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Renewable Energy: Opportunities and Challenges for Reinsurers

Overview of Renewable Energy

Solar Energy

Solar Energy (~47%*) - Solar energy captures sunlight to generate clean electricity.

- Photovoltaic (PV) - converts sunlight directly into electricity using solar panels
- Concentrated Solar Power (CSP) - uses mirrors to concentrate sunlight and generate electricity via steam turbines
- China dominates with ~33% of global installed capacity, followed by US (~7.5%)

*Percentage of global renewable energy capacity (IRENA, end-2025)

Wind Energy

Wind Energy (~25%*): Onshore & Offshore – mature but still rapidly developing

- Onshore accounts for ~92%
- Wind energy is already providing energy to more than 937 million households globally
- China accounts for half of global installed capacity, followed by Europe (~25%) and US ~(~11.5%)

*Percentage of global renewable energy capacity (end-2025)

Other Renewable Energy Sources

- Hydropower (~25%*), generates energy from flowing water
- Bioenergy (~3%), uses organic materials or waste-to-energy
- Geothermal (~0.3%*), taps Earth's heat
- Ocean (<0.1%), generates energy from tidal movements or waves

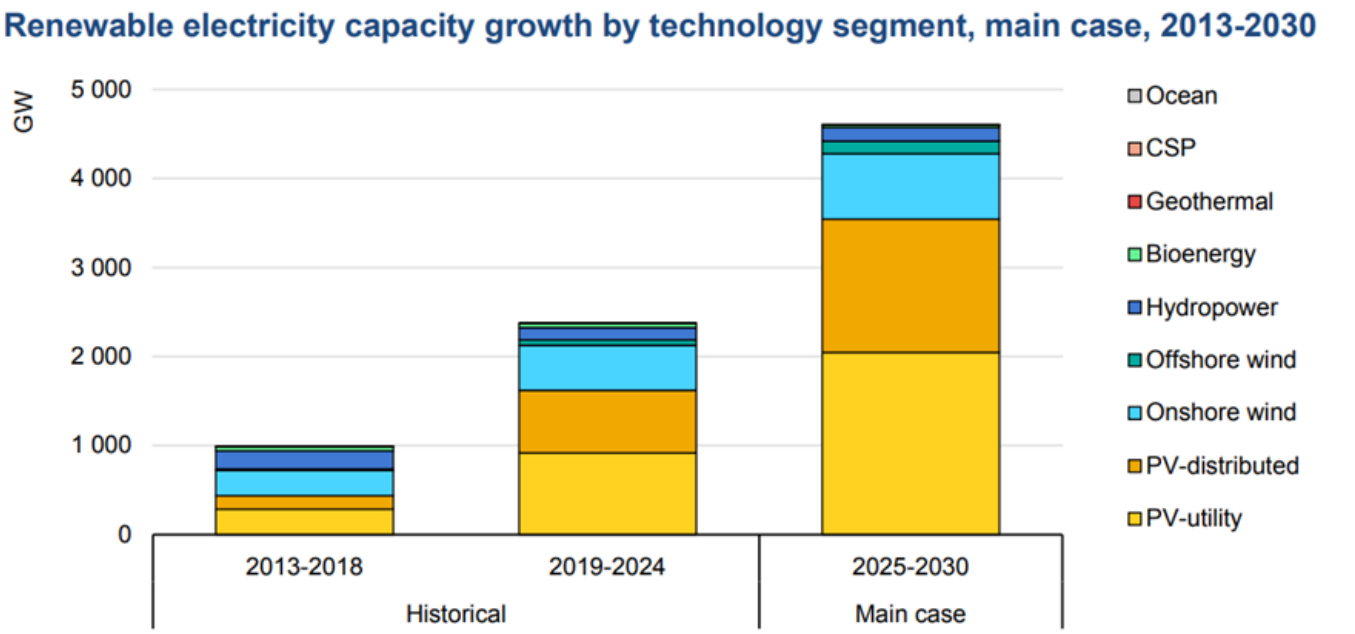
*Percentage of global renewable energy capacity (end-2025)

Rapid Market Expansion

- In the first half of 2025 renewable energy overtook coal as the world's leading source of energy!
- Global power generation installed capacity as at end-2025:
- Renewables ~49%
- Fossil fuels ~45%
- Nuclear ~4%
- The renewable energy market is rapidly expanding worldwide due to technological innovations and decreasing costs.
- Technological progress drives efficiency and adoption in renewable energy sectors across various regions.
- Government policies and incentives support the growth and diversification of renewable energy markets.
- The current Middle Est Conflict highlights the importance of alternative energy sources

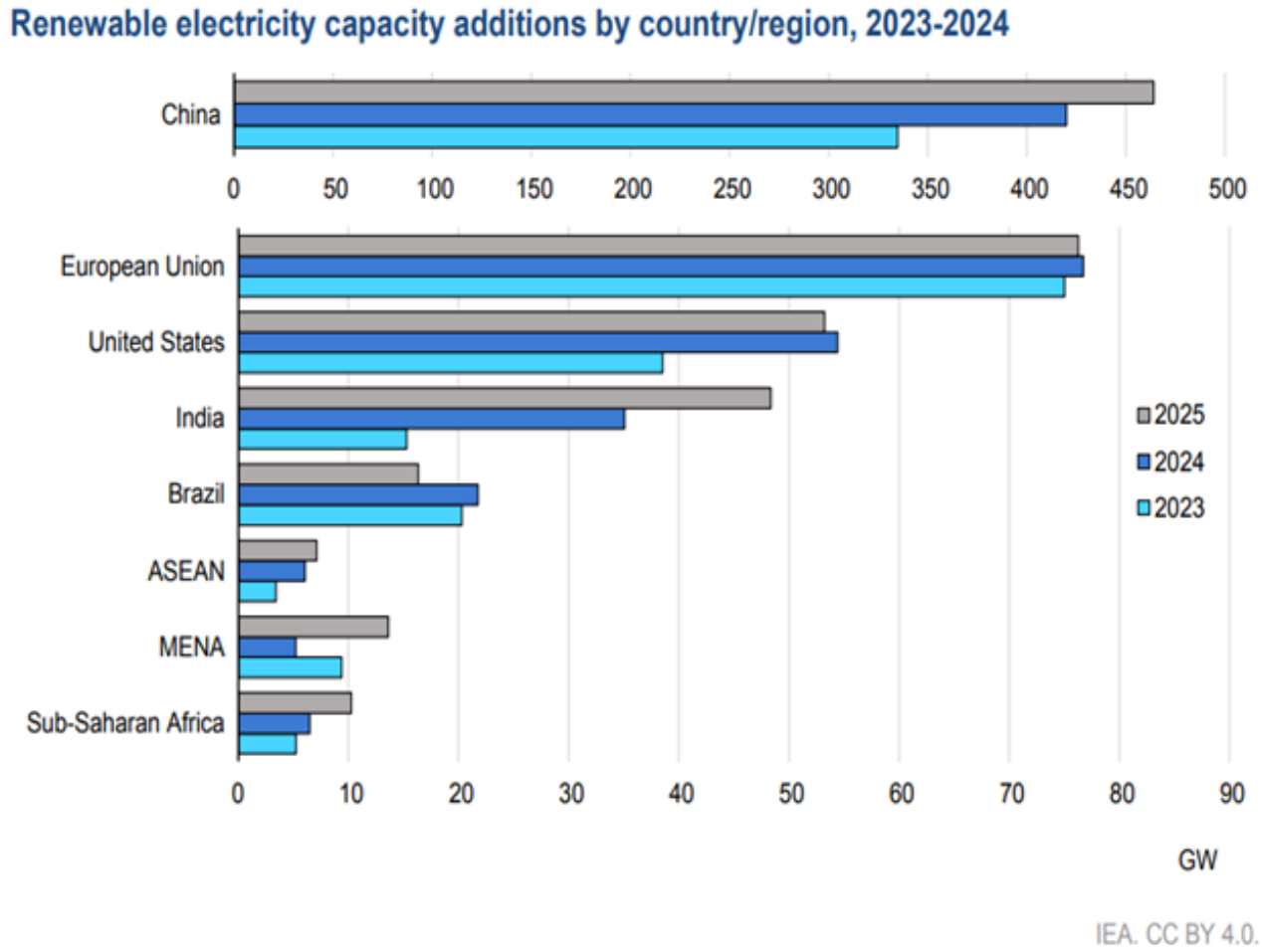
Global Capacity Growth

- Global renewable power capacity is expected to double between now and 2030, increasing by 4 600 GW
- Solar PV accounts for almost 80% of the global increase, followed by wind, hydropower, bioenergy and geothermal.



China & EU are the leaders in Renewables

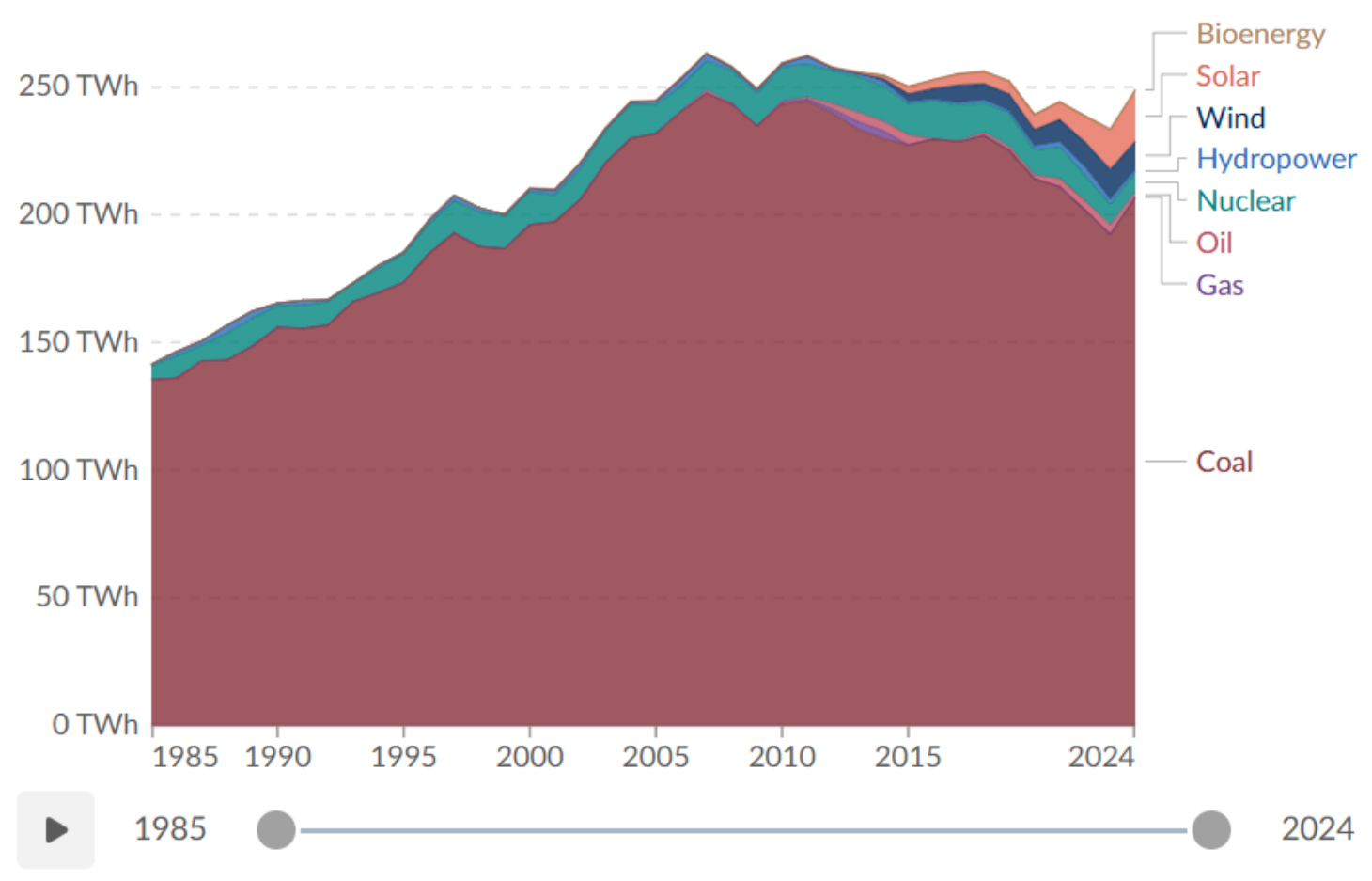
- China continues to account for nearly 60% of global renewable capacity growth.
- China's capacity is expected to double between now and 2030. Solar will dominate, (80% of this growth). By the end of 2024, China's combined wind and solar capacity already exceeded 1 400 GW, surpassing the 2030 target of 1 200 GW.
- China installed 212 gigawatts of solar capacity in the first six months of the year, more than America's entire capacity of 178 gigawatts as of the end of 2024



And where is Africa?

- According to recent statistics published by IRENA in March 2026, Africa's added capacity amounted to just 1.6% of all global additions despite its capacity rising by a record 15.9%, driven by Ethiopia, South Africa, and Egypt.
- In Africa, the installed **Wind** capacity is rather modest with South Africa leading, ranked 30th with 3.7 GW of installed capacity (5% added in 2025)
- In 2025 Africa installed ~4.5 GW of new **Solar** capacity (54% increase YoY), with South Africa accounted for ~35% of this growth

South Africa & Redstone Concentrated Solar Thermal Power Project



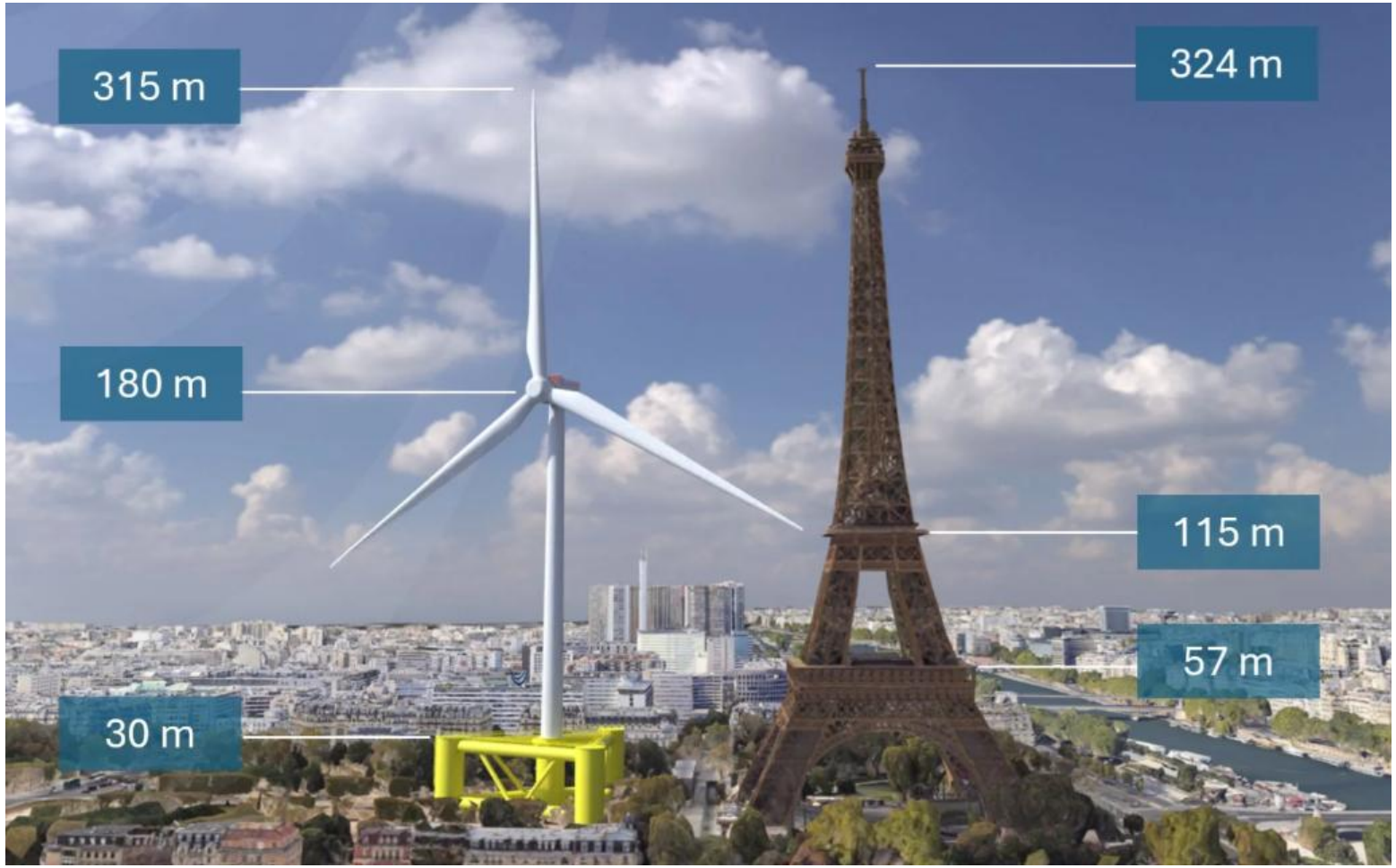
- On 30th May 2025, The Redstone Concentrated Solar Thermal Power Project received the commercial operation certificate from the South African national grid operator and was connected to the grid after 4 years of construction
- Construction cost: ~USD 715
- Once operational, the plant will supply approximately 785.8 GWh of clean electricity to the national grid annually — enough to meet the power needs of around 200,000 South African households.

Source: Energy Institute - Statistical Review of World Energy (2025)

A view of the Redstone Concentrated Solar Thermal Power Project in Northern Cape Province of South Africa [Photo/sasac.gov.cn]

Source: Arabian Company for Water and Power Development (ACWA Power) – lead shareholder

- Other shareholders in the project include the Central Energy Fund (CEF), Pele Green Energy and the local community



Typical Floater with WTG 20 MW

CHINA IS PRODUCING 24 - 26 MW WIND TURBINES!

A couple of interesting projects

Mingyang's OceanX floater

Source: Mingyan Smart Energy

Bhadla Solar Park in Rajasthan, India

Covers area of 56 square kilometers

2.25 GW capacity, enough to power over a million households

The largest solar farm in the world is in Bhadla, in the northern Indian state of Rajasthan.
SAJJAD HUSSAIN / Contributor

NOOR CSP in Ouarzazate, Morocco

Talatan Solar Park

The world's largest solar farm

7 times size of Manhattan

Once completed, it will be 10 times Manhattan & able to generate power for 5m housholds

Not only China is solar grazing

Dominion Energy solar farm in Sussex County, Virginia

Photo By Katherine Hafner

Iberdrola's Algeruz solar park in Portugal

Japan's MOL partnered with Hitachi to convert aging vessels into floating data centers

Source: MOL

Opportunities & Challenges

Opportunities

Fastest growing Energy sector

There is demand for renewable energy to meet the green energy targets

Tailored Insurance Solutions

New renewable energy projects need customized insurance to manage specific risks effectively

Renewable Energy Investment & Innovation

Investing in renewable energy risks introduces new opportunities to diversify reinsurance portfolios.

Offsetting Traditional Risks

Renewable energy exposure helps offset risks from traditional energy and industrial sectors and to diversify the portfolios

Challenges

Cat Accumulation

Renewables are usually clustered. How do we monitor the cat accumulation?

Volatility

Low loss frequency but high severity

Weather Variability Risks

Renewable energy projects are affected by unpredictable weather patterns that impact energy generation reliability.

Technology Reliability

The performance and durability of renewable energy technologies can be uncertain, posing operational risks.

Supply Chain Disruptions

Supply chain issues can delay projects and increase costs, adding unpredictability to renewable energy initiatives.

Limited Historical Data

Scarce historical loss data restricts the accuracy of risk models and with fast pace of innovation and projects getting bigger and bigger, We learn

Evolving Technologies

Rapid technological changes introduce uncertainties, complicating risk assessment and pricing in underwriting and reserving.

Modelling Challenges

Complex risk models face difficulties adapting to incomplete data and new variables, increasing underwriting risks.

Any Questions?

THANK YOU!