Assessment of potential future climate conditions in the Hesse region based on the 2 degree target

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This study addresses the question at which time horizon the global 2 degree target will be surpassed when information of SRES scenarios A1B, A2 and B1 is applied. These data were supplied by runs of the global climate model ECHAM5/MPI-OM T63L31. Initially the pre-industrial level of the global average temperature needed to be determined from the 20C data of ECHAM5 (1860-1889 period). Subsequently, the three SRES scenario runs were analyzed to identify the time at which the increase to the globally averaged temperature reached 2°C.

30-year periods, symmetrically placed around that time, were used to define the scenario-specific climate for the time when the 2-degree horizon was reached. These periods are for A1B 2036-2065, for A2 2041-2070 and for B1 2051-2080.

This study shows that, so far, the warming in Central Europe has been stronger than the global average. Corroberated by scenario runs, this effect continues into the future. However, it should be noted that the magnitude of this increase is subject to a scale-dependency. Regional climate models, such as CCLM, REMO or WETTREG, show smaller differences to the global average than a regional subset of the global model which encompasses 12 Central European grid points.