



Angola LNG ESHIA Process Utilizing EBI Tools to Address Biodiversity

**Biodiversity & the Oil & Gas Industry: Central & West Africa
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Angola LNG Project Description

- Project objective is to eliminate offshore gas flaring while providing gas for sale/export and domestic use.
- Project participants include Sonangol, Chevron, BP, ExxonMobil & Total.
- Gas will be supplied from offshore wells.
- Gas gathering system will deliver gas to the onshore LNG facility.



Angola LNG Project Description

- Onshore facilities will be located on Kwanda Island, partially on reclaimed land.
- Facilities will include gas reception & treatment, LNG process & storage facilities & a marine terminal.
 - Supporting facilities will include offices & residential housing.
 - A workers camp, laydown area and dock will also be required.



Angola LNG Biodiversity Position

We will support biodiversity conservation through actions in four major areas:

- Protect biodiversity throughout the project
- Engage in partnerships, collaborations and contributions
- Communicate, promote and monitor biodiversity activities
- Support research and education for improved biodiversity conservation



Angola LNG: Key Biodiversity Issues

- **Kwanda / Soyo area has important biodiversity resources in the form of mangrove ecosystems.**
- **Some global red-listed species are present in the wider Soyo area, although they have not been observed on Kwanda Island.**
- **Western Angola is classed as an Endemic Bird Area by Bird Life International; these species have not been observed in the Soyo area.**
- **Potential for cumulative impacts exists from additional developments in the Kwanda / Soyo region.**
- **Secondary impacts may include coastal erosion; changes in channel morphology; impact to fisheries etc.**
- **Potential reduction of pressure on mangroves and other trees used as firewood if domestic fuel becomes available, e.g. LPG.**

Energy & Biodiversity Initiative (EBI)

- **To develop & promote biodiversity conservation practices in upstream oil and gas development, several companies have joined with leading conservation organizations to form the EBI.**
- **The EBI is a partnership designed to produce guidelines, tools & models to improve the environmental performance of energy operations, minimizing harm to biodiversity, and maximize opportunities for conservation.**
- **The group has consulted with key stakeholders from industry, academia, and the environmental community.**

BP, Chevron, Conservation International, Fauna & Flora International, IUCN, The Nature Conservancy, Shell, Statoil, Smithsonian Institution

Integration of Biodiversity into ESHIA Process

EBI recommends Integration of Biodiversity in Seven Key Stages

- **Identification of alternatives**
- **Screening**
- **Scoping**
- **Baseline establishment**
- **Evaluation (impact analysis)**
- **Development of mitigation options and implementation**
- **Monitoring and adaptation**

Stakeholder engagement and estimation of secondary and cumulative impacts are key principles that underpin the ESHIA process.

Stakeholder Engagement

Local, regional and international stakeholders should be engaged to discuss biodiversity knowledge and concerns.

- **tap into local knowledge**
- **consult with users of biodiversity resources**

Angola LNG began stakeholder consultation in the site selection phase and will continue throughout the project life. Consultation has included local communities, interest groups, government, local & international NGOs.



Estimation of Secondary & Cumulative Impacts

Identify secondary impacts and their incremental impacts when added to other past, present and foreseeable current activities.

- **Impact on receptors due to interaction with other activities**
- **Impacts to larger area (ecosystem/regional approach)**

Angola LNG has the potential to:

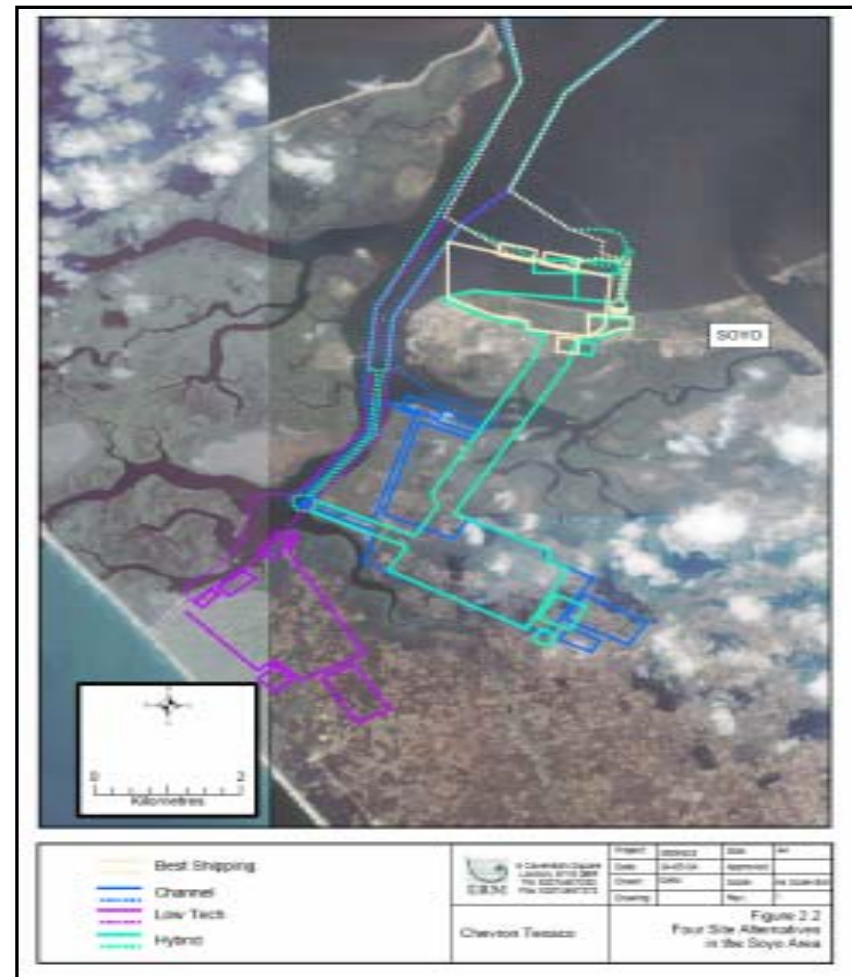
- Lead to demographic change
- Be a catalyst for industrial development
- Improve local education and training
- Stimulate the local economy
- Impact local fishing

Identification of Alternatives

Identify all reasonable alternatives for the project

- Document the process
- Consult with stakeholders

Key alternatives related to siting. A detailed site selection report documented the process.



Screening

Screening should be used to determine extent of the ESHIA

- Establishes basis for scoping, which identifies key impacts to be studied and establishes terms of reference

Angola LNG determined that the magnitude of the project and type of environment merited a full ESHIA

Project will be consistent with World Bank guidelines.



Scoping

Scoping should be used to determine presence, use & value of biological resources and assist in management of social issues

- Identify major impacts
- Determine key issues
- Establish Terms of Reference for the ESHIA

A Scoping Phase Supporting Document and Non-Technical Summary were produced.

Available on the project web site:
<http://www.angolalng.com>



Baseline Establishment

Baseline surveys should be conducted to provide information on the site-specific environmental setting of the project

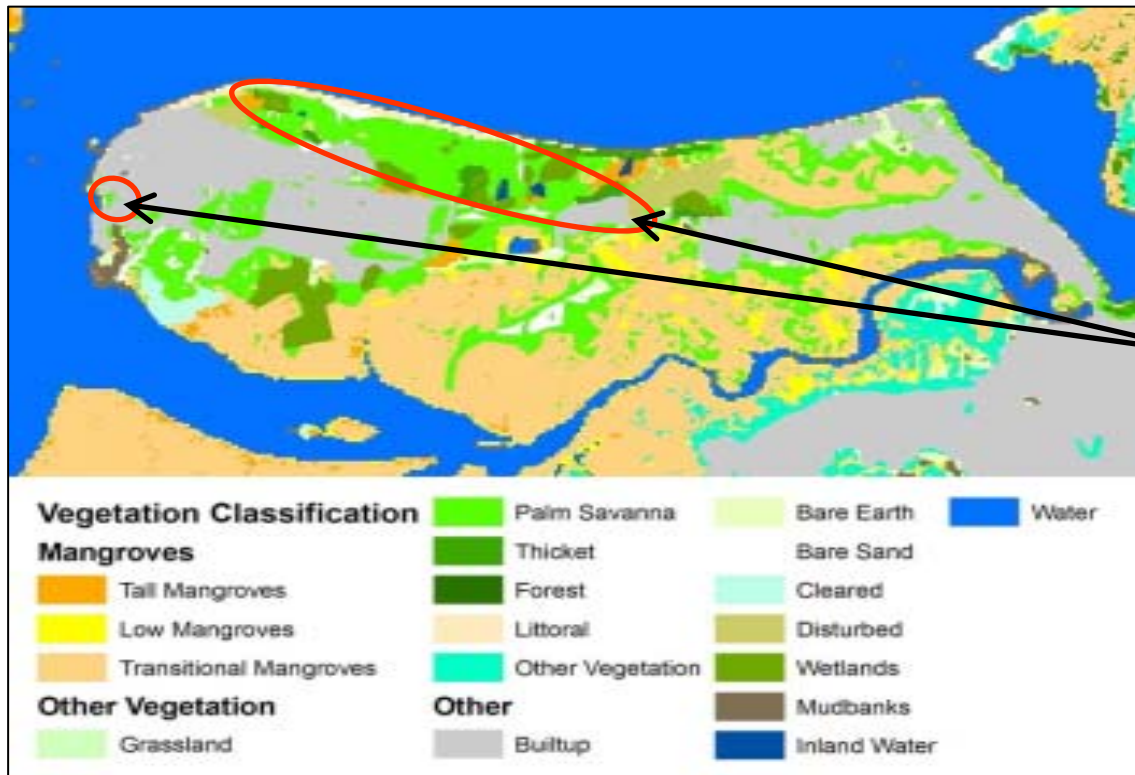
- **Ecosystems, habitats and species**
- **Results shared with stakeholders**

Detailed baseline information was collected offshore and onshore, although it was a challenge due to the presence of unexploded ordnance which limited access to some areas. The offshore data collected contributed to the scientific knowledge of the Congo River basin.



Existing Environmental Conditions - Flora

- Baseline field surveys have been carried out (2003 and 2005) to characterize the habitat on the project site.
- The dominant vegetation within the areas proposed for clearance is *Hyphaene* Palm Savanna with scattered areas of wetlands, scrub grassland and some isolated patches of mangroves.



Vegetation Classification Map showing character of habitat on Kwanda Island.

Approximate sites to be cleared.

Existing Environmental Conditions - Flora

In some areas of the project site the palm vegetation is well developed with extensive stands which reach high densities.



However, in most of the project area the palm vegetation is sparser and there are extensive patches of what seem to be a mixed grass and shrub vegetation.



Existing Environmental Conditions - Fauna

- **Mammals likely to occur in the wider area include small antelope, such as duikers, vervet monkeys, squirrels and rodents.**
- **Water birds such as woolly necked storks, common redshank and sacred ibis use the wetlands in the general area.**
- **Few mammals and birds were observed during site visits, however, this may be due to the season in which the visits were conducted (January).**

Summary:

- **The area contains vegetation that is common on Kwanda island and the Sereia peninsula and occurs elsewhere in better quality with less disturbance.**
- **It is not believed that any rare or protected species of flora or fauna occur in the project area.**
- **The habitat is likely to be of relatively low ecological value and there is a low probability that any protected species will be supported in the area.**

Evaluation (Impact Analysis)

Use ecosystem approach to determine primary and secondary biodiversity impacts and their effects over time.

- **Ability of ecosystem/habitat to recover**
- **Local value and role of biodiversity**
- **Temporary nature/cycles of some processes**
- **Global, national or local significance of the biodiversity component**

Impact assessment workshops are scheduled for September and October to fully evaluate project impacts.



Mitigation

Identify measures that safeguard the environment and the affected community.

- **Avoid or reduce at source**
- **Abate on site**
- **Repair or remedy**
- **Compensate in kind or by other means**

Biodiversity was an important consideration in site selection, site preparation, pipeline routing, etc.

Process will continue in the impact assessment workshops and development of the Environmental Management Plan.

A site specific biodiversity plan is in preparation.

Monitoring and Adaptation

Impacts on biodiversity should be monitored throughout the project

- Systematically assess changes to biodiversity against baseline data
- Check on compliance with licenses, etc.
- Monitor project impacts & effectiveness of mitigation measures

Environmental Management
and Monitoring Plans will be
developed prior to ESHIA
disclosure



Angola LNG: Biodiversity Actions

- Site selection to minimize loss of bio diverse habitat
- Broad based ESHIA explicitly includes biodiversity considerations, as per EBI recommendations
- Consultation with local people re biodiversity throughout project life
- Engagement with local and international NGOs
- Environmental protection measures included in engineering design contractor requirements - ensures biodiversity concerns carried throughout project lifecycle
- Angola LNG will develop a Biodiversity Action Plan



Biodiversity Initiatives

Angola LNG project participants are engaged in several site specific activities in Angola to protect sensitive species or habitats:

- **Chevron undertakes counts of the endangered olive ridley turtle nesting sites at the Malongo operations. A variety of measures are used to prevent disturbance to the turtles, and the Chevron volunteer effort to perform annual counts makes an important contribution to international research databases for these turtles.**
- **BP Angola had a dedicated Marine Mammal Observer on the seismic vessel during geophysical survey activities in Block 18 to ensure impacts of the sound created by air guns on whales and dolphins were minimized and to expand knowledge of marine animals in the area.**
- **ExxonMobil protects biodiversity through studies of whales/marine mammals in Block 15 to verify no/low impacts on their migration, breeding, birthing, or feeding. Several types of habitats and communities were studied, including fish, birds, reptiles, benthic fauna, and plankton.**

Biodiversity Initiatives

- **TOTAL E&P Angola has recently requested CIRAD - a French agronomic expertise centre - to perform a phyto-sanitary review of the crop and fruit-tree inventory of the Soyo and surrounding area. This work, when concluded, will provide a greater understanding of the local ecosystem, and also facilitate a greater enhancement of the sustainable development of the area.**
- **Angola LNG is funding and supporting the Giant Sable project and will continue to look for opportunities to contribute to biodiversity initiatives in Angola.**



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