
SITE SELECTION MATRIX FOR THE PROPOSED HOTAZEL SOLAR FACILITY 2

The Remaining Extent (Portion 0) of the Farm York A 279, situated in the District of Hotazel in the Northern Cape Province, was identified for the development of the proposed Hotazel Solar Facility 2 (Hotazel 2). This was based on the following location characteristics:

1. Solar Resource

The proposed location was selected for the development of solar photovoltaic (PV) facilities based on the predicted solar resource, as the economic viability of a solar facility is directly dependent on the intensity of the solar resource/ global horizontal irradiation (GHI). The overarching objective for a solar energy facility is to maximise electricity production through exposure to the solar resource, while minimising infrastructure, operational and maintenance costs, as well as social and environmental impacts. The Northern Cape receives the highest average daily GHI in South Africa, with the Hotazel area exhibiting approximately 2233 kWh/m²/annum. Figure 1 indicates the location of the proposed site on a solar resource map of South Africa.

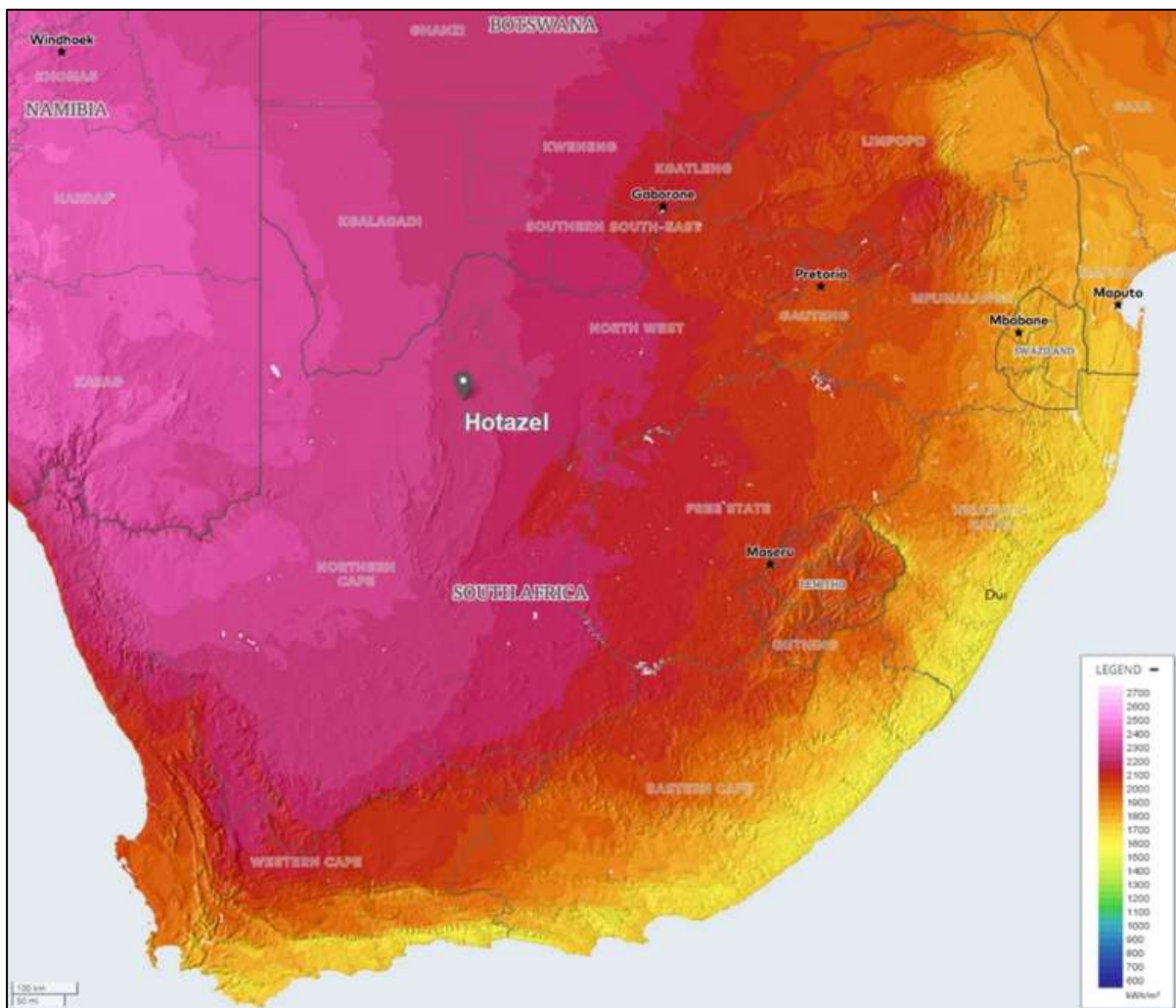


Figure 1: GHI of South Africa (Global Solar Atlas, <http://globalsolaratlas.info/>).

2. Grid Access

A key factor in the siting of any energy generation project is that the project must have a viable grid connection. Technical constraints, such as complex grid connections, can affect the costs of the facility and can therefore influence its economic feasibility. Solar PV facilities that are in close proximity to a grid connection point and/or demand centre are favourable and reduce the losses associated with power transmission.

The developer corresponded with Eskom network planners to understand their future demand centres as well as strategic plans to upgrade and strengthen any local networks. Hotazel 2 is intended to connect to the Hotazel Substation, which is less than 3 km from the site. The 66kV grid network between Hotazel, Kuruman and Kathu is currently being upgraded to 132kV to meet the increasing demand from mining activity in the area. Some of these upgrades are already complete, most noteworthy being the Hotazel-Eldoret 132kV line which runs along the south eastern boundary of the site. In addition, Eskom intends to construct a 400kV transmission line from the Mookodi MTS in Vryburg through to Hotazel. Notwithstanding the fact that the Hotazel 2 will contribute to meeting the electrical demand on the distribution network, close proximity to the planned 400kV infrastructure means that in due course, surplus power can be evacuated into Eskom’s Transmission System and conveyed at very high voltage for consumption elsewhere in the country.



Figure 2: Potential Grid Connection.

3. Proximity to towns with a need for socio-economic upliftment

The Site is situated in close proximity to the town of Hotazel and relatively close proximity to the towns of Deben, Kathu, and Kuruman. These towns are typically masked with high rates of unemployment, as is the case in the Northern Cape. The closest cities in the area are Kimberley and Upington, which both also experience the same level of unemployment and poverty. Consequently, local labour would be easy to source, which fits in well with the Department of Energy's (DoE) Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) economic development criteria for socio-economic upliftment. Currently, a large proportion of local labour is used in the mining and agricultural industry. A few negatives related to agricultural employment are that it is very seasonal and it is not always in close proximity to the employees' homes, forcing workers to travel large distances on a daily basis to reach their place of employment. Over the years, employment in the mining sector has shown to be very volatile.

4. Land Availability

Availability of large areas with few constraints can be a restraining factor for the development of a solar PV facility. The proposed Hotazel 2 project site is approximately 230ha. This is considered sufficient for the installation of a solar PV facility, while allowing for avoidance of any sensitive areas or features that may occur within the project site.

5. Landowner Support

The selection of a site where the landowner is supportive of the development of renewable energy is essential for ensuring the success of the project. The landowner does not view the development as a conflict with their current land use practices. The support from the landowner for the development to be undertaken on the affected property has been solidified by the provision of consent for the project to proceed on the property through the signing of a land lease agreement with the developer.

6. Topography

Sites that facilitate easy construction conditions (i.e. relatively flat topography, lack of major rock outcrops, limited watercourse crossing etc.) are favoured during site selection.

The project site consists of gently undulating topography, with slopes of less than 5% over most of the area, and with an altitude range of 1060-1080m above sea level. There are no streams or rivers located in the site. These characteristics are favorable for the construction and operation of a solar PV facility.

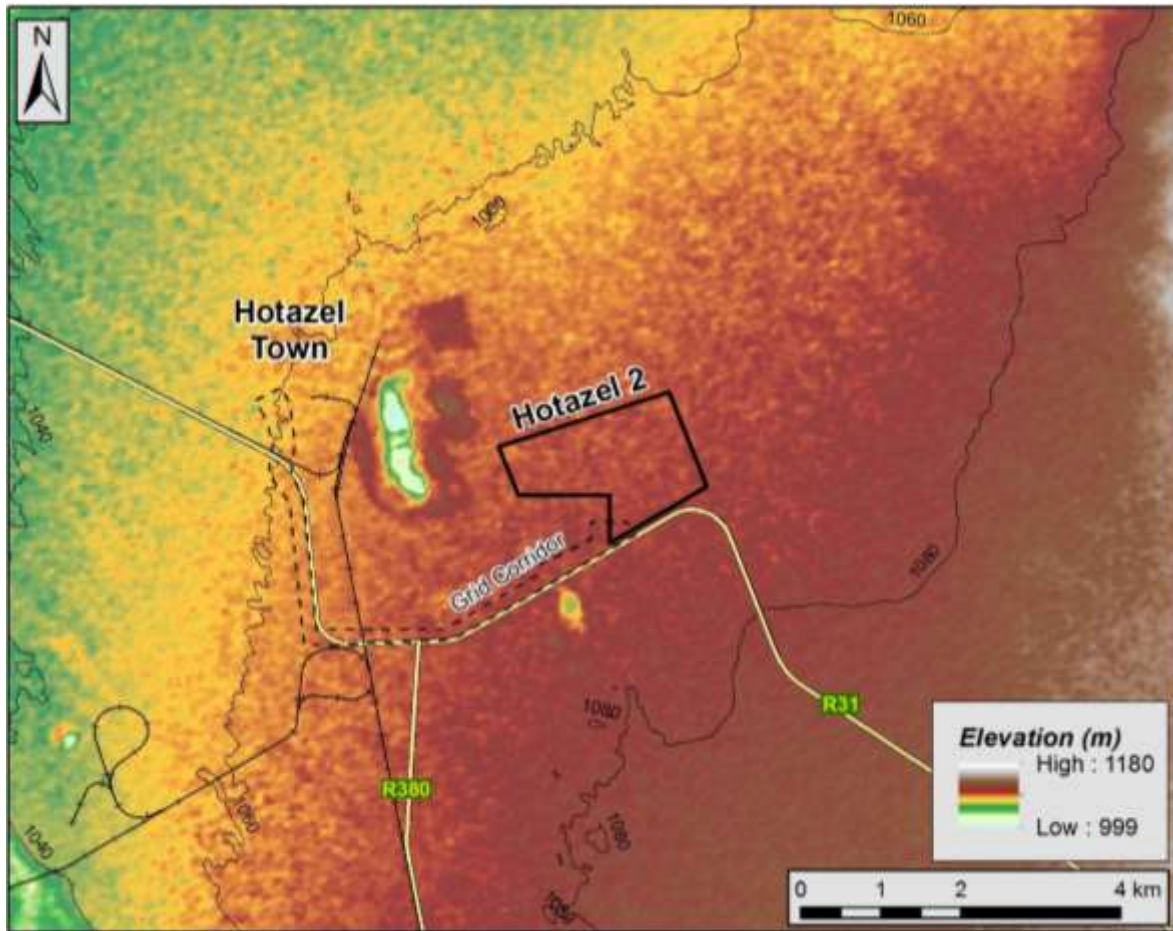


Figure 3: Topography of the project site.

7. Land Use Considerations

The current land use of the site is an important consideration in terms of limiting disruption to existing land use practices. Grazing land is generally preferred as the majority of the associated farming practices can continue in tandem with the operation of the solar PV facility. Surrounding land uses should also be assessed to ensure that the project is compatible with the surrounding area and does not present a conflicting land use.

The majority of land surrounding the Hotazel town is mining land reserved for related mining activities. The Remaining Extent (Portion 0) of the Farm York A 279 is one of the few available privately-owned land parcels suitable for solar PV development.

Agricultural land around Hotazel generally has very low agricultural potential, owing particularly to the following factors:

- The depletion of underground water resources due to mining activity;
- Periodic droughts that directly impact the ability to farm sustainably; and
- Stock theft being a persistent problem in the area and therefore resulting in low agricultural production as cattle and sheep farming and other forms of small livestock farming prove to be challenging.

Within the proposed Hotazel 2 project site, there is no cultivated agricultural land (as a result of low agricultural potential). The land is currently used for livestock grazing. Furthermore, the landowner is currently considering alternative land use options.

Other activities present within the surrounding areas include power lines, railway infrastructure, mining activities and the future development of other solar PV facilities that have received Environmental Authorisation. The development of Hotazel 2 is therefore compatible with the surrounding area and would not present a conflicting land-use.

8. Site Access

Access to the project site is considered as an important characteristic as easy access is required for the transportation of project related infrastructure (materials and components) and heavy machinery during construction. This is particularly important when considering transportation costs (direct & indirect), and the impact that they have on project economics and the ability to submit a competitive bid under the Department of Energy’s (“DoE”) Renewable Energy Independent Power Producer Procurement Programme (“REIPPPP”).

The project site can be accessed by the Regional Route 31 (R31), which runs along the southern boundary of the site.



Figure 4: Roads surrounding the project site.

9. Wind and dust consideration

Several mines in the area are located to the north-west, south-west and south of the Site. Venturing closer to these mining areas (downwind) will expose the SEF to increased dust levels thus reducing the efficiency of the solar PV modules and hence power generation of the SEF. The wind direction distribution for the project site appears to be predominantly from the north-east which it is hoped will blow most of the dust from the mines away from the Site. The manganese mine located directly north-west of the site is no longer in use and is under rehabilitation with reduced dust emission.

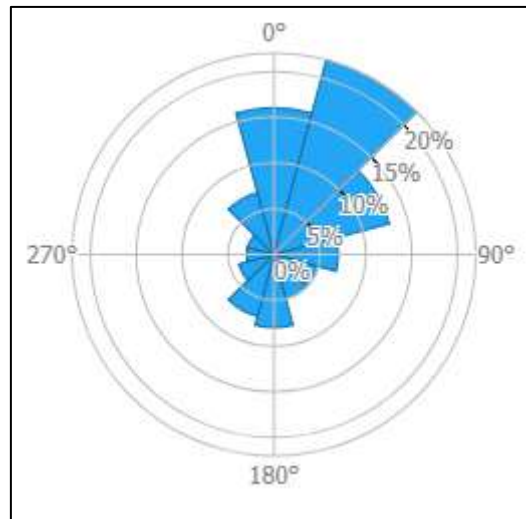


Figure 5: Wind Frequency Rose for Hotazel (<https://globalwindatlas.info/>).

10. Distance from airport/s

The nearest airport is the Sishen / Kathu airport which is located more than 45km south of the project site. Therefore, glint and glare will not affect any Air Traffic Control (ATC) towers or aircraft approach flight paths.