APPENDIX C3

BACKGROUND INFORMATION DOCUMENT

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AGTERGRONDINLIGTINGSDOKUMENT

JUNIE
2022

OMGEWINGSIMPAKEVALUERING EN OPENBARE DEELNAMEPROSES

BEOOGDE ONTWIKKELING VAN DIE HYDRA B-GROEPERING HERNUBARE KRAGAANLEGTE EN ROOSTERKONNEKSIE-INFRASTRUKTUUR, PIXLEY KA SEME DISTRIKSMUNISIPALITEIT

NOORD-KAAPPROVINSIE

'n Konsortium wat bestaan uit Akuo Energy Afrique, Africoast Investments en Golden Sunshine Trading beoog die ontwikkeling van 'n groepering hernubare kragaanlegte en verwante elektriese infrastruktuur, sowat 20 km noord van Philipstown en 30 km wes van Petrusville in die Pixley ka Seme Distriksmunisipaliteit en omstreke in die Noord-Kaapprovinsie. Die Projek staan bekend as die Hydra B Hernubare Kraggroepering. Die groepering behels die ontwikkeling van hoogstens een-en-twintig (21) sonkragaanlegte en verwante infrastruktuur.

Elke hernubare kragaanleg sal as 'n afsonderlike losstaande projek opgerig word, gevolglik sal afsonderlike Bestekopname- en Omgewingsimpakevalueringsproses (B&OIE's) vir elk van die hernubare kragaanlegte onderneem word. Die OIE-proses sal die projekte in lotte oorweeg, met Lot 1 wat 11 projekte sal oorweeg, Lot 2 wat 6 projekte sal oorweeg en Lot 3 wat 4 projekte sal oorweeg.

Weens die nabyheid van die hernubare kragaanlegte aan mekaar, sal die openbare deelnameprosesse vir elke lot van die projekte gelyklopend onderneem word, wat die publiek 'n geleentheid bied vir begrip van en om kommentaar te voorsien op al die projekte.

DOEL VAN HIERDIE AGTERGRONDINLIGTINGSDOKUMENT

Hierdie dokument stel dit ten doel om u, as 'n belangstellende en/of geaffekteerde party (B&GP), te voorsien van:

» 'n oorsig van die hernubare kragaanlegte wat deel vorm van die groepering en hul verwante roosterkonneksie-oplossings;
» 'n oorsig van die Bestekopname- en Omgewingsimpakevalueringsproses (B&OIE) en spesialisstudies wat onderneem word om die hernubare kragaanlegte en hul verwante roosterkonneksie-oplossings te evalueer;
» besonderhede van hoe u by die B&OIE-proses betrokke kan raak, inligting kan ontvang of kommentaar kan opper wat u dalk kan raak en/of vir u van belang kan wees.

OORSIG VAN DIE PROJEKTE

Die besonderhede van die verskeie projekte wat as deel van die Hydra B-groepering hernubare kragaanlegte beoog word, word in die tabel hieronder verskaf.

No.	Projeknaam	Plaasnaam en -gedeeltenommer	Vermoë	Projeklot
1	**Tafelkop FV-sonkragaanleg**	Gedeelte 3 van die plaas Grass Pan 40	240 MW	Fase 1
2	**Koppy Alleen FV-sonkragaanleg**	Gedeelte 5 van die plaas Koppy Alleen 83	100 MW	Fase 1
3	**Vrede FV-sonkragaanleg**	Gedeelte 5 van die plaas Bas Berg 88	150 MW	Fase 1
4	**Zionsheuvel FV-sonkragaanleg**	Restant van die plaas Leeuwberg 79	240 MW	Fase 1
5	**Amper Daar FV-sonkragaanleg**	Restant van die plaas Wolwe Kuil 44	100 MW	Fase 1
6	**Wag-'n-Bietjie FV-sonkragaanleg**	Gedeelte 1 van die plaas Leeuwe Berg 45	100 MW	Fase 1
7.1	**Ruspoort 1 FV-sonkragaanleg (Opsie A)**	Gedeelte 5 van die plaas Bokken Kraal 81 (Opsie A)	100 MW	Fase 1

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No.	Projeknaam	Plaasnaam en -gedeeltenommer	Vermoë	Projeklot
7.2	**Ruspoort 1 FV-sonkragaanleg (Opsie B)**	Gedeelte 4 van die plaas Knoffelfontein 74; Gedeelte 1 van Plaas 78; en Gedeelte 2 van die plaas Leeuwberg 79 (Opsie B)	100 MW	Fase 1
8	**Ruspoort 2 FV-sonkragaanleg**	Gedeelte 2 van die plaas Leeuwberg 79	100 MW	Fase 1
9	**Middelplaas FV-sonkragaanleg**	Gedeelte 4 van die plaas Grass Pan 40	100 MW	Fase 1
10	**Bokkraal FV-sonkragaanleg**	Restant van die plaas Bokken Kraal 81	100 MW	Fase 1
11	**HCA FV-sonkragaanleg**	Gedeelte 4 van die plaas Koppy Alleen 83	100 MW	Fase 1
12	**JW FV-sonkragaanleg**	Restant van Plaas 196	240 MW	Fase 2
13	**Pro Deo FV-sonkragaanleg**	Gedeelte 1 van die plaas Grass Pan 40	100 MW	Fase 2
14	**Uitkyk FV-sonkragaanleg**	Restant van Plaas 197	100 MW	Fase 2
15	**Kareekloof FV-sonkragaanleg**	Restant van die plaas Swart Koppies 86	100 MW	Fase 2
16	**JAN FV-sonkragaanleg**	Gedeelte 1 van die plaas Schaap Kraal 38; Gedeelte 1 van die plaas Annex Donker Hoek 89; en Restant van die plaas Kuhns Post 90	240 MW	Fase 2
17	**Driefontein FV-sonkragaanleg**	Gedeelte 1 van die plaas Driefontein 87	100 MW	Fase 2
18	**Jagpoort FV-sonkragaanleg**	Gedeelte 2 van die plaas Driefontein 87; Gedeelte 3 van die plaas Driefontein 87; en Gedeelte 2 van die plaas Kareekloof 85	150 MW	Fase 3
19	**Strydam FV-sonkragaanleg**	Gedeelte 3 van die plaas Stryd Dam 107	240 MW	Fase 3
20	**Roodekraal FV-sonkragaanleg**	Restant van die plaas Roode Kraal 106	150 MW	Fase 3
21	**Oosthuisfontein FV-sonkragaanleg**	Restant van die plaas Oosthuisfontein 108	100 MW	Fase 3

Die onderstaande infrastruktuur sal verband hou met elk van die ontwikkelings:

» FV-sonkragreeks bestaande uit FV-modules en monteerstrukture (met een- of tweekantige opwekking en 'n enkelas naspoorstelsel)
» Wisselrigters en transformators
» Kabels tussen die projekkomponente
» Batterykragbergingstelsel (BESS)
» 'n Interne aanlegsubstasie;
» Terreinkantore, sekerheidskantoor, bedryfs- en beheergebou en instandhoudings- en bergingsgebiede
» Toegangspaaie, interne verspreidingspaaie

Roosterinfrastruktuur vir elk van die projekte moet in oorleg met Eskom bevestig word en sal deur 'n aparte OIE-proses geëvalueer word.

Die projekte is om te help om Suid-Afrika se kraguitdaging aan te spreek en om in lyn te wees met die Departement van Minerale Hulpbronne en Energie (DMHE) se Geïntegreerde Hulpbronplan (GHP) 2019, om 'n uiteenlopende kragmengsel na te streef wat afhanklikheid van 'n enkele of 'n paar primêre kragbronne verminder. Die Ontwikkelaar is van voorneme om elke hernubare kragaanleg aan te bied ingevolge die Verkrygingsprogram vir Onafhanklike Hernubare Kragprodusente (REIPPP) of eenderse program. Die plan is dat die krag wat by elke sonkragaanleg opgewek word, aan Eskom verkoop en deur 'n beoogde roosterkonneksie-oplossing by die nasionale kragnet of by 'n privaat afsetter ingevoer sal word.

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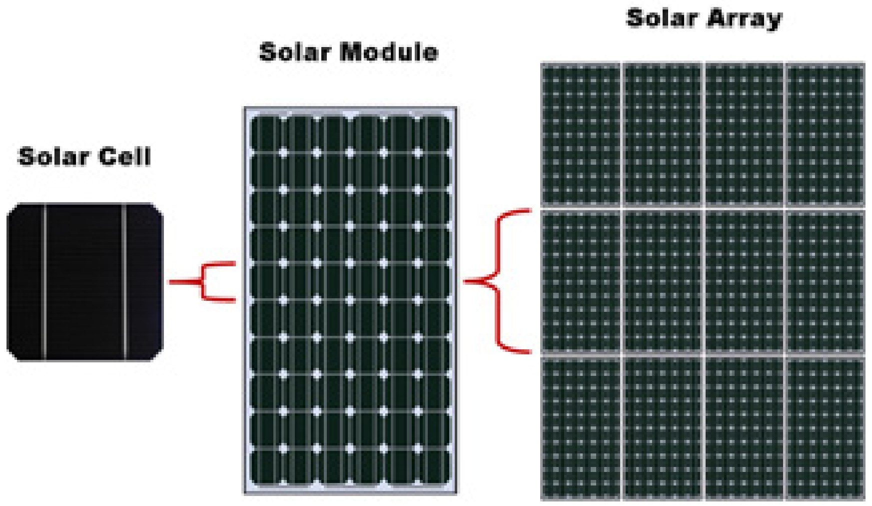
OORSIG VAN FV-SONKRAGTEGNOLOGIE

Sonkragaanlegte gebruik die son se energie om elektrisiteit op te wek deur 'n proses wat as die **Fotovoltaïese Effek** bekend staan. Hierdie effek verwys na ligfotone wat met elektrone bots, wat die elektrone gevolglik in 'n hoër staat van energie plaas om elektrisiteit voort te bring. Die FV-aanlegte se sonkragvelde sal uit die volgende komponente bestaan:

Fotovoltaïese Selle:
'n Fotovoltaïese (FV) sel word van silikon gemaak wat as halfgeleier optree en gebruik word om die fotovoltaïese effek voort te bring. FV-selle word in veelvoude/reekse gerangskik en agter 'n beskermende glaspaneel geplaas om 'n FV-paneel te vorm. Elke FV-sel se een kant is positief en die teenoorgestelde kant negatief gelaai, met elektriese geleiers wat aan beide kante aangebring is om 'n stroombaan te vorm. Hierdie stroombaan vang die vrygestelde elektrone vas in die vorm van 'n elektriese stroom (d.i. gelykstroom (GS)).



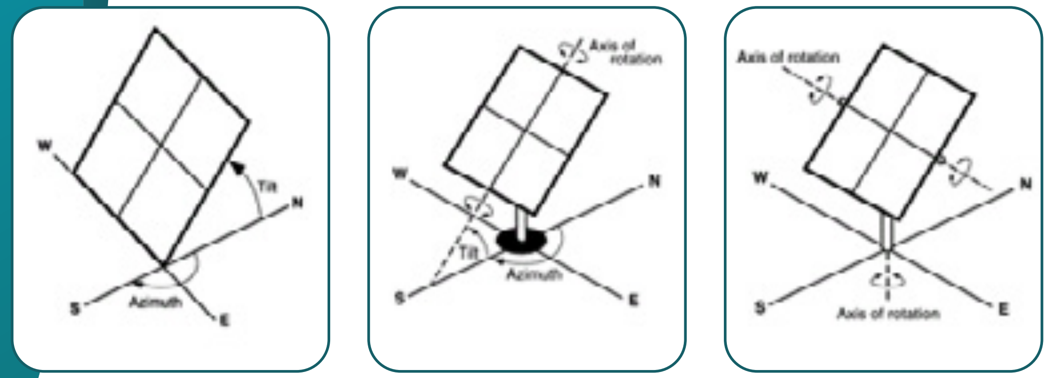
Figuur 2: Oorsig van 'n FV-sel, -module en -reeks/-paneel (bron: pveducation.com)

'n FV-sonpaneelmodule bestaan uit individuele FV-selle wat met mekaar verbind is, terwyl 'n FV-sonkragreeks 'n stelsel is wat bestaan uit 'n groep individuele FV-sonkragmodules wat elektries bedraad is om 'n veel groter FV-installasie te vorm. Die FV-panele sal op steunstrukture aangebring word om blootstelling aan die son te maksimaliseer.

Wisselrigters
Wisselrigters word gebruik om elektrisiteit wat deur die FV-selle opgewek word, van gelykstroom (GS) na wisselstroom (WS) om te sit sodat die aanleg met die nasionale kragnet verbind kan word. Verskeie wisselrigters sal in verskeie reekse gerangskik word om krag wat deur die aanlegte opgewek word, te versamel en om te sit.

FV-panele is ontwerp om vir meer as 20 jaar ononderbroke, meestal onbeman en met min instandhouding in bedryf te staan.

Steunstrukture
FV-panele sal op steunstrukture aangebring word. FV-panele kan hetsy vaste/stilstaande steunstrukture gebruik, of andersins kan hulle enkel- of dubbelas naspoorsteunstrukture gebruik. FV-panele wat vaste/stilstaande steunstrukture gebruik, word teen 'n hoek gestel (vaste-kanteling FV-stelsel) ten einde die hoeveelheid sonbestraling wat ontvang word, ten volle te benut. Met vaste/stilstaande steunstrukture, hang die hoek van die FV-paneel af van die breedteligging van die beoogde ontwikkeling en kan verstel word om die kenmerke van somer- en wintersonbestraling ten volle te benut. FV-panele wat naspoorsteunstrukture gebruik, volg die son se beweging deur die dag ten einde die maksimum hoeveelheid sonbestraling te ontvang.



Figuur 3: Oorsig van verskillende FV-naspoorstelsels (van links na regs: vastehoek, enkel- en dubbelasnasporing (bron: pveducation.com)

FV-panele is ontwerp om vir meer as 20 jaar ononderbroke, meestal onbeman en met min instandhouding in bedryf te staan.

FV-tegnologie-alternatiewe: Eenkantige versus Tweekantige Panele

Volgens Solar Mag (2020) is 'n tweekantige (bifacial) sonpaneel 'n energiefabriek met twee kante wat sonkrag met beide sy bo- en onderkant omskakel in elektriese krag. Hulle verskil van eenkantige (monofacial) sonpanele wat net die bokant vir sonkragproduksie gebruik. Die Engelse woord bifacial het die voorvoegsel "bi" (wat twee beteken) en "facial" (vir gesig of kant).

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Tweekantige panele is toegerus met sonkragselle op beide die bo- en onderkant van die paneel, wat gewoonlik die monokristallynsoort is, hoewel polikristallyn ook gebruik kan word. Tweekantige sonpanele word in veelvuldige konfigurasies aanmekaargesit, soos geraam, raamloos en met dubbelglas of 'n deursigtige onderkant. Konvensionele monokristallynsonpaneelstelsels is anders in die opsig dat hulle ondeursigtige onderkante het. Die monteerstruktuur wat gebruik word om 'n tweekantige sonkragreeks te monteer, is ontwerp om skaduwee van die weerkaatste sonbestraling op die agterkant van die PV-panele te verminder. Dit beteken dat daar net baie smal steunreëlings is en dat vertikale steun net in die hoeke is.

Die tipiese aansluitkas op die agterkant, wat die elektroniese interkonneksie vir die FV-panele is, is kleiner vir tweekantige FV-stelsels as in tradisionele sonkragreekse. Dit neem dus minder spasie in beslag en gooi minder skaduwee op die onderkant van die FV-panele.

Figuur 4: Foto van 'n tipiese Tweekantige Sonkragreeks

'n Tweekantige sonpaneelstelsel se boonste sonkragselle wys son toe, gevolglik vang hulle invallende sonkrag direk vas en absorbeer slegs sekere golflengtes. Die boonste sonkragselle funksioneer net soos dié van 'n konvensionele sonpaneelreeks. Die onderste sonkragselle absorbeer sonkrag wat van die grond af weerkaats word. Die weerkaatsingsvermoë van die grond is geskoei op die albedo-waarde, wat hoër is vir wit of ligter oppervlakke. Om 'n wit of silwer oppervlak onder die panele te verf, kan hierdie effek van verbeterde weerkaatsing op die onderkant van die panele meebring. Studies dui daarop dat 'n wit oppervlak, soos sneeu, meer as 80 % van albedo-lig weerkaats (in vergelyking met gras se 23 %).

Aangesien tweekantige panele elektrisiteit van beide kante af kan opwek, is die algemene voorkeurmonteringstrategie vir installering 'n enkelas-naspoorstelsel wat die son se beweging volg. Dit is ook tipies vir konvensionele modules; met 'n tweekantige stelsel word die modules egter ideaal hoër bo die grond en met groter spasiëring tussen modulerye geïnstalleer om die weerkaatste energie op die agterkant van die FV-panele te verhoog.

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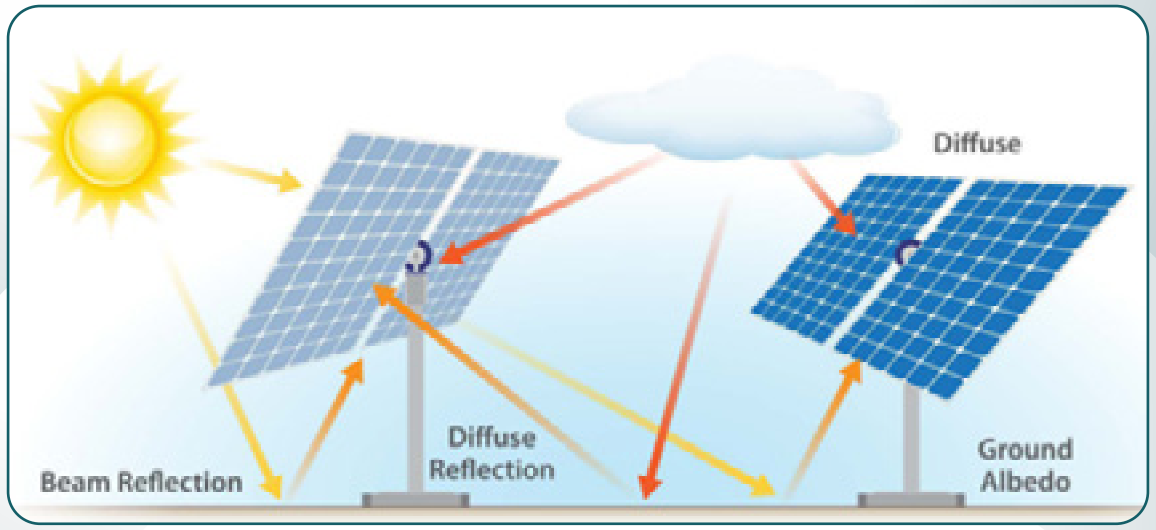

Figuur 5: Diagram wat wys hoe tweekantige FV-sonkragpanele werk (bron: NREL, Bifacial PV System Performance – separating fact from fiction, https://www.nrel.gov/docs/fy19osti/74090.pdf)

Doeltreffendheid verwys na hoe goed 'n sonkragsel en -paneel die totale hoeveelheid sonkrag wat op sy oppervlak skyn, omskakel in elektriese krag. 'n Studie deur LONGi Solar in 2018 het getoon dat tweekantige panele doeltreffendheid met 11 % in vergelyking met 'n konvensionele sonpaneelstelsel kan verhoog. Die doeltreffend van die verhoging met tweekantige sonkragselle kan tot 27 % wees deur 'n sonnaspoorstelsel te gebruik wat die panele, na gelang van die son se trajek deur die lug, beweeg en draai.

Namate die prys van tweekantige sonpanele meer begin meeding met dié van eenkantige panele, kan tweekantige FV-stelsels 'n hoër kragopbrengsgeleentheid (beter doeltreffendheid) bied, veral in die geval waar daar grondbeperkings is en minder panele geakkommodeer kan word. Dit is egter afhanklik van die albedo-omgewing (grondweerkaatsingsvermoë) en die terrein se verligtingstoestande om die tweekantige opbrengs te bewerkstellig.

Batterykragbergingstelsel (BESS)

Die behoefte vir 'n BESS spruit voort uit die feit dat elektrisiteit slegs deur die Hernubare Kragaanleg opgewek word terwyl die son skyn, terwyl die piekvraag nie noodwendig gedurende die dag plaasvind nie. Gevolglik sal die berging van elektrisiteit en die voorsiening daarvan tydens piekvraag beteken dat die aanleg meer doeltreffend en meer betroubaar sal wees en dat die elektrisiteitsvoorsiening meer bestendig sal wees.

» Die BESS sal meer hernubare krag van die FV-sonkragaanlegte stoor en by die kragnet integreer.
» Dit sal help met die doelwit om elektrisiteit by wyse van hernubare kragtegnologie op te wek, om by die nasionale kragnet in te voer, wat bekom sal word ingevolge hetsy die Verkrygingsprogram vir Hernubare Krag van Onafhanklike Kragprodusente (REIPPPP), ander staatsbeheerde verkrygingsprogramme of vir verkoop aan privaat entiteite, indien nodig.
» Die batterybergingsgebied se beoogde voetspoor is 2–10 ha.
» Die batterybergingstelsel se beoogde vermoë is 200–800 MWh.
» Die beoogde tegnologie wat gebruik gaan word is litium-ioonbatterye (LFP/NMC of ander) (Li-Ion), litiumkapasitors/elektrochemiese kapasitors (LiC), en/of Redoks-vloeibatterye (RFB).
» Soorte batterye wat oorweging sal geniet, is vastestaat- en redoks-vloeibatterye.

OMGEWINGSIMPAKEVALUERINGSPROSES

In ooreenstemming met die OIE-regulasies, 2014 (soos gewysig), wat ooreenkomstig Artikel 24(5) van die Nasionale Wet op Omgewingsbestuur (Wet 107 van 1998) (NEMA) gepubliseer is, benodig die applikant Omgewingsmagtiging (OM) van die Nasionale Departement van Bosbou, Visserye en die Omgewing, (DBVO), in oorleg met die Noord-Kaapprovinsie se Departement van Landbou, Omgewingsake, Grondhervorming en Landelike Ontwikkeling vir die ontwikkeling van die beoogde projekte. Ingevolge Artikel 24(5) van NEMA, die OIE-regulasies 2014 (soos gewysig) en Lyskennisgewings (Staatskennisgewing R327, R325 en R324), aangesien die projekte 20 MW in vermoë oorskry, is die aansoeke om OM vir die sonkragaanlegte onderhewig aan die voltooiing van 'n Bestekopname- en OIE-proses. Elke aansoek moet gerugsteun word deur omvattende, onafhanklike omgewingstudies wat ingevolge die OIE-regulasies, 2014 (soos gewysig) onderneem word.

'n OIE is 'n doeltreffende beplannings- en besluitnemingswerktuig. Dit bring mee dat potensiële omgewingsverwante gevolge wat voortspruit uit 'n beoogde aktiwiteit, geïdentifiseer en na behore tydens die oprigtings-, bedryfs- en uitbedryfstellingsfase van ontwikkeling bestuur word. Dit bied ook 'n geleentheid vir die projekaansoeker om vooraf gewaarsku te wees van potensiële omgewingskwessies en maak voorsiening vir die oplossing van kwessies wat geïdentifiseer en as deel van die OIE-proses oor verslag gedoen is, en bied ook die geleentheid vir dialoog tussen sleutelbelanghebbers en belangstellende en geaffekteerde partye (B&GP's).

Savannah Environmental is aangestel as die onafhanklike omgewingskonsultant wat verantwoordelik is vir die bestuur van die aparte aansoeke om OM en om die stawende OIE-proses te onderneem wat vereis word om die alle potensiële omgewingsimpakte wat verband hou met die projekte wat hierbo uiteengesit is, te identifiseer en te evalueer, en om gepaste versagtings- en bestuursmaatreëls aan die hand te doen wat in die Omgewingsbestuursprogramme (OBPr'e) vervat moet word.

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WAT IS DIE POTENSIËLE OMGEWINGSIMPAKTE WAT VERBAND HOU MET DIE BEOOGDE PROJEKTE?

Die ontwikkelingsgebied en die roosterkonneksiekorridors sal deur onafhanklike omgewingspesialiste geëvalueer word om die potensiaal vir omgewingsimpakte te identifiseer. Spesialisevaluerings sal voldoen aan die vereistes van die OIE-regulasies en die Spesialisevalueringsprotokolle waar dit van toepassing is. Spesialisstudies wat as deel van die OIE-prosesse beoog word, sluit die onderstaande in.

Spesialisstudie	Werksbestek
Biodiversiteit-impakevaluering	Evaluering van impakte op ekologie, fauna en flora wat verband hou met versteuring van plantegroei, fauna, habitatte en ekologiese prosesse in die projekgebied.
Vleiland- en varswaterimpakevaluering	Evaluering van impakte op varswaterhulpbronne soos dreineringslyne, riviere en vleilande in die projek- en omliggende gebiede.
Avifauna-impakevaluering	Voor-oprigting monitering ingevolge die tersaaklike riglyne om die evaluering van die impak op avifauna se habitat en sensitiewe spesies toe te lig.
Evaluering van Grond en Landboupotensiaal	Bepaling van grondsoorte in die projekgebied en evaluering van die omvang van die verlies aan landbougrond as gevolg van die projekontwikkeling en impakte wat verband hou met gronddegradasie en/of -erosie.
Erfenisimpakevaluering (Argeologie, Paleontologie en Kultuurlandskap)	Evaluering van impakte op erfenishulpbronne as gevolg van die versteuring of vernietiging van erfenisterreine en fossiele tydens die konstruksiefase deur uitgrawingsaktiwiteite en die evaluering van impakte op erfenishulpbronne tydens bedryf as gevolg van die visuele impak.
Visuele Impakevaluering	Bepaling van die teenwoordigheid van visueel-sensitiewe reseptors in die gebied en die evaluering van die impak van die FV-sonkragaanlegte en die roosterkonneksie-oplossing op hierdie reseptors en die algehele estetika in die gebied.
Maatskaplike Impakevaluering	Evaluering van die positiewe en negatiewe impakte op die maatskaplike omgewing as gevolg van die oprigting en bedryf van die aanlegte.
Verkeersimpakevaluering	Evaluering van die ontwikkelings se impak op verkeer en padnetwerke in die gebied.

Terreinspesifieke studies sal onderneem word om die potensiële impak van die beoogde ontwikkeling te evalueer om gebiede van sensitiwiteit in die geaffekteerde plaasgedeeltes te delinieer, impakte te evalueer wat verband hou met die projekte en aanbevelings te maak betreffende vermyding, bestuur en versagting van impakte. Studies sal toegelig word deur beskikbare inligting en gedetailleerde veldondersoeke wat ooreenkomstig die tersaaklike riglyne en protokolle onderneem word. Sodra die beperkende omgewingsfaktore bepaal is, kan die uitleg vir die beoogde aanlegte bepaal word en in die OIE se verslagdoening voorgehou word.

OPENBARE DEELNAMEPROSES

Die deel van inligting vorm die grondslag van die openbare deelnameproses en bied B&GP's die geleentheid om aktief by die OIE-prosesse betrokke te raak. Kommentaar en insette van B&GP's word aangemoedig ten einde te verseker dat oorweging aan potensiële impakte regdeur die OIE-prosesse geskenk word.

Die openbare deelnameproses poog om te verseker dat:

» inligting wat al die tersaaklike feite met betrekking tot die aansoeke bevat, aan B&GP's beskikbaar gestel word vir insae;
» deelname deur B&GP's op so 'n wyse gefasiliteer word dat hulle 'n redelike geleentheid gegun word om kommentaar te lewer oor die beoogde projekte; en
» voldoende insaetydperke aan B&GP's gebied word om kommentaar te lewer oor die bevindinge van die Bestekopname- en OIE-verslag.

Ten einde doeltreffende deelname te verseker, sluit die openbare deelnameprosesse in:

» die identifisering van B&GP's, insluitende geaffekteerde en naburige grondeienaars en -bewoners en tersaaklike staatsinstellings en die boekstawing van besonderhede in 'n databasis;
» die verwittiging van geregistreerde B&GP's van die aanvang van die OIE-prosesse en die verspreiding van die Agtergrondinligtingsdokument (AID);
» die voorsiening van toegang aan geregistreerde partye tot 'n aanlyn skakelingsplatform vir belanghebbers, wat projekinligting in 'n enkele digitale platform sentraliseer;
» om B&GP's 'n geleentheid te bied om met die projekspan te skakel;
» die plasing van terreinkennisgewings by die geaffekteerde eiendomme en in die studiegebied;
» die plasing van 'n advertensie in 'n plaaslike koerant en deur 'n plaaslike radiostasie te gebruik (waar beskikbaar);
» om B&GP's in kennis te stel van die vrystelling van die verslae vir oorsig en kommentaar, vergaderings wat gehou moet word en die sluitingsdatums waarteen kommentaar ontvang moet word;
» om 'n geleentheid te bied om via 'n gepaste virtuele platform (om die risiko's wat met COVID-19 verband hou, te verminder), in persoon (waar nodig) of telefonies met die projekspan te skakel.

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U VERANTWOORDELIKHEDE AS 'N B&GP

Ooreenkomstig die OIE-regulasies, 2014 (soos gewysig) en die Riglyne vir Openbare Deelname, 2014, word u aandag gevestig op u verantwoordelikhede as 'n B&GP:

- Om aan die OIE-prosesse deel te neem, moet u uself op die B&GP-databasis registreer.
- U móét enige regstreekse sake-, finansiële-, persoonlike- of ander belang wat u dalk in die goedkeuring of weiering van die aansoeke kan hê, bekend maak.
- U moet toesien dat enige kommentaar met betrekking tot die beoogde projekte binne die gestipuleerde tydsraamwerke ingedien word.

HOE OM BETROKKE TE RAAK

- Deur telefonies, per faks of per e-pos te reageer op die uitnodiging vir u betrokkenheid.
- Deur die Antwoordvorm aan die tersaaklike kontakpersoon terug te besorg.
- Deur tydens die OIE-prosesse met die projekspan te skakel.
- Deur die omgewingskonsultant met navrae of kommentaar te kontak.
- Deur oorsig oor en kommentaar op die verslae te bied, en wel binne die gestipuleerde oorsig- en kommentaartydperk.

As u uself as 'n B&GP vir die beoogde projekte ag, moedig ons u aan om gebruik te maak van die geleenthede wat deur die openbare deelnameproses geskep word om kommentaar te lewer of daardie kwessies en knelpunte te opper wat u raak en/of vir u van belang is of waaroor u meer inligting versoek. U insette vorm 'n belangrike deel van die OIE-prosesse.

Deur die meegaande Antwoordvorm in te vul en aan ons terug te besorg, registreer u uself outomaties as 'n B&GP vir die beoogde projekte en verseker u dat kennis geneem sal word van die kommentaar, knelpunte of navrae wat u met betrekking tot die projekte opper. Let asseblief daarop dat alle kommentaar wat ontvang word, in die projek se dokumentasie vervat sal word. Dit kan persoonlike inligting insluit.

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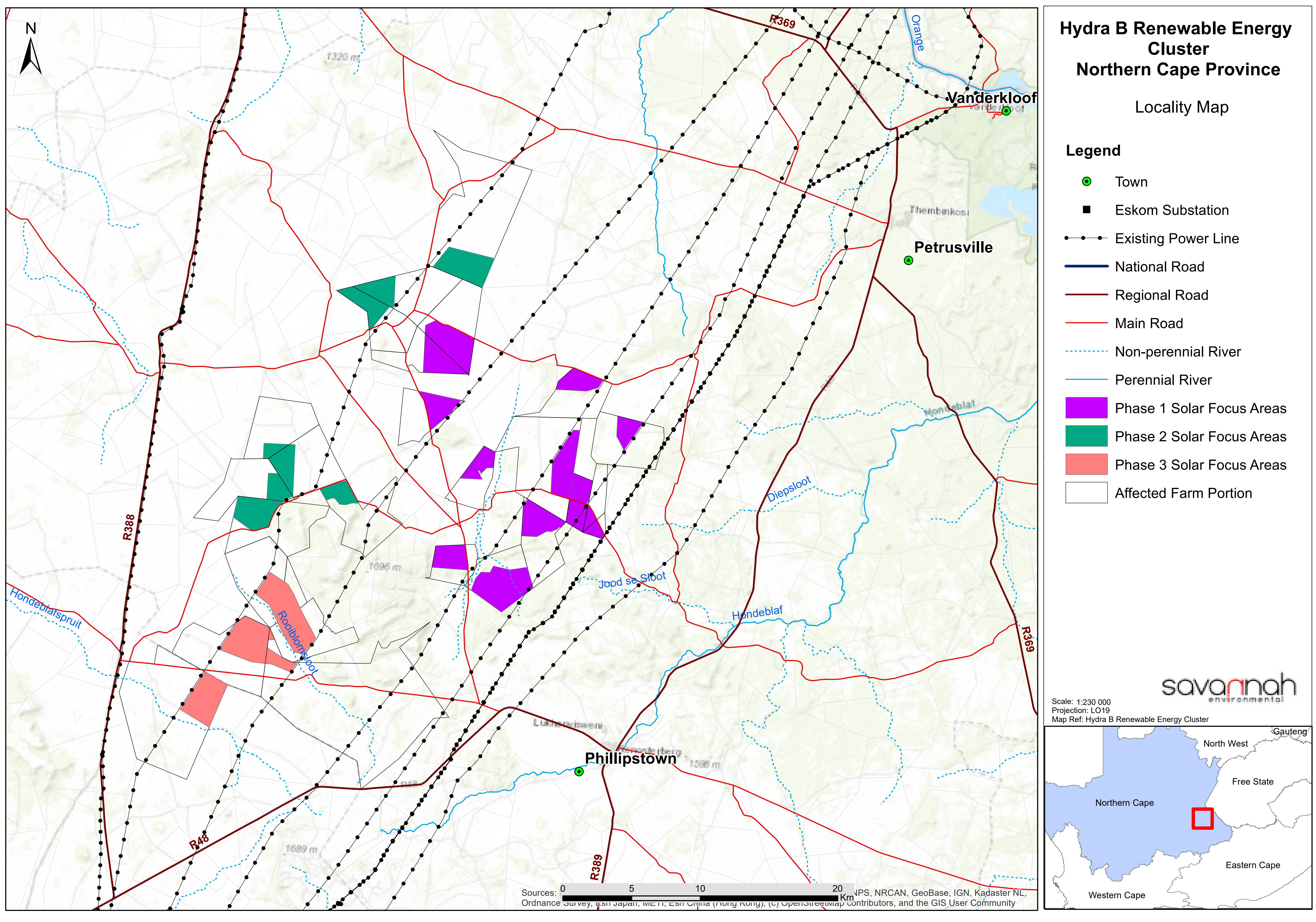
Figuur 1: Liggingskaart van die Hydra B Hernubare Kraggroepering.



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KOMMENTAAR EN NAVRAE

Rig alle kommentaar, navrae of antwoorde aan:

Nicolene Venter
Savannah Environmental (Edms.) Bpk.
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Tel: 011 656 3237
Selfoon: 060 978 8396
Faks: 086 684 0547
E-pos: publicprocess@savannahsa.com

Besoek www.savannahSA.com om die aanlyn skakelingsplatform vir belanghebbers te besoek en om die projek se dokumentasie te besigtig.

Kopiereg: Savannah Environmental (Edms.) Bpk.

BACKGROUND INFORMATION DOCUMENT (BID)

JUNE
2022

ENVIRONMENTAL IMPACT ASSESSMENT AND PUBLIC PARTICIPATION PROCESS

PROPOSED DEVELOPMENT OF THE HYDRA B CLUSTER OF RENEWABLE ENERGY FACILITIES AND GRID CONNECTION INFRASTRUCTURE, PIXLEY KA SEME DISTRICT MUNICIPALITY

NORTHERN CAPE PROVINCE

A consortium comprising of Akuo Energy Afrique, Africoast Investments and Golden Sunshine Trading propose to develop a cluster of renewable energy facilities and associated electrical infrastructure approximately 20km north of Philipstown and 30km west of Petrusville in the greater Pixley ka Seme District Municipality in the Northern Cape Province. The Project is known as the Hydra B Renewable Energy Cluster. The Cluster entails the development of up to twenty-one (21) solar energy facilities and associated infrastructure.

Each renewable energy facility will be constructed as a separate stand-alone project and therefore, separate Scoping and Environmental Impact Assessment (S&EIA) processes will be undertaken for each of the renewable energy facilities. The projects will be considered through the EIA process in batches, with Batch 1 considering 11 projects, Batch 2 considering 6 projects and Batch 3 considering 4 projects.

Due to the proximity of the renewable energy facilities to one another, the public participation processes for each batch of projects will be undertaken concurrently, providing the public with an opportunity to understand and provide comment on all the projects.

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 renewable energy facilities which form part of the cluster, and their associated grid connection solutions.
» An overview of the Scoping and Environmental Impact Assessment (EIA) processes, and specialist studies being undertaken to assess the renewable energy facilities and their associated grid connection solutions.
» Details of how you can become involved in the S&EIA processes, receive information, or raise comments that may concern and/or interest you.

OVERVIEW OF THE PROJECTS

The details of the various projects proposed as part of the Hydra B cluster of renewable energy facilities are provided in the table below.

No	Project name	Farm Name and portion Number	Capacity	Project Batch
1	**Tafelkop Solar PV Facility**	Portion 3 of the Farm Grass Pan 40	240MW	Phase 1
2	**Koppy Alleen Solar PV Facility**	Portion 5 of the Farm Koppy Alleen 83	100MW	Phase 1
3	**Vrede Solar PV Facility**	Portion 5 of the Farm Bas Berg 88	150MW	Phase 1
4	**Zionsheuvel Solar PV Facility**	Remainder of Farm Leeuwberg 79	240MW	Phase 1
5	**Amper Daar Solar PV Facility**	Remainder of Farm Wolwe Kuil 44	100MW	Phase 1
6	**Wag-'n-Bietjie Solar PV Facility**	Portion 1 of the Farm Leeuwe Berg 45	100MW	Phase 1
7.1	**Ruspoort 1 Solar PV Facility (Option A)**	Portion 5 of the Farm Bokken Kraal 81 (Option A)	100MW	Phase 1

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No	Project name	Farm Name and portion Number	Capacity	Project Batch
7.2	**Ruspoort 1 Solar PV Facility (Option B)**	Portion 4 on the Farm Knoffelfontein 74 Portion 1 on the Farm 78 Portion 2 on the Farm Leeuwberg 79 (Option B)	100MW	Phase 1
8	**Ruspoort 2 Solar PV Facility**	Portion 2 of the Farm Leeuwberg 79	100MW	Phase 1
9	**Middelplaas Solar PV Facility**	Portion 4 of the Farm Grass Pan 40	100MW	Phase 1
10	**Bokkraal Solar PV Facility**	Remainder of the Farm Bokken Kraal 81	100MW	Phase 1
11	**HCA Solar PV Facility**	Portion 4 of the Farm Koppy Alleen 83	100MW	Phase 1
12	**JW Solar PV Facility**	Remainder of the Farm Plaas 196	240MW	Phase 2
13	**Pro Deo Solar PV Facility**	Portion 1 of the Farm Grass Pan 40	100MW	Phase 2
14	**Uitkyk Solar PV Facility**	Remainder of the Farm Plaas 197	100MW	Phase 2
15	**Kareekloof Solar PV Facility**	Remainder of the Farm Swart Koppies 86	100MW	Phase 2
16	**JAN Solar PV Facility**	Portion 1 of the Farm Schaap Kraal 38, Portion 1 of the Farm Annex Donker Hoek 89; and Remainder of Farm Kuhns Post 90	240MW	Phase 2
17	**Driefontein Solar PV Facility**	Portion 1 of the Farm Driefontein 87	100MW	Phase 2
18	**Jagpoort Solar PV Facility**	Portion 2 of the Farm Driefontein 87, Portion 3 of the Farm Driefontein 87, and Portion 2 of the Farm Kareekloof 85	150MW	Phase 3
19	**Strydam Solar PV Facility**	Portion 3 of the Farm Stryd Dam 107	240MW	Phase 3
20	**Roodekraal Solar PV Facility**	Remainder of the Farm Roode Kraal 106	150MW	Phase 3
21	**Oosthuisfontein Solar PV Facility**	Remainder of the Farm Oosthuisfontein 108	100MW	Phase 3

The following infrastructure will be associated with each of the developments:

» Solar PV array comprising PV modules and mounting structures (monofacial or bifacial and a single axis tracking system)
» Inverters and transformers
» Cabling between the project components
» Battery Energy Storage System (BESS)
» On-site facility substation
» Site offices, Security office, operations and control, and maintenance and storage laydown areas
» Access roads, internal distribution roads

Grid infrastructure for each of the projects is to be confirmed in consultation with Eskom and will be assessed through a separate EIA processes.

The projects are intended to assist in addressing South Africa's energy challenge and to align with the Department of Mineral Resources and Energy (DMRE's) Integrated Resource Plan (IRP) 2019, to pursue a diversified energy mix that reduces reliance on a single or a few primary energy resources. It is the Developer's intention to bid each renewable energy facility under the Renewable Energy Independent Power Producer Procurement (REIPPP) Programme, or similar programme. The power generated from each solar energy facility is planned to be sold to Eskom and fed into the national electricity grid through the proposed grid connection solution or to a private off-taker.

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OVERVIEW OF SOLAR PV TECHNOLOGY

Solar energy facilities use energy from the sun to generate electricity through a process known as the **Photovoltaic Effect.** This effect refers to photons of light colliding with electrons, and therefore placing the electrons into a higher state of energy to create electricity. The solar fields of the PV facilities will comprise the following components:

Photovoltaic Cells:
A photovoltaic (PV) cell is made of silicone that acts as a semiconductor used to produce the photovoltaic effect. PV cells are arranged in multiples/arrays and placed behind a protective glass sheet to form a PV panel. Each PV cell is positively charged on one side and negatively charged on the opposite side, with electrical conductors attached to either side to form a circuit. This circuit captures the released electrons in the form of an electric current (i.e., Direct Current (DC)).

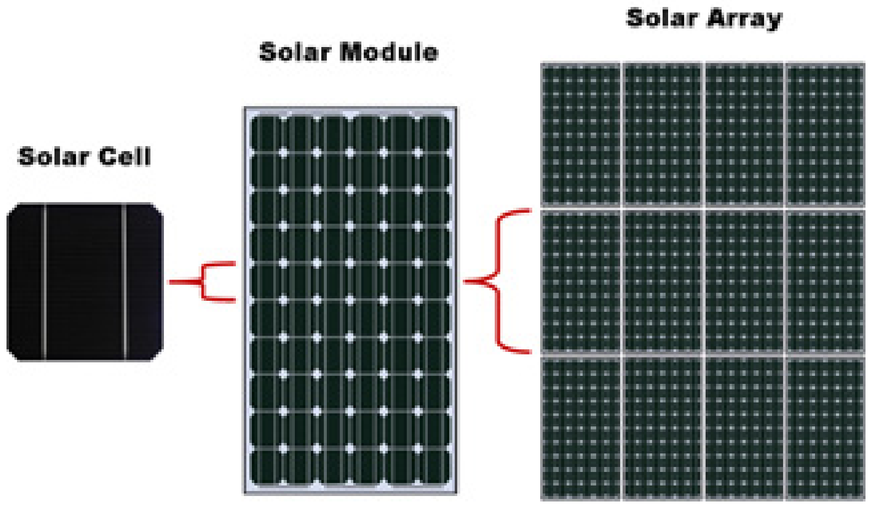

Figure 2: Overview of a PV cell, module and array/panel (Source: pveducation.com).

A solar PV module is made up of individual solar PV cells connected together, whereas a solar PV array is a system made up of a group of individual solar PV modules electrically wired together to form a much larger PV installation. The PV panels will be fixed to support structures to maximise exposure to the sun.

Inverters
Inverters are used to convert electricity produced by the PV cells from Direct Current (DC) into Alternating Current (AC) to enable the facility to be connected to the national electricity grid. Numerous inverters will be arranged in several arrays to collect and convert power produced by the facilities.

PV panels are designed to operate continuously for more than 20 years, mostly unattended and with low maintenance.

Support Structures
PV panels will be fixed to support structures. PV panels can either utilise fixed / static support structures, or alternatively they can utilise single or double axis tracking support structures. PV panels which utilise fixed / static support structures are set at an angle (fixed-tilt PV system) so as to optimise the amount of solar irradiation received. With fixed / static support structures the angle of the PV panel is dependent on the latitude of the proposed development and may be adjusted to optimise for summer and winter solar radiation characteristics. PV panels which utilise tracking support structures track the movement of the sun throughout the day so as to receive the maximum amount of solar irradiation.

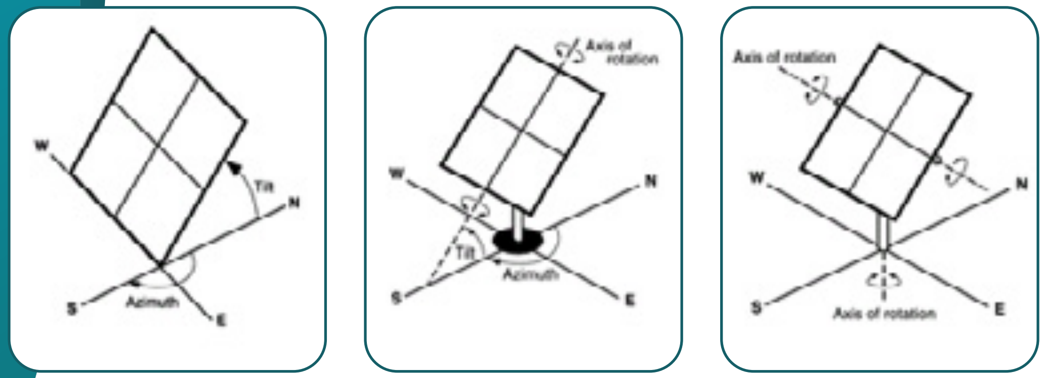

Figure 3: Overview of different PV tracking systems (from left to right: fixed-tilt, single-axis tracking, and double-axis tracking (Source: pveducation.com).

PV panels are designed to operate continuously for more than 20 years, mostly unattended and with low maintenance.

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PV technology alternatives: Monofacial versus Bifacial Panels

According to Solar Mag (2020), a bifacial solar panel is a double-sided energy factory that converts solar energy into electrical energy from both its top and bottom sides. They are different from monofacial solar panels which only use the top side for solar energy production. The word bifacial comes from the prefix "bi-" (meaning two), and "facial" (for face).

Bifacials are equipped with solar cells on both the top and the rear of the panel, which are usually the monocrystalline type, although polycrystalline can be used. Bifacial solar panels are assembled in multiple configurations such as framed, frameless and with double glass or a clear backsheet. Conventional monocrystalline solar panel systems differ such that they have opaque backsheets. The mounting structure used to mount a bifacial solar array is designed to minimize shading from the reflected solar irradiance onto the backside of the PV panels. This means there are only very narrow support rails and corner-only vertical supports.

The typically backside-placed junction box, which is the electronic interconnection for the PV panels, is smaller for bifacial PV systems than in traditional solar arrays. So, it takes up less space and casts less shade on the backside of the PV panels.

Figure 4: Image of a typical Bifacial Solar Array

The top solar cells of a bifacial solar panel system face the sun, so they capture incident solar energy directly, absorbing only certain wavelengths. The top solar cells function like those of a conventional solar panel array. The bottom solar cells absorb solar energy that is reflected off the ground. The reflectivity of the ground is based on the albedo value, which is higher for white or lighter surfaces. Painting a white or silver surface underneath the panels can provide this effect of increased reflectivity onto the backside of the panels. Studies show that a white surface, such as snow, reflects more than 80% of albedo light. (Grass, by comparison: 23%).

Since bifacial panels are able to generate electricity from both sides, the common preferred mounting strategy for installation is a single-axis tracking system, which follows the path of the sun. This is also typical for conventional modules; however, with bifacial system, the modules are ideally installed at a higher height above ground and larger spacing between module rows to increase the reflected energy onto the backside of the PV panels.

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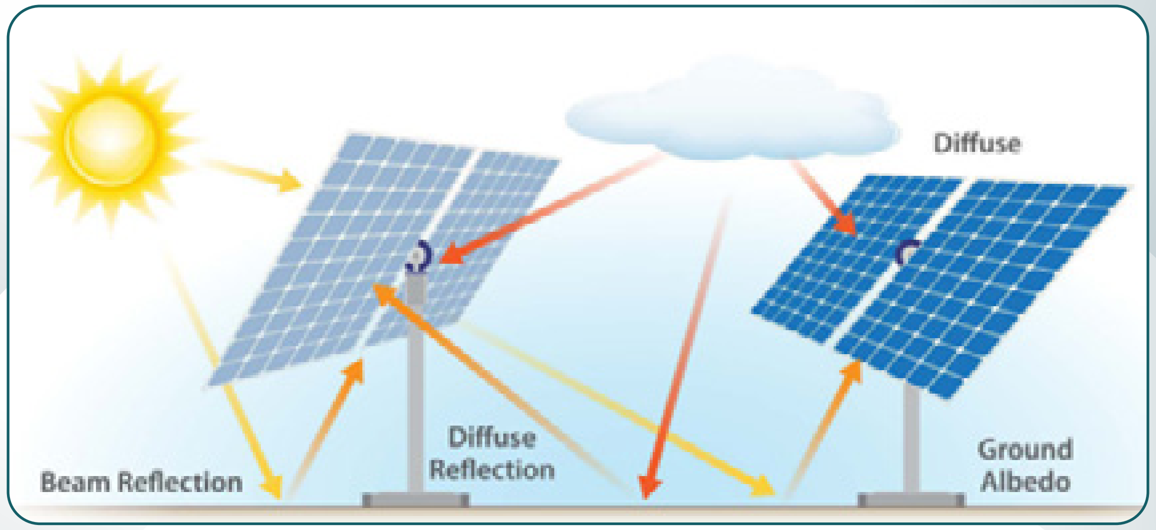

Figure 5: Diagram showing how bifacial solar PV panels work (Source: NREL, Bifacial PV System Performance – separating fact from fiction, https://www.nrel.gov/docs/fy19osti/74090.pdf)

Efficiency refers to how well a solar cell and panel converts the total amount of solar energy incident to its surface into electrical energy. A 2018 study by LONGi Solar showed that bifacials can increase efficiency by 11% compared to a conventional solar panel system. The bifacial solar cell efficiency increase can be as high as 27% by way of a solar tracking system that moves and rotates the panels based on the sun's trajectory across the sky.

As the bifacial solar panel price becomes competitive with that of monofacial panels, bifacial PV systems may provide a higher energy yield opportunity (better efficiency), especially in the case where there are land constraints and fewer panels can be accommodated. However, this is dependent on the albedo environment (ground reflectivity) and the site lighting conditions to inform the bifacial gain.

Battery Energy Storage System (BESS)

The need for a BESS stems from the fact that electricity is only produced by the Renewable Energy Facility while the sun is shining, while the peak demand may not necessarily occur during the daytime. Therefore, the storage of electricity and supply thereof during peak-demand will mean that the facility is more efficient, reliable and electricity supply more constant.

The BESS will:

» Store and integrate a greater amount of renewable energy from the Solar PV Facilities into the electricity grid.
» This will assist with the objective to generate electricity by means of renewable energy to feed into the National Grid which will be procured under either the Renewable Energy Independent Power Producer Procurement Program (REIPPPP) other government run procurement programmes or for sale to private entities if required.
» Proposed footprint of battery storage area: 2 – 10ha.
» Proposed capacity of battery storage: 200 - 800MWh.
» Proposed technology to be used: Lithium-ion batteries (LFP/NMC or others) (Li-Ion), Lithium capacitors/Electrochemical capacitors (LiC), and/or Redox-flow batteries (RFB)
» Battery types to be considered: Solid State Batteries and Redox Flow Batteries.

ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

In accordance with the EIA Regulations, 2014 (as amended) published in terms of Section 24(5) of the National Environmental Management Act (No. 107 of 1998) (NEMA), the applicant requires Environmental Authorisation (EA) from the National Department of Forestry, Fisheries and the Environment (DFFE), in consultation with the Department of Agriculture, Environmental Affairs, Land Reform and Rural Development, Northern Cape Province, for the development of the proposed projects. In terms of Section 24(5) of NEMA, the EIA Regulations 2014 (as amended) and Listing Notices (GNR 327, GNR 325, and GNR 324). As the projects exceed 20MW in capacity, the applications for EA for the solar energy facilities are subject to the completion of Scoping and EIA processes. Each application is required to be supported by comprehensive, independent environmental studies undertaken in accordance with the EIA Regulations, 2014 (as amended).

An EIA is an effective planning and decision-making tool. It allows for potential environmental consequences resulting from a proposed activity to be identified and appropriately managed during the construction, operation, and decommissioning phases of development. It also provides an opportunity for the project applicant to be forewarned of potential environmental issues and allows for the resolution of issue(s) identified and reported on as part of the EIA process, as well as provides opportunity for dialogue with key stakeholders and Interested and Affected Parties (I&APs).

Savannah Environmental has been appointed as the independent environmental consultant responsible for managing the separate applications for EA and undertaking the supporting EIA process required to identify and assess potential environmental impacts associated with the projects detailed above, as well as propose appropriate mitigation and management measures to be contained within the Environmental Management Programmes (EMPrs).

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WHAT ARE THE POTENTIAL ENVIRONMENTAL IMPACTS ASSOCIATED WITH THE PROPOSED PROJECTS?

The development area and the grid connection corridors will be assessed by independent environmental specialists to identify the potential for environmental impacts. Specialist assessments will comply with the requirements of the EIA Regulations and the Specialist Assessment Protocols where relevant. Specialist studies that are proposed as part of the EIA processes include the following:

Specialist study	Scope
Biodiversity Impact Assessment	Assessment of impacts on ecology, fauna and flora associated with disturbance of vegetation, fauna, habitats and ecological processes within the project area.
Wetland and freshwater Impact Assessment	Assessment of impacts on freshwater resources such as drainage lines, rivers, and wetlands within the project and surrounding areas.
Avifauna Impact Assessment	Pre-construction monitoring in terms of the relevant guidelines to inform the assessment of the impact on avifaunal habitats and sensitive species.
Soils and Agricultural Potential Assessment	Determination of land types within the project area, and assessment of the significance of loss of agricultural land due to the project development and impacts relating to soil degradation and/or erosion.
Heritage Impact Assessment (Archaeology, Palaeontology and Cultural Landscape)	Assessment of impacts on heritage resources due to disturbance or destruction of heritage sites and fossils during the construction phase through excavation activities, and assessment of impacts on heritage resources during operation as a result of visual impact.
Visual Impact Assessment	Determination of the presence of visual sensitive receptors in the area and assessment of the impact of the solar PV facilities and the grid connection solution on these receptors and the overall aesthetics within the area.
Social Impact Assessment	Assessment the positive and negative impacts on the social as a result of the construction and operation of the facilities.
Traffic Impact Assessment	Assessment of the impact of the developments on traffic and road networks in the area.

Site-specific studies will be undertaken to assess the potential impact of the proposed development, in order to delineate areas of sensitivity within the affected farm portions, assess impacts associated with the projects and make recommendations regarding avoidance, management and mitigation of impacts. Studies will be informed by available information and detailed field investigations undertaken in accordance with the relevant guidelines and protocols. Once the constraining environmental factors have been determined, the layouts for the proposed facilities can be determined and presented in the EIA reporting.

PUBLIC PARTICIPATION PROCESS

The sharing of information forms the basis of the public participation process and offers I&APs the opportunity to become actively involved in the EIA processes. Comments and inputs from I&APs are encouraged in order to ensure that potential impacts are considered throughout the EIA processes. The public participation process aims to ensure that:

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

In order to ensure effective participation, the public participation processes include the following:

- Identifying I&APs, including affected and adjacent landowners and occupiers of land, and relevant Organs of State, and recording details within a database.
- Notifying registered I&APs of the commencement of the EIA processes and distributing the Background Information Document (BID).
- Providing access to registered parties to an online stakeholder engagement platform, which centralises project information in a single digital platform.
- Providing an opportunity for I&APs to engage with the project team.
- Placing site notices at the affected properties and in the study area.
- Placing an advertisement in a local newspaper and using a local radio station (where available).
- Notifying I&APs of the release of the Reports for review and comment, meetings to be held and the closing dates by which comments must be received.
- Providing an opportunity to engage with the project team via appropriate virtual platform (to reduce the risks associated with COVID-19) in person (where required) or telephone.

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YOUR RESPONSIBILITIES AS AN I&AP

In terms of the EIA Regulations, 2014 (as amended) and the Public Participation Guidelines, 2014, your attention is drawn to your responsibilities as an I&AP:

» To participate in the EIA processes, you must register yourself on the I&AP database.
» You are required to disclose any direct business, financial, personal, or other interest that you may have in the approval or refusal of the applications.
» You must ensure that any comments regarding the proposed projects are submitted within the stipulated timeframes.

HOW TO BECOME INVOLVED

» By responding by phone, fax, or e-mail to the invitation for your involvement.
» By returning the reply form to the relevant contact person.
» By engaging with the project team during the EIA processes.
» By contacting the environmental consultant with queries or comments.
» By reviewing and commenting on the Reports within the stipulated review and comment periods.

If you consider yourself an I&AP for the proposed projects, we urge you to make use of the opportunities created by the public participation process to provide comment, raise issues and concerns which affect and / or interest you, or request further information. Your input forms a key element of the EIA processes.

By completing and submitting the accompanying reply form, you automatically register yourself as an I&AP for the proposed projects, and are ensured that your comments, concerns, or queries raised regarding the projects will be noted. Please note that all comments received will be included in the project documentation. This may include personal information.

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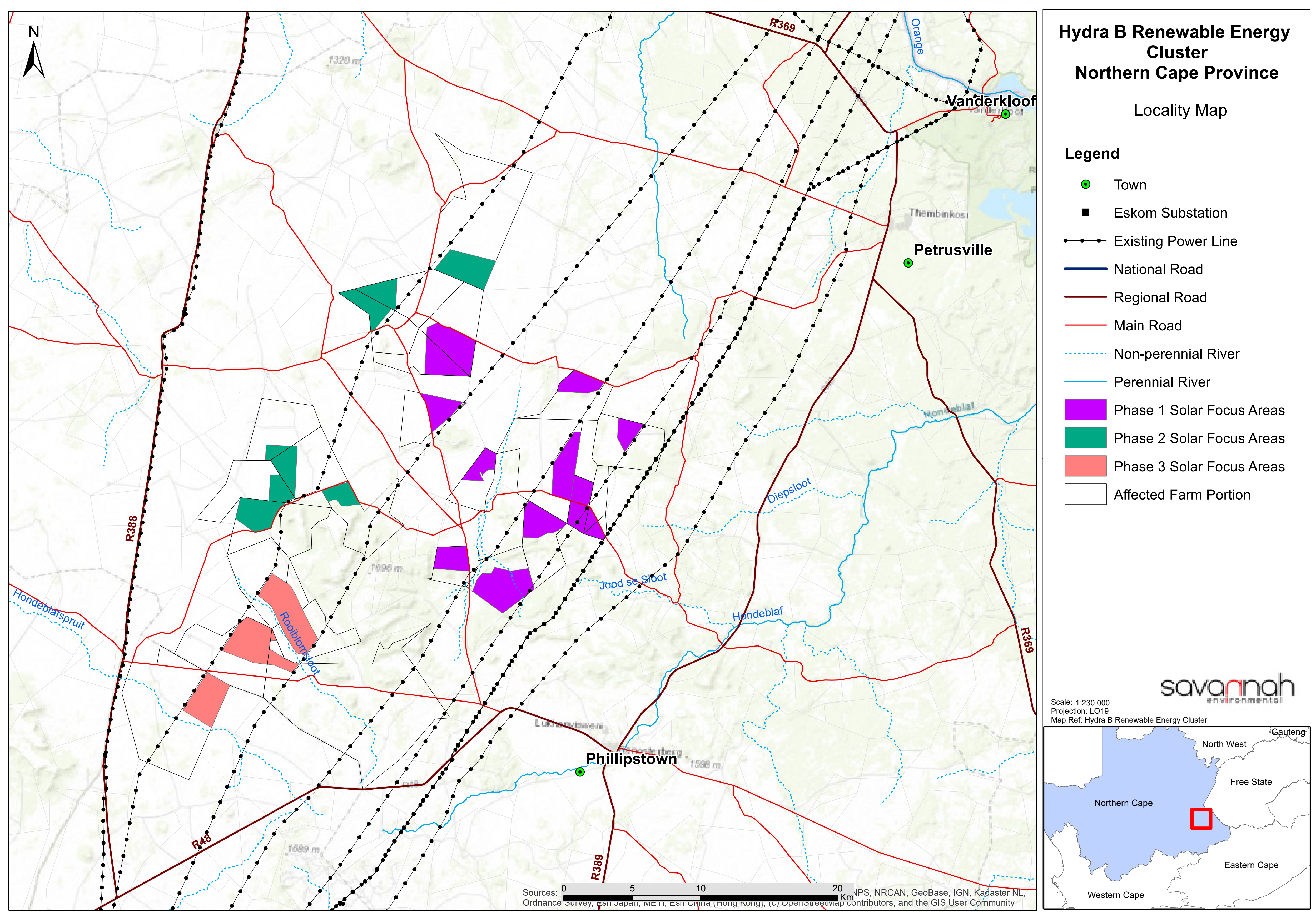
Figure 1: Locality map of the Hydra B Renewable Energy Cluster



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COMMENTS AND QUERIES

Direct all comments, queries or responses to:

Savannah Environmental
Nicolene Venter
P.O. Box 148, Sunninghill, 2157
Mobile: 060 978 8396
Tel: 011 656 3237
Fax: 086 684 0547
Email: publicprocess@savannahsa.com

To view project documentation, visit
www.savannahSA.com

savannah environmental

ENVIRONMENTAL IMPACT ASSESSMENTS AND PUBLIC PARTICIPATION PROCESS

PROPOSED DEVELOPMENT OF THE OF THE HYDRA B CLUSTER OF RENEWABLE ENERGY FACILITIES AND GRID CONNECTION INFRASTRUCTURE, PIXLEY KA SEME DISTRICT MUNICIPALITY, NORTHERN CAPE PROVINCE

Registration & Comment Form

June 2022

Return completed registration and comment form to: ***Nicolene Vente*** *of* ***Savannah Environmental***

Phone: *011 656 3237* **/** ***Mobile (incl. 'please call me'):*** *060 978 8396* / ***Fax:*** *086 684 0547*

E-mail: *publicprocess@savannahsa.com* ***Postal Address:*** *PO Box 148, Sunninghill, 2157*

Your registration as an interested and/or affected party will be applicable for this project only and your contact details provided are protected by the POPI Act of 2013

Please provide your complete contact details:

Name & Surname:			
Organisation:			
Designation:			
Postal Address:			
Telephone:		Fax:	
Mobile:			
E-mail:			

I would you like to register as an interested and affected party (I&AP) on the following Hydra B project/s database (please tick the relevant box)

Phase 1: Cluster of 12 Solar PV Facilities		**Phase 2:** Cluster of 6 Solar PV Facilities		**Phase 3:** Cluster of 4 Solar PV Facilities	

In terms of EIA Regulations, 2014, as amended, Regulation 43(1), you are required to register as an I&AP to receive further correspondence regarding the EIA process for the project and to disclose any direct business, financial, personal or other interest which you may have in the approval or refusal of the application (add additional pages if necessary)**:**

Please list your comments regarding your project selection above (add additional pages if necessary)**:**

Please provide contact details of any other persons who you regard as a potential interested or affected party:

Name & Surname:	
Postal Address:	
Telephone:	
Mobile:	
E-mail:	

Thank you for your registration