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CO2 emissions scenarios from a database of diverse socio-economic pathways

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Abstract: The Shared Socio-economic Pathways, or SSPs, are the next generation of socio-economic scenarios following the SRES. The SSP framework recognizes that different socio-economic conditions may lead to similar levels of emissions, or radiative forcing. This implies that any given level of radiative forcing may have very different socio-economic impacts depending on the conditions associated with it. To uncover different socio-economic conditions associated with any level of radiative forcing, we propose a methodology based on “scenario discovery” cluster analysis. With a database of hundreds of scenarios, we demonstrate how this method can identify very different groups of socio-economic scenarios sharing common CO2 emissions outcomes. We find that high emissions scenarios can occur under conditions of either high or low GDP per capita growth. We also find that for the high per capita GDP and high emissions scenarios, high productivity growth and catch-up are not necessarily required.

Keywords: Scenario discovery; Diversity; Socioeconomic pathways; Emissions scenarios; Database