Islands District Council Paper IDC 46/2010

Installation of Wind Monitoring Station at the SouthWest of Lamma Island

Purpose

1. The purpose of this paper is to seek Members' views on the proposed installation of an 80m high offshore Wind Monitoring Station at about 4km SouthWest of Lamma Island. Representatives from The Hongkong Electric Company Limited ("HEC") and its consultant will be present at the IDC Meeting to respond to any questions on this project.

Background

- 2. HEC proposed to install an 80m height offshore Wind Monitoring Station ("the Station") at about 4km SouthWest of Lamma Island for collection of wind data. The wind data collected from 2011 to 2015 is to confirm the study of developing a 100 Mega Watt offshore Wind Farm in Hong Kong with a view to generating 1% to 2% of renewable energy for their customers and protecting the environment of Hong Kong.
- 3. The construction work would comprise two separate stages: (i) the construction of the supporting deck including ground investigation and the foundation works below the water level and (ii) the construction of the lattice tower on top of the supporting deck. Approximately 8 numbers of marine piles will be installed by percussive piling as the foundation of the Station. The total sea-bed area affected is approximately 2030m².
- 4. Regarding the details of the proposed works, please refer to the Attachment prepared by HEC.
- 5. Relevant Government Departments such as Agriculture, Fisheries and Conservation Department, Civil Aviation Department, Environmental Protection Department, Marine Department, Planning Department and District Office (Islands) have been consulted. No adverse comment on the proposed works has been received during departmental circulation.

Gazettal of the Proposal

- 6. Lands Department will arrange for gazetting the foundation works of the Station under the Foreshore and Sea-bed (Reclamations) Ordinance (Chapter 127).
- 7. Members' comments and suggestions are invited.

District Lands Office, Islands

April 2010



Installation of Wind Monitoring Station <u>at the Southwest of Lamma Island</u>

1. Purpose

The Hongkong Electric Co., Ltd. (HEC) has applied to the Government for the grant of the Short Term Tenancy for the installation of an 80m high offshore Wind Monitoring Station ("the Station"). The proposal is now submitted for Members' comments prior to Lands Department arranges for the gazetting the foundation works of the Station under the Foreshore and Sea-bed (Reclamations) Ordinance (Cap 127) ("the Ordinance").

2. Background of the Station

To demonstrate continued commitment in supporting sustainable development and protecting the environment of Hong Kong, HEC is in active pursuit of developing about 100 Mega Watt offshore wind farm in Hong Kong with a view to generate 1% to 2% of renewable energy for the customers. Given the scarcity of land resources within the territory, going offshore is viewed as the way forward for sizable development of wind farm. Having reviewed the wind potentials of various proposed sites, HEC plans to install an 80m height offshore Wind Monitoring Station at about 4km SouthWest of Lamma Island for the collection of wind data to confirm study of developing an offshore wind farm in Hong Kong Waters. The construction work would comprise of two separate stages, namely (i) construction of the supporting deck including ground investigation and the foundation works below the water level and; (ii) construction of the lattice tower on top of the supporting deck.

3. Basic Information

In 2009, HEC has assessed the potential project impacts on water quality, marine ecology and fisheries, and has recommended appropriate mitigation measures to minimize those impacts as detailed in Appendix 1.

4. Installation of the Station and Gazetting under the Ordinance

Lands Department has processed the application for the Short Term Tenancy for the installation of the Station.

The information of the Station has been circulated among relevant Government departments and no adverse comments have been received. Departmental comments have been considered and have been addressed in the design and future installation works as appropriate. Lands Department considered that before approval could be given on the grant of the Short Term Tenancy, HEC has to obtain the authorization of the installation works from the Chief Executive in Council under the Ordinance.

5. The Proposed Wind Monitoring Station

| a. Scale of the proposed Station | | The plan area of supporting deck is approx. $11m \ge 14m$ maximum at about 15m above highest sea level. The Station will be fixed to the deck and the whole installation will occupy a height of not more than 80m. The area barricaded by the raking piles will vary with their depths such that the concerned area is 250 m^2 at mean sea level, 500 m^2 at sea bed level and 2030 m^2 (about) pile toe level. Further optimization of the proposed Station to reduce its scale will be carried out during detailed design stage. |
|-------------------------------------|---|---|
| b. Method of Installation | : | (i) Ground Investigation |
| | | The works will be carried out by initially installing a 250mm diameter thinned-wall steel casing down to the seabed and followed by lowering drill bits inside the casing to obtain soil samples at various depths. |
| | | (ii) Piling Works and Deck Construction |
| | | If the percussive piling is adopted, approximately 8 nos. of marine piles will be installed as the foundation of the Station. The proposed steel tubular piles will be driven into the existing seabed by a hydraulic hammer. The concrete supporting deck will then be constructed in-situ after the completion of the piling. |
| | | (iii) Wind Station Erection |
| | | If high rise mast tower design is adopted, the steel tower will be pre-fabricated offsite and transported to the site by marine vessel. The mast tower will then be erected by a heavy duty lifting barge and fixed to the supporting deck. |
| c. Timetable | : | The construction work will be commenced after granting of permission / Short Term Tenancy (STT) from the District Lands Office, Islands. |
| | | Note: Upon completion of construction works, the Station is expected to be erected on site for a maximum of 4 to 5 years. If the findings of wind data indicate that it is viable for constructing the proposed Wind Farm, the Station can either be |

| | retained to form part of the proposed Wind Farm, or otherwise the whole Station will be removed. |
|--|---|
| | |

Please see Appendix 2 for the location of the proposed Station.

6. Conclusion

Various technical aspects regarding the design and installation of the Station have been thoroughly studied, and the engineering, environmental and public safety aspects have also been examined to the satisfaction of relevant Government departments.

HEC has been in close dialogues with stakeholders from the fishery industry to hear their views and concerns with regard to the project. A Fisheries Review and Consultation Programme will be implemented prior to commencement of construction of the wind turbines. The Programme will also explore the possibility of additional measures to be undertaken to enhance fisheries resources in the area. A Fisheries Enhancement Plan will be developed if deemed necessary.

As recommended by Lands Department, comment on the Station shall be sought from the District Council before formal gazetting. In addition, under Section 6 of the Ordinance, any person who considers that he has an interest, right or easement in or over the foreshore and sea-bed may, by notice in writing delivered to the Director of Lands before the expiration of such time begin not less than 2 months as shall be specified in the notice, object to the proposed installation works.

Appendices

- 1. Mitigation Measures and Conditions to be Complied with by HEC
- 2. Plans showing the Proposed offshore Wind Monitoring Station

The Hongkong Electric Co., Ltd.

April 2010

APPENDIX 1 - MITIGATION MEASURES AND CONDITIONS FOR WMS TO BE COMPLIED WITH BY HEC

| EIA Ref. | Environmental Protection Measures | Duration of | Implementation Agent | Impler | nentation | Stage | | Relevant Legislation & — Guidelines |
|-----------------------------|---|------------------------|-------------------------|--------|-----------|--------|---|--|
| | | Completion of Measures | | Des | С | Post-C | 0 | |
| 1. Water Q | Quality | | | | | | | |
| S 6.8 and EM&A Manual | The contractor(s) will ensure that the works cause no visible foam, oil, grease, litter or other objectionable matter to be present in the water within and adjacent to the area of marine works. | During Construction | Contractor(s) | | ✓ | | | - |
| S 6.8 | Control and monitoring systems will be used to alert the crew to leaks or any other potential risks. | During Construction | Contractor(s) | | ✓ | | | - |
| S 6.8 | All plant will be fully serviced and inspected before use to limit any potential discharges to the marine environment | During Construction | Contractor(s) | | ✓ | | | - |
| S 6.8 | Avoid spillage of oil, fuel and chemicals from structures by adopting appropriate good site practices | During Construction | Contractor(s) | | 1 | | | Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes |
| S 6.8 | Any grout used would conform to the relevant environmental standards. In addition, the adoption of appropriate operational management by the contractor should lead to low potential for leakage during the pumping phase. | During Construction | Contractor(s) | | ✓ | | | - |
| S 6.8 | No debris shall be willingly discharged to sea. However, should debris be placed on the seabed, this will be removed (wherever practicable) | During Construction | Contractor(s) | | 1 | | | - |





| EIA Ref. | Environmental Protection Measures | Duration of Measures/Timing of Completion of Measures | Implementation Agent | Imple | nentatio | n Stage | Relevant Legislation & — Guidelines |
|------------|--|---|-------------------------|-------|----------|----------|--|
| | | | | Des | С | Post-C O | |
| 2. Waste I | Management | | | | | | |
| S 7.6 | The Contractor shall prepare and implement a Waste Management Plan which incorporates site-specific factors, such as the designation of areas for the segregation and temporary storage of reusable and recyclable materials. | Contract mobilisation / During Construction | Contractor(s) | | ✓ | | - |
| S 7.6 | The Contractor shall ensure only licensed waste collectors are used to collect chemical waste for delivery to a licensed treatment facility | Contract mobilisation / During Construction | Contractor(s) | | ~ | | Waste Disposal (Chemical Waste) (General) Regulation |
| | | | | | | | Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes |
| S 7.6 | The Contractor shall apply for and obtain the appropriate licenses/permits for the disposal public fill and chemical waste. | Contract mobilisation / During Construction | Contractor(s) | | 1 | | Waste Disposal (Chemical Waste) (General) Regulation |
| | | | | | | | Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes |
| | | | | | | | Waste Disposal (Charges for Disposal of Construction Waste) Regulation |
| S 7.6 | EM&A of waste handling, storage, transportation, disposal procedures and documentation through the site audit programme shall be undertaken. | During Construction | ET | | 1 | | - |





| EIA Ref. | Environmental Protection Measures | Duration of Measures/Timing of Completion of Measures | Implementation Agent | Imple | mentatior | n Stage | Relevant Legislation & | |
|-----------|--|---|-------------------------|-------|-----------|---------|------------------------|-------------|
| | | | | Des | С | Post-C | 0 | - Guidennes |
| 3. Marine | Ecology | | | | | | | |
| S 9.12.2 | The vessel operators will be required to control and manage all effluent from vessels. | During Construction / Marine works | Contractor(s) | | 1 | | | - |
| S 9.12.2 | A policy of no dumping of rubbish, food, oil, or chemicals will be strictly enforced. This will also be covered in the contractor briefings. | During Construction / Marine works | Contractor(s) | | • | | | - |
| S 9.12.3 | Vessel operators working on the Project construction or operation will be given a briefing, alerting them to the possible presence of marine mammals in the area, and guidelines for safe vessel operations in the presence of cetaceans. If high speed vessels are used, they will be required to slow to 10 knots when passing through a high density dolphin area. | During Construction / Marine works | ET & Contractor(s) | | ~ | | | - |
| S 9.12.3 | The vessel operators will be required to use predefined and regular routes, as these will become known to porpoise using these waters. This measure will further serve to minimise disturbance to marine mammals due to vessel movements | During Construction / Marine works | ET & Contractor(s) | | 1 | | | - |
| S 9.12.4 | To reduce underwater sound levels associated with percussive piling, the following steps will be taken: Quieter hydraulic hammers should be used instead of the noisier diesel hammers; Acoustic decoupling of noisy equipment on work barges should be undertaken. | During Construction / Marine works | Contractor(s) | | ✓ | | | - |





| EIA Ref. | Environmental Protection Measures | Duration of Measures/Timing of Completion of Measures | Implementation Agent | Implen | nentatior | n Stage | | Relevant Legislation & — Guidelines |
|-------------|---|--|-------------------------|--------|-----------|---------|---|--|
| | | | | Des | С | Post-C | 0 | |
| S 9.12.4 | Best practices are recommended to reduce the impacts to marine mammals: Instigate 'ramping-up' of the piling hammer to provide an advance warning system to marine mammals in the vicinity; Activities will be continuous without short-breaks and avoiding sudden random loud sound emissions | During Percussive Piling works for Foundation Construction | Contractor(s) | | • | | | - |
| S 9.12.4 | An exclusion zone of 500 m radius will be scanned around the work area for at least 30 minutes prior to the start of percussive piling. If marine mammals/sea turtles are observed in the exclusion zone, piling will be delayed until they have left the area. | During Percussive Piling works for Foundation Construction | ET | | ✓ | | | |
| S 9.15.1 | Marine percussive piling works to be restricted to a daily maximum of 12 hours within daylight operations. | During Percussive Piling works for Foundation Construction | Contractor(s) | | 1 | | | |
| 4. Fisherio | 25 | | | | | | | |
| S 10.7 | The impacts to fisheries resources will be minimised by adopting the following measures: The use of competent and experienced contractors and vessels operators; Good planning of the installation sequence to avoid possible clashes; Good promulgation of information relating to construction activities; Thorough auditing of all vessels; Observing good industry construction practices by the Contractors; and, | Marine Works / During Construction | Contractor(s) | | • | | | - |





| EIA Ref. | Environmental Protection Measures | Duration of | Implementation Agent | Impler | nentatior | n Stage | Relevant Legislation & – Guidelines |
|----------|--|---------------------------------------|-----------------------------|--------|-----------|----------|--|
| | | Completion of Measures | | Des | С | Post-C O | |
| S 10.7 | Inform fishermen of possible developments of the Project in advance | Marine Works / During Construction | Contractor(s) / Operator | | ~ | | - |
| S 10.7 | Using good engineering practice, including the use of appropriately sized piles (smaller piles generate lower levels of underwater sound) and piling equipment. | Marine Works / During Construction | Contractor(s) | ✓ | * | | - |
| S 10.7 | Using ramp-up piling procedures. Blow frequency during this ramping up period should replicate the intensity that would be undertaken during full piling (e.g. one blow every two seconds) to provide cues for fish to localize the sound source. Pile blow energy should be ramped up gradually over the 'soft start' period. | Marine Works / During Construction | Contractor(s) | | 1 | | - |
| S 10.7 | The relevant authorities will be notified of activities in the wind monitoring mast area during construction activities, including dates of any works. In addition, the Marine Department will be notified of the final location of the wind monitoring mast structures so that these can be updated on marine charts. | Marine Works / During Construction | Contractor(s) | | ✓ | | - |
| S 10.7 | All vessels engaged in construction activities will be equipped with a Maritime VHF radio and an agreed frequency channel maintained. All vessels involved in the construction works will show the correct lights and shapes and ensure that all movements are promulgated through the Marine Department | Marine Works / During Construction | Contractor(s) | | ✓ | | - |
| S 10.7 | Consider the use of Guard Ship during the construction phase, particularly in periods of high activity. | Marine Works / During Construction | Contractor(s) | | ✓ | | - |





| EIA Ref. | Environmental Protection Measures | Duration of Measures/Timing of Completion of Measures | Implementation Agent | Implen | nentation | ı Stage | | Relevant Legislation & – Guidelines |
|------------|---|---|-------------------------|--------|-----------|---------|---|--|
| | | | | Des | С | Post-C | 0 | |
| S 10.7 | A safety / exclusion zone of 500 m from any area of construction works will be established for all non-Project vessels. The working area will be marked in accordance with Marine Department Notice No. 23 (2009). | Marine Works / During Construction | Contractor(s) | | ✓ | | | - |
| S 10.7 | Temporary lighting should be provided for incomplete structures during construction | Marine Works / During Construction | Contractor(s) | | ✓ | | | - |
| S 10.7 | The wind monitoring mast should be marked according to the requirements of the Marine Department. The precise marking arrangement will be agreed during the Detailed Design Phase. | Detail Design | Designer | * | | | | |
| 5. Landsca | ape and Visual | | | | | | | |
| S 11.7 | Appropriate colours for the wind monitoring mast should be selected to reduce their visibility | Detail Design | Designer | 1 | | | | - |
| 6. Cultura | l Heritage | | | | | | | |
| S 12.8 | No mitigation measures or EM&A is required for cultural heritage aspect of the Project. | - | - | | | | | - |







