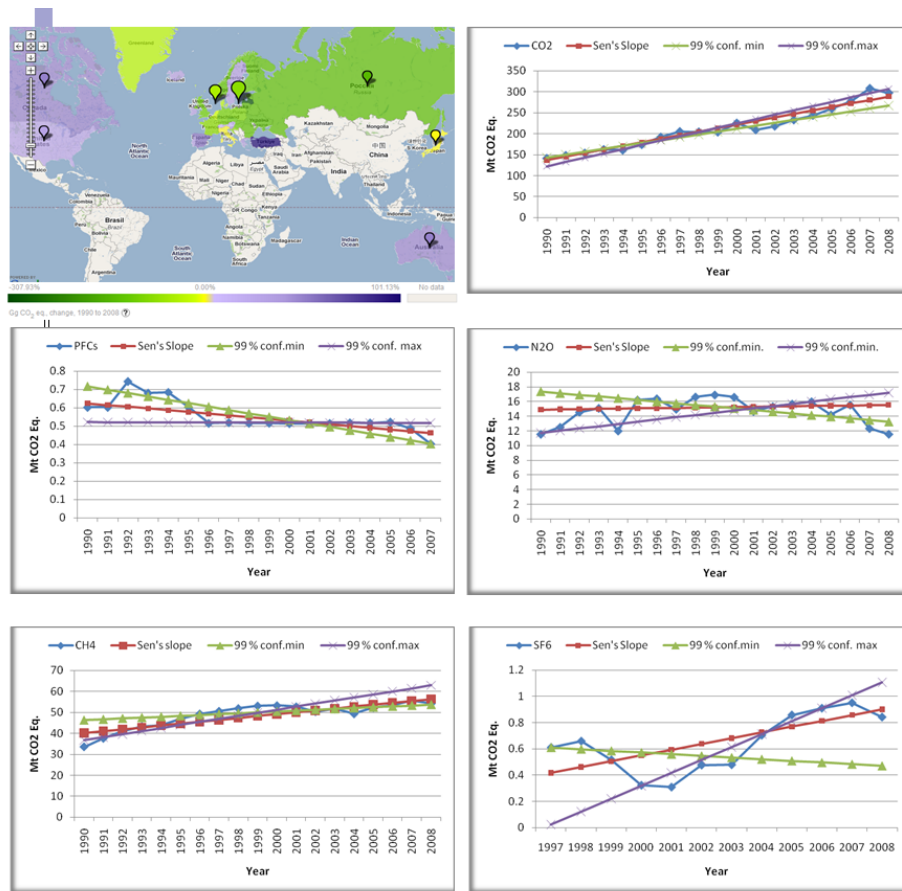


# Assessment of the Long-Term Trend of Turkey's GreenHouse Gas (GHG) Emissions Using the Mann Kendall Test

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According to the United Nations Framework Convention on Climate Change data base, there has been about a 100% increase in the total green house gas (GHG) emissions of Turkey between 1990 and 2008. The long term trends of reported individual (GHG) emissions ( $\text{CO}_2$ ,  $\text{CH}_4$ ,  $\text{N}_2\text{O}$ ,  $\text{SF}_6$  and Perfluorocarbons (PFCs)) during this period were assessed by using non-parametric Mann- Kendall test. Carbon dioxide and  $\text{CH}_4$  showed increasing trend with  $p=0.001$  significance level. Sulfur hexafluoride and  $\text{N}_2\text{O}$  increased during this period with  $p=0.05$  and greater than  $p=0.1$  significance level, respectively. However, a decreasing trend was recorded for PFCs with  $p=0.01$  significance level. The rate of change of individual GHG emissions was calculated by Sen's slope estimated. The highest rate of increase was found for  $\text{CO}_2$  with a value of 8.4 Mt/year while the lowest one was calculated as 0.035 Mt/year for  $\text{N}_2\text{O}$ . Total rate of increase of GHGs within this time frame was calculated as about 9.75 Mt/yr. When one compared this value with the values recorded for other European Union countries, Turkey is the second highest GHG emitter in Europe after Spain, for which the rate of increase was calculated as 10 Mt/yr. The same methodology was also applied to the main sectors responsible to GHG emissions. While the emissions corresponding to agricultural activities fell down, those from energy, industry and waste rised with 99% confidence level within this period.



**Figure 1.** Global map showing the percent growth observed in total GHG emissions (left top plot) (<http://maps.unfccc.int/di/map/>), in addition to variation of trends of individual GHGs emitted from Turkey between 1990 and 2008.