



The Power Pitch

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Investment in energy

Hydrogen? Nuclear? Electric vehicles? Investors can focus on whatever ‘flavour’ of energy transition technology they like, but none of it works unless the grid works.

Murray Fox, Global Head of Energy Transition, gathered experts for our recent energy transition dinner in Houston, many of whom noted that, getting the US grid fit for the future raises major financing challenges that will require some smart thinking and pragmatic policies, even in an election year.

Executives and board members across the industrials sectors gathered in Houston in June 2024, to take the pulse of the energy transition. Verdict: alive after a rebasing against the current macro environment of higher interest rate and supply chain costs. Having substituted the optimistic lens for realistic and pragmatic, can we begin to move forward in a more coordinated approach across policy, financing and project development? The concern now, however, is how to deliver that funding shot to kickstart progress when so many players have lost their nerve.

Analysts can't help noting that interest rates may stay higher for longer and challenges remain for financing and development costs in the new energy sector, which means some of the optimism many held for a better 2024 compared to 2023 is fading¹. Experts at our dinner certainly found themselves wondering what this means for the energy transition. With oil, gas and coal still the mainstay of the global energy system, has the false start already created stranded assets? Has it deterred investment in clean energy technologies that, had they been backed instead, might already be putting the brakes on greenhouse gas emissions? With artificial intelligence being such a popular investment choice, is it dragging investment dollars away from energy transition?



A lot of initial hypotheses are not playing out, most obviously on cost. We see investors caught between not wanting to be left behind and fearful of being too far ahead.

Everyone wants to be a fast follower, but this crowd instinct can lead to paralysis at a time when we need innovation leaders. Looming elections, regardless of outcome, only deepen the policy void and stoke uncertainty for investors. Yet there are some projects that transcend politics. Key among these is the upgrading of aging power grids: the average age of the installed base is around 40 years, and more than a quarter of the grid is 50 years old or older.

¹ <https://www.rystadenergy.com/insights/no-supply-chain-relief-amid-surgings-defense-spending>



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Additionally, this aging infrastructure is being asked to do more than ever before. Storms, floods and heatwaves are increasingly common events, placing huge strain on assets. Unidirectional power flows from centralised fossil fuel power stations are no longer fit for purpose in a low carbon world of distributed bi-directional renewable energy flows. Electric vehicles and AI data centres are guzzling more power than ever according to analysts at Marsh McLennan, for example, many believe EVs will drive load growth by more than 45 per cent, requiring capital investment in the transmission system of more than one trillion dollars by 2050².

5.5 million

miles of
distribution lines

1.3 million

megawatts of
generation capacity

200,000

miles of
transmission lines

Even without the demands of our fast-changing digital world, massive investment would be needed just to keep the lights on and the economy turning. Some areas are already prone to regular outages, and we are not talking about developing economies here. In August 2020, for example, extreme heat brought blackouts to the California Independent System Operator (CAISO) grid, while in February 2021, the Texas grid collapsed during a spell of record low temperatures, leaving millions of homes without power.

There are pockets of optimism, investments in new renewable capacity are boosting supply side capacity. The most recent summer assessment from the North American Electric Reliability Corp found that resource additions and delayed generator retirements have improved the outlook for 2024³ – although its longer-term forecast sees a growing number of areas face adequacy risks as early as next year. The steady addition of renewable energy sources, such as a record 25 GW of additional solar capacity added since last year, has helped meet the power demand in some areas across the US, while utility-scale battery resources have contributed to higher on-peak reserve margins during hours of peak demand. Demand side response is also playing a part in energy resilience, with programs such as California’s Flex Alert encouraging consumers to reduce their demands on the grid at peak times⁴.

Longer term, however, there is no dodging the need to find trillions of dollars to upgrade the grid. Federal funds are available - the US Infrastructure Investment and Jobs Act (IIJA) includes \$65 billion for upgrading and expanding national power infrastructure - and even a change of administration would be unlikely to strip away key infrastructure spend, particularly when it’s so good for jobs. But more will be needed.

² <https://www.marshmcclennan.com/insights/publications/2020/apr/modernising-ageing-transmission.html>

³ https://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC_SRA_2024.pdf

⁴ <https://www.flexalert.org>



Who will pay?



But where is this investment to come from? Cash-rich energy majors might step up to be utility providers, such as Shell Energy, which already offers renewable energy tariffs to consumers: could Big Oil be the new face of Green Power? It's too early to say. Beholden to shareholder returns, these low margin, high volume markets still need justification.

Private equity firms are also candidates, with Blackstone portfolio company Transmission Developers (TDI) backing the Champlain Hudson Power Express, a \$6bn transmission line that will deliver 1.25 GW of hydropower from Québec to New York, due to complete in 2026. Canadian utility Hydro-Québec will pay TDI a capacity payment over 40 years, delivering the kind of long-term derisked return that can be attractive to private equity backers.

Increasingly we turn to “Magnificent 7” – Apple, Microsoft, Alphabet, Amazon, NVIDIA, Tesla and Meta Platforms – might step up in order to balance the voracious energy appetites of their AI models with their net zero targets (2030 for Microsoft, Meta and Google, and 2040 for Amazon). We have already seen them scope out power purchase agreements for renewable contracts, with Danish solar farms and Norwegian wind farms bankrolled by Meta and Google respectively. In May, Microsoft struck the world's biggest renewable energy deal, when it signed a \$10 billion five-year contract with Brookfield Renewable for 10.5 GW of clean power in Europe and the US, almost eight times larger than the largest single corporate PPA ever signed⁵. The idea is this will not only deliver the clean energy the tech giant needs but that its purchasing power will help build out a greener and more resilient energy grid for all consumers. Interestingly, the agreement will not only focus on wind and solar, but also new or impactful carbon free energy generation technologies.

This decarbonises some of the incremental demand and does not leave anything to reduce the record 100m barrels per day of crude oil consumption the world currently needs.

⁵ <https://bep.brookfield.com/press-releases/bep/brookfield-and-microsoft-collaborating-deliver-over-105-gw-new-renewable-power>



The nuclear option

At the time of publication, data centre developer, Aligned, is considering small modular nuclear power, and some pundits increasingly see this as a viable option to deliver the reliable carbon-free base load capacity our modern world needs.

It's not a silver bullet though, and regulatory hurdles may prove steep. Modelling suggests small modular reactors (SMRs) may be a cheaper and faster way to build new nuclear power capacity but the radioactive waste footprint may be greater than traditional large-scale plants⁶.

Politically, however, nuclear is white hot. Energy Secretary, Jennifer Granholm, is calling for a tripling of current nuclear capacity and in June 2024, the Department of Energy issued a notice of intent to fund up to \$900 million to support the initial deployments of small modular reactor technologies⁷. Importantly, nuclear also appears to be election-proof, attracting a surprising amount of bipartisan support in Congress⁸.

Permitting fast-track

Even with cross-party support, new nuclear capacity will run into the same bottlenecks as other clean energy projects: grid access, planning and permitting.

The grid is not yet ready to integrate the 330 GW of utility-scale wind and solar generation capacity expected to come online by 2029⁹. Indeed, the US currently has an interconnection queue of over two terawatts of renewable energy awaiting connection to the grid, and this queue has grown almost five-fold in the past decade, stalling projects representing over \$3 trillion in potential investment. Based on past completion rates, less than ¼ of these proposed projects (accounting for 14 per cent of capacity) are likely to come online¹⁰. Last year, the Federal Energy Regulatory Commission (FERC) took a step forward when it ordered transmission providers to transition for a "first-come, first-served," to a "first-ready, first-served," cluster study process to reduce interconnection wait times¹¹. This should help, but there are still many planning hurdles for developers to overcome.

Interregional transmission lines are of particular importance. These cross-state projects would, if built, improve system resilience and reliability by increasing transmission capacity between regions. Indeed, a lack of strong transmission ties with neighbouring power systems was a key factor in the blackouts during winter storms Elliott and Uri in December 2022 and February 2021 respectively. Given that new lines can take 10 years to build (and supply chain challenges are only acting as a further drag on timelines, with the delivery time for transformers and other associated equipment stretching from 50 weeks to 150 weeks¹²), and the 36 shovel-ready transmission projects already in the pipeline represent only 10 per cent of the transmission investment needed, there's an urgent need to streamline planning and regulatory processes particularly for interregional lines if there's to be any hope of meeting President Biden's 2035 clean energy goals¹³.

⁶ <https://www.newscientist.com/article/2322252-mini-nuclear-power-stations-may-produce-more-waste-than-large-ones/>

⁷ <https://www.publicpower.org/periodical/article/doe-plans-offer-900-million-support-deployments-small-modular-reactors>

⁸ <https://www.seattletimes.com/nation-world/nation-politics/support-for-nuclear-energy-grows-in-congress/>

⁹ <https://www.marshmcclennan.com/insights/publications/2020/apr/modernising-ageing-transmission.html>



The Cripps Leadership Advisors Viewpoint

The energy transition continues to ebb and flow, encouragingly, the general direction of travel is forward. It will be powered by renewables, nuclear and other clean energy technologies that have yet to scale, plus trillions of dollars in investment.

It will also be powered by people, not just the armies of engineers and technicians needed to build out and operate the infrastructure, but critical to its success will be those charged with making the key decisions: what technologies to back? How much to invest? How should investments be structured to balance returns and sustainability goals?

Finding people with the specialist skills to collaborate and create the alliances required of the energy transition, to find solutions, both technical, commercial and financial, avoid the pitfalls and drive through unprecedented transformation at speed and scale, will be a key determinant of success.

Below the executive level, we predict a severe shortage of more technical leaders charged with executing and delivering these projects to commercial operations. There's already a scarcity of top tier project development executives.

Companies need to accelerate their resourcing plans, extend their networks and uplift the skills of their existing people. AI can take on a lot of the heavy lifting at lower levels but the key decisions around money, technology and change management will very much remain in the hands of the humans at the helm.

Our modus operandi is about forming proactive partnerships with our clients to think ahead to solve the challenges around succession planning, development and market access to the top leadership talent. Getting ahead and reacting to situations as they happen.

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¹⁰ <https://www.linevisioninc.com/news/how-dynamic-line-ratings-accelerate-renewable-energy-integration>

¹¹ <https://www.ferc.gov/explainer-interconnection-final-rule>

¹² <https://www.wri.org/insights/clean-energy-progress-united-states>

¹³ https://cleanenergygrid.org/wp-content/uploads/2023/09/ACEG_Transmission-Projects-Ready-To-Go_September-2023.pdf



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