

7. Environmental Performance

7.1. Environmental Governance

Following the implementation of the new Hong Kong Air Quality Objectives established in 2006, HK Electric is required to tighten its emissions at LPS. We have set up an Environment Committee to ensure that our operations adhere to the Company's Environmental Policy and comply with all applicable laws and regulations.

With continuous improvement in mind, HK Electric's comprehensive environmental and energy management systems follow the latest version of international standards ISO 14001 and ISO 50001.

7.2. Cleaner Fuels

Coal and natural gas are practically the exclusive fuels used at LPS. A small amount of oil is also used, mainly for starting and flame stabilisation of coal-fired units.

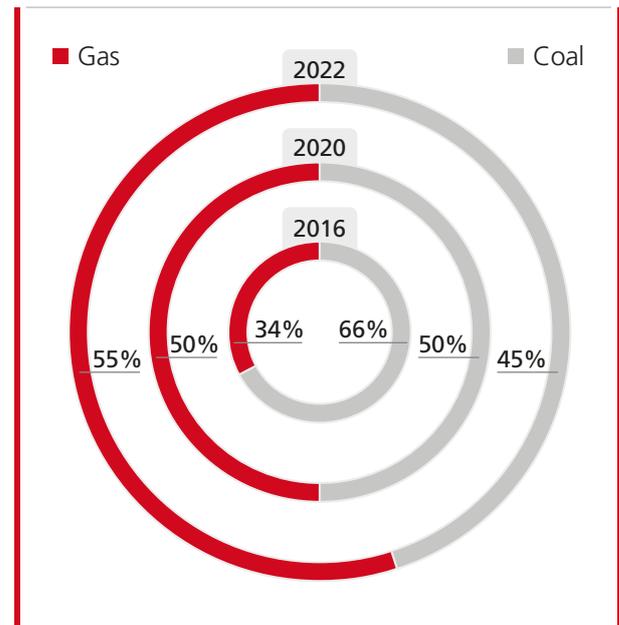
To reduce emissions, we have progressively increased the use of natural gas to generate electricity and reduce coal. Since 2010, gas-fired generation has accounted for about one-third of our total electricity output.



Currently, we are building a new gas-fired combined-cycle generating unit (L10) at LPS while construction planning is underway for L11. The two units will feature advanced efficiency-enhancing technology and the Selective Catalytic Reduction System. For the same amount of electricity output, the carbon emission and nitrogen oxides emission of each unit will be about 25% and 90% less than that of an existing older gas-fired unit respectively. After

the commissioning of these units in 2020 and 2022, the electricity we produce through gas-fired generation will increase to about 50% and 55% respectively, in support of the Government's carbon intensity reduction target for the city.

Fuel Mix (2016-2022)



(Based on GWh sent out)

Meanwhile, successful modifications made to the coal-fired generation units have enabled us to handle a wider range of coal types. In recent years, low-sulphur coal (sulphur content less than 0.15% and less ash content) has been used to help reduce sulphur dioxide and particulates emissions. About one-third of our coal-purchasing portfolio is low-sulphur coal.



7.3. Emissions Reduction

With the use of cleaner fuels and state-of-the-art technology, HK Electric has drastically reduced the emissions from its electricity generation process. Significant reductions in sulphur dioxide, nitrogen oxides and respirable suspended particulates emissions – by 40-90% in 2016 as compared to 2008 – have been recorded (Figure 6). The carbon emission per unit of electricity sold in 2016 stood at 0.79kg (Figure 7).



Figure 6 – Significant Emissions Reduction (2008-2016)

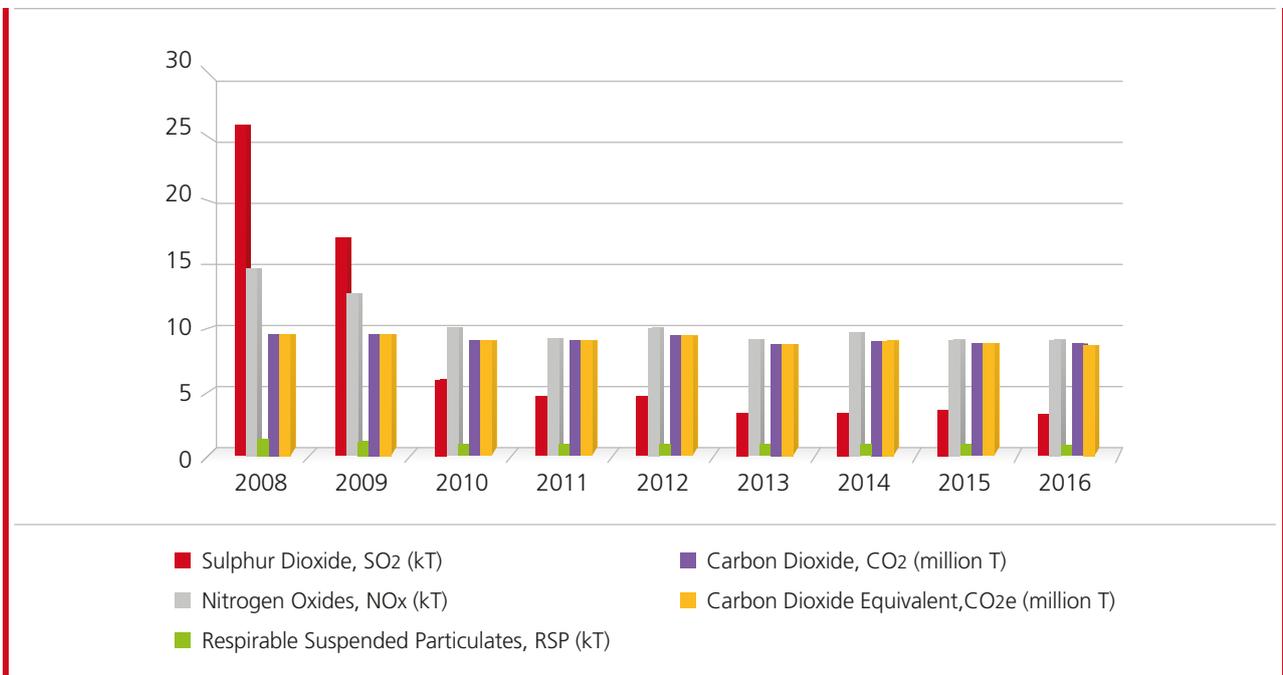
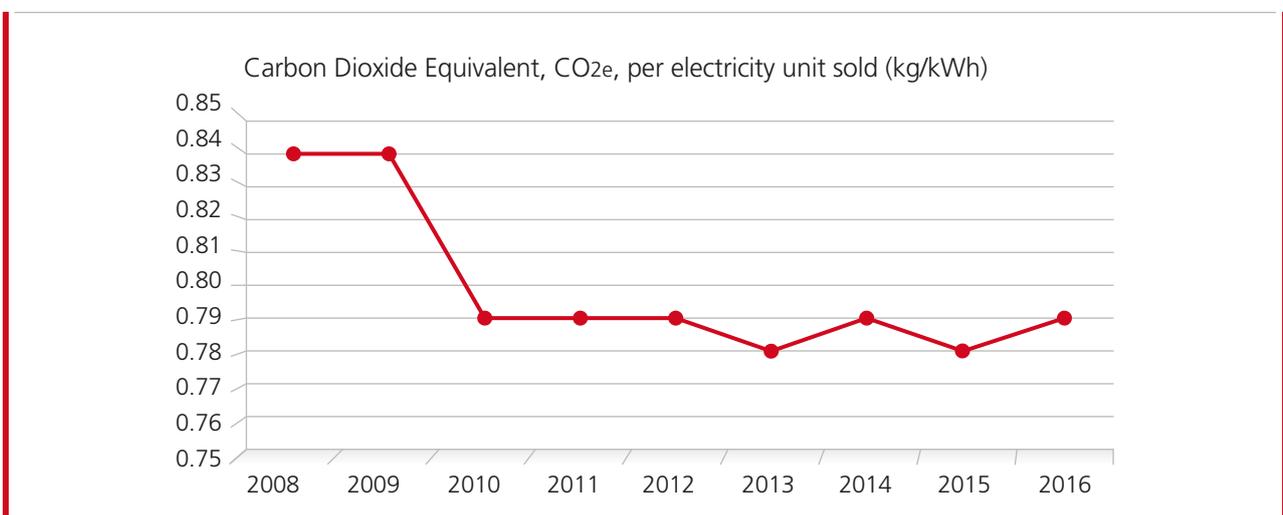


Figure 7 – Carbon Emission Per Unit Sold (2008-2016)



7.4. 4R and In-house Green Initiatives

As part of our Environmental Policy, we follow “4R” practices – Reduce, Reuse, Recover and Recycle – to minimise the consumption of valuable resources, such as power, paper and water, as well as to reduce waste. At LPS, our “rain and used water collection system” collects more than 100,000 m³ of water every year and helps cut down the amount of raw water consumption and waste water discharge.

Lamma Power Station Water Consumption / Discharge

	2014	2015	2016
Marine water withdrawal & discharge (million m ³)	2,094	2,023	2,160
Town water consumption (thousand m ³)	2,408	2,257	2,397
Waste water discharge (thousand m ³)	166	185	138

We also collect ash and gypsum, which are by-products of our electricity generation process, for industrial use and recycle waste oil through licensed collectors.

Ash / Gypsum Collected for Industrial Uses (kT)

	2014	2015	2016
Ash produced	213	211	237
Ash collected for industrial uses	213	208	238
Gypsum produced / collected for industrial uses	74	64	66

To save resources in our development projects, we are constructing a new demineralisation plant at LPS, which will adopt reverse osmosis and electro-deionisation technology to reduce the amount of chemicals needed to demineralise water during operation.

We work closely with our stakeholders to minimise the impact of our operations on the environment. An example is the provision of an on-shore power supply to contractors’ ash barges at LPS so that less-efficient barge engines can be turned off when collecting ash, reducing both emissions and energy consumption. We also incentivise our customers to switch to e-bills to reduce paper consumption.

To reduce food waste, a booking system for meals is in place at our canteens. We donate surplus food to the needy through Food Angel, an NGO in Hong Kong. For any remaining food waste, we encourage waste separation and use food waste eliminators to minimise the disposal volume.

To enhance employees’ awareness of reducing and recycling waste, we extended the “centralised rubbish station” scheme across our main office buildings in 2016, under which rubbish bins at individual workstations were replaced with a centralised rubbish station equipped with recycling bins at each floor.



Apart from the 4R practices, we also encourage staff and their families to adopt green initiatives through supporting the United Nations World Environment Day. Colleagues are invited to make low-carbon pledges in their daily lives, such as taking public transport instead of driving, having low-carbon meals, donating used books and clothing to charities. A total of 1,017 colleagues took part in various activities in support of this green appeal in 2016.

