

8.3.2 Singapore

The GHG emissions of Singapore was 10 MtCO_{2e} in 1975, escalating to 34.3 MtCO_{2e} in 1990 and 58.6 MtCO_{2e} in 2015. A majority of the emissions in 2015 (41%) were contributed by energy sector (Figure 8.31, top), industry sector (37%), transport sector (20%), residential sector (2%). As per the ICLAP model estimates (Figure 8.31, below), the emission increase at 4.5% per annum would lead to about 79 MtCO_{2e} in 2030 and 101 MtCO_{2e} in 2050.

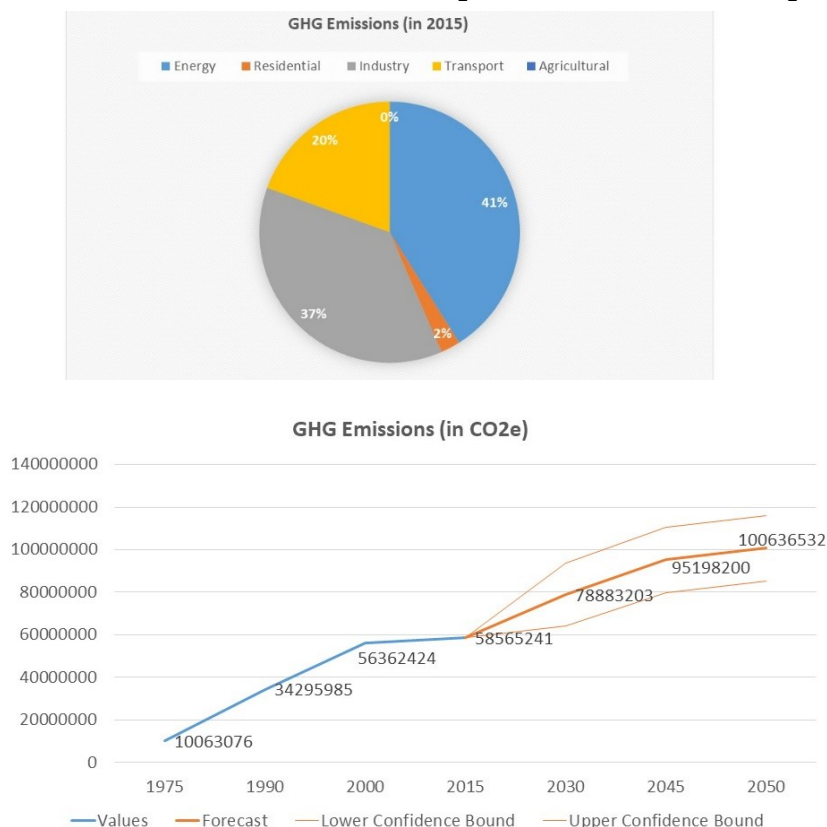


Figure 8.31: GHG contributions from different sectors in Singapore (top); ICLAP model estimates for Singapore's GHG emissions till 2050 (bottom)

The results for climate variability in Singapore indicate a temperature increase of 0.5–2.3 degC in the long run (Figure 8.32, top) depending on the emission scenarios. The scenario corresponding to the pathway with moderate GHGs (SSP245_MIROC6) exhibits an increase of 0.7 degC during 2030s (above the 1980 baseline temperature) to 0.85 degC in 2050s, peaking to 1.25 degC by 2080s. The spatial results for moderate scenario over 2010-80s are mapped in Figure 8.32 (middle). Meanwhile, the scenario corresponding to the pathway with the highest GHGs (SSP585_MIROC6) exhibits an increase of 0.5 degC during 2030s (above the 1980 baseline temperature), 1.2 degC in 2050s further escalating to 2.3 degC above normal during 2080s. The spatial results for high emission scenario over 2010-80s are mapped in Figure 8.32 (bottom). Meanwhile, the precipitation variation for Singapore ranges considerably between 115–310 mm in the long run (Figure 8.33, top) depending on the emission scenarios. The scenario corresponding to the pathway with moderate GHGs (SSP245_MIROC6) shows an increase of 115 mm during 2030s (above the 1980 baseline rainfall) to about 85 mm in 2050s, re-escalating abruptly to 295 mm above average during 2060s and stabilizing to 280 mm during 2080s. The spatial results for moderate scenario over 2010-80s are mapped in Figure 8.33 (middle). Meanwhile, the scenario corresponding to the pathway with the highest GHGs (SSP585_MIROC6) exhibits a precipitation increase of 175 mm (above the 1980 baseline rainfall) during both 2030s, retarding to 115 mm in 2040s, re-

escalating sharply to 240 mm in 2050s. It diminishes to 130 mm above average during 2070s that consistently rises again to 310 mm during 2080s. The spatial results for high emission scenario over 2010-80s are mapped in Figure 8.33 (bottom).

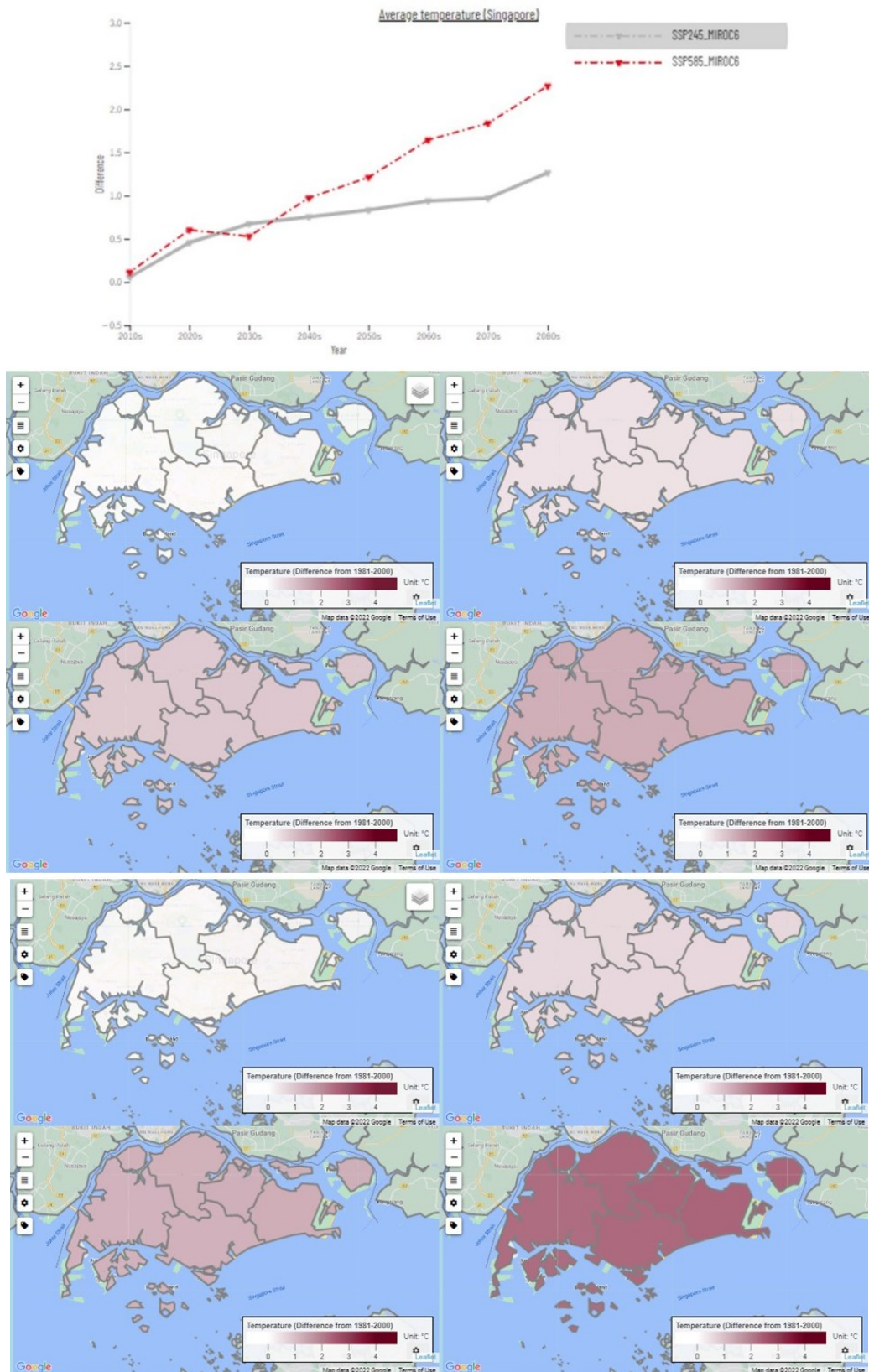


Figure 8.32: Temperature increase in Singapore under medium (grey) and high (red) emission scenario till 2080s (top); Spatial results for medium scenario for 2010s, 2030s, 2050s, 2080s (middle); Spatial results for high scenario for 2020s, 2030s, 2050s, 2080s (bottom)

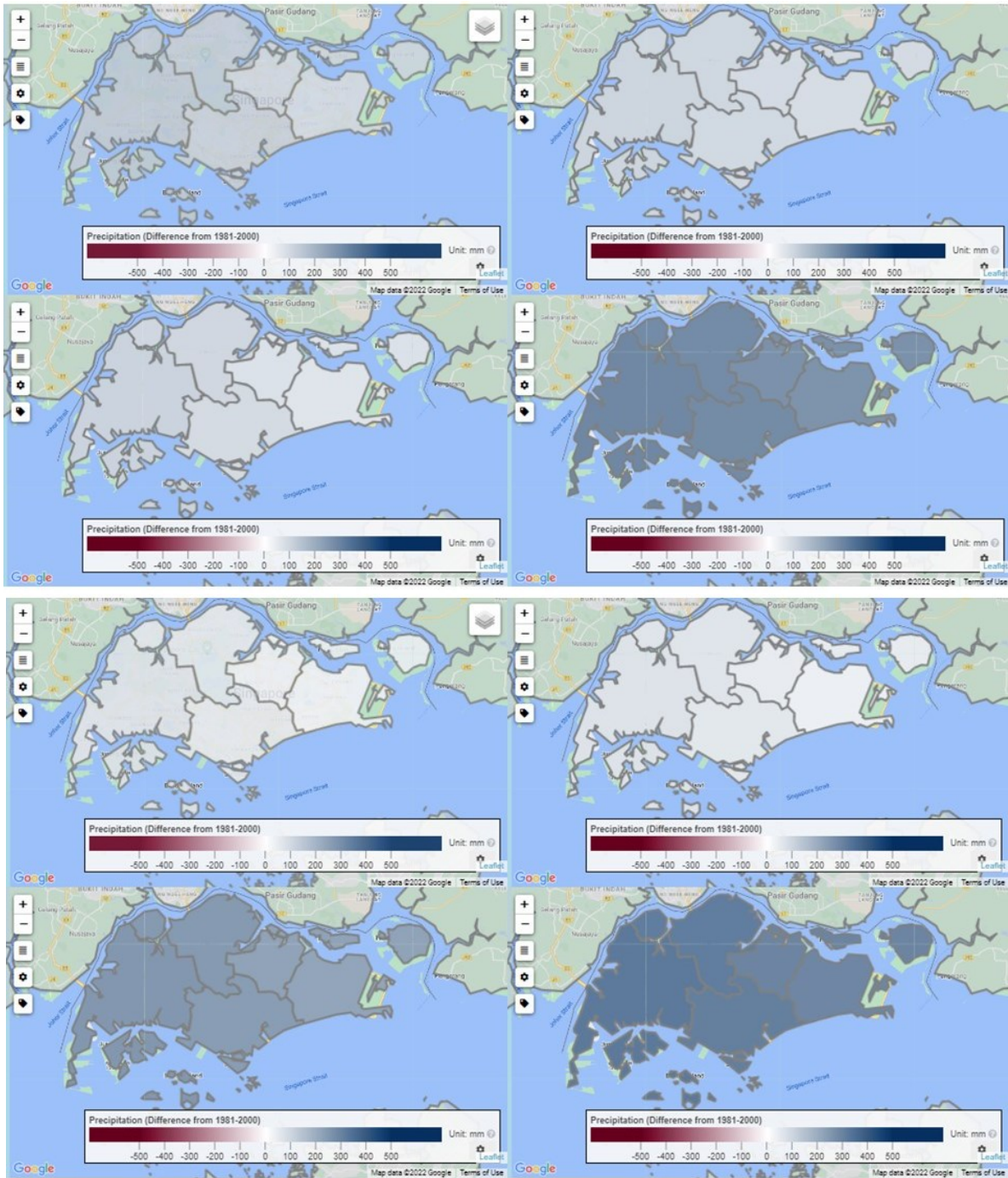
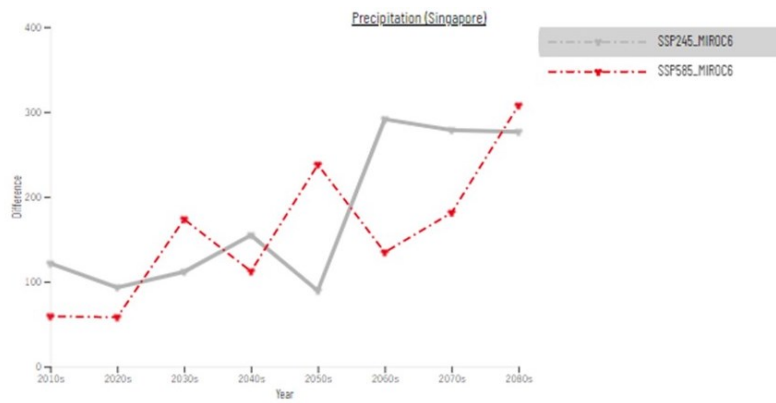


Figure 8.33: Precipitation variation in Singapore under medium (grey) and high (red) emission scenario till 2080s (top); Spatial results for medium scenario for 2010s, 2030s, 2050s, 2080s (middle); Spatial results for high scenario for 2020s, 2030s, 2050s, 2080s (bottom)