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Global Warming, Economic globalization and Civilization crises

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Global warming raises the question of the survival of humanity. Technological innovation and attempts at united action by States are still not able to fight effectively today against this scourge whose warning effects are starting to seriously worry with its share of heatwaves, drought and pollution. In a market economy dominated by international finance, it is very difficult for governments to protect themselves against the worrying prospect of excessive global warming, while large still exploitable energy assets fuel the economic interests of the markets. In the very workings of capitalism, short-term economic interests always take precedence. Today there are deep political disagreements concerning the urgency of the transformations to be undertaken, in an economic choice of preference for the present or the future. Furthermore, using GDP alone to determine collective well-being is not relevant, with regard to natural heritage assets, soil exhaustion, various pollution and respect for human rights. The constant search for an increase in GDP is part of a productivist logic for which it is necessary to produce to produce and to make a profit. Competition between states on the basis of GDP leaves little room for reflection on long-term well-being, which avoids questions relating to working conditions, the preservation of earthly heritage and unacceptable economic growth pockets of misery and poverty. Ecological transition policies clash with the interests of countries and multinationals producing non-renewable energies and the choices made by the globalized financial system. To preserve the quality of life of tomorrow's Earthlings, the consumer society and the indefinite rise of the desire economy must give way to an economy based on solidarity to combat the potential effects of global warming. It appears necessary to modify the rules of the game of globalization of world markets, through the implementation of a green revolution which cannot develop without international security and greater social justice.

Le réchauffement climatique pose la question de la survie de l'humanité. L'innovation technologique et les tentatives d'action solidaire des Etats ne sont toujours pas en mesure de lutter efficacement aujourd'hui contre ce fléau dont les effets annonciateurs commencent à sérieusement inquiéter avec son lot de canicules, de sécheresse et de pollution. Dans une économie de marché dominée par la finance internationale, il est très difficile pour les gouvernements de se protéger contre la perspective inquiétante d'un réchauffement climatique excessif, alors que d'importants actifs énergétiques encore exploitables alimentent les intérêts économiques des marchés. Dans le fonctionnement même du capitalisme, les intérêts

économiques à court terme priment toujours. Il existe aujourd'hui de profonds désaccords politiques quant à l'urgence des transformations à entreprendre, dans un choix économique de préférence pour le présent ou le futur. Par ailleurs, utiliser le seul PIB pour déterminer le bien-être collectif n'est pas pertinent, au regard du patrimoine naturel, de l'épuisement des sols, des pollutions diverses et du respect des droits de l'homme. La recherche constante d'une augmentation du PIB s'inscrit dans une logique productiviste pour laquelle il faut produire pour produire et réaliser du profit. La concurrence entre États sur la base du PIB laisse peu de place à la réflexion sur le bien-être à long terme, qui élude les questions liées aux conditions de travail, à la préservation du patrimoine terrestre et à la croissance économique des poches inacceptables de misère et de pauvreté. Les politiques de transition écologique se heurtent aux intérêts des pays et des multinationales produisant des énergies non renouvelables et aux choix opérés par le système financier mondialisé. Pour préserver la qualité de vie des Terriens de demain, la société de consommation et la montée indéfinie de l'économie du désir doivent céder la place à une économie solidaire pour lutter contre les effets potentiels du réchauffement climatique. Il apparaît nécessaire de modifier les règles du jeu de la mondialisation des marchés mondiaux, par la mise en œuvre d'une révolution verte qui ne peut se développer sans une sécurité internationale et une plus grande justice sociale.

Global warming, GDP, non-renewable energy, globalization, civilizational crisis, social inequalities, capitalism, international finance

Réchauffement climatique, PIB, énergie non renouvelable, globalisation, crise civilisationnelle, inégalités sociales, capitalisme, finance internationale

I. Introduction

In the early 19th century, Joseph Fourier, John Tyndall and Svante Arrhenius had already highlighted the importance of carbon dioxide emissions in global warming. In 1977, the Changing Climate Group report, commissioned by Jimmy Carter, warned of the risks of these emissions by 2035. Subsequent reports by oil companies also confirmed this phenomenon, but for reasons of economic interest, they were not made public. In 1988, the creation of the Intergovernmental Panel on Climate Change (IPCC) by the World Meteorological Organization and the United Nations Environment Programme confirmed these developments, and proposed scientific analyses in order to identify possible solutions to support international negotiations on the deleterious effects of greenhouse gas emissions on the climate.

Global warming can be defined as the significant modification of the Earth's climate, characterized by an increase in the average temperature at its surface of around 1°C since the pre-industrial age, with an acceleration of the movement over the last three decades of unbridled economic globalization. The indirect effects of this change are worsening droughts, rising oceans, more hurricanes, and a cascade of climatic events of unprecedented violence that threaten to decimate ecosystems and alter human living conditions. A scientific controversy persists

between those (fewer and fewer in number) who believe that this is a natural cycle from the cold period to the 18th century, and those who accuse human activities releasing carbon into the atmosphere of being directly responsible.

Today, the commitments made by economic players are far from sufficient to limit the increase in average temperature to less than 2°C by 2100. States and international organizations must therefore agree on the standards to be respected, taking into account the short- and long-term climatic and economic conditions that apply to each of them. Developing countries, which are already incurring significant human costs, cannot always meet their obligations, and this should encourage developed countries to provide them with "temporary" financial and technological support in this priority area for mankind. In the absence of substantial assistance on their part, developed countries would also have to suffer rapidly deteriorating living conditions as a result of global warming. Technological innovation cannot solve all the immediate social and societal issues, and the urgent solution is to directly prevent greenhouse gas emissions through coordinated action by all states.

The global warming raises the question of the survival of the humanity and the technological innovation cannot solve all the immediate societal and social questions without systemic support of the public authorities. It appears necessary to modify the rules of the game of the global market globalization, by the implementation of a green revolution which cannot develop without international security and a greater social justice. Immediate financial interests are opposed to the collective interest of the near future. In a market economy dominated by international finance, it is very difficult for governments to protect themselves against the worrying prospect of excessive global warming, when large energy assets are still exploitable and need to be sterilized. And yet, in the very workings of capitalism, short-term economic interests always take precedence, particularly for energy multinationals, oil-producing countries and international finance.

Ever since scientists first highlighted the influence of human activity on the climate, this issue has always been treated from a long-term perspective, as a problem to be solved not today, but the day after tomorrow. Most economic models have continued to ignore these issues, focusing instead on GDP growth, employment and short-term economic policies. Yet environmentalists had already been sounding the alarm since the 1970s. Since the Club of Rome report, the debate is framed in terms of a choice between growth and long-term recession, considering that there is a limit to economic development, given the depletion of the planet's resources. This supposedly Malthusian analysis has nonetheless awakened the world to the excesses of a civilization "of the moment" that exhausts available resources to satisfy desires that are constantly heightened by advertising information from the production system. The quest to satisfy the needs of populations in situations of misery and precariousness is ignored by profit-driven

supply policies, always open to the discourse of merchandise, organized by merchants within the framework of mainly ostentatious consumption.

It wasn't until the Earth Summit in Rio de Janeiro in 1992 that mankind's responsibility for the climate system was officially recognized by international organizations. The Rio principles emphasized the need to strike a balance between the "sovereign right" of states to exploit their own resources and their "international duty" not to cause damage to the environment of other countries. This situation is hardly acceptable in view of the stakes and potential risks involved, since dealing with environmental issues is essential to the survival of mankind; they could also give rise to future inter-state conflicts, given the international nature of pollution and its transmission to neighboring countries.

The United Nations Framework Convention on Climate Change (UNFCCC) currently has 177 member states, united to prevent human activities threatening the climate system. Each member state is required to provide regular reports on its climate policies with regard to the Kyoto Protocol (2005) and the Paris Agreement (2016). The COP (Conference of the Parties to the UNFCCC) analyzes climate trends and the policies put in place to protect the planet and the economic development of developing countries, and also establishes partnerships with non-state actors. However, state sovereignty remains firmly entrenched in people's minds, based on their own interests and without sufficient reference to the future living conditions of mankind as a whole.

II. Political, scientific and environmental debates on global warming

Despite the Paris agreements (COP21), which was quickly rejected from the US policy framework by President Trump, but now retained by Joe Biden, global oil consumption has never been so high, even though Iran and Venezuela, with their considerable oil reserves, are only marginally involved in international markets, due to US extra-territorial sanctions. According to TotalEnergies management, the coal, gas and oil mix represents 81% of the global mix in 2022, compared with 81% in 2000. Renewable energies have merely met the additional demand for energy consumption. Decarbonized energies are not immediately substitutable, either in terms of competitive market prices, or in terms of quantity in relation to specific expressed demand. However, the famous market price of oil is not the result of demand and supply in a free-trade situation, it is the result firstly of coalition agreements between certain dominant producers, and secondly of speculation on the financial markets. Today, the OPEC cartel balances its production to influence the price per barrel, in order to obtain equivalent revenues with fewer barrels sold. The smaller the supply on the market, the higher the price for constant or growing demand.

II.1. States' differing perceptions of the measures to be taken following the 6th IPCC report

The Sixth IPCC report (2023) alerts economic players to the urgent need for collective action on a global scale. It demonstrates that the climate is changing everywhere on Earth, and that human activity is unequivocally the main culprit, with irreversible effects in the current state of science. States and companies are not doing enough to prevent this catastrophic trend, which will lead to a reduction in habitable areas (one billion coastal dwellers will be directly threatened by 2050), an increase in diseases and epidemics, a deterioration in air quality, an explosion in morbidity rates, a reduction in the availability of food and drinking water (mainly in Africa and Asia), an increase in heat stress, a rise in poverty and precariousness (3.3 to 3.6 billion people living in highly vulnerable conditions), or a halving of the areas available for animal and plant species.

The IPCC insists on the rapid introduction of decarbonized energies, less meat-based diets, building insulation, electric transport, sensible use of telecommuting and a widespread fight against waste. Without a significant response, the planet's temperature will have risen by 1.5°C by 2030, 10 years earlier than previously forecast, with irreversible effects on the melting ice caps. In the worst-case scenario, global warming is expected to exceed 3.3°C by 2100, leading to the disappearance of many lands and islands, not to mention the loss of plant and animal biodiversity. The IPCC report considers that humanity has less than three years (i.e. 2026) to reverse the curve of carbon pollution.

The issue of energy markets cannot be solved without serious consideration of the geopolitical and geo-economic developments taking place in the world. In March 2022, the "special operation", ordered by Vladimir Putin, in the Ukraine prompted Western countries and NATO to impose economic sanctions on Russia and military measures to support the Ukrainian army. The immediate result was a fossil fuel supply crisis, which led to speculative price rises, making the fortunes of exporting countries and the shareholders of multinational energy companies. States' interests are often contradictory, and their reactions must be the subject of negotiations, particularly within the European Union. The choice of time horizons varies from one country or region to another. The estimated benefits of action against global warming are greater when the preference for the present is low, which is not the case for states with high levels of economic, social and financial vulnerability.

The question of nuclear power as a green energy source is still the subject of controversy, given the apparent contradiction between short- and long-term interests in energy issues, particularly between Germany and France. The policies to be implemented in the short term also depend on the economic and political conditions of each country. It is in France's interest to develop nuclear power, which creates waste in the very long term, but partially resolves the issue of decarbonization in the short term, while Germany is abandoning fission nuclear

power in favor of highly polluting coal-fired power plants in the short term and, in the longer term, research into fusion nuclear power, the hoped-for solution for decarbonization, which will undoubtedly come too late to prevent the effects of global warming.

While the climate responsibility of each state is no longer debatable, developing countries are asking the most industrialized countries to shoulder the bulk of the effort to reduce carbon emissions: the major economic powers such as the United States, Europe and China are the biggest polluters on the planet, and it is here that the negative effects are felt the most. Emerging countries have always been reluctant to make commitments in an area likely to hinder their own development. Even today, they want greater freedom of action in terms of international rules to control carbon emissions into the atmosphere in their favor, and stricter regulations for the developed countries who have forcibly taken the free right to pollute for over a century to impose their economic domination. India and China are even claiming the right to use the same processes as those used by the countries that developed during the 20th century. More generally, each country wants as many ecological constraints as possible for other countries, and as little control as possible over its own "pollution", in the constant attitude of "free riders".

In view of their particular responsibilities, the richest countries will have to agree to provide substantial aid to the countries most directly affected by the scourge of global warming, in order to meet the essential needs of the world's citizens. Financial support from developed countries remains woefully inadequate. This situation further accentuates the North-South divide and Africa's growing distrust of the industrialized Western world, blinded by violent greed towards the poorest countries. However, while the original responsibility of the developed countries is now recognized in the international landscape, that of the policies of today's emerging countries should not be minimized either, all the more so as the countries most sensitive to the consequences of global warming, namely the LDCs (Least Developed Countries), are not in a position to act collectively on the environmental violence they are suffering.

The Blanchard-Tirole report (2021) underlines that there is a significant gap between popular concern about global warming and the marked individual refusal of citizens to make the necessary effort to commit the country to a necessarily costly ecological transition, particularly in terms of lifestyle. There is a paradox to criticize households for being open to the economy of desires, when the permanence of public support for supply-side policies and the daily influence of targeted advertising information constantly influence their own demands. The very active lobbying of multinational corporations to delay the process is proving sufficiently effective to create a form of immobilism. As Edgar Faure once said, "immobilism is moving forward, and we don't know how to stop it".

Scientists are pessimistic about the global record in the fight against global warming. No G20 country is reducing its emissions at a rate in line with the targets

set with COP21, so much so that globalized economic competition is undermining environmental constraints, and the years 2022 and 2023 will have broken all previous records for CO2 emissions. The issue of "global warming" is on the diplomatic agenda of all countries, but it is always difficult to reach agreements. Issues of national competitiveness and attractiveness are put forward to delay the necessary control measures. It was not until COP 27 in Glasgow that coal was mentioned as a polluting fossil fuel whose use must be reduced.

The United Arab Emirates secured the organization of COP28 in Dubai. The President of COP28, Sultan al-Jaber, director of the oil company Adnoc, is an ardent advocate of technological solutions for storing carbon emissions and making oil and gas activities "clean", thanks to technological advances that are still insignificant given the urgency of the problem to be solved. On a personal note, he believes that without the use of fossil fuels, the world will return to cave civilization. The aim is to delay any significant progress, and to make the most of their subsoil's fossil energy resources in the short term, before this capital is definitively frozen and thus lost financially. That is why these countries are pinning their hopes on carbon capture and storage technologies, as mentioned in the latest report by the IPCC, while at the same time being convinced to invest in renewable energies, including nuclear power.

II.2. GDP, a misleading indicator of collective well-being

At global level, several economic reports predict a reduction in GDP of between 5% and 23% by 2100, *ceteris paribus*, depending on the assumptions adopted, without taking into account both the considerable human costs, which are difficult to quantify in economic terms, and the necessary evolution from a society of unbridled consumption to one of sobriety. The foreseeable negative effects in the short, medium and long term are unevenly distributed, all the more so as it is difficult to predict the intensity of damage in a context where human systems have settled in areas at risk, which should lead to major changes profoundly altering the historical trajectories of habitats and therefore populations.

While GDP was once a useful yardstick for measuring the productive evolution of societies, today it is arguably "counter-productive", as it fails to take environmental issues into account (Guilhaudis, Fontanel, 2019). Similarly, the notion of the population's overall well-being, which statisticians originally sought to define before the conceptualization of GDP, is difficult to pin down, given the heterogeneity of social situations. Government policies in favor of GDP growth neglect the value of natural assets, stocks of freely available goods and services, and the real living conditions of citizens. A strong increase in GDP can be achieved by raising the retirement age, increasing weekly working hours, increasing pollution or taking public health risks. How can we assess the full benefits and future damage, and over what period of time? Should we assume that people's efforts to adapt to global warming will be satisfactory, at least in part, or

should we focus on preventive action? Who should pay for safety measures and who should be supported in corrective action? Today, economists are not in a position to provide sufficiently precise assessments, given the uncertainties surrounding compliance with the rules laid down today and those that will inevitably be adopted in the future.

GDP does not highlight the future problems of its excesses. The disappearance of islands such as the Maldives, Solomon Islands, Palau, Fiji, Micronesia, Tuvalu, Seychelles, Kiribati, Cook Islands, Bora Bora, Tahiti and the Marshall Islands is inevitable by 2100 if nothing is done. Most Asian countries would also be affected, including Bangladesh, Vietnam, India (Bombay), Burma and Japan. The example of the Tuvalu archipelago, directly threatened by rising sea levels, is significant. Indeed, Australia, which is heavily dependent on coal, has a particular responsibility in the dramatic evolution of Tuvalu (two of its nine atolls are already partially submerged). In September 2023, the Australian government announced that residents could benefit from both emergency aid in the event of a natural disaster and "special rights", if necessary, to settle in Australia, when all the atolls will be submerged by 2100. Bangladesh and its coastal regions, on the other hand, are threatened with submergence, and no alternative solution has yet been found.

Many developing countries are particularly affected in the short term by the damage caused by global warming, even though they do not always have the means to meet the needs of a particularly vulnerable national population. It may be possible to reduce energy expenditure and maintain sufficient GDP growth in developed countries, but this will not be the case for economically disadvantaged countries. It's impossible to ask the world's poorest people to reduce their consumption and the satisfaction of their basic needs. It's not a question of burning the present for a "future without a future".

Emerging countries have always been reluctant to make commitments in an area likely to hinder their own development. Even today, they want more freedom of action regarding international rules to control carbon emissions into the atmosphere in their favor, and stricter regulations for developed countries who have had a free right to pollute for over a century to impose their rules by a strong economic domination. More generally, each country wants maximum ecological constraints in other countries and minimum control over its own "pollution", in the constant attitude of the "free riders".

The constant quest to increase GDP is part of a productivist logic: production for production's sake, and to make a profit. Under these conditions, production is necessary to demonstrate a country's capacity to produce and consume, without concern for the heritage of humanity or the consequences of production systems on the environment of today and tomorrow. The "casino" economy has spread through the system of economic globalization, as has international finance in its relentless pursuit of maximum short-term profitability for its financial operations. Whatever the long-term future, the aim is to develop an economy based on self-

interest and greed, with no regard for the human and physical environment. A number of citizens' initiatives have been launched, but NGOs are not to be outdone when it comes to political and business strategies, since most of the larger ones depend on public subsidies.

The cost of global warming for France has been estimated at 5 billion euros per year (Pisani-Ferry, Mahfouz, 2023), excluding the effects on productivity, human life quality and the constraint of reduced CO2 emissions by natural carbon sinks. France produces just 1% of the world's greenhouse gas emissions (compared with 2.5% for the UK and 7.5% for the EU), because it is no more an industrial country, the carbon intensity of value added being highly variable, ranging from 50% in the mining sector to 1 or 2% in many service sectors. However, it must also play a firm part in the fight against global warming, since carbon is stored in the atmosphere over the very long run.

But it must also play a resolute part in the fight against global warming, because carbon is stored in the atmosphere over the very long term, and it would be unacceptable for a former colonial power, responsible in its development for excessive carbon storage compared to that of developing countries, to behave like a stowaway. However, after 2030, the negative effects will be accentuated by the expected acceleration in temperature rises. We need to abandon the idea that GDP or GDP per capita is the alpha and omega of good governance. This is not to say that it isn't an interesting indicator, but it lacks the capacity to provide adequate information on the future of economic and social society that some would like to see it summarize. Without further statistical information, it becomes dangerous as an indicator of the sound management of the national economy.

Competition between states on the basis of GDP leaves little room for consideration of long-term well-being, avoiding questions of working conditions, preservation of the earth's heritage or unacceptable pockets of misery and poverty. The current over-exploitation of resources inevitably leads to an increase in relative and absolute scarcity, both of which are powerful drivers of war and migration. Under certain conditions, the pursuit of short-term profit has become lethal. Poverty in one country leads to migration, air pollution in one region affects all neighboring territories, global warming and its deleterious effects affect the security of all, but above all that of future generations.

III. Modes of action

Proactive government policies are needed, despite the unpopularity of the measures to be taken in a capitalist system where individual interest takes precedence. Major information campaigns are needed to explain to citizens and consumers that their personal interests are never just immediate, but are also expressed in favor of their future and that of their children. Consuming too much today can exacerbate the effects of scarcity in a future that is getting darker by the day. We need to explain the benefits of decarbonization, increased electrification,

controlled mobility and the transformation of lifestyles focused more on social relations than on the consumption of goods and services.

III.1. The world's energy transition policies, their limits and "perverse effects"

The war in Ukraine may be the catalyst for a more rapid transition to less carbon-intensive energies. State climate policies are likely to become dependent, at least in part, on the short-term competitiveness of countries and corporations, leading to the exercise of perverse effects in the orientation of economic policies. In a context of struggle for world leadership, the major powers are using subterfuge to shift the bulk of the effort to their rivals in the short term, thereby reducing the scope of cooperation agreements. While for a time it seemed that the most polluting companies had suffered from falling stock market valuations, this downward trend does not seem to be irreversible, given the global conflicts that are invading international discourse and modifying its content and direction, over a time horizon that is still very uncertain, just like the duration of these wars.

However, rising energy prices (particularly gas, oil and electricity) have made energy-intensive goods less competitive. The European REPowerEU plan (2022) aims to diversify supplies, reduce demand for fossil fuels, set up a hydrogen market, accelerate the use of renewable energies (45% of total supply), expand interconnections between European gas and electricity grids, reinforce the EU's contingency plans for security of supply, encourage the development of the circular economy, and - last but not least - improve the expected gains in energy efficiency and sobriety. The aim of the plan is to counteract rising energy prices and introduce policies to protect the climate by 2050.

In 2023, decarbonized energies accounted for just under 14% of the world's primary energy supply, but according to the International Energy Agency (2022), they should reach 30% by 2030. Support for the development of "green economy" technologies is being sought through a Green Deal Industrial Plan, accompanied by electricity market reform and regulation of critical raw materials. An international call to triple the importance of renewable energies has been made by the European Union and the United States, in response to the wishes expressed by the International Energy Agency (IEA) by 2030. Initially, the European Union allocated free allowances to the carbon-intensive industrial sectors covered by the Emissions Trading Scheme, and then legislated the creation of a Carbon Border Adjustment Mechanism (CBAM), in line with the guidelines set by the World Trade Organization, which authorized new exceptions for environmental constraints, under the supervision of the Dispute Settlement Body (DSB).

In 2019, the European Union proposed a "Fit for 55" program comprising 5 directives and 8 regulations aimed at reducing its emissions by 55% by 2030, and adopted the principle of carbon neutrality by 2050 in the Green Deal. The provisions primarily concern the Emissions Trading Scheme (ETS), with a

reduction in the cap, the eventual abolition of free allowances (including for aviation) and the funding of modernization and innovation funds. It is accompanied by a Social Climate Fund designed to reduce social and distributive impacts within and between countries. Developing countries consider this to be a form of protectionism, while Washington contests carbon pricing, which is not applied in the USA. In view of the rules laid down by the WTO, it seems very difficult today to create the optimum conditions for pure competition that the European Union would like to apply.

A number of complementary actions have been put in place, including carbon sinks, the share of renewable energies, energy efficiency actions, accelerated deployment of alternative fuel recharging and refueling points for cars, aircraft and ships, a ban on the sale of new CO₂-emitting cars and vans from 2035, the obligation for new buildings to be carbon-neutral by 2030, and the introduction of energy performance standards for existing buildings. Each member state must define its own sectoral targets and mobilize the corresponding instruments, to complement measures taken at European level. The transition of agriculture, which pollutes too much, must mobilize biomass for different uses (carbon sink, bioenergy, food sovereignty).

Carbon pricing encourages environmentally-friendly behavior on a daily basis, and encourages the development of new, cleaner, less carbon-intensive technologies. In this context, lobbying for exemptions and subsidies for fossil fuels must be firmly rejected. Furthermore, citizens who bear the cost of these taxes and indirect charges must be protected, especially low-income households. This often translates into additional costs that undermine the international competitive positions of domestic companies and production. In this context, to prevent relocation to countries practicing environmental dumping, a customs tariff must be introduced for countries or companies that do not bear the cost of this carbon adjustment at their borders.

For the European Union, lifestyle changes such as telecommuting, reduced travel, dietary changes, the fight against food waste and recycling could, on their own, contribute to reducing cumulative emissions between 2011 and 2050 by 16% compared with the trend" (Pisani-Ferry, Mahfouz, 2023). However, for the IPCC (2022), reducing emissions depends above all on the composition of supply, and therefore of producers, who have the potential to influence demand and therefore consumption. In addition, the question of the sustainability of greenhouse gas emissions would be brought to the fore, thus modifying the message of the usual indicators. Today, public subsidies tend to focus on buildings and housing, when agriculture should also be concerned. Households' contribution to global warming is very unevenly distributed, as their consumption increases with their income, but also - as is too often forgotten - with their wealth. There is also heterogeneity between comparable incomes, depending on housing type, heating system, investments made, household composition, municipality of residence or age.

The transition to a climate-neutral economy will undoubtedly exert considerable pressure on public spending, with the collective interest taking precedence over individual interests. First and foremost, we need to start renovating public buildings and infrastructure, but we also need to firmly support household equipment and investment to facilitate the "green" transition, as well as adaptation investments by public administrations. According to European Union forecasts (Table 1), a successful green transition by 2030 would require an increase in investment spending of around 67 billion euros, of which 31.3% would be for housing renovation, 25.4% for renovation of the private tertiary sector, 19.4% for business investment and 15% for public investment (Pisani-Ferry, Mahfouz, 2023). Public financing was expected to account for a quarter of total expenditure. It is likely that, in the short term, recourse to public investment will be called upon in the same way as the increase in compulsory levies. To reduce the inflationary effects of these operations, the "shock" would be cushioned by recourse to government borrowing from residents of the country.

Table 1 - Annual cost of the climate transition for European public finances, 2030 (Pisani-Ferry, Mahfouz, 2023, p.114).

in billions of euros	Additional investments in 2030	Constant share of public funding	Optimal scenario
Public buildings	10	10	10
Infrastructures	7	4	4
Housing renovation (heating, insulation)	21	10	14
Renovation of the private service sector	17	0	2
Equipping households with electric vehicles	-8	-2	-2
Electric vehicles for trucks and light commercial vehicles for business	4	0	1
Company Investment (including energy)	13	3	4
Adaptation	3	?	1
Total (including adaptation and excluding agriculture)	67	25	34

Wind and solar energy projects are currently proving to be larger than expected, but a further effort would be needed to move from doubling (the official target of

many countries) to tripling, which is now potentially achievable. However, China is the leader in the deployment of renewable energies, and Europe is dependent on it for the production of photovoltaic panels, wind power and batteries, which reduces its potential for specific action in this field, given the issues of security and dependence. Support for the development of "green economy" technologies is sought through an industrial program (Green Deal Industrial Plan) accompanied by both electricity market reform and regulation of critical raw materials, the famous rare earths. In the wind power and heat pump sectors, Europe is well established as an innovator, but environmental, societal and local problems do not always lead to the development of these energy sources. A number of actions also need to be encouraged, including:

- Technological innovation in favor of a green economy would be encouraged by an increase in the production price of carbon, provided that an appropriate social policy is implemented at the same time.

- Subsidies could be offered to certain companies wishing to commit to partial or total (eventually) decarbonization of their activities. However, these operations need to be closely monitored to avoid lobbying. In this context, independent national and/or European bodies could be set up and called upon to avoid waste, truncated information or abuse of power in advertising campaigns.

- Research and development based on economically attractive solutions for combating carbon emissions must receive specific, targeted and standardized financial support. A European body could be set up, with substantial financial resources, to fund high-risk, high-potential R&D projects.

III.2. Political conflicts

The United Nations Charter commits its members to saving succeeding generations from the scourge of war, defending the fundamental rights of men and women, promoting the progress of all citizens through tolerance, and respecting the dignity and equal rights of the human person. However, the members of the Security Council, the major powers, frequently veto any intervention by the UN in an armed conflict involving its members. Today, the broadening of the concept of security is not the subject of a unanimous collective position, particularly for those states that refuse to interfere in internal affairs.

In 2009, at the instigation of the Pacific Island States in particular, the United Nations General Assembly issued an expert opinion on the subject, attesting that climate change was a major factor in threats to international peace and security. In 2011, the Security Council noted that global warming posed a challenge if it led to a weakening of international security. However, in 2013, China, India and Russia, supported by around 100 developing countries, expressed their opposition to the UN Security Council taking up the issue of climate change. In July 2020, the Security Council held a debate on the link between climate change and security, which was followed by the creation of an informal expert group (IEG)

on the risks of global warming to peace and security. At the end of 2021, a binding initiative, supported by 113 member states, on the systematic integration of climate-related security risks into the Security Council's work on conflict prevention and management seemed to represent a considerable step forward on the subject. However, Russia (followed by India, with China abstaining) chose to exercise its right of veto on this initiative, arguing that a scientific issue should not be turned into a political proposal, diverting attention from the fundamental sources of conflict weighing on the West, unconcerned about the wars it is waging with their harmful consequences for the environment. The logics of emerging countries are in direct opposition to those of developing countries.

However, there is a risk that national climate policies will become dependent, at least in part, on the short-term competitiveness of countries and companies (which exert a strong lobbying influence on national governments), leading to the possibility of perverse effects in the orientation of economic policies. In a context of struggle for world leadership, the major powers use subterfuge to shift the bulk of the effort onto their rivals in the short term, thus reducing the scope of cooperation agreements. As for the most polluting companies, the fall in their stock market valuations is a trend, but short-term speculation, this downward trend does not seem irreversible, given the global conflicts that are invading international discourse and modifying its content and orientation, on a time horizon that is still very uncertain, as is the duration of these wars. While highly speculative pension funds (20% of equity capital and 40% of shares in US companies) are softly committed to decommissioning oil companies, they still have an immoderate appetite for dividends from the privatized profits of producers and distributors of carbon-based energy. In this context, immediate financial interest takes precedence over collective interest. The boundary between productive and commercial practices and morally and socially correct financial performance should be removed. "The capitalist will sell the rope with which he will be hanged", said Lenin.

To reach the 2030 and 2050 targets, all sectors of the economy will have to assume their share of responsibility in respecting carbon budgets to safeguard the future. New technological impetus must be given to renewable energies, in a context where the transition will be paid for by a slowdown in productivity and a transformation in consumption patterns. There are many ways of combating global warming, and a holistic approach is needed, as measures such as carbon pricing, "Fit for 55" or the Inflation Reduction Act will not be enough to reduce the danger in the long term. Only a transformation on a scale comparable to the industrial revolutions can lead to carbon neutrality, without sacrificing people's well-being, provided we produce more usefully and consume less unequally according to needs, not just satisfied desires. If, following the example of the United States, a group of powerful states were to use extraterritorial laws to condemn polluting companies, environmental standards would be more readily accepted, willingly or otherwise, by economic players.

Not all countries are on an equal footing, between producers and exporters of oil (USA, Russia, Saudi Arabia) or gas (USA, Russia, China and Iran) and net importers of these energy sources. There is also the challenge of countries' economic competitiveness in the face of energy prices, which varies according to whether they are producers, exporters or importers. Similarly, situations vary in terms of controlling carbon leakage and building a competitive industrial offer. The ecological and climatic transition will reduce investment in fossil fuels, but conflicts of interest between countries could lead to economic or military wars that would seriously delay the solutions to be envisaged for decarbonization. As in all situations of economic transition, inflation will be inevitable. Central banks, notably the ECB, are counting on an average price rise of around 2%, but given the speed and violence of the transition, a higher estimate should be targeted. Monetary policy rules must not stand in the way of climate action deemed necessary in any given period.

All states will suffer the irreversible consequences of widespread pollution, paving the way for many deadly conflicts to come. Wars over the availability of energy resources, due to soil desertification or the fruitless search for rare earths, are becoming probable at national level, as is the competitive use of rivers and the increasing scarcity of drinking water, which is as essential to every human being as clean air. Some states are already proposing to take legal action before the International Court of Justice against states whose greenhouse gas emissions infringe their territorial integrity, as the inexorable rise in water levels threatens their survival, even if the consent of all the states concerned seems difficult to obtain. And yet, migration poses major security problems, likely to jeopardize the political and economic stability of host countries, and hence of all international cooperation bodies. Globalization, which has enabled multinational companies to increase inequalities, will explode, leaving the way open, at least in part, to "friend-shoring", with the major powers applying mercantilist policies when their interests are at stake, as is the case today with the IRA (Inflation Reduction Act) initiated by the United States.

IV. From an economy of desires to an economy of needs: towards an economy of solidarity

Major information campaigns must be undertaken, sometimes in opposition to lobbies, to explain to citizens and consumers that their personal interests are not just immediate, but that they must also be open to the future and that of their children. We need to explain the benefits of decarbonization, increased electrification, controlled mobility and the transformation of lifestyles focused more on social relations than on the consumption of goods and services. Consuming too much today can lead to worsening the effects of scarcity in a future of rapid transition.

New economic development needs to be organized by public authorities at all levels - local, regional, national, international and global - controlling new technologies and the economic laissez-faire of unbridled globalized capitalism, which is dangerous in the long term (Fontanel, 1979). The best solution when it comes to energy remains non-consumption, less visible consumption and the quest for energy efficiency gains. We therefore need to renovate buildings, modify the consumption of individual vehicles, support telecommuting, fight against waste, promote low-energy public transport, but also to reflect on the level of taxes on the structure of final consumption and on that of investments with regard to the collective interest well understood and above all well shared. The fight against global warming can be likened to a "war economy", in which everyone must make the necessary efforts, at every level, to combat this new adversity on which it is possible and necessary to react and reduce.

The stress caused by the consequences of global warming will lead to a cascade of new stresses, including population movements whose trajectories are as yet unpredictable, as well as changes in public health and pandemics whose human cost will be borne by several generations. The emergence of armed, civil or economic wars may be envisaged, in the absence of consensus and support from all nations in the fight against global warming. More fundamentally, the economy of satisfying desires must give way to an economy of needs to reduce the economic crisis and poverty that will result from climate action. For the majority of the population, there can be no question of suffering the negative effects of taking global warming into account, given a standard of living where desires give way to the expression of needs. As the richest social strata pollute 1,200 times more than the average citizen in one year and over several years, they are the main culprits of environmental degradation, and their contribution must become decisive, given their responsibility. When, over a lifespan of 80 years, a rich person produces 1,200 more units of pollution per year than the average person, by the end of his or her life he or she will have contributed almost 100,000 units of carbon pollution, compared with 80 for the average person.

Man is subject to the law of a desire he does not understand" (Cohen, 2015). We need to return to a frugal economy, based first and foremost on satisfying society's fundamental needs, then allowing new productions to be invented in the surplus sector, where desires can be expressed in different forms and intensities, particularly in the non-market domain. On the other hand, these productions must not escape the rules of energy frugality, to avoid the rich being tempted once again to pose energy problems for future generations with their ostentatious demands.

Consumer society is all about individual happiness based on buying and possessing. Programmed obsolescence accelerates production systems, and infrastructure is replaced rather than renovated. Destruction replaces renovation. The idea of state performance is measured by GDP, a statistical concept that does not take into account the waste of earth and ocean resources. Multinationals are taking advantage of this situation by setting up shop in states that are least

committed to combating climate change and least demanding in terms of taxation or ecological regulations. Lobbies are also quick to act, even in competitive markets, to avoid any new regulations, be they administrative, ecological or fiscal. This is true of all energy companies, which defend their interests within a relaxed capitalist framework.

The fight against global warming, an inescapable challenge for international and therefore national security, implies a profound intellectual and economic revolution of the models in place, and a random restructuring of the power of States and multinationals in the contemporary world. Scarcity is both an absolute and a relative factor, as it also depends on physical and social contexts. The absence of clean air was not a physical phenomenon to begin with, but it can become one if pollution is systematic in a given region. Programmed obsolescence also leads to new forms of scarcity, testifying to its relative character. For the moment, scarcity is mainly societal, based on social inequalities, violence or peace, privileged or inhospitable territories. These situations are at the heart of contemporary disputes, conflicts and wars.

It is at the level of economic inequalities, founded on colonialism, the economic domination of a dominant and triumphant oligarchy and the absence of global economic democracy, that we must act. Indeed, the main culprits behind this planetary pollution are the owners, shareholders and managers of companies who, in the name of competition, do not seek to reduce the lethal effluvia of their economic activities, but to increase their profits again and again. The race for greed has become a sporting event. The climate transition can bring non-monetary positive externalities, such as the rise of the circular economy, the quest for healthy eating and the practice of a lifestyle more in tune with its environment.

All countries suffer from a problem of competitiveness, given their energy costs. Too preoccupied with the conditions of competition, they seem to overlook its limits, dominated by short-term decisions (on the scale of climate issues) and greed for personalized, often excessive profits, producing growing inequalities and profoundly disintegrating the necessary solidarity of a world suffering from social inequalities, pollution and global warming. We are witnessing a degeneration of democratic values, in the monopoly of information exercised in autocracies and the control of the media managed by the richest members of society in democracies. More worryingly, states are sometimes themselves de facto ruled by an oligarchy which, under the guise of democracy, institutes a plutocracy, quite sensitive to the action of lobbies, notably those seeking to expand the market for fossil fuel resources. The third industrial revolution raises the question of the current mode of production and consumption which, in the near future, will lead to the multiplication of natural ecological disasters, the rarefaction of resources and widespread permanent insecurity.

V. Conclusion

The energy transition is presented as a set of binding decisions, imposed by the State, with such a long-time horizon that its timeliness is deemed questionable. The third industrial revolution should tend towards greater democracy and egalitarianism, given the importance of virtually free public services, thanks to technological advances in digital technology and renewable energies. The tipping point will also depend on the price of oil and gas, two fuels that still largely dominate the energy market. As long as these economic sectors continue to reap substantial profits, they will continue to speculate on their sustainability. The United States and Russia continue to exploit natural gas, with heavy investments, which testifies to a lack of eagerness to reduce production of fossil fuels, whose cessation of exploitation will result in the immobilization of 100,000 billion dollars of frozen assets, if the target of a 2°celsius rise in the Earth's temperature, proposed by the Paris Conference, is not exceeded. In this context, and given the enormous revenues of carbon-based energy producers and the power of lobbies, we can expect strong reactions from beneficiaries to delay the unfreezing of their activities.

The cost of the transition must be fairly distributed, which implies resolute public action shared by all citizens, no doubt paid for by a growing public debt, with rising expenditure and falling compulsory deductions, unless public finances engage in a battle for greater income redistribution and wealth taxation. The "sobriety" sought must concern the richest countries and agents, and must not be perceived as a process of decline, given the new investments required for decarbonization, but rather as the search for another form of well-being, in a world that is less unequal and more responsible in terms of private and public consumption.

In an analysis known as "enlightened catastrophism", the aim is to convince economic players and citizens of the imminence of the crisis, and to make use of the past. "What should we have done to avoid it? ". Secondly, we need to adopt a few rules of action, which do not violently eliminate all the past, but which organize the present differently and prepare for the future.

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