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# ***The Climate Policy Cycle: why hasn't humanity's most serious problem become the number one political problem?***

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## **Abstract**

The current climate changes constitute the most serious problem humanity has ever faced, which puts at risk the quality of life and the very survival of the species in the near future. The text addresses the climate issue from the methodological perspective of the public policy cycle, aiming to answer the following question: why has the most serious problem facing humanity not yet become the number one political problem? The facts - scientific findings, conferences, international agreements, legislation and (un)adopted measures - are relatively well known, but the political process, less so. The political process is chronicled from the scientific discoveries about the greenhouse effect in the 19th century, the awakening of society's and governments' attention in the 1980s, the United Nations debates and international agreements from the 1990s on, the policies implemented in different countries, the results of which are being measured and monitored by the IPCC and other institutions. In the different stages, the cycle of climate policies unfolds as a scene with multiple agents, who use varied resources, adopt divergent positions and decisions for economic and political reasons. Denialism, the obstructions created by the oil industry, neoliberal forces and the extreme right, and the absence of a sense of urgency in society are pointed out as factors that prevent the climate issue from being elevated to the condition of the number one political problem of humanity. The research technique is a semi-systematic literature review.

**Keywords:** Climate change. Global warming. Climate policies. Public policy cycle.

## **Ciclo das políticas climáticas: por que o problema mais grave da humanidade não se tornou o problema político nº 1?**

## **Resumo**

As mudanças climáticas em curso constituem o mais grave problema que a humanidade já enfrentou, o qual põe em risco a qualidade de vida e a própria sobrevivência da espécie no futuro próximo. O texto aborda a questão climática sob a perspectiva metodológica do ciclo das políticas públicas, visando responder a seguinte questão: por que o mais grave problema da humanidade não se tornou até hoje o problema político nº 1? Os fatos - descobertas científicas, conferências, acordos internacionais, legislações e medidas (não) adotadas – são relativamente bem conhecidos, mas o processo político, menos. O processo político é relatado desde as descobertas científicas sobre o efeito estufa no Século 19, o despertar da atenção da sociedade e dos governos nos anos 1980, os debates e acordos internacionais das Nações Unidas a partir dos anos 1990, as políticas implementadas nos diferentes países, cujos resultados vêm sendo mensurados e monitorados pelo IPCC e outros organismos. Nas diferentes etapas, o ciclo das políticas climáticas desenrola-se enquanto cena com múltiplos

agentes, que utilizam recursos variados, adotam posições e decisões divergentes por razões de ordem econômica e política. O negacionismo, as obstruções criadas pela indústria petrolífera, pelas forças neoliberais e pela extrema-direita, além da ausência de um senso de urgência na sociedade são apontadas como fatores que impedem que a questão climática seja alçada à condição de problema político nº 1 da humanidade. A técnica de pesquisa é a revisão bibliográfica semi-sistemática.

**Palavras-chave:** Mudanças climáticas. Aquecimento global. Políticas climáticas. Ciclo das políticas públicas.

### **Ciclo de las políticas climáticas: ¿por qué el problema más grave de la humanidad no se ha convertido en el problema político nº 1?**

#### **Resumen**

El cambio climático en curso es el problema más grave al que se ha enfrentado la humanidad, que pone en riesgo la calidad de vida y la propia supervivencia de la especie en un futuro próximo. El texto aborda la cuestión climática desde la perspectiva metodológica del ciclo de las políticas públicas, con el objetivo de responder a la siguiente pregunta: ¿por qué el problema más grave de la humanidad no se ha convertido aún en el problema político número uno? Los hechos - hallazgos científicos, conferencias, acuerdos internacionales, legislaciones y medidas (no) adoptadas - son relativamente bien conocidos, pero el proceso político, no tanto. El proceso político se relata a partir de los descubrimientos científicos sobre el efecto invernadero en el siglo XIX, el despertar de la atención de la sociedad y los gobiernos en los años ochenta, los debates y acuerdos internacionales de Naciones Unidas a partir de los noventa, las políticas implementadas en diferentes países, cuyos resultados están siendo medidos y monitorizados por el IPCC y otros organismos. En las diferentes etapas, el ciclo de las políticas climáticas se desarrolla como una escena con múltiples agentes, que utilizan recursos variados, adoptan posiciones y decisiones divergentes por razones económicas y políticas. El negacionismo, las obstrucciones creadas por la industria petrolera, las fuerzas neoliberales y la extrema derecha, además de la ausencia de un sentido de urgencia en la sociedad son señalados como factores que impiden que la cuestión climática sea elevada a la condición de problema político número uno de la humanidad. La técnica de investigación es una revisión bibliográfica semisistemática.

**Palabras clave:** Cambio climático. Calentamiento global. Políticas climáticas. Ciclo de políticas públicas.

## **1 Introduction**

The policy cycle is an approach developed by the political science that has proved useful in understanding how public policies are generated and implemented. Its main virtue is that it provides an analytical framework in which policy is explained as a process with a start, middle and end, whose origin lies in the pressures and support of the social environment, and whose purpose is to respond to these pressures and supports. Policies do not arise spontaneously nor do they merely reflect the intentions of those in power; they are best understood in the light of the close relationship between the state, society and the market. The perspective of the cycle makes it easier to understand actions and decisions that, in common sense, seem disorganized and unconnected. The division into phases translates the complexity of reality into manageable and didactic categories (PARSONS, 2007).

The policy cycle analysis model was consolidated by David Easton (1968). The inputs (demands and support) of the political process come from the social environment; the political system processes the demands, resulting in the outputs

(decisions). The demands and support within the political system (from executive, legislative and judicial agents and bureaucrats) are called withinputs. Public policies are thus the result of a political process involving multiple agents and constraints both internal and external to the state. This process takes place in different phases, which make up the cycle. This perspective has gained strength in the growing literature of recent decades, in different areas of knowledge. The cycle should not be conceived as a mechanical succession of stages, but as a roadmap that helps to observe the processes of politics, processes that are not linear and which are often neither clear nor sharp to the scrutiny of the analyst (SUBIRATS et al, 2012, PARSONS, 2007).

The cycle theory lists five or more phases. The distribution into five stages is used here: (i) perception and definition of the problem; (ii) inclusion in the political agenda; (iii) formulation; (iv) implementation; and (v) evaluation. The heuristic capacity of the policy cycle is determined by the analyst's adequate incorporation of political agents (state, market and civil society) and their resources, political variables (correlation of forces, power resources) and contextual factors (ideologies, political culture, moral culture). In other words, the robustness and appropriate handling of the elements of political theory on which the analysis is based affect the results obtained when using this tool.

This text analyzes the climate policy<sup>1</sup> process from the perspective of the public policy cycle, ordering the facts in interrelated phases, highlighting influential agents, interests involved, resources mobilized, ideological elements and cultural conditioning factors. The research problem is based on the central finding of the IPCC's (Intergovernmental Panel on Climate Change) 6th Assessment Report on the global scale, anthropogenic origin and severity of climate change:

Human activities, mainly through greenhouse gas emissions, have unequivocally caused global warming, with the global surface temperature reaching 1.1°C in the 2011-2020 period above 1850-1900. Global greenhouse gas emissions have continued to rise, with historical and ongoing unequal contributions from unsustainable energy use, land use and land use change, lifestyles, and consumption and production patterns across regions, between and within countries, and among individuals." (IPCC, 2023, p. 4)

Based on this (disturbing) premise, the research problem was thus defined: why hasn't humanity's most serious problem become the number one political issue? The answer is based on an explanation of the central elements of the process that began in the early decades of the 19th century (when the greenhouse effect and atmospheric changes began to be investigated), the social and political attention that the issue received in the final decades of the 20th century (becoming the subject of debates and resolutions at the United Nations), the policies formulated and implemented in different countries and the evaluation of the results by various international bodies, most notably the IPCC. The climate policy cycle is a storyline in which different actors, divided by interests, priorities and ideological visions, respond in an unsystematic way to an exceptional challenge which, due to its risks for the near future, should be the top priority of international politics.

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<sup>1</sup> The terms "climate policies", "climate policies" and "policies to tackle climate change" are used interchangeably.

A semi-systematic literature review was used to outline the climate policy cycle.<sup>2</sup> From the wide range of literature, were chosen works that make it possible to trace links between the climate issue and politics, links that can be observed in the different phases of climate policies. Works from different social sciences (political science, sociology, economics, history) and works on climate science were included, with the aim of outlining the broad international and national lines of a multifaceted plot. Given the scope and limits of the article, it does not explore relevant aspects of the debate, such as regional repercussions and local initiatives aimed at mitigation and adaptation. The thread of the climate policy cycle is weaved from Philander (2008), Bolin (2007), Le Treut and Somerville (2007), Aron (2023), Bodansky (2001), Giddens (2010), Black (2013), Pasternak and Orsi (2021) and Marques (2023), in addition to the publications cited throughout the text.

Briefly, the climate policy cycle is as follows: (1) the perception and constitution of the political problem of climate began in scientific circles in the first decades of the 19th century, but only reached social repercussions in the final decades of the 20th century; (2) the inclusion of climate change in the political agenda took place in the 1980s when global warming went from being a scientific issue to a political issue; (3) the formulation of guidelines for facing the problem took place within the United Nations from the 1990s, with the adoption in 1992 of the UNFCCC – United Nations Framework Convention on Climate Change; (4) the implementation of policies in the countries took place from the 1990s onwards, partially taking into account the UNFCCC guidelines and the periodic deliberations of the Conferences of the Parties (COPs); (5) the evaluation of the effectiveness of policies to fight climate change has accompanied the whole process, through technical reports, especially those of the IPCC.

At the end of the paper, the relevant factors that stand in the way of tackling the climate issue, the greatest challenge ever faced by humanity, are highlighted. It is emphasized that in the light of scientific consensus, climate change does not represent "one" problem among others; it is "the" problem par excellence, and successfully tackling the issue is a condition for human survival.

## **2 Perception of the climate problem: the prominence of science**

Scientific studies on the greenhouse effect date back to the first decades of the 19th century. In 1824, the French physicist Joseph Fourier described the natural greenhouse effect of planet Earth: the climate on Earth is determined by the thermal balance between incoming and outgoing solar radiation; the atmosphere serves as an absorbing layer for solar radiation and the characteristics of the atmosphere determine the temperature on the Earth's surface. In 1856, researcher and feminist activist Eunice Newton Foote reported the first experiment demonstrating the greenhouse effect: thermometers were placed in three cylinders containing humid air, dry air and air enriched with CO<sub>2</sub>. Exposed to the sun, the researcher observed after some time that the cylinder containing CO<sub>2</sub> had the highest temperature. Five years later, in 1861, the Irish physicist John Tyndall presented new evidence that

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<sup>2</sup> According to Snyder (2019, p. 335), "the semi-systematic or narrative review approach is designed for topics that have been conceptualized differently and studied by various groups of researchers within diverse disciplines and that hinder a full systematic review process".

water vapor and other gases create the greenhouse effect. From 1879, the International Meteorological Organization began to collect and standardize data on weather conditions, including temperature. (BOLIN, 2007; PASTERNAK; ORSI, 2021)

The link between the industrial revolution and the greenhouse effect was established by the Swedish chemist Svante Arrhenius in 1896, when he concluded that the coal-fired industrial era was contributing to the increase in the natural greenhouse effect. The researcher believed that the phenomenon could be beneficial for future generations. In 1900, the Swede Knut Angstrom discovered that CO<sub>2</sub>, even in the low concentrations found in the atmosphere, intensely absorbs parts of the infrared spectrum and produces the greenhouse effect. (ARON, 2023; LE TREUT; SOMERVILLE, 2007)

Until then, scientific discoveries about the greenhouse effect were of no concern. The picture began to change in 1938, when amateur scientist Guy Callendar presented the first evidence that the planet was warming. Based on meticulous records from 147 weather stations around the world, he calculated by hand that global temperatures had risen by 0.3°C over the previous 50 years and attributed the phenomenon to CO<sub>2</sub> emissions from industry. This finding was disregarded for years in scientific circles, where the belief reigned that human beings had no ability to impact such a large system as the climate. (LE TREUT; SOMERVILLE, 2007)

Evidence from geochemist Charles David Keeling proved Callendar right. In 1958, determined to compare the amounts of CO<sub>2</sub> in water and air, he designed his own equipment and went to a weather observation station at the top of the Mauna Loa volcano in Hawaii. He took meticulous daily measurements and after five years he had unequivocal proof that the concentration of CO<sub>2</sub> in the atmosphere was increasing and that it was due to the use of fossil fuels. Since then, the daily readings at Mauna Loa have remained almost uninterrupted and the Keeling Curve constitutes the longest continuous record of changes in atmospheric CO<sub>2</sub> levels. The impact of these discoveries led government agencies in the 1970s to start monitoring CO<sub>2</sub> levels. Today, the Global Greenhouse Gas Reference Network monitors carbon dioxide levels at about 100 places around the world (PHILANDER, 2008).

In the 1960s, climate science gained strength. Launched in 1964, NASA's Nimbus satellites revolutionized the study of climate and weather systems, providing data on global temperatures, the concentration of greenhouse gases in the atmosphere, the ozone layer and the thickness of sea ice. In 1969, the Nimbus III satellite provided the first accurate measurement of global atmospheric temperature, confirming that the Earth's lower atmosphere was warming. Shortly before that, in 1967, the first accurate computer model of the planet's climate was produced by researchers Syukuro Manabe and Richard Wetherald. This model predicted that a doubling of CO<sub>2</sub> concentrations could increase the global temperature by 2°C, a prediction confirmed by subsequent observations and studies (BOLIN, 2007; LE TREUT; SOMERVILLE, 2007).

At the end of the 1960s, research carried out in Antarctica reinforced concerns about the impact of global warming. John Mercer, a glaciologist at Ohio State University in Columbus, warned in 1968 that global warming could collapse the ice sheets, leading to a disastrous rise in sea levels. Atmospheric warming, according to Mercer, could cause glaciers to disintegrate in a similar way to what had happened in

the distant past, causing sea levels to rise by around 5 meters.<sup>3</sup> (MANN, 2021) (In 1995, the huge Larsen ice shelf collapsed, and the warning was taken seriously. In 2002, Larsen B collapsed and in 2017 a large crack opened in Larsen C.)

In the 1970s, climate change began to be included in debates on development. In the famous Limits to Growth study by Meadows et al, published in 1970, there was the warning that "the measured amount of CO<sub>2</sub> in the atmosphere is growing exponentially, apparently at a rate of about 0.2% per year" and that "only about half of the CO<sub>2</sub> emitted from burning fossil fuels has actually appeared in the atmosphere - the other half has apparently been absorbed by the surface of the oceans". (MEADOWS et al, 2007, p. 69) Climate risk was linked to other factors: "Carbon dioxide, thermal energy and radioactive waste are just three of the countless disorders that man is introducing into the environment, at a rate that is growing exponentially." (MEADOWS et al., p. 75) At the root of the disorders introduced by humans, the authors observed five interrelated determinants: world population, industrialization, pollution, food production and the stock of natural resources. Still in this decade, in 1975, the term global warming was introduced into the environmental vocabulary by the American geochemist Wallace Broecker, and quickly became popular. Later, Broecker was the first to recognize the ocean conveyor chain, a global network of ocean currents that affect everything from air temperature to rainfall patterns.

In the 1980s, scientific evidence about the harmful consequences of human action on the environment and the climate gained greater social and political repercussions. The news of the study by British researchers Jonathan Shanklin, Joe Farman and Brian Gardiner in 1984 that the ozone layer over the British research station at Halley's Bay in Antarctica had lost a third of its thickness compared to previous decades had a strong impact. According to the researchers, this reduction - derived mainly from the intensive use of chlorofluorocarbons (CFCs), used in aerosols and refrigeration appliances - posed serious health threats, such as skin cancer, which sparked a wave of public fear and created the conditions for international cooperation between governments to reconstitute the ozone layer. (HOUGHTON, 2009)

In 1985, French and Soviet researchers drilled deep into the Antarctic ice, extracting an ice core more than 2,000 meters long, which provided information on the correlation between temperature and CO<sub>2</sub> levels over the last 150,000 years. (Subsequent investigations in Antarctica confirmed and extended this discovery. In 1998, the team extracted an even longer ice core, extending the climate to 420,000 years ago, revealing that CO<sub>2</sub> and methane levels in the atmosphere at the turn of the millennium were already above the maximum levels reached in the last four hundred thousand years. In 2004, another team of scientists extracted a 3 km ice core, containing in the sealed bubbles the climate record of the last 800,000 years, whose maximum atmospheric CO<sub>2</sub> levels are already exceeded today).

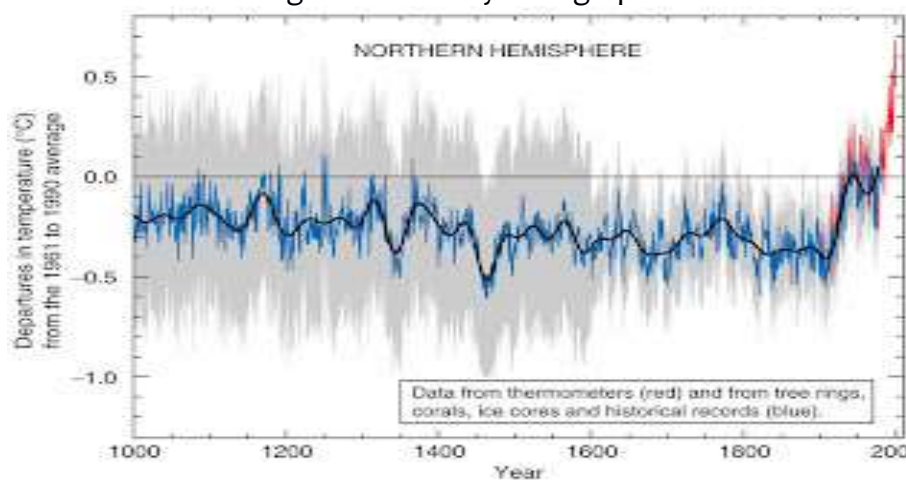
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<sup>3</sup> In the article "West Antarctic ice sheet and CO<sub>2</sub> greenhouse effect: a threat of disaster" (Nature, v. 271, p. 321-325, 1978) John Mercer argued that "if global consumption of fossil fuels continues to grow at the present rate, the level of atmospheric CO<sub>2</sub> will double in about 50 years. Climate models suggest that the warming effect resulting from the greenhouse effect will be greatly amplified at high latitudes. The temperature increase calculated at latitude 80°S could initiate the rapid deglaciation of West Antarctica, leading to a 5 m rise in sea level."

The Brundland Commission's report *Our Common Future*, published in 1987, systematized concerns about the predatory economic model and introduced the term sustainable development, which is now widely used. One of the important changes introduced at the time was the replacement of GDP by the HDI as a development indicator.

In 1998, an article by researchers from the University of Virginia, led by scientist Michael Mann, was published in the journal *Nature*, containing a graph of temperature fluctuations in the Northern Hemisphere between 1400 and 2000, based on data from tree rings (dendrology), ice cores and corals. The famous field hockey stick graph indicated the extraordinary rise in temperature in this hemisphere and its acceleration in the 1950s, the period of the Great Acceleration (intensification of anthropogenic social and economic activities).

Figure 1 – Hockey stick graph



Source: MANN (2012, p. 15).

The acceleration of GHG emissions from the middle of the 20th century onwards, clearly visible in the graph, is consistent with the findings of the study *Limits to Growth: The 30-year Update*, in 2004, which reaffirmed the predictions of the initial 1970s study on exponential growth. Citing meteorological forecasts for 2050, Meadows et al (2007, p. 120) were emphatic: "The issue is not whether the climate will change further in the future in response to human activities, but how much (magnitude), where (regional patterns) and how much (the rate of change)."

The scientific consensus on the seriousness of anthropogenic climate change was not reflected in public opinion. Minority academic dissent, sponsored by economic and political interests linked to the oil industry and disproportionately echoed by the media, led to the public perception that science was divided on the issue. Naomi Oreskes and Erick Conway (2010) reconstructed the denialist articulation in *Merchants of Doubt*. Since the 1990s, a group of US academics, funded by the oil industry, have dedicated themselves to questioning and contesting the existence, risk and anthropogenic causes of climate change. Among the deniers is Fred Singer, the best-known merchant of doubt. The book *Climate Change Reconsidered* (IDSO; SINGER, 2009) listed alleged evidence that contradicted that of the IPCC, serving as the basis for a petition sent to the US government, the central claim of which was: "There is no convincing scientific evidence that human release of carbon dioxide, methane, or other greenhouse gases is causing or will, in the foreseeable future,

cause catastrophic heating of the Earth's atmosphere and disruption of the Earth's climate." And furthermore: Furthermore: "There is substantial scientific evidence that increases in atmospheric carbon dioxide produce many beneficial effects upon the natural plants and the animal environments of the Earth." (IDSO; SINGER, 2009, p. 739)

The denialist authors were not experts in climatology or had a low reputation in scientific circles, but they succeeded in their efforts to sow confusion and avoid the climate crisis being seen as an issue for all of humanity, deserving of urgent and convergent action. Despite the general agreement of researchers – a survey by James Powell (2015), published in the journal *Science*, showed that only 4 out of 69,409 peer-reviewed articles rejected the hypothesis and suggested a lack of convincing evidence for anthropogenic global warming – the media continued to use the narrative that scientists were divided into "two sides".

An episode that contributed to the repercussions of the denialist theses was the so-called Climategate. In 2009, hackers leaked onto the internet a set of emails downloaded from a server at the climate research unit at East Anglia University in the UK. The emails allegedly revealed that director Phil Jones and scientists from the Climate Research Unit had manipulated data to exaggerate the anthropogenic effect on climate change. The affair exploded on the eve of COP15 in Copenhagen. The scientists denied any manipulation. An independent commission carried out a detailed examination of 11 studies published by the researchers over 20 years and found no evidence of deliberate scientific malpractice. A committee of the British parliament reached the same conclusion. The alleged manipulation, however, was widely publicized in the media and served as an opportunity for denialist theses. According to Michael Mann (2021, p. 41), it was all just a fabricated scandal, "a carefully crafted narrative foisted on the public and policymakers in a collaborative effort by fossil-fuel-industry front groups, paid attack dogs, and conservative media outlets."

Politically, denialism has become a hallmark of the American right and the international far right, whose most potent expressions have been the Trump administration in the United States [2017-2021] and the Bolsonaro administration in Brazil [2018-2022]. Several opinion polls have begun to indicate a correlation between being right-wing and climate denialism (CAPSTICK et al, 2015; ITS, 2021). Ideology has become a relevant predictor of citizens' positions on the climate issue: deniers are more likely to be found among supporters of conservatism and the far right, while democrats and progressives are inclined to accept the facticity and human causation of global warming.

Scientific evidence about the extent of climate change has continued to grow. In 2012, researchers found that the ice in the Arctic had reached its smallest area (3,410,000 km<sup>2</sup>) since satellite measurements began in 1979. In 2013, the Mauna Loa Observatory reported that the concentration of CO<sub>2</sub> in the atmosphere had exceeded 400 ppm for the first time. With each new IPCC report, there is more severe data on climate imbalance and its anthropogenic origin, with the main sources of GHG emissions being fossil fuels (oil, coal, natural gas), deforestation and burning, inadequate land use (agriculture and livestock), conventional construction techniques and improper waste disposal. (MARGULIS, 2020)

In the light of this review, the importance of science in recognizing the facticity of climate change and the need to elevate it to the status of an international

political problem becomes clear. At the end of the 20th century, there was already enough scientific consensus for national states to elevate the climate issue to the status of political problem number 1. What was missing? There was no favorable convergence of the great forces of the state, civil society, and the market, which did not happen due to the strong opposition of the capitalist elites.

### 3 Inclusion in the political agenda: the United Nations puts climate in the international discussion

The political agenda (the agenda of political problems prioritized by society and public authorities) depends on a variety of factors, often does not follow the logic of public rationality in setting priorities, and is strongly influenced by the interests of market agents and civil society. The climate issue, due to its systemic links, has oscillated in terms of its salience and prioritization by government leaders.<sup>4</sup> (PRALLE, 2009) Its inclusion and maintenance in the political agenda was due to pressure from scientific circles, environmental movements and progressive political forces, but in the opposite direction acted large economic corporations, especially oil companies, and the extreme right.

Concerns about climate stability were not at the center of environmental debates in the 1970s. At the 1st United Nations Conference on the Environment in Stockholm in 1972, the topic was absent and debates focused on topics such as air pollution, water and soil pollution, and the pressure of population growth on natural resources. One of its outcomes was the creation of the United Nations Environment Program (UNEP). Two conflicting positions that emerged at the UNEP had an impact on subsequent climate developments: several developed countries defended preservationism while developing countries argued for the right to use natural resources for their economic development. Brazil and China headed the alliance of peripheral countries opposed to recognizing the importance of environmental problems. At the time when Brazil was in the midst of the *economic miracle*, the Brazilian delegation argued that the major national problem was poverty, not pollution, and that environmental concerns should not hinder economic growth. (VIOLA, 2002)

Climate became one of the central themes of the United Nations in the 1980s. The Brundtland Commission report *Our Common Future*, endorsed by the United Nations in 1987, characterized climate change as a serious probability. In discussing the environmental risks and uncertainties of a high-energy future, it first highlighted "the serious probability of climate change generated by the 'greenhouse effect' of gases emitted to the atmosphere, the most important of which is carbon dioxide (CO<sub>2</sub>) produced from the combustion of fossil fuels", followed by urban-industrial pollution, environmental acidification and the risk of nuclear accidents. (UNITED NATIONS, 1987, p. 172) The UN's recognition of the seriousness of the problem was

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<sup>4</sup> Sarah Pralle (2009, p. 793) points out that "governments are unlikely to 'solve' the climate crisis with a single policy enacted at one particular moment. Instead, the problem requires governments to commit to a series of policy measures, with the probability that progressively more stringent targets will have to be enacted and enforced over time. In short, the climate change crisis requires that the issue remains a priority item that is not displaced by economic downturns and other political, economic and social developments."

echoed by environmental movements, civil society organizations and progressive political leaders.

The event that marked the beginning of the debate on the climate situation was the Villach Conference in Austria in 1985, but the repercussions of the issue gained momentum with the Toronto Conference in 1988. With the theme Changing Atmosphere: Implications for Global Security, it provided an opportunity to present research results from a multidisciplinary group of scientists on GHGs in global warming. As this group had no official representation, the Conference made no direct recommendations, but issued a stern warning about environmental changes, ozone depletion and global warming due to human action. "Both the political and scientific communities now agreed that action was needed. Suddenly, there was a perfect storm. The fact that there was a growing body of knowledge that needed to be assessed, that governments were beginning to see the need for such an assessment, and the convening efforts of the WMO [World Meteorological Organization] and UNEP." (ISC, 2018)

The creation of the IPCC in 1988 was a key decision in keeping the climate issue on the political agenda. Founded by the WMO and UNEP, the IPCC had a decisive impact on international public perception of the seriousness of climate change. Scientific research carried out on different continents began to have a agency for evaluating, interpreting and systematizing relevant information into comprehensive, easy-to-understand reports, providing policymakers with reliable assessments of climate change, its implications and risks, as well as mitigation and adaptation options. The agency has become internationally recognized as the leading authority on climate. However, because it is a political body of the United Nations and not a strictly scientific committee, the IPCC's initial reports used a relatively cautious tone, which became more forceful over time.

The recommendations of the report Our Common Future and the IPCC's 1st Assessment Report - which pointed out that in the last century there has been an increase in global temperature of between 0.3°C and 0.6°C, as a result of emissions from human activity added to natural emissions - guided the preparations for Rio-92, held in Rio de Janeiro in 1992. Known as the Earth Summit, the event adopted Agenda 21 - a global plan to protect the planet from the degradation caused by accelerated economic growth, with a view to sustainable development - and the United Nations Framework Convention on Climate Change.

At the beginning of the 21st century, climate concerns were on the political agenda of different countries, especially in Europe. The Stern Report (2006), commissioned by the British government, classified global climate change as "the greatest and most far-reaching market failure ever seen", calculated that the impact of climate change was then equivalent to 5% of global GDP, and could reach 20%, and that combating it would represent a cost of only 1% of global GDP.

The successive IPCC reports have been fundamental in keeping the climate issue on the public agenda. The factual evidence contained in the reports confirmed the predictions of the scientific models presented in previous decades. This has led the IPCC and the scientific community to be increasingly emphatic about the urgency of global action. An expression of this was the letter from more than 11,000 scientists from 153 countries, published in January 2020 in the journal Bioscience (RIPPLE et al., 2020), which revealed the researchers' sense of urgency.

Nevertheless, public perception continued to be strained by denialism. Denialist forces remained active in the media, captured by the idea of hearing "both sides", and on social networks, and established alliances with neoliberal and conservative groups. Articulated by liberal think tanks such as the Marshall Institute, the Heartland Institute and the Cato Institute, the US deniers' strategies incorporated free-market fundamentalism, an attack on environmentalists (supposedly "communists in disguise") and the premise that there were extraordinary risks to the economy if GHG emissions were controlled (ORESQUES; CONWAY, 2010). According to Jean Carlos Miguel (2022, p. 297), "with the participation of part of the mainstream media, the denialist network caused a decades-long delay in US climate policy."

In Brazil, denialist intellectuals have always been minor figures, caricatures or with low scientific reputation, including Olavo de Carvalho, José Carlos de Almeida Azevedo, Luiz Baldicero Molion, Ricardo Felício, Gustavo M. Baptista, Geraldo Luís Lino, Richard Jakubaszko and Dom Bertrand de Orleans e Bragança, who have dedicated themselves to challenging the IPCC and denouncing a supposed link between the climate crisis and the formation of a new communist global order. The association between denialism, neoliberalism and agribusiness was strengthened by think tanks such as Instituto Liberal, Instituto Mises Brasil, Instituto Millenium, Movimento Brasil Livre and Instituto Liberal Conservador. With the electoral victory of Jair Bolsonaro in 2018, the flow of denialist materials on virtual networks increased, propagating the idea that climate change is an element of the discourse of left-wing globalism or climatism, which harms the country's development. (MIGUEL, 2022)

In the context of tensions between supporters of urgent measures to curb global warming and the forces of denial, the perception spread in society that discussions in international forums were leading to few practical effects and that society's inaction was allowing a problem with tragic consequences to worsen. This gave rise to youth mobilization for the climate. In 2018, young Swede Greta Thunberg sparked a climate movement with international repercussions. In August of that year, the then-15-year-old, dissatisfied with the authorities' inaction in the face of climate problems, decided to hand out leaflets on global warming and sat alone in front of the Swedish Parliament in Stockholm with a poster that read *Skolstrejk för Klimatet* (School Strike for Climate). Greta repeated this protest every day for three weeks and shared her actions on social media, attracting the attention of the press and society. The following month, she decided to hold the protest every Friday, starting the Fridays for Future movement. Similar movements have sprung up in other European countries, such as Extinction Rebellion and Jóvenes por el Clima. The Global Climate Strike mobilizations became annual; in 2021 they took place in more than 1,000 cities in 80 countries. The emergence of youth climate activism, according to Maristella Svampa (2020), "not only revitalized the field of action, but also created new expectations in a context of renewed climate urgency. This movement is not without risks (...) but its persistence is of enormous importance in the context of the successive failure of the global climate summits."

In the light of agenda-setting studies, which show that not making decisions and limiting the scope of the conflict or the number of people involved is a common method for elites (COHEN, 2020), it is realistic to consider that climate activism is a key agent in overcoming the blockage of forces that prevent stopping global warming from becoming the most crucial political issue, the one that orders all the others.

#### 4 Formulation: international agreements and national policies

As the climate crisis entered and remained in international government agenda, it became possible to formulate measures to confront the climate problem, with the approval of various documents at United Nations conferences containing measures and commitments. Despite the apparent convergence, the documents express clashes between countries at different stages of development, geopolitical powers with divergent interests, and pressures from economic forces opposed to the environmental movement. As in the agenda-setting phase, the resource of knowledge (science) continued to be important, but other fundamental resources were mobilized in public policies, such as information, political support, money, the law and time.

The Montreal Protocol, which was approved in 1987 and came into effect in 1989, established restrictions on the use of chemical materials that destroy the ozone layer, especially chlorofluorocarbons (CFCs), which are widely used in the refrigeration and pharmaceutical industries, and methyl bromide, which is used in agriculture. The protocol was the basis for international cooperation, which led to the elimination of most of the destructive substances, making it possible to restore the Earth's protective layer. The hole in the ozone layer in Antarctica is expected to close by 2060, and sooner in other regions. Although the climate issue was not directly linked, a study endorsed by the United Nations showed that without the ban on CFCs, less carbon would have been stored in plants, vegetation and soil, which could have led to an additional global warming of 0.5 to 1°C. (UNITED NATIONS, 15/09/2021) Brazil adopted measures from 1988 and officially joined the agreement two years later, through Decree 99.280/1990, committing itself to eliminating CFCs completely by 2010. [The measures adopted introduced another problem: the substitutes for CFCs - HCFCs (hydrochlorofluorocarbons) and HFCs (hydrofluorocarbons) - increase the greenhouse effect. For this reason, the Brazilian HCFC Elimination Program was created in 2010, with the aim of eliminating the use of these substances by 1940].

The United Nations Framework Convention on Climate Change was approved in 1992, with signatures beginning at RIO-92. With 26 articles, the document created a single matrix on climate change and over the years has been ratified by 195 countries. Its main objectives include stabilizing the level of GHG concentration in the atmosphere and the intention to revert emissions to 1990 levels. Its highest decision-making body is the Conference of the Parties (COP), formed by all the countries represented in it. There was no quantification of the levels of emissions to be achieved, due to a lack of precise scientific knowledge. The document recognized that the largest part of global GHG emissions comes from developed countries, that per capita emissions in developing countries are still relatively low but will grow with development, and the special vulnerability of specific countries. Hence the guideline of common but differentiated responsibilities (UNITED NATIONS, 1992).

Since 1995, the COPs (Conferences of the Parties) take place annually (with the exception of 2020, due to the covid-19 pandemic) to define and evaluate the measures adopted by the States Parties.<sup>5</sup>

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<sup>5</sup> The COPs that have taken place until today are: COP 1 - Berlin (1995); COP 2 - Geneva (1996); COP 3 - Kyoto (1997); COP 4 - Buenos Aires (1998); COP 5 - Bonn (1999); COP 6 - The Hague (2000); COP 7 -

The Kyoto Protocol was signed in 1997 and came into effect in 2004. For the first time, targets were set for reducing GHG emissions. The rich countries committed themselves to reducing emissions by an average of 5% over the period 2008-2012, compared to 1990 emissions, with specific targets for each industrialized country. This Protocol was transformed into international law in 2005, valid for the countries committed to the agreement. The Protocol provides for three important instruments: the clean development mechanism, through which developed countries can implement projects to reduce GHG emissions in developing countries; emissions trading, which allows developed countries that have fallen below their maximum GHG production quotas to grant permits to developed countries that have exceeded their quota; and the joint implementation mechanism, which encourages joint action by developed countries to achieve the Protocol's objectives. (UNITED NATIONS, 1998) Brazil signed the agreement on 29/04/1998 and ratified it on 23/08/2002.

Emissions trading in the form of carbon credits is one of the main mechanisms forged by the United Nations. It is a controversial mechanism that uses market logic to tackle problems caused by the market economy. One carbon credit corresponds to one ton of CO<sub>2</sub>; other greenhouse gases can be converted into carbon credits (carbon equivalent). These credits can be traded on the international market, so that countries that have achieved their reduction targets can sell credits to countries that have not met their targets. Alongside the regulated market, there is the voluntary carbon market. "In it, any company, person, NGO or government can generate or buy voluntary carbon credits. These credits are also audited by an independent entity, but are not subject to UN registration and therefore do not count as a reduction target for the countries that are part of the international agreement." (SUSTAINABLE CARBON, n.d.) A sense of pragmatism and political realism is cited in favor of the instrument. European leaders wanted to force industry to emit less, the Americans wanted flexibility, and developing countries wanted money to combat climate change, explains Lisa Song (2019), and in Kyoto the possible agreement was carbon offsetting.

The Copenhagen Accord, signed in 2009, with a lot of resistance, low adherence and legally non-binding, had two highlights. The first was the recognition of the need to set a limit on the increase in global temperature to a maximum of 2°C. It was the first treaty to establish a "roof", based on scientific research, that would make it feasible to tackle ongoing climate change. The second was to define an amount of aid from rich countries to developing countries: US\$ 30 billion between 2010 and 2012, rising to US\$ 100 billion a year by 2020. (UNITED NATIONS, 2009) However, the amounts released are far from what was established.

In the same year, Brazil instituted its National Policy on Climate Change, through Law No. 12.187/2009<sup>6</sup>, with the general goal of reducing GHG emissions by 36.1 to 38.9% by 2020. Sectoral Plans for Mitigation and Adaptation to Climate

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Marrakech (2001); COP 8 - Delhi (2002); COP 9 - Milan (2003); COP 10 - Buenos Aires (2004); COP 11 - Montreal (2005); COP 12 - Nairobi (2006); COP 13 - Bali (2007); COP 14 - Poznan (2008); COP 15 - Copenhagen (2009); COP 16 - Cancún (2010); COP 17 - Durban (2011); COP 18 - Doha (2012); COP 19 - Warsaw (2013); COP 20 - Lima (2014); COP 21 - Paris (2015); COP 22 - Marrakech (2016); COP 23 - Bonn (2017); COP 24 - Katowice (2018); COP 25 - Madrid (2019); COP 26 - Glasgow (2021); COP 27 - Cairo (2022).

<sup>6</sup> Available at: [https://www.planalto.gov.br/ccivil\\_03/\\_ato2007-2010/2009/lei/l12187.htm](https://www.planalto.gov.br/ccivil_03/_ato2007-2010/2009/lei/l12187.htm).

Change<sup>7</sup> were defined; the National Plan for Risk Management and Response to Natural Disasters<sup>8</sup>; the National Plan for Adaptation to Climate Change and the National Assessment Report on Climate Change (RAN)<sup>9</sup>. The Brazilian government's main goals are: to increase the use of alternative energy sources to 18% by 2030; to achieve an estimated 45% share of renewable energies in the composition of the energy matrix by 2030; to promote new clean technology standards, to increase energy efficiency and low-carbon infrastructure in the industrial sector; to improve transport infrastructure; to zero illegal deforestation by 2030; and to restore and reforest up to 12 million hectares by 2030. (BRASIL, 2016)

In 2015, the Paris Agreement was signed, which, after resistance and clashes, was signed by 195 countries. The Agreement reaffirms the goal of limiting the increase in the global average temperature to 2°C above the levels at the beginning of the industrial revolution and promoting efforts to limit this increase to 1.5°C. Among the measures to limit global warming, the Agreement emphasizes the promotion of universal access to sustainable energy in developing countries, particularly in Africa, through the enhanced deployment of renewable energies. It recommends cooperation between governments, civil society, the private sector, financial institutions, cities, communities and indigenous peoples in actions to mitigate global warming. It establishes a committee made up of experts to facilitate implementation and promote compliance with the provisions. The rich countries have promised to guarantee funding of US\$ 100 billion a year, starting in 2020, to help the poorest countries tackle climate change. (UNITED NATIONS, 2015) Due to US opposition to the definition of mandatory targets, it was established that each country must formulate its nationally determined contribution (NDC), a voluntary contribution, reviewed every 5 years, which must be reported to the UNFCC Secretariat.

The extent and limitations of the Paris Agreement derive from its adherence to the logic adopted by the United Nations in the 1980s, centered on the concept of sustainable development, guided by market rules (green capitalism). The document sets no binding targets, contains no mandatory measures on fossil fuels, does not prohibit subsidies for oil consumption and does not point to profound changes in the world trade system. (SVAMPA, 2020) Environmentalists are increasingly critical of the timidity of the Agreement's measures and the subterfuges it makes possible.<sup>10</sup> Given the seriousness of the situation, there is no way to disagree with the warnings of environmentalists, who echo the voice of science in the face of the inability of politics to speed up unavoidable transformations in the economy.

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<sup>7</sup> Available at: <https://www.gov.br/agricultura/pt-br/assuntos/sustentabilidade/agricultura-de-baixa-emissao-de-carbono/publicacoes/download.pdf>.

<sup>8</sup> Available at: [https://www.gov.br/mma/pt-br/assuntos/climazoniodesertificacao/clima/arquivos/relatorio\\_empresarial\\_pna\\_web.pdf](https://www.gov.br/mma/pt-br/assuntos/climazoniodesertificacao/clima/arquivos/relatorio_empresarial_pna_web.pdf).

<sup>9</sup> Disponível em: [https://www.sgb.gov.br/publique/media/gestao\\_territorial/plano\\_nac\\_risco.pdf](https://www.sgb.gov.br/publique/media/gestao_territorial/plano_nac_risco.pdf).

<sup>10</sup> In Brazil, the Belém Charter (2021), which brings together a significant group of Brazilian civil society organizations, stated that "in the name of climate, the dispossession of territories is advancing" and that "the market mechanisms created to reduce GHG emissions represent a historical process of reconfiguring forms of accumulation and promote a new global re-engineering of the economy in the name of climate".

## 5 Implementation: insufficient and fragmented policies

International agreements have led to a wide range of policies, both national and between countries, including: policies for preserving and restoring forests; replacing fossil fuels with renewable energies (biofuels, wind, solar, geothermal, green hydrogen); banning and replacing greenhouse substances; encouraging public transport, cycling and walking; implementing carbon credits; strengthening natural carbon sinks; developing sustainable construction techniques; disseminating low-carbon technologies; encouragement of geoengineering research; information and education on climate change; creation of climate change monitoring instruments; climate change adaptation measures; public funding of technological innovation for environmental and climate purposes; encouragement of smart and sustainable cities; healthy eating policies; environmental education, family planning and conscious consumption. (MARGULIS, 2020; IPCC, 2022, 2023)

One of the most visible fronts for action are the 17 Sustainable Development Goals (SDGs), components of the United Nations' 2030 Agenda. Calling on governments, civil society and the private sector, the SDGs focus on today's central challenges: poverty eradication; zero hunger and sustainable agriculture; health and well-being; quality education; gender equality; clean water and sanitation; affordable and clean energy; decent work and economic growth; industry, innovation and infrastructure; reducing inequalities; sustainable cities and communities; responsible consumption and production; action against global climate change; life on water; life on land; peace, justice and effective institutions; and partnerships and means of implementation. Numerous actions are being developed internationally under the umbrella of the SDGs, which link climate action to socio-environmental sustainability.

Concrete policies, however, have been extremely modest, even after the United Nations recognized the climate emergency. With the exception of international cooperation to restore the ozone layer, induced by the Montreal Protocol (1987), governments, companies and civil society have been incapable of taking decisive action to meet the challenge. How can we understand the lack of a sense of urgency and international inaction in the face of the climate emergency? Analysts of the international scene attribute the impasses to structural factors of capitalism, the national conditions under which governments operate, the obstructions of economic corporations, the denialism and ideological barriers of neoliberalism and the extreme right, geopolitical confrontations and the values and behaviors prevalent in consumer society (GIDDENS, 2010; VIOLA; FRANCHINI, 2022; VIOLA, 2010; ESTEVO, 2019; CHOMSKY; POLIN, 2021).

The level of socio-economic development of countries has been a persistent variable in climate negotiations since the initial United Nations conferences. On the one hand, developed countries (especially Europeans) defend measures to curb environmentally/climatically aggressive development processes; on the other, developing and poor countries defend their right to progress. This divide helps to understand the formation of blocs in international negotiations. Viola (2002, p. 31ff) presents the panorama that has been structured since Rio-92, in nine blocs: (i) developed countries with high carbon intensity (United States, Canada and Australia); (ii) developed countries with medium carbon intensity, willing to take on global responsibilities (Germany, United Kingdom, Netherlands, Sweden, Denmark, Finland, France, Belgium, Luxembourg, Austria and Italy); (iii) developed countries

with medium carbon intensity with difficulties in reducing emissions (Japan, Norway, New Zealand, Iceland, Switzerland); (iv) countries of the former Soviet Union, whose emissions fell as a result of the economic collapse (Russia, Ukraine, Belarus, Bulgaria, Romania); (v) oil-exporting countries (Saudi Arabia, Kuwait, Iran, Iraq, the United Arab Emirates, Algeria, Libya, Venezuela, Indonesia and Nigeria); (vi) emerging countries with medium carbon intensity (China, India, South Africa, Mexico, Brazil, Thailand, Malaysia and the Philippines); (vii) emerging countries with low carbon intensity (Argentina, Chile, Uruguay, Costa Rica, South Korea and Hungary); (viii) poor countries (sub-Saharan Africa, Bangladesh, Bolivia, Honduras, Guatemala); (ix) small island states (Fiji, Jamaica, Malta).

The alliances between the blocs and the positions of the main world powers have dictated the direction of climate agreements. According to Viola and Franchini (2013), there are three types of climate powers: superpowers (China, the United States, the European Union), big powers (Brazil, South Korea, India, Japan, Russia) and middle powers. The different positions on the climate issue make it possible to define three types of powers: conservative, moderate conservative and reformist. Conservative forces resist the transformations needed to stabilize the climate system; reformist forces see the climate problem as a disruptive element in the crisis of civilization. The predominance of conservative and moderate conservative powers is the main characteristic of the conservative international system, which is incapable of providing sufficient responses to the climate crisis.

The United States (the largest historical emitter and the largest per capita emitter, responsible for 13% of total emissions) has oscillated between reformist positions under Democratic administrations (Clinton, Obama, Biden) and strongly conservative ones under Republican administrations, the apex of which was the denialist policy of Donald Trump's administration (2017-2021). Clinton, whose vice-president was environmentalist Al Gore, signed the Kyoto Protocol, but never sent it to the Senate for ratification. In 2001, President George W. Bush removed the country from the Kyoto Protocol. In 2017, President Trump removed the country from the Paris Agreement, which has delayed the climate fight around the world. (SORDI, 2020) Democratic President Joe Biden, elected in 2021, declared a return to the Paris Agreement, announced a package of measures aimed at reducing emissions and made a commitment to strive for carbon neutrality by 2050. The political and cultural divide underlying the alternation of power between Democrats and Republicans is cause for skepticism about this commitment.

China (the largest emitter since 2006, responsible for 26% of current global emissions) has moved from a defensive stance until 2009 to a proactive stance in international climate agreements under the governments of Hu Jintao and Xi Jinping. This position is confronted with the fact that the country is the leader in the ranking of total GHG emissions. Overcoming this uncomfortable position is difficult in the short term, given the Chinese government's public defense of the country's right to maintain the high levels of economic growth of recent decades, under an economic structure highly dependent on coal and oil. Hopes for progress driven by assertive climate policy lie in the ability to follow long-term policies, in the remarkable technological capacity with an accelerated increase in green technologies (solar and wind energy, electric cars, rail transportation), in the increase of forests and in stricter and more effective environmental regulation policies. (ESTEVO, 2019)

The European Union (27 countries, third largest emitter with 7.8% of emissions), since the 1980s, has maintained a leading role in favor of measures to mitigate climate change and preserve the environment, with leaders from the United Kingdom, Germany, Sweden, the Netherlands, Ireland, Denmark and Finland. (VIOLA, 2009) Its environmental/climate legislation is the most advanced among the major powers, its regulatory policies on decarbonizing the economy are strict, the use of renewable energies in transport is gaining scale (100% electrification of transport is expected by 2035) and public opinion in favour of climate mitigation measures is largely favourable. In 2019, the European Union signed the European Green Deal, with the commitment to reduce its net GHG emissions by 55% by 2030, compared to 1990 levels, and achieve carbon neutrality by 2050.

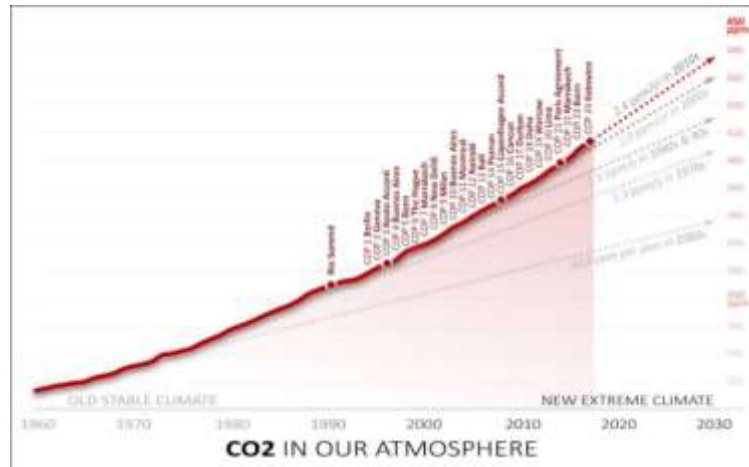
Brazil's position in international negotiations and in the implementation of climate policies, according to Viola and Franchini (2022), Pereira and Viola (2022), Avritzer, Kerche and Marona (2021) and Marques (2023), can be summarized in five moments:

- From the 1970s until 2005, Brazil was aligned with the conservative bloc, defending its right to development and the country's autonomy, including deforestation, which earned it the reputation of a climate villain.
- Between 2005 and 2010, Brazil adopted a drastic reorientation in terms of its climate commitment, going from being a climate villain (due to its high rates of deforestation) to one of the leaders among developing countries in terms of emissions control and climate policies. The country has made great advances in controlling deforestation in the Amazon, reducing GHG emissions by 55% between 2004 and 2010, and has implemented an important biofuels program. This enabled the government to announce at COP15 in Copenhagen a voluntary commitment to reduce emissions by 36-39% by 2020.
- The period from 2011 to 2015 was one of stagnation and regression. Despite keeping deforestation under control, the discovery of pre-salt oil reserves led to a slowdown in biofuel policies, there were incentives for the automobile industry and the reform of the forestry code allowed amnesty for deforesters. The country's climate commitment was weakened.
- The victory of the far-right in 2018 marked the beginning of the regression and the return to the status of climate villain. The Bolsonaro government has adopted denialist positions, interpreting climate negotiations as a commercial game and the Paris Agreement as part of a globalist conspiracy. State environmental control bodies have been weakened or abolished, favoring the deforestation of the Amazon Rainforest and Pantanal, the increase in fires and the expansion of predatory agribusiness.
- The election of President Luiz Inácio Lula da Silva in 2022 was a new turning point, this time in favor of restoring the country's climate commitment, which featured prominently in the government's plan and in the electoral debates. The new government has reappointed the country's main environmental leader, Marina Silva, to the Ministry of the Environment. However, environmental policy faces strong resistance in Congress.

Despite the number and variety of actions, the effectiveness of climate policies is proving to be a dangerous failure. Although they have prevented a further rise in temperature, they have not achieved the goal of stabilizing global warming; on

the contrary, it is increasing year on year. In the words of David Wallace-Wells (2019, p. 13), "more than half of the carbon dissipated into the atmosphere due to the burning of fossil fuels has been emitted in the last three decades alone". The graph below shows that in the space of time in which major conferences have been held and climate agreements have been established, GHG emissions have increased relentlessly.

Figure 2 – CO<sub>2</sub> concentration versus climate conferences



Fonte: SAXIFRAGE (2018).

The discrepancy between international debates and agreements and effective action is clearly visible. When the UNFCCC was approved in Rio-92, the concentration of CO<sub>2</sub> in the atmosphere was around 360 ppm; today, after the 27th COP, the concentration is around 420 ppm, the highest in perhaps three million years. There is no linear increase: there is an acceleration in the atmospheric concentration of GHGs. In the 1990s, the concentration grew at an average rate of 1.5 ppm per year; in the first decade of the 21st century, the rate grew to 2 ppm per year; in the second decade it jumped to 2.5 ppm. (MARQUES, 2023, p. 48)

Not even the unprecedented outbreak of extreme weather events in recent decades has changed the disconnection between discourse and practice. In 2003, Europe experienced its worst heatwave in 500 years and more than 70,000 people died as a result of the climate. Hurricane Katrina, in August 2005, hit the southern United States with winds of up to 280 km per hour, displacing more than a million people in the New Orleans metropolitan area and causing around a thousand deaths. The six-year drought that hit the Brazilian semi-arid region from 2012 to 2017 was the worst in Brazil's recorded history (since 1945). At the end of 2019, Australia suffered from forest fires, which lasted around 2 months, destroyed around 50 million hectares and more than 6,000 buildings, causing the death of 2 billion species of animals. In February 2023, the municipality of São Sebastião, SP, was hit by the heaviest rainfall ever recorded in Brazil: more than 600 mm of rain in 24 hours. (NOBRE, 2023) These and many other extreme events confirm scientists' predictions, but the implementation of climate policies has remained slow and fragmented.

Could public perception be at the root of the resistance to adopting measures in line with the seriousness of the climate crisis? Ambiguous elements emerge from opinion polls. A review of opinion polls from 1980 to 2014 indicated the following

trends: in the 1980s and early 1990s public awareness of climate change grew; the late 1990s and early 2000s were a period of growing concern, mixed with an increase in conflicting positions; between 2005 and 2010 public concern declined and skepticism increased in some countries, while in others concern grew; between 2010 and 2014 public concern about climate change stabilized. (CAPSTICK et al, 2015) More recent polls indicate that public concern has grown in recent years. The People's Climate Vote 2021 survey, carried out in 50 countries, found that agreement with the notion of a climate emergency is high, varying between 80% (in European countries) and 50% (Asian countries); a majority of 59% agree on the urgency of pro-climate action; and there is between 50% and 70% support for the need for policies to regulate companies in order to halt climate impact. (UNDP, 2021) In this survey, the policies most highlighted by respondents were: conservation of forests and soil; use of solar and wind energy; friendly agricultural technologies; and investments in green jobs. Lower scores are given to plant-based diets, affordable insurance and identifying the composition of products consumed.

Malcolm Fairbrother (2022) points out that the public still has little understanding of the need for strong measures. Two examples: a) various surveys show that while growing sections of the public are concerned about the climate, their willingness to pay for climate measures is low; b) there is a negative reaction from people to taxing high-carbon activities (such as the use of fossil fuels), especially in developed countries, where market solutions are preferred. According to the author, there is a need to better understand resistance to payments and taxation, how much of it results from distrust of government and whether greater social acceptance can be achieved if there is good government communication.

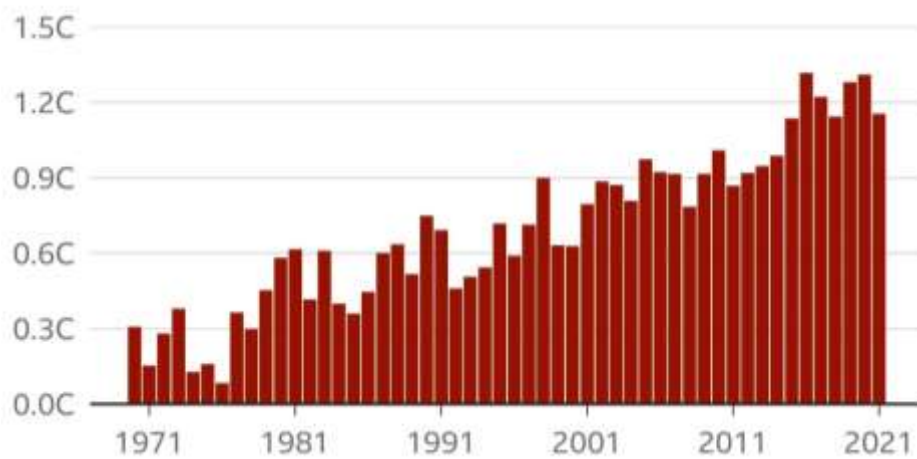
In Brazil, opinion polls have shown that the majority of the population is concerned about the environmental-climate situation, but that this is not translated into practical action. The Climate Change in the Perception of Brazilians survey, carried out nationwide, shows the following indicators in its 2022 edition: 94% believe that global warming is happening; 74% believe that warming is mainly caused by human action; 86% believe that environmental disasters in recent years are caused by global warming; 70% believe that global warming could harm them and their families a lot; 74% believe that it is more important to protect the environment even if it means less economic growth and fewer jobs. On the other hand, only 50% have ever voted for a politician because of their proposals to defend the environment; 26% have donated to environmental institutions; and 17% have participated in a demonstration or petition on climate change. (ITS, 2022) These figures reveal that there is a widespread notion that the problem is real, that most of the population is concerned, but that the issue does not arouse the sense of urgency it deserves.

The current panorama is similar to the one described by Giddens (2010, p. 22) about a decade and a half ago: "at the moment, we have no climate change policy", referring to the absence of a coherent and consistent set of actions. The time factor becomes more pressing every day, as we are in the decisive decade, according to Luiz Marques' eloquent writing (2023). A strange normality continues, with a succession of newspaper headlines on the most diverse subjects, there is little emphasis on party programs, school and university curricula. The socio-economic and cultural inertia is consistent with the slow rhythm of policies to curb GHG emissions.

## 6 Evaluation: a more dramatic climate picture with each report

The evolution of climate change is being monitored with increasing scientific rigor. "Today's temperature data comes from many sources, including more than 32,000 ground-based weather stations, weather balloons, radars, ships and floats, satellites and volunteer weather observers," explains NASA science writer Alan Buis (2022). Since the creation of the IPCC in 1988, periodic scientific reports have been produced and, with the exception of a few denialist publications, the assessment of different international organizations converges entirely on the levels of global warming and the manifestations of climate imbalance. The increase in the global temperature of the Earth's surface is an indisputable factual reality. Momentary fluctuations must be read in the light of the general trend. As can be seen in the figure below, temperatures are rising every decade.

Figure 3 – Annual Earth surface temperatures - 1971-2021



Source: Copernicus Climate Change Service (<https://www.bbc.com/news/science-environment-59915690>).

The measurement of temperatures confirms the predictions made on the basis of climate science computer models and reinforces the authority of the IPCC. The IPCC's 6th Assessment Report (2021/2022) reveals that average annual GHG emissions during the 2010-2019 decade were higher than in any previous decade, although their rate of growth (1.3% p.a.) is lower than in the 2000-2009 decade (2.1% p.a.). 17% of all the carbon emitted since the industrial revolution was released into the atmosphere in this last decade alone. At this rate, the climate policies adopted until 2020 will lead to a warming of the planet of 3.2°C by the end of the century. For there to be a 50% chance of stabilizing global warming at 1.5°C above pre-industrial levels, global GHG emissions need to peak between 2020 and 2025, fall by 43% by 2030 and reach carbon net neutrality by 2050. (Currently, only three small countries - Bhutan, Suriname and Panama - are considered carbon neutral).

UN Secretary General António Guterres (2022) spoke harshly about the content of the 6th report: "This IPCC report is a long list of unfulfilled climate promises. It is an archive of shame, cataloging the empty promises that put us firmly on the road to an uninhabitable world." He continues: "to keep the 1.5 degree limit agreed in Paris within reach, we need to cut global emissions by 45% this decade. But

current climate pledges would mean a 14% increase in emissions." This statement reflects the more incisive and serious language of the IPCC reports.

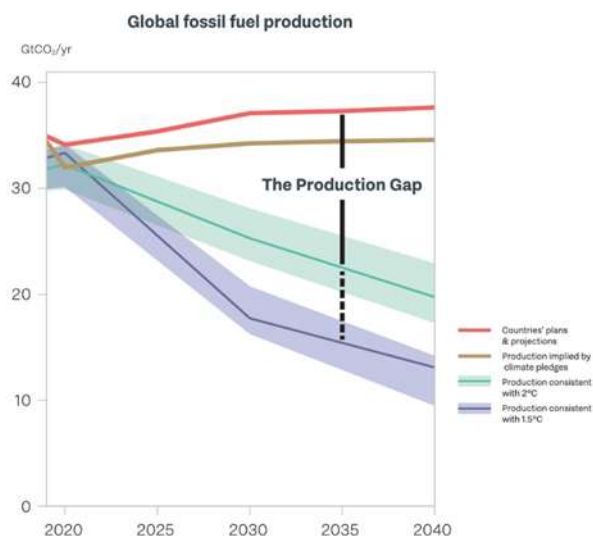
Chart 1 – Changes in the language of IPCC assessment reports

|                      |                                                                                                                                                                                                                        |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1st Report (1990)    | "By increasing their concentrations and adding new greenhouse gases such as chlorofluorocarbons (CFCs), humanity <i>is able to increase</i> the global annual average air temperature on the surface [of the planet]." |
| 2nd Report (1995)    | "The balance of evidence suggests <i>a perceptible human influence</i> on the global climate."                                                                                                                         |
| 3rd Report (2001)    | "Most of the warming observed over the last 50 years has <i>probably</i> [66%] been due to the increase in greenhouse gas concentrations."                                                                             |
| 4th Report (2007)    | "Most of the observed increase in global average temperatures since the mid-20th century has <i>most likely</i> [90%] been due to the observed increase in anthropogenic greenhouse gas concentrations."               |
| 5th Report (2013)    | "It is <i>extremely likely</i> [95%] that human influence has been the dominant cause of the warming observed since the mid-20th century."                                                                             |
| 6th Report (2021/22) | "It is <i>unequivocal</i> that human influence has warmed the atmosphere, the ocean and the Earth."                                                                                                                    |

Source: AMARAL; MAES, 20/03/2023.

The IPCC's more incisive language, however, does not find a proportional echo among the economic and political elites, most of whom are committed to the status quo. United Nations reports on the emissions gap and fossil fuel production have shown the discrepancy between climate commitments and country planning. The gap is huge, as can be seen in the figure below.

Figure 4 – Distance between GHG reduction target and planned global fossil fuel production



Source: SEI et al., 2021, p. 3.

The distance between the red line (planned production of fossil fuels) and the purple band (global temperature target of 1.5°C above pre-industrial levels) is one of the clearest indicators that the Paris Agreement has not guided the planning of governments and private corporations in practice. If fossil fuel production continues as planned by countries, carbon neutrality by 2050 will become a chimera.

Current geopolitical confrontations - the Russia-Ukraine war (2022), the Hamas attack and the massacre by Israel in the Gaza Strip (2023), the clashes between the United States and China in the dispute for world economic hegemony - are aggravating this situation. For example, they are delaying the global replacement of fossil fuels with renewable energies. According to the World Energy Outlook 2022, CO<sub>2</sub> emissions related to energy generation increased the most every year in 2021. If current trends continue, emissions "reach a plateau around 37 Gt before falling slowly to 32 Gt in 2050, a trajectory that would lead to a 2.5 °C rise in global average temperatures by 2100". This projection has a positive side: it is about 1°C lower than the trajectory predicted before the Paris Agreement, showing the progress that has been made since then. (IEA, 2022, p. 40) However, considering the urgency of reducing global emissions by 45% by 2030 and reaching net zero emissions by 2050, there is nothing to celebrate. Time is increasingly short to adopt powerful large-scale measures. We are in the middle of a decisive decade, says Marques (2023), and the resource of time must be at the forefront of concerns for our common future. Time is becoming an all-time scarce resource for successful climate policies.

## 7 Final considerations

Analyzing the climate issue from the perspective of the public policy cycle provides important elements for answering the problem of this research: why has humanity's most serious problem not yet become the number one political problem? It is worth highlighting four of these elements.

The first concerns the role of science. Without scientific studies and the proactivity of scientists, climate change would not have become an international political issue, nor would the public policies promoted by the United Nations since the 1990s have been adopted. Science has not only identified the causes of the problem, it has also provided knowledge on how to solve it. However, science is also home to skeptics and deniers, and from them the media has sold the public the idea that science is divided into "two sides", which has undermined the social consensus to act vigorously and cooperatively to stop global warming.

The second is the role of technology. There is knowledge and technology available in clean energy, reforestation, sustainable cities, regenerative agriculture and livestock farming, family planning, among other areas. In other words: climate change is not a technology problem. The real problem lies in the capitalist socio-economic structure, in the persistence of the economic model oriented towards unlimited growth and in the culture associated with the consumer society way of life (the economy of overproduction and overconsumption).

The third is the dimension of power and ideology. The weakness of policies to tackle climate change is mainly due to governments submitting to the interests of the oil industry and big corporations in the high-carbon economy, geopolitical conflicts, denialism, neoliberalism and the extreme right. Without coordination and global

political leadership, climate policies have been weak and insufficient to curb global warming.

The fourth is the indispensable cooperation between the state, the community and the market. What is at stake is the way of life associated with consumer capitalism, entrenched in all three social spheres. Only the coordination of collective efforts, under the leadership of public, community and private agents, in favor of profound transformations in the way of life will be able to overcome the systemic conditioning of the capitalist market. Although there are sustainable innovations in all three spheres, the results are modest. More robust results can be obtained if recommendations based on scientific evidence are accepted, such as those systematized by Sara Pralle (2009): the salience of the climate issue can be reinforced by emphasizing the consensus of scientists on the subject, local climate impacts, health impacts and personal experience.

Finally, it is worth remembering that the general outline of the climate policy cycle presented here can serve as a general framework. It is important to carry out in-depth studies on aspects such as: the climate policy cycle in Brazil; the characteristics and impact of climate denialism in different countries; the weight of political parties and elites in including and maintaining the climate problem in the decision-making agenda; the influence of civil society organizations and the market in the different policy phases. Without an understanding of the role of politics, it will be impossible to adopt powerful measures to curb global warming. Institutionalized politics will continue to play a central role, either in delaying or accelerating the pace of the measures needed to halt global warming.

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