

### What are the challenges for African FSRU developments ?

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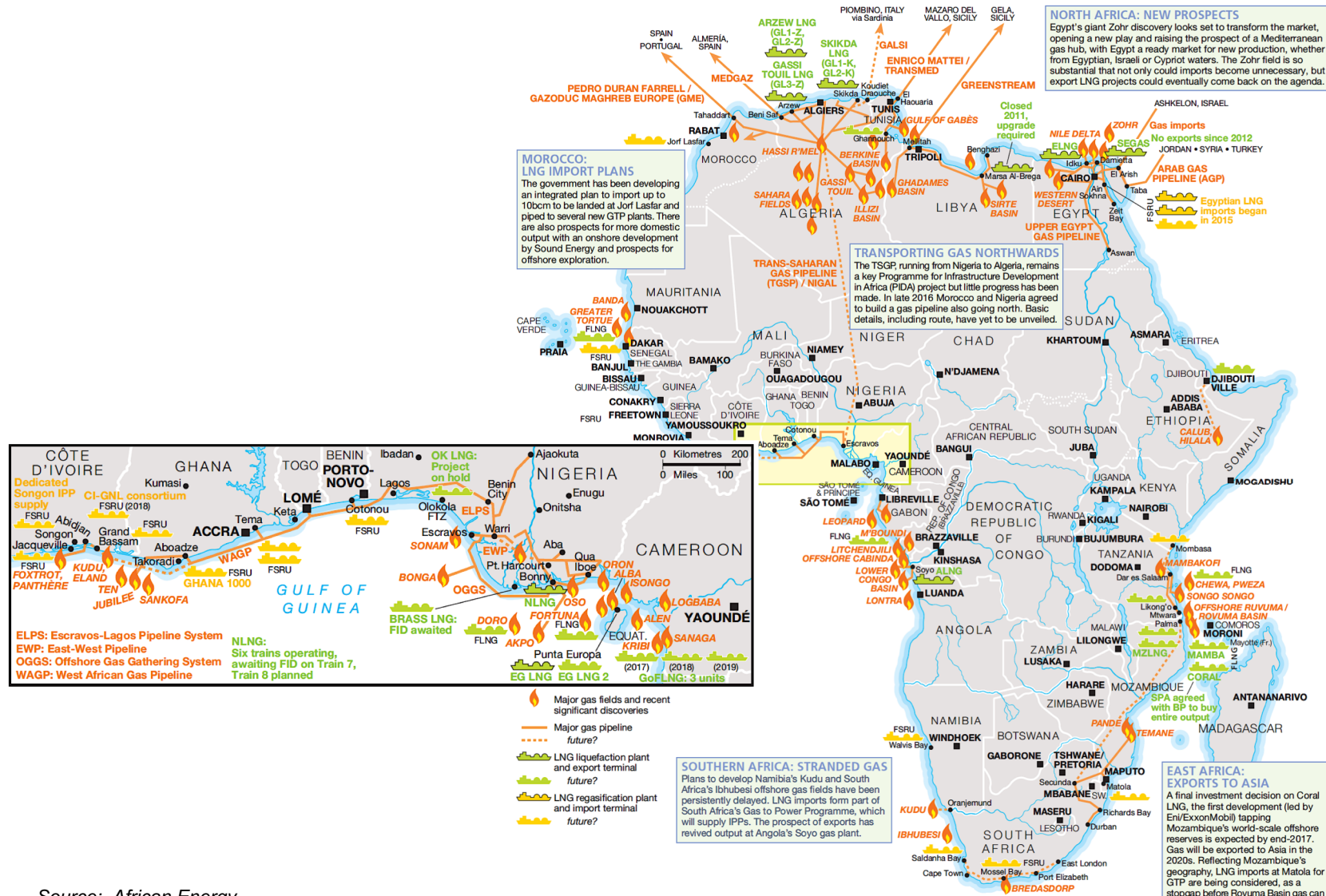
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The FLNG Global logo consists of the words "FLNG" and "Global" stacked vertically in a bold, teal-colored sans-serif font, enclosed within a white rectangular box.

**UK | USA | BRAZIL**

# African FSRUs



Source: African Energy



## FSRU challenges and opportunities in Africa

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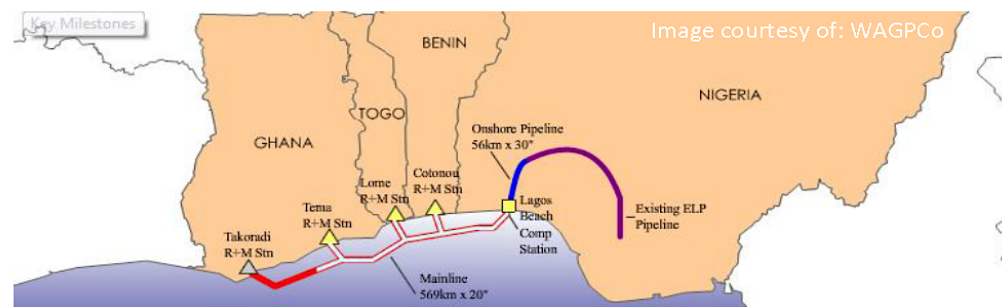
Tor-Ivar Guttulsrød 16th of May 2018  
ABS Global Gas Solutions



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# West Africa

- West Africa Pipeline built from Nigeria along Togo and Benin to Ghana. Extensions have been discussed.
- 2 FSRU projects in Ghana and activity in Togo
- Nigeria production has been dropping, ingenious use for power and LNG exports are important.
- Competition between pipeline gas and regassified LNG as well as competition between feeding pipeline, powerplant, and LNG plant.....



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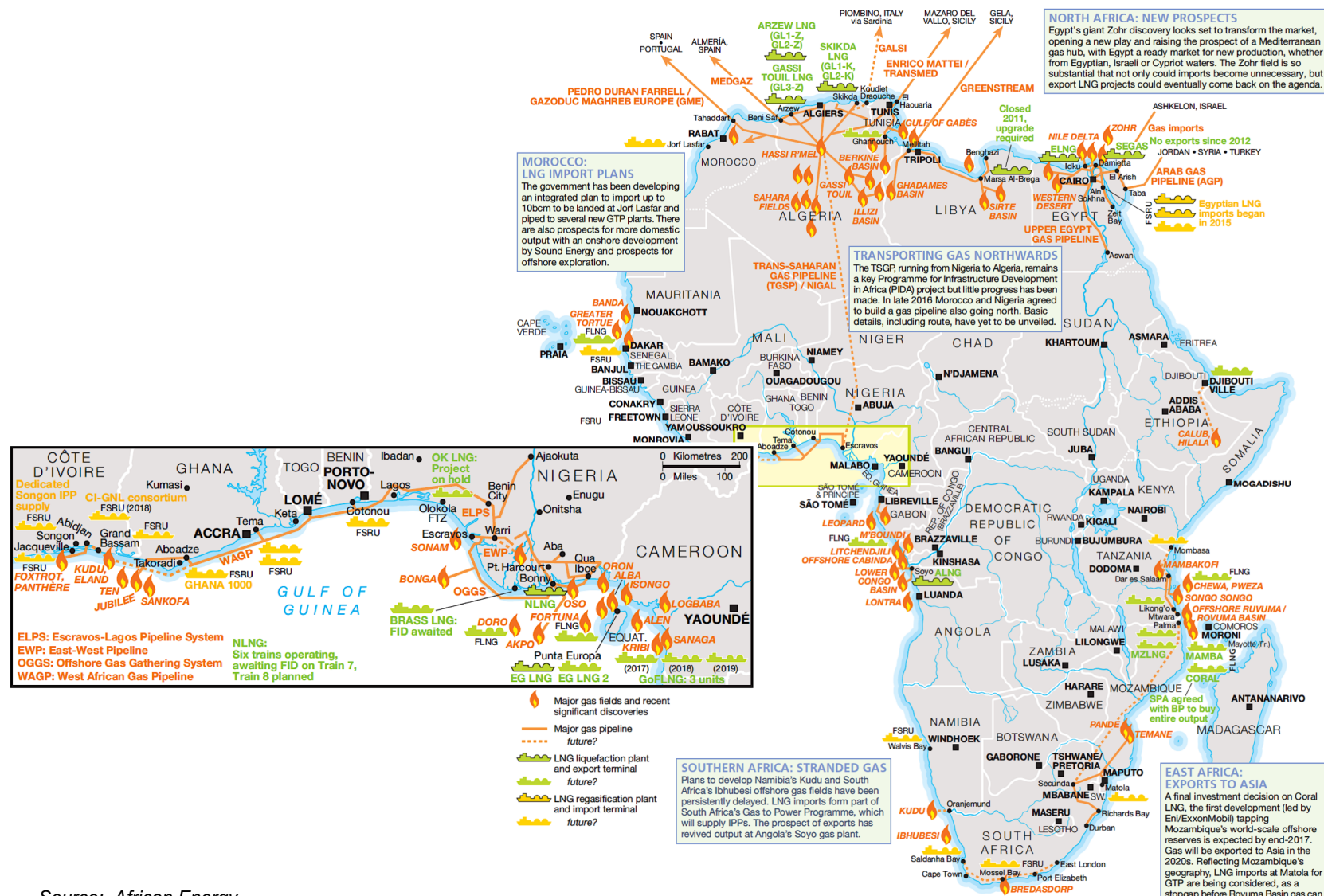
# Egypt

- Egypt has been exporting pipeline gas to neighbors, has two liquefaction plants, but currently has two FSRUs on hire....
- Gas production was falling while energy needs were growing.
- New gas finds, time for development and commercialisation and flexibility of FSRUs and LNG is summed up in the Egypt case.





# African FSRUs



Source: African Energy

# African FSRUs



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# There's a bit more going on!

**FSRU**



**Marine facility**



**Power plant**



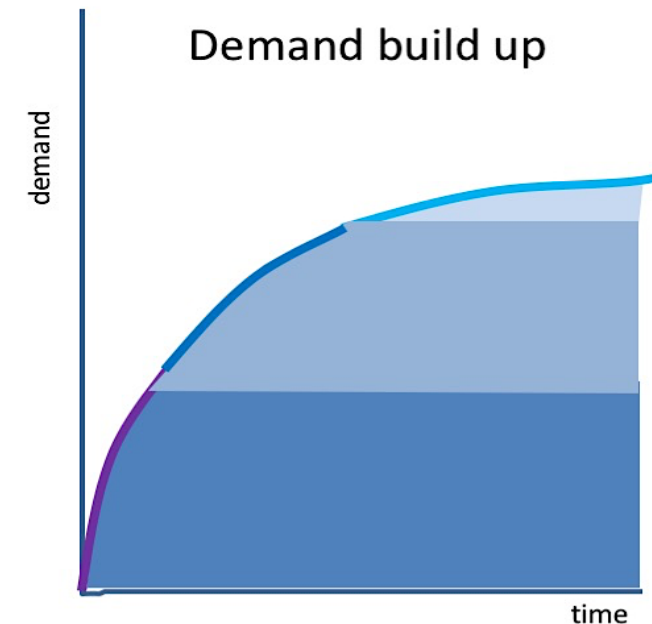
**Pipeline**





# Demand management

- Step 1
- Provide infrastructure for major loads (power plants, major industrial users- fertilisers)
- Step 2
- Provide infrastructure for medium to large loads
  - Power plants
  - Industrial users (cement, mines)
- Higher investment for lower loads
- Step 3
- Provide infrastructure for electrification of other users
  - Already remote and economically challenging



# Problems along the way

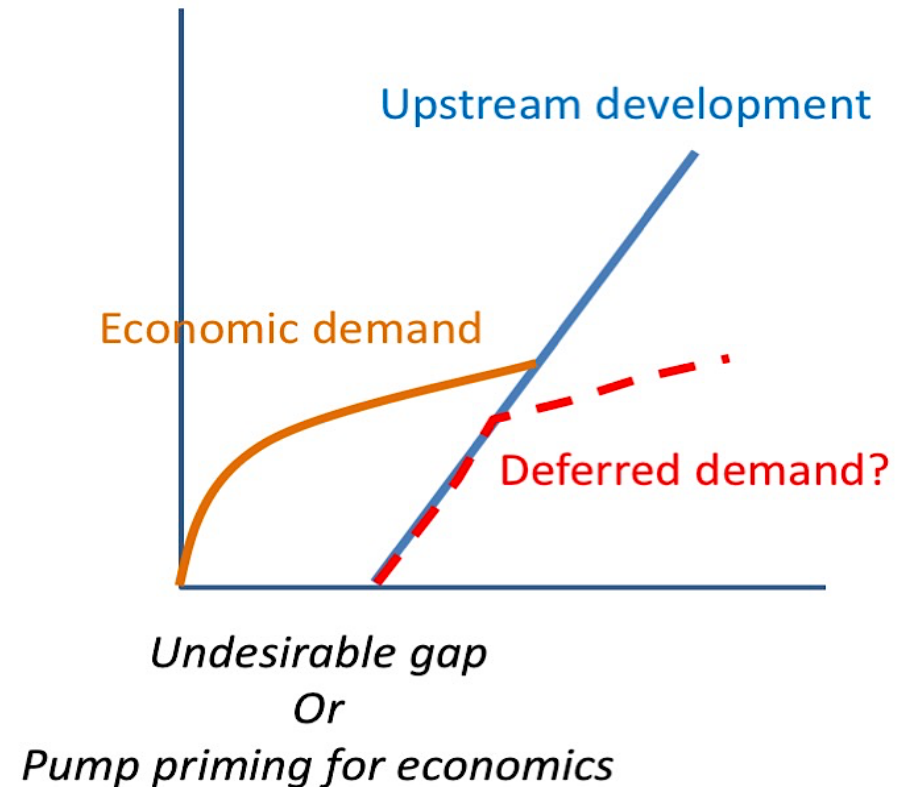
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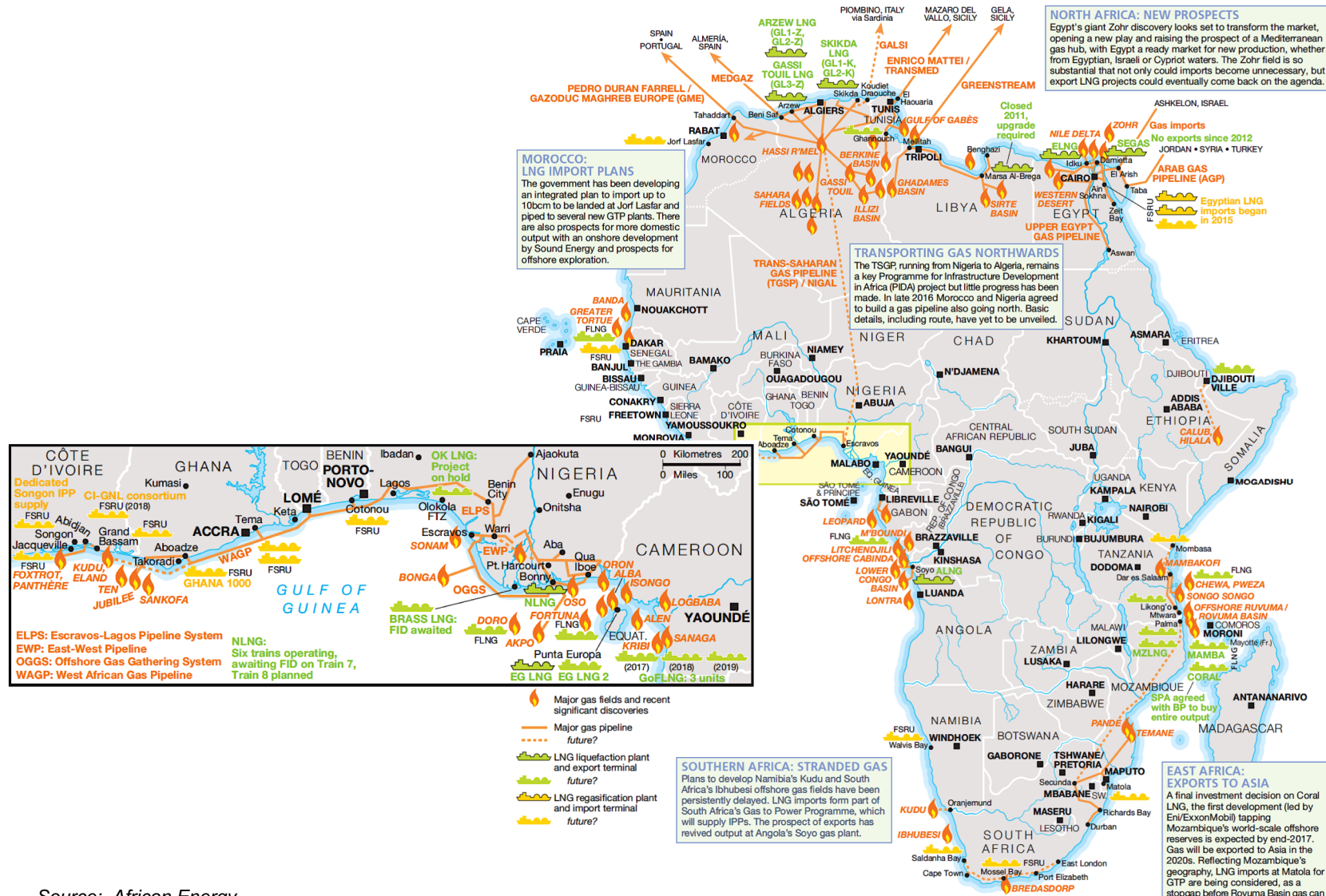
- Geography – how much infrastructure for how much load
  - Where are the power stations/users
  - When does economics run out
- Inertia from National utilities
  - Frequently have insufficient funds to convert
  - Are proud and responsible – they have been running the country for ages
  - Obsolescence has no meaning – things are kept running
- Who pays?
  - IPPs/national power utilities will upgrade their facility
  - Who is the gas utility? There has been no gas before

# Up or downside?

- Several west Africa companies have recently discovered large offshore hydrocarbon reserves
- Upstream development processes are relatively long
- How to continue to develop an economy?
- FSRU economics further challenged – short charters required
- Does indigenous gas immediately replace LNG?
- Can LNG be used to provide competition to long term monopoly gas suppliers



# African FSRUs



Source: African Energy