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SOLAR PV PROJECTS SITE SELECTION

In choosing a site for the development of a solar PV project we, as the developer, go through a process of evaluating a number of possible alternative sites in terms of the criteria that would make a viable site worth bidding in the competitive Department of Energy's Renewable Energy Independent Power Producer Procurement Programme (REIPPPP).

The REIPPPP is a very competitive program and a site that is marginally less suitable from a solar resource or development cost perspective has less chance of securing a successful bid. Therefore as developers, we put a lot of effort into evaluating and selecting the best available sites.

The Department of Environmental Affairs, together with other State Departments has gone through a Strategic Environmental Assessment process which has resulted in the creation of Renewable Energy Development Zones (REDZ). These REDZ's are a guideline as to where it is appropriate to develop renewable energy projects and the development of renewable energy projects is not restricted only to these areas. It is therefore still important to evaluate individual sites within or across these REDZ's and other areas to determine and select the most competitive sites.

The main criteria used in the evaluation of the alternative development sites are; a good solar resource, proximity to Eskom grid access, Eskom grid capacity, a flat open site, sufficient development space, no mountains nearby, low value land, low agricultural potential, low environmental sensitivity, availability of water and the land must be available for development.

A good solar resource. Most sites in or near the Kalahari have a very good solar resource and the resource reduces as you move away from this area. For example, the solar resource at Kenhardt in the Northern Cape is 8 – 10% better than at Beaufort Wet in the Western Cape. This difference makes it very difficult to do a competitive bid at Beaufort West.

A site should preferably be adjacent to or close by to a point where it can connect to the Eskom grid. Connection lines of up to a few kilometers can still be competitive.

The Eskom grid has to have the capacity at the grid connection point to evacuate the power from the project. If any extensive grid strengthening needs to be done to evacuate the power this grid upgrade is done at the cost of the project and thus the project is unlikely to be competitive.

Also at issue here is that the time taken to select, sign up, permit and bid a project is usually longer than the interval between successive REIPPPP bids. There is thus the risk that other projects might take up the available grid capacity in the time the project is being permitted and the project might have to be abandoned.

The project design and layout can be optimized on a flat open site as no special or expensive adjustments need to be made for shadow effects between the various components. The proximity of mountains can reduce the yield at a site. Land with a gentle northwards slope is also suitable.

Sufficient space allows for the optimization of the layout, but more importantly if there is sufficient space for multiple projects economies of scale can lead to very competitive bids.

Land with a high agricultural potential should not be used for the development of a solar PV project as food security outranks energy security.

A site with a low land value will allow a cost effective lease price and hence a more competitive bid.

Sites without any significant environmental sensitivities allow for development optimization without any costly layout constraints or design precautions. Environmental sensitivities include floral, faunal sensitivities as well as the existence or proximity to water courses or wetlands.

Water is needed for the construction and operational stages of a project. The solar PV projects use a low volume of water during the operational phase and so securing this water is usually not an issue. During the construction stage more water is needed and the water often needs to be obtained from distant sources and transported.