The Legislative Council

Panel on Environmental Affairs

Special Meeting on 28th March 2014

Tuesday, 25th March 2014

Submitted by Dr Nilton W.T. Chan

Dear Panel Members on Environmental Affairs of the Legislative Council,

Submission of Views and Oral Presentation on "Environmental Infrastructure Projects"

Introduction

1. I have been working in the energy and utilities industry for more than 14 years. I currently work for a global integrated energy company and have been developing large-scale biomass (wood based) and waste (municipal solid waste) to energy facilities in the United Kingdom for the past 8 years.
2. Being a permanent Hong Kong Resident, I wish to express my personal views and make comments on various matters in relation to the Environmental Protection Department (EPD)'s proposed development of the "Environmental Infrastructure Projects".

General Views

3. Hong Kong needs a comprehensive waste management plan to tackle the whole spectrum of the waste issues ranging from waste reduction, reuse, recycling, recovery to waste disposal. The waste management plan must be sustainable, realistic, practical and understood by the public, and it should have a committed timetable for its implementations.
4. The "Kong Kong Blueprint For Sustainable Use of Resources 2013-2022" and the "Food Waste & Yard Waste Plan for Hong Kong 2014-2022" published by the Environment Bureau in May 2013 and in February 2014 respectively have set out directions and actions to tackle the ongoing waste problems. In principle I support the vision for sustainable use of resources and the vision for reducing food waste. I agree it is a complex matter and most of the actions are interrelated. However I have concerns about the deliverability of the Government's ambitious targets by 2022. From my point of view, there are two major obstacles. First, there is a prolonged delay in gaining funding approvals for major waste management infrastructure projects. Secondly, there are persistent challenges in gaining participation and acceptance from the public.
5. Establishing waste reduction at source and citywide's recycling attitudes and green behaviours will take time (often longer than expected) and require continuous efforts from everyone including policy/decision makers, residents, visitors, companies and all walks of life in Hong Kong. In particular, decision makers must not hesitate to commit to waste management projects and in parallel fortify the efforts in ensuring the public are fully aware of the importance and the benefits of the projects in order to gain their overall acceptance and support.

Landfill Extensions

6. Ideally landfills should be minimised and landfilling must be considered as a short term solution and for contingency situations only.

7. The amount of waste currently disposed to Landfill sites is alarming and it is an urgent matter for the Hong Kong Government (HK GOV) to implement practicable solutions which can divert a significant amount of waste from landfilling. As mentioned earlier, all proposed actions (as stated in the two publications) require everybody's commitment and time to be fully accomplished. Even though all actions can be delivered in time, there will still be a requirement for landfilling post 2022.

8. The proposed extension of the existing landfill sites seems to be an inevitable solution. This is fairly understandable from a technical point of view but it may not be supported by the general public and especially the residents who live close to or being affected by the landfill sites. Unless clear justifiable messages on the delivery of the waste management plan are given to the public by EPD and HK GOV, the implementation of the plans would get slowed down.

Integrated Waste Management Facility (IWMF) Proposal

9. Considering the amount of waste Hong Kong generated daily today and even having a 40% total waste reduction target achieved by the year 2022, we will continue to require landfill capacities.

10. Direct and effective solutions are essential and one solution is to thermally treat a significant quantity of the waste that cannot be reduced, reused or recycled further. There are many thermal treatment facilities across the world and their technical capability and performance have already been demonstrated in other major cities in the world.

11. The environmental benefits offered by waste-to-energy are far better than landfill in terms of sustainability, renewable energy generation, carbon saving (compared to fossil fuel energy generation) and green house gas emissions.

12. The suggested moving grate technology to be used for IWMF has a long history and reliable track record in comparison to modern (or relatively advanced) technologies such as "Plasma Gasification". I tend to agree with EPD's view that using moving grate has a lesser technical risk and better performance guarantees than other technologies. More importantly, the proposed IWMF will be the first significant waste management facility in Hong Kong and because of its substantial duty to reduce waste disposal to landfill, it is reasonable to apply a technology which has hundreds of good reference facilities around the world.

13. However the technology selection for IWMF Phase 1 should not be restricted until a full technical assessment has been carried out from all prospective IWMF contractors who bid for the project.

Emissions Control

14. All thermal treatment technologies such as moving grate, fluidised bed and gasification without a doubt will produce emissions. It is a fact that the emissions can be controlled and can meet the very strict emission standards through plant operational excellence and combustion control together with modern flue gas treatment (FGT) methods.

15. For grate combustion, typically dust emissions account less than 10% (averaged) of the emission limit set by the European Union (EU). Dioxins and furans may account 2% (averaged) of the EU emission limit.

16. Although it may not be necessary, a multi-staged advanced FGT solution can be employed to further reduce dust / particulate matters emissions

17. The Environmental Impact Assessment (EIA) undertaken by EPD has demonstrated the proposed stack height could ensure ground and sea emission depositions within the acceptable level. The air quality modelling assessment has been carried out by an expert and therefore I have no comment on this matter.

18. In terms of odour, most modern waste-to-energy facilities are operated in a negative pressure environment whereby air continues to be drawn from outside through the waste reception hall and the combustion chamber. Therefore odour (as a result of organic reactions/decompositions) is greatly minimised. Again it may not be necessary, further odour control using a biofilter (for example) can be employed for the IWMF.

Process Residues (typically 6% to landfill, depending on waste composition)

19. All waste treatment facilities will produce process residues. In the case of moving grate firing combustion, we typically see 20% bottom ash and 6% air pollution control (APC) residues (boiler ash + fly ash). The amount of ashes produced is greatly depending on the input waste composition and it may go up or down over time as the waste mix is likely to be changed (for example, more food waste will be taken out from the mix in the future).

20. Normally the total organic carbon (TOC) in the bottom ash would be lower than 3% and the loss on ignition (LOI) would be lower than 5%. In addition the soluble (i.e. biologically relevant) heavy metal content and other potentially hazardous components would be negligible. The bottom ash could be processed to produce useful aggregate products for the construction industries. Hence they do not normally go to landfill.

21. The APC residues may account up to 6% of the total waste input. These residues typically consist of a) fine ash particles, b) products (salts) from the reaction between alkaline absorbents (e.g lime if use) and acidic gases, such as calcium chloride, calcium sulphate etc; and c) activated carbon, which is injected into the flue gas stream as an adsorbent for volatile heavy metals (e.g. Hg and Cd) and hazardous organic trace components (such as halogenated dioxins). The APC residues may require treatment prior to landfill disposal.

22. Overall it is unlikely that ash to be sent to landfill would be more than 10% of the total waste.

Recommendations for Consideration

23. Introduce various levels of charging scheme for domestic, commercial and industrial wastes.

24. Speed up the policy development and legislation processes for municipal solid waste (MSW) charging.

25. Discourage the excessive use of packaging materials by introducing charges where practical.

26. Introduce financial incentives for green achievers, recyclers and renewable energy producers.

27. Divert waste from landfills further by enhancing the waste treatment and recycling capacities.

28. Provide greater resources allocation, funding, infrastructure and logistic for waste separation, collection and recycling.
29. Introduce policy to support the development of smaller scale organic waste treatment schemes in strategic locations (e.g designated sites) to enhance food waste collection and treatment.
30. Speed up the procurement of organic waste treatment facilities (OWTF) Phase 2 and confirm the timetable and the specifications for the proposed OWTF Phase 3.
31. Confirm the landfill extension capacity of the existing landfill sites and provide a long term vision of these landfill sites.
32. The choice of technology for IWMF should not be restricted at this stage and EPD should allow "contractors" to offer the best available technical solutions. When choosing the technologies as well as selecting the final contractor(s), EPD as the procurer and the ultimate owner of the facility, can utilise its power to ensure a balanced assessment to be made on plant reliability and availability, guaranteed technical performance, effective emissions control and techno-economic analysis taking into account of long term operation and maintenance costs, sustainability and environmental impacts.
33. A state of the art IWMF for Hong Kong is needed and it is recommended EPD to publish their technology assessment which should demonstrate to the public that EPD indeed has chosen the best available technology for Hong Kong people.
34. It takes time to see the effect of a waste management plan whether it is successful or still requires improvement. As the waste compositions as well as the waste quantity today are likely to be different in the future, it is recommended EPD to provide a long term waste flow assessment and to confirm the necessities and timescale for further landfilling, the IWMF Phase 2 and other significant waste management facilities in the future.
35. The development of the proposed IWMF in Shek Kwu Chau requires continuous stakeholder engagement for public acceptance. I encourage a direct, comprehensive stakeholder management plan and a continuous open dialogue with the public to be offered by EPD in order to reinforce the necessities of landfill extension as well as the development of IWMFs and OWTFs.
36. I urge the Legislative Council to approve the funding for the development of IWMF Phase 1. This will enable a swift development of IWMF in order to minimise landfilling sooner.
37. A well-built resource level is required to implement the actions as stated in the two mentioned publications. I would recommend EPD to strengthen its waste management team to reinforce speedy implementation of the waste management plan.

Should you require any clarifications and discussions on the above points, please do not hesitate to contact me.

Yours faithfully,

Nilton Chan