

LTES 2<sup>nd</sup> Day  
Energy Scenarios for Resilient Transitions  
Opening presentation:

**IRENA**  
**Global and Regional Energy Outlooks**

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**Bonn, 30 October 2025**

- **Energy planning - too much centralization! Isn't it? How to plan under uncertainty – geopolitical and beyond ? the role of outlooks.**
- **Can you plan for one single sector or technology on isolation? How national energy plans and outlooks benefit from a regional energy transition outlook?**
- **Outlooks as tracking progress tools? The need of a KPI common framework for the COPs and G-forum.**
- **Pls, are you planning to implement the NDCs / LTS? So please are they based on energy transition outlooks, right?**
- **Gap on skills for several areas of energy transition: Is there any better moment of engagement and capacity building than while doing the outlooks?**
- **Granularity: how to connect with investment plans on the ground**

# Share of RE in the electricity mix would need to more than triple by 2050

Scaling power generation needs under the 1.5°C Scenario by 2030 and 2050, compared to 2022 progress

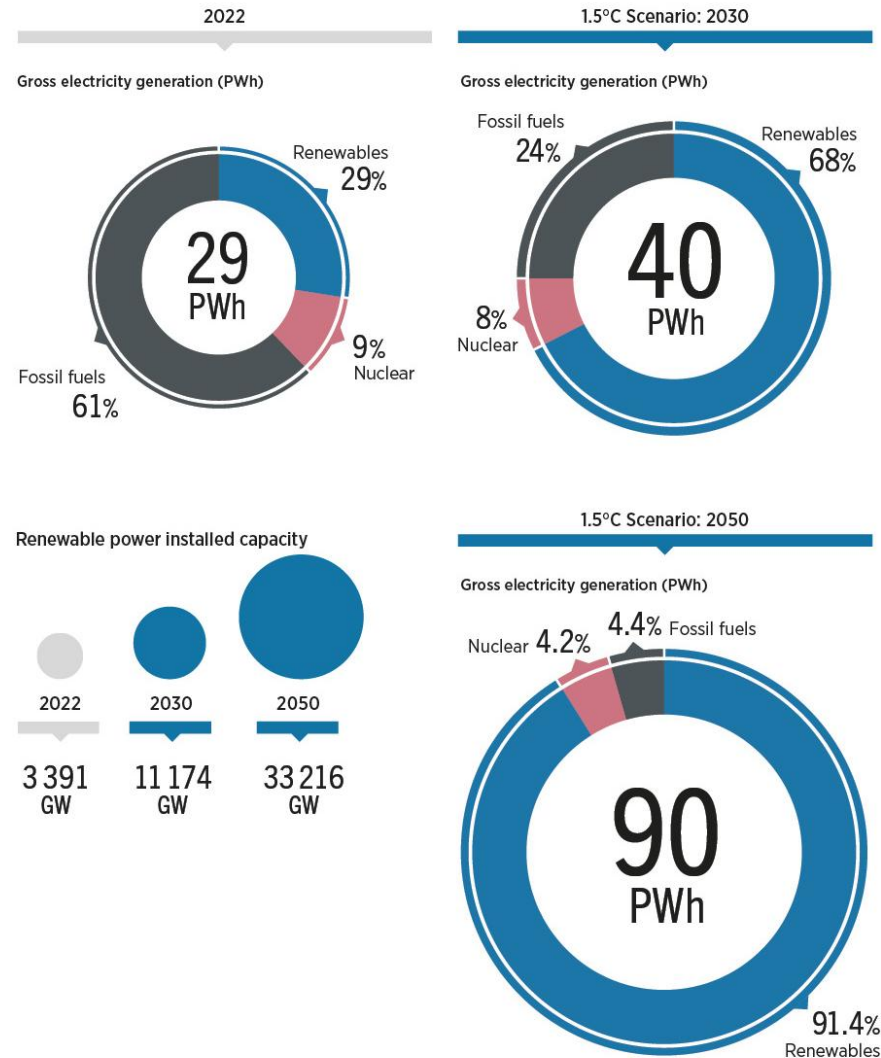
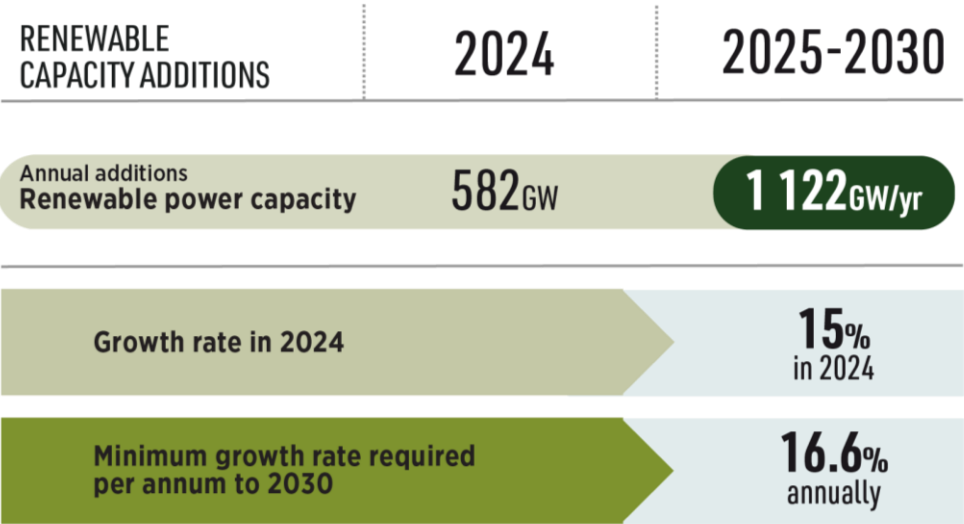


FIGURE 1.3 Breakdown of total final energy consumption by energy carrier between 2022, 2030 and 2050 under the 1.5°C Scenario

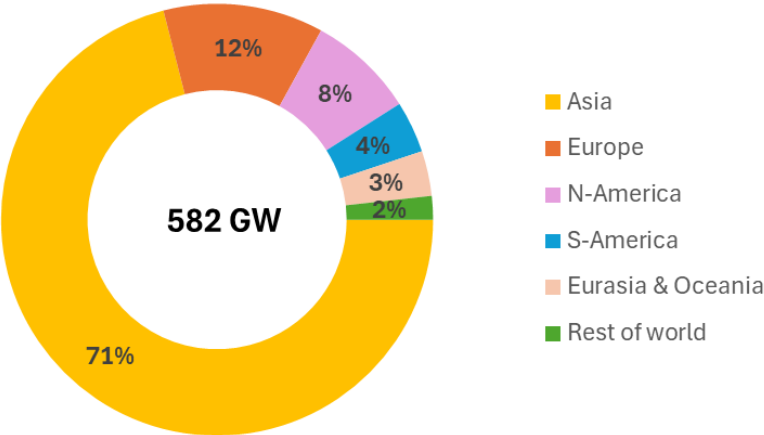


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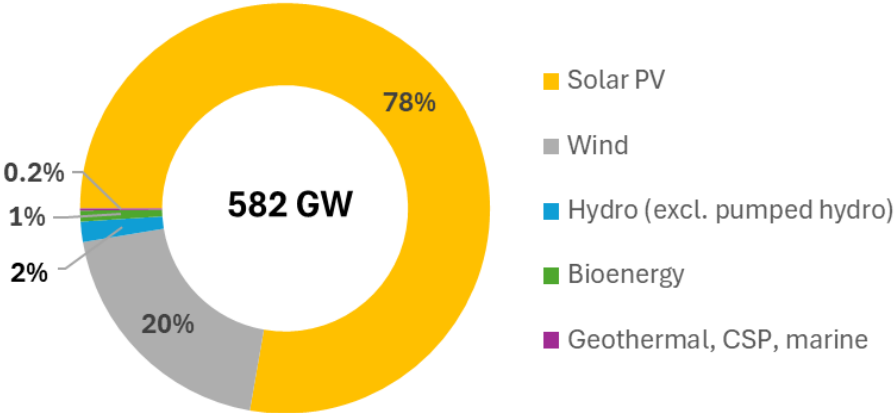
# RE power capacity: growth in 2024



Additions RE power capacity: share by region 2024



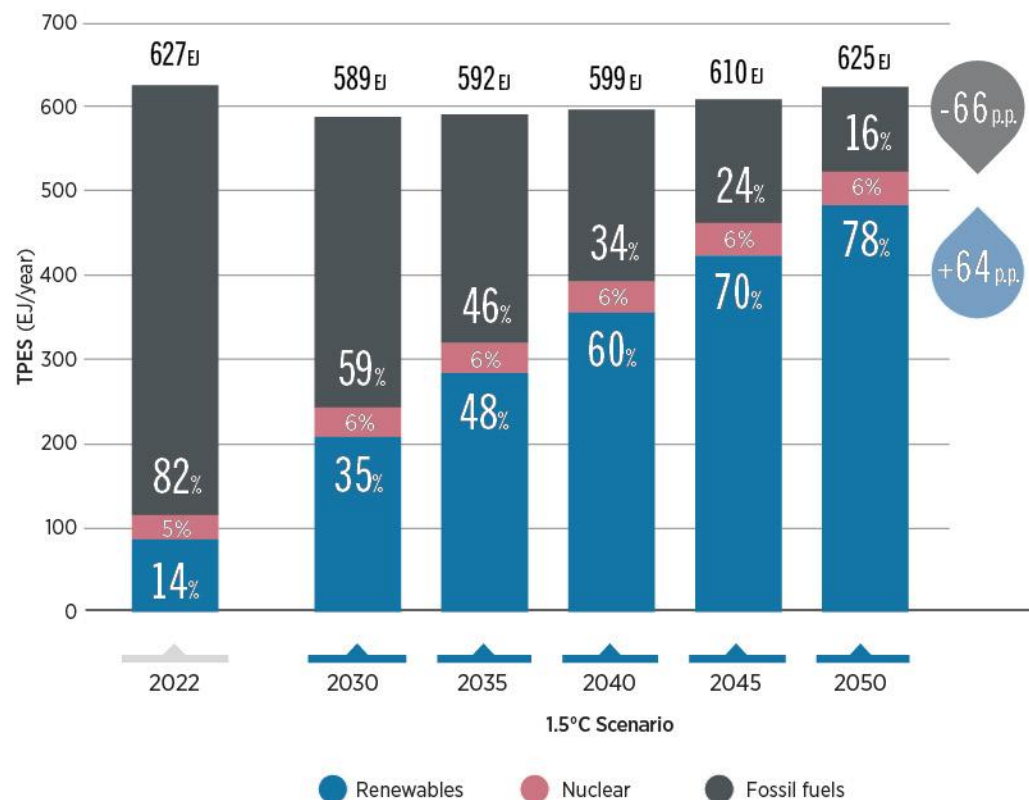
Additions in RE power capacity 2024



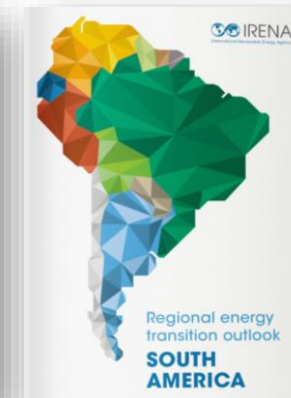
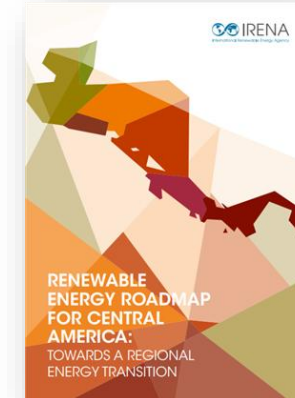
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# Renewables would dominate total primary energy supply in 2050

Global - Total primary energy supply by energy carrier group, 2022-2050 under the 1.5°C Scenario



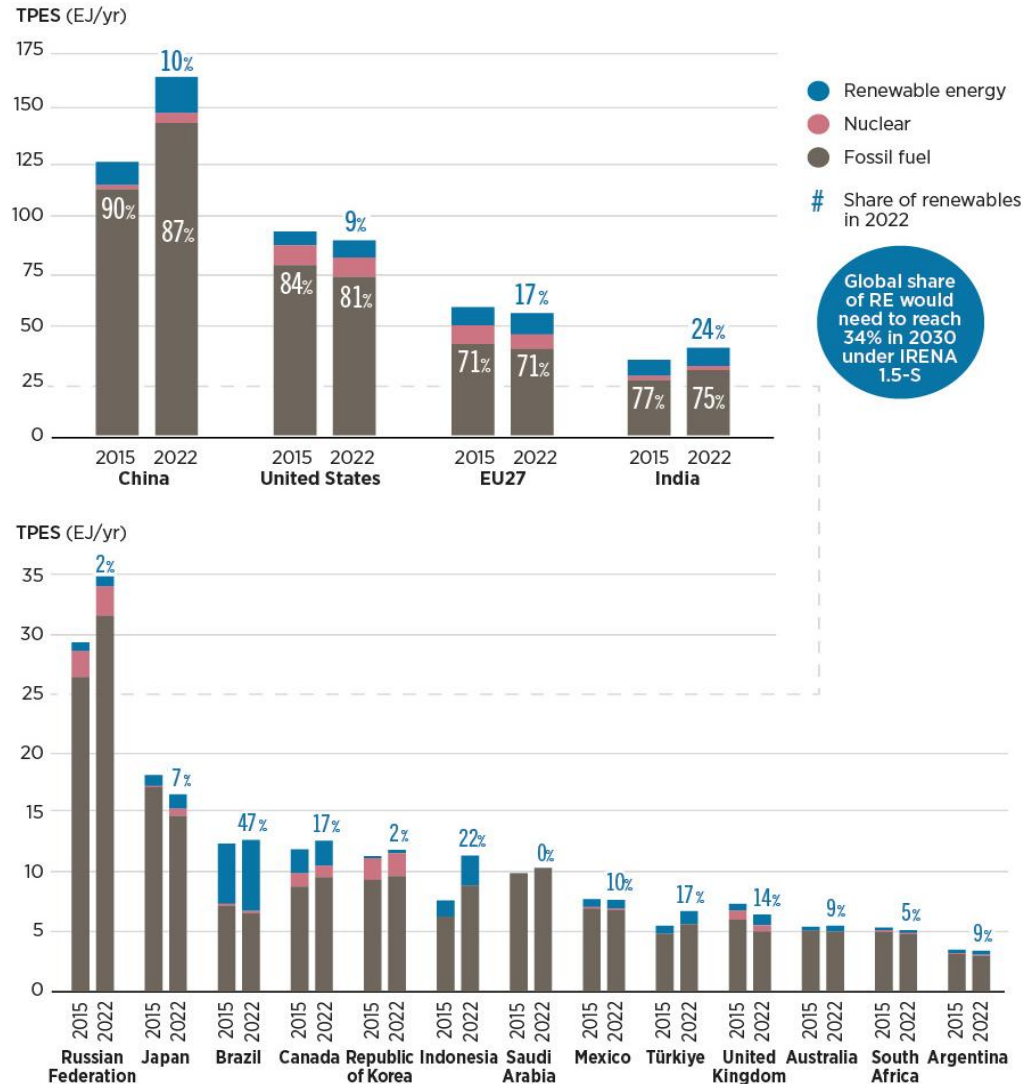
- Can you plan for one single sector or technology on isolation?
- How national energy plans and outlooks benefit from a regional energy transition outlook?



Notes: Global primary energy supply refers to the total amount of energy that is produced and consumed in various forms around the world. It includes all the energy sources that are used to produce electricity, power transportation, heat buildings and homes, and power industrial processes. Renewables include hydro, solar, wind, bioenergy, geothermal and ocean energy. EJ/yr = exajoules per year; p.p. = percentage points; TPES = total primary energy supply.

# Fossil Fuel Dependence and Renewable Energy Progress in G20 Nations

## Total primary energy supply by energy carrier for G20 nations in 2015 and 2022



Can you plan for one single sector or technology on isolation?

How national energy plans and outlooks benefit from a regional energy transition outlook?

Notes: Renewables include hydro, solar, wind, bioenergy, geothermal and marine energy; 1.5C-S = IRENA's 1.5°C Scenario; TPES = total primary energy supply; EJ = exajoule; RE = renewable energy; yr = year.

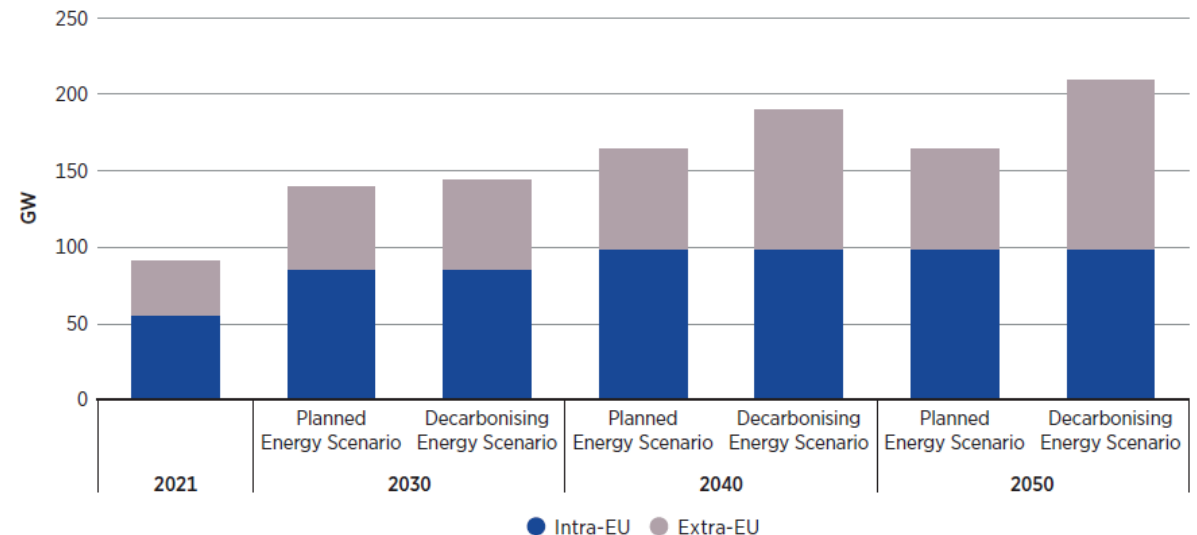
# EU Regional Energy Transitions Outlook (2025): International transmission capacity expansion for the power sector

- **Grid expansion, storage and DSM** are all critical to support renewables, reduce curtailment and improve system resilience.
- **Cross-border transmission** boosts flexibility, lowers costs and strengthens EU energy security.
- **International transmission capacity (sum total of interconnection capacity of EU Member States)** could more than double by 2050, reaching up to **209 GW** under the DES.
- **Faster permitting and regulatory alignment** are essential to unlock these benefits and meet decarbonisation goals.
- **A smarter, more connected grid underpins** a reliable, competitive and low-carbon EU power system.



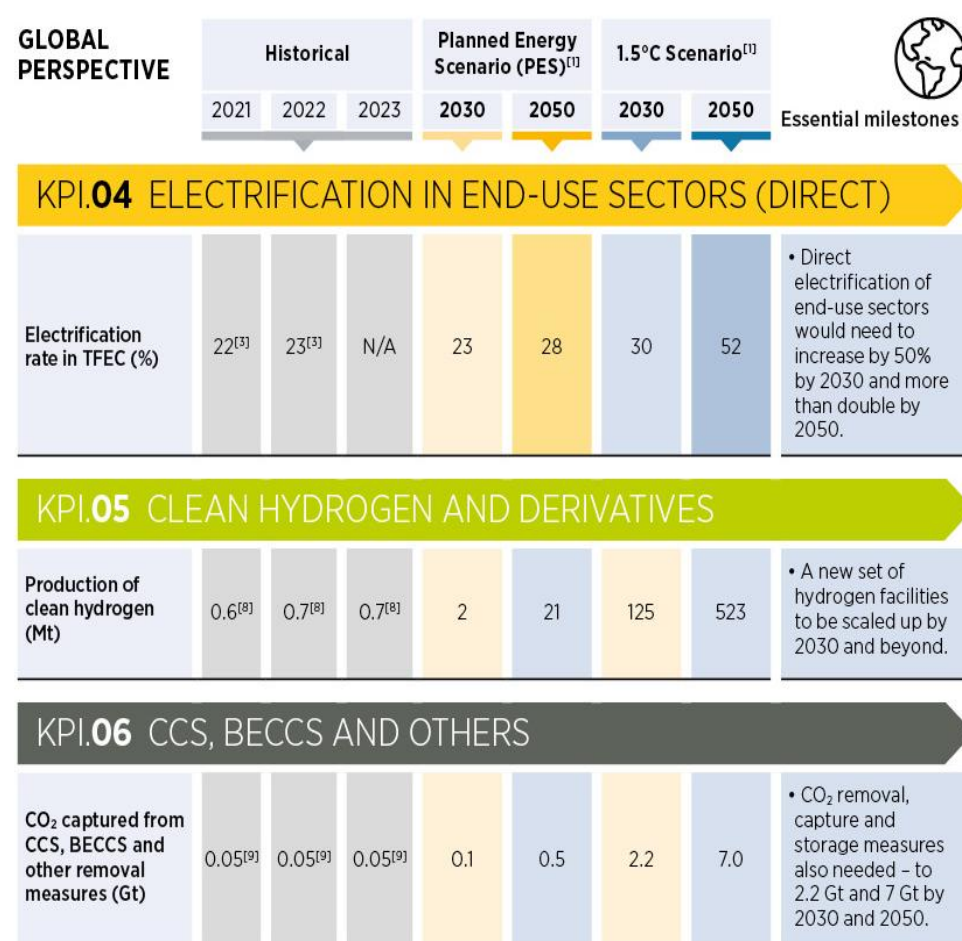
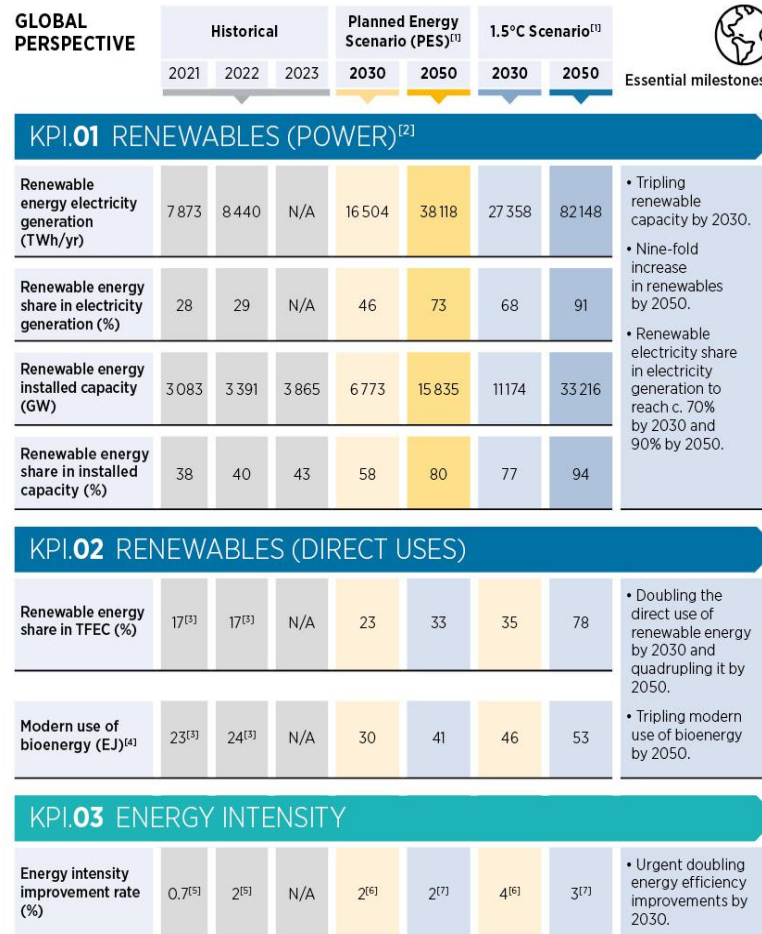
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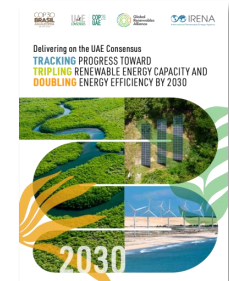


# Six key performance indicators to monitor progress towards the 1.5°C pathway

Key performance indicators for achieving the 1.5°C Scenario compared with the Planned Energy Scenario in 2030 and 2050: Global perspective

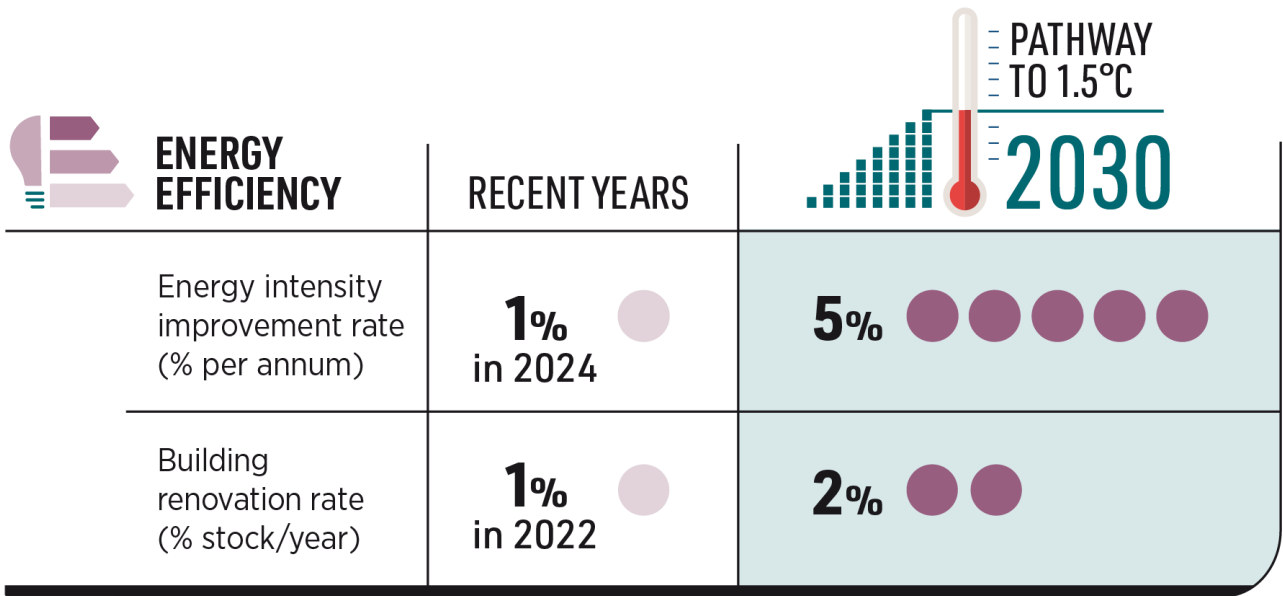


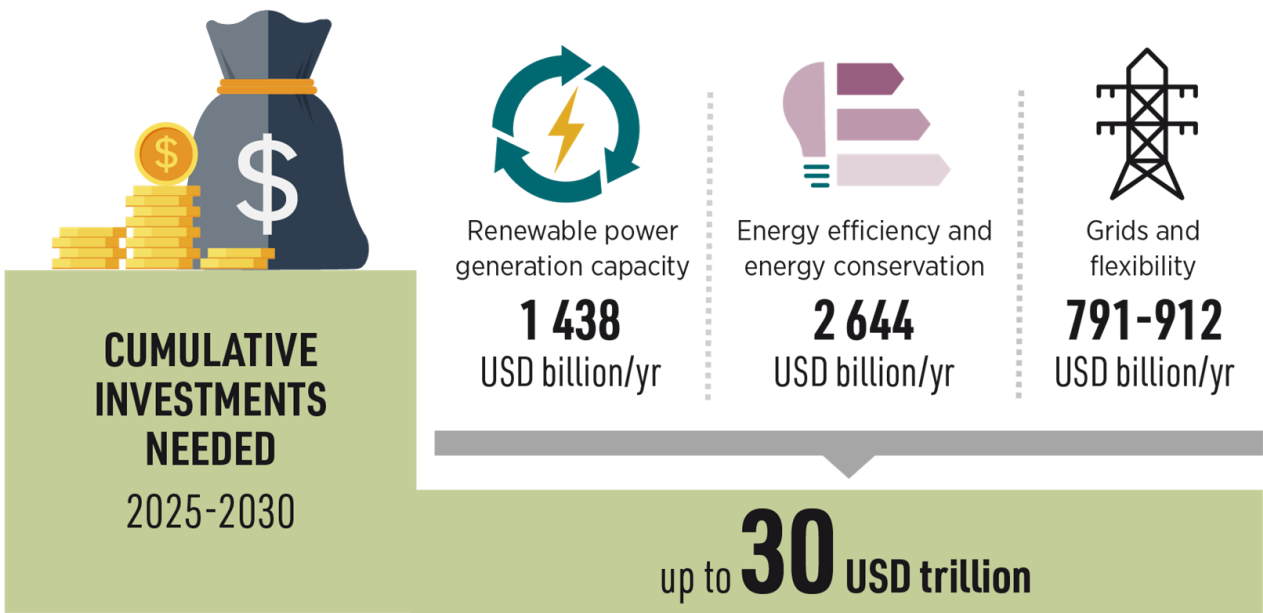
**Outlooks as tracking progress tools? The need of a KPI common framework for the COPs and G-forum.**



- **Energy intensity improvement rate 2022-2023 was 1% → below the 5% per year needed in the period 2022 – 2030 to achieve the global energy efficiency target.**

**Pls, are you planning to implement the NDCs / LTS?  
So please are they based on energy transition outlooks, right?**





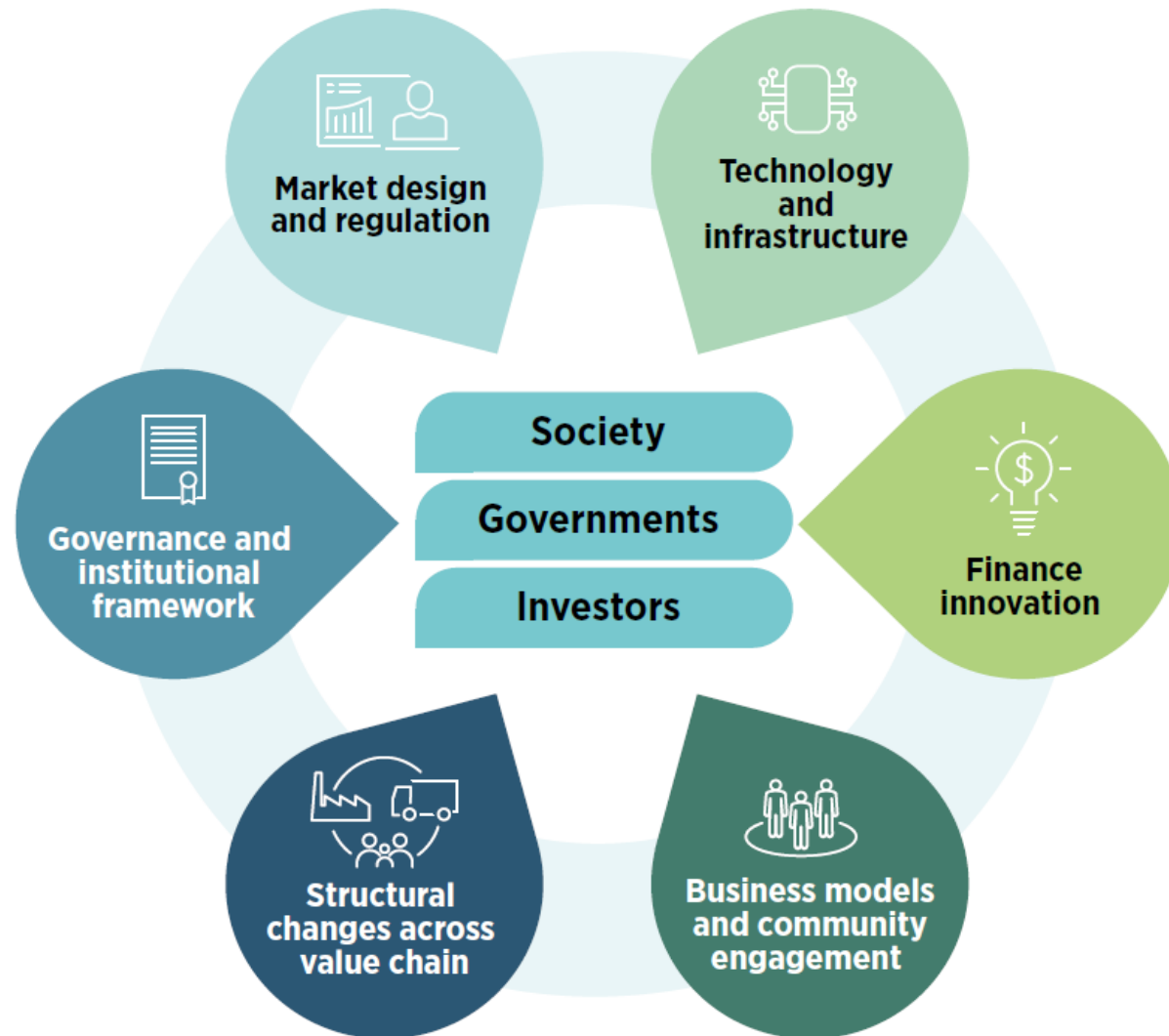
**Granularity:  
how to  
connect with  
investment  
plans on the  
ground**



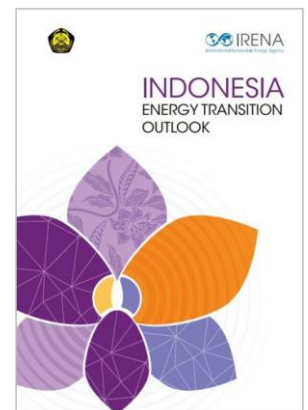
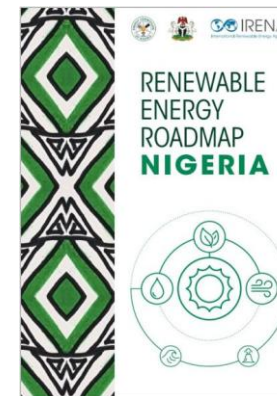
| Investment area                                    | Needs towards 2030  |
|--|---|
| Renewables   | Annual investment need to at least double (cumulative USD 8.6 trillion by 2030)           |
| Grids & flexibility                                | Nearly double (current USD 433 billion today). Increased by 6% vs 2023 (not enough)       |
| Battery storage                                    | Grew by 33% vs 2023 (USD 54 billion in 2024), but remain well off-track                   |
| EE & conservation (buildings, transport, industry) | Increase by more than 7x (USD 348 bio. In 2024 to an average of USD 2.6 trillion by 2030) |

# WETO: Planning for the energy transition

## Stakeholder engagement



- Gap on skills for several areas of energy transition - Is there any better moment of engagement and capacity building than while doing the outlooks?



# Final thoughts on the energy transition

"The right question is usually more important than the right answer."

Energy planning - too much centralization! Isn't it? How to plan under uncertainty – geopolitical and beyond ? the role of outlooks.

Don't plan – do not last! strategic planning using outlooks

Can you plan for one single sector in isolation? How national energy plans and outlooks benefit from a regional energy transition outlook?

Your neighbor country affects you! Let's go regional and systemic! The power of the regional interconnection and integrated energy planning. Go for energy transition framework – beyond energy systems and no single isolated planning

Outlooks as tracking progress tools? The need of a KPI common framework for the COPs and G-forum.

Too many goals, too different instruments ... you get nowhere or anywhere!

Pls, are you planning to implement the NDCs / LTS? So please are they based on energy transition outlooks, right?

Energy and climate plans if to be implemented, need to be coherent with energy transition strategies

Is there any better moment of engagement and capacity building than while doing the outlooks?

AIDA: attention, interest, desired, action. The ones responsible for energy plans and policy making are engaging during the joint outlook preparation.

Granularity: how to connect with investment plans on the ground?

Have you identified a portfolio of projects / actions on the ground - if not, sorry, you need more granularity.

