DEA National Electricity Grid Infrastructure SEA

The identification of suitable routing corridors for the efficient and effective expansion of Electricity Grid Infrastructure (EGI)

Biodiversity Planning Forum

14th May 2014
From the spatial analysis of the country needs, 17 (+1) Strategic Integrated Projects (SIPs) have been identified.

The SIPs cover a range of economic and social infrastructure.

All nine provinces are covered, with emphasis on poorer provinces.
SIP 8: Green energy in support of the South African economy
- Roll out of the Integrated Resource Plan (IRP2010)

SIP 9: Electricity generation to support socioeconomic development
- Accelerated construction of new electricity generation capacity

SIP 10: Electricity transmission & distribution
- Expand the transmission and distribution network
Strategic Environmental Assessment

- **Strategic approach** allows development to be viewed at a regional scale
  - Mandated by DoE and MEC’s responsible for the environment
  - Support from National Treasury
  - Support of the Portfolio Committee for Water & Environment for a more strategic approach
Where does the SEA fit?

Policy

- Sector Specific
- Non-spatial
- Overarching

Strategic Assessment (SEA)

- Integrative
- Regional Spatial
- Guiding

Impact Assessment (EIA)

- Project Specific
- Project Spatial
- Decisive
What does the SEA aim to do?

Integration
- Environment
- Economics
- Social

Agreement
- Interdepartmental
- Intergovernmental
- Private Sector
- Cabinet (Ministers)

Alignment
- Gazette
- IDPs & SDFs
- Plans & Policies

Decreased Risk
- Streamlined Authorisations
- Strategic Infrastructure Investment
SEA Administrative Implementation Diagram

Stakeholder Engagement

SEA recommendations and Site specific protocol

Provincial ExCo (Executive Committee)

Ministers

Cabinet Approval

MinMec Consensus Environmental Authorities

Gazetted Corridors and site specific protocol
# Electrical Grid Infrastructure SEA Project Team

## Project Coordinator: DEA
- **Dee Fischer**  
  Project Coordinator
- **Surprise Zwane**  
  Project Manager

## Project Partner: Eskom
- **Ronald Marais**  
  Head of Strategic Transmission Planning
- **Kevin Leask**  
  Chief Transmission Engineer

## Environmental Consultants: CSIR
- **Paul Lochner**  
  SEA Project Leader
- **Marshall Mabin**  
  EGI SEA Project Leader

## Joint Service Provider: South African National Biodiversity Institute
- Jeffrey Manuel and Fahiema Daniels
Vision for the SEA: *Strategic electrical grid infrastructure is expanded in an environmentally responsible and efficient manner that responds effectively to the country’s economic and social development needs.*

**Objectives of the SEA:**
- Identify strategic corridors for future Electrical Grid Infrastructure (EGI) expansion.
- Determine high level suitability from an environmental, economic and social perspective.
- Streamline the authorisation process for EGI within the corridors.
- Enable Eskom greater flexibility when undertaking land negotiation.
- Enable upfront strategic investment.
- Promote collaborative governance between authorising authorities.
- Develop a site specific development protocol.
SEA Objective: Legal context

- SEA not taking away the need for Environmental Authorisation i.e. NOT ‘delisting’ activities using Section 24A of NEMA
- SEA will not lead to a new process, rather keep to existing process (i.e. BA) but adapt.
- EIA regs will be modified to allow for certain listed activities in certain areas to be authorised through an ‘adapted’ BA process, provided there has been some form of pre-assessment undertaken.
- Level of BA assessment can either be more or less rigorous than current process depending on the area selected for development.
Approach to SEA

- No single approach to SEA can be applied to all circumstances
- Set of common principles for the application of SEA (Guideline Document: Strategic Environmental Assessment in South Africa, DEAT and CSIR, 2000)

<table>
<thead>
<tr>
<th>Content</th>
<th>Process</th>
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<tbody>
<tr>
<td>• Sustainability</td>
<td>• Flexible</td>
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<tr>
<td>• Opportunities and constraints</td>
<td>• Strategic</td>
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<tr>
<td>• Levels of environmental quality</td>
<td>• Tiered</td>
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<td></td>
<td>• Participative</td>
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<td>• Alternatives</td>
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<td>• Precaution and continuous improvement</td>
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</table>

- Three broad categories of SEA:
  - Policy SEA
  - Spatial plan and regional SEA
  - Sector plan and programme SEA
Review of Energy Sector SEAs Approaches- transmission and distribution expansion

• **Strategic Environmental Assessment (SEA) for proposed Transmission Power Line Corridors in the North-Eastern part of South Africa, Eskom, (2011).**
  - Transmission only
  - Constraints assessment only
  - Attributes weighted
  - Composite map
  - Optimum corridors identified- least impact/shortest path computation
  - Overlaid with informative layers (existing infrastructure, heritage, fire, lightening, visual, geology)

• **Development of an Environmental Constraints Framework for the Empangeni Planning Area, Institute of Natural Resources, 2010**
  - Distribution only
  - Assessment of constraints only- Environmental Constraints Framework (ECF)
  - Constraints separated into Engineering and Environmental
  - Attributes scored
  - Composite Map

• **Strategic Environmental Assessment (SEA) for Grid 25 Implementation Programme (2011- 2016), Ireland (2010)**
  - Transmission only
  - Constraints and Opportunities mapping
  - Attributes scored
  - Composite Map
EGI SEA Process

Phase I (Jan-Aug 14)

- Eskom Strategic Corridors
- Environmental Constraints Map
- Engineering Constraints Map
- Provincial Government Input
- Opportunities Map

Phase II (Sep –Feb 15)

- Draft Composite Map
- Sector Specific Inputs
- Local Government Inputs
- Second Draft Composite Map

Phase III (Mar-Dec 15)

- Specialist Scoping Assessment
- Final Composite Map
- Site Specific Protocol

Birds and Bats Monitoring Database
Transmission Development Plan (TDP) Overview
Eskom recently completed Strategic Transmission 2040 Network Study

Three generation scenarios were considered for the study:

- **The IRP 2010 base Scenario (BASE IRP)**
  - IRP was extended to 2040
  - Coal was fixed at 2030 level
  - Balance in similar ratio to 2030 mix

- **Increased Renewables Scenario (GREEN)**
  - Replaced nuclear component with RE base generation equivalent
  - CSP (with storage)/ Wind with CCV of 30% / Natural Gas

- **Increased Imports Scenario (IMPORT)**
  - Doubled imported power by 2030
  - Reduced coal & nuclear
Environmental Constraints Map

- Impact of EGI on the Environment
- A strategic level, GIS map that spatially represents the location and level of constraints associated with environmental features within the corridors
- Features considered can be separated into three categories:
  - The biophysical impact on the natural environment
    - Protected areas
    - Birds
    - Natural forest
  - The impact on the cultural or heritage significance of certain areas
    - World Heritage sites
    - National Heritage sites
  - Land use- areas zoned for land uses of strategic or national importance
    - SKA
    - Airports
Environmental Constraint Categories

- Features categorised according to four levels of sensitivity as follows:

<table>
<thead>
<tr>
<th>Level of Constraint</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘No- Go’</td>
<td>The area is rated as extremely sensitive to the negative impact of development. As a result the area will either have very high conservation value, very high existing/potential socio-ecocomic value or hold legal protection status.</td>
</tr>
<tr>
<td>High</td>
<td>The area is rated as being of high sensitivity to the negative impact of development. As a result the area will either have high conservation value and or existing/potential socio-economic value.</td>
</tr>
<tr>
<td>Medium</td>
<td>The area is rated as being of medium sensitivity to the negative impact of development. As a result the area will either have mediums levels of conservation value and or medium levels of existing/potential socio-economic value.</td>
</tr>
<tr>
<td>Low</td>
<td>Area is considered to have low levels of sensitivity in the context of electricity grid infrastructure development.</td>
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</table>
Impact of Environment on EGI

Identifies engineering constraints which are likely to impact on the life-time cost (both construction and maintenance) for the development of EGI in certain areas within the corridor.

Informative layer for Eskom only

Eskom line engineering team provided inputs into cost assumptions and classifications.

Cost impact of each constraint feature compared against a baseline cost scenario.

Baseline cost scenario: Lifetime cost associated with the construction and maintenance of 1km of 400kV line over a 20 year period assuming optimal environmental conditions for construction and maintenance.

Baseline cost scenario referred to as ‘BLC index’

Each constraint feature was introduced to the above scenario to determine impact on ‘BLC index’
Features categorised according to four levels of sensitivity as follows:

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<tr>
<td>‘No- Go’</td>
<td>The lifetime cost associated with development in this area is \ (&gt;3 \text{ times}\ \text{BLC index}).</td>
</tr>
<tr>
<td>High</td>
<td>The lifetime cost associated with development in this area is between \ 2 \text{ and} \ 3 \text{ times the BLC index}.</td>
</tr>
<tr>
<td>Medium</td>
<td>The lifetime cost associated with development in this area is between \ 1.5 \text{ and} \ 2 \text{ times the BLC index}.</td>
</tr>
<tr>
<td>Low</td>
<td>The lifetime costs associated with development in this area is \ (&lt;1.5 \text{ times}\ \text{the BLC index}).</td>
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Opportunities Map

• Identification of Positive features to enhance the economic and social component of the assessment
• Polarise the location of the corridors in the direction of national, regional or local economic or social development opportunities/priorities.
• Also identify key ‘pull’ factors for route placement within the corridors to maximise benefit and reduce negative impacts:
  – Recycling of existing transmission lines
  – Aligning to existing linear developments
  – Make use of existing servitude purchases
  – Seek out visual screening opportunities
  – Target degraded/transformed land
• Input from government (provincial and local) essential to understanding pull factors
Specialist Scoping Assessment

• Specialist studies will be undertaken- high level desktop assessments
  – Validate and adapt constraints and opportunities mapping assumptions ;
  – Undertake assessments where no existing data is available e.g. visual impact
  – Contribute to site specific protocol development
Consultation Process

• Comprehensive consultation process will be undertaken throughout the duration of the project
  – Expert Reference Group meetings
  – Project Steering Committee meetings
  – Provincial Government workshops
  – Local Government workshops
  – Sector Specific meetings (BUSA, CoM, Agric SA, SAPVIA, SAWEA, farmer associations, NGOs)
• Consultation will be accomplished through workshops, focus group meetings and an online consultation process
Timeframes

- 24 month project
- Corridors identified, assessed, supporting documentation completed and legal implementation process agreed by end of 2015
- Submitted for Cabinet approval thereafter and gazetted subsequently
## EGI SEA Provincial Road Show Schedule

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<tr>
<th>Meeting</th>
<th>Date</th>
<th>Location</th>
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<tr>
<td>Trip 1 Western Cape Provincial Consultation</td>
<td>12 May 2014</td>
<td>Cape Town</td>
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<tr>
<td>Trip 2 Eastern Cape Provincial Consultation</td>
<td>13 May 2014</td>
<td>King Williams Town</td>
</tr>
<tr>
<td>Trip 3 Limpopo, Gauteng, Mpumalanga Provincial Consultation</td>
<td>22 May 2014</td>
<td>Pretoria</td>
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<tr>
<td>Trip 4 Free State Provincial Consultation</td>
<td>27 May 2014</td>
<td>Bloemfontein</td>
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<tr>
<td>Northern Cape Provincial Consultation</td>
<td>28 May 2014</td>
<td>Kimberly</td>
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<tr>
<td>North West Provincial Consultation</td>
<td>29 May 2014</td>
<td>Mahikeng</td>
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<tr>
<td>Trip 5 Kwa-Zulu Natal Provincial Consultation</td>
<td>3 June 2014</td>
<td>Pietermaritzburg</td>
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<tr>
<td>Trip 6 Wind and Solar SEA and EGI SEA Expert Reference Group Meeting</td>
<td>11, 12 June 2014</td>
<td>Pretoria</td>
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Thank You

Any Questions?

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