‘The madness has to end’: Long-time promoter of dialogue says ‘decent nations’ must ‘finally’ punish Israel for ‘indefensible outrage’ in Doha

Israel’s strike on a residential building In Doha on Tuesday was a “cowardly, treacherous act of war” that “cries out” for stronger efforts to end the war, a prominent Lebanese expatriate said in a statement after explosions rocked the Qatari capital.

“This is an indefensible outrage, an unprovoked attack on a

country that has done nothing but try to reduce tensions and help the region regain some semblance of stability," said Roudi Baroudi, a high-profile executive, author, and energy expert who has spent years advocating for dialogue, diplomacy, and peaceful development across the Mena region.

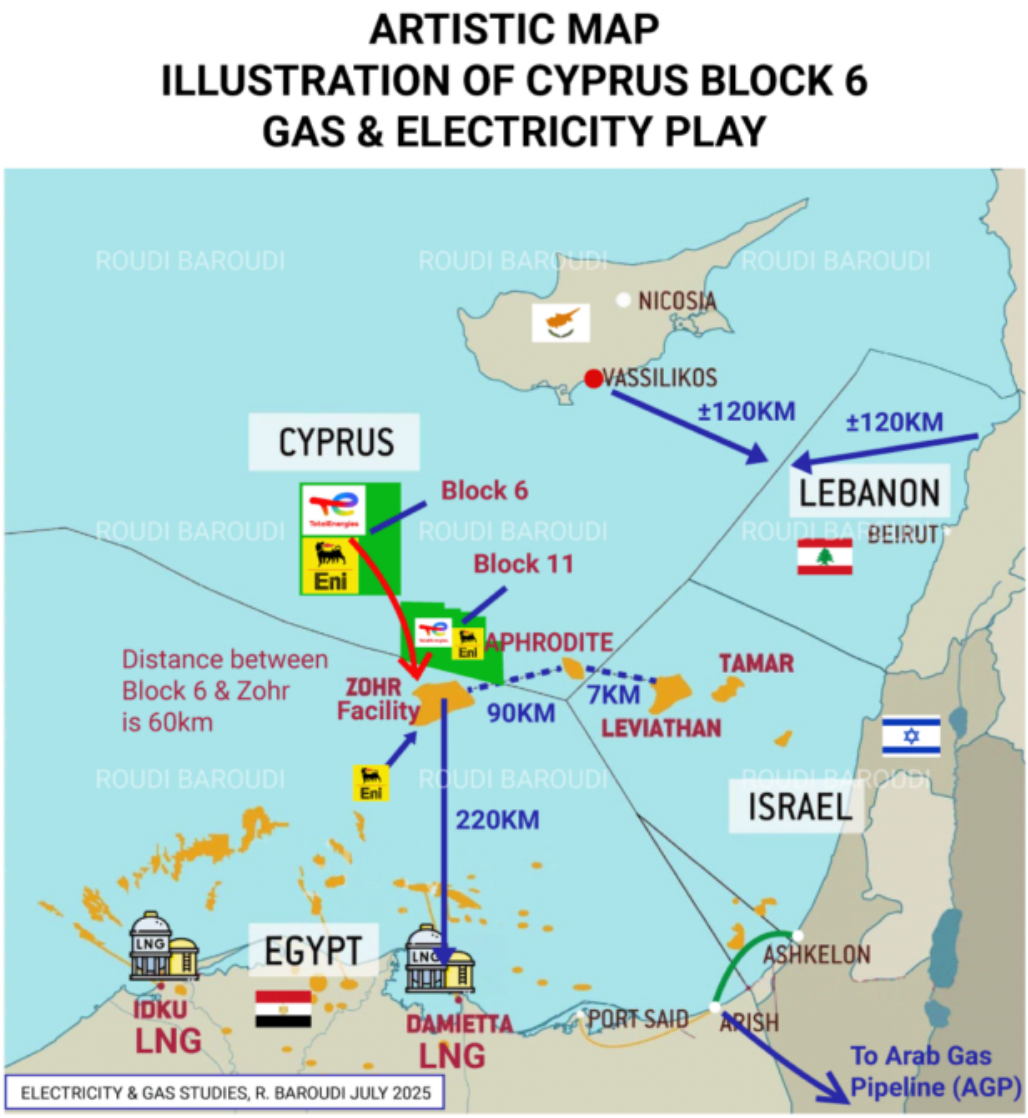
"This country and its government have done everything possible to help end Israel's continuing wars, mediating ceasefire talks since the beginning of the conflict in Gaza, also helping to end the brief but exceedingly dangerous clash between Israel and Iran, and using its good offices to reduce tensions on several other fronts as well. Qatar's leaders and diplomats have worked tirelessly, arranging several possible off-ramps that would not only have helped to spare the Palestinian and other peoples, but also to give Israel a way out of the corner its prime minister has painted it into. The Israelis should be thanking Qatar for having played such a diplomatic constructive and selfless role," he added.

> "Instead, today, the Netanyahu government has carried out a cowardly, treacherous attack that cries out for the international community to finally step in and apply all the pressure at its disposal. History will not look kindly on a government that clearly seeks to prolong the war – and the suffering of the Palestinians and others – for no other reason than to keep itself in power . Those who fail to stand for the defenseless civilians who continue to die under Israeli bombardment and blockade will not escape the same historical judgment."

"The madness has to end, and for that to happen, all states with any influence over Israel have to use it," Baroudi stated. "It must be made unequivocally clear that no state can conduct itself in this manner without inviting a swift and

painful response from the decent nations of this Earth: stop arming it, stop protecting it, stop funding it, stop trading with it – stop everything unless and until it starts behaving itself.” We need peace for all.

بارودي: استجرار الكهرباء والغاز من قبرص ينوع مصادر الطاقة ويحميها من أي تداعيات جيوسياسية



تبدو العلاقات اللبنانية القبرصية في حال تطور سريع وقد فتح هذا الباب رئيس الجمهورية العماد جوزاف عون فلاقى استجابة ورغبة عارمة لدى نظيره القبرصي كريستو دوليديس تجاه تطوير العلاقة بين البلدين الجارين وما لفت أن الرئيس القبرصي هو الذي بادر وطرح على الرئيس عون استجرار الكهرباء من قبرص إلى لبنان وقد تلقف رئيس الجمهورية اللبنانية هذه المبادرة وطلب من وزير الطاقة جو صدي متابعة الموضوع.

وفي هذا السياق أثنى خبير الطاقة الدولي رودي بارودي على مبادرة الرئيس القبرصي واللبناني، مؤكّدًا وجوب الترحيب بأي خطوة من هذا النوع باعتبارها نقطة انطلاق مهمة لتأمين الكهرباء للبنانيين وحل أزمة القطاع المستفحلة جزئياً منذ عقود وأن هذه الخطوة تأتي بعد الإعلان عن استئناف مفاوضات ترسيم الحدود البحرية بين البلدين.
كما أثنى بارودي على الدور الذي يلعبه الرئيس عون في ملف الطاقة

ككل واعتباره أولوية لما فيه من فائدة على الاقتصاد وتعزيز القدرات الاجتماعية للمواطنين اللبنانيين.

ولفت بارودي إلى أن هذه الخطوة ستتيح تزويد لبنان ما بين 150 و300 ميغاواط وفق مراحل متعددة ولا سيما بعد عام أو عامين على الأكثر عندما تبدأ قبرص بإنتاج الكهرباء من الغاز المستخرج من حقولها البحرية خاصة حقل كرونوس الذي يديره كل من شركتي ENI & TOTAL ENERGIES ما يعزز تنويع مصادر الطاقة وبأسعار مقبولة لا سيما وأن الحقل المعني في قبرص لا يبعد عن حقل زهر المصري سوى ٦٠ كلم ما يعني أن كلفة الإستخراج ستكون مماثلة لتلك المعتمدة في الحقل المصري وهي كلفة رخيصة نوعا ما.

ولفت بارودي إلى وجود محطتين رئيسيتين لإنتاج الكهرباء في قبرص، إحداهما بين لارنكا وليماسول، والأخرى في Vassiliko بين ليماسول وبافوس، بقدرة إجمالية تقارب 1600 ميغاواط من دون الكهرباء المنتجة من الطاقة الشمسية وبالتالي يمكن للبنان الاستفادة من هذه الطاقة بكلفة يتم التوافق عليها موضحا أن الكلفة ستكون اقل بكثير من كلفة الكهرباء المنتجة في لبنان عندما تبدأ قبرص العام المقبل باستخدام الغاز المستخرج من حقولها البحرية لإنتاج الكهرباء ولاسيما البلوك رقم 6.

بارودي طالب الحكومة اللبنانية بالإسراع بوضع الأطر الإصلاحية والتنظيمية للقطاع بشأن استجرار الكهرباء من قبرص وبإعداد دراسة جدوى اقتصادية تأخذ في الاعتبار كلفة الاستجرار ولفت أن محطة Vassiliko هي المحطة التي تصدر الغاز في 2026، على أن يواصل لبنان مساعيه لربط شبكته بالشبكة السورية للحصول على دعم إضافي كهربائي عن طريق محطة دير نبوح، بما في ذلك محطة الكسارة في منطقة البقاع.

Israel-Iran war needs to stop

before we all get burned

The long-feared war between Israel and Iran is now fully under way, and the repercussions threaten to include significant disruptions – not just for the two belligerents, but also for economies, peoples, and governments around the world.

To understand how and why an armed conflict between two

regional powers could have such a widespread impact, start by considering the following:

1. Iran’s reserves of crude oil and natural gas are, respectively, the second- and third-largest in the world;

2. While Israel has posited Iran’s alleged nuclear activities as its reason for going to war, its strikes have also focused on Iran’s oil and gas infrastructure;

3. At the time of this writing, five of Iran’s nine major oil refineries had been hit and knocked out of service, along with storage depots and other facilities;

4. Israeli forces also started a huge fire at the South Pars gas field, which Iran shares with Qatar – and which holds almost as much gas as all of the other known gas fields on Earth.

5. For good measure, Iranian strikes against the Israeli refinery complex at Haifa have led to the shutdown of several offshore platforms, further crimping regional hydrocarbon output;

Now consider that it gets worse. The destruction or shutdown of Iran’s ability to extract, process, distribute, and export hydrocarbons would cause tremendous problems at home, and put upward pressure on prices everywhere, although the global impact would likely be manageable. The situation would be far more disruptive if Israeli attacks hit Bandar Abbas area. That could cause prices for gas – and other forms of energy – to soar on world markets.

And yet even this is not the greatest peril threatened by this war. That desultory honour goes to the possibility that traffic could be disrupted in the Strait of Hormuz, the relatively narrow channel that connects the Gulf to the open ocean. The passage is only 40 kilometres at its narrowest spot, wending for over 150 kilometres between Oman and the

United Arab Emirates, to the west and south, and Iran's Hormozgan Province to the east and north. Hormozgan is also home to the famous port city of Bandar Abbas, which hosts a giant oil and petrochemical complex that has already been struck at least once by Israeli forces.

What really matters for our purposes is that Hormuz also connects several other of the world's most prolific oil and LNG producers – including Iraq, Kuwait, Qatar, and Saudi Arabia – to their overseas clients. As a result, every day, about a quarter of the world's crude oil and LNG requirements exit the Gulf through Hormuz, making it the most strategically important chokepoint of our times. If this flow were halted or even significantly slowed, the consequences could be disastrous for much of the world. Although most of these exports are typically bound for markets in Asia, even a brief reduction in available oil and gas could send crude prices, currently a little more than $70 a barrel, shooting past $100 or even $120 in short order.

If such a supply crisis lasted any length of time, the global economy would enter uncharted territory. Not only would sky-high energy prices cause inflation to rise across the board, but fuel shortages could also be expected to cripple businesses of every size and sort. Transport and manufacturing, food processing and medical research, power generation, household heating and cooling, even the Internet itself: everything that depends on energy could slow to a trickle. A global recession would almost certainly ensue, and given the current trade environment, that might lead to another Great Depression.

So what might cause such an interruption? There are several possibilities, including the accidental sinking or crippling of a supertanker or two in just the right (i.e., wrong) place(s). Even if one or more accidents did not make Hormuz physically impassable, they could make insurance rates prohibitively expensive, causing many would-be off-loaders to

decide against hazarding their ships amid the crossfire. Alternatively, Iran could decide to close the strait in order to punish the "international community" in general, for not doing enough to rein in the Israelis.

Whatever the rationale, the potential for global economic ruin – not to mention the ecological and public health risks posed by leaks of oil, nuclear materials, and/or other toxins into the environment – is simply not a risk that most intelligent people want to run. It therefore behooves those with the power to change the situation to do everything they can to end the conflict before its costs become more than a fragile world economy can bear.

Another is how to get Iran to behave itself, and that, too, shapes up as a difficult task. The Islamic Republic has spent most of the past half-century seeking to undermine US and Israeli influence over the region, and its substantial investments in proxy militias abroad and its own military at home may be skewing high-level decision-making. As the saying goes, when all you have is hammer, everything starts to look like a nail.

Despite these obstacles, it remains a fact that war is almost never preferable to negotiation. Iran and Israel agree on very little, their objectives are often in direct opposition to one another, and each views the other as a murderous and illegitimate state. Nonetheless, whether they realise it or not, both sides have a vested interest in ending the current conflict. Given the massive disparities in their respective strengths and weaknesses, this conflict could turn into a long-term bloodletting in which the value of anything achieved will be far outstripped by the cost in blood and treasure.

But who will get the two sides to so much as consider diplomacy when both of them are increasingly committed to confrontation? Although several world leaders have offered to act as mediators, the belligerents don't trust very many of

the same people. To my mind, this opens a door for Qatar, which has worked assiduously to maintain relations with all parties – and which already has a highly impressive record as a peacemaker – to step up in some capacity.

Whether it provides a venue for direct talks, a diplomatic backchannel for exchanging messages, or some other method, Doha has proved before that it can be a stable platform and a powerful advocate for peaceful negotiations. Let us hope it can do so again.

- *Roudi Baroudi is a four-decade veteran of the oil and gas industry who currently serves as CEO of Energy and Environment Holding, an independent consultancy based in Doha.*

The true cost of ocean plastic pollution

The problem of maritime plastic-waste pollution first became apparent in the 1970s. In the half-century since then, the problem has become ever more widespread, as scientific expeditions conducted by the Tara Ocean Foundation (of which I am executive director) have shown. Large pieces of debris, such as fishing nets, and their disastrous effects on marine life, are the most visible symptom. Such waste is estimated to kill more than one million seabirds and over 100,000 marine mammals annually, often through entanglement or suffocation, and promotes transport of invasive species, triggering a cascading effect on the ecosystems in which they play a central role.

Less visible, but more pervasive, are microplastics, which have been found in the deepest ocean trenches and all types of marine life. Microplastics can, among other things, modify bacterial and viral communities and disperse chemical toxins in food chains (often after being ingested by marine organisms). Some of these toxins, such as phthalates, are

associated with the chemistry of plastics, while others, such as pesticides and heavy metals, are absorbed by the plastic before it reaches the ocean and enters the food chain.

How these toxic substances interact with plastics has been the subject of much study. Plastic is comprised of monomers that have been chemically bonded to form long chains of polymers – ethylene, styrene, and propylene become polyethylene, polystyrene, and polypropylene. But the process of polymerisation is often imperfect, and some of the unpolymerised monomers that remain in plastic, like different types of styrene and bisphenol, pose major environmental and health risks.

Moreover, other chemical additives, including plasticisers, fillers, colorants, flame retardants, and antioxidants, are incorporated into polymer formulations to modify their properties. And non-intentionally added substances (NIAS) – impurities, raw materials used in manufacturing, byproducts, and degradation products – bind to finished plastics. In most cases, because free monomers, additives, and NIAS are simply trapped within the tangle of polymer chains, rather than being chemically bound to them, they are more likely to leach out during the production, use, and disposal of plastic, migrating into liquids, gases, and solids. Some 16,000 such molecules have been identified, but their effects are still not fully known, nor is their toxicity, which can change depending on how they are combined. What we do know is that one-quarter of these 16,000 molecules are pose a hazard to human health or the environment by disrupting biochemical processes in living organisms.

Halting the flow of microplastics and toxic pollutants into the world’s bodies of water is a Sisyphean task. Nevertheless, scientists are trying to stem the problem. For example, the Tara Europa expedition, in coordination with the European Molecular Biology Laboratory and more than 70 scientific institutions across the continent, has spent the past two

years investigating how these hazardous substances make their way into the seas and oceans bordering Europe. The mission plans to share its findings soon.

But the generation of toxic waste and debris is not the only way that plastic can harm ocean health. The plastics industry has been a major driver of climate change, accounting for an estimated 3.4% of global greenhouse-gas (GHG) emissions. Plastic production is on track to contribute 15% of GHG emissions by 2050, exacerbating global warming and thereby increasing the threats to marine life, which is sensitive to rising water temperatures.

Because plastic degrades the entire biosphere, not just the ocean, it is not a waste problem that can be solved by a few sustainability-minded citizens' recycling efforts. This is a systemic crisis that requires an economy-wide solution. A better approach is to understand plastic as one of the "new entities" that must not leak into the environment, a view initially formulated by the Stockholm Resilience Centre in its work on planetary boundaries and later endorsed by the United Nations. While acknowledging the impossibility of defining a precise threshold for harm, such an approach highlights the need for a drastic reduction in plastic use.

Research suggests that it would be economically feasible to halve global plastic production at a cost which would almost surely be less than the cost of inaction. But, according to a recent study by researchers at the University of California, Berkeley, even this reduction would not be enough to limit global warming to 1.5° Celsius above preindustrial levels, the target set by the Paris climate agreement. Instead, they found that meeting this goal would require a 75% reduction in plastic production compared to 2015.

‘THE POSSIBILITIES ARE ENDLESS’: ENERGY EXPERT LAUNCHES NEW BOOK ON RESOLVING MARITIME BOUNDARIES

ZOUK MOSBEH, 23-04-2025: Energy expert Roudi Baroudi signed copies of his latest book during a launch event at Notre Dame University – Louaize on Wednesday.

The book, “Settling Maritime Boundaries in the Eastern Mediterranean: Who Will Be Next?”, is part of Baroudi’s years-long effort to promote regional energy cooperation. In it, the author makes the case that if East Med countries are serious about exploiting their offshore hydrocarbons, they need to settle their maritime borders in order to attract the major energy companies whose technical and financial muscle are virtual prerequisites for undersea oil and gas activities.

Co-hosted by the Office of NDU Publications (which published the book) and the university's Office of Research and Graduate Studies, the signing event took place at NDU's Pierre Abou Khater Auditorium. All proceeds from sales of the book will go toward Student Financial Aid at NDU.

Inspired by the landmark US-brokered October 2022 agreement that saw Lebanon settle most of its maritime boundary with old foe Israel, the new tome stresses the need to define other East Med borders as well, including those between Lebanon and Cyprus, Lebanon and Syria, Syria and Cyprus, Cyprus and Turkey, and Turkey and Greece.

Publication was delayed by the outbreak of the Gaza war in October 2023, but the author says that conflict – which also led to massive destruction and loss of life in Lebanon – only underlines the need for regional players to find a new modus vivendi.

“We can’t keep doing the same things over and over again, and then expecting a different outcome,” Baroudi said during the NDU event. “For the first time in many years, all of Lebanon’s branches of government – Parliament, Cabinet, and Presidency – are fully functional. We have to start thinking of ways to reduce the scope for friction, to open the way for foreign investment, and hopefully start producing offshore gas.”

“Almost all of Lebanon’s energy needs are met by imported hydrocarbons; imagine if we discover enough gas to provide 24/7 electricity to all Lebanese,” he added. “And what if we had enough to start exporting it, too? Lebanon’s coast is less than 100 kilometers from Cypriot waters: this means that once the island and its partners have built a pipeline and/or a liquified natural gas plant, Lebanese gas could flow straight into the entire European Union, one of the world’s largest energy markets. The possibilities are endless. And now imagine all of the countries of the region having similar prospects – just because they finally got around to figuring out where their national waters begin and end.”

In addition to the manifold benefits of energy security and lucrative export revenues to fund domestic investment in things like education, healthcare, fighting poverty, and transport, Baroudi said the exercise of negotiating sea

borders could help build trust and good will.

“There isn’t enough of those commodities in the East Med region, and often for good reason,” he explained. “But we have to start somewhere, and maritime boundaries are a great place to do that because they open the way for investment and various forms of cooperation, direct or indirect, including fisheries monitoring and regulation, marine protected areas, tourism, weather forecasting, search and rescue, etc.”

With more than 47 years of experience, Baroudi has worked in multiple fields, from electricity, oil and gas, and petrochemicals to pipelines, renewables, and carbon pricing mechanisms. He also has led policy and program development with, among others, the World Bank, the US Agency for International Development, the International Monetary Fund, and the European Commission. The author of several books — including “Climate and Energy in the Mediterranean: What the Blue Economy Means for a Greener Future” (2022) — as well as numerous studies and countless articles, his expertise has made him a highly sought-after speaker at regional energy and economic conferences. Currently serving as CEO of Energy and Environment Holding, an independent consultancy based in Doha, he is also a Senior Fellow of the Transatlantic Leadership Network, a Washington think-tank. In 2023, he received the TLN’s Leadership Award in recognition of his efforts to promote peace.

Climate displacement is also a health crisis

By disrupting care services, climate displacement deprives affected communities of access to doctors, hospitals, and pharmacies.

Every year, 21.5mn people are forcibly displaced by floods, droughts, wildfires, and storms. This number is set to rise dramatically over the coming decades, with up to 1.2bn people expected to be driven from their homes by 2050. The unfolding climate crisis is not just a humanitarian disaster but also a global health emergency.

Climate displacement poses both direct and indirect threats to public health. By disrupting care services, it deprives affected communities of access to doctors, hospitals, and pharmacies. Climate-induced migration also exacerbates poverty, overcrowding, and social instability. Food production is often severely affected, while unsanitary living conditions fuel the spread of infectious diseases.

As the climate crisis threatens to derail global efforts to achieve the UN Sustainable Development Goals, the health and well-being of hundreds of millions of people across the developing world are at risk. High-income countries are not

immune: in the US, 3.2mn adults were displaced or evacuated due to natural disasters in 2022 alone.

Pharmaceutical companies must play a pivotal role in bolstering global health resilience. Their involvement is particularly critical in conflict zones at the forefront of the climate-displacement crisis, where life-saving medicines and vaccines are often in short supply.

While the pharmaceutical industry has made strides in reducing carbon dioxide emissions and adopting more sustainable practices, its efforts fall far short of mitigating climate-related disruptions to supply chains.

Some pharmaceutical companies, such as Novartis and Novo Nordisk, have launched targeted programmes to aid populations displaced by extreme weather events, while others have donated cash or supplies in response to natural disasters. The demand for these donations has risen with increasing climate and humanitarian needs. Hikma, a generic medicine manufacturer founded in Jordan, reported $4mn in donations in 2020, and $4.9mn in 2023, mostly serving the needs in the surrounding region.

No company has developed a comprehensive strategy to ensure that displaced communities have sustained access to health products. A more holistic approach is needed. Amid the ongoing climate-displacement crisis, pharmaceutical companies should adopt a four-pronged strategy to strengthen healthcare systems. For starters, they could help deliver medicines to vulnerable communities in remote areas by revamping their supply-chains, from building redundancy into shipping networks to redesigning products to be more stable in hot climates where refrigeration may be unavailable.

Second, pharmaceutical companies must invest in research and development to create vaccines, diagnostics, and therapeutics targeting climate-sensitive diseases. Rising global temperatures are accelerating the spread of mosquito-borne illnesses such as dengue, malaria, and Zika, as well as waterborne diseases like cholera and shigella, putting displaced populations at even greater risk.

Third, pharmaceutical companies should forge long-term partnerships with humanitarian organisations focused on climate displacement. Public-private collaborations have also proven effective in strengthening health resilience. Since 2010, for example, leading vaccine manufacturers like GSK and Pfizer have supplied Gavi, the Vaccine Alliance, with billions of vaccine doses, protecting vulnerable populations in some of the world's most resource-constrained countries.

Lastly, pharmaceutical companies must boost efforts to cut greenhouse-gas emissions across their value chains. While the climate impact of pharmaceuticals may get less attention than that of traditional manufacturing industries, the sector emits more CO2 per $1mn of revenue than the automotive industry.

The active support and engagement of shareholders, employees, and other stakeholders is crucial. Investors, in particular, must encourage companies to align their business practices with global health and climate goals.

Climate displacement is not a distant or hypothetical threat; it is a rapidly escalating health emergency. The pharmaceutical industry has a moral responsibility to act. To do so effectively, companies must get ahead of the curve and provide vital, life-saving treatments to those on the front lines of the climate crisis.

Clean energy progress hinges on policy, science and action

It is tough to be optimistic about the climate these days. While the costs of extreme weather events like the Los Angeles wildfires pile up, the US federal policy pendulum is swinging away from facts, reason, and basic human decency. Nonetheless, even as the US government moves in the wrong direction, trends in science, economics, and increasingly local politics indicate that the pendulum will swing back in due course.

After all, no-one can argue with the physics of today's clean energy technologies. Heat pumps, induction stoves, and electric vehicles (EVs) – to name just three – are fundamentally better technologies than what came before. The best gas furnaces might reach 95% efficiency, meaning they are converting 95% of the energy they use into heat; but most heat pumps easily top 200%, with some reaching 400% or more. Similar comparisons can be made between induction and gas stoves, and between EVs and gasoline- or diesel-powered vehicles. By and large, we know what technologies we should be using to eliminate greenhouse-gas emissions; and in cases where we don't, we know what kinds of things to try.

This knowledge extends well beyond EVs and heat pumps to

entire industrial sectors like cement or iron and steel. Here, outgoing US President Joe Biden's administration has made an important contribution with the Department of Energy's Liftoff Reports, which chart pathways to commercialisation for a broad selection of low-carbon technologies.

Consider cement, which accounts for some 8% of annual global greenhouse-gas emissions. Ordinary Portland cement, patented 200 years ago, has dominated the sector for decades. While measures like clinker substitution and efficiency improvements can abate up to 40% of emissions, getting to zero will require additional steps. These generally fall into two categories: cutting emissions from producing Portland cement or switching away from it altogether. Promising US start-ups like Brimstone and Sublime Systems are racing to demonstrate that either path is commercially viable.

One key ingredient is public subsidies to help firms climb the learning curve and slide down the cost curve toward faster commercialisation. Both Brimstone and Sublime Systems received early research and development funding from the US Advanced Research Projects Agency-Energy (ARPA-E) and have now advanced to the deployment stage, receiving up to $190mn and $90mn, respectively, to build their first commercial plants. All told, the Bipartisan Infrastructure Law and the Inflation Reduction Act allocated around $100bn for such purposes, with public funding contingent on matching private investments.

Moreover, these sums are dwarfed by the Department of Energy's loan programme. With just $17bn in taxpayer funds, the IRA authorises the department's Loan Programs Office to lend $350bn for investments in clean energy and domestic EV manufacturing. And those public funds then catalyse multiples more in private investments. While some Republicans and members of Donald Trump's incoming administration want to cut this programme, doing so would only hurt US competitiveness.

Can we restore sanity to our national policies? It might be trite to say that change begins at home, but what is trite is often true. A good place to look is New York. While the city has many problems, its climate policies are not among them.

Around 70% of New York's direct emissions come from heating and cooling buildings, while the other 30% comes from cars and trucks. Fortunately, Local Law 97 is already addressing the former. The law is one of the most ambitious decarbonisation measures for buildings anywhere, requiring most to reduce their emissions by 40% this decade, and by 100% by 2050. And while New York can do only so much about vehicle emissions, its long-delayed congestion pricing programme is finally being implemented. That is a good start.

Given that New York used to be the world's most congested city, the quality-of-life improvement from less traffic can already be felt. The same goes for another measure that took an absurdly long time to address: the lack of trash bins. Over the past year, the city has finally issued official trash, recycling, and compost bins, with enforcement for residential buildings beginning this month. Cleaning up our own act – including with mandatory composting and other policies – will not save the planet. But effective government just might.

Physics alone will not push the pendulum all the way back to where it was before. That will require policies based on sound economics. As long as Trump does not break the fulcrum and bring the entire pendulum crashing down, policies pioneered by his predecessor and by local communities will continue to be a force applying pressure in the right direction. – Project Syndicate

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Climate change forged a new reality in 2024: 'This is

life now’

Intolerable heat. Unsurvivable storms. Inescapable floods.

In 2024, billions of people across the world faced climatic conditions that broke record after record: logging ever more highs for heat, floods, storms, fire and drought.

As the year drew to a close, the conclusion was both blatant and bleak: 2024 was the hottest year since records began, according to European climate scientists.

But it may not hold this dubious honor for long.

“This is life now and it’s not going to get easier. It’s only going to get harder. That’s what climate change means,” said Andrew Pershing, chief programs officer at Climate Central, a US-based non-profit climate advocacy group.

“Because we continue to pollute the atmosphere, we’re going to get, year after year, warmer and warmer oceans, warmer and warmer lands, bigger and badder storms.”

Others use still bolder language.

“We are on the brink of an irreversible climate disaster,” said the 2024 State of the Climate report.

Here’s how that looked this year, what 2025 holds, and why there are still reasons to be hopeful.

SOS

This was the first year when the planet was more than 1.5 degrees Celsius hotter than it was in the 1850-1900 pre-industrial period, a time when humans did not burn fossil fuels on a mass scale, according to the European Union’s Copernicus Climate Change Service.

The sheer number of days of extreme heat endured by billions of people – from the desert town of Phoenix, Arizona to the desert town of Phalodi in India’s Rajasthan – was startling.

Sunday, July 21, was the hottest day ever.

Until Monday, July 22.

The day after dipped a smidgen cooler.

These consecutive records came during Earth’s hottest season on record – June to August – according to Climate Central.

Those three months exposed billions of people to extreme heat, heavy rain, deadly floods, storms and wildfires.

Friederike Otto of World Weather Attribution, a global team that examines the role of climate change in extreme weather, said heatwaves were a “game changer.”

The world has not caught up: many deaths go unrecorded while some African countries lack an official definition for a heatwave, meaning heat action plans don’t kick in, she said.

“There is a huge amount of awareness that needs to be had to even adapt to today’s heat extremes but, of course, we will see worse,” Otto told the Thomson Reuters Foundation.

Between June 16-24, more than 60 percent of the world's population suffered from climate change-driven extreme heat.

This included 619 million in India, where more than 40,000 people suffered heatstroke and 100+ died over the summer.

Birds fell from the sky as temperatures neared 50 C (122 F).

Millions were affected: from China to Nigeria, Bangladesh to Brazil, Ethiopia to Egypt, Americans and Europeans, too.

Climate Central said one in four people had no break from exceptional heat from June to August, the highs made at least three times more likely by climate change.

During those months, 180 cities in the Northern Hemisphere had at least one dangerous extreme heatwave — a phenomenon made 21 times more likely by human action, Climate Central said.

TOO HOT TO WORK

"The number of days where you are starting to push the physiological limits of human survival (are rising)," said Pershing, citing Pakistan and the Arabian Gulf as two areas that neared breaking point this year.

Hundreds died during the Hajj pilgrimage to Makkah as Saudi Arabia topped 50 C (122 F).

In the US Midwest and Northeast, Americans broiled under a heat dome when high pressure trapped hot air overhead.

NASA's Earth Observatory said extreme heat was often exacerbated by hot nights, a dearth of green space or air con, or a surfeit of concrete, which absorbs heat.

Heat and drought fueled wildfires this year, with blazes in the Mediterranean, United States and Latin America. Fires burned from the Siberian Arctic to Brazil's Pantanal wetlands.

"(The Pantanal) is a wet area that is not supposed to burn for

months on end so that is probably something I would look out for next year where we see wildfires in ecosystems that are not traditionally burning ecosystems," said Otto.

THE MOST VULNERABLE

The "new normal" hits the vulnerable hardest.

"The people who are succumbing to heat-related deaths are not the millionaires and billionaires," said Pershing.

"If you are a reasonably well-to-do person you can afford air conditioning, you have a vehicle that can get you where you need to go, you have ways to keep yourself cool. If you don't have access to these things or you lose them because of a power outage or another storm, that creates these additional vulnerabilities."

In Africa, nearly 93 percent of the workforce faces extreme heat.

On the Arabian Peninsula, it is more than 83 percent of workers.

European and Central Asian workers could be next in line.

For Otto, the answer to this fast-spreading risk lies in empathy, putting the poor and vulnerable – "the vast majority of the global population" – at the center of climate action.

"In Bangladesh, when you put the survival of the poorest in the center of the action, you actually have a society that is really well-equipped to deal with tropical cyclones," she said.

"People know what to do and there are drills and practices."

Silver linings, though, are rare.

"Empathy is in short supply," said Otto.

BOILING SEAS

Ocean temperatures also hit alarming levels in 2024, wreaking havoc on land and sea.

Hurricane Milton came barely two weeks after Hurricane Helene, with abnormally warm waters in the Gulf of Mexico turbo-charging the twin storms that lashed the US Southeast.

“In that some places in the Gulf of Mexico … temperatures were 400 times more likely because of climate change,” Pershing said.

Climate Central found a similar link between October’s floods in Spain and unusually warm waters in the Tropical Atlantic.

Human-driven climate change made these elevated sea surface temperatures up to 300 times more likely, Climate Central said.

“WE NEED DRILLS”

Otto said this year’s extremes, notably Europe’s floods, illustrated a “failure of imagination” and a refusal to adapt.

“We don’t just need the weather forecast or warnings. We need drills. We have to practice survival wherever heavy floods can happen and they can happen everywhere,” she said.

Infrastructure also failed.

“The way that we have canalized rivers and sealed all the surfaces … will mean disastrous damages every time there is a flood … There is always this short-termism that it’s expensive to fix it now but of course it will save lots of money and livelihoods later,” she said.

For Pershing, adaptation is “an exercise in imagination because we haven’t seen these kinds of events before … That is the challenge of climate change: we’re going to be confronted

year after year with conditions we've never experienced."

SO WHAT NEXT?

Nobody expects a quick end to extreme weather but Otto is hopeful that humans may change their polluting ways.

"That is a reason for optimism …clinging to fossil fuels (is) increasing inequality and destroying livelihoods but it increasingly makes less sense …for national economies."

In another upbeat note, Otto said better preparations in Europe meant fewer deaths in this year's floods than previously.

But ocean temperatures are a key concern for 2025.

"The amount of heat stored in the ocean … really has my attention because we are not quite sure if there is something different going on in the climate system," said Pershing.

Another risk – complacency.

"People do have a way of getting used to conditions and you can kinda get numb to it," Pershing said.

And complacency can breed paralysis.

"This was the hottest year, last year was the hottest year – probably next year will be the hottest year again," said Otto.

Brazil's Climate Push Must

Start at Home

As the current G20 president and host of next year’s United Nations Climate Change Conference, Brazil has sought to establish itself as a global climate leader. But to have the biggest impact, Luiz Inácio Lula da Silva’s government must lead by example, which means committing to ambitious emissions targets and energy policies.

AMSTERDAM – Ever since Brazilian President Luiz Inácio Lula da Silva returned to office in 2023 and told the world that Brazil is “back on the world stage,” the government has endeavored to establish itself as a global climate leader. As the current G20 president, Brazil is pushing for a sustainable bioeconomy and scaled-up climate finance – goals that it will surely continue to pursue as the host of next year’s United Nations Climate Change Conference (COP30). Moreover, the country recently formed a troika with the hosts of COP28 (the United Arab Emirates) and COP29 (Azerbaijan) to preserve the Paris climate agreement’s goal of limiting global warming to 1.5º Celsius.

The Brazilian government has not been afraid to challenge rich countries and individuals as part of its efforts to halt

the rise in global temperatures. But to have the biggest impact, Brazil must lead by example. As the saying goes, charity begins at home. The timing could not be better: countries must submit more ambitious 2035 emissions-reduction targets, known as nationally determined contributions (NDCs), by February 2025.

The need to cut greenhouse-gas (GHG) emissions has never been more urgent for Brazil, which was recently hit by record flooding and has been fighting devastating forest fires for weeks. To be sure, investing in adaptation and resilience requires increased financial flows from the wealthy countries responsible for the bulk of historic pollution to vulnerable countries suffering the worst effects of global warming. But reducing fossil-fuel emissions and extraction, which has harmed traditional and indigenous communities' health, destroyed their land, and diminished their capacity to provide for their families, is also a matter of economic and social development. Brazil must devise an energy policy that works for these communities.

The share of electricity generated from wind and solar power is expanding rapidly, and these renewable-energy sources are becoming cheaper by the day. Brazil has abundant sun and wind and the tools to operate these technologies successfully. But, equally important, local communities are already expanding clean-energy infrastructure and have created innovative and effective solutions to participate in the decarbonization decision-making process.

Various community-led and decentralized clean-energy projects, often developed in partnership with NGOs, are being launched across Brazil, from isolated villages in the Amazon to densely populated *favelas* (informal settlements) in Rio de Janeiro. At the same time, the country's indigenous peoples have developed robust consultation protocols for the design and implementation of public and private renewable-energy projects on their land.

Last year, COP28 closed with an agreement to “transition away from fossil fuels” – the first time such a call has been made at the climate summit – and to triple renewable energy and double energy efficiency by 2030. To honor that agreement, Lula’s government must challenge the false notion that fossil fuels are necessary for development and can complement efforts to scale up and provide equitable access to community-centered renewable energy.

To show the world that Brazil can lead the global renewable-energy transition by example, its updated NDC must commit to bold action, such as stopping new fossil-fuel projects and shutting down existing ones, and deploying the resources required to meet the global goal of tripling renewable-energy generation. Moreover, to advance the goal of energy justice, the government should implement policies aimed at ensuring that solar and wind power reaches vulnerable communities.

If the Brazilian government creates a national platform that provides operational support to these clean-energy solutions, the country can show the world that it is possible to decarbonize while putting people first. In fact, this is not only possible but essential.

A few years ago, the world came together to combat the COVID-19 pandemic. Governments quickly poured resources into vaccine development and production, successfully creating the tools to solve a novel problem in record time. In this case, the world has everything it needs to accelerate the energy transition and limit global warming; all that it is missing is the political will to commit to – and follow through on – ambitious targets and policies. Brazil can and should be one of the first countries to demonstrate it.

This is how we know when the world has its hottest day

On Sunday, the world had its hottest day on record. Just 24 hours later, that record was broken again, making Monday very likely the hottest day in thousands of years.

It may seem improbable for scientists to gauge the world's hottest day given that they don't have temperature monitors in every corner of the world and less than a century of relatively widespread observations. But they've developed a technique that's increasingly useful as the planet heats up.

This month's shocking heat findings, announced by the EU's Copernicus Climate Change Service, are based on "reanalysis," a technique that mixes temperature data and models to provide a global view of the climate. The center creates a nearly real-time picture of the Earth's climate, including temperature, wind and precipitation, for roughly every 30-square-kilometer chunk of the planet's surface.

This reanalysis goes back to 1940, and it allows researchers to say with confidence when a record is broken, whether for a day, month or year. Beyond the new daily heat record, the data also shows that 2023 was the hottest year ever recorded and that every calendar month for the past 13 months has been the hottest on record.

Though there aren't thermometers in every corner of the world, Copernicus receives a large amount of weather data that it uses to underpin its reanalysis.

"We have this constant flow of information coming into the center," says Carlo Buontempo, director of the Climate Change Service, which is part of the European Center for Medium-Range Weather Forecasts (ECMWF).

Scientists at the center receive 100 million readings per day about weather conditions from around the world. Observations come from airplanes, satellites, ships, radar and surface-level weather stations – all feeding real-time information about temperature, wind, rain and snow information, as well as other factors like air pollution. This information is fed into a model, known as ERA5, which is already equipped with historic information about the global climate.

There are gaps in these observations, because the data sources don't cover every part of the world. Weather conditions like cloudy skies may also reduce the amount of data coming from sources like satellites. To fill these gaps, the scientists take the predictions they have already made, based on the long-term ERA5 model, and test them against the observations. That means a forecast that predicts a particular temperature in a particular place will be tested against all the data researchers receive about the weather in that place and nearby, as well as broader forces like ocean currents and air circulation.

This is done repeatedly while assessing how compatible the

prediction is with what's actually been recorded. The model also accounts for any errors in the recorded data, and relies on the laws of physics, including the weather patterns, currents and airflow that govern how the global climate works.

In this way, it's possible to create a complete picture that is as accurate as possible. That's what allows scientists to confidently declare a record like when the world experiences the hottest day in human history.

Globally, five weather services – the U.S.'s National Oceanic and Atmospheric Administration and NASA, the ECMWF, the China Meteorological Administration and the Japan Meteorological Agency – carry out continuous appraisals of global temperature using this technique. While their models differ slightly, the five groups have come to similar conclusions about record heat in recent months and years.

Historical data is trickier to come by. The longest-running temperature series, the Central England Temperature in the U.K., started in the 17th century. Data from before humans were systematically monitoring temperatures comes from sources like bubbles of gas trapped in glacial ice, or tree rings. These sources aren't as specific as a thermometer reading, but it's possible to say with confidence that recent temperatures are likely the highest in around 100,000 years, Copernicus says.

Meteorologists also have a good idea when a particularly significant day, like the hottest day on record, is on its way. This is partly because global mean temperatures usually peak between early July and early August. Last year's hottest day – which was the previous record for the hottest ever – occurred in early July amid a historic oceanic heat wave. An intensifying El Nino – a natural global climate phenomenon that usually means hotter temperatures globally – provided yet another clue that record heat was brewing.

Until this July, it looked for a while like the world wouldn’t set a new daily record, says Buontempo.

“The global mean temperature for the oceans started rising again,” he says. “Some of the people who systematically monitor our predictions started to sound alarm bells.”

By the start of last week, they were paying extra attention to the reanalysis and getting ready to make an announcement.

This technique isn’t just useful for making “hottest day ever” announcements: It’s being used to train artificial intelligence forecasting models, especially for “ensemble” weather forecasts, which represent multiple possible future scenarios. It’s also used by solar energy companies to help homeowners work out how much energy their panels might generate, and by wind energy companies to plan where to put wind farms.

Copernicus is currently working on a new model, known as ERA6, which will be more precise – dividing the world into 14-km squares – and incorporate many more historic data sources, including early satellite readings from the 1970s.

For Buontempo, more important than any one day is the recent extraordinary streak of record-breaking months, given that’s a better indicator of how rapidly the world is warming. But pinpointing a specific day does make a changing climate feel much more immediate.

“I think we have to make it more tangible, more direct, more visible,” he says. “It is important that people are informed.”