



# Alba Power Station 5 Block 4 Supplementary ESIA Updated Climate Change Risk Assessment

February 2023  
1B0114206  
Rev. 00\_Final





(PO Box 10379)  
The Address Tower  
Office 203, 2<sup>nd</sup> floor, Bldg 655  
Road 3614, Block 0436  
Al Seef, Kingdom of Bahrain  
+973 17 533 259  
+973 17 533 754  
info@environmentarabia.com

Telephone  
Fax  
E-mail

Title	Updated Climate Change Risk Assessment
Date	August 2023
Author	EACS, RHDHV

Document History		
File Name, Revision Number	Status	Date
1B0114206 Alba Power Station 5 Block 4 Updated Climate Change Risk Assessment, Rev 00_Final	Final	14/08/2023

Checked By	Rajith Chandran, Eman Rafea	
Initials/Date	RC, ER	14/08/2023
Approved By	Halel Engineer	
Initials/Date	HE	14/08/2023

Copyright©2023, Environment Arabia, All Rights Reserved. The information in this report shall not be disclosed, duplicated, used in whole or in part for any purpose. A written approval from Environment Arabia shall be obtained prior to use of this document.

## Table of contents

	Page
1 INTRODUCTION	1
1.1 Project description	1
1.2 Report scope	1
2 APPENDICES	3
Appendix A Physical and Transition Risk Assessment Prepared by Envirotech	
Appendix B Updated Climate Change Risk Assessment Prepared by EACS	

## 1 INTRODUCTION

### 1.1 Project description

Aluminium Bahrain B.S.C. (Alba) is the world's second largest single site aluminium smelter. Alba began operating in 1971 with a production capacity of 120,000 metric tonnes per annum (mtpa). Since then, Alba has expanded its capacity to 1,561,222 mtpa of high-quality aluminium products (as of 2021), making its operations critical to Bahrain's downstream aluminium sectors and wider socio-economic development.

Alba owns and operates a smelter plant located adjacent to King Hamad Highway, south of Sitra in the Kingdom of Bahrain. The plant currently features six potlines, with the latest line commissioned in 2018 and achieving full production in Q3 2019. To power production processes, Alba operates a total of five power stations (PS) and generates electricity for use in the facility on-site using natural gas.

As of now, Alba has a captive power generation capacity of 3,665 MW, with PS3, PS4, and PS5 supplying the electricity required by production processes. PS1 has been scheduled for full decommissioning, while PS2 will be kept on standby to provide emergency support and black start capability. Decommissioning works for PS1 and PS2 are currently underway.

PS3 was installed in 1992 and consists of two combined cycle blocks, with six gas turbines and two steam turbines and a total capacity of 800 MW. PS4 was installed in 2005 and consists of two combined cycle blocks, with four gas turbines and two steam turbines and a total capacity of 900 MW. PS5 was newly commissioned in 2019 and consists of three combined cycle blocks, with each block hosting one gas turbine, one steam turbine, and one heat recovery steam generator. PS5 currently has a total capacity of 1,800 MW.

To improve the plant's overall operational efficiency, a fourth block to PS5 with a similar 1:1:1 combined cycle configuration as the existing three blocks was proposed. On completion of the PS5 Block 4 Expansion Project (hereafter referred to as 'the Project'), the capacity of PS5 will increase from 1,800 MW to 2,481 MW.

Block 4 will be integrated with the plant's existing infrastructure with respect to power evacuation, although independent facilities will be constructed for operational controls. PS5 Block 4 is expected to commence its commercial operations in Q4 2024. Given that the Project will expand the capacity and increase the efficiency of PS5 beyond that of PS3 and PS4, Alba intends to shut down and maintain PS3 as emergency standby, while PS4 will be operate on a partial basis.

### 1.2 Report scope

An Environmental and Social Impact Assessment (ESIA) was undertaken by Envirotech Consultancy W.L.L. (Envirotech) on behalf of Alba, and was submitted to the Supreme Council for Environment (SCE), the national environmental regulator, in Q1 2022. The approved ESIA Report was issued to BNP Paribas, the coordinator of project finance, and an Environmental and Social Due Diligence (ESDD) was performed by Citrus, the appointed third-party reviewer.

Following the review of the ESIA, Citrus issued an Equator Principle Action Plan (EPAP) document which identified the gaps in the ESIA and provided actions to mitigate the gaps. One of the gaps identified in the EPAP was the climate change risk assessment

which required updating to align with the EP4 requirements. The following actions were recommended:

- With external consultancy support, update Climate Change Risks Assessment to meet the requirements set out in the EP4 Guidance Note on Climate Change Risk Assessment (CCRA). To include:
  - Assessment of transition risks;
  - alternatives analysis;
  - compatibility with Bahraini climate change commitments; and
  - justification of GHG emissions data.

Following the receipt of EPAP, Envirotech prepared an updated CCRA in the form of an ESIA addendum report and submitted it to Citrus for review. This report is presented in **Appendix A**.

Following the review of updated CCRA, additional gaps/actions were identified:

- Prepare a stand-alone document,
- expand analysis of alternatives to include how the project compares with similar assets, assessment of less GHG emissions intensive options and whether the analysis justifies the proposed design, and
- include justification of GHG emissions data, specifically whether the emissions estimates have received independent validation.

In response to the ESDD outcomes, Alba commissioned Environment Arabia Consultancy Services W.L.L (EACS) to address the gaps in the ESIA and Equator Principle Action Plan (EPAP). The CCRA was prepared by Royal HaskoningDHV UK Ltd., as subcontracted by EACS, and addresses two compliance gaps identified by Citrus. This report is presented in **Appendix B**.

## 2 APPENDICES

## **Appendix A**

### **Physical and Transition Risk Assessment Prepared by Envirotech**

## **Appendix B**

### **Updated Climate Change Risk Assessment Prepared by EACS**