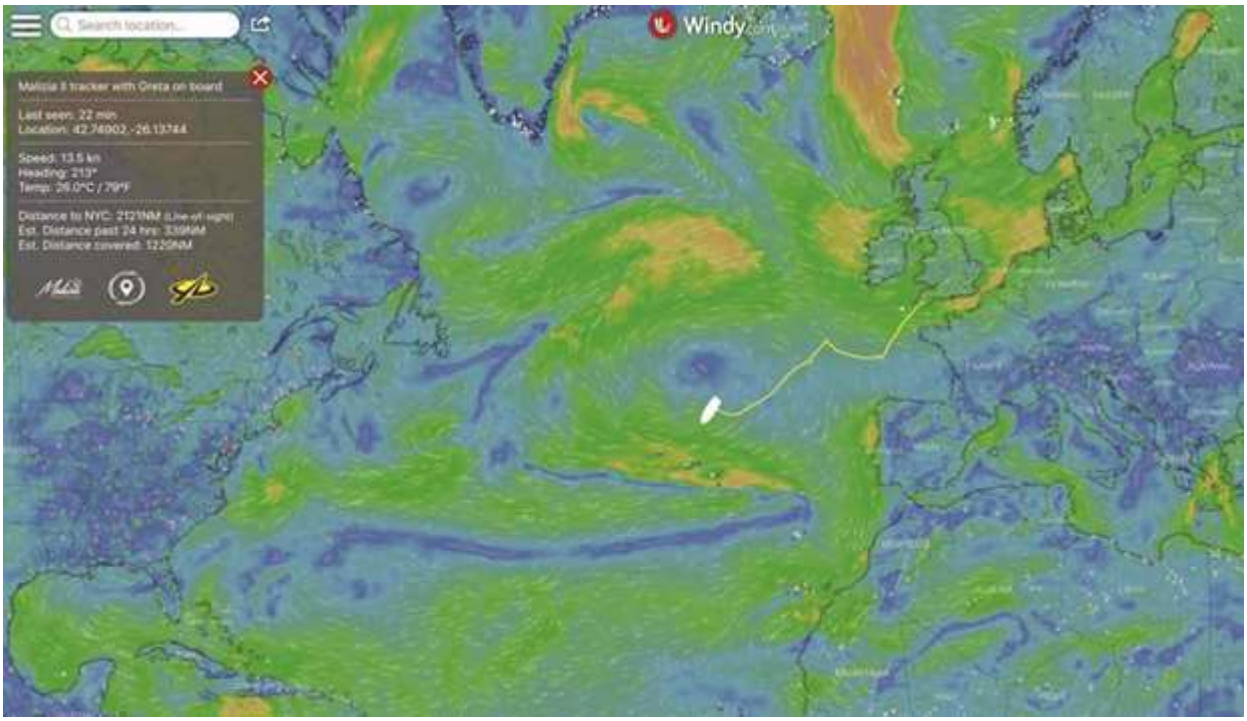
Planetary thinking



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.

Airlines scramble to overcome polluter stigma

Reuters Seoul/Stockholm/London

In Lorna Greenwood’s London home, there is a shelf lined with travel guides.
But the 32-year-old mother and former government employment lawyer has given up flying.
Greenwood, who grew up enthralled by the possibilities offered by plane travel, is part of a growing group of environmental activists in Northern Europe who are shunning flights as concerns about global climate change increase.
“It’s a tough pill to swallow, but when you look at the issues around climate change, then the sacrifice all of a sudden becomes small,” Greenwood said.
A Swedish-born anti-flying movement is spreading to other

European countries, creating a whole new vocabulary, from “flygskam” which translates as “flight shame” to “tagskryt,” or “train brag.”

A number of famous Swedes have stopped flying, including opera singer Malena Ernman, the mother of teenage activist Greta Thunberg who has thrust climate change into the spotlight.

“Flygskam” was a major topic at a three-day airline summit in Seoul this weekend, with global industry leaders launching a counter-offensive.

“Unchallenged, this sentiment will grow and spread,” Alexandre de Juniac, head of the International Air Transport Association (IATA) told some 150 CEOs.

The industry says it is shrinking its carbon footprint and its sustainability plan is among the most ambitious and globally focused of any industry.

“Come on, stop calling us polluters,” de Juniac said at a news conference after detailing the global initiative.

The IATA said the CO2 emission for each CEO’s flight to Seoul was half the amount of a 1990 flight, largely thanks to more fuel-efficient aircraft.

Commercial flying accounts for about 2.5% of global carbon emissions today but without concrete steps, that number will rise as global air travel increases.

The aviation industry has set out a four-pronged plan to achieve carbon-neutral growth from 2020 and halve net emissions from 2005 levels by 2050.

But airline leaders acknowledge they have struggled to articulate their plans in a way that resonates with the public.

When CNN anchor Richard Quest asked a room full of aviation executives whether they had used an often available booking option to offset emissions from their own flights to the South Korean capital, only a handful raised their hands.

The industry’s plan rests on a mix of alternative fuel, improved operations such as direct flight paths and new planes or other technology.

But a widely publicised March study funded by investors

managing $13tn said airlines were doing too little.
“If we as an industry can provide better, more concrete answers…people will start to feel more comfortable that airlines are serious about this commitment,” JetBlue CEO Robin Hayes said in an interview.
Questions remain over how airlines will slow, steady and finally reduce harmful emissions.
Use of sustainable-fuel would have the single largest impact, reducing emissions from each flight by around 80%, according to the IATA.
The problem is that it is in short supply.
“The reality today is there’s just not enough and it’s too expensive,” KLM CEO Pieter Elbers told Reuters.
KLM last week announced a deal to develop and buy biofuels from Europe’s first sustainable aviation fuel plant, due to open in 2022.
Still, the IATA targets 2% of total fuel supply from sustainable sources by 2025 and then expects a steady increase.
In Europe, eliminating dozens of national airspaces borders could reduce fuel consumption by around 6%, but lobbying for a Single European Sky has been bogged down for years.
Airlines say small steps like single-engine taxiing and the use of lighter materials are cutting around 1-2% of emissions each year.
In the absence of a quick and substantial reduction its carbon footprint, the industry has committed to a carbon-offset programme.
The global Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) allows airlines to purchase pollution credits from environmental projects.
It’s unclear what will count as an “offset” and critics say such schemes hide how much effort is being made by industry and how much is being imported and at what price.
“The risk is that the price airlines are effectively paying for carbon will not be politically acceptable in 5 or 10 years,” a senior aviation executive said, asking not to be

named.
European Union Transport Commissioner Violeta Bulc told Reuters she favours reviewing available green technology every five years “and then seeing if we can reach even further.”
For now, trains are benefiting from the anti-flight movement, although airline bosses in Seoul said that option barely exists in their busiest new markets such as Indonesia’s archipelago.
In Stockholm, Susanna Elfors says membership on her Facebook group Tagsemester, or “Train Holiday,” has spiked to some 90,000 members from around 3,000 around the end of 2017.
“Before, it was rather taboo” to discuss train travel due to climate concerns, Elfors said. “Now it’s possible to talk about this on a lunch break…and everybody understands.”

America’s bipartisan climate-policy failure

By Mark Paul

SARASOTA – US President Donald Trump's anti-climate agenda is in full swing. His administration has already taken action 117 times to repeal or weaken climate regulations, and much more deregulation is in the works. By unravelling environmental protections on an unprecedented scale, including through executive orders, Trump is using every tool at his disposal to increase fossil-fuel extraction and the production of dirty energy. Apparently, he is hell-bent on topping his predecessor's own fossil-fuel boom.

That is right, former President Barack Obama presided over a fossil-fuel boom: the domestic shale-energy revolution enabled by the advent of hydraulic fracturing (or fracking). The fact is that neither major party in the United States has been the climate champion that the country and the world needs. While young activists around the world are stepping up to show what true climate leadership looks like, politicians are barely taking note. As Dianne Feinstein, a Democratic US senator from California, dismissively told a group of young people advocating a Green New Deal (GND): "I've been doing this for 30 years. I know what I'm doing."

The longer both parties cling to a policy of "business as usual", the more likely we are to face a climate catastrophe in which millions of people perish or have their lives upended. In reality, though, the responsibility for adopting a new paradigm ultimately rests with the Democrats. While Trump has been disastrous for the planet, his administration's policies are in keeping with a Republican Party that will not change anytime soon.

In a recent review of more than 1,000 climate-related bills introduced in the US Congress since 2000, we found that, in the past decade alone, Republicans presented 187 that would increase greenhouse-gas (GHG) emissions. Most of these bills have sought to advance the interests of the fossil-fuel industry over those of everyone else. The Republicans' purported rationale is to achieve "energy independence,"

which, in practice, has meant offering special treatment to the oil, gas and coal companies that spend exorbitant amounts on campaign contributions.

Not long after coming to office, Trump promised that by unleashing America's fossil-fuel reserves, his administration would "create countless jobs for our people, and provide true energy security to our friends, partners and allies all across the globe". Following the same logic, Don Young, a Republican congressman representing Alaska, has introduced the American Energy Independence and Job Creation Act, which would allow exploration and extraction of oil and gas reserves in Alaska's Arctic National Wildlife Refuge. Adding insult to injury, the bill would direct half of the tax revenues generated by the exploitation of public resources to a pot of incentives for the fossil-fuel industry.

But the real insult is the behavior of Democratic leaders, who continue to abide by what James K. Boyce of the University of Massachusetts calls "climate-change denial lite". Consider the case of the Democratic National Committee (DNC). Last year, the DNC decided that it would no longer accept contributions from political action committees affiliated with the fossil-fuel industry, only to reverse course and embrace an "all-of-the-above" energy policy just months later.

Though congressional Democrats have introduced modest proposals to curtail GHG emissions, they have not made any major push for climate legislation since the failed American Clean Energy and Security Act of 2009 (the Waxman-Markey bill). And even that bill would not have reduced emissions fast enough, relative to what the climate crisis demands.

Among the more meaningful climate bills introduced by Democrats in recent years is the 100 by '50 Act, which includes provisions to "achieve 100 per cent clean and renewable energy by 2050". But, again, this falls far short of

what is needed to limit global warming to 1.5ºC above pre-industrial levels, the threshold beyond which the Intergovernmental Panel on Climate Change forecasts devastating consequences.

Fortunately, a growing chorus of Democrats has begun to demand genuine action that would start to make up for decades of climate-change denialism lite. They understand that without significant, comprehensive action by the US, the climate cannot possibly be stabilised at a level that is still conducive to human flourishing.

Rather than talking about what people must give up to reduce emissions, the climate realists are trying to sell voters on a new vision of the economy, one that offers long-term economic security and environmental stability. The GND resolution introduced earlier this year has rapidly shifted the window of discourse, such that once-radical proposals are now garnering public support and being debated seriously.

Though the details of the GND still need to be fleshed out, Democratic presidential contenders such as Washington Governor Jay Inslee are already offering concrete proposals in accordance with its prescriptions. The GND could be the "north star" of the country's decarbonisation path. But much will depend on Democratic congressional leaders such as Speaker of the House Nancy Pelosi, who has scoffed at ambitious climate proposals as a "green dream." Either that changes, or we will all find ourselves in an environmental nightmare.

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Europe’s tough emissions rules come with $39bn threat

Time is running out for car makers in Europe. Just six months out from stiff new emissions rules, the industry is facing up to an estimated €34bn ($39bn) in penal- ties as well as eroding profits from selling more electric cars. Starting in 2020, car fleets in Europe will need to meet more stringent regulations on how much carbon dioxide they’re allowed to release. The industry is ill prepared for the looming change, and the huge fines pending for subverting the new rules could prompt some brands to abandon the European market and test the mettle of those that remain. The threat is part of a broader pileup: vehicle sales are falling in key markets around the world, and the US is exchang- ing blows on trade with China and the European Union, threatening to raise costs and rattle the global economy. Worse yet, automakers have been unable to pry buyers from the highest-emission cars, such as the Mercedes-AMG GLE 63 S sport utility vehicle that spouts more

than three times the car maker’s targeted CO2 fleet level from 2020. “In an industry that is already suff ering from global trade issues, from Brexit, from peaking sales, that’s a very, very danger- ous cocktail,” Evercore IS auto analyst Arndt Ellinghorst said on a call earlier this month regarding the EU emissions issue.

Fines could mount to €34bn through 2021, according to research firm Jato Dynamics, whose projection tracks with other indus- try estimates. While the new regulations are expected to be painful for the industry to adjust to, past precedent suggests the EU is unlikely to allow Europe-based carmakers to be driven to ruin. Volkswagen AG, the world’s biggest car- maker, faces the largest penalty at about €9bn based on 2018 reported emissions, followed by Peugeot maker PSA Group and Fiat Chrysler Automobiles NV — the company with the single largest gap between actual performance and the new targets. BMW AGand Daimler AG could see earnings drop sharply due to their heavy reliance on high-emission SUVs. Toyota Motor Corp, maker of the Prius and several other hybrids, was the only automaker to see its emissions fall last year in Europe, according to Jato. While its calculation doesn’t take into account a blitz of upcoming electric models like Volkswa- gen’s ID.3 hatchback and Porsche Taycan, European Environment Agency data show emissions rising — not falling — for the past two years to a four-year high in 2018. Fumes are emitted from the exhaust pipe of an Audi in London. A Volkswagen spokesman reiterated recent comments by off icials including chief executive of- ficer Herbert Diess that it’s the company’s goal to meet European emission limits. A spokesman for BMW said paying fines wasn’t a strategic option, and the company on Tuesday brought forward its planned rollout of electric cars by two years. Daim- ler said its plan to reach the targets also depended on customer decisions. “It’s not quite an existential problem yet, but there are going to be questions of how do you explain to shareholders that I’m losing so much money, and it’s going to create immense pressure,” Michael Schweikl,

managing consultant responsi- ble for automotive at PA Consulting Group, said in an interview. Starting January 1, all but 5% of the EU's car fleet can emit no more than 95 grams of carbon dioxide per kilometre driven. One year later, no new vehicle can exceed that level.

Fines of 95 euros per gram for each car over the target will add up quickly, driving automakers to speed up the electrification of their lineups by of- fering more gasoline-electric hybrids and cars fully powered by batteries. "I have never seen such a material event risk in my career," Evercore's Ellinghorst warned in a research note to clients last month under the subject line "The 2020 CO2 cliff ." Automakers aren't panicking — yet. PSA expects to be compliant from day one and won't pay any fines, a spokesman said. However, in 2018, sales of EVs and hybrid vehicles accounted for less than 1% of PSA's registered sales. The quandary on CO2 doesn't end there, because in addition to being less popular, low-emission cars are much less profitable than the rest of automakers' fleets. At Volkswagen, less than 1% of sales were plug-ins or battery cars last year, and about 6% at BMW. An analysis by UBS last year estimated Ebit margins on Tesla Inc's Model 3 sedan were, at best, half those of BMW's gasoline-powered 330i model.

The push for electrification in Europe means selling mass-market vehicles there will be unprofitable "for a decade or two," John Murphy, an auto analyst for Bank of America Merrill Lynch, said during a presentation this month in Detroit. The 2020 limits were agreed to in 2014 after years of back-and-forth on balanc- ing a reduction in emissions while not costing carmakers too much. What no one foresaw was the extent of consumers' love aff air with gas-guzzling SUVs and Volkswa-gen's diesel-emissions cheating scandal that surfaced the following year. Diesels, which emit about a fifth less CO2 than equivalent gasoline cars, were a key plank in carmakers meeting the tighter regulation. But some European cities have

started to ban diesels, leaving the cars to languish on dealer lots. “The top automakers will face trouble as none of them are currently on track to meet the target,” Jato Dynamics said in an April blog post. “The incoming CO2 targets can be seen as the apocalypse of the car industry in Europe.” The new rules may prompt some brands without a strong presence in Europe to abandon the market altogether, said Ellinghorst, though he declined to specify which might do so. General Motors Co already eff ectively withdrew in 2017 when it sold the Opel brand to PSA. Companies without fully-electric vehicles in Europe such as Ford Motor Co and Japan’s Mazda Motor Corp face steep challenges. Honda Motor Co does too, but it plans to launch a small battery-electric model later this year. Ford said in a statement it expects to meet the 2020-2021 targets, but that its longer- term strategy in Europe through 2030 “assumes a strong uptake of electrified vehicles” by consumers. Representatives for Mazda had no immediate comment. If the industry fails to clear the new bar set by regulators, it won’t be the first time.

When many automakers missed the boat on the switch to new emissions testing in September, it was nearly enough to send Europe’s largest economy into recession. Employees work on BMW i3 electric cars on the assembly line at a factory in Leip- zig, Germany. Simply selling more small cars won’t help, as even the most fuel-eff icient gas-pow- ered vehicles also face tougher mandates. Carmakers aren’t likely to be able to pass along the added costs for equipping those cars with cleaner technology, Bernstein analyst Max Warburton wrote in a recent report. He said that may lead to “the death of the small car” in Europe. The regulations do allow for some creative ways to lower average fleet emissions and mitigate penalties, at least during a phase- in period. Cars that emit less than 50 grams CO2 per kilometre will count for two cars in 2020, and slightly less each year after. Fiat Chrysler has also made use of the op- tion to pool fleets of high-emission autos with low- or zero-polluting cars, pairing up with Tesla Inc in a

deal that likely will involve paying the US company several hundred million dollars. Mazda and Toyota are also forming a pool. “I think that 2020 is doable. The concern is about customer acceptance for new technology,” said Antonio Massacesi, head of fuel economy and greenhouse gas compliance for Fiat Chrysler’s European business. “That risk is one of the reasons why we decided to enter into a pool with Tesla.”

Large Exxon Shareholder Starts Divesting Over Climate Change

(Bloomberg) — One of Britain’s biggest fund managers started selling shares in Exxon Mobil Corp., saying America’s largest oil company isn’t doing enough to address climate change.

Legal & General Investment Management, which oversees about $1.3 trillion and is one of Exxon's top 20 shareholders, said some of its funds have already divested from the company and will ask its clients if it can withdraw more money.

The global oil industry has become increasingly unfashionable for investors as the transition away from fossil fuels raises doubts about its long-term future. Energy stocks currently make up 5% of the S&P 500 Index, down from 13% a decade ago.

The divestment affects a small portion of Exxon's equity — Legal & General owns about 0.6% of the company, and the divesting funds hold just a fraction of that — but it intensifies pressure on the Texas firm, once the world's largest public company. It will also be a fillip for campaigners who want investors to divest from the most polluting companies.

Divestment is a way to "hold Exxon accountable for something that's really material for their future," said Meryam Omi, head of sustainability at Legal & General Investment Management. "People in the street who have their own pension that's going to mature in 30 years time don't get a chance to talk to Exxon themselves."

Exxon is the only oil major Legal & General is divesting, as competitors including Chevron Corp. and Royal Dutch Shell Plc meet or exceed the insurer's basic standards on climate change action. It would also use its remaining shareholding in the company to vote next year against the reappointment of the chairman, a role currently held by Chief Executive Officer Darren Woods.

Exxon is the largest of 11 companies that Legal & General said it will exclude from its "Future World" funds because of climate change risk. Others include MetLife Inc., Subaru Corp., Hormel Foods Corp., Sysco Corp. and Rosneft PJSC. Two companies it withdrew capital from last year for the same

reason, Occidental Petroleum Corp. and Dominion Energy Inc., will be added back to the funds because they addressed concerns raised by the insurer.

While standards differ by sector, Legal & General said it expects oil and gas companies to set targets to cut pollution in their own operations as a bare minimum. It also wants the company to disclose the volume of greenhouse gas emissions its operations and customers are responsible for each year.

“We’re on track to meet greenhouse gas reduction measures we announced last year which are expected to help significantly to improve emissions performance,” Exxon spokesman Scott Silvestri said in an email. “They include a 15% decrease in methane emissions and a 25% reduction in flaring by 2020.”

Exxon already publishes an annual tally of emissions from its operations and is “providing solutions to consumers to help them reduce their emissions,” Silvestri wrote.

Legal & General declined to disclose the exact value of its divestment from the oil company. At the end of March, the stock made up 0.7% of one of the asset manager’s funds, according to its website. The overall value of that fund at the time was about 4.4 billion pounds ($5.5 billion), suggesting the Exxon stake was worth more than $350 million.

Several other companies are “on the cusp” of divestment when it comes to climate action, according to Sacha Sadan, the director of corporate governance at the insurer’s investment unit, without saying which ones. And even those that were named as particularly strong on sustainability compared to their peers, such as Equinor ASA and French bank BNP Paribas SA, will be expected to continuously move their businesses away from polluting activities or risk being divested.

“This engagement is not about picking up the laggards, it’s about pushing up the whole industry,” said Omi. “We need to keep the pressure on.”

Returns at Legal & General's Future World funds will suffer very little as a result of the divestments, Omi said. The difference between what the funds would return without divesting and what they will return otherwise, which she called a "tracking error," will be less than 0.3%.

The insurer is hoping to convince all clients to follow its advice around companies lagging in climate action, partly by demonstrating it doesn't sacrifice returns. That could lead to further capital outflows.

A campaigner at ShareAction, a London non-profit that helps investors engage with companies on climate change and other issues, said the move could also inspire other asset managers to reconsider their holdings.

"We expect this to signal to markets the huge risk of investment inaction on the climate emergency ahead of us," Jeanne Martin, senior campaigns officer at ShareAction, said.

Veering away from companies that are performing well is a major departure from its peers and Legal & General's own past. The insurer has held Exxon stock for about 20 years, and it's the asset manager's seventh-largest equity holding overall, worth about $2 billion at the end of March. Since the day it started its investment in Exxon, the shares have returned 200% in total, according to data compiled by Bloomberg.

(Updates with an estimate of divestment value in 11th paragraph.)

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