





# Air

## Cleaner air for everyone

Air pollution is a regional problem and requires everyone to play their part. We are doing ours to limit the release of emissions in order to improve Hong Kong's air quality.



An artist's impression of the Lamma Power Station Extension.

### The Switch to Gas

Generating electricity by burning fossil fuel inevitably produces CO<sub>2</sub> and a number of air pollutants such as sulphur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), and particulate. SO<sub>2</sub> and NO<sub>x</sub> are of environmental concern because of their connection to acid rain. NO<sub>x</sub> and particulate are related to formation of smog. CO<sub>2</sub> is one of the greenhouse gases.

The emission of all these pollutants will be significantly reduced with the commissioning of our first gas-fired generation unit in 2006. Compared with coal, natural gas combined cycle unit is not only more efficient but also cleaner. The amount of CO<sub>2</sub> and NO<sub>x</sub> generated by a gas-fired combined cycle unit compared with a traditional coal-fired unit are only about half and one fifth respectively. Negligible levels of SO<sub>2</sub> and particulate are found in the flue gas as natural gas contains only a traceable amount of sulphur and practically no ash. This is the reason why we are making the switch to gas-based electricity generation for future plants.

### Pioneering the Use of Flue Gas Desulphurisation Plants

We aim to use only high-grade coal in order to keep air emissions low. In the past few years, the average sulphur and ash contents of coal burnt in Lamma Power Station were well within licence requirements.

Recognising that technology holds the key in a business like ours, we are dedicated to keeping abreast of the latest developments and employing them wherever possible. This is an area in which we have long been ahead of the curve.

We were the first utility in South East Asia to install large-scale Flue Gas Desulphurisation (FGD) Plants that remove more than 90% of the SO<sub>2</sub> in the flue gas by using the wet limestone scrubbing process. Three of our newer generating units, which account for more than half of our total electricity output, are now fitted with FGD plants. In the process, a useful by-product, gypsum, is produced. Gypsum is a stable material and a marketable product. Its principal use is in the manufacture of wallboard and cement.



Collected rainwater is sprayed onto our coal yard.

To tackle NO<sub>x</sub> emissions, the boilers of our latest coal-fired generating units are fitted with cutting-edge low NO<sub>x</sub> burners. The new burners reduce NO<sub>x</sub> emissions by two thirds compared to older burners, without consuming any raw material.

Ash is another potential airborne pollutant, so we treat all our flue gas by electrostatic precipitators which remove over 99% of fly ash. Flue gas conditioning plants are also installed to further enhance the efficiency of the electrostatic precipitators in capturing fly ash. The adoption of FGD plants and low NO<sub>x</sub> burners reflects our pragmatic and responsible approach in making the latest coal-fired units at Lamma Power Station highly environmentally friendly.

The concentration of SO<sub>2</sub> and NO<sub>x</sub> in the flue gas of our boilers are continuously monitored online and relevant data transmitted to the Environmental Protection Department. We maintain a six-station ambient air monitoring network on the southern part of Hong Kong Island and north Lamma Island. More than two decades' worth of data are available for study.

### Fugitive Dust Control

We consumed more than four million tonnes of coal in 2004, all of which was treated to ensure that an absolute minimum of dust escaped. On arrival of the coal, a chemical dust suppressant is applied to the coal at the unloaders and at major transfer points. Wherever practicable, the transfer takes place in an enclosed pipe conveyor system. Water is sprayed onto the coal yard to minimise the level of dust, using collected rainwater or run-off where available.

Ash, limestone and gypsum are stored in silos and transported when needed in an enclosed system wherever possible. Thanks to the real-time dust monitors installed at strategic locations of Lamma Power Station, we can take immediate action to suppress dust nuisance whenever there is the slightest possibility of dust escaping.

To confirm the effectiveness of our efforts, we have been working with the Lamma Rural Committee to conduct leaf sampling exercise. The results speak for themselves – no trace of ash or coal dust has been found since the commencement of the sampling work in early 1990s.



Our FGD plants can remove more than 90% of SO<sub>2</sub> in flue gas.

