Perspective on Energy Transition and Regional Cooperation

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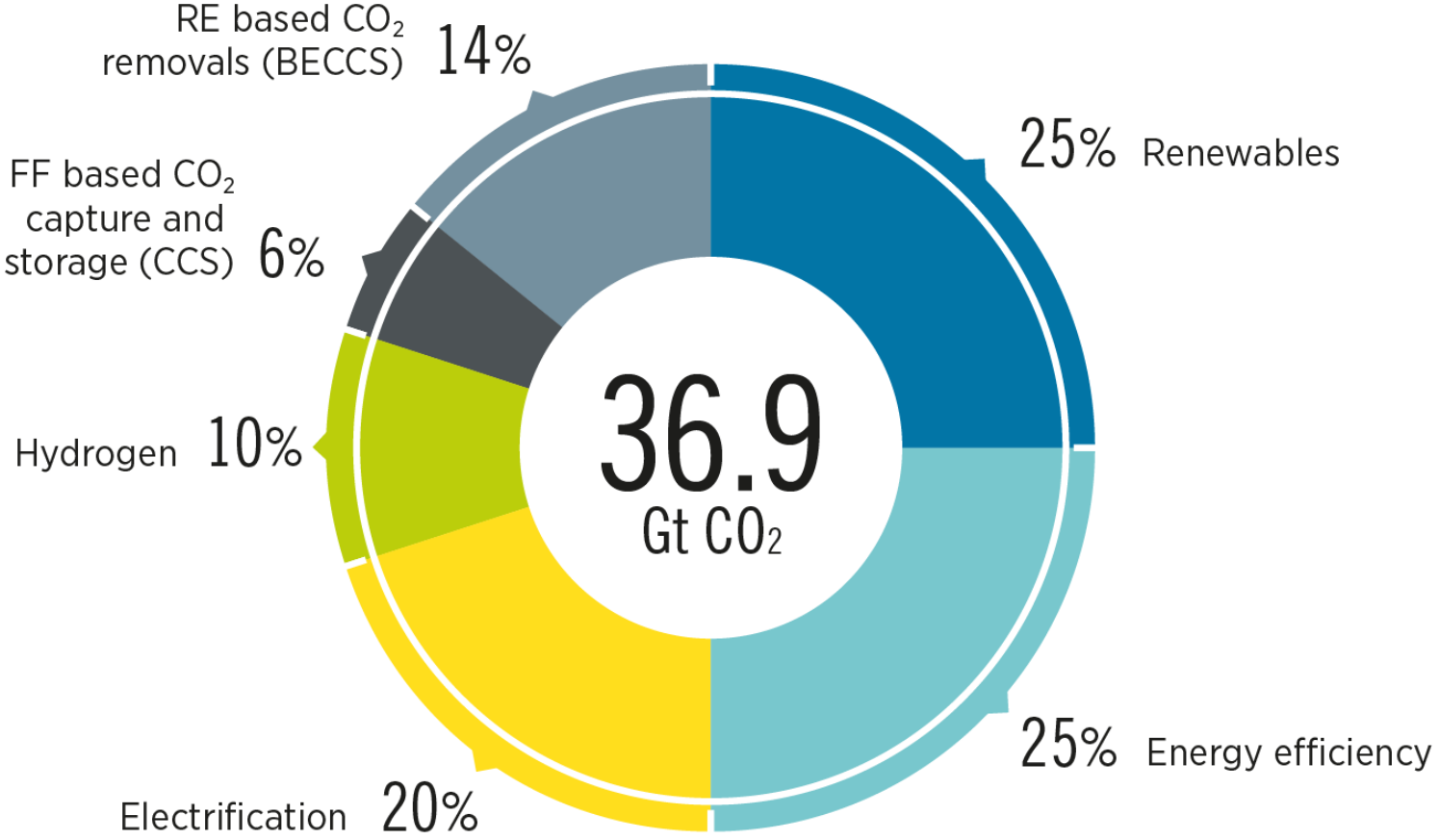
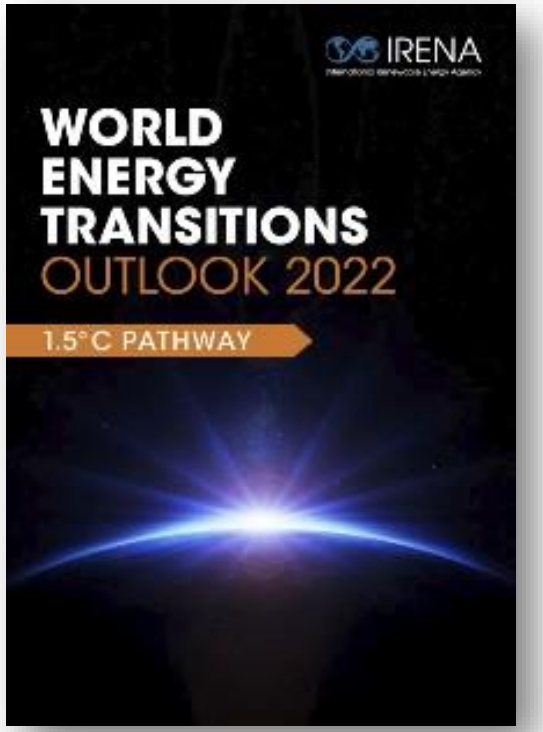
RE, efficiency and electrification dominate energy transition

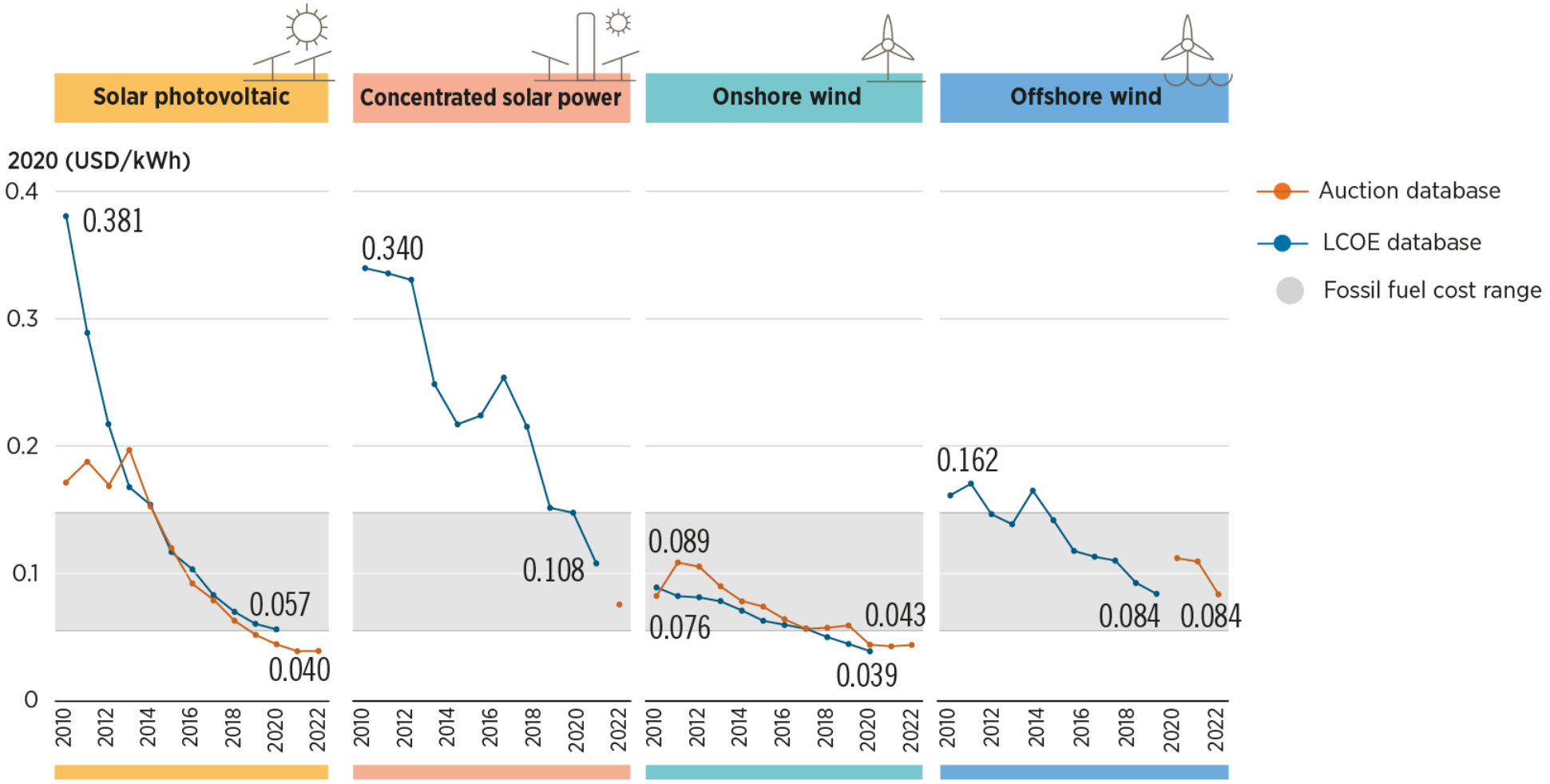
- **Reducing emissions by 2050 through six technological avenues**
- 90% of all decarbonisation in 2050 will involve Renewable Energy through direct supply of low-cost power, efficiency, electrification, bioenergy and green H2.



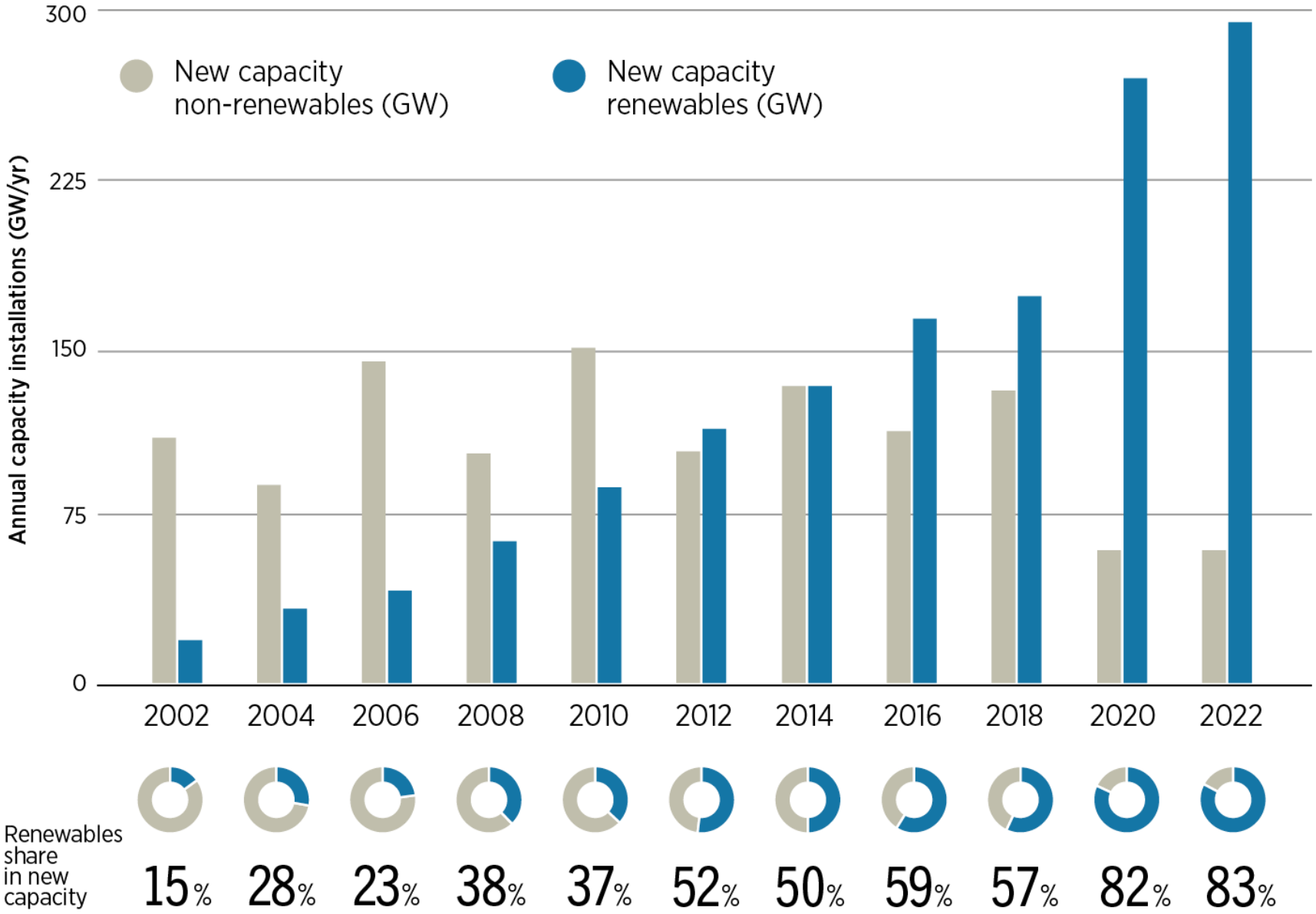


RE-based electricity is already the cheapest power option

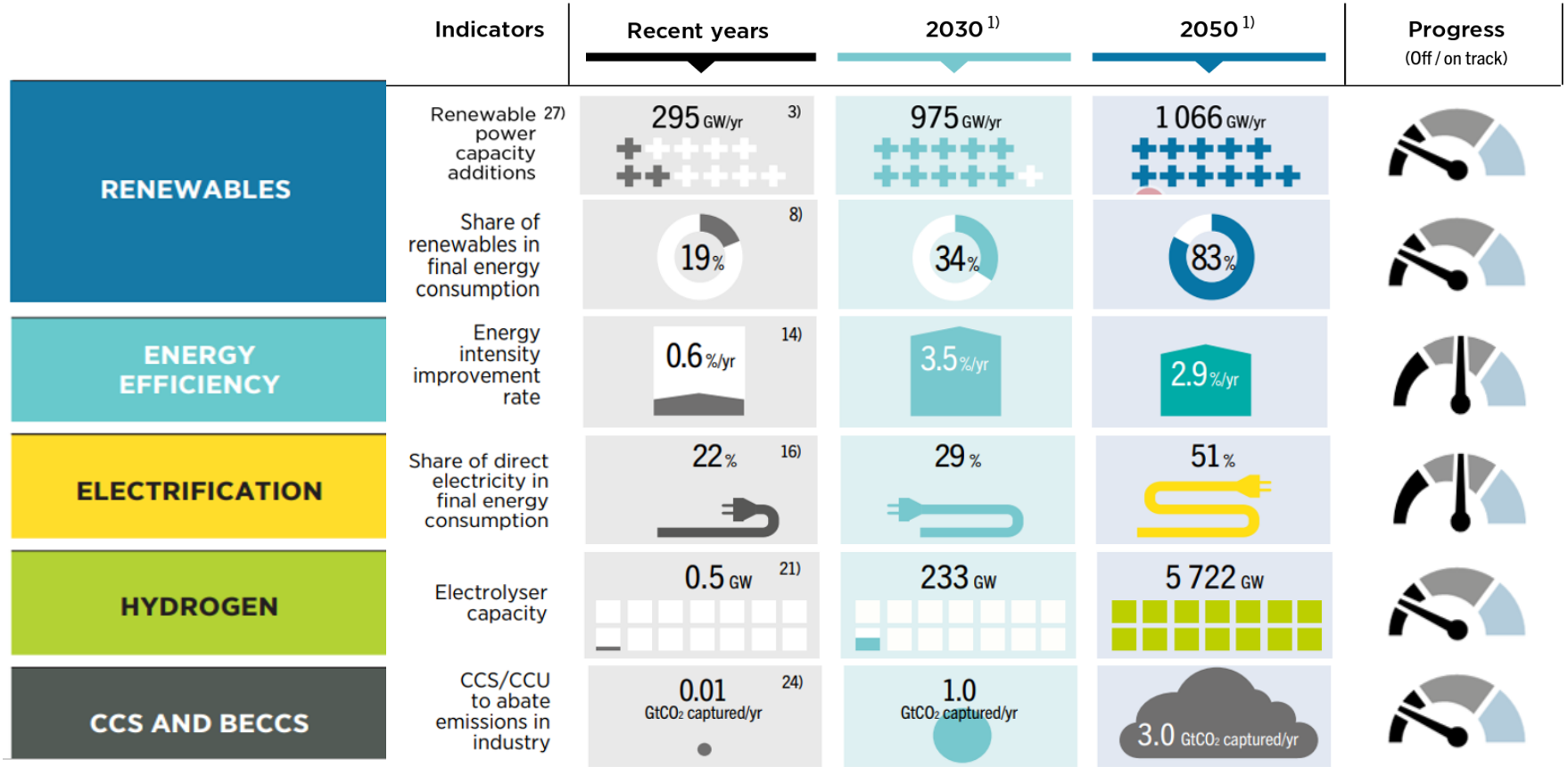
- Global WA-LCOE from utility-scale solar PV projects **fell by 85% between 2010-2020**, CSP by 68%; on-shore wind by 56%, and off-shore wind by 48%.



Record 295GW growth in renewables achieved in 2022

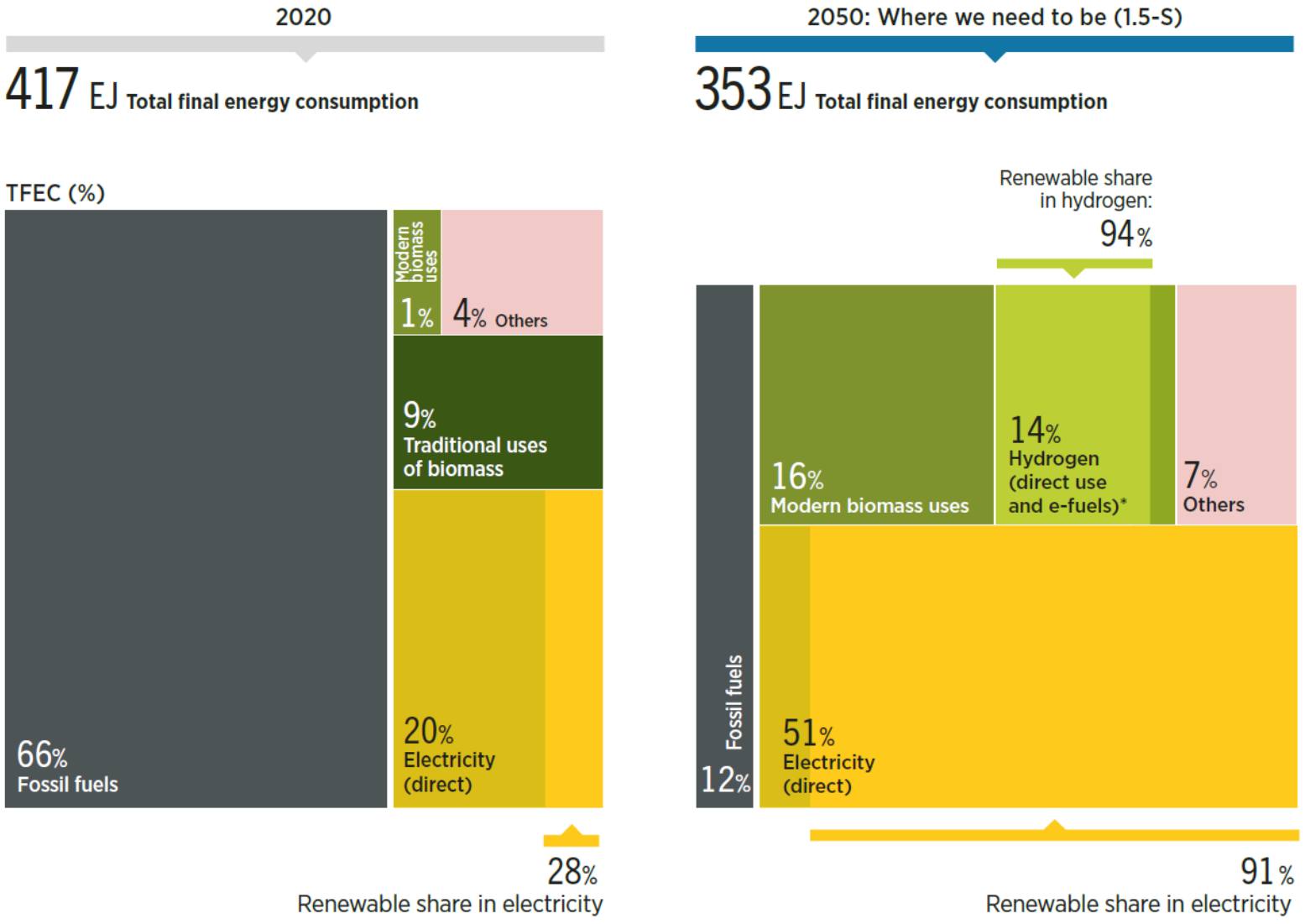


The energy transition is far from being on track to 1.5°C



- **Significant acceleration** is needed across energy technologies, from deeper end-use **electrification**, to **direct renewable use**, **energy efficiency** and **infrastructure** additions
- The **lack of progress** will increase future **investment needs** and the **costs of worsening climate change effects**

Electricity becomes the main energy carrier in 2050

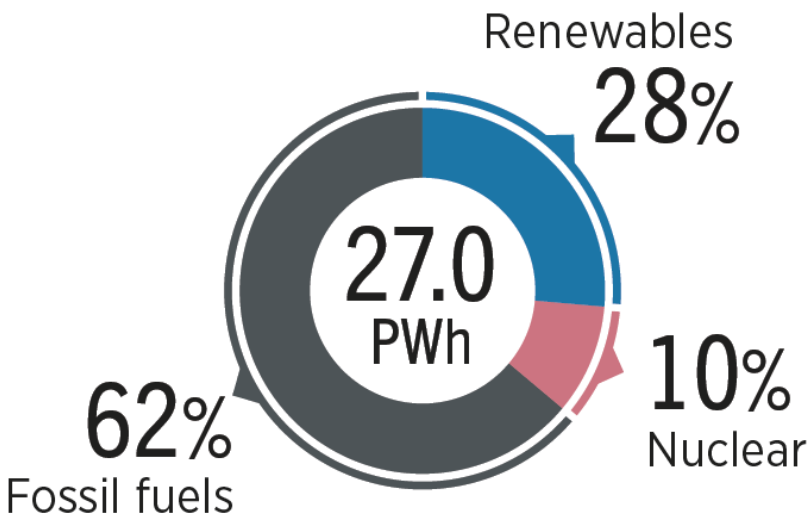


- Total final energy consumption **decrease by 15%** from 2020 to 2050
- **Renewable energy** deployment, improvements in **energy efficiency** and the **electrification** of end-use sectors contribute to this shift
- More significant roles of **modern biomass** (16%) and **hydrogen** (14%) in 2050
- **94% of hydrogen** consumption in 2050 from **renewables**

Power generation needs to more than triple by 2050

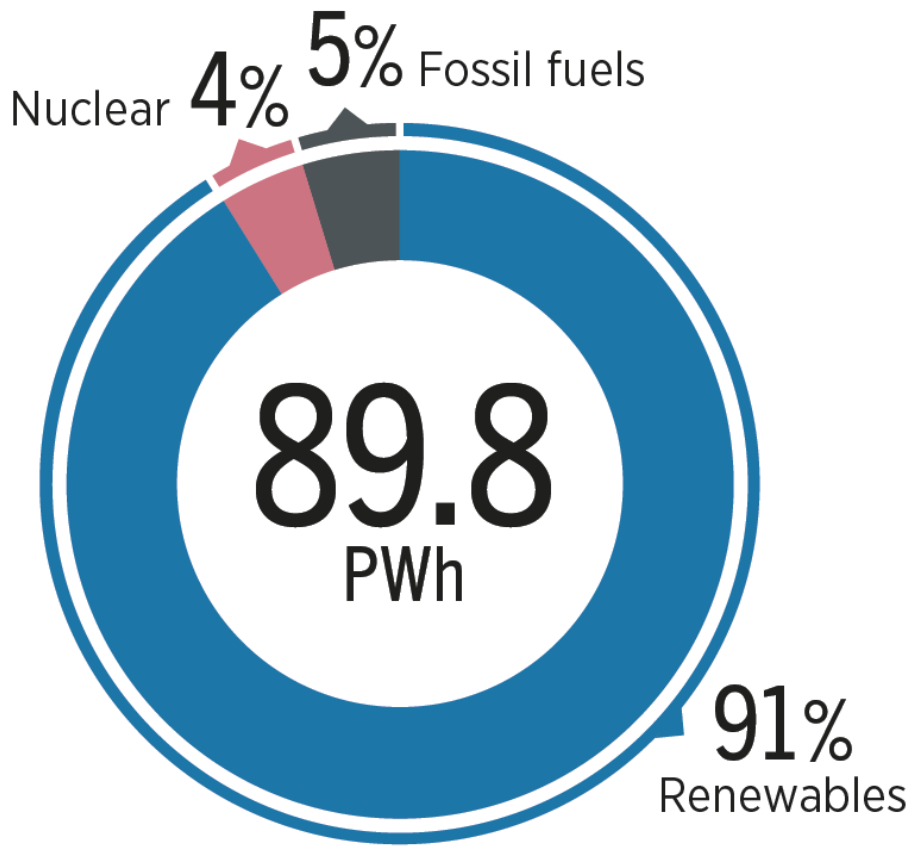
2020

Gross electricity generation (PWh)



2050: Where we need to be (1.5-S)

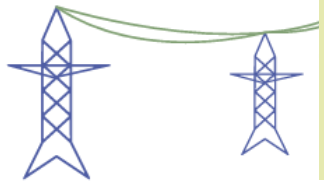
Gross electricity generation (PWh)



The way forward – 3 priority pillars of Energy Transition

PHYSICAL INFRASTRUCTURE

- Forward-looking **planning**
- Invest in **grids and trade routes on land and sea**
- Facilitate national, regional and global strategies for **new supply-demand dynamics** and promote equity and inclusion.



POLICY AND REGULATION

- Design of **policy and regulatory frameworks**
- These need to enable different levels of the energy transition, from local to global, and **account for new supply-demand dynamics.**

INSTITUTIONS AND SKILLED WORKFORCE

- Capacity among institutions, communities and individuals to **acquire the requisite skills, knowledge and expertise**
- Develop **a skilled workforce**

Deployment of RE requires a significant amount of critical materials

Installed Capacity by 2050

Wind

2021		2050
Onshore: 769 GW	10x	Onshore: 6,170 GW
Offshore: 56 GW		Offshore: 2,002 GW

Solar

2021		2050
481 GW	30x	14 036 GW

EV

2021		2050
6.8 mln	250x	1.7 bln

Long-term Supply is Not a Show-Stopper for the Energy Transition

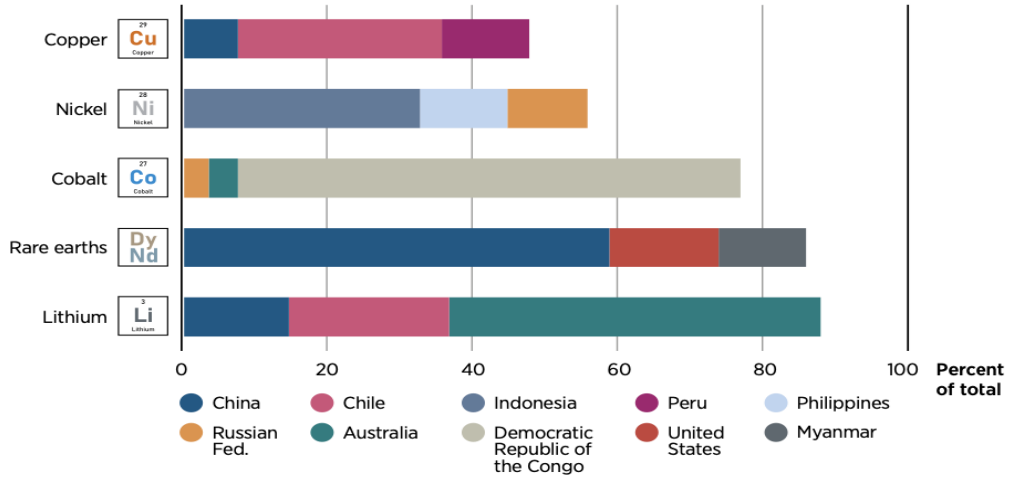
❑ **Challenges exist and vary by material**

- Time needed to **ramp-up supply**
- Lack of geographical **diversification**
- Lack of **ESG practices** across the supply chain
- Lack of precise and transparent **assessment of needs and activities to date**

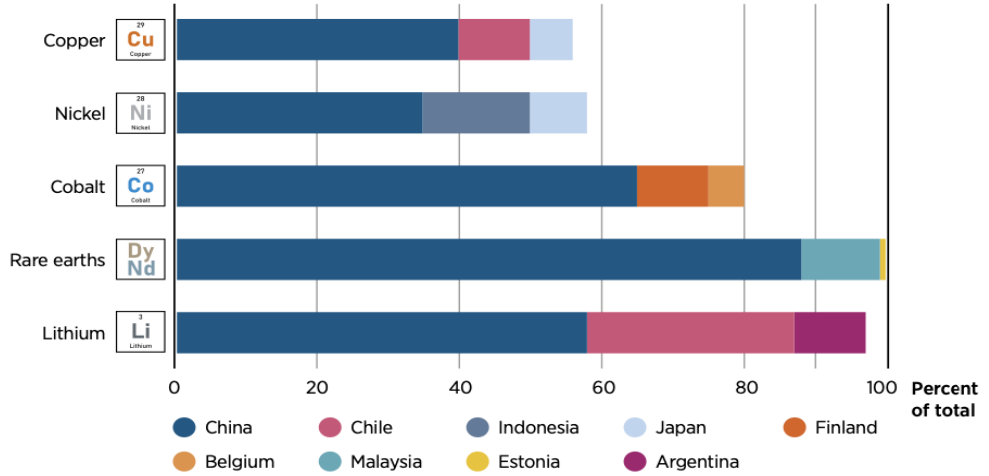
❑ **Solutions already exist and their mix is needed**

- **Innovation in chemistries helps reduce or eliminating material demand; in mining, processing and recycling advance efficiency and sustainability**
- **Circularity concept enables material and product reuse and recycling**
- Need for a **third-party ESG verification**

Where critical materials are mined



Where critical materials are processed



IRENA's Energy Transition Support

IRENA's engagement with Parties to the Paris Agreement

40 Input to NDC already provided

18 Implementation of support

7 Work plan development

18 Scoping

Europe — 5

Belarus
North Macedonia
Albania
Bosnia and Herzegovina
Türkiye

2 | 3

Asia and the Pacific — 27

Bhutan
Fiji
Jordan
Kyrgyz Republic
Lebanon
Myanmar
Nepal
Palau
Papua New Guinea
Tonga
United Arab Emirates

Indonesia
Iraq
Lao PDR
Mongolia
Solomon Islands

Pakistan

Afghanistan
Cambodia
Kazakhstan
Kiribati
Micronesia (Federated States of)
Niue
Samoa
Saudi Arabia
Tuvalu
Uzbekistan

11 | 5 | 1 | 10

Latin America and the Caribbean — 22

Antigua and Barbuda
Belize
Cuba
Dominican Republic
Ecuador
El Salvador
Grenada
Nicaragua
Paraguay
Saint Kitts and Nevis
Uruguay

Bahamas
Colombia
Dominica
Saint Lucia
Saint Vincent and the Grenadines

Trinidad and Tobago

Argentina
Barbados
Guyana
Panama
Perú

11 | 5 | 1 | 5

Africa — 29

Benin
Burkina Faso
Eswatini
Gabon
The Gambia
Liberia
Mali
Mauritius
Mozambique
Niger
Nigeria
Seychelles
South Africa
Uganda
Zambia
Zimbabwe

Botswana
Cameroon
Comoros
São Tomé and Príncipe
Sudan

Chad
Egypt
Morocco
Rwanda
Senegal

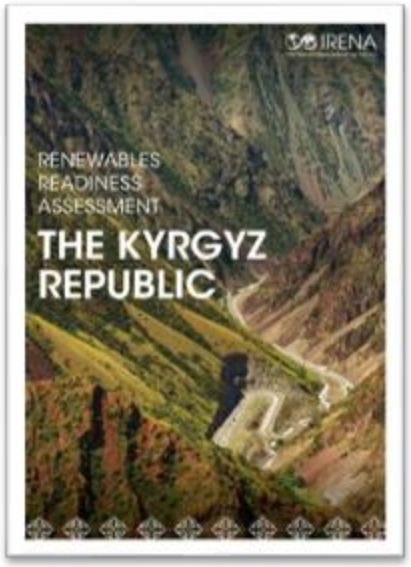
Ethiopia
Ghana
Lesotho

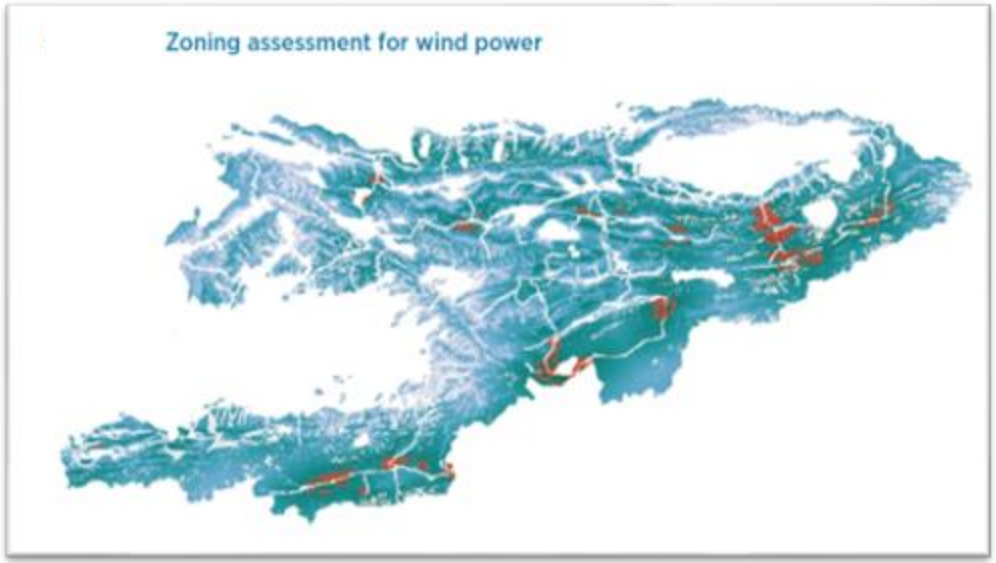
16 | 5 | 5 | 3

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.

IRENA's Engagement with Central Asia

- Webinar on Advancing the Energy Transition in Central Asia through NDCs and LTS (2021, with UK COP26 Presidency)
- Capacity Building for Renewable Energy Targets and Renewables Readiness Assessment for Kyrgyzstan (2022)
- Strengthening Bioenergy Data of Kazakhstan for Monitoring SDGs and NDCs (2023)



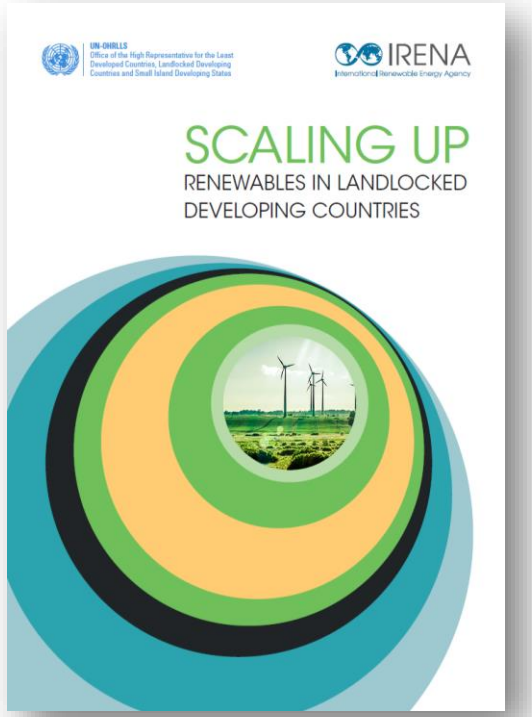


IRENA's Engagement with Central Asia

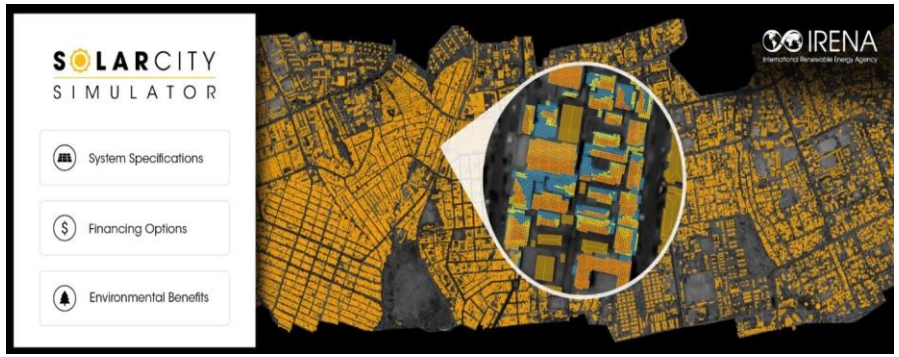
- **Scaling Up Renewables in Landlocked Developing Countries (LLDCs)** (2022)
  - Ambitious renewables targets consistent with NDCs and LTS offers a strong business case for investment.

- 3 Solar Projects under the **ETAF** in Uzbekistan (2023)
  - Masdar and the AIIB have agreed to commit capital.

- **SolarCity Simulator** for Tashkent (ongoing, with UNDP)
  - A web-based platform for planning of rooftop PV



ETAF
Energy Transition Accelerator Financing Platform



MANAGED BY: IRENA International Renewable Energy Agency

PARTNERS: ABU DHABI FUND FOR DEVELOPMENT · AIIB ASIAN INFRASTRUCTURE INVESTMENT BANK · Masdar A MUBADALA COMPANY · Swiss Re

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THANK YOU!