





YEAR X - NUMBER 3 - JULY-SEPTEMBER 2024









CO2 Technology Centre of Sulcis



ARANO SARANOS Econology Enature





CO2 Technology Centre of Sulcis

4 CO2 Misleading Narratives

6 Bicycle Transport: A Prescription for a Healthier Environment and Reducing Climate Change

12 Pakistan's Approach to BRI and the CPEC: Opportunities, Challenges and Prospects

16 Burning Trees: As the Biomass Industry Grows, Its Carbon Emissions Go Uncounted

20 In The Pan Amazon,

Environmental Liabilities Of Old Mining Have Become Economic Liabilities

24 Renewable Energy Projects and their Impact on Communities

28 Can a 'Net-Zero' World Lead to True Sustainability?

30 The EU's dependency on imports for critical minerals needed for the green transition - here's how that can change

34 Under Pressure From Big Oil, Supreme Court Requests Biden Position on Climate Suit

36 Sugarcane by the Sea for Ketone Biofuel Production

38 Last stand: Eureka





Year X - Number 3 JULY-SEPTEMBER 2024

Editor in Chief: GIANNI SERRA

Editorial team:

JEZ ABBOTT Farzad Ramezani Bonesh Theo Hart Lenore Hitchler Alice Masili

Contributors:

NICK ENGELFRIED TIMOTHY J. KILLEEN PETER SUTORIS MICHALIS CHRISTOU SAMUEL CARRARA EDWARD CARVER

Thanks this issue:

The Revelator Mongabay Undark The Conversation Common Dreams

Publisher:

Sotacarbo CO2 Technology Centre Sulcis Grande Miniera di Serbariu 09013 Carbonia (Italy)

Provider: Aruba

Reg. Nr. 2/2014 Cagliari Ordinary Court

Only Natural Energy [ONE] is a digital magazine published every three months. https://www.onlynaturalenergy.com info@onlynaturalenergy.com

Photo credit: CPL Sam Shepherd/NZ Defence Force

CO2 Misleading Narratives

GIANNI SERRA ONE

Confronting climate change is imperative; doing it rationally and honestly is a duty. However, the discrepancies and half-truths that permeate the global discourse on energy transition and climate action are stark. While the world urgently needs to confront climate change, the path taken often appears misaligned with the values of fairness and genuine sustainability.

Consider the hidden carbon footprints and costs associated with mineral production. While the global focus is on reducing CO2 emissions associated with such an activity, this goal is often pursued without a transparent and holistic assessment of the entire lifecycle of energy production.

The activity involves many steps, including excavation, production, transportation, installation, and maintenance of minerals. CO2 emissions are present in different quantities at every step. Some businesses and sectors involved in this activity manage to obscure their carbon footprints better than others, leading to a skewed narrative that benefits certain interests while potentially undermining the broader objective of carbon neutrality.

If the global energy transition truly aims at reducing CO2 emissions, the starting point should be a comprehensive and objective comparison of the actual carbon footprint of each energy source. Instead, the focus is on a race between fossils and renewables, with little attention to the CO2 emissions throughout the entire journey required for production and distribution. The two-horse race of renewables (wind and solar) vs fossil fuels (coal, oil and gas) is just a convenient simplification that does not benefit the general interest and is inconsistent with the final goal of carbon neutrality. An open discussion should not exclude any technology that can help achieve the emissions reduction.

Not all energy sources are equal, not all areas are suitable, and not all communities are equally equipped to bear the burden of transitioning to the sustainable future. Calling this a "transitioning" is misleading in many ways, as it conveys a sense of a harmonious and planned progression. This process actually resembles a revolution, with significant disruptions, economic upheavals, and social challenges. The impact on local communities varies widely, with some regions experiencing job losses and environmental degradation while others may see only short-term economic benefits.

The narrative often fails to acknowledge these disparities, instead opting for a simplified, reassuring story that masks the energy transition's true costs and challenges, like lower levels of employment compared with the traditional base-load power generation.

Without transparency, the pursuit of carbon neutrality will be another chapter in the long history of environmental and social exploitation.

Delivery of Yakult drinks on a Yakult-branded bicycle in Fukushima City. Photo credit: Mikael Colville-Andersen

A JASA

6

SUBREY.COM JULY-SEPTEMBER 2024



Bicycle Transport A Prescription for a Healthier Environment and Reducing Climate Change

LENORE HITCHLER ONE

Most people need to earn money to pay for living expenses, and many of them would like to help heal the planet while doing so. The maladies that the planet faces are increased by shipping and delivering merchandise to retail stores and food to customers' residences. During the delivery process, the environment is contaminated by the generation of pollutants. This leads to the poisoning of water, air, soil, plants, animals, and even ourselves. The use of fossil fuels by the delivery sector also contributes to the greenhouse effect, which is a major cause of climate change.

The delivery of goods is completed during "last mile" when deliveries are made to their final destination of either retail stores or a customer's home. This stage of delivery produces vast amounts of carbon dioxide (CO2) which is a major greenhouse gas. Georgia Ayfantopoulou of the Hellenic Institute of Transport in Thessaloniki, Greece stated that between 20% and 30% of a city's CO2 emissions come from last-mile deliveries. Fortunately, bicycle transport for delivering both merchandise and meals is a prescription that can employ many workers. Using bicycles is an outstanding method to cut down the use of fossil fuels and to help mend the planet. Both regular and electric bikes (e-bikes) are used, and some bicycles are specifically designed to carry cargo. To be fair and honest, there are various major issues with using bicycles for making deliveries. These concerns, such as whether or not they can make as many deliveries as vans, and the amount of goods that can be potentially handled by cargo bikes, were addressed by the ITF. The ITF is an abbreviation of The International Transport Forum which is part of the OECD, the Organisation for Economic Co-Operation and Development. The ITF stated that "logistics companies report that they can make as much as 25% more deliveries in a day than a van." Jos Sluijsmans, from the International Cargo Bike Festival, stated that "50% of goods transported in cities can be moved by cargo bikes."

Also, bicycle delivery is not practical in rural areas. However, according to the United States Census, 80% of the population resides in urban areas. Even though motor vehicles can potentially go faster than bicycles, urban traffic is relatively slow. The National Association of City Transportation Officials even advises a speed limit of 25 miles per hour (mph) on major streets in urban areas. According to Time, some models of electric bicycles can get 20 miles per hour (mph), whereas some can get 28 mph. Thus, the speed of e-bikes in urban areas is comparable to motor vehicles.

Another difficulty with using bicycles for cargo delivery is that some merchandise is just too heavy. However, many deliveries are small, and cargo bicycles can be designed to hold a significant load. The ITF reported that cargo bikes can carry up to approximately 1,000 pounds.

Further difficulties with cargo bicycle transport include the side effects facing cyclists, especially their poor working conditions. Current wages are inadequate to pay for a decent standard of living, especially considering the high price of apartments in the United States. Families with cyclists as their means of support live close to the official poverty level. Also, employee benefits are usually not provided, such as paid sick and vacation days in addition to health insurance. When cyclists are considered independent contractors, they must pay approximately 12.4% of their income into social security, and they don't get Workman's Compensation. Also, weather conditions such as high winds, icy roads, and extreme hot and cold temperatures can be hazardous for cyclists. Weather conditions for cyclists are not the only conditions that can make delivery cyclists uncomfortable. If bicycles are ridden full-time every day, it is exhausting for most people. Both pedaling and maintaining the proper riding posture during a full day's work expends a lot of energy.

Besides the uncomfortable conditions that delivery cyclists face on a day-to-day basis, there are questions about the long-term health effects of full-time bicycle use. Are cyclists going to have painful feet, ankles, legs, and arms in the future? Can their backs withstand riding on a bike all day? Are they going to develop tendonitis and arthritis? Since full-time cycling is so new, these questions are yet to be answered.

Thus, there are physical and financial liabilities of making bicycle delivery a full-time career. However, working as a bicycle delivery person might be a good option for those who need part-time employment, such as students. They can combine the necessity of earning money with their need for exercise.

Even though individual cyclists might not fare too well, cargo bicycling is extremely economical for businesses. Using delivery vans for the last mile is very expensive. The Onfleet, Inc. website reported that "last mile delivery costs account for 53% of the total cost of shipping." In contrast, the ITF reported that replacing two mini trucks in Bogota with three cargo bikes lowered delivery costs by 16%.

In addition to the benefits of using cargo bicycles for businesses, they are great for the environment. Using bicycles produces fewer pollutants and greenhouse gases than delivery vans. The Zedify website in the United Kingdom published a study entitled "Potential for e-cargo bikes to reduce congestion and pollution from vans in cities."

Another delivery process that produces vast amounts of CO2 is food delivery. It is an expanding service in the United States and various cities throughout the globe. The Fundera website reported that in 2021 "60% of American consumers order takeout or delivery at least once a week.

The report found that in 2016, vans produced 33% of NOx emissions from road transport in the UK. NOx are nitrogen oxides formed in engines during combustion processes and are found in both smog and acid rain. NOx acts as an indirect greenhouse gas by producing ozone, a greenhouse gas, during photochemical processes in the atmosphere. The report went on to state that "Looking just at tailpipe emissions from road transport (i.e. excluding tyre and brake wear and road abrasion), vans accounted for 31% of particulates (both PM10 and PM2.5) in 2016. ... Replacing vans with (e-) cargo bikes disproportionately improves air quality and reduces emissions of greenhouse gases. Vans in the parcel and delivery sector may each emit more than 10 tonnes of CO2 per year. Trials by DHL [a logistics company that specializes in international shipping], where two vans are replaced by a 'City Hub' and four e-cargo bikes, are estimated to reduce CO2 by 16 tonnes pa. [per year]."

The report went on to state that "Per mile traveled, vans emit more carbon dioxide than cars. According to DBEIS, [Department for Business and Industrial Strategy] in 2018, average van emissions were 262gCO2e/km compared to 154gCO2e/km for a petrol car. Collectively van emissions accounted for 17% of greenhouse gas emissions from road transport (19mtCO2e) in 2016."

Other sources confirm that using cargo bikes reduces CO2 emissions and thus are a better environmental choice than delivery vans. The ITF reported that "According to a variety of studies including one by the UK Department of Transport, commercial deliveries by vans contribute a disproportionate amount of pollution, about 30% of all transport emissions and over 50% of nitrogen oxide. [Various sources provide different statistics. However, the point is that vans produce a lot of greenhouse gas.] ... A study by the University of Westminster estimated an e-cargo bike emits 90% less carbon dioxide than a van."

A study conducted in Paris estimated that "cargo bike trips reduce the emissions generated by transporting one ton of goods over one kilometer [0.62 miles] by approximately 99% for vans and trucks." Another Paris study found that "the eleven-fold increase in the volume of goods delivered by bike between 2001 and 2014 led to reductions of 45% and 50% in local air pollution and congestion from freight traffic, respectively."

Additional evidence showing that bicycles produce less CO2 than vans was reported by the New York City Department of Transportation. It found that "20 cargo bike miles per day replace 20 van or box truck miles resulting in a per bike CO2 savings of approximately 7 tons per year." Considering that 7 tons of CO2 is produced from only 20 van miles, the total amount of CO2 produced by all vans is enormous.

Another delivery process that produces vast amounts of CO2 is food delivery. It is an expanding service in the United States and various cities throughout the globe. The Fundera website reported that in 2021 "60% of American consumers order takeout or delivery at least once a week. ... More than 112 million Americans say they've used a food delivery service. [Various other sources provide different statistics on this. For example, Mike Peregudov, co-founder of Whizz, a company that rents ebikes, stated that "close to 200 million Americans order takeout at least once per week."] Using motor vehicles for individual food delivery produces large amounts of greenhouse gases. USwitch is a United Kingdom price comparison service. They estimated that the carbon footprint of households that spend around \$63 per week on food delivery services is 450% higher than average than those that don't.

In the United States alone, vast amounts of greenhouse gases are produced by over a million food deliverers using motor vehicles. According to the Business of Apps website, Doordash has a total of around one million people who deliver meals. Grubhub has around 65,000. Instacart has over 600,000 people who pick up items from stores and deliver them to customers.

Besides the high cost to the environment, motorized food delivery does not pay well. According to the Roadwarrior website, the average hourly pay for a Grubhub driver in the US, as of March 2024, was \$18.75 with wages ranging from \$9.86 to \$39.77. As of May 2024, the average hourly pay in the US for Uber Eats was also \$18.75. Since these are average figures, many drivers earn less than these amounts.

Fortunately, using bicycles is a better financial option for those who deliver food. Bicycles are cheaper to purchase than motor vehicles. Additionally, there are savings in fuel costs, vehicle maintenance, and expensive repairs resulting in cyclists having a larger income than motor vehicle drivers. Thus, using bicycles increases the take-home income of food deliverers as well as producing less greenhouse gases.

Switching from the big picture of the pros and cons of bicycle cargo delivery in general to one specific operation is relevant.

Trevor Roark is an entrepreneur who owns and operates Curbwise LLC. Curbwise LLC is a bicycle-powered delivery and distribution company based in Stevens Point, Wisconsin serving the surrounding area. Trevor's customers include many local businesses, nonprofits, and local governments. According to Trevor's website, "At the core of Curbwise is the triple bottom line approach (People, Planet, then Profit). Whether a business/organization/farm is looking to invest in local people power, reduce their carbon footprint (fossil-fuel-free delivery), and/or sustain a more localized economy, our delivery/distribution service will happily crank it out."

Trevor replied to several questions. He stated "I have learned that the subsidization of fossil fuels has made my job (and maintaining my business) difficult, as well as employing pilots [cyclists who work for Trevor]. Basically, since the subsidies have deflated the cost of fuel, it's very difficult to keep the cost of my services low enough to be competitive with other delivery/distribution services."

He added that "The most typical model of delivery we've seen in the U.S. is gig work [gig workers are independent contractors or freelancers with temporary jobs in the service sector] for the likes of DoorDash, GrubHub, Eat-Street, Uber Eats, etc. I don't know all of the details, but gig work allows CEOs of these companies to pay less and provide less. Case in point, the CEO of DoorDash has a net worth of \$2.1 billion, according to Forbes (real-time net worth). One cannot accumulate that much money and pay employees or 1099s (gig workers) a living wage with benefits."

One of Trevor's customers is Siren Shrub, which is a local company that makes specialty vinegar products. One of the owners stated "We are always exploring ways to reduce our environmental impact and support local initiatives. Collaborations with businesses like Curbwise not only help us achieve these goals but also inspire our community to consider greener alternatives in their daily lives."

A customer who directly hires Trevor for personal deliveries stated "I want a community with less cars on the road, more bikes and more pedestrians. ... How much safer is it for my daughter to have Trevor on his bike delivering goods than a car-based delivery rushing from



house to house to try and make enough to break even."

Thus, using bicycles during the last mile delivery stage is great for the financial bottom line in addition to protecting both the health of the populace and the environment.

Bicycle transport cuts down on both greenhouse gases and particulate matter, which is extremely damaging to human health. However, full-time bicycle riding takes its toll on cyclists, and it is difficult to make a decent living making bike deliveries. Thus, cyclists pay the price to protect the environment and fight climate change, while everyone else benefits from their labor. Fortunately, it is possible to improve working conditions for cargo cyclists. Then, cyclists, businesses, and the environment will all benefit from using cargo bicycles for last mile deliveries.

Pakistan's Approach to BRI and the CPEC: Opportunities, Challenges and Prospects

The BRI project has brought Pakistan \$25.4 billion in direct investment. The CPEC is the key pillar of Pakistan-China friendly relations.

FARZAD RAMEZANI BONESH

The One-Belt, One-Road Initiative (BRI), launched by Beijing in 2013, seeks to connect Asia to Africa and Europe, to improve regional integration, increasing trade and stimulating economic growth.

The China-Pakistan Economic Corridor (CPEC) is an important part of the BRI plan and one of the most successful BRI projects. The \$62 billion China-Pakistan Economic Corridor (CPEC) was officially launched by the two countries in 2015 and has been a game-changer with initial successes.

The BRI project has brought Pakistan \$25.4 billion in direct investment, 510 km of highways, more than 8,000 MW of electricity generation, and 886 km of main transmission network. The project had slowed down due to political, economic, and security challenges and crises in Pakistan.

In July 2023, Pakistan and China signed six important documents for the expansion and acceleration of cooperation (CPEC). Pakistan's new government is hoping to inject new momentum, hoping to revive the massive investment plan after project delays and build an upgraded version of the CPEC.

The CPEC is the key pillar of Pakistan-China friendly

relations. Pakistani Prime Minister Shahbaz Sharif arrived in China on his first five-day official visit (from June 4-8 2024) to start a new era of CPEC.

In an article in the Global Times, he said that the enhanced version of the CPEC will promote regional connectivity, integration, and shared prosperity, attract more Chinese investment in key sectors in Pakistan, create more job opportunities, stimulate economic growth, and promote stability. He also spoke about the development of macroeconomics in the country. From this point of view, the upgraded version of the CPEC with more than 60 projects promises a brighter future with growth, increased livelihood, innovation, and cooperation in industrialization, agriculture, information technology and mining, in harmony with Pakistan's development agenda.

Based on mutual understanding, the second phase will be accelerated and the CPEC projects will be integrated with Pakistan's national priorities in renewable energy, innovation, and job development. Simplifying foreign direct investment (FDI) processes in Pakistan through the establishment of the Special Investment Facilitation Council (SIFC) in June 2023 is a key strategic goal in the next five years. To



replicate China's model in Pakistan, Islamabad is pursuing access to Chinese capital markets, monitoring and facilitating investment programs, and commitment to support and provide security for Chinese personnel, projects, and institutions. Pakistan is looking to recover its economy from recession and foreign debt. Therefore, the economic advantages of the second phase of the CPEC can create jobs, grow innovative industries, and increase export and communication capacities. Pakistan can hope for good growth. It highlights the benefits of the CPEC in its four major initiatives, the development of Gwadar seaport land transport and infrastructure development, and the creation of Special Economic Zones. The agriculture sector is the backbone of Pakistan's economy and the country is looking for cooperation under the CPEC to increase production.

China's investment in the CPEC and approaches such as the construction of the new Gwadar International Airport, is stimulating the positive economic growth and GDP of Pakistan and turning Gwadar into a regional and international logistics center. One of the main goals of the CPEC is to develop Gwadar Port as a transportation port and a regional economic hub. It seems that Islamabad considers the advancement of all projects in the CPEC to strengthen the strategic relationship with China, control India and expand Beijing's influence in the Indian Ocean change the game in the region, and connect Afghanistan and Central Asia. In its 2025 vision, the government of Pakistan has put the modernization of transportation and regional connectivity in line with the CPEC plan. In fact, projects such as the Karachi-Peshawar road project, Central Asian-CPEC, and Afghanistan's joining BRI means strengthening Pakistan-Central Asian transit routes.

The CPEC project is supposed to connect the western part of China to Gwadar and Islamabad wants to develop China's trade with the Middle East, and Africa centered on Gwadar and Pakistan. Apart from this, Pakistan has tried to make its place more important by plans such as inviting other players to the CPEC. There is wide agreement among the provinces and political parties of Pakistan on the benefits of CPEC. There are also hopes for socio-economic development, reaching the benefits of the CPEC to local communities, and pushing the country towards sustainable development and self-reliance.

Obstacles of the CPEC

The CPEC is still progressing at a slow pace. Of the 21 power projects, 14 have been completed, of the 24 transport projects, six have been completed and of the nine Special Economic Zones (SEZs), none have been completed. Apart from the impact of poli-

tical instability and technical challenges, security is the number one challenge of the corridor in Pakistan. The CPEC development program is facing a huge challenge including the insurgents in Baluchistan, the jihadists and extremists, the killing of Chinese nationals and Pakistani workers, the increase in security costs, and the provision of security and facilities. Major extremist groups can be a significant threat to BRI or CPEC.

Despite the government's greater commitment to support and provide security for Chinese personnel, projects, and institutions and cover the security of the 3,000-kilometer corridor with tens of thousands of security forces, there is still a complete lack of Chinese trust. In the last year, sometime after the attacks on the Chinese companies, they suspended the work in the projects. Baloch nationalists have asked China to shut down the CPEC and leave Balochistan. The geopolitical, political, and military consequences of the expansion of China's presence in Pakistan are important. According to many in Pakistan, the United States and India are colluding and interfering in the CPEC. From India's point of view, China's increasing presence in the region and Kashmir, and the CPEC project are "illegal, illegitimate, and unacceptable".

Despite US concerns about China's ambitions, the CPEC may be adversely affected by geopolitical competition in South Asia. The basic problems of lack of water, electricity, and gas are among the major difficulties of the CPEC. The unavailability of essential services will cause a delay. For example, the potential of Gwadar is promising, but the incentives are not enough and the infrastructure is insufficient. Therefore, Gwadar's full transit and commercial potential will not be fully utilized in the short term.

Still, the type of distribution of economic projects, the approach of the federal government, and the competition between states in Pakistan cause challenges and competition. Pakistan's debt and obligations have increased to 124 billion dollars, of which 30 billion dollars are owed to China. Pakistan's economic problems have made some consider the CPEC as the main factor. Although China has repeatedly extended the deadline for repayment of Pakistan's loans, there are concerns about the way forward. However, government officials maintain that the CPEC has not become a "debt trap" and that the negative publicity against CPEC has a political element. However, there are still concerns about environmental effects, foreign loans, and debt crisis.

Vision

The pace of projects has decreased, but it is expected to increase to 62 billion dollars by 2030. Parts of the CPEC are still in the early stages, but without CPEC, Pakistan would have faced a severe energy crisis. The second phase of the CPEC seems to be more beneficial by focusing on industrial cooperation and trade linkages through increased investment in sectors such as energy, agriculture, information technology, mining, and nine Special Economic Zones (SEZs).

The second phase of the CPEC can play an important role in strengthening the development of infrastructure, employment, trade, education and employment, growth of human capital and investment in Pakistan, and strengthening the national economy. The CPEC can still play an important role in making Pakistan one of the main economies of the region.

The management of Pakistan's political stability, the finalization of the bilateral agreement and the construction of routes, the geographical proximity of Gwadar port to the Middle East, and the change in global and regional conditions can cause the success of the CPEC to attract other international actors.

However, the economic conditions and foreign exchange reserves of Pakistan, and the increase in Pakistan's foreign debts, may slow down Beijing's investment and negatively affect the continuation of investment in Gwadar. If the challenges, especially the security ones, increase day by day and the policies of the two countries do not go well, it may have adverse financial consequences for Pakistan.

Gwadar Port Traffic, Pakistan. Photo credit: Sadiqrizwan

NTICA

6

Burning Trees: As the Biomass Industry Grows, Its Carbon Emissions Go Uncounted

Wood-pellet companies have devastated forests in the Southeast and New England. Now they're looking to expand.

> NICK ENGELFRIED The Revelator

The port of Longview, Washington has served as a bustling hub of commerce for more than a century. Ships carrying everything from grain to wind turbine parts pass through it every day headed for distant places — but it's to the timber industry that Longview owes its existence. Located at the confluence of the Columbia and Cowlitz rivers, this town of 38,000 was founded by the Long-Bell Lumber Company in the early 1920s to house workers at its nearby mills.

Today the community is at the center of a political debate with immense implications for the region's forests.

Longview is one of at least four locations on the U.S. West Coast where companies hope to begin manufacturing wood pellets — compressed wood used as fuel for power generation or home heating — for export on an industrial scale. By turning trees into energy, this growing biomass industry seeks to benefit from subsidies established in Europe and Asia to encourage renewables. If the UK-based Drax Group gets its way, Longview will house a plant capable of producing 450,000 metric tons of pellets annually, enough to run a small power plant for a year.

Drax and other biomass companies say they're promoting carbon neutral energy while practicing sustainable forestry to harvest the wood fuel referred to as biomass energy. However, the industry's behavior in places where it has long operated appears to undermine this claim.

"It starts with logging whole trees and grinding them up in polluting plants," says Brenna Bell, forest climate manager for 350PDX, an environmental group based in Portland that opposes the Longview project. "The resulting pellets are shipped overseas."The pellets are then often burned, or "cofired," with coal, supposedly reducing coal's emissions, and have more recently replaced coal in some power plants. "The most counterintuitive part is none of the associated carbon emissions are counted by governments who classify biomass as clean energy."

Faulty accounting methods have allowed biomass companies to sell themselves as climate-friendly even as they seek to convert carbon-rich natural forests into tree plantations in the Pacific Northwest and be-



yond. Nowhere are the on-the-ground impacts clearer than in the Southeast, where large wood biomass export projects have operated longer than anywhere else in the United States.

Selling the Biomass Story

The Drax power generating station looms over North Yorkshire, England, tall as a city high-rise. For decades the plant was Western Europe's largest coal polluter, but in 2003 Drax began converting the first of four boilers to cofire wood. Last year the company finished replacing coal at its plant with wood pellets, hailing the milestone as a step toward a "zero-carbon energy future."

Communities in the American Southeast, where Drax sources much of the wood for its plant, weren't celebrating.

"The biomass industry in the Southeast expanded from barely anything 15 years ago to exporting over 9 million tons of wood pellets annually today," says Adam Colette of Dogwood Alliance, which works to protect southern forests. "We're talking over 100,000 acres of forest being cleared solely for this purpose every year. And that's a conservative estimate."

The South has long been among the most logged regions in the country, but the arrival of biomass companies put new pressure on remaining natural forests. A study commissioned by the Southern Environmental Law Center showed forest loss has increased significantly in the area surrounding biomass pellet plants in Virginia and North Carolina.

"The industry calls biomass a climate solution," Colette says. "Smart people in government, even some well-intentioned people in the climate movement, support giving it hundreds of billions in subsidies. You've got to ask, how is that possible? It's not that biomass is as powerful as the fossil fuel industry."

Fossil fuel companies amassed immense political

clout over centuries. By contrast, the biomass industry is only decades old. Yet biomass companies have won political favor by peddling a narrative with immense allure for policymakers who want quick fixes to the climate crisis.

On paper, converting existing coal plants to run on wood pellets looks like an easy climate win. But burning wood produces even more carbon than coal per unit of energy generated. Because this carbon can theoretically be reabsorbed if forests grow back, some governments consider the process carbon neutral — but continually cut and regrown forests never achieve the carbon storage potential of older trees. And even if the carbon released during deforestation is eventually reabsorbed, it stays in the atmosphere for decades in the meantime. None of this is accounted for by policymakers who see biomass as green energy.

Nor is it only foreign governments subsidizing the industry. In parts of the United States, too, trees are burned for electricity. Ironically these include jurisdictions that regard themselves as among the world's greenest.

Burning the Forest

"We've been deluded about biomass in Burlington, Vermont," says Zack Porter, executive director of the New England-based Standing Trees. "We're supposedly America's first city to run entirely on carbon-neutral renewable electricity. Yet our leaders tout that title knowing we still rely on Vermont's largest point source of carbon emissions: the McNeil biomass power plant."

Burlington's Joseph C. McNeil generating station pumps close to half a million tons of carbon dioxide into the atmosphere every year but is considered carbon neutral energy under Vermont's Global Warming Solutions Act. This designation has been justified partly by biomass companies' claim that they burn mainly "waste wood," or branches and other tree parts leftover from logging, as well as wood residues such as sawdust.

"The problem is, to timber companies 'waste' is any wood they can't find a higher value use for," says Porter. "They see old or crooked trees that can't be sold for lumber as waste. But we actually have a scarcity of ecologically important logs and snags in New England forests, and creating more demand to remove them worsens the problem." Wildlife species that depend on woody debris for habitat include marbled and Jefferson salamanders, both of whom are considered imperiled across parts of their New England range.

At a hearing in Burlington last year, a proposal to heat University of Vermont medical center buildings with steam from McNeil drew intense opposition, suggesting climate groups have momentum as they push policymakers to rethink the role of biomass in Vermont's grid.

There would be precedent for such a move. New York and Massachusetts have taken steps to exclude forest biomass from benefiting off clean energy incentives, and advocates like Porter think other Northeast states should follow suit.

In fact, there's a growing national movement to make climate policies more accurately reflect the carbon footprint of wood biomass, both in U.S. circles and beyond. This goal has taken on increased importance as the industry seeks to expand beyond the South and Northeast into regions where it has yet to establish a major presence.

Stopping the Expansion

Back in Longview, climate activists prepare to fight what could become the state's first industrial-scale wood-pellet manufacturing plant. Locals plan to speak out against Drax's Longview project at a hearing expected later this year. Across the Columbia River, 350PDX has been educating the public about impacts of the biomass industry by tabling at public events and hosting a screening of the documentary Burned. Other West Coast biomass plants have also drawn opposition.

At the port of Grays Harbor, two hours' north of Longview, Pacific Northwest Renewable Energy wants to build a pellet plant comparable in size to the Drax project. Two more plants, with a combined ability to produce about a million tons of pellets annually, are proposed by Golden State Natural Resources in California.

To bolster political support for these plants in greenleaning West Coast states, the companies involved have leaned into a new talking point: that removing "waste" wood from forests will somehow blunt increasingly devastating fire seasons. "This industry is playing on people's justified fear of fire," said Rita Vaughan Frost, an Oregon-based forest advocate with the Natural Resources Defense Council. "But their demand for a product to constantly deliver to customers will actually shift resources away from fire-management regimes based on the best science, such as Indigenous practices that include prescribed burns."

Despite purporting concern about fire, the biomass industry on the West Coast has proposed doing something very similar to what it's already done in the Southeast and New England: turning carbon-rich, biodiverse forests into tree plantations whose purpose is to grow wood as fast as possible for conversion into fuel.

Ironically, this is happening even as the climate benefits of intact forests are drawing unprecedented attention. In December the Biden administration announced it will amend national forest management plans all over the country with the intent of protecting old-growth forests.

And in Washington State there's a growing movement to protect mature "legacy forests" that don't yet qualify as old growth but provide significant carbon storage benefits. The biomass industry's goals complicate such efforts.

"I want people to know we have a precious opportunity right now to keep this destructive industry out of our region before it gets established and expands," says Bell of 350PDX. "We need to focus on that, because if we let them gain a foothold our work will get that much harder."

> Originally published by The Revelator May 20, 2024



ONLYNATURALENERGY.COM JULY-SEPTEMBER 2024

In The Pan Amazon, Environmental Liabilities Of Old Mining Have Become Economic Liabilities

TIMOTHY J. KILLEEN Mongabay

Although new mines use state-of-the-art technology, the industry also has a legacy of ageing containment dams at older mines, particularly shuttered mines that no longer generate revenues to finance improvements in the technology surrounding tailings storage facilities (TSF). Their failure can result in the release of millions of cubic metres of toxic sludge into river systems. In populated areas, this can impact the water supplies of communities, wreak havoc on the local economy and endanger the health of thousands of inhabitants. In remote landscapes, a failed containment structure will contaminate (tens of) thousands of hectares of aquatic and riparian habitat, threaten wildlife and disrupt the livelihoods of Indigenous families.

Although mining companies have fully embraced the need to improve their environmental management, they tend to focus on new mines where state-of-the-art technology could be incorporated into the design of new projects, often with additional benefits that reduce operating costs and conflicts with nearby communities. Until recently, less attention was focused on the older and decommissioned mines and their associated environmental liabilities. That changed after two recent incidents in Minas Gerais (Brazil) where legacy dams constructed using a flawed engineering design failed with disastrous consequences.

The first event occurred at the Mariana iron ore complex in 2015 when a dam failed and released ~44 million metric tonnes of mud and effluent into the Río Doce. The operating company, a joint venture between two of the largest and most experienced mining corporations (Vale SA and BHP), agreed to a remediation plan estimated to cost R\$6 billion (~US\$1.2 billion). That is only a fraction of the financial cost of the disaster, however, because lost operating income forced the operating company (Samarco) to default on US\$13.4 million in corporate bonds. Yet to be determined are costs associated with civil action in the UK and Australia where BHP is being sued on behalf of individuals impacted by the incident.

The second event was even worse. In 2019, the Brumadinho tailings dam collapsed at another Vale-operated

Ohio Valley Mushroom Farm, Acid-Mine Drainage. Photo Credit: Jack Pearce (Flickr)

iron ore mine, releasing twelve million metric tonnes of tailings that triggered a flood which swept across the mine's operations center and adjacent agricultural landscape. The tailings facility, which had closed in 2014 after thirty years of operations, was classified as a low-risk small dam and, allegedly, was monitored twice a week for cracks and filtration. In February 2021, the government of Minas Gerais and Vale agreed on a remediation plan with an estimated cost of US\$7 billion, while reaching individual settlements with families impacted by the disaster at a cost of \$US 630 million. The Securities and Exchange Commission (SEC) sued Vale in April 2022 for deliberately misleading investors as to the safety of its tailings management systems.

Corporate shenanigans

The ongoing attempts by companies to isolate themselves from environmental liabilities highlight the legal challenges when those liabilities were created by corporate actors that no longer exist as legal entities. This behavior has long been practiced by both mining and oil companies that permutate their legal identity via complex transactions that exploit legal maneuvers available to companies that have participated in mergers, acquisitions or sale of corporate subsidiaries that exist as distinct legal entities.

For example, the Oroya metallurgical complex in Central Peru has operated as an industrial mill for more than a century. It was owned by a private company between 1920 and 1980, when it was nationalized and ran as a stateowned corporation until 1997. It was sold to the RENCO Group of the United States, which maintains that it has legal liability only for the period since it acquired the facility. In 2005, an environmental monitoring study revealed that 97 per cent of the children in nearby communities suffered from lead poisoning caused by inhalation of dust that originated in the Oroya tailings heap. Almost immediately, RENCO spun off its Peruvian operations into a separate corporate entity to protect the holding company from the financial liabilities of remediation, estimated at ~US\$5 billion. The dispute revolves around a claim and counterclaim: the government maintains that RENCO failed to eliminate toxic emissions, while the company argues it is not responsible for clean-up obligations that the Peruvian state had explicitly assumed during the privatization process.

The lengthy legal contest highlights a reality of the mining business. Depreciating assets are spun off into subsidiaries, which are sold to low-cost operators seeking to extract the last bit of value from a mineral deposit. Legal action to hold a corporate entity liable for events occurring decades after the closure of a mine is not likely to succeed, a fact highlighted by companies in their declarations to the Security and Exchange Commission. The inability to make a defunct corporation pay for remediation forces the state to assume the full cost of remediation. Unfortunately, governmental budgets are constrained and solutions expensive. The most likely outcome is that elected officials will ignore the problem and let their citizens suffer the impacts of environmental degradation.

The same strategy is being used to escape (or limit) legal and financial liability in the Peruvian oil industry after five decades of negligence and mismanagement. The corporation that pioneered investments in Northern Peru in the

ONLYNATURALENERGY.COM JULY-SEPTEMBER 2024

1970s, Occidental Petroleum, transferred operations in its principal concession to Pluspetrol in 2000. By coincidence, Pluspetrol had assumed operational control of an adjacent field in 1996 from the state-owned company Petroperu, replacing Occidental, which was a junior (rather than senior) partner. In both instances, Occidental was the operating partner and, presumably, liable for any accidents that might have occurred during its legal tenure. Both concessions were located within the ancestral lands of the Achuar, who are equally displeased by the practices of Occidental, Pluspetrol and Petroperu. Occidental was sued by the communities in a US court and reached an (out-ofcourt) settlement; the company did not accept, however, any responsibility for oil spills in the concession they had operated for forty years. Pluspetrol operated both concessions for slightly more than twenty years and, allegedly, continued many of the substandard practices of their predecessors.

Like all oil companies, Pluspetrol operates via subsidiaries and joint ventures, a deliberate strategy to manage the risks associated with their business. Pluspetrol declared one of its Peruvian subsidiaries bankrupt in December 2021, a not-illogical corporate maneuver considering those oil fields were well past their productive prime. However, it also represents a brazen attempt to avoid legal liability by arguing that the operator is not responsible for the contamination that occurred previous to its tenure. In its announcement, the company blamed the Peruvian environmental supervision agency (OEFA) for holding it responsible for the contamination that occurred in previous years when other companies (e.g., Petroperu and Occidental) were operating the block. Occidental and Pluspetrol will probably escape legal and financial liabilities; however, Petroperú has fewer legal options. As a state-owned company, it can neither pull up stakes and leave, nor declare bankruptcy, which is a political decision reserved for either the President or Congress (or both). Its legal liability is complicated by the Oleoducto Norperuano, a key infrastructure asset managed by Petroperú since its construction in 1973 – and the source of the vast majority of the oil spills that have contaminated the region. The regulatory agency that oversees the oil industry (OSINERGMIN) contends that Petroperú should not be held liable, however, because over eighty per cent of the incidents have been caused by sabotage.

The company's fiercest critics are the Awajún and Huambisa ethnic groups, who occupy the land transected by the pipeline. Although they oppose the pipeline, they are not the primary suspects in the recurring sabotage that plagues the financial health of Petroperú and exacerbates the environmental liabilities that afflict their communities.

Those criminal acts are assumed to be caused by individuals who benefit economically from clean-up efforts, including the service companies that are contracted to remediate the spills and provide compensation to impacted communities in the form of health care and basic infrastructure. Petroperú may get stuck with the tab, but it has effectively ignored almost all judicial or regulatory mandates to remediate the impact from more than a thousand spills that have contaminated forest and aquatic habitats across Northern Peru. The price tag for that remediation, if it ever materializes, has been estimated at US\$1 billion; that number, although large, is probably an underestimate and the reality is likely to be at least one order of magnitude greater.

> Originally published by Mongabay June 5, 2024

COMMEMORATING THE 20TH ANNIVERSARY OF SEE CONFERENCE

9th International Conference on Sustainable Energy and Environment (SEE 2024)

SECURING A SUSTAINABLE NET-ZERO FUTURE NOW

18-20 December 2024 Millennium Hilton Bangkok, Thailand

MAIN CONFERENCE TOPICS

- Advanced energy and power systems
- Bioenergy, biofuels and biorefinery
- Circular economy and sustainability
- Decarbonisation of end-use sectors: Buildings, industry and transport
- Environmental and climate science, technology, and management
- Future climate technologies and innovation
- Green governance and policy

SPERDO

ORGANISERS

SA IGSEE

IMPORTANT DATES

Abstract submission Notification of acceptance Full paper submission (optional) Registration payment 15 July 2024 15 August 2024 30 September 2024 15 October 2024

PUBLICATION AND DISSEMINATION

- Programme and book of abstracts
- Publication in the conference proceedings

SEE 2024 SECRETARIAT

NET ZERO

The Joint Graduate School of Energy and Environment, King Mongkut's University of Technology Thonburi, 126 Pracha Uthit Road, Bangmod, Thungkru, Bangkok, 10140 THAILAND

(66) 0-2470-8309-10 ext.4130

see.jgsee@gmail.com

www.see-conf.com

Renewable Energy Projects and their Impact on Communities

ALICE MASILI

ONE

Cristiano Spillati is a renewable energy entrepreneur. As the Managing Director of Limes Renewable Energy, he explains the significance of collaboration and dialogue in renewable energy projects and their profound impact on communities.

How does the Limes contribute to the energy transition?

We are developing renewable energy projects at the highest technical standards. Mitigating potential negative local impacts and creating positive spill-over effects into the local community is at the heart of the Limes approach and sets us apart from other developers. We also have a strong focus on agrivoltaics projects, combining crop cultivation and electricity production, addressing the issue of agricultural land use by conventional solar PV projects.

You deal with renewable energy, solar and wind, and energy storage. What storage projects have you developed? What type of batteries do you create?

Currently, Limes has a pipeline of 550MW in Italy and 400MW in Chile, our projects are still in the development phase. Unlike in the UK, in the markets in which Limes is involved, storage is in its infancy. In many areas regulations around battery storage have been very recently defined or are still in the process of definition. At present

Limes is focused on lithium-ion batteries.

What are the most significant hurdles you encounter in developing a project?

Limes prides itself on our ability to identify and successfully develop renewable projects, but the process is not simple. Our extensive knowledge and expertise in the sector and across the markets in which we operate allow us to navigate a number of challenges associated with the development of renewables.

Primarily, there are difficulties prior to the development phase of a project, in acquiring the location. Suitable land is scarce and the competition for this land is extremely strong. Aside from this aspect of competition, this demand naturally affects the price of land and therefore acquiring land at a reasonable price is a challenge.

Similarly, grid congestion poses another challenge, insufficient capacity in the transmission network to accommodate the power generated by new renewable projects can limit the profitability of proposed projects or require additional investment in the local network to allow for more reliable and consistent access to the grid.

These difficulties can be mitigated by a coordinated effort to expand and upgrade infrastructure with the implementation of smart grid technologies and the development of policies that support the integration of renewable energy into the local grid. Perhaps the most widely reported issue facing the implementation of renewable projects is that of 'NIMBYISM'. The general population is overwhelmingly in agreement that the future of power lies in the use of renewable sources.

However, both national and local governments and communities alike remain reluctant to see such projects brought to fruition in their 'backyards'. Like the overarching theme of NIMBYISM, excessive procedures, changing policies and low levels of cooperation from central ministries and public administrations also prove hurdles for renewable developers. Procedures are often cumbersome and, in some instances, even once complete, policy changes result in additional requirements or the invalidation of previously completed work.

Again, a collaborative approach is integral to solving this, policies must reflect the need for these projects and prevent local authorities and communities from agreeing in principle and expecting them to be enacted elsewhere, engaging all stakeholders from the outset is integral to community acceptance. Limes' approach, prioritising genuine and tangible positive local impact is an example of this.

Your website shows you prefer to promote local development by favouring local labour and businesses. The benefit to local communities is obvious, but what is it for your company?

The local element is integral to Limes' approach, in addition to our belief that this is the only right way to act as developers and as guests in the communities and locations in which we operate, there are benefits to the business case. Improving project acceptability from the local community and local administrations allows for a smooth(er) construction and operation of the projects.

The inclusion of local people and expertise within the entire process enables a transition from development to operation which the local community feels ownership of and results in a more streamlined process throughout.

Your website has also a section dedicated to landowners interested in marketing their land. What do you think about speculation related to agriculture? In the long run, is installing a photovoltaic system or wind turbine more

Why Limes?

"Limes is a Latin word for the 'path' or 'road' taken to venture into new territories.

It is the perfect nod to the company's Italian roots whilst encompassing our purpose, to provide a path



Cristiano Spillati

towards new opportunities for powering the world with clean, renewable energy.

We are developing solar photovoltaic, wind, and battery storage projects. We also have hybrid projects within our portfolio, these involve a combination of solar and batteries and wind and batteries. Limes focuses on projects of varying sizes, sources and locations, offering a more differentiated range of opportunities rather than singular large-scale projects.

Currently, Limes' business model is focused on the development and sale of ready-to-build assets.

Given the experience of senior management in raising debt and equity for renewable energy projects, we have not discounted the option of evolving into a hybrid IPP, keeping minority stakes in some of the projects we develop and providing postready-to-build services like finance and PPA origination and structuring, EPC-M (management of EPC), commercial asset management.

Required stages of development differ in order, depending on the country, but at present, the typical outline of the process begins with land origination and a pre-feasibility assessment followed by obtaining site exclusivity by way of a land option with the owner. Once completed, the next phase is to secure a grid connection point and finally obtain the necessary permits.

Again, these permits vary depending on the location but most commonly include environmental permits covering landscape, visual, noise and archaeology. In the case of wind projects specifically, wind measurements must be recorded on the site for at least one year and an additional bird and bat study must be completed."

convenient than farming the land?

Agri-PV offers a dual land use opportunity, maximising land efficiency by allowing crop cultivation, livestock grazing, beekeeping activities, and generating additional revenue through renewable energy. A coherent and effective agri-PV project integrates renewable energy with agricultural production, creating a value greater than the sum of its parts. We collaborate with landowners, local agronomists, agri-PV consultancies, and social cooperatives to ensure site-specific solutions for both electricity production and land cultivation. Analyses show that converting less than 1% of Italy's agricultural land to agri-PV could meet 2030 targets without compromising agricultural production in any way.

Effective management of agri-PV projects is integral for ensuring the success of both renewable energy generation and agricultural productivity, offering landowners a unique dual-use opportunity. If these projects are well developed and implemented the perceived conflict between renewable energy and agricultural land use is non-existent. As an English farmer involved in an agrivoltaics project on his land once said, "It's not about producing 10 units of energy or 10 units of food. It could even be six units of each. But then we might discover that the two halves are greater than the whole."

In your experience, what are the requirements for developing agro-photovoltaic systems, including from an environmental and landscape perspective, to obtain project approval?

As with all projects, these requirements will differ from country to country. Currently, within Italy, in which Limes has considerable experience, projects must ensure that a minimum of 70% of the land is maintained for crop cultivation and that the economic value generated by crop production is also maintained.

Additionally, the electricity produced by the Agri-PV project must represent at least 60% of a standard photovoltaic project. Finally, the area occupied by the solar panels must account for no more than 40% of the total land area of the project.

Is there an obligation for monitoring and control in other countries to prove the continuity of the agricultu-

ral/pastoral activity?

Currently, Limes is exclusively developing Agri-PV projects in Italy where monitoring is becoming increasingly important. We expect monitoring to become mandatory for all types of Agri-PV projects globally in the future, as is the case in Italy for advanced projects to access incentives.

How do you see the development of the renewable energy sector in Italy, and what are you doing to meet the new challenges?

Italy has been too slow to develop renewable energy strategies and projects in comparison to other European countries, to date. The current commitment to meet EU targets by 2030, and the dire economic sanctions that will follow if Italy fails to do so, must motivate to act quickly and with purpose. Italy is subject to the same stalling and slowing as many other countries as possible in Europe, policies are watered down, deadlines are extended and targets are left unmet, with constantly changing priorities and no tangible commitment to action. Italy, along with much of Europe needs sufficient political will to progress the energy transition at the speed required to meet EU targets.

What trends in the renewable energy sector could impact your company?

Fortunately, technological advancements and trends are in our favour, as technology in the sector continues to improve and create efficiencies, becoming more widespread and gradually these technologies become cheaper to access. Trade restrictions could negatively affect the cost of electricity produced by renewable energy, making it more expensive, we are seeing evidence of this in the US, where public incentives have become necessary to compensate for import duties on equipment from China to maintain the economic viability of projects.

More generally, the development and implementation of large-scale renewable energy projects is very capital intensive and so the high cost of debt poses a risk. These uncertainties contribute to the reasoning behind Limes' portfolio approach, developing a range of projects of varying sizes and in varied geographies enables us to adapt to changing circumstances and remain flexible in our approach to development.

The agrivoltaic demonstration installation is part of Aarhus University and it is located in Foulum (Denmark). It was installed in 2022 as part of the Hyperfarm project. Photo Credit: Marta Victoria



Can a 'Net-Zero' World Lead to True Sustainability?

The Cold War shows that environmental sustainability, like peace, cannot be achieved solely by focusing on technology.

PETER SUTORIS

Undark

Throughout history, human societies have relied on technological progress to solve their challenges. In technology's early days, this worked well. It is hard to dispute, for example, the invention of the wheel helping to alleviate hunger through more efficient agriculture. But as both societal challenges and technology became more complex, the line between "problem" and "solution" has blurred.

The Cold War is perhaps the most salient contemporary example. Leaders on both sides of the Iron Curtain came to view nuclear weapons as a way to achieve peaceful coexistence in a world of incompatible ideologies. The doctrine of mutual assured destruction, made possible by the most powerful weapons ever made, was to guarantee peace. And while proponents would argue that it worked — the Cold War never erupted into World War III — nuclear weapons did not make nationalist sentiments, historical grievances, or expansionist tendencies go away, of which the war in Ukraine is a painful reminder. Technology can, at best, kick conflicts down the road. Peace cannot be engineered.

Environmental sustainability cannot be engineered, either. Like peace, it is a social and political challenge. Key tenets of Western civilization's economic and political systems rest on the commodification of nature. A dead tree has economic value; a living tree typically doesn't. Nature conservation is only considered a good idea insofar as it benefits economic growth.

The notion of nature having an intrinsic value might exist in philosophy classrooms but not in mainstream legal, political, and economic systems. Achieving sustainability requires confronting these uncomfortable truths about Western civilization.

What if, just as a mutually destructive world couldn't secure real peace, a net-zero world can't guarantee real sustainability?

During the Cold War, building more (and more powerful) weapons than the enemy became synonymous with peace-building. Today, decarbonization, the effort to reduce the emissions of carbon dioxide across the economy, has become virtually synonymous with environmental sustainability, as reflected in the Biden administration's environmental legislation, the European Union's net-zero plan, or Australia's Long-Term Emissions Reduction Plan.

According to the United Nations, the goal is a net-zero world where all emissions released are counterbalanced by emissions that are eliminated. Based on these policies, this destination is clear and all that matters is how quickly we can get there. But what if the destination is wrong? What if, just as a mutually destructive world couldn't secure real peace, a net-zero world can't guarantee real sustainability?

Scholars are increasingly pointing to ways that an overwhelming focus on emissions reduction — what has become known as carbon tunnel vision — can get in the way of holistically addressing the many sources of environmental decay. Zeroing in on one specific issue has the effect of leaving other challenges, such as biodiversity loss, particulate air pollution, or groundwater depletion,

Congo is very rich in mineral resources, these deposits require extensive manual labor to extract, often under life-threatening conditions. Mining of cobalt is tied to human rights abuses, such as unsafe worksites, child labor, and forced Congolese labor, in addition to environmental degradation. Photo credit: The International Institute for Environment and Development.

in the shadows. Although these issues are exacerbated by climate change, they are caused by a much wider range of underlying mechanisms, from changes in land use to global international trade to the removal of vast amounts of natural resources (known as extractivism).

Flattening the environmental polycrisis into a supposedly singular crisis of greenhouse emissions obscures the many ways in which Western civilization degrades the environment — ways that often don't lend themselves so readily to engineering solutions or economic profit to be made from the transition to "green" technologies and which demand a more fundamental reckoning with our civilization's lopsided relationship with nature.

The current conversation around net zero centers around engineering questions like how to quickly replace fossil fuels with less polluting alternatives or how to build cost-effective carbon capture solutions. As important as addressing such questions might be in achieving progress in specific areas of climate adaptation and mitigation, they do not target the underlying political dimensions of environmental decay.

When such technical questions come to dominate the public conversation about the environment, this can obscure, among other things, environmental justice concerns related to decarbonization. In his searing expose of the latter, "Cobalt Red: How the Blood of the Congo Powers Our Lives," Siddharth Kara pointed to the landscapes denuded and lives ruined by the world's hunger for cobalt, one of the metals needed for batteries in electric vehicles and in other decarbonization efforts. Evidence of such devastation elsewhere in the world is piling up.

In her essay "Let Them Drown," Naomi Klein points out that the extraction of fossil fuels on which the current economy is built depends on "sacrificial people and places" whose ruination is justified by the march of progress. Decarbonization has not transformed this underlying logic. It too depends on ruthless extraction, objectification of nature, and decimation of communities unlucky enough to be sitting on minerals currently in demand. Can such an ideology truly deliver an environmentally sustainable world?

Decarbonization and "clean tech" cannot rebalance Western civilization's relationship with the natural world.

History offers some clues. In February 1946, U.S. Navy Commodore Ben H. Wyatt met with the inhabitants of Bikini Atoll in the Marshall Islands in the Central Pacific. He asked them whether they would be willing to resettle temporarily so that the U.S. could proceed with its nuclear bomb tests "for the good of mankind and to end all world wars," as Jack Niedenthal wrote in his account of the meeting. The Bikinians conceded and left their ancestral lands, never to return permanently.

> Originally published by Undark April 11, 2024

ONLYNATURALENERGY.COM JULY-SEPTEMBER 2024

The EU's dependency on imports for critical minerals needed for the green transition here's how that can change

MICHALIS CHRISTOU and SAMUEL CARRARA The Conversation

The climate transition is a materials transition. Decades of international diplomacy around oil, gas and pipelines are now giving way to conversations around the supply of critical raw materials. And not before time: to meet the EU's energy and climate targets, we need to build the right technologies, in the right quantities, at the right speed. The problem is that many of these technologies are built with materials imported from just a handful of countries.

Critical raw materials are defined as those materials which have significant economic importance and are exposed to a high supply risk, often because of a high concentration of supply from a few third countries. Demand for these precious resources is expected to increase exponentially in the coming years, not just in the EU, but around the world. This will increase global competition just as the EU's own needs soar. Against this backdrop, preparedness is crucial.

On 23 May, the EU's Critical Raw Materials Act came into force. The Act is a first attempt to provide Europeans with a regulatory bedrock to develop domestic resources, diversify sourcing and strengthen the resilience of supply chains and the circularity of critical raw materials in the EU, all while striving to ensure the highest social and environmental standards.

The new rules outline three goals for the EU's annual consumption of raw materials: 10% are to originate from local extraction, 40% to be processed in the bloc and 25% to come from recycled materials. The act also claims that no



Save for silicon, the primary component of solar panels and photovoltaic cells, and cobalt, a key component for EVs, demand for all these critical materials for the green transition is predicted to rise by 2050. Photo credit: Joint Research Centre.

more than 65% of a given mineral can be sourced from a single non-EU country. As a sign of urgency, the Act was adopted in record time only eight months from its original publication.

Demand for rare earths for clean energy technologies to increase fivefold by 2030

In our work at the EU's Joint Research Centre (JRC), we showed that in the case of many of the strategic clean energy technologies, the bloc is entirely dependent on single sources most often China for raw materials, and also for other segments of the value chain. Our finding that demand for rare earths will increase fivefold by 2030 to satisfy our wind turbine needs alone, was quoted by President von der

Leven when she announced the Commission's intention to introduce the Critical Raw Materials Act. The proposed Act was published last year alongside our comprehensive forecast on critical materials supply chains and demand. Our study analyses the supply chains of 15 technologies crucial to achieving the green and digital transitions and the EU's defence and space agenda, across five key sectors: renewables, electromobility, Information and Communication Technologies (ICT), industry and aerospace & defence. The study also helped to establish the concept of strategic raw materials, and the list of materials it encompasses. Strategic raw materials fulfil some additional criteria: they are key to technologies which are strategic for the EU's energy and digital transition and its security goals; their demand is forecast to

increase rapidly, perhaps outstripping supply; options for substitution are limited; and scaling up production is difficult.

Unprecedented demand and concentration of supply

The study shows a rapid, multi-fold increase in the demand for the critical raw materials which are key to the EU's green, digital and security goals. The EU relies heavily on imports for these materials. In fact, for raw materials supply, the EU share in global production is never higher than 7%. For example, while the EU is a global leader in wind turbine production, it is fully dependent on China for the permanent magnets and the rare earth elements used in them. China is also the major world supplier for crystalline silicon solar photovoltaic cells and modules, the main technology that will be deployed to achieve the almost fivefold increase in the EU's solar PV capacity by 2030. Raw materials are also key for hydrogen electrolysers, especially as the bloc's plan to wean itself off Russian energy imports by 2027, RE-PowerEU, requires a tenfold increase in electrolyser manufacturing capacity in Europe by 2025. Global shortages in materials such as iridium loom in the 2020s and 2030s, as supply is unlikely to keep pace with demand unless significant actions are taken.

We predict a rapid increase in demand for critical raw materials not only in the EU but also in all regions of the world, precipitating competition for them across countries and sectors. For example, compared to 2020, lithium demand for batteries in the EU is expected to grow 12 times as large in 2030 and 21 times as large in 2050. Globally, the surge with respect to 2020 is 18 times in 2030 and 90 times in 2050. A similar pattern is found for graphite (natural and synthetic), which is used for components of solar and wind industries and batteries. Demand is expected to increase 14 times by 2030 and 26 times by 2050, compared to 2020.

Hope for the best, prepare for the worst

In addition, the Covid-19 crisis, the Suez Canal obstruction in 2021 and the 2020-2023 global microchips shortages have also reminded us of our supply chains' vulnerability. Figure 1 shows global shares in production for materials and key components in the main renewable energy technologies. It also shows how dependencies propagate downstream in the value chain, extending from raw materials to components and to the final products, and how complicated it is to deal with these dependencies in an integrated way. The dominant role of China raises concerns not only about the competitiveness of EU industry but also increases the risk of supply disruptions, thus constituting an important geopolitical risk.

Propagation of dependencies along the value chain

The EU needs to monitor the supply disruption risk and to prepare for these events. Or, as Stephen King said, "we can hope for the best for as long as we are prepared for the worst". The Act requires that stress tests are carried out for the supply chain of each strategic raw material at least every three years. These are what-if scenarios, analysing the potential impact of severe supply disruption events and the way supply chains would react. The EU and its Member States would need to know, for example, what sectors would be affected by a potential disruption in the supply of a particular material, what shortages or price spikes might follow, and the cascading effects of those. Such



JRC elaboration from the Foresight report.. Photo credit: Joint Research Centre.

stress tests are not unusual in other sectors such as banking and energy supply, and can provide useful insights into the resilience of supply chains.

Innovation and substitution with advanced materials

Anticipation is key to getting this right. New production and processing capacities take time to develop. While we don't have good alternative materials yet, research and innovation in advanced materials is of paramount importance both to the EU's autonomy and to its global leadership. In fact, energy is one of the key research and innovation priorities identified in a Communication on advanced materials supply for industry published by the Commission in February this year. Advanced materials can help by decreasing production costs, increasing efficiency, and making production more sustainable (for instance by using lower amounts of critical raw materials). At the JRC

we are looking closely at the gap between demand and innovation, with a particular focus on high-impact areas and supply chain resilience. We find that advanced materials can be good for innovation and substitution in many clean energy technologies, but they often face barriers to widespread adoption. We need to ensure that more efficient, sustainable alternatives reach the market faster. Optimising the properties and composition of materials is already helping reduce and could even eliminate cobalt and nickel from electric-vehicle batteries, and possibly even replacing lithium with sodium. It could also mean a steady reduction of rare-earth content in permanent magnets for wind turbine generators. And new chemical solvents for carbon dioxide capture would offer improved environmental and operational performance.

> Originally published by The Conversation May 23, 2024

Under Pressure From Big Oil, Supreme Court Requests Biden Position On Climate Suit A monumental case against Big Oil could go to a jury trial. But the industry has undertaken a "stunning and unprecedented campaign" to have the case dismissed, according to the The Guardian.

Common Dreams

The U.S. Supreme Court on Monday asked the Biden administration for its position on a climate lawsuit against Big Oil following a pressure campaign the industry has mounted to have the court

dismiss it.

The case, brought by the city and county of Honolulu, is one of dozens of state and local lawsuits seeking to hold Big Oil to account for the climate impact that its products have had and for the deception and disinformation used to sell them. The industry could be found liable for many billions of dollars if such cases reach jury trials, and so a group of companies has filed a petition, supported by legal briefs and a public advertising campaign, to the Supreme Court to hear their case for dismissal.

The Center for Climate Integrity (CCI) wrote Monday that the solicitor general, the administration lawyer who will handle the request, should advise the Supreme Court that states and municipalities can file these cases in state courts—to ignore Big Oil's petition, effectively.

"Big Oil companies are fighting desperately to avoid trial in lawsuits like Honolulu's, which would expose the evidence of the fossil fuel industry's climate lies for the entire world to see," Richard Wiles, the group's president, said in a statement. "Communities everywhere are paying dearly for the massive damages caused by Big Oil's decadeslong climate deception. The people of Honolulu and other communities across the country deserve their day in court to hold these companies accountable."

In November, the Hawaii Supreme Court rejected a previous Big Oil effort to stop the case, which set the table for a potentially momentous jury trial—none of the climate lawsuits have yet reached that stage, and City and County of Honolulu v. Sunoco et al. could be the first. The industry had tried to argue that the lawsuit sought to regulate interstate and international carbon emissions, which states don't have the right to do, and thus the case couldn't be brought in state court. The court ruled the case wasn't about the regulation of carbon emissions.

Big Oil then filed its Supreme Court petition, backed by a major campaign: right-wing groups have not only filed amicus briefs with the court but also mounted an unusually public campaign calling for the court to dismiss Honolulu and other such cases. "This looks to be the most aggressive campaign yet to influence the court on behalf of Big Oil," Kert Davies, CCI's director of special investigations, toldE&E News. "The fossil fuel industry and its allies are clearly threatened by these legal efforts to hold them accountable, and they're going to unprecedented lengths to send out distress signals in the hope they'll be rescued from standing trial."

"Far-right fossil fuel allies have launched a stunning and unprecedented campaign pressuring the Supreme Court to shield fossil fuel companies from litigation that could cost them billions of dollars," according toThe Guardian, which tied the campaign to Leonard Leo, the so-called architect of the Supreme Court, thanks to his influence in conservative legal circles and over Donald Trump, who appointed three of the current justices as president.

An ad produced by the Alliance for Consumers, a nonprofit that has ties to Leo, posits the Supreme Court as the "solution" to the overreach of "leftwing officials" who are pushing a political agenda through the courts by misusing public nuisance lawsuits. Conservatives have also published opinion pieces in favor of the Big Oil petition in outlets such as *Bloomberg Law, The Hill, National Review,* and *The Wall Street Journal*, which titled its piece "Honolulu Tries to Mug Energy Companies."

"I have never, ever seen this kind of overt political campaign to influence the court like this," Patrick Parenteau, a professor at Vermont Law School,

told The Guardian.

The fact that the Supreme Court asked the solicitor general for the administration's position indicates that some justices are interested in the case—the court throws out thousands of petitions a year without asking for such input. CCI, like the Hawaii Supreme Court, finds no merit in the industry's legal argument that Honolulu is an attempt to regulate emissions. "Lawsuits like Honolulu's are not seeking to solve climate change or regulate emissions—these plaintiffs simply want Big Oil to stop lying and pay their fair share of the damages they knowingly caused," Alyssa Johl, the group's vice president of legal and general counsel. "The solicitor general should make clear that federal laws don't preempt the ability of communities to hold companies accountable for their deceptive claims under state law."

In a similar case last year, Biden's solicitor general sided with Colorado municipalities that had filed suit and rejected the arguments in a Big Oil petition, urging the Supreme Court not to take up Big Oil's petition. The court followed the administration's advice on that and a few related cases. Roughly 40 states and municipalities have filed such suits since 2017.

There remains the possibility that the federal government itself could bring a case against Big Oil for propagating disinformation and blocking a green transition. Last month, Sen. Sheldon Whitehouse (D-R.I.) and Rep. Jamie Raskin (D-Md.) called on the U.S. Department of Justice to investigate the industry for those alleged crimes, following a three-year probe that their congressional committees had conducted.

Monday's Supreme Court request of the solicitor general notes that Justice Samuel Alito didn't take part in the considerations of the case—"probably because he owned stock in Conoco Phillips, a defendant in the case," according to *The Guardian*.

> Originally published by Commondreams June 10, 2024

Sugarcane by the Sea for Ketone Bioticel Production THEO HART

A very large area in Brazil is covered with sugarcane that is used to make biofuel. The sugary juice of the cane gets fermented, something many microbes would readily do.

However, ethanol is their choice despite its several weaknesses as an engine fuel. For one thing, it must be made anhydrous for it to blend with other engine fuels. Distilled ethanol carries with it some water, and its removal is an expensive extra step.

That this ferment is very well-known technique evidently mattered more when raising capital. Also, the yeast sold as a protein for livestock feed helps. Depleted cane stalks, called bagasse, are typically burnt to provide heat for the distilling, plus electricity from a gas turbine generator, with excess electricity sold. It all adds up financially.

Historically, several Caribbean islands were notable for producing sugar from sugarcane, which was very lucrative for a long time. One indication of this is the 1763 Treaty of Paris, by which France ceded to Britain its colony of New France (Quebec in Canada) but regained control of the sugar isles of Martinique and Guadeloupe, which the Brits had recently taken over. Evidently, having sugar was more valued.

But times change: the scale of sugar produced by a mill grew larger, sugar became cheaper, and smaller mills were no longer profitable. Several of the islands that once had mills no longer do, and sugarcane is no longer grown on them in quantity. However, if the juice itself is fermented to a biofuel other than ethanol, something easier to separate from the ferment, cane production may be revived. Butanoic acid is a likely choice, as it may be isolated from the ferment in several ways, then its vapour sent over hot catalyst to form its ketone.

This is PPK [dipropyl ketone], which is superior to ethanol as an engine fuel, blending better with gasoline and being more energy-dense. Doubtless many markets for it as a gasoline additive would quickly exist displacing ethanol in that role.

Irrigation

Sugarcane is a thirsty crop, and the more water it gets, the more it grows, so irrigation is beneficial. Many of the islands are rather dry, and about seventy desalination plants of various sizes, all using reverse osmosis, have been built over the last twenty years. This process uses quite a bit of electricity, which, typically in the Caribbean, is expensive.

Less than half of the seawater entering such a plant becomes drinkable water, while the rest, now saltier, is rejected and sent back into the sea. It could instead have its sodium removed and then used for irrigation. The key to this is the low solubility of sodium bicarbonate, which will drop out when sufficient potassium bicarbonate is added, leaving a solution of potassium cloride (KCl). It is likely to be about 12% by weight, which is too high and needs to be reduced.

One way is letting plants take the potassium ions out of the water and store them in their leaves. A preli-



minary step may be to mix in water already low in potassium ions and so lower their concentration. A good candidate for such removal is water hyacinth (Eichornia crassipes), which floats and grows rapidly. However, it is generally thought a weed difficult to control, so caution might dictate some other plant be selected.

Whichever plant it is, flowing water slowly past them in a lengthy canal should result in the exit water being low in potassium and thus well-suited for irrigation use. These plants lifted from the canal may be sun dried, then compacted into pellets or wafers, and marketed as an organic fertiliser. They would contain plenty of nutrients, in particular nitrogen and potassium.

But it is the leaves that mostly do, and the dried leaves may be separated from the rest — by pin milling and air sorting, for example — to become the fertiliser, while the rest is otherwise made use of. Making furfural is a likely option since bagasse can also be used, as can sargassum gathered from the sea, so enough material for a furfural plant would be available.

Furfural is only made from vegetation, and the two most significant plants in the world, in South Africa and the Dominican Republic, are based on bagasse. The numerous smaller makers, who are mostly Chinese, use maise cobs. An annual output of 5000 tonnes of furfural is usually profitable. Acetic acid is a byproduct.

Making Potassium Bicarbonate

From ordinary potash fertiliser (KCl) can come the potassium bicarbonate needed.

The first step is mixing the dry KCl with a robust sodium acetate solution and then using ethanol to extract potassium acetate, leaving NaCl behind. Next: gas the alcoholic extract with CO2 to drop out potassium carbonate, which is not soluble in ethanol. About half the potassium reacts this way, while the rest gets an acetic acid molecule somewhat firmly attached.

This rather surprising result was disclosed in an old British patent [521 202]. Heat will drive off the acid, and contacting it with sodium bicarbonate will provide the sodium acetate wanted in the first step. Potassium bicarbonate is readily enough got from its carbonate.

A stand-alone plant is conceivable, so buy potash fertiliser and soda and then sell potassium bicarbonate. Acetic acid would simply circulate, but a source of CO2 would be needed. Some quantity buyers of this bicarbonate would be mixing it with ordinary salt to get sodium bicarbonate (and soda also if they want), plus KCl, the usual potash fertiliser.

Exports of potassium bicarbonate to several countries would likely be possible, where some local businessperson could supply the local market with washing soda.

LAST STAND



The Eureka Mine, the last active major hard rock gold mine in the Sierra Nevada Mother Lode belt, holds a significant place in history.

Originally known as the 'Summit', it operated from 1855 to 1875 and reopened in 1895 as the 'Central Eureka'. This historical mine, which operated intermittently until 1924, when it was consolidated with the Old Eureka, has been a part of the gold mining industry's rich history.

At this time, Central Eureka's main shaft had reached a depth of 4,500 feet and, along with its holdings at the Old Eureka, had produced 1,800,000 ounces of gold.

The Federal government suspended all gold mining operations due to the Second World War. The mine reopened in 1946 and remained in operation until the 1950s. Various reports indicate that its final year of operation was between 1951 and 1958.





www.onlynaturalenergy.com info@onlynaturalenergy.com