

EGU22-5928

<https://doi.org/10.5194/egusphere-egu22-5928>

EGU General Assembly 2022

© Author(s) 2022. This work is distributed under the Creative Commons Attribution 4.0 License.



Commitment as Lost Opportunities

Marina Martinez Montero¹, Michel Crucifix¹, Nicola Botta², and Nuria Brede²

¹UCLouvain, ELIC, Louvain-la-Neuve, Belgium

²PIK - Potsdam Institute for Climate Impact Research, Potsdam, Germany

In the context of climate change, the word "commitment" was originally used to denote how much extra warming is to be expected eventually given a certain fixed concentration of CO₂. The notion has evolved and now it is customary to encounter terms such as "constant emissions commitment", "sea level rise commitment" and "zero emissions commitment". All these notions refer to how much change with respect to the current climate state is expected at a given point in the future considering our current climate state and specified future anthropogenic emissions.

Here, we propose thinking about commitment as available options for future action that will allow future decision makers to avoid harmful futures. The definition requires the identification of unwanted outcomes e.g., too high temperature or too fast sea level rise and the specification of a range of possible future anthropogenic emission/intervention scenarios. Given an initial climate state, the measure of commitment is based on the diagnosis of which of those emission/intervention scenarios yield futures safe from the unwanted outcomes. This new definition of commitment explicitly captures the notion of legacy: It measures the range of options that the next generations have at their disposal to avoid harmful futures.

We illustrate the definition and methodology with a simple model featuring ice sheet tipping points and ocean carbonate chemical balance. After having introduced the model, we specify the considered future anthropogenic emission/intervention options available, along with the considered unwanted outcomes. We show how the safe options available for future generations would change in time if we were to follow some of the most standard emission scenarios used in the literature.