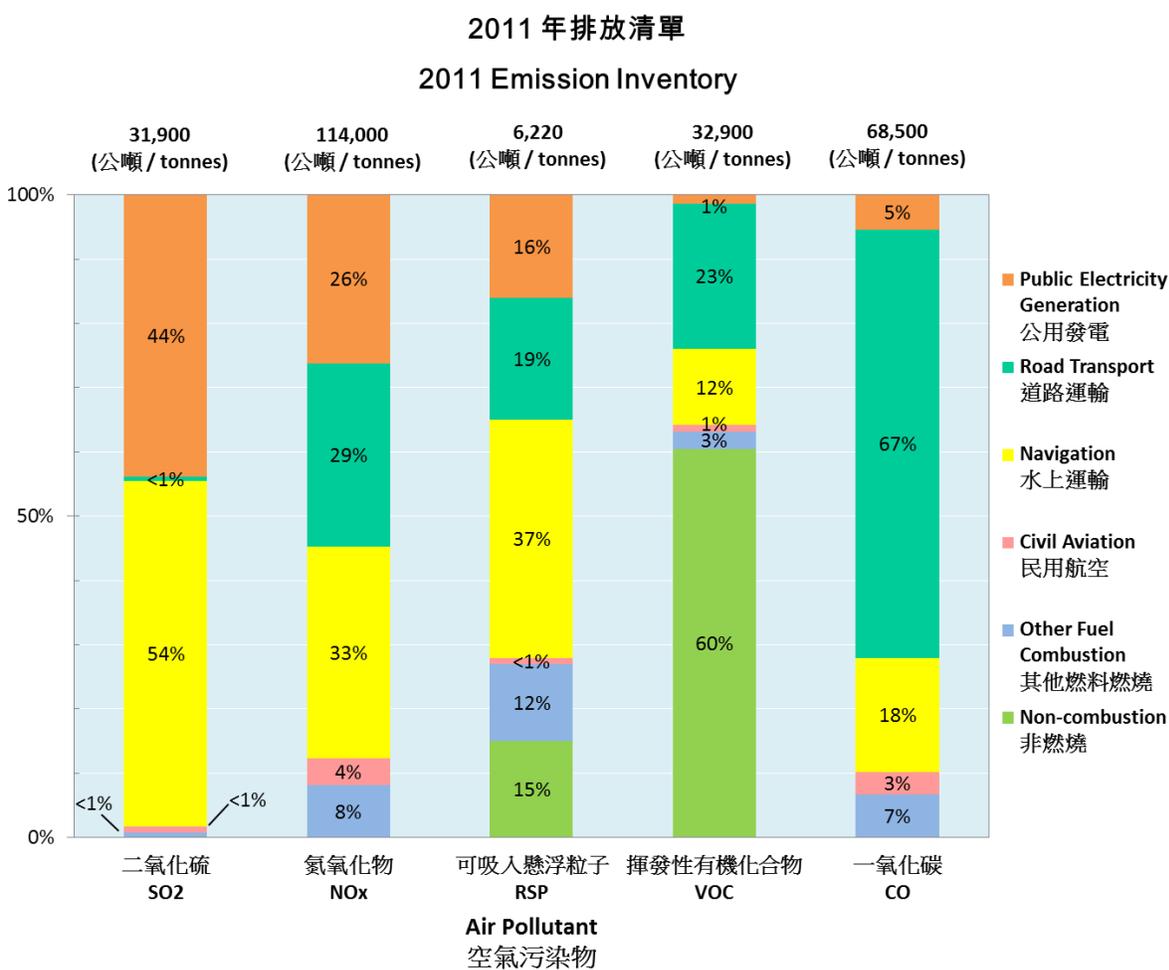


Hong Kong Air Pollutant Emission Inventory

The emission inventory of the Hong Kong Special Administrative Region (HKSAR) covers five major air pollutants, namely: [sulphur dioxide \(SO₂\)](#), [nitrogen oxides \(NO_x\)](#), [respirable suspended particulates \(RSP or PM₁₀\)](#), [volatile organic compounds \(VOC\)](#) and [carbon monoxide \(CO\)](#). Emission inventory provides essential information on the levels of air pollutant emissions for the development of air quality management strategy. It helps assess the effectiveness of emission control measures that are in implementation, identifies areas where control actions should be stepped up, and supports air quality impact modeling and assessment.

Emission Inventory for 2011

The diagram below shows the emission inventory for 2011 under different emission source categories including public electricity generation, road transport, navigation, civil aviation, other fuel combustion sources and non-combustion sources.



[See Data](#)

Topics of Interest

[Emission Trends \(1997-2011\)](#)

[Changes in Emission Relative to Population, Energy Consumption and Economic Growth](#)

[Emission Reduction Plan up to 2020](#)

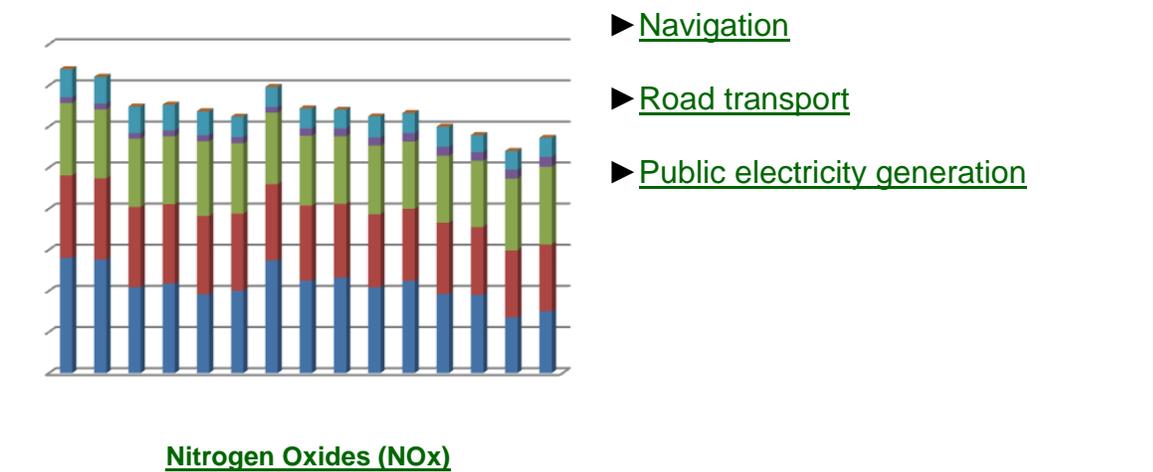
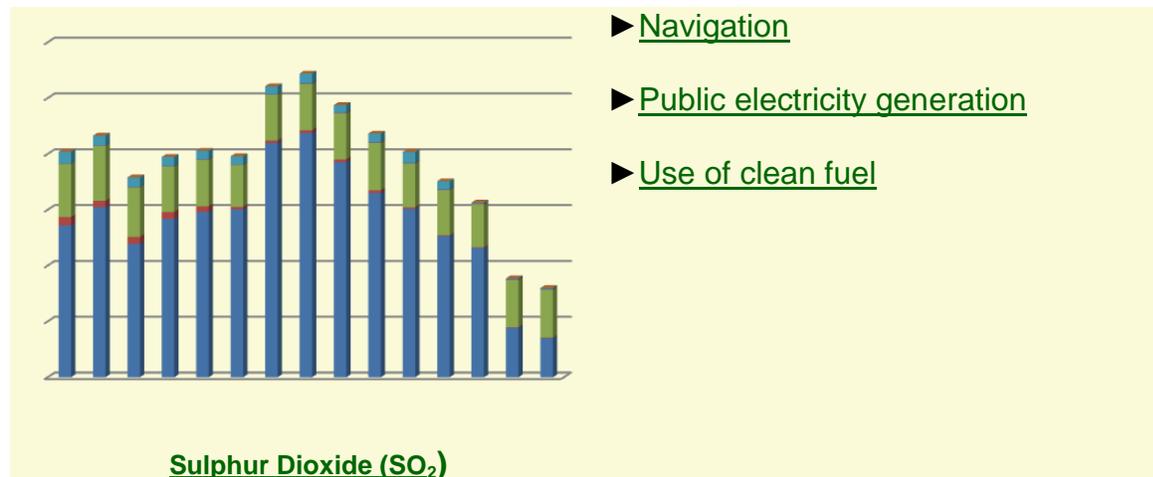
[Update of Emission Inventory](#)

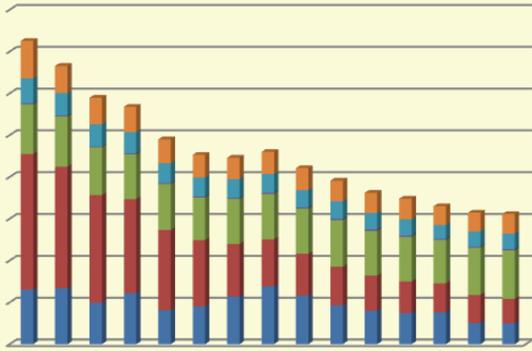
Emission Trends (1997-2011)

Trend of Emissions from Specific Source Categories

Legends:

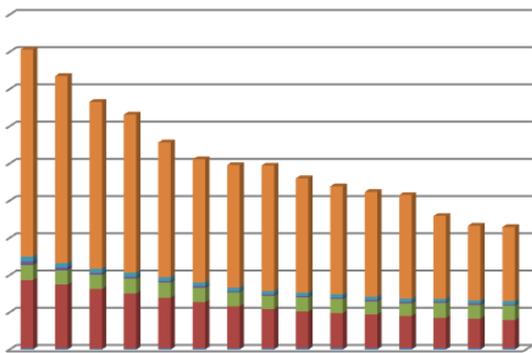
- | | |
|--------------------------|-----------------------------------------|
| ■ 非燃燒
Non-combustion | ■ 其他燃料燃燒
Other Fuel Combustion |
| ■ 民用航空
Civil Aviation | ■ 水上運輸
Navigation |
| ■ 道路運輸
Road Transport | ■ 公用發電
Public Electricity Generation |





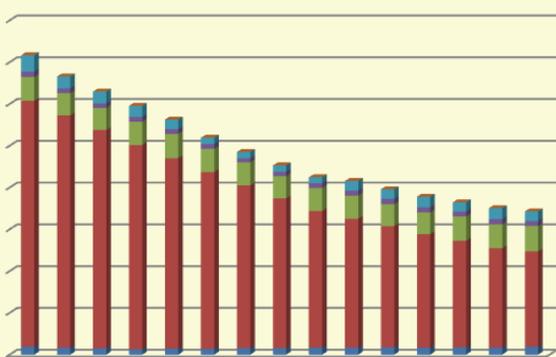
- ▶ Navigation
- ▶ Road transport
- ▶ Public electricity generation

Respirable Suspended Particulates (RSP)



- ▶ Consumer products, paints & printing
- ▶ Road transport

Volatile Organic Compounds (VOC)



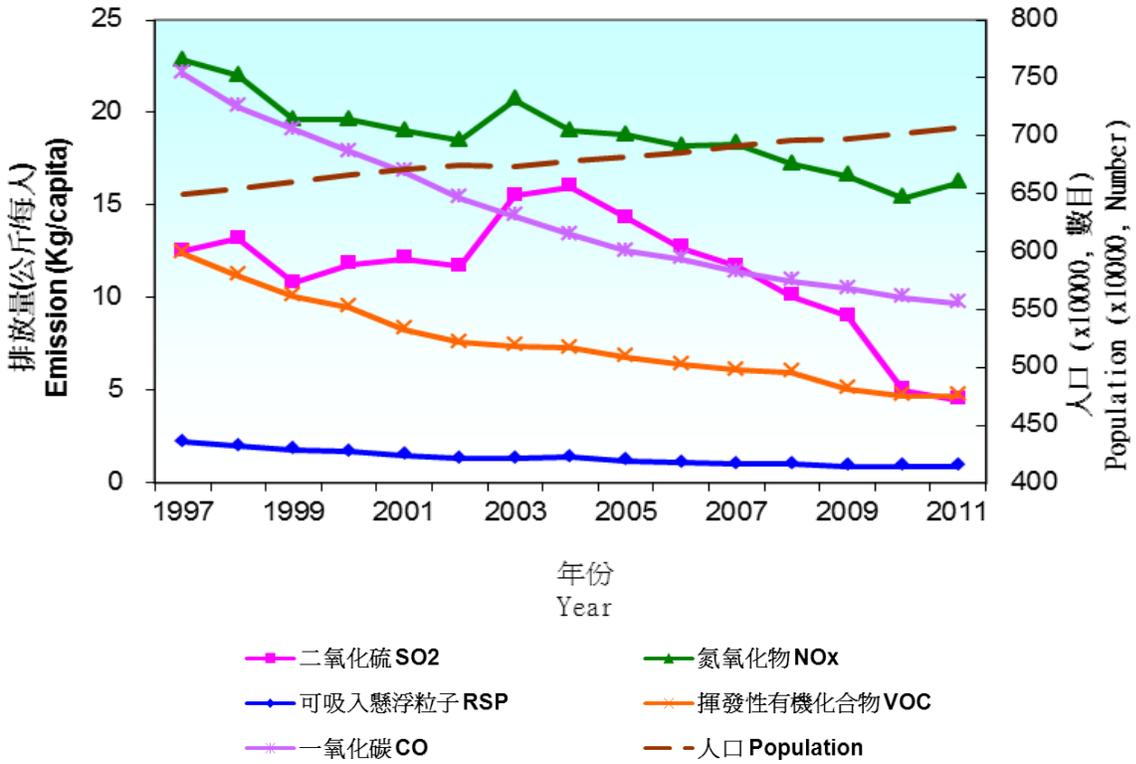
- ▶ Road transport

Carbon Monoxide (CO)

Changes in Emission Relative to Population, Energy Consumption and Economic Growth

1. Changes in Emission Relative to Population

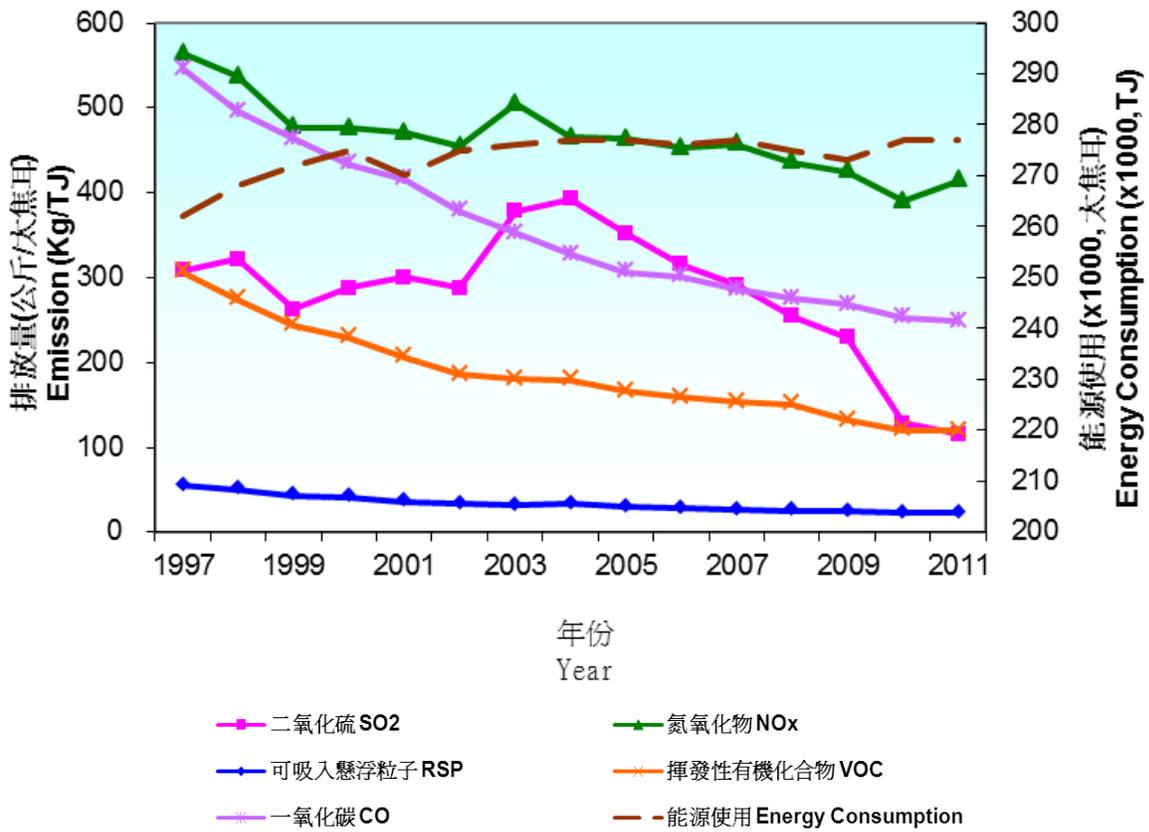
1997-2011 排放量/每人
1997-2011 Emission per Capita



[See Data](#)

2. Changes in Emission Relative to Energy Consumption

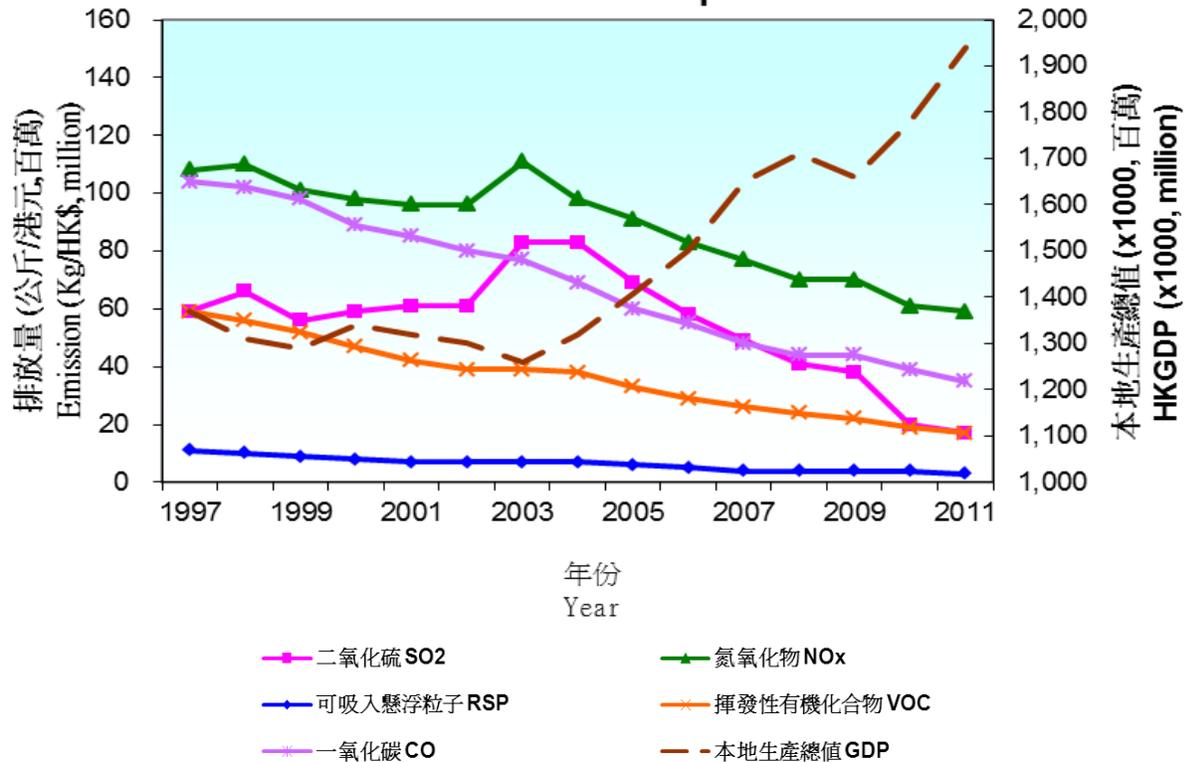
1997-2011 排放量/能源使用量 1997-2011 Emission per Energy Consumption



[See Data](#)

3. Changes in Emission Relative to Economic Growth

1997-2011 排放量/本地生產總值 1997-2011 Emission per GDP



[See Data](#)

Emission Reduction Plan up to 2020

The Hong Kong SAR and Guangdong Provincial Governments have long been collaborating to improve the air quality in the Pearl River Delta (PRD) Region^{note1}. Over the past years, the two Governments reduced significantly the emissions of four major pollutants, namely SO₂, NO_x, RSP and VOC. At the meeting of Hong Kong-Guangdong Joint Working Group on Sustainable Development and Environmental Protection held in November 2012, both sides endorsed a new set of [emission reduction targets/ranges](#) up to 2020, using 2010 as base year. Both sides will implement additional pollution control measures on this basis for bringing continuous improvement to the regional air quality. For Hong Kong, the new reductions targets in 2015 for SO₂, NO_x, RSP and VOC are 25%, 10%, 10% and 5% respectively; whereas the emission targets for 2020 are set between 15% and 75%. The two governments will conduct a mid-term review in 2015 to assess the progress made in emission reduction, with a view to finalizing the emission reduction targets for 2020. To achieve the emission targets set for 2015 and 2020, Hong Kong will implement the following key measures:

- tightening vehicle emission standards;
- phasing out highly polluting diesel commercial vehicles;
- retrofitting Euro II and Euro III franchised buses with selective catalytic reduction devices;
- strengthening inspection and maintenance of petrol and liquefied petroleum gas vehicles;

- requiring ocean-going vessels to switch to low sulphur fuel while at berth;
- tightening the cap on the sulphur content of locally supplied marine diesel;
- controlling emissions from off-road mobile machinery;
- further tightening the emission caps on power plants; and
- controlling VOC contents of solvents used in printing and construction industry.

Changes in 2011 emissions in Hong Kong compared with 2010 emission levels range from -10 % to +6%. Details are listed in the table below:

Pollutant	2010 Emission (Tonnes)	2011 Emission (Tonnes)	Change in Emission 2010-2011	2015 Reduction Target (Reference to 2010)
SO ₂	35,500	31,900	-10%	-25%
NOx	108,000	114,000	+6%	-10%
RSP	6,290	6,220	-1%	-10%
VOC	33,300	32,900	-1%	-5%

Note: Emission figures are presented in 3 significant figures.

The slight increase in NOx emissions in 2011 was due to an increased use of coal for power generation to make up the shortfall in supply of natural gas and an increase in the tonnage of vessel arrivals in the marine sector.

Update of Emission Inventory

Making reference to international developments and technological advancement, we have been updating the methodologies to compile emission inventory including the collection of most updated data with an aim to provide a better support to the management of air quality. Whenever the compilation methodology is updated, new activity data are collated, or errors in the estimates are identified, we will follow international practice to update the emission inventory and to revise the emission inventory for past years as far as practicable based on the updated methods and available data to enable meaningful emission trend analysis to be made. Updates of the emission inventory are listed in the [Summary of Updates to the Emission Inventory](#). Major updates in recent years are highlighted below :

- EPD commissioned a comprehensive study on the marine emission inventory in 2008, which was completed in 2012. The study collected extensive local vessel activity data and reviewed the latest emission compilation methodologies of advanced places such as the Port of Los Angeles of the USA. The study concluded that these latest emission compilation methodologies can provide more realistic estimates of marine emissions. Based on the study findings, we updated the previous emission inventory for marine vessels. The updated emissions from vessels were higher than the previous ones.
- EPD have been conducting emission measurements for on-road vehicles by means of remote sensing equipment and advanced portable emission measurement systems (PEMS). The measurements have provided a more robust basis for us to estimate vehicle emissions. They have also found that vehicles with inadequate maintenance, e.g., LPG vehicles with worn-out catalytic converters, could emit considerably above their normal levels. We made use of the findings to update our vehicle emission estimation model and compile the vehicle emission inventory.

- Since the implementation of the Air Pollution Control (Volatile Organic Compounds) Regulation in April 2007, we have used the sales report data submitted by importers under the Regulation to compile VOC emissions of regulated products including six types of consumer products (air fresheners, hairsprays, multi-purpose lubricants, floor wax strippers, insecticides and insect repellents), printing inks, paints, adhesives and sealants. Emissions from cleansing solvents during the application of paints have also been estimated. To compile VOC emissions for the regulated products, we also made reference to EPD's studies on printing industry, solvent usage for coatings and VOC-containing products, and survey data for marine paints to assess emissions from VOC-containing products

Emission Inventory Reports

[2011 Hong Kong Emission Inventory Report](#)

[2010 Hong Kong Emission Inventory Report](#)

Useful References

[Intergovernmental Panel on Climate Change \(IPCC\)](#)

[U.S. Environmental Protection Agency \(U.S. EPA - AP42\)](#)

[European Environment Agency \(EEA - EMEP/EEA Emission Inventory Guidebook\)](#)

[Census and Statistics Department \(C&SD - Hong Kong Statistics\)](#)

[Electrical and Mechanical Services Department \(EMSD - Hong Kong Energy End-use Data\)](#)

Note:

¹ PRD Region refers to the whole territory of HKSAR and the Pearl River Delta Economic Zone (PRDEZ). PRDEZ includes Guangzhou, Shenzhen, Zhuhai, Dongguan, Zhongshan, Foshan, Jiangmen, Huizhou (Huicheng, Huiyang, Huidong, Boluo), and Zhaoqing (Duanzhou, Dinghu, Gaoyao, Sihui).

http://www.epd.gov.hk/epd/english/environmentinhk/air/data/emission_inve.html