

1 INTRODUCTION

The Government of South Africa (Department of Energy, DoE), through its energy policy initiatives such as the Integrated Resource Plans (IRP), has embarked on a programme to include renewable energy sources in its energy supply mix. The DoE is considering the use of solar energy as a renewable energy source to generate electricity and supply the energy to the National Grid. In addition it is looking at concentrating the generation facilities in a number of Solar Parks within the Solar Corridor in the Northern Cape Province where the Direct Normal Irradiation (DNI) is high and sufficient to generate solar power that warrants investment on a larger scale. DoE has designated CEF (SOC) Ltd. to undertake the Technical Feasibility and Environmental Impact Assessment studies on the proposed Upington site in the Northern Cape Province for the Solar Park development with a nominal generation capacity of 1GW. Lidwala Consulting Engineers (SA) (Pty) Ltd was appointed by CEF (SOC) as the independent Environmental Assessment Practitioner (EAP) to undertake both the Scoping and EIA phase for the proposed Solar Park.

It is envisaged that the proposed Solar Park will make use of different Solar Technologies such as *Concentrated Solar Power (CSP)* which include; Parabolic Trough (PT) and Central Receiver (CR) and *Photovoltaic (PV)*; which include fixed and tracking crystalline PV, fixed thin film PV and Concentrated PV (CPV) with a total generating capacity of 1GW.

1.1 Project location

The proposed 1 GW Upington Solar Park will be located on the remaining extent of Farm Klipkraal 451, which falls within the //Khara Hais Local Municipality in the Northern Cape Province. The site can be accessed via the N10 (to the north of the farm) and N14 (to the south of the farm) and can also be accessed via other secondary roads. A locality map showing the proposed locality of the Solar Park is shown in **Figure 1.1**. The portion of the farm where the Solar Park development is proposed covers an area of approximately 5011 hectares of municipal land. The actual footprint for the Solar Park (will be confirmed during the EIA Phase) will be smaller than the total size of the site (5011 ha) due to various layout options selected during feasibility and the Geotechnical study findings. It is envisaged that the different solar technologies and the associated infrastructure will be within the boundaries of the Klipkraal site and must avoid any impact on the environmental sensitive areas such as watercourses.

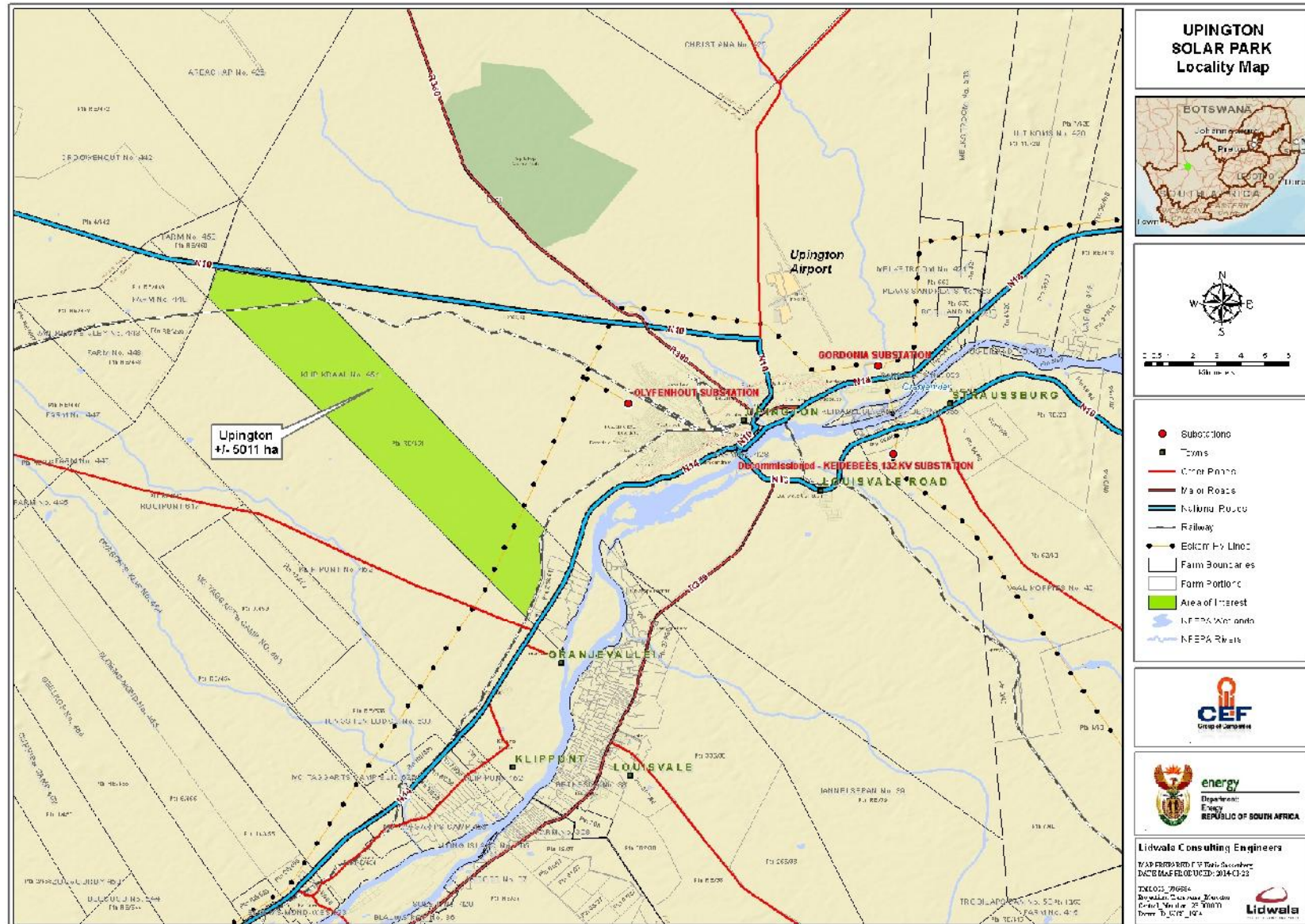


Figure 1.1 Locality map showing the proposed locality of the 1GW Upington Solar Park.

1.2 Need and Justification for the Project

Electricity generation sources need to be diversified to ensure security of supply and reduction in the carbon footprint created by the current heavy reliance of South Africa on coal to produce electricity. The electricity demand is increasing in South Africa, and there is a need to develop and implement renewable energy initiatives. Solar energy technology, wind energy, small scale hydro, biomass and biogas are the technologies that South Africa has identified that are to be developed and implemented.

The Northern Cape Province was identified as the most suitable location for the first Solar Corridor, due to its consistent solar radiation, flat and sparsely populated land, good transport and availability of water resources. Studies on solar irradiance which included the pre-feasibility study have indicated that the Upington area is one of the highest areas of irradiance in the world and would thus be a good location to develop a solar power generating facility. The area in and around Upington is becoming a focus area for South Africa's developing solar energy industry. Projects in the area include the Eskom CSP (adjacent to the site), Khi Solar One CSP, Solar Reserve PV and multiple other Renewable Energy Independent Power Producer Programme (REIPPP) projects.

The design of a Solar Park is similar to that of an industrial or business park. The Solar Park would be developed and operated by a landlord-type of entity and Independent Power Producers (IPPs) would be offered parcels of land on which they could construct, own and operate their own solar energy plant generating facilities. The Solar Park would provide common, 'back-bone' infrastructure such as a grid connection, water supply, drainage, roads and telecommunications, with the intention of reducing planning cost and timescales and capital costs from an IPP perspective, as a result of potential economies of scale. The Solar Park would obtain preliminary permits and approvals with suitable flexibility to enable IPPs to develop within the site, thus further reducing planning and timing costs and risks for IPPs. Centralised maintenance, security and fire protection services would be offered to IPPs by the Solar Park operator. IPPs would sell electricity generated directly to a Buyer, who would be independent of the Solar Park operator.

The proposed Upington Solar Park will have a project life of 26 to 30 years or more to generate 1GW (1000 MW) of electricity from renewable solar power. The energy from the Solar Park has to be integrated and connected with the local and provincial electricity grid to be able to provide electricity, and this will be done in conjunction with Eskom who is the national electricity supplier. Following engagement with Eskom and other relevant stakeholders, it has been assumed in this study that Eskom will act as the main power purchaser (Buyer) of energy generated from the Solar Park. The Eskom Transmission Development Plan (TDP) 2013-2022 has identified the Upington solar park area as part of the Namaqualand customer load network. The Eskom TDP has also identified the Upington solar park as an integration point for the renewable energy input and the following projects are identified to strengthen the Upington area:

1. Aries –Upington 1 x 400kv line by year 2016
2. Aries-Upington 2 400kv line by year 2016
3. Ferrum –Upington 400kv line by year 2016
4. Niewehoop –Upington 1 400kV line by year 2016
5. Upington 5 x500MVA 400/132Kv Transformation by year 2016

1.2.1 Renewable Energy Targets

It is assumed that the Greenhouse effect causing the increase in temperatures will be affected due to the clearing of vegetation, industrial activity, the burning of fossil fuels for the generation of electricity among other activities produce excessive levels of Greenhouse Gasses such as Carbon Dioxide is well documented. It is claimed that this accumulation of Greenhouse Gasses is leading to a gradual warming of the earth's atmosphere and a range of potentially dangerous environmental side-effects. Renewable energy has a number of advantages over energy supplied by fossil fuels, which include energy saving, cost saving, environmental benefits including economic and social benefits that will contribute towards long-term global sustainability.

The White Paper on Renewable Energy promulgated in 2003 - Government set a target of generating 10 000 GWh by 2013.. There is currently approximately 1850MW (PV and CSP) of power that has already been procured from Rounds 1-3 of the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP).

1.2.1 Project-related Benefits

There are public and private sector socio-economic benefits associated with the Solar Park and opportunities for economic development through fostering national participation in the solar industry value chain.

The feasibility study has demonstrated that there are no fatal flaws to the overall feasibility of the Solar Park and indeed could provide considerable benefits to both the local and the national economy in terms of job creation, peak power generation and greenhouse gas mitigation.

1.3 Summary of the EIA Process

In terms of the EIA Regulations published in Government Notice R543 of 2 August 2010 in terms of Section 24 (5) of the National Environmental Management Act (Act No. 107 of 1998), certain listed activities as set out in Government Notices R544, R545 and R546 require environmental authorisation before they can proceed. The 'listed activities' triggered for the proposed 1 GW Upington Solar Park are provided in **Table 1.1**.

Table 1.1: Summary of the GN 544, 545 and 546, **listed activities** number and short description of project activity that require authorisation under NEMA.

Detailed description of listed activities associated with the project	
Listed activity as described in GN R.544, 545 and 546	Description of project activity that triggers listed activity
<p><i>No. R. 544 Item 9(i) and (ii):</i> The construction of facilities or infrastructure exceeding 1000 metres in length for the bulk transportation of water, sewage or storm water -</p> <p>(i) with an internal diameter of 0,36 metres or more; or (ii) with a peak throughput of 120 litres per second or more, excluding where: a. such facilities or infrastructure are for bulk transportation of water, sewage or storm water or storm water drainage inside a road reserve; or b. where such construction will occur within urban areas but further than 32 metres from a watercourse, measured from the edge of the watercourse.</p>	<p>The proposed Solar Park and associated infrastructure may require the construction of infrastructure which exceeds 1000m in length for the transportation of water, sewage or storm water with an internal diameter of 0.36 metres or more; or with a peak throughput of 120 litres per second or more.</p> <p><i>The relevance for any of the above mentioned items will be confirmed during the Environmental Impact Assessment Process.</i></p>
<p><i>No. R. 544 Item 11(i), (ii), (iii), (vi), (x) and (xi):</i> The construction of:</p> <p>(i) canals;</p> <p>(ii) channels;</p> <p>(iii) bridges;</p> <p>(iv) dams;</p> <p>(v) weirs;</p> <p>(vi) bulk storm water outlet structures;</p> <p>(vii) marinas;</p> <p>(viii) jetties exceeding 50 square metres in size; (ix) slipways exceeding 50 square metres in size;</p> <p>(x) buildings exceeding 50 square metres in size; or</p> <p>(xi) infrastructure or structures covering 50 square metres or more where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.</p>	<p>The construction of canals, channels, bridges, bulk storm water outlet structures, buildings exceeding 50 square meters in size; or infrastructure or structures covering 50 square metres or more within watercourse or within 32 metres of a water course might be required for the Solar Park infrastructure.</p> <p><i>The relevance for any of the above mentioned items will be confirmed during the Environmental Impact Assessment Process.</i></p>
<p><i>No. R. 544 Item 12:</i> The construction of facilities or infrastructure for the off-stream storage of water, including dams and reservoirs, with a combined capacity of 50000 cubic metres or more, unless such storage falls within the ambit of activity 19 of Notice 545 of 2010;</p>	<p>The Solar Park and associated infrastructure (for example a water treatment plant is proposed) may require the construction of facilities for the off-stream storage of water, including dams and reservoirs with a combined capacity of >50 000 cubic metres.</p> <p><i>The relevance for any of the above mentioned items will be confirmed during the Environmental Impact Assessment Process.</i></p>
<p><i>No. R. 544 Item 18i:</i> The infilling or depositing of any material of more than 5</p>	<p>The development of the Solar Park may require the excavation, removal or moving of soil from a watercourse.</p>

<p>cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic metres from:</p> <p>(i) a watercourse;</p>	<p><i>The relevance of this activity will be confirmed during the Environmental Impact Assessment Process.</i></p>
<p><i>No. R. 544 Item 22(ii):</i> The construction of a road, outside urban areas,</p> <p>(i) with a reserve wider than 13,5 meters or,</p> <p>(ii) where no reserve exists where the road is wider than 8 metres,</p>	<p>The construction of roads (access roads and internal roads) for the proposed Solar Park and its associated infrastructure.</p> <p><i>The relevance of this activity will be confirmed during the Environmental Impact Assessment Process.</i></p>
<p><i>No. R. 544 (No. R. 922) Item 55A:</i> The construction of facilities for the treatment of effluent, wastewater or sewage with a daily throughput capacity of more than 2000 cubic metres but less than 15 000 cubic metres.</p>	<p>The construction of a water treatment plant as part of the Solar Park with a planned daily throughput of 4000 cubic metres but less than 15 000 cubic metres.</p>
<p><i>No. R. 545 Item 1:</i> The construction of facilities or infrastructure for the generation of electricity where the electricity output is 20 megawatts or more.</p>	<p>The construction of the proposed Solar Park will have a generation of electricity where the output is 20 megawatts or more. The Solar Park will have a generation capacity of up to 1GW.</p>
<p><i>No. R. 545 Item 3:</i> The construction of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of more than 500 cubic metres.</p>	<p>The construction of facilities for the storage and handling of dangerous good of more than 500 cubic metres. Fuel and other substances to be used during construction and operation may need to be stored on-site.</p>
<p><i>No. R. 545 Item 5:</i> The construction of facilities or infrastructure for any process or activity which requires a permit or license in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent and which is not identified in Notice No. 544 of 2010 or included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case that Act will apply.</p>	<p>A Water use licence will be required in terms of section 21 of the National Water Act (Act No. 36 of 1998) Possible Water uses: 21 b: storing of water 21 e : engaging in a controlled activity identified as such in section 37 (1) or declared under section 38 (1); (for example irrigation of any land with waste or water containing waste generated by a waterwork etc. and 21 f: discharging waste or water containing waste into a water resource through a pipe, canal, sewer or other conduit; and 21 g Disposing of waste in a manner which may detrimentally impact on a water resource. Section 21 (c) and (i) may also apply (impeding or diverting the flow of water in a watercourse and altering the beds, banks, course or characteristics of a watercourse.</p> <p><i>The relevance of this activity and the different items will be confirmed during the Environmental Impact Assessment Process.</i></p>
<p><i>No. R. 545 Item 8:</i> The construction of facilities or infrastructure for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex.</p>	<p>The construction of facilities or infrastructure outside an urban area with a capacity of >275 kilovolts for the transmission and distribution of electricity as part of the proposed Solar Park and associated infrastructure.</p>
<p><i>No. R. 545 Item 15:</i> Physical alteration of undeveloped, vacant or derelict land for residential, retail, commercial, recreational, industrial or institutional use where the total area to be transformed is 20 hectares or</p>	<p>The Solar Park and its associated infrastructure will be on land which is currently undeveloped. The land will be transformed over an area of >20 ha for commercial electricity generation (size of the site +- 5011ha)</p>

more;	
<p><i>No. R. 546 Item 14 (a) (i)</i>: The clearance of an area of 5 hectares or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation, except where such removal of vegetation is required for: (1) purposes of agriculture or afforestation inside areas identified in spatial instruments adopted by the competent authority for agriculture or afforestation purposes;</p> <p>(2) the undertaking of a process or activity included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case the activity is regarded to be excluded from this list;</p> <p>(3) the undertaking of a linear activity falling below the thresholds in Notice 544 of 2010.</p>	<p>The construction of the Solar Park and associated infrastructure may result in the clearance of an area of 5 hectare or more of indigenous vegetation outside an urban area. (size of the site +- 5011ha)</p>

Lidwala Consulting Engineers (SA) (Pty) Ltd was appointed by CEF (SOC) as their independent EAP to manage the application and to undertake environmental studies including appropriate specialist fields. Through this process Lidwala SA will identify and assess all potential environmental impacts associated with the proposed Project. In order to obtain authorisation for all aspects of this project, comprehensive, independent environmental studies are required to be undertaken in accordance with the EIA Regulations.

There are three phases in the EIA process:

- Application Phase;
- Scoping Phase; and
- EIA or Assessment Phase.

The EIA process and appeal process as legislated in terms of NEMA is shown diagrammatically in **Figure 1.2**. The Environmental Scoping Study identifies and evaluates potential environmental impacts associated with all aspects of the proposed Project. In terms of the EIA Regulations, *feasible and reasonable* alternatives are discussed within the Scoping Study (refer to **Chapter 2**).

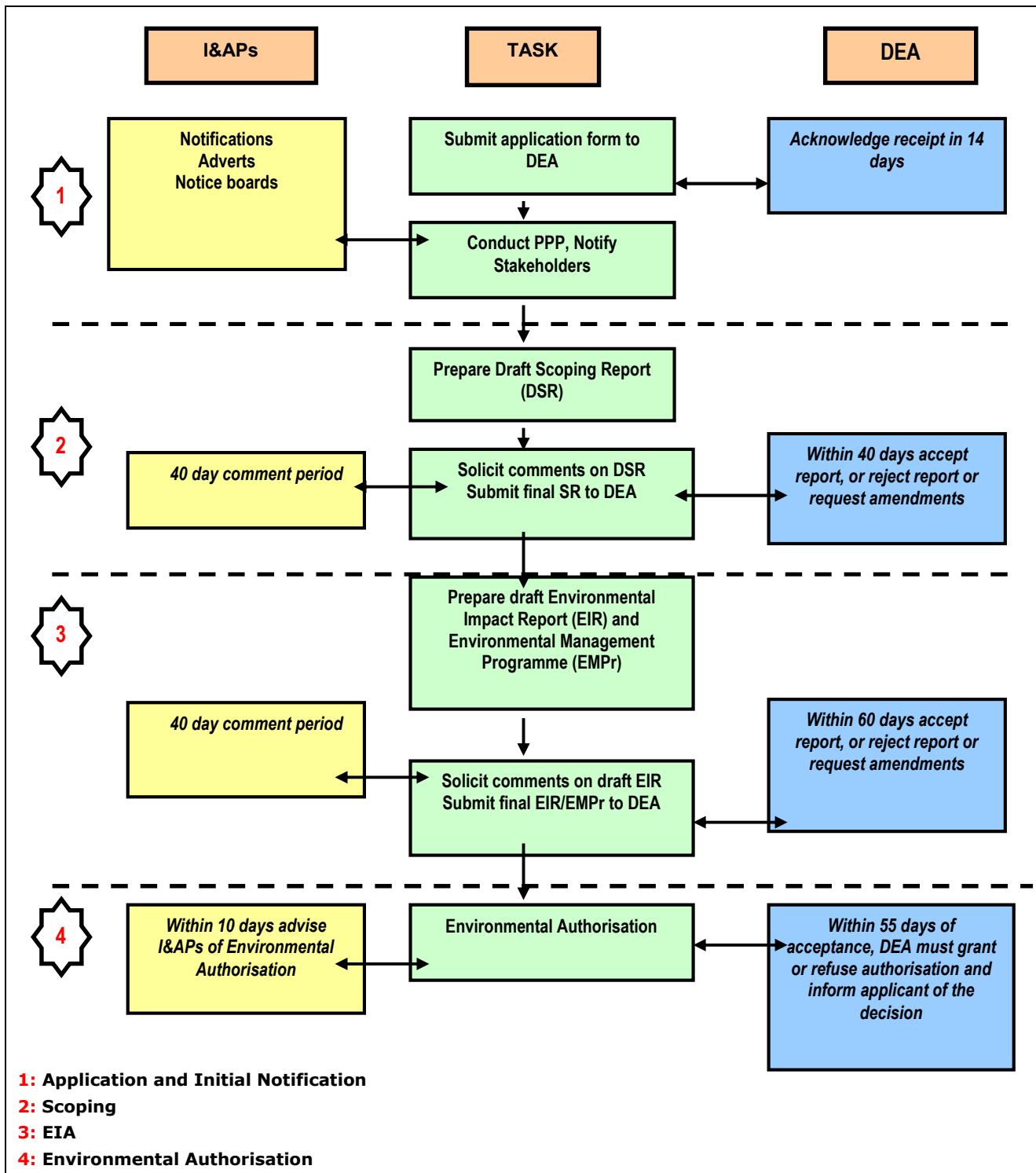


Figure 2.2: Environmental Impact Assessment Process

1.3.1 Application Phase

The Application Phase is to complete the appropriate application form by the Independent EAP and the proponent as well as the subsequent submission and registration of the Project with the competent authority. As this is a proposed electricity generation project and the applicant is parastatal the National Department of Environmental Affairs (DEA) is

the competent authority and the Northern Cape Department of Environment and Nature Conservation (DENC) will act as the commenting authority.

The DEA reference number allocated to this application is **14/12/16/3/3/2/588**. The DENC reference number allocated is **NC/NAT/ZFM///KHA/UPI/2014**. These reference numbers must be included on all official correspondence with the authorities regarding this project.

A copy of the Acknowledgement of Receipt of the Application is included in **Appendix A**.

1.3.2 Scoping Phase

The scope of an environmental assessment is defined by the range of issues and alternatives to be considered as well as the approach followed. The characteristic of a scoping exercise is as follows:

- It is an open process that involves the authorities, the proponent, stakeholders and I&APs;
- Feasible and reasonable alternatives are identified and selected for further assessment;
- Important characteristics of the affected environment are identified;
- Significant issues that are to be examined in the assessment phase are identified; and
- It provides the basis for determining terms of reference for the assessment procedure.

The result of the scoping phase is a report indicating all possible important environmental issues that must be taken into consideration during the assessment phase. As required by regulation, a Draft Scoping Report (DSR) must first be compiled which provides the public an opportunity to comment prior to submission of the Final Scoping Report (FSR) to the authorities. **This report is the Draft Scoping Report (DSR)**. This scoping report is prepared according to NEMA Regulation 543 Section 28: Contents of scoping reports.

a) Draft Scoping Report

The aim of the Draft Scoping Report is to document the outcome of the Scoping Phase. This report includes *inter alia*:

- Details of the proposed Project (**Chapter 1**);
- Details on alternatives for the proposed Project (**Chapter 2**);
- Contact details and expertise of the environmental assessment practitioner undertaking the scoping process (**Chapter 1**);
- Description of the key legislation and guidelines potentially applicable to the proposed activity (**Chapter 3**);
- A description of the receiving environment (**Chapter 4**);
- A register of Interested and Affected Parties (**Appendix C**);

- Details of the stakeholder engagement process conducted including a summary of issues raised through the process to date (**Chapter 3**);
- A description of the environmental issues and impacts associated with the proposed Project and alternatives which have been identified (**Chapter 5**);
- A description of the issues that require further investigation (**Chapter 5 and 6**);
- A description of the methodology to be used in the assessment of impacts (**Chapter 7**); and
- A Plan of Study (PoS) for the EIA which will include a description of the public participation process to be undertaken and terms of reference for the identified specialist studies required within the EIA phase (**Chapter 7**).

b) Final Scoping Report

Once the draft Scoping Report is reviewed by Interested and Affected Parties (IAP's), comments are collected and responded to, the report is amended accordingly (where required) and finalised for submission to the authorities.

1.3.3 EIA or Assessment Phase

Once the Final Scoping Report and the plan of study (PoS) for the EIA is submitted to and accepted by DEA the Project will proceed into its detailed EIA or Assessment Phase including specialist studies and their findings.

Lidwala EPS will produce a Draft Environmental Impact Report (EIR) after the completion of all the specialist studies. The Draft EIR is subject to public comment for a period of 40 days. The Draft EIR will provide an assessment of all the identified key issues and associated impacts from the Scoping Phase.

a) Draft Environmental Impact Report

The Draft EIR would contain, *inter alia*, the following:

- Contact details and expertise of the environmental assessment practitioner undertaking the EIA process;
- A detailed description of the proposed activity;
- A description of the affected environment including a description of the affected properties;
- A description of the ongoing public consultation process;
- A description of the need and desirability of the proposed activity;
- An indication of the methodology used in determining the significance of potential environmental aspects;
- A comparative assessment of the feasible technical and site alternatives;
- A summary of the findings and recommendations of any specialist report or specialised processes;

- An assessment of the impacts in terms of nature of the impact, extent, duration, intensity and probability;
- An assessment of cumulative impacts;
- The determination of the significance of the impacts;
- A description of environmental management and mitigation measures;
- A description of assumptions, uncertainties and gaps in knowledge;
- An environmental impacts statement including a summary of the findings and a comparative assessment of the positive and negative implications of the Project activity and identified alternatives;
- A draft Environmental Management Plan (EMP); and
- Copies of specialist reports and reports on specialised processes (if required).

b) Final EIR

Once the Draft EIR has been reviewed by Interested and Affected Parties, comments will be collected and responded to and the report will be amended accordingly and then finalised.

1.4 Way Forward

The Draft Scoping Report (DSR) was distributed for public comment for a period of 40 calendar days. All comments on the document will be considered and a response thereto provided within a Comments and Response Report prior to submission of the FSR to the relevant authorities for consideration.

It is anticipated that DENC will provide comment to DEA on the adequacy of the DSR, and DEA will consider these comments prior in making a final decision to accept the report and the POS. Upon acceptance DEA will instruct the EAP to continue on to the next phase of the EIA process.

1.5 DETAILS OF ROLE PLAYERS


1.5.1 Introduction

The following section of the DSR provides the particulars, including contact details, of the applicant, the EIA consultant and the relevant authorities.

1.5.2 Details of Applicant

CEF (SOC) Ltd is a private company, incorporated in terms of the Companies Act, and is governed by the CEF Act. The one share issued is held by the South African Government and is not transferable. The company is controlled by the Minister of Minerals and Energy. The details of the applicant are shown in **Table 1.2** below.

Table 1.2: Details of the applicant

Name of Applicant:	Central Energy Fund (SOC) Limited 
Contact person:	Mpho Mthembu
EIA Project Manager	Mpho Mthembu
Postal Address:	P O Box 786141, Sandton 2146
Tel:	010 201 8116
Fax:	010 201 8216
E-mail:	mphom@cefgroup.co.za

1.5.3 Details of Independent Environmental Assessment Practitioner

Lidwala Consulting Engineers (SA) (Pty) Ltd was appointed by CEF (SOC) as the independent EAP to undertake both the Scoping and EIA phase of the proposed project.

Lidwala SA is an integrated group of trained scientists, project managers, engineers and GIS technicians, providing cost-effective solutions and specialist services in a wide range of disciplines. The multi-disciplinary consulting, management and design approach allows for the execution of projects in a holistic way, as this is believed to be the best environment to fully meet the needs of our clients.

The environmental and planning services department (Lidwala EPS) is situated in Nelspruit, Polokwane, Randburg and Pretoria. Lidwala EPS provides environmental planning and management services in accordance with the Integrated Environmental Management (IEM) procedure, the EIA regulations required by the Department of Environmental Affairs (DEA), and other internationally recognised standards such as ISO 14000, the international standard for Environmental Management Systems.

The members of this department have extensive experience in the environmental strategic planning fields, impact assessment, management plans and other related environmental fields such as waste management, Environmental Management Systems (EMS) and environmental legislation. The company's impressive track record includes a wide range of projects.

The CVs of the Project Director and Project Leader as well as the specialists that provided input into this scoping report are available in **Appendix B**.

Table 1.1: Details of the independent EIA consultant (EAP)

Name of Consultant:	Lidwala Consulting Engineers (SA) (Pty) Ltd 
Contact person:	Mr. Frank van der Kooy(PrSciNat) / Mr. Marinus Boon
Postal Address:	P.O. Box 32497, Waverley, 0135
Tel:	0861 543 9252
Fax:	086 686 1628
E-mail:	environmental@lidwala.com / Mboon@lidwala.com

1.5.4 Details of Competent / Relevant Authority

The National Department of Environmental Affairs (DEA) will act as the competent authority and the DENC as the commenting authority for this application. The mandate and core business of DEA is underpinned by the Constitution and all other relevant legislation and policies applicable to the government.

Table 1.2 : Details of the relevant competent authority – DEA

Name:	National Department of Environmental Affairs  environmental affairs Department: Environmental Affairs REPUBLIC OF SOUTH AFRICA
Contact person:	Mmatlala Rabothata
Address:	315 Pretorius Street, Pretoria, 0001
Tel:	012 395 1768
Fax:	+27 (0) 12 320 7539
E-mail:	mrabothata@environment.gov.za

1.5.5 Details of Commenting Authority

Table 1.3 : Details of Commenting Authority

Name:	Northern Cape Department of Environment and Nature Conservation 
Contact person:	Marvin Mathews
Address:	90 Long Street, KIMBERLEY, 8300, Private Bag X 8102
Tel:	054 338 4800
Email:	mmathews@ncpg.gov.za