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What were the main energy transition trends you were seeing in the US pre-pandemic?

Partly sparked by the previous administration’s pull-back from climate change policy, we saw a lot of US companies come out very forcefully with new, aggressive commitments on climate action. That’s the biggest trend – a real groundswell of companies making climate change goals and speaking very publicly about them.

What mood do you see in US boardrooms on cutting emissions?

There’s two groups of companies we work with. One is the climate leader group, and they have set ambitious climate change goals and now are getting serious about how they meet them. We work with them to put in place a business plan, saying: “This is how much it’s going to cost. These are the reductions you’re going to see year-on-year.” The second group are maybe nervous about the new administration, seeing a lot of momentum towards new climate change regulations and wanting to get their internal house in order. We get a lot of first-timers asking to help them set up GHG [greenhouse gas] inventories. There is a lot of capacity-building going on right now, helping them understand what levers they have to reduce their emissions and understand the business cases that underlie those levers. There’s super leaders and the please-help-us-we’re-lost group. Both are welcome.

How much has the mood in large companies in the US changed on this issue in the last two or three years?

It’s a continuous shift. I wouldn’t say it was drastic – since 2015 and the Paris agreement was adopted, each year a big group of companies has decided they need to pay attention to this. I certainly see this continuing, not abating, perhaps it’s increasing. That increase is equally driven by the new US administration as by concerns about brand or environmental impact.

There are a proliferation of standards on reporting green policies and carbon emissions, could there be the emergence of dominant cross-border benchmarks with more global currency?

The goals that ENGIE Impact helps companies set and meet – like RE100, Science Based Targets (SBT), Climate Pledge, Net Zero/Carbon Neutral are all global. They are driven largely by US and European NGOs but it is global companies making these

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commitments. The SBT initiative is an interesting animal because it sets targets, and the reductions themselves are very ambitious, and the initiative has set rules for how you can reach those targets, which do not include the use of carbon offsets today. I'd say 95% of companies thought they would be using some level of carbon offsets, and they signed up to SBT perhaps not paying a lot of attention to that. One of the questions we get folks asking is: “How do I meet this SBT without offsets?” That in itself is driving a new trend towards which is called in-setting. It's pretty complex to address scope 3 emissions from your suppliers and customers. In-setting requires asking: “How can we do a project similar to an offset project but within our value chain?” This new world of in-setting is being largely driven by SBTi.

How do you develop an insetting project or approach for your clients?

First, there's no agreed definition of in-setting, so I'm using my own definition. Offsetting is when you buy an emissions reduction from anyone, anywhere. It meets a standard so you can prove that it occurred and you own the claim to it and someone else gave up the claim. It could be I'm running a coal plant and I purchase an offset from a reduce deforestation project in Brazil – those two activities have nothing to do with one another. With in-setting you look at emissions that relate to your emitting activity. If I am a company that sells food products, I go to the farmers I am buying from and say: “We would like to help reduce your emissions, will you work with us to put a plan in place to reduce fertilizer use, use no-till methods, and regularly monitor your soil carbon?” Rather than this very hands-off approach where you buy an offset, now companies are delving much more deeply into the world of their suppliers and working hand-in-hand to reduce emissions with them. We design that process for them – no matter where in the world they need to be active.

What forms of green energy technology do you see as having the most potential?

It's a we-need-everything moment. President Biden has put in place a goal of 100% renewable energy in the US by 2035, a lot of countries have set similar goals, so renewables will continue to be a major focus. One hot topic I see a lot of lately is green hydrogen. ENGIE had one of the first hydrogen business units of any major global energy company, with approximately 30 projects being developed in 10 countries and counting. I'm intimately involved in developing green hydrogen projects here in the US but you see investment pouring into hydrogen-focused companies all over the world. You see a lot of interest from electricity companies and gas utilities. I know the Biden administration is considering investment or production tax credits and other policies to support green hydrogen deployment in the US and many companies, ENGIE included, will be ready to pounce when they do. I expect a severe escalation as soon as there is a better policy signal supporting it.

Is this primarily for powering large transport like shipping?

The best thing about hydrogen is that it's for a variety of applications. The real value is that it can help with hard-to-abate sectors and it can be a renewable energy storage vector. Anything hard to electrify, green hydrogen can power. Hard-to-abate includes refineries, they use hydrogen for steel making, hydrogen works well for heavy mobility because it's very hard to electrify heavy-duty vehicles. The renewable energy storage piece comes into play for example with electric utilities. They have renewables but there are times of the day when the sun is shining and the wind is blowing and they don't need all the energy so it gets wasted – some of that can be transformed into green hydrogen. The problem is that right now it's very expensive but it's expensive because no one is buying it. The electrolyzers that generate hydrogen are practically bespoke. Once it

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becomes a less custom process, that price will drop precipitously. The EU estimated the price would drop by 2030 by at least 60%, and I would be shocked if we don't go beyond that. There are huge economies of scale to be had .

Shipping and aviation are two sectors often seen as hard to tackle for decarbonisation. Any thoughts on progress in the sector?

Sustainable aviation fuel (SAF) is another area I see trending. Shipping is likely to lag behind aviation for a number of reasons as integrating alternative fuels requires significant adjustments to the ships themselves whereas we have drop-in fuels for aviation that work today; we don't have to build new planes. The airline industry has been working towards integrating SAF into the aviation sector for 10 years. When I managed the climate negotiations team at the Department of State, the airlines brought SAF into the negotiations on the International Civil Aviation Organization (ICAO) Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA). SAF has been growing slowly since then but it's about to pop now, for a number of reasons. First, government policy support is likely coming thanks to the Biden Administration. Second, a lot of corporates are willing to pay a premium for their business travel and cargo transport to neutralize the related carbon emissions and a new initiative is about to make that much easier. And, third, SAF is mostly biofuels-based today but in the next few years we expect to see major breakthroughs in synthetic fuels derived from hydrogen and CO₂. It's expensive technology now but once the hydrogen price drops the cost of synthetic fuels will drop as well. And with synthetic fuels, the sky's the limit (pun intended) in terms of scaling because you aren't limited by the amount of available “scavenged” feedstocks.

Are we close to a breakthrough in SAF?

There are already companies running pilot projects for synthetic fuels right now. It's not commercial, but by 2030 or so I would expect an exponential leap in biofuels uptake and real amounts of synthetic fuels in the market. One definitely follows the other but I wouldn't imagine it's that far behind because of the expected growth in green hydrogen use.

How significant globally is the US joining the Paris agreement?

It's critical to the success of the Agreement, so it is a necessary but insufficient step along the path of driving global ambition for climate action. What comes next is the updated US commitment (the Nationally Determined Contribution, or NDC) to the Paris agreement, which will be revealed in the next month and then how the US is able to use their commitment to drive increased ambition from other countries. It's complicated by the fact that the US Congress likely doesn't want to pass a binding climate change bill that puts in place a national cap. The benefit of the current plans Biden has put forward is there are dozens of ways to reduce emissions in the US, he is not only focusing on setting a cap, like in the EU where they have companies trade emissions under the cap. He is working on more than two dozen opportunities to drive emission reductions through regulation or rule makings or even just federal procurement. He has a lot of levers to pull, which makes him less beholden to getting any particular thing through Congress.

So people are still sceptical of Biden's ability to get major legislation through Congress?

Yes. If they were willing to move beyond the filibuster [a blocking measure in the US legislature that requires a 60% majority vote to overcome] and change that rule there would be a chance to pass something that put in place a national carbon cap of some sort. So far they have said they are not willing to do that and there are a few [Democratic] senators who are unlikely to support what the progressives want. I'm not holding my breath. I am holding my breath for new tax incentives for clean energy investments

and that will make a very big impact not just in the US but globally. There's a big ripple effect when the US makes massive investments into things like solar and wind energy, which we did starting in 2009-2010 – the same thing will happen if the US makes big investments in green hydrogen, for example. Driving down the price of renewable power helps the whole world. Biden still has a lot of levers to pull without legislation and I think he will be aggressive in pulling them.

How do you see the mood among US voters on environmental issues?

US public opinion is much more supportive of climate policies than you would think looking at Congress. The majority of the American public is passively supportive and a part of the public is aggressively supportive – just not a big enough part yet.

How do you see the climate for green investing?

Green investing is about to really take off. You've seen a steady move to green investing over the last five years or so. One of the groups of companies we have coming to us for advice on how to embed a carbon goal into their processes are large banks and investment companies. That is fascinating, impactful work because it's impacting everyone they are investing in. If they set as a requirement for investment that you meet a carbon neutral goal or a science-based target, that has an exponential impact on emissions. You're seeing it all over the US and Europe.

Looking ahead to 2030, what are the big trends you see playing out throughout the decade?

I'd expect renewables to increase as an overall percentage of energy sourcing. We'll see green hydrogen becoming a real thing rather than something only talked about, alternative fuels emerging and electrification of cars. The one unknown for me is how much voluntary action will win the day vs regulation.

Presumably, momentum begins to take over if it becomes clear that is where the capital and policies are moving?

Exactly. Thinking of technology, solar and wind is already commercially viable, but we need to take full advantage of it. We need upgrades to the grid, we need better storage technologies, and that technology is already viable. For technologies that are more expensive, government support will be critical to cause a tipping point into commercial viability. I see that as potentially more important than setting a cap on emissions. If you prove the technologies can be viable, the private sector will take it and run with it.

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