

4.3.2 Sydney

The GHG emissions of Sydney was 10.7 MtCO_{2e} in 1975, that escalated to 13.1 MtCO_{2e} in 1990 and 17.6 MtCO_{2e} in 2015. A majority of the GHGs in 2015 (Figure 4.4, top) were from the industry (56%) and transport (22%), followed by the residential (17%) and energy sector (6%). As per the ICLAP model estimates (Figure 4.4, bottom), there would be an increase in emissions at 1.3% per annum, leading to 19.7 MtCO_{2e} in 2030 and 22.7 MtCO_{2e} in 2050.

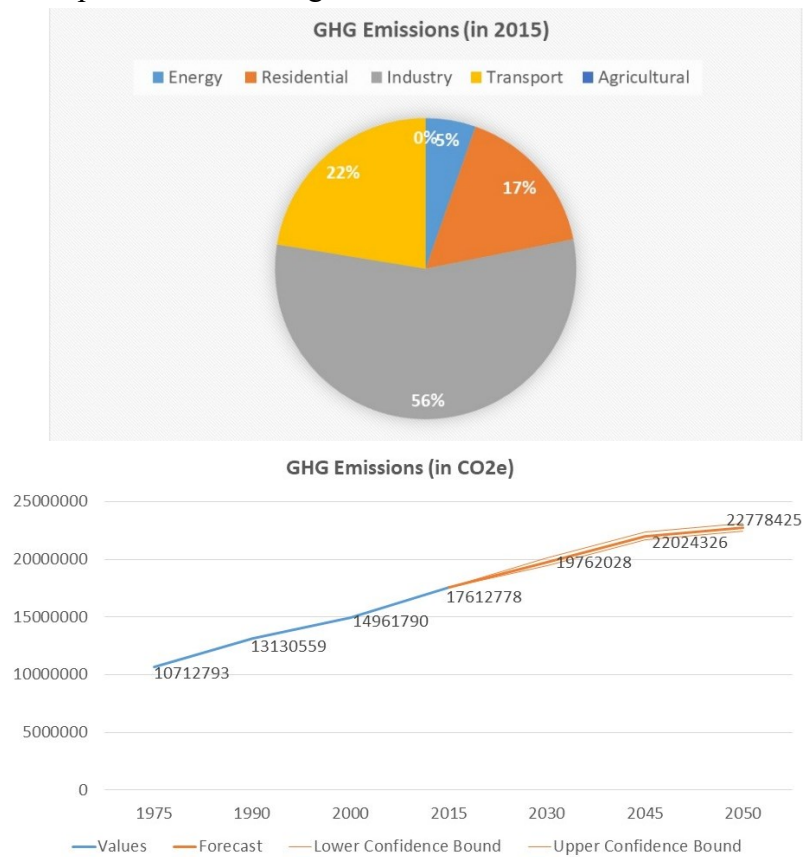


Figure 4.4: GHG contributions from different sectors in Sydney (top); ICLAP model estimates for Sydney's GHG emissions till 2050 (bottom)

The results for climate variability in Sydney indicate that depending on the emission scenarios, there would be a temperature increase of 1.2–3.2 degC up till 2080s (Figure 4.5, top). 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), 1.0 degC in 2050s, peaking to 1.3 degC in 2060s and stabilizing to 1.2 degC till 2080s. The spatial results for moderate scenario over 2010-80s are mapped in Figure 4.5 (middle). Meanwhile, the scenario corresponding to the pathway with the highest GHGs (SSP585_MIROC6) exhibits an increase of 0.7 degC in 2030s (above the 1980 baseline temperature), 1.5 degC in 2050s further rising sharply to 3.2 degC above normal up to 2080s. The spatial results for high emission scenario over 2010-80s are mapped in Figure 4.5 (bottom). Meanwhile, the precipitation change for Sydney shows a very high variability in the long run, ranging from -20 to 185 mm from the normal (Figure 4.6, top) depending on the emission scenarios. The scenario corresponding to the pathway with moderate GHGs (SSP245_MIROC6) exhibits an increase of over 125 mm during 2030s (above the 1980 baseline rainfall), declining to 10 mm in 2040s, rising again to 130 mm in 2060s and thereafter stabilizing around 120 mm in 2080s. The spatial results for moderate scenario over 2010-80s

are mapped in Figure 4.6 (middle). Meanwhile, the scenario corresponding to the pathway with the highest GHGs (SSP585_MIROC6) shows rainfall hovering around 40 mm (above the 1980 baseline rainfall) in 2030-40s, rising up to 185 mm in 2050s, declining to 80 mm in 2060s, re-escalating to about 175 mm in 2070s and dipping sharply to 50 mm in 2080s. The spatial results for high emission scenario over 2010-80s are mapped in Figure 4.6 (bottom).

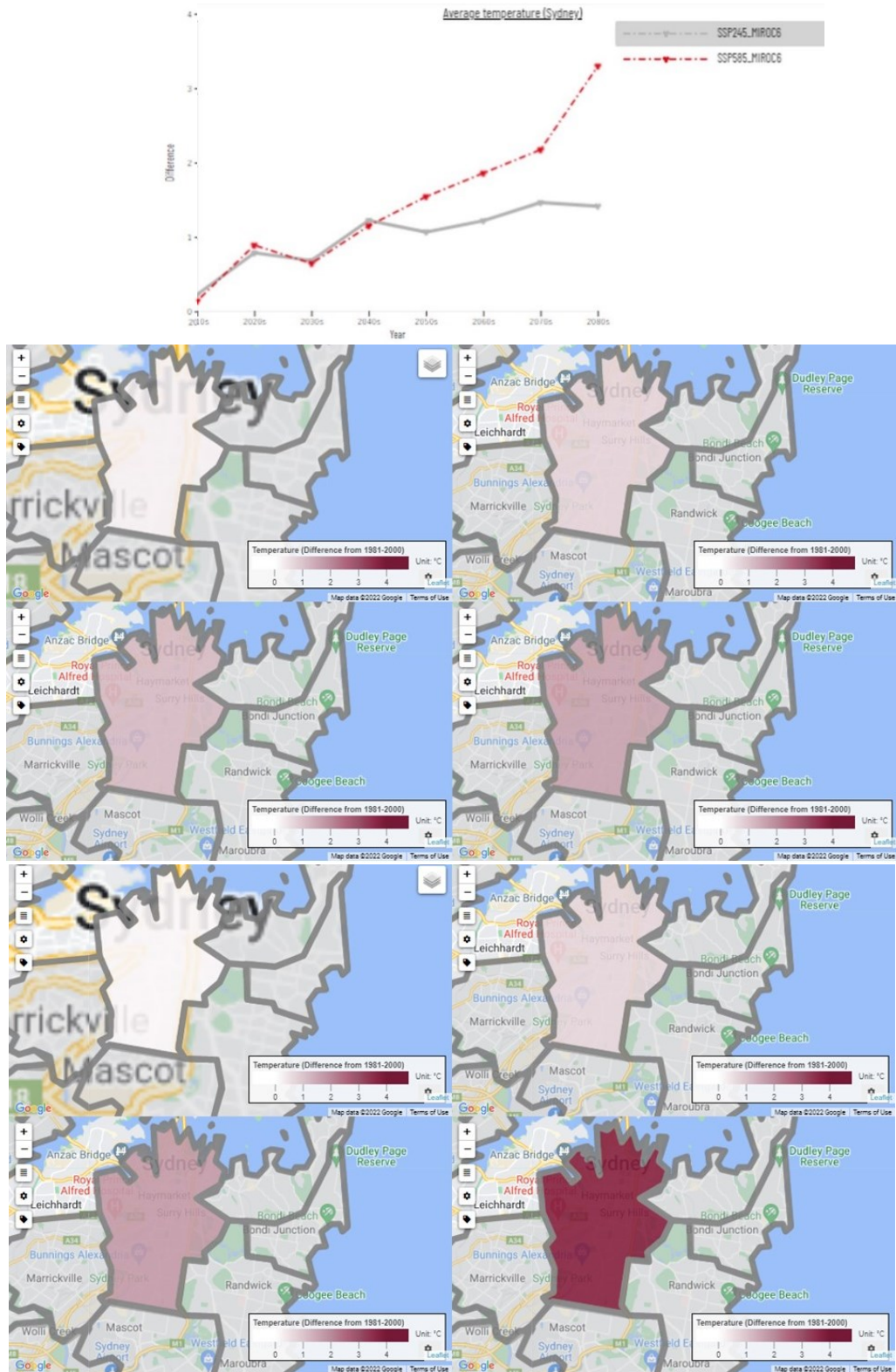


Figure 4.5: Temperature increase in Sydney under medium (grey) and high (red) emission scenario till 2080s (top); Spatial results for medium scenario for 2010s, 2030s, 2050s, 2080s (middle); Spatial results for high scenario for 2020s, 2030s, 2050s, 2080s (bottom)

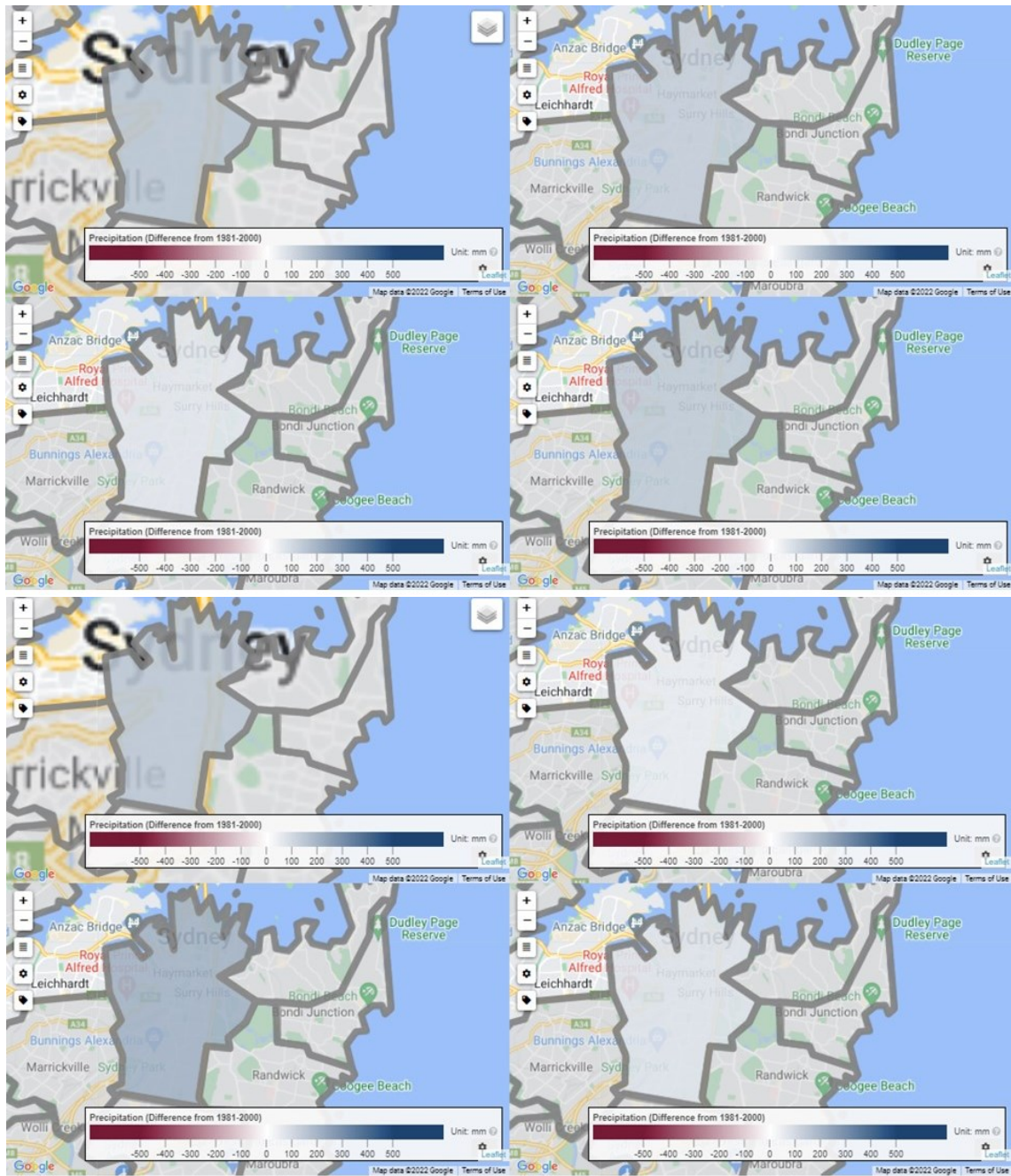
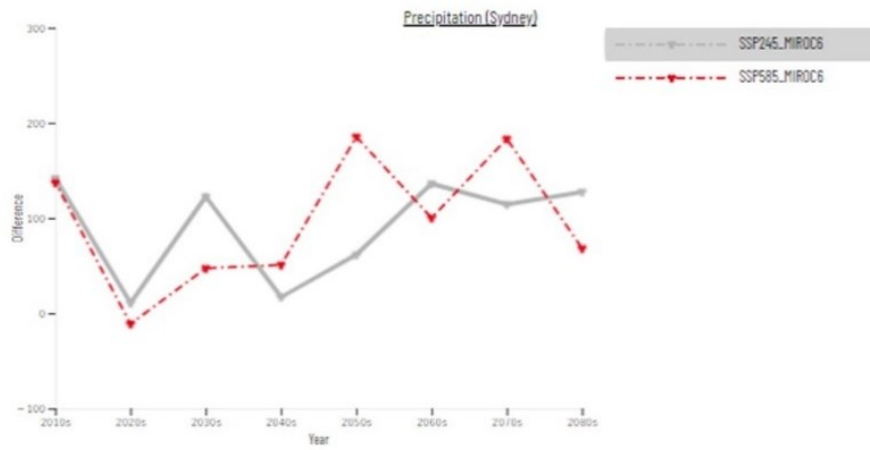


Figure 4.6: Precipitation variation in Sydney under medium (grey) and high (red) emission scenario till 2080s (top); Spatial results for medium scenario for 2010s, 2030s, 2050s, 2080s (middle); Spatial results for high scenario for 2020s, 2030s, 2050s, 2080s (bottom)