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Quarterly Commentary

Orbis Global Equity

30 SEPTEMBER 2023

Many countries around the world would like to transition away from an energy system reliant on fossil fuels. The potential benefits are enormous: increased energy security, reduced local pollution, and lower carbon emissions.

The perceived winners of this trend have been renewables such as wind and solar. We have watched closely as renewable sources of energy have rapidly become more cost competitive, driven by “Wright’s Law” effects—as cumulative production grows, industries learn, and costs fall.

But this is widely appreciated, and hence has largely been priced into the (many) equities we studied, and passed on, in the renewables space.

Intermittency: The Achilles heel of renewables

What’s less appreciated is that renewables have a key flaw, which makes them increasingly *less* useful the *more* they are adopted in the energy system. That flaw is “intermittency”—wind turbines don’t generate when there is no wind, and solar panels don’t generate when there is no sun.

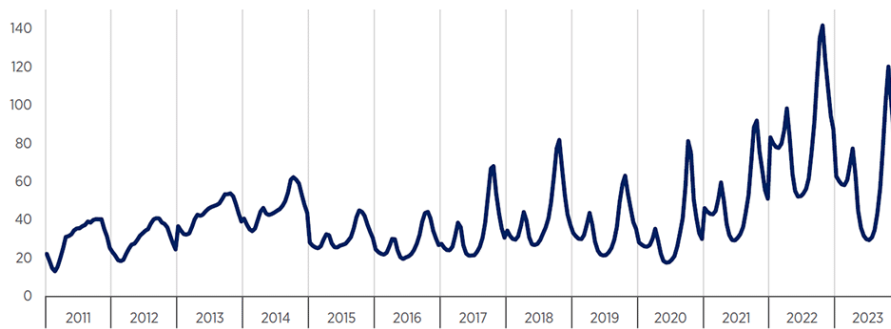
When renewables are first added to an electricity system, the overall intermittency effect is small, as there is a large base of other power sources that are either dispatchable (gas and coal) or continuously

generating (nuclear). However, as the proportion of power provided by renewables grows over time (and the proportion of dispatchable power falls), intermittency issues grow, and power prices become more volatile.

A prime example of this is California's grid. California is particularly advanced in deploying renewables compared to other US states. As the deployment of renewables has increased, prices have become more volatile, with a large spike in the evening, when the sun is setting but demand from homes is rising. The most valuable power is now precisely when renewables are not generating. Effectively, renewables are becoming a victim of their own success.

As more renewables are deployed, intraday power prices become more volatile

Average 24-hour power price profile, by year, for California's electricity grid, dollars per megawatt hour



Source: Bloomberg, California Independent System Operator, Innotap, Genscape. The plot between each pair of gridlines shows the average path of power prices over a 24-hour day in that year. Year-to-date data used for 2023.

In the future, battery storage could go some of the way to addressing intermittency. However, in our analysis the cost of building 4-hour storage (the best most battery systems can manage today) for a renewables project doubles the cost vs. a project without storage. However, 4-hour storage would not be sufficient to fully address intermittency, as systems must also contend with longer-term seasonal and weather-related fluctuations in renewables generation.

Nuclear: An overlooked but valuable solution

This is the core of why we are attracted to nuclear as a source of power. Nuclear power stations can generate power almost 24/7,

running around 95% of the time. They don't suffer from intermittency. Yet they are also low carbon.

This led us to begin analysing the nuclear energy sector to understand if there were any investment opportunities to capitalise on this reliable form of low carbon energy.

Nuclear power is both reliable and low carbon

| | Coal / Gas | Renewables | Nuclear | Hydro |
|------------|------------|------------|---------|-------|
| Reliable | ✓ | ✗ | ✓ | ✓ |
| Low Carbon | ✗ | ✓ | ✓ | ✓ |

Source: Orbis.

Enter Constellation

We initially came across Constellation Energy in early 2022. The company had just spun out of Exelon, a US utility. Constellation is the largest US producer of zero carbon electricity, with 21 gigawatts (GW) of nuclear capacity (enough to power about 17 million homes for a year). They also make money selling electricity to end consumers, in addition to smaller gas and renewables operations.

What piqued our interest was that Constellation traded at a very attractive valuation relative to its replacement cost. When we initially invested in the company, its enterprise value was ~\$25bn. Given a \$5-10bn per GW cost of constructing new nuclear plants, Constellation's replacement value was around \$100-200bn. Of course, new plants last about 80 years, and Constellation's have been operating for 30 to 40 already—but even including depreciation, the company's enterprise value was a fraction of its replacement value.

What surprised us in more detailed research was to find that Constellation had a competitive advantage, which is very unusual in the energy space. The advantage stems from their significant scale—Constellation has triple the nuclear capacity of the next-largest nuclear generator. That allows the company to run multiple copies of

the same nuclear reactor design, achieving economies of scale in maintenance. We see this in the hard numbers, where Constellation achieves more output on similar assets compared to peers, and is consistently ranked as the best producer in the US on production, cost, and safety.

“Inflation Reduction Act”

Shortly after our initial investment, the US passed landmark climate legislation in the so called “Inflation Reduction Act”. The act included a suite of subsidies for renewable energy, but also for nuclear power.

While our research left us thinking that nuclear power would eventually be subsidised in some form, we were pleasantly surprised by the speed and magnitude of the support. This was necessary, because unlike Europe, the US does not have widespread carbon pricing. Carbon pricing nudges up the cost of coal and gas power, and in most markets, gas plants are the marginal source of supply, so higher carbon prices flow through to better pricing for nuclear generators.

Without widespread carbon pricing in the US, nuclear power plants had been under intense pressure from cheap natural gas power. Many nuclear power plants had closed, which jeopardised carbon intensity goals. With the subsidy payments in the Inflation Reduction Act, policymakers are trying to keep nuclear power plants online, which is likely to be very valuable in achieving environmental goals over the coming decades. In simple terms, the legislation provides a floor price of \$44 per megawatt hour (MWh) from 2024 until 2032 for nuclear power—with the floor price increasing with inflation.

For Constellation, the subsidy regime transforms the economic and intrinsic value of the business. They will receive a fixed minimum price, which guarantees profitability. This boosts both earnings and the

valuation those earnings deserve by reducing the uncertainty and risk in the earnings stream.

That is already positive, but what is even more favourable is that Constellation is still exposed to upside in market power prices—there is a floor price, but no ceiling price. That provides an asymmetric risk profile, and this observation has been a key difference in our view on the stock compared to the market's view.

Nuclear Safety?

Opposition to nuclear is often not on cost grounds, but on the grounds of safety. After all, we have all heard of Chernobyl, Three-Mile Island and Fukushima.

We believe that this is a common case of the seen and unseen. A small number of nuclear accidents are highly vivid (the seen). However, they have also been exceptionally rare. We believe, in fact, that nuclear is among the safest forms of energy in the world, significantly safer than generation by coal, oil, gas, or biomass. The difference is that the harms from fossil fuel generation are less vivid, as accidents tend to be smaller scale (fires) and distant (coal mining injuries in far-flung countries), and much of the local harm (pollution) is unseen.

There is an outstanding question on how to store nuclear waste. The US has a candidate site for deep underground storage at Yucca Mountain in Nevada, but it has been held up by political disagreements. In the meantime, the US government reimburses power producers for the costs of on-site storage, where nuclear waste is sealed in large metal “casks”. These casks have been entirely safe to date in their operation, are closely monitored, and are designed to withstand earthquakes, floods, and even projectiles.

True Net Zero

We often see adverts for “100% renewable power tariffs”. These seem wonderful on the surface, but having dug deeper, we believe these should come with a giant asterisk. 100% renewable power is physically impossible at present, due to the outlined intermittency issues. So how can leading power companies offer these tariffs?

They do this using renewable energy “credits” or “certificates”. When it is not sunny or windy, the company procures gas or coal power, but also provides you with a virtual certificate for power generated from renewables at another time and place.

Putting aside the intuitive issues with these credits, they would clearly fall flat if everyone signed up to “100% green energy”. In that case there would be no-one left on the grid to provide the dispatchable power needed when renewables aren’t generating. Worse, these credit systems can create perverse incentives for companies to produce more energy where there is no demand. Constellation’s CEO commented on this system recently, in a US context: “[the system] told developers to build generation in places where customers are not located and encouraged them to produce energy at times customers don’t need it.”

As an operator of round-the-clock zero carbon power plants, Constellation is uniquely placed to offer a product which answers the problem of intermittency. They have launched an “hourly carbon-free energy match platform” which matches zero-carbon power from their nuclear plants much more closely to its end consumption. This June, Constellation announced a pioneering agreement with Microsoft to provide this product to a Microsoft data centre in Virginia, and the two companies collaborated on the software to enable this matching of supply and demand.

We believe this highlights how leading companies are increasing their standards around what really constitutes low-carbon power. As the

largest provider of zero-carbon electricity in the US, Constellation is primed to be a key beneficiary. Though the shares have performed well since our purchase, we remain substantial shareholders.

On the numbers, we have high confidence that Constellation can generate at least \$2.8bn p.a. in free cash flow from 2026. That suggests a near-7% free cash flow yield on the company's current enterprise value—an undemanding price given the long-term floor on the company's profits. We also see plausible paths to higher upside. If the US rolls out either widespread carbon pricing or further nuclear subsidies, the company's enterprise value could more than double, approaching the replacement cost of the assets.

As policymakers come to grasp that nuclear power is essential to the energy transition, Constellation's position should strengthen over time. In Constellation, we believe we've found a company that is playing a positive role for society—and whose shares trade at an attractive discount to intrinsic value.

Commentary contributed by Ben Harris, Orbis Portfolio Management (Europe) LLP, London.

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