Supplementary material for:

Sensitivity analyses of OH missing sinks over Tokyo metropolitan area in the summer of 2007

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Results and discussions of sensitivity analyses are described in Section 5 of the main text. Fig.10 shows incremental ratios of concentrations of NO_2, O_3, OH and secondary aerosol components in the chg-RCHO, chg-DCB1 and chg-PROD2 cases compared to those in the base case, which are averaged over the target period. Fig.13 shows incremental ratios of concentrations of NO_2, O_3, OH and secondary aerosol components in the chg-ALK5, chg-OLE2 and chg-ARO2 cases compared to those in the base case, which are averaged over the target period. Only selected species are included in these figures. Incremental ratios of concentrations of other remaining species in the chg-RCHO, chg-DCB1 and chg-PROD2 cases are shown in Fig.S1, and those in the chg-ALK5, chg-OLE2 and chg-ARO2 cases are shown in Fig.S2 in this Supplementary material. Abbreviations of species names which appear in Fig.S1 and Fig.S2 are shown in Table S1.

Table S1 Abbreviations of species names which appear in Fig. S1 and S2.

Name	Description
NO	Nitric Oxide
O3P	Ground State Oxygen Atoms
NO3	Nitrate Radical
N2O5	Nitrogen Pentoxide
HNO3	Nitric Acid
O1D2	Excited Oxygen Atoms
HONO	Nitrous Acid
HO2	Hydroperoxide Radicals
CO	Carbon Monoxide
HNO4	Peroxynitric Acid
HO2H	Hydrogen Peroxide
SO2	Sulfur Dioxide
SULF	Sulfates
C_O2	Methyl Peroxy Radicals
HCHO	Formaldehyde
COOH	Methyl Hydroperoxide
MEOH	Methanol
RO2_R	Peroxy Radical Operator representing NO to NO2 conversion with HO2 formation
ROOH	Lumped higher organic hydroperoxides
R2O2	Peroxy Radical Operator representing NO to NO2 conversion without HO2 formation
RO2_N	Peroxy Radical Operator representing NO consumption with organic nitrate formation
RNO3	Lumped Organic Nitrates
MEK	Ketones and other non-aldehyde oxygenated products which react with OH radicals slower than 5 x 10^{-12} cm^3 $molec^{-2}$ sec^{-1}
PROD2	Ketones and other non-aldehyde oxygenated products which react with OH radicals faster than 5 x 10^{-12} cm^3 $molec^{-2}$ sec^{-1}
CCO_O2	Acetyl Peroxy Radicals
PAN	Peroxy Acetyl Nitrate
CCO_OOH	Peroxy Acetic Acid
CCO_OH	Acetic Acid
RCO_O2	Peroxy Propionyl and higher peroxy acyl Radicals
PAN2	PPN and other higher alkyl PAN analogues
CCHO	Acetaldehyde
RCO_OOH	Higher organic peroxy acids
RCO_OH	Higher organic acids
BZCO_O2	Peroxyacyl radical formed from Aromatic Aldehydes
PBZN	PAN analogues formed from Aromatic Aldehydes
BZ_O	Phenoxy Radicals
MA_RCO3	Peroxyacyl radicals formed from methacrolein and other acroleins

Name	Description
MA_PAN	PAN analogue formed from Methacrolein
TBU_O	t-Butoxy Radicals
ACET	Acetone
NPHE	Nitrophenols
PHEN	Phenol
BZNO2_O	Nitro-substituted Phenoxy Radical
HOCOO	Radical formed when Formaldehyde reacts with HO2
HCOOH	Formic Acid
RCHO	Lumped C3+ Aldehydes
GLY	Glyoxal
MGLY	Methyl Glyoxal
BACL	Biacetyl
CRES	Cresols
BALD	Aromatic aldehydes
METHACRO	Methacrolein
MVK	Methyl Vinyl Ketone
ISOPROD	Lumped isoprene product species
DCB1	Reactive Aromatic Fragmentation Products that do not undergo signficant photodecomposition to radicals
DCB2	Reactive Aromatic Fragmentation Products which photolyze with alpha-dicarbonyl-like action spectrum
DCB3	Reactive Aromatic Fragmentation Products which photolyze with acrolein action spectrum.
ETHENE	Ethene
ISOPRENE	Isoprene
TRP1	Terpenes
ALK1	Alkanes and other non-aromatic compounds that react only with OH, and have kOH < 5×10^2 ppm^{-1} min^{-1}
ALK2	Alkanes and other non-aromatic compounds that react only with OH, and have kOH between 5×10^2 and 2.5×10^3 ppm^{-1} min^{-1}
ALK3	Alkanes and other non-aromatic compounds that react only with OH, and have kOH between 2.5×10^3 and 5×10^3 ppm^{-1} min^{-1}
ALK4	Alkanes and other non-aromatic compounds that react only with OH, and have kOH between 5×10^3 and 1×10^4 ppm^{-1} min^{-1}
ALK5	Alkanes and other non-aromatic compounds that react only with OH, and have kOH greater than 1×10^4 ppm^{-1} min^{-1}
ARO1	Aromatics with kOH < 2×10^4 ppm^{-1} min^{-1}
ARO2	Aromatics with kOH > 2×10^4 ppm^{-1} min^{-1}
OLE1	Alkenes (other than ethene) with kOH < 7×10^4 ppm^{-1} min^{-1}
OLE2	Alkenes with kOH > 7×10^4 ppm^{-1} min^{-1}

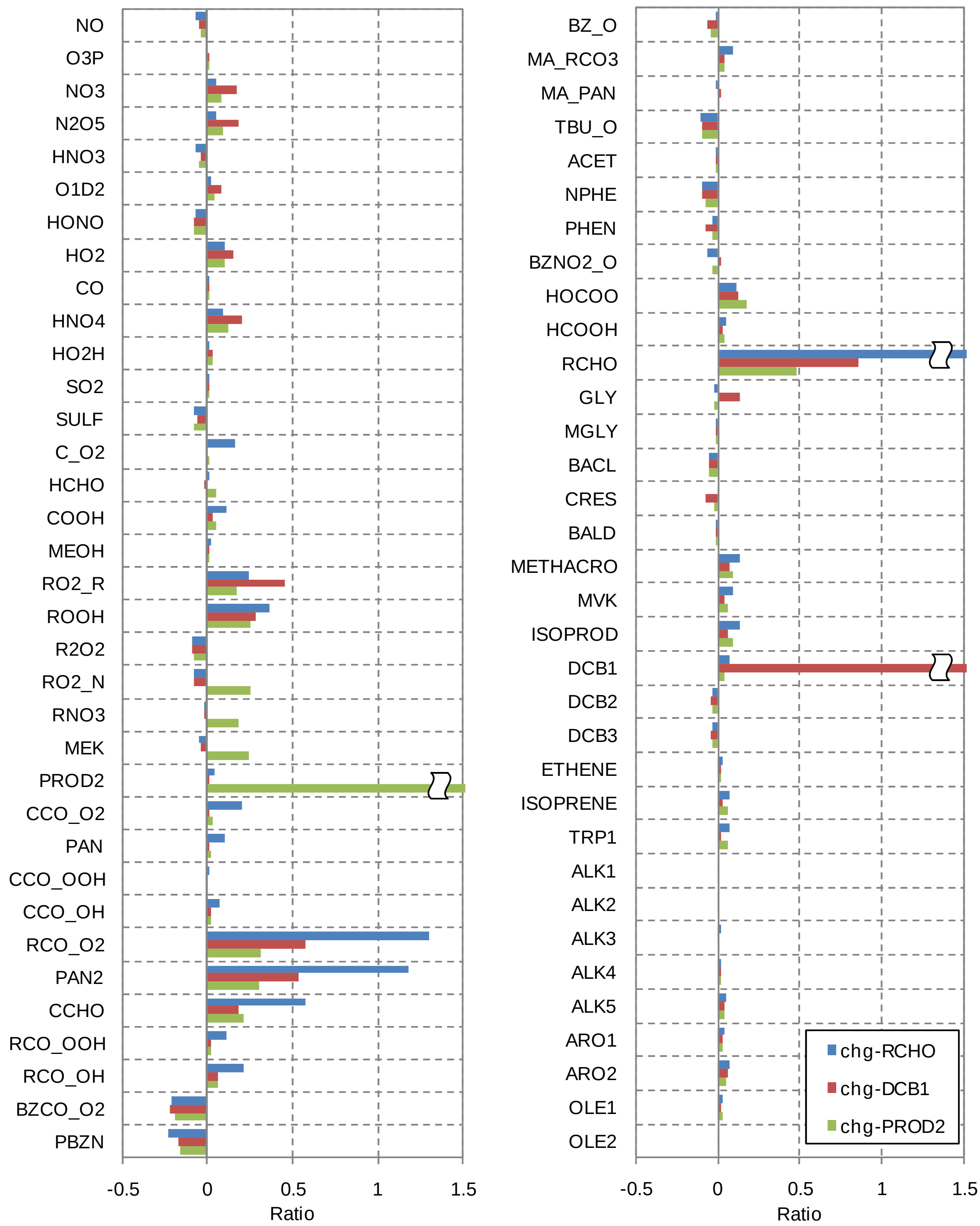

Fig.S1 Incremental ratios of concentrations of species which are not included in Fig. 10 in the chg-RCHO, chg-DCB1 and chg-PROD2 cases compared to those in the base case, which are averaged over the target period.

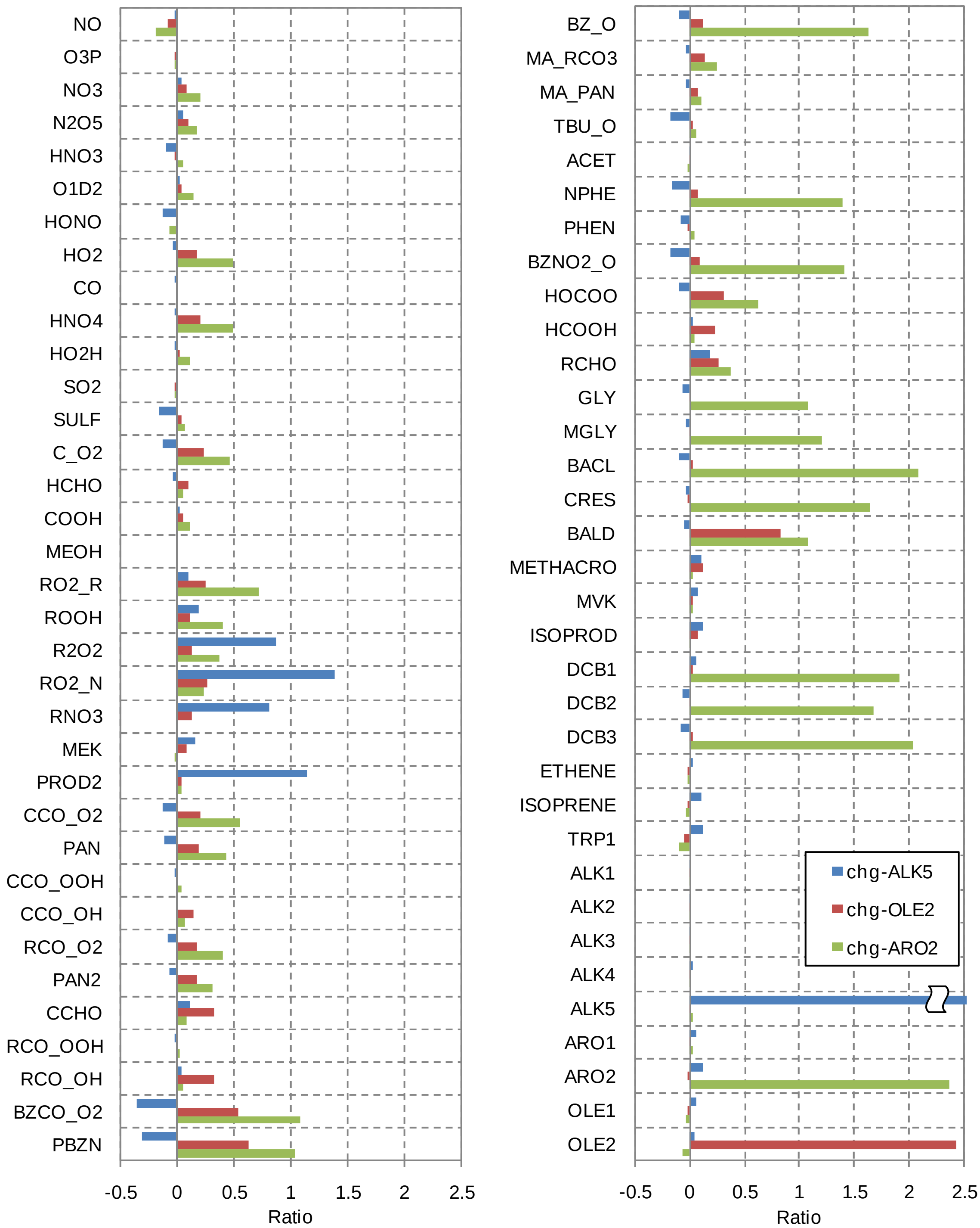

Fig.S2 Incremental ratios of concentrations of species which are not included in Fig. 13 in the chg-ALK5, chg-OLE2 and chg-ARO2 cases compared to those in the base case, which are averaged over the target period.