E&PG Paper 3/2016

For discussion
on 18 August 2016

AQO Review Working Group
Energy and Power Generation Sub-group

Proposed Air Quality Improvement Measures and their Key Considerations

Purpose

This paper summarizes the new air quality improvement measures suggested by Members at the first meeting held on 8 July 2016 and the key considerations for further deliberating the measures.

Proposed New Air Quality Improvement Measures and their Key Considerations

2. In the sub-group meeting held on 8 July 2016, Members proposed a number of measures on building energy efficiency, wider use of renewable energy, fuel mix for electricity generation, emission control and operation of power generation plant, use of biomass, new solar technology and energy storage system.

3. Some of the measures on building energy efficiency, renewable energy and , fuel mix for electricity generation have been considered by the government and progressively implemented with a view to attaining targets for carbon reduction, energy saving and energy mix for electricity generation, as set out in Table 1. As an example, the "Energy Saving Plan for the Built Environment 2015~2025+" published by the Government in 2015 has set the target of reducing Hong Kong's energy intensity by 40% by 2025.

Table 1 - Measures that have been progressively implemented

A. Building energy efficiency measures
1. Encourage stakeholders in the commercial sector and the non-government sector, e.g. universities and hospital to adopt demand-side management (DSM) measures;
2. Explore building energy efficiency measures for old existing buildings which are not covered by the Building Energy Efficiency Ordinance; and

3. Encourage major electricity users to reduce peak load demand so as to reduce the operation and emissions from coal-fired generation units for coping with peak load demand.
B. Use of renewable energy
1. Encourage or provide incentives for the private sector to develop distributed power generation by renewable energy (RE); and 2. Facilitate distributed RE systems to connect to the power grid. 3. Encourage the development of more small scale waste-to-energy facilities, such as waste incinerators, organic waste treatment plants, etc. for waste disposal as well as recovering energy for local use
C. Fuel mix for electricity generation
1. Replacement of coal-fired generation units by gas-fired units; and 2. Consider importing more nuclear electricity from the Mainland 3. Increase the use of wind and solar energy in electricity generation.

4. Members are requested to take into account Government's prevailing policies when deliberating the above measures with the relevant bureaux/departments attending the sub-group meeting.

5. For other proposed measures on emission control and operation of power generation plants, use of biomass, new solar technology and energy storage system, key considerations to implement these measures are set out in Table 2.

Table 2 – Other proposed new air quality improvement measures

Description	***Key considerations for implementation***
D. Power generation plant	
1. Upgrade burners of gas-fired generation units to improve fuel efficiency and emission performance	- Cost implication - Technology advancement in emission reduction - Service life of gas-fired generation units
2. Review operations of gas-fired power generation units with a view to identifying further emission reduction potential	- Operation constraints to meet electricity demand - Cost implication -
E. New solar energy technology	
1. Explore the idea of "SolarRoad" for promoting the use of solar energy	- Road safety - Technology maturity - Capital and operation costs - Maintenance implication - Energy yield

Description	*Key considerations for implementation*
F. Use of biomass as fuel	
1. Explore the use of waste materials such as corncobs, waste wooden pallets as fuel	- Precedent in using these biomass as fuels - Environmental performance - Cost implication - Adaptation to existing combustion equipment - Availability of commercial plants in using the biomass as fuel and their scale - Supply of biomass - Requirement for pre-treatment for the biomass - Community acceptance
G. Energy Storage	
1. Explore the feasibility of using electric vehicles (EV) as electrical energy storage for power grid	- Cost implication to modify the EV charging system - Technical and safety considerations, particularly to the EV owner - Impacts on stability of the power grid - Site selection and security protection for charging facilities - Impact on the service life of EV battery
2. Explore the use of old EV batteries as an electrical energy storage system for the power grid	- Service lifetime of EV batteries - Space requirement for housing EV batteries - Technical considerations - Impacts on stability of the power grid -

Advice Sought

6. Members are invited to to offer their views on the proposed measures and comment on the key considerations to further deliberate on the practicability for their implementation.

Environment Bureau / Environmental Protection Department
August 2016