Energy Expansion and Independence

Part 1: The Forces Shaping Global Energy

By Katherine Kroll, Head of Institutional Sustainable Investing

Fast Reading

- At Brown Advisory, we believe the future of energy investment that will mostly benefit our clients lies not in choosing between fossil fuels and renewables, but in building diversified portfolios that reflect the complexity of today's landscape and can maximize returns. By applying rigorous, bottom-up research across the full energy value chain, we identify companies – like Constellation Energy, SLB, and Carrier – driving innovation, resilience, and long-term value at the intersection of decarbonization and geopolitical stability.
- The path forward lies in cultivating a well-rounded energy ecosystem, integrating the reliability of existing fuels and infrastructure with the promise of innovative, scalable clean technologies. Companies at the forefront of enabling this integration are shaping a more stable, lower-carbon global economy, and present investors with a blueprint for resilient, future-proof returns.

In a world marked by geopolitical instability and rapid economic change, independent thinking offers an important counterweight to reactive short-termism.

This philosophy of independent thinking is particularly vital in today's global energy landscape. In 2024, global energy demand rose at nearly twice the pace of the previous decade, fueled by emerging markets and the accelerating electrification of advanced economies – a trend intensified by the growth of artificial intelligence.[1] Meeting this demand requires expanding energy supply, increasing efficiency and innovating at every link in the value chain.

Meanwhile, recent geopolitical shocks – notably the Russia-Ukraine conflict – have exposed the dangers of overreliance on any single energy source or supplier. Advanced economies have learned firsthand that resilience and diversification in energy infrastructure are critical to national security and economic vitality.

At Brown Advisory, we believe that building reliable, diversified and innovative energy systems is analogous to constructing resilient and forward-looking investment portfolios. In this piece, we detail our approach to investing in and around the evolving energy sector, with a focus on how our research guides us to companies positioned at the intersection of climate mitigation and long-term outperformance. By allocating capital to companies redefining the future of energy, we aim to deliver enduring financial returns, even in a rapidly changing world.

Re-thinking Resilience: Investing Across the Energy Spectrum

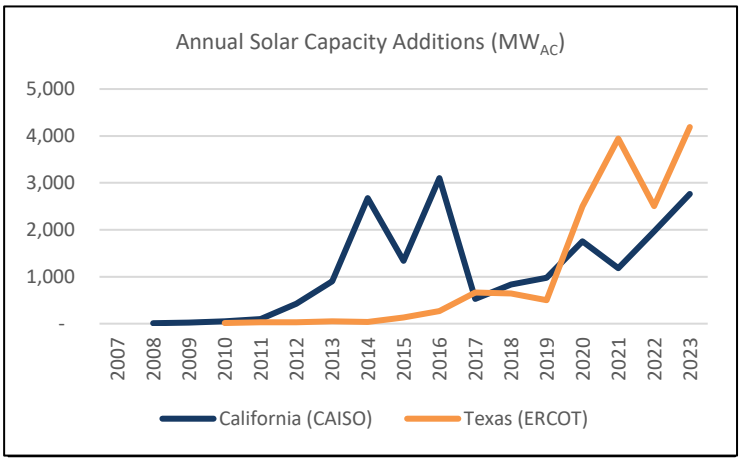
Energy investment is often framed as a choice between fossil fuels and renewables. We believe this is a false dichotomy that overlooks the complexity of the current landscape. Even low-carbon energy sources can present significant social challenges, particularly concerning human rights within their supply chains. While high-carbon energy sources have traditionally supported the reliability and consistency of global energy systems, they have also played a role in areas such as destabilizing weather patterns and affecting geopolitical dynamics. Resilience involves building systems that are diversified across geographies, fuels and technologies. Indeed, independence – the same pillar that underscores Brown Advisory's investment philosophy – is increasingly driving our energy strategy.

Nuclear energy is experiencing a resurgence, with several countries reversing phaseout plans and increasing investment in this stable, carbon-free baseload power source. This shift may have been surprising to some due to outdated safety concerns, but thanks to our non-exclusionary investment process, our investment teams have remained open to opportunities across the energy spectrum. Consequently, they have found numerous high-quality investment opportunities that have been beneficiaries of the recent change in sentiment.

Similarly, sectors such as materials and infrastructure – including cement, steel and transmission – are being re-evaluated as critical enablers of energy expansion. Again, our emphasis on rigorous, bottom-up research has uncovered compelling investment opportunities that reflect the complexity of these industries, rather than excluding them outright due to their carbon intensity.

At the same time, the installation of renewables is accelerating rapidly, accounting for the majority of new global capacity additions.[2] These assets are increasingly recognized as vital for both national security and climate objectives. While investments in energy production sources such as solar have not always yielded attractive returns in the past, our disciplined analytical approach – applied across materials, nuclear and renewable supply chains – shows that the economic case for solar has never been stronger[3]. Interestingly, the majority of U.S. utility-scale solar capacity is now being added in Texas – and Texas is the leader in U.S. wind energy production – challenging the perception that "green" energy is limited to traditionally "red" states.[4]

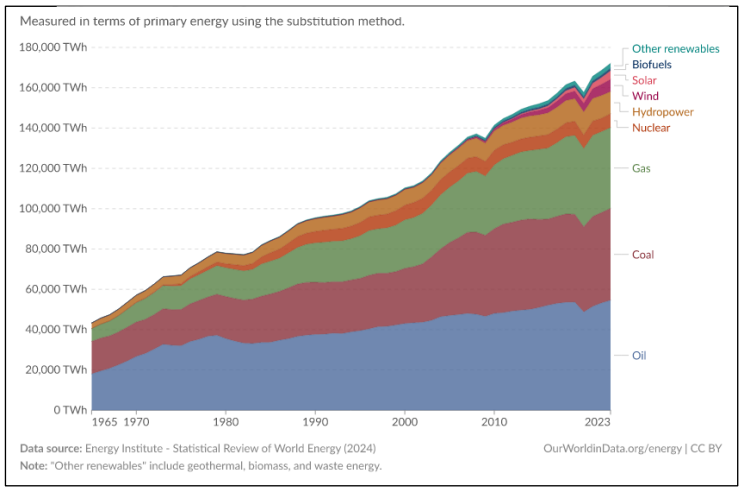
FIG 1: Texas has surpassed California in solar capacity additions



Source: Lawrence Berkeley Lab, "Utility-Scale Solar," as of 2024; Utility-Scale Solar | Energy Markets & Policy

Yet, fossil fuels remain a central component of the global energy mix: as of 2023, fossil fuels (coal, oil, and natural gas) still account for about 82% of global primary energy consumption.[5] This is down only 3% from 85% in 2013, despite hundreds of billions of dollars invested annually in wind, solar, and other renewables.[6]

FIG 2: Energy Consumption by Source, World



Source: Our World in Data from Energy Institute, "Energy Mix," as of 01/2024; Our World in Data, from Energy Institute – Statistical Review of World Energy

As investors, we look for mission-critical companies that we believe can help accelerate the evolution towards a more secure and plentiful energy system. We seek those energy companies making meaningful strides in operational efficiency, which are not only enhancing their margins, but also advancing critical objectives such as emissions reduction and natural capital preservation, and this in turn benefits shareholders. Our investment universe includes traditional energy providers who deliver shareholder value by offering reliable energy solutions while actively managing and mitigating the risks associated with the products and services they provide.

The message for investors is clear – portfolios concentrated in a single region or energy source face vulnerabilities similar to those that impacted an unprepared Europe in the wake of Russia's invasion of Ukraine. By contrast, portfolios that prioritize diversification – across geographies, fuels and a broad spectrum of companies facilitating energy addition – are typically better positioned to deliver both resilience and attractive long-term returns.

This new reality calls for a profound rethinking of energy investment. No longer can portfolios or national policies afford to treat fossil fuels and clean energy as mutually exclusive.

Instead, the path forward lies in cultivating a diversified energy ecosystem – one that integrates the reliability of existing fuels and infrastructure with the promise of innovative, scalable clean technologies. We believe companies at the forefront of enabling this integration are shaping a more stable, lower-carbon global economy, and present investors with a blueprint for resilient, future-proof returns.

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How we Apply this at Brown Advisory

At Brown Advisory, we seek to consider any data, factor, business tactic or strategy, economic or market condition – whether quantitative or qualitative – that helps us better understand the material challenges and opportunities facing a business or issuer. Our highest obligation in every investment strategy is our fiduciary duty to deliver performance for our clients, which means thinking independently and looking beyond conventional wisdom.

The following companies appear in several of the Brown Advisory sustainable equity strategies and illustrate how energy expansion sits at the intersection of decarbonization, innovation and geopolitical stability. These examples demonstrate how a rigorous, bottom-up investment process can uncover differentiated opportunities – identifying exceptional companies that may be overlooked by other market participants.

Constellation Energy: Nuclear as the Backbone of Clean, Reliable Power

Constellation Energy (CEG) is the largest producer of carbon-free electricity in the United States, operating 21 nuclear reactors across 12 sites.[7] While nuclear energy was once sidelined due to cost concerns and public skepticism, the Ukraine crisis has fundamentally reshaped global perspectives by revealing the dangers of relying on imported fuels. Today, nuclear provides about 10% of global electricity and over 25% of global low-carbon electricity, according to the International Energy Agency (IEA).[8][9]

Constellation's fleet stands out not only for its scale but also for its industry-leading safety and efficiency. In 2023, its reactors achieved capacity factors above 94% – a benchmark of operational excellence – and maintained a top-tier safety record.[10] As a result, Constellation's nuclear operations avoided an estimated 122 million metric tons of CO_2 in 2023, equivalent to taking more than 28 million cars off the road.[11][12]

But Constellation's impact goes far beyond reliable, carbon-free power. The company is at the forefront of innovation, pioneering the use of

nuclear facilities for clean hydrogen production and supporting the decarbonization of hard-to-abate sectors. With a pledge to achieve net-zero operations by 2040 and a commitment to supplying 100% carbon-free energy to corporate and municipal customers, Constellation is enabling economic growth while reducing emissions.[13]

Further, Constellation Energy maintains one of the strongest safety records in the Energy sector, which is a cornerstone of both its operational excellence and business success. With a total recordable incident rate (TRIR) of just 0.32 in 2023 – below the industry average—Constellation demonstrates its commitment to protecting employees and communities across its facilities.[14] The company's nuclear plants have consistently operated with zero significant safety events.[15] In 2023, the company delivered over 220,000 hours of health and safety training and maintained a near-perfect operational record, with its nuclear fleet running at nearly 100% capacity during the hottest summer on record.[16] This culture of safety not only ensures regulatory compliance and environmental stewardship, but also builds trust with customers, partners, and stakeholders. Ultimately, Constellation's rigorous safety standards reduce operational risks, minimize costly disruptions, and position the company as a reliable, responsible leader in clean energy—making safety not just a value, but a distinct business advantage.

Crucially, our investment in Constellation Energy demonstrates the value of primary, bottom-up research over rigid, top-down definitions. At the time of our due diligence, many investors – especially those following top-down frameworks – remained hesitant to recognize nuclear as "sustainable." Instead, we focused on a comprehensive evaluation of all relevant data, looking beyond outdated perceptions to understand the long-term potential. This approach allowed us to identify Constellation as a critical enabler of energy security and decarbonization– an insight that would have been missed by adhering strictly to conventional, top-down metrics.

In a polarized and rapidly evolving world, it is more important than ever to maintain an open-minded, research-driven perspective. By considering every data point that can enhance our understanding, we ensure our clients benefit from forward-thinking, resilient investment decisions, rather than those rooted in the past.

SLB: Bridging the Old and New in Energy

SLB (formerly Schlumberger) exemplifies how the Energy sector can both expand its reach and reduce global emissions, particularly in industries that are difficult to decarbonize. Historically recognized as a leader in oilfield services, SLB provides technology that remains essential for ensuring a stable and secure global energy supply. At the same time, in 2023 alone, SLB's solutions enabled the avoidance of over 830,000 metric tons of CO_2e which is about 1.9 million barrels of oil avoided.[17] This is not simply an incremental improvement; these emissions reductions are fundamental to making today's oil and gas production cleaner, more efficient, and more sustainable.

SLB's commitment to decarbonization extends well beyond its legacy business. Over the past three years, SLB's Transition Technologies portfolio has already achieved $1 billion in revenue – an amount that is nearly one-third of the annual revenue of some of the world's largest renewable energy companies – with plans to triple that figure by 2030.[18] It's rare to find a clean energy business model that has achieved such success.

These investments target pivotal technologies for the low-carbon transition, including carbon capture and storage (CCS), geothermal energy, responsible lithium extraction (crucial for battery manufacturing), and grid-scale energy storage. Notably, in 2023, 85% of the increase in SLB's annual R&D spend was dedicated to climate mitigation and energy expansion initiatives.[19] Within the next decade, the company intends to direct a third of its entire R&D budget towards new energy ventures.[20]

Additionally, SLB's digital business delivers advanced technology solutions that transform how energy companies explore, develop, and manage resources. By leveraging cloud computing, artificial intelligence, and data analytics, SLB enables clients to collect, interpret, and act on vast amounts of data from subsurface exploration through production. Central to this offering is the DELFI digital platform, which integrates workflows and empowers cross-disciplinary collaboration, making operations more efficient, accurate, and secure. These digital tools help clients reduce operational costs, improve safety, and make faster, more informed decisions across the energy value chain.

Importantly, SLB's digital business continues to deliver strong growth even as its legacy operations ebbs and flows. This clear decoupling from traditional industry cycles highlights the distinct and increasing value that clients place on SLB's digital solutions, even in a challenging spend environment. In the context of energy addition, SLB's digital platforms are not only optimizing oil and gas operations but are also being rapidly adopted in new areas such as carbon capture and storage (CCS), geothermal energy, and hydrogen projects. By enabling more effective resource management, real-time emissions monitoring, and predictive maintenance, SLB's digital business empowers energy companies to minimize their environmental impact, accelerate the shift to cleaner technologies, and achieve sustainability objectives with greater efficiency.

What distinguishes SLB is its "both/and" approach: The company is simultaneously making fossil fuel production less carbon-intensive – vital for hard-to-abate sectors like heavy industry, chemicals, and transportation – while also accelerating the deployment of breakthrough clean technologies. By leveraging its expertise and innovation, SLB is helping industrial clients reduce emissions without sacrificing operational reliability or energy access.

SLB's story is a data-driven testament to pragmatic progress. Its efforts not only support the vital energy needs of today – keeping hospitals running, schools operating and communities powered – but also lay the groundwork for a more sustainable and resilient energy landscape. Overlooking SLB's pivotal role in decarbonizing essential industries would mean missing one of the most effective contributors to a stable, sustainable global energy system.

Carrier Global

Energy expansion is not just about creating new sources of supply, it is also about maximizing the efficiency of the energy we already produce and use. Companies that drive energy efficiency are critical to global energy security, as they help economies do more with less. This not only eases pressure on energy systems but also reduces vulnerability to supply disruptions, ultimately supporting geopolitical stability.

Carrier Global (CARR) stands at the forefront of this effort as a global leader in HVAC (heating, ventilation, and air conditioning), refrigeration and building automation technologies. As demand rises

for more energy-efficient buildings and reliable cold chains, Carrier's solutions deliver a measurable impact. Its focus on electrification and the development of lower-impact refrigerants directly supports the transition away from high-emission, fossil fuel-based heating and cooling.

A significant portion of Carrier's business is aligned with global sustainability trends – with 45% of its HVAC and transport refrigeration revenue now coming from products classified as "clean technology."[21] These innovations help reduce greenhouse gas emissions and enable building owners to meet increasingly stringent energy standards. Carrier's digital solutions, such as the Abound platform, empower clients to monitor and optimize energy consumption and indoor air quality, delivering both environmental and cost benefits. Carrier also offers Lynx, its equivalent platform for the cold chain, which uses real-time monitoring to help reduce loss and waste—both food and medicine—across logistics networks.

Carrier's acquisition of Viessmann Climate Solutions further strengthens its leadership in the European heat pump market, a segment poised for substantial growth as electrified heating gains favor in energy policies. In 2024 alone, Carrier's technologies helped clients save over 5.8 billion kilowatt-hours of energy – the equivalent of taking nearly a million gasoline-powered cars off the road.[22] The company has also committed to avoiding more than one gigaton of customer GHG emissions by 2030 and to investing over $4 billion to develop intelligent climate and energy solutions that reduce environmental impacts.[23]

By enabling greater efficiency and lower emissions across the built environment and cold chain logistics, Carrier supports a more robust, flexible and reliable energy landscape. These advances not only support a lower carbon energy mix, but also help insulate economies from supply shocks, fostering greater geopolitical resilience and stability.

CRH: Materials Innovation for the Foundation of Energy Independence

If clean energy and digital infrastructure are the engines of the future, then building materials – especially cement and concrete – are the foundation on which that future will stand. Nowhere is this more apparent than in the work of CRH, one of the world's largest building materials company and a central player in energy infrastructure.

Concrete is the most widely used man-made material on the planet, with over 4 billion tonnes produced annually.[24] Its ubiquity is not just a matter of convenience, but necessity: Cement and concrete are integral to wind turbine bases, dam walls, solar farm foundations, transmission towers and battery gigafactories. According to the IEA, meeting global net-zero goals will require trillions of dollars in new infrastructure, much of it literally built from concrete. [25]

Yet, the sector's environmental impact is hard to ignore. Cement production accounts for roughly 7–8% of global CO_2 emissions – more than the entire aviation industry.[26] Most of these emissions stem not from the fuel used but from the chemical process (calcination) of turning limestone into clinker, the binding agent in cement. This has made cement a lightning rod in sustainable investing debates, with some arguing it should be excluded from responsible investment portfolios.

CRH's story, however, challenges this narrative. In 2023, CRH supplied materials for a number of renewable energy projects, including wind, solar, and hydro; it also played a pivotal role in the modernization of hundreds of kilometers of transmission lines and public transport infrastructure across North America and Europe. To put this in perspective, a single offshore wind turbine foundation can require up to 1,500 tonnes of concrete – without which the clean energy buildout would be impossible.[27]

CRH has established some of the most ambitious decarbonization targets in the industry. The company is aiming for a 30% reduction in CO_2 intensity by 2030 (from a 2021 baseline), with a clear roadmap to net zero by 2050.[28]

How is this being achieved? Through bold investment and innovation:

- **Alternative Fuel and Supplementary Materials:** CRH is a leader in substituting traditional fuel with lower-carbon alternatives like fly ash, slag and calcined clays, reducing the carbon footprint of cement by up to 20%. In 2023, 13.6% of CRH's cementitious materials came from recycled or alternative sources, ahead of most global peers.[29]
- **Carbon Capture, Utilization and Storage (CCUS):** CRH is engaged in partnerships and pilot projects to capture CO_2 directly from kiln operations, aiming to scale these technologies company-wide.
- **Circular Economy:** The company recycles construction and demolition waste into new aggregates and concrete, closing material loops and reducing pressure on natural resources.

Looking ahead, CRH is participating in research to develop concretes that act as carbon sinks, absorbing atmospheric CO_2 throughout their lifetime – a process known as carbonation.[30] This could not only offset emissions but also help make our built environment a net contributor to climate solutions.

CRH's evolution demonstrates that the materials sector is not just a source of emissions, but also a driver of decarbonization at scale. In our view, excluding companies like CRH from sustainable investing consideration risks undermining the very infrastructure required for energy evolution. Instead, we feel CRH exemplifies how innovation, scale and a commitment to sustainability can turn a "hard-to-abate" sector into a key pillar of a net-zero, resilient future.

Conclusion

In the first part of this two-part series, we underscore just how complex and dynamic the global energy landscape has become. Through the lens of companies such as Constellation Energy, SLB, Carrier Global, and CRH, we have seen that advancing resilience and sustainability in energy requires openness to a wide range of solutions, as well as a willingness to look beyond conventional categories and assumptions. Our approach at Brown Advisory is guided by thorough research, independent thinking, and an ongoing effort to learn from both successes and setbacks across the energy spectrum.

While there are no simple answers or one-size-fits-all strategies, we remain committed to seeking out companies that are making meaningful contributions to a more secure, efficient, and sustainable energy future. As the sector continues to evolve, we recognize that new challenges and opportunities will emerge. In the second part of this series, we will turn our attention to areas such as natural gas, solar, and the role of supporting infrastructure, sharing further observations on where we see the most promising developments and how we are adapting our thinking in response to an ever-changing environment.

U.S. INSTITUTIONAL SALES & SERVICE
(410) 873-5252
institutionalsales@brownadvisory.com

INTERNATIONAL INSTITUTIONAL SALES
+44 (0) 20-3301-8130
internationalinstitutionalsales@brownadvisory.com

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