

Promoting Natural Gas and LNG Development in Sub-Saharan Africa

United States Department of Energy – Office of International Affairs and Office of Fossil Energy

April 2020



Africa: Opportunity to Promote U.S. Interests



The Department of Energy's (DOE) work building local capacity and relationships with African counterparts:

- Promotes U.S. technology, expertise, and business practices.
- Promotes U.S. as partner of choice, challenging competitors & creating better options.

Why Promote LNG and Gas Development in Africa?

- ▶ Opportunities for U.S. Companies – LNG and Gas Projects.
 - Projects in Africa will involve a significant percentage of imported expertise and goods across all segments.
 - U.S. technology and expertise critical to LNG liquefaction projects.
 - U.S. Companies Conoco (~20%) and Air Products (~80%) of operating liquefaction process licenses.
 - U.S. technology and expertise critical to development of gas resources.
 - U.S. technology in import projects.
 - U.S. technology in gas fired power stations.

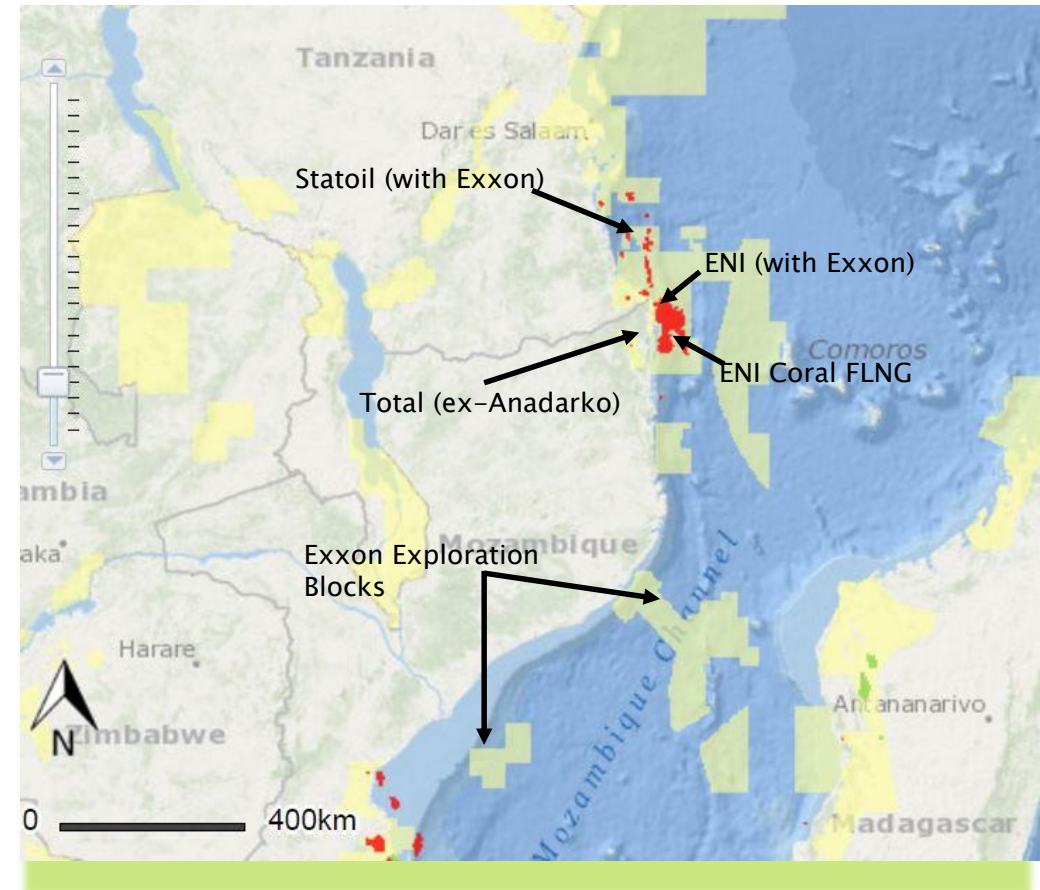
Why Promote LNG and Gas Development in Africa?

- ▶ Build local gas markets for U.S. LNG exports.
 - Examples could include:
 - Potential coastal LNG gas to power projects
 - Competing with existing generation sources (esp. small diesel) to reduce costs.
 - Contributing to local development to attract U.S. investment and innovation.
 - West Africa and South Africa as potential consumers for U.S. LNG exports
- ▶ Build relationships that help U.S. companies compete with foreign firms, including Chinese firms.

African Gas Projects → Openings for U.S. Interests

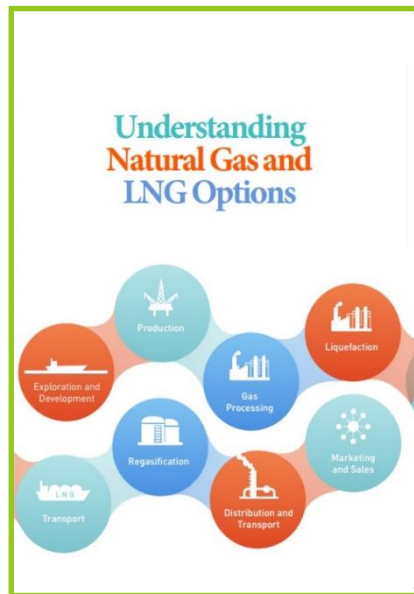
- ▶ Opportunities for DOE Engagement:
 - Development of huge gas deposits in Mozambique: ExxonMobil, GE, and other U.S. companies stand to benefit.
 - Potential ExxonMobil project in Tanzania.
 - South Africa regulatory development on importing LNG and developing domestic resources.
 - Several West African countries are broadening or considering development of their LNG import and export industries.

Key East African Gas Prospects



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Inside The LNG Handbook Process



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The LNG Handbook Process

Program inspired by the Commercial Law Development Program (CLDP)
series of handbooks on power project finance and power purchase agreements.
(Department of Commerce with funding by Power Africa)

- The Department of Energy Model:
 - Collaborate with world-class African authors and experts to develop Handbook content.
 - Hold regional stakeholder engagement workshops.
 - Draft a book presenting general principles on framing public policy decisions and facilitating private investment in natural gas, targeted specifically to Africa.
 - Hold regional workshops using the book as a tool to facilitate dialog and build capacity.
- The Objectives:
 - Use the Africa Handbooks to frame conversations on good policy and best practices in other regions.
 - Increase African confidence in the value of U.S. supplied technology, expertise, goods, and services.
 - Open markets to U.S. private investment and sales.
 - Increase African confidence in the U.S. private sector and the U.S. Government as partners and reliable sources of information and advice.
- DOE later also produced a generic version of the LNG Handbook for other markets.



Workshops – Key Crosscutting Factors

Our pre-drafting workshops focused on scoping LNG projects and identified key factors leading to success or failure.

- ▶ **Partner and Stake-Holder Alignment:** If expectations and interests are not aligned it will be difficult to pull off the project.
- ▶ **Government Objectives:** Clear objectives and clarity on the implications of policy, design, and model choices on revenue and project prospects.
- ▶ **Transparency:** Transparency across and within all stakeholder organizations leads to maximum trust.
- ▶ **Access to past experience** – balance experience executing projects and need for innovation.

Each project structure configuration has unique pros and cons that must be evaluated in the context of driving factors.

Project Structure

Integrated

Merchant

Tolling



Driving Factors

- Legal Regime and Taxes
- Governance
- Efficient Use of Project Facilities
- Flexibility in Ownership
- Flexibility for Expansion
- Desire for Limited Recourse Financing
- Operational Efficiencies
- Marketing Arrangements
- Regulations
- Gas Transfer Price

<https://energy.gov/ia/articles/understanding-natural-gas-and-lng-options>



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Infrastructure Models

Large (integrated)



Source www.rasgas.com

Different infrastructure models present tradeoffs between costs, economies of scale, and ability to scale up or down for different markets.

Small



Source www.line-engineering.com.hk

Medium-Large Phased



Source www.nlng.com

Floating



Source www.maritime-connector.com



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The LNG Handbook – Some Observations

- The workshops provided strong networking opportunities for U.S. company, African private sector leaders, financial institution representatives, leading global experts, and U.S. and African officials to learn from each other and get to know each other better in an informal and more private setting than most conferences.
- The handbook development process and workshops allowed officials time and incentives for substantive, active thinking. Workshops format allowed officials to be more open and frank with each other.
- The book and the dialogue promoted by the handbook and associated workshops are tools that fill a need – a forum of equals and a common starting point for discussion.
- Participants continue to look to our program as a forum to share ideas and learn from each other.
- The Handbooks and associated workshops can position DOE as a global leader in moving the LNG conversation forward.

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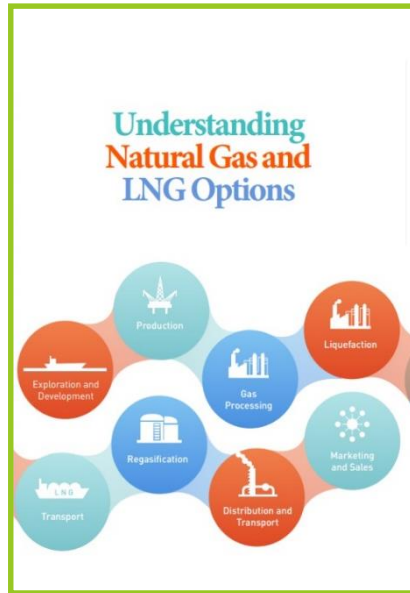
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Workshops and other Engagements



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Implementation: Workshop Plan

- Regional workshops – key to engaging foreign partners.
- Held in East Africa, South Africa, West Africa.
 - ✓ Goal: Reach emerging producers and consumers.
 - ✓ Focus on LNG liquefaction (exports) and regasification (import) project finance, project management, and gas to power opportunities.
 - ✓ Help partners be more comfortable with the ideas of risk and profit sharing through technical discussions and create business opportunities for U.S. companies.
 - ✓ Help partners make industry and government contacts to learn from others and share knowledge.



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Mozambique– April 2017

- ▶ Theme of sharing experiences of natural gas and LNG development among African countries and experts.
 - LNG Handbook Presentation.
 - Six African country presentations (including Tanzania).
 - Expert panels.
 - Broad cross section of Mozambique (Ministry, INP, ENH, Ministry of Finance, Waza think Tank).
- ▶ Reached largest emerging producers.
- ▶ Broadened and deepened dialogue on gas and LNG development in Africa.



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South Africa – May 2017



- ▶ DOE LNG Handbook event at the Gas to Power World Congress (Africa Utility Week).
 - Panel on LNG Handbook
 - Working Level Bilateral Meetings
 - LNG Handbook Reception/Launch Event with Power Africa Coordinator and other government and private sector officials.



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INDUSTRIAL DEVELOPMENT ZONE



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South Africa – October 2017

- ▶ Expert workshop with South African Development zones and IPP office, other Africans and global experts coming to Africa Oil Week.
 - South Africa is a significant potential consumer of LNG in sub-Saharan Africa and could serve as a catalyst for other projects.
 - Extended our dialogue to help Africans learn from countries and companies who have developed LNG to power projects.
 - Expert panels on development finance, and legal frameworks.
 - Keynote from Secretary Perry and high-level bi-lateral engagement with African Ministers.



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Washington, DC – June 2018

- ▶ Expert workshop at the World Gas Conference.
 - Power Africa Gas Roadmap and the key role of Gas to power in Africa.
 - Evolution of LNG markets and impacts on contracts.
 - Gas-to-power project financing.
 - Q&A and Discussion on LNG Development Opportunities in sub-Saharan Africa.
 - Keynote by Shawn Bennett, DOE Office of Fossil Energy.



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Next Steps

- Workshops to re-engage with the community.
 - National Energy Technology Lab (NETL) workshop in the U.S. – Summer 2020 (in planning.)
- Schedule new workshops out to September 2021 in Africa.
- Work towards updates and new modules:
 - Update content on natural gas markets and projects in Africa.
 - Analyze how to commercialize scalable LNG and gas to power in Africa to match local market needs.

Next Steps: Africa –and Beyond

- Regional elements – add on modules.
 - Central focus is on enabling U.S. investment in and exports to Africa and other regions.
 - Focused content highlighting the centrality of U.S. technology and expertise.
 - Explore technology trends and innovative finance.
- Modules might include:
 - Case studies of successful projects.
 - Study on how projects in general, and U.S. investors and suppliers can be successful in emerging gas and LNG markets.
 - Survey of emerging technologies.
 - Survey of smaller scale and modular project approaches.
 - Region specific examples of policy challenges and opportunities.
 - Region specific survey of finance and project execution challenges and opportunities.
 - Outline of steps that increase the probability of successful project implementation.



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