

## 1. Introduction

This document gives information for the country and regional emission tables of Regional Emission inventory in ASia (REAS) version 3.1 that present annual emissions for major sub-sectors and fuel types. See Kurokawa and Ohara [submitted] for basic methodology, results, and other information about REAS 3.1. Please note that the overview paper of REASv3.1 (Kurokawa and Ohara [submitted]) is under review and thus, there is a possibility that current data sets of REASv3.1 will be revised during the revision processes. Emissions from more detailed sources will be opened after the overview paper is accepted.

## 2. Directories and file names

Table data for major sectors and fuel types are tarred and zipped (with gzip) as REASv3.1\_SECTOR.tar.gz and REASv3.1\_FUEL.tar.gz. Directories and files are created by unpacking the files as follows:

REASv3.1\_SECTOR/

XXX/

EM\_TBL\_SECTOR\_CNT\_RGN\_XXX.txt

REASv3.1\_FUEL/

XXX/

EM\_TBL\_FUEL\_CNT\_RGN\_XXX.txt

XXX: Species codes

CNT: Country codes

RGN: Region codes

\* See next pages for definition of each code.

(1) XXX: Species codes

Species codes	Species
SO2	Sulfur dioxide
NOX	Nitrogen oxides (as NO <sub>2</sub> )
CO_	Carbon monoxide
NMV	Non-methane volatile organic compounds
PM10_	PM <sub>10</sub>
PM2.5	PM <sub>2.5</sub>
BC_	Black carbon
OC_	Organic carbon
NH3	Ammonia
CO2	Carbon dioxide

(2) CNT: Country code

Country codes	Countories
AFG	Afghanistan
BGD	Bangladesh
BRN	Brunei Darussalam
BTN	Bhutan
CHN	Chnia
IDN	Indonesia
IND	India
JPN	Japan
KHM	Cambodia
KOR	Republic of Korea
LAO	Laos
LKA	Sri Lanka
MDV	Maldives
MMR	Myanmar
MNG	Mongolia
MYS	Malaysia
NPL	Nepal
PAK	Pakistan
PHL	Philippines
PRK	People's Republic of Korea
SGP	Singapore
THA	Thailand
TWN	Taiwan
VNM	Vietnam

(3) RGN: Region codes

Region codes	Regions
WC	Country Total
China	
BJ	China: Beijing
TJ	China: Tianjin
HE	China: Hebei
SX	China: Shanxi
NM	China: Inner Mongolia
LN	China: Liaoning
JL	China: Jilin
HL	China: Heilongjiang
SH	China: Shanghai
JS	China: Jiangsu
ZJ	China: Zhejiang
AH	China: Anhui
FJ	China: Fujian
JX	China: Jiangxi
SD	China: Shandong
HA	China: Henan
HB	China: Hubei
HN	China: Hunan
GD	China: Guangdong
GX	China: Guangxi
HI	China: Hainan
CQ	China: Chongqing
SC	China: Sichuan
GZ	China: Guizhou
YN	China: Yunnan
XZ	China: Tibet
SN	China: Shaanxi
GS	China: Gansu
QH	China: Qinghai
NX	China: Ningxia
XJ	China: Xinjiang
HK	China: Hong Kong
MC	China: Macau

Region codes	Regions
India	
AP	Andhra Pradesh
BJ	Bihar, Jharkhand
AN	North East (Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Tripura)
GU	Gujarat
HA	Haryana
KG	Karnataka, Goa
KE	Kerala
MC	Madhya Pradesh, Chhattisgarh
MA	Maharashtra
OR	Orissa
PU	Punjab, Chandigarh
RA	Rajasthan
TN	Tamil Nadu
UU	Uttar Pradesh, Uttaranchal
WB	West Bengal
HJ	Himachal Pradesh, Jammu and Kashmir
DE	Delhi
Japan	
HT	Hokkaido-Tohoku
KN	Kanto
CB	Chubu
KK	Kinki
CS	Chugoku-Shikoku
KO	Kyushu-Okinawa

### 3. Information to read files

In the table files, emissions from major sector categories and fuel types are provided from 1950 to 2015. Followings are the codes for sector categories and fuel types:

#### 3.1 Sector categories

##### 3.1.1 SO<sub>2</sub>, NO<sub>x</sub>, CO, PM<sub>10</sub>, PM<sub>2.5</sub>, BC, OC, and CO<sub>2</sub>

Sector category codes	Sector categories
PP	Power plants including both electricity and heat production
IND	Industry including both combustion and non-combustion sources
ROAD	Road transport
OTRA	Other transport (not including aviation and navigation)
RESI	Residential
ODOM	Other domestic (not including fishing)
TOTAL	Total

##### 3.1.2 NMVOC

Sector category codes	Sector categories
CMB	All combustion sources except for road transport
ROAD	Road transport including both tail pipe and evaporative emissions
INDPRC	Industrial processes
EXT	Extraction processes
PAIN	Paint use
SLV	Solvent use
WST	Waste treatment
TOTAL	Total

### 3.1.3 NH<sub>3</sub>

Sector category codes	Sector categories
CMB	All combustion sources
MM	Manure management (not including application for fertilizer)
FER	Fertilizer including both synthetic and livestock manure fertilizers
HUMAN	Human perspiration and respiration
LTRN	Latrines
INDPRC	Industrial processes
TOTAL	Total

### 3.2 Fuel types

Fuel type codes	Fuel types
COAL	Primary coal
DC	Secondary coal
NGAS	Natural gas
OGAS	Other gas fuels
LF	Light oil fuels
MD	Diesel oil
HF	Heavy oil fuels
BF	Biofuel
OTH	Other fuels
NCMB	Non-combustion sources
CEMK*	Combustion emissions from cement kilns (only for Japan)
HEAVY_FUEL_OIL	Heavy fuel oil
TOTAL	Total

\* In Japan, emissions from cement production were estimated not by fuel consumption, but based on production amounts of cement in each kiln type. Therefore, contributions from total emissions from cement kiln combustion were included in CEMK.

## References

Kurokawa, J. and Ohara, T.: Long-term historical trends in air pollutant emissions in Asia: Regional Emission inventory in ASia (REAS) version 3.1 (submitted to Atmos. Chem. Phys.).