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Accelerating Renewable Energy Investments to Meet COP28 Goals by 2030

Sustainability Research Paper

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At COP28, over 130 countries committed to tripling global installed renewable energy (RE) capacity from around 3,400 gigawatts (GW) in 2022 to 11,000 GW in 2030 or 60% of global power generation capacity.[1,2] Thus, more than 1,000 GW of new installed RE capacity will have to be added on average every year.[3] In 2023, a 50% growth of new RE – the biggest in the last 20 years – added 510 GW, spearheaded by China.[4] This capacity addition was possible thanks to more than USD 660 billion in RE investments, twice as high as in 2015 when the Paris Agreement was signed.[5] However, to achieve the 2030 target, around USD 1.3-1.55 trillion will need to be invested annually,[6,7] 30% of which is expected to come from the public sector alone.[8] What are the barriers to further RE investment? How will the public and private sectors scale up such investments? What factors could accelerate RE investments to achieve COP28 targets?

SUSTAINABILITY RESEARCH PAPER

This research paper is part of a 12-month series published by the Al-Attiyah Foundation every year. Each in-depth research paper focuses on a current sustainability topic that is of interest to the Foundation's members and partners. The 12 technical papers are distributed to members, partners, and universities, as well as made available on the Foundation's website.

- Over the past two decades, RE has experienced unprecedented growth. In 2023, RE comprised 87% of all new power generation capacity additions, marking a 54% year-on year increase.[4]
- In line with the 28th meeting of the Conference of the Parties (COP28) target, RE investments need to increase from around USD 660 billion in 2023 to at least USD 1.3-2 trillion between 2024 and 2030, including to less mature RE technologies beyond solar and wind, and to sectors beyond electricity such as heating, cooling, and system integration. Addressing the unequal distribution is also critical: half of global RE investments are currently concentrated in China, while Africa and other developing regions are lagging the most.[9]
- RE growth has been driven both by technological innovation and by a plethora of targeted policy support including feed-in tariffs, Research and Development (R&D) subsidies, and reverse auctions, notably in Germany,[10] China, and the US, as exemplified by recent measures like the Inflation Reduction Act (IRA).
- Scaling up RE investments is hampered by several barriers, including slow permitting processes, the need for robust technical solutions for grid stability, lower profitability than fossil fuels and high geographic concentration, underscoring the urgent need for comprehensive de-risking measures and a reform of the global financial system.
- To further accelerate the deployment of RE, governments may need to introduce or extend targeted policy support mechanisms such as subsidies and public guarantees, but also ensure that their power grids and energy market regulations are fit for integrating RE. The scale of policy support should also be expanded, particularly for the wind industry and in developing countries that are facing high interest rates.[11]
- By drastically scaling up RE, countries all over the world will not only contribute to global (and national) climate targets, but also reap significant economic, financial, industrial and security benefits.

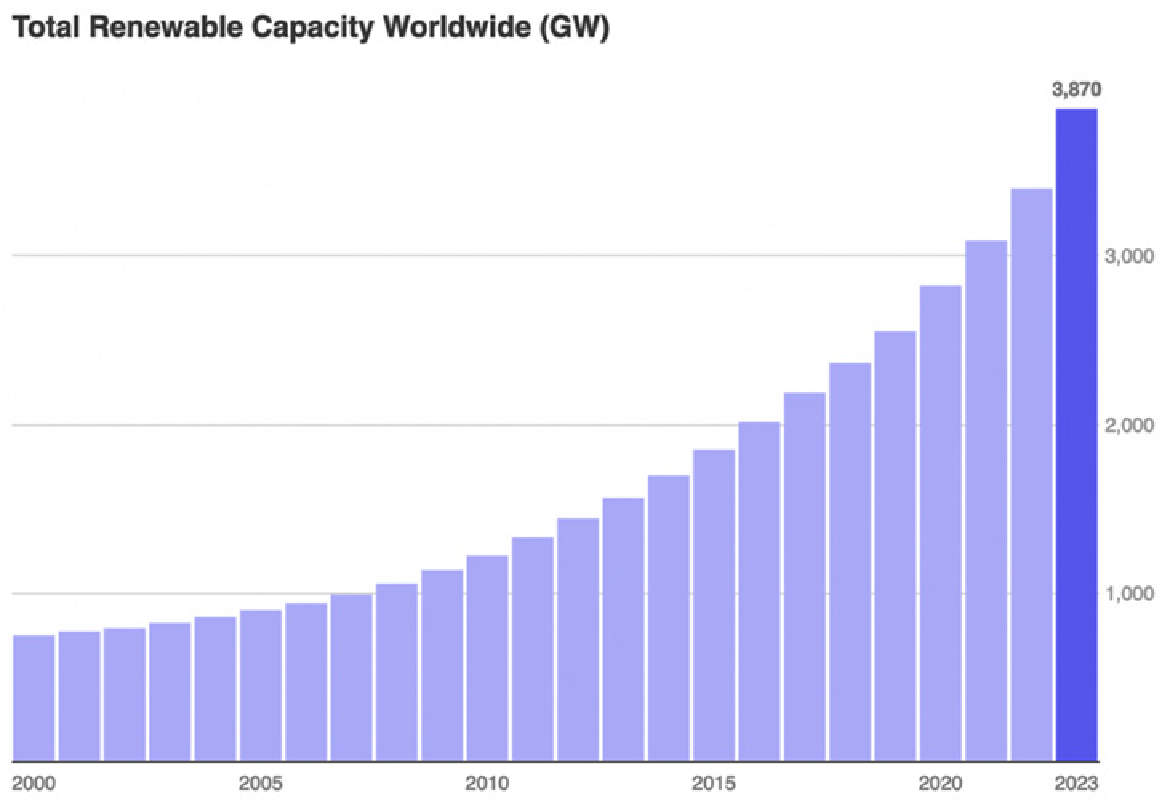
Renewable energy (RE) for power generation – grid-connected hydropower, wind energy, solar energy, bioenergy, geothermal, as well as off-grid RE technologies – has grown drastically since the beginning of the 21st century. By the end of 2023, according to the International Renewable Energy Agency (IRENA), global RE generation capacity amounted to 3,870 gigawatts (GW) (see Figure 1).[6,4]

Over the past twenty years, the total installed capacity of RE increased more than twelve-fold from 310 GW in 2000 to more than 3,900 GW in 2022.[2] In terms of annual capacity additions, RE's share has grown from 15% in 2002 to 87% in 2022,[12] rapidly overtaking other energy sources. From 2015 to 2022, further acceleration in RE capacity growth averaged at around 11% annually.[13] For the first time in history, RE produced 30% of global electricity[14] (compared to 19% in 2000) which is estimated to rise to 42% by 2028.[15,16,17]

IRENA also predicts that RE will surpass coal as soon as 2025 as the largest source of electricity generation worldwide,[6,4] while the energy think tank Ember recently found that "the world may be on the brink of driving down fossil fuel generation".[15,18]

Such rapid deployment of RE, however, had not been widely expected and the installation of new RE generation capacity regularly overachieved national as well as global expansion targets and forecasts. For example, on the global level, until recently the IEA systematically underestimated the expansion of wind power and of solar.[15] Seven countries from all over the world are already generating close to 100% of their electricity from RE, mostly from hydropower or geothermal (Albania, Bhutan, Ethiopia, Iceland, Nepal, Paraguay, and the Democratic Republic of Congo).[19]

Figure 1: Total RE Capacity Worldwide, 2000-2023



Source: Renewable Energy Capacity Tracker (2024)

To triple RE capacity by 2030, annual investments in RE power generation will need to increase as well, from around USD 660 billion in 2023 to at least USD 1.3-2 trillion between 2024 and 2030 or a total of USD 8 trillion for RE by 2030 in addition to another USD 4 trillion for grids and storage infrastructure.[20,7] In contrast, fossil fuel investments still amounted to more than USD 1 trillion in 2023, up from USD 840 billion in 2020.[21] Fossil fuels also received a record high of direct subsidies of at least USD 1.7 trillion in 2022,[22] similar to the annual investment needed to achieve the tripling of RE capacity by 2030 (together with indirect subsidies adding up to USD 7 trillion).[23]

Besides these contradicting policy signals, scaling up investments in RE is hampered by the ongoing global 'polycrisis' first started by the COVID-19 pandemic in 2020, aggravated by the Russian invasion of Ukraine, increasing disruptions of global supply chains, and rising interest rates that disproportionally affect investments in RE compared to power generation based on fossil fuels (see further section 3).[24]

Compared to RE, the marginal costs of fossil fuel power generation are very high and volatile, i.e. the additional cost to produce one extra unit of electricity is composed primarily of fuel costs. This is the case particularly for internationally traded fossil oil and gas (O&G)[25] whereas the marginal costs of RE-generated electricity are close to zero. Costs of power generation from RE can thus be more predictable than that of fossil fuels. Historically, and just like fossil fuels, RE has never been subsidy-free and has been supported both by direct and indirect measures, e.g., (re-)using existing infrastructure such as grid networks or publicly owned land.26

Over the past two decades, solar and wind power capacities have reached a combined 13% of global electricity generation, thanks to strong capacity growth in 2023 of 23% for solar and 10% for wind in 2023 compared to 2022.[27] Historically the growth of solar and wind power was driven by the implementation of RE support policies in Germany in the 1990s and 2000s, which were followed by similar initiatives in other European countries, as well as China and the United States. These measures played a critical role in boosting innovation and driving the economy of scale, in turn decreasing costs and enhancing the competitiveness of RE. Instruments such as public funding for research and development (R&D), tax incentives, feed-in tariffs (FITs), and reverse auctions were instrumental in lowering RE costs and boosting investments in RE technologies. This led to solar photovoltaic (PV) becoming cost-competitive with all fossil fuels by 2015. Nowadays, a variety of policy measures exist that support the deployment and scaling up of RE, of which the following four have gained the most attention.[28]

Feed-in-Tariffs

FITs are a specific mechanism employed by governments that commit to paying above the retail or wholesale electricity prices to ensure the profitability of RE power generators and secure investment flows. In 1991, Germany launched its FIT under the Electricity Feed-in Law, which was overhauled in 2000 with the Renewable Energy Sources Act (EEG), embracing technologies like solar, wind, and biogas. This act received strong backing from various groups, including regions undergoing industrial restructuring and rural communities. In 2023, Germany revised it and published a revised EEG, which has a budget of EUR 28 billion and aims for 80% of electricity from RE by 2030.[29] Previously, under the EEG program, investors were assured a steady cash flow for 20 years, which increased wind power generation from 9.5 terawatt-hours (TWh) in 2000 to 139.8 TWh in 2023, positioning Germany as a leader in European wind power. The program's guaranteed funding ended in 2016 when the law was revised to replace FITs with a reverse auction system for wind power. However, FITs for solar PV have continued and expanded, allowing plants whose initial 20-year period had ended to still benefit from somewhat reduced FITs.[30]

Reverse Auctions

In a reverse auction, sellers compete by bidding down the prices at which they are willing to sell their goods and services, unlike traditional auctions where buyers bid upwards until the highest offer wins, i.e. the procurement process is inverted. This mechanism allows the competitive market to determine the price for RE and prevents potential overpayments that might occur with direct subsidies. When implemented effectively, reverse auctions promote competitive pricing, lower costs, enhance access to affordable energy, and increase transparency in the energy procurement process.

Morocco provides a notable example of successful reverse auctions for RE. Lacking substantial O&G resources, Morocco imports about 95% of its primary energy needs as fossil fuels, and to a minor extent electricity from Spain.[31] To diversify its energy portfolio, the country conducted large-scale reverse auctions for solar and wind power in 2011 and 2012, which were among the largest in the Middle East and North Africa at the time. Contributing to Morocco's target of 42% of electricity from RE by 2020 (up from 17% in 2010),[32,33] 1.2 GW were auctioned between 2012 and 2016, of which the 850 MW of wind power were auctioned at record-low prices of USD 25-30/MWh on average.[34,35] Overall, by 2018 a total of 2.4 GW was auctioned in the two-phase process where bidders were initially pre-selected based on criteria such as financial capacity, access to finance, and technical expertise. The country also established a dedicated agency to attract investors and manage the concentrated solar power auction. This was complemented by the development of a public-private partnership model that helped mitigate risks associated with this pioneering project and secure the necessary funding. Political stability in Morocco further aided the auction process.[32]

Tax Credits

Tax credits are a pivotal financial mechanism used to support the growth of RE by reducing the tax burden on companies and individuals investing in RE technologies. For example, in the United States, the Inflation Reduction Act (IRA) has significantly expanded these benefits, offering around USD 394 billion in tax incentives at least by 2032 for various forms of RE, including solar and wind power.[36,37] These credits decrease the initial capital cost of installing RE systems, making them more financially accessible and attractive to investors and homeowners alike. By allowing a percentage of the cost of RE installations to be deducted directly from one's tax liability, these incentives not only lower the effective price of RE technologies but also encourage broader adoption.

Carbon Contracts for Difference

Carbon Contracts for Difference (CCfDs) are innovative financial instruments designed to encourage investment in low-carbon technologies by stabilizing revenues for producers at a predictable price per ton of CO2 emissions reduced or avoided. Originating in the UK, CCfDs act as a safety net that covers the difference between a predetermined strike price and the actual carbon price in the market. This mechanism ensures that investors can achieve stable returns despite fluctuating carbon prices, thereby reducing financial risk and making green investments more appealing.[38] Following the UK's lead, the United States and Germany have also adopted CCfDs to bolster their RE sectors.[39] In these countries, CCfDs have been pivotal in promoting the adoption of RE technologies by providing financial security and supporting long-term contracts.[38]

Despite the drastic growth in recent years, RE development still faces major barriers. While some challenges are inherent to most of the emerging technologies, others stem from an imbalanced regulatory environment and market structure.

Firstly, the permitting process for RE projects is notably protracted. For example, in the UK planning and permitting can take up to four times longer than actual construction. Efforts are currently being made, as seen in Germany, to de-bureaucratize these processes, which could significantly reduce project lead times and accelerate deployment schedules.[40]

Secondly, the RE sector faces emerging challenges in securing essential material inputs. There are first signs of fragmentation in the markets for critical minerals necessary for RE technologies which risks making them more difficult and costly to obtain and could slow down the global energy transition.[41] Energy storage could be another roadblock: Current storage technologies and infrastructures are often inadequate or too costly, slowing down the broader adoption and integration of variable RE.[42] 'Clean flexibility' could be one way forward: solutions that balance the grid when weather-dependent sources like wind and solar do not match electricity demand, ensuring that excess RE is stored or relocated, and thus providing a sustainable alternative to fossil fuels used for grid balance.[43]

Thirdly, RE projects often exhibit lower profitability compared to fossil fuel ones.[44] This stems from higher initial investments and a longer timeframe needed to amortise these upfront costs. In some developing countries and emerging economies, the situation is exacerbated by market structures where state monopolies restrict competition from independent power producers, such as for example in Mexico. These monopolistic practices significantly hinder the integration and growth of RE and require even higher expected returns to offset upfront costs. The sector's vulnerability to global price fluctuations such as high inflation and rising input costs,[45] along with disruptions in supply chains, further exacerbate these financial hurdles.

Figure 2: Global RE Deployment and Capacity Additions Needed by 2030

	Renewable capacity in 2030 (GW)	Capacity additions needed over 2023–2030 (GW)	Renewable capacity in 2030 (relative to 2022)	Renewable capacity growth from 2014–2022
Sub-Saharan Africa	300	260	× 6.6	× 1.9
Middle East and North Africa	500	460	× 11.8	× 1.8
Latin America	730	420	× 2.3	× 1.6
Eurasia	340	240	× 3.6	× 1.2
Asia	5350	3850	× 3.6	× 2.7
OECD	4290	2910	× 3.1	× 1.7
World	**11510**	**8130**	**× 3.4**	**× 2.0**

Source: Climate Analytics (2023)[20]

These challenges have recently led to the deferment of numerous projects by both RE-focused firms like Ørsted as well the RE-divisions of multinational O&G companies such as BP.[46,47] Looking into the investment landscape specifically, one can observe the uneven distribution of RE capacity across the globe and the different paces needed to reach the Paris goal of limiting global heating to 1.5°C (see Figure 2).

The already apparent geographical disparities are fuelled by further financial and infrastructural challenges. A notable barrier is the lack of de-risking measures that could make RE investments more attractive to private and institutional investors. Additionally, so-called 'currency risks' attributed to currencies outside the IMF 'basket' (EUR, GBP, RMB, USD, YEN) render RE projects in other geographies more costly,[48] while the sovereign credit ratings by credit rating agencies tend to exacerbate already existing debt distress and the costs of borrowing particularly for developing countries, over-proportionally affecting RE projects due to their higher upfront costs than fossil fuel projects.[49] Lastly, in the ongoing energy transition period, repeated 'greenflation' due to supply shortages can push up prices for a broad range of components which are essential for creating fossil-free energy systems.[50]

At the end of the supply chain, RE could potentially be much cheaper for consumers, yet the merit-order effect hinders this financial benefit. Energy sources are dispatched based on their marginal costs, from lowest to highest, and thus the average market prices increase as more costly electricity sources (such as coal and gas) are added. This barrier in electricity market design has prompted for example the EU to initiate reforms,[51] to stimulate RE and protect consumers from price spikes. Overall, the barriers to RE growth are diverse and complex, necessitating a coordinated and multifaceted response through regulatory reforms and a future-proof global financial system with better and fairer access to cheaper RE financing.[52]

KEY BENEFITS FROM ACCELERATING GLOBAL RE DEPLOYMENT: ECONOMIC, FINANCIAL, INDUSTRIAL AND SECURITY-WISE

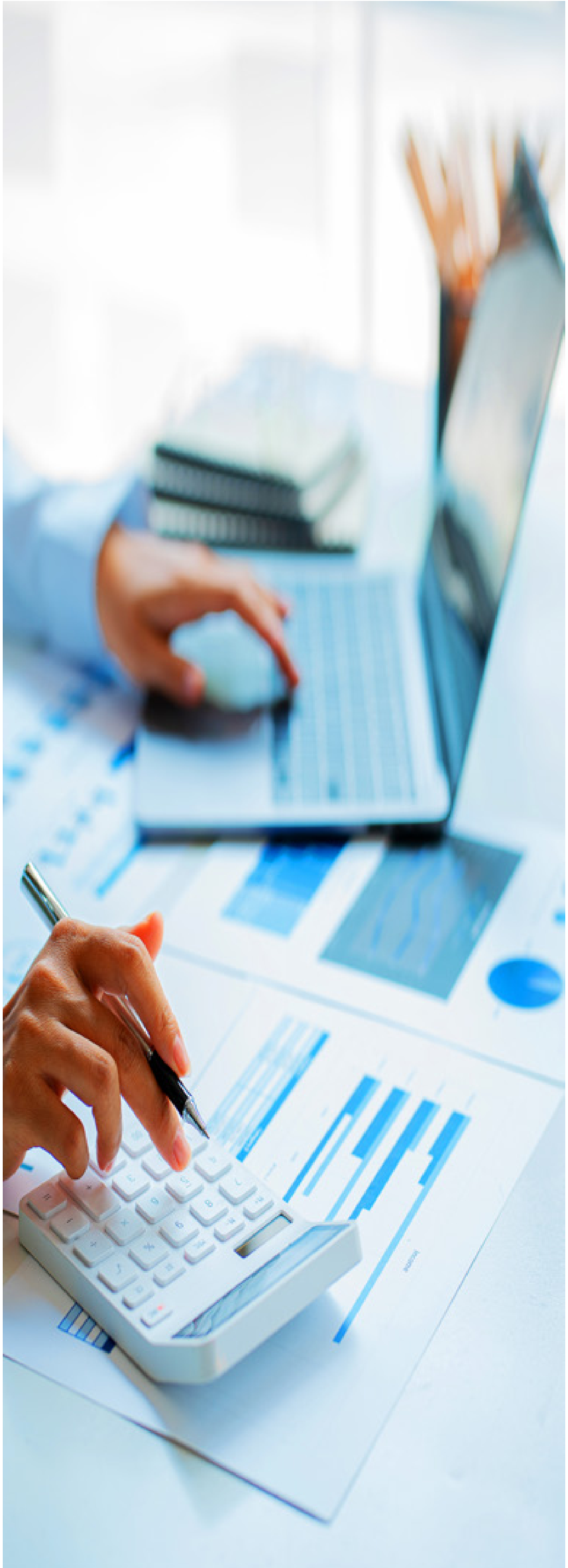
RE – like most green technologies – is often framed as too expensive. These discussions tend to ignore the already incurring climate damages from GHGs, projected to surge to USD 1.7-USD 3.1 trillion annually by 2050 if substantial measures are not implemented.[53] In fact, economic progress and achieving climate targets are mutually beneficial rather than exclusive, as the transition to RE is already proving to be a powerful economic driver. In 2023, newly installed clean energy – which besides RE includes environmentally friendly (such as energy efficiency) and low-emission technologies (e.g., nuclear) – accounted for one tenth of the global GDP growth of 3.1%,[54] adding USD 320 billion to the world's economic output of USD 105 trillion.[53,55] In China, clean energy was even the top driver of economic growth in 2023: Including the value of goods and services, the sector contributed a record USD 1.6 trillion (RMB 11.4 trillion) to the Chinese economy, 30% more than in 2022. Without the contribution of the clean-energy sector to its economic growth in 2023, China's GDP would have risen only by 3.0% instead of the recorded 5.2% (see further section 5).[56] Globally, the clean energy sector is not just generating wealth but also employment, with projections estimating over 30 million new clean energy jobs by 2030.[53]

Countries worldwide can benefit from increasing RE investments, but as of 2024, RE are still heavily concentrated in China and countries of the Global North. Increasing RE investment in underfinanced geographies – despite higher (perceived) financial and political risks – can still be an opportunity thanks to the lower cost of electricity generation from RE compared to fossil fuels. Against this backdrop, the catalytic USD 30 billion climate investment fund ALTÉRRA was created by the COP28-host UAE, in collaboration with the

Brookfield Global Transitions Fund. Touted as the world's largest RE-dedicated fund, it aims primarily at developing countries, including Least Developed Countries and Small Island Developing States, promising to catalyse further investment of USD 250 billion by 2030 through its expected multiplier effect. ALTÉRRA invests its capital both through fund investments and direct/co-investments. Among others, via the Catalytic Transition Fund set up with Brookfield, ALTÉRRA's risk-adjusted returns available to investors are adjusted upwards and are more attractive than those of previous investment funds/vehicles.[57,58,59]

Besides investment vehicles such as ALTÉRRA, an increasing number of innovative financial instruments are beginning to take shape that can free up resources and incentivise clean energy investments. For example, specifically for central banks, discussions are emerging around 'Dual (Green) Interest Rates' to allow preferential conditions for climate-positive investments, besides 'Climate Bailouts' that would allow owners to sell their fossil fuel assets to central banks if they build RE with the money they receive.[60,61] Both instruments could contribute to decreasing the RE investment disparity since most countries have central banks while O&G and coal companies exist in all world regions.

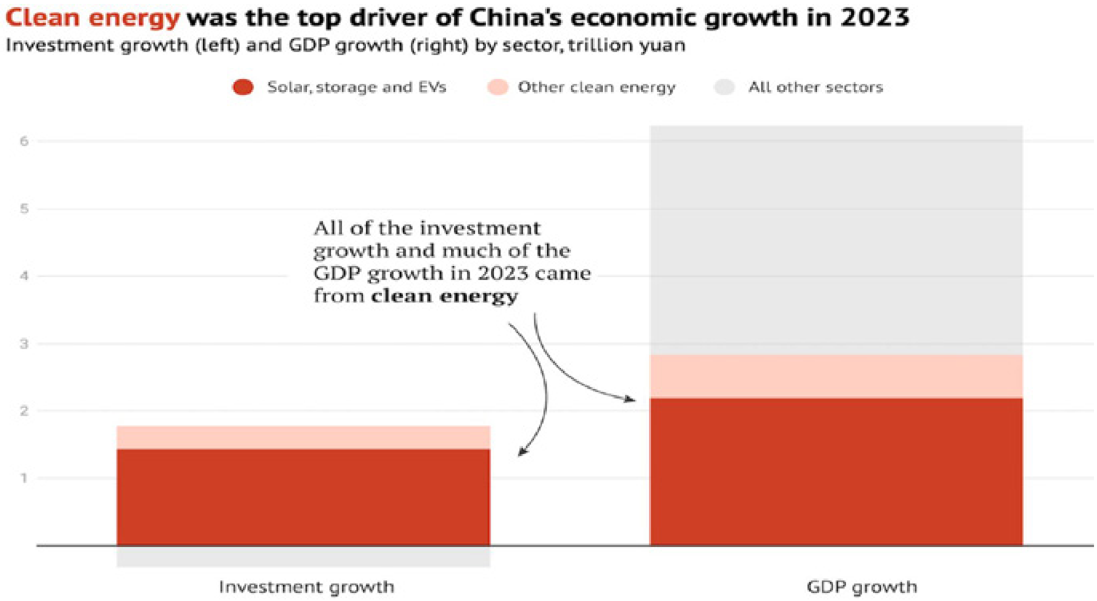
Besides financial investments, trade and exports of RE and related technology will play a key role for tripling global RE capacity by 2030. In general, exports often rely on insurances, guarantees and other forms of support to go ahead, a role taken over by financial institutions, predominantly export credit agencies (ECAs). Denmark's ECA, the Export and Investment Fund (EIFO), exemplifies the potential in exporting RE technologies, and how countries can transform their domestic RE advantages into global business opportunities.



Since 2015, the ECA committed more than EUR 14 billion in support to RE and electric infrastructure – 98% of all its commitments.[62] Admittedly, the case of Denmark cannot be easily generalised since the potential for RE exports is determined first and foremost by national industries. However, increasing support to clean energy technologies and related infrastructure such as grids and electric vehicles (EVs) can be an attractive option for ECAs to diversify their portfolios as well as for domestic industries and exporters to focus on future-oriented investments. The potential for climate-positive (or at least climate-neutral) exports is huge. Internationally, ECAs still support fossil fuels and sectors heavily dependent on them such as military or shipping[63]– in direct conflict with global (and sometimes national) climate targets – and aided by historically high fossil fuel subsidies that distort the competitiveness with RE further.[23]

Besides economic and financial reasons, the strategic shift towards domestic RE can also enhance national energy security if countries reduce their dependency on erratic fossil fuel supplies and their volatile markets.[64,25] The IRA in the US exemplifies this approach by reshoring and 'friend-shoring' RE supply chains, aimed at reducing reliance on Chinese exports of RE, EVs and other green technologies.[65] However, as of 2024, RE supply chains are still heavily concentrated in China. To reduce their import dependence again, targeted and far-reaching industrial policies as in the US (or more recently in the EU) and a strategic focus on creating a 'circular economy' are needed, with recycling and re-using all RE and clean energy technologies as key policy targets. For example, batteries of aging EVs can be re-used for residential storage of solar-generated electricity,[66] while innovative and increasingly easy to recycle wind turbine blades could be used in different wind parks for many decades thanks to their longer lifetime.[67]

Figure 3:China's Investment Growth and GDP Growth by Sector in 2023



Source: Carbon Brief (2024)[56]

Case study: China's RE Capacity Growth and RE exports

To reach the target of tripling RE capacity by 2030, countries worldwide could learn various lessons from China, including on how to strike synergies between public and private sector engagement to foster rapid growth of installed RE capacity. In 2023, China was the primary catalyst behind the rapid expansion of RE generation capacity, particularly in solar and wind energy.[4,68] The country contributed a staggering 80% of the global increase in solar photovoltaic (PV) capacity and more than 60% of the growth in wind generation capacity.[69,70] China alone is also predicted to account for as much as 60% of new RE capacity to become operational by 2028.[4]

From 2010 onwards, China has shown an exponential increase in wind and solar power capacity, surpassing its 2020 target as early as 2017 to become the first country in the world to have over 100 GW of installed solar power capacity.[71] In June 2022, China published its 14th Five-Year Plan detailing its aim for 33% of electricity generation to come from RE sources by 2025, with more than half of it expected to come from solar and wind power. According to the IEA, for these two RE technologies, China is likely to reach its target of 1,200 GW five years earlier than planned, i.e., already by 2025.[72] Remarkably, in 2023, the capacity of solar PV installed in China matched the total installed worldwide in the previous year. China is further estimated to have the share of wind and solar capacity overtake that of coal for the first time in 2024, accounting for a combined 40% compared with coal's 37%.[73]

Furthermore, clean energy made a significant impact on China's economy, contributing a record RMB 11.4 trillion (USD 1.6 trillion) in 2023, which represented a larger proportion of economic expansion than any other sector (see Figure 3). With an investment of USD 890 billion in clean energy sectors, China nearly matched the total global investments in fossil fuel supply for the year (USD 1 trillion), or almost equivalent to the GDP of Switzerland or Türkiye.[56]

Dominating already over 80% of the global solar module manufacturing capacity,[74] China's stronghold in solar manufacturing is expected to keep increasing, making China the key player in meeting the global target of tripling RE by 2030. Behind this expanding leadership is China's investment and export finance support to RE, especially demonstrating an increasing share of overseas RE investment. For example, in 2023, China provided an additional USD 7.9 billion for RE-related investment projects and construction contracts via the Belt and Road Initiative (BRI), the world's largest infrastructure investment programme that progressively phases down fossil fuel investments.[75,76] Under the BRI, another important transition-related area is China's investment in metals and mining (including of critical minerals which are key to energy transitions) and which surged to USD 19.4 billion in 2023 with a 158% increase from the previous year.[77] To effectively stimulate the global energy transition, therefore, it is crucial for countries worldwide to scale up RE investments – across its entire supply chains – and amplify support measures, such as those implemented by China.

The Chinese government has played different roles in scaling up RE, effectively utilising a combination of policy frameworks, regulatory incentives, and significant financial support. As a top-down approach, strategic initiatives on RE development and technological innovation in the energy sector are outlined in China's five-year plans. This top-level policy enables effective cross-ministry and cross-department collaboration, which has resulted in a boom of supportive RE policies (see Table 1). Together, these policies have been creating a fertile environment for RE advancements, particularly for technological innovations including EVs and lithium batteries.

Meanwhile, private companies like BYD and LONGi have been at the forefront of these innovations, driving down costs and enhancing efficiency, as well as attracting substantial investment worldwide, which in turn encouraged the Chinese government to further strengthen support. By creating such a virtuous cycle, China's holistic approach of leveraging both governmental support and private enterprise innovation offers a blueprint for other countries worldwide.

Table 1: Selected RE Policies in China, 2019-2024

Year	Policy name	Department
2019	Establishing and Improving the Renewable Energy Power Consumption Guarantee Mechanism	NDRC, NEA
2020	Guidelines on Promoting the Healthy Development of Non-Hydropower Renewable Energy Generation	MOF
2021	Guidance on Accelerating the Development of New Energy Storage	NDRC, NEA
2021	Guiding Increased Financial Support to Promote the Healthy and Orderly Development of Industries such as Wind and PV Power Generation	NDRC
2022	Continuing the Policy of Grid Parity for New Wind and Photovoltaic Power Generation Projects in 2022	NDRC
2022	Planning of large-scale wind power and solar PV bases in deserts and wasteland areas	NDRC, NEA
2023	Promoting Renewable Energy Power Consumption with Full Coverage of Green Electricity Certificates	NDRC, NEA, MOF
2023	Supporting the Development of the PV Power Generation Industry by Regulating Land Management	MNR, NFGA, NEA
2023	Guidance on Promoting the Recycling of Retired Wind and PV Equipment	NDRC, NEA
2023	Implementation of Accelerating the Construction of Charging Infrastructure to Better Support EV in Rural Areas and Rural Revitalization	NDRC, NEA
2024	Measures for the Supervision of Full Guaranteed Purchase of Electricity from Renewable Energy	NDRC

Notes: *National Development and Reform Commission (NDRC), National Energy Administration (NEA), Ministry of Finance (MOF), Ministry of Natural Resources (MNR), National Forestry and Grassland Administration (NFGA)*

Source: Compiled by the authors, based on the State Council of China (2024)

What is more noteworthy is China's efforts in synergising land management and RE deployment which further stimulates investment. By streamlining land approvals, this approach not only prioritizes RE projects over other land developments in certain areas, but also reduces the bureaucratic hurdles that often delay such initiatives. This alignment aims to encourage investment by ensuring that land is readily available for RE initiatives, thereby mobilising private sector resources. For example, in February 2022, the NDRC and NEA announced plans to promote the construction of large-scale wind power and solar PV bases in the desert Gobi and wasteland areas of Northern China. By greenlighting the land use of RE projects in these areas, China can not only maximize the desert's high solar radiation, but also encourage companies to invest in the vast stretches of affordable land, contributing to the target of 455 GW of newly installed capacity (wind and solar) by 2030.[78] This land-focused strategy carefully balances RE expansion with other land uses such as agriculture through targeted zoning regulations and permission greenlight, playing a pivotal role in promoting investment in China's energy transition.

CONCLUSION

RE has experienced unprecedented growth over the past two decades. However, to meet the COP28 target to triple global RE capacity by 2030, scaling up both public and private RE investments remains the key challenge. By channelling investments effectively, countries can overcome substantial barriers such as supply chain disruptions and globally uneven RE investment flows.

Further RE installation growth requires targeted policy support such as continued or even expanded subsidies and public guarantees to address rising interest rates. China's model shows the effectiveness of integrating top-down strategic policies with industrial innovation, serving as a blueprint for other countries. Additionally, as demonstrated by the land focused RE policy in China, the adoption of multi-faceted policy toolkit can add great value in investment mobilisation. To achieve the ambitious COP28 target, countries worldwide should adopt and adapt the best practices, significantly ramping up investments in RE. This will not only contribute to achieving global (and national) climate goals, but bring with it significant economic, financial, industrial and security benefits.

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As the world grapples with the consequences of anthropogenic emissions, the Middle East, and North Africa (MENA) region stands at a critical juncture.

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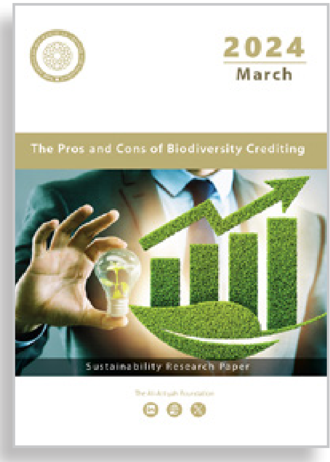

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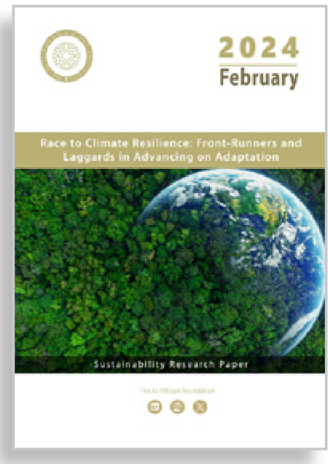

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