

World's \$1tn wealth fund weighs in on Amazon wildfire uproar

Norway's \$1tn sovereign wealth fund, the world's largest, is adding its clout to a growing number of asset managers across the globe scrutinising supply chains and businesses as wildfires rip through the Amazon. "We have had a focus on deforestation for several years and follow the ongoing serious situation," Carine Smith Ihenacho, chief corporate governance officer at Norges Bank Investment Management, said in an emailed comment. The wealth fund's chief governance officer said that she expects companies to have a strategy for reducing deforestation from their own activities and supply chains. In 2017, the fund initiated dialogue with companies that buy and sell soy and cattle products in Brazil, Ihenacho said. The Norwegian investor, which holds more than 9,000 companies around the world, has ratcheted up its work on ethics and sustainability over several years. It has taken steps to exclude or put companies under observation on a set of criteria, and it also engages directly in dialogue with companies to express its views. By the end of 2018, the fund had invested \$6.2bn in stocks in Brazil, and about \$2.8bn in bonds, according to a holdings overview on its website. "We have in previous years divested from one soy producer in this region due to links to unsustainable production and deforestation," Ihenacho said. Not only engaging directly with companies, the Norwegian fund has also taken initiative to talk to lenders to get a broader perspective on deforestation and financing, according to the governance officer. The fund engaged with banks in Brazil, Colombia, Indonesia and Malaysia last year, Ihenacho said, to understand how they monitor deforestation risk in their credit loan portfolios.

Brazil's neighbours are also burning, poisoning the Amazon



As the fires ravaging Brazil's Amazon stoke global outrage, its neighbours are also scorching, ripping up and poisoning their forests – largely under the radar.

Bolivia and Peru have seen faster growth in the number of fires this year than Brazil, as illegal miners, ranchers and cocaine producers continue to wreak havoc.

The 2.5mn square-mile Amazon is being attacked on all sides, with fires claiming an area equivalent to dozens of soccer pitches every hour in Brazil alone. At the deforestation rates seen in recent years, the whole forest will lose an area about the size of Virginia over the next decade according to Michael T Coe, senior scientist at the Woods Hole Research Center.

That's endangering an eco-system that not only hosts a vast and largely unknown share of the world's biodiversity but also helps regulate the continent's climate.

Fires have multiplied in Brazil as loggers and farmers, emboldened by President Jair Bolsonaro's disdain for environmental oversight, set ablaze land cleared earlier this year. Countries like Colombia, Peru and Bolivia aren't encouraging deforestation, but lack resources and political will to enforce existing regulations, according to Carolina Gil, an attorney for environmental protection group Amazon Conservation.

“The current crisis in Brazil is just the tip of the iceberg,” Gil said.

Continued destruction threatens to turn dense forests into scrub-land covered in shrubs and weeds, she added, wrecking a region which provides a home to tens of thousands of animal and plant species, and roughly one-fifth of the world’s fresh water.

Colombia, which has the largest swath of the Amazon after Brazil and Peru, lost 530,400 acres (215,000 hectares) of the rainforest in 2017, according to satellite data monitored by Amazon Conservation. Brazil, which has about six times as much of the jungle, has been losing about 1.58mn acres a year.

Meanwhile, cultivation of coca plants, the raw material for cocaine, more than quadrupled in Colombia between 2012 and 2017. Farmers often slash down forest in national parks to plant illegal crops in remote parts of the country where the government’s presence is weak or non-existent.

Mercury used by informal gold miners also continually seeps into the rivers in Colombia’s Amazon, poisoning fish.

Colombia’s environment ministry didn’t reply to a written request for comment.

Brazil has experienced more than 83,000 fires so far this year, up 77% from the same period last year, according to the country’s National Institute for Space Research, known as Inpe. Meanwhile, Bolivia and Peru have seen their number of fires roughly double during the same period.

In Bolivia, where nearly 19,000 fires have destroyed more than 1mn acres of forest this year, left-wing President Evo Morales has mobilized firefighters and used a Boeing 747 Supertanker to fight the blazes.

Bolivia’s environment ministry and presidential press office did not return phone calls and emails seeking comment. Morales on Sunday said he was open to international help to put out fires and called for a summit between countries that make up the Amazon to “coordinate immediate actions and long-term plans,” according to a statement.

Peru’s environment ministry didn’t reply to an email seeking

comment.

Brazil's neighbours don't share Bolsonaro's belligerence, or hostility to environmental protection, but their record isn't much better, said Rodrigo Botero, director for the Foundation for Conservation and Sustainable Development in Colombia.

"You can see across the region that the pressures in countries like Bolivia, which is suffering huge losses, or Paraguay are the same as in Brazil," he said. "It's not a question of left or right."

Can power napping solve electric car charging challenge?



TUTTIGART, Germany (Reuters) – Automakers around the world are pushing hard for new networks that can charge electric cars fast. In Europe, some power companies and grid operators are testing whether it might be smarter and cheaper to move into the slow lane.

A 15-month study of electric car charging behavior in Germany has concluded that consumers can be persuaded to accept slow, overnight recharging that could help avoid brownouts from surges in electricity demand or costly upgrades to power grids.

The prospect of millions of EVs hitting the roads as governments gradually ban new diesel and gasoline cars is seen as a major challenge for power companies, especially in Germany which is switching from nuclear and coal to less predictable sources of energy such as wind and solar.

The small study in the wealthy Stuttgart suburb of Ostfildern-Ruit though has helped alleviate the concerns of some grid operators that too many electric vehicles (EVs) charging at peak times could cause network crashes.

The engineers at Netze BW, the local grid operator behind the trial, found that all the households involved came around to leaving their electric cars plugged in overnight and only half ever charged simultaneously.

“Since the experience with the project we have become a lot more relaxed. We can imagine that, in future, half of the inhabitants of such a street own electric vehicles,” said Netze BW engineer Selma Lossau, project manager for the study.

Still, with limited EV battery ranges for now, slow, overnight charging doesn’t get around the problem of how to persuade drivers to ditch petrol cars altogether.

Without a network of fast-charging stations offering quick refueling, drivers may be wary of using EVs for long trips –

which is why some automakers want lots of fast-charging stations to encourage the widespread adoption of electric cars.

'CHANGED MY OUTLOOK'

Slower, or delayed, charging has already gained traction in Norway, Europe's leading EV market, where nearly 50% of new car sales are zero-emission vehicles.

A study by energy regulator NVE showed that Norway faces a bill of 11 billion crowns (\$1.2 billion) over the next 20 years for low- and high-voltage grids, substations and high-voltage transformers – unless it can persuade car owners to charge outside peak afternoon hours.

The investment cost to the country of 5.3 million people could drop to just over 4 billion crowns if cars are charged in the evening, and may fall close to zero if batteries are only plugged in at night, NVE said.

NVE is now working a tariff proposal which will penalize peak-hours charging. Tibber, a Norwegian power company, already offers cheaper electricity for EV charging if you let it decide when your car is charged while firms such as ZAPTEC offer ways to adjust charging to the available grid capacity.

Some of the 10 households participating in the Stuttgart trial said they initially wanted to keep topping up their cars for fear of running out of juice, but soon adapted to leaving the power company to handle it as it saw fit overnight.

An electric car parks next to a charging station in Ostfildern near Stuttgart, Germany, August 19, 2019. Picture taken August 19, 2019. REUTERS/Ralph Orłowski

"At the start, I did not want to take any risks and charged frequently in order to feel secure. Over time, I changed my outlook," said Norbert Simianer, a retired head teacher who drove a Renault Zoe during the trial. "I grew used to the car

and became more at ease in handling the loading process.”

Simianer and his neighbors were given electric cars and 22 kilowatt (kW) wall-boxes for their garages, alongside two charging points in the street, all free of charge.

In return, they gave up their normal cars and allowed Netze BW, which is a subsidiary of German utility EnBW (EBKG.DE), to monitor and carry out a deferred and down-scaled charging process during a seven-and-a-half-hour period overnight.

Netze BW tried various options, either slotting cars in at the maximum 22 kW charging flow one after another, or lengthening the charging time for individual cars by adjusting the power flow, or combining both methods, Lossau said.

The participants, who used apps to check the status of their car batteries, grew accustomed to the lack of instant charging capability because their vehicles could always handle their everyday commutes of up to 50 km (31 miles).

EnBW said nine of the 10 households in the trial on Ostfildern-Ruit’s Belchenstrasse had opted to keep the wall-boxes and most were exploring leasing electric car.

TWO-WAY STREET

Lossau said monitoring 10 households did not in itself provide the “empirical mass to draw conclusions for the load profile of all of Germany”.

She also said there would need to be better two-way communication between EVs, the grid and consumers for the system to function efficiently on a large scale.

“There will have to be more exchange of information between e-cars and the grid to update the loading status in real-time, because otherwise, there can be the wrong impression about the speed of loading,” she said.

Utility companies developing so-called vehicle-to-grid (V2G) services, however, are struggling to persuade some automakers to use technology that allows two-way flows of information, and power, between batteries and grids.

Carmakers such as Volkswagen (VOWG_p.DE), Daimler (DAIGn.DE) and Ford (F.N), for example, are prioritizing one-directional fast-charging instead to overcome consumer resistance to EVs.

Japan's Nissan (7201.T) has been leading the way among carmakers exploring V2G though Germany's BMW (BMWG.DE) has now decided to develop it too, saying cooperation between cars and grids will be key to making e-mobility ready for mass markets.

"It is about making sure there is enough supply for the electric cars and that the lights do not go out elsewhere," a BMW spokesman said. "The cars don't just load when it's best for the market, but they can also supply power back to the grid to help even out demand spikes."

"There has to be more progress on the data exchanges, however. It is not yet the standard," he said.

Nevertheless, the Ostfildern-Ruit trial has raised hopes that power grids might be able to cope with an influx of electric cars, especially if the consumers play ball.

Even if drivers resist overnight charging, suppliers of software and equipment to power grids, such as Germany's Siemens (SIEGn.DE), are also looking at safer and more efficient ways to manage how and when power is used to charge cars.

MORE DATA PLEASE

The German city of Hamburg, for example, started a three-year pilot project this month with Siemens to pre-emptively identify overloads on transformers and along cables, and manage EV charging points accordingly.

“Loading processes offer so much flexibility that the overload on the networks can be reduced by deferring loading times or reducing the load that is supplied,” said Thomas Werner, expert at Siemens Digital Grid.

“This happens through the digitization of hardware and software and with communication technology,” he said.

Using software to help protect aging power networks from predictable surges could also avoid costly hardware upgrades to parts of the 1.7 million km of distribution grids in Germany.

With few than 100,000 electric-only cars in Germany at the moment, there is little threat of blackouts from over-demand. But the Transport Ministry in Berlin envisages up to 10 million electric cars on the roads by 2030.

The number of charging points across the country also only stands at 21,000. That’s up 50% over the last year but still barely a fraction of future needs.

Next up for Netze BW is a trickier test.

Managing the power for 10 households with electric cars in a suburban street of 22 homes is one thing, now the power company is launching a study of car charging behavior in an apartment block with 80 flats, where quarrels over access are likely.

It is also looking at a study in rural areas, where the longer cables required present challenges in maintaining stable voltages for charging.

But that’s still only part of the story. Lossau said power companies would have to work more closely with carmakers to fill knowledge gaps and exchange information.

“It can only work if we get more data from each other.”

Additional reporting by Lefteris Karagiannopoulos in Oslo;
editing by David Clarke

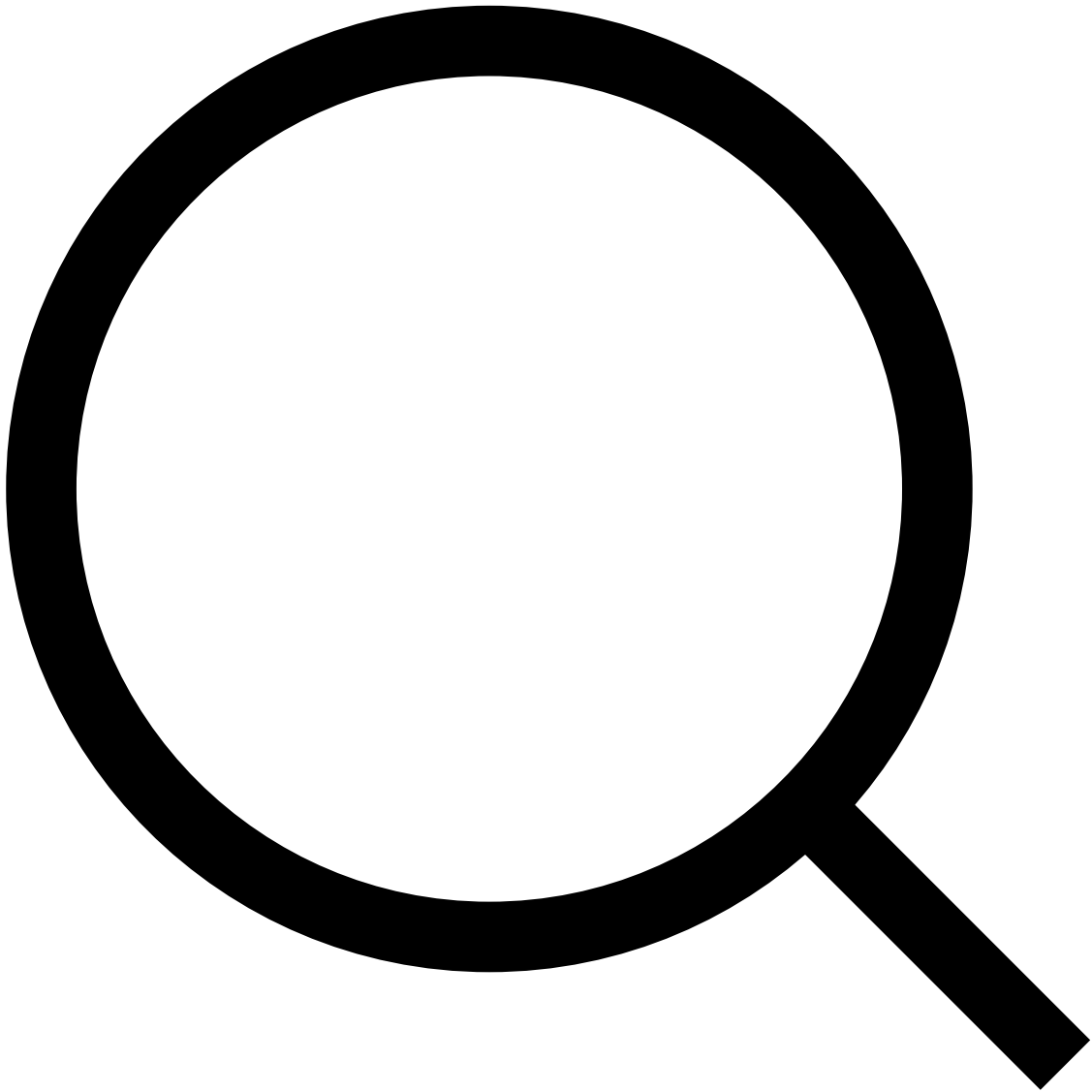
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High above Greenland glaciers, NASA looks into melting ocean ice



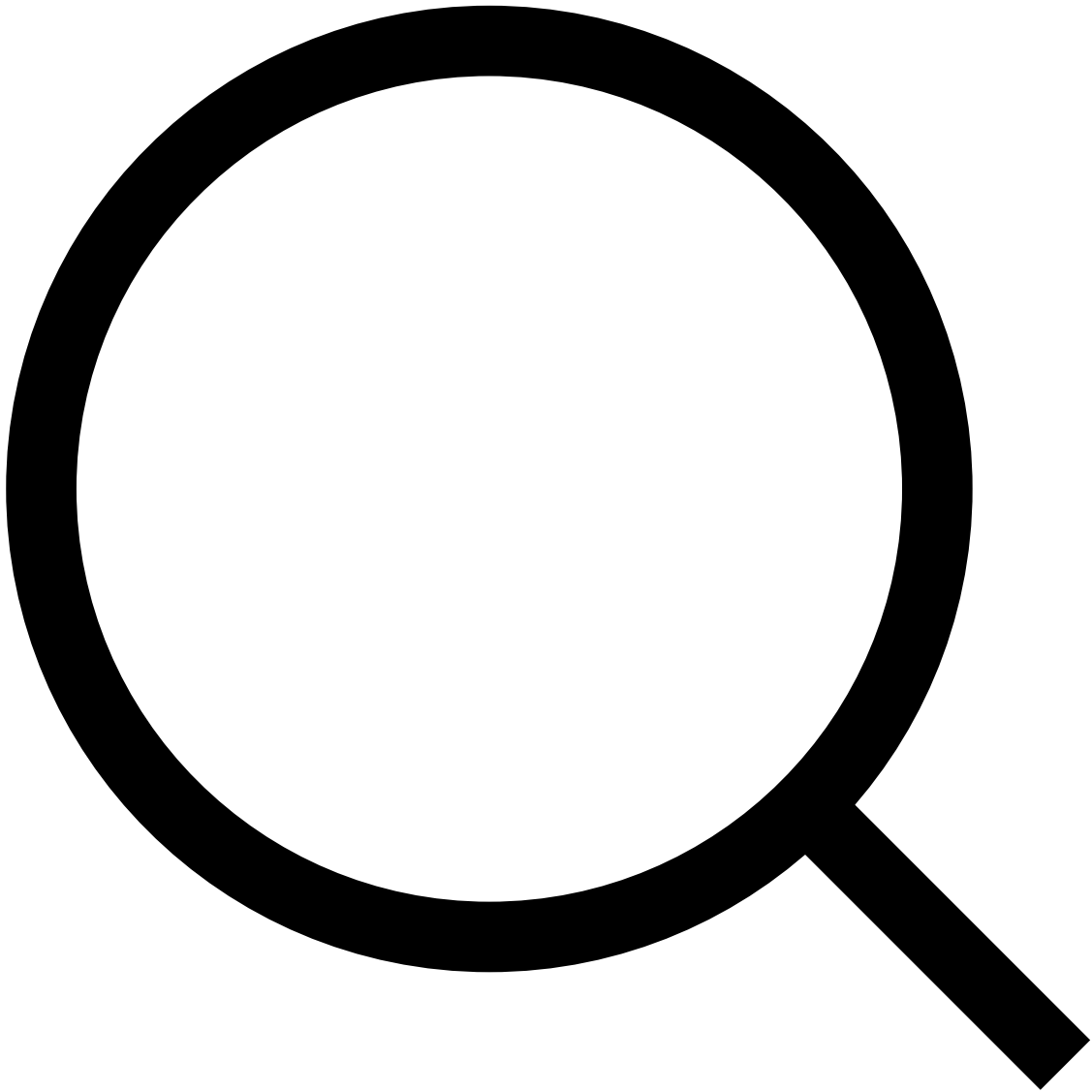
Skimming low over the gleaming white glaciers on Greenland's coast in a modified 1940s plane, three NASA scientists, led by an Elvis-impersonating oceanographer, waited to drop a probe into the water beneath them.

They are part of Oceans Melting Greenland – or OMG – a mission that has flown around the vast island for four summers, dropping probes to collect data on how oceans contribute to the rapid melt of Greenland's ice.



Willis is investigating how warmer layers of water off the coast come into contact with glaciers.

Dressed in a blue jumpsuit and with thick sideburns that give a hint of his occasional pastime impersonating Elvis, Joshua Willis, 44, is the oceanographer from NASA's Jet Propulsion Laboratory behind the project – and, along with his wife, its name.

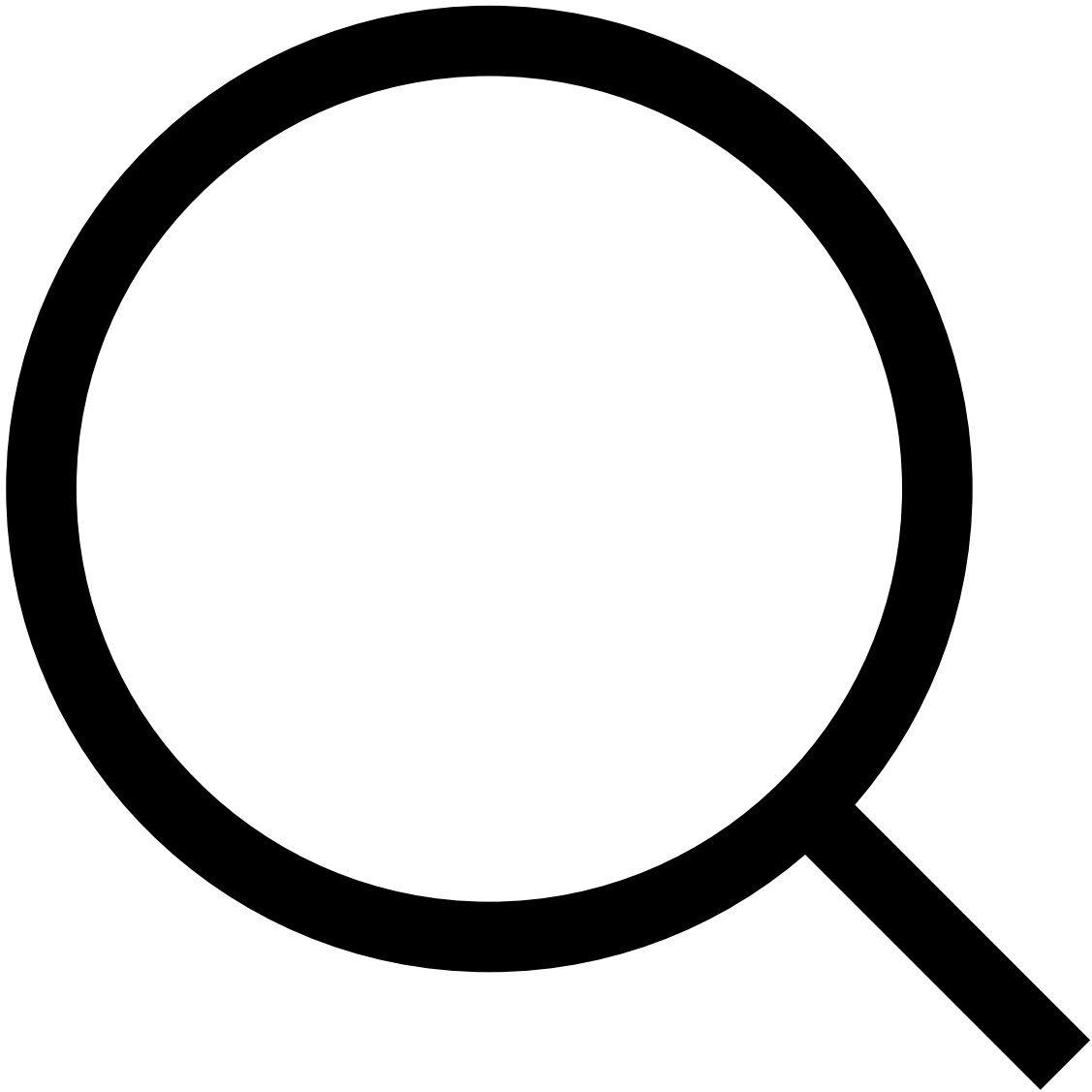


Three NASA scientists drop probes into the Arctic to measure the impact of the oceans on ice melt.

'Ice cube under a hair dryer'

Willis is investigating how warmer layers of water off the coast come into contact with glaciers and how this effects how quickly they melt.

"A lot of people think of the ice here as melting from the air warming, sort of like an ice cube under a hair dryer, but in fact the oceans are also eating away at the ice's edges," Willis said.

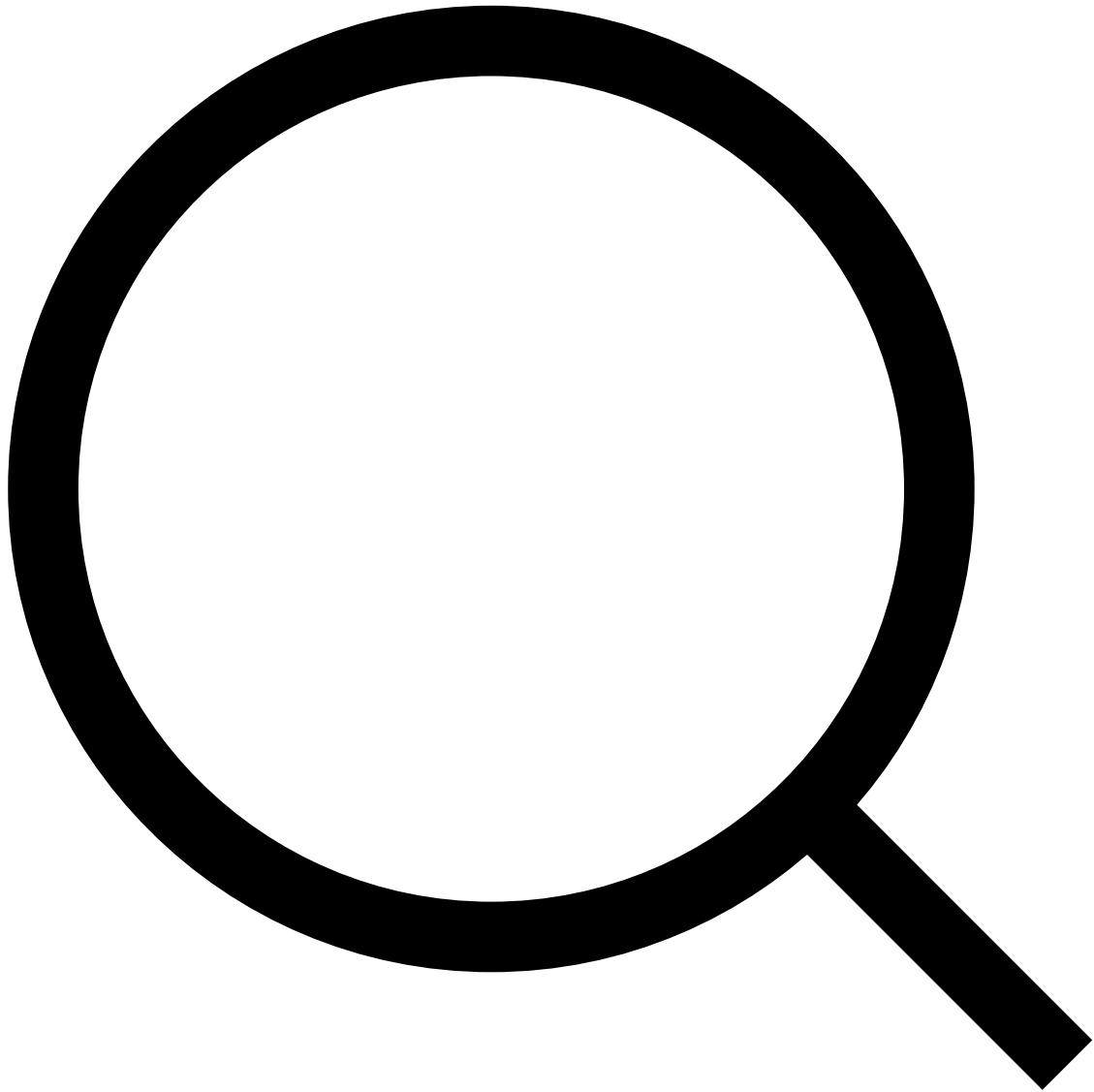


The scientists are part of Oceans Melting Greenland or OMG.

OMG surveys Greenlandic glaciers in the winter, comparing it with the data they collect about the oceans in the summer over a five-year period, which Willis hopes will allow researchers to better predict sea-level rise.

Greenland 'a challenge'

NASA – best known for the moon landings and space travel – started to study the earth's climate in greater depth from the 1970s when its inter-planetary exploration budget was reduced, using its satellites to look at the earth.

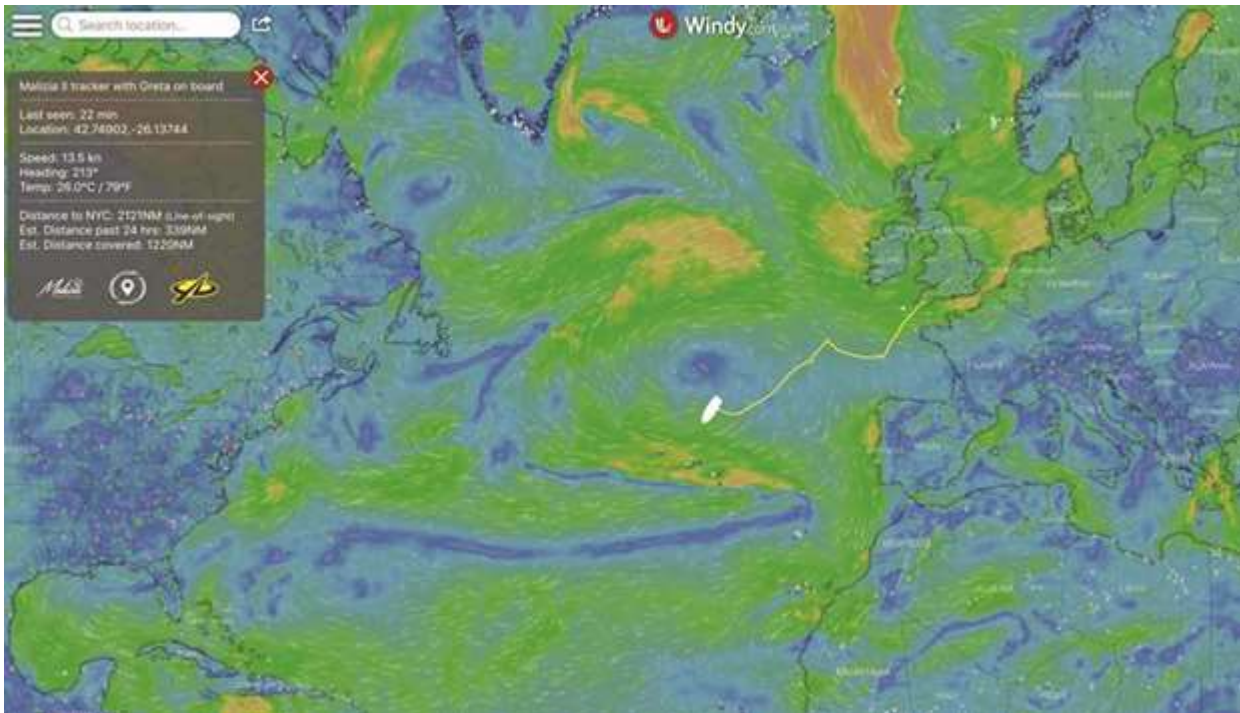


With OMG, Willis hopes they can provide data to give better predictions of sea-level rise.

Today it has more than a dozen satellites in orbit monitoring earth's seas, ice, land and atmosphere, along with missions like OMG, which Willis hopes will provide data to give better predictions of sea-level rise around the globe.

Agence France-Presse

Planetary thinking



By Erik Berglof London

The Swedish climate truthsayer Greta Thunberg has set sail for the United States in a zero-emissions racing yacht to generate waves in a different part of the world – including at next month's United Nations Climate Action Summit in New York. She will arrive in America at a time of growing transatlantic awareness of the threat posed by climate change. But whether shifts in public opinion will translate into concrete action remains to be seen.

Taking sustainability seriously means that we can no longer ignore our planetary boundaries. We need to start designing tools and policies to make all aspects of society more sustainable, before the costs of doing so become so large as to impoverish us. This has increasingly become a task not just for academics who specialise in the field, but for scholars and researchers generally. Sustainability should now be the lens through which we approach all policy-related empirical

questions. We need challenge-driven, mission-oriented research, and that calls for a broad multidisciplinary effort. To that end, Michael Grubb of the University of Cambridge, along with two co-authors, made a monumental contribution with his 2014 book *Planetary Economics: Energy, Climate Change, and the Three Domains of Sustainable Development*. Grubb marshals a broad range of tools from within the economics discipline to chart the way to a sustainable society. That framework will need to be broadened beyond economics, but it provides a useful starting point.

The “three domains” in the book’s subtitle concern human behaviour, and how it can be influenced through regulation, traditional market-based pricing, and innovation. Transforming a system requires action in all three areas. For example, better regulation can change human behaviour in a way that reduces prices and spurs innovation, in turn yielding even better regulation and lower costs.

Unfortunately, these three traditional domains within economics have each evolved separately, developing their own languages, evidence, policy recommendations, professional societies, and journals. The goal of a “planetary economics” is to integrate the domains within a single community, whose sole objective is to build a civilisation that can exist within Earth’s boundaries.

This is already happening on the margins. Evolutionary and institutional economists are talking to organisational and behavioural economists about how individual social and economic choices make up complex systems over time. Complexity economists like W Brian Arthur have been studying such questions for decades. And, in parallel, “Solow Residual” economists have drawn on all three domains to make sense of unexplained factors in economic growth.

But this multidisciplinary intermingling is not happening nearly fast enough. What we need is a new field of planetary social science to unite different perspectives, conceptual frameworks, and analytical tools – from political science, sociology, anthropology, and psychology. Just as we cannot

ignore the climate science, nor can we ignore the geopolitical and security challenges that will confront a warming planet. Beyond the participation of individual consumers, private corporations, and civil society, building a sustainable global economy will require active state intervention. Governments urgently must adjust regulatory frameworks, reset market incentives, and expand the hard and soft infrastructure needed for innovation to thrive. Moreover, policymakers should be prepared to take calculated risks, and to recalibrate policies based on feedback.

The sub-discipline that has perhaps come closest to integrating other disciplines, including medicine and environmental science, is public health. In *Survival: One Health, One Planet, One Future*, George R Lueddeke, the chair of the One Health Education Task Force, shows how public health can be incorporated into a wide range of fields to address individual, population, and ecosystem health.

Another crucial area, of course, is education. In 2015, the international community adopted the UN's 2030 Agenda and the 17 Sustainable Development Goals, one of which (SDG 4) regards high-quality universal education as a key to building "peaceful, just, and inclusive societies." Yet progress toward this goal, particularly in developing countries, is being hampered by inequality, poverty, financial shortfalls, extremism, and armed conflict.

In advanced economies, education systems need to prepare students for a world that is undergoing fundamental social, economic, and technological change. Young people today will need the skills not just to cope with the ongoing transformation, but to lead it. That means education policy, too, must become challenge-driven. In practical terms, every university should consider creating a compulsory course on systems thinking and cross-disciplinary approaches.

Meanwhile, public- and private-sector organisations around the world are being asked to integrate the SDGs into their daily operations. In *Survival*, 17 organisations, ranging from the US Centres for Disease Control and Prevention to the World

Wildlife Fund, tell Lueddeke how they are adopting a more multidisciplinary approach. But, in general, it is clear that many – if not most – countries have yet to consider the costs of implementing the SDGs fully. Without their active participation, success is unlikely.

In fact, most national finance ministries have not fully bought into the 2030 Agenda. In advocating sustainability, we must not create new vulnerabilities in the form of over-indebtedness. Recent experience shows that financial crises can rapidly undermine economic and political achievements, sometimes reversing decades of development or jeopardising future economic growth and stability.

As Greta Thunberg steps onto new shores, those in power should consider their responsibility to all generations. We urgently need to create the conditions for the emergence of a planetary social science that can inform our policy decisions. Ultimately, the planet will carry on. But whether humanity survives will depend on the leadership shown today, and on the systems of governance and scholarship that we build for the future. There is nothing like the prospect of extinction to focus the mind. – Project Syndicate

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The real obstacle to climate action



By Kemal Dervis And Sebastian Strauss/Washington, DC

Climate change is probably the biggest threat facing humanity today. According to the United Nations Intergovernmental Panel on Climate Change, the world must cut its carbon dioxide emissions to net zero by 2050 in order to prevent global warming of 1.5°C, or likely more, above pre-industrial levels in this century. The challenge calls for drastic immediate action, because the infrastructure investments the world makes today will determine the carbon intensity of its growth path for decades.

Yet despite widespread recognition of the size and urgency of the climate challenge, emissions continue to increase, land is “under growing human pressure,” and the Amazon has never been more threatened.

Much of the early climate debate revolved around whether the world should take drastic immediate action to mitigate global warming, or adopt a more gradual approach. The gradualists argued with some success that drastic immediate measures would impose heavy short-term economic costs.

But three recent developments have altered the course of the debate. First, the various feedback loops triggered by global warming now threaten to cause greater and more imminent damage

than previously thought.

Second, the cost of clean energy has declined much faster than previously assumed. According to the International Renewable Energy Agency, renewable-energy sources are already the cheapest power option in much of the world, with solar and wind technologies leading the way. Moreover, the cost of “greening” could fall even faster in the future through learning-by-doing. This is also likely to be the case in urban design, transportation, agriculture, and forest protection, all of which need to undergo a green transition.

Finally, the immediate negative externalities of the world’s current high-carbon growth model, such as air pollution, are now better recognised as adding to the short-term cost of climate change. Reducing them would therefore partially offset the upfront cost of mitigation.

These shifts greatly strengthen the case for pursuing much faster and bolder forms of mitigation. As the 2014 New Climate Economy Report concluded, there need not be a tradeoff between growth and forceful climate action, even in the short term.

So, why is more not being done? For starters, although the green transition may have a small net aggregate cost, it is certain to generate losers (as well as winners). And as is often the case with such transitions (for example with trade liberalisation), the gains will be spread across large parts of the population, while the losses will be more concentrated on specific groups, making them more visible and politically disruptive.

When advocating policies that result in aggregate welfare gains, economists often fail to give enough consideration to their likely distributional impact. Instead, they often implicitly assume that the winners will compensate the losers. But if such compensation does not actually occur, the losers are left worse off and can often block change, as the “yellow vest” protesters (gilets jaunes) have done since 2018, when the French government proposed a new climate-friendly fuel tax.

The de facto coalition that is currently resisting climate

action consists of the vested interests that own carbon-intensive assets (such as oil companies) and the mostly lower-income groups that would be short-term losers in a rapid transition. Compensating the latter and isolating the former is politically essential.

Unfortunately, it is not clear whether, say, the young German urbanites who voted for the Greens in the European Parliament elections this year would happily compensate the older auto workers – let alone Polish coal miners – who would suffer in a rapid transition. And complicating matters further, the groups at risk of short-term losses from green policies are often bearing the brunt of digitisation and globalisation, too.

Another hurdle to bold action is that climate protection constitutes an “additive” global public good, because there is only one atmosphere and the emissions of any one country add to global greenhouse-gas concentrations as much as those of any other country. This causes the free-rider problem of “carbon leakage.” Europe may well reduce its emissions in line with (or even beyond) the aims of the 2015 Paris climate agreement, but if India and China’s emissions keep increasing – or if Brazil allows the Amazon to collapse – those efforts will have been futile.

Clearly, the whole world would benefit from a co-operative solution. But without a binding international agreement or a supranational authority that can impose global green policies, few countries have an incentive to engage in sufficient mitigation efforts – leaving everyone worse off.

One possible measure to deter free riding is a carbon border tax, as recently proposed by the incoming president of the European Commission, Ursula von der Leyen. Governments that tax carbon could levy a border tax equal to the implicit subsidy given to their “dirty” exports by governments who do not have such a tax. This would effectively impose a kind of shadow carbon price on free riders, prompting them to produce fewer carbon-intensive goods.

Provided that it is non-discriminatory, such border pricing would enhance global welfare and be compatible with World

Trade Organisation rules. But calculating the appropriate tax would be very difficult in practice. It would, for example, necessitate calculating the tax equivalent of regulatory ceilings. The measure may also invite countries like the United States to retaliate with distortive measures, making it somewhat perilous. Moreover, the tax would likely have regressive distributional consequences, hurting poor countries the most. A better strategy, then, is to increase green investment in developing countries substantially, with multilateral development banks catalysing private financing in addition to their own funds.

Distributional issues – not aggregate costs – are the real obstacle to the ambitious policies needed to avert possibly catastrophic climate change. Similar challenges, at both the national and international level, also affect the transitions entailed by the so-called Fourth Industrial Revolution.

Neo-nationalist populists are already feeding on the fears created by disruptive change. Ambitious carbonisation could further fan these flames if it is not accompanied by social policies that effectively ease the process. Progressives everywhere must therefore unite in support not only of a rapid green transition, but of one that is politically feasible and desirable for the vast majority of citizens – even in the short run. – Project Syndicate

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The case for carbon tariffs



By backing tariffs that would reflect the carbon intensity of key imports, more than 3,500 US economists have broken with the free-market orthodoxy that national environmental policies should not impede global trade liberalization. They were right to do so.

AVIGNON – This January, 3,554 US economists – including 27 Nobel laureates, four former Chairs of the Federal Reserve, and two former Treasury Secretaries – proposed a previously heretical policy. The United States, they said, should combine a domestic carbon price with a “border carbon adjustment system.” By backing tariffs that would reflect the carbon intensity of key imports, they broke with the free-market orthodoxy that national environmental policies should not impede global trade liberalization.

They were right to do so. Absent carbon tariffs, concerns about industrial “competitiveness” will continue to constrain vital action to counter harmful climate change.

The fundamental obstacle to decarbonization is the apparent paradox that the costs are trivial at the final consumer level, but large for an individual company. As the Energy

Transitions Commission's recent *Mission Possible* report emphasizes, the technology to achieve total decarbonization of the global economy by around 2050-60, with very small effects on households' living standards, already exists. If all steel used in car manufacturing were produced in a zero-carbon fashion, the price of a typical car would increase less than 1%. The total cost to decarbonize all the harder-to-abate sectors – heavy industries such as steel, cement and chemicals, and long-distance transport (trucking, aviation, and shipping) – would not exceed 0.5% of global GDP. Viewed from this perspective, there is no excuse for national policymakers failing to adopt policies that can drive progress to a zero-carbon economy.

But, viewed from the perspective of an individual company, the costs of decarbonization can be daunting. Producing zero-carbon steel could add 20% to total production costs, and producing zero-carbon cement might double cement prices. So any individual steel or cement company that committed to zero-carbon emissions, or was forced to do so by regulation or carbon pricing, could be driven out of business if its competitors did not face equivalent constraints.

This conundrum has so far stymied the effective use of explicit carbon prices to drive decarbonization. Almost all economists who accept climate science believe that carbon taxes, or prices set in an emission-trading scheme, must be part of any optimal policy response. But even in places where this theoretically desirable policy has been deployed – for example, within the European Emissions Trading System – carbon prices have played a less important role than either regulation or direct subsidization of renewable energy in driving decarbonization. The reason for this is either that carbon prices have been too low to make a major difference, or that the most energy-intensive heavy industries have been exempted. And those weak policies reflect the fear that higher carbon prices and more complete coverage will make domestic

industry uncompetitive with imports from countries without such policies.

The obvious response is to impose carbon taxes in one country, or in a customs union of multiple countries, with an equivalent tariff per ton of carbon on carbon-intensive imports, combined with rebates of the tax for exporters. Ten years ago, when I was Chair of the UK Committee on Climate Change, we debated this possibility. But it was met by a wall of opposition. Such policies, it was said, violated WTO rules, were undesirable in principle, and would unleash tit-for-tat tariff increases justified by whatever environmental priority each country wished to pursue.

Since then, we have successfully used other policy levers to drive large-scale deployment of renewable electricity systems, with costs falling dramatically as a result. But in the industrial sectors, the multiplicity of alternative possible routes to decarbonization, and the fact that different routes will likely be optimal in different circumstances, makes it essential to use the price mechanism to unleash a market-driven search for least-cost solutions. And to do that, we need an answer to the competitiveness problem.

That's why the ETC's *Mission Possible* report argues for the inclusion of border carbon adjustments (carbon tariffs) in policymakers' tool kit, and why so many leading US economists have reached the same conclusion. They now argue for a carbon price within the US, combined with border adjustments for the carbon content of both imports and exports. Such a scheme "would protect American competitiveness and punish free riding by other nations."

But while the economists couch their argument in language designed to play well in the US, the policy could equally be applied by other countries to defend their industries against carbon-intensive imports from America, should the US choose to be a free rider in efforts to tackle global climate change.

Indeed, no country committed to addressing climate change should regard this policy proposal as a threat to its economy. If one country applies a tax of, say, \$50 per ton of carbon dioxide emitted, with an equivalent border tax on imports and with a rebate for exporters, any other country doing the same will leave its industries in exactly the same relative competitive position as before either country introduced the policy. But companies in both countries would now face an effective carbon price.

Global political agreement on carbon pricing has proven to be elusive. A carbon tariff could unleash a sequence of independent national decisions that drive a beneficial “race to the top” in which roughly equal carbon prices spread around the world.

Sometimes, intellectual taboos should be dropped. Border carbon adjustment is an idea whose time has come. It could play a major role in driving progress toward the zero-carbon economy that is technologically and economically possible by mid-century.

The coming clash between climate and trade



By Jean Pisani-Ferry /Paris

The incoming president of the European Commission, Ursula von der Leyen, has laid out a highly ambitious climate agenda. In her first 100 days in office, she intends to propose a European Green Deal, as well as legislation that would commit the European Union to becoming carbon neutral by 2050. Her immediate priority will be to step up efforts to reduce the EU's greenhouse-gas emissions, with the aggressive new goal of halving them (relative to 1990 levels) by 2030. The issue now is how to make this huge transition politically and economically sustainable.

Von der Leyen's programme reflects growing concern over climate change among European citizens. Even before the continent's recent heat wave, protests by high-school students and the surge in support for Green parties in the European Parliament election had been a wake-up call for politicians. Many now regard climate action not only as a responsibility to future generations, but also as a duty to today's youth. And political parties fear that dithering could lose them support among huge numbers of voters under 40.

In truth, however, the EU (including the United Kingdom) is a minor contributor to climate change these days. Member states'

combined share of global CO2 emissions has declined from 99% two centuries ago to less than 10% today (in annual, not cumulative terms). And this figure could fall to 5% by 2030 if the EU meets von der Leyen's emissions target by that date.

While the EU will undertake the painful task of cutting its annual emissions by 1.5bn tonnes, in 2030 the rest of the world will likely have increased them by 8.5bn tonnes. Average global temperatures will therefore continue to rise, possibly by 3C or more by 2100. Whatever Europe does will not save the planet.

How Europe deals with this frontrunner's curse will be critical. The von der Leyen plan will inevitably cost jobs, curtail wealth, reduce incomes, and restrict economic opportunities, at least initially. Without an EU strategy for turning the moral imperative of climate action into a trump card, it won't be tenable. A backlash will come, with ugly political consequences.

So what strategy might Europe adopt? One option is to bet on leading by example. By building an environmentally friendly development model, Europe and other climate pioneers would establish a path for others to take. And non-binding international agreements such as the 2015 Paris climate agreement would help to monitor progress, thereby pushing laggard governments to act.

But because climate preservation is a classic public good, climate coalitions are inherently unstable – and larger ones create even more incentive for members to defect and free-ride on others' efforts. Leadership by example is thus unlikely to suffice.

Alternatively, Europe could build on its first-mover advantage to develop a competitive edge in new green technologies, products, and services. As Philippe Aghion and colleagues have argued, innovation can help tap the potential of such technologies and start changing the direction of economic development.

There are encouraging signs: the cost of solar panels has fallen faster than anticipated, and renewables are now more

competitive than had been expected even ten years ago. Unfortunately, however, Europe has failed to convert climate action into industrial leadership. Most solar panels and electric batteries are produced in China, and the United States is its only serious competitor.

Europe's remaining card is the size of its market, which still accounts for some 25% of world consumption. Because no global firm can afford to ignore it, the EU is a major regulatory power in areas such as consumer safety and privacy. Moreover, European standards often gain wider currency, because manufacturers and service providers that have adapted to demanding EU requirements tend to adhere to them in other markets, too.

The EU's bet is that the combination of its own strong commitment to decarbonisation and the much softer, but global, Paris climate agreement will lead firms to redirect research and investment toward green technologies. Even if other countries do not set ambitious targets, the argument goes, enough investment may be redirected to make green development more affordable for all countries.

Yet current progress in this regard is clearly insufficient to curb global emissions and keep the global increase in temperature this century well below 2C above pre-industrial levels, as the Paris agreement stipulates. For example, global coal-powered capacity is still growing, because China and India are building plants faster than the US and Europe are dismantling them.

Europe is therefore short of tools that could make its transition to carbon neutrality economically and politically sustainable. In her address to the European Parliament, von der Leyen dropped a bomb: she promised to introduce a border tax aimed at preventing "carbon leakage," or the relocation of carbon-intensive production to countries outside the EU.

Such a tax will win applause from environmentalists, who (often wrongly) believe that trade is bad for the world's climate. More important, the measure would both correct competitive distortions and deter those tempted to abstain

from taking part in the global climate coalition. As long as there is no binding climate agreement, a carbon border tax makes economic sense.

Yet such a tax won't fly easily. Committed free traders (or what remains of them) will cry foul. Importers will protest. Developing countries and the US (unless it changes course) will portray the measure as protectionist aggression. And an already crumbling global trade system will suffer a new shock. It is ironic that the new leaders of the EU, which has relentlessly championed open markets, will likely trigger a conflict between climate preservation and free trade. But this clash is unavoidable. How it is managed will determine both the fate of globalisation and that of the climate. – Project Syndicate

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The Dangerous Delusion of Optimal Global Warming



Aug 1, 2019 ADAIR TURNER

The Nobel laureate economist William Nordhaus believes that global warming should be limited to 3.5°C, which is much higher than the 2°C targeted by the Paris climate agreement. But Nordhaus's approach represents a misguided application of sophisticated modeling to decision-making under extreme uncertainty.

LONDON – The United Kingdom is now legally committed to reduce net greenhouse-gas emissions to zero by 2050. Opponents in Parliament argued for more cost-benefit analysis before making such a commitment; and Nobel laureate economist William Nordhaus argues that such analysis shows a much slower optimal pace of reduction.

The 2015 Paris climate agreement seeks to limit global warming to “well below 2°C” above preindustrial levels, while the Intergovernmental Panel on Climate Change recommended in 2018 that the increase be capped at 1.5°C. By contrast, Nordhaus's model suggests limiting warming to 3.5°C by 2100. If that were the objective, net zero emissions would be acceptable far later than 2050.

But Nordhaus's approach represents a misguided application of sophisticated modeling to decision-making under extreme

uncertainty. All models depend on input assumptions, and Nordhaus's conclusions rely crucially on assumptions about the additional harm of accepting 3.5°C rather than 2°C of global warming.

For some types of climate impact, quantitative estimates can be attempted. As the Earth warms, crop yields will increase in some colder parts of the world and decrease in hotter regions. Any estimate of the net economic impact is subject to wide margins of error, and it would be absurd to imagine that benefits in one region will be transferred to others that have been harmed, but at least modeling can help us to think through the possible scale of these effects.

But it is impossible to model many of the most important risks. Global warming will produce major changes in hydrological cycles, with both more extreme rainfall and longer more severe droughts. This will have severe adverse effects on agriculture and livelihoods in specific locations, but climate models cannot tell us in advance precisely where regional effects will be most severe. Adverse initial effects in turn could produce self-reinforcing political instability and large-scale attempted migration.

To pretend that we can model these first- and second-round effects with any precision is a delusion. Nor can empirical evidence from human history provide any useful guidance for how to cope with a world that warmed to Nordhaus's supposedly optimal level. After all, 3.5°C warming above preindustrial levels would take us to global temperatures not seen for over two million years, long before modern human beings had evolved.

Modeled estimates of adverse impacts are also incapable of capturing the risk that global warming could be self-reinforcing, creating a nontrivial risk of catastrophic threats to human life on Earth. Recent Arctic temperature trends confirm climate model predictions that warming will be

greatest at high latitudes. If this produces large-scale melting of the permafrost, huge amounts of trapped methane gas will be released, causing climate change to accelerate. The higher the temperature attained, the greater the probability of rapid and uncontrollable further warming. Models always struggle to capture such strongly endogenous and non-linear effects, but Nordhaus's 3.5°C point of optimality could be a hugely unstable equilibrium.

Before the 2008 financial crisis many economists, including some Nobel laureates, believed that sophisticated "value at risk" (VaR) models had made the global financial system safer. Then-US Federal Reserve Chair Alan Greenspan was among them. In 2005, he reassuringly observed that the "application of more sophisticated approaches to measuring and managing risk" was one of the "key factors underpinning the greater resilience of our largest financial institutions."

But those models provided no warning at all of impending disaster. On the contrary, they deluded bank managers, central bankers, and regulators into the dangerous belief that risks could be precisely foreseen, measured, and managed. VaR models could not capture the danger of catastrophic collapse resulting from endogenous self-reinforcing feedback loops within a complex and potentially fragile system. The same is true of supposedly sophisticated models purporting to discern the optimal level of global warming.

The economic costs of achieving carbon neutrality by mid-century are also uncertain. But we can estimate their maximum order of magnitude with far greater confidence than is possible when assessing the costs of adverse effects of climate change.

Achieving a zero-carbon economy will require a massive increase in global electricity use, from today's 23,000 TW hours to as much as 90,000 TW hours by mid-century. Delivering this in a zero-carbon fashion will require enormous

investments, but as the Energy Transitions Commission has shown, it is technically, physically, and economically feasible. Even if all those 90,000 TW hours were provided from solar resources, the total space requirement would be only 1% of Earth's land surface area. And in real-world competitive energy auctions, solar and wind providers are already committing to deliver electricity at prices close to and sometimes below the cost of fossil fuel generation.

Total cost estimates must also account for the energy storage or backup capacity needed to cover periods when the wind doesn't blow and the sun doesn't shine, and for the complex challenge of decarbonizing heavy industrial sectors, such as steel, cement, and petrochemicals.

Added up across all economic sectors, however, it's clear that the total cost of decarbonizing the global economy cannot possibly exceed 1-2% of world GDP. In fact, the actual costs will almost certainly be far lower, because most such estimates cautiously ignore the possibility of fundamental technological breakthroughs, and maintain conservative estimates of how long and how fast cost reductions in key technologies will occur. In 2010, the International Energy Agency projected a 70% fall in solar photovoltaic equipment costs by 2030. It happened by 2017.

Rather than relying on apparently sophisticated models, climate-change policy must reflect judgment amid uncertainty. Current trends threaten major but inherently unpredictable adverse impacts. Limiting global warming to well below 2°C will cost at most 1-2% of GDP, and those costs will come down if strong commitments to reduce emissions unleash technological progress and learning-curve effects. Given these realities, zero by 2050 is an economically rational target.

Climate Changed Turbines in Landfill Trigger Debate Over Wind's Dirty Downside



Wind turbines may be carbon-free, but they're not recyclable.

A photograph of dozens of giant turbine blades dumped into a Wyoming landfill touched off a debate Wednesday on Twitter about wind power's environmental drawbacks. The argument may be only beginning.

Fiberglass turbine blades – which in some cases are as long a football field – aren't easy to recycle. And with BloombergNEF expecting up to 2 gigawatts worth of turbines to be refitted this year and next, there could be heaps more headed for dumps.



A technician repairs a wind turbine blade in Adair, Iowa.

Photographer: Daniel Acker/Bloomberg

Cynthia Langston, solid waste division manager for the city of Casper, declined to say where the turbine debris came from. But she's happy to have it. The 1,000 blades will bring in about \$675,000 for the landfill, helping keep trash costs low for local residents. Plus, Langston said, wind-farm junk is less toxic than other garbage.

"It's much cleaner than the contaminated soil and demolition projects from the oil and gas industry," Langston said in an interview. "These are about as non-toxic as you can get."

Wind turbine blades represent a "vanishingly small fraction" of overall waste in the U.S., according to the American Wind Energy Association.

Sachin Shah, chief executive officer of one of the world's largest clean-power operators, Brookfield Renewable Partners LP, said "there will be an aggressive effort to re-use

materials" in the years ahead.