AFRIMARI

Let there be light!

Gas and Power

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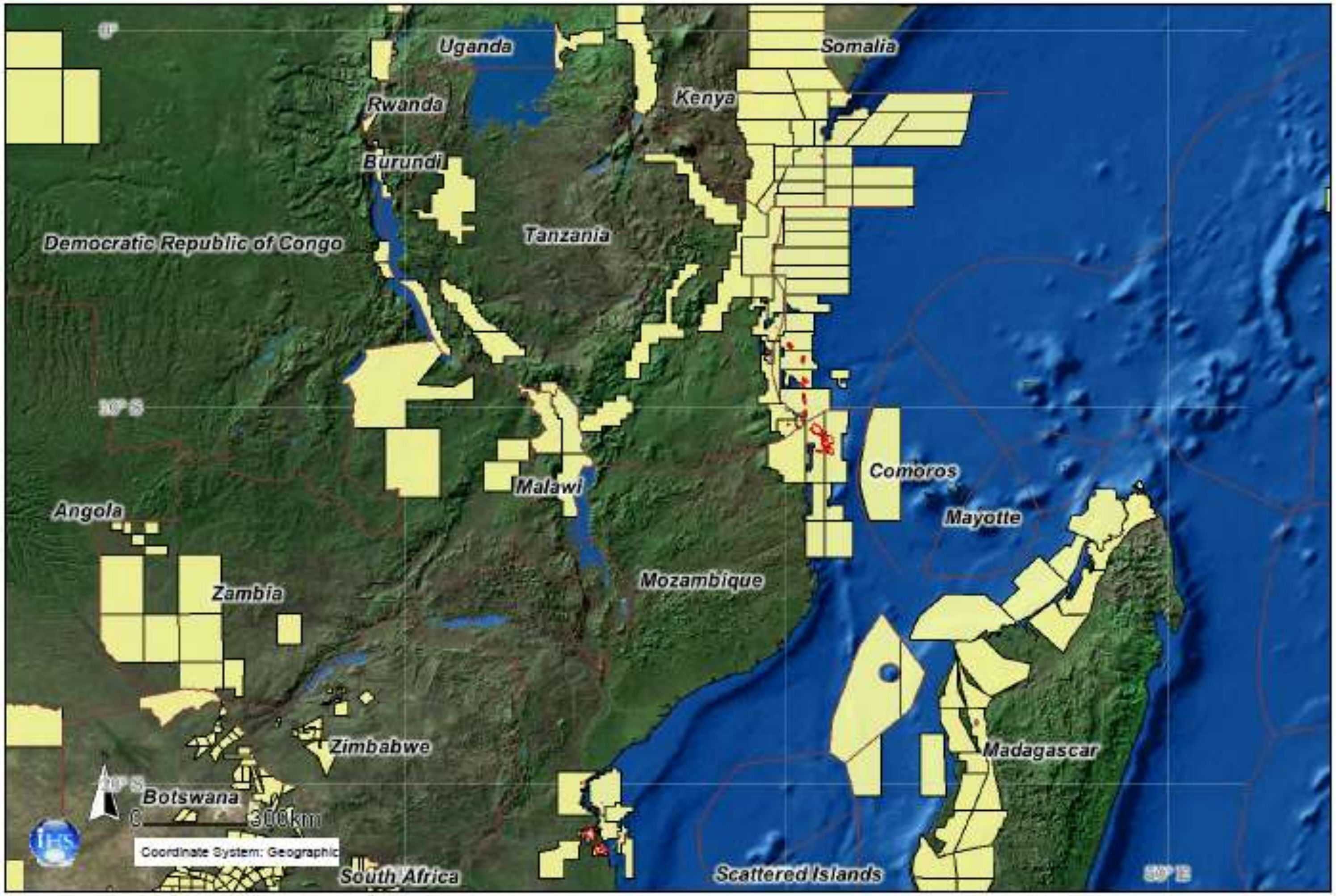
The East African Gas Bonanza: Update



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Exploration success continues

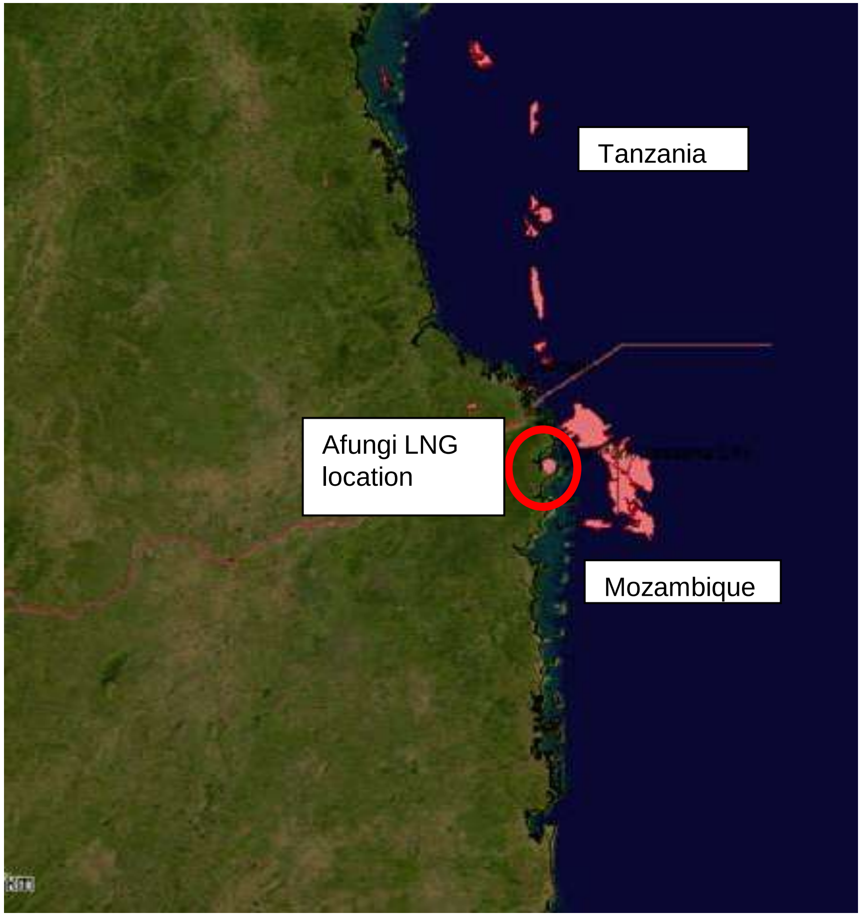
Top 10 Discoveries Since 1 January 2012

				Discovered Resources		
Rank	Discovery Name	Region	Country	Liquids (MMbbl)	Gas (Bcf)	Total (MMboe)
1	Golfinho/Atum Complex	Africa	Mozambique	30	22,000	3,697
2	Mamba Northeast 1	Africa	Mozambique	30	16,000	2,697
3	Coral 1	Africa	Mozambique	16	10,400	1,749
4	Carcara	Latin America	Brazil	1,200	1,200	1,400
5	Mamba North 1	Africa	Mozambique	11	6,000	1,011
6	Pao de Acucar	Latin America	Brazil	550	2,225	921
7	Mzia 1	Africa	Tanzania	9	4,500	759
8	Tangawizi 1	Africa	Tanzania	3	3,800	636
9	Sardar E Jangal 1	Middle East	Iran	492	500	575
10	Jodari 1	Africa	Tanzania	7	3,400	574
Total - Top 10 Discoveries Since 1 January 2012				**2,348**	**70,025**	**14,019**
Total - East Africa Discoveries Since 1 January 2012				106	66,100	11,123
East Africa Discoveries as a % of Total				*5%*	*94%*	*79%*

Source: IHS

Discoveries in Mozambique and Tanzania top the discovery list, encompassing 79% of the total resources discovered by the top 10 discoveries

LNG Hub in East Africa?



•Both countries are planning LNG projects at different levels of progress

<u>Mozambique</u>

•Mozambique planning plant with 4 production trains initially, expansion possible to mammoth 12 trains
•Capacity 50 million t/y
•Initial contracts awarded
•Could start-up in 2018 at earliest

<u>Tanzania</u>

•2-train plant
•Site not yet selected, six options
•FID unlikely before 2016

Gas for Domestic Use

- Strong awareness of potential benefits of hydrocarbon production to economy at grassroots level. Example: Protests in Tanzania

Source: The East African, February 2 2013

- Governments preparing to avoid "resource curse", recognise need for utilising gas reserves on home turf
- Draft Gas Master Plans in Tanzania and Mozambique underline growing importance of gas in developing downstream sectors and <u>electricity generation</u>

Gas in Africa

- Africa has 7.5% of world's proven gas reserves
- African gas production: 203 bcm in 2011
- Algeria, Egypt & Nigeria produces 88% of the continent's gas
- African gas consumption: 110bcm in 2011
- Consumption of gas growing faster than production since 2000, 6% vs 4%
- Potential for demand for gas to increase significant; part of global trend

The Current State of Electricity in East Africa

- Region has lowest electrification and elec. consumption rate in Africa
- 16% of Mozambicans and Kenyans, 9% of Ugandans have access to electricity, 14% of Tanzanians$_1$
- 70% of schools in Kenya, Tanzania & Uganda do not have electricity$_1$
- Loss average is 18-22%; 10% in South Africa$_2$
- 310,029MW/h was imported in 2011 across region: Kenya and Uganda leading exporters$_3$
- Electricity supply vulnerable to climate changes, rainfall patterns
- Thermal power ie diesel expensive due to import fees
- Geothermal potential significant but expensive
- Urgent need to diversify energy mix

1World Bank 2International Energy Agency 3East African Community

Future gas electricity projects

- Focus is still on coal and hydropower electricity projects
- Many ambitious plans!
- Tanzania: Mtwara (400MW)- Symbion Power
- Mozambique: Ressano Garcia (175MW)- Sasol & Electricidade de Moçambique (EdM) (2014)
- Kenya- planning LNG import terminal
- Several other projects that are just as important:

  - regional gas pipelines

  - transmission projects (ie East African Highway)

The Challenges

- •Funding
- •Regulatory reform ill-suited to gas, reform slow
- •Lack of planning, resulting in confusion amongst policy makers and investors
- •Tension between export and domestic gas utilisation
- •Institutional weaknesses
- •Distrust of foreign investors in some countries
- •Poor business environment deterring investors
- •Inadequate transmission & distribution network
- •Price sensitivity
- •Distance of offshore reserves from demand centres