The Uncertain Future of Global Climate Change Commitments

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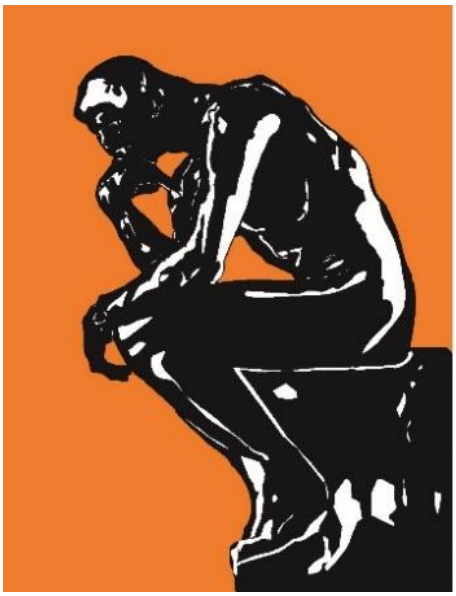

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"When night falls, he smiles with the utmost pride and satisfaction at the perfect plan to catch fish.

— Well, the problem is that he cannot fall asleep on an empty stomach."

In "The Perfect Plan"; *The Kingfisher Story Collection* (2022)

Abstract

In the face of the climate crisis, countries around the globe have committed to reducing greenhouse gas emissions (GHG) and achieving carbon neutrality. While the effects of such commitments remain ambiguous, some risks and obstacles could potentially hinder nations, even leading to failure in fulfilling their climate commitments. The paper presents four major challenges that can impede the global progress towards emission reduction targets as pledged: 1) energy security and global socio-economic development demands, 2) political conflicts, geopolitical instability, and warfare, 3) challenges in developing and scaling emission reduction technologies, and 4) public perceptions toward climate change. Without addressing these challenges, humanity and the Earth's ecosystems will face the dangers of venturing into “uncharted waters” full of uncertainties and disorder. A potential solution to these issues is for the world to transition from an eco-deficit culture to an eco-surplus culture, where the lasting values of Earth's ecosystems are recognized as the conscience of our time.

Keywords: socio-economic development; energy demand; technological development; political conflicts; geopolitical instability; climate change denialism; eco-surplus culture

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In a world struggling with the urgent need to combat climate change, nations have made significant commitments to reduce emissions and mitigate environmental impacts. These commitments are crucial to achieving the goals set by the Paris Agreement, aimed at limiting global warming to below 2°C. Despite these commitments, the situation remains far from optimistic as total emissions have continued to reach new peaks since 1990 (see Figure 1). In 2023, the Antarctica witnessed its lowest recorded levels of sea ice ever (Biino, 2023; Purich & Doddridge, 2023), while the International Energy Agency predicts that CO2 emissions will again hit record level in 2023, with the exact peak remaining uncertain (Frangoul, 2023). Alongside these challenges, there are risks and obstacles that could potentially hinder nations, even leading to failure in fulfilling their climate commitments. This article will examine some of the primary risks and challenges that have the potential to obstruct emission reduction targets as pledged. These insights can serve as a warning of the difficulties that nations have faced, are facing, and will continue to face in fulfilling their climate commitments.

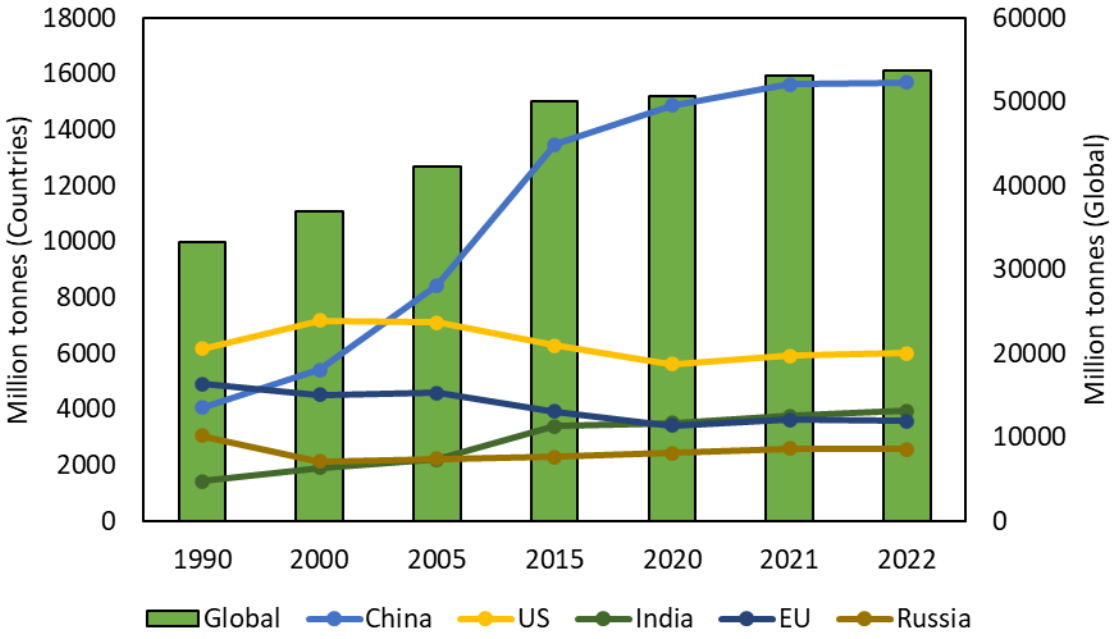

Figure 1: The world's and top 2022 emitting countries' emissions during 1990-2022. The figure is generated on data from (Emissions Database for Global Atmospheric Research, 2023).

1. Challenge of energy security and global socio-economic development demands

To sustain human society's functioning, economic and social activities play irreplaceable roles. Social development has long been intertwined with economic development (although this comparison has its shortcomings). Therefore, to ensure stable economic and social activities while concurrently meeting emission reduction goals, transitioning energy sources from fossil fuels to renewable energy sources is critical (Dolge & Blumberga, 2021), as energy-related emissions account for up to 73.2% of total human-generated emissions (Ritchie, 2020). Failing in the energy transition process is nearly synonymous with failing to achieve emission reduction commitments.

Recent trends have shown that countries are encountering numerous obstacles in restructuring their energy systems, even the European Union (EU), often considered a climate leader. The EU has committed to reducing its emissions by 55% compared to 1990 levels by 2030. However, the organization still relies significantly on fossil fuels to meet a substantial portion of its energy needs. In 2019, according to Eurostat, the EU's external dependency was 70% for hard coal, 90% for natural gas, and 97% for crude oil. This external dependency has been increasing over the years. In the same year, the EU imported fossil fuels worth 363 billion euros, accounting for 2.6% of GDP or the equivalent of over 9 million jobs in Europe. Furthermore, rising energy prices pose a challenge to transitioning to cleaner energy sources, potentially hindering the EU's climate change efforts (Borrell, 2021). Over

the past three decades, the EU has only reduced emissions by 32%, leaving "significant gaps" in the next seven years (European Commission, 2023). According to a European Commission report, the EU needs to accelerate greenhouse gas reductions nearly three times faster than the previous decade to meet climate change goals (Niranjan, 2023).

The escalation of the Russia-Ukraine conflict since 2022 has significantly exacerbated the difficulties in energy transition for EU countries, such as Germany, one of the leading advocates for carbon emissions reduction. In its Climate Action Program 2030, Germany aimed to phase out coal for electricity production and relied on renewable energy. However, due to a sharp reduction in natural gas imports from Russia, the inadequate compensation of alternative renewable energy sources, and the closing of its last nuclear power plant in April 2023, Germany faced setbacks in energy supply. The setbacks have turned Germany from one of the world's leading industrial nations into one facing the risk of "deindustrialization" due to soaring energy costs (Mchugh, 2023). In light of this impending crisis, Germany had to consider reopening coal-fired power plants in October 2023 to ensure winter energy supply (Clifford, 2023; The Federal Government, 2023; Wacket et al., 2023).

India, the world's third-largest emitter, with emissions accounting for 7.3% of global emissions in 2022, also faces the risk of failing to fulfill its environmental commitments (see Table 1). According to India's Minister of Environment, Forest and Climate Change, India committed to reducing emission intensity in GDP by 45% by 2030, from the 2005 level (Luthra, 2022). The implementation of this commitment by India has been partially affirmed through its Third National Communication to the UNFCCC. According to the report, India's emission intensity — total greenhouse gas emissions per unit increase in gross domestic product (GDP) — decreased by 33% from 2005 to 2019 due to rapid forest cover expansion and the application of green Hydro technologies (Euronews Green & Reuters, 2023). However, recent emission figures from India indicate signs of difficulty in controlling and reducing its greenhouse gas emissions. According to the United Nations Environment Programme (UNEP) report, India's greenhouse gas emissions increased by 5.1% in 2022 compared to 2021, the second-highest rate after Indonesia's 10% increase (United Nations Environment Programme, 2023). Research by Friedlingstein and et al. (2023) also predicts that India's emissions will continue to rise by approximately 8.2% (ranging from 6.7% to 9.7%) compared to 2022. This analysis is based on separate forecasts of +9.5% for coal, +5.3% for oil, +5.6% for natural gas, and +8.8% for cement.

Table 1: Emissions, emission rates in 2022, and emission reduction commitments of the top five emitters in the world

Countries	Emission levels in 2022	Emission rate 2022	Emission Reduction Commitments

China	15,685 million tons	29.16%	- Achieve peak emissions by 2030. - Achieve net-zero emissions by 2060.
United States	6,017 million tons	11.19%	- Reduce U.S. greenhouse gas emissions by 50-52% compared to 2005 levels by 2030. - Achieve 100% carbon-free electricity by 2035. - Become a carbon-neutral economy by 2050. - Provide 40% of federal investments in climate and clean energy to disadvantaged communities.
India	3,943 million tons	7.33%	- Reduce emissions intensity in GDP by 45% by 2030, compared to 2005 levels. - Attain around 50% of cumulative installed electricity capacity from non-fossil fuel sources by 2030, with low-cost technology and international financial support, including from the Green Climate Fund.
EU	3,588 million tons	6.67%	- Reduce emissions by at least 55% compared to 1990 levels by 2030. - Achieve carbon neutrality by 2050.
Russia	2,580 million tons	4.8%	- Reduce emissions by 30% compared to 1990 levels by 2030. - Achieve carbon neutrality by 2060.

The rapid increase in India's emissions results from the growing demand for electricity outpacing the capacity of renewable energy sources, leading to increased use of fossil fuels to make up for the shortfall. Despite being the world's fifth-largest economy, India faces the challenge of poverty reduction (about 210 million Indians currently living in poverty, according to United Nations estimates). To meet the electricity demands for sustaining economic growth and addressing social issues, especially poverty, India heavily relies on coal — a cheap, domestically available fossil fuel. While energy generated from coal accounted for 73% of India's total electricity in 2022, in November 2023, the country announced plans to install an additional 80 gigawatts of coal-fired power plants by 2032 to meet energy demands (Vaidyanathan, 2023). It is evident that, despite committing to emissions

reduction, India's current priority remains economic and social development to alleviate poverty.

2. Political conflicts and geopolitical instability among nations

To realize a systemic shift towards sustainable development, commitments and cooperation between nations and political factions are critically necessary. However, the current political instability, geopolitical conflicts, and armed conflicts worldwide not only disrupt the implementation and maintenance of climate efforts and policies (Adebayo et al., 2022) but also show signs of exacerbating climate change more severely.

One notable example of political conflict is the United States (US). The rivalry between the two major political parties, Democrat and Republican, has eroded the consistency and deepened the divide in the nation's climate actions and policies. Under former President Barack Obama, a representative of the Democratic Party, the United States committed to participate in the 2015 Paris Agreement and pledged a $3 billion contribution to the Green Climate Fund. However, on June 1, 2017, under the leadership of former President Donald Trump, a representative of the Republican Party, the US announced its withdrawal from the Paris Agreement, including discontinuing the $3 billion financial pledge.

Shortly after President Joe Biden, a Democrat, won the presidential election against former President Trump, he promptly announced the US's return to the Paris Agreement. President Biden also established the nation's first-ever National Climate Task Force, comprising over 25 Cabinet-level leaders from various agencies, to achieve goals, such as reducing greenhouse gas emissions by 50-52% compared to 2005 levels by 2030, reaching 100% carbon-free electricity by 2035, and becoming a net-zero emissions economy by 2050 (The White House, 2021). The 2022 Inflation Reduction Act is also a prominent symbol of President Biden's climate efforts, as it represents the largest-ever investment, $783 billion, to cut carbon emissions and combat climate change in the US history (Seltzer, 2022). However, the process of passing this bill also highlights deep divisions between the two parties on climate change: all Democratic members of both the Senate and the House of Representatives voted in favor, while all Republican members voted against it (Meyer, 2022).

The political conflict can gradually turn climate-related issues into "weapons" for political interests. When climate change is used as a weapon, it becomes difficult to distinguish between legitimate environmental concerns and strategic political actions. This prompts significant inquiries regarding the genuineness and validity of measures carried out under the pretense of climate mitigation and adaptation. It also poses difficulty in discerning authentic environmental endeavors from those motivated by hidden non-environmental agendas, resulting in preemptive, opposing, or punitive reactions from opponents.

For instance, if President Biden introduces policies restricting oil pipelines from Canada and limiting oil extraction on US soil, the Federal Energy Regulatory Commission approved a natural gas pipeline expansion project, sparking controversy in the Pacific Northwest region (Plautz & Bright, 2023). More recently, the Republican-controlled House of Representatives passed a bill that slashed approximately 40% of funding for the Environmental Protection Agency (EPA). In addition to EPA budget cuts, Republicans also attempted to remove some bills passed by Democrats in the previous year to assist marginalized communities in climate change and pollution mitigation (Frazin & Folley, 2023).

Apart from political disputes between parties, geopolitical instability and military operations between nations also pose a risk of undermining previous efforts to reduce emissions or even destroying global climate change mitigation efforts. According to the estimation by Initiative on GHG Accounting of War – a group of experts studying the climate impact of the Ukraine conflict – approximately 150 million tons of CO2 have been emitted into the atmosphere in the 18 months since the Ukraine conflict began. About 25% of these emissions result from the fossil fuel consumption of both the Russian and Ukrainian military. Fifteen percent of the total emissions come from frequent wildfires along military frontlines. An estimated one-third of the emissions (about 55 million tons of CO2) are attributed to the climate costs of rebuilding towns, cities, and infrastructure damaged by the war, making it the largest contributor to greenhouse gas emissions (Agence France Presse, 2023).

In reality, the impact of geopolitical instability, military activities, and warfare between nations goes far beyond the listed figures. When war breaks out, all resources and manpower are prioritized for the conflict, depleting a nation's accumulated resources and severely impacting its economy, thus significantly affecting climate change mitigation and adaptation efforts (Q.-H. Vuong, 2021). The destruction and harm caused by war increase with its scale, leading to heightened animosity and mistrust among nations (Vuong et al., 2021). This creates barriers that are difficult to overcome in achieving global consensus and commitment to addressing climate change.

Even in the absence of full-scale war, geopolitical instability can trigger arms races as nations perceive threats to their national security. The military has long been a significant source of greenhouse gas emissions, primarily due to emissions from military machines, such as tanks, aircraft, aircraft carriers, and other vehicles relying on fossil fuel energy for operation. Beyond direct emissions from military activities, logistics, base operations, and emissions in the supply chain of weapons and equipment contribute significantly to greenhouse gas emissions. Preliminary estimates from the Scientists for Global Responsibility and Conflict and Environment Observatory suggest that global military activities account for about 5.5% of global emissions (Parkinson, 2022). This surpasses the total emissions of Russia (4.8%) and ranks just behind India (7.33%) and the EU (6.67%) (Emissions Database for Global Atmospheric Research, 2023). If, for any reason, nations engage in a global arms race, it would pose a serious threat to emissions reduction efforts. There are already signs of this

risk materializing, as NATO recently passed a decision to increase its military budget for 2024 by an additional 12%, amounting to €2.03 billion (Reuters, 2023). Once this catastrophe occurs, it will be challenging to control, as it directly relates to national security and existential threats. Additionally, to manage emissions, the prerequisite condition is to obtain information related to emissions. According to the Kyoto Protocol of 1997 and the Paris Agreement of 2015, reporting of emissions from military activities is exempted to avoid compromising national security (Mcfarlane & Volcovici, 2023).

3. Challenges in developing and scaling global emission-reducing technologies

Technological solutions have long been considered the answer to reducing emissions generated by providing energy for economic and societal activities. There are several technology pathways proposed to achieve net-zero emissions in the energy sector, such as electrifying end-use sectors, carbon capture, utilization, and storage (CCUS) to remove CO2 from the atmosphere, low-carbon hydrogen and hydrocarbon fuels, and bioenergy utilization. However, these technologies face numerous challenges in commercializing various steps within the value chain, hindering the scaling of technology applications. The process of developing and successfully commercializing a novel technology is both time-consuming and fraught with risks. It begins with initial concepts, proceeds to prototyping, and then scales up. Only when it is successful, a new technology will be commercialized on a large scale. Even successful examples in clean energy technology development, such as solar panels, lithium-ion batteries, or LED lights, took between 10 to 30 years from initial prototypes to commercialization (International Energy Agency, 2020).

According to a recent report from the International Energy Agency (IEA), current technological advancements are still far from achieving the goal of net-zero emissions. If the world aims to achieve net-zero emissions by 2070, more than 40% of cumulative emission reductions will rely on technologies that have not yet been commercially adopted by the market (during the early adoption stage). Meanwhile, nearly 35% of cumulative emission reductions from the current trajectory come from technologies that are either at the prototype or demonstration stage (International Energy Agency, 2020). To ensure the successful development and expansion of these technologies, substantial investments in research and development and technical enhancements are indispensable.

In some countries with significant emissions, emission-reducing technologies are not yet widely adopted. China, as the world's largest emitter of greenhouse gases, accounting for approximately 29.16% of global emissions in 2022, plays a crucial role in global emission reduction efforts. Under the leadership of Chairman Xi Jinping, China gained attention for its pledge to reach the emission peak by 2030 and attain carbon neutrality by 2060 (Anderson, 2023). To achieve this, China identified the need to reduce emissions from its steel and cement industries, which collectively contribute to 70% of China's industrial emissions (Chen et al., 2023; Shan et al., 2018). The government and industry leaders have sought and

implemented technological solutions to reduce emissions, capture and sequester carbon, and adopt appropriate improvements for these industries.

A study published in 2022 by Wang et al. (2022) developed a model called C3IAM/NET-IS (China's Iron and Steel Industry Assessment and Integrated Assessment Model/National Energy Technology Innovation System) to evaluate the carbon neutrality prospects of China's iron and steel production sector. The model predicts that total CO2 emissions will peak at around 1,514-1,530 million tons before 2023 and then decrease to around 73 million tons by 2060. To achieve this, China needs "carbon sinks" to reach carbon neutrality. This demands a concerted effort to advance and implement energy-efficient technologies in the transition period from 2020 to 2060, which can reduce up to 22% of greenhouse gas emissions. Solely switching from electric arc furnaces that utilize 50% scrap to ones that use 100% scrap could save up to CNY 4,361 billion (approximately USD 594 billion) when utilizing 15.14 billion tons of scrap steel.

However, China has not yet possessed low-emission technologies, not to mention carbon-neutral technologies (Zhao et al., 2022). Current technology pathways applied in steel and cement production have limited carbon reduction potentials. This reality necessitates significant investments in implementing a new set of technologies, including CCUS, electrochemical technologies, hydrogen energy, and scrap utilization. In practice, even with clear leadership consensus, local implementation will still take considerable time, not to mention the adaptation process within businesses. Furthermore, the pace of technology change to increase scrap steel recycling from a very low share, even at a rate of +10%, is seen as challenging (Chen et al., 2023). Considering the complexity of advanced technology combinations, stricter conditions need to be met, requiring even more time for implementation. At the same time, China is currently facing the pressure of balancing economic challenges and emissions reduction (Kennedy et al., 2023). China's energy structure heavily relies on coal, which poses a significant barrier to achieving its emission reduction goals.

Even when emission-reducing technologies have been successfully developed, expanding their scale of use still requires success in the market. This depends on both policy incentives and consumer choices. One of the key technologies for emission reduction that needs to win in the market to scale up is electric vehicles (EVs). Transportation is currently one of the largest sources of greenhouse gas emissions, contributing to over 16% of total emissions. Rapidly reducing emissions from transportation is an urgent requirement to address climate change. Electric vehicles have the potential to eliminate emissions entirely from tailpipes, making them an attractive option for reducing air pollution and contributing to global climate change mitigation. Many countries worldwide, including EU, China, Canada, and others, have set plans to limit or completely ban the production of new fossil fuel-powered vehicles by 2035 (Abnett, 2023). The UK, in particular, has set a goal to completely ban fossil fuel-powered vehicles by 2030 (Jolly, 2023). Moreover, 12 US states have adopted

California's Zero Emission Vehicle (ZEV) program, requiring automakers to sell a fixed percentage of ZEVs each year (Union of Concerned Scientists, 2019).

However, the recent decision by the UK government to delay the ban on new fossil fuel-powered vehicles until 2035 instead of the previously planned 2030 has raised concerns about the country's ability to support the continued competitiveness and expansion of EVs in the market, which, in turn, would help achieve emissions reduction goals in the transportation sector (Department for Transport & MP, 2023; Lawless, 2023). This decision could also potentially be used as a reason by other countries to extend the timeline for implementing bans on fossil fuel-powered vehicles.

4. Public perceptions toward climate change

Public support and engagement are crucial for implementing and sustaining effective climate policies and the widespread adoption of emission-reducing technologies. However, due to the politicization of climate issues and their use as weapons against opposing political factions, the topic of climate change has become deeply polarized within the public. In major economies like Canada, Germany, and the UK, for instance, conservative party supporters are less likely to believe that they will be significantly harmed by climate change compared to those supporting liberal or green parties. Conservative supporters in Canada and Australia are also less likely to believe that wealthier countries should do more than developing nations to address the issue (Stokes et al., 2015).

However, there is no country that has the stark public division regarding climate change like in the US (Stokes, 2015). A survey by the Pew Research Center revealed that 78% of Democratic Party members describe climate change as a significant threat to the nation's prosperity, up from 58% a decade ago. In contrast, only 23% of Republican Party members see climate change as a major threat, a figure nearly identical to that of a decade ago (Tyson et al., 2023). A Washington Post-University of Maryland poll also showed deep divisions between Democrats and Republicans on the issue of extreme weather (Ajasa et al., 2023).

This deep division of perspectives creates favorable conditions for climate change denial and related conspiracy theories to be widely accepted by a significant portion of the public, despite the consensus among climate scientists that human activities are causing increasingly severe climate change impacts (Lynas et al., 2021; Powell, 2017). A 2016 Fairleigh Dickinson poll found that 41% of Americans believed that "global warming is a myth concocted by scientists" (Uscinski & Olivella, 2017). When a substantial segment of society still views climate change as a “hoax” or “scam”, they not only fail to support environmental protection and emission reduction measures but also hinder environmental policy efforts (Dunlap & McCright, 2010). This creates opportunities for politicians to exploit and garner voter support.

For example, consider the case of Governor Ron DeSantis, who attempted to outdo former President Donald Trump in climate denial by rejecting all major investments and grants that would imply acknowledgment of human-induced climate change, such as refusing a $5 million grant to establish a program providing financial assistance to affected residents looking to equip their homes with energy-saving devices or the $3 million Clean Air Act grant aimed at reducing pollution, as well as the "Solar for All" program to provide solar panels to low-income residents. This left Florida residents to face the devastation of Hurricane Idalia in 2023, a storm directly linked to climate change, without federal support (DeBerry, 2023; Otten, 2023). Similarly, House of Representatives Speaker Mike Johnson passed a plan to cut about 40% of funding for the Environmental Protection Agency (EPA) and has questioned the science behind climate change while opposing efforts to use clean energy (Friedman, 2023).

Furthermore, recent signs indicate that people are losing trust in the scientific community, especially in the United States, following the endorsement of President Joe Biden by renowned scientific journals *Nature* and *Science* during the 2020 presidential election between Biden and former President Donald Trump (Editorial, 2020; Malakoff, 2020). Recent studies have shown that the loss of neutrality and objectivity due to partisan interests has significantly eroded the trust of many voters, especially those who support former President Trump (Zhang, 2023). The erosion of trust not only affects certain scientific journals such as *Nature*, but also spreads throughout the broader scientific community.

According to a recent Pew Research Center survey, public trust in the positive social impact of science and scientists in the United States has declined sharply (kennedy & Tyson, 2023). Compared to 2016, the number of people who believe that science has a positive impact on society has decreased by 10%, from 67% to 57%, while those who think science has a negative impact have doubled from 4% to 8%. Over a quarter of respondents stated that they have little or no trust in scientists acting for the greater good of the public, up from 12% in April 2020. This decline in trust occurs across both parties, but it is most severe among Republican Party members, with nearly 40% having little or no trust in scientists acting for the greater good. Given the substantial decrease in public trust, it is becoming progressively difficult to convince the public to participate in the fight against climate change using scientific data.

5. The uncertain future of global climate change mitigation efforts

It is evident that in the battle against climate change, there are numerous persistent risks and challenges, and new ones continue to emerge. These include ensuring energy supply for economic and societal activities, political and geopolitical instability, challenges of technological development and diffusion, and public awareness of climate change. These challenges impede the progress of reducing emissions, and there is currently no effective

resolution in existence, all the while climate change and ecological catastrophes are intensifying.

This has led to some environmental activists resorting to more radical approaches. In recent years, environmental activist groups have engaged in inappropriate and sometimes unlawful activities to draw attention from the public and exert pressure on governments to enact emission-cutting policies. For instance, the group "Just Stop Oil" has carried out destructive actions targeting priceless artworks by world-renowned painters like Horatio McCulloch, John Constable, Leonardo da Vinci, Vincent Van Gogh, Joseph Mallord William Turner, and many others (Alao, 2022). Another protest tactic employed by these groups is blocking transportation routes. In particular, on April 25, 2023, the organization "Last Generation" staged road blockades on over 30 transportation routes in Berlin, leading to traffic jams on several major city roads (Grieshaber, 2023).

Often viewed as an environmental threat, wealthy businesspeople, corporate owners, and large conglomerates have become the target of environmental activist organizations. In his recent book, Andreas Malm, a professor of human ecology at Lund University in Sweden, even called for the destruction of all CO2-emitting devices, stating, "[d]amage and destroy new CO2-emitting devices. [...] Let the capitalists who keep investing in the fire know that their properties will be trashed" (Andreas, 2021). However, even Malm acknowledges that the consequences of such actions are uncertain. According to him, "The situation is so dire, so extreme, that we have to experiment, have to try" (Illing, 2021).

Facing pressure and radicalization from environmental activists, business entities pushed back during the 2023 United Nations Climate Change Conference (COP28). COP28 President Sultan Ahmed Al Jaber stated, "There is no science out there, or no scenario out there, that says that the phase-out of fossil fuel is what's going to achieve 1.5C." Beyond rejecting the science, Jaber also criticized environmental activists for exacerbating polarization and division occurring worldwide, saying, "Please help me, show me the roadmap for a phase-out of fossil fuel that will allow for sustainable socio-economic development, unless you want to take the world back into caves. [...] I don't think [you] will be able to help solve the climate problem by pointing fingers or contributing to the polarisation and the divide that is already happening in the world" (Carrington & Stockton, 2023). In addition to holding the position of Minister of Industry and Advanced Technology of the UAE, Sultan Ahmed Al Jaber also serves as the CEO of the Abu Dhabi National Oil Company (ADNOC) and the Chairman of Masdar, a state-owned renewable energy company. COP28 concluded with an agreement to "transition away" from fossil fuel dependence rather than "phase-out" it, a result deemed by many scientists as "devastating" (Carrington, 2023).

Through COP28, the reactions of the involved parties have highlighted signs of impasse and contradictions in addressing the climate issue. Amidst the pressing need for immediate measures to address climate change, the existing state of inaction and inconsistencies can be

considered tantamount to failure. Failure in such a critical situation is highly detrimental as it would push both humanity and the planetary ecosystem further into the "uncharted waters", full of unpredictability and chaos.

Upon careful contemplation, it becomes clear that the risks of failure in combating climate change stem from a lack of eco-surplus culture, a cultural value system that prioritizes environmental protection and healing, as culture is the software of the mind, shaping and driving values, worldviews, perceptions, thoughts, emotions, attitudes, and behaviors of individuals (Hofstede et al., 2005; Vuong, 2023; Vuong et al., 2022). The socio-economic development models of nations today are still influenced by eco-deficit cultural values (Q. H. Vuong, 2021). Therefore, to overcome the current impasse and contradictions and prevent humanity and the planetary ecosystem from being cast into stormy weather, the construction of the eco-surplus culture in society, especially within businesses, is of utmost importance (Nguyen & Jones, 2022; Vuong & Nguyen, 2024; Q. H. Vuong, 2021). This change in cultural values can serve as a leverage for implementing fundamental sustainable changes (Abson et al., 2017).

The global battle against climate change is a battle for the survival of all humanity but must be fought on "local battlegrounds," including regions, nations, and local communities. Nevertheless, there is a growing indication that some countries are in danger of reneging on their climate pledges. An evident illustration is that the most prominent nations in terms of greenhouse gas emissions are confronted with the prospect of reducing their obligations. To prevent this from happening, the world needs to foster an eco-surplus culture in which the enduring values of Earth's ecosystems are viewed as the conscience of the era (Vuong & Nguyen, 2024). Only then can nations, political factions, organizations, and individuals reduce conflicts, promote cooperation, and mutually support each other in emissions reduction, based on the principle of harnessing the power of the three common factors: "common environment, common challenge, and common future".

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