Representation of the climate issue by the European Commission. A counterproductive bias?

(Ollivier Bodin - Greentervention)

Summary: *The European Commission adopted a "Strategic Foresight Report" on 9 September 2020. This report is intended to provide the strategic framework on which short-term policy initiatives will be based, including to address climate vulnerabilities. It appears that in this report the estimate of the potential cost of global warming of 2°C compared to the current level suffers from a double bias. First, it takes into account only a very small part of the expected effects of disruptions on human activities. Second, it completely ignores the radical uncertainty surrounding such estimates because of the unprecedented nature of warming. Such biases legitimize policies that would not meet the Paris commitment to keep the average temperature rise compared to the pre-industrial level below 2°C, and as close as possible to 1.5°C. Since the IPCC does not rule out catastrophic scenarios for the habitability of the planet in the event of a warming of up to 3°C, we advocate economic policies that are explicitly based on the precautionary principle inherent in the Paris Agreement. As we argued in a previous post, this includes abandoning GDP growth, an undifferentiated variable, as a priority guide to economic policy, and choosing an indicator that favours the development of sustainable activities and gives negative value to activities that are not.*

The individual and collective representation of the consequences of climate change on our societies determines our behaviours and the policies we are prepared to pursue and to which we consent. The communication difficulties encountered during the COVID pandemic show, in a relatively short time scale, the importance of representation when politics is confronted with unprecedented, massive and negative interactions between a natural phenomenon and human activities. The governments quickly realized that they could not represent the challenge posed by the pandemic nor found their policies using a simple probability calculation based on the first best estimates of mortality of "only" 1% of the infected persons and a collective immunity rate of 50%, 60% or ?, as was sometimes suggested at the beginning of the epidemic. They had to take into account in particular the state of knowledge that could only be developed very gradually, the uneven distribution of risks among different ages and the constraint posed by the capacity for emergency hospital admission. This last constraint forms a threshold beyond which catastrophic scenarios are inevitable such as those that the inhabitants of Brescia and Bergamo or eastern France suffered at the very beginning of the epidemic.

The Commission's representation of the climate issue

The Commission recently sent a "strategic foresight report" to the European Council and Parliament. The report should allow "short-term (political) initiatives to blend into a long-term perspective." The report lists the vulnerabilities facing the European Union, including those related to climate change. In the body of the text, the choice is made to summarize the climate risk as follows: an average temperature of 3°C above the pre-industrial level (a further 2°C compared to today) would result in an increase in mortality of tens of thousands and an annual cost of "at least" 1.36% of GDP (p.25). This figure, validated by the European Commission, and

which will surely be used and reused without reservation by other institutions, comes without further comment or reservations about the degree of uncertainty surrounding it. It should be noted, however, that in a box of the same report the Commission presents other figures, more alarming, but without establishing any link between the two estimates.

Can this representation really be the "strategic" basis for short-term initiatives compatible with the commitments made in Paris? On the contrary, does it not risk leaving a doubt about the absolute necessity of respecting this agreement which stipulates that global warming must remain as close as possible to 1.5° C above pre-industrial level?

Two approaches to guiding economic policies

Before looking more closely at the figures put forward by the Commission, a point on methodology is necessary. There are (at least) two different approaches identified in the literature that lead to opposing conclusions on how to guide economic policies.

The first approach is a cost-benefits analysis. It calculates the "optimal" temperature, minimizing the difference between the costs of the investment needed to stabilize the temperature at the "optimal" level and the expected benefits at that temperature, i.e. the damage avoided by not reaching a higher temperature. This method assumes that to each future temperature level one can assign an expected damage according to a probabilistic calculation. This method is recommended in particular by the Nobel Prize laureate W. Nordhaus. He concludes that the "optimal" temperature in 2100 would be about 3.5°C above the pre-industrial level, and the optimum equilibrium temperature would be 4°C[1]. Mr W. Nordhaus is therefore critical of the Paris Agreements.

The second approach, incompatible with the first, and which is favoured by a growing number of economists including in financial and monetary institutions, is based on the precautionary principle. In particular, it aims at avoiding a catastrophic planetary evolution that exceeding a temperature threshold could trigger with a non-negligible probability.

Depending on the approach used, the policy will differ. Following the first approach, we will maximize the expected growth with an eye on the balance of expected costs and benefits, but without strong constraints on greenhouse gas emissions.

The other approach leads to policies constrained by a maximum level of greenhouse gas emissions, similar to the constraint imposed by hospital capacity in the management of the COVID crisis. The objective for the climate, as was the case for the pandemic, is to maintain the risk of scenarios with catastrophic consequences at a level as close to zero as possible. This approach takes full account of the warnings of IPCC scientists.[2] The reason for this choice

[1] See his presentation at the reception of the Nobel Prize and his article in the American Economic Review

[2] Created in 1988, IPCC (Intergovernmental Panel on Climate Change) is an international body that synthesizes research on the climate system, its evolution, the impact of warming and solutions to it.

is simple: to act differently would be to play Russian roulette with the hospitality of the planet and there is no one to insure this habitation against a total crash.[3]

In practical terms, the consequence of this second approach is to keep the average temperature of the planet as close as possible to 1.5°C above pre-industrial level. This implies, as we pointed out in a recent post, to use the speed of decarbonization of the economy as a priority objective of economic policies and not the growth of an undifferentiated aggregate such as GDP.

Where do the Commission's figures come from?

The figures presented by the European Commission were produced as part of the PESETA project[4] conducted by the Joint Research Centre of the European Institutions. The excess mortality in a world at 3°C above the pre-industrial level would be 90.000 Europeans per year due to exposure of vulnerable people to more frequent episodes of extreme heat. The cost of this excess mortality compared to the current situation is estimated at 0.96% of GDP. The annual cost due to the other factors considered by the study is therefore 0.4% of GDP, three quarters of which is related to a greater frequency of river or coastal flooding. If we stopped there, we could conclude that with some measures of health prevention and flood protection, the populations of the European Union could live without much problem in a world whose global average temperature would be 2 degrees higher than today, and 3 degrees above the pre-industrial level.

The Joint Research Centre's report also breaks down the impact between the different regions of the Union. As one would expect, the anticipated losses in the southern EU countries are higher (up to 2.2% of GDP around the Mediterranean basin compared to 0.2% in the north of the Union), but this is mainly due to a massive gap in terms of excess mortality. The gap for economic impact itself is small, at 0.4% of GDP (impact of 0.6% of GDP in the South and 0.2% in the North). Based on these facts, it is understandable that the Commission does not problematize the issue of the asymmetric impact of global warming on regional cohesion. The order of magnitude does not make the issue look urgent.

Impacts taken into account far fewer than impacts not taken into account

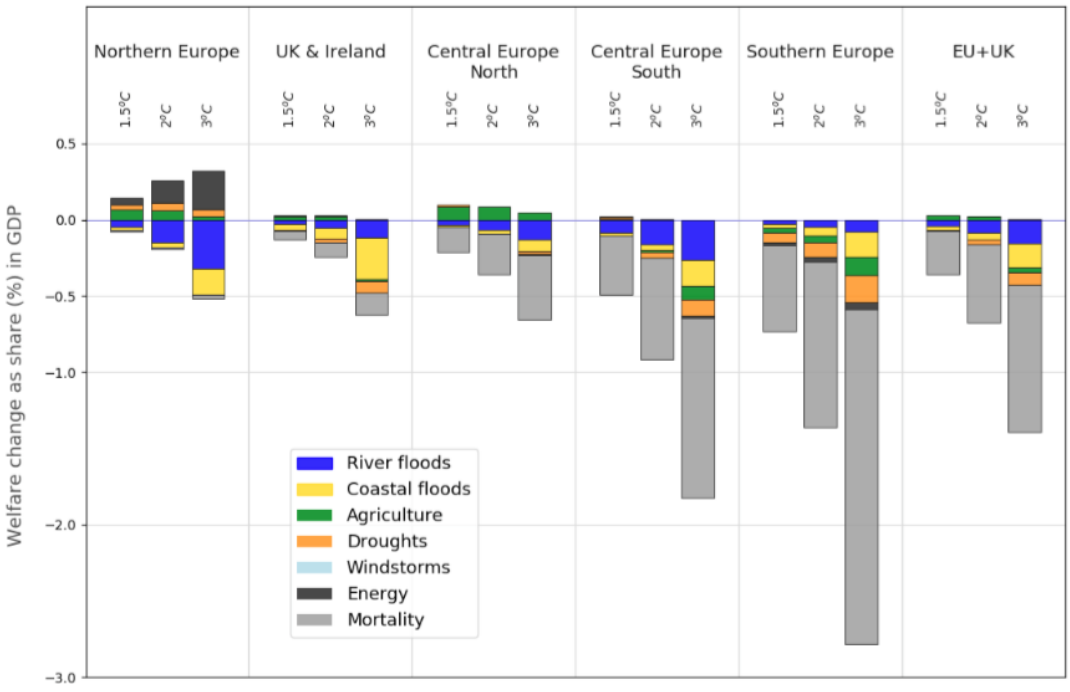
Let us first list - it will be short - the consequences included in the analysis of the report in addition to the excess mortality due to heat episodes and to floods: productivity in agriculture (only for the cultivation of cereals), the cost of electricity production when it depends on water as a source of energy or cooling, and the increased frequency of droughts and that of storms whose impact is considered negligible.

[3] NB: these last metaphors are all extracted from IMF Working paper 2019/185,P.11, Bank for International Settlements-Banque de France, The Green Swan, P. 1, and G. Heal, The Economics of the Climate, Journal of Economic Literature, 2017, 55(3), P. 1046-63

[4] Peseta: Projection of Economic Impacts of climate change in Sectors in the EU based on a bottum up Analysis. The economic impacts are detailed Economic analysis of selected climate impact, JRC PESETA IV project – Task 14 (2020)

The list of possible impacts mentioned by the report but not covered by the empirical analysis is much longer. According to the report, the impact on continental ecosystems (including forest fires) is only partially taken into account, and the impact on ocean ecosystems (acidification) and unsalted water not at all. The impact of rising sea levels on coastal erosion and infrastructure is not. Moreover, human health will deteriorate not only because of extreme heat episodes as taken into account, but also because of the persistence of higher average temperatures, air pollution and an increased frequency of vector-borne diseases (malaria, dengue,...). In some areas the energy need will increase and water shortages will appear. Tourism, transport, labour productivity, livestock and other agricultural production will also be affected. Similarly, it is necessary to consider a greater frequency of production line disruptions with third countries also suffering from the effects of climate change or an increase in production costs in these countries. Climate change can also lead to unprecedented migratory pressures, increasing the risk of conflict or political destabilization that is difficult to quantify. In any case, the need for adaptation will be much higher in non-European southern countries, which will increase pressure on external cooperation budgets.

Figure 20: Welfare change from selected climate impacts (% of GDP) for the EU-27 and UK, and for the constituent EU macro regions, for three levels of global warming. The results represent change with respect to current economy.



Source: PESETA IV, 2020.

In view of this list, we see that the "at least" is more a euphemism than a mere precautionary clause. The lack of coverage of risks alone should delegitimize the use of this figure in an official strategic document.

Multiple sources of uncertainty

But this does not exhaust the subject. For this figure not only partially reflects reality, but it is also itself highly uncertain as the authors of the research centre acknowledge. There are five

sources of uncertainty that add up. They are not specific to this estimate and are shared by all the estimates of "costs" of climate change.

- The first is related to estimating the physical or biophysical impact of climate change. For example, the link between the concentration of greenhouse gases and the average temperature on the planet's surface is well established, as is the average rise in temperatures and the recurrence of periods of extreme heat. But these links are not deterministic, and are subject to various meteorological unknowns. At the regional level, there may be temperature thresholds that mark a complete change in the local weather regime with unpredictable consequences.
- Second, on a global scale, at a temperature of 3°C above pre-industrial levels, it cannot be ruled out that positive feedbacks from certain impacts of global warming such as deforestation or melting permafrost could irreversibly and uncontrollably accelerate global warming[5].
- Third, the economic model used is itself a source of uncertainty. The poverty of historical data makes estimating parameters unreliable[6] [7].
- Fourth, the model can only represent economic structures shaped by the historical climate context and "produce" gradual adjustments. However, some activities could suddenly disappear, especially if the weather hazards are no longer insurable. On the other hand, the model used does not take into account the capacity and cost of adapting to climate change.
- Fifth, the model does not take into account the retroactive loops between the real economy and the financial sphere. Assets are subject not only to material risks to production, but also - for those condemned by the carbon footprint - to a transition risk (see for example the Finance Watch report, Breaking the climate-finance doom loop).

The cacophony between the various institutions is also detrimental to the establishment of effective policies. The OECD in a 2017 report estimated the upper cost limit in a business as usual (BAU) scenario at 10% to 12% of global GDP by 2100[8]. The figure was taken up unreservedly in the summary of the report. In the long report, this estimate is preceded by a mention that serious, non-linear (?) and unpredictable damage could be significant (beyond the upper limit?). In a discussion paper presenting the scenarios used for the "stress tests" of financial institutions in the face of climate risk, the Bank of France takes up the figure of 12% without reservation for the BAU scenario. On the other hand, in June 2020 the more lucid "Network for Greening the Financial System" (NGFS) estimates losses of up to 25% of GDP for the BAU , also pointing out that not all risks are or can be taken into account and that debates on the right method remain intense.

[5] See : W. Steffen &al., 2018, Trajectories of the Earth System in the Anthropocene

[6] Olivier Blanchard while supporting orthodox macroeconomic models recognizes substantial flaws with them.

[7] Here a comparison of climate, epidemiological and economic models

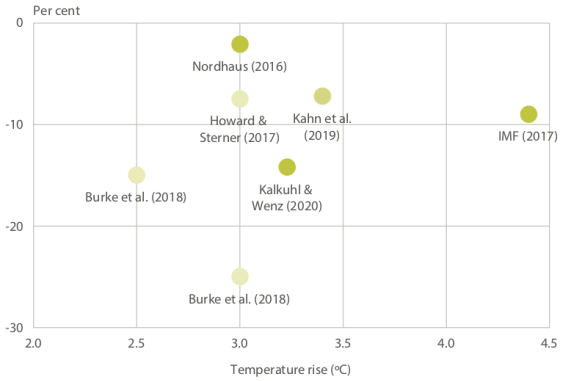
[8] The numbers mentioned in this paragraph cannot be compared to the numbers by the European Commission mentioned above. The former represent the GDP difference between two scenarii at a given time horizon, the second an annual cost of natural events.

Uncertainty in impacts from physical risks

Economic impacts at high degrees of warming would be unprecedented and much more severe than currently estimated given known gaps in modelling.

- There is little agreement across studies about the relationship between temperature and the economy. The adjacent chart shows a range of damage estimates for different levels of warming. The differences arise from the type of modelling approach (e.g. IAM, econometric, CGE), whether impacts are considered to directly affect the growth rate, and the future level of adaptation.
- There are a number of reasons to suggest that these are underestimates of the potential risks. Although some studies capture non-linearities in biophysical processes as temperatures increase, few fully capture the potential risks of tipping points accelerating global warming. Studies that have assessed the potential impacts from tipping points on policy responses find that emissions prices should be up to eight times higher.
- In addition, the damage estimates shown only cover a limited number of risk transmission channels and tend to ignore the risks from low probability, high impact events (particularly in regions with lower levels of development).
- Another key assumption is that socioeconomic factors such as population, migration and conflict remain constant even at high levels of warming. The World Bank (2018) has suggested that climate change could displace almost 140 million people by 2050 in countries in Sub-Saharan Africa, Latin America, and Asia.

Estimates of GDP losses from rising temperatures in the academic literature



Source: As shown. Shade of marker reflects temperature baseline used in the underlying study. Burke, Howard & Sterner (lightest shade) measure temperature rise relative to pre-industrial levels. Kahn (medium shade) uses a baseline of 1960-2014. Nordhaus, IMF and Kalkuhl & Wenz (darkest shade) use a near-term baseline (ranging from 2005-present day).

NGFS

NGFS SCENARIOS 30

Source: NGFS Scenarios

The courage to decide in uncertainty

While each institution has its own way of presenting the case, they have one thing in common. None of them explicitly says: "In the current state of knowledge, no (probabilistic) estimate of the cost of global warming can be used as a basis for the decision. We must act according to other principles." Which is in our view the only correct way to respond in a situation of fundamental uncertainty.

The representation by the Commission of climate risk in a strategic document is consistent with the unfortunately still prevalent idea that economic policies must aim primarily at accelerating growth, not decarbonizing the economy. This is inconsistent, however, not only with the proactive announcements to reduce greenhouse gases, but also with the latest IPCC analyses. In a recent report, the IPCC compares the risks associated with a warming of 1.5°C above pre-industrial levels with those associated with a "2°C" and, in part, "3°C" scenario. Consensus points to a significant increase in risks between the "1.5°C" and the "2°C " scenarios, let alone "3°C, both for the planet as a whole and for the regions in southern Europe (see pages 246 to 250 of the report). Let us recall in this context that in the current trend and without additional measures the EU's 2050 carbon neutrality target cannot be achieved and that based on current global trends, a warming of 3°C above the pre-industrial level is emerging.

The profound transformation of the production system that must be accomplished in a generation requires much more than the funding provided for by the European Green Deal. European and national decision-makers must put on the table all the options for a revision of the principles that guide European economic policies. The latter are not yet sufficiently encouraging the private and public sectors to accelerate their carbon disengagement. All policies can contribute to the objective, whether it is trade policy, the budgetary rules of the Stability Pact, prudential and monetary policies, competition, or the internal market. But, to be useful, revisions of these policies will have to be based on a lucid diagnosis of our knowledge and ignorance as well as on the courage to decide under uncertainty.