LEGISLATIVE COUNCIL
PANEL ON ENVIRONMENTAL AFFAIRS

Response to Follow-up Actions

Arising from Discussion at the Meeting on 24 October 2016

Government's response to follow-up actions arising from the discussion at the meeting of 24 October 2016 on the review of the Fifth Technical Memorandum for Allocation of Emission Allowances for Power Plants

(a) To provide supplementary information explaining (i) the reasons why, unlike the measurement of ambient $PM_{2.5}$, there is no reliable measurement method of $PM_{2.5}$ concentrations in a stack where water droplets are present, and (ii) whether reference can be made to the relevant measurement method(s) set out in the "EPA Method 202 Best Practices Handbook" issued by the United States Environmental Protection Agency in January 2016

Respirable suspended particulates (RSP) includes PM_{10} and $PM_{2.5.}$ PM_{10} is particulate matter (PM) having a nominal aerodynamic diameter not more than 10 micrometers while $PM_{2.5}$ not more than 2.5 micrometers. PM from power plants has filterable and condensable components, which could exist in the form of PM_{10} and $PM_{2.5}$. Inside a power plant stack, PM exists in the form of solid or liquid particles, known as filterable PM, which for example could be ash residues from combustion of fuel. There are also vapours that could condense to form fine particles after discharge into the atmosphere. They are known as condensable particulate matter (CPM), which for example could be inorganic compounds such as sulphuric acid mist.

2. In the case of local power plants, coal-fired generation units account for about 85% of the RSP emissions of the power sector with a significant portion being filterable particulate matter. Most of the coal-fired generation units are equipped with wet scrubbers for desulphurization and have to be prioritized for use for meeting the

emission caps in respective Technical Memorandum for Allocation of Emission Allowances for Power Plants.

3. The major challenge in measuring filterable $PM_{2.5}$ in a stack preceded by a wet scrubber is that water droplets entrained in the flue gas may dissolve some of the $PM_{2.5}$ and their sizes could be larger than the cut size for the particle sizing device, rendering their collection for measurement impossible and the measurement results not representative. Furthermore, $PM_{2.5}$ could agglomerate with the aid of water droplets in the stack to form larger particles. After discharge into the atmosphere, these particles would revert back to smaller particles after the evaporation of the water. In the case of measuring $PM_{2.5}$ in ambient air, the above problems do not exist because the water droplets associated with the particles, if any, would have been evaporated.

4. So far, the United States Environmental Protection Agency (USEPA) has not promulgated a method to measure filterable $PM_{2.5}$ in a wet stack. Neither are we aware of the European Union having set a standard method for such measurement. We will continue to monitor closely the relevant development.

5. As for the "EPA Method 202 Best Practices Handbook" issued by the USEPA in January 2016, it is for measuring condensable PM but not filterable PM. In other words, it cannot solve the problems outlined above for measuring filterable PM in a wet stack.

(b) To provide the latest progress of achieving the target of reducing energy intensity in Hong Kong by 40% by 2025 (compared to 2005) laid down under the Energy Saving Plan for Hong Kong's Built Environment 2015~2025+

The Government promulgated the “Energy Saving Plan for Hong Kong's Built Environment 2015~2025+” last May, which sets a target of reducing Hong Kong's energy intensity by 40% by 2025. Achieving this target requires actions by the whole community. The Government has formulated various policy measures to encourage various sectors of the community to work together for energy saving.

(I) Government Buildings

2. The Government is leading by example. We have set a target to reduce electricity consumption in Government buildings by 5% from 2015/16 to 2019/20, using comparable operating conditions in 2013/14 as the base. To achieve this target, energy audits for major Government buildings are being conducted to help relevant bureaux and departments formulate measures to enhance energy efficiency. We have requested them to implement electricity saving projects and to enhance green housekeeping measures having regard to results of the energy audits.

3. The Government updated the circular on Green Government Buildings last year to enhance the environmental performance framework of new and existing Government buildings. All new Government buildings should aim to outperform the Building Energy Code by 3% to 10%.

(II) Non-Government Buildings

4. As regards energy saving in private buildings, the Buildings Energy Efficiency Ordinance (BEEO) came into full operation in 2012 to enhance building energy efficiency. The Government has committed to reviewing the Building Energy Code once every three years. The latest review was completed last year. The 2015 version, which has already taken effect, is more stringent and requires a further 10% improvement to energy efficiency. We expect that up to 2025, energy savings from all new buildings in Hong Kong will be about five billion kilowatt hours, equivalent to the total annual electricity consumption by about one million households or a reduction in carbon dioxide emissions of about 3.5 million tonnes.

5. On promotion of energy efficient electrical appliances, the Electrical and Mechanical Services Department (EMSD) regularly reviews the scope and standards of the Mandatory Energy Efficiency Labelling Scheme ("MEELS"). In light of technological development, new grading standards of room air conditioners, refrigerating appliances and washing machines (washing capacity of 7kg or less) were introduced in November 2015. The upgraded standards are estimated to bring

about an annual electricity saving of 300 million kWh and an annual reduction of carbon dioxide emissions by about 210,000 tonnes. In addition, we plan to introduce amendments to the Energy Efficiency (Labelling of Products) Ordinance to include five categories of products to MEELS, namely televisions, electric storage water heaters, induction cookers, washing machines (with a washing capacity greater than 7kg but less than 10kg), and room air conditioners (with both heating and cooling functions). The estimated annual energy saving arising from the third phase of MEELS is around 150 million kWh with an annual reduction of 105,000 tonnes of carbon dioxide emissions.

6. The development of energy efficient infrastructure is also important. District cooling systems (DCS) are energy efficient air-conditioning systems. The DCS project in the Kai Tak Development (KTD) is the first of its kind in Hong Kong. Upon its full completion in 2023, the maximum annual electricity saving is estimated to be 85 million kWh with a corresponding annual reduction of 59,500 tonnes of carbon dioxide emissions. The DCS project in KTD is being implemented in phases. Phases I and II have been completed and district cooling services are currently provided to the Ching Long Shopping Centre, Kai Tak Cruise Terminal building, Trade and Industry Tower, and two primary schools. We will consider the provision of DCS in New Development Areas and Redevelopment Areas as appropriate to foster low-carbon development.

7. On public education, the Environment Bureau and EMSD launched the "Energy Saving for All" Campaign in 2015 to promote energy saving and enhance energy efficiency. The campaign comprises the Energy Saving Charter on Indoor Temperature, the "Energy Saving for All" dedicated website, the Youth Energy Saving Award and the "Energy Saving for All" TV Announcement in the Public Interest. To sustain the momentum, we launched a new Energy Saving Charter in June this year to further promote the message of energy saving. In addition to air-conditioning, the new Charter will cover different kinds of electrical appliances. EMSD has also organised the Energy Saving Championship Scheme (the Scheme) this year to appeal to shopping malls, office buildings, residential buildings / housing estates, primary and secondary schools, and tertiary education institutions for their participation. The

Scheme seeks to recognise organisations for the adoption of energy efficient technologies and equipment, application of operational optimisation of energy consuming systems (i.e. retro-commissioning), development of best practices in energy management and promotion of energy saving.

8. Promotion of energy saving requires concerted efforts of different sectors in the community. The Government has established a dialogue platform with relevant stakeholders in the built environment sector to discuss ways to promote green buildings and to explore energy saving targets and measures.

9. Our target of reducing Hong Kong's energy intensity was promulgated in 2015. Various measures have been implemented or are in the pipeline to achieve this goal. More time will be required for the measures to take effect in particular those involving behaviour change. We are committed to working with various sectors of the community to achieve the energy intensity reduction target.

Environment Bureau
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