

# Emissions inventories in Pakistan: Current status and way forward

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## Conclusions



- ▶ Pakistan faces great difficulties in the face of rising threats such as pollution and adverse impacts from climate change. Air pollution results in a rising disease burden, loss of lives and significant impact on natural environment (World Bank, 2006, 2010).
- ▶ Abatement strategies, setting up emission inventories and implementation of regulation has been weak, as well as monitoring of impacts (Colbeck et al, 2010).
- ▶ Three local efforts for emission inventories has happened, one in 1990, another in 1994 and the latest in 2009, which have all focused on greenhouse gases (GHG).
- ▶ Internationally, a unified effort to systematically develop inventories was carried out by the International Institute for Applied Systems Analysis (IIASA) up till 2005, using the Greenhouse Gas and Air Pollution Interaction and Synergies (GAINS) model (Amann et al., 2008).
- ▶ An additional challenge in this context is that since 2011, the Pakistan's Environmental Protection Agency (PEPA) had to shut down air pollution monitoring centers across the country due to adopted 18<sup>th</sup> Amendment. This has meant delegating PEPA's powers to the provincial units. As of now, air pollution monitoring has halted since the 2011 post-devolution, even after JICA installed nationwide state-of-the-art monitoring labs towards a continuous monitoring system in 2007.

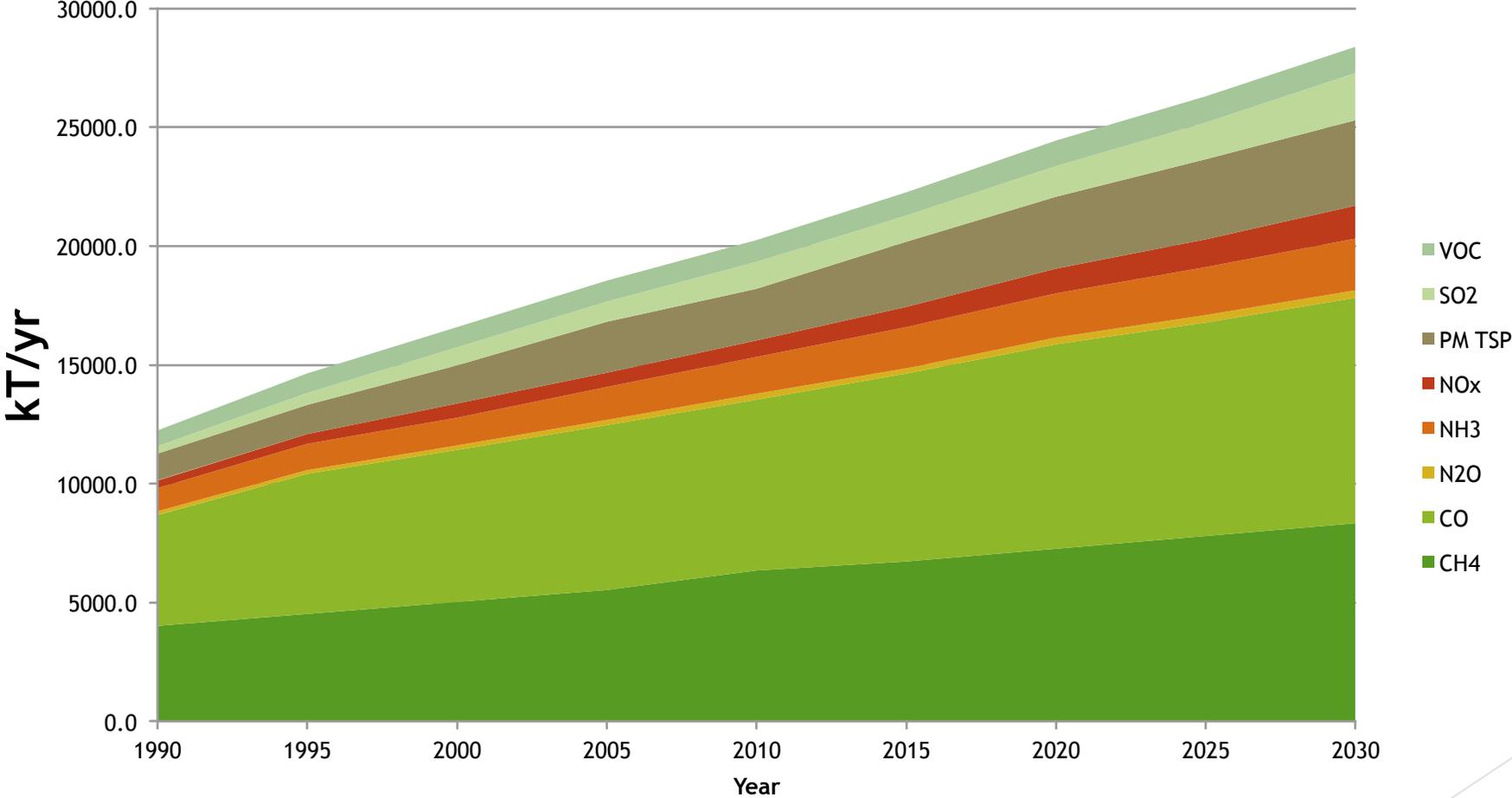
# Conclusions

- ▶ Preliminary data collected by these stations in 2010 indicated air pollution levels to be 1.6~3.1times higher than Pakistan Air Quality Standard, and 2.8~5.5times higher than that of the Japanese Standard (From Federal EPA data).
- ▶ While many strategies of air pollution abatement for Pakistan are presented in the latest literature (see Purohit et al, 2013 for example), gaps in emission inventories coupled with lack of continuous data monitoring can potentially have dangerous impacts.
- ▶ Using the GAINS model based on a 2005 reference (Amann et. al., 2008), we find that projections reach alarming levels by 2030, even in the optimistic Business As Usual (BAU) scenario.
- ▶ However, since these inventories are not updated, these projections are very likely underestimates, hiding potential and great harm to health and well-being of citizens.
- ▶ This highlights the importance of such inventories as providing a critical benefit to society at large.
- ▶ Local and international collaborations towards development and application of **comprehensive** emission inventories and air pollution monitoring strategies are long overdue and are thus recommended as a way forward for Pakistan.

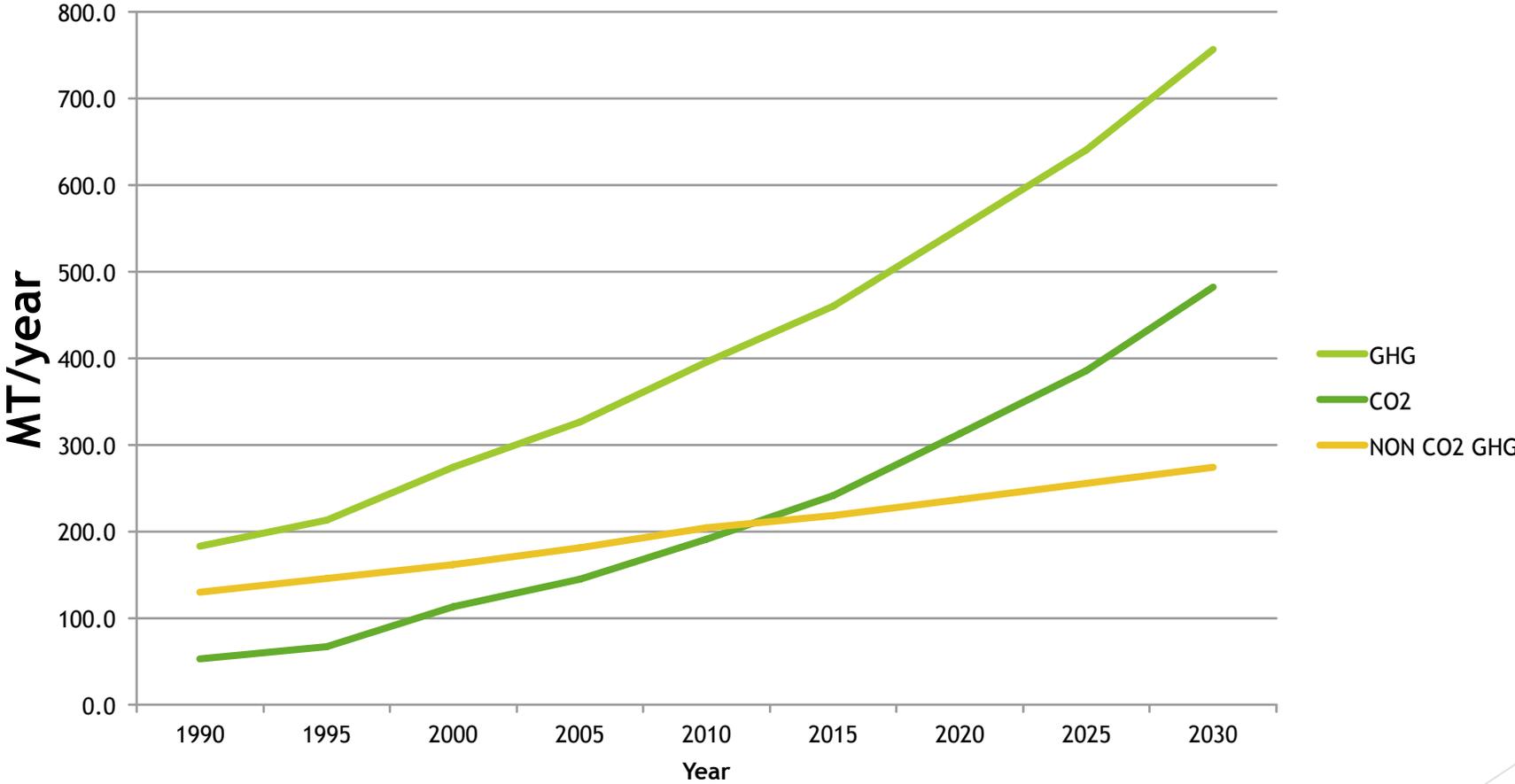
# Methods

- ▶ For Pakistan, we use the Greenhouse Gas and Air Pollution Interaction and Synergies (GAINS) model, with 2005 emission inventories as a reference in a Business As Usual (BAU) scenario till 2030.
- ▶ The various species included in this analysis are SO<sub>2</sub>, NO<sub>x</sub>, PM<sub>TSP</sub> (Total Suspended Particulates), NH<sub>3</sub>, CO and six greenhouse gases, CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, HFC, PFC and SF<sub>6</sub>.

# Results



# Results



# References

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