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Aden Jama takes one of his few remaining goats out to look for pasture. «Before the Somaliland drought I had 220 sheep and goats and 12 camels. Now I have 40 sheep and goats and three camels left».
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Soonstainability

GIANNI SERRA
ONE

"Meeting the needs of the present generation without compromising the ability of future generations to meet their own needs." This is the definition of sustainability provided by the United Nations World Commission on Environment and Development in 1987.

Sustainability was the key then. Still, it is. The 2030 Agenda for Sustainable Development, adopted by all United Nations Member States in 2015, aims to be a "blueprint for peace and prosperity for people and the planet, now and into the future". The Agenda includes 17 goals ranging from poverty and hunger to gender equality, justice, affordable and clean energy.

It would be easy to dismiss it as a PR exercise detached from reality. But some countries are proving sceptics wrong - those goals are achievable in the real world. And most importantly: now. Present and future generations' fortunes depend on the urgency to address the global climate emergency.

Costa Rica may be a small nation but has become a world leader in the race to cut carbon emissions and protect biodiversity. The Central American country has now one of the world's most successful forest-conservation programs after its deforestation rates were among the worst in the world in the 1960-1970s. In 2021, Costa Rica has managed to generate more than 98 per cent of its power from renewable sources for the seventh year in a row. Recently, President Carlos Alvarado Quesada announced that Costa Rica would expand Cocos Island National Park and the surrounding Marine Protected Area, increasing Costa Rica's preserved ocean area from 2.7 to 30 per cent. Nine years ahead of the global deadline to save nearly one-third of the world's land and sea.

Several studies explain how enforcing a strict legal and financial system to protect the environment can boost economic growth rather than block it. Overdue actions are unsustainable. Costa Rica's parallel and steady increase in the Gross Domestic Product confirms it. But it remains a small country between the Pacific Ocean and the Caribbean Sea. Whatever policy it adopts can not affect the planet's CO2 emissions curves or the global economy. It's not China or India, nor the USA. But it can teach them a lesson. ONE

No finance, no fix

While there is global consensus on the need to combat climate change, there is less agreement on who is responsible for making and funding changes.

STEPHANIE METZGER
ONE

COP 26 was a tumultuous event. Postponed by a year because of the Covid-19 pandemic, the meeting in Scotland in November 2021 was highly anticipated and under great pressure to produce results. The United Kingdom held the presidency; MP Alok Sharma led the event with ambitious goals to 'consign coal to history' and promote the interests of the oft-underrepresented developing nations.

While many heads of state spoke of grand ambitions, coverage of the event was not all positive. There is concern that the world is acting too slow to stop the effects of climate change, especially considering that the 2021 IPCC report predicts that global warming of 1.5 degrees C may happen within the next two decades without further action.

Coming six years after the Paris Agreement was signed at COP 21, this year's event included a major assessment of the Nationally Determined Contributions (NDCs) that define each country's mitigation efforts. The Paris Agreement includes a 'ratchet' clause which requires all signatories to update their NDCs every five years. COP 26 was supposed to be the first five-year check, and although it was delayed a year, it is still the first time countries must submit significant revisions to their NDCs.

Sharma led a successful crusade to change this process to a yearly review, claiming that five-year intervals will delay action until it is too late to meet the goal of limiting warming to 1.5 degrees Celsius. In addition to updating the NDC process, COP 26 saw the announcement of new net-zero goals from countries such as India, action to limit deforestation, and the clarification of rules for a global carbon market as proposed under the Paris Agreement. Negotiators also made progress on methane reduction, climate finance, and coal power.

US President Joe Biden at COP26: «The science is clear: We have only a brief window to raise our ambition and rise to meet the threat of climate change. We can do it if the world comes together with determination and ambition».
Photo credit: The White House

Methane Reduction

The Global Methane Pledge was a significant achievement for this year's meeting. Originally introduced by the EU and US, over 100 countries signed onto the pledge to cut methane emissions by 30% by 2030. Methane has an outsized effect on short term climate change – in the first 20 years after emission, it is 80 times more powerful than CO2 at trapping atmospheric heat. Therefore, cutting methane emissions in the short term could significantly limit warming to 1.5 degrees C.

While the announcement of this initiative is an important step in the right direction, it is also critical to examine implementation details. One encouraging aspect of the statement is that it already has financial and technical support attached. In addition to $328 million in philanthropic support, international finance institutions such as the European Investment bank have signed on to provide project finance. However, the commitment is voluntary, and major emitters such as China, Russia, and India are not signatories.

United States President Joe Biden has also proposed stricter domestic methane rules in tandem with the COP announcement. The new rule focuses on reducing methane emissions from the oil and gas industry. Biden, attempting to regain the United States' international leadership role, announced the new law on November 2nd to coordinate it with the rollout of the Global Methane Pledge. However, the US has declined to participate in the International Methane Emissions Observatory, a programme by the UN to monitor global methane emissions. This contradiction in US policy illustrates the difficulty in translating pledges into action.

Climate Finance

A critical aspect of this year's COP was negotiations over climate finance. In particular, it was time to reexamine the pledge, made in 2009, that developed countries would mobilize $100 billion per year in climate finance for developing nations. While there is global consensus on the need to combat climate change, there is less agreement on who is responsible for making and funding changes. Like any collective action problem, climate change mitigation strategies require full participation to be effective. Still, there is a strong incentive for individual actors (or nations) to free ride on others' efforts. Developing countries also make claims of injustice because of the historic advantages conferred onto developed nations from the unlimited use of fossil fuels. The $100 billion climate finance pledge was a key part of addressing these disparities. Unfortunately, this goal has not yet been reached, and of the money currently provided, 70% has been in the form of loans.

The parties at COP26 have reaffirmed their commitment to the $100 billion finance goal, and they expect to reach it by 2023. However, developing countries have expressed reservations about the role of private finance in meeting this promise. Using loans for climate projects ultimately still puts the burden of funding mitigation efforts on developing countries. Many developing countries already have high sovereign debt burdens, and the covid-19 crisis exacerbated this issue:

Photo credit: PA

low-income countries' debt increased to $860 billion in 2020, a 12% increase from 2019. Accordingly, developing countries are reluctant to take on more debt than necessary, especially to address a problem that they perceive to be the fault of the high-income countries. While grant funding might be a preferable method, developed countries are not always keen to fund projects with no expected return. Internal political pressure in countries such as the United States makes it difficult to ratify purely charitable funding agreements.

The issue of climate finance will continue to be of critical importance as the need for mitigation and adaptation projects expands over time. Financial commitments from developing countries are vital for promoting decarbonization in countries that may otherwise be reluctant to participate in climate agreements for fear of slowing their development. The COP26 published a Climate Finance Delivery Plan, which laid out the priorities for future efforts. Developed countries agreed to mobilize more finance, including more grants for the lowest income countries.

There is also an increasing focus on adaptation, as many countries already feel the effects of climate change. The next few years will be extremely important for developing trust between developed and developing countries – developed nations need to follow through on their commitments or risk losing credibility.

"Phase down" of coal power

COP President Sharma made eliminating coal power a major goal for the UK COP Presidency. Negotiators included the "phase-out" of coal power as a critical aspect in the COP 26 agreement, though the text did not include specifics such as a timeline. However, at the final hour, China and India signalled that they would not sign the agreement with the current language. As the world's biggest coal users, they protested that coal was still essential to their growth and committing to a phase-out was impossible at this time. Instead, negotiators settled on a new phrase – countries would work to "phase down" unabated coal. This wording leaves room for some coal in the future energy system, and it still permits abated coal power, meaning the use of carbon capture and storage (CCS).

While China and India were blamed for the new language, other countries also cheered the change. For example, Australia still considers coal as key to its economy, and its updated NDC will not increase the ambition of the country's 2030 emissions reductions targets. Other major producers of fossil fuels, such as Saudi Arabia and South Africa, also quietly expressed displeasure with the original wording. While President Sharma and other European representatives left the conference feeling disappointed in the outcome, it is important to note that this is the first time fossil fuels have been explicitly addressed in a COP agreement. Moreover, acknowledging the need to reduce coal use from China and India represents a significant shift from their stance at previous COPs.

As with the other aspects of the agreement, it will be impossible to measure the impact of the "phase down" clause immediately. Some countries already have plans to phase out coal completely; for example, many EU nations have deadlines to close any remaining coal plants within the next 5 to 15 years.

Many developing countries have also recently deprioritized the role of coal within their electricity systems. For instance, Vietnam's Power Development Plan 8 has reduced the planned coal power capacity through 2030, in line with its recent net-zero pledge. This case is likely to be representative of the path for many developing countries – a conscious effort to reduce their reliance on coal but no plans for an immediate exit.

COP commitments vs reality

It is always difficult to measure the success of international meetings such as COP until countries have the time to implement their commitments. This fact often leads to criticism of such meetings as being all talk, no action, or merely a chance for high-level leaders to show off with grand speeches without having to make real change.

While this criticism is valid, it also undervalues the diplomatic process. International agreements are an important first step to establishing baseline expectations and accountability measures for a specific issue. For example, this year's agreement on methane emissions is a new achievement for the COP, which has never produced a comprehensive deal on methane.

Still, scientists have increasingly realized that this decade will be vital in determining the ultimate level of planetary warming. Actions taken through 2030 will either enable sufficient decarbonization or show that the world is still falling behind in its efforts. Accordingly, it is imperative to monitor how countries implement the new agreements from COP26.

The new yearly review of NDCs should help to increase oversight. Delivering on finance commitments will also be key. Ultimately, each country has its plan to combat climate change, and COP is more of an overarching framework than a specific guide. ONE

Poisoned city: The story of Brazil's forgotten environmental disaster

Hundreds of tons of carcinogenic agrochemicals, including DDT, were abandoned by the Brazilian government at a factory near an orphanage on the outskirts or Rio de Janeiro in the 1960s. The factory had produced the pesticides to eradicate malaria-carrying mosquitoes. After it shut down, the residents, unaware of the dangers, continued to use them, even applying the dust directly to their children's hair to kill head lice. More than half a century later, residents continue to suffer from the impact on their health.

PEDRO GRIGORI
Agencia Publica/Mongabay

A fading, yellow, Mexican-style gateway separates Cidade dos Meninos from the rest of the world. Built in the 1940s, the arched structure marks the boundary between the state of Rio de Janeiro and an area of federal land lost in time. Two security guards halt any unknown vehicle trying to enter the small community; they ask the strangers inside who they are, where they are going, and what their relationship with the inhabitants is.

Beyond the gateway exists a rural expanse in the middle of the dense sprawl of Baixada Fluminense, part of the metropolitan sprawl of the city of Rio de Janeiro and one of the most violent regions of Brazil. Inside Cidade dos Meninos, however, there is a feeling of peace and a deep silence. The whole community, home to 1,400 families, is served by a single dirt road.

These days, the former orphanage in Cidade dos Meninos no longer houses any children. Quite the opposite: it's as though the community is under some kind of spell that stops any child from attending a school built on their land. "An invisible monster," is what the locals will tell you.

The community is the scene of one of Brazil's worst environmental disasters. But unlike other cases of contamination caused by toxic substances, such as the caesium-137 accident in the city of Goiânia, the story of Cidade dos Meninos has been forgotten. To this day, no solution has been found to the problem.

The first warning one gets of the disaster that sealed the fate of the orphanage and its residents is on a plaque less than a kilometer from the entrance, that reads: "DANGER — CONTAMINATED AREA."

The sign was put up almost three decades ago, and also marks the last time Brazil's federal government took any official action aimed at controlling the pollution caused by hexachlorocyclohexane, or HCH, a toxic pesticide that looks like harmless white dust.

In the five decades of its existence, the Cidade dos

Hidden by foliage, worn, its paint peeling paint and its contact numbers no longer in use, the warning sign about the contamination is itself a testament to the neglect suffered by the *Cidade dos Meninos* community.
Photo credit: Dado Galdieri/Hilaea Media

Meninos orphanage was home to almost 5,000 orphans and street children from Rio de Janeiro and other states across Brazil. The wider community was also home to the orphanage's employees, who were provided housing in the area and made a life for themselves and their families there.

A poison factory

Long before the COVID-19 pandemic, malaria was the main infectious disease in Brazil. In the first half of the 20th century, Baixada Fluminense was one of the main hotspots of the disease. It was in this context that the Ministry of Education and Heath made use of eight disused buildings in Cidade dos Meninos to set up the Institute of Malariology in 1947, the same year the orphanage was founded.

The institute's founding purpose was to "carry out studies, research and investigations on malaria." However, spurred on by the desire to transform Brazil into an "industrial powerhouse," three years later the installations started to be used to produce insecticides to fight the mosquitoes that spread the disease.

"We are going to free our country's economy from the heavy burden of importing chemical products," Pedro Calmon, the minister of education and health at the time, said during the inauguration of the HCH factory in the middle of Cidade dos Meninos.

In official correspondence dated between 1947 and 1960, the foundation that ran the orphanage made a number of complaints to the Ministry of Education and Health. They said the size of the institute was being expanded without consent, complained about the proximity of the insecticides to the children living in the orphanage, and reported that a group of the factory's employees was setting a bad example for the

Today, more than 1,000 people live in Cidade dos Meninos. Amanda da Silva braids her brother's hair in front of the Don Bosco Institute, where she lives with her family. Photo credit: Dado Galdieri/Hilaea Media

young residents. The premises of the Institute of Malariology's factory were expanded and the insecticide production was increased.

Among the new chemical products produced on site were benzene hexachloride (BHC) and dichlorodiphenyltrichloroethane(DDT) pastes, 1080 (sodium fluoroacetate), and calcium cyanide — all byproducts of HCH, an organochlorine. The factory also started to produce medication, such as penicillin and tetracycline, among others. Production only came to a complete stop in 1960, owing to the repeated requests of the Christ the Redeemer Shelter Foundation. However, when the factory closed its doors, the machinery and equipment were not the only things left behind. Dozens of cardboard vats containing nearly 400 metric tons of pure HCH, as well as barrels filled with raw materials and residual waste were also carelessly left on site or disposed of improperly.

At the time, little was known about the problems caused by the pesticides. "Nowadays we know that these substances are extremely harmful to people's health," says Ana Cristina Simões Rosa, a doctor in public health and the environment from the Oswaldo Cruz Foundation, Brazil's leading biosciences research institute. "The chemical structure of these substances is similar to our natural hormones, which facilitates their entry into the body's metabolic pathways," she says. Once inside the human body, the consequences are enormous. "It is a carcinogenic substance. It disrupts the functioning of the endocrine system, produces neurocognitive changes and alters the nervous system," Simões Rosa adds.

Studies have repeatedly shown that HCH can cause cancer, fetal and birth defects, sudden miscarriages, and changes to the nervous system. Regulatory agencies have also discovered another troubling characteristic of such substances: their accumulation in the environment. "Organochlorines have a very stable chemical structure, both in the natural environment and in the human body, which means they take years to decompose. Using a substance that doesn't decompose as an insecticide is a disaster," Simões Rosa says.

Brazil only banned the use of HCH in 1985, by which point it had already been taken off the market in dozens of other countries. Even so, it continued to be used in anti-disease campaigns until 1995.

Rosália Maria de Oliveira, also with the Oswaldo Cruz Foundation and the author of one of the main academic studies on Cidade dos Meninos, says that despite the warnings coming from the scientific community, the government continued to carelessly use organochlorine pesticides, believing they represented "progress." "The scientific authorities' worldview was guided by the belief in the benefits brought about by scientific and technological advances," she says.

'We used to have 'powder fights' as kids'

Weathered over the years by the sun and the rain, the cardboard vats containing the HCH started to fall apart, and the white powder was left strewn across the floor. A number of other chemical substances

were also forgotten about in the factory. Exactly which substances these were remains unknown to this day, but it's thought that between 300 and 400 metric tons of HCH alone were left on site, according to the Rio de Janeiro State Foundation for Engineering and the Environment (FEEMA).

"The residents used to say: if it were dangerous, the government wouldn't have left it here," says Miguel da Silva, a community leader.

"We used to use the powder for everything," adds Maria Sarmento, 93, the community's oldest remaining resident. "We used to put it in our houses to kill mosquitoes; if a child had head lice, we would either shave all their hair off or cover it in the powder. It was our go-to, heal-all medicine."

In the absence of any notice or sign that warned about the dangers concealed within the factory, the residents of the community came and went without concern. In the hands of the children, the poison became a toy. They used to throw small rocks of the powder at each other, in a game akin to a paintball fight. "The game we used to play here was 'powder wars,'" Miguel says as he walks through the forest near the old factory. "The factory was full of hiding places, so we used to go there and play. The little rocks of HCH powder used to crumble into dust when you hit someone with it, so we used to pick up little bits of it from the floor and throw it at our friends."

The children of the community used to squeeze the valves of the chlorine cylinders so they could see the "yellow gas" burst out, and would aim it at one another. They treated as treasures the powders of all colors that they found hidden in drawers. Miguel's family, like many others, believed that the toxic pesticide was in fact a medicine, hence their willingness to apply it directly to their children's scalps to kill lice. "Now I'm nearly bald, but back then I had a lot of hair," Miguel says, laughing. "If people get infected by putting their hands in the powder, or by eating a guava fruit from a tree near the factory, imagine what it used to do to us when we put it in our hair."

The poison was even used in public works in the area. At least 360 metric tons of HCH powder were spread across Cidade dos Meninos in little over 20 years. Adults and employees of the children's shelter also made use of the factory and the materials left behind there to build huts or chicken coops. "Since there wasn't anyone there keeping an eye on things, whatever was left behind at the factory became communal property," Miguel says.

The pesticide even ended up in the markets of Duque de Caxias, the neighboring city, where residents sold it rolled up in newspapers. It was this practice that caught the attention of the media. The story only started to gain traction, however, in July 1989, when newspapers in Rio de Janeiro released a series of reports on contamination caused by agrochemicals.

That same month, FEEMA surveyed the area and found nearly 40 metric tons of pure HCH powder. The powder was removed and taken to São Paulo, where it was destroyed. FEEMA also took soil and fruit samples from Cidade dos Meninos. The results of the subsequent analysis: HCH was present in every single one of the samples taken.

Three years later, results from laboratory tests identified HCH in blood samples taken from 31 people from seven families living within 100 meters (330 feet) of the old factory. Nevertheless, public interest in the Cidade dos Meninos case did not last long. Oliveira, the Oswaldo Cruz Foundation researcher, analyzed every report published on the pollution at Cidade dos Meninos between the 1940s and 2006 for her doctoral thesis, which was published later that year. It showed that the media closely followed the case in the early 1990s, but as the years went by, the number of reports diminished and the tragedy began to be forgotten about without ever having been solved.

The 'solution' that made things worse

In 1993, a number of federal, state and municipal bodies signed an agreement accepting responsibility for the chemical pollution in Cidade dos Meninos. The Ministry of Health assumed responsibility for the "complete and permanent decontamination of the area."

To carry out the work, the Ministry of Health chose one of Brazil's biggest agrochemical producers, Nortox Agro Química. In collaboration with the University of Campinas (Unicamp), the company decided to use quicklime to cover the chemical pollution. The operation became something of an event in the community, and the residents watched from up close as the fac-

tory was demolished and the quicklime was applied in September 1995.

Miguel says the period during which Nortox worked in the community was the "worst moment" for the residents. "They created an even bigger problem. That was the period in which the highest number of our neighbors died," he says. Several other residents we speak with tell the same story.

The Ministry of Health said the quicklime treatment managed to remove 98% of the chemical contaminants. Nortox echoed this. "Taking into account the situation which prevailed in the community for 30 long years, the existing quantities of toxic substances no longer represent any kind of risk to the health of the population or the environment," the company said in a 1996 report on the decontamination efforts.

However, at least 10 different studies carried out in the following years have shown that the quicklime treatment was ineffective. Analysis done in 1999 by Oswaldo Cruz Foundation researcher Helena Pinto Bastos went even further, detailing how the failed decontamination attempts carried out by Nortox actually made the situation worse. In 1989, FEEMA had judged the total size of the contaminated area to be 13,000 square meters (nearly 140,000 square feet). The area in which Nortox had buried the quicklime-treated waste resulting from the demolition of the factory, however, measured 33,000 m2 (355,000 ft2). Since the decontamination efforts were unsuccessful, all of the ground that came into contact with the chemicals ended up becoming contaminated, meaning in effect the contaminated area had tripled in size.

When contacted for comment, Nortox declined to make a statement on the matter.

With the contamination of the area ongoing, the Ministry of Health started to search for other ways to deal with the issue. It reached out to Japan, Germany, the Netherlands, the U.S., the U.K. and Canada. But to this day, no proposal has come to fruition.

It's in the blood

Sixty years after the closure of the factory, the pesticide remains in the community. And it's not restricted to the area where the factory once stood, or on the walls plastered with paste made from the white powder. High levels of the carcinogens have been found in the blood of 95% of 1,400 inhabitants who were tested, according to the Oswaldo Cruz Foundation.

The chemical pollution forced the orphanage and the public school to close. And, with them, went the remaining jobs in Cidade dos Meninos. The residents couldn't even plant crops or raise animals in the area. In 1999, every animal in Cidade dos Meninos was slaughtered in an attempt to reduce the spread of the contaminants, which can be passed on through meat and other animal products.

Despite this, people still live in Cidade dos Meninos. The "natives," as the oldest residents are known, are engaged in a decades-long struggle to remain in their community, even amid government neglect and the inordinately high number of cancer cases.

Where the pesticide factory once stood, there's now a eucalyptus plantation, planted specifically to act as a kind of natural wall, preventing the wind from blowing toxic dust over the rest of the community.

"There's no way you can miss my house. If you can't find it, just ask someone where 'Powder Miguel' lives, and they'll show you", Miguel says. "They used to use [this name] as a kind of joke. 'Powder Miguel,' they called me, because that's all I would talk about." And it's true: nobody has spoken about and struggled against the contamination more than he has. In the same period when the chemical pollution was discovered, a tragedy transformed a young Miguel into "Powder Miguel." "My little brother died from liver cancer. He was only 19 years old. When we discovered the effects that the chemical powder could cause, I thought that my brother's death could have something to do with it. My anger at what had happened started to grow and grow," he says.

Miguel took part in a number of lawsuits aimed at trying to get the area decontaminated. He told the story of Cidade dos Meninos at lectures, public hearings, and at meetings with city councilors, state and federal legislators, and even with ministers of health. He assumed the role of spokesman for the community and traveled to the capital, Brasília, several times at the invitation of the federal government to discuss the future of the community. In 1992, he managed to bring the then-minister of health, Adib Jatene, back to Cidade dos Meninos to get to know the area perso-

Maria Sarmento, the oldest resident of Cidade dos Meninos, worked in the nursing ward of the orphanage. Photo credit: Dado Galdieri/Hilaea Media

nally. "What has to leave here is the powder, not the people," he says when asked why he and his family continue to live there. Miguel's house is the closest to the old factory. All the other houses that were located even closer were either expropriated or demolished.

His decades-long fight for the decontamination of Cidade dos Meninos didn't bring Miguel praise or recognition. Quite the opposite: over the years he has even received death threats. At 58, Miguel has gone through a lot. His experiences have made him an expert storyteller. He has a degree in geography, has served in the army, was the municipal secretary for the environment of Duque de Caxias, and stood for City Council, unsuccessfully, with the sole purpose of using his allocated political advertising time to talk about agrotoxins.

"I was born in 1963 and moved here in 1965. I learned to walk in Cidade dos Meninos," Miguel says. His father, a butcher, arrived with the family at the invitation of an uncle who worked in the orphanage. "He used to say that there was no way you'd go hungry here. You could plant and raise whatever you needed to eat." Miguel studied at the local school, Sarah Kubitschek Municipal College, alongside the children from the orphanage. "They had a good life — five meals a day! When I used to argue with my mum, I'd ask her to send me to the orphanage," he laughs.

As he takes us through the ruins of the factory, Miguel recalls how, on the same day that he received the news from the government that the funding for the decontamination work had been authorized, the courts decided to close the orphanage and all of the schools in Cidade dos Meninos. "A lot of people thought it was my fault. They said that I was responsible for the school closures, for the orphanage shutting down," he says. "I was born after the factory closed, it wasn't me that left that poison there."

At the start of this year, Miguel lost another brother, his eldest. "He had battled against lung cancer for a long time, but it took a toll on his body and he grew weak, and died of a heart attack," he says.

A study carried out by the Oswaldo Cruz Foundation in 2002 drew a link between exposure to the white chemical dust and the incidence of cancer in the region. Throughout the 1980s and 1990s, inhabitants who lived within 12 kilometers (7.5 miles) of the factory had a higher mortality rate for cancer of the pancreas, liver, larynx, bladder and blood among men, and of pancreatic and blood cancer among women, when compared to populations further away from the factory.

'It was very lively here, there were a lot of parties'

At 93, Maria Sarmento is the oldest resident of the Cidade dos Meninos community. When we meet her, she's holding a photo album in her hands. "There used to be a little lake here, but it was filled in because of the powder. Not even a single fish could survive there any longer," she says, pointing to a black-and-white photograph. Her family arrived in the area in 1949,

two years after the orphanage opened. She was a nursing assistant and her husband a nurse. "When the pesticide factory opened, they had to open a health clinic in the orphanage, so we came to look after the children," Maria says.

Maria lives in one of the first houses to be built in Cidade dos Meninos. Seated in a chair in front of a large blue window, she shows us the spacious living room. "It's a really nice house, very well built. It could withstand a hurricane. And it's enormous." It's so big that it was divided into two. She lives in the front part of the house, and at the back lives Tereza da Silva, 85.

Upon hearing the sounds of visitors, Terezinha, as she's known, quickly appears on her neighbor's veranda. Tereza arrived in 1960 along with her husband, who, as a child, had grown up in the orphanage and had returned, years later, as a member of the staff. "It was very lively here, there were a lot of parties. Church parties, forró dances," Terezinha says. "My husband died, but nowadays I live here with my granddaughters, and plenty of other women who come to visit me."

The orphanage opened its doors before construction had even been completed. The children's living quarters were divided into four different buildings, where they were placed according to their age and level of schooling. As well as studying, sleeping and eating, they took part in vocational courses, such as mechanics, woodwork, welding and metalworking.

The main focus of extracurricular activities was farming. The community planted their own food, and raised cattle, poultry and pigs. They were self-sufficient, producing everything that they consumed, and even used to have a surplus to sell to neighboring communities. The students who worked on the farms were remunerated for their work and encouraged to deposit their earnings in an account so that they would have some savings when they left the orphanage.

Half a century later, 73% of residents remained contaminated

In 2000, the Ministry of Health carried out a major risk assessment of the soil, water, air and food sources of the Cidade dos Meninos community, as well as took blood samples from the residents. The results only came to light in 2005, under pressure from the residents, who threatened to take the government to court over the matter. The results of the laboratory tests showed that 95% of the 1,400 inhabitants of Cidade dos Meninos who were tested had been contaminated, with 30% showing high levels of toxicity. Only 2% of the residents tested showed no signs of contamination. Simões Rosa, who works at the Oswaldo Cruz Foundation's Center for the Study of Worker´s Health and Human Ecology (Cesteh), and who carried out the tests, says: "The study confirmed that the population [of Cidade dos Meninos] showed changes in their thyroid hormones, changes to testosterone levels in men and estrogen levels in women."

A follow-up assessment of the population only began in 2018. It remains incomplete because of the COVID-19 pandemic. However, *Agência Pública* reporters had access to a report that was delivered to the residents, containing the results of the blood tests done between 2018 and 2019. Of the 750 people tested, 73.5% had residues of organochlorine pesticides, such as HCH and DDT. The tests also brought good news. The levels of contamination were 10 times lower than those found in the test results released in 2005. "Over time, these molecules degrade bit by bit," Simões Rosa says.

Now, the residents complain about their access to health care. When someone in the community feels ill, the nearest medical facility is the small community health center, where there's only one doctor. According to the Ministry of Health, the Cidade dos Meninos Basic Health Unit employs six community health agents, one nurse, one nurse technician, a dentist, and a dental health assistant. *Agência Pública* reporters contacted the Ministry of Health to ask if new plans for decontamination efforts in Cidade dos Meninos had been outlined, but received no response.

A refuge from the outside world

"This is a good place to live, there's no danger, there aren't any stray bullets," says Fernanda de Barros as she watches her 5-year-old son play in the backyard. "It's a good place to raise a family."

On the other side of the arched gateway entrance to Cidade dos Meninos, the Baixada Fluminense district of Rio de Janeiro has the highest crime rates in the state: the highest levels of street robberies, car thefts and bus assaults. A report by the *Fogo Cruzado (Crossfire)* platform showed that 1,033 shootings were recorded in the area in 2020; 293 people died in those incidents, eight of them killed by stray bullets. Six of them were children. Duque de Caxias was the munici-

A statue of Saint Margarida blesses what used to be a classroom. Photo credit: Dado Galdieri/Hilaea Media

pality with the highest number of shootings. These numbers help explain why a large proportion of Cidade dos Meninos "natives" think like Fernanda.

They see no reason for leaving the community, despite having lived for decades at risk of having their house expropriated, as has happened to many residents. "The residents are never included in the plans [of the public authorities]," says Jair Jovelino, vice president of the residents' association.

"If we have to leave, the residents' association is going to fight so that we end up leaving with the guarantee of good living conditions elsewhere. We live in peace and tranquility here, and you can't put a price on that."

Miguel and his family agree. Even the most prominent voice against the chemical pollution can't imagine a life for himself away from Cidade dos Meninos. "I want to live here for the rest of my life. And after I pass away, I want my ashes to be scattered here. The HCH dust will go, and Miguel's dust will take its place."

This story was first published in Portuguese by Agência Pública, translated by Matthew Rose and is part of the Por trás do alimento (Behind the Food) project, a partnership between Agência Pública and Repórter Brasil that investigates the use of agrotoxins in Brazil. Full coverage can be found on the project's website.

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Copenhagen. Photo credit: CGP Grey

Europe's islands are leading the charge in the clean energy transition

ALLISON BALOGH
Horizon

Carbon dioxide from power generation must be reduced to reach EU climate targets for cutting greenhouse gas emissions by at least 55% by 2030 and becoming climate neutral by 2050. European research and innovation are fostering new disruptive technologies and sustainable solutions to make this happen.

So how is it possible to establish energy self-sufficiency that simultaneously safeguards the islands' futures and meets climate goals? The wind blows, the sun shines and the waves lap their shores. Harnessing these renewable energy sources (RES) has tremendous potential to reduce or eliminate the need for fossil fuels-derived energy.

Clean electricity by the islands, for the islands

The ways in which islands can make changes to transform their energy landscapes are nearly as diverse as the islands themselves, and Europe's islands are making pioneering contributions across the board that have caught the world's attention.

The island of Ærø in Denmark, with its brightly painted houses and cobblestone streets, is well on its way to a complete transition to RES, garnering it first place in the EU's RESponsible Island competition rewarding holistic achievements in local renewable energy initiatives.

According to Halfdan Abrahamsen, Media and Information Manager at Ærø EnergyLab, the island now regularly generates more energy with its wind farms than it uses – about 125% to 140% annually. District heating plants integrated with warm water storage rely on solar energy, heat pumps, biomass and biofuels to take care of about 70% of the island's heating needs.

On smaller and more isolated islands, being 'off the grid' may seem like a busy urban dweller's dream vacation, but for inhabitants it means energy isolation leading to challenges creating potable water. These islands can now take some cues from the second smallest of the Canary Islands, El Hierro, which joined Ærø as another RESponsible Island prize winner.

'Desalination and water distribution accounts for more than 40% of El Hierro's annual energy demand and was really the impetus for the wind-pumped hydroelectric plant developed in the context of the 100%RES-EL HIERRO project,' explained Santiago González, Chief Executive Officer of Gorona del Viento El Hierro, the company that runs, operates and maintains the power station.

When the winds are blowing, they turn the turbine to generate electricity. Surplus wind power is used to pump the water from a lower reservoir to a higher elevation, ready to work with gravity to generate electricity even when the winds cease to blow. The plant will be able to cover up to 70% of the annual energy demand of the island and has even supplied 100% for up to 25 consecutive days!

Hybrid technologies like these that find ways to make 'deposits' in times of excess boost the potential of intermittent RES. The tiny Greek island of Tilos has exploited this potential in a pioneering hybrid power station consisting of a wind turbine, a small photovoltaic (PV) park and a battery storage system, the first of its kind in Greece and among the first in Europe. These accomplishments and more have won it three European awards and a RESponsible Island prize.

According to Eustathios Kontos, General Secretary of the Island of Tilos, prior to the TILOS project, which began in 2015, there were only a handful of residential PV installations. A few years later, the island boasts a fully functioning hybrid power station that can supply around 50% to 60% of needed energy even during a mild wind year and, during some winter months, has exported excess clean energy to neighbouring islands.

More than energy production

There's more than one way to support a clean energy transition and the islands are powering ahead with a multifaceted approach.

'TILOS' success inspired us to expand the penetration of clean energy production, energy saving measures and intelligent energy management in areas including public lighting and management of the water network. We also added a conventional and a PV-based electric vehicle (EV) charging station. Carbon neutrality is our ultimate aim in the near future,' added Kontos.

Transportation is a major contributor to climate-changing emissions and islands are moving forward in this area too. Ærø is encouraging EVs and has cut bus emissions by 40% with solar panels and gas-to-liquid fuel. Free bus rides means the green buses now transport five times as many people, significantly reducing car-related pollution and the expenses of road maintenance and expansion.

And you won't hear – or smell – Ellen on the Danish seas. Ærø's fully electric ferry Ellen is the world's largest, developed within the context of the E-ferry project.

Building sustainability takes a village

Community involvement is a recognised prerequisite for long-term success, and while this holds true everywhere, on small islands it is even more critical.

Cooperatives are a Danish tradition, from the first cooperatively owned dairy created by Danish farmers in 1882 to the oldest operating wind turbine in the world (43 years and counting!) developed by Danish teachers.

Ærø's first community-owned wind farm was established in 1985 and its wind farms continue to be community-owned. Similarly, the district heating plants are private companies that are cooperatively owned. Abrahamsen noted: 'When you hook up to one of our three district heating plants, you must buy a share by default. In our experience, local ownership results in local acceptance and local enthusiasm. "Not in my backyard" is a phrase known to anyone who has tried to erect a wind turbine or build a solar plant – local ownership lubricates the gears of change.'

González agreed: 'Ultimately, changes that benefit citizens foster acceptance and support. Our charging points for cars are free and a portion of savings from the wind-pumped hydroelectric facility are passed on to islanders as subsidies to purchase EVs or home PV systems.'

The rich tradition of Tilos' inhabitants in progressive innovation has played a significant role in the island's successful transformation. Tilos is not alone: survey of 15 Aegean islands carried out by the project showed that nearly 75% of islanders supported transition to an energy future in line with the Tilos model.

Planning for success

Deciding on what to implement and how is not as simple as the successes featured here might make it seem. Because future scenarios are difficult to explore and strategies are hard to align, the INSULAE project has developed a novel investment planning tool for islands, offered as a software-as-a-service. 'The investment planning tool gives robust insights from scenarios with sustainable options tailored to an individual island and with a step-by-step long-term pathway,' said Jeanne Fauquet, product manager at Artelys. It is also a communication tool that helps share visions of the future with a larger audience to get everyone on the same page.

So how do the islands turn their action plans into actions? 'The NESOI European Islands Facility provides professional onsite technical assistance to local authorities and private bodies, such as energy analyses, business and financial modelling, definition of tender procedures, etc. The idea is to empower local island entities through capacity building and networking,' explained Andrea Martinez, deputy managing director at Sinloc and NESOI project coordinator.

NESOI support is open to all of Europe's 2,400 inhabited islands and the team is ready to invest a total of €6.2 million. Each beneficiary will receive a maximum grant amount of €60,000 and an additional €60,000 worth of technical assistance provided onsite by the NESOI team of experts.

The Facility's first open call in October 2020 resulted in approval of 28 projects expected to eliminate around 300 kilotonnes of carbon dioxide emissions annually. The second funding call will be launched in October 2021.

NESOI is ensuring the long-term viability of projects by selecting those that can maintain positive profitability with medium- to low-risk investments, but projects at all levels of maturity can apply for funding. Interested parties can check out the NESOI website and subscribe to the NESOI newsletter for updates.

Martinez added: 'Perhaps the most impressive outcome of the NESOI project was that, after the success of the first call, our initial projected investment mobilisation of €100 million has increased almost 10-fold, reaching a new projection close to €1 billion.'

Gaining momentum and setting the pace

Europe's clean energy transition is gaining momentum, and islands are at the forefront of this movement. Leon Nielsen of CIRCE, and INSULAE project manager, put it in a global context: 'Infrastructure improvements and societal changes tend to happen together, creating a positive feedback loop – societies benefit from maintaining ecosystems, "green credentials" enhance the islands for citizens and visitors, and local economies and their populations are revitalised, motivating further action – hopefully on the mainland as well since energy is a global problem requiring global action.'

Approximately 11,000 islands on our planet have permanent inhabitants and Europe's 2,400 islands are home to 16 million people. Their physical separation from the mainland creates significant challenges when it comes to a steady supply of things the rest of us often take for granted – from potable water and the energy to power our homes and businesses.

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Is local eating loco?

Advocates of locally produced food assert that one way to lower our use of fossil fuels and thus climate change is to become locavores, who consume a diet that almost exclusively consists of locally grown or produced foods.

LENORE HITCHLER

ONE

There are many problems with the agricultural system. For example, the production and distribution of food are responsible for producing many greenhouse gas emissions, leading to climate change. Advocates of locally produced food assert that one way to lower our use of fossil fuels and thus climate change is to become *locavores.*

Locavores consume a diet that almost exclusively consists of locally grown or produced foods. Of course, fossil fuel usage is not the only problem with our agricultural system; just as climate change is not the only reason to support local food eating. There are many positive aspects as well as criticisms of this alternative food distribution system.

It is worth learning more about locally-sourced foods to see their role in the food system. Tamzin Pinkerton and Bob Hopkins wrote *Local Food—How To Make It Happen in Your Community*, and they provide statistics on the growing popularity of eating locally grown food. For example, a study found that one in six Americans stated that they went out of their way to buy local food as much as possible.

Local food sources include direct sales from farmers to consumers, such as roadside stands, U-pick, community-supported agriculture (CSA), farmers' markets, and farm to school programs. According to the US Department of Agriculture Census, 42% of school districts surveyed have a farm to school program, including over 42,500 schools.

Alice Waters is the author of the *Edible Schoolyard—A Universal Idea*. Waters provided a little history of children gardening in their schoolyards and included

Photo credit: tabletop.texasfarmbureau.org

a photo of students working in a school garden in New York City in the early 1900s.

Gardening is as local as it gets. According to the US Census Bureau, 25% of households grow some of their own produce. Gardening has the potential of becoming a major source of food. For example, Pinkerton and Hopkins reported that gardeners in Havana, Cuba produce more than 90% of the city's fruits and vegetables. There are several options for those who don't have any land available for gardening. They could participate in community gardening. Also, a new approach is to garden on a neighbors' land for a percentage of the produce.

A significant drawback to eating locally is that it is highly restrictive in food choices. Because of winter weather, very few regions can provide food during the whole year. However, consumers are used to getting a variety of globally sourced products and consuming foods that are not in season.

Besides providing limited choices, eating locally is frequently more expensive than standard supermarket fare. Michael Pollan, author and professor of Science and Environmental Journalism, wrote an article in the *New York Times Magazine*. He stated that a primary explanation of why local food is so expensive is that the federal government's farm bills have subsidized corn, soybeans, wheat, rice, and cotton. Fresh produce has not been subsidized.

He added that "the system is rigged to make the most unhealthful calories in the marketplace the only ones the poor can afford."

Subsidies were also discussed in *Animal, Vegetable, Miracle—A Year of Food Life* by biologist Barbara Kingsolver. These include: "the portion of agricultural fuel use that is paid for with our taxes ($22 billion), direct Farm Bill subsidies for corn and wheat ($3 billion), and treatment of food-related illnesses ($10 billion).

Besides the federal government subsidizing only certain agricultural practices, government agencies have enacted regulations restricting farming practices for small, local farmers and increasing their expenses.

In *Everything I Want to Do is Illegal*, Joel Salatin wrote about this. He stated that processing facilities are illegal in agriculturally zoned areas because this procedure is not considered farming as it is considered to be industrial or commercial in nature. In the past, farmers slaughtered their own chickens or other livestock on site, which is cheaper than sending them to a slaughterhouse.

There are other political difficulties in establishing local food distribution. Farmers who locally sell their products have to compete with the global agricultural system. Farmer and author Ben Hewitt wrote *The Town That Food Saved—How One Community Found Vitality in Local Food*. He stated that the US industrial food system is annually worth nearly $1 trillion. Additionally, the mainstream agricultural sector has more resources and power than local growers.

As well as political difficulties, there are sociological obstacles such as the time constraints of adding special trips to farmer's markets, local food coops, etc. People work long hours, take care of their families, and prefer one-stop shopping.

Another sociological issue of local food is the conservative beliefs of some of its adherents. For example, Salatin, a leader in the local food movement, espouses some extremely right-wing views.

He stated that minimum wage and child labor laws should be abolished, social security should be phased out, the government should get out of health care [this would eliminate Medicare and Medicaid], and the public school system should be shut down, privatized, and replaced with vouchers for private schools

Still, another sociological analysis is that locally sourced food does not necessarily entail fair and decent treatment of farmworkers. Professor Margaret Gray, Ph.D. reports on this in *Labor and the Locavore-The Making of a Comprehensive Food Ethic*. Gray focused on the Hudson Valley agricultural region, which supplies New York restaurants and farmers' markets, as a microcosm of national working conditions. Gray found:

meager wages, long hours of difficult manual work, lack .of overtime pay, run-down housing, lack of respect … [field work and packing] requires bending and stretching, long hours on one's feet, repetitive motions, wielding sharp tools, carrying heavy loads, and working in extremes of heat, wet, and cold. … the type of benefits guaranteed to other kinds of workers, such as sick and vacation days, health insurance, and retirement funds, were unheard of. … they lacked the basic legal safeguards that most American workers enjoy, including overtime pay, a right to a day of rest, and collective bargaining protections.

Gray added that "Food writers are fond of the notion that local farms play a role in creating community, but that communitarianism clearly does not extend to the laborers. … Any code of ethical eating that ignores this perpetuation of injustice is highly selective, if not morally hollow. A comprehensive food ethic would privilege individual human workers as much as animals and the environment."

Besides improving the social conditions of farmworkers, some innovations to localism could be initiated to make it more complete in practice. For example, people could grow greens in their own homes.

Sprouts can be grown in jars on a small shelf section, and microgreens can be grown in a tray that doesn't take up much room. These greens are incredibly healthy and nutritious.

Even in urban areas, insects could be raised as they can be grown in a small space, don't require many resources, are extremely nutritious, and can be raised with a low amount of fossil fuels.

Another alternative practice that local farmers and gardeners should adopt is to utilize local native species. Indigenous peoples are good sources for knowledge about using edible natives. Many species that are considered weeds are highly healthy and nutritious.

Research should be initiated to learn how these local weeds could be grown as crops. Lou Bendrick, in *Eat Where You Live—How to Find and Enjoy Local and Sustainable Food No Matter Where You Live*, points out the advantage of growing plants that grew locally before European settlement. These plants are

Local vegetable market in Dhanbad (India).
Photo credit: diningandcooking.com

adapted to local climate, rainfall, soil and require less maintenance.

Growing crops and livestock is at the beginning of the food cycle, and dealing with human wastes is at the end of the cycle. Instead of polluting the environment, these wastes should be handled locally and returned to the soil as fertilizer. In *The Town That Food Saved* Hewitt stated that in a functioning food system, the waste of one producer becomes the resource of another.

Even though there are many negative aspects of eating locally, there are also many positive characteristics. Locavores state that local food-sourcing use fewer fossil fuels because of shorter transportation miles, thus contributing less greenhouse gas emissions.

Various chapters in *The Local Food Movement* edited by Amy Francis dealt with this subject. Rich Pirog, from the Leopold Center for Sustainable Agriculture at Iowa State University, found that in the US, food traveled an average of 1,500 miles from farm to consumer.

He also reported that the conventional food distribution system used 4 to 17 times more fuel and emitted 5 to 17 times more carbon dioxide than food sold locally. Another chapter in the book reported

that FoodShare found that a year of consuming local rather than supermarket foods would save half a tonne of greenhouse gas emissions per household.

In *Animal, Vegetable, Miracle*, Kingsolver wrote about eating a diet based on local foods: "In addition to direct transport, other fuel-thirsty steps include processing … packaging, warehousing, and refrigeration." Even marketing uses natural resources and fossil fuels. For example, consider all the trees and fossil fuels needed to print advertisements.

Unfortunately, not everyone agrees that growing locally lowers fossil fuel use. Journalists Alisa Smith and J. B. Mackinnon are the authors of *Plenty—Eating Locally on the 100-Mile Diet*.

They report that "the Agribusiness and Economics Research Unit of Lincoln University in New Zealand studied the total amount of energy used to bring apples, onions, dairy products, and sheep's meat to market in Britain versus the same products shipped 11,000 miles from New Zealand.

The researchers found that owing to the heavy energy consumption of industrial farming in the UK, it was more efficient to maintain the $330 million trade from New Zealand than to have the British raise these products on their own."

Another advantage of local food sourcing is that farmers receive a larger proportion of food price. In 2019, the US Department of Agriculture reported that for each dollar that Americans spent on food, US farmers and ranchers earned only 14.6 cents. The remaining 85.4 cents include processing, wholesaling, distribution, marketing, and retailing.

Also, the money made from local sales stays in the community instead of going to the headquarters of national supermarkets. A study from *Food4All* found that for every dollar spent on local foods, 76 cents remains in the community.

As well as contributing to local communities, locally grown food can be more nutritious than what is sold in supermarkets. Dr. Corilee Watters is a professor of nutrition. She stated that produce sold in supermarkets is bred for higher yields and that research indicates higher-yielding varieties can be lower in nutrients. She added that another issue is that produce is harvested before it is ripe. However, this procedure lowers vitamin C content.

Also, supermarket produce loses nutrients during transport and the time spent on store shelves. In the US, fruits and vegetables may spend up to five days in transit following harvest. Vitamin C degrades rapidly after harvest, and this degradation continues during storage, according to Dr. Diane Barrett, a food chemist at the University of California [UC] Davis.

She stated that green beans kept refrigerated for seven days after harvest lost 77% of their vitamin C. According to a 2005 study from Penn State University, spinach can lose 90% of its vitamin C content within 24 hours after harvest. This study also found that spinach kept refrigerated for eight days lost around 50% of its folate.

Besides being more nutritious, local foods are less likely to pose health risks due to contamination. Professor Jasia Steinmetz, Ph.D. is a registered dietician and nutritionist and author of *Eat Local—Simple Steps to Enjoy Real, Healthy & Affordable Food*. She wrote that eating locally is safer for consumers. She stated: *"Food that goes through multiple handlers also has more opportunities for contamination. Local food may be safer for several reasons: fewer people handle the food; the farmer's reputation is directly dependent on his customer's health, and the food is usually sold as a whole, so there is less entry for contaminants."*

Another advantage of consuming food from local sources is that it could lower the damage that the global food system causes to people and the environment. Many workers working in exported crops are paid extremely inadequate wages, have deplorable working conditions, and are exposed to toxic chemicals.

Additionally, native ecosystems are destroyed to pave the way for exports. This frequently leads to deforestation, which contributes to climate change. Also, when agricultural systems are exporting food, they are frequently not producing enough for the local population.

Thus, there are many things to consider when evaluating the value of locally sourced foods. For example, farmers may profit by earning a higher proportion of the money spent on food.

Consumers could benefit by consuming more foods that are healthy and nutritious. Furthermore, the global environment would benefit. For instance, more forests might survive as fewer would have to undergo deforestation to grow crops for foreign export. This might even lead to slowing down climate change. ONE


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Australia's two-way strategy

ALICE MASILI
ONE

COP26 was useful. At least the Australian government showed its true face. Despite a smoky plan, Prime Minister Scott Morrison exposed his country strategy to achieve climate neutrality. "The Australian way" plans to focus on new technologies, but it is hard to understand how and when. Fossil fuels, heavy industry and mining are all still there. Unscathed. No severe decarbonisation strategies are on the horizon.

Before the Glasgow conference, Australia set its net-zero emissions target by 2050. Morrison said emissions will fall by 30-35% by 2030 (compared to 2005), stating that this will not end the fossil fuel sector.

Keeping its 2030 target unchanged, Australia opposed any proposal to strengthen the emission reduction targets for 2030, reiterating its intention not to submit updated voluntary national contributions (NDCs) before COP27. The Australian government claims its goals are aligned with the Paris agreement and they will do even better without any change.

While 40 countries pledged to phase out coal, signing the Global Coal to Clean Power Transition Statement, Australia does not want to give up its leadership as a coal exporter, even if it comes with the reputation of being one of the most polluting countries.

According to a recent analysis of the independent climate and energy think tank *Ember*, after the Paris Agreement Australia emitted 5.34 tons of carbon dioxide per person every year. No other country can match it. Second is South Korea (3.81), followed by South Africa (3.19), the United States (3.08) and China (2.71). Australia emits five times CO2 from coal energy than the global average.

Is do-not-change-anything "the Australian way" towards net-zero? In Glasgow, the Prime Minister promised to establish a new $1 billion technology fund to boost investment in Australian companies to develop new low emissions technology. "Our plan to reach net-zero by 2050 is an Australian one that's focused on technology not taxes and this fund backs Australian companies to find new solutions".

These new solutions should be low-carbon technologies such as clean hydrogen, ultra-low-cost solar, energy storage for firming, low-emission materials (steel and aluminium), carbon capture and storage and soil carbon.

The financial backing will be provided by the national and territorial governments, research institutes and the private sector, including the Australian Renewable

The Coleambally Solar Farm is a 150MW renewable electricity project owned and operated by Neoen in NSW, Australia.
Photo credit: Neoen

Energy Agency (Arena), the Clean Energy Finance Corporation (Cefc), the Clean Energy Regulator (Cer) and other specific programs.

Since 2012 Arena has funded more than A$ 1.8 billion in early-stage research and development projects related to solar, wind and other renewable energy technologies, as well as energy storage and grid integration.

Cesc, which should facilitate the financial flows in the clean energy sector and encourage investments in renewable energy, energy efficiency and low emission technologies and projects, has invested over A$ 9.5 billion in clean energy projects worth over A$ 32.8 billion.

Cer has committed approximately A$ 2.5 billion to emission reduction projects in various sectors, including energy efficiency, industry and transportation.

Australian companies are trying to seize these opportunities. The national government has received several gigawatt-scale green hydrogen projects. One of the most ambitious is located in the Western Green Energy Hub.

Expected to be operational in 2030, it could produce up to 50 gigawatts of hybrid wind and solar power over 15,000 square kilometres. It should produce over 3 million tons of hydrogen from renewable sources or around 20 million tons of green ammonia. Production would supply both domestic and foreign markets. The estimated cost is 100 billion Australian dollars.

There is also the Moolawatana Renewable Hydrogen project - it will combine approximately 3 GW of wind and 3 GW of solar with electrolysers, a desalination plant and a 500-km-dedicated H2 pipeline. The project is still in the pre-feasibility phase. And there are many more at this stage.

Australia does not look idle. There are several projects on green hydrogen and synthetic fuels going on Down Under. But it remains fastened to gas and coal.

This is the *Australian way*: do not dismantle anything before there is something just as reliable and convenient to replace it. Only time will tell whether this is the best path towards carbon neutrality or climate catastrophe. ONE

An Indigenous peoples' approach to climate justice

DEBORAH McGREGOR
Carbon Brief

Climate change has been identified as the "defining issue of our time" by many of the world's leading experts and the diagnosis of planetary health is dire. The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services has concluded that goals for achieving sustainability "cannot be met by current trajectories" and UN secretary-general António Guterres has referred to humanity's "war on nature" as "senseless and suicidal".

The term "climate justice" has emerged to explain how those who are least responsible for climate change – the most vulnerable, disadvantaged and marginalised – tend to suffer its gravest impacts.

There are few groups that this applies to more than Indigenous peoples, who have been described as "among the poorest of the poor and, thus, the most threatened segment of the world's population in terms of social, economic and environmental vulnerability".

Understanding the role of Indigenous peoples in determining future climate policies does not only consist of how climate change affects their livelihoods and survival – although that is critically important. Indigenous leadership is also necessary if climate justice is to be achieved, as is support for advancing transformative and innovative solutions that account for all life.

Exclusion is the norm

Indigenous peoples around the world, from the First Nations in Canada to the Maori of New Zealand, can – and do – play an important role in climate assessment, mitigation, adaptation and governance.

An International Work Group for Indigenous Affairs (IWGIA) and International Labour Organization joint report noted in 2021 that Indigenous peoples were responsible for protecting an estimated 22% of the planet's surface and 80% of biodiversity. Research also suggests that levels of biodiversity are equal, if not higher, in areas with a greater Indigenous presence and where Indigenous languages remain spoken.

The role played by Indigenous groups, in particular women, in environmental protection has been recognised, with UN Climate Change executive secretary Patricia Espinosa recently stating: "Indigenous women carry the knowledge of their ancestors while also leading their communities into a resilient future. When Indigenous women engage, climate policies and actions at every level benefit from their holistic, nature-focused knowledge and leadership."

However, despite recognition of Indigenous peoples' con-

Protesters hold signs during a protest against plans to pass the Dakota Access pipeline near the Standing Rock Indian Reservation (November 18, 2016). Photo credit: REUTERS/Stephanie Keitha

tributions, serious gaps remain in terms of involvement in generating climate solutions. Exclusion remains the norm.

In response to the release of part one of the most recent Intergovernmental Panel on Climate Change (IPCC) assessment report, Tunga Rai, representative of the Rai Indigenous people of Nepal, observed that Indigenous peoples and their knowledge continue to be marginalised in such assessments. He stated:"It is unfortunate to see that the climate science, including [the] summary for policymakers of the IPCC report, does not recognise our distinct knowledge systems/Indigenous science and the positive contribution of Indigenous peoples in climate action. The summary unveils the changes in the atmosphere, ocean, cryosphere and biosphere, but fails to cite even once human rights and the rights of Indigenous peoples. This gesture is even more threatening than climate change itself, for Indigenous peoples."

Indigenous planetary health and climate assessments

Indigenous peoples have diagnosed, assessed and offered their own solutions to a warming climate, as exemplified by Indigenous environmental and climate change declarations at international, national and local levels over the years. For example, the Kimberley Declaration of 2002 states: "Since 1992 [when the UN Framework Convention on Climate Change was agreed in Rio de Janeiro], the ecosystems of the Earth have been compounded in change. We are in crisis. We are in an accelerating spiral of climate change that will not abide by unsustainable greed."

As climate change has intensified, so have assaults on Indigenous self-determination. This was noted in the Kari-Oca 2 declaration, which was released in parallel with the UN's Rio +20 meeting in 2012 and ratified by more than 500 Indigenous peoples: "Since Rio 1992, we as Indigenous peoples see that colonisation has become the very basis of the globalisation of trade and the dominant capitalist global economy. The exploitation and plunder of the world's ecosystems and biodiversity, as well as the violations of the inherent rights of Indigenous peoples that depend on them, have intensified.

"Our rights to self determination, to our own governance and own self-determined development, our inherent rights to our lands, territories and resources are increasingly and alarmingly under attack by the collaboration of governments and transnational corporations."

People marched in in Plymouth (USA) while participating in the 50th anniversary of the National Day of Mourning.
Photo credit: Erin Clark/Boston Globe

In releasing these statements, Indigenous peoples have called into question the legitimacy and applicability of global and nation-state political and legal mechanisms, as these same states and international governing bodies continue to fail Indigenous peoples around the world.

As my colleagues and I have outlined, Indigenous peoples' assessments of the state of the world's climate and environment, based on their own knowledge and understanding, have found the global approaches thus far to be lacking in achieving climate justice.

In response, Indigenous peoples have proposed a path forward that promotes Indigenous and human rights, as well as the rights of nature, aimed at bringing about a "just, equitable and sustainable world".

Decolonising climate change

Eriel Tchekwie Deranger, executive director of Indigenous Climate Action, has stated that "the climate crisis cannot be addressed in any meaningful way without addressing its root causes – capitalism, colonialism and extractivism". Indigenous climate justice frames the challenge of global warming – along with other environmental injustices – as inevitably tied to, and symptomatic of, these ongoing processes of colonialism, dispossession, violence and violations of Indigenous and human rights.

It also recognises that there are unique considerations to be taken into account specifically in relation to Indigenous peoples – including recognition of Indigenous knowledge systems and sustainable livelihoods – and that addressing

these issues must be led by Indigenous peoples. Over the years, Indigenous peoples have borne witness to transformations of the natural environment throughout periods of historical and ongoing colonialism, such as widespread deforestation and pollution of water sources. These experiences have equipped them with knowledge of how to navigate catastrophic environmental change, although these dimensions of Indigenous experience have thus far had limited impact on climate change policy.

What is required is a profoundly different set of logics to attend to the full scale of climate justice and clearly diagnose, assess and then problem-solve climate change. Such approaches already exist in the lives, experiences and knowledge of Indigenous peoples.

Indigenous peoples prioritise responsibility to future generations in their relationships with the Earth, as well as "non-human relatives", including the trees, fish, animals, skies and water. These are seen as possessing spirit and agency, recognising that we are made of the same elements, and thus are part of the same community.

They also recognise that nature itself, or "Mother Earth", has rights that must be respected, and this should be recognised in government-formulated policies and legal processes. This perspective was recognised internationally in 2017 at the COP23 climate conference, in a document released by Indigenous groups titled Rights of Nature: Rights-Based Law for Systemic Change. It stated that "we must stop treating the Earth as a commodity", adding that:

"Recognising rights of nature means that human activities and development must not interfere with the ability of ecosystems to absorb their impacts, to regenerate their natural capacities, to thrive and evolve, and requires that those responsible for destruction, including corporate actors and governments be held fully accountable."

An innovative response based on Indigenous, nature-derived logics is evident in the Universal Declaration of Rights of Mother Earth, generated at the World People's Conference on Climate Change and the Rights of Mother Earth in Cochabamba, Bolivia over a decade ago. It pointed to a different logic of human-nature relationships that can inform the economic, social, political and legal transformation called for by international scientific assessments of the state of the planet. Indigenous peoples' declarations seek in essence to "decolonise" these broader processes, an approach that involves addressing the root causes of climate change, advancing self-determination and recognising Indigenous people as partners at the decision-making table in a nation-to-nation framework. In practice, this means focusing on local climate initiatives as an expression of sovereignty and moving towards a "just transition" for communities.

Such efforts are chronicled in a recent Indigenous Environmental Network report, in collaboration with Oil Change International, which examines Indigenous resistance to fossil fuel projects and highlights the importance of land defence, and the assertion and exercise of rights and responsibilities to the Earth.

Moving forward

Indigenous climate justice advocates argue that as long as these dominant world systems fail to embrace the transformation required and offered by Indigenous peoples – including an acceptance of the rights of Mother Earth – humanity as a whole will continue to fail the planet.

The UN Declaration on the Rights of Indigenous Peoples (UNDRIP) could form an integral part of any international climate change policy or initiative on the matter, particularly as it relates to Indigenous and human rights. Currently, it does not.

What is more, despite some recognition of Indigenous contributions, challenges remain to full, meaningful and equitable participation in the upcoming COP26 climate summit.

With the world still falling short on climate action and planetary health deteriorating, Indigenous climate leadership is essential in moving forward.

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China's power outages and its double carbon target 3060

XING ZHANG

ONE

Although China is an electricity generation powerhouse, it does experience power shortages from time to time. The most recent power outage happened last summer, resulting in elevators being turned off, stores' opening hours being shortened, factories having to ration electricity and some residents in north-eastern China even having to light up candles for a few weeks.

In September, we saw industrial output decline for the first time since China started recovering from the COVID-19 lockdown. Power outages happened shortly after China announced that it would reach carbon peak by 2030 and be carbon neutral by 2060 (known as double carbon target 3060) in September 2020.

Some experts suggested attempts to shift from coal to renewables being a factor in the blackouts. In all fairness, this suggestion is too far-fetched. Other experts think this results from a conflict between market-oriented fuel prices and government-controlled electricity rates.

In China, the National Development and Reform Commission (NDRC) solely controls the national electricity pricing mechanism. Provincial authorities lowered the electricity price by as much as 15 per cent or raised it by as much as 10 per cent from a fixed starting point - the range was revised to 20% on 11 October 2021. Meanwhile, the price of coal is not similarly regulated but set by the market instead.

Coal still dominates power generation in China, accounting for 68.5% of the nation's power supply in 2020. Figures from NDRC show that power demand rose by 13.8% in the first eight months of 2021 and over 50% of this growth comes from coal power.

2017 blackout in Shanghai (China).
Photo credit: paulazhang.wordpress.com.

Unsurprisingly, the NDRC also reported that thermal power generation (mostly coal) grew by 12.6% during this period. But coal production was up by only 4% and coal import reduced by 3.6%.

The growth in energy demand and lack of coal supply pushed coal prices to a record high. As a result, the power companies were unwilling to produce adequate power because it was simply not profitable. Over 90% of power plants have recorded losses in recent years. Some utility firms, especially private players that rely on spot coal, did not want to purchase coal and had to reduce generation.

To stabilise coal prices, the NDRC announced on 11 October 2021 that they would adjust the floating range of market-based electricity transaction prices in principle to a two-way range of 20%.

The 20% fluctuation limit does not restrict rates for coal-fired electricity for energy-intensive enterprises. The new mechanism is based on a benchmark price plus a floating range, after considering costs, reasonable margins and market changes. China's coal prices started to plunge after the government announced new regulation.

China gave power plants the freedom to negotiate long-term contracts with grid operators within a specific price band. Because the country has overcapacity in coal-fired power, the grid operator had the pricing power, and generators bid low, further lowering power prices.

Although power plants run at a loss, grid operators are still making profits. For example, in 2020, the National Grid made 450.9 billion Yuan profit, while the Southern China Grid made 100.8 billion Yuan. Increasing the feed-in tariff and balancing up profits distribution between power generators and grid operators will undoubtedly help to encourage power generators to produce more electricity.

However, it questions whether the energy crisis will affect China's determination to tackle climate change and finally move away from coal.

On 24 October 2021, the Chinese government issued top-level guidance on carbon peaking and carbon neutrality: retaining double carbon targets 2060, strictly controlling coal consumption between 2021 and 2025, and reducing coal consumption between 2026 to 2030. However, a new principle was introduced in the action plan for carbon peaking that followed: carbon cuts must happen in a secure and orderly manner. The world also witnessed China teaming up with India, forcing the word change from 'phase out' to 'phase down' coal at COP26 on 13 November.

On 17 November, the State Council stressed that China's energy resources are dominated by coal and ordered to improve the level of clean and efficient use of coal.To achieve its double carbon targets 3060 and build a new energy system with renewable energy dominating, China will retain coal power to guarantee supply and provide flexibility. But to what level? Recent research by the University of California, Berkeley, analysed scenarios in which China was not reliant on coal power.

Under a high power demand scenario, assuming an average annual power demand growth of 2.7% between 2018 and 2040, China would need to retain 310 gigawatts (GW) of coal power for reliability needs. Under a low demand scenario, of 1.9% annual growth in demand, the entire coal power fleet could be replaced by a combination of wind, solar and energy storage by 2040.

The difference between the two scenarios highlights the critical importance of managing power demand. Under the low demand scenario, to phase out coal power by 2040 would require annual increases of between 100–150 GW of solar and wind capacity and 15 GW of energy storage between 2020 and 2025. Then 250 GW of solar and wind power and 90 GW of energy storage will be needed to be added annually from 2025 to 2040.

China currently has around 1,100 GW installed capacity of coal power in place. The power outages resulted from coal and electricity pricing mechanism rather than capacity shortage. In fact, coal power has significant overcapacity in China, with typical plants running at less than 50% of their capacity. To ensure its 3060 double carbon goals becoming a reality, China at least has to stop building new coal-fired power plants immediately, audit current coal power capacity and resolve overcapacity.

The Chinese government also needs to issue guidance on replacing the coal plant fleet with zero carbon alternatives as soon as possible. ONE

'We're Taking Action Into Our Own Hands' — A Community Stands Against a Landfill

Long Island residents and their allies seek environmental justice after decades of pollution.

ERICA CIRINO
The Revelator

As you drive down East Woodside Avenue in Brookhaven, New York, a green mountain seems to emerge from otherwise flat surroundings. Gulls and turkey vultures circle above its dark, sparkling peak.

Soon, as you pass South Village Drive, the breeze begins to carry an acrid stench. It's strong enough to spark an immediate headache. Rolling up the windows only offers the slightest protection.

That's because what rises ahead is not a mountain but the 192-acre Brookhaven Landfill. If you listen as you approach, you can hear a fleet of diesel-powered garbage trucks idling outside the entrance on Horseblock Road. Get near enough and you can taste the exhaust in the air.

Brookhaven, located on ancestral Unkechaug land, opened in 1974 as a dumping ground for municipal solid waste. That changed in 1991, when the landfill switched to accepting ash from garbage collected and incinerated elsewhere on Long Island, along with local construction, demolition and street debris.

Up close the 270-foot-high Brookhaven Landfill is shrouded by trees. But the pollution it spews spreads far beyond that green border, traveling through the air, soil and into groundwater.

Those toxins are not felt equally. Approximately 486,000 people live in the town of Brookhaven, but it's the 12,000 or so residing in the landfill's shadow — in a predominantly African American and Latino hamlet within Brookhaven called North Bellport — who bear the brunt of its pollution burden.

"Our community has the lowest life expectancy on Long Island," says local activist Dennis Nix. CDC statistics estimate a person's life span in the majority Black and Latino community of North Bellport at 73.2 years, 20 years less than the longest-lived census tract on Long Island, which is predominantly white. Nix used to work at the landfill and says he believes toxin exposure there left him disabled.

"This is a community that's been looked over for many years," he says. "We're taking action into our own hands."

Nix and many others have had enough.

"The problem is systemic, and racism on Long Island runs deep," says Hannah Thomas, a longtime racial justice activist who has lived in North Bellport for more than 50 years.

"Our community has collectively been speaking out against the landfill before it even opened in 1974,"

Brookhaven. Photo credit: brookhavenvillageassociation.org/Chris Marshall

says another activist, Monique Fitzgerald.

Lately their case has been further reinforced by widespread calls to action on racial violence against people of color by Black Lives Matter and other activist groups in the United States and globally.

"When George Floyd was murdered in 2020, a group of residents decided to hold a Black Lives Matter protest in the North Bellport area to show that we're opposed to this kind of violence against Black people too," says Fitzgerald.

Inspired by the protests, Fitzgerald, Thomas and Nix organized the Brookhaven Landfill Action and Remediation Group, or BLARG, to address the community's history of environmental racism and injustice.

"We felt we needed new action and conversation to bring attention to the disproportionate harm we face," says Fitzgerald. They were quickly joined by Michelle Mendez, Abena Asare, Kerim Odekon and others who live in and around North Bellport.

The organization has made formal requests, in ongoing community calls and letters, for the town of Brookhaven and state of New York to immediately act to close and remediate the landfill, with the community's involvement. To start, it has called for a public conversation led by affected communities and experts about how best to cope with Long Island's abundance of trash, tapping into zero-waste solutions and prioritizing safety and health for communities like North Bellport that are affected by environmental injustice.

The town has announced it will close the landfill in 2024, but its plans remain elusive and unsatisfactory. No plans of remediating communities affected by the landfill, or efforts to implement zero-waste solutions, are known to exist. Meanwhile the group has uncovered records detailing a planned increase of waste-disposal operations in the area.

BLARG wants answers from the landfill's stakeholders — the town of Brookhaven and the New York State Department of Environmental Conservation; Winters Bros, which hauls waste and is the town's contracted recycler; and Covanta, the incinerator company turning Long Island's garbage into the ash.
According to some in the community, these stakeholders have not been forthcoming in holding a dialogue; they say the town and state have long seemed to ignore most attempted calls for meaningful community engagement despite the clear consequences of inaction. The New York state environment department, town of Brookhaven, Winters Bros and Covanta did not reply to multiple requests for comment for this article.

Ashes to Asthma

The Brookhaven Landfill still takes in more than a million tons of incinerator ash every year from three Covanta-owned facilities on Long Island.

When incinerators burn trash, they release heavy metals, PCBs, particulate matter, climate-warming gases, and harmful chemicals like ammonia and benzene. That initial pollution occurs miles away from North Bellport, but the incinerator ash itself is also dangerous. It emits similarly carcinogenic, hormone-disrupting and irritating gases and toxic fine-ash particles easily carried by the breeze. North Bellport's asthma-included ER visitation rate is the second-highest of any community in Suffolk County. Public health experts have identified the constant diesel truck traffic, gas flaring and landfill odors as harmful to residents' lungs and found they play a role in the development of asthma.

"There are both physical and psychological impacts," says Odekon. "You always have to wonder: Did I get sick based on where I live?"

Many members of the community say they were never fully informed about the landfill's health risks. Less than a mile south of the dump sits a large shelter for unhoused families, and next door to the shelter is the Frank P. Long Intermediate School — where more than 30 staff members have been diagnosed with cancer since 1998, some of whom have died. A state lawsuit filed by teachers, parents and neighbors alleges the town of Brookhaven has failed to protect them from the harmful odors and chemicals emitted by the landfill.

While the New York State Department of Health has not determined the cases to be a "cancer cluster" of particular concern, the community remains alarmed.

"Environmental contamination is very difficult to prove in association with cancer, and it's often multiple hits that contribute to illness," says Odekon, a physician. North Bellport, he says, is exposed to a cocktail of chemicals associated with the landfill and its continued operation.

Brookhaven landfill viewed eastbound on East Woodside Drive near leachate tanks and active ashfill shrouded by trees. Photo credit: Erica Cirino

Sludge Compounds the Issue

Additional risks are buried beneath the ash, street and construction debris. In June 2010 the landfill started accepting 10,000 tons of sewage sludge a month from New York City and elsewhere on Long Island — until the noxious odors led to an evacuation of Frank P. Long School in March 2011. This health crisis led New York state to revoke the town's permit to accept sludge after just nine months.

Prior to that the landfill accepted municipal solid waste, which releases climate-warming and toxic gases, for nearly 20 years. That only stopped in 1990 after the Long Island Landfill Law phased out such dumping of "untreated" trash on deep-flow groundwater recharge areas to prevent continued contamination. The law passed in 1983 following the discovery of landfill-related chemicals leaching into Long Island groundwater.

Brookhaven was — and remains — one of those leaching landfills. In the 1980s U.S. Geological Survey scientists detected a contaminant plume in the region's shallow Upper Glacial aquifer containing an array of chemicals linked directly to Brookhaven Landfill and a leaking liner. North Bellport sits in the plume's path, and tests have shown detectable levels of landfill-linked chemicals including iron, BPA, manganese, ammonia and 1,4-Dioxane in ground and surface waters across the hamlet for decades.

Another concern stems from the presence of PFAS, a class of chemicals commonly found in items made of plastic — and consequently in U.S. drinking water — that are linked to a wide range of health issues like cancer, reproductive problems and hormone disruption. According to Suffolk County Department of Health Services documents obtained by BLARG through the state's Freedom of Information Law, seven of 20 households still using private wells in 2017 were tested for contamination with landfill chemicals. Water samples from two households tested positive for PFAS in levels exceeding New York State drinking-water standards, and two had levels of iron and manganese exceeding the state standards.

Money Matters

For years the town has argued that closing the landfill would affect its finances and therefore its abilities to continue serving as an endpoint for Long Island trash. The town's annual revenues from the landfill top tens of millions a year.

"Importing trash is cash," Odekon says.

Despite racking up around half a billion dollars in waste revenues over the past decade, the town has less than half the finances ready to cover the anticipated cost of closing the landfill, according to a memo from Supervisor Ed Romaine obtained by BLARG through the Freedom of Information Law. Romaine first estimated the cost at around $32 million. He and his office did not respond to our emails.

The town seems determined to make up for any lost revenue. In late 2020 and early 2021, BLARG's investigative and outreach efforts helped shed light on and avert a recently proposed landfill expansion — yes, despite the closure slated for 2024. It's also currently monitoring the town's hushed effort to "excess," or rezone, and sell nearly 137 acres of land adjacent to the landfill — land that would have been used for its proposed ashfill — for "light" industrial purposes, such as an industrial park. BLARG organizers fear the move would only increase pollution and injustice.

And something else looms on the horizon. According to town records and waste hauler Winters Bros' newly publicized plans for a 228-acre waste-by-rail hub near the existing landfill, it seems likely Long Island's future ash and construction and demolition debris will be shipped to landfills upstate and out of state. Shipping it all first to and then from Brookhaven would create a whole new set of problems, the activists argue.

"We for sure do not need a railway, which would surely increase the amount of waste in our community," says Asare.

The town's idea of solutions following the landfill's closure look, to BLARG, like anything but. "Slapping solar panels on the trash, building an enormous waste-by-rail station, and who knows what else — everything is under wraps," Odekon says.

The Future: Can a Polluted Community Go Zero-Waste?

Even as those fights continue, BLARG has begun working on the problem from a different direction. Its members hope to reduce the amount of trash the community generates in the first place.

This summer the group organized a 90-day pilot community composting program, which collected and composted 1,300 pounds of food scraps from 20 families.

The effort took place at North Bellport's Chris Hobson and Bill Neal Memorial Community Garden, a project initially started more than a decade ago by a network of neighbors to address the lack of affordable, nutritional food available to the community.

"Diverting waste from a landfill is a radical action," says Fitzgerald. "We need to show people that it can save lives."

BLARG has also started auditing the community's waste, a crucial early step in making North Bellport as a zero-waste community, another of the group's goals.

Problems like Brookhaven won't go away easily. Industry experts project that plastic production will rise into the future, as will the pollution it creates at every step of its lifecycle. And like Brookhaven, the effects of this toxic pollution will continue to be felt unequally, often by communities of color, reinforcing systemic racism.

As it continues its fight, BLARG's organizers invite North Bellport residents and allies to join in efforts for community-led landfill closure, remediation and transparency — to be a part of the solution.

"It's amazing to see how our support has expanded out from the community into a constellation of allies speaking out together for justice," says Mendez. "The people who have been harmed deserve to have their voices heard."

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13th World Climate Change Conference

Climate change litigation is growing and targeting companies in different sectors

The body of climate change legal cases is becoming more diverse, now involving not only claims of disinformation and greenwashing against oil, gas, and cement companies. Other types of companies with a high carbon footprint, such as those in the meat and dairy industry, are also being targeted.

JOANA SETZER and CATHERINE HIGHAM

LSE Business Review

In May of this year, climate change litigation made global headlines in the wake of an unprecedented judgment issued by the Hague District Court in the case of Milieudefensie v Shell. The court ordered Shell to enhance the ambition of its greenhouse gas emissions reduction efforts, requiring the company to set – and meet – companywide emissions reduction targets of 45% below 1990 levels by 2030. While this case was the first of its kind, it is also part of a growing global body of climate change litigation, which is playing an increasingly critical role in the domestic implementation and enforcement of the Paris Agreement.

Globally, the cumulative number of climate change-related cases has more than doubled since 2015. Just over 800 cases were filed between 1986 and 2014, while over 1,000 cases have been brought in the last six years. Among these, cases of 'strategic' litigation – cases filed with the express aim of achieving a wider societal goal – have been on the rise. While most litigation continues to be filed against governments, a small but growing group of cases also targets the private sector.

Direct and indirect litigation against private actors

The body of climate change cases is increasingly diverse, with new strategies and arguments being deployed and developed all the time. In this context, it is crucial for corporate actors to understand the range of cases that may impact them. Historically, cases seeking to influence corporate behaviour in the climate context have consisted of cases against the companies with the highest historical emissions (i.e., the Carbon Majors), and cases challenging potential high emitting projects and developments. Many of these cases focus on the direct and value chain emissions associated with certain activities, often seeking to draw a direct causal link between those emissions and a given set of climate impacts. These cases are pictured in the centre of the figure below. While historically these

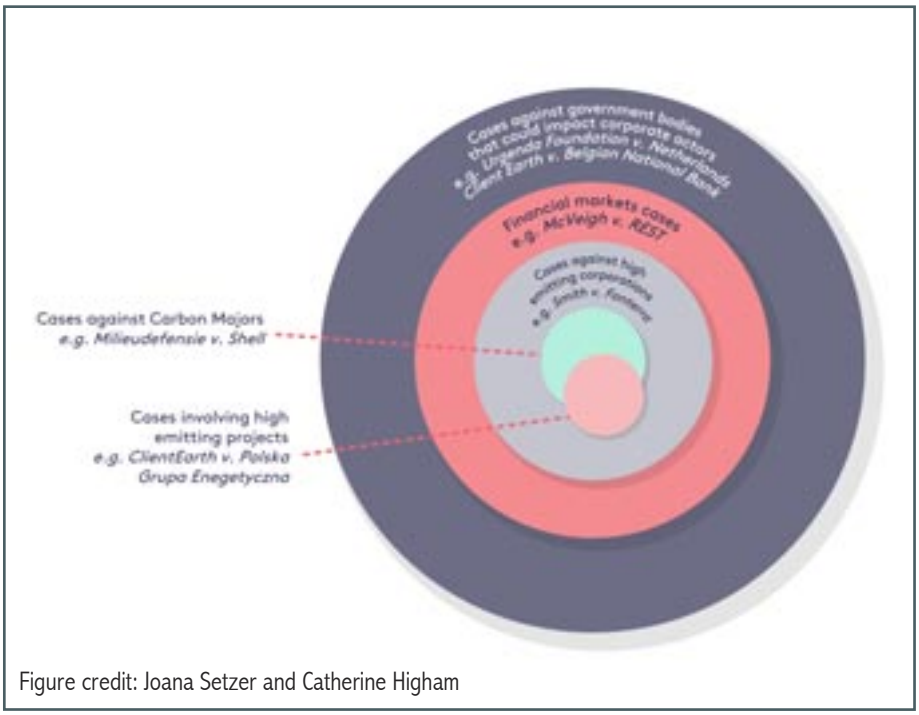

Figure credit: Joana Setzer and Catherine Higham

cases have focused on oil, gas, and cement companies, often integrating claims challenging disinformation and greenwashing, we are also now starting to see litigation against other types of companies with a high carbon footprint (such as those in the meat and dairy industry), pictured in the next ring out. However, these 'direct cases'' are far from the only cases that may seek to influence corporate action.

Finance in focus

We have identified two other key types of litigation that could have major – if indirect – impacts for business practices. Firstly, we see a growing number of cases involving actors from the financial services industry. Such cases ultimately seek to influence emissions trends by increasing the cost of capital for high emissions activities. Early examples of this type of litigation focused primarily on the disclosure of climate-change related risks and their relevance to investment decisions, often drawing on the recommendations and guidance produced by the Task Force for Climate-related Financial Disclosures (TCFD). This line of cases involves claims by shareholder activists against specific companies, as well as cases against asset managers such as pension funds. However, as Colombo has argued, recent cases such as *McVeigh v. Retail Employees Superannuation Trust (REST)* appear to mark a move beyond cases focused on disclosure to cases focused on due diligence. In McVeigh a pension fund subscriber argued that in failing to adequately manage climate risk, the trustees of the fund had neglected to carry out the duties of care, skill and diligence owed to the Trust's beneficiaries. The case ultimately settled as a result of REST's decision to align its investment portfolio with the goals of the Paris Agreement and adopt a target of net-zero emissions by 2050, but preliminary rulings from the court, coupled with the Trust's subsequent actions, clearly demonstrate the 'salience' of the arguments put forward.

The impact of 'climate commitments cases'" against governments

The other group of cases that may have far-reaching impacts for business involves legal challenges to governments, which seek to challenge either a lack of ambition or a lack of implementation for climate goals. In our report we identify over 100 such cases, which often centre on climate commitments or targets, building on the emerging consensus around global temperature limits represented by the Paris Agreement and reinforced by the publication in 2018 by the Intergovernmental Panel on Climate Change (IPCC) of the Special Report on 1.5 Degrees, as well as the growing popularity of the concept of 'net zero'. More than half of this group of cases (37) build on the approach taken in the landmark case of *Urgenda Foundation v. State of the Netherlands*, which was the first piece of litigation to successfully challenge the adequacy of a national government's overall approach to reducing emissions. Whether successful or not, such cases may often result in increased government ambition, and correspondingly in increased regulation focused on private sector emissions.

Looking forward: the challenge of net zero

The Shell case discussed above represents one of the first clear judicial determinations that the 1.5°C temperature limit, referred to in Article 2.1(a) of the Paris Agreement, and generally understood as requiring the global community to reach net-zero emissions by mid-century, should be used to inform legal standards of conduct in the absence of explicit legislation. Crucially, in confirming Shell's legal responsibility to align its operations with global efforts to meet this goal, the Court emphasised the need for Shell to reduce both its direct and value chain emissions. This emphasis on the need for companies to have concrete and credible climate policies encompassing both the net-zero goal and value chain emissions is likely to be a key element of how climate law and litigation affect the private sector in the short term.

A similar case is already ongoing in France, and since the publication of our report new cases modelled on Shell have now been threatened against auto manufacturers and the oil and gas industry in Germany. Meanwhile, Australia has also seen potentially precedent-setting litigation on net-zero filed in recent months: a case against gas company Santos filed by the Australasian Centre for Corporate Responsibility is challenging the company's claims to have a clear and credible plan to reach net-zero on the grounds that it constitutes misleading or deceptive conduct.

Climate change litigation continues to grow and diversify, spreading to increasing numbers of jurisdictions and areas of law. This growth and diversity reflect the increasing urgency with which the climate crisis is viewed by citizens around the world and the growing understanding of the role all actors – including businesses and investors – will need to play in the transition to a net-zero global economy.

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Climate pollution from plastics to outpace coal emissions in US by 2030, report finds

The petrochemical industry has found a new market for fossil fuels: Plastics.

ELIZABETH GRIBKOFF
Environmental Health News

With dozens of new plastics manufacturing and recycling facilities in the works, the U.S. plastics industry will release more greenhouse gas emissions than coal-fired power plants by 2030, say the authors of a new report.

Emissions from the plastics sector equaled that of 116 coal-fired power plants last year, according to the report out from Bennington College's Beyond Plastics project. Meanwhile, 42 plastics manufacturing and recycling facilities have opened, or are in the process of being built or permitted, since 2019. "As the world transitions away from fossil fuels for electricity generation and for transportation, the petrochemical industry has found a new market for fossil fuels: plastics," Judith Enck, president of Beyond Plastics, told reporters.

With the U.S. coal industry in decline, the report authors say policymakers at home and at the upcoming COP26 climate summit, a conference happening at the end of month where world leaders will hash out the details of climate pledges, need to factor the climate toll of plastics into emissions reductions efforts. "Leaving out plastics is leaving out a giant piece of the problem," Enck said. "We would like the national leaders that are gathering in Glasgow, Sco-

Photo credit: Pixabay

tland, to take the plastics issue just as seriously as they are taking transportation and electricity generation."

Climate costs of U.S. plastics

The report authors calculated emissions from 10 stages of plastics production, from hydraulic fracturing, or fracking, for the raw material—ethane in natural gas—all the way up to burning waste in incinerators. Cracker plants, where natural gas is heated at such high temperatures that it fractures into plastic building blocks like ethylene, have the heaviest emissions toll, producing around 70 million tons of carbon dioxide-equivalent pollutants, which is equal to the emissions of 35 coal-fired power plants. Because the report looks at emissions from a range of greenhouse gases, the authors converted the warming potential of all the pollutants into an equivalent amount of carbon dioxide, the most common greenhouse gas.

The authors say that emissions reports from the plastics industry are incomplete as they don't adequately account for leaks of methane—a greenhouse gas that's 84 times more climate-warming than carbon dioxide in the short-term—and other gases from the transport and production of plastics feedstocks. They note that while so-called "chemical recycling," which uses large amounts of energy to melt used plastics into building blocks for fuel and other products, is uncommon now, new plants could add up to 18 million tons of carbon dioxide-equivalent pollutants by 2025. Enck referred to chemical recycling as plastics' "new deception" now that Americans are aware that less than 9% of plastics are recycled.

Shipping resins and other plastics building blocks overseas accounts for a significant amount of emissions as well, said Jim Vallette, president of Material Research, the firm that Beyond Plastics hired to do the report analysis. "Plastic is very much like the new coal because the coal industry also is counting on exports to stay alive," he added.

Harmful plastics pollution

Plastics facilities don't just create planet-warming greenhouse gas emissions. They also release benzene, formaldehyde, and the carcinogen ethylene oxide, among other harmful pollutants. The plastics industry has come under fire in recent years for building its polluting plants in poorer parts of the country: 90% of the climate pollution from U.S. plastics plants occurs in just 18 communities that are mostly in Texas and Louisiana, according to the report.

"The health impacts of the emissions are disproportionately borne by low-income communities and communities of color, making this a major environmental justice issue," Enck said.

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Photo credit: adamxphotos.com

SIÈGE SIMON

Siège Simon was one of the largest coal mines in the Lorraine region of France. Geological surveys between 1817 and 1849 identified coal deposits. The construction activity began only in 1904, and the mine started operation in 1907. Forty years later, in 1947, Siège Simon employed up to 360,000 workers. The mine had five wells, built between 1909 and 1958 when the extraction reached nearly 59 million tons of coal in the whole year.

25 February 1985 is the day of the tragedy of Siège Simon: 22 miners were killed by an explosion at 1,050 metres depth. In 2002, shaft number five was closed down, and that signalled the end of the mine either. ONE

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