

Abstract

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Critical infrastructures such as transportation, electricity generation, emergency and health services, and communication networks are of vital importance. Their failure would result in significant disruption of the economy, security, or other drastic consequences. Climate related hazards have the potential to cause damage to critical infrastructure. Depending on the development path of society the utilization of critical infrastructures will vary in the future.

This paper analyzes the impact of climate change and adaptation on critical infrastructures in the context of different socio-economic developments for Germany. Three different Shared Socioeconomic Pathways (SSP) were implemented on a national level within the macro-econometric model PANTA RHEI. Considered aspects in the national context are population and demographic development, GDP development, land use and developments in the field of energy, climate policy, and transportation. Climate change effects on transportation, health care system, and electricity generation and the effects of possible adaptation measures are combined with the three SSP scenarios on the national level to calculate their economy-wide impacts for Germany.

The model calculations help to quantify the impacts of climate change on different SSP scenarios and provide a meaningful risk assessment regarding the impacts of climate change and adaptation on critical infrastructure.