National Wind and Solar Photovoltaic Strategic Environmental Assessment

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New Path Growth for South Africa

National Development Plan:
- Officially adopted in 2012
- Targets: eliminate poverty and reduce inequality by 2030

New Growth Path for South Africa:
- Objectives:
  ✓ 5M jobs created by 2020
  ✓ structural problems in the economy resolved
  ✓ job drivers identified via opportunities in specific sectors and markets

First identified job driver: infrastructure development

Lack of adequate infrastructure: obstacle to the development of the wider South African economy and to Government achieving its social, economic and political goals
National Infrastructure Plan (NIP):

• Improving SA’s economic landscape, creating job opportunities and improving the delivery of basic services through infrastructure development

• **18 Strategic Integrated Projects (SIPs)** have been developed to promote fast-tracked development and growth of social and economic infrastructure across all nine provinces ([Link: http://www.gov.za/issues/national-infrastructure-plan](http://www.gov.za/issues/national-infrastructure-plan))

• 3 energy related SIPs
  
  SIP 8 – Green energy in support of the South African economy
  SIP 9 – Electricity generation to support socio-economic development
  SIP 10 – Electricity transmission and distribution for all

• **SIP 8** in particular aims at facilitating the implementation of sustainable green energy initiatives as envisaged in the NDP and Integrated Resource Plan (IRP2010)
Lack of Spatial Planning

- To date more than **550 projects (41 GW)** are proposed in SA

- Current SA policies: **no spatial reference** for Renewable Energy allocation

- Difficulties for eskom to **plan ahead** and allocate budget for upgrade
Study Objectives

• Facilitate **Sustainable Development** through a holistic consideration of:
  - Environmental Impacts;
  - Social Needs; and
  - Economics.

• Undertake **Wide Stakeholder Consultation** with:
  - Government Departments & Parastatals;
  - 3 Spheres of Government;
  - Private Sector; and
  - Public.

• Achieve **Integration** through the alignment policies and plans at:
  - National;
  - Provincial; and
  - Local levels.

• Create an **Enabling Environment** through:
  - Streamlined Authorisations; and
  - Infrastructure Availability.
Our mission

Identify **Renewable Energy Development Zones (REDZs)** that are of strategic importance for large scale wind and solar photovoltaic development in terms of Strategic Integrated Project 8, and in which significant negative impacts on the natural environment are limited and socio-economic benefits to the country are enhanced.
Study Outputs

Geographical Areas: 8 Renewable Energy Development Zones

Scoping level pre-assessment datasets (incl. Agriculture, Landscape, Heritage, Terrestrial & Aquatic Biodiversity, Birds, Bats, Civil Aviation, Defence, Telecommunication, Weather Services, SKA, Mining, Noise, Flicker) → online screening tool?

Protocols: minimum requirements and streamlined environmental assessment process

Updated Legislation: Gazette and Exception Notice for the SIPs SEAs findings
Solar PV

Wind

Development Potential

Highest Provincial Development Potential

Constraints Mask (Negative Mapping)

Study Areas
Identification of no-go areas (Negative Mapping)

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Attributes</th>
<th>Wind Buffer</th>
<th>Solar Buffer</th>
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<tbody>
<tr>
<td><strong>Natural</strong></td>
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<td><strong>National SE Applications</strong></td>
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<td>Fossil Fuel Power</td>
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<td>Natural Areas</td>
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<td>Protected Areas</td>
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<td>Mountain Areas</td>
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<td>Forest Areas</td>
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<td>Biodiversity Areas</td>
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<td><strong>DEA Protected Areas</strong></td>
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<td>Special Natural Areas</td>
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<td>National Parks</td>
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<td><strong>Technical</strong></td>
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<td><strong>GIS Overlay</strong></td>
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</table>

- **Negative Mapping**
- **Wind Buffer**
- **Solar Buffer**
Study Areas

Industry Input (5 year)

Focus Areas

Consultation with national/provincial and local authorities and key stakeholders
Wind and Solar PV Focus Areas

- 8 areas over 5 provinces
- ~ 80,000 km²
- ~ 17,000 farm portions
Scoping Level Pre-Assessments

Absolute & Relative Sensitivity Layers for Wind & Solar PV for the 8 REDZs:

- Agriculture
- Landscape
- Heritage
- Terrestrial & Aquatic Biodiversity
- Birds
- Bats
- Civil Aviation
- Defence
- Telecommunication
- Weather Services
- SKA
- Mining
- Noise
- Flicker
All consumptive and non-consumptive water uses not falling under Schedule 1 of the Water Act require a water use license, unless the water use falls within the conditions and limits of a General Authorisation (GA).

The full Water Use License Application (WULA) process requires the determination of the "Reserve" for the relevant catchment in case of a consumptive water use application (groundwater, surface water). GA does, however, not apply to any activities occurring within 500 m of a wetland or in the quaternary catchments specified as being excluded from this GA.
Biodiversity Sensitivities

- Rivers and Wetlands
- Land Cover
- Protected Areas
- Biomes
- Forest Patches
- Terrestrial Threatened Ecosystems
- Vegetation Type Endemism
- Additional Sensitive Vegetation Types
- Critical Biodiversity Areas (CBAs)
- Succulent-Karoo Ecosystem Programme (SKEP) Expert Derived Priority Areas
- Eastern Cape Protected Areas Expansion Strategy (EPAES) Priority Areas
- Pristine Thicket
- Renosterveld Clusters
- Riverine Rabbit Habitat
- National Protected Areas Expansion Strategy (NPAES) Priority Areas
- Extra Features Derived from Digital Elevation Model (DEM)
- Expert Features
Maps of freshwater ecosystems based on the National Freshwater Ecosystem Priority Area (NFEPA) wetlands and rivers data

The NFEPA rivers layer was not edited, as it is considered to be a good representation of the important river systems of South Africa.

The NFEPA wetlands layer in the FAs was edited, due to under-mapping of isolated wetlands (depressions, seeps and flats):
- Polygons misidentified as natural wetlands were deleted;
- Wetland polygons that were mapped as the same wetland system but which have been split into slivers/multiple polygons (generally as a result of landform modelling), were merged;
- Artificial aquatic features (e.g. dams, wastewater treatment ponds) that have erroneously been mapped as natural wetlands were deleted.
- ...
Combined Sensitivities

Landscape-based development density limits of remaining areas

Development Density Limits
appropriate cluster size and spacing of wind or solar PV facilities

<table>
<thead>
<tr>
<th>Sensitivity</th>
<th>Cluster size guide</th>
<th>Buffer between clusters</th>
<th>Indicative overall development density</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>ha/Turbine</td>
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<tr>
<td>Very High</td>
<td>Further assessment required before development can be considered</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>30 turbines</td>
<td>6 km if within same viewshed as another cluster</td>
<td>302</td>
</tr>
<tr>
<td>Medium</td>
<td>60 turbines</td>
<td></td>
<td>208</td>
</tr>
<tr>
<td>Low</td>
<td>120 turbines</td>
<td></td>
<td>160</td>
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Cluster: All turbines within 6 km of each other and within the same viewshed having a valid environmental authorisation or for which an environmental application has already been lodged and the assessment process is underway.
Generation vs Transmission Evacuation Capacities

Example: REDZ7: Upington

![Chart showing generation vs transmission evacuation capacities for REDZ7: Upington](chart.jpg)
Electricity Grid Infrastructure Strategic Environmental Assessment - SIP 10
Thank You

Feel free to contact me for more information:

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