

EIA PROCESS FOR THE PROPOSED HDF ENERGY RENEWSTABLE® SWAKOPMUND HYDROGEN-TO-POWER PROJECT



BACKGROUND INFORMATION DOCUMENT (BID)

February 2022

1. BACKGROUND

HDF Energy (Pty) Ltd is a global market leader in the development and operation of hydrogen-to-energy technology. Having established HDF Energy Namibia (Pty) Ltd, the company is proposing to benefit from Namibia's considerable renewable energy capacity to create the Renewstable® Swakopmund project.

Renewstable Swakopmund will be Africa's first integrated solar-hydrogen power project with the objective of supplying Swakopmund, and surrounds, with renewable energy.

To inform their development, HDF Energy has appointed SLR Environmental Consulting (Namibia) Pty (Ltd) (SLR) to undertake an Environmental Impact Assessment (EIA) to identify and assess the environmental and social aspects and potential impacts associated with the proposed project and to inform their application for an Environmental Clearance Certificate (ECC).

2. PROJECT MOTIVATION

The development of the HDF Energy Renewstable® Swakopmund Project will allow for the Republic of Namibia to commence decarbonizing its electrical power supply, reducing its reliance on imported electricity, providing strong secure supply of electricity, meet electricity peak demands, localize baseload capacity, maximise on countries renewable resources, diversify the country's energy mix while contributing towards Namibia's efforts to combat climate change.

The project will also result in considerable economic investment during the design and construction phases (estimated investment of NAD\$ 3 billion) Furthermore the operation of the facility will reduce the overall cost of electricity providing further economic stimulus.

3. ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

To inform the Ministry of Environment, Forestry and Tourism (MEFT) and the Ministry of Mines and Energy's (MME) decision on the ECC application, an Environmental Impact Assessment (EIA) process must be undertaken in terms of the Environmental Management Act (Act 7 of 2007) and the associated Regulations (GN. R 28 of 2012).

The EIA process will include project initiation / screening & application, scoping and impact assessment phases, as well as the compilation of an Environmental Management Plan (EMP) to ensure the potential environmental and social impacts are avoided / minimized, during the life of the Renewstable Swakopmund Project.

The EIA regulatory process aims to:

- notify Interested and Affected Parties (I&APs) and provide reasonable opportunity for involvement;
- provide information on the project and its alternatives;
- document the baseline environment that may be affected;
- identify, in consultation with I&APs, and assess the potential impacts of the proposed project and its alternatives;
- present appropriate mitigation or optimisation measures to minimise potential impacts or enhance potential benefits, respectively; and
- allow for informed, transparent and accountable decision-making by the relevant authorities

An illustration of the EIA Process is shown on the overleaf.

4. YOUR ROLE

You have been identified as I&AP who may want to contribute to the EIA for the proposed project. Register as an I&AP to the undersigned, with contact details below.

For comments to be included in the Scoping Report, please complete the enclosed registration/comment form (separate word document) and send it to SLR by latest 18 March 2022.



- The proposed project description and associated activities; and alternatives being considered (Figure 1 and Section 5);
- Key environmental and social issues identified to date (Section 6);
- Further engagement opportunities (including, amongst others, I&APs input to the Draft Scoping Report (Section 8).

6. DESCRIPTION OF THE PROPOSED PROJECT

The Renewstable® Swakopmund project, will generate consistent, reliable, and clean renewable power from an intermittent source of energy. The sizing of each equipment of this hybrid power plant is optimised to deliver 30 MW during the day and 6 MW during the night and evening with a capacity factor of ~85% at the best cost.

The project proposes the production of green hydrogen using demineralized water produced from a desalination plant located immediately north of Swakopmund town. The desalination plant, with an estimated abstraction of 600 m³/day, will produce approximately 200m³/day of demineralized water which will be piped via a ~ 6 km pipeline to the hydrogen plant.

The hydrogen chain consists of several electrolyzers which separate the hydrogen and oxygen molecules. The oxygen molecules are released and the hydrogen molecules directed for storage in a series of storage vessels.

Stored hydrogen is then used to fuel a hydrogen fuel cell to produce 6 MW of power.

The 85 MW solar array covers an area of approximately 170 ha.

Solar and hydrogen generated power is then evacuated from the site via a new above ground transmission line which will tie into the existing Tamariskia substation.

Given the advancement of hydrogen power, HDF Energy are also applying for clearance to develop a hydrogen refueling station.

The main components of Renewstable® Swakopmund project are:

- Solar Photovoltaic (PV) plant
 - Eighty-five (85) MW solar PV power plant with tracker configuration.
- Demineralized water supply
 - ~ 600 m³/day reverse osmosis desalination plant which will generate ~ 200 m³/day of demineralized water;
 - Brine discharge;
 - Onsite renewable power supply from solar PV cells;

5. PURPOSE OF THIS DOCUMENT

This document has been prepared to inform I&APs about:

- The EIA process being undertaken for the proposed project;

- A ~ 6 km long bulk pumping main pipeline.
- Hydrogen chain
 - Twenty-four (24) MW of electrolyzers that will be located into a building.
 - Thirty-nine (39) hydrogen storage vessels each with a storage capacity of 115 m³. Total storage is 4 485 m³.
 - Six (6) MW of hydrogen fuel cells using Proton Exchange Membrane (PEM) technology to transform the stored hydrogen and the oxygen available in the surrounding air into electricity and water. The fuel cells will be in four (4) independent containerised modules.
- Battery Energy Storage System (BESS)
 - A 90 MWh short-term BESS: The battery will be in a maximum of twenty-five 40 ft (12.2 m) containers.
- Energy Management System (EMS)
 - The EMS is the software that will compute the solar irradiance forecast in advance and optimize the use of both the hydrogen and battery storages in order to deliver the maximum amount of power to the grid and minimize the energy losses. In case of low sun resources, it can maximize the energy supply and adapt the generation profile to comply best with the contractual obligations.
- Hydrogen refueling station
 - Capacity to install a hydrogen refueling station.

A conceptual layout of the project components is provided below (Figure 1) while the project layout is included at the end of this document

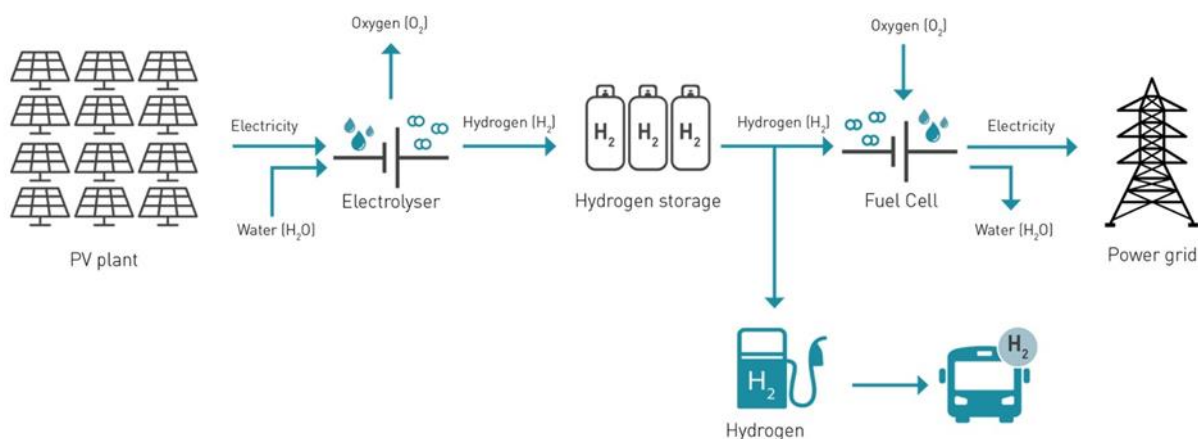


Figure 1: Renewable Hydrogen-to-Power Concept

Potential environmental and social issues associated with the various project components' activities and facilities include:

7.1 TERRESTRIAL BIODIVERSITY

7.1.1 Relevant to all project components

Localized physical destruction and general disturbance of biodiversity (including vegetation, vertebrates, invertebrates and avifauna) resulting from construction activities.

7.1.2 Desalination plant and associated infrastructure

Temporary impacts on shoreline biodiversity due to the construction and permanent site impacts during operations of intake and discharge pipelines and associated infrastructure and activities.

7.1.3 Water pipeline

Impact on animal movement as a result of the proposed (bulk) pipeline that would be of a significant size (i.e. diameter).

7.1.4 Power supply

The construction and operations of power lines and Solar PV structures may pose a risk to avifauna due to the increased potential for collisions (and electrocutions associated with power lines) to occur.

7.1.5 Service roads along the linear infrastructure

The construction activities associated with service roads along the linear infrastructure, cumulatively impacting on biodiversity.

7.2 MARINE ENVIRONMENT AND SHORELINE DYNAMICS

7.2.1 Desalination Plant

Impacts on the marine ecology and shoreline dynamics as a result of the construction and operation activities associated with the intake and discharge systems, including (amongst others) the discharge of the brine into the sea.

7.3 NOISE

7.3.1 Relevant to all project components

Potential noise impacts and disturbance to third parties as a result of construction activities for the project infrastructure.

7.3.2 Desalination Plant and booster pump stations

During operation, the desalination plant and various pump stations along the pipeline route could cause noise related impacts.

7.4 VISUAL

7.4.1 Relevant to all project components

Change to the visual landscape and impact on sense of place related to all proposed new surface infrastructure. Specifically, the solar arrays and infrastructure (i.e. powerlines, bulk pipelines and associated infrastructure) would extend long distances, causing visual disturbance to road users, amongst others tourists, travelling on the Swakopmund Henties Bay road.

7.4.2 Glint and Glare

Light reflection from the solar array may impact on aeronautical users, particularly flighting on approach and departure from the Swakopmund aerodrome.

7.5 ARCHAEOLOGY

7.5.1 Relevant to all project components

Possible impact/loss of archaeological resources within the areas to be affected by construction activities.

7.6 WASTE

7.6.1 Relevant to all project components

Construction and maintenance activities associated with all project components will result in waste generation that can cause impacts on biodiversity, visual impacts, general environmental degradation, etc. if not properly managed.

7.7 GROUND AND SURFACE WATER

7.7.1 Relevant to all project components

Groundwater quality, as a result of construction and operation phase activities and pollution (i.e. hydrocarbons spillages during construction or chemicals used at the desalination and hydrogen plants).

Hydrological impacts, i.e. deviation of natural stormwater paths leading to erosion and sedimentation.

7.8 SOCIO-ECONOMIC

7.8.1 Relevant to the project development and end users

The development of the project will positively contribute to electrical supply and power security for the town of Swakopmund. Jobs will also be created during construction and operations of the project, further improving the economy.

7.8.2 Employment and Skills transfer

The development of the proposed project is estimated to introduce NAD\$ 3 100 000 000 while the operational phase is estimated to introduce 30 employment opportunities directly.

The majority of these employment opportunities are to be afforded to local residents and Namibian entities.

The project also introduces several new technologies not currently catered for in Swakopmund. This will provide the opportunity for skills diversification and upskilling which will be ideally sourced from local markets.

8. INFORMATION SHARING MEETINGS

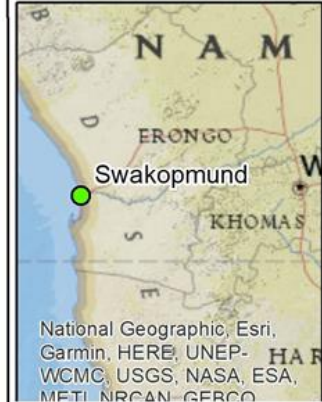
Stakeholder engagement sessions, i.e. public meeting(s) and key stakeholders meetings, will be held to provide a basic overview of the proposed project; as well as the objectives of the EIA process.

I&APs will be provided with an opportunity to raise any issues or concerns. The outputs from these meetings will be used to inform the EIA process and associated terms of reference for specialist studies to assess the key issue identified.

The Public Meetings will be held at the following venues and scheduled dates:

- Swakopmund Plaza Hotel - 09 March 2022, 14:00-15:30PM.

A second meeting is scheduled for 10 March 2022 at a time and venue to be confirmed.



- Legend**
- Water pipeline
 - Hydrogen refuelling
 - Hydrogen Plant
 - Desalination Plant
 - Solar photovoltaic
 - Substation
 - Property boundary

Scale: 1:40 000 @ A4

Projection: Transverse Mercator
WGS84

HDF Energy
Renewstable Swakopmund

Locality Plan



Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

