IRENA

International Renewable Energy Agency

Global Trends in the Renewables Supply Chain: Jobs Today and in the Future

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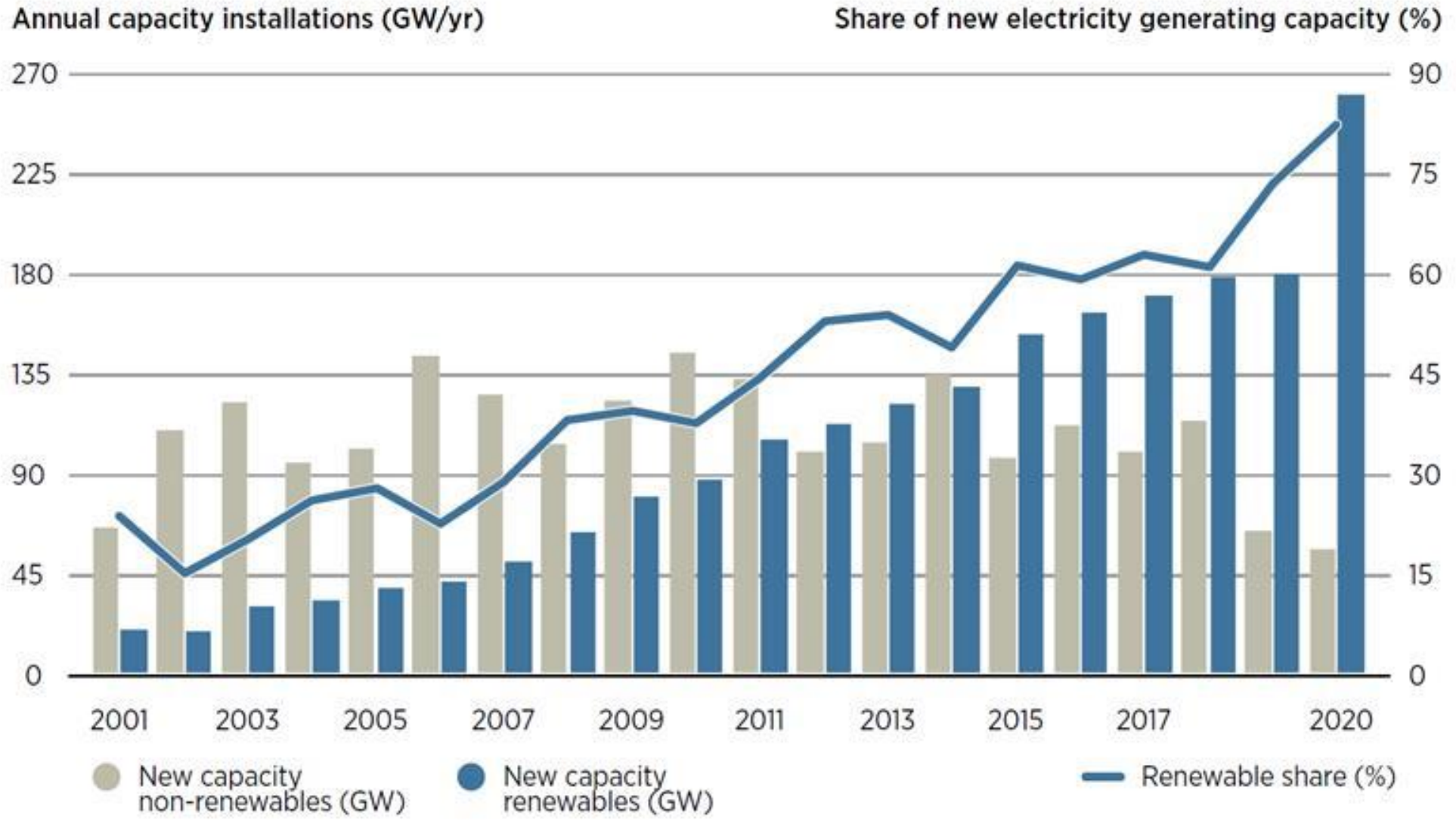
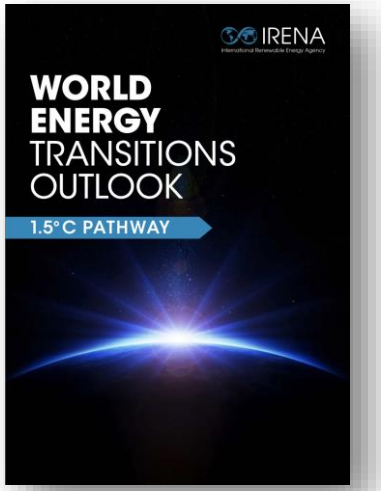
IndustriALL webinar, "Building Union Power in Renewables", 9 December 2021

Renewable energy jobs today

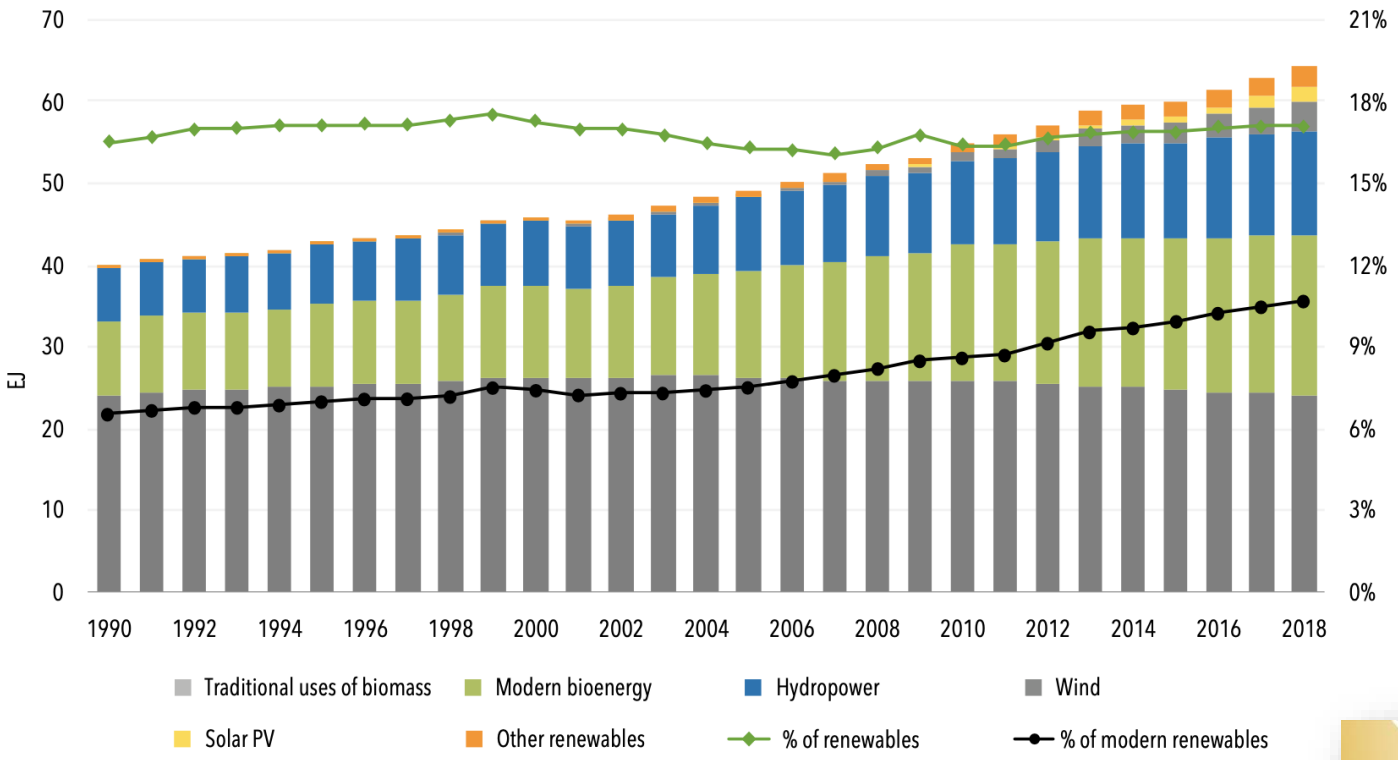
Renewable electricity installations and share of new capacity



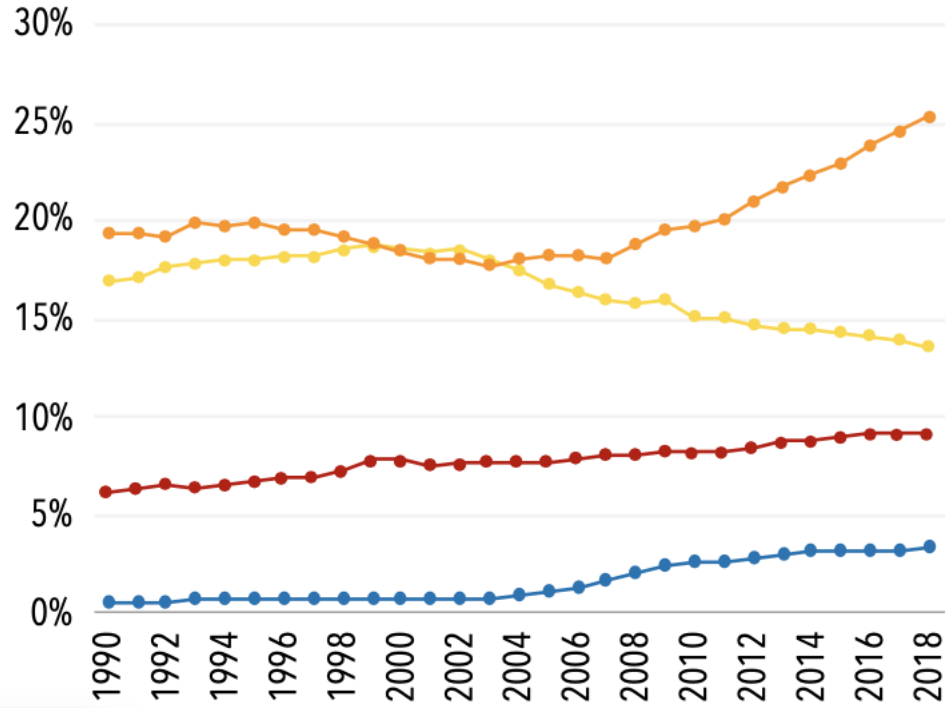


Renewable energy share in energy consumption

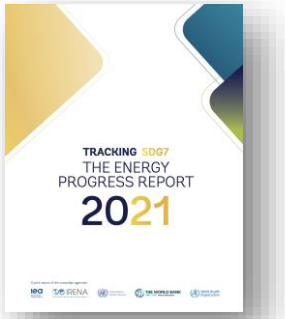
Renewable energy consumption by technology and share of total, 1990-2018



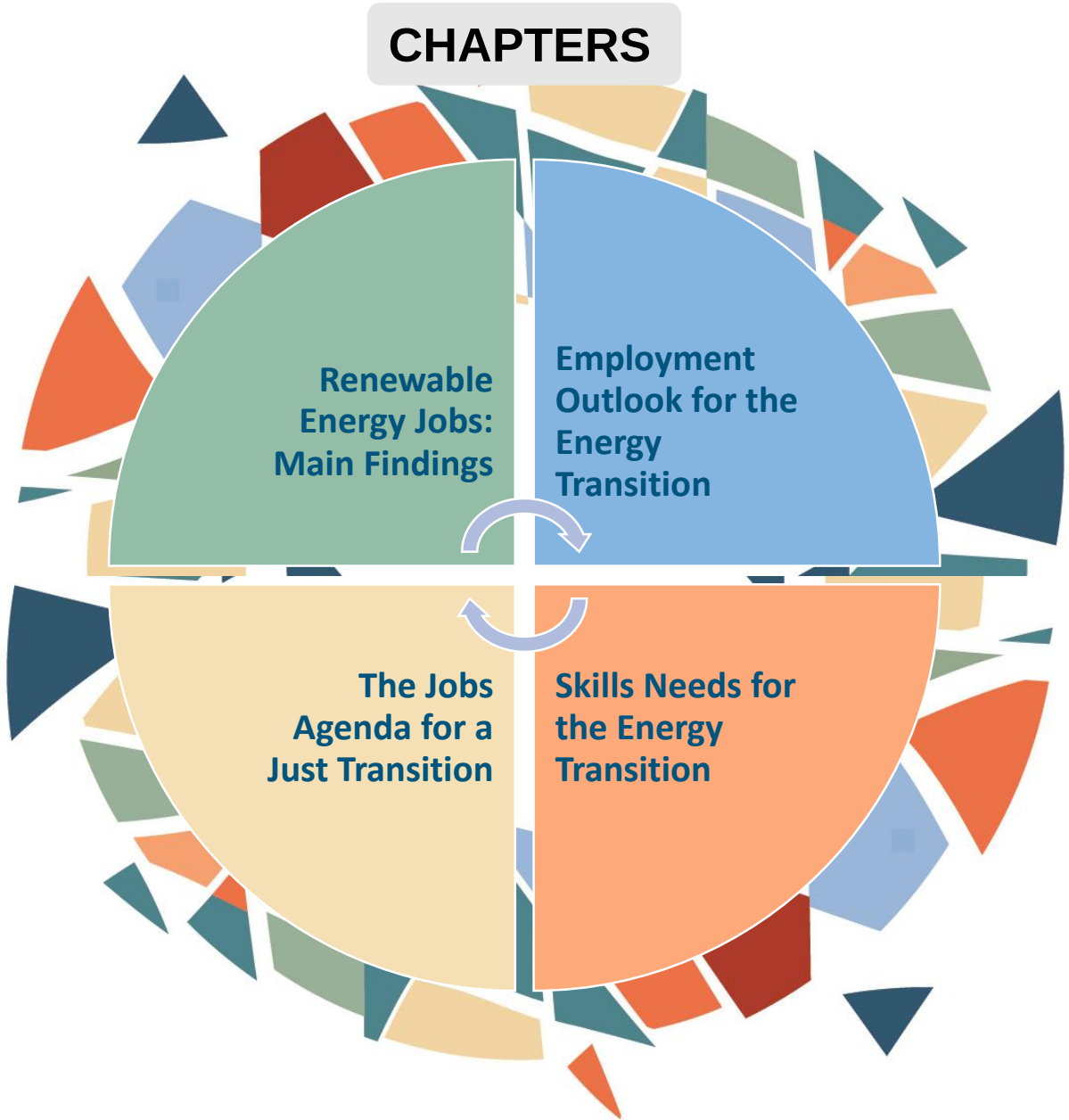
Renewable energy share by end use, 1990-2018



Source: Tracking SDG7. *The Energy Progress Report 2021*



Inside the 2021 Jobs Review

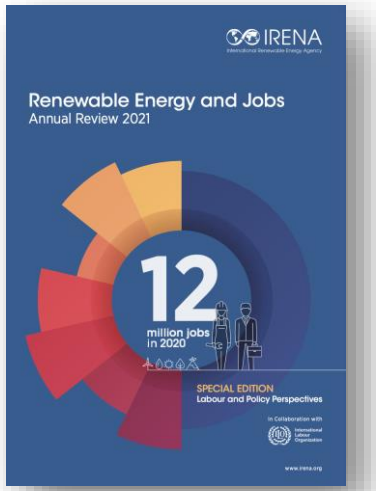


Aspects highlighted throughout the report:

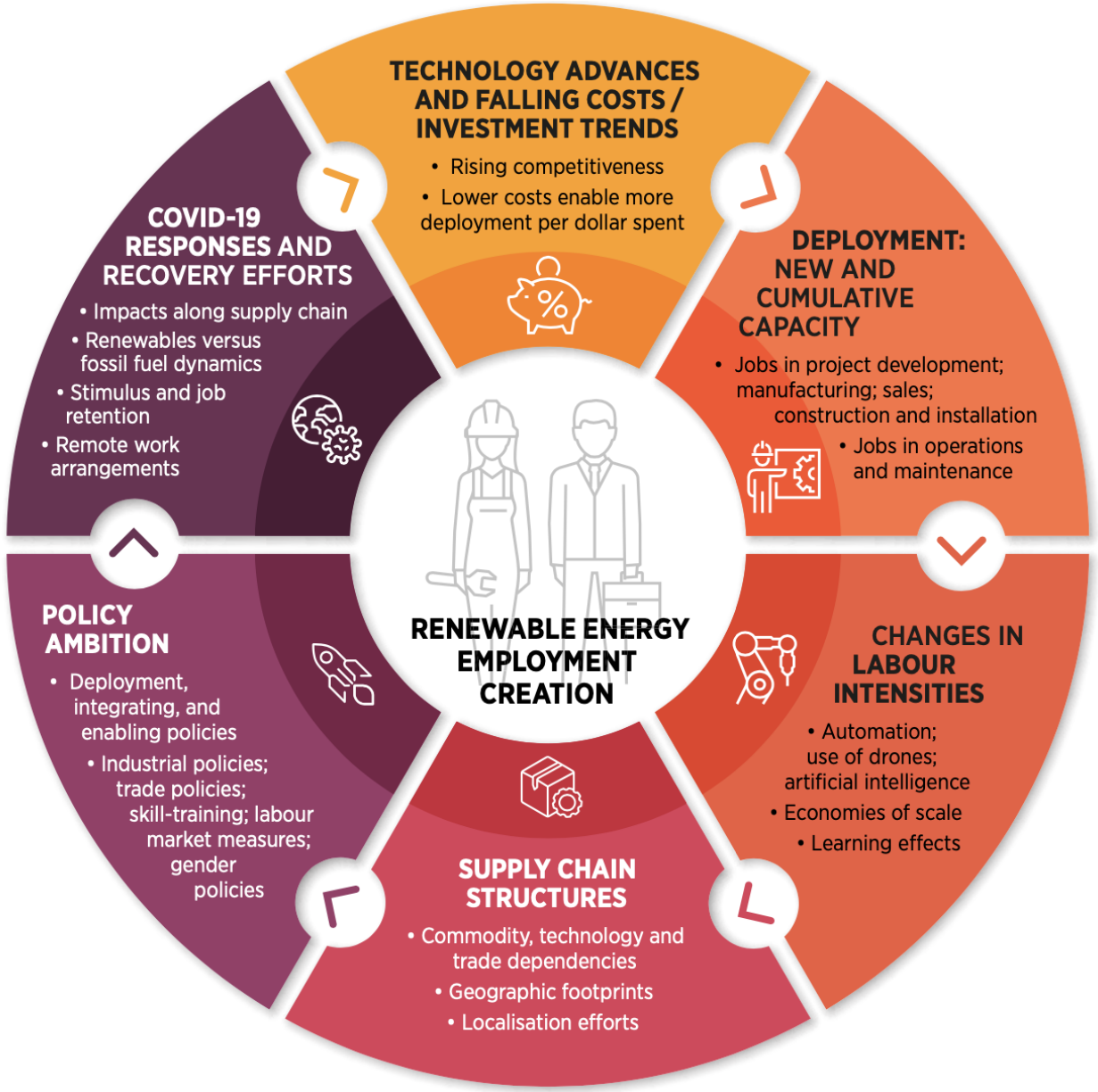
Gender

Job Quality

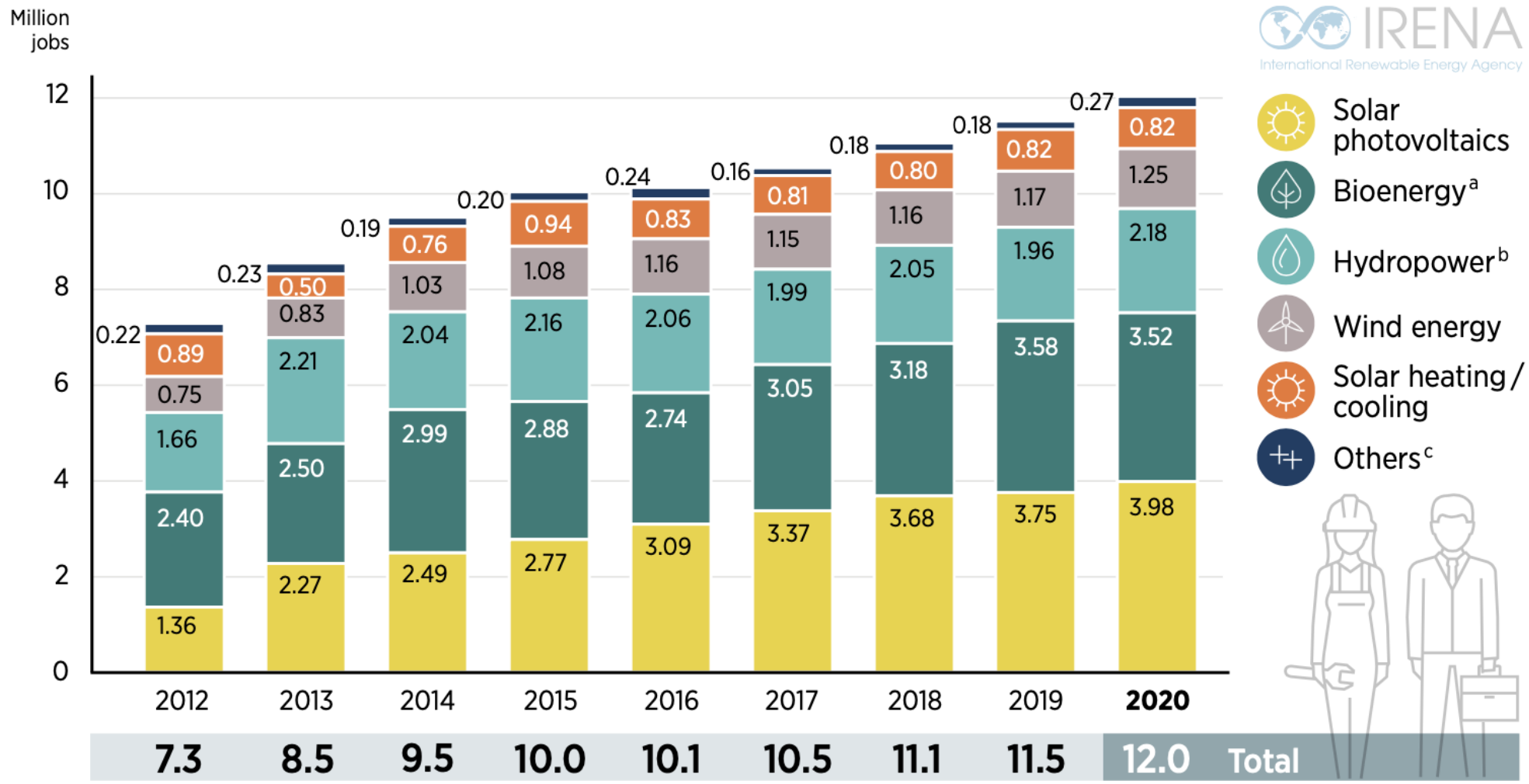
COVID-19 Impacts



Factors influencing renewable energy employment



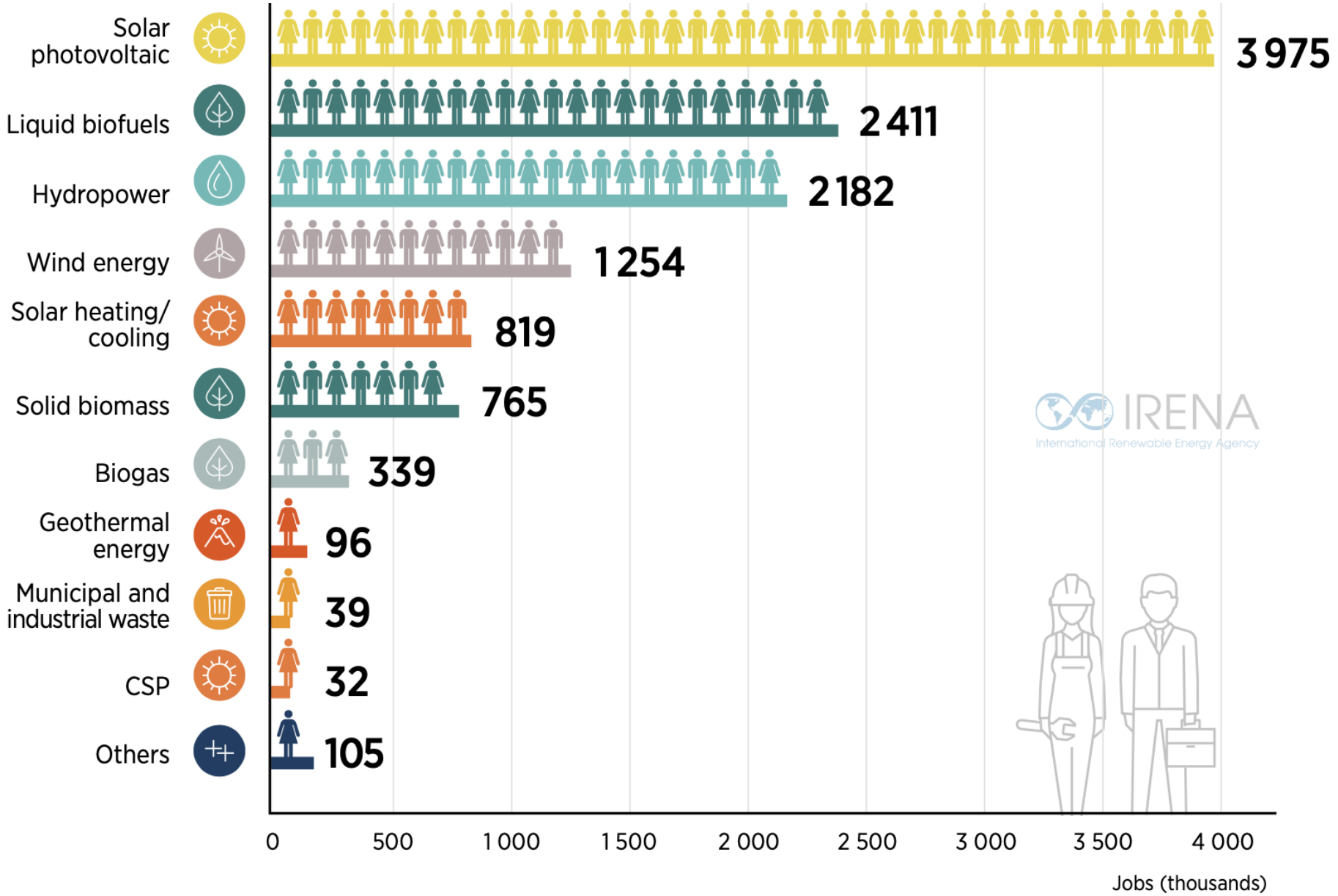
Growth of renewable energy jobs, 2012-20



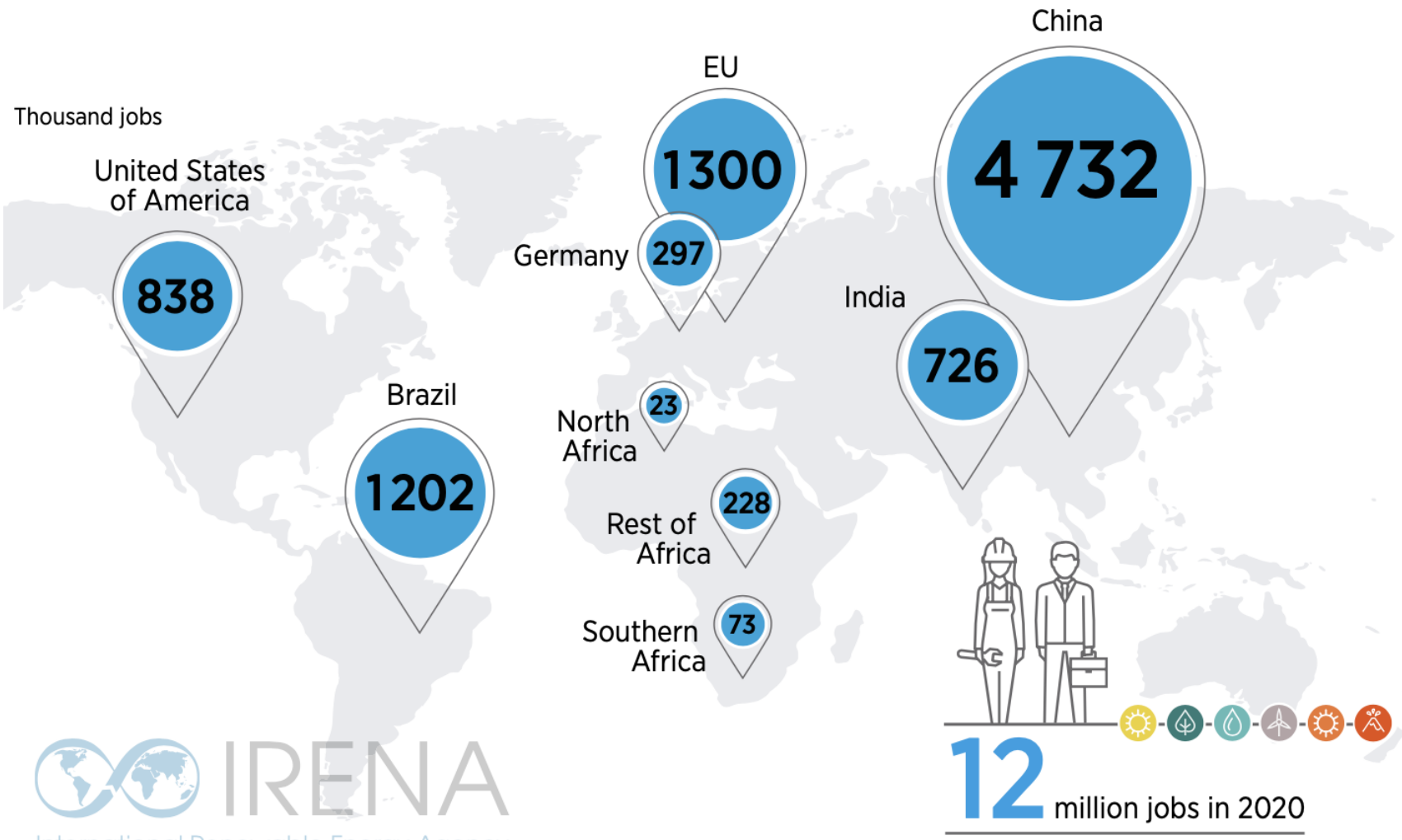
a Includes liquid biofuels, solid biomass and biogas.
b Direct jobs only.
c "Others" includes geothermal energy, concentrated solar power, heat pumps (ground based), municipal and industrial waste, and ocean energy.

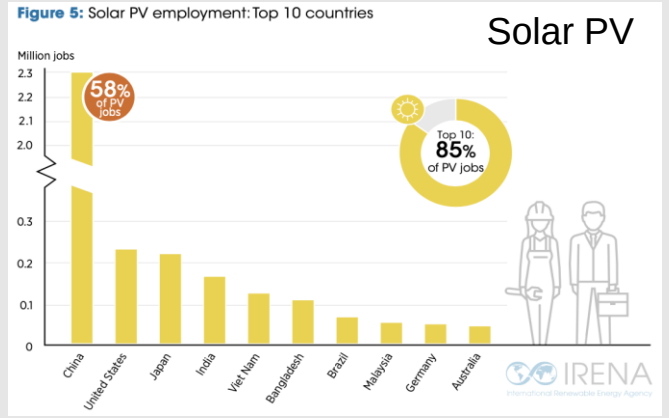
Source: IRENA jobs database.

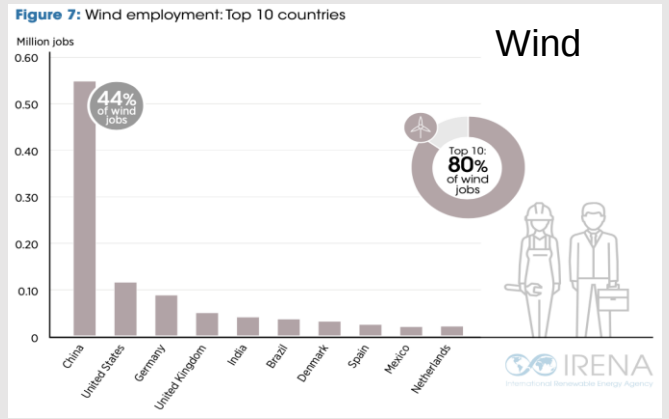
Jobs in renewable energy in 2020, by technology

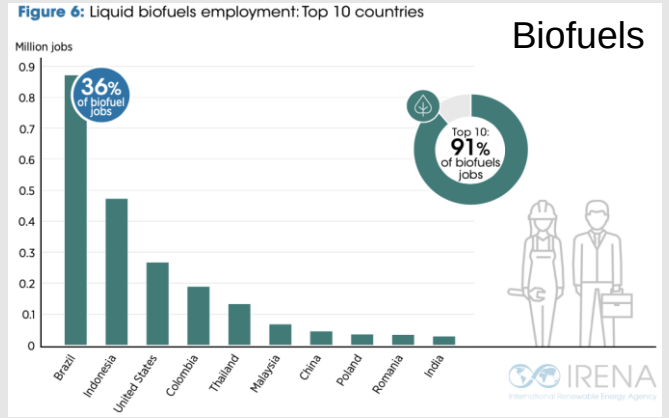


Renewable energy jobs in 2020, by region/country, and Top 10 countries



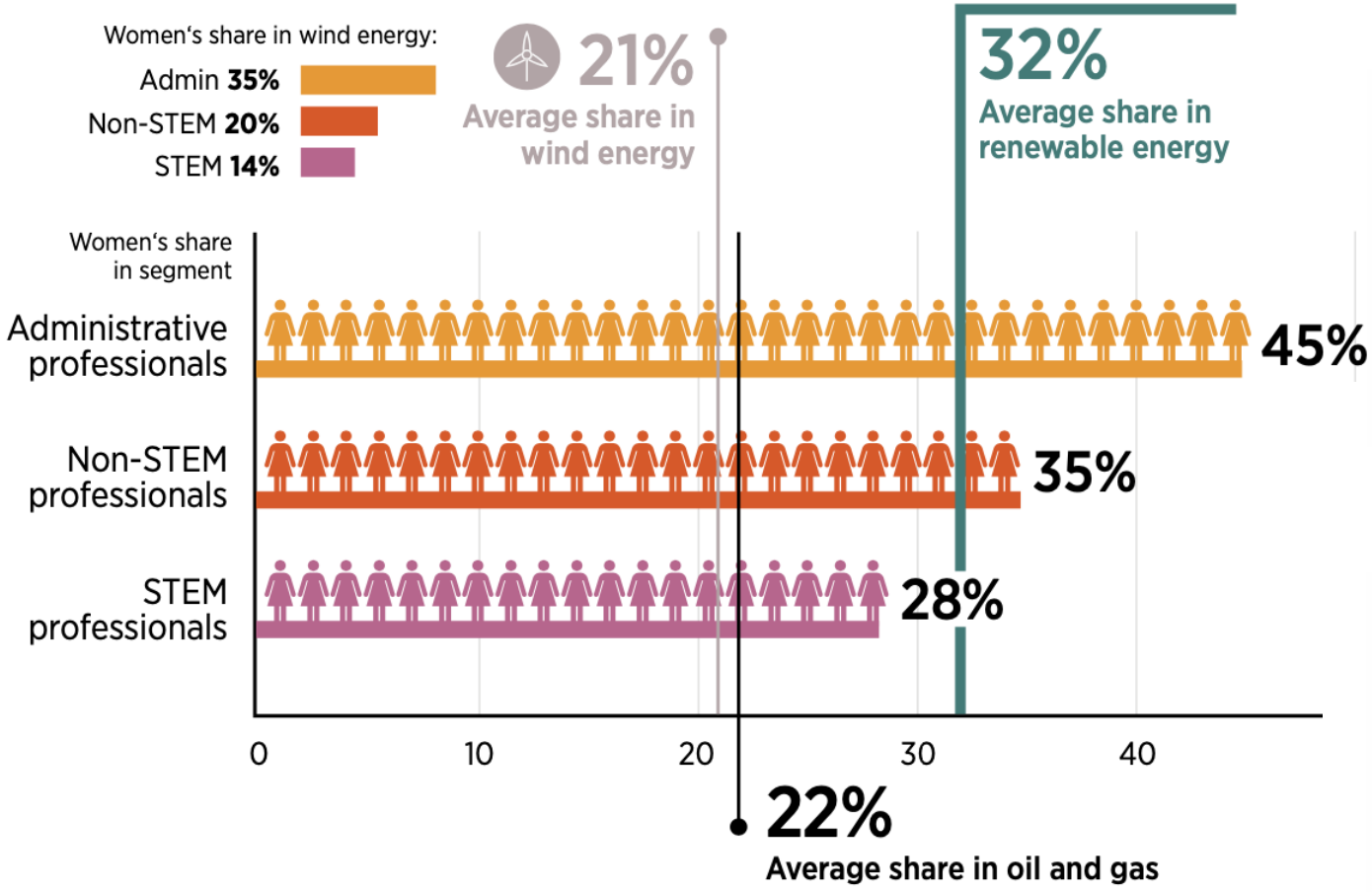




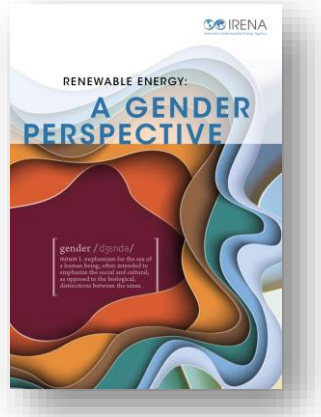


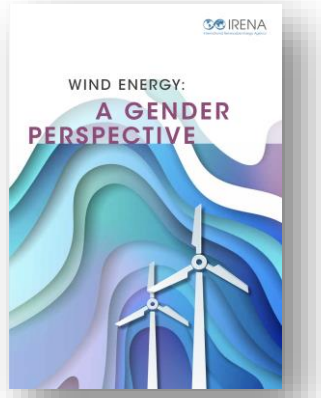
Women's share of the renewable energy workforce

Women's share in the oil & gas, RE, and wind power workforce, with breakdown by STEM, non-STEM and administrative positions

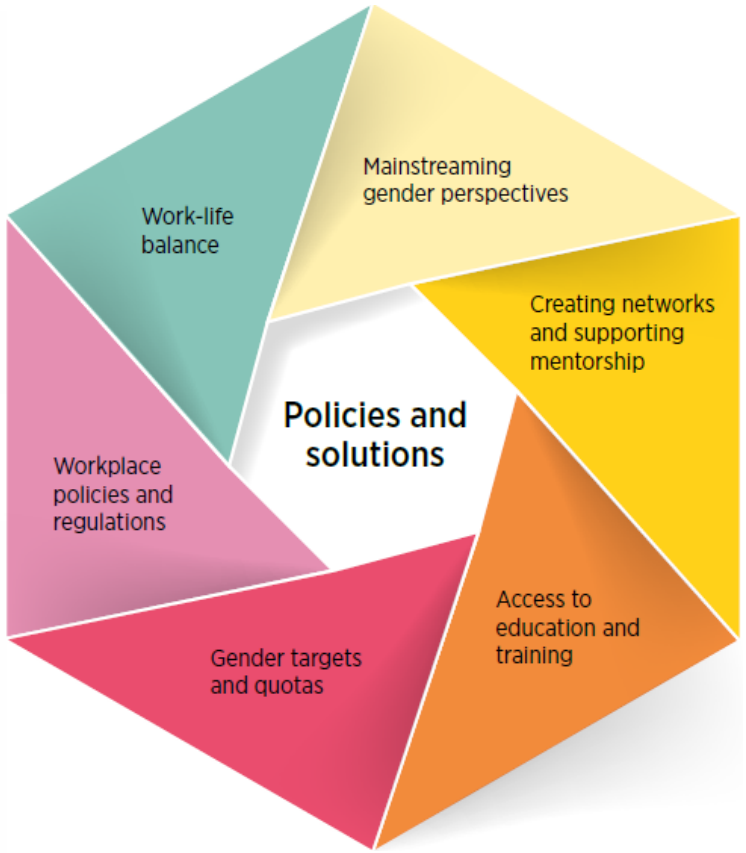


Note: STEM = science, technology, engineering and mathematics.

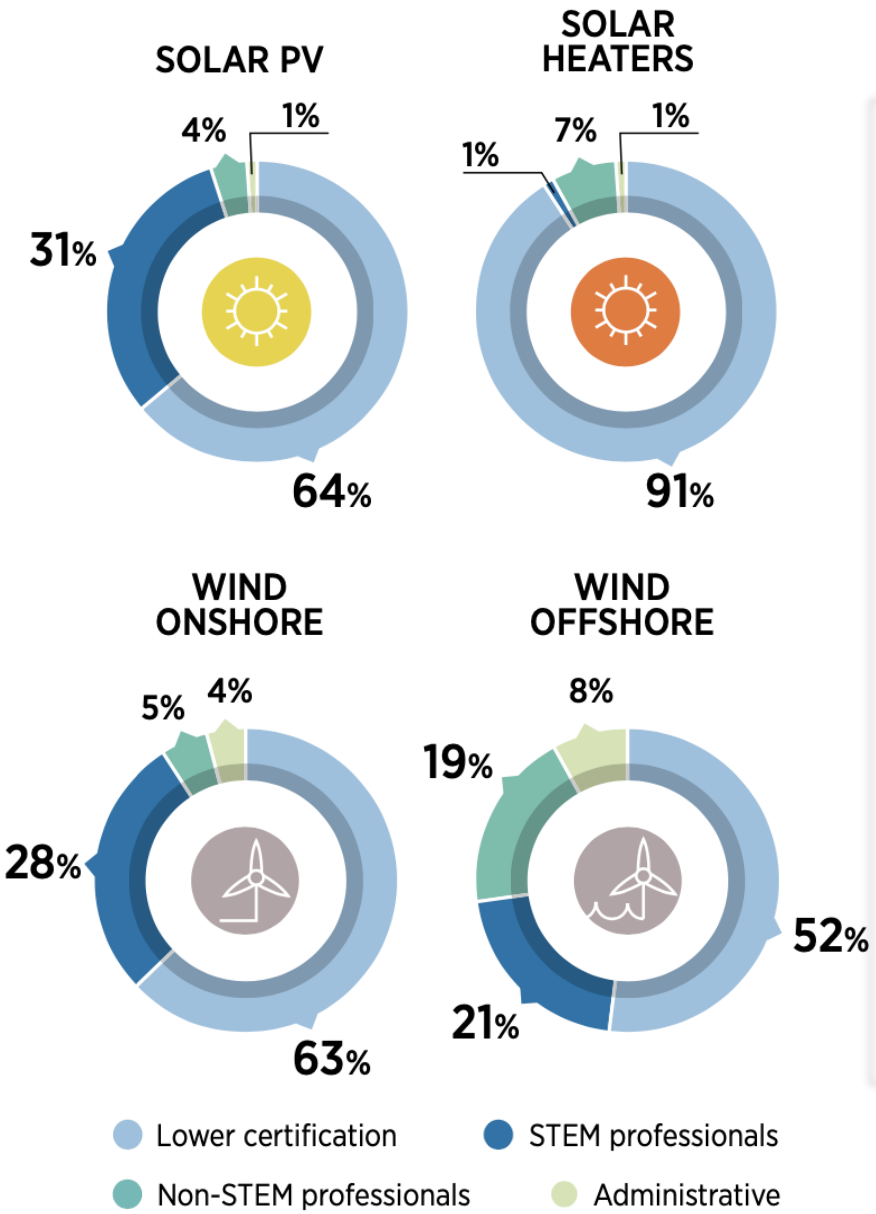




Coming in 2022 -- **Solar PV: A Gender Perspective**



Occupational requirements | Skill-delivery pathways



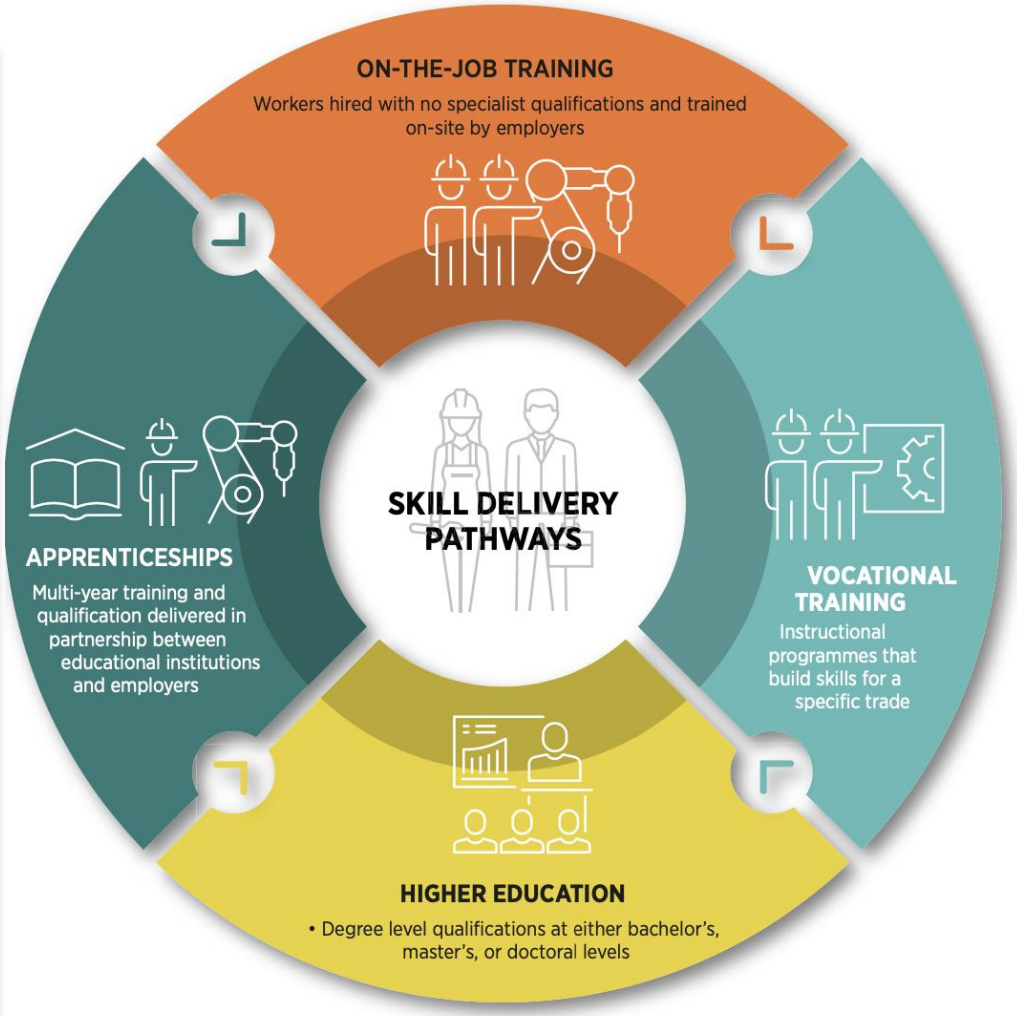
RE offers employment opportunities for a wide range of occupations

Higher-education:

- STEM fields and other non-technical qualifications (lawyers, logistics experts, financial analysts, regulators, etc.).

Most jobs don't require a university degree, but rather **manual dexterity** and **practical problem-solving abilities.**

- Skills imparted through apprenticeships, vocational training, or on-the-job experience.



The decent jobs agenda

Decent jobs – good wages, safe workplaces and labor rights – are a must for a just transition

- Wages
- Workplace conditions
- Rights at work
- Collective bargaining

Wages and job quality depend on a host of factors, including:

- ❑ Occupational and skills patterns in RE sectors (wage differentials)
- ❑ The geographic footprint of clean energy, and:
  - **prevailing local wages** and conditions
  - the extent of **unionisation** *(membership and coverage)*
  - enforcement of **labour standards** by governments
  - the presence of **collective bargaining** arrangements
- ❑ Stance of renewable energy companies

Renewable energy companies vary in their stance vis-à-vis unions:

- Many older manufacturing, engineering, and construction firms have a history of engaging with unions.
- But newer firms often hew to a "start-up" culture skeptical or hostile to unionisation.
- Management may regard labour more as a cost factor than a valuable resource.
- But for many wind and solar projects, capital costs, etc. weigh more heavily than labour costs.

Scenarios and results for future development

The energy transitions towards 1.5C

Many scenarios and emission pathways exist

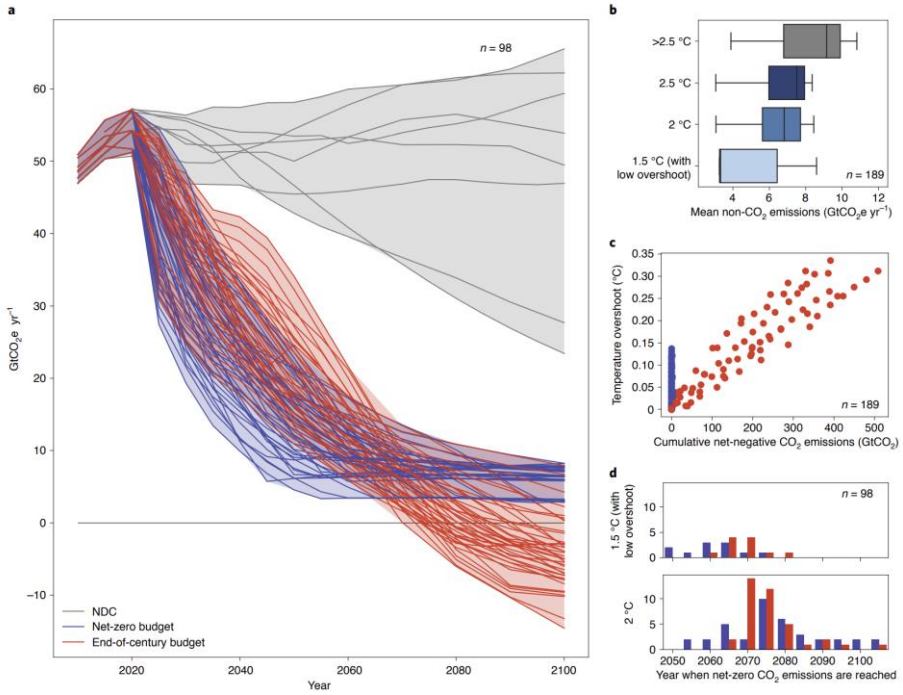
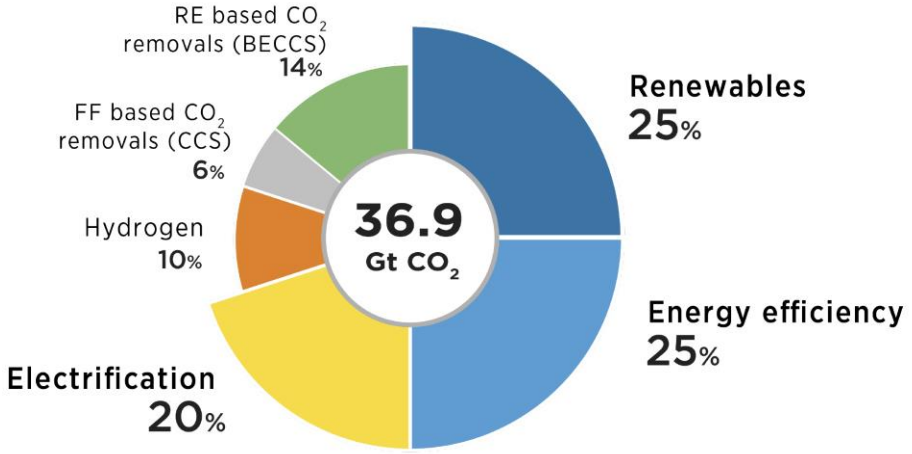
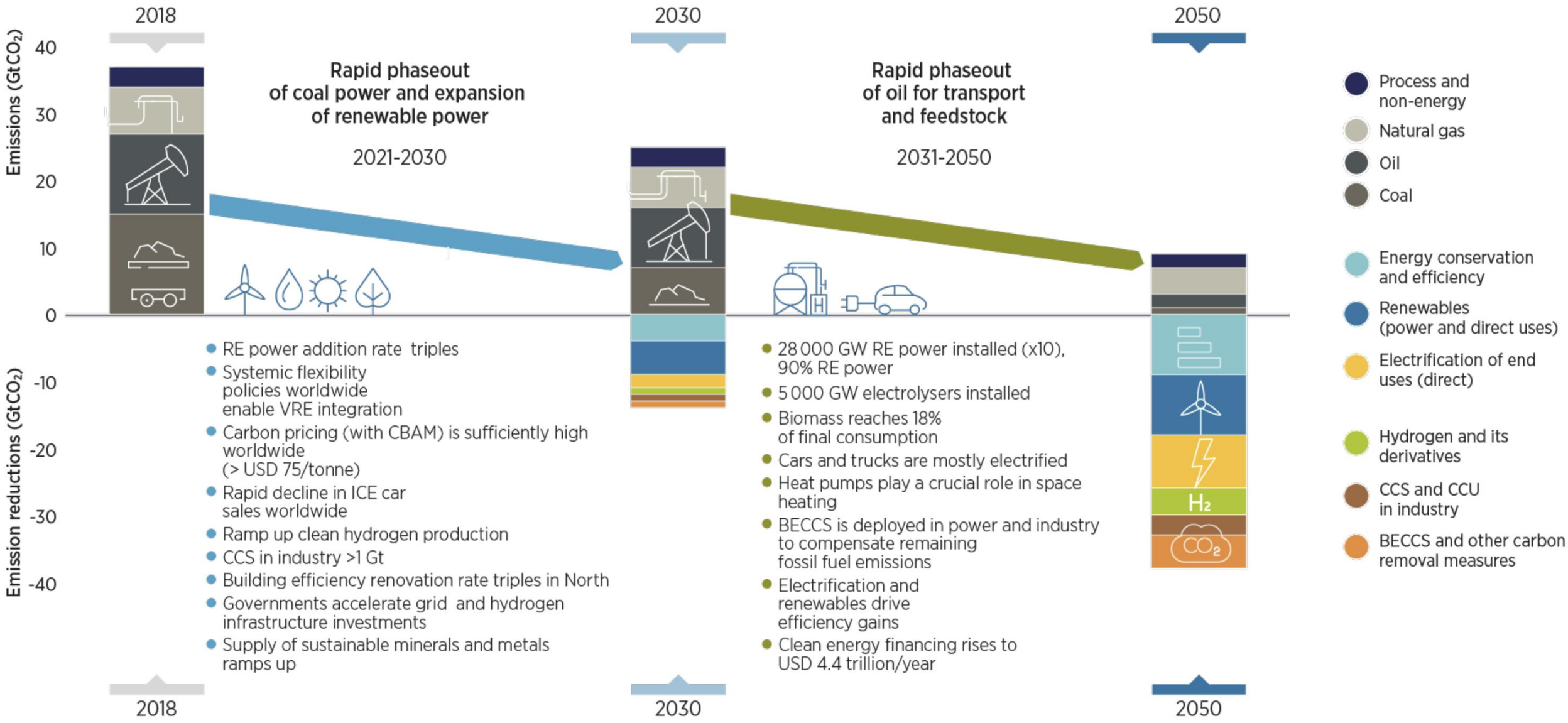


Fig. 1 | Emissions and temperature characteristics. a, GHG emissions in NDC scenarios (grey) compared to stringent mitigation scenarios that reach peak temperatures below 2 °C with limited overshoot (net-zero budget scenarios, blue) and mitigation scenarios with the same long-term carbon budget with temperature overshoot (end-of-century budget scenarios, red). **b**, Residual non-CO_2 emissions after the point of reaching net-zero CO_2 emissions

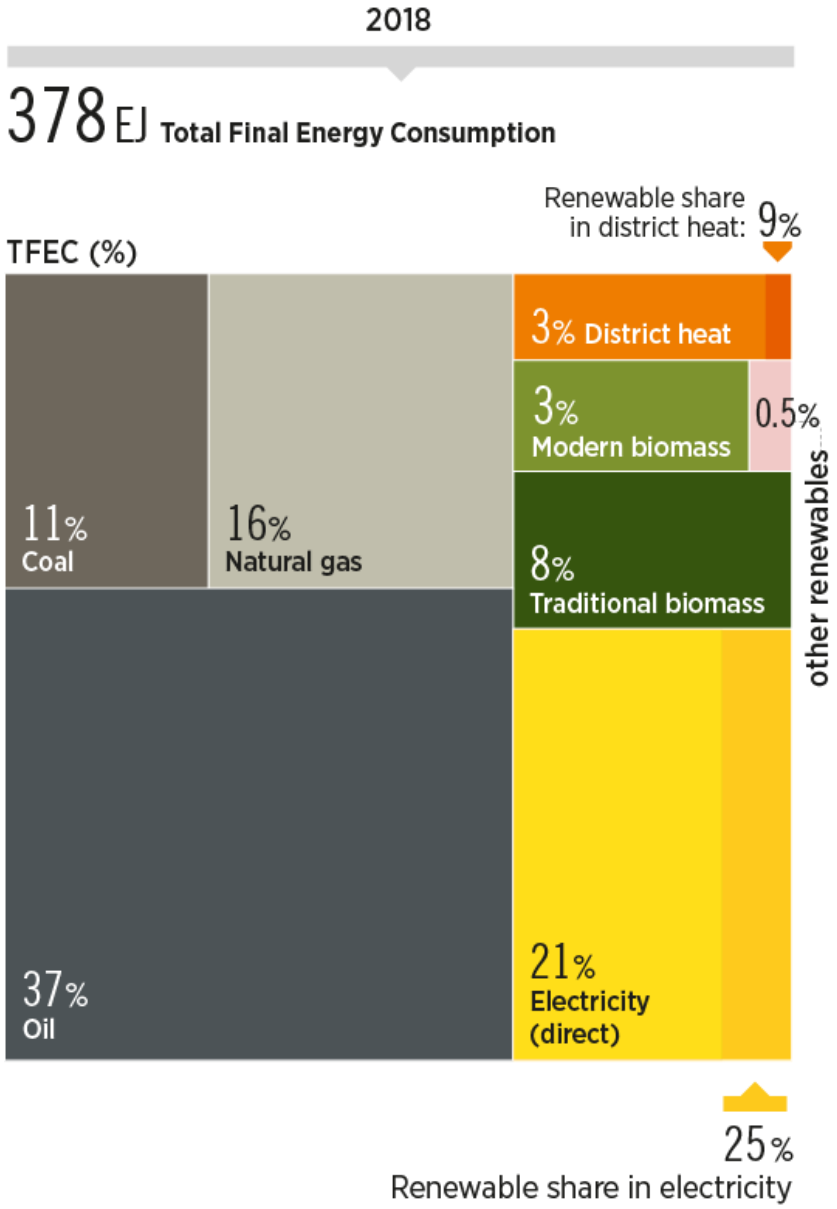
All will involve renewable energy, efficiency and electrification

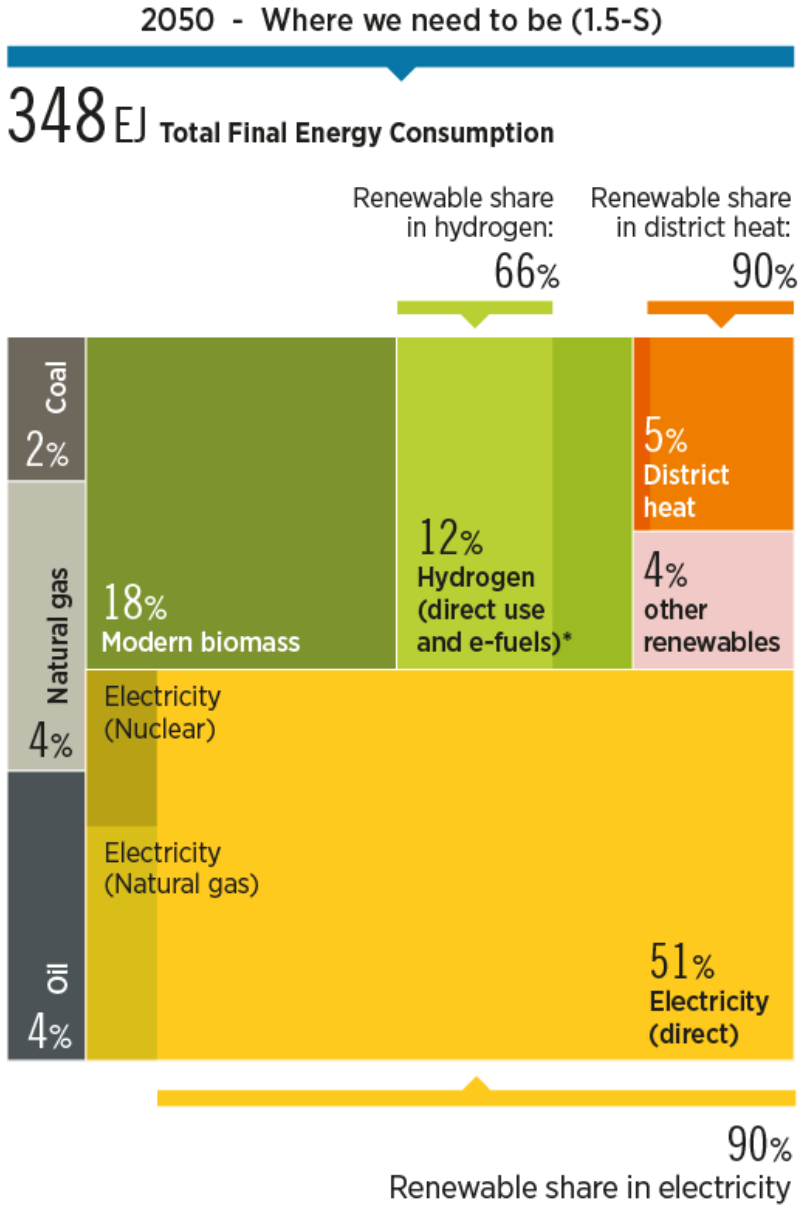


Pathway towards net zero – phasing out of fossil fuels



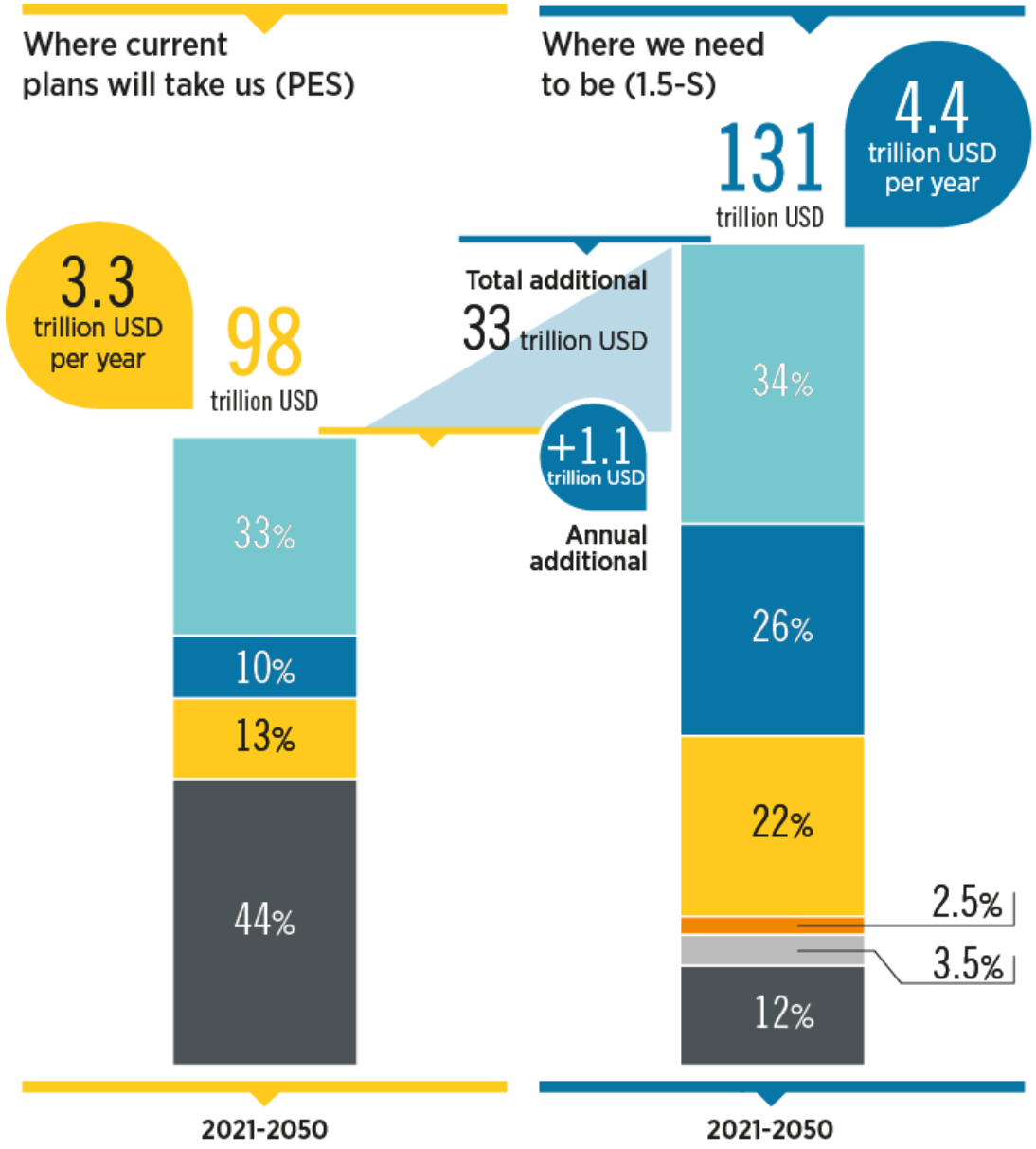
Where we are (2018) and where we need to be (2050)





- By 2050, electricity would be the main energy carrier with more than a 50% direct share of total final energy consumption – up from 21% in 2018.
- By 2050, 90% of total electricity needs would be supplied by renewables followed by 6% from natural gas and the remainder from nuclear.
- Another 8% of final energy would come as indirect electricity in the form of e-fuels and hydrogen.

New investment priorities: renewables, efficiency and electrification

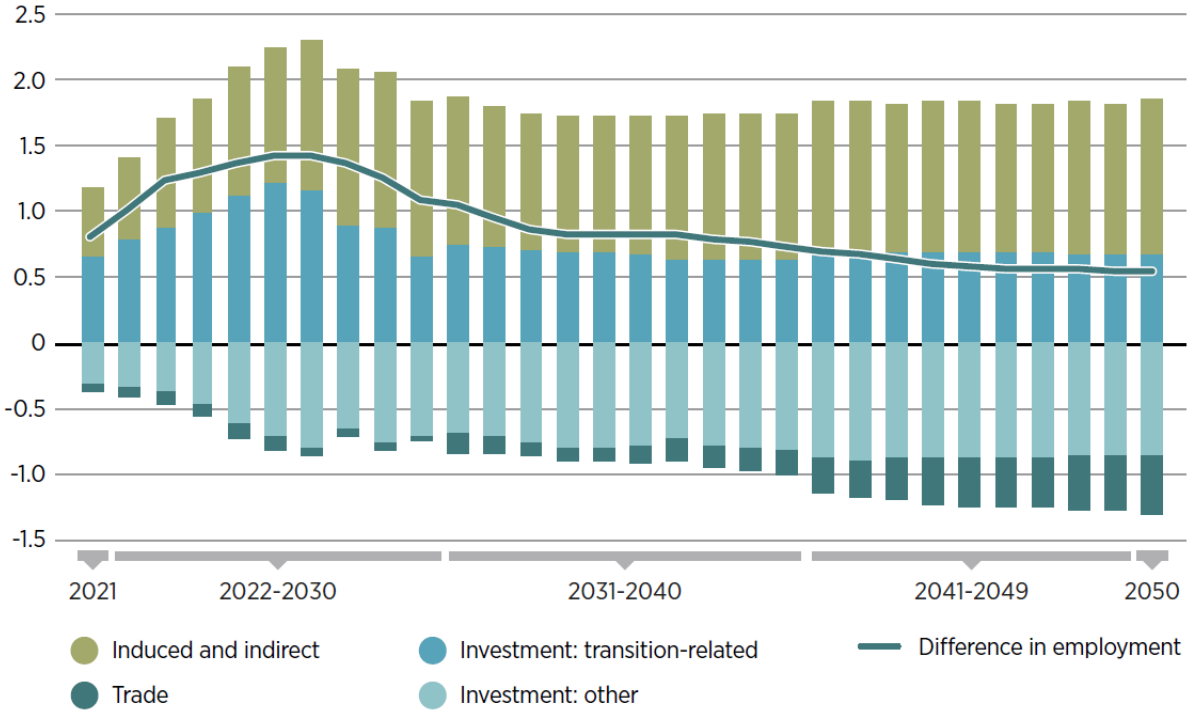


- Energy efficiency
- Renewables (power and direct use)
- Electrification of heat and transport and infrastructure
- Innovation
- Others (carbon removals and circular economy)
- Fossil fuel and nuclear

- A climate-safe future calls for the scale-up and redirection of investments towards energy transition technologies, away from fossil fuels.
- Accelerating the pace of the energy transition and scaling up investments in energy transition technologies in all sectors hinges on what the world does between 2021 and 2030. Setting the right investment priorities is key.

Globally, more employment

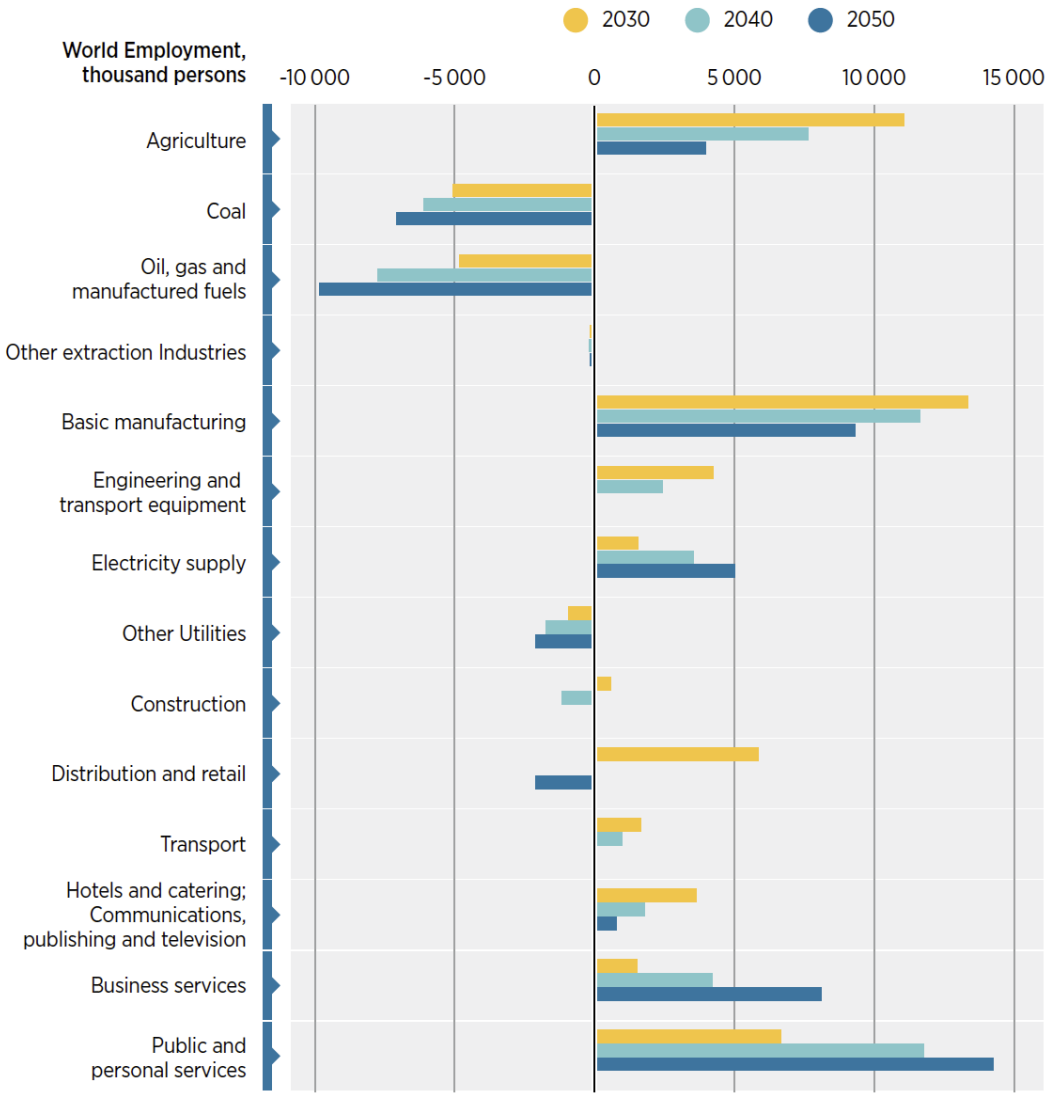
Difference in Employment from PES (%), by driver



Note: **Transition-related investment** includes the effects of changes in investments on transition-related categories such as renewables for power generation and end uses, energy efficiency, power grids and flexibility, electrification and hydrogen and electric vehicle infrastructure. Government transition-related spending is also included here. **Other investment** includes fossil fuel supply, crowding out and any endogenous responses in investment (for example, to changes in prices of production). **Trade** includes net trade in fuels and any endogenous responses to other trade (for instance, as a response to price and wage changes). **Induced and indirect** effects include the effects of changes in taxes (income, value added tax) such as those due to oil rent losses, revenue recirculation through lump-sum payments, aggregate prices and other changes in consumer expenditure (including reallocations and indirect effects).

- The overall economic effect is positive
- "More" is determined by comparing the 1.5C scenario with a reference
- In IRENA's analysis, the reference contains all NDC pledges and current energy plans but does not suffice.
- The difference is driven by
  - Investment,
  - Trade, and
  - Indirect and induced effects

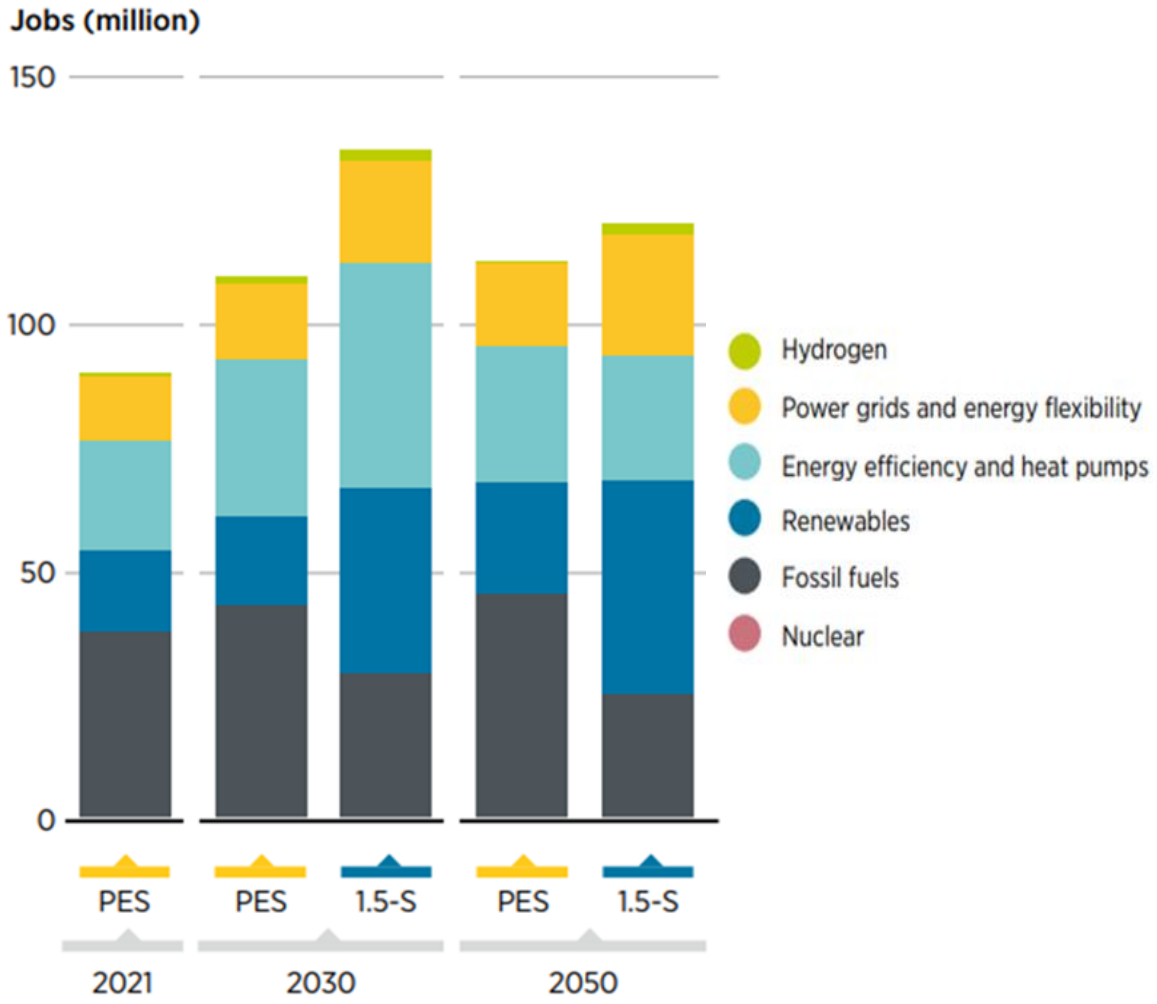
Gains and losses



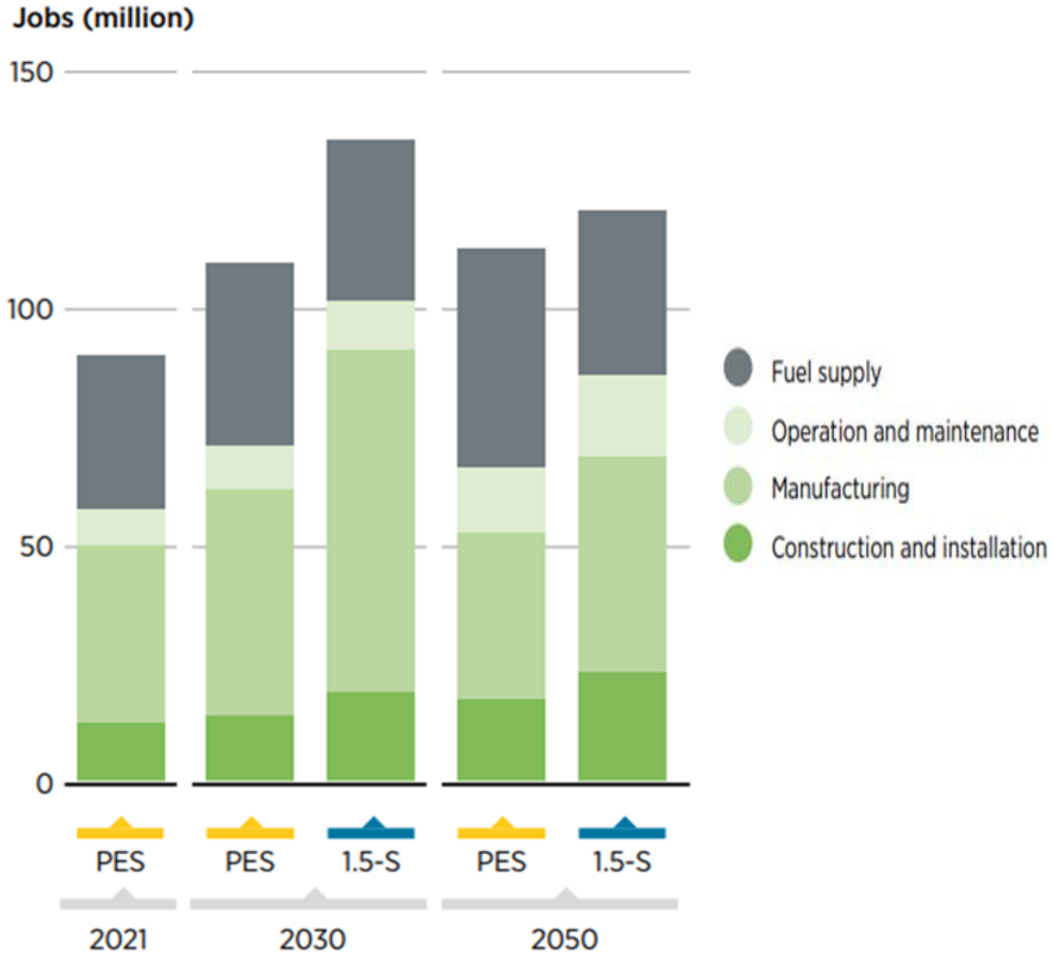
- Economic sectors are responding differently to the energy transition
- The size and direction of the effect depends on
  - The contribution to the energy transition's value chains,
  - Relative prices
  - Supporting policy framework

A transformed energy sector will have 122 million jobs in 2050

Energy sector jobs by technology under the PES and 1.5°C Scenario (million), global results

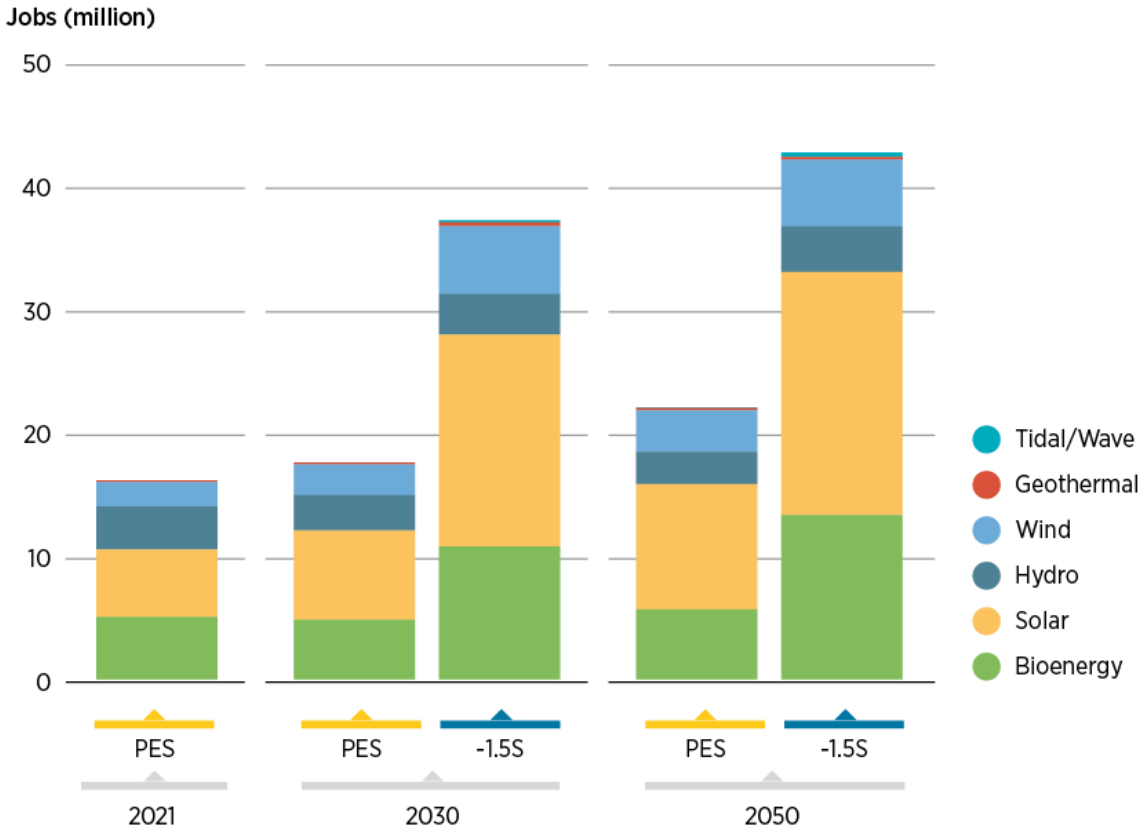


Energy sector jobs by segment of value chain in the PES and 1.5°C Scenario (excluding vehicles)

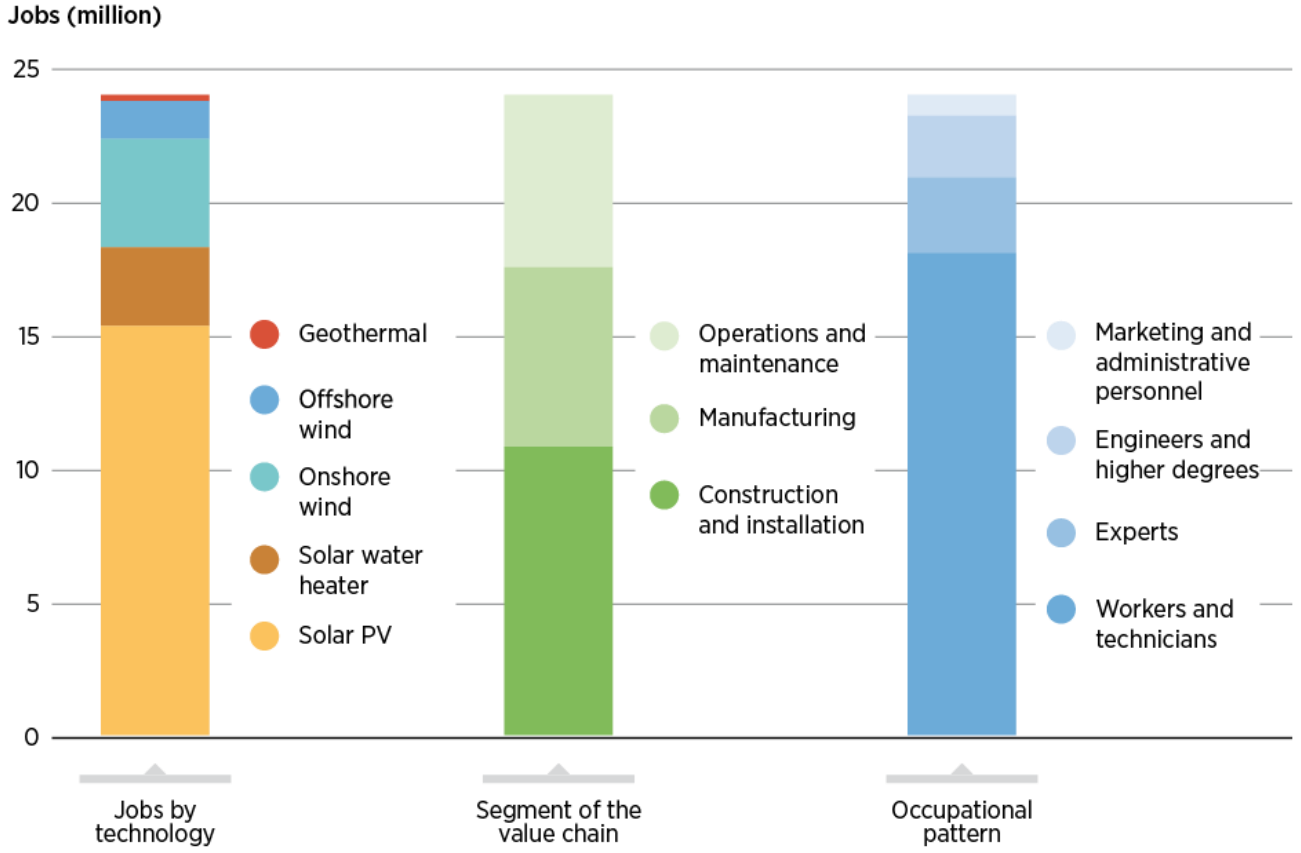


Renewable energy jobs will increase to 43 million in 2050

Jobs in renewable energy, by technology, in the 1.5°C Scenario and PES (million)



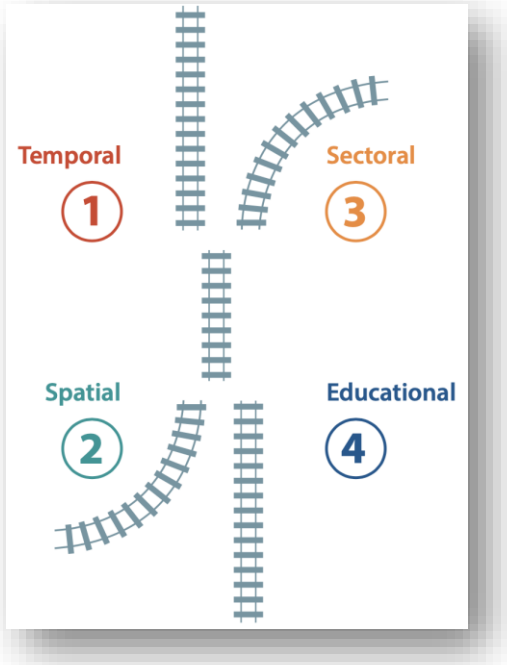
Structure of jobs in the 1.5°C Scenario by 2050 for a subset of renewable technologies by technology, segment of value chain and occupational requirements



Potential labour market misalignments

Under IRENA's 1.5C pathway (WETO), the gain in RE / transition jobs by **2050** would outstrip the loss of FF jobs significantly.

BUT…



WETO Job Gains & Losses (millions of jobs)	2050	Change from today
Energy sector, *of which:*	122	+ 31
-- Transition-related	96	+ 43
• *Renewables*	*43*	*+ 27*
-- Fossil fuels	26	- 12

Potential labour market misalignments

1. **Temporal.** The creation of new jobs does not necessarily take place on the same time scale as the loss of employment.
2. **Spatial.** New jobs are not necessarily being created in the same locations – communities, regions or countries – where losses occur.
3. **Sectoral.** Job gains and losses may affect different sectors of the economy, given different supply-chain structures and diverging sets of inputs between rising and declining industries.
4. **Educational.** The skills associated with vanishing jobs do not always match those required by emerging jobs.

Comprehensive policy framework for a just energy transition

Challenges and potential misalignments

- Finance
- Power system structures
- Structural dependencies
- Labour markets
- Fossil fuels and commodities
- Job misalignments
- Technology
- Decent jobs agenda
- Supply chains
- Diversity needs
- Trade