Supplement Material

Data availability of the study

Fig. I: Data availability from the 15 monitoring stations during 2010 to 2014.

Maximum and average concentrations of gaseous pollutants

Table I: Maximum and average concentration of gaseous pollutants from the three monitoring station types during 2010 to 2014.

Monitoring station type	Maximum concentration** (ppb)					Average concentration*** (ppb)				
	CO*	**NO**	**NO_2**	**SO_2**	**O_3**	**CO***	**NO**	**NO_2**	**SO_2**	**O_3**
BKK sites	5.7±0.9	419.2±236.0	120.5±14.8	29.8±5.3	153.7±10.8	0.7±0.2	16.3±7.8	20.2±5.7	3.3±1.0	18.6±2.3
Roadside sites	8.0±0.4	683.0±396.0	166.0±19.8	26.0±5.7	130.5±14.8	1.0±0.1	60.5±42.7	30.9±8.1	2.6±1.0	13.9±8.6
BKK suburb sites	4.5±1.2	297.5±70.6	115.8±15.8	72.2±58.3	163.0±18.5	0.7±0.1	11.4±3.8	16.1±2.6	4.0±2.3	21.4±3.3

* in ppm

** average maximum concentration ± 1 standard deviation (SD)

*** average concentration ± 1 SD

Seasonal variations of gaseous pollutants

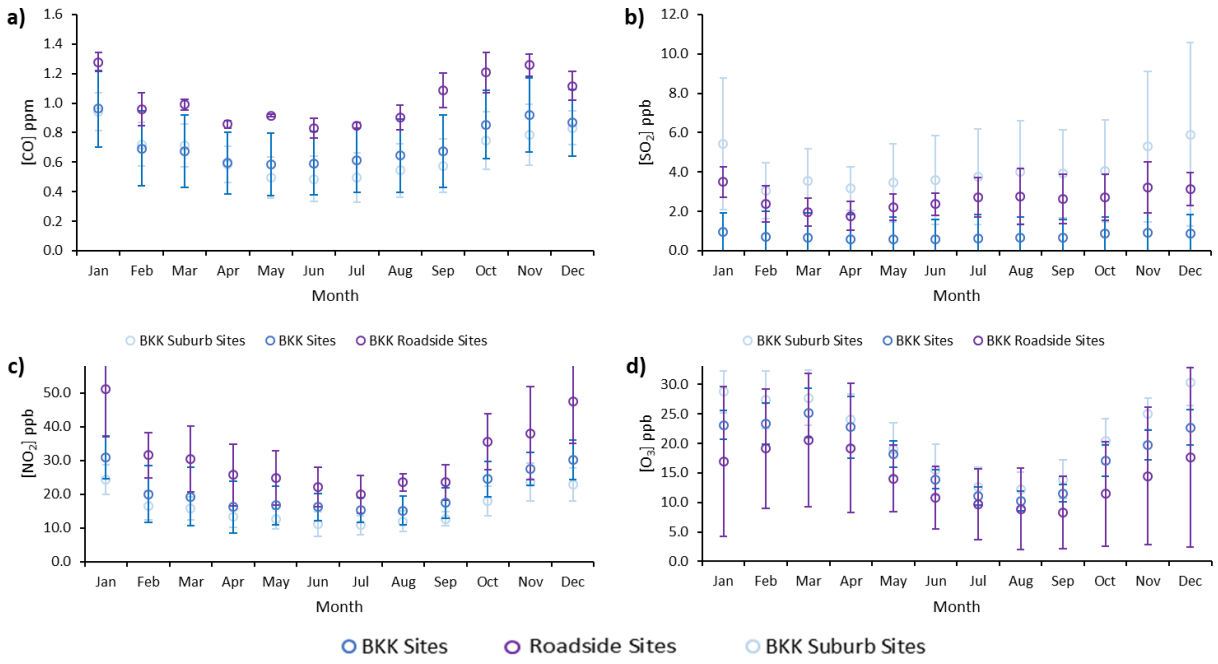

Fig. II: Seasonal variations of a) CO b) SO_2 c) NO_2 and d) O_3 from the three monitoring station types during 2010 to 2014.

Inter-annual variations of gaseous pollutants

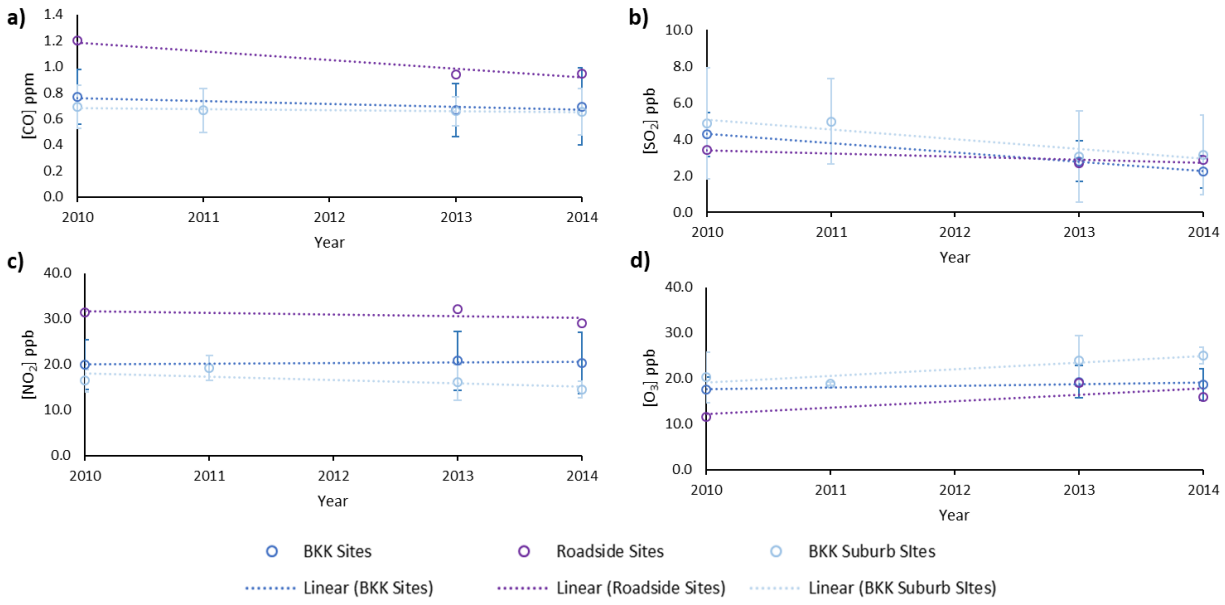

Fig. III: Inter-annual variations of a) CO b) SO_2 c) NO_2 and d) O_3 from the three monitoring station types during 2010 to 2014.

Season wise of the diurnal variations of gaseous pollutants

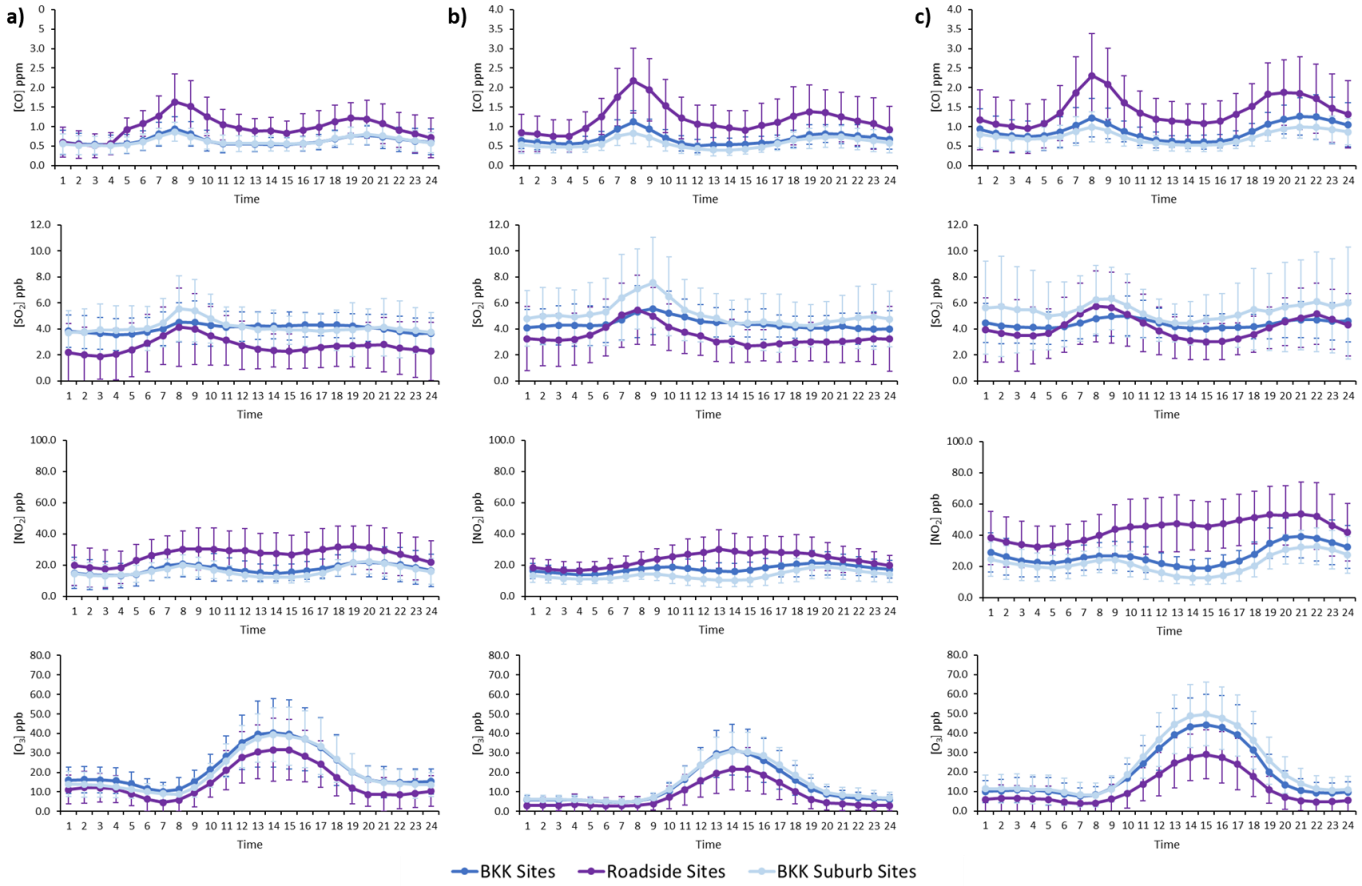

Fig. IV: Season wise of the diurnal variations of CO, SO_2, NO_2 and O_3 during a) local summer b) wet season and c) local winter at the three monitoring station types.

Chemical rate coefficients

Table I: chemical rate coefficients during dry season at BKK sites, roadside and BKK suburb sites, 2010 to 2014.

Rate coefficient	Unit	BKK sites	Roadside sites	BKK suburb sites
j_1	min^{-1}	29.7±0.7	29.7±1.0	29.8±0.7
	s^{-1}	0.004±0.002	0.007±0.0001	0.006±0.003
k_3	$ppm^{-1}\ min^{-1}$	0.47±0.2	0.64±0.3	0.55±0.3
	$cm^3\ molecule^{-1}\ s^{-1}$	$2.02e^{-14}$±$2.1e^{-16}$	$2.03e^{-14}$±$1.2e^{-18}$	$2.03e^{-14}$±$1.4e^{-16}$

Correlation plots and correlation (r) between CO/NO_x and SO_2/NO_x and concentration distribution of species

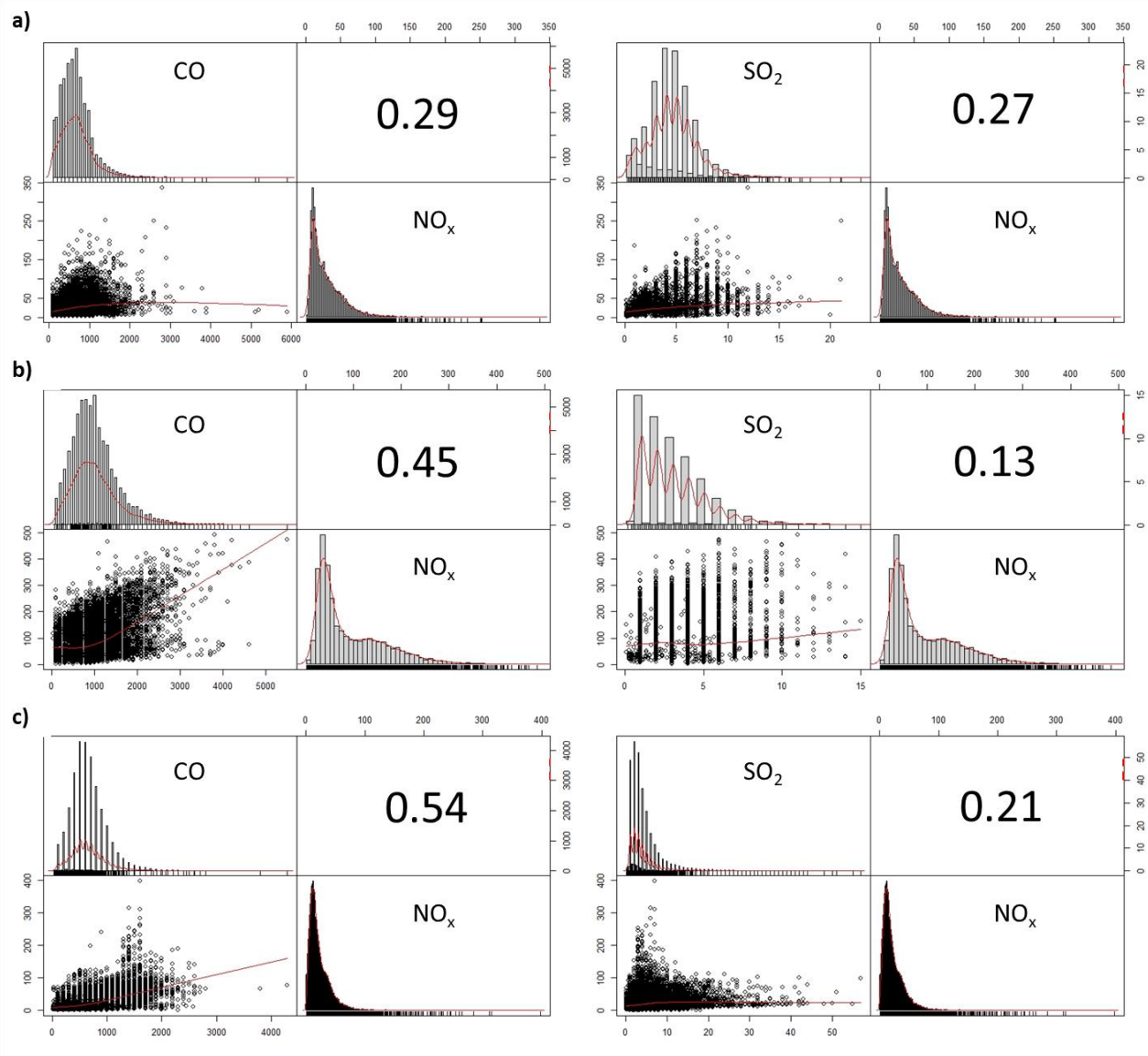

Fig. V: Correlation plots and correlation (r) between CO/NO_x and SO_2/NO_x and concentration distribution of species at a) BKK sites b) roadside sites and c) BKK suburb sites.

AQI O_3 Calculation

To calculate AQI for O_3, a midpoint of 8-hour average of O_3 concentration is needed. The midpoint of a specific hour is calculated from the average of hourly O_3 concentration of the previous four hours, at the given hour and the following three hours (Fig. VI a). To get a valid calculation, at least 6 of 8 records (75%), are needed. Calculated AQI values are compared with the AQI table (Fig. VI b) (US.EPA, 2017a, 2017b)

Hours	1	2	3	4	5	6	7	8	9
$[O_3]_{hourly}$						*			
		The previous 4 hours				AQI	The following 3 hours		

Fig VI a: The calculation of a midpoint of AQI for O_3 (modified from US.EPA, 2017a)

Air Quality Index (0-500)	Who Needs to be Concerned?	What Should I Do?
Good (0-50)	It's a great day to be active outside.	
Moderate (51-100)	Some people who may be unusually sensitive to ozone.	**Unusually sensitive people:** *Consider reducing* prolonged or heavy outdoor exertion. Watch for symptoms such as coughing or shortness of breath. These are signs to take it a little easier. **Everyone else:** It's a good day to be active outside.
Unhealthy for Sensitive Groups (101-150)	Sensitive groups include **people with lung disease such as asthma, older adults, children and teenagers, and people who are active outdoors.**	**Sensitive groups:** *Reduce* prolonged or heavy outdoor exertion. Take more breaks, do less intense activities. Watch for symptoms such as coughing or shortness of breath. Schedule outdoor activities in the morning when ozone is lower. **People with asthma** should follow their asthma action plans and keep quick relief medicine handy.
Unhealthy (151 to 200)	**Everyone**	**Sensitive groups:** *Avoid* prolonged or heavy outdoor exertion. Schedule outdoor activities in the morning when ozone is lower. Consider moving activities indoors. **People with asthma**, keep quick-relief medicine handy. **Everyone else:** *Reduce* prolonged or heavy outdoor exertion. Take more breaks, do less intense activities. Schedule outdoor activities in the morning when ozone is lower.
Very Unhealthy (201-300)	**Everyone**	**Sensitive groups:** *Avoid all* physical activity outdoors. Move activities indoors or reschedule to a time when air quality is better. **People with asthma,** keep quick-relief medicine handy. **Everyone else:** *Avoid* prolonged or heavy outdoor exertion. Schedule outdoor activities in the morning when ozone is lower. Consider moving activities indoors.
Hazardous (301-500)	**Everyone**	**Everyone:** *Avoid all* physical activity outdoors.

Fig. VI b: The AQI (US.EPA, 2017b)