



Adani Green Energy Limited

Screening Level Natural Hazard and Climate Change Assessment in Jaisalmer District, Rajasthan

Executive Summary

14 December 2020

Project No.: 0577764

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EXECUTIVE SUMMARY

Adani Green Energy Limited (hereinafter referred to as 'AGEL' or 'Client') commissioned Environmental Resources Management (hereinafter 'ERM') to conduct Screening Level Natural Hazard and Climate Change Physical Risk Assessment for its proposed hybrid power projects in Rajasthan as given below.

- 390 MW: 101.2 MW Wind and 360 MW Solar in Fategarh
- 600 MW: 151.2 MW Wind and 2 X 300 MW Solar in Jaisalmer
- 700 MW: 510 MW Wind and 250 and 350 MW Solar in Jaisalmer

The assessment was required to be undertaken against international standards to meet the requirement in terms of providing lenders. Accordingly, present assessment was conducted in accordance with Equator Principle (EP) 4 guidelines of IFC as recommended in the Environmental and Social Due Diligence (ESDD) Report of the Project (dated 18 December 2020).

The assessment involved review of national level plans and commitments towards climate change followed by evaluation of natural hazards under baseline and climate change conditions.

National Climate Policies ad Framework

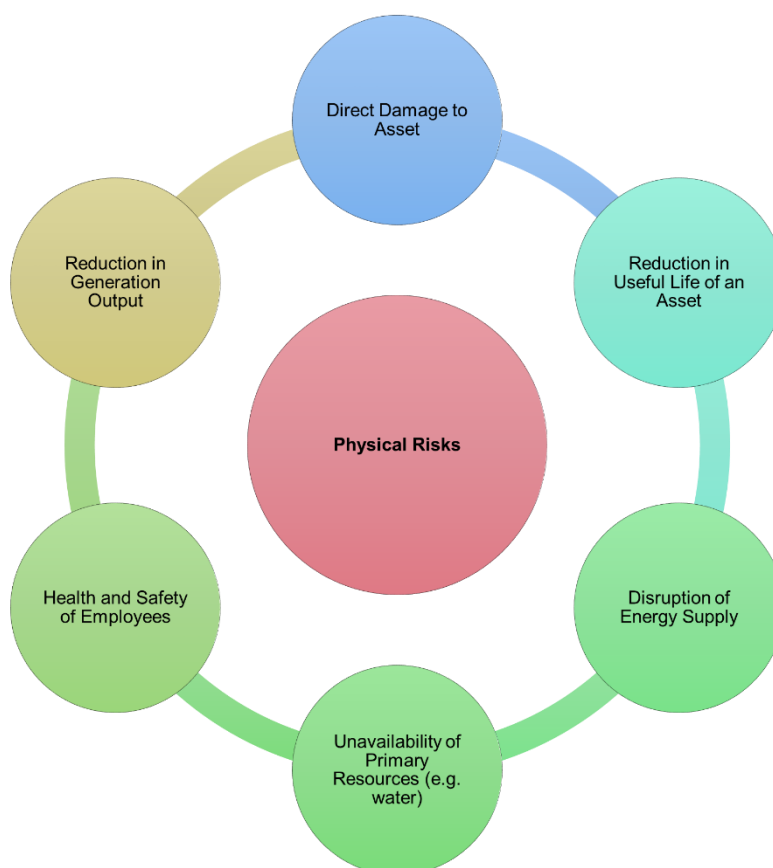
The review of national level action plans for climate change indicated promotion and implementation of renewable energy in general and solar energy projects in particular to reduce greenhouse gas emission, and providing power in the remote areas as one of the aims to address climate change related issues. India aims to produce 100GW of power by 2022 using solar energy, 60GW of power using wind energy by 2030. Accordingly, the proposed project can be considered to be in alignment with the national commitment for production of renewable energy.

Further, the national policy on disaster management recognises the natural disaster such earthquake, floods, river erosion, cyclones, and tsunamis etc. have detrimental effect on economy of the nation. The policy also recognises the need for systematic plan to manage these hazards involving six elements as: preparedness, response, prevention, mitigation, rehabilitation and recovery.

Approach and Methodology

As, some these hazards are climate driven, these are likely undergo changes as a result of climate change in future, in terms of intensification of likelihood or severity, affecting the project as presented in Figure E-1.

Figure E-1 General Implications of Climate Change on Wind and Solar Farms



Therefore, it becomes important to identify such hazards which are likely to affect the project locations under baseline and climate change condition.

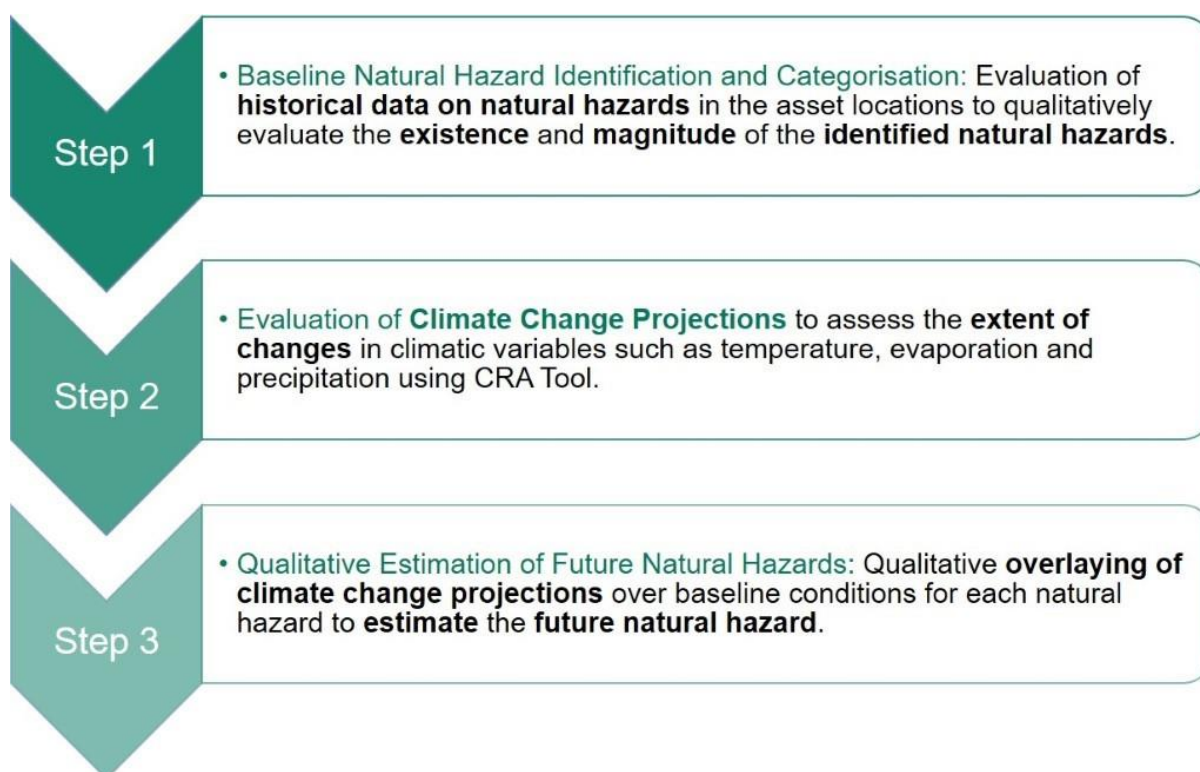
Accordingly, present assessment aims at Screening Level Natural Hazard and Climate Change Physical Risk Assessment for proposed projects identified above.

The present assessment is a high level qualitative screening exercise, involving application of scientific principles, and professional judgement based on the best available data sources and information in the open source.

As a part of this assessment following natural hazards were evaluated under baseline and climate change conditions using a three stepped approach as presented in Figure E-2 below

- Water Availability
- Riverine Flood
- Extreme Heat
- Cyclone
- Wind Speed
- Thunderstorm and Lightning

Figure E-2 Approach for the Present Assessment



The baseline hazards were evaluated based on the review of recognised global and national level open source databases/literature as presented in Table 1.2 of the report. The hazards were categorised in three four categories as No Hazard, Low, Medium, High, and Not classification. The hazards were categorised based on the conservative normalisation of hazard categories available in the original data sets or based on the potential of the hazard to inflict damage on built and natural environment, and health and safety as presented in Table 1.3 of the report.

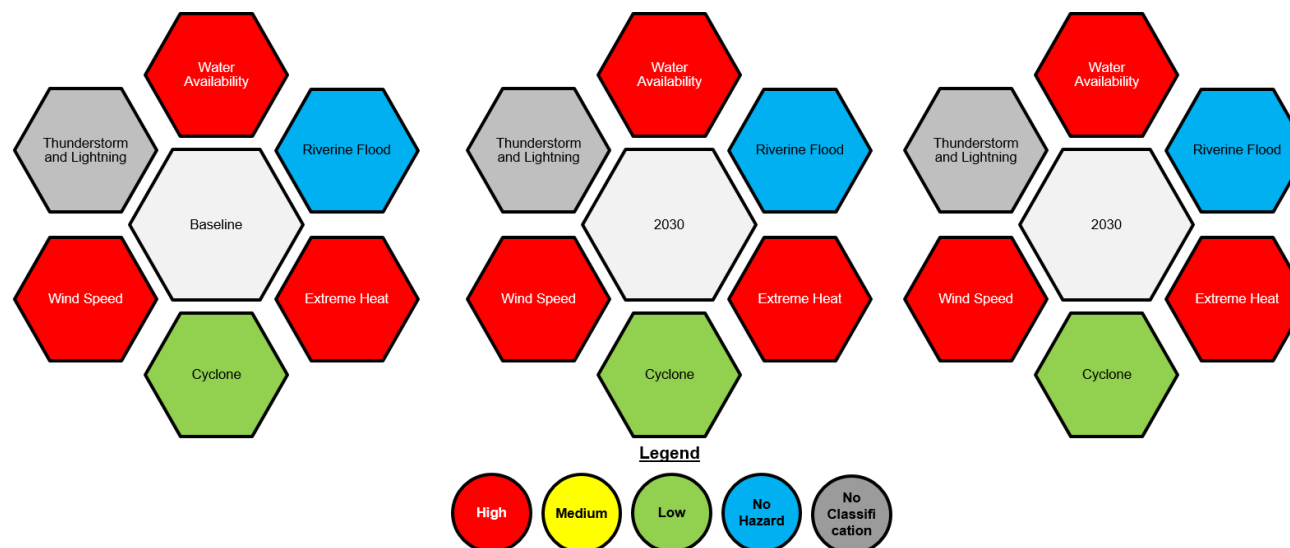
The likely changes in above hazards due to climate change were evaluated qualitatively for climate change scenarios of RCP 4.5 and RCP 8.5 during timeframes of 2030 and 2050, using CMIP-5 Climate Change Projections following the TCFD guidelines as recommended in EP-4. The likely changes in hazards are based on application of scientific principles, professional judgement and likely relation between natural hazards and the climate parameter.

The assessment indicated that water availability, extreme heat, and wind speed are likely to 'High' hazard under baseline and climate change conditions. Cyclones indicated 'Low' hazard in the region. Following the evaluation of natural hazards under baseline and climate change conditions, general recommendations were provided on implications, available control measures and additional recommendations for each of the natural hazard were provided as presented in Section 1.7 of the report.

Climate Hazard Assessment – Key Findings

Figure E-3 presents the summary of natural hazards under baseline and climate change scenarios of RCP 4.5 and RCP 8.5.

Figure E-3 Summary of Natural Hazards under Baseline and Climate Change Scenarios of RCP 4.5 and RCP 8.5



It should be noted that although the riverine flood presented 'No hazard' within Study area, localised flooding can happen due to changes in land used due to project development and extreme rainfall. Data on such localised flooding is not available and evaluation of such localised flooding need Site level assessment involving modelling studies. Therefore, although there is no riverine flood hazard indicated at project Site, the general implications of flood were identified, with recommendation for Site level flood risk assessment.

Implications Analysis

Based on the future natural hazard, projects implications were evaluated for the solar and wind power plant, infrastructure and components. Along with this, further preventive actions, management plans and adaptation measures were recommended. These are presented in Table 1.21 the main report.

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