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Conservation Capitalism: Doing More With Less

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Everything is getting smart these days, including buildings, grids, and cities. In the fourth installment of our Convergence series, which examines five growth themes that are shaping the future of investing, Hugo Scott-Gall speaks with Alaina Anderson, CFA, portfolio manager and global research analyst, and Anil Daka, CFA, global research analyst, to discuss renewable energy, smart infrastructure, and new business models, as well as how environmental, social, and governance (ESG) factors are accelerating these trends.

Comments are edited excerpts from our podcast, which you can listen to in full below.

https://media.blubrry.com/the_active_share/b/content.blubrry.com/the_active_share/The_Active_Share_COVID_19_End_

I'm going to start with a big, provocative question that gets to the heart of this conversation. Is the energy transition as big as the dot-com bubble?

Alaina: Well, that certainly is provocative.

I've heard concerns that the energy transition and resultant froth we've seen in the valuations of some renewables companies is similar to what we saw in the dot-com bubble of the 2000s. But we're talking about two very different phenomena.

The dot-com bubble was driven by a push of technology from technologists to consumers. There was a "build it

and they will come" mentality.

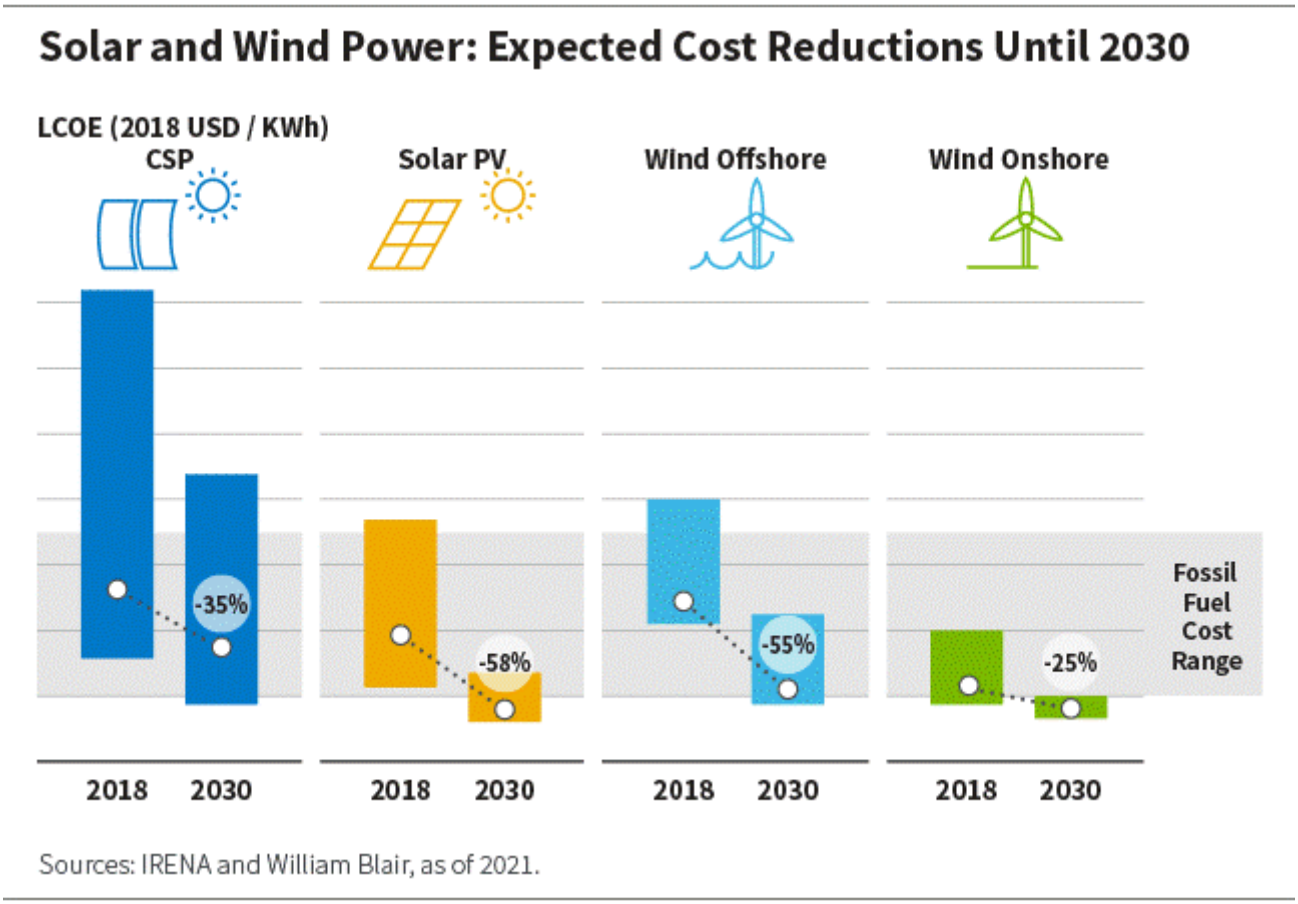
Conversely, with renewables, we're seeing a pull of demand. We've decided as a global community to reduce our commitment to hydrocarbons (generating electric power from coal). As a result, a very natural substitution effect is driving the growth of renewables.

So, while I understand where the sentiment is coming from, the demand side of the equation is much more of a pull within renewables than we've seen from other high-momentum phenomena in the past.

We're dealing with real-world problems, like physics. We have the will, as you say; we want to get cleaner. But does the technology allow us to do so at a reasonable price?

Alaina: That's really been the catalyst for the uptake in renewables—the fact that the cost curves have been coming down quickly as big users or developers have deployed capital, helping to create economies of scale. Even though solar and wind are at parity with or cheaper than incumbent fuel types like coal, in many cases, we're still expected to see about 50% cost decreases through 2030.

That should continue to decrease the use of coal and catalyze the penetration of renewables. At the end of the day, this is an economics issue, and if it's cheaper, more and more developers and electric power utilities should rely on renewables.



Anil: You're right, Hugo, to bring up the science behind this transformation. Consider the cost of a lithium ion battery. In the late 1980s or early 1990s, when Sony first developed the battery, it cost a few thousand dollars per kilowatt hour. Today the best estimates, leaders like Tesla and Volkswagen, do it for $100 or so per kilowatt hour.

Big technology improvements have facilitated that. The receptors get better; the anodes and cathodes get better. Then you add scale on top of that, and you get the cost curves Alaina was referring to.

We have a pretty clear roadmap of what it is going to look in the next five to 10 years because the cost curves of the future are based on the chemistry that's happening in labs today. You can look at the capability of an anode or cathode in the lab today and have reasonable confidence in what the production version is going to look like five or seven years from now. When you add the scale and all its benefits, you have a high level of confidence that the cost curves you've seen will continue.

Carrying on with that thought, what are the constraints in delivering this transition? If it's not physics or chemistry, is it capital? Political capital? Is it large amounts of invested capital that don't want change (or change at a certain pace)? Because the energy transition that we're discussing is enormous: it involves rebuilding the supply chain and front-end technology.

Alaina: I think you hit the nail on the head, Hugo. It's a large transition in a capital-intensive space, so the ability to deploy capital at scale is key to success.

We've seen some financing support for those who are doing green energy development. That's important because

keeping the cost of capital low is going to be critical for the deployment of resources and the insulation of returns for developers in this space.

Interestingly, the companies that have been able to deploy capital at scale over time have been the oil majors. If you needed to do large, capital-intensive projects with a huge science underpinning, that was their job. The question is, what role will they play to deploy capital at scale as we transition from hydrocarbon to green energy? There have been quite a few commitments, but it remains to be seen.

Anil: I'll add my two cents on the consumption, because Alaina touched on all the right points on the generation end.

Every year the world sells about 90 million cars, and the average car in the United States lasts for about 12 years. So even if everyone wants an electric vehicle (EV), and even if the price were on parity with traditional cars, it would still take 12-plus years for the entire fleet to get renewed.

But prices are not on parity at every price point of consumption. If you want to buy a $30,000 car today, you could replace it with an EV. But if you want to buy a $20,000 car, we're not there yet; it will probably take another five plus years or so.

That creates a somewhat slower and a steadier pace of transformation than people would probably like to see.

Alaina: That's a good point. When we talk about the capital that needs to be deployed to support this transition through 2050, estimates are in the hundreds of trillions. These are massive numbers with dates certain, which I think is an added obstacle.

As you mentioned, Hugo, political commitments will also likely play a role. An interesting argument has been occurring between developed and emerging market countries about how a strong commitment to decarbonization is hampering industrialization. How we manage that—balancing emerging markets' need to industrialize with our need to decarbonize—will be an interesting diplomatic and philosophical question for us to work through from a global community perspective.

Do you think there's been an overestimation of timelines? Anil made the point that a tremendous amount of capital invested has been invested in a lot of installed assets. To incentivize the switch will take a lot of capital investment with very clear incentives. Sometimes you need a wedge, which is provided by government. Still, the numbers are so big, as Alaina said, that I wonder if the economic life of whatever asset we're talking about may prove stickier—because while green can be a political and moral color, it's definitely an economic color.

Alaina: Well, just think about the age of the coal fleet in some emerging markets. It's low because we're still onboarding new coal mines there. To shutter those mines means just taking an economic loss.

Is that what's being asked? Basically, yes, so how do we think through subsidizing that as a global community? It's a very difficult question.

Sixty percent of China's energy mix is still coal. That's down from 80% in 2000 and 70% in 2010, but 60% is still three times that of the United States. It's the reserve fuel for electric power generation and heating.

That's not a ship you can right overnight, and the targets the global community has put in place seem very aggressive when you think about it from that perspective.

Anil: Let's use buildings as an example to look at it from a consumption perspective again. Most buildings last 100 years, sometimes longer. But heating and cooling systems within those buildings, which make up about a third of all carbon emissions, are updated every 15 to 20 years.

Thanks to digitalization, the new systems do a better job in a much more efficient fashion. Once you put sensors in different parts of the building and connect those sensors to a centralized unit that lets you understand the heating and cooling zones depending on different weather patterns, your ability to control the overall energy needs of that building go up dramatically.

So the cost of digitalization comes down, as we all know, based on Moore's Law, and everything else follows from that. It becomes that much easier, even for older infrastructure, to beat the pace of expectation as the cost of digitalization comes down.

This is a trend that's well understood, but perhaps less applied in the context of energy. Marrying the declining cost of digitalization with what you're seeing on the cost curve of carbon emissions gives you a "one plus one is more than two" kind of effect.

Are you saying that by making dumb assets smarter, it's actually the operational cost curve that moves rather than the capital cost curve?

Anil: Right.

I get it. You talked about making buildings smart. Once you can measure things like idle time, you begin to shift operating cost curves. But how meaningful is that?

Anil: We're talking about big numbers. Heating and cooling costs are about a quarter of the overall cost of maintaining a building. If you go from SEER 10 or SEER 11 energy efficiency standards to the more recent SEER 15, you save about 30% to 40% on your energy bill. That's material.

There's also a cost-of-financing element. If you make these assets more energy efficient, your cost of financing comes down as you can meet certain certification credentials.

So, if you take the savings in operational costs, then you layer in some of the financing benefits, I think you'll see more and more people take that route. It's material enough for people to make that switch.

I don't think I would remain the host of this podcast if I didn't ask you more questions about EVs. We talked about the inertia ("I've already spent money on my car and I want to get a useful life out of it"). But range anxiety is another reason people don't buy EVs, correct? What else is holding people back? And how quickly do those things change?

Anil: The top three concerns are the cost, the range anxiety, and the charging infrastructure.

The cost of buying an EV is probably the first concern. But the math works in a weird way, partly because of the

range question. Range anxiety seems to dissipate at about a 250-mile range. But to get a 250-mile range, you need a large battery, and the larger the battery, the higher the cost of making the battery. But every year the cost comes down. Scale is building. And range anxiety will be addressed as part of the cost calculation, because I don't think you will see cars with less than a 250-mile range coming.

The last concern is infrastructure constraints. If you want to keep your car ready to go at any point, you need a home-charging facility or charging infrastructure, which Tesla has built out. The other manufacturers are still trying to catch up.

Alaina: I've been encouraged by legacy car companies deploying capital at scale to change their fleets.

Anil: Absolutely, and I think the last 12 to 18 months have been profound in that aspect. Practically every top-10 carmaker has come out with an ambitious target as to what percentage of their fleet they want to see fully electric.

I want to take a bit of a turn and ask you, Alaina, about the huge growth of interest in ESG, and the flow of funds to ESG investing. Is it changing the cost of capital as well as the allocation of capital? Is it self-fulfilling?

Alaina: Yes. We have to decarbonize what's already installed, and we can't put more capital into the ground for these carbon-emitting spaces. So, we starve the capital. The oil majors might naturally acquire the technology they need to make their businesses fit for purpose for 2030 and 2050. However, their cost of capital is high. We've marshaled quite a lot of resources to make sure we constrain the capital that fossil can access, so it's tough for them to make acquisitions using their shares or getting bank financing. That evolution has been very important, not just from a shareholder perspective, but from a stakeholder perspective.

Anil, can you see the effect of ESG as you look across your coverage area? Are people using different lenses to assess companies?

Anil: Absolutely. We try to ask companies, "What is ESG awareness doing to the things we care about—your organic growth, your pricing, the quality of your business models, the strength of your competitive advantage?" In almost every one of these attributes, the names that we consider leaders have expanded on that strength versus their peers.

And we issue a challenge: every year you should use a little less than you did last year. Every year, for example, you want to use a more diverse stream of hydro energy while at the same time maintaining or even increasing comfort.

The more complex the operation is, the better the leaders tend to get—partly based on relationships, partly based on their awareness and understanding of technology.

What do you think are the biggest risks of this transition being derailed? We talked about the benefits of digitalization—you start making things smart, you add software on top of hardware, and you get better outcomes in terms of operating costs and efficiency. But does that create an extra risk, as with cybersecurity?

Anil: It's a tug of war. There's a cost of going digital, but the benefits far outweigh the risks, partly because of the challenge that we're trying to solve. As Alaina said early on, the magnitude of what needs to be accomplished is large, and the net impact and the benefits it can have for everyone are tremendous.

Alaina: I agree, Anil, that there are risks, but the rewards are much higher. As we electrify, we digitalize, and as we digitalize, we open ourselves up to hacks, and we have to think about hardening our infrastructure in a different way. Hardening infrastructure for utilities used to involve putting overhead power lines below ground. Now it also includes preventing the kinds of cyberattacks that we saw with the Colonial Pipeline.

But any slippage in global coordination around the commitments that we've made would also be a huge risk—an even bigger risk than cybersecurity, frankly. There's not a country or jurisdiction that can mitigate by the two degrees Celsius scenario alone. Developed markets can't get there without emerging markets. The United States can't get there without Europe. It's most important that we try to make 2050 a reality.

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