

## GAS IN EAST AFRICA

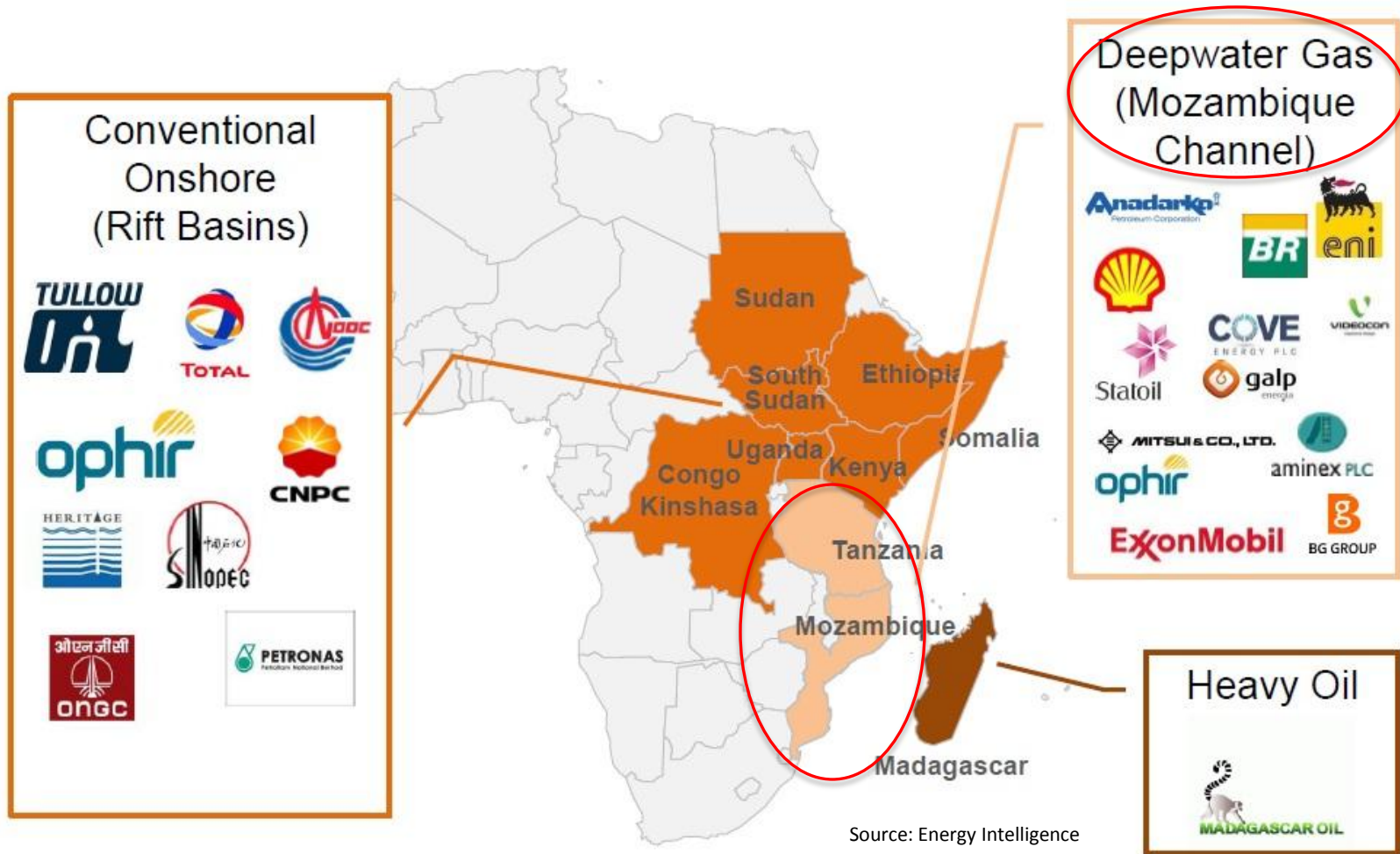
### Assessing the Potential for Various Stakeholders



KIVI NIRIA Lecture – 22.X.2013

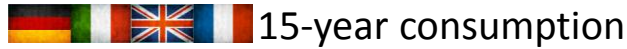
Luca Franza

# E&P Landscape in Greater East Africa



# A Substantial Reserve Base

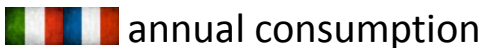
- **MOZAMBIQUE: 3 – 4.5 Tcm**



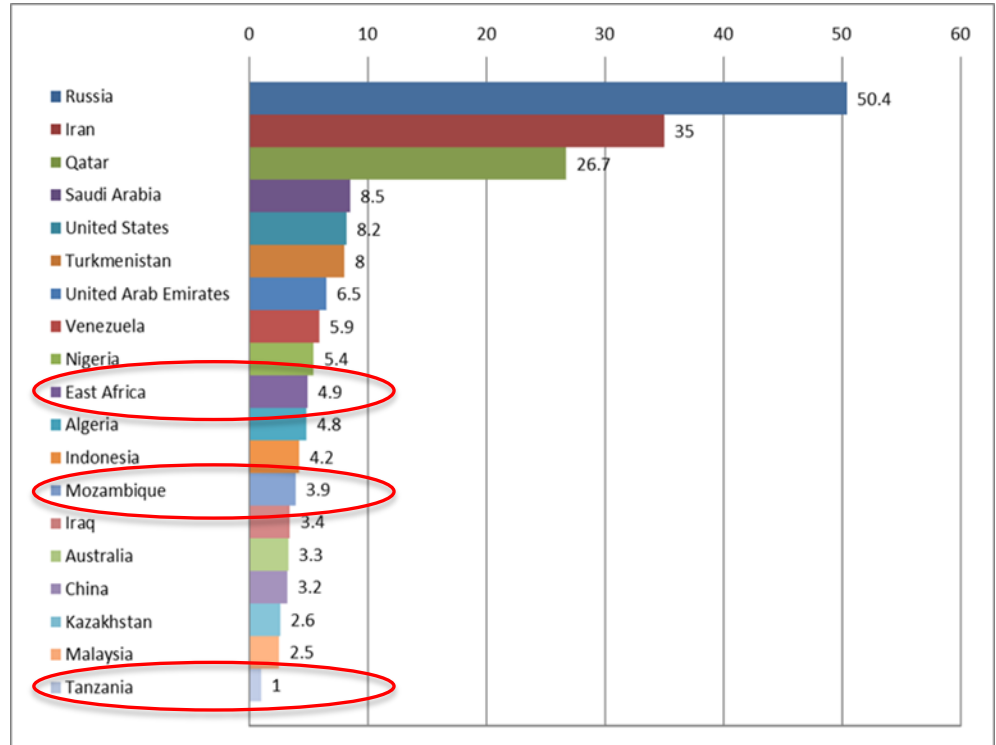
- **TANZANIA: 700 Bcm – 1.2 Tcm**



- **KENYA: 60 – 140 Bcm**



- **Associated gas elsewhere**

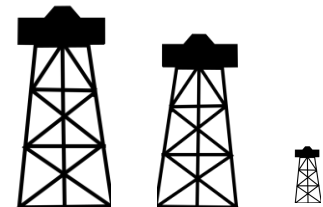


Aggregate estimates from companies and governments.  
Comparisons are approximate and refer to the median values.

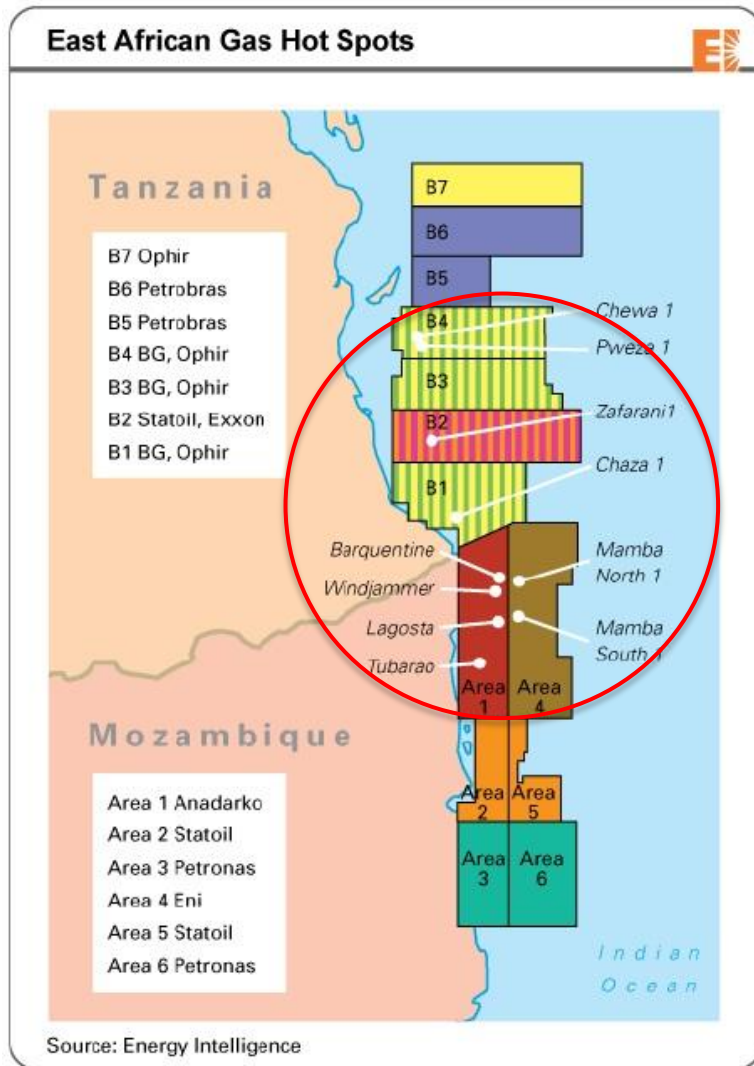
Proven gas reserves in Tcm. Source: EIA 2012.  
Data for East Africa refer to potential reserves and data for Australia are from 2011

## Significant upside potential in East Africa as drilling activity is ongoing

- 19,000 wells drilled in Central and North Africa
- 14,600 in West Africa
- Only ~600 in East Africa!



# Licensing Situation: Focus on the 'Hot Spot'



13 license areas for 7 operators:

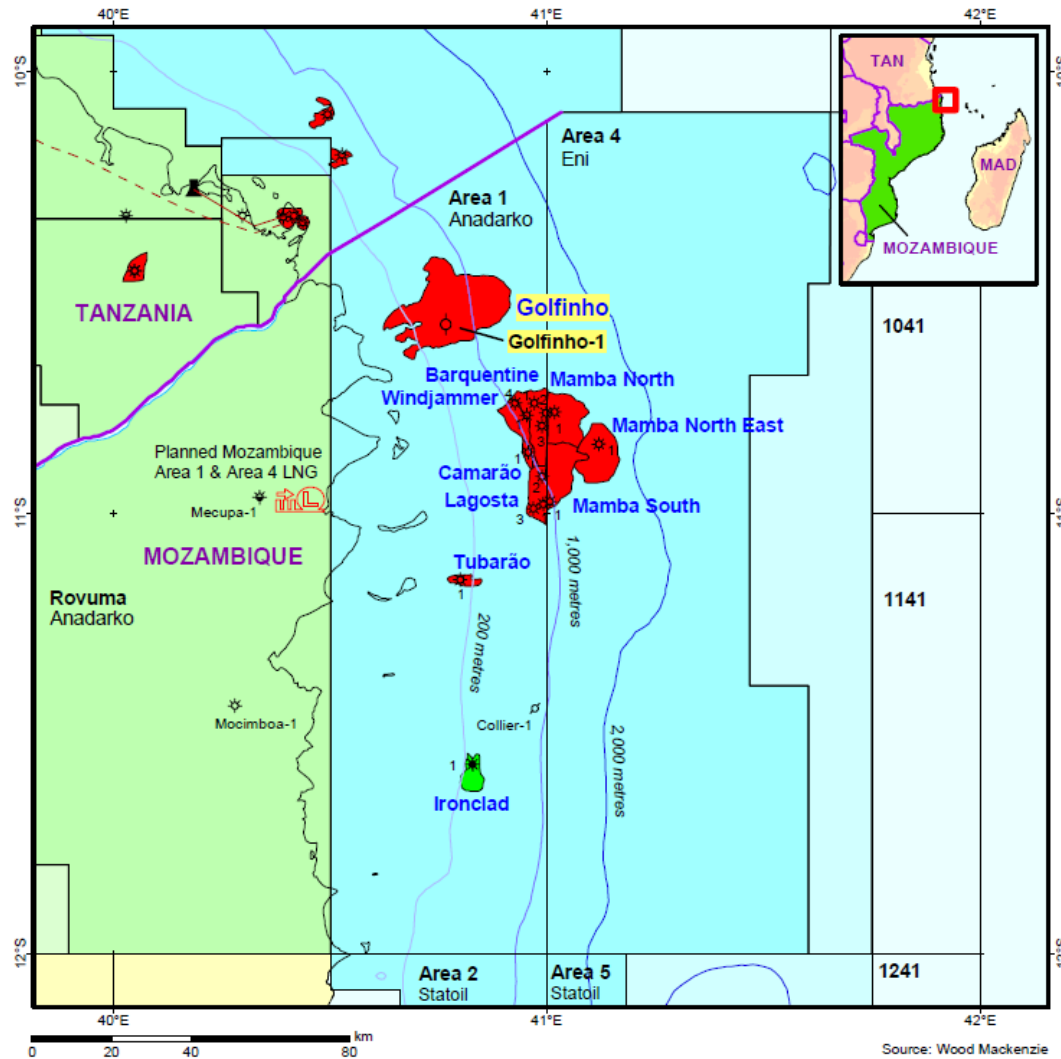


# Reserves and Equity Distribution

Discoveries/complex	Location	Partners	Reserves Bcm	Status
Mamba complex	Area 4 (Mozambique)	Eni (50%), CNPC (20%) ENH (10%), Galp Energia (10%), Kogas (10%)	1.98-2.12 Tcm	Planned
Prosperidade complex	Area 1 (Mozambique)	Anadarko (36.5% ↓), Mitsui (20%), ENH (15%), Bharat (10%), Videocon (10% ↓), PTTEP (8.5%)	480-850	Planned
Atum – Golfinho	Area 1 (Mozambique)	Anadarko (36.5% ↓), Mitsui (20%), ENH (15%), Bharat (10%), Videocon (10% ↓), PTTEP (8.5%)	430-990	Planned
Jodari – Mzia – Chaza	Block 1 (Tanzania)	British Gas (60%), Ophir (40%)	380-590	Planned
Papa	Block 3 (Tanzania)			
Pweza – Chewa – Ngisi	Block 4 (Tanzania)			
Zafarani – Lavani	Block 2 (Tanzania)	Statoil (65%), Exxon (35%)	280-370	Planned
<b>Pande – Temane</b>	<b>Onshore Mozambique</b>	<b>Sasol (70%), ENH (25%), IFC (5%)</b>	<b>85</b>	<b>Producing</b>
Mbawa	Block L8 (Kenya)	Apache (50%), Origin (20%), Pancontinental (15%), Tullow Oil (15%)	60-140	Planned
<b>Songo Songo</b>	<b>Central Tanzania</b>	<b>Pan Ocean (100%)</b>	<b>33</b>	<b>Producing</b>

Source: Author (based on company estimates, not displayed: new Agulha finding of 150-200 Bcm, Area 4)

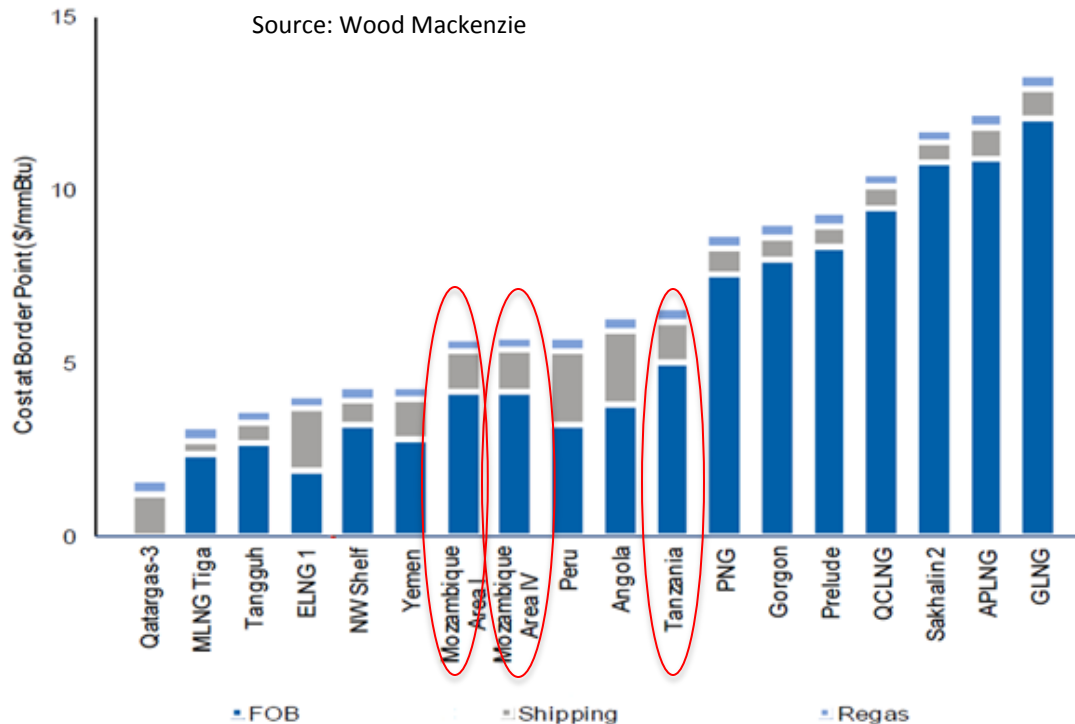
# Anadarko – ENI Joint Development



Prosperidade/Mamba comparable in size with Groningen (2.8 Tcm)

# Excellent Prospects for LNG...

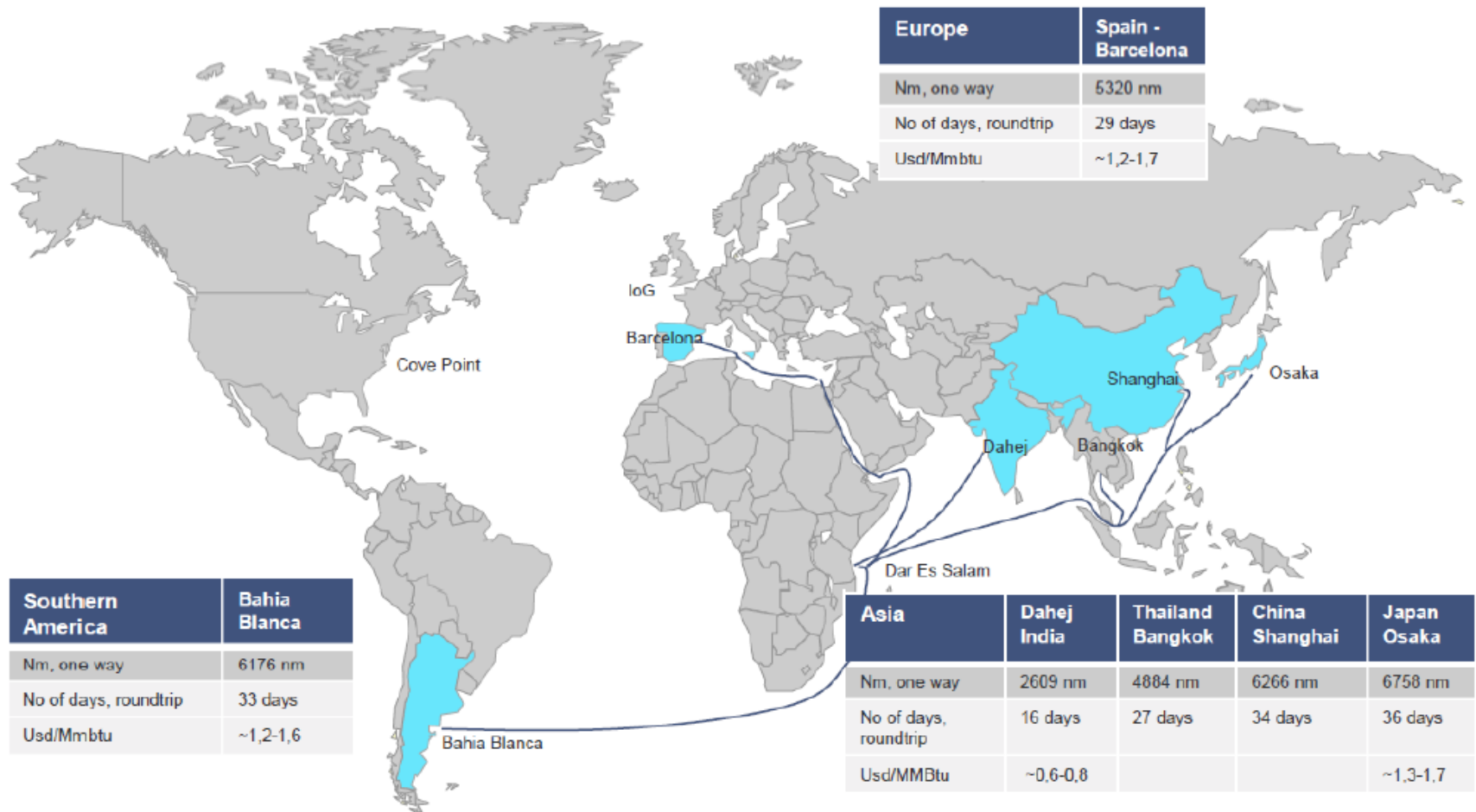
- Proposed: 4 trains ENI-Anadarko (20 MTPA, FID by 2014, operational 2018); 2-4 trains BG Group-Statoil (10-20 MTPA, FID by 2016, operational 2020)
- Cost: FOB + shipping to Japan + regas: 5.3-6\$/MMBtu (Mozambique, Tanzania)



**East Africa LNG ~50% cheaper than Australia LNG**

**More competition from brownfield North American and Qatari projects**

# LNG Marketing: an 'Indian Basin' Emerging?



Source: Statoil

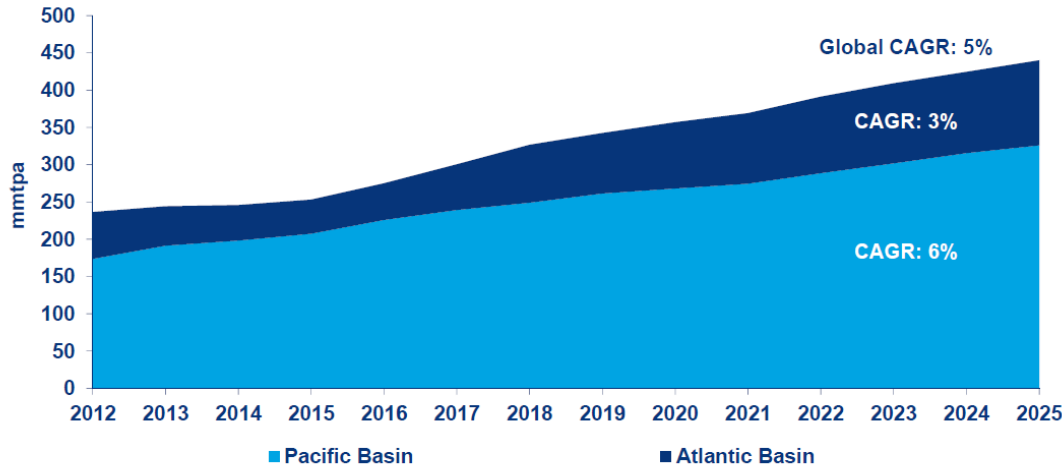
**East Africa at the crossroads of the Atlantic and the Pacific basins**

**Asia offers the best netback, marginal volumes could reach Europe and S. America**

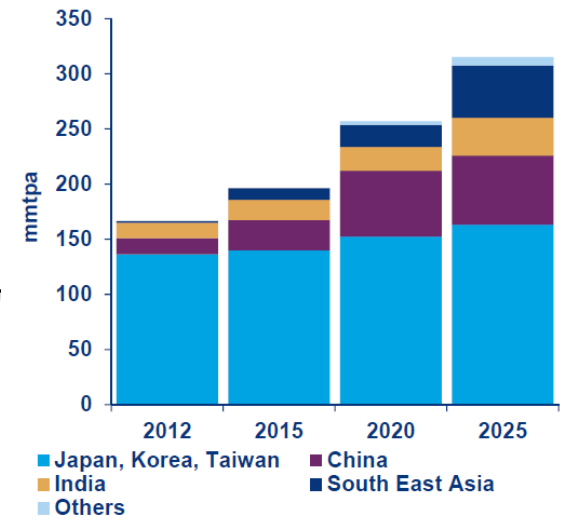


# LNG Marketing: Market Window in Asia 2018-2020

Global LNG Demand Forecast

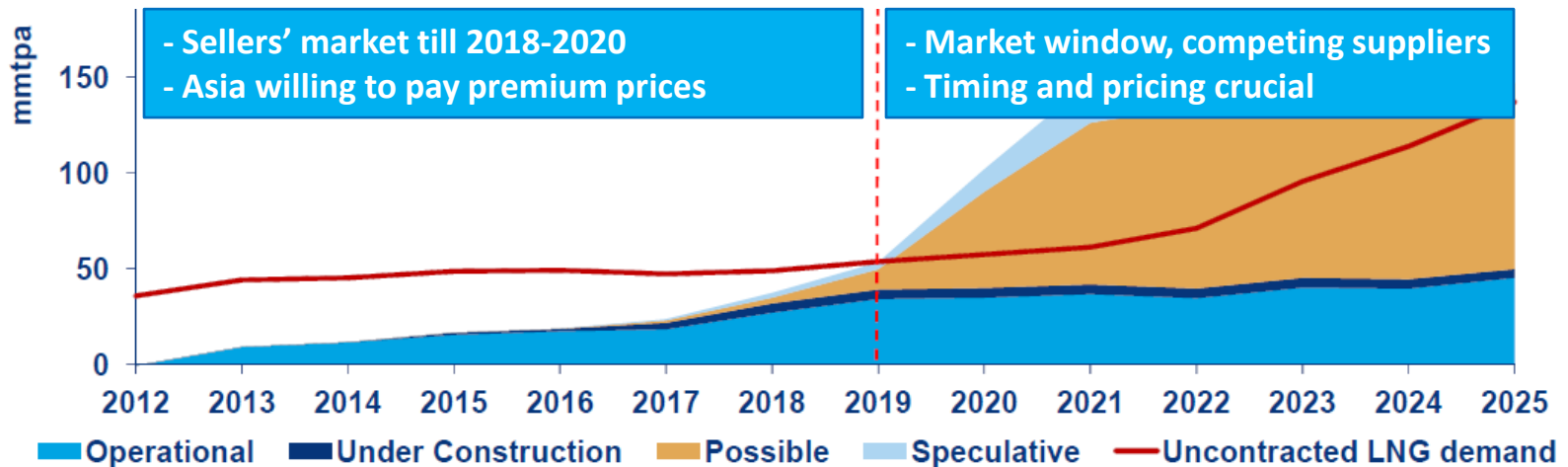


Asian LNG Demand



Source: Wood Mackenzie LNG Tool Q1 2013

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Excludes 'flexible' Qatari "diversion" volumes that are 'allocated' to the Atlantic Basin and any other Atlantic volumes

Source: Wood Mackenzie LNG Tool, Q1 2013

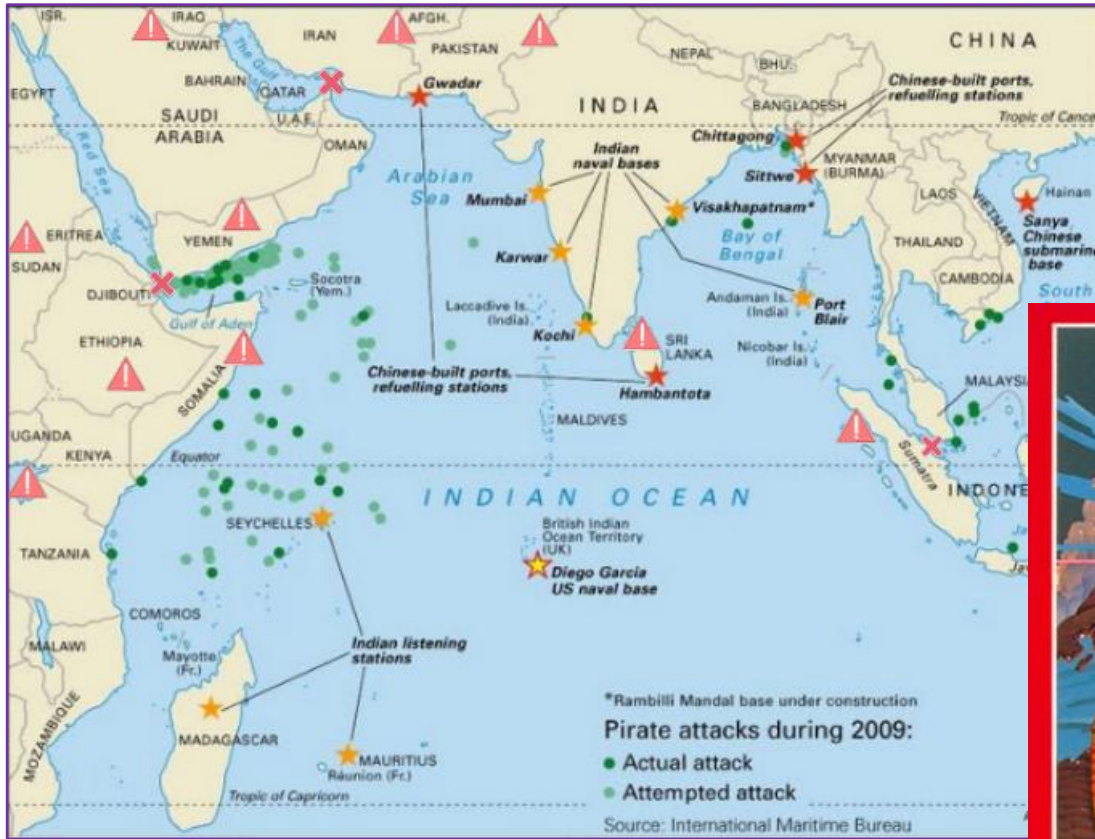
## ...but the Environment is Challenging

**Projects look robust, yet cost overruns may occur in future due to:**

- Poor infrastructure (gas-related, but also ports, roads, railways...)
- Lack of experience (no oilfield services, no skilled workforce)
- Difficult access to financing
- Obstacles to cross-border trade
- Regulatory uncertainty
- Weak institutional framework



# Security Threats across the 'Crescent of Crisis'



# A Golden Opportunity for Development



**President Armando Emilio GUEBUZA a.k.a. 'GUEBUSINESS'**

# LNG – Local Perspective

- Originates the highest government revenues , to be used for:
  - Poverty reduction and improvement of welfare;
  - New infrastructure;
  - External debt reduction;
  - Investment in non-gas sectors (economic diversification)
- Brings in capital faster than other options
- Has a very high job creation potential



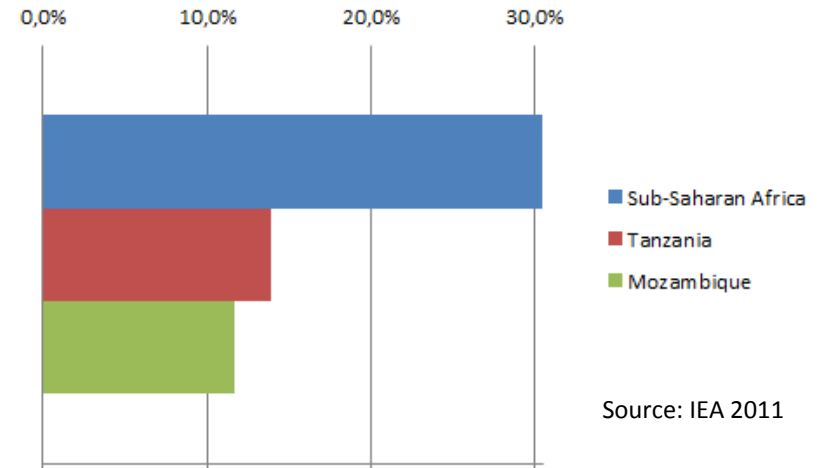
**Large gas revenues entail some risk ('Dutch Disease')**

**Complementary monetization options needed to maximize benefit**

# Power for East Africa



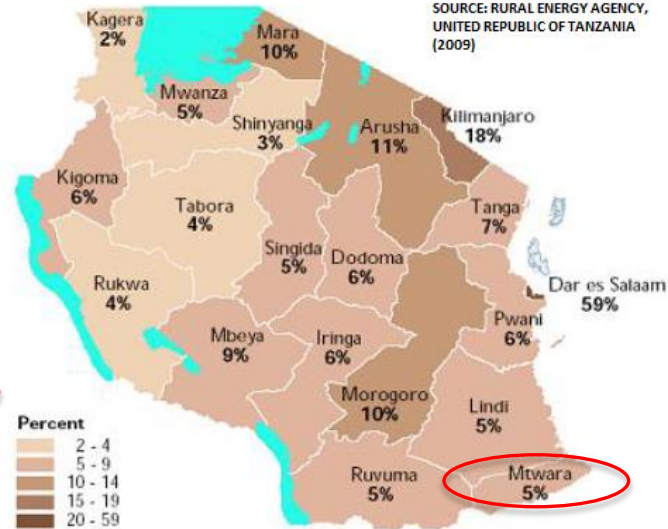
- Very low electrification rate
- Demand for electricity set to skyrocket



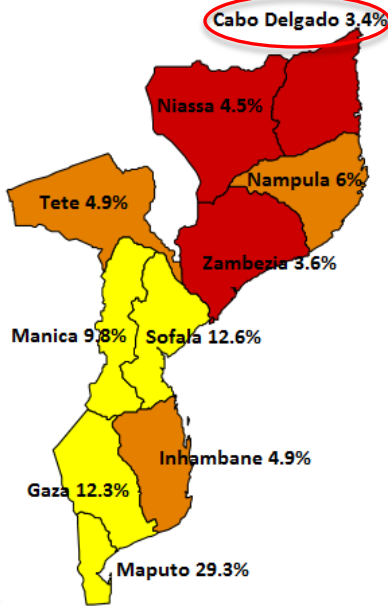
Source: Author

# Local Power Generation Needs to be Prioritized

SOURCE: RURAL ENERGY AGENCY, UNITED REPUBLIC OF TANZANIA (2009)



Households with electricity, %



SOURCE: NATIONAL STATISTICS OFFICE OF MOZAMBIQUE (2007)



# Fertilizers

- Economies heavily reliant on agriculture (28-30% GDP, 76.5-80.5% workforce)
- Limited availability of fertilizers keep crop yields low, now unique chance
- Demand for fertilizers in the SADC region projected to grow by 66% (2007-2017)
- Proposed locations: Inhambane (Mozambique), Kilwa and Mtwara (Tanzania)



**Biggest uncertainty is overcapacity in the global market**



# Other Monetization Options

## GTL

High added value and import substitution, but CAPEX requirements very challenging

## CNG

Cleaner and cheaper than imported fuel, but distribution constraints

## Methanol

High added value, companies expressed interest, but risks of oversupply even with 1 plant

	Fertilizer	GTL	LNG	Methanol	Aluminum w/ Power	Power 150 MW	Power 250 MW
D&I Labor (av. annual)	500	6,100	4,200	750	1,400	80	140
Induced Employment (long term av. annual)	9,400	56,900	71,400	11,700	19,000	1,400	2,400
Value added (\$million)	200	4,580	6,520	460	970	0.20	0.34
Government revenues (av. annual \$million)	180	860	1,040	220	300	150	150

Source: ICF

# Institutional Framework and Business Environment

- Decision-making process on monetization ongoing, in order to:
  - Provide investors with more clarity
  - Make sure to get a ‘fair share’ of the resource value
- Legislation currently under review in both countries:
  - Natural Gas Master Plan under discussion in Mozambique
  - Gas Legislative Package under discussion in Tanzania
- Government take now **65-70%**, as a result of recent tightening of fiscal terms
- Fiscal terms could further tighten in future

# Fiscal and Contractual regimes

	Mozambique	Tanzania	Mozambique	Tanzania
<b>Contract denomination</b>	Exploration and Production Concession Contract (EPCC)	Production Sharing Agreement (PSA)	<b>Royalty</b>	6% for gas, 10% for oil  5% for offshore <sup>134</sup> , 12.5% for onshore and continental shelf
<b>Most relevant legislation</b>	2001 Petroleum Law, Decree no. 24 of 2004, 2012 Private-Public Partnership Law, <i>Draft Petroleum Law and Gas Master Plan under discussion</i>	1980 Petroleum Act, <i>Draft Natural Gas Policy (part of a broader Gas Legislative Package, yet to be drafted) under discussion</i>	<b>Surface Fee</b>	Not applied  Negotiable for exploration (\$4-16/sq.km), \$200/sq.km for development
<b>Institutional framework</b>	Ministry of Mineral Resources, INP (regulator), ENH (NOC)	Ministry of Energy, TPDC (NOC)	<b>CAPEX Allowances</b>	Negotiable (25% according to the model EPCC)  20%
<b>State participation</b>	ENH is entitled to an interest in development (5-20% in post-2012 EPCCs, negotiable up to 25% in pre-2012 EPCCs) but must reimburse exploration costs.	TPDC is entitled to a 20% interest in development and does not have to reimburse exploration costs.	<b>Education Tax<sup>135</sup></b>	Not applied  Not applied
<b>Signature Bonus</b>	Negotiable (0.5-5% total asset value)	Not applied	<b>Value Added Tax</b>	17%  18%
<b>Corporate Income Tax</b>	32%	30% (with additional 10% Branch Profit Tax <sup>137</sup> )	<b>Cost Oil (Recovery Ceiling)</b>	Negotiable, differs for onshore and offshore  50-70% of production net of royalty depending on the period
			<b>Profit Oil</b>	Negotiable based on a R factor  Negotiable based on production

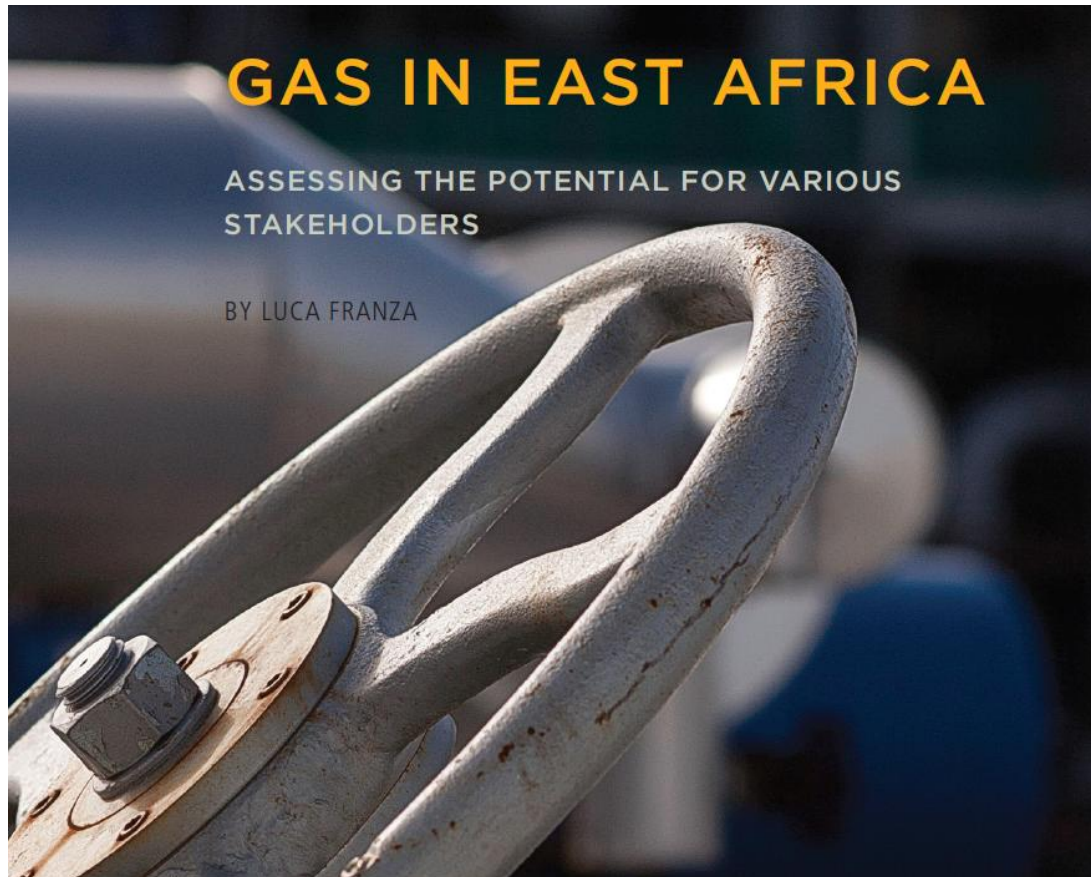
Source: Author, based on a data collection from Deloitte, PLC, Tax Rates, Upstream Advisors, PWC, EY and Wood Mackenzie.

# Conclusion

- The decision-making process may delay LNG, but it is crucial to have solid, comprehensive policies in place *and* there are concrete margins for a win-win solution
- ‘Dual-flag approach’ could be the answer

**Governments quickly cash in revenues from export, and show the benefits of gas to their own people. Companies get favourable taxation, invest in (relatively) viable domestic projects and enjoy the benefits of a stable political climate.**

**Thank you very much for your attention.**



Full report available at: [www.clingendaelenergy.com](http://www.clingendaelenergy.com)