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💎 by Mario Sechi

WERE EFFICIENT, FAST AND CLEANER

NOTHER PANDEMIC YEAR comes to an end. Some optimists wonder when it will ever end, others are steeped in pessimism, certain that there will never be a "the end" on the film we are experiencing. Your reporter simply thinks that the "new normal" started some time ago and that we must take note that the ship of history has changed its course. Where are we going? That is a good question, especially if we put it in the layout of a magazine about energy in its various (infinite) forms. One word: civilization. Illuminist objections are well taken; perhaps the word "progress" would be more suitable? No, because words are set in their historical context, and today's understanding of the word progress implies the idea of superseding some fundamental elements of our present that cannot be filed under the label of past. They will be part of our landscape for a long time to come; they are still a fact of the future.

How did we get here? An incessant process of change dictated by culture and technology. We cannot underestimate the immense strength of the economy, the engine of production, but the engine being a non-autonomous "machine," this factor comes a few seconds behind other dynamic forces. To be sure, we are rushing headlong toward the machine detaching from humankind and the birth of autonomous Artificial Intelligence, but that's another story. Experience always advises me to look at nuances and that which is not spoken, read the words and look at the images. I am a chronicler who loves history. When I turn around and look back, I see the instinct of creativity, and the power of invention and discovery, in addition to the thrust of necessity and the consequent function of economy. The useful (which is not always the desirable) is not enough to describe reality. I don't believe that everything comes down to analyzing economic reports; this approach has too many limitations. Life is revolution and counter-revolution, motion and stillness. Marx overthrew Hegel, the Enlightenment was challenged (and defeated) by Romanticism, which in turn was imprisoned by the empire of technology, which is where we live now, hanging in the balance.

My intention is not to write a history of ideas; I just want to think back and remember that civilization runs on the tracks of history, which is created by people. Thus, it can have many dimensions and narratives; it can be a linear succession of events (the domain of time), whereas, literally, it can flow into no time (uchronia) and no place (utopia, which we have aplenty). History can create a universe of distant facts that comprise a set of coherent elements. So, when I hear speeches declaring the "end of the era of hydrocarbons," I wonder if the speaker has a minimum of historical sense, realism and imagination.

The era of hydrocarbons implies a negative judgment that contradicts the reality of history. They need but read one book, Vaclav Smil's Energy and Civilization: A History, to have all the elements for a more balanced, serene and realistic evaluation. Smil wrote, "In history, the passage from phytomass-based fuels



to fossil fuels and from animate driving forces to mechanical ones has brought unprecedented changes, significantly improving the quality of life and marking the transition to a new era." Smil refers to the fact that "in the 1800s, the people of Paris, New York and Tokyo lived in a world whose energy foundations were no different from those of the 1700s and even the 1300s; the power sources of these societies were wood, coal, hard work, and draft animals." Just imagine what the world was like before oil and the inventions that exploited its availability, efficiency and low cost. There is a popular understanding that the Industrial Revolution came with the steam engine, but this kind of engine was inefficient and very heavy, therefore, it was limited to water and rail transport. According to Smil, in 1900, a steam locomotive dispersed 92 percent of the coal it put in the boiler. The real revolution was brought by internal combustion engines powered by liquid propellants derived from refining crude oil; they were efficient, light, fast, and produced less pollution.

A Summer 2021 G20 meeting in Rome about climate change and the COP26 summit in Glasgow may seem like remote events. Nonetheless, we deal with these events in this issue, because we believe that efforts, advances and even failures should not be forgotten. This is the point of any informed and non-demagogic debate on our future. History can be a guiding light for those who care to see. Scenarios are being painted as if they were instant occurrences, as opposed to the results of a long journey. Nowadays, progress coincides with a non-existent production and energy consumption system without hydrocar-



Salvador Dalì, The Persistence of Memory, 1931. Museum of Modern Art, New York.



The Earth lit up, as seen from a NASA satellite. European electricity market prices per MWh are skyrocketing, in Germany, in December, they reached a record high of EUR 431.



bons; it materializes according to desires created by the flavor of the day. Seeking a route by observing the facts and the real possibilities is considered as odd, even revolutionary. Newsflash: it doesn't work that way. Just read the papers. As I write this, on December 20 of a year that's coming to an end, 68 percent of the UK electricity grid is produced by fossil fuels, 5.6 percent by renewable energy and 24.5 percent from other sources (mainly nuclear energy). At the same time, European electricity market prices per MWh are skyrocketing, reaching an incredible record, 431 EUR in Germany. As a quick comparison, in the same period of 2019, Europe's prices fluctuated between 25 and 50 euros per MWh. According to the weather calendar, winter began on December 1 and will continue until the end of February (that March's weather is never hot should also be a concern). The effect on inflation is well known. In the United States, it gallops, with an immediate impact on the political scenario and President Biden's plans. In Europe, it bites, forcing economists to revise forecasts due to surprising differences between reports and reality. The Italian central bank has doubled its estimates for 2022, bringing the inflation rate up to 2.8 percent, against the 1.3 percent indicated only six months ago, while Germany's production prices are at their highest level since 1951. You need anything else?

What we are having is not an orderly energy transition. Remember what Harvard economists thought after the collapse of the Soviet Union, about a smooth transition from communism to capitalism. We know how things went. Russia is now a gas empire, and the Kremlin hasn't moved to Massachusetts. The way of decarbonization must face realism, meaning a patient and gradual process, which any economic system needs in order to make a change-whether it's in the West or elsewhere. The era of hydrocarbons cannot be dismissed as easily as you turn on your car engine, which nine times out of ten runs on gas. We will talk about this again in the new year, but, for now, let's watch the (woodburning) fireplace and visit with family (by car, diesel and electric engine, mild hybrid). Let's cook dinner for Christmas and New Year's Eve (gas stoves, steel pots, ceramic plates, energy-intensive industry). Let's enjoy the Christmas Tree and Nativity Scenes (plastic, copper, glass, wood, electric grid). Let's read a good book (paper, wood-based pulp, ink, press, electricity), listen to music (powerful servers and cloud, rare earth minerals, electricity), call close friends (silicon, lithium, rare earth minerals, plastic, glass, electricity), and make a toast (glasses, energy-intensive consumption). Let's wish for our children that they will live in a more educated era (school, concrete, gas and electricity), which will be aware, wise and full of historical sense. An era when the word civilization will be used to recognize the great merits of the past every now and then. A past that, despite a virus that has done all it could to turn the clock back, has given us wealth so far, in the era of hydrocarbons and nowhere else, together with a longer lifespan and peace. Happy Holidays.

we

IS IT SO HARD TO GET HUMANITY TO SAVE ITSELF

🚺 by **Moisés Naím**

DESPITE THE COMMITMENTS MADE SINCE THE EARTH SUMMIT HELD IN RIO IN 1992, EMISSIONS HAVE INCREASED BY 60 PERCENT. WHILE CLIMATE STABILITY IS THE ULTIMATE COLLECTIVE GOOD, ENSURING THE ADEQUATE AVAILABILITY OF THIS PUBLIC GOOD WORLDWIDE IS A PERVERSE PROBLEM

RIENDS OF THE EARTH warned that the world had lost valuable time in the race to stave off climate change." "U.N.
Secretary General expresses disappointment at inconclusive outcome of the climate change conference." "South criticizes north for not fulfilling climate commitments." "Low targets, goals dropped, meeting ends in failure." "The text went from weak to weaker to weakest and it's very weak indeed." "Even if we meet every target, we will only get to part of where we need to go."

Reactions to Glasgow 2021? Think again. These headlines followed the climate summits in Buenos Aires in 1998; The Hague, 2000; Bali, 2005; Copenhagen, 2009; Lima, 2014 and





Paris, 2015. Glasgow headlines echoed with similar sentiments: "It is not a secret that COP26 is a failure," said activist Greta Thunberg, adding that "It should be obvious that we cannot solve the crisis...this was a two-week-long celebration of business as usual and blah, blah, blah."

THE ULTIMATE PUBLIC GOOD

Explain the exasperating paradox: why, if everyone agrees that something big needs to be done—and soon!—to keep the planet livable, has it been impossible to overcome the obstacles on the path to the obvious? Despite commitments made by virtually all countries since the first meeting took place in Rio in 1992, carbon emissions have increased by 60 percent. Of the twenty-six climate summits, just a few have made important progress. The 2005 Kyoto Protocol, for example, established emission-cut targets for the richest countries, but none for the less developed countries—a group that, at the time, included

China. Paris 2015 brought specific targets designed to limit the increase of average temperature of the planet to no more than 1.5 degrees Celsius. But they were voluntary, and they didn't work.

Considering all this, expectations for Glasgow were modest. And yet, three positive and practical developments that preceded the meeting might have given room for hope. The first was the pledge by the U.S. government to double its climate change budget to USD 11.5—a move already passed into law by the American Congress. The second was China's announcement that it

would be halting the construction of coal-fired power plants in other countries. Finally, there was a pledge by more than 100 countries to lower 2020 methane emissions by 30 percent by 2030. Even so, the Secretary General of the United Nations called the final document signed in Glasgow "an important but insufficient step, reflecting the interests, contradictions and the state of the political will in the world today."

Why? Because a stable climate is the ultimate public good. And ensuring the adequate provision of public goods on a global scale is a wicked problem—a problem uniquely resistant to solutions due to its inherent complexity and characteristics. Indeed, fighting global climate change may be the wickedest problem humanity has ever confronted.

WHO WILL PAY THE BILL?

U.S. Treasury Secretary Janet L. Yellen has said "the price tag to address climate change is of the order of 100 trillion dollars

plus." Yellen adds that investment on such a titanic scale will necessitate both a public and a private component. The public sector has dragged its feet on the matter, but its problems are as nothing compared with the challenges of mobilizing private investment for this purpose.

Despite many attempts, few businesses have found a way to turn a profit on investment to curb global temperature rises. Such investments would benefit all members of society, and no one can be prevented from enjoying their fruits. What's more, the supply of stable climate doesn't dwindle as more people enjoy it. A stable global climate is, in other words, the textbook definition of a global public good.

Economists have long known public goods are provided mostly by governments because it's not usually possible for a business to profit from a good whose enjoyment flows equally to those who pay for it and those who don't—the famous "free rider" problem. And so, while Secretary Yellen is surely right that pri-

> vate sector involvement is a must if the problem is to be solved, we're still far from providing private capital with a good reason to invest in finding solutions. Sadly, if a way exists for the private sector to turn a flood control project in Bangladesh into a money-making proposition, it has not been discovered yet.

> The consequence is an increasing imbalance between the supply and demand for global public goods required to fight climate change, a gap that claims a growing number of victims from extreme weather events every year. So far, conventional economic strategies have

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been unable to resolve this dilemma. Despite modest progress being made through measures such as carbon credits and pollution taxes, the involvement of the private sector has lagged. Economists know this as "the tragedy of the commons," the tendency to overexploit unregulated goods without clear ownership, such as international fish stock, common lands or clean air. Not that it takes modern economic theory to understand this: 2,300 years ago, Aristotle wrote that "what is common to many is taken least care of."

THE DIFFICULT JOB OF CONVINCING THE RICH COUNTRIES

To make things worse, many of the projects that would disproportionately benefit today's less developed countries would need to be financed by taxpayers in the richer countries. It is difficult to persuade taxpayers in Europe or the United States to open their wallets to fund massive investments aimed at pre-



The Vessel (TKA) is an architectural structure that is part of the Hudson Yards plaza redevelopment project in Manhattan, New York. This complex honeycomb structure, designed by British designer Thomas Heatherwick, reaches a height of 16 stories and includes 154 flights of stairs, nearly 2,500 steps and 80 viewing terraces.



The U.S. Congress has approved the government's proposal to double the climate change budget to USD 11.5 billion. Pictured is Capitol Hill, the seat of Congress in Washington.



Gwynt y Môr wind farm off the coast of North Wales. The energy transition to renewable sources is one of the pillars of climate action. venting droughts in Botswana, the disappearance of glaciers in Central Asia, deforestation in Ethiopia or the Democratic Republic of Congo or coastal flooding in Africa and Latin America, even if it was their ways of producing and consuming energy that caused these problems. Limited private financing has gone to mitigation projects that seek to blunt the impact of harms already done, since such projects are often at least partially rivalrous or excludable. But it's not enough. Richer countries will need to take decisive coordinated action to make investments that benefit the entire planet, not just their taxpayers. In fact, these governments will need to use taxpayer money to finance public goods which benefit everyone in the planet.

The central strategy in the mitigation of climate change, curbing CO₂ emissions, will require the largest investment in public goods in our history. This will be difficult not only due to the tragedy of the commons but, also, due to growing geopolitical polarization, which prevents a proper, unbiased consideration of global mitigation and adaptation projects all over the globe. Although the path ahead is far from clear, there are reasons for cautious optimism in the struggle to bring climate change under control. The largest oil and gas corporations are already beginning the energy transition in earnest through carbon capture and storage initiatives, renewable energy schemes and hydrogen generation projects across the planet. Governments and multilateral institutions, like the World Bank, are developing financial instruments, such as green bonds, dedicated to climate change adaptation. Momentum in the right direction is mounting. Ongoing mitigation and adaptation efforts will be needed, and if vigorously pursued the result will likely be a less healthy but still livable planet.



MOISÉS NAÍM

we

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SCRATCHING OFF THE RHETORICAL PAINT OF THE GREEN TRANSITION REVEALS MAJOR ISSUES RELATING TO GEOPOLITICAL, ECONOMIC AND TECHNOLOGICAL POWER, WHICH HELPS UNDERSTAND THE CAUSES OF THE CLIMB-DOWN AT COP26

020 WAS THE YEAR of the great promises of world environmental policy. Leaders of Western countries have incorporated the green transition into their political plans as they sought to resolve the pandemic crisis. The two issues were combined, although they resulted in different political outcomes. The pandemic has pushed governments towards an economic paradigm shift that requires greater state intervention, not only from a health and emergency point of view, but also in term of industry and technology. In the loosening of the purse strings, and to legitimize the huge growth in public spending, green policies have been included to tackle climate change and develop a more sustainable economy. On the environmental front, however, there is an important mismatch between rhetoric and reality. On the one hand, there is the dialectical invocation of the Apocalypse by Western rulers, adherence to the formula promoted by the most radical environmental movements and the offer to listen to a new ideology. On the other hand, there is the reality of capitalism and the pragmatic demands of national and international politics. Where does the road to ecology lead? For now, with similar strategies throughout the Western world, it has produced taxation of polluting activities, incentives for electrification, investments in research and development towards new green technologies and subsidies for alternative and renewable energy sources. There is an attempt to develop a green transition that, for economic and political reasons, must neither be drastic nor trigger the apocalyptic ideology that inflames the media debate. Governments have quickly realized that there are two main risks stemming from the acceleration in environmentalism: the first is the possible socio-economic impact of a too rapid and radical green transition, with harmful effects on employment and on fundamental industrial supply chains. The second risk is that a prolonged explosion in the prices of raw materials, also fueled by new green technologies, could lead to a wider and more general inflationary spiral that jeopardizes the economic recovery. We therefore need gradualness and moderation.

MANY HOPES, FEW REAL COMMITMENTS

This direction has been certified by both the G20 and COP26, where the green agenda of the Western powers has been forced to face up to the reality of the rest of the world. By mid-2021,

the concrete commitments made on climate change were few; the G20 summit in Rome in fact gave little confidence to the great hopes placed on COP26. There was neither an explicit commitment by large countries to carbon neutrality by 2050 nor a promise to end fossil fuel subsidies, which had been placed at the top of COP26 priorities. Although the G20 leaders pledged to stop financing coal-fired production outside their national borders this year, they failed to reach the same agreement on domestic production. This situation leaves the door open to reshoring coal-fired plants, particularly for coal-

launched by China last July and with a proposal to extend the standardization of the price of emissions to new sectors in Europe, the process is still far from complete. In addition to further extending global stabilization (the U.S. is still silent on this point), political capacity to coordinate these efforts on a global level will be needed, in order to avoid the offshoring of carbon emissions to other places in the world based on differences in regulation and prices. This is difficult to achieve in a fragmented, unequal world characterized by deep geopolitical tensions and interests, whereas the regionalization of carbon

whereas the re

emissions prices in the medium term appears more likely. Furthermore, three other issues may explain the very low common denominator reached on climate at the G20. First, the increasingly serious energy crisis in Europe and China has led to a significant hike in prices of supply and consequently of energy bills. This political problem is difficult to manage and slows down the race for green policies, which inevitably contributes to the growth in energy demand and the rally in prices. Second, there are the political reasons behind the failure of COP26, as clearly shown by the absence of key leaders like Putin and Xi, whose cooperation is crucial to reaching a coordinated solution to climate change. Russia is not just important for climate change, but also for ironing out the European energy crisis, given its pivotal role as a gas supplier. Third, the "drive for green" is good for the world of finance, which has found a new sector in which to pour capital with possible vast returns. Large investors are willing to finance technologies and new businesses,



Russian President Vladimir Putin and Chinese President Xí Jinpíng were the notable absentees from COP26 in Glasgow.



Shanghai skyline. China, one of the world's highest CO₂-emitters, has set a goal of carbon neutrality by 2060. China, the U.S. and India, the COP26 results can be considered

neither a success nor a particularly significant constraint for

world powers. In fact, we need to realize that the major "producers

of vetoes" on climate issues are also the largest polluters in the

world in terms of emissions (China, U.S. and India) or the

largest oil exporters (Australia, Russia and Saudi Arabia). China

and Russia have pushed the carbon neutral target to 2060, and

scientists to maintain the target of limiting global warming to

just 1.5 °C rather than 2 °C set in previous years. Australia has

only recently promised neutrality by 2050, under increasing

pressure from other Western governments, while Saudi Arabia



has aimed for 2060, but without giving up on maintaining its leadership in oil production.

THE NOTICEABLE ABSENCES IN THE CLIMATE DEBATE

Beyond the still relatively late pledges on climate neutrality and the lack of concrete plans for the use of coal in the energy mix, two other important issues seem to have been absent from the discussion so far: one is the decarbonization of global supply chains, which account for a large proportion of greenhouse gas emissions (eight key supply chains alone account for 50 percent of total annual emissions). One potential path could be greener but also shorter supply chains, with an evolution towards a regionalized rather than globalized economy, with obvious and important economic and geopolitical consequences. The second missing point is a global carbon price strategy. Although the possibilities for a global stabilization of the price of CO_2 emissions are increasing, with a new national emissions trading scheme



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but they do not want a radical policy agenda that could create political and social imbalances or policies consisting almost exclusively of hyper-regulation and subsidies. They don't intend to risk plunging the economic system into a new crisis.

THE STRUGGLE FOR SUPREMACY GOES GREEN

The climate issue thus, in addition to being a scientific problem, becomes precisely a geopolitical issue, through which the competition between the powers of the globe unfolds. The U.S., in ways similar to what occurred after the Second World War, is pushing for the construction of a new military-industrial-technological complex and green policies are part of this project. The channeling of public and private resources by the U.S. government towards new, more efficient and less polluting technologies is part of the strategy to compete with China. Indeed, superiority in terms of industrial technology is crucial, above all if, as noted recently by Henry Kissinger, we are at the beginning of a new Cold War. The "green program" is the ideological and cosmetic framework that conceals the struggle for economic and technological superiority over China. The rest of the Western world follows its own leading power, the U.S., despite the sacrifices (especially in Europe), in terms of industry and employment. It is no coincidence, therefore, that China seeks to slow down this race and tries to disperse the competition to other fronts, from military to digital, without foregoing mass electrification. The Chinese have accepted the new canon that informs economic and technological development, but they want to play at their own pace and with their own rules. And all the other major non-Western world powers are like them.

Therefore, the significant climb-down of COP26 cannot be understood if we fail to consider all the variables that underlie the ideological question. Scratching off the rhetorical paint of the green transition reveals major issues relating to geopolitical, economic and technological power. And as always, this second dimension involves strategies and compromises that go beyond the nice stories of good moral intentions and movement-led utopias.

we

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BREAKING THE SILENCE ON THE GLOBAL ENERGY CRUNCH IS UNCOMFORTABLE BUT ESSENTIAL IF WE WANT TO AVOID PROLONGING THE CURRENT CRISIS

NYTHING AND EVERYTHING has been said about Glasgow's COP26. There are those who have emphasized that "the best is the enemy of the good," and therefore better little than nothing. Small steps have been taken, and facts will demonstrate that governments have respected the commitments undertaken. And there are the critics who have pointed out that even in Glasgow no one went beyond the usual "cheap talk" typical of these summits, as the Nobel laureate Jean Tirole said years ago. (Or the usual "blah, blah, blah," in the recent words of Greta Thunberg.) It is not enough to ennoble it as the Glasgow Climate Pact in order to hide its poor results compared to the great expectations built up in two years of preparation. As usual, no operational decisions were made, but instead the result was a thousand future, vague, non-binding commitments. What struck me most about COP26-which also applies to the G20 in Rome at the end of October-was not, however, what was said, which was self-evident, but what was not said or was deliberately silenced. Two "silence" issues stand out. The first is the serious energy crisis that is affecting the whole world, the first crisis of the era of globalization, wherein events in all corners of the world-be it the droughts in Brazil and California or the big freeze in China and Japan-have ricocheted everywhere in real time making energy systems much more unstable, unpredictable and less governable. The second issue was the skyrocketing of methane prices in one year, from USD 2 million





per British Thermal units (MMBtu) to peaks of USD 40 per MMBtu. These prices have affected wholesale electricity prices that, because much of its production depends on methane, have jumped in Italy from last year lows of EUR 10 per Megawatt hour (MWh) to recent peaks of EUR 385 per MWh.

THE ISSUES SILENCED AT THE SUMMIT

The negative impact on household bills at unprecedented levels is inevitable, with hefty government interventions required to mitigate the social impact. What this reminds us is that the energy transition, even more than a technological, infrastructural, energy issue, is a social issue that, if not adequately addressed, harms the most vulnerable groups in society. Equally inevitable is an inflationary surge in energy prices around 5 percent in the eurozone with the risk—identified by Kenneth Rogoff from Harvard University—that the specter of stagflation we experienced in the 1970s could be about to return. The crisis we are experiencing, caused by an actual shortage of methane and even coal, is difficult to absorb in the short term, a problem recognized by the European Commission.

The second unmentioned issue concerns the decisions taken by governments to cushion the crisis, decisions that moved in the exact opposite direction to the commitments they were making in front of the audience of 40,000. Boris Johnson who—while describing COP26 a great success (while its chairman, Alok Sharma decreed its conclusion with tears in his eyes) —had recently reactivated old coal plants to make up for the scarcity of methane and wind power, the latter due to low wind. What a nerve then to blame India for its refusal to set a precise date for phasing out the coal that generates more than 70 percent of the country's electricity.

The reality is that the nature and depth of the energy crisis are making clear the contradictions of the green transition, at least in the terms in which it is put forward, revealing positions different from those previously supported by governments. Even just a short time ago, French President Emmanuel Macron could not have given his 12 October speech for the presentation of the France 2030 Plan in which he exalted the role of



The streets of Times Square closed to traffic due to a blizzard. Extreme weather events have increased in recent years due to climate change.



Cattenom nuclear power plant in the east of France. Outgoing President Emmanuelle Macron has openly sided in favor of atomic energy which produces no CO₂ emissions.



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nuclear power and his firm decision to support, by financing it, the development of new generation reactors. Similarly, in China, President Xi Jinping has expressed his intention to review in depth the times and road maps established for achieving full carbon neutrality by 2060. In the United States, President Joe Biden was forced by Congress to halve the enormous resources foreseen for the "Building Back Better" measure, sacrificing most of the Clean Electricity Performance Program. These actions were not considered in the G20 in Rome and in the COP26 in Glasgow and are manifestations of the organized hypocrisy that characterizes a large part of international relations.

THE ESSENTIAL STEPS

The crisis, we have said, has revealed essential steps to prevent the repetition of great market tensions. Three are the essential nature of methane, even in the long term, to reduce the use of coal in Asian countries; the need to resume mining in the oil industry to expand the extraction capacity of both methane, now saturated, and oil; to make use of the whole cornucopia of technologies and not just renewable technology. Telling it as it is, while uncomfortable, is essential if we want to avoid prolonging the current crisis.

ALBERTO CLÒ

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Economist and academic, in 1980 he founded Energia, a magazine published by Rie-Ricerche Industriali ed Energetiche, of which he has been director since 1984.





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THE CONFERENCE OF GLASGOW (COP26) WILL NEVER FULLY ENSURE GLOBAL EMISSIONS IN LINE WITH THE PARIS AGREEMENT. WHILE PROGRESS MAY HAVE BEEN MADE IN SEVERAL AREAS, THEIR ACTUAL VALUE WILL ONLY BECOME APPARENT IF PROGRESS IS MADE IN THE NEXT TWELVE MONTHS HE WINDOW OF OPPORTUNITY for avoiding disastrous climate impacts is closing quickly, given that warming is currently at 1.1° C above pre-industrial levels and all regions of the world are experiencing increasingly destructive climate. Following the most recent report by the International Panel on Climate Change (IPCC), the UN Secretary-General António Guterres said that the current situation was a "code red for humanity."

The 26th meeting of the Conference of the Parties (COP) of the United National Framework Convention on Climate Change (UNFCCC) took place in Glasgow in early November. This was seen as the most important climate change event

1. GLOBAL GREENHOUSE GAS EMISSIONS

To limit the rise in temperatures to 1.5° C, global greenhouse gas emissions will need to be reduced by 45 percent by 2030, a trend in stark contrast to the 14 percent increase estimate based on the NDCs set by all 191 countries as of last July 31st. *Source: UNFCCC*

2. TEMPERATURE



An IEA analysis published during COP26 shows that, if all the commitments made in Glasgow or previously are met, global warming could be limited to 1.8°C.



since the signing of the Paris Agreement in 2015. Its significance was due to the bottom-up approach to climate mitigation which underscores the Paris Agreement. The net effect of the national plans (the NDCs) submitted in 2015 was that collectively they projected warming of around 3.2° C by the end of the century, well above the objectives of the Paris Agreement that would have kept temperatures below 2° C, preferably 1.5° C above pre-industrial levels. However, the Paris Agreement included a five-yearly "ratchet mechanism," one designed to increase ambition over time, and ahead of COP26, governments were expected to come forward with new and more ambitious NDCs (most of them did). Despite this, the revised 2030 pledges were inadequate, as they projected warming of 2.4° C by the end of the century. To limit warming to 1.5° C, global emissions must be reduced by 45 percent by 2030, rather than an anticipated rise of 14 percent, even in the revised NDCs (Chart 1).

In addition to the 2030 targets, many countries made net zero or carbon neutrality pledges, around midcentury, most by 2050, some by 2060 (including China) and others by 2070 (India). During COP26, the IEA published an analysis suggesting that if all NDCs, net-zero/carbon neutrality pledges and other commitments made in or before Glasgow are implemented, warming could be limited to 1.8° C (Chart 2). While this was the first time that national pledges projected levels below 2° C, many of the long-term targets are not supported by existing policies and measures.

THE GLASGOW CLIMATE PACT

Given these figures, many policymakers wanted Glasgow to ensure, or at least encourage, that countries review their mitigation targets in the short term, rather than wait another five years. The final communication of COP26, the Glasgow Climate Pact (GCP), requested "*parties to revisit and strengthen the* 2030 *targets in their nationally determined contributions as necessary to align with the Paris Agreement temperature goal by the end of* 2022, *taking into account different national circumstances*." Furthermore, the Pact also requested that the secretariat undertake an annual update of the synthesis report, one that would assess the cumulative impact of the NDCs. Both measures will further strengthen the ratchet mechanism.

Under the Paris Agreement the NDCs were to be reviewed in five years' time and an assessment of progress completed in 2023 through a global stocktake. Preparation for the stocktake has begun and the GCP "welcomes the start of the global stocktake and expresses its determination for the process to be comprehensive, inclusive and consistent." In Glasgow, it was announced that COP28 would take place in November 2023 in the UAE, which will have a significant role in the evaluation of the stocktakes outcome.

While the Parties adopted the Pact by unanimity, one of the key tests of 2022 will be if further revision of the NDCs will have taken place, and it is far from clear how many countries will do this. The day after the conference, the Australian Government stated that "Australia's 2030 target is fixed," while New Zealand's Climate Change Minister was quoted in the media as saying that this language was only aimed at those countries with "inadequate targets" and that revision did not apply to New Zealand. However, in the European Parliament, a debate on the outcome of Glasgow led to calls for the EU to increase its 2030 GHG reduction plan.

COP26 was also a crucial opportunity for enhancing ambition on climate finance, adaptation, and "loss and damage" and for finalizing the rules governing the implementation of the Paris Agreement. Given the accelerating climate impacts worldwide, there has never been a more urgent need for international finance and cooperation in managing and building resilience to climate change impacts. This is especially true for developing countries and the most vulnerable regions.

An essential element to the GCP was its acknowledgment of the science and in particular it "welcomed" Working Group I of the IPCC and "*noted with serious concerns*" their findings. The GCP also recognized that the impacts of 1.5° C of warming would be much lower than 2° C and therefore parties should resolve to pursue efforts to limit warming to the lower temperature. In 2022, the IPCC will publish the outcomes of Working







Operational and maintenance inspection of a wind turbine. Of renewable sources, wind power will record the greatest increase in power generation in 2021 (+17%).

Between 2015 and 2020, 10 million hectares of forest were lost each year, according to the Food and Agriculture Organization (FAO). With the Glasgow Leaders' Declaration on Forests and Land Use, adopted on the sidelines of the COP26 negotiations, 130 countries committed to halting and reversing forest destruction by 2030. Groups I (On Impacts, Adaption and Vulnerabilities) and II (on mitigation options), along with a synthesis report of all three working groups. These findings are likely to impact the public and policy landscape in the approach of COP27, which will take place in Egypt in November 2022.

Outside of the formal COP negotiations, the Presidency organized themed days in which key sectorial initiatives were announced and/or discussed to increase their profile, scope and membership. While these were not always new or unique, they were generally considered valuable, as they would create momentum for further mitigation by increasing finance, encouraging states and the private sector to set milestones and targets for action and facilitating cooperation and peer to peer learning and exchange. Particularly highlighted during the Summit were: Glasgow leaders declaration on forest and land, in which 130 countries promised to halt and reverse forest loss by 2030; the formal launch of the Global Methane Pledge, in which countries pledged to cut methane emissions by 30 percent by 2030; and the launch of the Glasgow Financial Alliance for Net-Zero (GFANZ), the members of which represented 450 firms in 45 countries and had committed USD 130 trillion to-wards the net-zero transition, pledged to net zero by 2050 and to provide a 2030 interim goal.

THE "FIRST TIME" OF FOSSIL FUELS

Both inside and outside the formal negotiations, the continued use of fossil fuels was highlighted. Within the Presidency sectorial initiatives were announcements on the use of coal, with a statement on "Global coal to clean power transition" and an announcement that more countries had joined the Powering Past Coal Alliance (PPCA), in which countries and regions committed to developing plans to phase out their use of coal. In addition a new initiative was launched by the Danish and Costa Rican Governments, the Beyond Oil and Gas Alliance



(BOGA), in which its members, including France, Sweden, Ireland and Greenland, seek to deliver a managed and just transition from oil and gas production.

A drama at the end of the conference also focused on fossil fuels, with at the final moment the Indian Government objecting to the draft of the text, which called for "accelerating efforts towards the phaseout of unabated coal power and phase-out of inefficient fossil fuel subsidies." Following negotiations, the phaseout was replaced with "phase-down." While the insistence on the change at the last moment caused disquiet in some countries, such linguistic changes have little impact on those outside the negotiating room, and the explicit reference to reducing fossil fuel use within the final statement of a COP is said to be first.

Despite the hype and rhetoric beforehand, it was clear that COP26 would never fully ensure global emissions that were in line with the Paris Agreement, and the much-repeated Presidency objective of keeping 1.5° C alive was as much as could be expected. While progress may have been made in several areas, actual value will only become apparent if progress is made in the next twelve months. Therefore, regarding climate mitigation, it will be essential to see how many countries revisit and strengthen their NDCs by COP27 and if this significantly moves global emissions closer to the Paris Agreement.

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ENERGY GOVERNANCE

by Kirsten Westphal

CURRENT ENERGY GOVERNANCE IS OUTDATED, OUT OF STEP WITH THE CHANGING DEFINITION OF THE CONCEPT OF SECURITY AND UNSUITABLE FOR TRANSITIONS TIED TO THE PARIS AGREEMENT. IT NEEDS TO BE UPDATED



OP26 IN GLASGOW HAS BROUGHT a leap forward in terms of new announced pledges. Prior to the Conference, the International Energy Agency's (IEA)World Energy Outlook 2021 had stated that the world was on track to limit global warming to 2.1 degrees Celsius by the end of the century. After Glasgow, global warming would only increase by 1.8 degrees Celsius. This presupposes, of course, that all targets set are fully implemented.

However, implementing the pledges is not enough, and the IEA NetZero Report highlights that international collaboration must be taken to new heights. The Paris Agreement and the consecutive COPs and UN Framework Convention on Cli-



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mate Change (FCCC) reports have highlighted the urgent need to mitigate climate change. Article 2.1 of the Paris Agreement stipulates that nationally determined contributions should be formulated with the goal to keep global warming well below 2 degrees Celsius and pursue limiting the temperature increase to 1.5 degrees. Moreover, the Paris Agreement has been created through a bottom-up process to achieve the climate target.

Besides climate change mitigation, there is the broader goal of sustainability and respect for planetary boundaries. Of the 17 Sustainable Development Goals (SDGs) adapted by the United Nations, SDG 7 aims to provide "affordable and clean energy" by 2030 for the world's 8.5 billion people. The goal of sustainable growth is highlighted by the consequences of the Sars-Cov 2 pandemic. The world is searching for blueprints for a better recovery.

Finally, supply security of fossil fuels must be ensured in the transitional period without perpetuating the existing energy system. The energy transition encompasses incremental changes in energy efficiency, structural ruptures with the coal exit and systemic shifts with electrification and digitization. Moreover, the processes involve actors at all levels and at all stages of the energy production chain—from producers to end consumers. Yet, the energy transition pathways look very dif-



ferent across the globe in terms of starting and end points, speed and components. Transitions imply uncertainty and unpredictability as they profoundly alter the supply and demand balance in incumbent markets, affect business models and change the political economy of energy. Yet, neither the energy transition nor energy governance start from scratch. Policymakers worldwide face the Herculean task of making the energy system more sustainable and climate friendly.

GOVERNING THE ENERGY TRANSITION: A HERCULEAN TASK

In historical terms, governing the energy transition is an unprecedented task: energy transitions in the past switched from one energy source (wood, coal, oil, electricity) to another. Previous energy transitions were kick-started by major inventions (steam engine, combustion engine, light bulbs). Nevertheless, these new technologies initiated a systemic shift with profound effects on societies, economies, cultures and political organizations. Yet, these transitions happened organically reflecting technological life and innovation cycles without too much concern about lock-in effects. In contrast, this time the energy transition must take place in a rapid and rigorous manner.

What we are witnessing since the turn of first decade of this century is a new model of governing through goals and targets. Regarding the task of governance, the targets for the energy transition are declared by the U.N. with the SDG 7 for 2030 and set in a binding manner by the Paris Agreement for 2050. The latter has been translated into regional and national commitments to climate-neutrality by 2050 (e.g., EU and U.S.) or carbon-neutrality by 2060 (e.g., China, Russia and Saudi Arabia) and by 2070 (India). The sum of national pledges and nationally determined contributions shall help achieve the common goal.

However, the mechanisms and institutions behind this change are rather weak, consisting of a chain of recurring reporting, monitoring and increasing ambitions. This governance model requires a translation into specific national/regional and even local energy policy measures. The policy measure chosen by different countries and regions may therefore differ remarkably across the globe. This creates a high level of uncertainty and unpredictability about future pathways of different players and their interaction regionally and globally. Even if the endpoint is defined, the type, the timing and the sequence of the measures linked to specific energy carriers and solutions have not been agreed upon.

The fact that energy policy measures are cross-cutting issues that intersect with climate, environmental, economic and industrial policies is not a new observation. The energy transition, however, is also part of an industrial revolution as are digitalization and artificial intelligence. The challenge to govern the energy transition on the different levels is paramount.





The existing energy governance architecture stems from the past and has neither kept pace with the changing definition of energy security terms nor is fit to govern multiple energy transitions in line with SDG 7 and the Paris Agreement.

GOVERNING A NEW ENERGY WORLD

The energy transition will profoundly change the energy world. The value is no longer generated primarily from the fossil fuel resource such as coal, oil or gas, but rather at the stage of conversion into end-user energy/ services. The generation of rents from fossil fuel reserves will be increasingly difficult, as the deposits will be devalued, instead, more and more value will be created downstream of the energy supply chain and in services. Profits will be generated by the availability and use of low-carbon technologies. The new system will be more electrified, digitized, demand-side driven and distributed. Today's energy system rests on individual sectors such as electricity, buildings,

transport and industry, each characterized by a dominant mix of fossil fuels (Goldthau et al., 2018). In the system of the future, the sectors such as electricity, industry, heating and cooling, transport and mobility will be coupled by the use of electricity and clean molecules. Because of the changes in the system, a relocation of production and demand will take place and the boundaries of the existing energy system will be increasingly blurred.

First and foremost, however, energy efficiency and renewable energy are available and can be harvested worldwide. This ubiquity is a plus

for energy security, but also allows for shaping new energy communities and ties upon political choice. Connectivity will be defined politically, knocking on existing interdependencies, alleviating old sensitivities and vulnerabilities, but also creating new ones.

The above said is particularly true for electricity grids and their different shapes (central, decentralized) as well as sizes (local, national, trans/continental). "Grid Communities" (Scholten, Daniel (2018): The Geopolitics of Renewables. Cham: Springer International Publishing (61) are cases in point). Hydrogen is seen as the lacking pillar for decarbonization of difficult to abate sectors. Hydrogen and its derivatives will be a center piece of the industrial revolution, but also create new cross-border value chains with knocking on effects on industrial locations, cluster and production chains. Yet again, the emerging trade and production patterns are less determined by geology, and more driven by political choices. Of course, the above-described trends are far from being comprehensive. There is no silver bullet at hand, but a combination of technologies including energy efficiency, renewables, fuel switch, nuclear, carbon capture use and storage (CCUS) as well as behavioral change are needed to put the world on track. However, these key components are mentioned in this essay in order to highlight two major challenges for governing global energy transitions. First, energy governance has to address emerging energy spaces which do not necessarily overlap with existing governance institutions. Second, the governance of flows is central, where and when critical infrastructures such as electricity and telecommunications intersect. Networked governance is important not only with regard to flows, but also regarding corporate actors, non-governmental organizations and civil societies. Governance faces increasing complexity.

For the Organization for Economic Cooperation and Development (OECD) world and the industrialized countries, the chal-

> lenge is to guarantee energy security in the incumbent system, without perpetuating it, and in parallel accelerating incremental structural and systemic changes. The challenges in other parts of the world, especially in the Global South, are very different, though. Zooming into the OECD world however allows us to sketch out the shortcomings, deficiencies and challenges to governance. The IEA, the traditional organization for energy security, has managed to enlarge both the focus and scope of its geographical activity. The energy transition implies power shifts and alters the

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political economy on the national and the international level. It creates winners and losers and can thus result in more regional instability. Managing the phase-out of hydrocarbon trade can reduce vulnerabilities and hedge risks and costs on both sides of the value chain. The components of the energy transition from energy efficiency, renewables, hydrogen, carbon capture and storage (CCS) and behavioral change require tailored and polycentric governance approaches.

THE DIFFERENT SPEEDS OF THE TRANSITION

The targets for the energy transition are set. The question remains whether all states will deliver and whether the contributions are sufficient to achieve the goal. The commitment to the goals alone does not create a level playing field, only the implementation of measures will lead to a more level energy path and consumption pattern. Addressing climate change raises questions about the fair distribution of responsibilities,

Transport of wind turbines. According to the IEA, in 2021 increased electricity generation from renewable sources is expected to push the share of renewables in the global energy mix to an all-time high of 30 percent.



Hydrogen fuel cell for alternative electricity generation. Hydrogen's contribution will be critical to the decarbonization of fossil fuel-intensive sectors.



A Harijan woman carries water from the well on her head, Gujarat, India. Currently, around 2.3 billion people live in water-stressed countries. A figure that is destined to grow with the worsening of the climate crisis. costs and benefits. Inequalities, fragmentation and heterogeneity may increase.

The pacing problem, the different measures and ambitions, creates an environment of competition and rivalry. In order to reduce costs, sharing the burden and responsibilities of horizon-scanning, scenario-planning and early engagement is essential.

Multilateral governance has been in crises and the commitment to targets rather than measures proved to be a solution. The fact that there is no common script for the energy transition and no one silver bullet requires non-hierarchical, polycentric and polythematic approaches in specific regions, coalitions of the willing as well as around specific energy sources, carriers and technologies.

Even if networked governance implies a multistakeholder approach, the nation state will remain important in certain functions. Working toward a level playing field, a rules-based energy world and a functioning market will be a major step to making the transition as smooth as possible. Free riders, cherry pickers and technological hegemony have to be addressed. The more norm and paradigm driven the international governance system will be with regard to justice and solidarity, the more evenly costs and benefits will be shared. International cooperation will be taken to new heights by sharing best practices and efficient, effective and inclusive policies. How should policies be designed so that they break down path dependencies, achieve catalytic effects and best connect different levels?

Finally, two decisive trends will have to be closely watched. First, will regionalization result in competitive regional governance and add to energy bloc rivalry or will it provide steppingstones for global governance? Second, will energy transition result in new competitive and functioning markets, or will states increasingly control and potentially limit use of key technologies and value chains?

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This text is an abbreviated and updated version of Kirsten Westphal's article, 'Global energy governance: meeting the challenge of the energy transition' published in February 2021 in the Oxford Energy forum, a publication by the Oxford Institute for Energy Studies.

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The INOCE

by Roberto Di Giovan Paolo

COPS WORK IN THE DAY TO DAY OF INITIATIVES AND CHECKS. AS SECRETARY GENERAL GUTERRES STATED AT THE END OF THE PROCEEDINGS, COP26 BEGINS NOW E FIRST TALKED ABOUT IT in "Oil" and then in "WE," before the fateful COP21 in Paris when the world was not yet aware of the work of the Parties (nations, NGOs, associative and academic world) urged by the United Nations, even though Rio de Janeiro 1992 (United Nations Conference on Environment and Development) and Kyoto 1997 (2005 Protocol) represented a global turning point, at least in terms of diplomatic negotiations on the environment.

The Treaties signed in Paris in December 2015 were a milestone that established a series of initiatives, including economic, which could not be deployed year by year. Not surprisingly, subsequent COPs have been cloaked in a veil of inconclusiveness and deferment to a point that—after yet another disappointment certified by the Secretary General António Guterres in COP25—we now realize that what was needed was a breather and alternative preparation for COP26, because this was the "road test" of Paris 2015 and could not fail.

WE MUST COME TO TERMS WITH THE FACTS

The Covid-19 pandemic gave us a hand and the wait for this recently concluded COP26 made it the focus of unprecedented attention, attracting the attention of the G20 (held in Italy a week earlier), and of all the stars of international non-governmental organizations, with Greta Thunberg flanked by many other leaders of associations and figures from industry, politics and political activism.

The headlines of newspapers, TV, radio and social networks were monopolized by the ups and downs, negotiations, announcements and documents coming from Glasgow and rocketing around the world. You can opt to take the view of "the glass half full" or "half empty," but with lights off and the crowds dispersed, looking to the future and not to the headlines, we all knew we could ignore the predictable media images of COP26 that brought its President, Alok Sharma, close to tears; or the "blah blah blah" derided by Greta, and begin to deal with the effects, possible or announced, immediate or future.

The "road test" of Paris COP21 has been done and all the parties involved—countries, coalitions of states, NGOs, environ-

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POLLUTING MUSIC? A DISCORDANT NOTE

A SURPRISING STUDY SHOWS THAT STREAMING TODAY POLLUTES MORE THAN THE RECORDS, CDS AND CASSETTE TAPES OF THE PAST

The transition to digital for music has been a change of epic proportions, not only from a production point of view but also structurally, changing even our "intimate" relationship with the records themselves. The real surprise, however, comes from Matt Brennan and Kyle Devine, two professors of musicology, respectively from the University of Glasgow and the University of Oslo. Before the study in question, Brennan and Devine had already written books on the "dematerialization" of music (i.e., Apple, Google or Spotify, YouTube, Pandora), therefore of the economy, duration, real cost but also the impact that it has on the environment. Now they tell us, with the latest research, that the use of PVC (the main material used in vinyl), derived from petrochemicals, has, with the use of plastic, fallen from 61 million kilos to just 8 million kilos from 2000 to 2016. This should be excellent news, yet we find that, in terms of greenhouse

gas emissions, annual consumption increased from the equivalent of 140 million kilos in 1977 to 157 million kilos in 2000. For 2016, there is talk of emissions between 200 and 350 million kilos, and estimates are much higher for 2020. Why? This greater availability of supply has completely changed the demand side, making music readily available not only to fans or young people, but also creating new uses, for example in fashion stores or in airports, doctors' clinics or shopping malls. The study and the data tell us, therefore, that the supply chain has changed, and streaming now involves energy consumption so high and linked to the needs of servers all over the world that it is equivalent to the total consumption necessary to produce vinyl records, cassette tapes and compact discs. A nice conundrum for the many musicians who have long been committed to the climate and being "green"!

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mental associations and public administrations, industries, production chains—know that the Secretary General is right to say that COP26 starts now: there are acknowledgments, pledges, timelines and public and private methods of dialogue. General and generic declarations, without data, without precise references to reports, to things written and recorded, will no longer have any value. And from now on this will be true for decision makers, generally "half-fulls," and for proponents, generally "half-empties."

But let's start from the beginning, or rather from the end, that is, from the final document launched in a dramatic session marked by the "hijack" by India and China, an outcome that many delegations, especially the United States, had known about for hours. This is not shocking news given that India had made clear her concern about the coal issue since the G20 in Rome. There she referred on the one hand to the difficulty for non-developed or emerging countries to switch to clean energy in a few years in the absence of the economic or structural means; and on the other hand to the additional issue of stopping the production of hard coal, given that India is the third largest producer in the world, after China and the U.S.. In short, India made its move, knowing that a large part of the world that matters wouldn't try to stop it.

In conclusion, the document establishes a historic agreement on the need to limit the increase in global warming to below 1.5 degrees Celsius and, in return, a "non-immediate" closure of coal plants, which meant by 2030 or 2050, the hypothesis of stormy mediation. China announced that it will reach the target by 2060, India by 2070. Glass half full or half empty? First, it should be noted that no debate has been raised against the evidence of the existing situation provided by the UN at the latest COPs with attention to Russia, Saudi Arabia and, above all, the U.S. under the Trump administration. In addition, every annual report from the UN body responsible, the United Nations Framework Convention on Climate Change (UN-FCCC), was accompanied by waves of skeptical, if not contrary, declarations by many world governments, even the most prominent.

COHESION, AGREEMENT, TRUST: THIS YEAR'S RESULTS

In summary, no one disputes global warming; no one disputes the measures to reduce and stop it; no one disputes the coal spill and the need to end state or international subsidies to fossil fuels. That doesn't seem like nothing! Assuming that a compromise had also been approved for the closure of coal plants in 2050, should we not have controlled and built supranational control bodies? Or, reversing the approach, would we have respected a decision without loopholes in countries like India and China but also in the heart of coal-mining European nations like Poland? Judging by the plans submitted so far to the UN-FCCC, it is better to prepare in advance an effective check of the mid-term progress of pledges than to hope that the deadlines of a solely media-based compromise will be respected.

Just browse through the documents delivered in recent years by various countries to find the leaks and flaws, years of delays and incomplete deliveries of documents late or rushed before the last COP that followed Paris 2015. Of course, COP21 allowed time until COP26 to present National Plans (or intergovernmental plans, in the case of the European Union, which of all of them did at least do its homework), both general and specific for the areas of action. But judging from the documents delivered, it was clear that not even the general statements were desired by all. It's different now: the Paris pledges have become commonplace. Keeping the temperature rise below 1.5 degrees Celsius means concrete action: emissions cuts of 45 percent by 2030. And even in relation to the desired exit from coal, despite the limited results we have seen to date, the agreement signed in Glasgow provides for some circumstantial limited forms of exit, in case hearts change, or less expensive and technically feasible methods appear.

But it's all about the money. USD 100 billion a year has been

promised by the biggest polluters to help convert the economies of those countries that lack the abilities for technical or economic development. Both the poor, perennially developing countries, and the prosperous countries have raised questions about the program's implementation. The start date is 2023, with the possibility that the figure will double between 2025 and 2030. How will it happen? Here, and this is new to COP26, a different mechanism will probably be used, one that the European Union has already implemented with its "Green Deal." Public money will be used as a lever for a private market now fully oriented and well disposed towards green investments. In a July report, speaking only of the energy transition, Bloomberg estimated investments of up to USD 173 trillion to guarantee net-zero emissions by 2050.

We should remember that at the time of Paris 2015, only Angela Merkel's Germany took the initiative from freshly signed agreements to guarantee billions in incentives to the car manufacturers to make both conventional and electric versions of all models by 2025 and to invest in charging stations. Anyone who opens an auto magazine today will find that in just six years the "pre-Revolution" (the Revolution will probably happen only with hydrogen) has already happened and the market has found an unexpected "consumerist" regeneration. The extent to which this coincides with the guidelines for the fight against climate change will be seen in the results (there are doubts over the energy efficiency of electricity), but this is something to bear in mind. And cars are not the only economic sector that has experienced major change in five to six years.

THE MEDIA VALUE AND "COLLATERAL" AGREEMENTS

COP26 in Glasgow attracted media attention from nations and important NGOs, but also from entrepreneurs, researchers and the economic and financial world. Secular and without false moral judgment, this attention was not taken for granted. It was a significant change from previous COPs. The meetings and "collateral" agreements, always to be taken with due caution, were a large part of the media topic trend that wandered around the world of social networks for about two weeks. Among others, the topics that won particular attention included the "Beyond Oil and Gas Alliance," led by Costa Rica and Denmark to put an end to fossil fuels (to which Italy also adheres in small and economic part); the agreement to limit methane emissions by 30 percent by 2020, signed by over one hundred countries and led by the U.S. and the European Union; the vast and flexible agreement between the U.S. and China, which, if it produces just 10 percent of the working hypotheses, would be an important driver for the planet's green economy in the years to come. Not to mention the implicit and explicit geopolitical effects that instead largely exceed any threshold of real international political and economic interest (one eye on Putin and the upcoming U.S. elections as of now).

The accomplishments of COP26 can be summarized as a convergence on the analysis of the situation, one never approved by everyone in black and white before; a formalized joint commitment to limit global warming to below 1.5 degrees Celsius; the exit from coal was slowed but not canceled ("phasing out" replaced by "phasing down"); reached agreements on methane and energy; confirmed financial commitments with specified dates and beneficiaries.

Of course, more could have been done, but if more can be done, only results will prove it, and to get results, we need to be able to compare certain choices (not promises and vague statements) and look at them alongside the targets; therefore, certain information, numbers, investment figures and specific action tables are important, all within specified times. The other, not insignificant, part of Glasgow COP26 was the determination of methods of control. Each country will have to provide the UNFCCC, and therefore make public, a five-year

The fifth day of the United Nations Climate Change Conference in Glasgow. In 2021, global CO₂ emissions are expected to rebound to pre-Covid-19 pandemic levels.

climate plan that meets the specified objectives. First date will be set in 2025 for 2030, and in 2030 for 2040. Of course, we can also pad out tables and reports with "blah blah blah," but it will be done publicly and can be read on the UNFCCC web-

site, in real time and available for the next COP meeting. The effects of COP26 will be evaluated over the years with the same criteria. We know that Kyoto was a starting point, or Paris a milestone, in the recognition of a problem shared by the whole of planet Earth and the meeting in Katowice, Poland (COP24) a simple step of consolidation. The strong media attention surrounding external events, hundreds of seminars and public and private initiatives, has certainly revitalized the post-Brexit tourism economy but has not always led to a frank and concrete discussion on numbers and actions. And it must be said, that the G20 held in Rome, only just before and closely connected to COP26, created a climate of close and focused dialogue. These are terms to keep in mind for the next editions, it being understood that the COPs operate in the day-to-day of initiatives and controls. Secretary General Guterres had a point when he declared, at the end of the event, that COP26 really starts now.

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ROBERTO DI GIOVAN PAOLO

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TODAY, AS IN THE 17TH CENTURY, CLIMATE CHANGE HAS TRIGGERED AN IRRATIONAL RESPONSE AND THE SEARCH FOR AN IMMEDIATE, ALMOST MAGICAL SOLUTION. BUT THE MOST EFFECTIVE WEAPONS IN CRISIS SITUATIONS ARE LOGICAL THINKING AND SCIENTIFIC METHOD

N GLASGOW, not far from the center, there is a sinister mansion. Pollok House is a typical noble residence, which, like many old houses, hides a ghost story. In this case, the ghost is that of Janet Douglas (a not very spooky name), a profoundly deaf maid who served in the house, who in 1677 became a "witch hunter." Janet, who boasted the gift of clairvoyance, began to accuse five fellow villagers of witchcraft. And so, after a summary trial typical of such stories, the unfortunate accused were condemned to the stake (except—how good of them—a 14-year-old who was locked up in prison). Janet, who had become a little too large a presence for that small town, was then sent to the United States. And all historical traces of her were lost, although another legend tells of her involvement in the Salem witch trials, but perhaps that story is a little exaggerated.

Another disturbing tale, COP26, is set in the same area, during this year's Halloween, and the proximity to Pollok House is more than just physical. Indeed, the witch hunts that troubled Europe have an unexpected feature in common with the debate at COP26. Europe in the 1600s was the victim of a climate crisis that, in the space of a few decades, transformed the medieval warmth (the excellent climate that had led the Vikings to colonize Greenland) into a mini glaciation that lasted three centuries. The abrupt drop in temperature that started the "winter of our discontent" was not investigated with scientific rigor by



local populations, especially in the northern regions, which suffered dwindling harvests, And thus the witch hunting began (without too many gender distinctions) in an attempt to find rapid justification and a magical solution to the scarcity of crops. Thousands of people were involved in summary trials and hundreds suffered brutal and unjust executions.

Now another climate shift, this time upward, is generating a new witch hunt. In this case, the witches are the energy and industrial companies (steel works, car factories, cement plants) that in the last few centuries have produced the reality we know today: population growth from one to nearly eight billion; the doubling of life expectancy to over 70 years; a drop in infant mortality from 43 percent to 4.5 percent; a 15-fold increase in per capita income, with positive repercussions on people's health and wellbeing; access to education (illiteracy has fallen from 85 to 15 percent); and I could go on. But little or nothing is said about these successes. Rather, the focus is on the external effects of this unprecedented growth in human development: the increase in CO_2 emissions, which have risen from 280 parts per million before the industrial revolution to 420 parts per million today, and the warming effect this has on the temperature of the globe.

CLIMATE ROUND TABLES

Hence the launch of discussion tables (Conferences of the Parties or COPs) which, since 1995, have sought to design a new development model structured around reducing emissions. But the attempts at centralized planning of a zero-emissions growth model have so far been unsuccessful. In fact, the boxing match between politics and CO_2 has now reached the third round. So far the points are all in favor of our opponent.

The first round starts in Kyoto in 1997. The COP3 Protocol signed by 37 industrialized countries plus the European Union, which sanctioned the first attempt to reduce emissions by 5 percent compared to 1990 levels, achieved only partial results. In 2012, the effective cut in emissions by these countries was 12.5 percent but, at the signing of the protocol, the signatories already had 11 percent covered thanks to the closure of large polluting industries in the former Soviet Union. Actually, the failure was due to the exit of some large countries that had signed the agreement: the U.S. failed to ratify it and Canada and Japan abandoned it or remained inactive. This failure can also be seen in the continuous increase in global emissions from 22 billion tons in 1997 to 34 billion in 2015.

The Kyoto target (already achieved ex ante as we have seen) was therefore pursued by continuing to move the highest emission activities from the area of the signatories to those Asian countries that were off the radar. With the result that emissions were probably increased, rather than decreased.

Now the second round, COP21, which began in Paris in 2015, has just ended. In this agreement, there was an overhaul of the emissions governance model wherein all the countries commit-

CO2 and quality of life

Last century has seen an unprecedented development: the world population has grown from one to nearly eight billion; the average life expectancy has reached beyond 70 years; per capita income has increased around 15 times, with positive repercussions on people's health and well-being. However, this impressive growth has brought with it an increase in CO₂ emissions, with concentrations in the atmosphere rising from 280 parts per million before the industrial revolution to 420 parts per million today.



LIFE EXPECTANCY IN 1800, 1950 AND 2015

Source: Our World in Data based on HYDE, UN, and UN Population Division [2019 Revision]



GLOBAL AVERAGE: 46 YEARS



ANNUAL GROWTH IN GDP AND CO2 EMISSIONS, WORLD

Annual percentage change in total gross domestic product (GDP) and annual carbon dioxide (CO_2) emissions.



ANNUAL CO2 EMISSIONS



KYOTO PROTOCOL CARBON EMISSIONS, 1990-2012



ted to a program of non-binding targets and with different reduction rates. The objective of limiting the rise in temperature by 2100 was made more explicit ("well below two degrees") with monitoring every five years, to ensure gradual progress in the reduction of emissions.

Glasgow is the first fact check for the Paris Agreement. But little has been done between Paris and Glasgow: environmental policy seems unable to defeat its opponent. In 2020, annual CO₂ emissions were stable at 34 billion tons, fossil fuels make up an unchanged 80 percent of the energy mix and the weight of solar and wind, the key weapons of the transition, remains at just 2 percent. Coal, given up for dead, is at an all-time high in price and consumption. The trend in temperature rise looks to reach three degrees Celsius, instead of being limited to half that. In addition, cracks are beginning to show in the economic and social sustainability of the "fast and furious" transition that the reduction scenarios describe. Even though the more creative scenarios illustrate the prospects of a "soft" replacement of emission sources, 2021 showed the opposite. If demand continues to be hungry for fossil fuels and supply is already aligned in terms of investment with the trend of more radical cuts (target of within 1.5 degrees Celsius and the substantial exclusion of fossil fuels in our future), then we fail to balance the energy and economic system. Prices rocket, as happened with gas (fall values at USD 200 per barrel equivalent!), and repercussions are projected on all industrial activities that are closely tied to fossil combustion. Steel, aluminum, copper and zinc are at maximum prices, and activities are reduced to a minimum for fertilizers, with potential impact on the next agricultural harvest.

The sweet transition has a strong and bitter aftertaste. Glasgow begins the third round. The targets are confirmed or even strengthened (reduction target of 1.5 degrees Celsius around midcentury), but the pledges appear vague. The absence of China and Russia at the summit and India's decision not to set binding targets on reducing the use of coal are just a partial narrative of the actual scale of the political crisis surrounding climate issues. The other part reveals a U.S. administration unable to garner the Congressional vote to achieve a transition support package for a 50-55 percent cut in emissions (double Obama's commitment). Many European countries are worried about a winter with very high energy costs and supply risks. OPEC and Russia have been urged to produce more oil and gas. Laws have been proposed to prevent hikes in energy bills. And there have been frequent blackouts in Asia due to a shortage of coal.

In short, while we continue to raise the bar of the targets, the papers reveal that we cannot even get off the ground. At the same time, the ideological paradox tells us we must keep pointing at the culprits: the big oil companies, our new witches of the 21st century, which must stop investing in hydrocarbons. By so doing we seek to exclude concrete options for the coming decades, such as carbon capture or the replacement of coal with gas, which ap-



pear too advantageous for the continuity of the business model of oil and gas companies. The extreme transition plan foresees only one way: decarbonization by way of defossilization, a perilous and difficult undertaking for the world economy. It is therefore very easy to predict that the Glasgow round will confirm the unhappy trend of rounds one and two and that the 2030 target (bending the emissions curve drastically downwards to zero in 2050) will inevitably be missed.

A NEW STRATEGY

How can we build a winning strategy?

First, by accepting the essential role that some sources play in the energy mix and in modernity and human progress. Be aware that excluding fossil fuels-or nuclear-from taxonomy (and therefore from our vision of the future) means progressively dry-



Mad Meg (Dulle Griet), Pieter Bruegel the Elder, 1561. 115 x 165 cm, detail, Mayer van den Bergh Museum, Antwerp.

A drone communicates

with a combine harvester

and a tractor during harvest.





© GETTY IMAGES

ing up 85 percent of the energy potential, and, above all, depriving all industries (including those engaged in building new green energy plants, or new networks) of raw materials essential for the transition.

Be aware that the intermittent nature of renewables does not have a technological solution at hand and that the demand for energy has no alternatives capable of bringing about a rapid change in trends and methods of consumption.

Be aware that a market deprived of supply response, such as the oil, gas and coal sectors are today, due to the long-term uncertainty associated with new investments, and investor pressures, will lead to an upward push in prices in order to find a balance through "demand destruction."

Be aware that, in this context, the prospect of a just transition will be an illusion.

In short, the food crisis of the 1600-1700s was not resolved with a witch hunt but with the Enlightenment, that is, the identification of the most suitable technological solutions to improve crops, without ideologies and taxonomic exclusions; resolved with the most effective weapon: logical thinking and scientific method. The current energy problem requires nothing less.

FRANCESCO GATTEI

He is Chief Financial Officer at Eni. Previously he was the Americas Upstream Director of Eni, Vice President of Strategic Options & Investor Relations at Eni and, before that, in charge of the E&P portfolio at Eni.

THE WINTER OF



by **Davide Tabarelli**

AFTER A SPRING 2022 REDUCTION, WE WILL HAVE TO GET USED TO HIGH GAS PRICES WITH LARGE FLUCTUATIONS AND MARKETS STRUGGLING TO GIVE EFFICIENT LONG-TERM GUIDELINES FOR INVESTMENTS

HIS GAS CRISIS is both expected and inevitable and a bell-wether of future trends. The crisis reveals serious past mistakes where action should have been taken, but politicians hesitated. In Europe, the price of gas and electricity has rocketed since the summer of 2021, with variations so irrational that it can be said that the markets have failed. It is part of the confusion that has hit the global economy in its arduous climb out of the pandemic. What is happening with gas also affects other sectors, from chips to logistics, wheat to wood, polystyrene to steel. At the beginning of 2020, gas prices in Europe stood at EUR 20 per megawatt hour (MWh); by October, after a dizzying rise, they reached EUR 137, from which they then dropped to around EUR 80. This instabil-

ity is hard to explain and of an intensity that in any market is indicative of profound inefficiencies.

STOCK PROBLEMS AND PRICE HIKES

The fundamental reason for the hike is the shortage of gas from Russia, Europe's main supplier, which in 2019, before the pandemic, sold the EU 38 percent of its final consumption, 166 billion cubic meters (bcm), a record that will probably be surpassed in 2021. This scarcity was evident in the low stocks on hand at the beginning of winter, when the stockpiles began to be used to cover the surge in seasonal consumption for heating. Compared to previous years, total European stocks were 20 percent lower



EUROPE AND GAS

One of the reasons for greater gas consumption, and price tensions, was the continuous contraction of European domestic production, especially in historical producer countries, such as Holland and Italy.



PRICES AND MARKET

Trading volume on the London ICE for gas futures contracts in Europe went from around 2 million contracts per month to 5 million in October 2021, showing a very high correlation with the price hikes.

> which, even with recovering demand, does not justify the almost fivefold hike in prices. The stock situation varied a lot among different countries, with very high levels in Italy and France, but lower in Germany, with a 30 percent deviation from normal levels. Low stocks resulted first from a winter that lasted longer than normal across the northern hemisphere, including Russia. In the meantime, demand has recovered sharply due to the rebound of the economy and a strong increase in electricity consumption. In many countries, and in particular Italy, electricity is made above all with gas, and the plants that use it shape the prices on the wholesale electricity markets. Therefore, electricity prices were marked by the same increases as gas with values that went from EUR 50-60 per MWh at the beginning of the year to peaks of almost EUR 300 in October 2021. In the following weeks they stabilized, though still above the EUR 200 mark.

> One reason that led to greater gas consumption and price tensions was the lower production of electricity from wind power during the summer, as all of northern Europe was marked by a period of low wind. The demand for gas-fired power plants had to offset lower production from wind power, just as electricity consumption was recovering. Less availability of gas from abroad resulted from the diversion, mainly to Asia, of liquefied natural gas (LNG). Asian demand skyrocketed due to the recovery and to the shortage of coal, especially in China. The decline in U.S. gas production, following the fall in prices in 2020, cut the num

ber of shipments exported to Europe. There was also the continuous contraction of European domestic production in historical producer countries such as Holland and Italy. The large Groningen field developed by Shell and Exxon since the 1950s is essentially closing due to issues of micro-seismicity that have raised opposition among environmentalists. In ten years, Dutch production has shrunk from 75 to 20 bcm per year. In Italy, where reserves are plentiful, production is being reduced to zero due to political opposition to any type of drilling, development and research. From the peak of 21 bcm per year in 1994, 3 bcm will be produced in 2021.

LOW VOLUMES OF IMPORTS FROM RUSSIA

The greatest responsibility for the imbalance between supply and demand is the unwillingness, or, more worryingly, the inability of Russia to send more imports to Europe. This is measured in the very low levels accumulated in the stocks managed by Gazprom in Germany and Austria. Russia explained that all of its long-term contracts, only partially linked to spot prices, have been fully respected and that, in some cases, volumes have even been increased. What is equally clear is that smaller volumes were sent through the pipelines that pass into Ukraine, a country with which Russia has been at war since 2014, which led Europe to apply heavy economic sanctions against Moscow. There was also the significant dispute over the granting of authorizations

PJSC' Chayandinskoye field in eastern Siberia. Beginning in the summer of 2021, gas prices in Europe exploded, mainly due to a shortage of supply from Russia, our main supplier.



It is very likely that, well into 2022, gas prices will experience large fluctuations, with markets struggling to offer efficient long-term indications for investments. for the start-up of the new Nord Stream 2 gas pipeline, parallel to the first line. However, it is not in Russia's interest to create problems for Europe by making prices skyrocket according to a short-term speculative logic. Russia has been exporting large volumes of gas for sixty years and has always proved to be an excellent and reliable supplier. It has every interest in remaining so in the coming decades, given the enormous reserves that it will have to exploit throughout this century. The accidents it experienced during the summer at two major pipeline plants should raise concerns in the long term. There are structural problems in the transport system, likely the result of Gazprom's insufficient infrastructure investments. It is old and needs to be modernized, not least to limit the losses in the atmosphere of methane, a problem rightly highlighted in Glasgow at COP26. On the other hand, the volumes sent to Europe have been growing steadily in recent years, with a peak of 185 bcm reached in 2020 and it is likely that this is the best it can do. Capacity limits, political games, low stocks, soaring domestic demand for the long winter, all explain the low volumes from Europe's main gas supplier.

To quantify the physical shortfall at the end of 2021, we can calculate about one fifth—that which is lacking in stocks compared to normal levels—and this imbalance cannot entirely explain (as happens in moments of profound instability) a fivefold increase in price in less than a year. We must avoid the easy shortcut of accusing speculation, because it does not allow us to fully understand what is happening. However, the liquidity of the international financial system, a constant in recent years, plays an important role in moving investors from one market to another. Energy markets having recently become particularly attractive for those who bet on upward movement. The volumes traded on the London Intercontinental Exchange (ICE) went from around 2 million contracts per month to 5 million in October 2021, with a very high correlation with the price hikes.

The role of finance in positive terms was highlighted by the first conclusions of the survey launched by the European Union Agency for the Cooperation of Energy Regulators (ACE) and made public on 13 October 2021. In essence, finance, together with physical trading companies and industrial companies, drove upwards because there was an objective shortage of gas in Europe. But we will never be able to understand whether the intensity of the increases is justifiable.

It is more important to understand how long the crisis will last. Is it a temporary flare-up, or is there a structural element to it? The markets themselves are the first to give us an idea of what could happen, through the negotiation of forwards contracts. These indicate gas prices in sharp decline starting from the fall of 2022, about half of those of the winter, EUR 45 against the current EUR 90 per MWh; while for 2023, the values are just over EUR 34 per MWh. The markets, in essence, tell us that these are temporary tensions and that, in a few months, everything should return to normal. However, it should be emphasized



that forward curves always get it wrong in predicting future prices, as it should be in the commodity markets. At the beginning of 2021, the prices for November were indicated at levels around EUR 30, a third of the prices. It is more likely that we will experience a future in which there will be many fluctuations, after the decline that will occur in fall 2022, because there will be a great demand for gas, including to complement renewables, while imports from abroad will grow in an international market in which there will be a scarcity of new export capacity. In essence, high gas prices, with large fluctuations, will become something we will have to get used to, with markets that will struggle to offer efficient long-term indications for investments, as occurred in 2021.

we

DAVIDE TABARELLI

He is Chairman and co-founder of Nomisma Energia, an independent research company in Bologna that deals with energy and environmental issues. He has always worked as a consultant for the energy sector in Italy and abroad, dealing with all the major aspects of this market.



In the summer of 2012, a revolutionary idea was born: an underwater vegetable garden no bigger than a shopping bag. Today this garden is a pioneering, eco-friendly and self-sufficient system, but above all an alternative and economically viable form of farming. We are on the Ligurian coast, in the seaside town of Noli, and this is Nemo's Garden, the first underwater greenhouse system in the world.

This project was conceived by Sergio Gamberini, founder of Ocean Reef Group. From his brilliant mind comes an idea that is revolutionizing farming in the new millennium: a set of transparent biospheres in which plants of all kinds can grow, from strawberries to beans, from basil to tobacco. In recent months tobacco cultivation for pharmaceutical use has been started on a trial basis, after several lab studies found that plants grown in biospheres contain more essential oils and have greater antioxidant activity. These factors are essential in the pharmaceutical field to produce vaccines.

Agriculture accounts for 70 percent of the world's freshwater consumption. According to the Intergovernmental Panel on Climate Change (IPCC), the phenomenon of desertification caused by climate change has already significantly reduced agricultural productivity in many regions of the world. Nemo's Garden, a project with zero environmental impact, represents an alternative system of farming particularly suitable in areas where environmental or geomorphological conditions make growing plants almost impossible. The energy needed to operate the entire system is self-produced thanks to solar panels on the surface; the water to irrigate the plants comes from the condensation process that occurs on the inner walls of the biosphere, turning it from salt to fresh. With the exception of sowing and harvesting, which require human intervention, Nemo's Garden is totally self-sufficient. These exceptional characteristics offer hope that we have found a sustainable alternative agricultural system to help combat the challenges that climate change poses to our survival.

CHIARA DI GIORGIO

THE UNDERWATER GREENHOUSE

A group of divers admire Nemo's Garden and the surrounding seascape during a recreational dive. The metal structures in Nemo's Garden act as a shelter for marine life, promoting fish repopulation in the surrounding area.

© GIACOMO D'ORLANDO



PHOTOGALLER

Giacomo d'Orlando

is a self-taught documentary photographer, born and currently living in Italy. He began his career as an advertising photographer in 2011, but in 2015 he decided to move to Nepal and then Peru to break into the world of photojournalism. From 2018 to 2020 he lived between Australia and New Zealand. This prompted him to focus more on the environment, with particular attention to possible future scenarios caused by climate change.





BIOSPHERE IN WAITING

Three of the six biospheres that make up Nemo's Garden lay on the shoreline of Noli beach with a protective cover to prevent damage from external agents before being transported to the water for installation.



AN IDEAL ENVIRONMENT

Dario Piombo, an electrical engineer on the Ocean Reef team, empties the biosphere of seawater. Once the water is drained by suction through a simple plastic pipe, the biosphere will be filled with air from an oxygen cylinder specially brought down to create an ideal environment for plant growth. Once this is done, no more air needs to be added due to the photosynthesis process of the plants.









THE UNDERWATER FARMER

Portrait of Emilio Mancuso, biologist in charge of the plant growing process within the Nemo's Garden biospheres.



MARINE TRANSPORT The dark silhouette of Gabriele Cucchia, Ocean Reef team engineer seen from the seabed as he transports the top of the biosphere to the predefined installation site.





SUCCESS

What biosphere number 2 looks like at the end of the cycle of growing tobacco for pharmaceutical purposes. The lushness and size of the plants indicate yet another experimental cultivation success.

SHOOTS EMERGE

Within a few days of planting, the first basil shoots sprout from the hydroponic trays used within biosphere number 5.

IN THE TEST TUBE

Laura Pistelli, researcher of Plant Physiology at the Department of Agricultural, Food and Agro-Environmental Sciences, University of Pisa, looks at a test tube containing a hydro-alcoholic extract of basil grown within the biospheres of Nemo's Garden. The extract will be used to determine metabolites with antioxidant activity present in the plant.

HARVESTING AT SEA

Luca Gamberini and Teddie Falkeborn harvest basil plants inside biosphere number 1. After gently removing the cones from the hydroponic trays, avoiding contact with salt water, the plants will be placed inside multiple layers of plastic bags used to transport them to the surface.





THE PROJECT SYMBOL

The tree of life stands out in the center of Nemo's Garden. This metal structure not only has the task of separating and dividing the wiring destined for each individual biosphere but is also symbolic. It represents the core of the project, which is the possibility of growing land plants at the bottom of the sea.

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BRUSSELS' ACTION PLAN

by Brahim Maarad

IN THE FIGHT AGAINST CLIMATE CHANGE, THE EUROPEAN UNION HAS ALREADY TURNED SEVERAL RESOLUTIONS INTO CONCRETE ACTION. OPTIMISM PREVAILS IN THE EU, DICTATED BY THE SUCCESS OF GETTING MORE THAN 100 COUNTRIES TO JOIN THE GLOBAL COMMITMENT ON NATURAL GAS HE EUROPEAN UNION went into COP26 in Glasgow with three goals: first, to secure commitments to reduce emissions in this decade, in order to maintain the target of limiting global warming to 1.5 degrees Celsius; second, to meet the target of USD 100 billion per year in climate finance to developing and vulnerable countries; and third, to secure agreement on the Paris Regulation. As the conference ended, broad progress was made on all three fronts for Brussels.

In concrete terms, several commitments (and promises) from the European Commission (EC) have already been translated into action: the global commitment to reduce methane emissions by 30 percent by 2030, sought by the EU and the U.S., has been signed by more than 100 countries. Brussels has allocated an additional EUR four billion, bringing annual climate finance to vulnerable countries to 27 (out of the promised total of 100). The EC has joined South Africa's decarbonization strategy and has entered into a partnership with Bill Gates to mobi-

lize USD one billion to finance innovative projects in favor of the green transition. Brussels has announced a new strategy against deforestation—not only will it allocate EUR one billion from now until 2030, but it provides for a ban on imports of products that cause it. And it has inaugurated the Global Gateway, an investment plan (EUR 300 billion by 2027) for an Anti-Silk Road in China that is not only more democratic but also greener.

LOOKING AHEAD TO COP27 IN EGYPT

"If all long-term commitments announced in Glasgow will be implemented, we should keep global warming under 2 degrees. So we need to work further, so that next year's climate conference in Egypt puts us firmly on track for 1.5 degrees." This was a comment made by EC President Ursula von der Leyen at the conclusion of the Conference. "Everyone has to take their responsibility. In the EU, we will cut our emissions by at least 55 percent by 2030. We will become the first climate neutral by 2050. And we will continue to support our partners to speed their climate transition," von der Leyen promised.

Her deputy, Frans Timmermans, was more pragmatic in his COP26 report to the European Parliament: "[It] did not solve the climate crisis but that was also not the purpose. It had to bring the objectives of the Paris Agreement within reach and allow us to start implementing this deal. This it did," he explained. "[It] sharpened our focus and gave us momentum. I believe it does represent clear progress. I believe we're now traveling in the right direction, a direction set two years ago by the European Union," claimed the Dutch Socialist Commissioner, who oversees the climate dossier in Brussels. "The Glasgow COP embraced the highest level of ambition of the Paris Agreements as our common target. We now have a global consensus on the need to limit climate change to 1.5 degrees. Ten days after COP26 this almost seems like a given but ten days before we began, the mantra was still below two degrees, and some countries even challenged the fact that Paris ever spoke of 1.5," he pointed out.

"Two years ago in the COP in Madrid, the EU laid down our ambition for climate neutrality by 2050. At that stage, there was little to no movement from other major emitters in the G20. China, U.S., but also Japan, South Korea, India, Russia, Saudi Arabia and others. Since then, each of these countries has announced targets of their own, varying from climate neutrality in 2050 to net zero carbon emissions in 2060 and in a single case 2070, India. 90 percent of the global economy is now on a net zero trajectory, that was only 30 percent a year

ago," Timmermans recalled.

The European Commission's optimism is dictated by the success of getting more than 100 countries to join the global methane commitment. This initiative originated from the U.S. (the world's largest producer of hydrocarbons) and the EU (the largest consumer). The collective commitment is to reduce global methane emissions by 30 percent by 2030.

According to the latest report from the Intergovernmental Panel on Climate Change (IPCC), which Brussels draws on, methane is responsible for about

half of the net 1 degree Celsius increase in global average temperature since pre-industrial times. "Rapidly reducing methane emissions is complementary to action on carbon dioxide and other greenhouse gases, and is regarded as the single most effective strategy to reduce global warming in the near term and keep the goal of limiting warming to 1.5 degrees Celsius within reach," argues the EU.

The 105 countries involved in the initiative (however, China, Russia and Australia are missing) commit to a collective goal of reducing global methane emissions by at least 30 percent from 2020 levels by 2030 and moving towards using best available inventory methodologies to quantify methane emissions, with a particular focus on high emission sources. Delivering on the global commitment to methane would reduce warming by at least 0.2 degrees Celsius by 2050.

However, less convincing is the commitment to allocate USD 100 billion a year for climate finance for developing countries. The goal was to bring the target forward to 2023, but the concluding statement at COP26 does not specify a date. The EU,



CUT METHANE EMISSIONS BY 30 PERCENT BY 2030

The EU and U.S. have signed a commitment, the "Global Methane Pledge," endorsed by more than 100 countries (excluding China, Russia and Australia), to achieve a reduction in global methane emissions of at least 30 percent from 2020 levels by 2030.

DECARBONIZE SOUTH AFRICA

The governments of South Africa, France, Germany, the United Kingdom and the U.S., along with the EU, have announced an ambitious, long-term new partnership for a just energy transition to support South Africa's decarbonization efforts.

FINANCE CLIMATE ACTION

From 2020 to 2025, developed countries have pledged USD 100 billion a year for the climate to help the most vulnerable countries. The EU is the main donor, with over a third of the funds paid out, amounting to USD 27 billion.

COMMITMENTS AND TARGETS

INFRASTRUCTURE The Commission unveiled the Global Gateway strategy, an investment plan to build the world's sustainable digital, climate and energy infrastructure.

This is a commitment of EUR 300

billion over the next seven years.

PROMOTE

SUSTAINABLE

SUPPORT TECHNOLOGY FOR THE TRANSITION The EU has partnered with Bill Gates to mobilize

USD one billion between 2022 and 2026 to fund innovative green transition projects.



The bronze "Europa" statue in front of the European Parliament. The EU aims to reduce its emissions by at least 55 percent by 2030 and become climate neutral by 2050.



Ursula Von der Leyen, President of the European Commission.

Palm oil plantation in Indonesia. Brussels aims to prevent products responsible for deforestation,

such as palm oil, soy, timber, beef, cocoa and coffee, from entering the EU market. however, proved more generous by adding another four billion for its share, bringing it to USD 27 billion. "100 billion should be reached [...] in 2022, if our partners agree to step up further," said von der Leyen. But that may be little more than her wishful thinking.

There was some concrete action on this front in Glasgow: South Africa, France, Germany, the United Kingdom and the U.S, along with the EU, have announced a "Just Energy Transition Partnership" to support South Africa's decarbonization efforts. This is an initial commitment of USD 8.5 billion for the first phase of funding, through various mechanisms including grants, concessional loans and investments and risk-sharing instruments, including to mobilize the private sector. The partnership is projected to prevent up to 1-1.5 gigatons of emissions over the next 20 years and help South Africa move away from coal and accelerate its transition to a low-emissions, climateresilient economy.

TECHNOLOGY PUSH AND FIGHT AGAINST DEFORESTATION

Moreover, von der Leyen and Bill Gates, as founder of Breakthrough Energy, officially launched a pioneering partnership that will stimulate investment in essential climate technologies. The partnership will mobilize up to USD one billion be-

TACKLE DEFORESTATION

The European Commission has announced a EUR 1 billion contribution between now and 2030 to the Global Forest Finance Pledge. It also provides for a ban on the importation of the products that cause it.



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tween 2022 and 2026 to accelerate the deployment and rapidly commercialize innovative technologies that help deliver on the ambitions of Europe's Green Deal and meet the EU's 2030 climate goals. There are four areas of interest: clean hydrogen, sustainable aviation fuels, direct air capture and long-life energy storage.

For many observers, however, the real success of COP26 is the fight against deforestation: more than 100 world leaders, who lead the countries that are home to 86 percent of the world's forests, have pledged to halt deforestation by 2030, bringing to the table financial commitments (including private investment) in the amount of EUR 19.2 billion. The European Union has pledged one billion, 250 million of which are to be allocated to the Congo Basin (the Earth's second largest lung after the Amazon). But the Commission went further. A few days after the COP, Brussels unveiled its strategy to fight deforestation on another front: ensuring that only deforestation-free products are allowed on the EU market. "Between 1990 and last year, we have lost 420 million hectares of forest-that is an area larger than the European Union," explained Timmermans. And this is where the EU has important responsibilities. Its demand for commodities, such as palm oil, soy, wood, beef, cocoa and coffee and derivatives such as chocolate and furniture, is a strong driver of deforestation. It is precisely these products that have ended up in the crosshairs of the European executive's new action. "More and more citizens want us to put an end to this. Our proposal therefore creates a strong due diligence system. It ensures that we only import these products if we can ascertain that they are deforestation-free and produced legally," Timmermans announced.

The list, which now does have the ring of a political choice, could be extended in the future, assured the European Commissioner for Agriculture, Virginijus Sinkevicius. Companies will need to ensure that goods and products have not been produced on land cleared or degraded after December 31, 2020, and that they have been produced in accordance with the laws of the country of production. Failure to meet the requirements will result in a ban on placing the products on the EU market. "Those who consume forests will not have access to the single EU market. The sale of meat, soy, palm oil, wood, cocoa and coffee produced in areas of new deforestation will not be allowed," summarized the European Commissioner for Economy, Paolo Gentiloni.

Finally, also in the name of climate, the Commission unveiled the Global Gateway strategy to invest in building infrastructure around the world. This is a commitment of EUR 300 billion over the next seven years. "The EU [...] will offer its partners a response to the urgent needs to develop sustainable and high quality digital, climate and energy and transport infrastructures and strengthen health, education and research systems across the world, taking into account their needs and the EU's own interests," explained the European executive.

we

BRAHIM MAARAD AGI reporter. Brussels correspondent.

by Giandomenico Serrao

THE NEW GOVERNMENT HAS RAISED ENVIRONMENTAL TARGETS WHILE AT THE SAME TIME REAFFIRMING ITS SUPPORT FOR THE NATIONAL OIL INDUSTRY. WE SPOKE WITH AMUND VIK, THE STATE SECRETARY IN THE MINISTRY OF PETROLEUM AND ENERGY



Amund Vik was appointed State Secretary in the Norwegian Ministry of Petroleum and Energy on October 14, 2021. Mr. Vik has worked for the Norwegian Labor Party since 2010. Previously, he worked as a consultant for Nordic Energy Research.

ACED WITH SKYROCKETING gas prices in Europe and the rest of the world, Norway aims to consolidate its role as a gas supplier to Europe. The new government—which took office last October—looks to the energy transition and the COP26 pledges for decarbonization without, however, forgoing its own oil and gas industry, which represents 14 percent of GDP, 20 percent of revenues, over 40 percent of exports and employs 160,000 people.

The government, led by the Labor Party leader Jonas Gahr Støre, raised its environmental targets by announcing that it plans to cut greenhouse gas emissions by 55 percent compared to 1990 levels by 2030, approximately the same as the previous targets set between 50 and 55 percent. There is also a planned increase in carbon tax to 2,000 Norwegian kroner (EUR 200) per ton, compared to the previous 590 kroner. But the new government has also reaffirmed its support for the national oil industry.

We talked about it with State Secretary in the Norwegian Ministry of Petroleum and Energy, Amund Vik.

As Europe prepares for the green transition, insufficient gas supply in relation to demand is creating difficulties. What are the causes of this crisis and how long will it last?

The gas market has been globalized in recent decades and the

NORWENERGY

Norway is one of Europe's leading hydrocarbon producers. The Oil & gas industry accounts for 14 percent of GDP, 20 percent of revenue, more than 40 percent of fields of the Norwegian continental shelf.



SNØHVI

GOLIAT



European market has also been liberalized over time. Europe now has multiple sources of supply, is connected to the global gas markets through Liquefied Natural Gas (LNG) and has prices that are mainly linked to the trading that takes place in the main hubs. Gas prices in Europe are today increasingly influenced by the dynamics of the global gas market through the growing trade in LNG. Gas prices in Europe fell to historic lows last year and, at the moment, a combination of several factors has resulted in very high prices.

Do you and the whole of the Norwegian government intend to increase gas exports to Europe? How do we get out of the "energy crunch" that is affecting Europe and the world?

On the Norwegian continental shelf, there are companies that explore, produce and sell oil and natural gas. The high prices are a strong incentive to companies operating on the Norwegian continental shelf to produce gas. The quantity of gas produced and exported and transported depends on the capacity of the fields and the transport infrastructures of our continental shelf. The Norwegian pipeline system is currently in operation at near full capacity. Our fields are providing a steady yield of natural gas of approximately 110 billion cubic meters (bcm) per year in Europe. We should be able to sustain the current high level of gas exports for many more years, as the remaining gas reserves are significant and we continue to invest to find additional resources and develop more. We are investigating a possible increase in export capacity from the Barents Sea, including through an oil pipeline. There are currently no plans for an expansion of LNG capacity in Norway.

The Norwegian government recently said it wanted to strengthen the country's 2030 emissions reduction targets. At the same time, it announced that "the oil and gas sector will be developed, not decommissioned." Do you see gas as an important source for green transition and energy security?

Market developments this year demonstrate the importance of gas in heating, industry and power generation in Europe. In the future, I think gas will continue to be a key flexible source of heat and electricity that complements intermittent renewables and allows markets to move away from the use of coal.

GIANDOMENICO SERRAO AGI news agency journalist.



Lofoten Islands, Norway. The Norwegian government led by the Labor Party leader Jonas Gahr Støre raised its environmental targets by announcing that it plans to cut greenhouse gas emissions by 55 percent compared to 1990 levels by 2030.



Oslo Opera House, Norway.

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CONTRADICTIONS from the WHITE HOUSE

JOE BIDEN PUT CLIMATE ACTION AT THE CENTER OF HIS CAMPAIGN, BUT HIS ADMINISTRATION'S ACTUAL ACCOMPLISHMENTS ARE INCHING FARTHER AWAY FROM THE AGENDA AND APPROVAL RATINGS ARE FALLING

> UT EMISSIONS by 50 percent by 2030, add more forested areas and clean nuclear power to save the Earth from overheating. Joe Biden went to COP26 in Glasgow with a climate agenda unheard of in American history, warned that there is "little time" left to reduce emissions from fossil fuels ("an existential threat to humanity"), and pledged (taking up Greta Thunberg's challenge) that Washington is responding "with deeds, not just words." It all seemed good. Except that contradictions are alive in the White House. Because Biden also asked OPEC (and Russia) to pump more oil and gas to stop the runup in energy prices. The facts beckon Biden back to the present: the average U.S. price of gasoline is over USD 3.30, while heating bills have doubled, inversely proportional to the White House tenant's popularity rate.

"On the surface it seems like an irony... everyone knows that idea that we're going to be able to move to renewable energy overnight ... it's just not rational. No one has anticipated that





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Gasoline prices in the United States have soared since May 2021. In large areas of the country, the gallon exceeded USD 4, while the national average came in at USD 3.30. Home heating bills in the last few months of the year doubled compared to 2020. this year we'd be in a position—or even next year—that we're not going to use any more oil or gas. We're going to stop subsidizing those fossil fuels. We're going to make significant changes," explained the President, who has made the green campaign a permanent message of his policy. He got off to a flying start on his agenda: after taking office, he shut down the Keystone pipeline and banned the sale of new licenses (about a quarter of U.S.-made greenhouse gases come from extraction on public land). Yet his roughly USD 2 trillion climate and welfare mega-plan ("Build Back Better") maintains subsidies to the oil industry—estimated at about USD 20 billion a year—while providing incentives for over USD 500 billion for clean energy.

A DOSE OF REALITY

After the election campaign, once the party was over, came a dose of reality: "They [the American middle-class] have to get to their work. They have to get in an automobile, turn on the key, get their kids to school. The idea that we can—that there's an alternative to walk away from being able to get in your automobile is just not realistic," says Biden, called to account for yet another gap between his agenda and the concrete everyday deeds taking place between the White House and Congress.

A few days after Biden returned from Scotland, the ordeal in Glasgow over, the U.S. government arranged the largest sale of Gulf of Mexico exploration licenses by auctioning off 80 million federal acres, an area twice the size of Florida. A recent report by the International Energy Agency (IEA) indicates that all new exploration should be halted if the temperature increase is going to be contained within 1.5 degrees Celsius of preindustrial levels.

Biden's supporters became his critics. The Biden Administration boomeranged: "We are in a climate crisis. There is no room for the left hand and the right hand to be doing different things. It's not credible to say you're fighting for 1.5 degrees while you're calling for increased oil production," observes Jennifer Morgan of Greenpeace International.

Thirteen Republican states sued over the White House's freeze on new licenses and a federal judge in Louisiana agreed with them. The U.S. administration thus gave the green light to resume the "temporary" sale of licenses pending the appeal process. New auctions are scheduled early next year in Wyoming, Colorado, Montana and other western states.

"The real kicker isn't even that the President has been hostile to conventional sources of energy. The issue is how he has responded [to] rapidly rising gas prices ... instead of helping U.S. oil and gas companies produce more here at home, [he] started begging OPEC to pump more oil, Biden's hypocrisy about energy is unbelievable," says Texas Republican Congressman August Pfluger, from the state's 11th Congressional District, the Permian Basin, where nearly half of America's oil is extracted.

BIDEN UNDER FRIENDLY FIRE

What are the solutions? They're all medium- to long-term, but Biden doesn't have time, he's due for a midterm vote in 2022, and polls are like a barometer when it points to a storm. The President would like to make "Build Back Better" the cornerstone of his time in the White House, the culmination of his long political career. What Obamacare was for Barack Obama. What's in Biden's shopping basket? It contains rebates that cut the cost of installing solar panels on homes by 50 percent, incentives that discount the cost of electric cars by USD 12,500, the Clean Energy and Sustainability Accelerator for investments in clean energy production and the creation of the Civil-



ian Climate Corps (over 300,000 climate volunteers). All very expendable in terms of communication. But then there is reality knocking at the door: the "green" plan that doesn't confront the economic reality (rampant inflation) and reveals that politics involves not only the adversary (the Republicans) but also the unexpected "enemy within." Biden and the Democrats face the problem of a slim majority in the Senate where Senator Joe Manchin's vote becomes decisive, especially when he says no to Biden's plan. The West Virginia senator, "citing concerns about adding to the national debt [and] rising inflation," risks dealing the death blow to America's climate revolution. President Biden will eventually bring his rebuilding plan home, but we can predict one thing: it will be less green and more black.

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RITA LOFANO

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Hydraulic fracturing plant for oil extraction in the United States. U.S. President Biden has partially backtracked from his election platform on the issue of phasing out hydrocarbons, stating that we cannot move to renewables "overnight."





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HEN PRIME MINISTER Fumio Kishida arrived in Glasgow at the last moment, after securing victory in the general election in Japan, he gave a rather cautious speech on achieving carbon neutrality. The goal remains to achieve net-zero emissions by 2050, as announced by his predecessor Yoshihide Suga, and to reach 46 percent fewer emissions than 2013 levels by 2030. But Mr. Kishida chose not to give a roadmap, and perhaps not to make promises he might be unable to keep. Rather, Japan has made funding available to Asian countries, providing up to USD 10 billion over five years to help Asian developing countries make the long journey towards net-zero carbon emissions

tries make the long journey towards net-zero carbon emissions. The diplomacy of writing the check, typical of Japan, strikes

by Giulia Pompili

THE TEST

EAST

THE GOAL OF ZERO EMISSIONS: FROM POLITICS TO INDUSTRIAL STRATEGY. ASIAN DEMOCRACIES ARE THE PLACE TO LOOK TO UNDERSTAND HOW POLITICS WILL TACKLE THE CHALLENGE OF CLIMATE CHANGE WITHOUT FORGETTING GROWTH

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again. Then Mr. Kishida announced an allocation of USD 100 million for research, which on the one hand will seek to perfect a new generation of energy powered by hydrogen or ammonia and, on the other hand, will study new energy models compatible with economic growth. The Tokyo government is also investing heavily in researching the perfect battery, inspired by the work of the 2019 Nobel Prize in Chemistry winner Professor Akira Yoshino, who in the 1980s invented the first rechargeable lithium-ion battery. Japan registers more patents than any other country in the battery sector, and today dozens of its universities host international scientists and as many are welcomed by the research centers of large industries.

BECOMING A NET-ZERO EMISSIONS LEADER

From the point of view of international politics, Japan, the world's third largest economy, would like to become the leader in the fight against climate change in Asia. It shares this aspi-

ration with the world's second largest economy, China, a country of contradictions. China is the largest emitter of greenhouse gases in the world and the giant that few trust, but at the same time it is the world leader in the field of renewables. President Xi Jinping launched his green strategy a few years ago, designed to limit pollution and transform the People's Republic of China into the most responsible country in the field of climate change. The eyes of the world are therefore on Asia when it comes to reducing emissions. In this part of the world, made up of 58 countries and 4.4 billion

people, it is estimated that energy demand will double by 2030, and today it accounts for approximately 53 percent of global demand. In order not to halt the economic growth of the smaller but important countries in the Asia-Pacific region, China, Japan and South Korea know that they need to focus on an efficient energy system that limits emissions.

The case of Japan, among the industrialized countries in Asia, is the most interesting for understanding how politics move and what concrete solutions are on the table, solutions beyond Western slogans. Because Japan is devoid of natural resources, it is dependent on imported coal, and has been especially so since March 11, 2011, the day of the triple catastrophe—earth-quake, tsunami and an accident at the Fukushima nuclear power plant—which changed everything. In the days following the tragedy, all Japanese nuclear power plants were gradually shut down. As major protagonists of Japanese economic growth in the 1980s and 1990s, the lack of transparency on security

systems—demonstrated by the failure of TEPCO, the company that still manages the Fukushima plant today—prompted the Tokyo government to take "a pause for reflection," as the response to nuclear power was defined by the Japanese media. But slowly, over the past decade, the anti-nuclear front has become strong, influential on public opinion, and above all bipartisan. At the same time, there has also been growing debate on environmental safety and climate.

To explain how climate change affects daily life, the Japanese often use the example of cherry blossom trees. In one of the oldest national traditions in Japan, on the occasion of hanami, festivals and picnics are organized under the trees to enjoy the flowering of cherry blossoms, the symbol of rebirth after the long winter. Every year, the Japanese Meteorological Agency publishes the blossom forecast calendar between March and April, which varies according to the different areas of the archipelago; but in recent years, spring comes earlier and earlier

and wetter. Sudden rains ruin the party and the blossoming. In addition, according to the latest report by the Japanese government, in the prefecture of Okinawa, the southernmost archipelago of Japan, there are a month and a half more days of extreme heat (called "moshobi," the days in which the temperature exceeds 35 degrees Celsius) than in 1930. In the northernmost prefecture of Hokkaido, famous for its winter festivals and ski resorts, there is 14 percent less snow. Throughout Japan, torrential rains are increasingly frequent, as well as droughts and especially typhoons. The season

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of tropical storms runs from May to the end of September, but in recent years they have become more powerful and more frequent. Climate change affects the daily lives of Japanese citizens. This is more or less what has happened in the last fifteen years in South Korea, where the capital, Seoul, periodically experiences the phenomenon of "airmageddon," days in which the government must ask citizens to stay indoors because of the high concentration of fine particles in the air. The industries that have made South Korea the fourth largest economy in Asia, the Tiger ready to overtake Japan, are the same that today force children to play indoors and shoppers to go underground.

PROTECTING THE ENVIRONMENT, BUT ALSO DEVELOPMENT

Even the Chinese Communist Party has understood that environmental safety, directly linked to health, is a sensitive issue for public opinion, but at every international summit, its leader



To explain how climate change affects daily life, the Japanese often use the example of cherry blossom (pictured, in Tokyo). Every year, the Japanese Meteorological Agency (JMA) publishes the calendar of blooms. In recent years, spring has been coming earlier, loaded with moisture. Sudden rains ruin the traditional party, and the blooms.



Worker at work at a solar panel production line in Hai'an, Jiangsu Province, China.



Gangnam Style statue, inspired by the dance from the song of the same name that, in 2012, made the Gangnam district, one of the richest in Seoul, famous worldwide. The Korean capital periodically witnesses the phenomenon of airmageddon, days in which the government asks citizens to stay indoors because of the high concentration of particulate matter in the air.

ENERGY CONSUMPTION AND ECONOMIC GROWTH

By 2050, global energy consumption in the International Energy Agency (IEA) Reference Case increases by nearly 50 percent compared to 2020, mainly due to non-OECD economic and population growth, particularly in Asia. Nearly all the growth in world energy consumption occurs in non-OECD Asia, driven by economic growth.

Source: International Energy Outlook 2021 (IEO2021)

AVERAGE ANNUAL PERCENTAGE CHANGE IN GDP, 2020-2050, SELECT REGIONS



ASIA

AMERICAS

EUROPE



ENERGY CONSUMPTION BY REGION [Quadrillion British thermal units]



OTHER AMERICAS

3.13627%

OECD •

HYSTORY

2050

2040

2020

20

30

3.32301%

PROJECTIONS

NON-OECD

MIDDLE EAST AFRICA

100



OTHER EUROPE

AND EURASIA

3.26755%





INDIA 5.36616%

RUSSIA

1.41953%

ASIA MIDDLE EAST AFRICA AMERICAS EUROPE AND EURASIA

200.

OTHER ASIA

3.85529%

CHINA

3.30893%

The IEO2021 Reference Case reflects current trends and the relationships between supply, demand and prices in the future. It is a base case built to be compared with cases that include alternative assumptions about economic factors, prices, policy changes or other determinants of the energy system, in order to estimate the potential impact of these assumptions.

ENERGY: CONSUMPTION AND PRODUCTION IN NON-OECD ASIA

100

Non-OECD Asia leads growth in liquid fuels consumption but has a limited increases in crude oil production. Therefore, it does not have adequate production to meet the growing demand and most of the crude oil it uses comes from the Middle East.

INDIA OTHER NON OECD ASIA CHINA





CRUDE OIL PRODUCTION BY SELECT REGIONS [Million barrels per day]





Xi Jinping stresses the necessity to "balance the protection of the environment and economic development, addressing climate change but also safeguarding people's livelihoods." Last year Xi Jinping announced that China will reach carbon neutrality by 2060, but only after reaching peak emissions by 2030. Beijing has made it clear that it is not the time to abandon fossil fuels and has even hinted that there will be an expansion in use in the next four years. "Common prosperity," that is, Xi Jinping's political strategy in which wealth is widespread, can only be achieved with a long-term plan of action. A government document published a few days before COP26 in Glasgow showed how, in parallel with the use of coal, China wants to "reduce waste, further promote renewables and unconventional fuels and reform the electricity network." Within the next ten years, Chinese energy produced by wind and solar plants is expected to reach 1,200 gigawatts. The Chinese political system allows the use of transformations in forced stages every five years, according to rigid protocols that have no electoral consequences. The situation in the Asian democracies is very different.

The Japanese Ministry of the Environment had never been particularly influential in Tokyo. However, in 2019, then Japanese prime minister Shinzo Abe decided to transform it into the public, even international, face of his government. In one of the latest government reshuffles, he appointed as Environment Minister a Japanese political star, Shinjirō Koizumi, son of the hugely popular former prime minister Junichirō Koizumi. Koizumi junior is young, not even forty, speaks fluent English and is very telegenic when he arrives at international climate summits. In one of his first public outings, he said that the war on climate change had to be "cool" and "sexy." But apart from the media appeal of his expressions, he has never spoken of a concrete strategy for the conversion of Japan. His father, Junichirō Koizumi, Shinzo Abe's political mentor, is among the most famous conservatives in modern Japanese history, in part because he has now been out of politics for ten years and has turned into an anti-nuclear activist. The Japanese Conservative Party therefore experiences an internal division on the energy transition, which is not only ideological but also practical. On the one hand, there are the repentants, those who want to do away with coal-almost all imported-and also "the cleanest energy currently available, nuclear power," because Fukushima "showed that absolute safety cannot be achieved." According to most of the ideologues of this point of view, Japan, forced to rethink its energy system from scratch, could be an example for other industrialized powers. On the other hand, there is the current of the government, which would like to use nuclear power to restart the Japanese economy as soon as possible. There are already a dozen reactors across the country that have been restarted, and Mr. Kishida has said that when it comes to energy needs, you must be pragmatic. One of his first visits after





being appointed Prime Minister was to the Fukushima nuclear power plant.

SOUTH KOREA'S CHALLENGE

On September 1, South Korea became the fourteenth country in the world to introduce a law on carbon neutrality. Democratic President Moon Jae-in, who will end his term in March, wanted Parliament to legislate on the matter so that the goals-to reduce greenhouse gas emissions by 35 percent or more compared to 2018 levels by 2030 and achieving net-zero emissions by 2050-could not be changed by future governments. For South Korea, an economy that in recent years has been growing rapidly and is being relaunched on the global stage, it is a rather grueling challenge, as it is the 13th largest emitter in the world and accounts for about 1.38 percent of global emissions. But it is above all the kind of economy that will be difficult to decarbonize because it depends on industries such as steel, automotive and semiconductors, which require vast quantities of hard coal, and relies on fossil fuels for 67 percent of the country's production of electricity. As a result, per capita carbon dioxide emissions in South Korea total 11.7 tons, one of the highest levels in the world. Renewables are still an expensive and impractical option in the country, accounting for only 5.5 percent of energy production and, according to the Federation of Korean Industries, the geographic conformation combined with the high population density prevents the construction of new plants. The need to restrict imports to strengthen Korean industry, especially in key sectors, will inevitably lead the government to consider the nuclear option. Perhaps it will happen after the end of the term of Moon Jaein, whose campaign in 2016 promised not to build additional nuclear plants in addition to the four already in operation. (They meet 22 percent of the nation's energy needs). In any case, East Asia, and especially the democracies of this area, are the place to look to understand how politics-that are more pragmatic and less prone to slogans-will react to the public's growing demand for change without forgetting growth. we

GIULIA POMPILI

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FOR BEIJING, THE GLASGOW CONFERENCE WAS NEITHER A COMPLETE FAILURE NOR A RESOUNDING SUCCESS. IT WILL BE REMEMBERED FOR XI'S ABSENCE AND THE WATERING DOWN OF THE COAL PHASE-OUT, BUT ALSO FOR THE U.S.-CHINA JOINT DECLARATION



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S THE WORLD'S LARGEST emitter of greenhouse gases, China's attitude and position in global climate negotiations is critical if they are to be successful, so in the run up to COP 26 all eyes were on China. Beijing likely believed that its announced climate targets—peak emissions before 2030 and carbon neutrality by 2060—were a testament to its ambition and willingness to take a leading role in global climate negotiations. Nonetheless, Chinese President Xi Jinping's absence from COP26 and his reluctance to commit to phasing out coal in the near term weighed heavily on perceptions. But success at COP26 was going to be subjective and China's position was always likely to be ambiguous, as it has to manage a domestic power crisis, one which has led to an uptick in coal consumption. But at the same time, the country continues to develop a roadmap for peaking emissions and decarbonizing.

THE GAP BETWEEN AMBITION AND REALITY

In September 2020, Beijing announced a unilateral pledge to peak emissions before 2030-moving up the timeframe from its previous nationally determined contribution (NDC) to peak emissions by 2030-and more importantly to reach carbon neutrality by 2060. This was the first such pledge from a developing nation that, while low on details, promises to fundamentally transform the country's energy mix, from its current reliance on fossil fuels for 80 percent of the energy mix to nonfossil fuels accounting for 80 percent of the mix by 2060. The announcement also prompted Japan and South Korea to issue their own 2050 net zero targets. But one year later, when COP26 finally convened, pressure was mounting from the international community for China to ratchet up its ambition even further. Moreover, going into the meeting, expectations were further raised by science showing the unequivocal impact of climate change, with the last seven years the hottest on record.

From Beijing's perspective, its 30-60 targets are already a huge contribution to global efforts. Had COP26 taken place as planned in 2020, China would have likely gone into it lauded for its ambitious commitments. From an international perspective, however, China's failure to raise the level of ambition further and to issue a more specific roadmap to achieving these goals were seen as barriers to global efforts. Yet given that countries had updated their NDCs ahead of the conference, major increases in ambition during the two weeks were always unlikely. The UK presidency therefore chose to opt for sectoral deals on halting and reversing deforestation, ending the use of coal and controlling methane emissions. In the second week, further commitments were made on electrifying vehicles and phasing out oil and gas.

SELECTIVE SIGN UPS

Even though China signed some of the pledges, it did not join them all: for instance, it signed up to the global deforestation pledge, which it had not done in 2014, but failed to adhere to the global methane pledge. Nonetheless, the Chinese delegation did announce that China would issue a domestic action plan to cut methane emissions in the coming year, an important step forward. The question of methane emissions is closely linked to China's coal sector and the challenges it faces with a phase-out. Since coal currently accounts for 57 percent of China's energy mix, decarbonizing the power sector and the economy will take time. Furthermore, like many developing nations, the Chinese economy is growing and increased urbanization is underway, so energy use is set to rise. Even though



in 2020 China was responsible for nearly 50 percent of global renewable capacity addition, it also continues to add coal-fired capacity. Indeed, COP26 took place as power outages limited supplies and economic activity throughout China, prompting the government to expedite coal output. Indeed, given China's economic expansion and ongoing energy needs, coal and oil demand are set to peak in the mid-2020s, but gas consumption is expected to rise through the 2030s. Because of these domestic constraints, the Chinese government is currently designing its roadmap to 2060, seeking to limit coal use and cut emissions, but it has also argued that it prefers to under-commit and overperform. Ultimately, China's pledges are determined by its domestic agenda and even though the leadership is committed to achieving net-zero, the short-term imperative of supply security and economic expansion inform Beijing's international pledges. For these reasons, China has clearly positioned itself within the developing world in international climate negotiations, gradually assuming a leadership role of the Global South. While

China and India were widely chided for their role in watering down the language around phasing out coal—which the U.S. also ultimately supported—Beijing pushed back against developed nations for failing to deliver on the funding pledged to helping developing nations transition. As part of the developing world, China can point the finger at richer nations, but there are undoubtedly potential economic benefits for China from increased financing for renewables and cleantech, because it dominates the supply and processing of most of the raw materials for clean technologies. Success at COP26 is therefore highly subjective: the final document was the first to include language around fossil fuels, but it was not as strong as the UK presidency had hoped it would be. Equally, NDCs were only partly ratcheted up, but more countries pledged net-zero and several sectoral agreements will now be able to drive change.

THE END OF MULTILATERALISM?

The choice of unilateral vs multilateral pledges at COP26 also

highlighted China's ambiguity. At COP21 in Paris, China's emergence as a key contributor to the success of Paris was facilitated by a combination of its strong domestic agenda—given that economic activity was slowing and coal use was falling and international coordination, especially with the U.S.. In Glasgow, there was limited coordination between the EU and the U.S. ahead of time. In the context of fraught U.S.-China relations, especially during the Trump Administration, Xi Jinping's 30-60 pledge in September 2020 was issued unilaterally, a week after a China-EU summit in which Beijing did not disclose its intention to pledge a net zero target and ahead of the U.S. presidential elections. Beijing was clearly signalling that it was taking a leading role alone.

The U.S.-China joint declaration toward the end of the summit injected renewed momentum in the final talks, although it did not drive them. The outcome, known as the Glasgow Climate Pact, was flawed but was not as bad as some had feared going into the meeting. The summit agreed to rules on global carbon markets and commitments to toughen up national climate plans, with periodic evaluations, maintaining the key goal that of limiting global warming relative to pre-industrial levels to 1.5 degrees Celsius. Interestingly, the U.S.-China joint declaration was credited with boosting hope and confidence, even though it offered no new commitments and was essentially a reiteration of unilateral action points issued simultaneously.

The specific pledges regarding methane and deforestation are significant because these issues are now squarely on the global agenda, but COP26 would have achieved these even without the U.S.-China joint statement. To be sure, the signal that despite U.S.-China rivalry the two sides were able to come together on a matter of huge significance was important. And even though the Glasgow Declaration, unlike the U.S.-China joint announcement in 2014, did not lead to more ambitious commitments from China or the U.S., it did create new opportunities for regular exchanges between the U.S. and China, including an agreed meeting in the first half of 2022 to focus on measurement and mitigation of methane. Moreover, the decision to create a "Working Group on Enhancing Climate Action in the 2020s" that will meet regularly will help establish working relations between the U.S. and China following several years of limited engagement and a no-trust environment. It remains to be seen how regularly the Working Group meets, the makeup of the delegations and the topics it discusses. If regular meetings on climate can deliver global regulatory frameworks and environmental standards, or progress on new technologies such as Carbon Capture, Utilization and Storage (CCUS), they will generate real momentum on climate change too.

For China, COP26 was, at the end of the day, not a complete failure but not a resounding success either. From an international reputation perspective, COP26 will likely be remem-



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bered for Xi's absence, for the watering down of the coal phase out, but also for the U.S.-China joint declaration. The significance of China's domestic pledges, the 30-60 targets, alongside signing on to the deforestation efforts and promises to publish its own methane emissions action plan, are hugely significant for global efforts. They were, however, partly overshadowed by the lack of detail around their implementation. China's growing economic and political clout also masks the fact that it is still a developing country in many aspects. In the balance of considerable challenges and large ambitions, it was a case of both good COP and bad COP for China.

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THE ASIAN GIANT SURPRISED THE WORLD WITH BOLDER THAN EXPECTED ANNOUNCEMENTS AT COP26. PRIME MINISTER MODI PROMISED ACTIONS THAT REQUIRE MOONSHOT EFFORTS, QUANTIFIABLE FROM A FINANCIAL POINT OF VIEW AT USD 1000 BILLION

ROM DAY ONE to the final hours of the United Nations Climate Change Conference (COP26) in Glasgow this year, India remained in the headlines. This is emblematic of the country's importance in the global energy landscape as indicated by this year's India Energy Outlook produced by the International Energy Agency (IEA). It also reflects the importance the world places on the energy choices of a nation whose population had a miniscule historic role in dumping carbon emissions into the atmosphere yet whose decisions today will no doubt have an impact on the limited carbon sink we all share. To that end, India's Prime Minister Narendra Modi started the summit by announcing an incredibly ambitious, ratcheted up and nationally determined contribution (NDC) target for 2030 and announced the nation would achieve net-zero carbon emissions by the year 2070. All of this will undoubtedly have an impact on the country's energy landscape, which is already in the eye of a transition storm. It will also require that partner nations, civil society organizations and private sector entities, including companies as well as financiers, roll up their sleeves and find ways to meaningfully help India attain the vision it has so clearly laid out in Glasgow.

TRANSITION TIME

While the headlines from India's announcement gravitated towards the net-zero carbon emissions target of 2070, the more impressive targets are the near-term ones that aim to not only decrease the carbon emissions intensity of its economy to less than 45 percent (of 2005 levels) but also meet 50 percent of the electricity requirements, currently at 10 percent, from renewable energy, all by 2030. This herculean task will require tremendous amounts of capital expenditure, which the IEA estimates in one of its scenarios to lead to India using USD 1 out of every 7 spent globally on energy storage and renewable energy technologies. The government of India intends that as much as possible of this capital will be spent on India-based manufacturers, and rightly so if it is to own its remarkable energy transition and create jobs. This also presents an incredible opportunity for foreign firms to set up shop and partner with local entities to be a part of the localized renewable-energy value chain.

But as renewable energy takes up more of the electricity capacity of India, pressure will mount on India's coal sector, which is under tremendous stress, predominantly to feed power plants that operate at flagging levels of operational efficiency. Furthermore, poor revenue collection by electricity distribution companies, which are unable to pay for fuel stocks on time, and the inability to accurately gauge demand by those state owned utilities, lead to regular swings between coal supply surplus to shortage. These problems are of course exacerbated by the higher rates of variable renewable energy entering India's generation capacity mix. Yet by endorsing the final statement of COP26 that included language of a "phase down" of coal, India has indicated that it is reading the writing on the wall. While it may take some time, the planners in-country will need to get activated on what an energy future for the country looks like that does not include coal.

To manage this inevitable transition, India has already joined three other countries (South Africa, Indonesia and the Philippines) to receive pilot funding from the World Bank's Climate Investment Funds (CIF) under the Accelerating Coal Transitions (ACT) program that will enhance in-country capacity to manage coal transitions. The USD 2.5 billion in resources unlocked for the four countries will be crucial for India as the work of coal transition will be long and drawn out. New research from National Foundation for India indicates that 13-20 million people across various sectors linked to the coal value chain are likely to be impacted by a transition away from coal. In addition to ensuring a just energy transition for those people, managing this transition will require careful calibration of state budgets, particularly those dependent on the coal value chain, and new management plans for large public sector enterprises like Coal India Limited, the Indian Railways and India's central power generation company, NTPC.

FINANCING THE TRANSITION

The scale of financing required to deliver on India's COP26



pledge is significant and it is no surprise that Prime Minister Modi focused in his summit statements on the need to mobilize USD 1 trillion to support his nations' vision. And while the calls for developed nations to mobilize this finance for poor nations has been a consistent theme in the climate negotiations, delivering it has been difficult. Thus, some answers for mobilizing finance will have to come from within India itself and the enabling environment it creates to lure private capital towards its lucrative energy market transition opportunities. To put things into perspective, the IEA states that the amount India needs to support its most ambitious clean energy scenario for the country is roughly the same as its likely oil import bill of USD 1.4 trillion by 2030. This means the more India chips away at transitioning its transportation sector towards electricity, the better.

While already a leader in issuing green bonds and running competitive auctions to bring down the cost of large-scale renewable energy projects tariffs to record lows, the country should consider experimenting with transition bonds. These bonds, rather than focusing on the addition of renewable energy capacity, could raise capital to transition some of the country's large fossil fuel value chain oriented public enterprises towards clean energy value chain business verticals. Already Coal India Limited, NTPC and Indian Oil have shown that they are entering the renewable energy business but this pace could be accelerated. Supporting these state-owned institutions to make the transition will be crucial to ensuring a just transition that saves jobs and vital social infrastructure associated with these venerable institutions.

And while foreign private capital and the private sector continue to support the growth of India's clean energy transition, it is domestic financial institutions (public and private) and the government financial management machinery that needs to catch up and create a solid framework in support of a climatealigned economy. A recent report by Carbon Tracker indicates that the Mumbai Stock Exchange has the highest number of listed firms (including state-backed ones) that face a high risk of asset stranding (pegged at USD 59 billion) due to holdings

INDIA'S ENERGY BOOM

India's booming economy and population will lead to a greater increase in energy demand than any other country, in all IEA projections to 2040. Before the pandemic, the increase in Indian demand was estimated at around 50% between 2019 and 2030. The current expected growth is closer to 35% in the Stated Policies Scenario (STEPS) and 25% in the Delayed Recovery Scenario.

ENERGY DEMAND GROWTH IN INDIA BY SCENARIO, 2019-2040





HOW THE ENERGY MIX WILL CHANGE

Solar energy in India will boom in the coming years, matching the share of coal in the Indian power generation mix within two decades in the Stated Policies Scenario (STEPS). Today, solar accounts for less than 4% of the country's electricity production and coal is close to 70%. By 2040, the two sources will converge at around 30% according to STEPS.









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Traffic on the streets of Hyderabad in South East India. According to the IEA, India will need an amount equivalent to that spent on oil imports, or USD 1.4 trillion, to implement its ambitious decarbonization plans.



A cyclist in front of the tall Bombay Stock Exchange (BSE) building in India.



Solar engineer Minakshi Diwan handles maintenance work on the solar plant in the village of Tinginapu, in the Indian state of Orissa. Minakshi is one of four women trained by the Orissa Tribal Empowerment and Livelihoods Program (OTELP), an organization funded by the Department for International Development (DFID), to install solar lighting in their village, which has been without electricity for over 15 years. in the coal value chain. Resolving this bad debt crisis and starting afresh with new lending guidance to create a manageable generation portfolio as India makes the transition is key. For this, guidance to public and private lenders from India's central bank, the Reserve Bank of India (RBI), which recently joined the Network for Greening the Financial System (NGFS), will be key. Through this association the RBI will be able to build awareness about climate-related risk among regulated financial institutions and integrate climate-related risks into financial stability monitoring.

INDIA AS THE FULCRUM

In its latest outlook the IEA states that India has arrived at the center of the global energy stage in terms of energy consumption and projected growth—more than any other country over the next 25 years. The fact that it is doing this in the backdrop of a global consensus to limit carbon emissions while experimenting with incredible innovations in energy technologies and the business models to deploy them is commendable. This makes India well poised to share lessons and be at the center of the global energy stage in ushering forth the global energy transition. To that end, India needs to continue to develop the

role of the international organization it launched at COP21 in Paris, the International Solar Alliance (ISA). The next phase of this coalition would be to have Indian state-run entities such as NTPC provide technical assistance to developing member countries with less robust renewable energy markets to develop projects based on the lessons NTPC has gained from in-country projects. By taking on such a role, NTPC could continue its evolution focusing on expanding its clean energy business vertical.

Perhaps nothing symbolizes India serving as a fulcrum of the global energy landscape more than its launching of the Green Grids Initiative—One Sun, One World, One Grid (GGI-OS-OWOG) at COP26 in Glasgow. This effort will aim to build out a transnational network of connected transmission lines and solar parks to allow for the flow of green electrons from one part of the world to another. While this may seem like a difficult proposition, regional cross-border transmission networks already deliver electricity between India and her neighbors and there are plans for other super grids in southeast Asia. As India undertakes the task of building a regional power market across complex unintegrated geographies, it is well poised to lead this effort.

India surprised the world with bolder than expected announcements at COP26. Prime Minister Modi is shooting for the moon because we need moonshot efforts for this decisive decade of climate action. But moonshots are hard to achieve alone and without the right tools and processes in place. While the country is open to partner with foreign collaborators as it charts this new ambitious course, it must also continue to undertake reforms at home to deliver on its international commitments.

we

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IN GLASGOW, THE DIVERSE AFRICAN CONTINENT HAS PARTICIPATED IN THE NEGOTIATIONS FOR THE MOST PART AS A COHESIVE FRONT UNITED BEHIND THE REQUEST TO SCALE UP FINANCIAL COMMITMENTS, IDENTIFIED AS THE NECESSARY CONDITION TO ACHIEVE A JUST TRANSITION

by Giulia Sofia Sarno

URING THE PANDEMIC, rich countries have mobilized unprecedented resources. For developing economies, the comparison with the response to the climate emergency that is ravaging the Global South was striking, especially as Organization for Economic Cooperation and Development (OECD) data confirmed that wealthy nations failed to respect their commitment to deliver USD 100 billion annually in climate finance by 2020. For Africa, international financial support is critical to face the pressing challenges of climate change while ensuring timely implementation of sustainable development plans. At COP26, finance-related dossiers had the highest priority for the continent, which is characterized by a unique vul-

FINHNEE

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nerability to climate change and reduced capacity to adapt. The World Meteorological Organization has found that Africa is warming more and at a faster rate than the global average, while its geographical vulnerability is exacerbated by unsustainable debt levels, high rates of poverty and financial and technological constraints. Data from the International Monetary Fund show that Sub-Saharan Africa alone has lost over USD 520 million annually in economic damage caused by climate change since 2000. Efforts to adapt will also be very expensive and costs for Sub-Saharan Africa are estimated at USD 30–50 billion annually in the next decade, excluding even higher costs for disaster relief. Despite the shared climate vulnerability, Africa is highly heterogenous and hosts countries facing diverse climate-related threats, with different socioeconomic conditions, energy systems and energy transition potential. A first distinction should be drawn between oil and gas producing states and those that are not endowed with fossil fuels. A second major difference is drawn by the Sahara Desert dividing the Northern region from Sub-Saharan Africa. From an energy perspective, the Sub-Saharan region is characterized by high rates of energy poverty. According to Sustainable Development Goal (SDG) 7 Tracking Report, Sub-Saharan Africa is home to 75 percent of the global population without access to electricity and to the 20 countries with the lowest access rate. In spite of significant progress in electricity access over the last ten years, due to rapid population growth the absolute deficit has grown, with 570 million people lacking electricity in 2019. The Covid-19 crisis could further worsen the situation, leading to 630 million people with no access by 2030. As electricity demand is expected to at least quadruple by 2040, universal and sustainable access remains a very challenging goal for Sub-Saharan African countries.

Energy transition, climate change and development challenges are deeply intertwined in the continent and the core question for Africa is what type of energy sources will fuel its future. In Glasgow, the diverse African continent has participated in the negotiations for the most part as a cohesive front united behind the request to scale up financial commitments, identified as the necessary condition to achieve a just transition.

THE NEGOTIATIONS

One of the key requests of the African Group of Negotiators (AGN), representing all African countries, was to discuss past and future climate targets. The agreement signed in Glasgow urges developed economies to deliver on the USD 100 billion commitment, which in 2019 reached only USD 79.6 billion annually. Unfortunately, the agreement lacks reference to making up the shortfall for the period 2020-2022 when the target is expected to be missed. With regards to the post-2025 target, the main request by developing countries was to calculate it based on a scientific analysis of their needs. In an early draft of the agreement, the AGN and others proposed a target of USD 1.3 trillion per year with a "significant percentage on a grant basis," which was rejected. The specification on grants is essential. Recent studies have demonstrated that high debt levels are linked to higher climate vulnerability. The core idea is that indebtedness reduces capacity to invest in climate action, which leads to further debt to repair the damages and losses of adverse events, and to higher borrowing costs caused by the increased climate risk in the country. This vicious circle can only be interrupted by increasing the share of grants over loans in financial support for development and climate action. The lat-





In 2019, the total climate finance allocated by developed countries to developing countries

was USD 79.6 billion, more than 20 billion less than the 100 billion pledged in 2009 at COP15.

est data show that currently 71 percent of climate finance is still made of loans.

Not just the quantity but also the quality of climate finance was a priority for Africa. Finance should be predictable, accessible, grant-based and delivered transparently. For the AGN, it was a priority to "achieve at this COP a transparency framework with strong rules on accounting" to ensure a rigorous reporting on the support provided, needed and received. Developing countries insisted also on discussing a working definition for "climate finance" to clarify what exactly counts towards the target. Issues such as double counting between development aid and climate finance are frequent, reducing the amount and number of additional resources for climate action. Another crucial priority for the AGN was finance for loss and damage, which refers to unavoidable impacts of climate change that cannot be adapted to. The request was to set aside new and additional funding for loss and damage, an option rejected by rich nations. Nevertheless, the Glasgow Pact establishes a dialogue "to discuss arrangements" for funding.

Finally, the balance between mitigation and adaption finance was a high priority for the AGN that advocated for a 50-50 percent rule. The latest OECD data show that finance is heavily skewed towards mitigation projects (64 percent) mostly because they are seen as more profitable than adaptation. Aiming at obtaining a stable and predictable source of funding for adaptation, the AGN was the leading negotiating group to demand that part of the revenues gained from carbon market mechanisms ("share of proceeds" in Article-6 negotiations) are dedicated to adaptation. This proposal was not agreed upon, but



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the AGN scored a victory as progress was achieved on setting a "global goal on adaptation" to track progress and catalyze funding, for which the group pushed strongly.

A JUST TRANSITION

In Glasgow, the African continent has generally confirmed its support for increased climate action, often driven by the firsthand experience of the violent impacts of climate change. The president of Nigeria, Muhammad Buhari, representing the largest oil producer in Africa, pledged to reach net-zero by 2060 but also requested rich nations to finance projects for transition fuels. On the other side, rich nations including Canada, Denmark, the United States and the United Kingdom pledged to stop spending on fossil fuels abroad by 2022, with some exceptions. Efforts to restrict fossil fuel investments on the continent were seen by some African parties as unjust as many wealthy countries behind the pledges include natural gas in their own multidecade plans to transition to clean energy.

As they are mainly responsible for the emissions that caused climate change, rich countries have a responsibility to use their capacity to make the first and most significant steps in global mitigation efforts. This would allow developing economies to use a fair share of the global carbon budget in order not to delay efforts to eradicate poverty and respond to the needs posed by population growth, urbanization and industrialization. Most African countries have updated their National Determined Contributions (NDCs), presenting an ambitious plan to align their development pathway with the Paris Agreement. However, most African NDCs are entirely or in part conditional on a certain level of international financial support.

Therefore, the extent to which developing economies will be able to implement their energy transition and the pace at which they will phase out fossil fuels, largely depends on the political willingness of rich countries to mobilize climate finance. Failure to deliver on the USD 100 billion commitment was a serious matter because it undermined trust in the climate finance system, which should provide a predictable and reliable source of funding essential to make the transition to clean energy a credible alternative.

During COP26 an historical partnership was launched by the U.S., France, Germany and the EU to support South Africa's transition from coal to clean energy, providing USD 8.5 billion over the next five years. It represented a "watershed moment," using the words of President Ramaphosa, as the deal will help South Africa achieve its NDC emission reduction goal and it represents a replicable model to support just transition in developing economies.

In Sub-Saharan Africa, specific circumstances open an unparalleled window of opportunity. On the one hand, in the region most grids and energy systems are underdeveloped leading to a



Data from the International Monetary Fund show that, in sub-Saharan Africa alone, the economic damage due to climate change has been generating losses of more than USD 520 million every year since 2000. In the photo, fishermen on the Congo River.



In the Fulani village of Hore Mondji, located in southern Mauritania on the banks of the Senegal River, a women's cooperative uses solar energy to run the well that provides water for the garden. A project promoted by UNICEF in collaboration with local authorities.



major electricity access deficit. On the other hand, its countries are endowed with an enormous, diverse and largely untapped renewable energy potential. This creates the opportunity to develop largely RES-based energy systems to achieve universal access. However, the timing of climate finance is essential in order to prevent carbon lock-in.

OUTCOMES AND ROAD TO COP27

The outcomes of COP26 were underwhelming for Africa, as concrete financial commitments were scarce. Nevertheless, the Glasgow Pact recognizes the importance of crucial issues for Africa and has laid the foundation for a key financial dossier to be reignited at COP27 to obtain more substantial results. The most positive outcomes were achieved on adaptation. Developed economies are now urged to "at least double" finance for adaptation by 2025 reaching USD 40 billion, though still a fraction of what is needed. New pledges were also made for the Adaptation Fund, which finances projects and programs that help vulnerable communities in developing countries adapt to climate change, and which is completely grant-based.

As an AGN negotiator said after Glasgow, a main takeaway is that Africa "is not consulted in the big, final decisions that count." He argued that one possibility to strengthen Africa's stand at the UN climate negotiations is for the African-Union to become a party to the Convention-and-Paris Agreement, as is the EU. African participation in Glasgow was also seriously undermined by problems linked to travel permits, accommodation and vaccinations, which reduced the number of participating delegates, making it one of the less inclusive COP in years.

Next year COP27 in Sharm-El-Sheik will have to deal with many of the unresolved issues for Africa. Taking place on the continent, the summit represents a great opportunity to bring African priorities to the forefront and define a stronger role for Africa in shaping the climate agenda.

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