# BACKGROUND INFORMATION DOCUMENT

# PROPOSED ESTABLISHMENT OF THE UPINGTON SOLAR THERMAL PLANT

NORTHERN CAPE

A IKHI CSP SOUTH AFRICA INITIATIVE





SUSTAINABLE FUTURES ZA !Khi CSP South Africa (Pty) Ltd is proposing the establishment of a commercial solar electricity generating facility and associated infrastructure on Portion 3 of the Farm McTaggarts Camp 453, which lies ~20km west of the town of Upington in the Northern Cape.

The solar facility is proposed to accommodate a Concentrating Solar Power (CSP) component and a Photovoltaic (tracking and/or concentrating) component and associated infrastructure on a portion of the proposed site. This project is known as the Upington Solar Thermal Plant. The nature and extent of this facility is explored in more detail in this document

#### AIM OF THIS BACKGROUND INFORMATION DOCUMENT

This document aims to provide you, as an interested and/or affected party (I&AP), with:

- » An overview of the proposed solar facility.
- » An overview of the Environmental Impact Assessment (EIA) process and specialist studies being undertaken to assess the potential impacts, both positive and negative of the proposed project.
- » Details of how you can become involved in the EIA and public participation process, receive information, or raise issues, which may concern and/or interest you.

## OVERVIEW OF THE PROPOSED PROJECT

The proposed site for the Upington Solar Thermal Plant was identified through an extensive site selection process which took climatic conditions (primarily as the economic viability of a solar facility is directly dependent on the annual direct solar irradiation values for a particular area), orographic conditions, relief and aspect, and the availability of a grid connection (i.e. a point of connection to the National grid) into consideration.

The solar energy facility is proposed to be established on a portion of Portion 3 of the Farm McTaggarts Camp 453, which falls within the Kai Garib Local Municipality. The larger site covers an area of approximately  $22km^2$  which is much larger than the ~6km<sup>2</sup> development footprint for the proposed facility. The facility can, therefore, be appropriately placed within the larger site.

The facility is proposed to accommodate up to 110MW which will be comprised of a combination of the following technologies (in any combination):

- » 50 MW trough plants (CSP)
- » 50 MW power tower plants (CSP)
- » 10 MW PV plants

The Renewable Energy Feed-in Tariff Process (criteria not yet finalised by NERSA), selection process, IRP from government and the economics of the solar facility will be key in determining the final technology combination and the schedule of implementation for the facility.

The above technology options will also include the associated infrastructural requirements which will include:

» A steam turbine and generator housed within a 2-storey building

- » A generator transformer and a small substation outside the building
- » An overhead power line feeding into the Eskom electricity network via a "turn in and turn out" configuration to an existing distribution line running ~ 4 km south of the site
- » Water supply pipeline/s to the facility and extraction point on the Orange River
- » Water treatment plant and water storage facilities
- » Blow down pond (for wastewater from the generation process)
- » Access roads to the site from the main road, as well as access roads within the site
- » Workshop, office and storage areas

The local level issues pertaining to the larger farm portion are currently being considered with sitespecific studies in order to delineate areas of sensitivity within the broader site. Once the constraining environmental factors have been determined through the EIA process, the layout of the proposed facility can then be finalised, and assessed in detail in the EIA Phase.

# TURNING SOLAR ENERGY INTO ELECTRICITY

Solar generating facilities use the energy from the sun to generate electricity. Concentrating Solar Power (CSP) goes one step further by collecting the incoming solar radiation and concentrating it (focusing or combining it) on a single point, thereby increasing the potential electricity generation. The proposed facility will be considering a combination of CSP (trough and power tower systems) and PV (photovoltaic systems).

The *trough system* will be comprised of parabolic collectors (i.e. trough-shaped reflectors which focus the solar radiation onto a receiver at its focal point), a receiver tube/heat collection element (i.e. a metal absorber containing the heat transfer fluid surrounded by a glass envelope which absorbs the solar energy received from the parabolic trough), a sun-tracking system (i.e. an electronic control system and associated mechanical drive system used to focus the reflector onto the sun), and support structure (i.e. holds the parabolic trough in accurate alignment with incoming solar radiation while resisting the effects of the wind). The collected energy in the heat transfer fluid is used to generate steam through a conventional heat exchanger system that is in turn used for electricity generation in a conventional steam turbine and generator.

The *power tower system* will be comprised of 2 component groups: a heat collection system and the conventional generating plant portion. The heat collection system consists of heliostats (movable, reflective mirrors which are oriented according to the sun's position in order to capture and reflect the solar radiation) and a receiver (consisting of metal tubes which transfer the heat from the solar radiation to water with the purpose of generating steam). The receiver is mounted on a 160m high tower, that provides elevation and structurally supports the receiver. In the generating portion the steam drives a turbine which is connected to a generator (in order to produce electricity, as stated above).

The *photovoltaic system* will be comprised of photovoltaic cells (semiconductors which absorb solar radiation to produce electricity), optics (mirrors or lenses which are used to concentrate the solar radiation onto the photovoltaic cell), support structure (metal frame that holds the cells and allows for movement to follow the sun) and an inverter (used to convert the electricity which is produced as direct current into alternating current for grid connection).



Illustrations of trough, power tower and photovoltaic systems (left to right; photos courtesy of Abengoa Solar S.A.)

# ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

In terms of the EIA Regulations published in terms of Section 24(5) of the National Environmental Management Act (NEMA, Act No. 107 of 1998), !Khi CSP South Africa requires authorisation from the National Department of Environmental Affairs (DEA) (in consultation with the Northern Cape Department of Agriculture and Nature Conservation), for the undertaking of the proposed solar energy facility. In terms of sections 24 and 24D of NEMA, as read with the EIA Regulations of GN R385 (Regulations 27 - 36), R386 and R387, a Scoping Phase and an EIA are required to be undertaken for this proposed project.

In order to obtain authorisation, comprehensive, independent environmental studies must be undertaken in accordance with the EIA Regulations. This project has been registered with the National DEA under application reference number 12/12/20/1831.

An EIA is an effective planning and decision-making tool. It allows the potential environmental consequences resulting from a proposed activity to be identified and appropriately managed during its establishment and its operation. It provides the opportunity for the applicant to be fore-warned of potential environmental issues, and allows for resolution of the issue(s) reported on in the EIA report as well as dialogue with I&APs.

!Khi CSP South Africa has appointed Savannah Environmental, as the independent environmental consultants, to undertake the required Scoping Phase and EIA Phase to identify and assess all the potential environmental impacts associated with the proposed project, and proposes appropriate mitigation and management measures in an Environmental Management Plan (EMP). As part of these environmental studies, I&APs will be actively involved through the public involvement process being undertaken by Sustainable Futures ZA.

The phases of an EIA are:

 Impact
 Final EIA report & draft EMP

 Scoping Study &
 Assessment & draft EMP

 Scoping Study Report
 EA report:

 Specialist studies
 submitted to DEA

# POTENTIAL ENVIRONMENTAL IMPACTS ASSOCIATED WITH THE PROPOSED SOLAR FACILITY

Although a solar facility utilises a renewable resource to generate electricity, the construction and operation of the proposed facility has the potential to impact on the environment in both a positive

and negative manner.

A number of potential environmental impacts, both positive and negative, associated with the proposed solar facility have been identified. These potential impacts will be assessed through the following specialist studies:

| Ecology, fauna &<br>flora      | The construction of the solar facility and the associated disturbance<br>of vegetation may result in impacts on ecology                                 |
|--------------------------------|---|
| Agricultural<br>potential      | Impacts on agricultural areas and potential, and land capability  |
| Heritage sites & palaeontology | Disturbance to or destruction of heritage sites and palaeontology (fossils) may result during the construction of the solar thermal facility            |
| Geology & erosion<br>potential | Relating to underlying geology, soil conditions and erosion potential   |
| Social                         | The construction and operation of the facility may result in employment opportunities and impacts on land use characteristics                           |
| Visual quality & aesthetics    | Depending on the technology selected, and their location spatially, solar facilities have the potential to have a visual impact on the surrounding area |
| Noise impacts                  | The operation of the solar facility may result in noise emissions which could impact on the ambient noise levels  |

These potential impacts will be assessed through specialist studies which will be undertaken in two phases as follows:

- A Scoping Phase, where potential issues associated with the proposed project will be identified, described and evaluated as part of a desktop study. Areas of sensitivity within the broader site are identified and delineated in order to identify an appropriate portion of the site for the proposed development.
- An ETA Phase, which involves a detailed assessment of potentially significant impacts identified in the Scoping Phase. Practical and achievable mitigation and management measures will be recommended within the Draft Environmental Management Plan (EMP).

Specialist studies will be guided by existing information, field observations and input from the public participation process. As an I&AP, your input is considered an important part of this process, and we urge you to become involved.

## PUBLIC INVOLVEMENT PROCESS

The sharing of information forms the basis of the public involvement process and offers you the opportunity to become actively involved in the EIA from the outset. Comments and inputs from I&APs during the EIA process are encouraged in order to ensure that potential impacts are considered within the ambit of the study.

The public involvement process aims to ensure that:

- » Information that contains all the relevant facts in respect of the application is made available to I&APs for review.
- » I&AP participation is facilitated in such a manner that they are provided with a reasonable opportunity to comment on the proposed project.
- » Adequate review periods are provided for I&APs to comment on the findings of the Draft Scoping and EIA Reports.

In order to ensure effective participation, the public involvement process includes the following 4 phases:

#### PHASE 1 Notification of EIA

Application form (DEA)

Advertise - local & regional newspapers

Distribute site notices, BIDs and stakeholder letters

#### PHASE 2 Environmental Scoping Phase Consultation -

Stakeholders & I&APs

Public Monting

Public Review - Draft Scoping Report

#### PHASE 3

Environmental Impa Assessment Phase On-going consultation with I&APs

Public Review - Draft EIA Report & EMP

Public feedback meetings

#### PHASE 4

Decision Making

Authority Review - Final EIA Report - DEA

nform I&APs of decision

# YOUR RESPONSIBILITIES AS AN I&AP

In terms of the EIA Regulations, your attention is drawn to your responsibilities as an I&AP:

- » In order to participate in this EIA process, you must register yourself on the project database.
- » You must ensure that any comments regarding the proposed project are submitted within the

stipulated timeframes.

» You are required to disclose any direct business, financial, personal or other interest which that you may have in the approval or refusal of the application for the proposed solar facility.

### HOW TO BECOME INVOLVED

- 1. By responding (by phone, fax or e-mail) to our invitation for your involvement which has been advertised in local and national newspapers.
- 2. By returning the attached Reply Form to the relevant contact person.
- 3. By attending the meetings to be held during the course of the project. As a registered I&AP you will automatically be invited to attend these meetings. Dates for public meetings will also be advertised in local and regional newspapers.
- 4. By contacting the consultants with queries or comments.
- 5. By reviewing and commenting on the draft Scoping and EIA Reports within the stipulated 30day review periods.

If you consider yourself an I&AP for this proposed project, we urge you to make use of the opportunities created by the public involvement process to provide comment, or raise those issues and concerns which affect and/or interest you, and about which you would like more information. Your input into this process forms a key element of the EIA process.

By completing and submitting the accompanying reply form, you automatically register yourself as an I&AP for this project, and are ensured that your comments, concerns or queries raised regarding the project will be noted.

# COMMENTS AND QUERIES

Direct all comments, queries or responses to:

Shawn Johnston of Sustainable Futures ZA PO Box 749, Rondebosch, Cape Town, 7701 Phone: 083 325 9965 Fax: 086 510 2537 E-mail: swjohnston@mweb.co.za

To view project documentation, visit

www.savannahSA.com

