

## 1. INTRODUCTION

### 1.1 Background

The Hongkong Electric Co., Ltd (HK Electric) operates the Lamma Power Station (LPS) with a number of power generating units currently in active operation, including six coal-fired units (i.e. L2, L4 to L8), three gas-fired combined cycle gas turbine units (CCGTs) (i.e. L9, L10 and GT57) and five oil-fired open cycle gas turbine units (OCGTs) (i.e. GT1 to GT4, GT6).

At LPS, there were originally seven OCGTs, GT1 to GT7, which were commissioned in the late 80s prior to the enactment of the Environmental Impact Assessment Ordinance (EIAO). Two of the OCGTs, namely GT5 and GT7, were later converted into a CCGT unit (GT57) in 2002 with a total power generation capacity of 345 MW. GT57 was subsequently converted to a gas-fired unit in 2008. A Project Profile for the conversion and operation of GT57 was prepared for application for permission to apply directly for an environmental permit (EP) and the associated EP (EP-083/2000) was issued by the Environmental Protection Department (EPD) in 2000. The other five OCGTs, namely GT1 (55 MW) as well as GT2, GT3, GT4 and GT6 (125 MW each), are used for peak-logging and provide back-up power supply in case of emergencies.

GT2, GT3, GT4, GT57 and GT6, which are located within the Gas Turbine Compound (GT Compound) of LPS and have a total power generation capacity of 845MW, are approaching the end of their service life. Therefore, HK Electric proposes to decommission and demolish these units sequentially from 2022 onwards, and to construct and commission up to four new OCGTs with a capacity of up to 130 MW each (i.e. the proposed GT8, GT9, GT10 and GT11, with a total power generation capacity of 520 MW) within the GT Compound (hereafter referred to as “the Project”) in order to maintain the peak-logging and emergency operational requirements. GT1 located outside of the GT Compound is not included in the Project. GT1 will continue to operate within the LPS.

### 1.2 Purpose and Objectives of the EIA Study

The Project is classified as a Designated Project under the EIAO (Cap. 499) as a result of the following elements:

- Demolition of four existing OCGTs and one existing CCGT at LPS (Schedule 2, Part II, Item 4 A public utility --- electricity power plant); and
- Installation of up to four new OCGTs at LPS (Schedule 2, Part I, Item D.1 Public utility electricity power plant).

An application for an Environmental Impact Assessment (EIA) Study Brief for the Project together with a Project Profile have been submitted to the EPD by HK Electric on 11 June 2020 in accordance with the requirements under Section 5(1)(a) of the EIAO. An EIA Study Brief No. ESB-331/2020 (“the EIA Study Brief”) for the Project was issued by EPD on 21 July 2020.

The purpose of this EIA study is to provide information on the nature and extent of environmental impacts arising from the decommissioning and demolition of the existing units (i.e. GT2, GT3, GT4, GT57 and GT6) and subsequent construction and operation of the new units (GT8, GT9, GT10 and GT11) at the same site in accordance with the requirements described in the EIA Study Brief. This information will contribute to decisions by the Director of Environmental Protection on:

- The overall acceptability of any adverse environmental consequences that are likely to arise as a result of the Project;
- The conditions and requirements for the detailed design, construction and operation of the Project to mitigate against adverse environmental consequences wherever practicable; and
- The acceptability of residual impacts after the proposed mitigation measures are implemented.

In more detail, the specific objectives of the EIA study defined in the EIA Study Brief are as follows:

- (i) to describe the Project and associated works together with the requirements and environmental benefits for carrying out the Project;
- (ii) to identify and describe the elements of the community and environment likely to be affected by the Project and/or likely to cause adverse impacts to the Project, including both the natural and man-made environment and the associated environmental constraints;
- (iii) to identify and quantify emission sources and determine the significance of impacts on sensitive receivers and potential affected uses;
- (iv) to identify and quantify potential waste management issues and impacts arising as a result of the decommissioning, construction and operation activities of the Project;
- (v) to identify and quantify contaminated land within any Project area for the development works, and to propose measures to avoid off-site disposal in the first instance;
- (vi) to propose the provision of infrastructure or mitigation measures so as to minimise pollution, environmental disturbance and nuisance during decommissioning, construction and operation of the Project;
- (vii) to investigate the feasibility, effectiveness and implications of the proposed mitigation measures;
- (viii) to identify, predict and evaluate the residual environmental impacts (i.e. after practicable mitigation) and the cumulative effects expected to arise during the decommissioning, construction, and operation phases of the Project in relation to the sensitive receivers and potential affected uses;
- (ix) to identify, assess and specify methods, measures and standards, to be included in the detailed design, decommissioning, construction and operation of the Project which are necessary to mitigate these residual environmental impacts and cumulative effects and reduce them to acceptable levels;
- (x) to design and specify the environmental monitoring and audit (EM&A) requirements; and
- (xi) to identify any additional studies necessary to implement the mitigation measures of monitoring and proposals recommended in the EIA report.

The EIA Report has been prepared in accordance with the requirements in the EIA Study Brief and the *Technical Memorandum on Environmental Impact Assessment Process (EIAO-TM)*, in order to support the application for an EP for the Project under the EIAO. The description of the Project presented in the EIA Report has been based on the best available information compiled by HK Electric that describes the relevant construction activities, operational details and baseline information describing the conditions relating to the Project and its surrounding environment.

### 1.3 Organisation of the Report

Following this introductory section, the remainder of this EIA Report is organised as follows:

- Section 2 Provides a description of the Project highlighting the decommissioning/ demolition, construction and operational activities and the timeline for implementing the Project, provides information on the need, purpose, objectives and benefit of the Project, as well as consideration of alternatives for the Project. This section forms the basis of the technical assessments presented in Sections 3 to 7 below.
- Section 3 Presents the air quality impact assessment.
- Section 4 Presents the noise impact assessment.
- Section 5 Presents the water quality impact assessment.
- Section 6 Presents the waste management implications.
- Section 7 Presents the land contamination impact assessment.
- Section 8 Describes the EM&A requirements.
- Section 9 Presents the conclusions and summarises the environmental outcomes of the EIA Study