The G20 Riyadh Summit's Climate Change Performance: A Debt Accrued

Brittaney Warren, G20 Research Group
January 15, 2021

The G20 leaders met for an unprecedented virtual summit on November 21–22, 2020. They convened in the midst of two converging crises — the health crisis and the climate crisis. The COVID-19 pandemic was the G20's central focus, but climate was on the agenda too. Saudi Arabia, host of the 2020 Riyadh Summit, promoted "safeguarding the planet" as one of three thematic pillars of its presidency. It included six action areas: managing emissions for sustainable development, combating land degradation and habitat loss, preserving the oceans, fostering sustainable and resilient water systems globally, promoting food security, and promoting cleaner energy systems for a new era. But on climate change, Riyadh's first priority was the circular carbon economy (CCE). This is a highly controversial approach to meeting global climate goals, as it focuses on managing rather than mitigating or stopping emissions, and as the fossil fuel sector is among its strongest advocates.

In addition to prioritizing CCE, and in particular the recirculation of captured carbon back into the fossil fuel sector, the G20 did not improve its performance compared to previous years across most dimensions of summit performance. This importantly included no new money mobilized for climate finance or for a green recovery. As such, the G20 effectively failed to fill the climate governance gap left by the United Nations, whose core climate and biodiversity bodies chose to postpone their summits until 2021. In doing so, the G20 further increased its financial and social debt to society for its members' historical and projected emissions contribution and the resulting human toll.

This article first reviews G20 leaders' public views on climate change in their addresses delivered virtually at the Riyadh Summit and next analyzes the G20's summit performance on climate change across the six dimensions of summit performance (Kirton 2013). It then discusses the causes of such performance.

Leaders' Public Views at the Summit Table

Several, but not all, G20 leaders delivered a recorded message or a recorded address at the side events, or both. There were two side events, one on "Safeguarding the Planet: The CCE Approach" and one on "Pandemic Preparedness and Response."

Saudi Arabia

Saudi Arabia's King Salman bin Abdulaziz Al Saud's climate change agenda centred on the circular carbon economy. At the Safeguarding the Planet side event, King Salman stated that the carbon captured from CCE would be filtered back into the oil and gas sector to produce more fossil fuels. He also highlighted Saudi Arabia's goal to make 50% of its electricity mix from wind and solar by 2035.

United Kingdom

Prime Minister Boris Johnson's Leader's Message highlighted the UK's new Ten Point Plan for a Green Industrial Revolution and called on the G20 "to make bold pledges and harness [its] collective ingenuity and resources to defeat the pandemic and protect our planet and our future for generations" ahead of the UK's online Climate Ambition Summit in the weeks following the Riyadh Summit and in advance of the 26th Conference of the Parties (COP) to the UN Framework

Convention on Climate Change (UNFCCC) that the UK will co-host with Italy in November 2021. Johnson also praised the Saudi city of Neom's leadership on advancing green hydrogen and solar power.

Italy

Prime Minister Giuseppe Conte's address at the Safeguarding the Planet side event laid out his plans for the G20 Rome Summit scheduled for October 30-31, 2021. He stated that climate change would be a top priority, described climate change and biodiversity loss as an "existential threat," and said his G20 presidential priorities would be based on the three Rio conventions on climate change, biodiversity and desertification. These would include addressing the climate-energy nexus, a swift transition to a carbon neutral future and CCE. Notably, Conte qualified his support of CCE by stating it could not be the only approach as "there is no escaping the reality of the need to mitigate emissions."

Beyond clean technology, Italy's G20 presidency would pay special attention to urbanization, namely smart cities and green jobs. Conte reiterated Italy's commitment to reach carbon neutrality by 2050, under the Next Generation EU policy. He announced Italy would host a youth conference on climate change at the end of 2021, as part of its co-hosting role for COP26 with the UK.

Lastly, Conte stated that the impact of the pandemic on society and the economy "should not affect our determination to address these challenges" and that "the current social and economic systems fail to take climate change into account," thus acknowledging the need for systemic change.

Japan

Prime Minister Yoshihide Suga's address at the Safeguarding the Planet side event reiterated Japan's commitment to reach carbon neutrality by 2050, to create a "green society" at home, to make the environment a pillar of Japan's economic growth strategy and to support CCE alongside "various options to address climate change." He called for international cooperation on the Paris Agreement and for a paradigm shift on economic growth, stating that "addressing climate change is not a constraint on economic growth" and emphasizing the need for "transformation of industrial structures as well as our economy and society," especially for future generations.

Suga also declared a need to conserve the marine environment, to implement the Osaka Blue Ocean Vision established under Japan's 2019 G20 presidency and to reduce plastic to zero by 2050. He also referred to the importance of the links between biodiversity and ecosystems, such as coral reefs and land degradation.

Australia

Prime Minister Scott Morrison's address at the Safeguarding the Planet side event emphasized the need for a sustainable recovery and for ocean health. On climate change he stated that Australia is committed to meeting its emissions reduction targets and expressed support for "unlocking" low-emissions technology, including hydrogen, CCE, green steel and aluminum. He said that Australia was firmly committed to the Paris Agreement. He claimed Australia had overachieved, by a significant margin, its Kyoto Protocol targets and that Australia was "right on track to meet our Paris target and to beat it." However, monitoring by Climate Action Tracker (2020a) shows that Australia is not on track to meet its climate target under the Paris Agreement.

Morrison expressed support for Osaka's Blue Ocean Vision and announced a concrete commitment to ban the export of plastic waste. He expressed full support for Saudi Arabia's proposals on protecting coral reef protection and tackling illegal, unreported and unregulated fishing. He highlighted the importance of biodiversity loss and wildlife recovery from Australia's 2019-20 bushfires, including soil health.

China

President Xi Jinping's address at the Safeguarding the Planet side event called on the G20 to "strengthen our response to climate change." He named three things to do so. First was to "continue to take the lead in tackling climate change" by following "the guidance of the UNFCCC and push for the full and effective implementation of the Paris Agreement." Here he highlighted China's goals of reaching peak emissions by 2050 and carbon neutrality by 2060. Second was to "deepen the transition toward clean energy." Here Xi applauded Saudi Arabia's CCE proposal; referred to Sustainable Development Goal (SDG) 7 on Sustainable Energy for All; touted China's domestic efforts within its 14th Five Year Plan to advance energy efficiency, new energy, green industries, and greener economic and social systems; and highlighted that China has the world's largest clean energy system. Third was to "protect the ecosystem with a respect for Nature," with the word "nature" notably capitalized in the official translation. Xi noted that China will host the 15th COP to the UN Convention on Biodiversity (UNCBD), to be held in May 2021 in Kunming, and stressed that he hoped the meeting would set goals and actions for global biodiversity protection in the years ahead.

Lastly, Xi encouraged G20 cooperation on land degradation, coral reefs, ocean plastics and "stronger defense for global ecological security." He concluded by stating: "Let us work together for a clean and beautiful world."

India

Prime Minister Narendra Modi's address at the Safeguarding the Planet side event opened with a statement that "today we are focused on saving our citizens and economy from the effects of the global pandemic" and "equally important is to keep our focus on fighting climate change." He said that "climate must not be fought in siloes, but in an integrated, comprehensive and holistic way," that "every single individual must prosper" and "the focus must be on the human dignity of everyone," and that the "entire world can progress faster if there is greater support of technology and finance to the developing world." He then highlighted India's adoption and success in implementing low-carbon and climate-resilient development practices, including on renewable energy, smoke-free kitchens, elimination of single-use plastics, biodiversity efforts leading to an increase in the lion and tiger population, land restoration, the circular economy and a coalition on construction to advance the resilience of critical infrastructure. Modi said the issue of resilient critical infrastructure had "not caught the attention it deserves [as the] poor are especially impacted by this." He also stated that India was "not only meeting [its] climate targets but exceeding them." India is indeed on track to exceed its climate target, which is in line with the 2°C goal of the Paris Agreement (Climate Action Tracker 2020b).

United States

In his address at the Safeguarding the Planet side event, President Donald Trump falsely bragged about his administration's efforts to prioritize the environment. Trump declared that he protected American workers by pulling the United States out of the Paris Agreement that is "designed to kill the American economy" and claimed that U.S. emissions had been reduced more than any other country's emissions. He referred to his administration's efforts to reduce lead in water, to plant one trillion trees, to reduce marine litter and to restore access to federal lands, including the Bears Ears National Monument. He claimed America's air is cleaner than when he entered office and that renewable energy production had risen, and declared American leadership in horizontal drilling and hydraulic fracturing (fracking).

In reality, U.S. emissions are projected to rise due to Trump's aggressive rollback of environmental and emissions standards with its climate target ranked "critically insufficient" (Climate Action Tracker 2020c). Trump weakened rules on lead in water and removed protection for Bears Ears, a culturally significant natural site to the Zuni tribe, opening the protected area up for oil and gas

development (Friedman 2020; Dwyer 2020; Huey 2018). Moreover, there are many documented climate and environmental health impacts of fracking, including air pollution from methane, water pollution, soil contamination, earthquakes and exposure to over 600 toxic chemicals that increase health risks (Hoffman 2012).

France
President Emmanuel Macron's address at the Safeguarding the Planet side event stated that "we need a concerted effort by everyone for the common good of our planet…towards climate and biodiversity." He stated that the launch of the One Health High-Level Experts Council in Paris on November 12, 2020, "was a big step forward in this direction."

South Africa
President Cyril Ramaphosa's address at the Safeguarding the Planet side event focused on COVID-19 and did not reference climate change explicitly. However, he called on the G20 to implement the UN 2030 Agenda Sustainable Development Goals (SDGs) to better withstand future crises. He was the only G20 leader to raise the issue of gender inequality, noting that women are particularly vulnerable to social and economic disruption.

Dimensions of Summit Performance
The Riyadh Summit's overall climate performance was poor on the six dimensions assessed (see Appendix A).

Domestic Political Management
The leaders of all G20 members attended the Riyadh Summit, but some left early (Follain et al. 2020). U.S. president Donald Trump left as UK prime minister Boris Johnson spoke. Trump's replacement, Treasury Secretary Steven Mnuchin, also did not stay for long. He was replaced by White House economic advisor Larry Kudlow.

The invited leaders of Spain, Jordan, Rwanda, Singapore, Switzerland, the United Arab Emirates and Vietnam attended. So did the leaders of the United Nations, the International Monetary Fund, the World Bank, the Organisation for Economic Co-operation and Development (OECD), the World Health Organization (WHO), the UN Food and Agriculture Organization, the World Trade Organization, the International Labour Organization, the Islamic Development Bank, the Arab Monetary Fund, the Financial Action Task Force and the Financial Stability Board (FSB).

Deliberations
In its deliberations, the G20 performed badly compared to previous years.

The Riyadh Summit declaration dedicated 679 words to climate change. This is much lower than the previous year at Osaka in 2019, which produced 2,034 words. It is much lower than the overall summit average of 1,308 words. By portion, 12% of all words made at Riyadh referred to climate change. This is again lower than the 31% from Osaka in 2019, although it is higher than the 9% average.

Riyadh dedicated four paragraphs to climate change. This is the lowest amount since the 2009 London Summit. It is well below the 15 made at Osaka in 2019, which is also the average per summit. Riyadh's four paragraphs took 5% of the declaration. This is lower than the 8% at Osaka in 2019, but is on par with the average of 5%.

Thus, when measured by the number of words and paragraphs, the G20 performed worse at Riyadh than in previous years. Measured by portion, it performed better by words and consistently by paragraphs. However, in consideration of the urgency of the climate crisis — the Intergovernmental Panel on Climate Change (IPCC) (2018) warns that the business-as-usual approach must transform now in order to keep the planet liveable by 2030 — the slight rise by portion does not signal any sense of urgency from the G20 leaders.

Several of the right topics were discussed at Riyadh, including nature-based solutions, implementation of the Paris Agreement, mobilizing climate finance for developing countries' adaptation and mitigation efforts, natural disasters and extreme weather events, the financial stability implications of climate change, and the prevention of environmental degradation, including biodiversity, oceans, and clean air and water, in addition to the more controversial CCE approach. However, the substance of these discussions did not yield strong outcomes across any of the remaining dimensions of summit performance discussed next.

Direction Setting

On principled and normative direction setting, or linkages between climate change and the G20's two foundational missions of global financial stability and making globalization work for all. In this context, the G20 made three affirmations (plus one related one on energy).

On the first mission of promoting global financial stability, there were two references. One appeared in the section on climate change and vaguely agreed "to advance environmental stewardship for future generations…while maintaining healthy economies." The other appeared in the section on financial sector issues and noted the FSB was "continuing to examine the financial stability implications of climate change."

On the second mission of making globalization work for all, there was one reference, in the climate change section, to "building a more environmentally sustainable and inclusive future for all people."

Another link to globalization for all, one critical to climate change, appeared in the energy section. It was the commitment on fossil fuel subsidies that has been reiterated since the 2009 Pittsburgh Summit: "we reaffirm our joint commitment on medium term rationalization and phasing-out of inefficient fossil fuel subsidies that encourage wasteful consumption, while providing targeted support to the poorest."

Decisions

In its decision making, the G20 leaders found consensus on three climate change commitments, taking only 3% of the 107 commitments made at Riyadh. This number is much lower than the 13 made at Osaka in 2019, and it is lower than the average of six. Since 2008, the G20 has made more than three commitments at seven, or about half, of its 15 summits. This shows that the three made at Riyadh, although lower than average, is not extraordinary in the G20's historical climate commitment making.

Further, on the subject of climate change and potential emissions reduction, the substance of the commitments matters more than the number of commitments made. Riyadh's three climate commitments were to support climate change, to implement the Paris Agreement and to endorse CCE. The first two are reiterations of past commitments and do not add anything new to what G20 leaders are already committed to doing. The third endorses an approach to remove carbon from the atmosphere but recirculate it back into the fossil fuel sector to support fracking, which is a chemical-intensive, highly polluting and high emissions process used to extract hard to produce dirty energy.

Thus quantitatively and qualitatively, the G20 leaders did not lead on this key dimension of performance.

Delivery

In the G20's delivery of its climate commitments, compliance with the 35 assessed commitments averaged 69%. From 2017 to 2019, compliance rose: compliance with commitments from the 2017 Hamburg Summit averaged 68%, from the 2018 Buenos Aires Summit averaged 78% and from the 2019 Osaka Summit averaged 89%. In terms of substance, compliance with these nine commitments suggests the rising trend will continue with the three commitments made at the Riyadh Summit.

Of the nine commitments from 2017 to 2019, the highest compliance, at 87%, was with the commitment to implement the Paris Agreement. This commitment excluded the United States and was very vague, with a wide variety of actions counting toward members' compliance. The next highest compliance, at 83%, came with the two commitments focused on technological solutions to climate change. This was followed by 77% compliance with the three climate finance commitments. Notably, of these climate finance ones, the two on market-based solutions and private sector investment scored significantly higher, at 94%, than the one to mobilize $100 billion per year by 2020 from public and private sources for mitigation and adaptation in developing countries, at 43%. Thus the finance commitment to support adaptation scored lower than the commitments to support the private sector. The three core commitments on adaptation averaged 69%.

These nine commitments are similar to the three Riyadh commitments to implement the Paris Agreement; "tackle climate change" and endorse CCE. These commitments match the vagueness and technological focus that help explain the rising high compliance trend over the past three years.

However, although high compliance with the three Riyadh climate commitments is predicted, the substance of the commitments strongly suggests high compliance will not lead to meaningful emissions reductions.

Development of Global Governance

In its development of global governance, the G20 made six references to institutions both inside and outside the G20.

Two were to inside institutions — the FSB and the Climate Stewardship Working Group. One reference came in a statement that the FSB was continuing to examine the financial stability implications of climate change. The second was a recognition of a "toolbox" developed by the Climate Stewardship Working Group to address sustainability and climate change.

Four references were made to two outside institutions. There were two references to the UNFCCC, one looking back to COP21 in Paris in 2015 and one looking ahead to COP26 in Glasgow in 2021 (for the purposes of assessing the development of global governance, COPs are counted as separate institutions from the UNFCCC itself).

Money Mobilized

The G20 did not mobilize any money for climate change. Further, its members, prior to the summit, increased their investment in the fossil fuel sector in their COVID-19 recovery packages and, at the summit, implicitly encouraged channelling money to the oil and gas sector through the G20's endorsement of CCE.

On climate financing, G20 leaders recalled a past commitment to step up climate financing, but did not pledge any new money. Climate financing is one of three pillars of the Paris Agreement, and is necessary for meeting the other two pillars of mitigation and adaptation.

With regard to the COVID-19 recovery packages, only 30% of funds went to green sectors (Climate Transparency 2020). At Riyadh, the G20 did not green these packages. Moreover, although the G20 extended debt deferral to the spring of 2021, it did not listen to the UN secretary-general's call to do so until the end of 2021 and to include middle-income countries. The leaders' declaration acknowledged that 46 countries requested debt deferral, amounting to an estimated $5.7 billion — money that would support countries facing the impacts of not only the health crisis but of climate-related disasters too.

On CCE, although the IPCC (2018) has recognized that sucking carbon from the sky is now a reality in order to meet the more ambitious 1.5°C target of the Paris Agreement, in practice the CCE option is often used to reach otherwise inaccessible oil by fracking. In an address at the Riyadh Summit, King Salman stated that Saudi Arabia intends to use CCE technology for "enhanced oil recovery," which is another way of referring to fracking. It comes with a slew of environmental problems and encourages emissions growth. Due to its revenue-generating potential of "recycling" carbon back into the fossil fuel sector, the biggest beneficiaries are oil and gas companies. It also gives these companies an opportunity to greenwash their services (Roberts 2019).

Thus the G20 provided greater financial support and incentives to the brown economy than to the green economy in the lead-up to and at the summit itself. This was a missed opportunity to tackle the health and climate crises together.

Causes of Performance

There are several causes of this poor summit performance, as the systemic hub model of G20 governance suggests (Kirton 2013; Kirton and Kokotsis 2015). The most salient is a lack of political will, particularly from the hosting country.

Shock-Activated Vulnerability

The first is shock-activated vulnerability, most obviously in the form of the diversionary external shock of the COVID-19 pandemic, with the rise of the second and third waves closely coinciding with the Riyadh Summit in November. The almost immediate and widespread health and economic impacts of COVID-19 crowded out the G20's attention to the climate crisis. The terms "COVID-19" and "pandemic" dominated the leaders' declaration, appearing in 27 of its 38 paragraphs, or 71% of them.

The G20's declaration recognized the pandemic's impacts on the broader environment, and on water, food and energy security (see Appendix B). It made one reference to natural disasters and extreme weather events broadly. However, it did not recognize the impact of climate change or natural disasters on people's health, lives or livelihoods.

In 2020 there were several disasters, including two back-to-back category four hurricanes, Eta and Iota, that hit Honduras and Guatemala just a few weeks before the G20 leaders met. The storms killed 200 people and left another 150,000 homeless, pushing them from poverty to extreme poverty, and increasing their vulnerability to poverty-related illnesses on top of the pandemic, and in the face of corrupt government spending (BBC 2020b; Abbott 2020).

In 2020, several G20 members themselves were hit by unprecedented wildfires. There was the "gigafire" in California, which tore through one million acres, as well as many other wildfires tearing through four million acres of California (Milmand and Ho 2020). The California fires resulted in 31 direct deaths and between 1,200 and 3,000 deaths from smoke and air pollution (Center for Disaster Philanthropy 2020; Vainshtein 2020).

Australia experienced 240 days of bushfires from 2019 and into 2020 (BBC 2020a). As of February 2020, the bushfires directly killed 33 people, including nine firefighters, and destroyed 3,094 homes, burned over 17 million hectares of land, and killed over one billion animals and hundreds of billions of insects, with 113 animals at risk of extinction due to extensive habitat loss (Richards et al. 2020). At least 400 people died from smoke pollution (Pickrell 2020).

The Arctic region, including Canada, Siberia, Alaska and Greenland, had "zombie fires" that covered the area in smoke (Witze 2020). No direct deaths were recorded. But the fires set a pollution record, releasing the most greenhouse gas emissions into the atmosphere in a single month than in the past 18 years (Sengupta 2020). In the aftermath of the American and Australian fires, the number of air pollution deaths point to potential similar findings for those exposed to the zombie fire smoke in the Arctic region.

Air pollution was therefore the biggest killer of these wildfire events. The largest sources of air pollution are the burning of fossil fuels, including in vehicles and for heat and power generation; resource extraction, including oil and gas, and other mining ventures; municipal and agricultural waste; and residential cooking, heating and lighting (WHO n.d.). These pollutants are also the primary sources of climate change. As of December 16, 2020, the G20 countries collectively recorded 1,148,542 deaths from COVID-19. Every year, 3,212,368 people in G20 countries are estimated to die from bad air quality (see Appendix C).

Yet with the economy stalled and gross domestic product (GDP) in decline across all G20 members when COVID-19 hit, global emissions and the accompanying air and noise pollution also (temporarily) declined. This may have triggered a response from G20 leaders that the recession would take care of climate change in the near term, so active climate change governance could wait. Moreover, unlike with COVID-19, leaders may be desensitized to the annual, regularly occurring pollution-related deaths, whose causes and cures are understood and thus do not cause the same psychological shock; pollution-related deaths lack the same wall-to-wall media coverage, and the element of uncertainty of a new, fast-spreading virus.

Multilateral Organizational Failure

On multilateral organizational failure, the second cause of summit performance, the governance gap left by the COVID-19–caused postponement of the two central UN climate and biodiversity summits in 2020 should have, but did not, inspire the G20 to fill the gap.

In May, the COP Bureau of the UNFCCC announced that COP26, scheduled for November 9-19, 2020, was delayed a full year to November 1-12, 2021. The UNCBD's COP15, originally scheduled for October 15-28, 2020, was postponed to May 17-30, 2021. These delays left climate change formally ungoverned at the high-level UN in 2020. At the end of 2021, there will be nine years left to make the transformative changes required by 2030 to avoid the most deadly consequences of the climate crisis (IPCC 2018). The urgency of climate change was, in effect, acknowledged by the G20 leaders in their declaration in 2019. This shows that the crisis-level impacts of climate change are known by the G20. The poor summit performance on climate change therefore suggests a lack of political will, and even willful negligence, by the G20. This is emphasized by the ability of the G20 members to quickly and suddenly generate $11 trillion for the pandemic recovery response, signalling that resorting to holding a summit virtually does not adequately explain the G20's inaction on the climate crisis.

Predominant Equalizing Capabilities

The third cause of summit performance, predominant equalizing capabilities, is measured by GDP, the Gini coefficient on inequality and members' individual greenhouse gas emissions.

On GDP, the G20's share of global GDP suggests the conditions were right for the G20 to advance on climate change. Despite the economic downturn, the G20 produces about 80% of global GDP. Yet the downturn did distract the G20, whose primary mission is to foster economic growth and financial stability. In the second quarter of 2020, the G20's collective GDP fell by 6.9% (see Appendix D) (OECD 2020). This was much higher than the decline of 1.6% after the 2008–09 global financial crisis. China was the only G20 member whose GDP grew (by 11.5%) in the second quarter, reflecting the early onset of the pandemic in China and its subsequent recovery. All other members' GDP fell. India's fell the most by 25.2%, followed by the United Kingdom's by 20.4%, Mexico's by 17.1%, South Africa's by 16.4%, France's by 13.8%, Italy's by 12.8%, Canada's by 11.5%, Turkey's by 11%, Brazil's and Germany's each by 9.7%, the United States' by 9.1%, Japan's by 7.9%, Australia's by 7%, Indonesia's by 6.9%, and Korea's and Russia's each by 3.2%.

The G20's emissions have followed this trajectory. In the first quarter of 2020, China cleared its skies and its emissions declined, but they rose in the second quarter and surpassed the country's 2019 record. The rest of the G20 members' emissions stayed in decline along with their GDP. The G20's emissions are expected to be 7.5% lower at the end of 2020 compared to the previous year (Climate Transparency 2020). Optimistically, in 2019 there was a slight decrease in their emissions due to policy rather than any external shock or recession. However, with the G20 investing its COVID-19 recovery funds in polluting industries, there is a real risk emissions will rise when GDP rises once vaccines are fully distributed.

On the measure of inequality, wealth inequality in G20 countries has been converging overall; it is the highest it has ever been in the past 50 years, with inequality rising across all but two G20 members (OECD n.d). Wealth inequality is a pertinent issue for climate action, as it directly addresses issues around climate justice, such as environmental racism and a just transition to green jobs. This was demonstrated clearly during the Yellow Vest riots in France in response to President Emmanuel Macron's efforts to implement a carbon tax that would help the climate but hurt the working class. The Gini coefficient measures income inequality within and among countries on a scale between 0 and 1, where 0 is perfect equality and 1 is no equality. The data of 2020 show that G20 members' average is equal to the world's average of 0.746 (World Population Review 2020). The United States has the lowest coefficient of 0.48. However, inequality is higher than it was 30 years ago, with the top 1% of Americans earning about 40 times more than the bottom 90%. All other G20 members' scores were 0.62 or above.

The OECD (n.d.) attributes the drivers of rising inequality and poverty to globalization, technological change and policy approaches. Another factor is the view that "inequality is an inevitable product of capitalist activity" (Muller 2013). Although there is more equal availability of opportunity in the world, people have unequal capacity to exploit that opportunity, as determined by their class, gender, race, ability and other factors.

The G20 therefore did not advance solving the puzzle of how to decouple its pursuit of infinite economic growth from its emissions growth, and how to distribute wealth fairly in order to ensure a just transition. This task may be impossible. Indeed, it increasingly appears contradictory due to the lack of synchronicity of the evidence on climate change with the links between late-stage capitalism and systemic inequality.

Converging Characteristics

The convergence of several characteristics forms the fourth measure of summit performance. For climate change, those characteristics are the democratic character of the G20 members, which is linked to better climate policies (Fiorino 2018), Paris Agreement climate target rankings and the domestic legal embeddedness of climate change.

Globally, 2019 was the 14th consecutive year of decline in global freedom and democracy (see Appendix F). On freedom, from 2019 to 2020, the G20 saw a collective decline of five points. Australia, Canada, China, Indonesia and Mexico each had a one-point decrease. India had the largest decrease of three points. Argentina, the United Kingdom and Turkey each had an increase of one point. The rest had no change. On democracy, from 2018 to 2019 (data are unavailable for 2020), the G20 had a collective decline by 1.42 points. Brazil, Italy, India, Mexico and Turkey all saw a democratic decline, and Canada, France, Indonesia and Russia saw a democratic rise. The other G20 members had no change.

On climate targets, Climate Action Tracker ranks countries on a six-point scale where "critically insufficient" indicates a climate target compatible with a 4°C world, "highly insufficient" a <4°C world, "insufficient" a <3°C world, "2°C compatible" a <2°C world, "1.5°C Paris Agreement compatible" a <1.5°C world and "role model" a <1.5°C world. Despite India's low score on democracy, it ranks highest: its climate target is ranked as 2°C compatible. However, all other countries' targets are not in line with the Paris targets. The United Kingdom, Australia, Mexico, Brazil and the European Union are ranked insufficient. Germany, Japan, Canada, South Africa, Korea, Indonesia and China rank highly insufficient. The United States (host of the cancelled 2020 G7 summit), Russia (host of the 2020 BRICS summit), Saudi Arabia (host of the G20 2020 Riyadh Summit), Turkey and Argentina ranked critically insufficient. Italy's (host of the 2021 G20 summit) ranking was not available. Thus the group of G20 countries with the weakest climate targets includes most of the authoritarian regimes, represent major carbon-producing economies, and includes the hosts of the 2020 G7, G20 and BRICS summits. The collective club leadership in 2020 by democratically weak countries with weak climate targets is a strong salient factor in the G20's poor climate performance at Riyadh.

On legal embeddedness, two G20 members — the United Kingdom and France — have embedded their Paris Agreement climate targets into law (see Appendix E). In the G20, those two countries have the strongest climate change performance according to the Yale Environment Performance Index (Wendling et al. n.d.-b). They have the highest compliance with their climate change commitments (along with Germany and the European Union). The policy documents of Germany, Japan, South Africa and China reflect their climate targets. Canada, Korea and the European Union have proposed legislation for their climate targets.

Some of these rankings may rise in 2021, as leading up and in the wake of the Riyadh Summit some G20 members, including China, raised the ambition of their climate targets to net zero by 2050 or 2060. These changes are not reflected in the above data.

Domestic Political Cohesion
On domestic political cohesion, the Riyadh Summit had a mix of newcomers and veterans, with the latter group composed mostly of authoritarian leaders, and two lame ducks (Freedom House 2020). Only one G20 leader, German chancellor Angela Merkel, has a background in environmental or climate change governance. There are 15 G20 members with a recognized Green Party, but the party holds seats in parliament in only four countries.

Lame Ducks
Republican U.S. president Donald Trump took office on January 20, 2017, and has attended four G20 summits, including Riyadh. On November 3, 2020, Trump lost the election to Democrat Joe Biden. Thus the Riyadh Summit was Trump's last appearance at the G20. Trump has a background in real estate and as a reality TV show host. Under his leadership there has been a sharp rise in America's internal conflict and violence, particularly with his encouragement and support of white supremacist violence against Black people and other minorities. Trump grossly mishandled the pandemic response, leading to the highest number of COVID-19 deaths in the world. In this

context, Trump has continued to roll back environmental regulations and attack the multilateral climate regime. He formally withdrew the United States from the Paris Agreement on November 4, 2020. Under President-Elect Joe Biden, the United States will rejoin the agreement in early 2021. The U.S. Green Party was founded in 2011, but is uncompetitive in America's two-party dominant electoral system and holds no seats.

Germany's chancellor Angela Merkel took office in 2005, won a fourth term in 2017 and formed a coalition government in 2018 between her centre-right Christian Democratic Union (CDU), its Bavarian counterpart, the Christian Social Union and the centre-left Social Democratic Party. Having attended every G20 summit since the start, Merkel is the most experienced veteran, with Riyadh her 15th one. However, she will step down as leader of the CDU and will not seek a fifth term in 2021. Merkel has a background in physics and a PhD in quantum chemistry, making her the only scientist within the G20. She also served as minister of environment, conservation and reactor safety in the mid 1990s, and oversaw the 1995 UN climate conference in Berlin. Germany's Green Party, Alliance90/The Greens, was formed 40 years ago. It has gained popularity in recent years and it openly backed Merkel's CDU in the 2017 elections (Goldenberg 2017). The party holds 67 of 709 seats, or 9.4%, in the Bundestag (lower house). It holds 12 of 69 seats, or 17%, in the Bundesrat (upper house). Combined, this gives the Green Party 79 of 778 legislative seats, or 10%.

Newcomers
Japan's prime minister Yoshihide Suga was the newest leader at Riyadh, having taken office on September 14, 2020, under the country's Liberal Democratic Party, after Shinzo Abe resigned for health reasons. He served under Abe as Chief Cabinet Secretary from 2012 to 2020. He hails from a family of strawberry farmers, has a background in law and began his political career in the 1970s. Greens Japan was founded in 2012 in the wake of the Fukushima nuclear power plant disaster (Global Greens 2019). It has run candidates since then but has no seats in the Diet.

The President of the European Council Charles Michel and the President of the European Commission Ursula von der Leyen both took office on December 1, 2019, making the Riyadh Summit their first G20 summit. Michel began his political career as a teenager, and became the youngest prime minister of Belgium since 1845, serving in the role from 2014 to 2019. He obtained his law degree and became a lawyer in the late 1990s. Von der Leyen is a German politician and held several positions under German chancellor Angela Merkel. Her background is as a physician specializing in women's health. She entered politics in the late 1990s, and became Germany's first female minister of defence. The European Green Party was established in 2004 (European Greens n.d.). It holds 52 of 705 seats, or 7%, in the European Parliament.

Mexico's President Andrés Manuel López Obrador took office on December 1, 2018, under the National Regeneration Movement that he founded in 2014. He did not attend the G20 summit in 2019, and sent his Secretary of Foreign Affairs instead, making the 2020 Riyadh Summit his first. His parents were merchants and his education is in political science and public administration. The Ecologist Green Party of Mexico (Partido Verde Ecologista de México), founded in the 1980s, does not currently hold any seats in Mexico's Chamber of Deputies. It won 2.55% of the vote in the last election. Mexico's Green Party is an anomaly in the "global greens" network due to its conservative leanings. In 2009 the European Green Party withdrew its recognition of Mexico's Green Party due to its efforts to reintroduce the death penalty (European Greens 2009). The Mexico Greens are also accused of corruption and anti-environment policies (Tuckman 2015).

Experienced
Canada's Prime Minister Justin Trudeau took office on November 4, 2015, after his Liberal Party won a majority government. In the fall 2019 election, the Liberals formed a minority government. Trudeau has attended five G20 summits, with Riyadh his sixth. His formal education is in liberal arts,

education and engineering. He started but did not complete a master's degree in environmental geography, before becoming a media personality with the Canadian Broadcasting Corporation and a substitute high school teacher. In 2019, the Green Party of Canada won three of the 338 seats, or 0.9%, in Canada's House of Commons, under the leadership of Elizabeth May.

Korea's President Moon Jae-in took office on May 10, 2017, as leader of the Democratic Party. Since then, he has attended three G20 summits before Riyadh. He was born to North Korean refugees, grew up in poverty, became a human rights lawyer in the 1980s and entered politics in the early 2000s. The Korea Greens were formed in 2012, in response to the Fukushima disaster in Japan. The party holds no seats in the National Assembly.

France's President Emmanuel Macron was elected on May 14, 2017, as leader of the centrist liberal party La République En Marche!, which he founded in 2016. Macron attended three G20 summits before Riyadh. His professional background is in investment. His political career began in 2012 as the minister of economy, industry and digital data. France's Green Party gained traction in the 2017 elections, and had a surge in support in the 2019 European Parliament elections, but does not hold any seats (Lough 2019).

South Africa's President Cyril Ramaphosa took office on February 15, 2018, as leader of the African National Congress. He therefore attended two G20 summits before Riyadh. On May 8, 2019, he won 57.5% of the vote in the 2019 South African general election. He assumed the Chair of the African Union in 2020. He fought against apartheid and as a university student was jailed and sentenced to solitary confinement for 11 months for organizing rallies in support of Mozambique's independence. After this, he obtained a law degree and practiced as a legal advisor for the Council of Unions of South Africa. He has been an advocate of African regional trade, youth employment and gender equality, and co-authored a book on cattle. South Africa has a Green Party that has no seats in parliament.

Australia's Prime Minister Scott Morrison took office on August 24, 2018, making the Riyadh Summit his third G20 summit. Morrison heads the Liberal Party of Australia, a centre-right political party, and the Liberal-National Coalition, an alliance of centre-right political parties in government since 2013. He was a child actor, earned a degree in economic geography and worked in the tourism industry prior to entering politics in the mid 2000s. The Green Party of Australia holds one of 151 seats, or 0.7% in the House of Representatives and holds six of 76 seats, or 7.9% in the Senate. Combined the Green Party of Australia has 10 of 227 seats, or 4.5%.

Italy's Prime Minister Giuseppe Conte took office in June 2018, as part of the coalition agreement between the Five Star Movement and the League, both right wing and Euro-sceptic parties. He has attended three G20 summits, including Riyadh. His coalition dissolved in August 2019, and a new government, under his leadership, was formed among the Five Star Movement, the Democratic Party of Italy, and the Free and Equal Party of Italy. Prior to joining politics, Conte was a law professor. The Green Party does not hold any seats in the Italian Parliament or Senate.

Brazil's President Jair Bolsonaro took office on January 1, 2019, with 55.1% of the popular vote, making Riyadh his second G20 summit. He ran under the conservative Social Liberal Party, but switched allegiances to the Alliance for Brazil on November 12, 2019. Bolsonaro's policies are far-right and populist, with the Alliance for Brazil — not yet an official party — rooted in national conservatism. Bolsonaro's background is as a military officer and he served in the Chamber of Deputies (lower house) for several years. Brazil's Green Party has four representatives in the Chamber of Deputies and none in the Senate; however, there are two members of the Sustainability Network, a political party founded in 2013.

UK Prime Minister Boris Johnson took office on July 24, 2019, as leader of the Conservative Party, and has attended two G20 summits including Riyadh. He is the co-host of the 2021 UN climate summit to be held in November. He attended an elite boarding school and studied literature at Oxford University. He began his political career in 2001 and gained prominence for his vocal support of Brexit during the 2016 campaign. The Green Party of England and Wales was founded in 1990. It holds one of 650 seats, or 0.5%, in the House of Commons. The party reached a record 50,000 members in 2019.

Argentina's President Alberto Fernández, a centre-left figure with no prior experience as an elected official, was elected in October 2019 with 48.24% of the vote, making the Riyadh Summit his second. His background is as a criminal lawyer and entered politics in the 1980s. Argentina's vice president Cristina Fernández de Kirchner (president from 2007 to 2015) was caught up in a corruption scandal throughout 2019 and 2020. Argentina does not have a Green Party.

Veterans
Russia's President Vladimir Putin, a former KGB officer, took office on May 7, 2012, making Riyadh his ninth G20 summit. Although Russia has a Green Party, it is not recognized by the European Green Party or the Global Greens, in part due to its endorsement of Russia's authoritarian president whose policies are not in line with the principles of the Global Greens.

China's President Xi Jinping became head of the People's Republic of China in 2013 and was confirmed for a second five-year term in March 2018, at which time he eliminated presidential term limits. He has attended eight G20 summits, including Riyadh. He studied chemical engineering and grew up in rural China as a manual labourer before entering politics in the late 1970s and early 1980s. China has no Green Party.

Indonesia's President Joko Widodo won a second term in April 2019 with 55.5% of the vote, under the Indonesia Democratic Party of Struggle, which is based on traditional Javanese principles. Widodo has attended seven G20 summits including Riyadh since he first took office in July 2014. Prior to entering politics, Widodo studied forestry with a focus on plywood and then entered the family furniture business. He reportedly entered politics to reform his home town and began his political career as mayor of Surakarta in 2005. Indonesia's Green Party was founded in 2012. It was unsuccessful in becoming an official registered party in the 2019 election.

India's Prime Minister Narendra Modi took office on May 26, 2014, under the right wing Bharatiya Janata Party, and has been to six G20 summits including Riyadh. Modi has a master's degree in political science. He has been a long-time supporter of Rashtriya Swayamsevak Sangh, a right-wing, paramilitary volunteer organization with a prominent role in the Hinduism nationalist movement. The India Green Party was established on November 18, 2018. It does not hold seats in Parliament.

Turkey's President Recep Tayyip Erdogan took office on August 28, 2014, under the conservative AKP, which he co-founded in 2001. He has been to six G20 summits, starting with the 2015 one in Antalya that he hosted. Prime Minister Ahmet Davutoglu attended the 2014 summit. Erdogan's background is in economics and he started his political career in the 1970s, during which time he was briefly jailed for inciting religious hatred. In 2016 his government survived a coup. Ahead of the Riyadh Summit, on September 21, 2020, on International Peace Day, a Green Party of Turkey (Yesiller Partisi) was established (Yesiller 2020). Its five priorities are a carbon-free economy, a green new deal, water as a right for all, healthy food for all, and equality of gender and sexual choice. Turkey is the only G20 member that has not ratified the Paris Agreement, apart from the United States, which withdrew its earlier ratification.

Saudi Arabia's King Salman acceded the throne on January 23, 2015, and attended the 2015 and 2016 summits before hosting the 2020 summit. He sent his foreign minister, Ibrahim Abdulaziz Al-Assaf, to represent Saudi Arabia at the 2017 summit, and his son Crown Prince Mohammed Bin Salman to the 2018 and 2019 summits. The crown prince also played a key role in the 2020 summit. The king studied religion and modern science. Saudi Arabia is an authoritarian monarchy governed by the country's founding family and therefore does not officially have a Green Party. There are reports one operates clandestinely, operating through a Facebook page.

Club at the Hub
The G20 has continued to be a hub where the heads of international and regional institutions and invited countries convene and thus link the G20 with the rest of the world. However, due to the pandemic and a lack of leadership from the United States and the UN, in 2020 the G20's global connections were weakened.

Under the Saudi presidency, a new connection was made to the Middle East and Arab world with Jordan, the United Arab Emirates (as chair of the Gulf Cooperation Council), the Arab Monetary Fund and Islamic Development Bank invited. Also invited were the Asian countries of Vietnam (as chair of the Association of Southeast Asian Nations) and Singapore, the European countries of Spain (a permanent guest) and Switzerland, and the African country of Rwanda (as chair of the New Partnership for Africa's Development). There was also a strengthened connection to Africa, with G20 member South Africa assuming the role of chair of the African Union in February 2020. The emerging economies representing the BRICS group of Brazil, Russia, India and China also met virtually, under the leadership Russia, on November 17.

Yet there were also disconnections. No Latin American country was invited as a guest, leaving out a region highly vulnerable to COVID-19 and climate change. The heads of the core climate and environment institutions of the UNFCCC, UNCBD and UN Environment Programme, notably all led by women, were also not invited. In addition, the G7 summit scheduled to be held in the United States was postponed indefinitely, rather than re-scheduled in virtual format, against the backdrop of a highly divisive American polity, spiking COVID-19 cases and deaths due to incompetent leadership, and an increase in violence and civil unrest incited and encouraged by Trump.

Conclusion
Spurred by the pandemic, the G20 leaders were forced to meet online to conduct digital diplomacy, resulting in the loss of face-to-face encounters, such as the ceremonial aspects of summitry and spontaneous interactions among the leaders between and on the side-lines of the formal meetings (Naylor 2020; Kirton 2020). Thus they read only scripted, rehearsed speeches, with some leaders leaving in the middle of others' addresses, while others could be seen on their phones or conversing with people off camera. As a result, there was a real constraint on the possibilities for personalized engagement.

This was not helped by host King Salman's unenergetic and controversial leadership, including on climate change. Although the host put climate change on the G20's agenda before the pandemic hit, the shock of the pandemic is a less salient factor in explaining the poor outcomes for climate stability from the Riyadh Summit. This is because King Salman achieved his climate goal — to advance the Saudi vision for a circular carbon economy — at the summit despite the pandemic. The G20 endorsed CCE in the leaders' declaration. Moreover, Saudi Arabia has the lowest scores on democracy and freedom in the G20, has no Green Party due to its authoritarianism, has a climate target with the lowest ranking of critically insufficient and has the lowest compliance with its climate change commitments in the G20. These factors indicate that with or without a global health shock, Saudi Arabia lacked the political will and intention to promote real climate action. And this was also

not helped by the lack of climate leadership and authoritarianism from the hosts of the other 2020 summit clubs — the G7 under Trump and the BRICS under Putin.

Expectations of what the G20 could have achieved at Riyadh may be considered too high given the unprecedented virtual and geopolitical constraints (Marchyshyn 2020). Regardless, the climate emergency did not stop for COVID-19. The G20 accounts for 80% of global emissions and GDP and thus its inaction on the climate emergency and heavy-handed backing of the fossil fuel sector, particularly in members' COVID-19 recovery packages, is a moral failure. Every moment of inaction and every unconditional bail-out dollar given to polluting industries passes the burden of action to the disenfranchised today and to Generation Z tomorrow. Overall, in its support for recirculating captured carbon back into the fossil fuel sector to produce more carbon, combined with a general lack of funding for climate adaptation or a green COVID-19 recovery as well as poor substantive performance across several key dimensions of summit performance, the G20 failed to fill the void in global climate governance left by the cancellation of the 2020 UN climate and biodiversity talks.

Yet leadership changes in 2021 offer some hope. In 2021, Italy will host the G20 and the United Kingdom will host the G7. Both countries are co-hosting the 2021 COP26 climate summit. China is hosting the UNCBD COP15 biodiversity summit. And the United States will have a new climate-friendly president in the White House. These changes in leadership bode well for an improvement in international climate cooperation at the G20 and beyond. And, although slight, the signs of emissions reductions in 2019 due to policy action rather than to external shocks, and an increasing number of G20 countries committing to longer-term targets in line with the science, suggest a turn of course in 2021 and a window of opportunity for grassroots leaders to successfully push high-level leaders to reconcile their historic and projected environmental debt.

References

Abbott, Jeff (2020). "'We Are Fed Up:' Guatemalans Continue Anti-Government Protests," Aljazeera, November 28. https://www.aljazeera.com/news/2020/11/28/guatemalans-return-to-protest-as-anger-at-government-persists.

BBC (2020a). "Australia Bushfires: Hundreds of Deaths Linked to Smoke, Inquiry Hears," May 26. https://www.bbc.com/news/world-australia-52804348.

BBC (2020b). "In Pictures: Hurricanes Leave Hondurans Homeless and Destitute," BBC, November 29. https://www.bbc.com/news/world-latin-america-55064560.

Center for Disaster Philanthropy (2020). "2020 North American Wildfire Season," December 7. https://disasterphilanthropy.org/disaster/2020-california-wildfires.

Climate Action Tracker (2020a). "Australia," updated as of September 22, 2020. https://climateactiontracker.org/countries/australia/.

Climate Action Tracker (2020b). "India," updated as of September 22, 2020. https://climateactiontracker.org/countries/india/.

Climate Action Tracker (2020c). "USA," updated as of July 30, 2020. https://climateactiontracker.org/countries/usa/.

Climate Action Tracker (n.d.). "Countries." https://climateactiontracker.org/countries.

Climate Transparency (2020). "Comparing G20 Climate Action and Responses to the COVID-19 Crisis." https://www.climate-transparency.org/wp-content/uploads/2020/11/Climate-Transparency-Report-2020.pdf.

Coronavirus Database (n.d.). "World COVID-19 Stats." Date of Access: December 16, 2020. https://ncov2019.live/data.

Dwyer, Colin (2020). "Trump Administration Finalizes Plans to Allocate Development on Downsized Monuments," NPR, February 6. https://www.npr.org/2020/02/06/803467297/trump-administration-finalizes-plans-to-allow-development-on-downsized-monuments.

Energy and Climate Intelligence Unit (n.d.). "Net Zero Emissions Race: 2020 Scorecard." Date of Access: December 29, 2020. https://eciu.net/netzerotracker.

European Greens (2009). Statement on Partido Verde Ecologista de Mexico, European Greens. Accessed: December 29, 2020. https://europeangreens.eu/news/egp-withdraws-recognition-mexican-green-party-part-green-family.

European Greens (n.d.). "About," European Greens. Date of Access: January 12, 2021. https://europeangreens.eu/organisation.

Fiorino, Daniel (2018). *Can Democracy Handle Climate Change?* (Toronto: Wiley).

Follain, John, Arne Delfs, Ilya Arkhipov and Josh Wingrove (2020). "Trump Tweets About Voter 'Fraud' During G-20 Opening Meeting," Bloomberg, November 21. https://www.bloomberg.com/news/articles/2020-11-21/trump-tweets-about-voter-fraud-during-g-20-s-opening-meeting.

Freedom House (2020). "Countries and Territories," Freedom House. Accessed: December 29, 2020. https://freedomhouse.org/countries/freedom-world/scores.

Friedman, Lisa (2020). "E.P.A to Promote Lead Testing Rule as Trump Tries to Burnish His Record," *New York Times*, September 27. https://www.nytimes.com/2020/09/27/climate/trump-environment-lead.html.

Global Alliance on Health and Pollution (2019). *Pollution and Health Metrics*, December. https://gahp.net/wp-content/uploads/2019/12/PollutionandHealthMetrics-final-12_18_2019.pdf.

Global Greens (2019). "Greens Japan Interview 2019," Global Greens, March 4. Accessed: December 26, 2020. https://www.globalgreens.org/news/greens-japan-interview-2019.

Goldenberg, Rina (2017). "Germany's Green Party: How it Evolved." Deutsche Welle, September 24. https://www.dw.com/en/germanys-green-party-how-it-evolved/a-40586834.

Hoffman, Joe (2012). "Potential Health and Environmental Effects of Hydrofracking in the Williston Basin, Montana." Accessed: December 4, 2020. https://serc.carleton.edu/NAGTWorkshops/health/case_studies/hydrofracking_w.html.

Huey, Aaron (2018). "What the Bears Ears Monument Means to a Native American," *National Geographic*, October 18. https://www.nationalgeographic.com/environment/2018/10/bears-ears-monument-native-americans-photography/.

Intergovernmental Panel on Climate Change (2018). "Special Report: Global Warming of 1.5°C." https://www.ipcc.ch/sr15/.

Kirton, John (2013). *G20 Governance for a Globalized World* (London: Routledge).

Kirton, John (2020). "A Small Short-Term Success at the G20's Riyadh Summit," G20 Research Group, November 22. http://www.g20.utoronto.ca/analysis/201122-kirton-performance.html.

Kirton, John and Ella Kokotsis (2015). *The Global Governance of Climate Change: G7, G20 and UN Leadership* (London: Routledge).

Lough, Richard (2019). "France's Greens Make Strong Gains in European Parliament Vote," Reuters, May 26. https://www.reuters.com/article/idUSKCN1SW0TW.

Marchyshyn, Maria (2020). "The G20's Riyadh Summit: Grand Ambitions Based in Virtual Reality, G20 Research Group, November 24. http://www.g20.utoronto.ca/analysis/201124-marchyshyn.html.

Milmand, Oliver and Vivian Ho (2020). "California Wildfires Spawn First 'Gigafire' in Modern History," *Guardian*, October 6. https://www.theguardian.com/us-news/2020/oct/06/california-wildfires-gigafire-first.

Muller, Jerry (2013). "Capitalism and Inequality: What the Right and the Left Get Wrong," *Foreign Affairs*, March/April. https://www.foreignaffairs.com/articles/2013-02-11/capitalism-and-inequality.

Naylor, Tristen (2020). "All That's Lost: The Hollowing of Summit Diplomacy in a Socially Distanced World," *Hague Journal of Diplomacy* 15(2020): 583–598.

Organisation for Economic Co-operation and Development (2020). "G20 GDP Growth – Second Quarter of 2020," September 14. http://www.oecd.org/sdd/na/g20-gdp-growth-second-quarter-2020-oecd.htm.

Organisation for Economic Co-operation and Development (n.d.). "Inequality." Accessed: December 16, 2020. http://www.oecd.org/social/inequality.htm.

Pickrell, John (2020). "Bush-fire Smoke Linked to Hundreds of Deaths," *Nature*, March 24. https://www.nature.com/articles/d41586-020-00886-9.

Richards, Lisa, Nigel Brew and Lizzie Smith (2020). "2019-20 Australian Bushfires – Frequently Asked Questions: A Quick Guide," Parliament of Australia, March 12. https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/pubs/rp/rp1920/Quick_Guides/AustralianBushfires.

Roberts, David (2019). "Could Squeezing More Oil Out of the Ground Help Fight Climate Change? The Pros and Cons of Enhanced Oil Recovery," Vox, December 6. https://www.vox.com/energy-and-environment/2019/10/2/20838646/climate-change-carbon-capture-enhanced-oil-recovery-eor.

Sengupta, Somini (2020). "Intense Arctic Wildfires Set a Pollution Record," *New York Times*, September 14. https://www.nytimes.com/2020/07/07/climate/climate-change-arctic-fires.html.

Tuckman, Jo (2015). "Mexico's Greens: Pro-Death Penalty, Allegedly Corrupt – and Not Very Green." *Guardian,* April 21. https://www.theguardian.com/world/2015/apr/21/mexico-green-party-corruption-claims-environment.

Vainshtein, Annie (2020). "'Hidden Cost' of Wildfire Smoke: Stanford Researchers Estimate Up to 3,000 Indirect Deaths," *San Francisco Chronicle*, September 24. https://www.sfchronicle.com/california-wildfires/article/Hidden-cost-of-wildfire-smoke-Stanford-15595754.php.

Wendling, Zachary A., John W. Emerson, Alex de Sherbinin, Dan C. Esty, et al. (n.d.-a). "2020 EPI Results." Environmental Performance Index, Yale Center for Environmental Law and Policy. Accessed December 29, 2020. https://epi.yale.edu/epi-results/2020/component/epi.

Wendling, Zachary A., John W. Emerson, Alex de Sherbinin, Dan C. Esty, et al. (n.d.-b). "Climate Change." Environmental Performance Index, Yale Center for Environmental Law and Policy. Accessed December 29, 2020. https://epi.yale.edu/epi-results/2020/component/cch.

Witze, Alexandra (2020). "The Arctic Is Burning Like Never Before — and That's Bad News for Climate Change," *Nature*, September 10. https://www.nature.com/articles/d41586-020-02568-y.

World Health Organization (n.d.). "Ambient Air Pollution: Pollutants." Accessed: December 16, 2020. https://www.who.int/airpollution/ambient/pollutants/en/.

World Population Review (2020). "Gini Coefficient by Country 2020." Accessed: December 17, 2020. https://worldpopulationreview.com/country-rankings/gini-coefficient-by-country.

Yesiller (2020). "Greens in Turkey Launch Green Party!," September 21. https://yesiller.org.tr/2020/09/21/greens-in-turkey-launch-green-party/.

Appendix A: G20 Performance on Climate Change

Summit	Domestic political management Compliments #	%	Deliberation Words #	%	Direction setting Financial stability	Global-ization for all	Priority place-ment	Demo-cracy	Human rights	Decision making # commit-ments	Delivery Commitments Score	% assessed	Development of global governance Inside Bodies created Ministers	Officials	# refer-ences	# bodies	Outside # refer-ences	# bodies
2008 Washington	0	0%	64	1.7	0	0	0	0	1	0	-	-	0	0	0	0	0	0
2009 London	0	0%	64	1.0	0	0	1	0	0	3	45%	33% (1)	0	0	0	0	1	1
2009 Pittsburgh	1	5%	911	9.7	0	0	4	0	0	3	93%	33% (1)	4	0	2	2	10	5
2010 Toronto	1	5%	838	7.4	0	0	0	1	0	3	71%	100% (3)	0	0	0	0	3	3
2010 Seoul	2	10%	2,018	12.7	0	0	2	1	0	8	53%	50% (4)	5	3	10	7	20	11
2011 Cannes	2	10%	1167	8.2	0	0	0	1	0	8	69%	37% (3)	2	0	4	2	11	7
2012 Los Cabos	0	0%	1,160	9.1	0	0	0	1	0	6	80%	50% (3)	1	5	8	3	6	5
2013 St. Petersburg	1	5%	1,697	5.9	0	0	1	0	0	11	42%	27% (3)	0	3	6	5	10	7
2014 Brisbane	0	0%	323	3.5	0	0	0	0	0	7	+0.51 76%	71% (5)	0	0	0	0	4	2
2015 Antalya	0	0	1,129	8	0	0	0	0	0	3	85%	85% (1)	1	1	2	2	5	3
2016 Hangzhou	0	0	1,754	11	0	1	0	1	0	2	79%	100% (2)	1	3	4	3	5	4
2017 Hamburg	0	0	5,255	15	0	0	1	1	1	22	71%	23% (5)	0	11	11	5	26	9
2018 Buenos Aires	0	0	532	6	0	0	0	0	0	3	79%	79% (2)	0	0	0	0	3	3
2019 Osaka	0	0	2,034	31	1	1	0	0	0	13	89%	15% (2)	1	1	3	3	10	9
2020 Riyadh	0	0	679	4	2	1	0	0	0	3	NA	NA	0	0	2	2	4	2
Total	7		19,625		3	3	9	6	2	95			15	27	52	34	118	71
Average	0.5	0	1,308.3	8.9	0.2	0.2	0.6	0.4	0.1	6.3	0.38		1.0	1.8	3.5	2.3	7.9	4.7

Notes:

NA = not available. Blank = not applicable.

Domestic Political Management includes all explicit references in summit documents to G20 members that specifically express the gratitude in the context of climate change.

The % of members complimented indicates how many G20 members received compliments.

Deliberation refers to number of references to climate change in the summit documents. The unit is the paragraph; % refers to the percentage of words related to climate change.

18

Direction Setting includes the number of references to the G20's core mission of financial stability and globalization for all. Priority Placement refers to the number of references to climate change is referenced in the introduction or chair's summary; the unit of analysis is the sentence. Democracy and Human Rights refer to the number of references to these subjects in relation to climate change; the unit of analysis is the paragraph.

Decision Making refers to the number of climate change commitments.

Delivery refers to compliance with climate change commitments. % Assessed is the percentage of climate change commitments, with the number of commitments assessed in parenthesis.

Development of Global Governance refers to G20 references to institutional bodies related to climate change. Inside refers to the number of G20 ministerial or official-level groups created or established at that summit and the total number referred to related to climate change. Outside refers to external multilateral organizations related to climate change. The unit of analysis is the sentence.

Appendix B: Shock-Activated Vulnerability to Climate Change, Environment and Sustainability

Text from the Leaders Declaration from the 2020 G20 Riyadh Summit:

2020-1: As we recover from the pandemic, we are committed to safeguarding our planet and building a more environmentally sustainable and inclusive future for all people.

2020-2: We stress our continued resolve to ensure a stable and uninterrupted supply of energy to achieve economic growth as we respond to the challenges brought about by the pandemic.

2020-3: We reaffirm our commitment to tackling the challenges in food security and nutrition, as well as reinforcing the efficiency, resilience, and sustainability of food and agriculture supply-chains, especially in light of the effects of the pandemic.

2020-4: We acknowledge that affordable, reliable, and safe water, sanitation, and hygiene services are essential for human life and that access to clean water is critical to overcome the pandemic.

Appendix C: COVID-19 Deaths and Air Pollution Deaths

G20 member	Annual air pollution deaths, 2019	COVID-19 deaths, 2020
Argentina	17,011	41,204
Australia	4,884	908
Brazil	66,245	183,053
Canada	7,835	13,744
China	1,242,987	4,634
France	18,992	59,072
Germany	41,839	24,009
Italy	29,368	66,537
Indonesia	123,753	19,248
India	1,240,529	144,353
Japan	49,554	2,688
Korea	17,343	612
Mexico	48,071	115,099
Russia	99,392	48,564
Turkey	39,985	17,121
United States	107,507	312,345
United Kingdom	24,794	65,520
Saudi Arabia	8,732	6,080
South Africa	23,547	23,661
Total	3,212,368	1,148,542

Sources: Coronavirus Database (n.d.); Global Alliance on Health and Pollution (2019).

Appendix D: Predominant Equalizing Capabilities

G20 member	Gross domestic product Second quarter, 2020	Gini coefficient, 2020
Argentina	Not available	0.768
Australia	−7%	0.656
Brazil	−9.7%	0.849
Canada	−11.5%	0.728
China	+11.5%	0.702
France	−13.8%	0.696
Germany	−9.7%	0.669
Italy	−12.8%	0.833
Indonesia	−6.9%	0.832
India	−25.2%	0.832
Japan	−7.9%	0.626
Korea	−3.2%	0.67
Mexico	−17.1%	0.777
Russia	−3.2%	0.879
Turkey	−11%	0.794
United States	−9.1%	0.48
United Kingdom	−20.4%	0.746
Saudi Arabia	Not available	0.834
South Africa	−16.4%	0.806
Total/Average	−6.9%	0.746*a

Sources: Organisation for Economic Co-operation and Development (2020); World Population Review (2020).
Note: [a]0.746 = G20 average; world average = 0.74.

Appendix E: Environmental and Climate Change Ranking

G20 member	Climate change performance: Yale ranking, 180 countries	Climate change compliance	Overall environmental performance: Yale ranking, 180 countries	Climate Action Tracker ranking	Legal status of climate target
United Kingdom	2	92% (2)	4	Insufficient	Law (2050)
France	4	87% (3)	5	n/a	Law (2050)
Germany	14	93% (1)	10	Highly insufficient	Policy document (2050)
United States	15	63% (11)	24	Critically insufficient	n/a
Australia	20	85% (5)	13	Insufficient	n/a
Japan	24	75% (8)	12	Highly insufficient	Policy document (2050)
Italy	27	69% (9)	20	n/a	Under discussion (2050)
Canada	37	85% (5)	20	Highly insufficient	Proposed legislation (2050)
Mexico	41	76% (7)	51	Insufficient	Under discussion (2050)
South Africa	48	56% (13)	95	Highly insufficient	Policy document (2050)
Korea	50	78% (6)	28	Highly insufficient	Proposed legislation (2050)
Argentina	54	58% (12)	54	Critically insufficient	Under discussion (2050)
Russia	57	43% (14)	58	Critically insufficient	n/a
Indonesia	78	63% (11)	116	Highly insufficient	n/a
Brazil	88	63% (11)	55	Insufficient	n/a
Turkey	96	36% (15)	99	Critically insufficient	n/a
China	103	75% (8)	120	Highly insufficient	Policy document (2060)
India	106	65% (10)	168	2°C compatible	n/a
Saudi Arabia	130	33% (16)	90	Critically insufficient	n/a
European Union	n/a	86% (4)	n/a	Insufficient	Proposed legislation (2050)
Total/Average		69%			

Sources: Climate Action Tracker (n.d.); Energy and Climate Intelligence Unit (n.d.); Wendling et al. (n.d.-a, b).
Notes: n/a = not available; Climate change compliance — numbers in brackets are ranking in the G20.

Appendix F: G20 Global Freedom and Democracy Scores

G20 member	Type of government	Green Party		Democracy index			Freedom score		
		Formed	Seats held 2020	2019	2018	Difference	2020	2019	Difference
Argentina	Flawed democracy	No		7.02	7.02	0	85	84	+1
Australia	Full democracy	Yes	1/151 (0.7%) House of Representatives 6/76 (7.9%) Senate 10/227 (4.5%) Total	9.09	9.09	0	97	98	−1
Brazil	Flawed democracy	Yes		6.86	6.97	−0.11	75	75	0
Canada	Full democracy	Yes	3/650 (0.5%) House of Commons	9.22	9.15	+0.07	98	99	−1
China	Authoritarian regime	No		2.26	3.32	−1.06	10	11	−1
France	Full democracy	Yes		8.12	7.80	+0.32	90	90	0
Germany	Full democracy	Yes	67/709 (9.4%) Bundestag 12/69 (17%) Bundesrat 79/778 (10%) Total	8.68	8.68	0	94	94	0
Italy	Flawed democracy	Yes		7.52	7.71	−0.19	89	89	0
Indonesia	Flawed democracy	Yes		6.48	6.39	+0.09	61	62	−1
India	Flawed democracy	Yes		6.90	7.23	−0.33	71	75	−3
Japan	Flawed democracy	Yes		7.99	7.99	0	96	96	0
Korea	Flawed democracy	Yes		8.00	8.00	0	83	83	0
Mexico	Flawed democracy	Yes*		6.09	6.19	−0.10	62	63	−1
Russia	Authoritarian regime	Yes[a]		3.11	2.94	+0.17	20	20	0
Turkey	Hybrid regime	Yes		4.09	4.37	−0.28	32	31	+1
United States	Flawed democracy	Yes		7.96	n/a	n/a	86	86	0
United Kingdom	Full democracy	Yes	1/650 (0.5%) House of Commons	8.52	n/a	n/a	94	93	+1
Saudi Arabia	Authoritarian regime	Yes[b]		1.93	1.93	0	7	7	0
South Africa	Flawed democracy	Yes		7.24	7.24	0	79	79	0
Difference						−1.42			−5

Notes:
[a] Mexico's Green Party exists is not recognized by the European Greens and/or the Global Greens.
[b] Saudi Arabia's Green Party operates in secret.
European Union: European Green Party = 52/705 seats in European Parliament