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BEYOND CLIMATE

Renewables as a Strategic Imperative in an Uncertain World

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Abstract

This thought leadership document explores the economic and strategic imperatives driving the transition to renewable energy, drawing from an in-depth discussion with Dr. Bart Boesmans, Advisor at ACWA Power, and an expert in the renewable energy sector. The insights provided by Dr. Boesmans have shaped the foundation of this document, which offers a comprehensive perspective on how the renewable energy shift is evolving from a climate-first agenda to a central pillar of economic strategy. As the renewable energy sector continues to mature, its role in driving global economic resilience, energy security, and industrial competitiveness has become more evident. This document integrates these insights into a holistic view of the renewable energy transition, highlighting its economic advantages, speed of deployment, and resilience benefits.

The views expressed here are Dr. Bart Boesmans' personal insights and do not necessarily represent the official positions of ACWA Power.

About MP Perspectives

The MP Perspective Series curates insights from conversations with leading thinkers across Management Partners and MP-Connect's expert network. Rooted in real-world experience and strategic dialogue, the series explores the most pressing themes in economic development, corporate and public strategy, and business and technology transformation. From reimagining institutional roles in rapidly shifting economies to unlocking value through digital innovation and AI, each edition connects the dots between macro trends and actionable insights. Designed for decision-makers and forward-thinkers, the MP Perspective Series provokes new ideas, challenge assumptions, and illuminate pathways toward more resilient and future ready organizations.

About the Expert

Dr. Bart Boesmans is the Former Chief Technical Officer at ACWA Power, a leading global player in renewable energy and water desalination solutions. With nearly 30 years of experience, he has held pivotal roles in engineering, operations, R&D, and business development, shaping ACWA Power's growth in the Middle East and internationally.

Before joining ACWA Power, Bart held senior positions at ENGIE (formerly GDF SUEZ), where he contributed to both renewable and conventional energy projects. His leadership has been instrumental in the development of large-scale solar, wind, and water desalination projects that are driving economic growth and energy security in fast-growing markets.

Dr. Boesmans holds a PhD in Energy Systems and a Master's degree in Electromechanical Engineering from the University of Leuven, Belgium. He is also a visiting professor at the University of Leuven, where he shares his expertise in power generation and renewable energy.

His work has positioned him as a key thought leader in the energy sector, blending technical expertise with strategic vision to advance sustainable energy solutions. Fluent in English, French, and Dutch, Dr. Boesmans brings a global perspective to his leadership and innovation in the renewable energy industry.

Executive Summary

The renewable energy transition has evolved significantly from its origins as an environmental necessity to become a critical economic and strategic opportunity. What began as a moral choice driven by environmental concerns, particularly the depletion of finite resources and the impact of issues like acid rain, has evolved into an essential driver of economic growth, national energy security, and global competitiveness. As the climate crisis gained prominence, this foundation has grown, reinforcing renewables as a strategic economic asset.

The transformation in renewable energy is clear, with global weighted avg. LCOE for utility-scale solar dropping to $43/MWh in 2024 from over $350/MWh in 2009, and onshore wind reaching $34/MWh. In contrast, fossil fuels, like coal and gas, have seen modest reductions, with gas peaking plants still expensive. The Middle East offers an even more promising scenario, with record-breaking PPAs. UAE's Al Dhafra Solar PV project set a global benchmark at $13.5/MWh, while Saudi Arabia's Al Sadawi Solar PV and Fasiliyah PV projects achieved tariffs of $12.9/MWh and $10.4/MWh, respectively, highlighting the region's leadership in affordable renewable energy.

This economic shift has been facilitated by advances in modular technology. Solar panels and wind turbines, once massive, bespoke projects, are now produced in large-scale, modular forms, allowing for rapid deployment and cost reductions similar to the automotive and electronics industries. These developments have led to an acceleration in corporate adoption, with companies like Amazon and Microsoft securing billions of dollars in renewable energy contracts to power their data centers and reduce their exposure to energy price volatility.

Renewables are reshaping industrial geography. Regions that offer abundant renewable resources are becoming the new industrial hubs, attracting energy-intensive industries such as steel, chemicals, and data centers. The speed at which renewables can be deployed—often within 1 to 2 years, compared to the 5 or more years required for gas plants and up to 20 years for nuclear—makes them an attractive solution for fast-growing economies.

The resilience provided by renewable energy is another key benefit. As the world becomes increasingly vulnerable to energy price shocks and geopolitical instability, renewables offer a solution that is both reliable and locally sourced. With energy sovereignty becoming a critical priority, countries are turning to renewable energy not only to reduce reliance on imported fuels but also to strengthen their national energy security. Once a renewable energy asset is built, it provides a fuel-free source of power that can operate independently of global energy markets, insulating economies from supply disruptions and geopolitical risks.

The next step is for governments, businesses, investors, and industries to seize the advantages offered by renewables. While renewables no longer require direct financial incentives or subsidies, policymakers must create stable, long-term regulatory frameworks that focus on elements such as permitting, grid access, and market access to incentivize renewable adoption. Additionally, investments in grid infrastructure and energy storage are essential to support the transition. Corporate leaders should align their energy strategies with renewable energy, securing long-term contracts and ensuring energy resilience in the face of market volatility. Investors can target stable-policy markets that support the growth of renewables and their integration into national grids. Industry leaders must shift the narrative from subsidy dependence to positioning renewable energy as essential infrastructure that drives national competitiveness, industrial growth, and job creation

The renewable energy transition has already moved from being a climate-first solution to becoming an economic imperative. It is no longer about whether renewables should be adopted, but how quickly stakeholders can align their strategies to capture the full potential of this generational opportunity. As the world accelerates toward an energy future defined by renewables, the opportunities are vast, but the window to act is limited. Dive deeper into this transformative journey to understand how you can position yourself to capture the full value of the renewable revolution. The time to act is now, and the path forward is clear.

Contents

1. From Climate Imperative to Economic Engine

For decades, renewable energy was presented as a moral choice: an act of environmental responsibility, a way to decarbonize and mitigate the looming threat of climate change. While this framing succeeded in mobilizing early supporters, it has become increasingly insufficient. The energy landscape has changed dramatically. What began as a climate-first movement has evolved into an economics-first transformation, driven by a confluence of cost breakthroughs, technological innovations, and strategic imperatives. Today, renewables are not simply about doing the "right thing" for the planet—they are about securing competitive advantage, driving economic growth, and building resilient energy systems.

Renewable energy's roots extend beyond climate change, originating in the mid-20th century amid growing concerns about the exhaustion of finite fossil fuel resources and environmental degradation from industrial activities. Issues such as acid rain, smog, and pollution raised alarm about the unsustainable nature of conventional energy systems. Initially, renewable energy was seen as a way to reduce dependence on exhaustible and polluting fuels, with its environmental benefits seen as a secondary, but important, consideration. As the effects of climate change became increasingly undeniable, the renewable energy sector was increasingly recognized for its potential to address this urgent challenge, solidifying its place as a central strategy for economic, security, and sustainability goals

1.1 Driving Down Costs with Modular Advantage

The most profound transformation in the energy landscape is the rapid, sustained decline in renewable energy costs. Over the past decade, solar photovoltaics (PV) and onshore wind have

achieved one of the most dramatic cost reductions in modern industrial history. Solar PV costs have fallen by around 75% in just ten years, while wind has followed a similar trajectory. These declines were not minor, incremental gains—they reflect a structural shift in how energy is produced, financed, and scaled.

"The primary driver for renewables has shifted from environmental concerns to economic and strategic advantages."

The traditional model of energy generation was based on the logic of "big iron": centralized coal, gas, or nuclear plants delivering economies of scale through bespoke, site-specific construction and better thermodynamic efficiency. These projects took years, sometimes decades, to plan, finance, and build. Renewables have rewritten that logic through modularity. A single solar module currently is less than 1 kilowatt, and a typical wind turbine is a few megawatts. But when produced at industrial scale—hundreds of thousands of solar panels rolling off automated assembly lines, or thousands of wind turbines delivered annually—they add up to gigawatt-scale power at extraordinary speed.

This is not just a story of technology; it is a story of manufacturing. By shifting cost savings from

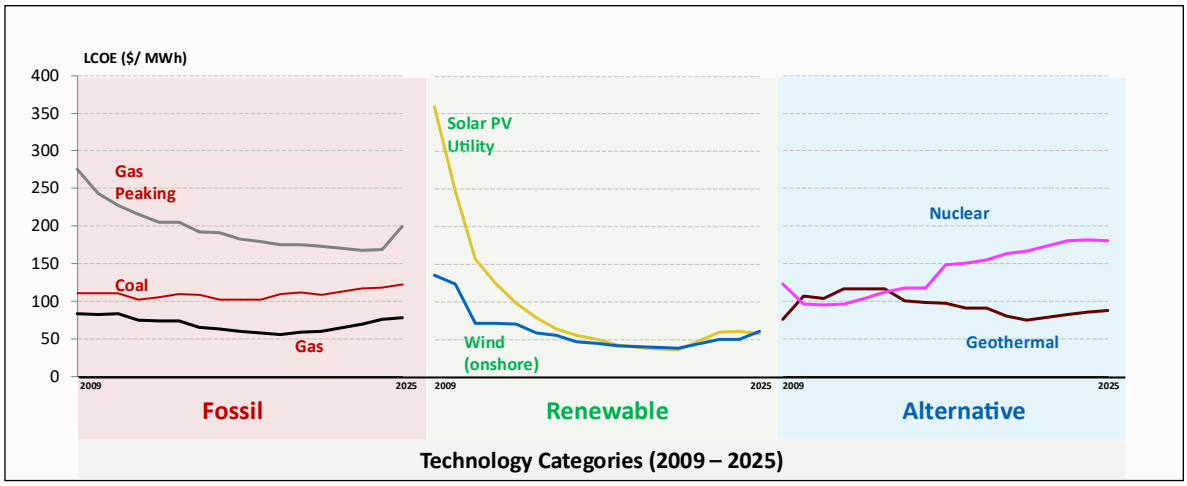


Exhibit 1: Plummeting Cost of Renewable Energy: Levelized Cost of Energy Comparison (LCOE)—Historical Comparison[5]

site-level engineering to supply chain scale, renewables mirror the economic logic of the automotive and electronics industries. Just as mass production brought down the cost of cars, computers, and smartphones while raising quality, modular renewable technology has unlocked predictable, repeatable declines in unit costs.

The outcome in energy is transformative, Exhibit 1 illustrates the dramatic shift in the Levelized Cost of Energy (LCOE) over the past 15 years, comparing between fossil, renewable, and alternative technologies. The data highlights one of the most powerful trends driving the renewable energy transformation: a steep decline in the cost of solar PV and onshore wind, significantly outpacing cost reductions in fossil-based generation.

In 2024, global weighted avg. LCOE[1] for utility-scale solar panel costs have fallen to $43 per MWh, compared to over $350 per MWh in 2009. Similarly, onshore wind has achieved competitive pricing around $34 per MWh, showing substantial cost reductions. In contrast, coal and gas have experienced only modest reductions in cost, with gas peaking plants still remaining significantly more expensive. This reinforces the point that renewables, such as solar and onshore wind, are not just environmentally preferable—they are now the most cost-competitive option for new power generation in many global markets.

A closer look at the Middle East region suggests an even promising situation than the global average, with multiple record-breaking PPAs[1] being signed across the UAE and Saudi Arabia. In the UAE, the **Al Dhafra Solar PV project** set a global benchmark with a tariff of just **$13.5/MWh** for its 2 GW capacity, while the **Mohammed bin Rashid Al Maktoum Solar Park – Phase 6** achieved one of the lowest tariffs for utility-scale solar at **$16.2/MWh** in 2023. These prices highlight the region's leadership in cost-competitive solar energy. In Saudi Arabia, projects like the Al **Sadawi Solar PV project**, with a tariff of **$12.9/MWh** for its 2 GW capacity, and the **Fasiliyah PV independent power producer project**, with a tariff of **$10.4/MWh** for 600 MW, world-record low tariff, further underscore the Middle East's position as a global hub for affordable, renewable energy. These developments not only drive energy transition but also foster economic growth, setting the Middle East apart as a leader in renewable energy deployment and market competitiveness. Additionally, Saudi Arabia has also signed significant **wind PPAs**, such as the **Dumat Al Jandal Wind Project**, with a tariff of **$19.9/MWh** for 400 MW, demonstrating the region's commitment to diversifying its renewable energy portfolio.

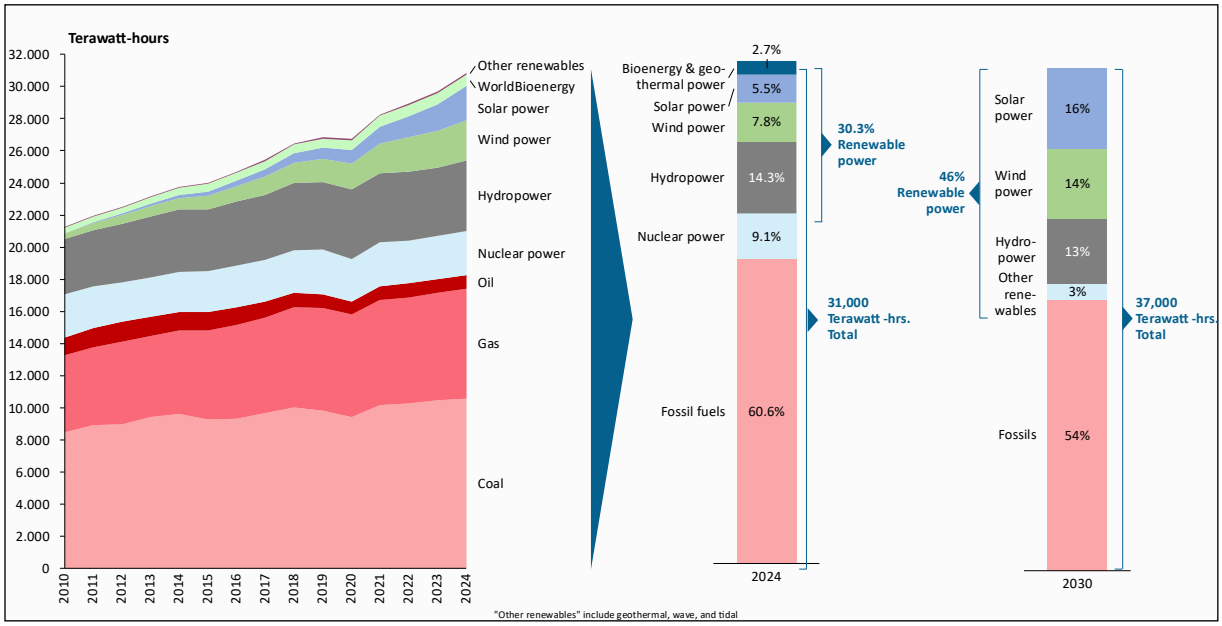


Exhibit 2. Energy mix curve. Electricity production by source, world (terawatt-hours)

"Renewables completely changed the approach to energy generation by introducing modular technology. Instead of large plants, you can now build very large projects using small components… a wind turbine today is typically only a few megawatts, and a solar module is less than 1 kilowatt… This shift to modular technology is the main reason for the success of renewables as it leads to huge scale advantages in manufacturing and to fast and flexible deployment."

The combination of modular design, industrialized production, and declining financing costs has created a new baseline: renewables are no longer a premium alternative; they are the default choice in many markets. As grid operators, investors, and corporate buyers increasingly recognize, the economics-first argument is decisive. Businesses and governments are no longer choosing renewables out of altruism, but because they are the most competitive option.

1.2 Embracing Abundance by Capitalizing on Surplus

The second transformative dynamic is the move from scarcity to abundance. For more than a century, energy strategy revolved around scarcity: limited reserves of coal, gas, or oil; exposure to supply disruptions; and the need to ration finite resources. Renewables have upended this paradigm. In regions with strong solar irradiation or steady wind resources, electricity is now produced in surplus, particularly during peak production hours.

This surplus changes everything. Energy planning is no longer about managing shortages—it is about capturing and monetizing abundance. Businesses that can shift operations to coincide with low-cost renewable supply are realizing competitive advantages. Industries that depend heavily on electricity, such as data centers, aluminum smelters, and chemical producers, can secure cheap, predictable energy supply and improve their global cost positioning.

Abundance also redefines siting strategies. Instead of locating industries near fossil fuel

deposits, ports, or pipelines, the new logic is to site industries near renewable hubs. Entire industrial clusters may emerge around these hubs, much like cities once formed around waterways, coal seams, or railroads.

In 2023, 81% of new renewable capacity globally delivered electricity cheaper than fossil alternatives, proving that the so-called "green premium" has flipped to a "green discount"[2].

Exhibit 2 highlights the ongoing shift in the global electricity mix, showing both the current state (2024) and the projected share by 2030. The chart makes clear that renewables are no longer marginal contributors—they already account for 30.3% of global electricity generation today and are projected to grow to 46% by 2030. Within that mix, solar and wind are the fastest-growing sources, expected to rise from a combined 12.8% in 2024 to 30% by 2030. This trend is driven by two reinforcing dynamics: rapidly falling costs (as shown in Exhibit 1) and expanding deployment capacity enabled by modular technology and storage integration. As fossil fuels' share declines from 60.6% in 2024 to 54% by 2030, the growth in renewables will be the defining feature of the coming decade's energy landscape.

"Renewables are now an abundantly available and very low-cost form of power generation."

The strategic implications of abundance ripple across both corporate and national agendas. For companies, abundant renewables create a hedge against volatility and provide a platform for electrification. For nations, they reduce dependency on imports, improve trade balances, and strengthen sovereignty. The surplus is not a problem to manage but an opportunity to capture—through storage, flexible demand, and new industrial models.

1.3 Unlocking Potential via The Storage Solution

While abundance is transformative, it creates a challenge: variability. Without mechanisms to store or shift surplus electricity, grids risk instability, and market spot prices can fall to zero or even negative during peak generation. Storage resolves this by turning variability into reliability, enabling renewables to power critical loads day and night.

Battery storage is following the same cost curve that solar experienced a decade ago. Lithium-ion battery container prices fell over 20% in 2024 alone, reaching below $100/kWh—the steepest decline since 2017[3]. Importantly, large-scale storage projects can be built within one to two years, far faster than traditional thermal plants, allowing rapid scaling alongside renewable deployment.

Storage not only stabilizes grids; it unlocks new business models. Companies can use batteries for peak shaving, arbitraging electricity costs by storing cheap surplus power and consuming it during high-tariff periods. Microgrids, enabled by storage, allow factories, campuses, and even neighborhoods to operate independently during wider grid disturbances. For investors, storage creates new opportunities in infrastructure finance, complementing generation assets with firming capacity.

Global pledges aim for 1,500 GW of energy storage and 25 million km of new or updated transmission lines by 2030. The COP29 Global Energy Storage and Grids Pledge—endorsed by 65 countries and over 100 non-state actors—commits to doubling global grid investments and accelerating storage deployment as critical enablers of the renewable transition[4].

"Energy storage, particularly battery technology, is critical for enabling higher penetration of renewables and is following a similar cost-reduction trajectory as solar PV. The same is true for energy efficiency technologies. Renewables, storage and energy efficiency should be seen together."

Storage is thus the bridge between abundance and reliability. It ensures that the advantages of cheap renewable energy are not lost in volatility but captured in stable, predictable supply. For businesses, it means continuous operations and predictable costs. For governments, it provides the confidence to accelerate renewable targets without risking grid reliability. For the global energy system, it represents the final piece in the puzzle of making renewables the backbone of modern economies.

2. Seizing the Business & Industry Opportunity

For corporate leaders, the renewable energy transition is no longer about fulfilling environmental obligations or securing regulatory approval; it is now about securing competitive advantage. With renewables' cost-effectiveness and scalability, companies have an opportunity to transform their business models, ensuring cost leadership, operational flexibility, and long-term market positioning. For both enterprises and governments, the renewable shift presents a chance to redefine energy strategy and achieve lasting economic resilience.

2.1 Accelerating Growth Using The Speed Advantage

The renewable energy sector's remarkable ability to scale quickly is one of its most attractive attributes. Unlike traditional energy sources—where gas plants take up to five years to develop and nuclear plants can take 10 to 20 years—renewables can be deployed at scale within a few years, depending on how fast permitting is done, in Middle East this is well organized and quick where as in other places this can be a process taking years. This swift deployment is essential for fast-growing industries and economies where energy demand is rising rapidly and where delays in power procurement can mean lost billions.

The speed advantage that renewables offer lies not only in their construction timelines but also in their flexible deployment model. Solar and wind projects do not require the immense, bespoke engineering efforts of conventional power plants. Instead, these projects leverage modular technology—standardized components that can be rapidly assembled, similar to how automobiles or smartphones are produced in vast numbers. This flexibility gives businesses the ability to quickly lock in power at favorable prices, ensuring cost stability and predictability—key

factors in industries like data centers, which rely on cheap, constant electricity to operate.

In fact, the accelerating trend in Corporate Power Purchase Agreements (PPAs) reflects this advantage. Corporates, particularly in energy-intensive sectors like technology and manufacturing, are increasingly securing long-term, fixed-price contracts with renewable suppliers. In 2024 alone, corporate PPAs surged to a record 62.2 GW, a 35% increase from the previous year[7]. This indicates that companies are looking to hedge against volatility by locking in energy prices for 10–20 years, far beyond the typical market price fluctuations. This shift is not just about sustainability goals but about securing long-term energy pricing certainty, which is particularly important in an era of fluctuating fossil fuel prices.

For industries with high electricity cost shares, such as data centers, steel mills, and chemical plants, this predictable, cost-stable energy becomes a strategic lever. As demand for digital services and high-performance computing rises, so does the need for power. Securing cheap, renewable power is no longer a luxury but a necessity for firms to stay competitive. By securing renewable energy contracts, businesses can protect themselves against future energy price hikes, making them less dependent on volatile fossil fuel markets.

"Renewables can be deployed at scale within 1 to 2 years, significantly faster than conventional gas plants or nuclear plants, making them ideal for fast-growing economies."

With renewable energy solutions increasingly becoming the preferred option for industrial operations, the long-term investment potential is clear. However, this speed is not just a benefit for corporate buyers—governments are also capitalizing on this quick deployment model. Governments that have embraced renewable energy projects are seeing faster economic growth, job creation, and national resilience in comparison to countries that are still dependent on slow-to-develop fossil-based infrastructure.

2.2 Unlocking Sector Potential with Renewables

For companies across multiple sectors, renewables represent a powerful tool for operational efficiency and market positioning. While the renewable transition initially gained traction in industries with high electricity demand—such as technology and manufacturing—its benefits are now expanding across all sectors, including transport, industrial heat, and hydrogen production. As electrification accelerates, companies in these sectors are increasingly turning to renewables as a means to achieve cost savings, improve operational flexibility, and decarbonize their operations.

The abundance of renewable power is crucial in sectors like steel, aluminum, chemicals, and data processing. These industries, which often rely on electricity for high-temperature processes, can now shift demand to times when power is cheap and abundant, such as midday in sunny regions or windy periods in others. This is made possible by the combination of renewables and energy storage systems. For instance, data centers can now move workloads from one geographical location to another to optimize for energy prices. Large cooling operations in industries like pharmaceuticals or steel manufacturing can shift energy demand to low-cost periods, taking advantage of solar or wind surplus. This practice is called load shifting, and it has allowed companies to reduce overall operational costs while maintaining a steady, predictable energy supply.

In fact, as demand for electricity grows, companies are increasingly turning to long-term renewable power contracts. For example, Microsoft contracted 19 GW of new renewables in 2024 across 16 countries to meet its increasing energy demands[8]. Similarly, Amazon remained the largest corporate buyer in 2024, with over 600 projects globally[9]. These companies are not simply buying renewable energy for environmental purposes but are making a strategic business decision to lock in energy costs that provide certainty for years to come. By hedging against rising energy costs, these companies can achieve better margins, more predictable cash flows, and long-term cost stability.

Global data center electricity demand will nearly double to ~945–1,000 TWh by 2030[10]. This increase underscores the growing importance of renewable energy sources to meet the growing energy needs of these energy-intensive facilities. As data centers continue to expand rapidly, their energy consumption will drive the demand for clean, reliable energy sources that can meet the electrification needs and long-term stability required by the sector.

"The attractiveness of renewable energy for industries is influenced by three main factors: energy cost, share of electricity in your overall energy consumption, and the ability to shift energy consumption to times when energy is cheap and abundant."

Exhibit 3 illustrates how global electricity consumption is set to accelerate as new demand centers emerge, creating both opportunities and pressures for energy strategy. Between 2023 and 2050, total power demand is projected to grow at +3.5% per annum, reaching 64,000 TWh.

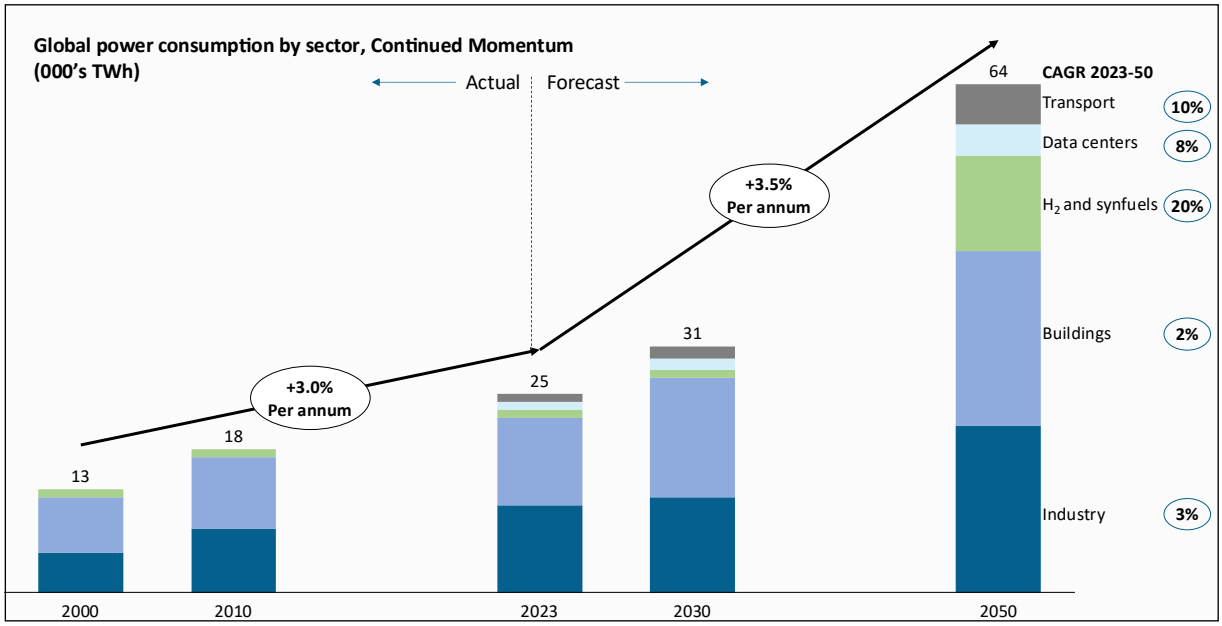


Exhibit 3: Growth in electricity consumption by industry is expected to accelerate as new demand centers emerge[11]

The fastest-growing segments are hydrogen and synthetic fuels (+20% CAGR), transport (+10% CAGR), and data centers (+8% CAGR)—all sectors where high electrification and operational flexibility make renewables a natural fit. This trajectory amplifies the relevance of renewables in corporate strategy: industries with large and growing electricity demand can hedge cost volatility, secure supply, and improve competitiveness through long-term renewable power contracts. For sectors like data centers, steel, and hydrogen production, aligning expansion plans with low-cost renewable hubs will be a decisive factor in future profitability. This rapid and concentrated growth in electricity demand will not only reshape the competitive landscape—it will also determine the geography of industrial and digital infrastructure. As power-intensive sectors expand, the availability of cheap, reliable renewable energy will increasingly dictate where production sites, data centers, and hydrogen hubs are located.

2.3 Leveraging Energy Hubs to Re-design Siting

The geography of energy production is undergoing a significant transformation. Just as ports and railroads once defined the locations of industrial and economic activity, today, renewable energy hubs are becoming the driving force behind industrial siting decisions. With the dramatic reduction in the cost of energy from solar and wind, businesses now have the ability to locate their operations closer to abundant renewable resources, rather than near traditional energy infrastructure like oil fields or gas pipelines.

The growth of renewable energy hubs offers companies in energy-intensive industries—like steel and data centers—the chance to rethink their location strategy. Instead of relying on the expensive and volatile energy markets that come with traditional fossil fuels, businesses can now situate themselves in areas where energy costs are low and reliable. These hubs, which are often located in regions with optimal renewable resources, such as sunny deserts or windy plains, offer the promise of cost stability and predictable energy supply.

"Renewables should be positioned as an economic opportunity for businesses—creating growth, lowering long-term costs, and enhancing energy security"

For example, Dubai's largest solar-powered data center is owned by Moro Hub, a subsidiary of Digital DEWA, demonstrating how businesses are leveraging cheap renewables for sustainable and efficient operations. Similarly, China's first commercial underwater data center, developed by Shanghai Hicloud Technology Co., utilizes wind energy and seawater cooling, further highlighting how industries are now co-locating in renewable energy hotspots.

The potential to reduce operational costs while enhancing sustainability is reshaping the way companies think about energy consumption. However, energy hubs are not limited to data centers. For industries like steel, the increasing reliance on green hydrogen for low-carbon steel production has made it crucial for companies to rethink their energy sourcing strategy. Instead of building production plants near consumers, companies are considering whether it is more cost-effective to build factories close to renewable energy sources and transport the finished product.

The role of microgrids in this transformation is also pivotal. Microgrids allow industrial sites to operate independently from the main grid in case of disruptions. These decentralized, self-sufficient systems are gaining traction in regions that are integrating renewables. Industries can now secure reliable and low-cost energy while ensuring continuity of operations. This flexibility in energy sourcing and delivery is positioning renewables as the cornerstone of future industrial development.

3. Resilience, Risk Mitigation & Energy Security

In a world marked by volatile fuel markets, shifting trade alliances, and concentrated supply chains, renewable energy is quickly becoming a cornerstone of both national resilience and corporate risk management. As businesses and governments face increasingly unpredictable external shocks—from geopolitical tensions to policy changes—renewables offer a stable, resilient energy source. By reducing dependence on volatile fossil fuel markets and decentralized supply chains, renewables provide a strategic hedge against global economic uncertainty.

The focus now is not just on energy generation, but on how renewables enable energy security, strengthen supply chains, and mitigate risk. The transition to renewable energy must be understood within the context of a rapidly changing geopolitical landscape, where resilience and security are becoming just as critical as cost-effectiveness.

3.1 Achieving Energy Sovereignty

At its core, energy sovereignty is about control—control over a nation's energy supply, independence from foreign imports, and resilience against external shocks. Unlike conventional fossil fuel plants, which require regular shipments of fuel, renewable energy—once built—is essentially fuel-free. A solar farm or wind turbine is independent of global markets and can be operated indefinitely, providing an important buffer against price volatility and geopolitical tensions. This creates significant strategic value for countries that rely heavily on imports for energy.

The shift towards renewable energy allows countries to reduce their dependence on imported fuels, improving their trade balance and insulating their economies from geopolitical disruptions. Unlike oil and gas, which can be affected by sanctions, trade wars, and supply

chain disruptions, renewables are resilient because they are locally sourced and self-sustaining. Once a renewable energy project is built, it is in the hands of the nation, reducing its exposure to external supply chain risks and providing energy security for the long term.

For many countries, particularly those with abundant natural resources such as solar radiation and wind, the move toward energy independence has become a key pillar of their national strategy. By investing in renewables, these nations are positioning themselves not only as energy producers but as energy sovereigns—secure from the risks of supply disruption and able to foster economic growth without relying on foreign energy imports.

The European Union, for example, has tied its renewable energy transition directly to strategic autonomy. The EU Renewable Energy Directive targets 42.5% renewables by 2030, aiming for 45%, with renewable energy seen as a key component of Europe's broader energy security strategy. In 2024, solar produced 11% of the EU's power, surpassing coal for the first time and underscoring the growing importance of renewables in national energy security[12].

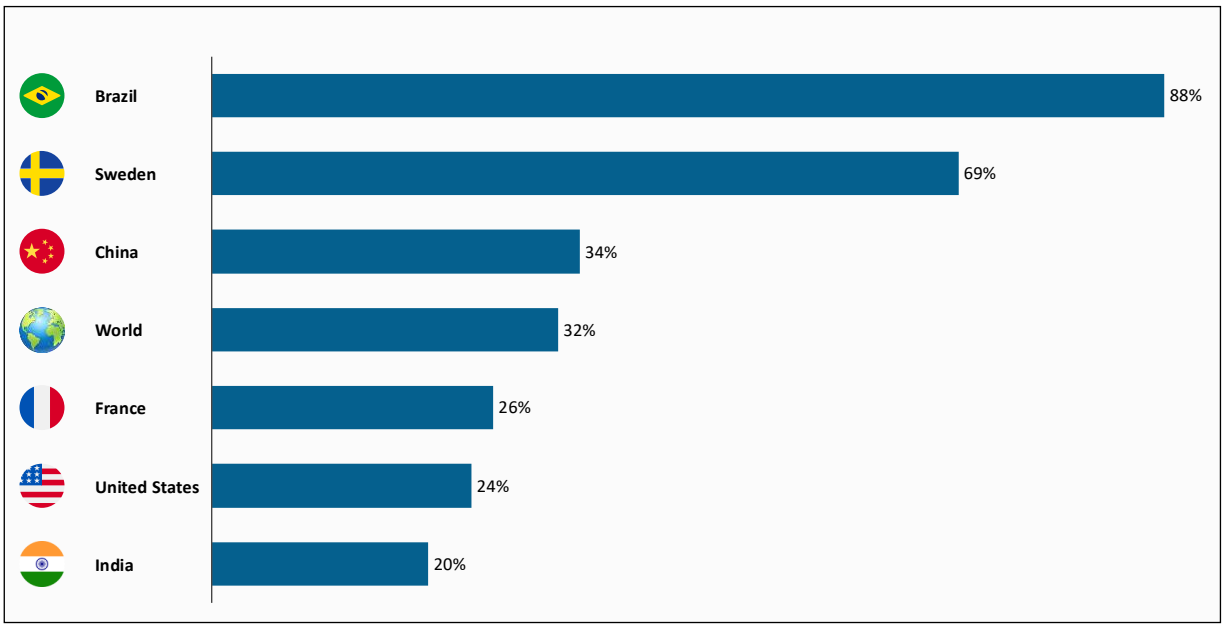


Exhibit 4: Top countries by share of electricity from renewable sources (Renewables include solar, wind, hydropower, bioenergy, geothermal, wave, and tidal), 2024[16]

Exhibit 4 provides a snapshot of the share of electricity generated from renewables across major economies in 2024. While the global average sits at 32%, leaders like Brazil (88%) and Sweden (69%) demonstrate what is possible when renewable generation, including hydropower, solar PV, and wind, is prioritized and integrated effectively into national grids. Hydropower makes a large contribution to low-carbon electricity across the world, accounting for around one-sixth of global production. China already derives 34% of its electricity from renewables, with hydropower making up a significant portion, while the United States and India remain at 24% and 20%, respectively. This variation underscores the link between renewable penetration, which includes hydropower, and energy sovereignty: countries with higher renewable shares are less dependent on imported fuels and more resilient to global price and supply shocks. For nations lagging, accelerating renewable adoption—especially hydropower—is not just an environmental objective; it is a strategic move to secure domestic supply and shield economies from geopolitical volatility.

For businesses, energy sovereignty through renewables ensures that energy supply remains stable and predictable, with less reliance on volatile fuel prices and geopolitical events. Renewables allow companies to secure long-term, predictable energy costs, reducing exposure to the risks that often accompany fossil fuel supply chains.

"Renewable energy significantly enhances national energy security and resilience. It reduces dependency on imported fuels, insulating a country's economy from geopolitical tensions and price volatility."

Countries with higher renewable shares are less dependent on imported fuels and more resilient to global price and supply shocks. For nations lagging behind, accelerating renewable adoption is not just an environmental goal—it is a strategic move to secure domestic supply and shield economies from geopolitical volatility.

3.2 Strengthening Operations with Renewables

In addition to securing national energy supply, renewables also enhance business continuity by providing resilient infrastructure. As supply

chains become more globalized and interconnected, the risks of grid disruptions and physical attacks on centralized infrastructure increase. The decentralized nature of renewable energy helps reduce the risks associated with these vulnerabilities. Solar panels, wind turbines, and battery storage systems, when deployed on a large scale, are inherently more resilient than traditional energy infrastructure, which relies on a few large, centralized plants.

For businesses, this resilience means greater reliability in operations. Energy-intensive industries, such as mining, manufacturing, and data processing, which rely on uninterrupted power supply, benefit significantly from distributed renewable energy. These industries are increasingly turning to microgrids—localized energy systems powered by solar and battery storage—to ensure continuity of operations during grid disturbances. A microgrid can operate independently from the main grid, allowing critical operations to continue even when external energy supplies are disrupted. This self-sufficiency is becoming an essential component of business resilience.

"Renewables are actually increasing our security of supply... once your plant is built, it's in your hands, it's yours, and renewable energy equipment manufacturing, while dominated by Chinese companies, has a growing global footprint."

For example, South Africa's rooftop PV capacity grew from 2.3 GW in mid-2022 to 5.4 GW in early 2024[13], significantly helping to reduce load-shedding—scheduled power outages due to grid stress or fuel shortages. This increase in distributed generation is reducing the country's reliance on fossil fuels while also improving the reliability of the power supply. Similarly, in U.S. industrial sectors, microgrid deployment for commercial and industrial users grew significantly in 2024, as firms sought to "bring their own power" to ride out outages and price shocks. By incorporating renewable energy into their operations, these industries not only reduce their exposure to volatile fuel prices but also increase their operational flexibility in response to unpredictable market conditions.

Renewables' distributed generation model provides an added layer of resilience that helps businesses future-proof their operations. Microgrids, backed by solar power and battery storage, offer energy independence in the face of external disruptions, ensuring that critical industries and operations remain resilient to grid disturbances. Furthermore, these modular assets are harder to disrupt than centralized plants, offering a level of flexibility and stability previously unavailable in fossil-based energy systems.

For governments, renewable energy can enhance national security by creating redundant and distributed systems that are far more resilient than traditional centralized grids. By supporting decentralized energy generation through renewables, nations can reduce vulnerability to attacks, natural disasters, or supply chain breakdowns. Governments that prioritize renewable energy systems will be better positioned to protect their populations and industries from energy insecurity.

3.3 Policy Stability as the Security Multiplier

While renewables provide the foundations for energy security, their potential cannot be fully realized without the right policy framework. Stable, bankable regulatory systems are critical for attracting investment in renewable energy projects. In the past, subsidies were needed to support the transition to clean energy. Today, however, renewables are increasingly competitive without subsidies. To ensure continued growth, governments must create long-term policy frameworks that guarantee stability for investors, producers, and consumers. This stability helps to reduce the perceived risks associated

with renewable energy projects, making it easier for investors to commit capital to large-scale deployments.

"Governments should set rational, long-term targets for the energy system (e.g., for 2030 or 2035) based on what is technically and economically optimal"

For example, countries like the United States and the European Union have recognized the importance of policy stability in ensuring the continued success of their renewable energy sectors. The U.S. has integrated renewable energy into its long-term energy strategy, aiming for 100% carbon-free electricity by 2035[14], however, the current administration's policy shifts may impact this trajectory. The rollback of federal tax credits for wind and solar projects and the withdrawal from the Paris Agreement signal a move away from previous clean energy commitments. These changes could influence the pace and scale of renewable energy adoption in the coming years. In Europe, the REPowerEU plan focuses on rebuilding energy systems to achieve energy security and resilience through renewables and energy efficiency. The stability provided by such national plans, which set clear policy goals and long-term targets, is essential for keeping capital flowing into the sector.

The importance of policy stability is particularly evident in the global renewable energy investment landscape. In 2025, global clean energy investment is projected to reach $2.2 trillion, approximately twice the investment in fossil fuels[15]. This reflects the increasing economic feasibility of renewables and the growing recognition that they are essential for long-term energy security.

Governments play a critical role in supporting the renewable transition by ensuring that their policy frameworks are aligned with the realities of energy markets. Creating a bankable, stable regulatory environment allows for the continued development of renewable energy projects and strengthens the resilience of national energy systems. For investors, this stability translates into lower risk profiles and greater investment confidence. For industries, renewables provide not only energy security but also the opportunity to reduce operational risks and capitalize on new growth opportunities in the energy market.

"Stable, long-term policy is considered more critical for investment than subsidies, which can be volatile and create risk."

4. Building a Unified, Economics-First Narrative

The renewable energy transition is no longer just about fulfilling environmental goals—it is about harnessing a strategic economic asset. The conversation has shifted, as renewables are increasingly understood as not just a climate solution, but as a driver of economic growth, job creation, energy security, and cost competitiveness. The biggest challenge for the renewable energy sector today is not technology or cost—it is narrative. To win the support of a broad range of stakeholders, renewables must be seen as a mainstream economic infrastructure rather than a subsidized niche sector.

For the renewable energy industry to reach its full potential, it must reframe the conversation. Governments, businesses, and investors all need to understand renewables not as a temporary solution to an environmental problem, but as a foundational component of a stable, low-cost, and resilient global economy. Renewables are now poised to be the core drivers of future economic growth, not just within energy sectors, but across industries.

4.1 Reframing for Broader Appeal

In order to bring renewable energy into the mainstream, the conversation must move beyond its environmental appeal. It must be reframed as national strength, industrial competitiveness, and job creation. Renewable energy must be viewed as a key lever in enhancing energy security, lowering operational costs, and creating new economic opportunities across industries. The shift from green premium to green discount has made it clear that renewables are no longer an expensive alternative—they are now the most cost-effective source of new energy production, particularly in the most promising geographies.

Governments are beginning to recognize the economic advantages of renewable energy as well. In 2024, solar surpassed coal for the first time in Europe, underscoring the fact that renewable energy has already become a mainstream energy source. The push to decarbonize is no longer framed as an environmental issue—it is now framed as a strategic priority for national economic competitiveness and energy independence.

One of the most compelling ways to broaden the appeal of renewable energy is by showing that it does not come at a high economic cost, but instead delivers tangible economic benefits. Take Texas, for example, where wind and solar already account for nearly 40% of the electricity supply[17]. This has helped reduce costs for residents while providing a solid foundation for new industrial investments in the state, even during periods of energy crisis. The state's experience demonstrates that renewables can be a pragmatic solution, capable of ensuring energy reliability while also creating opportunities for industrial growth.

In employment and job creation too, the clean energy sector is already a major driver of economic growth, employing nearly 35 million people globally. In 2023, the renewable energy sector saw a significant rise, with 16.2 million people employed, up from 13.7 million in 2022. For every dollar invested, renewable energy creates three times as many jobs as fossil fuels, and the

IEA estimates that the transition to net-zero emissions will result in a net gain of 9 million jobs. While around 5 million jobs in fossil fuel production may be lost by 2030, the clean energy sector is expected to create 14 million new jobs, with additional demand for 16 million workers in sectors like electric vehicles, hyper-efficient appliances, and hydrogen technology. By 2030, over 30 million jobs could be generated across clean energy, efficiency, and low-emissions technologies, underscoring the importance of a just transition that ensures no one is left behind[19].

As costs fall and demand becomes predictable, renewables are catalyzing the localization of manufacturing. Countries are tying clean power build-out to domestic value chains—pulling upstream and midstream production of modules, inverters, turbines, batteries, transformers, and cables closer to demand and resource hubs. This is not subsidy-first; it is economics-first: abundant, low-cost electricity plus stable policy creates bankable offtake that anchors factories, supplier ecosystems, and skilled jobs. The result is an accelerating onshoring trend—from the U.S., where clean-manufacturing announcements now number in the hundreds following recent policy signals, to Europe and India, which are scaling domestic solar and grid equipment to strengthen energy sovereignty and industrial resilience.

"The renewable energy industry has to understand that this industry has reached a point where the narrative has to change… it is now part of the mainstream."

The most effective way to communicate renewable energy's value is to highlight its impact on economic growth and industrial resilience. For example, in China, where the energy transition is happening at an unprecedented pace, solar energy is not just supporting decarbonization efforts—it is also bolstering the country's manufacturing base and creating millions of new jobs. By reframing renewables as economic infrastructure, the sector can gain the kind of cross-sector support needed for large-scale adoption across the globe.

For corporate leaders, the focus on economic outcomes—cost savings, predictability, and supply security—aligns well with their growth objectives. This shift from climate-first to economics-first allows renewable energy to appeal to business leaders who view economic stability and competitive advantage as the key drivers of decision-making.

4.2 The Next Infrastructure Moment

Just as railroads defined the industrial age in the 19th century, and the internet shaped the economic landscape of the 20th century, renewable energy is emerging as the backbone of 21st-century economic infrastructure. To continue progressing towards the global clean energy future, governments and industries need to recognize that renewables, grid infrastructure, and domestic manufacturing are not separate sectors—they must be treated as a unified, integrated economic strategy. This integrated approach will allow countries to build a foundation that is economically resilient, energy-secure, and sustainable.

"Policymakers need to create a framework that not only allows renewables to compete but ensures that it is seen as the foundation of economic growth—offering long-term stability, job creation, and energy security."

The shift to clean energy manufacturing is already happening, and it's clear that this is not just a green movement, but an economic opportunity. In the U.S., clean manufacturing investment tripled from $2.5B in Q3 2022 to $14B in Q1 2025 with over 380 factory announcements since the IRA's passage[18]. With that, the U.S. is well on its way to becoming a global leader in clean energy manufacturing. Similarly, India and

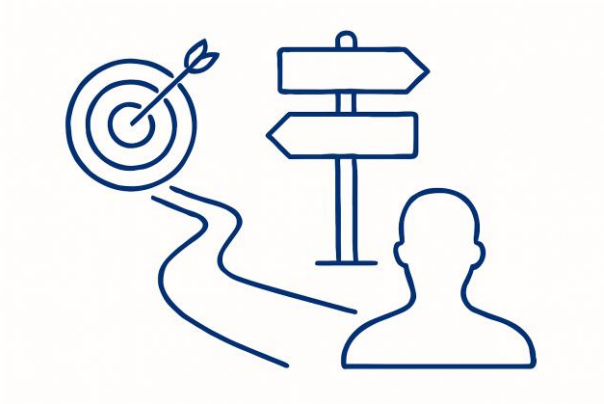
Europe are also ramping up domestic solar capacity with investments aimed at localizing production and ensuring energy sovereignty through domestic clean tech production. This surge in clean manufacturing is fueling the expansion of solar panel production and other clean technologies, creating new industries and jobs, particularly in states that have embraced renewable energy policies. As countries increasingly prioritize clean manufacturing, they are also creating a new competitive landscape, where energy-intensive industries like steel and data centers are incentivized to site themselves in regions with the most affordable renewable energy.

The rise of clean manufacturing is helping to position renewable energy as a national economic priority—not just a climate mitigation tool. For policy makers, this signals the need for long-term plans that align renewable energy development with the manufacturing agenda, ensuring that countries don't just consume clean energy but also become global players in its production.

The rise of clean energy manufacturing also signals a growing recognition that energy security is not just about the supply of energy but about who controls the production of the technologies required to build out that energy infrastructure. Countries that can domestically manufacture clean energy technologies, such as solar panels, wind turbines, and battery storage, will be in a much stronger position to ensure energy security, reduce trade imbalances, and create new jobs. By embracing renewable energy manufacturing as an essential part of their economic agenda, countries can turn the energy transition into a powerful engine of economic growth and industrial competitiveness.

5. Pathways Forward: Strategic Actions for Stakeholder

As the renewable energy transition accelerates, the question is no longer whether to act but how swiftly and effectively stakeholders can seize the opportunity. Renewables have already proven themselves as economic engines, and now the path forward is clear: stakeholders must align their strategies to capture the full potential of clean energy. Governments, businesses, investors, and industries all have a critical role to play in advancing the renewable energy agenda—not just for the environment but for long-term economic resilience, energy security, and global competitiveness.



1. Policymakers: Align Energy Strategy with National Interests

For policymakers, the first step is to lock in stable, long-term regulatory frameworks that enable the scale-up of renewable energy systems and infrastructure. A clear energy vision for the future, with 2030–2035 targets, will guide market development and attract the capital needed to drive the transition. Governments must prioritize grid expansion, storage integration, and energy security alongside decarbonization goals. It is essential to create bankable policies that encourage investment, foster technological innovation, and ensure that renewables remain a mainstream economic pillar.

Actions for Policymakers:

- Develop coherent, long-term energy strategies that set clear targets for renewable energy adoption.
- Align national industrial policies with renewable energy goals to boost local manufacturing and job creation.
- Invest in grid infrastructure and storage solutions to support higher renewable penetration without compromising grid reliability.
- Provide policy stability that reduces risk for investors, ensuring a predictable and favorable environment for large-scale renewable energy projects.
- Foster public-private partnerships to accelerate the deployment of renewables in key sectors like transportation, heavy industry, and data centers.

2. Corporate Leaders: Lead the Charge for Cost-Competitive Energy

For corporate leaders, the renewable shift is about securing long-term competitive advantage. Renewables are no longer just a sustainability checkbox but a strategic asset for securing cost stability, enhancing operational flexibility, and positioning for future growth. Corporate leaders should integrate renewables into their core business models by securing long-term power purchase agreements (PPAs), optimizing energy procurement strategies, and aligning their site selection with renewable energy hubs. Renewables offer the speed and cost advantages that are essential for companies navigating volatile markets.

Actions for Corporate Leaders:

- Secure long-term PPAs to lock in energy costs and reduce exposure to market volatility.
- Integrate renewables into supply chain strategies, ensuring cost-effective,

stable energy procurement for global operations.
- Prioritize site selection in areas with abundant renewable resources and favorable energy economics.
- Design flexible operations that can shift energy demand to low-cost periods, taking full advantage of renewable surplus energy.
- Leverage renewable energy investments as a key driver of cost leadership and competitive market positioning.

3. Investors: Target Stable, Resilient Energy Markets

For investors, the renewable transition is a unique opportunity to drive long-term value creation while reducing exposure to fossil fuel risks. The renewable sector offers low-cost, predictable returns and attractive long-term growth potential. To capture the full potential of clean energy, investors must target stable-policy markets, ensure strong grid readiness, and focus on infrastructure assets like storage and transmission lines. By aligning their portfolios with clean energy and sustainable infrastructure, investors can mitigate risk while supporting the global transition to energy sovereignty and economic resilience.

Actions for Investors:

- Invest in markets with stable regulatory frameworks and clear long-term energy targets.
- Support infrastructure development, including energy storage and grid modernization, to enable high renewable penetration.
- Incorporate renewable energy assets into portfolios, focusing on long-term, stable returns rather than short-term volatility.
- Identify and fund projects that align with energy sovereignty goals, such as distributed energy systems, microgrids, and domestic renewable energy production.
- Engage in public-private partnerships to accelerate the development of renewable energy projects in key growth markets.

4. Industry: Shift the Narrative from Subsidy Dependence to Economic Infrastructure

For renewable industry leaders, renewable transition presents an opportunity to redefine the value proposition of renewables. The industry must shift the narrative from subsidy dependence to mainstream economic infrastructure. Renewables should no longer be viewed as niche, dependent on government incentives, but as critical drivers of national competitiveness. This strategic reframing will broaden support across industries, sectors, and stakeholders. Industry leaders must take a proactive role in leading the charge for renewables, advocating for stable policies and grid investment, and positioning renewable energy as a key pillar of modern economic growth.

Actions for Renewable Industry Leaders:

- Shift the narrative from subsidies and climate optics to the economic benefits of renewables, such as job creation, cost reduction, and national resilience.
- Advocate for stable energy policies that support long-term renewable energy investments, ensuring that the sector's growth is sustained without policy volatility.
- Promote the economic value of renewables to stakeholders, framing them as drivers of industrial competitiveness and national economic strength.
- Support the development of energy hubs where industries can co-locate with renewable energy generation, reducing energy costs and strengthening supply chain resilience.

Conclusion: A Strategic Imperative for the Future

The renewable energy transition has moved beyond being a moral imperative for mitigating climate change—it has become a strategic inevitability for businesses, governments, and investors alike. Costs have plummeted, storage technology is enabling greater integration, and the resilience benefits of renewables are now widely recognized. The real question is no longer if businesses, governments, and investors should act, but how quickly they can seize the benefits of this generational opportunity.

For corporate leaders, the focus is on securing cost leadership and energy security through long-term PPAs and strategic siting. For policymakers, the emphasis is on creating stable, long-term regulatory frameworks that support the growth of renewables while fostering grid development and energy sovereignty. For investors, renewables provide a low-risk, high-return opportunity to future-proof portfolios against the uncertainties of fossil fuel markets. And for industry leaders, the call is to position renewables as mainstream economic infrastructure, vital to ensuring long-term success and competitiveness in a rapidly changing world.

The time for action is now. The renewable transition is not a distant goal but a rapidly unfolding reality. The question remains: how quickly can stakeholders embrace this shift and unlock its full potential for economic growth, resilience, and energy security? The path forward is clear, and the opportunities are limitless.

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Endnote

1.
    a. IRENA, 2024 LCOE: https://taiyangnews.info/business/irena-renewable-power-generation-costs-in-2024-report
    b. PPAs : https://renewablesnow.com/news/abu-dhabi-solar-project-of-2-gw-seals-ppa-at-record-low-tariff-707692/
    c. PPAs : https://www.dewa.gov.ae/en/about-us/media-publications/latest-news/2023/06/dewa-receives-the-lowest-bid
    d. PPAs : https://www.saudigulfprojects.com/2024/11/saudi-arabia-signs-9-3-billion-worth-ppas-for-9200mw-projects/
    e. PPAs : https://energy-utilities.com/saudi-arabia-achieves-two-new-world-record-solar-news111675.html
    f. PPAs : https://masdar.ae/en/news/newsroom/middle-easts-largest-wind-farm-marks-key-construction-milestone-with-arrival-of-first-turbines
2. Wave Hanson: https://wavehanson.com/investment-approach
3. BloombergNEF : https://about.bnef.com/insights/commodities/lithium-ion-battery-pack-prices-see-largest-drop-since-2017-falling-to-115-per-kilowatt-hour-bloombergnef/
4. Global Renewable Alliance: https://globalrenewablesalliance.org/signatories-cop29-global-energy-storage-grids-pledge/
5. Lazard, 2025: https://www.lazard.com/media/eijnqja3/lazards-lcoeplus-june-2025.pdf
6. IEA:
    a. https://ourworldindata.org/electricity-mix
    b. https://www.iea.org/data-and-statistics/charts/global-electricity-generation-by-renewable-energy-technology-main-case-2023-and-2030
    c. https://www.iea.org/energy-system/renewables
7. Global Renewable Alliance: https://globalrenewablesalliance.org/wp-content/uploads/2025/06/Corporate-Sourcing-Policy-in-Action.pdf
8. Microsoft, 2025 Environmental Sustainability Report: https://cdn-dynmedia-1.microsoft.com/is/content/microsoftcorp/microsoft/msc/documents/presentations/CSR/2025-Microsoft-Environmental-Sustainability-Report.pdf
9. Data Center Dynamics, Amazon: https://www.datacenterdynamics.com/en/news/amazon-was-the-largest-corporate-buyer-of-renewables-in-2024
10. Data Center Dynamics, IEA: https://www.datacenterdynamics.com/en/news/iea-data-center-energy-consumption-set-to-double-by-2030-to-945twh/
11. McKinsey & Company, Global Energy Perspective 2024: https://www.mckinsey.com/industries/energy-and-materials/our-insights/global-energy-perspective
12. European Commission: https://commission.europa.eu/topics/energy/repowereu_en
13. Biz News: https://www.biznews.com/energy/rooftop-solar-generation-doubled-two-years
14. IEA, 2024: https://www.iea.org/reports/united-states-2024/executive-summary
15. IEA, 2025: https://www.iea.org/reports/world-energy-investment-2025/executive-summary
16. Our World in Data: https://ourworldindata.org/electricity-mix
17. PV Magazine USA: https://pv-magazine-usa.com/2025/07/22/solar-wind-and-storage-reliably-power-texas-grid-during-unexpected-coal-shutdown
18. Rhodium Group : https://rhg.com/research/clean-investment-monitor-us-clean-energy-supply-chains/
19. UN Org: https://www.un.org/en/climatechange/raising-ambition/renewable-energy

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