Coega Overview

Nuclear Readiness

The Economic Benefits of Nuclear for EC
Coega Overview

Nuclear Readiness

The Economic Benefits of Nuclear for EC
<table>
<thead>
<tr>
<th>Coega Development Corporation (Pty) Ltd – a state owned entity</th>
<th>Coega IDZ and Deep Water Port of Ngqura</th>
<th>Coega Commercial Services</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>11 500 Ha prime industrial estate located in Port Elizabeth</td>
<td>Human Capital Solutions VACC (Construction Village)</td>
</tr>
<tr>
<td></td>
<td>186 Ha NMBLP adjacent to Volkswagen SA</td>
<td></td>
</tr>
</tbody>
</table>

**Infrastructure implementing agent for government**

<table>
<thead>
<tr>
<th>33 Operational investors IDZ &amp; NMBLP</th>
<th>15 International companies 18 Home-grown companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>R6.489 bn private sector investment</td>
<td>R2.646 bn top-structures for investors</td>
</tr>
<tr>
<td>17 367 Jobs have been created in the IDZ thus far</td>
<td>7 174 Operational jobs 11 192 Construction jobs</td>
</tr>
<tr>
<td>Over 71 445 people trained since inception</td>
<td>2 x Customs Controlled Areas (CCA) to reduce costs for exporters</td>
</tr>
</tbody>
</table>
Coega Overview

11,500 Ha Industrial Zone

Full integration with new deep-water port

Full integration with modern city and port
Priority Sectors for Investment

- Chemicals
- Agro-processing
- Logistics
- Automotive
- Metals
- Services
- Energy
- Maritime
- Trade Solutions / Training & Development Cluster
IDZ Zones per Priority Investment Sector
Index

1. Coega Overview
2. Nuclear Readiness
3. The Economic Benefits of Nuclear for EC
South Africa’s Diverse Energy Mix

- Coal
- Bio Energy
- Natural Gas
- Wind
- Nuclear
- Solar
Eastern Cape Energy Map

CURRENT AND POSSIBLE EASTERN CAPE ENERGY PICTURE
Nuclear Localisation
<table>
<thead>
<tr>
<th>Critical Areas of Focus (Milestones)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety, liability &amp; Licensing</td>
</tr>
<tr>
<td>Nuclear Siting &amp; Supporting Infrastructure</td>
</tr>
<tr>
<td>Manufacturing, Industrialisation &amp; Localisation</td>
</tr>
<tr>
<td>Programme Management</td>
</tr>
<tr>
<td>Funding &amp; Financing</td>
</tr>
<tr>
<td>Technology &amp; Construction</td>
</tr>
<tr>
<td>Public Awareness &amp; Info Centres</td>
</tr>
<tr>
<td>Nuclear Fuel Cycle</td>
</tr>
<tr>
<td>Human Resources &amp; Skills Dev</td>
</tr>
<tr>
<td>Quality Standards &amp; Accreditation</td>
</tr>
<tr>
<td>Waste Disposal Strategy</td>
</tr>
<tr>
<td>Environmental</td>
</tr>
</tbody>
</table>

IAEA milestones
DoE media release 2015
AREAS OF FOCUS

1. Coega Nuclear Readiness
   • CDC engagements with Nuclear Industry
   • Provincial Nuclear Readiness – Transforming the Landscape (learnings from REIPPPP)
   • Coega IDZ and logistics Integration
   • Coega Readiness for industrialisation & local manufacturing

2. Value add from CDC Business Units

Project implementation – Operationalization of Investors (DEDISA & DCD experience)
   • Investor Services
   • Spatial Planning
   • SHEQ
   • Operations: facilities
Coega central to supporting Nuclear Localisation

• The CDC is working closely with various entities in preparing for the Nuclear Programme

• Focus areas include:
  - Institutional readiness, clarification of roles and demystification
  - Communication & public awareness building
  - Local content manufacture and service provision
  - Advanced Nuclear Manufacturing
  - Skills training (recent participation in China partnership)
  - Human capital and facilitated labour provision
  - Coordinated ancillary infrastructure development and logistics requirements (Port integration, Road & rail, accommodation etc)
  - Harnessing ancillary SMME opportunities
<table>
<thead>
<tr>
<th>Initiatives</th>
<th>Experience and Capability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nuclear Component &amp; Advanced Manufacturing</td>
<td><strong>Manufacturing sites</strong>, with close proximity to Port and logistics network identified for Nuclear. Site for potential establishment of full <strong>Nuclear Fuel Cycle</strong> production facilities which could in future include recycling of spent nuclear fuel</td>
</tr>
<tr>
<td>Industry Engagement</td>
<td>Participation in <strong>international and national industry activities</strong>&lt;br&gt;Membership on the Nuclear Industry Association of South Africa-&lt;br&gt;Continuous engagement with Eskom- Koeberg Nuclear Power plant</td>
</tr>
<tr>
<td>Supplier Development</td>
<td>Facilitation of emerging entrants into the manufacturing sector in particular black and women owned enterprises, assistance with the commercialization of newly developed home grown patents and technology, ensuring technology transfer</td>
</tr>
<tr>
<td>Human Capital Solution</td>
<td>On a provincial level, CDC prepared the <strong>initial labour absorption forecasts</strong> related to the nuclear build at Thyspunt on behalf of the Office of the Premier for submission to the National Infrastructure Skills Planning Committee.</td>
</tr>
<tr>
<td>Labour Management</td>
<td>Recent experience with Dedisa Peaking Power Project at Coega IDZ</td>
</tr>
<tr>
<td>Infrastructure Programme Implementation</td>
<td>Project Management Services for the <strong>Development of Supporting Infrastructure and logistics</strong> i.e. Port Infrastructure liaison, Roads, Bridges, Housing &amp; support infrastructure</td>
</tr>
</tbody>
</table>
## Nuclear Localization Readiness Study

<table>
<thead>
<tr>
<th>Project name</th>
<th>Nuclear localisation: Nuclear Localisation Readiness Study Programme for the imminent South African Nuclear Power Plant build programme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implementing Agent</td>
<td>Coega Development Corporation (CDC)</td>
</tr>
<tr>
<td>Project Rationale</td>
<td>The Coega IDZ intends to establish advanced manufacturing capabilities for Nuclear Power Plant (NPP) components, and for Nuclear Fuel cycle (NFC) related components to support the establishment of the new nuclear build programme at Thyspunt, 80 km from the Coega IDZ.</td>
</tr>
<tr>
<td>Project Value</td>
<td>The estimated cost for Nuclear Localisation Readiness Study Programme</td>
</tr>
<tr>
<td>Project schedule</td>
<td>2016/17 and extends beyond this current financial year (The Nuclear Programme is targeted for 2023-2030)</td>
</tr>
</tbody>
</table>
| Project Status & docs available | In Progress  
CDC Nuclear Localisation Readiness Framework  
The Dti Localisation study  
NIASA localisation assessment & Skills Development Study |
| Existing partners and commitments | CDC, Department of Energy, Eskom, the Department of trade industry (Dti), District Municipality, Potential investors – Nuclear industry, NIASA, Service Provider(s) – Energy Sector Consulting Expertise, Academic Institutions of Higher Education/ Learning. |
Supply Chain: Opportunities for Manufacturing

Nuclear
- Reactor Pressure Vessel
- Reactor Internals

Mechanical
- Steam Turbine
- Condenser
- Heat Exchangers
- Pumps
- Valves

Electrical
- Generator
- Transformers
- Switchgear

Equip. Modules
- Nuclear & non-nuclear

Construction
- Concrete
- Rebar
- Buildings
- Doors & Windows
- Piping
- Fencing
- Sand & Gravel

Chemical
- Radioactive Waste
- Nitrogen & CO2 Storage

Misc.
- Fire Protection Systems
- HVAC Systems
- Cranes & Hoists
- Elevators

Base Industry
Fabricators
Sub-suppliers
Main Subcontractors and Suppliers
Principal Contractors
Technology/OEM
Project
1. Coega Overview
2. Nuclear Readiness
3. The Economic Benefits of Nuclear for EC
How we arrived at the estimate

**Fiction**

The nuclear programme will cost SA R1 trillion. This figure – although widely quoted in the media, is untrue

**Fact**

The price of the nuclear build is still unknown. Vendors have not yet submitted their proposals. This will be determined through the Department of Energy driven procurement programme
How then to estimate nuclear benefits if you don’t have a price?

- Nuclear Africa estimates the build cost to be around **R650bn over ten years** for the entire fleet.

- Reviewed the cost estimates of 43 plants under construction currently around the world, and the actual costs of the last 23 plants constructed in the USA (inflation adjusted).

- All of these international estimates broadly concur with the Nuclear Africa estimate of **R650bn**.

- We expect **R260bn** of that will be spent on the Thyspunt nuclear build over the next ten years.
Income effects .... Wages, profits and tax contributions

**INCOME EFFECTS (DIRECT)**

- Nuclear Build estimated impact on the EC – Units 1&2
  - Localization est. for SA (assuming 60%) R16bn
  - Employment Construction est. average R1.9bn p.a. (direct, wages)

- Localization (35%) R5.6bn
  - Of which est. 71% will remain in province, balance accrued to rest of SA

- Of which we expect R1,920bn to accrue to the EC (12%)
  - Direct tax revenue est. average R429m p.a.

- Direct wage impact (construction phase) on EC = R1,349bn p.a

**Total employment estimate:**
Inclusive of localization impacts, some 22,900 formal sector jobs to be created (direct + indirect impacts) est. at 35% localization of which the EC est. to garner 12%. Most of these jobs, skilled and semi-skilled average duration 214 days

**Construction jobs**
- 15,000 peak est.
- 9000 average (direct)

**Indirect employment** (induced, inclusive localization) average R3.3bn p.a.

**Total economy-wide impact on Provincial GDP**
est. average R15.6bn p.a.
which gives est. rise in provincial GDP of around 3%, peaking at 5.5% (2027)
Consumption – how nuclear drives demand

**CONSUMPTION EFFECTS**

Construction of a new nuclear power plant will provide a substantial boost to suppliers of **commodities** like concrete and steel and manufacturers of hundreds of components. The figures are calculated per megawatt (MW) of installed capacity.

- 523,560 m³ concrete
- 66,000 tons of steel
- 70.4 km of piping
- 480 km of electric wiring
- 130,000 electrical components

Likely localization scope:
- Civil construction and engineering
- Piping
- Pressure vessels and tanks
- Ventilation
- Electrical components
- Steel cladding
- Instrumentation and control components

The **multiplier estimates** are based on multipliers normed for the EC economy by Quantec and gives for every Rand spent on nuclear, the local economy will benefit R1.04 (Kouga), the EC economy **R1.18** and the national economy **R1.87**. The EC multiplier is based on existing industrial capacity, however with a supplier development and localization programme the balance can shift to R1.36 (EC) and R1.94 (national).