

**Confirmed Minutes of the 108th Meeting of
the Environmental Impact Assessment Subcommittee
held on 15 June 2009 at 2:30 pm**

Present:

Prof Paul LAM, JP (Chairman)
Mr TSANG Kam-lam (Deputy Chairman)
Dr Dorothy CHAN, BBS
Mr Edwin LAU
Dr MAN Chi-sum, JP
Prof Joseph LEE
Mr Michael LEE
Dr YAU Wing-kwong
Prof LAM Kin-che, SBS, JP (ACE Chairman and non-EIASC Member)
Ms Josephine CHEUNG (Secretary)

Absent with Apologies:

Ms Teresa AU
Ms Betty HO
Mr Simon WONG, JP

In Attendance:

Mr J K CHAN	Acting Assistant Director (Conservation), Agriculture, Fisheries and Conservation Department (AFCD)
Mr C W TSE, JP	Assistant Director (Environmental Assessment), Environmental Protection Department (EPD)
Ms Loletta LAU	Executive Officer (CBD), EPD

In Attendance for Agenda Item 3:

Mr Sam WONG	Principal Environmental Protection Officer (Regional Assessment), EPD
Mr Stanley LAU	Senior Environmental Protection Officer (Regional Assessment) ³ , EPD
Mr Alan CHAN	Senior Marine Conservation Officer (East), AFCD
Dr SO Chi-ming	Fisheries Officer (Assessment & Claims), AFCD
Mr LEE Wai-hung	Wetland & Fauna Conservation Officer (Ornithology), AFCD
Mr LEE Ying-ming	Country Parks Ranger Services Officer (East), AFCD
Mr NG Tak-wah	Senior Town Planner/Urban Design 1, Planning Department
Mr Alex TANCOCK	General Manager, Wind Prospect (HK) Ltd.

Mr Joseph LAW	Project Manager – HK Renewable Energy, CLP Power Hong Kong Ltd. (CLP)
Mr Rick MORSE	Head of Environmental Strategy and Development, CLP
Mr LO Pak-cheong	Commercial Director, CLP
Ms Rhonda LAM	Public Affairs Manager, Environment, CLP
Mr Brian ASHCROFT	Regional Director, BMT Asia Pacific Ltd. (BMT)
Mr Richard COLWILL	Managing Director, BMT
Mr Alexander DUGGIE	Managing Director, Urbis Ltd.
Mr Michael THOMAS	Landscape Designer, Urbis Ltd.

Action

Agenda Item 1 : Confirmation of the draft minutes of the 107th meeting held on 21 January 2009

The Chairman informed Members that the draft minutes of the 107th meeting held on 21 January 2009 had been circulated to Members in February 2009. Members had confirmed the draft minutes by circulation.

Agenda Item 2 : Matters arising from the minutes of the 107th meeting held on 21 January 2009

2. There were no matters arising from the minutes of the last meeting.

Agenda Item 3 : EIA report on Hong Kong Offshore Wind Farm in Southeastern Waters (ACE-EIA Paper 6/2009)

Internal Discussion Session

3. The Chairman informed Members that agenda item 3 would be divided into the following four sessions –

- (a) Internal Discussion Session
- (b) Presentation Session
- (c) Question-and-Answer Session
- (d) Internal Discussion Session

The Presentation Session and Question-and-Answer Session would be opened to the

public. Internal Discussion Sessions of agenda item 3 and all other sessions of the meeting would remain closed.

4. A Member declared that his company was commissioned by the CLP Power Hong Kong Ltd. (CLP) as an independent monitoring agent to review the continuous emission of CLP's power stations. A Member declared that he was a member of the CLP Education Fund Advisory Committee. The meeting agreed that they could stay and continue to take part in the discussion in view of the indirect relationship with the project under consideration.

5. The Chairman informed Members that the current EIA was a designated project under "Schedule 2" of the EIA Ordinance. The public inspection period of the EIA report was from 3 June to 2 July 2009. The Environmental Protection Department (EPD) received 30 sets of public comments before the meeting. Separately, some Members had raised some questions and made some comments on the EIA report. The public comments as well as the response from the project proponent to Members' questions and comments had been circulated to Members for reference before the meeting.

6. Members agreed that the discussion should focus on the need for the project, financial implications of the project, landscape and visual impacts, water quality impacts, fisheries, geological impacts, avifauna, light pollution and noise impacts.

(The project proponent team joined the meeting at this juncture.)

Presentation Session (Open Session)

7. Mr Alex Tancock introduced the background and purpose of the project. Mr Brian Ashcroft briefed Members on the findings of the EIA study.

Question-and-Answer Session (Open Session)

Need of the project

8. A Member enquired about the need of the project. Mr Brian Ashcroft explained that the Chief Executive stated in the Policy Address in May 2007 the target of meeting 1% to 2% of Hong Kong's total electricity supply with

renewable energy (RE) by 2012. The project was built to meet this policy target and had a capacity to produce approximately equivalent to 1% of Hong Kong's annual total electricity needs. It was a global trend to develop RE to reduce greenhouse gas emissions.

9. A Member enquired about the choice of wind power instead of other forms of RE. Mr Alex Tancock explained that electricity generation technology by wind power was the most popular among various forms of RE technologies in the world up to the current stage. In 2008, about 50% of the RE electricity generation capacity in Europe and 40% of those in the United States were from wind power. The Mainland was developing wind power facilities at a fast pace as wind power was the most cost-effective RE facilities other than large scale hydroelectric power facilities. In Hong Kong, it would not be possible to achieve the near 1% target by developing other forms of RE facilities.

Financial implications

10. A Member enquired about the cost implications of the RE project, in particular on electricity tariffs. Mr Joseph Law explained that the project was part of the business of the CLP in Hong Kong and thus fell into the regime of the Scheme of Control Agreements which included a provision in encouraging RE usage in their electricity generation. At the current stage, they mainly focused on the assessment of technical and environmental acceptability of the project. A research mast would be constructed to collect wind and wave data to understand better the offshore environment. The data would be important for the assessment of the project on the economic aspect. In general, the cost of using RE in electricity generation would be higher than burning of fuels, such as coal and natural gas. Depending on the size of the wind farm, preliminary estimation showed that the potential cost implication would be less than 1% for a wind farm generating 50 mega-watts (MW) of electricity to about 2% for a wind farm generating 200 MW of electricity.

11. A Member enquired about the estimated daily output of the wind farm assuming a wind speed of 5 metre/second (m/s). Mr Alex Tancock explained that the estimated output would hinge on the size of the project and type of turbine but these would depend very much on the characteristics of the wind regime at the site and the data had yet to be collected from the research mast. Based on available local wind data, the initial estimation was that the wind farm could produce

electricity for about 80,000 local household consumption each year based on the 200 MW capacity.

12. A Member asked about the possibility of reducing fossil fuels for electricity generation after operation of the wind farm project. Mr Joseph Law said that coal was used by CLP as the final tier to meet the load demand. Coal burning would be reduced when electricity could be generated by wind power.

Landscape and visual impacts

13. A Member enquired about the visual impacts of the project, including impacts on hikers/visitors to the Sai Kung Country Park and the proposed geopark (Geopark) in Sai Kung area. Mr Alexander Duggie explained that very few visual sensitive receivers (VSRs) were within the 5 km zone from the wind farm site as shown in Figure 10.28 of the EIA report (which used a 3-D modelling approach). Most of the VSRs were in the 15 km zone. When moving farther away from the site, the visual impacts of the wind farm within the range of view would diminish dramatically. VSRs within the 5 km zone were mainly boat users. In view of their brief stay in the area, the impacts would be very transient. The level of impacts in the worst case was categorized as “moderate” which mainly referred to visitors near the Ninepin Group. Based on the per year visitor estimates of about 110,000 to the Geopark in Sai Kung area provided by the Agriculture, Fisheries and Conservation Department (AFCD), it was estimated that the number of visitors to the 5 km zone would be around 50,000 to 100,000 per year as the boat trips would depend very much on weather conditions. In the 15 km zone, the level of significance of visual impacts on residents of Silverstrand and Bella Vista was categorized as “moderate”. While the residents would perceive the wind farm from a farther distance, the time of stay in the residence was longer. For other VSRs, the impacts were assessed to be “slight” or “insignificant”. For the construction phase, the anticipated residual visual impacts were shown in Figure 10.27 of the EIA report. The level of impacts was generally slightly higher due to the construction activities around the site. The level of significance of visual impacts for visitors near Ninepin Group during the construction phase was categorized as “substantial”.

14. Mr Richard Colwill said that visitors to the Geopark would travel on boat. The co-existence of the wind farm and Geopark would be complementary as visitors could enjoy the natural geology on one side while appreciating the

environmentally-driven wind farm project on the opposite side. Mr Alex Tancock added that overseas experience showed that offshore wind farm often became a site of tourist attraction in view of its positive blend with the natural seascape, such as the wind farm about 3 km from the popular beach resort of Great Yarmouth in the UK. As regards hikers of the Sai Kung Country Park, Figure 10.7a of the EIA report showed a computerized assessment of visibility of the turbine blades based on the contours of different viewpoint locations. It showed that the majority of Sai Kung Country Park would not be able to view the wind farm structures. The site selection process had considered a site far away from popular hiking areas.

15. A Member asked about the difference in terms of footprint of the project by using 40 turbines (each of 5 MW) or 67 turbines (each of 3 MW). Mr Alex Tancock explained that the 5 MW turbines would be larger with longer blades but there would be slight difference in terms of footprint. If fewer turbines were used, they would be spaced further apart within a similar footprint area. In conducting the EIA study, both scenarios were taken into account and environmental impacts of the worst-case scenario were taken. As the technology of wind turbine was evolving at a fast pace, the flexibility of allowing different scenarios would enable them to use the most cost-effective technology with the least environmental impacts available at the time of construction.

16. Mr Alexander Duggie referred to the layout plans in Figures 10.1a and 10.1b of the EIA report and explained that there was not much difference in terms of landscape and visual impacts for the two scenarios. International research showed that a clear majority of the public had more favourable responses towards the appearance of wind farms and accepted them as positive contributions to the landscape in the long run compared with other types of development. There were also symbolic and psychological meanings attached to wind farms in representing efforts for sustainable development of RE.

17. A Member asked about the possibility of reducing the footprint of the project. Mr Joseph Law said that if the number of turbines was reduced, it should be possible to reduce the footprint of the project proportionately. Nonetheless, it should be noted that the output of 200 MW of electricity was a requirement to meet the Government's target.

18. A Member enquired about the availability of information on the perception of wind farms in the local context or perception to specific groups of

people, such as hikers and nature lovers. Mr Alexander Duggie said that no specific information was available on these aspects. Nonetheless, there was information from local residents of Scotland expressing that the wind farm gave calming effects on the residents as a part of the landscape. According to some famous landscape architects, the visual impacts of a large-scale structure in a wide landscape would not be significant given that there was no identifiable object in the vicinity to give the structure a sense of scale. Mr Brian Ashcroft added that in the local context, the project would have a symbolic meaning for Hong Kong as a landmark of better environment.

19. The Chairman enquired about public engagement on the impacts of the project in particular on the aspect of visual impacts. Mr Brian Ashcroft explained that they had an extensive stakeholder consultation process through meetings, briefings and site visits. The general response was quite favourable. They would continue to liaise with stakeholders to enhance communication and facilitate understanding of the project. A Member suggested that the hiking groups should be included.

20. A Member noted that there were concerns over the planned application of the Geopark for being listed as a United Nations Educational, Scientific and Cultural Organization (UNESCO) Global Geopark due to the existence of a wind farm about 5 km away. The project proponent team explained that while the wind farm was about 5 km away from the Ninepin Group, it was about 10 km away from most sites of the Geopark. The project had avoided environmentally sensitive areas including the Geopark. Neither the proposed wind farm development nor the proposed cable alignment fell within the buffer area of the Geopark.

Water quality impacts

21. A Member pointed out that in Hong Kong, it was known that red tide and algal bloom patches might be formed in Mirs Bay and be carried by the tidal current to the south of Hong Kong through the proposed wind farm location. As the model results indicated reduction in flow velocities within the wind farm, the effect of the wind farm upon the mass transport through the wind farm location and its vicinity remained to be evaluated.

22. Mr Richard Colwill explained that conservative assumptions were

adopted in the EIA study by using the 3-D hydrodynamic models. Based on the modelings, the absolute value of reductions in current speed was only about 0.1 m/s within the wind farm footprint. The small deviations in current speeds inside the wind farm were localized, which would not cause abrupt changes to the flushing capacities in major channels. The difference in velocity at agreed coastal locations before and after the project was found to be negligible. The water quality was not likely to be changed due to the small variations in velocities at the wind farm site.

23. A Member considered that the footprint of the wind farm was quite large (4 km x 4 km) and it was located close to precious coastal waters of excellent water quality and high marine conservation interest. While the impact assessment of the wind farm on flow and water quality had been carried out, it was considered that other impacts in the same general area would need to be further studied after operation. As there were uncertainties on the operational impact of the wind farm, it was strongly advisable for monitoring in the operational phase to be carried out. The availability of such data would reduce substantially the uncertainty of the model predictions.

24. A Member enquired about examples of offshore wind farm projects of similar scale in overseas countries. Mr Alex Tancock said that the biggest offshore wind farm was a project with an output of 630 MW of electricity and there was experience around the world in building large scale offshore wind farms near urban waters.

Fisheries

25. A Member noted that only information on fishing intensity in June and July was presented in the EIA report. Mr Richard Colwill explained that radar data was illustrated for June to July to illustrate busy summer fishing activities. The EIA study also included review of relevant available information, such as port surveys of AFCD, interviews with fishery sector, visual surveys at the site and studies by radar tracking during site selection exercise. The information collected was consistent with previous studies that the area was not a major fishing area and productivity of capture fisheries was relatively low as the site was mainly silty mud bed with low ecological value.

26. A Member noted that overseas experience showed that turbine foundations could serve as artificial reef substrate for colonization by benthic

epifauna which was likely to benefit the overall abundance and diversity of fisheries resources in the area. He suggested the project proponent to liaise with the fishery sector on opportunities for fishery enhancement activities. Mr Joseph Law said that they had been liaising with the fishery sector on the project and a boat trip to the site would be arranged. They would continue to work with them closely on the potential impacts and opportunities of the project.

Geological impacts

27. A Member enquired about the study of geological impacts of the site. Mr Brian Ashcroft explained that there would not be physical interference, including laying of cables, between the project and the Geopark. With the use of suction caisson foundation, the impacts on the surface sediment area would be minimized as no dredging and piling would be required. The construction works would not intrude into the rock layer of the seabed or affect the permanent geology of the site. Mr Richard Colwill added that the wind farm structures would have a service life of about 20 to 25 years and the setting could be fully reversible.

Avifauna

28. A Member noted that only day time surveys of birds were conducted in the EIA study. Mr Richard Colwill explained that a review of literature and previous seabird surveys had been conducted on the bird movement in the area. It was found that birds were sparsely populated in the study area. Birds identified were mainly species active dominantly in the day time and there were no migratory routes. Conducting night time surveys with radars would not be able to capture bird activities of identified bird species. Findings of the EIA study were consistent with previous seabird studies.

Light pollution

29. A Member enquired about possible impacts of the navigation lighting of turbines, especially impacts on star gazing activities at Sai Kung. Mr Richard Colwill explained that the rays of navigation lighting would have a range of up to 5 nautical miles and they would not be visible along most parts of the shoreline at Sai Kung. The aviation lighting would mainly be at the top of the turbines pointing upwards with low to medium intensity. Mr Alex Tancock added that they were working closely with the Civil Aviation Department to ensure that the lighting

installations would comply with the requirements and minimize light pollution.

Noise impacts

30. A Member enquired about the noise impacts of the turbine operation, especially on boat users. Mr Alex Tancock explained that noise impact assessments on marine mammals and birds were included in the EIA report. It was not a requirement in the Study Brief to assess the noise impacts on boat users. As indicated in a noise contour plot shown (based on a typical noise emission of 105.1 dB(A) in a wind speed of 8 m/s at 10 m above ground level), the noise level diminished away from the wind farm. The noise level at the east of Ninepin Group would be less than 20 dB(A) which would be less than the background noise of the ocean. On the request of Members, Mr Tancock undertook to provide a copy of the noise contour plot for Members' reference.

(Post-meeting note: The noise contour plot provided by the project proponent was circulated to Members after the meeting.)

31. A Member enquired about the tonal character of the noise from the turbine operation. Mr Brian Ashcroft explained that the characteristic of the noise was sub-tonality which would not be annoying in the offshore context. Mr Alex Tancock added that the noise generated from modern wind turbines was minimal as the design of the nacelle was sound proof to minimize mechanical sound.

Other issues

32. A Member was concerned about the sewage generated by workers during the operational phase. Mr Richard Colwill explained that the maintenance works would only involve temporary stay of a few workers on the platform being transported by boats. The workers were not expected to stay overnight in the emergency accommodation. Mr Rick Morse said that they would ensure that the requirements on waste management, including sewage generated by workers, would be fully complied with.

33. A Member enquired about the use of the diesel tank of 100 m³ in the offshore transformer station. Mr Alex Tancock explained that the diesel would be used for the generator at the transformer platform for back-up use. The size of the diesel tank was similar to that for a large fishing boat.

(The project proponent team left the meeting at this juncture.)

Internal Discussion Session

34. On the issue of landscape and visual impacts, A Member suggested requiring a shorter distance between the turbines in order to reduce the footprint and thus the visual impacts. Mr Ng Tak-wah advised that from the visual impacts point of view, different configurations and layouts of the turbines would have different visual impacts. While a more clustered layout with shorter distance between the turbines would reduce the footprint of the project, the visual impacts might not necessarily be reduced.

35. On the proposed Geopark, Mr Lee Ying-ming advised that the proposed Geopark would include two regions covering eight locations, including the Ninepin Group, Ung Kong Group, Tung Ping Chau and Double Haven. The Ninepin Group consisted of islands out at the east waters. The islands were famous for its imposing hexagonal columns which measured over 2 metres in diameter, ranking first in the region. Application had been made to the Mainland Authority for the proposed Geopark to be listed as a National Geopark by end 2009.

36. Mr Alan Chan advised that given the immense scale of the project, large footprint area of the development site, the pristine natural seascape of East Sai Kung, any visual impact arising from the proposed wind farm on visitors to the Geopark, in particular the geosite at Ninepin Group would be of great concern. As such, AFCD had provided updated information to the project proponent, including the proposed development plan, location map and estimated number of visitors of the Geopark, to allow an accurate and robust assessment be made in the EIA report. AFCD also requested the Planning Department to scrutinize the assessment results from visual perspective. In light of the concern over visual impacts, AFCD had invited the project proponent to present the project proposal in the Country and Marine Parks Board to be held on 18 June 2009.

37. Having regard to the findings and recommendations of the EIA report and information provided by the project proponent, the meeting agreed to recommend to the full Council that the EIA report could be endorsed with the following proposed conditions –

- (a) the project proponent should submit to the Director of Environmental Protection (DEP) for approval, before commencing the construction of the project, the final layout of the wind farm turbines with demonstrations that the final layout, among the possible alternative layouts, has minimized the footprint of the project and maximized the distance of the turbines from Ninepin Group and Ung Kong Group;
- (b) the project proponent should submit to the DEP for approval, before commencing the construction of the project, a fisheries enhancement plan incorporating measures, including deployment of artificial reefs, in consultation with the fishery sector and the AFCD;
- (c) the project proponent should enhance the Environmental Monitoring and Audit on marine water quality covering the following items (as shown in the **figure** attached) –
 - (I) For the construction phase monitoring:
 - (i) adjust the location of the control station from C2 to C2’;
 - (ii) an additional station M10 to monitor the construction impact to the ecologically important Basalt Island; and
 - (iii) additional four tidal current stations TC1 to TC4 to monitor the impact of the wind farm on the surrounding tidal current and salinity-temperature structure (hourly measurements for tide and current based on moored instruments, and vertical conductivity-temperature-depth profiles).
 - (II) For the operational phase monitoring:
 - (i) same measurements at TC1 to TC4 at least for one year; and
 - (ii) similar measurements at two locations (TC5 and TC6) within the wind farm.
- (d) to facilitate communications and consultation in respect of environmental impacts of the project, the project proponent should, within six months upon the issue of the Environmental Permit, set up a Stakeholder Liaison Group comprising representatives of concerned parties, including those related to fishery sector, environmental and

hiking groups, to advise on the design, construction and operation of the project and should inform the Advisory Council on the Environment (ACE) and the DEP in writing the membership and terms of reference of the Stakeholder Liaison Group and should take into account ACE's views. The project proponent should place all minutes of meetings, relevant documents and associated papers of the Stakeholder Liaison Group on the dedicated website set up by the project proponent, within one month of the dates of the meetings.

38. The meeting also agreed to recommend the Secretary for the Environment to closely monitor the fuel mix used for electricity generation by the CLP to ensure that the burning of fossil fuels would be reduced proportionately with the generation of RE by wind power upon completion of the project.

39. The meeting agreed that there was no need to invite the project proponent team to attend the full Council meeting.

Agenda Item 4 : Monthly updates of applications under the Environmental Impact Assessment Ordinance

40. Members noted the updates.

Agenda Item 5 : Any other business

Modus Operandi of the EIA Subcommittee

41. The Chairman informed Members that the current "Modus Operandi of the EIA Subcommittee" was issued in 2001 as an annex to ACE Paper 1/2001. At the informal meeting of the "Working Group to review EIA-related matters" (Working Group) under the EIA Subcommittee held on 21 April 2009, Members (including some retired Members) took the opportunity to update and review the Modus Operandi. The marked-up version with proposed amendments had been passed to Members before the meeting.

42. Members had no further comments on the proposed amendments and agreed to submit the revised Modus Operandi to the full Council for endorsement at its coming meeting in July 2009.

Guidance Notes related to EIA process

43. The Chairman informed Members that the Working Group also took the opportunity to review the Guidance Notes related to EIA process. EPD would seek comments from stakeholders on the draft revised Guidance Notes. EPD would consider the comments received and submit the recommended revised versions of the Guidance Notes to EIA Subcommittee for further comments and agreement.

Tentative items for discussion at 109th meeting

44. The agenda was being compiled. Members would be informed in due course.

Agenda Item 6 : Date of Next Meeting

45. The next meeting was scheduled for 20 July 2009.

(Post-meeting note: The meeting scheduled for 20 July 2009 was cancelled.)

**EIA Subcommittee Secretariat
June 2009**

**Proposed locations for marine water quality monitoring stations for
Hong Kong Offshore Wind Farm in Southeastern Waters**

