the weekly anthropocene

Dispatches From The Wild, Weird World Of Humanity And Its Biosphere

September 8 2021

The Renewables Revolution: Dispatches

In September 2021 so far...

The **Los Angeles** City Council voted unanimously to transition to 100% clean electricity by 2035, moving the target forward 10 years from their previous 2045 goal. (Pictured: Pine Tree Wind and Solar Farm).

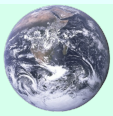
New York State became the second US state after California to set a date to ban new gas-powered cars, emulating many European countries. New York Governor Kathy Hochul signed legislation requiring that all new passenger cars and passenger trucks sold in the state by 2035 must be zero-emission vehicles. Great news!

New analysis shows another way that coal, the dirtiest, most carbon intensive, and most person-killing fossil fuel, is getting absolutely decimated. In 2015, the year the Paris Agreement was signed, the world was full of plans to build new coal-fired power plants, with 1,553 gigawatts (GW) in the pipeline globally. Since then, 1,175 GW of coal plants have been cancelled-an astonishing victory, preventing a 56% expansion of the global coal fleet and essentially a second China's-worth (1,047 GW) of coal plants from being built. Only 327 GW of new coal plants went into operation over the same period, meaning a coal plant planned as of 2015 was 3.6

times more likely to be cancelled than built! The new-coal pipeline as of 2021 looks very different: only 297 GW of new coal plants are in development now anywhere in the world (a 76% decrease from 2015!) and only 185 GW currently under construction. Plus, new coal plants are only proposed in a few countries these days: China is responsible for over half of the new coal plants still planned to be built, and just six countries (China, India, Vietnam, Indonesia, Turkey, and Bangladesh) are responsible for 82%. And still, *all of those* countries contributed to the wave of cancellations since 2015 and now are actively making moves away from coal, that are likely to accelerate further.

Democrats in Congress are still working on passing landmark climate action policy through reconciliation-we'll see how it goes.

A new Department of Energy report found that if we invest and politically support a build-out, the United States **could get 40% of its electricity from solar power by 2035**, and that wind, hydropower, and other renewables could bring us up to a 100% clean power grid. (For comparison, we're now at about 3% solar electricity and 20% total renewables electricity nationwide).



Carbon Offsets: Historically Terrible, But...

In this newsletter, we'd like to discuss some new carbon drawdown and offset projects (in the next article). However, this is such a complex, controversial, and easily misleading field that we'd like to give an overview of the concept first-and to explain why it's important to be skeptical about this.

Carbon offset programs (also commonly known as "carbon credits" and "carbon markets" are a really fascinating field, but also one where new developments need to be taken with a grain of salt-or perhaps a shaker-full. The core idea is that companies or other entities producing greenhouse gas emissions pay someone somewhere else to draw down an equivalent amount of carbon from the atmosphere, offsetting their atmospheric damage. This is a sector that has many fascinating, innovative new projects needing funding, but also many "snake oil salesmen."

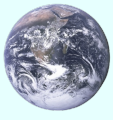
There have been a *lot* of cases where carbon offsets have huge unforeseen negative effects. There was a massive scandal in Brazil where it turned out that carbon credits had been sold by entities promising not to cut down large swathes of forest land...and then they *sold the land to be clear-cut anyway*, so the buyers' carbon emissions occurred, and then the "offset" forest got cut down, with the owners paid twice.

There's also a very reasonable argument that says carbon offsets are inherently a

bad idea because they offer an "out" for companies to keep emitting while getting societal/activist pressure off their back, regardless of what kind of impact the offsets are having. Studies have found that the entire California carbon offset market (based primarily on paying for forest conservation or management in the US) likely had a net result of increasing carbon emissions, as it provided a legal/societal loophole for companies to keep polluting when they would likely have shut down those operations otherwise.

There's also the problem of "additionality;" beyond potential perverse incentives how do you know whether you're getting any real change for your payments? When a new solar farm or wind turbine is put up, new carbon emissions-free electricity is definitely being generated. When paying for forest management that's supposed to be equivalent to a company's emissions, it's really hard to tell whether anything would have been different if the payment hadn't been made. And all of that can be overcome if the goal is to improve outcomes on the ground, since that's quantifiable (this writer worked in 2019 with a pioneering reforestation initiative in Madagascar, not tied to carbon markets, and saw firsthand the extraordinary community and ecological benefits) but it falls apart when it's trying to sell itself as an equivalent to carbon emissions elsewhere. Forest conservation is a critically important goal in itself, and we absolutely need to be doing it, but it's way too vulnerable to fuzzy math and misrepresentation to be used as a source of carbon offsets.

All of these problems combine in a new bout of "greenwashing:" in the last few years, large fossil fuel companies like Total and Shell have been trying to brand their natural gas exports and at-the-pump gasoline as "carbon neutral," because they've sent a pittance to forest management programs in the tropics-many of which were simply to the owners of chunks of forest far away from roads and so not under threat. These programs essentially ran on straight-up lies and imaginary statistics: experts are unanimous that there's no possible way to make that carbon math work, and that there's no excuse or acceptable offset for new fossil fuel development anyway. EasyJet and British Airways are also trying to sell "carbon neutral" flights by donating to tropical forest preservation, with the same impossibility of justifying it based on facts on the ground. In sum, if you see a fossil fuel or airline trying to sell you "carbon neutral" carbon-emitting products, it's essentially a dressed-up scam-don't fall for it.



Carbon Offsets: They Just Might Work This Time.

And yet, even with all of the problems discussed above, under the right conditions, carbon offsets can be a great way to direct funding to innovative new carbon-reduction technologies and more climate-smart methods of land and forest management. It's probably best to think of carbon offsets not as a one-to-

one "get out of jail free" card, where you can claim absolution for each tonne of carbon you cause to be emitted, but as a pro bono investment in scaling up technologies and practices that are inherently valuable in their own right. A few recent developments have been encouraging in this respect.

Online payment company Stripe recently announced a multimillion dollar investment in six of the "best" (in terms of scalability, legitimacy, and potential utility) carbon drawdown/offset companies in the world. Notably, none of these relied on forest-based offsets, instead focusing on innovative new carbon drawdown technologies like direct air capture and mineralization. Also, notably, one of those six companies was Running Tide, a really fascinating Portland, Maine-based company that's raising venture capital to promote their model of growing high-carbon-absorption kelp and then sinking it to be sequestered in sea-bottom sediments. (Pictured: their kelp growing in the ocean). Here's an article about them. In this writer's subjective analysis, Running Tide appears to be one of the most interesting carbon removal companies out there, with a lot of energy, momentum, and capital and their side and a strong scientific basis for their solution. (It would be a lot harder to dig up kelp from ocean sediments than to cut down trees or lose them to wildfires, auguring well for the long-term viability and efficacy of Running Tide's carbon offsets).

On September 8th, 2021, the Orca plant, the world's largest-ever mechanical facility for directly removing CO2 from the atmosphere, started running in Iceland. (Pictured). Co-created by Swiss company Climeworks (also one of the six companies funded by Stripe), this technology unambiguously works to sequester carbon (which is very exciting!) and cost between US $10 and $15 million to build To quote the Guardian's article on the Orca plant, "To collect the carbon dioxide, the plant uses fans to draw air into a collector, which has a filter material inside. Once the filter material is filled with

CO_2, the collector is closed and the temperature is raised to release the CO_2 from the material, after which the highly concentrated gas can be collected. The CO_2 is then mixed with the water before being injected at a depth of 1,000 metres into the nearby basalt rock where it is mineralised." Notably, the Orca plant can only sequester about 4,000 metric tonnes of carbon dioxide per year, a miniscule, nearly imperceptible fraction of the estimated 33 billion tonnes likely to be emitted in 2021. However, it's a solid early-stage proof of concept: Insurance company Swiss Re has already signed a deal with Climeworks to pay $10 million as partial offsetting of Swiss Re's emissions. Hopefully, this money will help scale up and decrease the cost of direct air capture technology.

Also in early September, The Nature Conservancy and Amazon (the online retail behemoth) announced a new joint project focused on the Amazon (Rainforest) in order to help offset the company's emissions. The Agroforestry and Reforestation Accelerator is intended to fund 3,000 small farmers in the Brazilian state of Para (which covers much of the Amazon rainforest and is home to 40% of Amazon deforestation) to plant high-value tree crops like cocoa, moving them away from dependence on cutting down trees to open up space for cattle ranching. Notably, Amazon (the company) acknowledges the historic problems with carbon markets, and says that they are working on new, higher standards of validation for carbon offsetting in this project.

In sum, carbon offsets haven't worked very well in the past-but we are starting to see some promising signs of major companies putting money towards innovative technologies that might scale up to become really effective ways of drawing down carbon. While the core focus in fighting to climate crisis obviously needs to be on decarbonizing our energy systems and getting everything renewables-powered as soon as possible, this has the potential to pay dividends in the future if something like Climeworks or Running Tide ends up being big enough to really move the needle. Let's see how it goes!

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