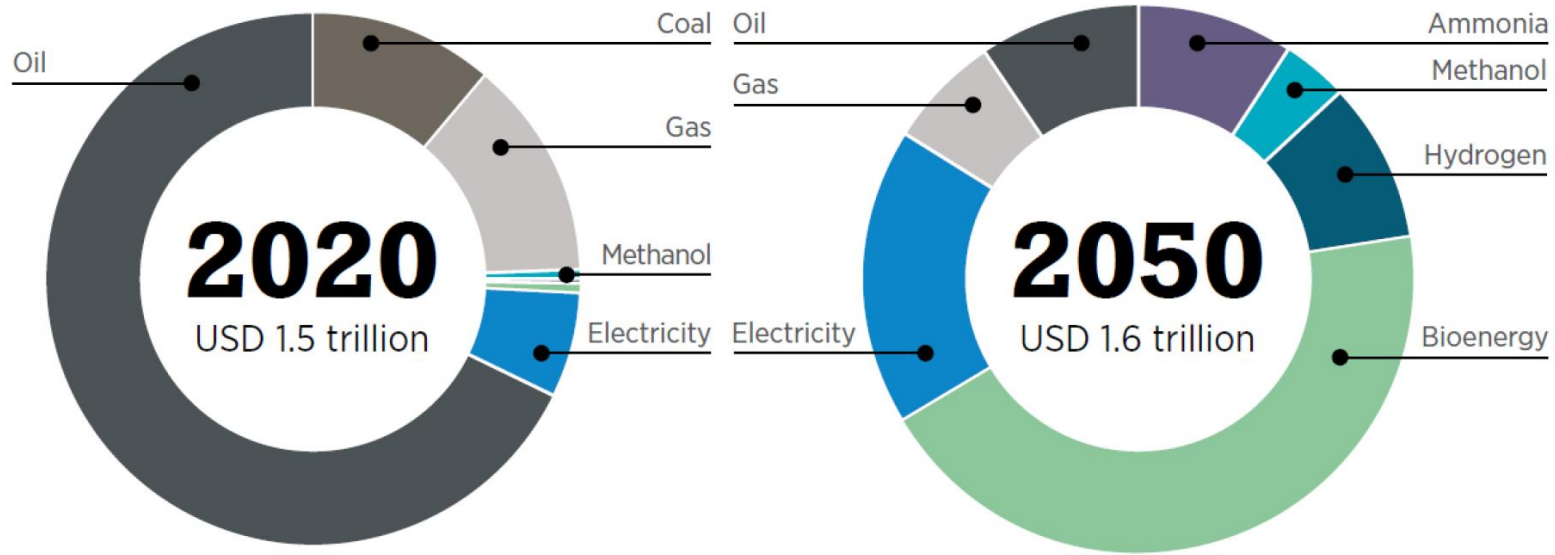
The global weighted average levelised cost of electricity from utility-scale solar photovoltaic (PV) projects fell by 85% between 2010 and 2020, concentrating solar power (CSP) by 68%; on-shore wind by 56%, and off-shore wind by 48%.

# Green hydrogen needs to move from niche to mainstream by 2030



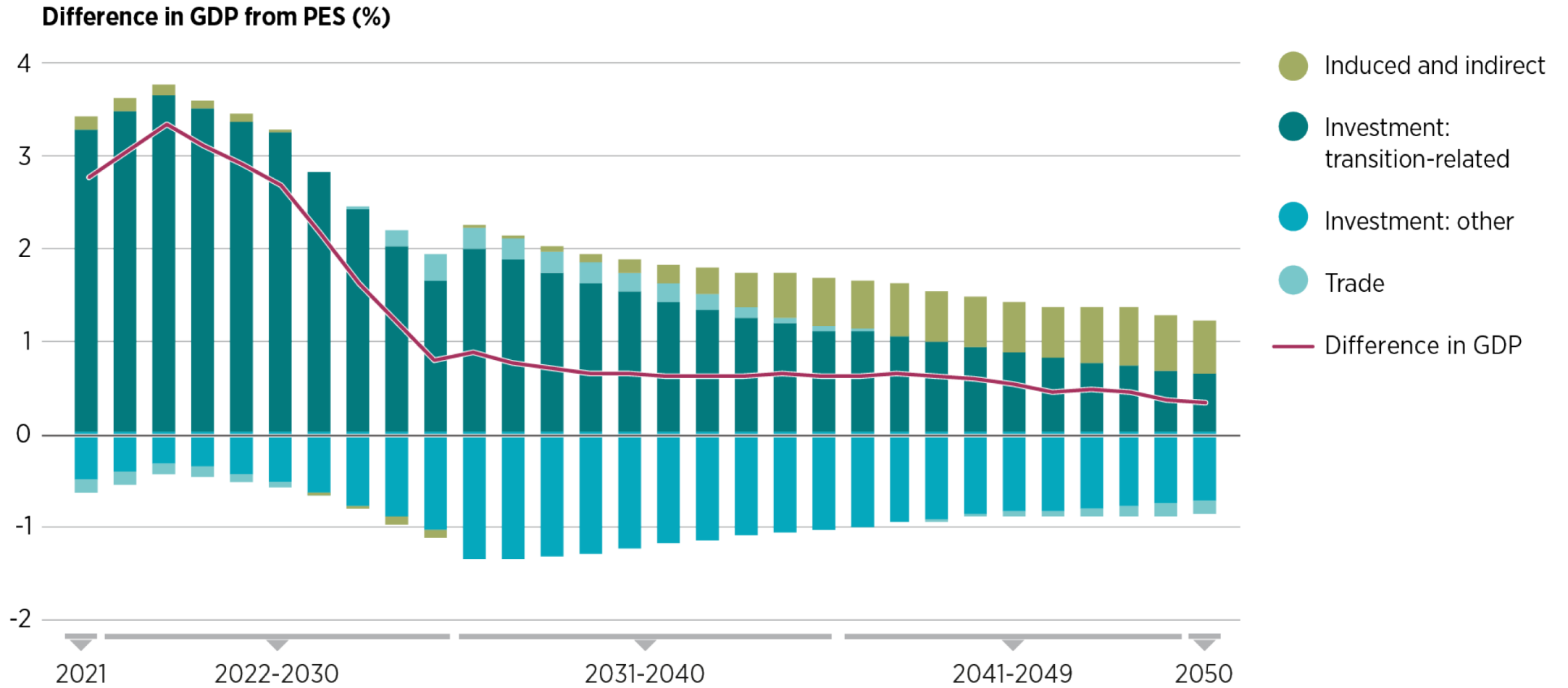
Policymakers should identify priorities for indirect electrification using green hydrogen with a focus on hard-to-abate sectors and devise strategies for its deployment.

# Geopolitics of the energy transformation: the hydrogen factor



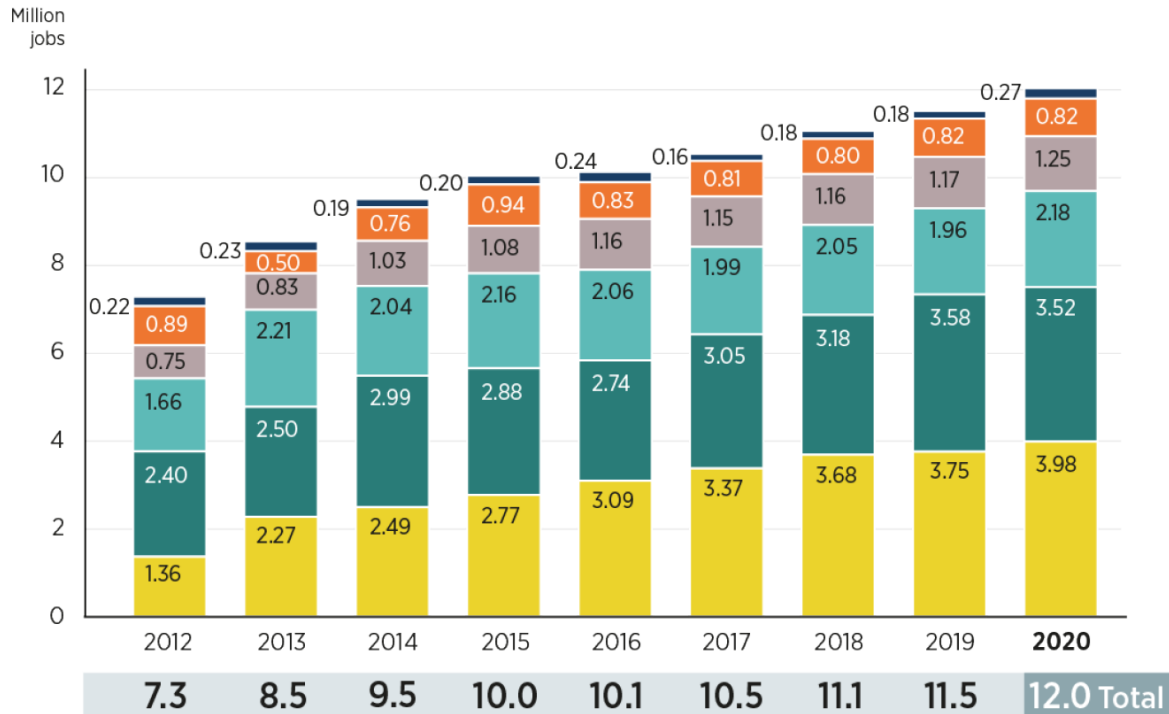
# The 1.5°C Pathway Provides a Boost in Global GDP







GDP difference between the 1.5°C Scenario and PES, with GDP drivers



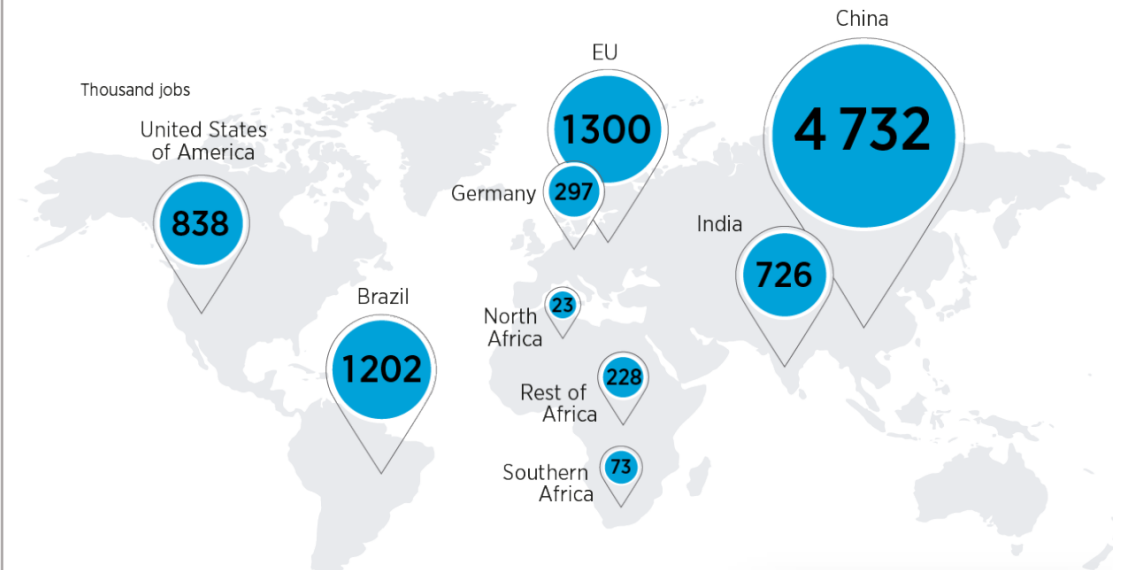


# Jobs in renewable energy – by year and selected countries

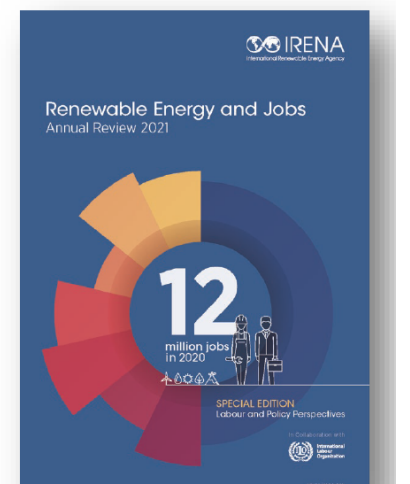


-  Solar photovoltaics
-  Hydropower<sup>b</sup>
-  Solar heating/cooling
-  Bioenergy<sup>a</sup>
-  Wind energy
-  Others<sup>c</sup>

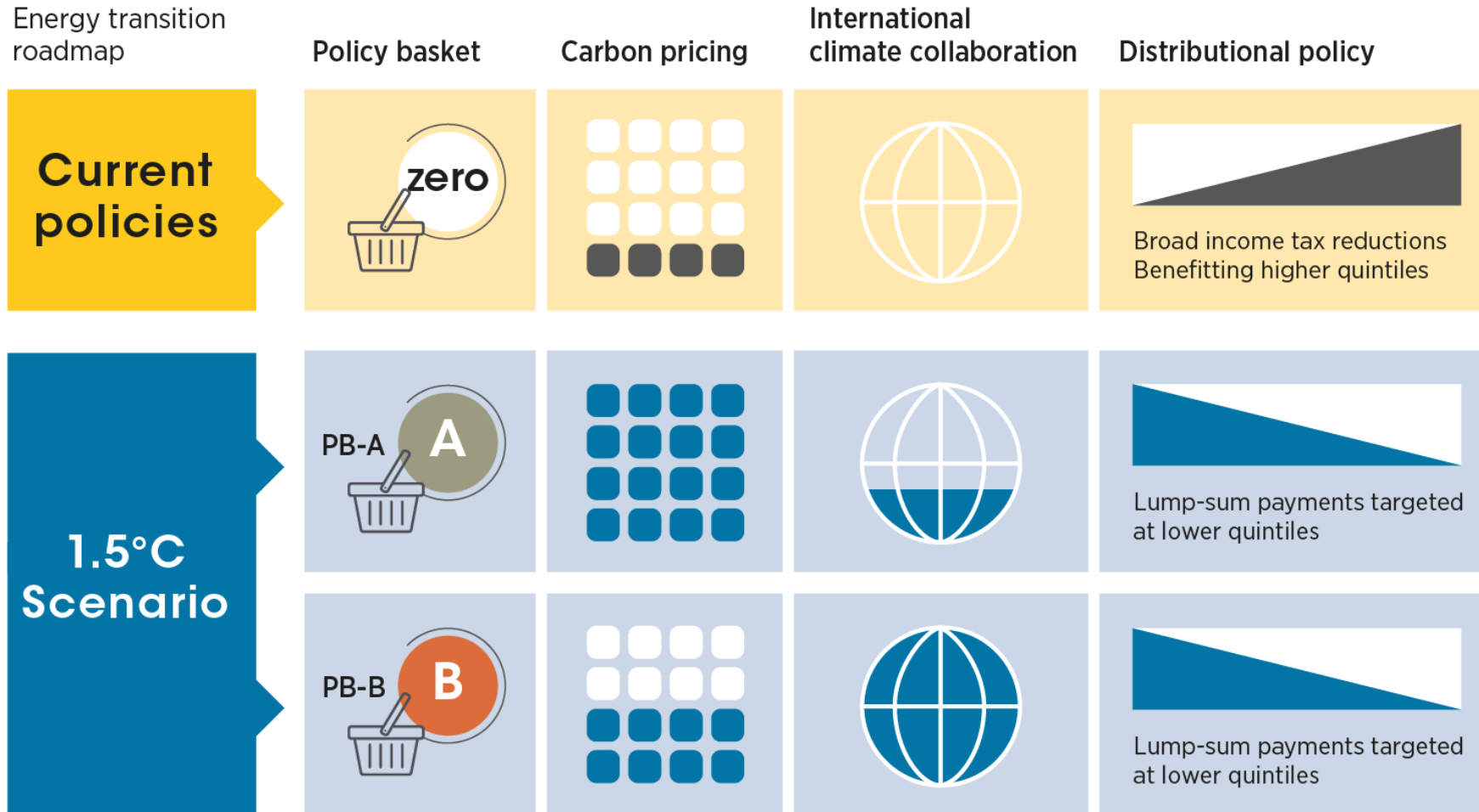
<sup>a</sup> Includes liquid biofuels, solid biomass and biogas.  
<sup>b</sup> Direct jobs only.  
<sup>c</sup> "Others" includes geothermal energy, concentrated solar power, heat pumps (ground based), municipal and industrial waste, and ocean energy.



**12** million jobs in 2020

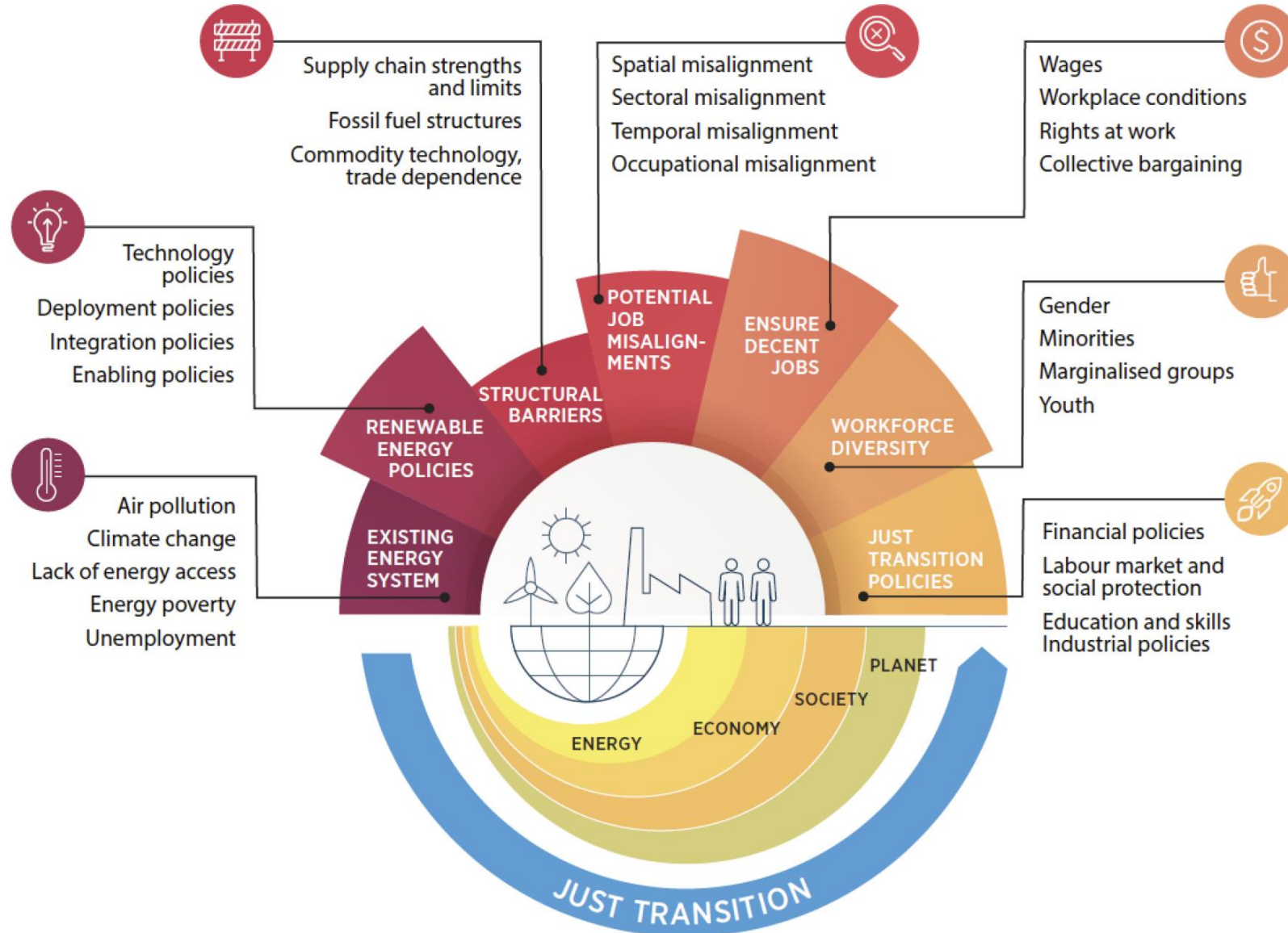


# Policy as a cornerstone of a sustainable energy transition



An ambitious, sustainable and resilient energy transition depends on triggering a global collaborative effort and deep social engagement

# Just transition – a comprehensive policy framework



# IRENA's Energy Transition Support

82 countries

168 work-packages

1.9 bn population

4 bn tons of CO2

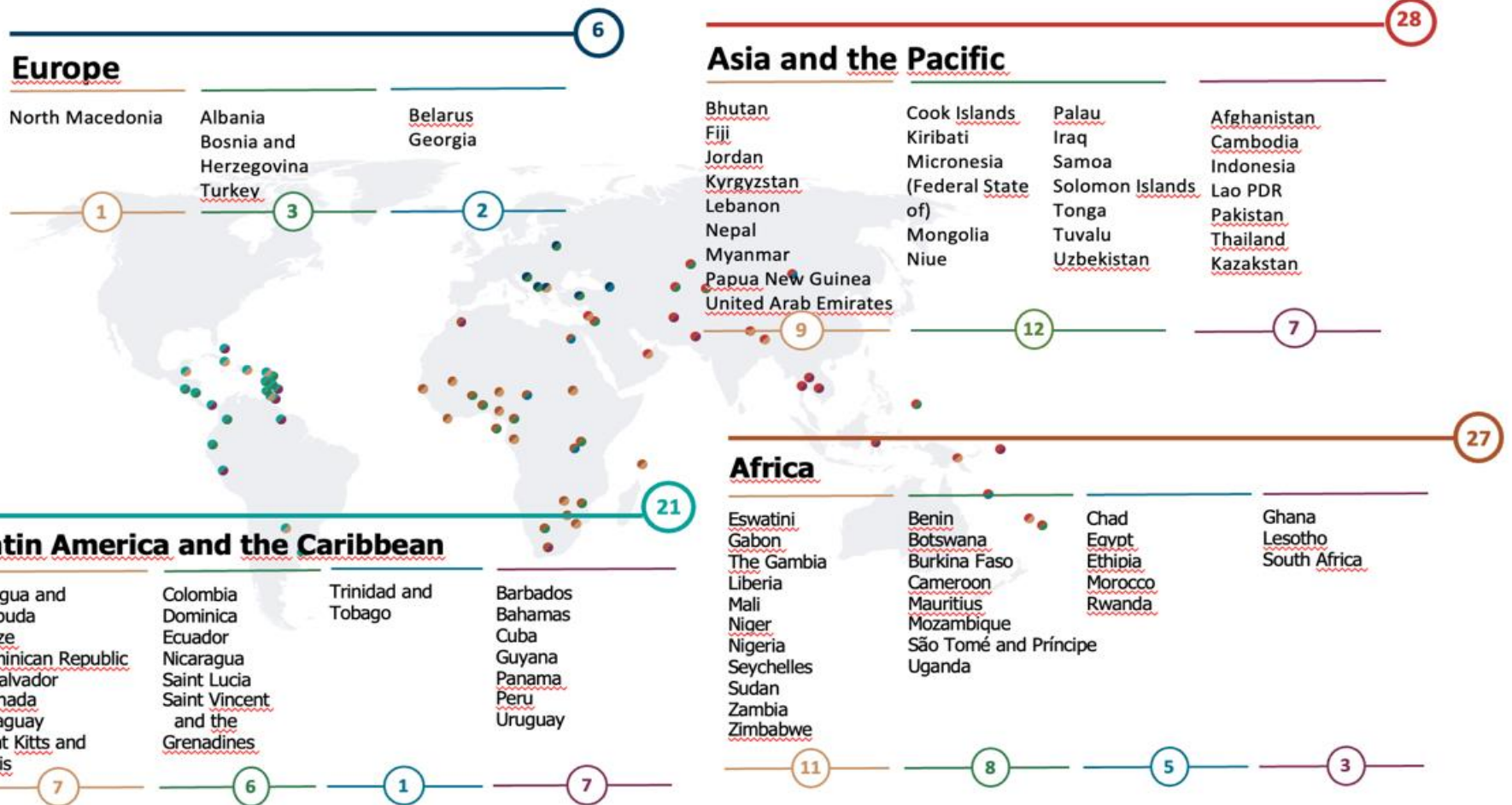


27 Input to NDC provided

22 Implementation of Support

15 Work plan development

18 Scoping/on hold



Disclaimer: This map is provided for illustration purposes only. Boundaries and names shown on this map do not imply any official endorsement or acceptance by IRENA.



# WORLD ENERGY TRANSITIONS OUTLOOK 2022

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Thank you!

# Despite some progress, the energy transition is far from being on track to 1.5°C

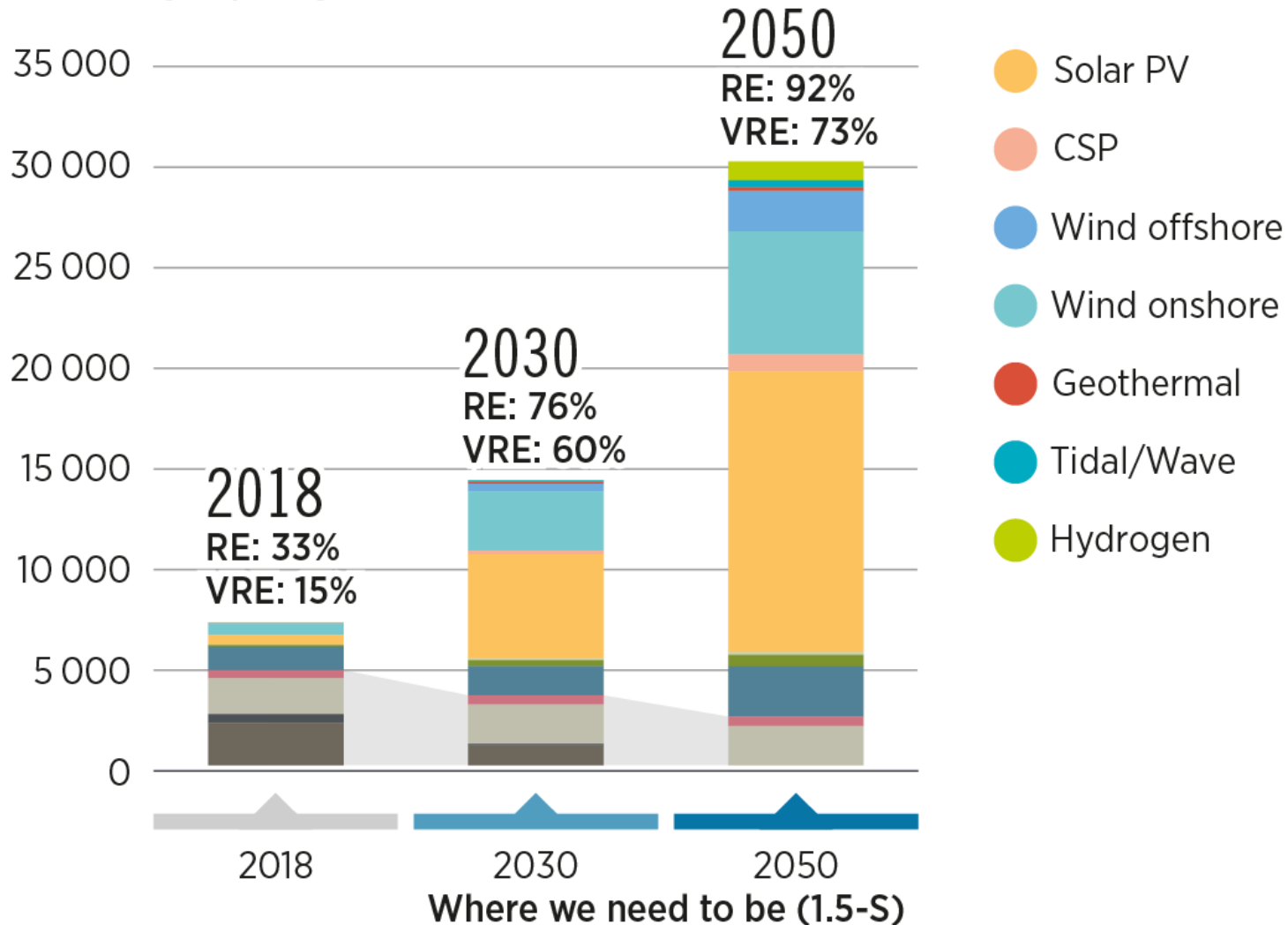
## Tracking progress of key energy system components

Indicators		Recent years	2050	Off / On track
RENEWABLES	Share of renewables in electricity generation	26%	90%	
	Modern bioenergy consumption	18 EJ	58 EJ	
ENERGY EFFICIENCY	Investment needs for energy efficiency	0.3 USD trillion/yr	1.5 USD trillion/yr	
ELECTRIFICATION	Passenger electric cars on the road	7 million/yr	147 million/yr	
HYDROGEN	Clean hydrogen production	0.8 Mt	614 Mt	
CCS AND BECCS	CCS and BECCS to abate emissions in industry	0.04 GtCO <sub>2</sub> captured/yr	8.4 GtCO <sub>2</sub> captured/yr	

Achieving the 2050 target depends on sufficient action by 2030. Radical action is needed to change the current trajectory. This will require **political will** and well-targeted **policy packages**.

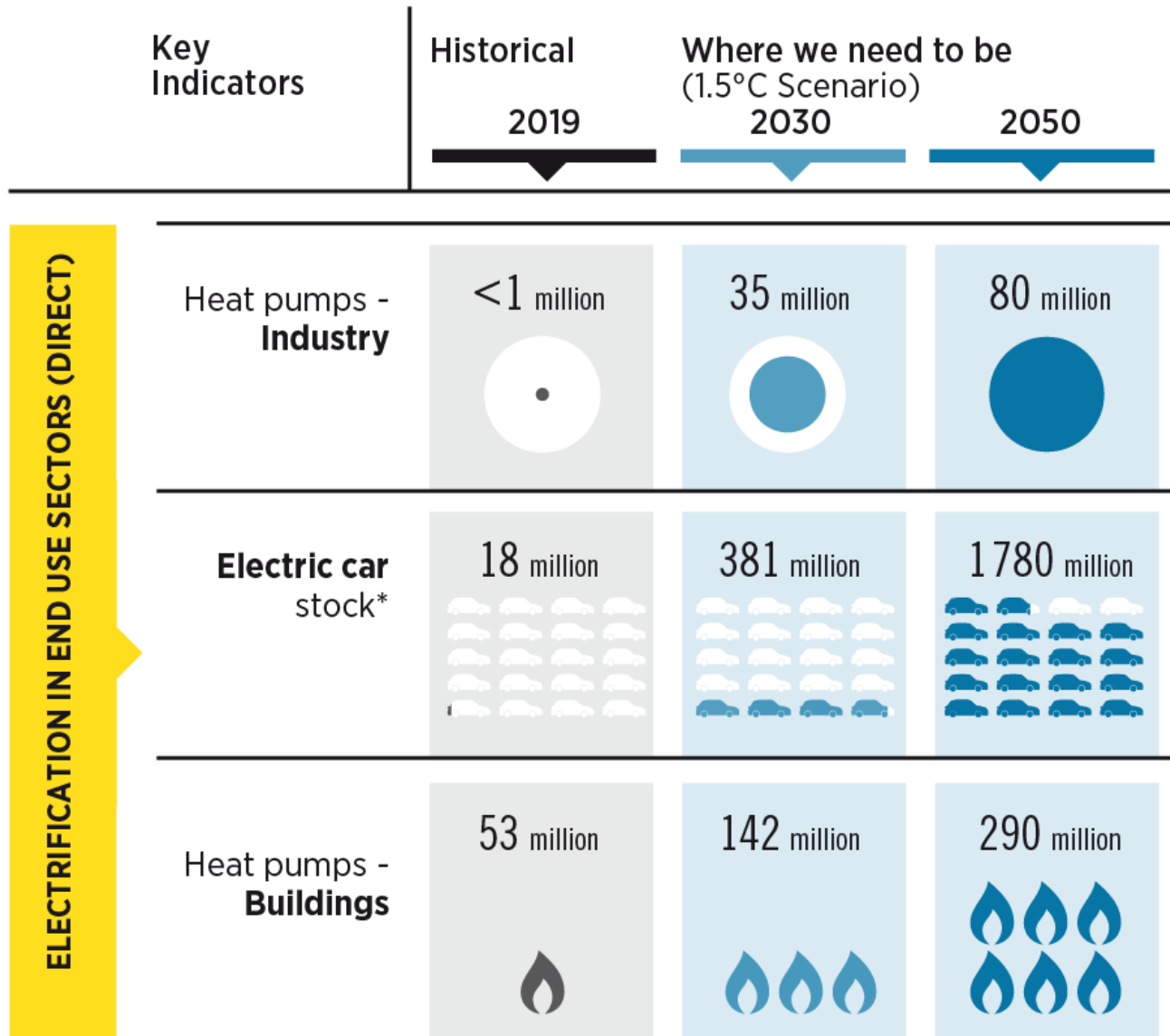
# Renewables could decarbonize 90% of the power sector by 2050

## Electricity capacity (GW)



- Renewables will provide **65%** of the **total electricity supply** by **2030** respectively from over 25% in 2018
- Specific policies and measures such as **RE targets, tax incentives, pricing mechanisms**, among others are needed to increase the deployment of renewables
- Renewables will necessitate an annual investment of more than **USD 1 trillion** till 2030.

# Electricity becomes the main energy carrier in future energy systems



- **Global electricity demand** in end-use sectors will rise **1.3 times** the 2019 levels to reach **Ca.31 000 TWh** by 2030.
- The share of electrification in end-use sectors like **industry, buildings, transport** to reach **28%, 56%, and 9%** in 2030, respectively.
- Policymakers should identify priorities for **electrification** with a focus on **hard-to-abate sectors** and devise strategies for its deployment.



# New investment priorities: renewables, efficiency and electrification

