

EIA FOR THREE 10MW PHOTOVOLTAIC (SOLAR) ENERGY FACILITIES PROPOSED FOR MARIENTAL, OMARURU AND OKAHANDJA

BACKGROUND INFORMATION DOCUMENT



PURPOSE OF THIS DOCUMENT

The purpose of this Background Information Document (BID) is to provide stakeholders with a background to three proposed solar energy facilities and to invite Interested and Affected Parties (I&APs) to register in the Environmental Impact Assessment (EIA) process. By registering as an I&AP, stakeholders can submit comments on the proposed solar energy facilities and be kept informed throughout the EIA. This BID includes the following sections:

- Introduction
- How does the EIA Process work?
- What is Public Participation and how do you get involved?
- What is proposed and where?
- Why are solar energy facilities needed and what benefits are anticipated?
- How does a typical solar energy facility work?
- What alternatives are being considered?
- Potential environmental impacts associated with the project
- Way forward

Introduction

Namibia Power Corporation (Pty) Ltd (NamPower) propose to off-take power from an Independent Power Producer (IPP) or Producers (IPP's). The power will be generated from three individual 10 megawatt (MW) photovoltaic (PV) solar energy facilities at three separate locations in Namibia namely; Mariental, Omaruru and Okahandja (Figure 3). In terms of the Namibian environmental legislation (Environmental Management Act (No. 7 of 2007)), an EIA is required to obtain an Environmental Clearance Certificate from the Ministry of Environment and Tourism (MET) before the project can proceed. As a preferred IPP or IPP's has not yet been selected, NamPower has appointed Aurecon South Africa (Pty) Ltd (Aurecon) to undertake the EIA study to investigate the biophysical and socio-economic environmental issues. The findings will help inform MET's decision-making and to inform the design and operation of the three proposed PV solar energy facilities.

HOW DOES THE EIA PROCESS WORK?

An EIA is a process that evaluates the biophysical and socio-economic characteristics of proposed projects and the consequences of the project on the environment and the people that live in the area affected by the project activities. Where negative impacts are likely to result from the project, measures can be recommended to avoid or lessen these impacts to a level where the impacts are considered acceptable from a biophysical and social perspective. Where positive impacts are likely to result from the project, measures can be recommended to increase these impacts. The EIA process also provides I&APs with opportunities to comment on the project and to be kept informed about decisions that may impact on them or the environment. The various stages of the consultation within the EIA process are shown in Figure 2.

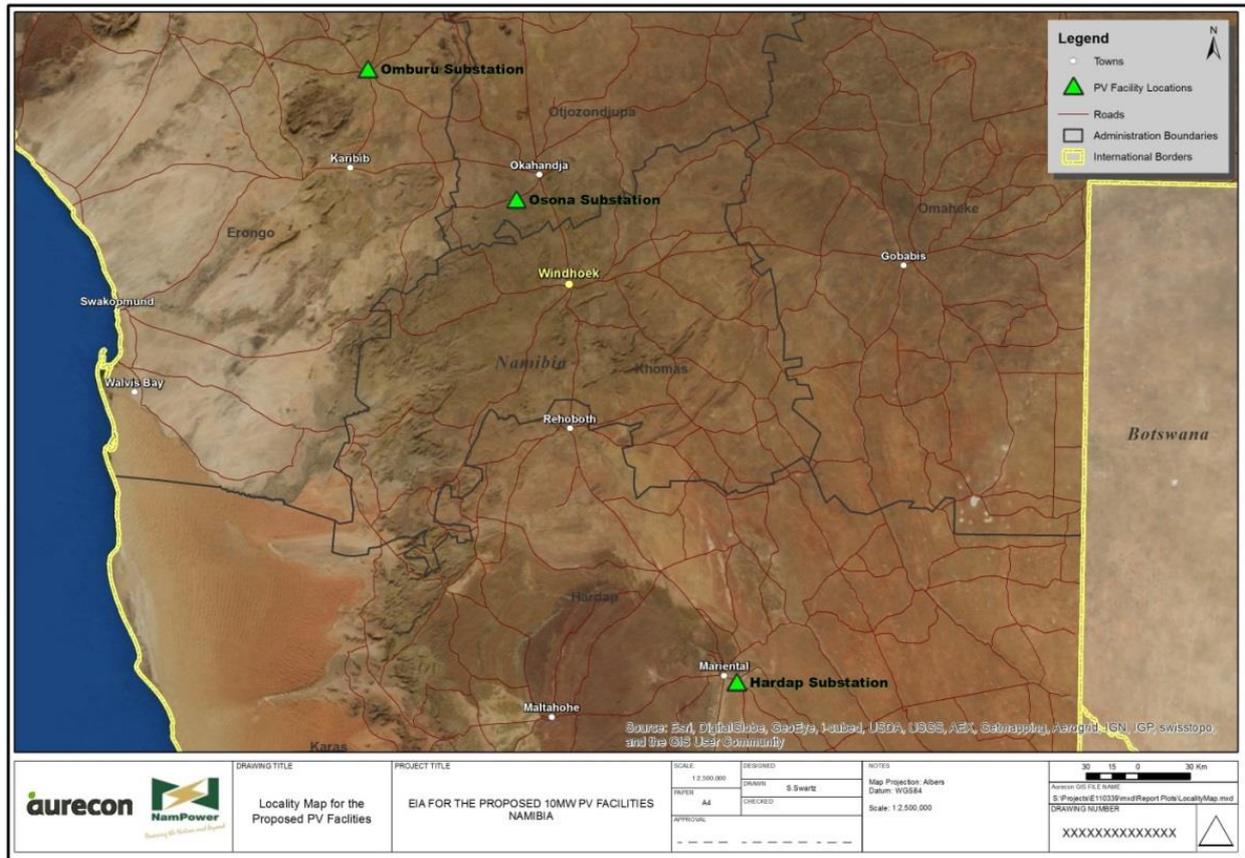


Figure 1 | Locality Map indicating the project locations

The EIA process would typically consist of a scoping phase and an EIA phase. However, MET’s decision can be informed by the scoping report if sufficient information is provided at this stage. Due to the impacts of solar energy facilities being well understood, the scoping report will include specialist assessments of the proposed project, assessments of all anticipated impacts and mitigation measures to address the anticipated impacts which should be sufficient for decision making by MET. It is therefore anticipated that the project would not need to proceed to the EIA phase.

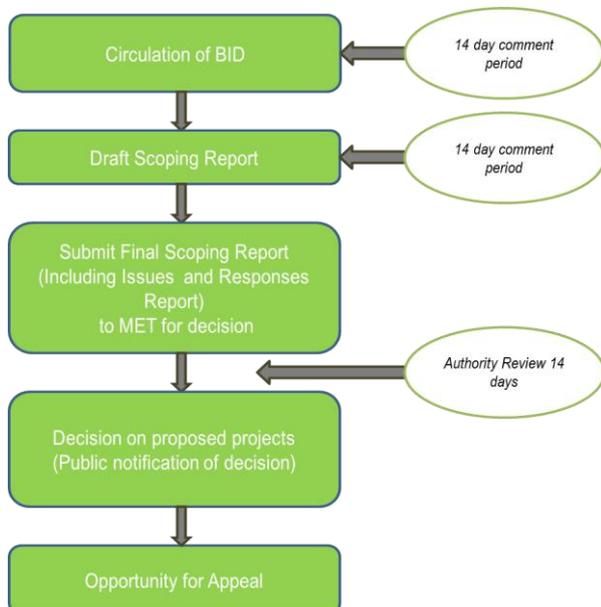


Figure 2 | Assessment process

WHAT IS PUBLIC PARTICIPATION AND HOW DO YOU GET INVOLVED?

Public participation is an important part of the EIA process, as it allows the public to obtain information about the proposed project, to view documentation, to provide input and voice any concerns. You have been identified as a potential I&AP for these projects, either because you represent an affected organisation or because of your proximity/location to the proposed projects.

Public participation will take place at various stages of the project through the following steps:

- Advertising the project in local newspapers
- Distributing this BID to identified stakeholders
- Lodging the Draft Scoping Report in the respective local libraries (Mariental, Omaruru and

Okahandja) and on the Aurecon website (www.aurecongroup.com) and the NamPower website (www.nampower.com.na)

- Registered I&APs will also be informed of the availability of the Draft Scoping Report for a 14 day comment period, during which period the public will have the opportunity to review the draft document and raise any issues or concerns
- Advertising the decision received from MET and affording an opportunity to I&APs to appeal the decision.

WHAT IS PROPOSED AND WHERE?

NamPower identified three existing substations into which each of the proposed solar energy facilities could feed, based on the grid capacity, network of existing transmission lines, the national map of solar radiation indicating the average sunshine hours per day and location of the largest source of demand. The three substations identified were the Hardap substation near Mariental, Omburu substation near Omaruru and Osona substation near Okahandja. Three alternative sites, were identified at each substation and assessed by specialists. Each alternative site is approximately 100 hectare (ha) in extent and within a 5km radius from the substation. All sites are located on farming land, which are currently used for stock grazing, transmission line corridors and are uninhabited. A site selection process was undertaken to select the preferred three sites (one alternative site per substation location). The site selection process will be detailed in the Scoping Report. It should be noted that Osona site 1 was decreased in size as a small hill, considered to be sensitive in a number of aspects, was distorting the findings for the site and hence was excluded from the original 100 ha site for the site selection process. The following sites were selected as the preferred sites (see Figure 3, Figure 4 and Figure 5):

- Hardap site 1 on Farm Koichas 89 close to Mariental, Hardap Region (referred to as Hardap site);
- Omburu site 3 located on Omaruru Townlands Portion B, 2215 close to Omaruru, Erongo Region (referred to as Omaruru site); and
- Osona site 1 located on Portion C of Farm Gross Barmen 7 near Okahandja, Otjozondjupa Region (referred to as Osona site).

An area of 35ha is generally required to construct a 10MW PV solar energy facility. Areas with a footprint of 35ha were therefore identified within the 100ha sites, informed by sensitive features on site, which were excluded from the development area.

Each of the proposed 10MW solar energy facilities would consist of the following:

- **Photovoltaic component:** numerous rows of PV panels and associated support infrastructure to generate electricity.
- **Transmission corridor:** one overhead 66kV transmission line located within the transmission corridor to connect the proposed onsite substation to the existing main substation.
- **On-site substation:** the on-site substation to collect the electricity produced on site and step it up to the correct voltage to transfer via the transmission line to the existing main central substation.
- **Access road corridor:** a 100m corridor to accommodate the access road for constructing, servicing and maintaining the facility.
- **Buildings:** operation and maintenance buildings to house equipment and a guard cabin for security.
- **Additional infrastructure:** includes a boundary fence for health, safety and security reasons; water supply infrastructure for groundwater abstraction and storm water infrastructure, if required.

WHY ARE SOLAR ENERGY FACILITIES NEEDED AND WHAT BENEFITS ARE ANTICIPATED?

Namibia has a high reliance on power imports (on average 60%, but up to 80 % during dry seasons). A number of Namibia's energy import agreements are about to end and if not renewed, Namibia is likely to face a capacity deficit in its electricity generation from 2015.

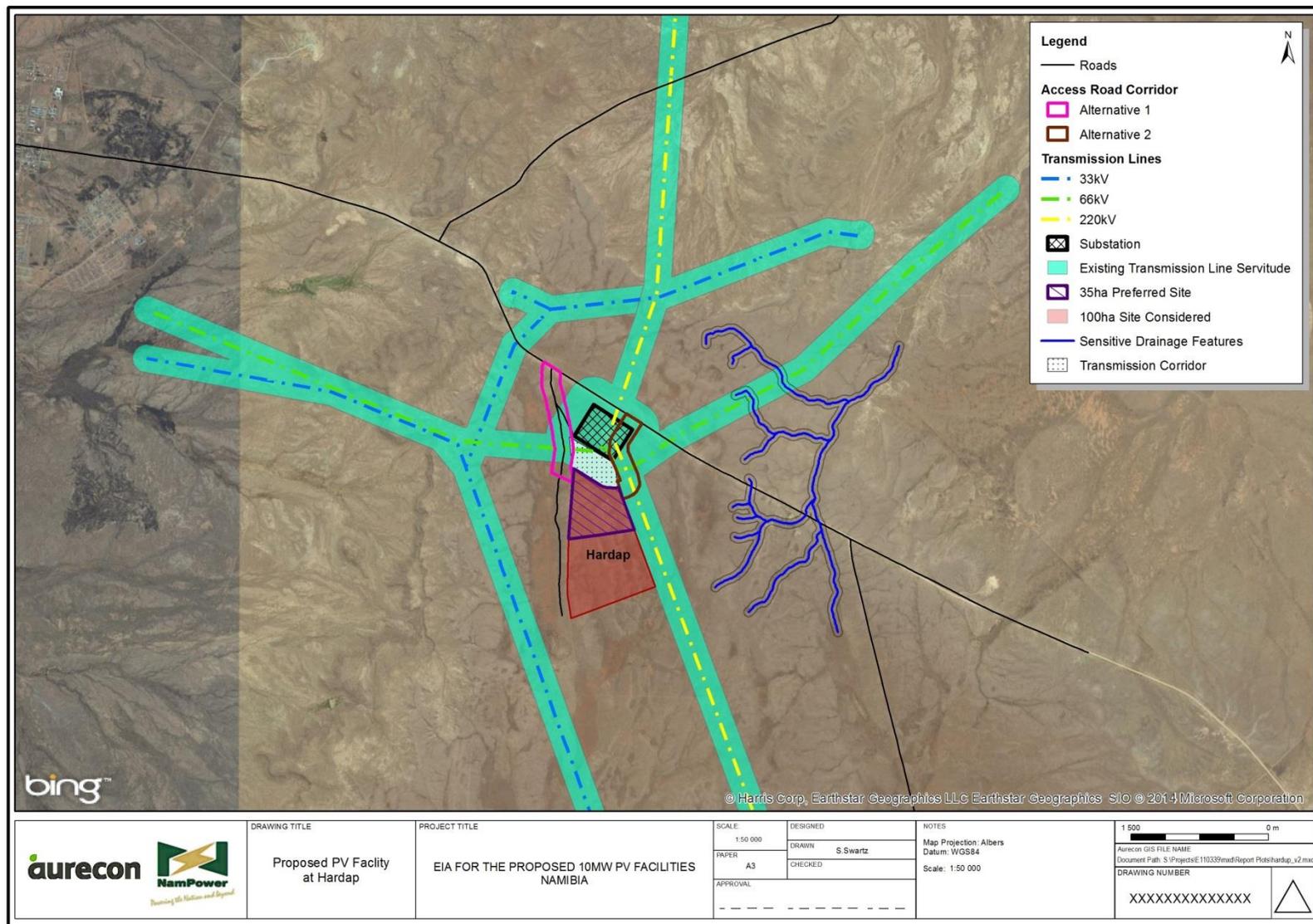


Figure 3 | Preferred 35ha area for development at Hardap Substation

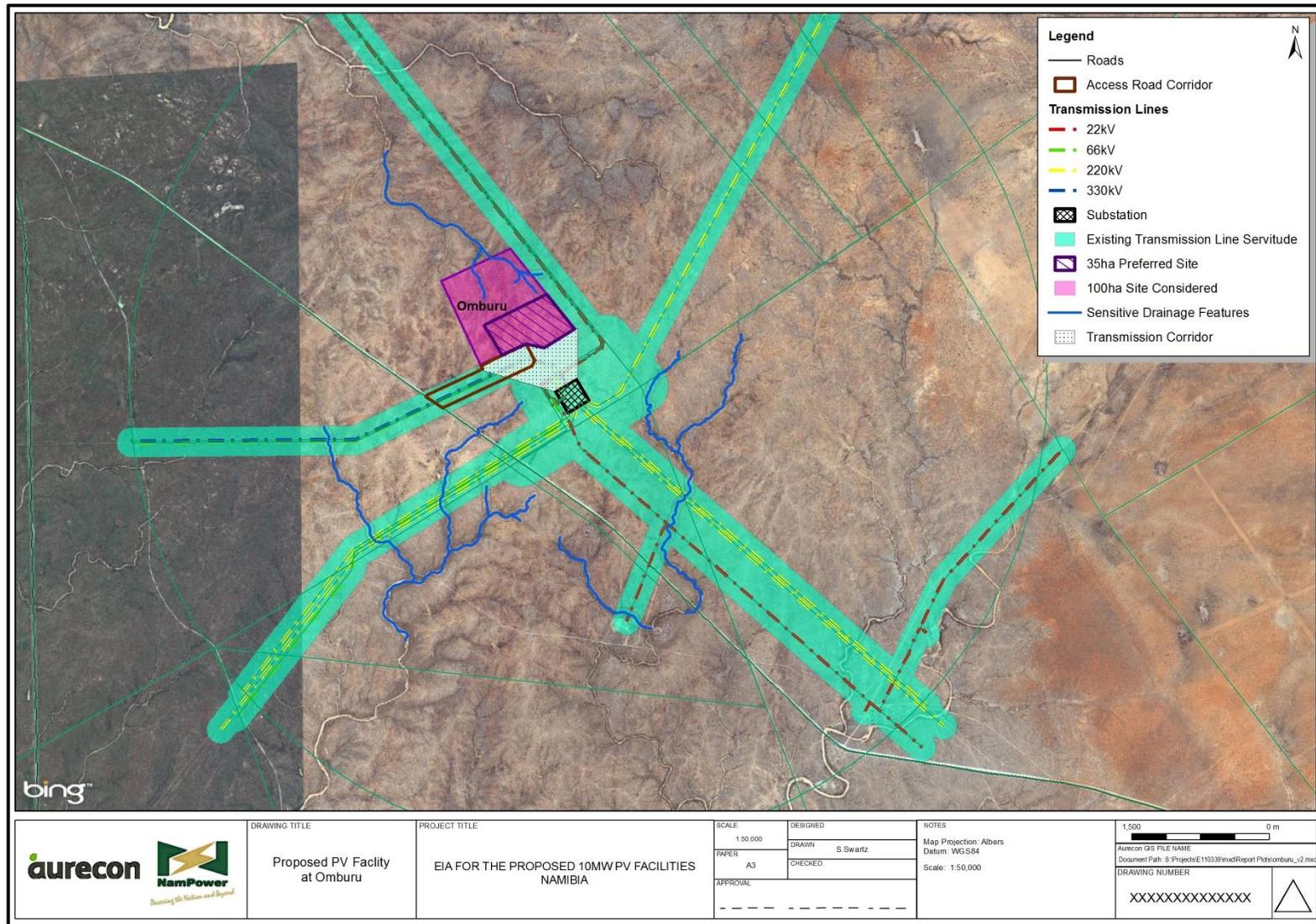


Figure 4 | Preferred 35ha area for development at Omburu Substation

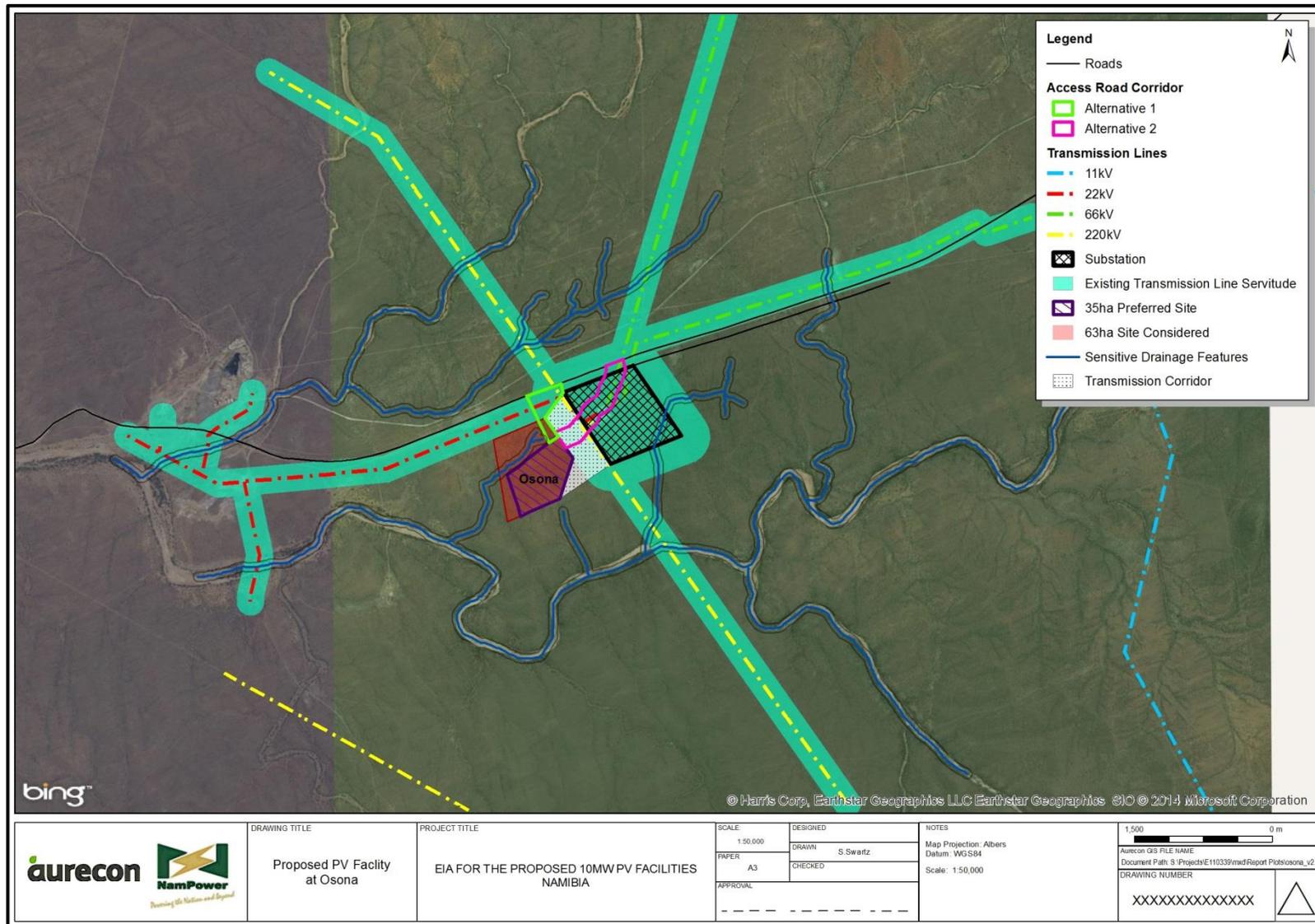


Figure 5 | Preferred 35ha area for development at Osona Substation

This is based on current growth forecasts of its electricity demands (peak demand of 534MW with a 4% per annum growth)¹. In order to address the potential capacity deficit, and to take advantage of the good solar resource in Namibia, NamPower is proposing to purchase electricity from solar energy facilities.

Renewable energy is recognised internationally as a major contributor in diminishing the negative effects of climate change, as well as providing a wide range of biophysical environmental, economic and social benefits that can contribute towards long-term global sustainability. These impacts include, amongst others, reduction of greenhouses gases emitted per unit of electricity, reduced reliance on fossil fuelled power stations, employment benefits and associated social upliftments, improvement in electricity security and diversity, and expenditure in local economy. The proposed solar energy facilities are therefore expected to contribute positively towards climate change mitigation. The establishment of the proposed solar energy facilities would also help to meet the current national electricity demand, which far exceeds supply. Furthermore, the proposed projects would assist Namibia in meeting its international obligations by aligning domestic policy with internationally agreed strategies and standards as set by the Kyoto Protocol and United Nations Convention on Biological Diversity, to which Namibia is a signatory.

HOW DOES A TYPICAL PV SOLAR ENERGY FACILITY WORK?

Solar panels capture light energy from the sun to generate electricity through a process known as the PV effect, where light energy energise the electrons to produce electricity (see Figure 6²). There are various types of solar panels, but for the proposed PV solar energy facilities Conventional PV solar cells are proposed.

Conventional PV technology generates electricity by converting solar radiation energy into a direct current which needs to be converted to an alternating current to connect to the grid.

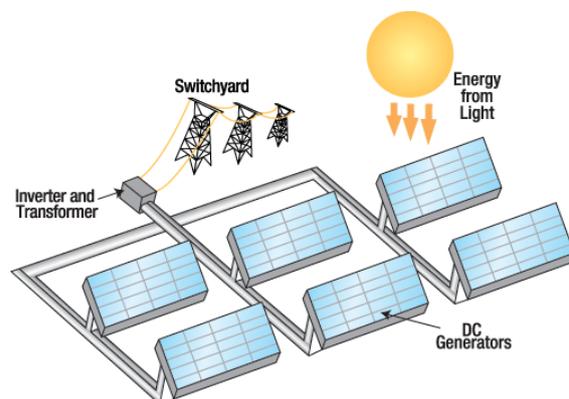


Figure 6 | Illustration of a typical PV facility

WHAT ALTERNATIVES ARE BEING CONSIDERED?

The best suitable site at each location (Mariental, Omaruru and Okahandja) was selected through the Multi-criteria Decision-Making process. This is therefore forms the assessment of alternatives and only the preferred site location alternative will be assessed in detail against the “no-go” option in the assessment phase. Mounting alternatives and access road alternatives will however be considered in the EIA process. For all three sites, two mounting alternatives to fasten the panel to the frame will be considered, namely:

- a) **Single-Axis Tracking PV:** The panels are fixed on a single axis that follows the seasonal sun to ensure maximum exposure to sunlight as indicated in in Figure 7a.
- b) **Fixed Tilt PV:** This is typically a rack mounted system of panel arrays on frames and installed at a fixed angle (see Figure 7b). These arrays would be uniformly aligned to facilitate efficient sun energy capture.

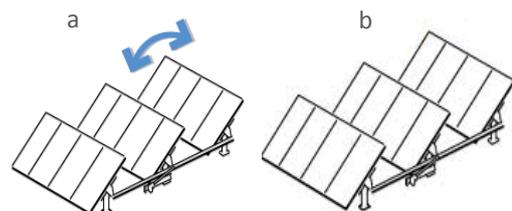


Figure 7 | Mounting Alternatives

¹ UNDP Environmental Finance Services, July 2011. Concentrating Solar Power Technology Transfer for Electricity Generation in Namibia, (CSP TT) NAM.

²Figure 5 Source: NamPower

The following access road alternatives, as indicated in Figure 2, Figure 4 and Figure 5 will be considered:

- **Hardap:** two access road alternatives will be considered with Alternative 1 following the existing farm road running north-west of the substation. Alternative 2 follows the existing access road to the substation that would be extended to the proposed site.
- **Omburu:** one access road alternative following the existing transmission service road to provide direct access to the main road.
- **Osona:** two access road alternatives will be considered with Alternative 1 being a new access road to connect the proposed PV to the main road via the shortest distance. Alternative 2 follows the existing substation access road.

POTENTIAL ENVIRONMENTAL IMPACTS ASSOCIATED WITH THE PROJECTS

The proposed solar energy facilities and associated infrastructure could result in a range of biophysical and socio-economic impacts. The scoping phase will identify the potential impacts that could be expected. Based on site specific characteristics, certain impacts will be more significant than others. The types of impacts expected as well as the assessments to be undertaken are indicated in Table 1 below.

Table 1 | Potential impacts to be assessed and specialist assessments to be undertaken

Potential impacts	Specialist assessments to be undertaken
<ul style="list-style-type: none"> • Disturbance of flora, fauna and avifauna 	<ul style="list-style-type: none"> • Ecology Impact Assessment by Environment and Wildlife Consulting to consider fauna, flora and avifauna
<ul style="list-style-type: none"> • Impact on agricultural resources 	<ul style="list-style-type: none"> • Assessment by Aurecon EIA team
<ul style="list-style-type: none"> • Impacts on surface water resources including riparian vegetation 	<ul style="list-style-type: none"> • Assessment by Aurecon EIA team and Ecology Impact Assessment
<ul style="list-style-type: none"> • Stormwater impacts including sedimentation and erosion 	<ul style="list-style-type: none"> • Assessment by Aurecon EIA team
<ul style="list-style-type: none"> • Impacts on heritage resources 	<ul style="list-style-type: none"> • Heritage Impact Assessment by Quaternary Research Services
<ul style="list-style-type: none"> • Visual impacts 	<ul style="list-style-type: none"> • Visual Impact Assessment by Visual Resource Management Africa
<ul style="list-style-type: none"> • Social impacts (including economic development, employment rates and types, HIV infection rates, theft, etc) 	<ul style="list-style-type: none"> • Social Impact Assessment by Digby Wells
<ul style="list-style-type: none"> • Noise and dust pollution 	<ul style="list-style-type: none"> • Assessment by Aurecon EIA team
<ul style="list-style-type: none"> • Impact on energy production 	<ul style="list-style-type: none"> • Assessment by Aurecon EIA team
<ul style="list-style-type: none"> • Increased traffic 	<ul style="list-style-type: none"> • Desktop Assessment by Aurecon Transport Engineers
<ul style="list-style-type: none"> • Storage of hazardous substances on site 	<ul style="list-style-type: none"> • Assessment by Aurecon EIA team
<ul style="list-style-type: none"> • Impact of construction waste 	<ul style="list-style-type: none"> • Assessment by Aurecon EIA team
<ul style="list-style-type: none"> • Cumulative impacts 	<ul style="list-style-type: none"> • Assessment by Aurecon EIA team

WAY FORWARD

Further work will be done to compile the Draft Scoping Report. Following the completion of the Draft Scoping Report, it will be lodged in the respective libraries (Mariental, Omaruru and Okahandja), on the Aurecon website as well as the NamPower website. Registered I&APs will be notified of the lodging and given an opportunity to comment on the report. Should you wish to raise any initial issues or concerns regarding the proposed projects, or if you wish to register as an I&AP, please contact the Public Participation Office at the details below.

Comments can be submitted to the EIA PPP team from 4 April 2014 until 23 April 2014:

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List of abbreviations used in this BID:

BID	Background Information Document
DSR	Draft Scoping Report
EIA	Environmental Impact Assessment
ha	hectare
I&AP	Interested and Affected Party
IPP	Independent Power Producer
MET	Ministry of Environment and Tourism
MW	Megawatt
PV	Photovoltaic