Supporting Information of
Investigating the background and local contribution of the oxidants in London and Bangkok

M. Anwar H. Khan,*[a] Rayne Holland,[a] Amy Foulds,[a] James C. Matthews,[a] Sanjee Panditharatne,[a] Michael E. Jenkin,[b] Douglas Lowe,[c] Panida Navasumrit,[d] Carl J. Percival,[e] Dudley E. Shallcross [a,f]

[a] *School of Chemistry, University of Bristol, Cantock's Close, Bristol, BS8 1TS, UK, *E-mail: anwar.khan@bristol.ac.uk*
[b] *Atmospheric Chemistry Services, Okehampton, Devon, EX20 4QB, UK*
[c] *School of Earth, Atmospheric and Environmental Science, The University of Manchester, Manchester M13 9PL, UK*
[d] *Laboratories of Environmental Toxicology/Chemical Carcinogenesis, Chulabhorn Research Institute, Laksi, Bangkok 10210, Thailand.*
[e] *NASA Jet Propulsion Laboratory, California Institute of Technology, 4800 Oak Grove Dr, Pasadena, CA 91109, USA*
[f] *Department of Chemistry, University of the Western Cape, Robert Sobukwe Road, Bellville, 7375, South Africa*

List of Contents

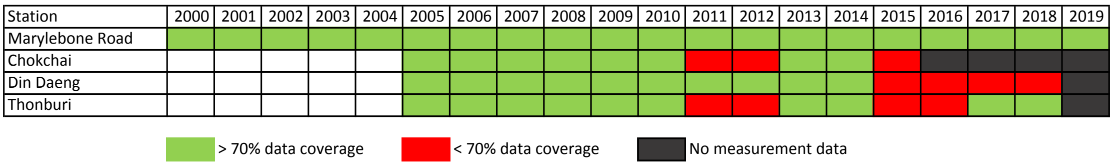


Fig. S1 The yearly OX (O_3+NO_2) data coverage for London and Bangkok roadside sites.

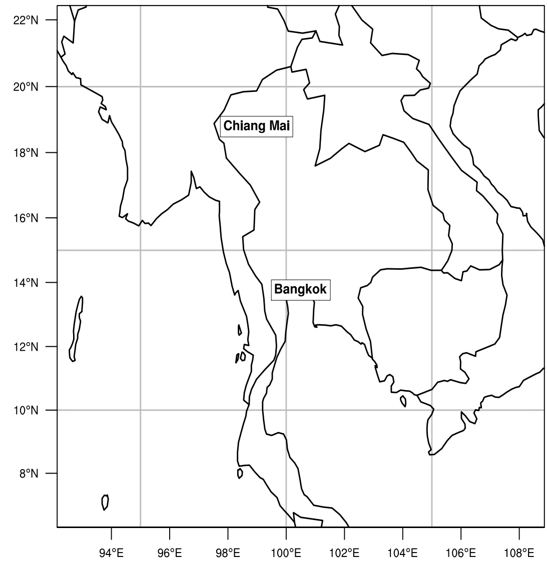


Fig. S2 The model domain for Bangkok study

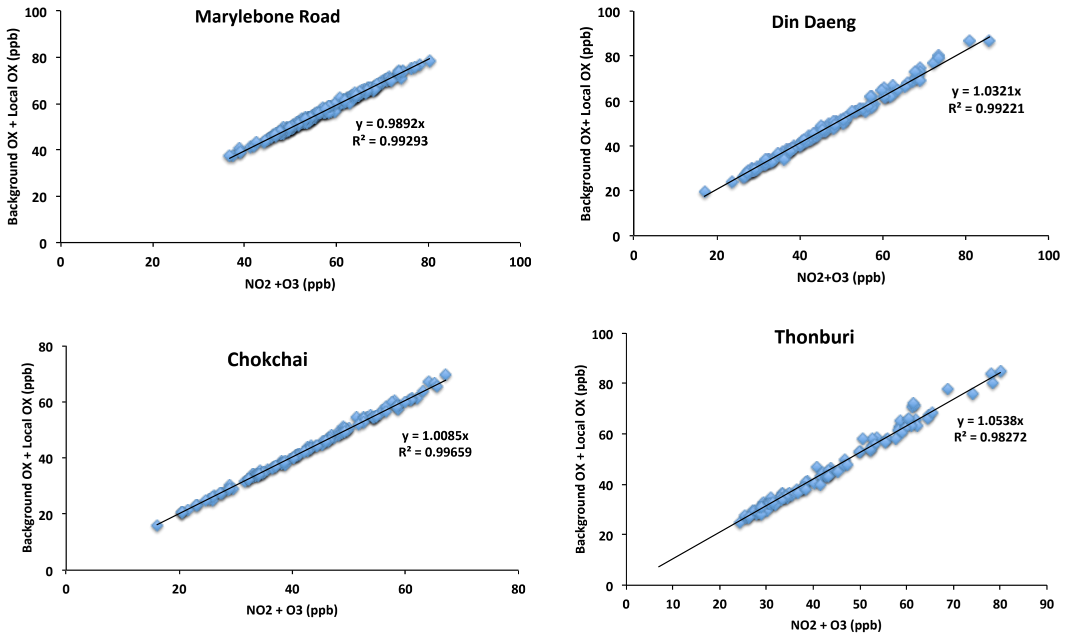


Fig. S3 The correlation between monthly background OX+ local OX and monthly averaged NO_2+O_3 for London and Bangkok roadsides

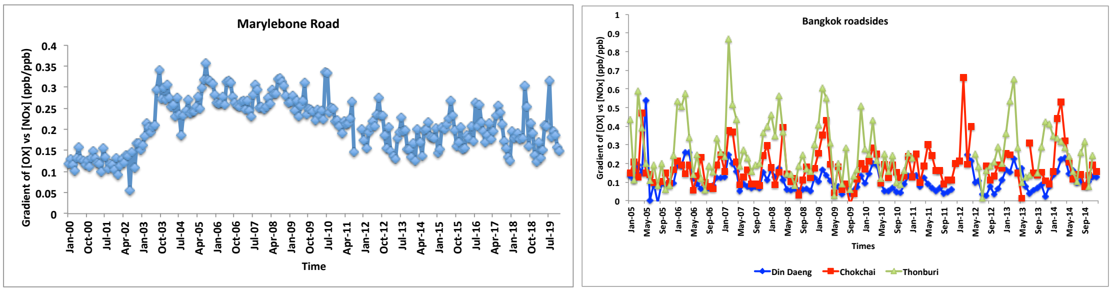
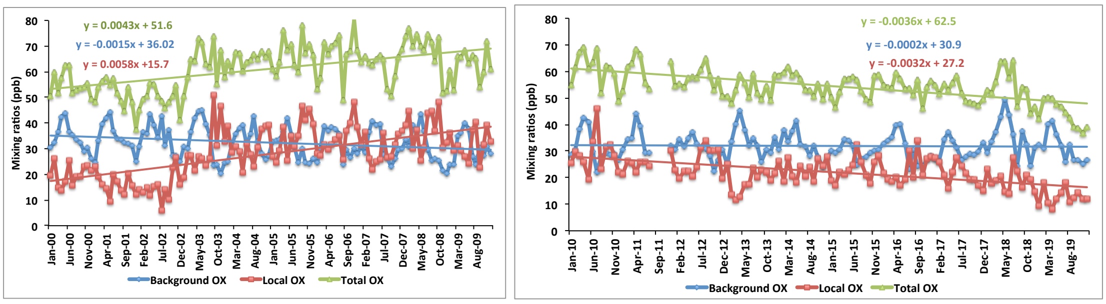


Fig. S4 The monthly averaged gradients of [OX] vs [NO_x] plots for (a) Marylebone Road and (b) Bangkok roadsides sites



(a) (b)

Fig. S5 The trend of background, local and total oxidant (OX) levels in the Marylebone Road for the period of (a) 2000-2009, and (b) 2010-2019

Table S1. Mapping of GEIA sectors to CRI-v2R5 species for speciation of the EDGAR v4.3.2 NMVOC emissions. Note that V20 (chlorinated hydrocarbons) and V25 (other VOC's) aren't mapped to CRI-v2R5 species.

GEIA sector	Description	CRI-v2R5
V01	Alcohols	0.2*CH3OH + 0.8*C2H5OH
V02	Ethane	C2H6
V03	Propane	C3H8
V04	Butane	NC4H10
V05	Pentane	NC4H10
V06	Hexanes	NC4H10
V07	Ethene	C2H4
V08	Propene	C3H6
V09	Ethyne	C2H2
V10	Isoprene	C5H8
V11	Monoterpenes	0.5*APINENE + 0.5*BPINENE
V12	Other alkenes	TBUT2ENE
V13	Benzene	BENZENE
V14	Toluene	TOL
V15	Xylene	OXYL
V16	Trimethylbenzenes	OXYL
V17	Other aromatics	OXYL
V18	Esters	0.5*HCOOH + 0.5*CH3CO2H
V19	Ethers	0.2*CH3OH + 0.8*C2H5OH
V21	Formaldehyde	HCHO
V22	Other aldehydes	0.5*CH3CHO + 0.5*C2H5CHO
V23	Ketones	0.6*KET + 0.4*MEK
V24	Alkanoic acids	0.5*HCOOH + 0.5*CH3CO2H