

5.3.21 Zhengzhou

The GHG emissions of Zhengzhou was 3.42 MtCO₂e in 1975, that escalated to 9.94 MtCO₂e in 1990 and 55.8 MtCO₂e in 2015. A majority of the GHG emissions in 2015 (Figure 5.61, top) were contributed by the energy sector (63%) and industry sector (27%), followed by residential sector (6%) and transport sector (4%). As per the ICLAP model estimates (Figure 5.61, below), there would be an increase in emissions at 7.2% per annum, leading to 66.8 MtCO₂e in 2030 and 89.6 MtCO₂e in 2050.

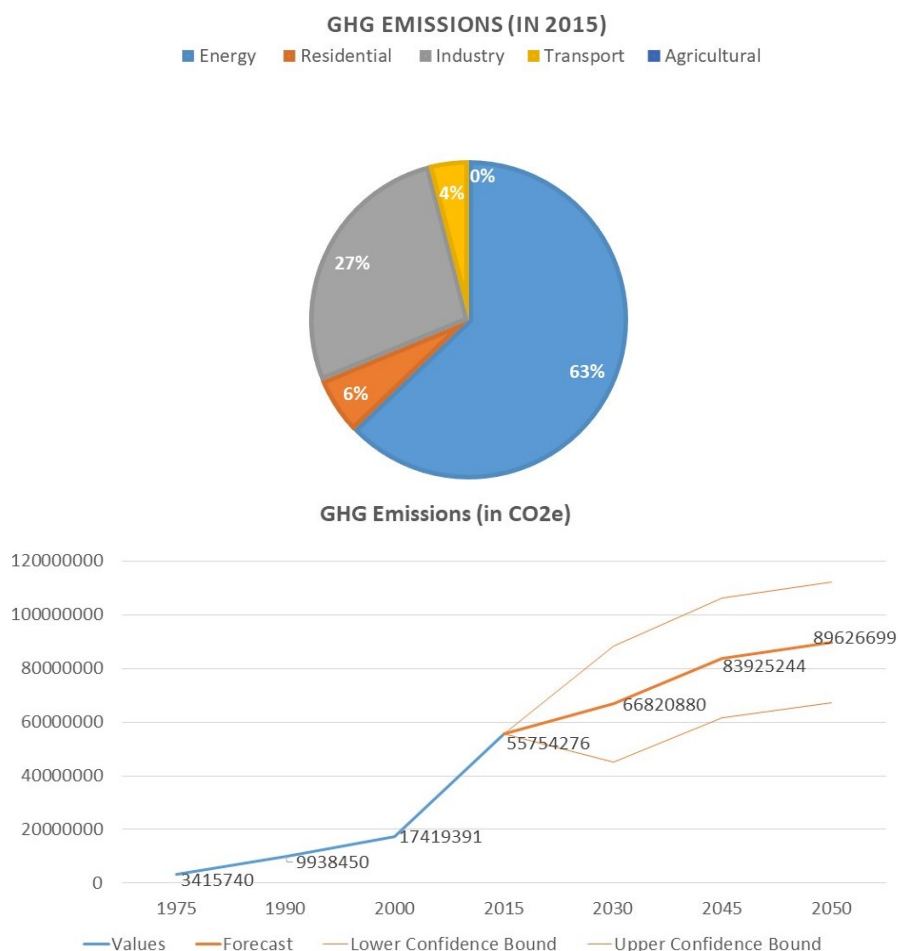


Figure 5.61: GHG contributions from different sectors in Zhengzhou (top); ICLAP model estimates for Zhengzhou's GHG emissions till 2050 (bottom)

The results for climate variability in Zhengzhou indicate that depending on the emission scenarios, there would be a temperature increase of 1.8 – 4.1 degC from 2030-80s (Figure 5.62, top). The scenario corresponding to the pathway with moderate GHGs (SSP245_MIROC6) exhibits an increase of 1.8 degC in 2030s (above the 1980 baseline temperature), 2.0 degC in 2050s, peaking to 2.4 degC during 2080s. The spatial results for moderate scenario over 2010-80s are mapped in Figure 5.62 (middle). Meanwhile, the scenario corresponding to the pathway with the highest GHGs (SSP585_MIROC6) exhibits an increase of 1.9 degC in 2030s (above the 1980 baseline temperature), 3.0 degC in 2050s further rising to 4.0 degC above normal up to 2080s. The spatial results for high emission scenario over 2010-80s are mapped in Figure 5.62 (bottom). Meanwhile, the precipitation change for Zhengzhou shows a very high variability during 2030-80s, ranging from 10 to 175 mm from the normal (Figure 5.63, top) depending on the emission scenarios. The scenario corresponding to the pathway with moderate GHGs (SSP245_MIROC6) exhibits

an increase of about 75 mm in 2030s (above the 1980 baseline rainfall), declining to 20 mm in 2050s, rising again to 170 mm in 2070s and dipping to 100 mm in 2080s. The spatial results for moderate scenario over 2010-80s are mapped in Figure 5.63 (middle). Meanwhile, the scenario corresponding to the pathway with the highest GHGs (SSP585_MIROC6) shows Zhengzhou's city rainfall increase to around 10 mm (above the 1980 baseline rainfall) during 2030s, 150 mm in 2050s, to about 120 mm in 2080s. The spatial results for high emission scenario over 2010-80s are mapped in Figure 5.63 (bottom).

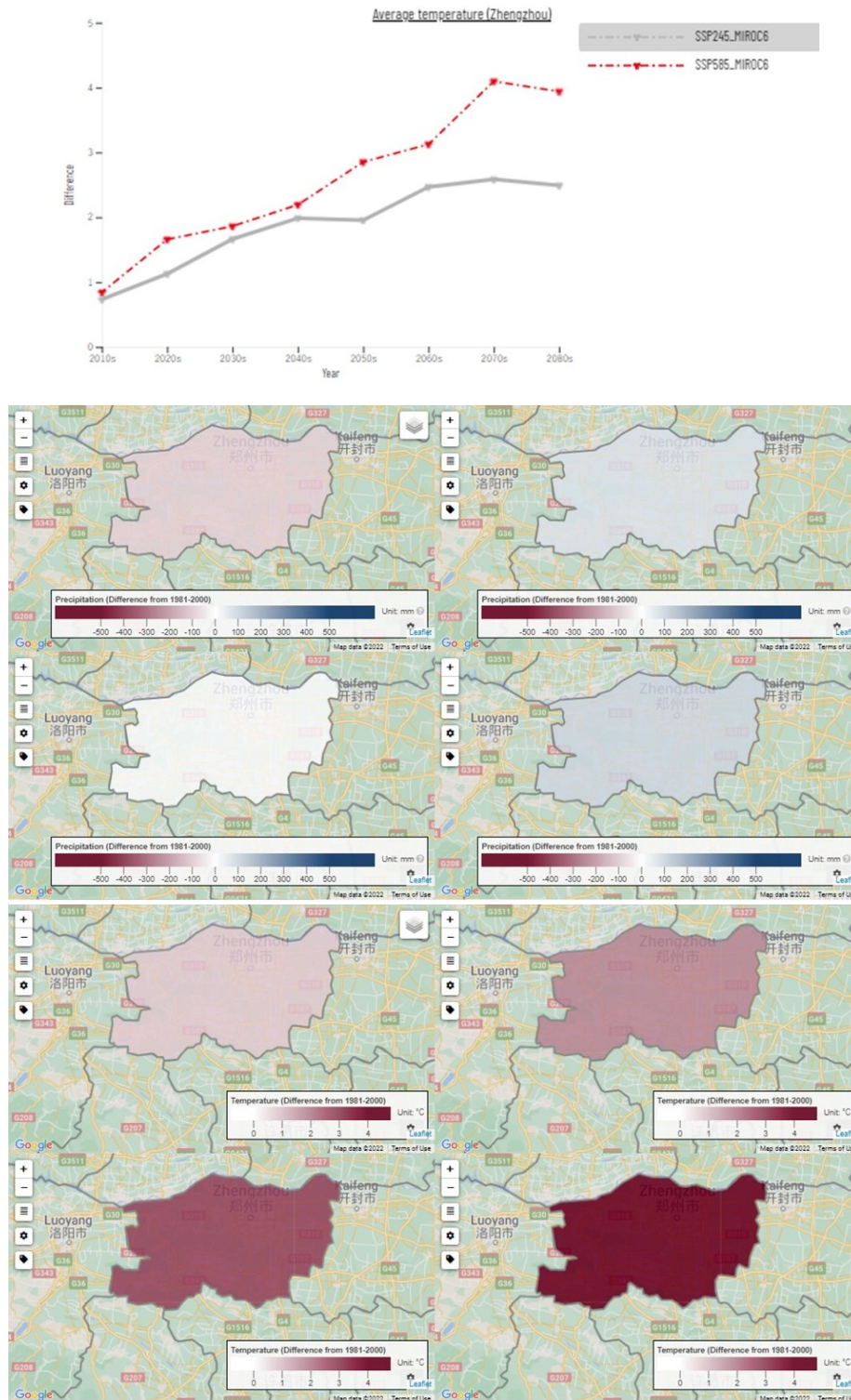


Figure 5.62: Temperature increase in Zhengzhou under medium (grey) and high (red) emission scenario till 2080s (top); Spatial results for medium scenario for 2010s, 2030s, 2050s, 2080s (middle); Spatial results for high scenario for 2020s, 2030s, 2050s, 2080s (bottom)

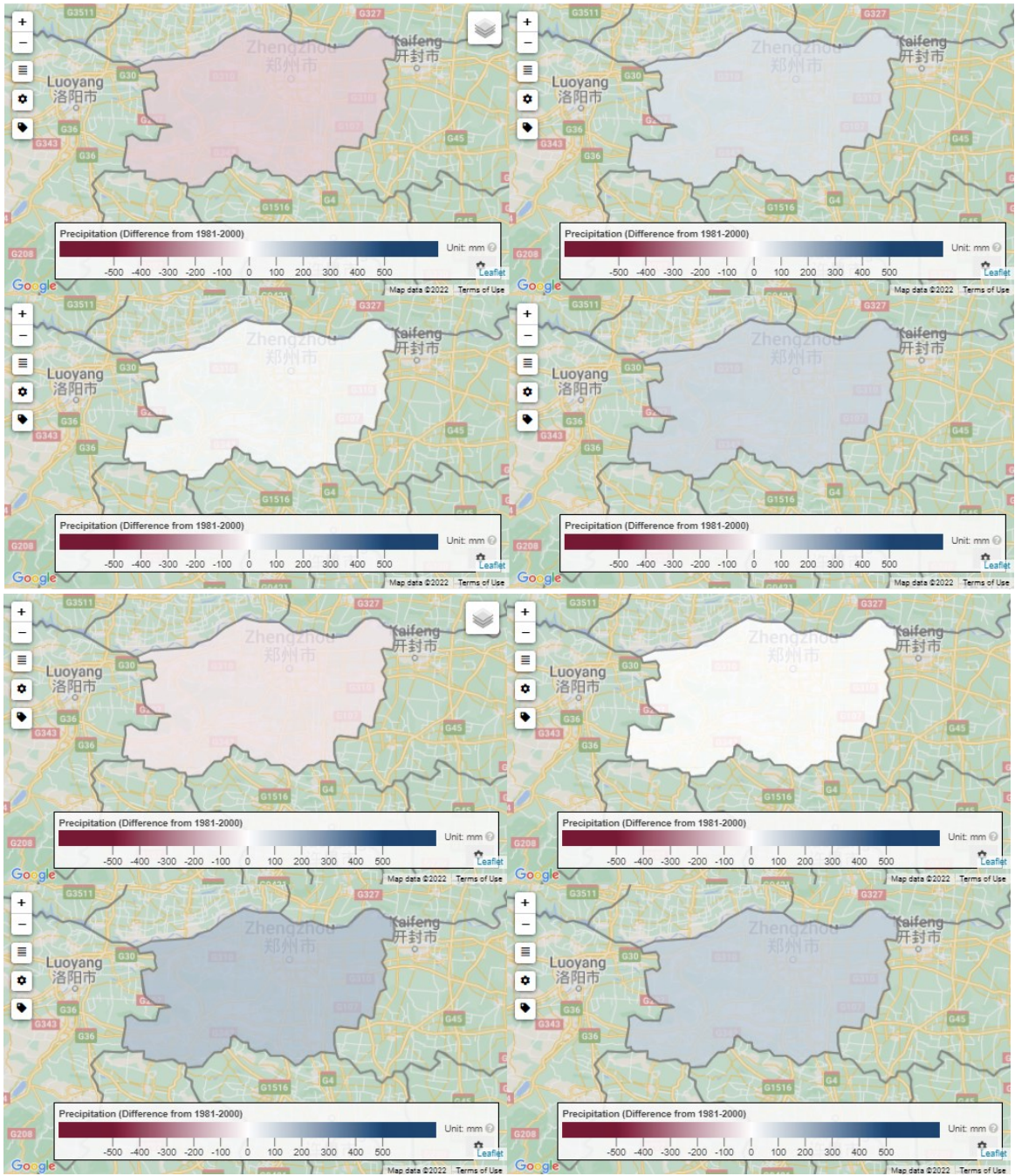
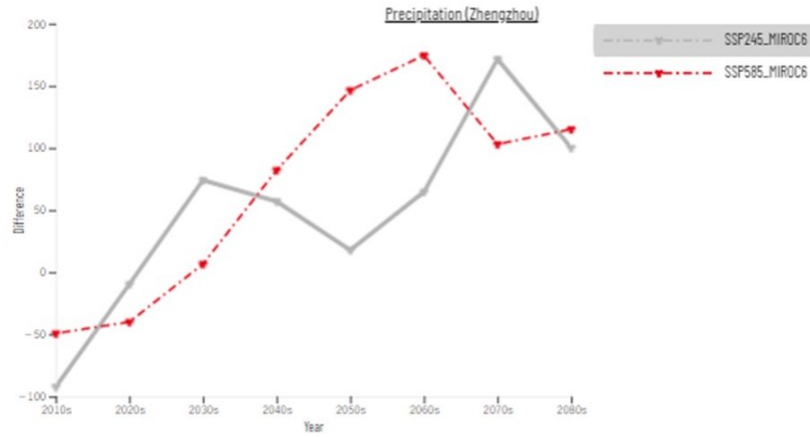


Figure 5.63: Precipitation variation in Zhengzhou under medium (grey) and high (red) emission scenario till 2080s (top); Spatial results for medium scenario for 2010s, 2030s, 2050s, 2080s (middle); Spatial results for high scenario for 2020s, 2030s, 2050s, 2080s (bottom)