Poster title: Development of very low emission scenarios for climate change research in line with the Paris Agreement long-term goal

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Statement:

Understanding whether progress is consistent with the long-term goal of the Paris Agreement requires benchmarks; benchmarks that can be compared to the emissions reductions achieved and proposed under the NDCs. Scientists have extensively explored transition pathways limiting warming below 2°C. However, the same cannot be said for 1.5°C. Therefore, an international consortium of six global modelling teams has explored this question and has developed a new set of scenarios that limit end-of-century radiative forcing to 1.9 Watt per square meter – an RCP1.9 if you wish. These scenarios keep warming in 2100 below 1.5°C with roughly 66% probability. No attempt was made to keep warming below 1.5°C throughout the century, and peak warming is hence often higher than 1.5°C. One scenario out of this diverse set has been selected for further analysis with state-of-the-art Earth system models as part of the Sixth Phase of the Coupled Model Intercomparison Project (CMIP6).

These new scenarios provide a wealth of information that can be of interest to the facilitative dialogue and the global stock take. They provide sectorial detail on how a transformation to a 1.5°C world can look like, how near term emissions can be achieved, and provide important insights to understand the consequences of lower or higher emissions in 2030 in the context of pursuing 1.5°C. Higher emissions in 2030 come with a temperature penalty over the 21st century. For example, peak temperatures are about 0.2°C higher if emissions in 2030 are at the high (>45 $GtCO_2$-eq yr^{-1}) instead of the low (<30 $GtCO_2$-eq yr^{-1}) end of the available range. Being at the high end of this range would also roughly halve the probability of limiting peak warming below 1.5°C over the coming decades. A same trade-off was found for the timing of achieving global zero emissions, a goal referred to in Article 4 of the Paris Agreement. In general, net zero greenhouse gas emissions are achieved between 2050 and 2075 in these 1.5°C scenarios. However, if emissions in 2030 are higher than 40 $GtCO_2$-eq yr^{-1}, zero emissions already have to be reached before 2060.

Scenario analysis and data will be made available online.