Tournee 1 Solar (RF) (Pty) Ltd – Executive Summary: Climate Change Risk Assessment

Introduction

Tournee 1 Solar (RF) (Pty) Ltd is undertaking the development of the Tournee Solar PV 1 and Tournee Solar PV 2 Facilities (Tournee Solar Park) and associated 132kV Overhead Powerline, northeast of Standerton in the Mpumalanga Province. The Solar Park will comprise of 460 320 bifacial solar PV modules with a total generation capacity of 300 megawatts across the two facilities. This executive summary presents key insights from a Climate Change Risk Assessment (CCRA) undertaken to evaluate how climate change may affect the project now and in the future. The objective is to identify potential risks to people, infrastructure, and operations, and to inform resilience planning throughout the project lifecycle.

Climate change, and the broader political and societal response to it, is already generating material risks and opportunities for businesses globally. These risks have gained momentum over the past five to ten years and are expected to increase exponentially in scope and severity in the coming decades. Physical impacts from extreme weather events such as storms, floods, and droughts can disrupt business operations, damage assets, and present health and safety risks to workers. Proactively understanding and addressing these risks enables both companies and communities to build resilience in the face of a changing climate.

The CCRA was aligned with international best practice, including the Equator Principles (EP4, 2020) and the International Finance Corporation (IFC) Performance Standards on Environmental and Social Sustainability (2012), which require the identification of climate-related physical risks as part of project due diligence.

Methodology

The CCRA was undertaken as a desk-based assessment using publicly available climate datasets and predictive models, supplemented by site-specific information for the Tournee project. Key authoritative sources such as the World Bank Climate Change Knowledge Portal and the World Resources Institute (WRI) Aqueduct Risk Tool and ERM's Climate Impact Platform (CIP) and Climate Data Tool (CDT).

The assessment considered projections for two of the four climate change mitigation scenarios that represent sets of guidelines for climate change scenario projections known as the Representative Concentration Pathways (RCP). The two RCPs used are:

- RCP 8.5 – where low mitigation is implemented.
- RCP 4.5 – where high mitigation is implemented.

A projected change in the number of variables, including extreme weather-events metrics are presented. For each of the metrics under consideration:

- The simulated baseline state over South Africa calculated for the period 1961 – 1990 is shown.
- The projected changes in the metrics are subsequently shown, for the time-slab 2021-2050 relative to the baseline period 1961-2000, and for
- The time-slab 2071-2100 relative to the period 1961-1990.

The findings of this tool form the basis for the analysis of the Climate Change Risk Assessment predictions for the Facility and Overhead Powerline.

Additionally, the assessment the ThinkHazard! Model which provides a general view of the hazards, for a given located, that should be considered in the project design and implementation to promote disaster and climate resilience. The tool highlights the likelihood of different natural hazards affecting the project area (very low, low, medium and high), provides guidance on how to reduce the impact of these hazards, and where to find more information.

Findings

Both the Solar Park and Overhead Powerline are located in the Gert Sibande District municipality, situated in the north-western part of Mpumalanga

In terms of the ThinkHazard! Evaluation, the following risks are associated with the Tournee Solar Park in the Gert Sibande Municipality:

- Wildfire: High
- Earthquake: Medium
- Water Scarcity: Medium
- Extreme Heat: Medium

- Cyclone: Low
- River flood: Very Low
- Urban flood: Very Low
- Landslide: Very Low

Wildfire

Wildfire risk in the Gert Sibande District Municipality is classified as high, with a greater than 50% annual likelihood of conditions that could support significant wildfires causing potential loss of life and property. Wildfire risk must therefore be considered throughout all project phases, particularly during design and construction. Potential impacts include damage from direct flames, radiant heat, ember storms, surface fires, and wind-borne debris that may compromise infrastructure integrity during extreme fire weather events.

Climate change projections indicate that wildfire risk is expected to increase in frequency, duration, and severity due to rising temperatures and greater rainfall variability, resulting in longer fire seasons and more fire-prone days. Projects in the area should be designed to be resilient to escalating wildfire conditions, with site-specific studies used to inform appropriate fire-resistant design and mitigation measures

Extreme Heat

Extreme heat within the Gert Sibande District Municipality is classified as a medium risk, indicating a greater than 25% likelihood of at least one period of prolonged extreme heat causing heat stress within the next five years. This level of risk requires consideration during all phases of the project, particularly in project planning, design, and construction. Climate change projections indicate that continued greenhouse gas emissions will result in more frequent and intense heat extremes over the next 50 years, with temperature increases in this region expected to exceed the global average. As a result, project infrastructure and operational practices should be designed to remain functional and safe under long-term warming conditions.

Water Scarcity

Water scarcity in the district is also assessed as a medium risk, with up to a 20% chance of drought occurring within the next decade. Drought conditions may affect construction activities, infrastructure

design, and the wellbeing of personnel and surrounding stakeholders. Climate projections indicate a medium confidence increase in drought frequency, severity, and spatial extent over time, which is expected to exacerbate water scarcity. It is therefore prudent to incorporate long-term water-efficient design and management measures to ensure the project remains resilient to increasing drought and water availability constraints under future climate conditions.

Mitigation Measures

Wildfire resilience is a key adaptation priority for the project, given the high wildfire risk in the region. Design and operational measures should therefore focus on reducing the likelihood and consequences of fire-related damage. This includes the use of fire-resistant fencing and the establishment of appropriate setback distances around critical infrastructure, as well as active vegetation management and the creation of fire breaks to limit fuel loads. Emergency response and evacuation procedures must be incorporated into project planning to protect personnel and assets during fire events. In addition, infrastructure design should account for the potential impacts of windborne debris during extreme fire weather, which could compromise equipment and structural integrity.

Extreme heat presents a further climate-related risk that requires proactive adaptation measures. Rising temperatures may affect the performance, efficiency, and lifespan of electrical infrastructure, including inverters, transformers, and associated equipment. To address this, heat-tolerant components should be selected, supported by enhanced cooling and ventilation systems where necessary. From an occupational health and safety perspective, heat stress management procedures should be implemented to protect construction and operational personnel, including appropriate work scheduling, rest periods, and access to shade and hydration.

Although flooding is assessed as a low to very low risk at a district scale, localised stormwater and erosion risks may still occur during intense rainfall events. Adaptation measures should therefore include the design and implementation of adequate drainage systems around substations, access roads, and laydown areas to safely convey stormwater and prevent infrastructure damage. Erosion control measures should be implemented to limit sediment mobilisation and downstream impacts, particularly during construction, thereby reducing maintenance requirements and safeguarding surrounding land uses.

In conclusion, the Climate Change Risk Assessment identifies wildfire as the most material climate-related risk to the Tournée Solar PV Facilities, with extreme heat and flooding representing secondary risks. By integrating the recommended adaptation measures into project design, construction, and operation, the project can be made resilient to current and future climate conditions. This approach ensures compliance with Equator Principles 4 and IFC Performance Standards, while supporting the long-term sustainability and reliability of renewable energy generation in the context of South Africa's low-carbon energy transition.