

Drilling For Domestic Gas In Onshore Africa

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Topics



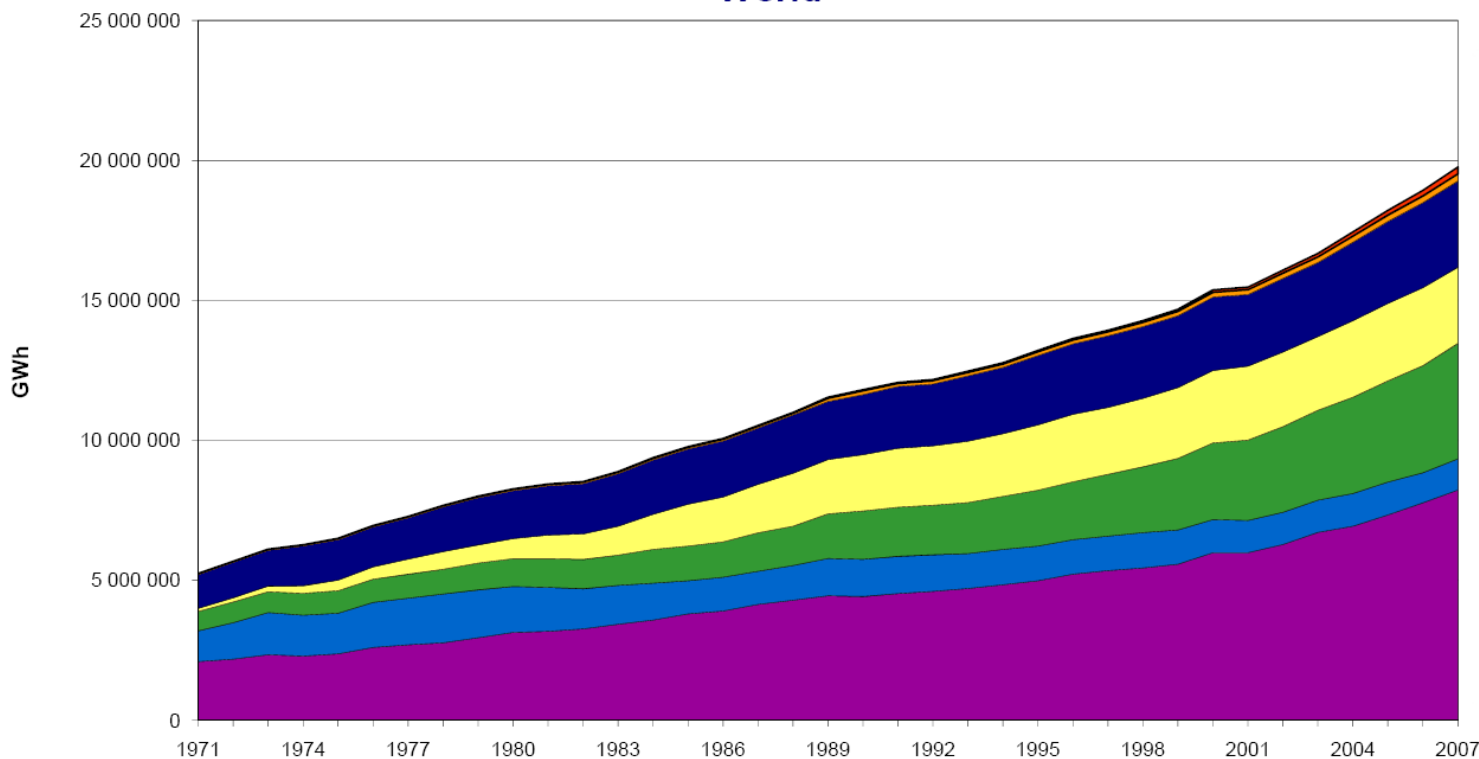
- **African GAS-use Concept**
- **Btu: Common Denominator in Pricing Fuels**
- **Users of GAS in Africa**
- **Electricity Costs by Fuel Type**
- **The Equation**
- **Conclusion**

Electricity Generation by Fuel - World

IEA Energy Statistics

Statistics on the Web: <http://www.iea.org/statist/index.htm>

Electricity generation by fuel
World



	Trend	
	1971	2007
Geothermal/Solar/Wind	0.00%	1.48%
Comb. Renew & Waste	0.00%	1.45%
Hydro	23.94%	15.46%
Nuclear	2.41%	13.80%
Gas	13.48%	21.06%
Oil	20.52%	5.66%
Coal/Peat	39.63%	41.06%

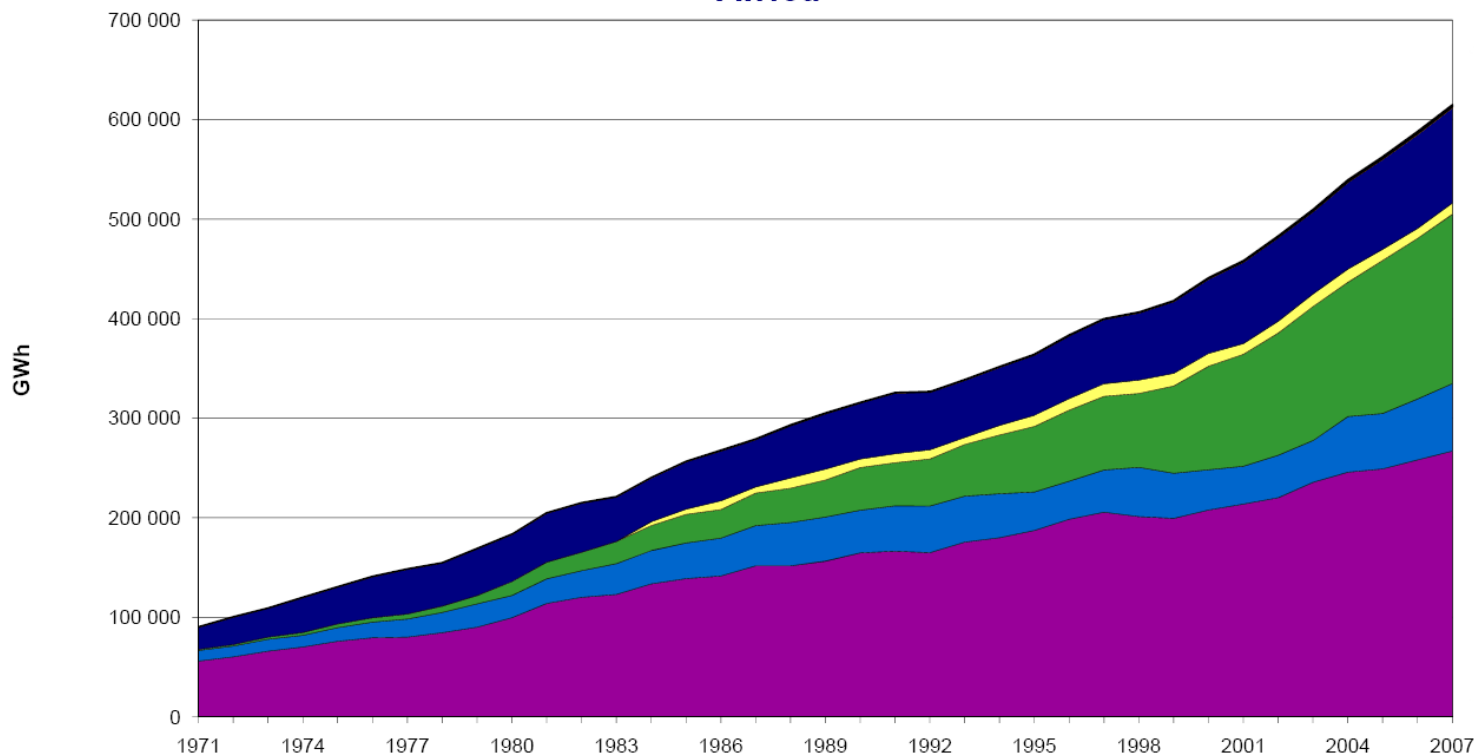
■ Coal/peat
 ■ Oil
 ■ Gas
 ■ Nuclear
 ■ Hydro
 ■ Comb. renew. & waste
 ■ Geothermal/solar/wind

Electricity Generation by Fuel - Africa

IEA Energy Statistics

Statistics on the Web: <http://www.iea.org/statist/index.htm>

Electricity generation by fuel
Africa



	T r e n d	
	1971	2007
Geothermal/Solar/Wind	0.00%	<0.01%
Comb. Renew & Waste	0.00%	<0.01%
Hydro	24.96%	16.05%
Nuclear	2.41%	1.94%
Gas	2.30%	27.53%
Oil	11.12%	10.98%
Coal/Peat	62.00%	43.48%

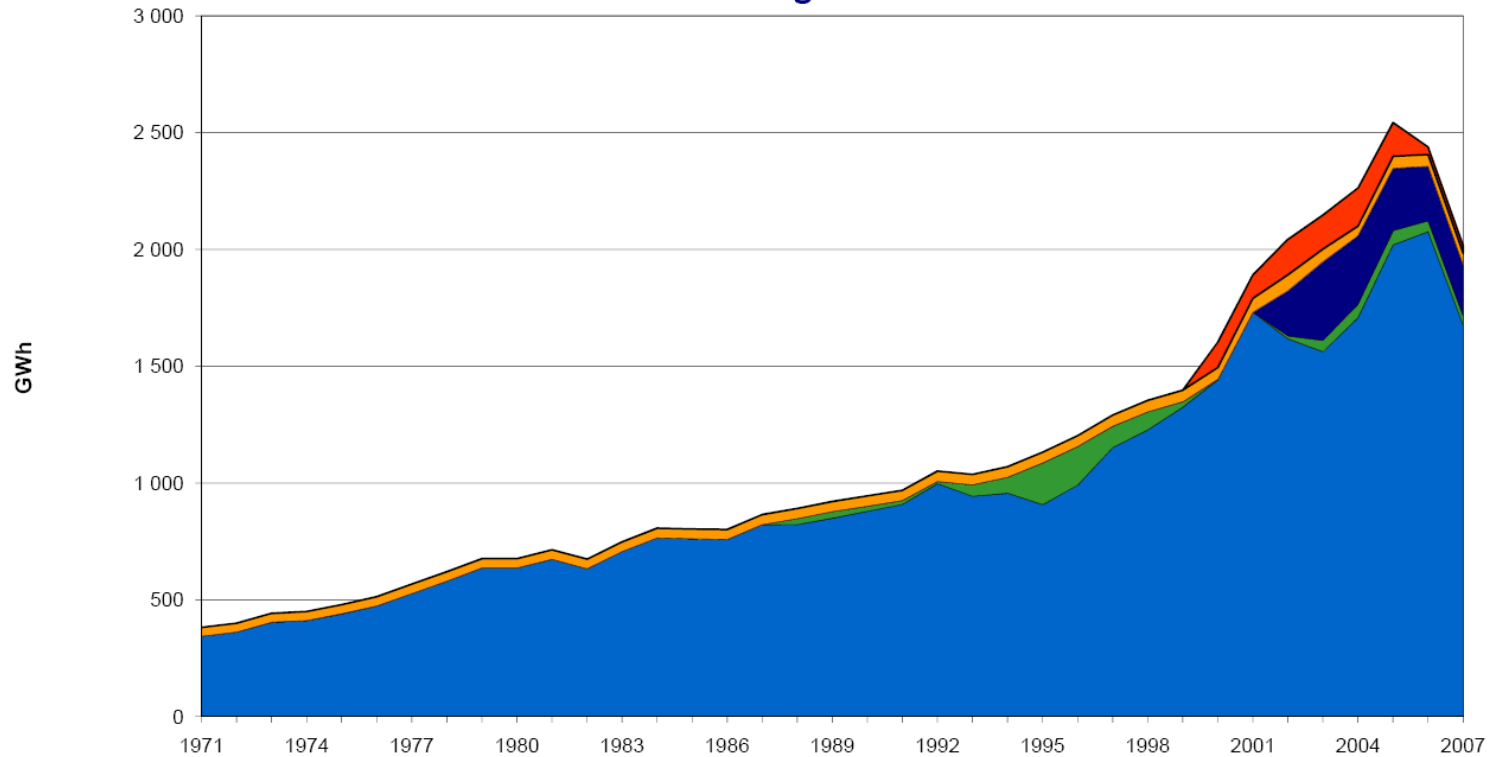
■ Coal/peat
 ■ Oil
 ■ Gas
 ■ Nuclear
 ■ Hydro
 ■ Comb. renew. & waste
 ■ Geothermal/solar/wind

Electricity Generation by Fuel - Sénégal

IEA Energy Statistics

Statistics on the Web: <http://www.iea.org/statist/index.htm>

Electricity generation by fuel
Senegal



Coal/peat Oil Gas Nuclear Hydro Comb. renew. & waste Geothermal/solar/wind

The Concept

- **>44% of Africa's Electric Power & >85% of Senegal's Power is Generated With 'Oil'. But Oil is Expensive, Dirty, often Imported & substantially suppresses local African economics, competitiveness & payment ability**
- **Oil Displacement with Domestic Gas can Create:**
 - **Less Expensive Power**
 - **Domestic Revenue and Content**
 - **Balance of Payments Improvement**
 - **Cleaner Power Generation**
- **Sustainable Development Plan Involves:**
 - **Private-Sector Providers Taking Drilling Risk for Sound Economic Returns**
 - **Government Support (Not Control!) & Country Benefit**

Domestic Gas Usages

- **Public + Private Industrial Power:**
 - Gas-Powered Turbines for Electrical Grids
 - Hybrid Powered Diesel Engines (*Altronics* Conversion) & Gas-Fired Diesels (e.g. Aggreko) for Power- Grid & also for 'Inside-The-Fence' Plants
- **Industrial: Pre-Calcinators (Kilns) - Heating**
- **Transportation: CNG**
- **Household: Cooking Gas**

Dakar Area's Addressable Gas Market

POWER			
Gas-Powered Turbines	115 MW	20.0 MMCFD	570,000 N3MD
(Hybrid) HFO Engines	177 MW	22.4 MMCFD	636,000 N3MD
Gas-Fired Diesel Engines	12 MW	2.3 MMCFD	65,000 N3MD
INDUSTRIAL			
Cement, Mines, etc	Heat	20.0 MMCFD	567,000 N3MD
	304 MW + Industrial	64.7 MMCFD	1,838,000 N3MD
TRANSPORTATION			
CNG	50,000 Taxi / Plus Buses / Trucks / Autos plus Industrial Plant Gas Transport for Distributed Power Production		
HOUSEHOLD			
Cooking Gas	4,000,000 People in Dakar presently all using LPG		

All Of This Market Is Substantially On Fortesa Pipeline Infrastructure

Domestic Gas Transportation

- Pipeline (Supply => Wholesale => Retail)
- Modern CNG Transportation Containers



BTU: The Common Denominator

– *The Challenges of Onshore African Gas* –

- **Supply Development:** Exploring For & Developing the Resource
- **Market Development:** Equipment to Use Gas Fuel
- **Infrastructure Timing:** Pipelines Lead Time With Market Assurance
- **Pricing GAS in-accord with its *BTU Value*:**
*No Subsidy – No **Non-Commercial** Government Fuel Price Demand*
- **Payment Assurance:** Gas Development from Bankable Customers
- **Market Diversity:** Both Public & Private Buying on '*Identical Pricing Terms*'

The Historic African Concept has incorrectly been:

“Gas is a By-Product of Oil Production”

But Now:

Natural Gas can be a ‘Primary Product’ & a Key African Fuel For Domestic Economic Development & Competitiveness!

BTU: The Common Denominator

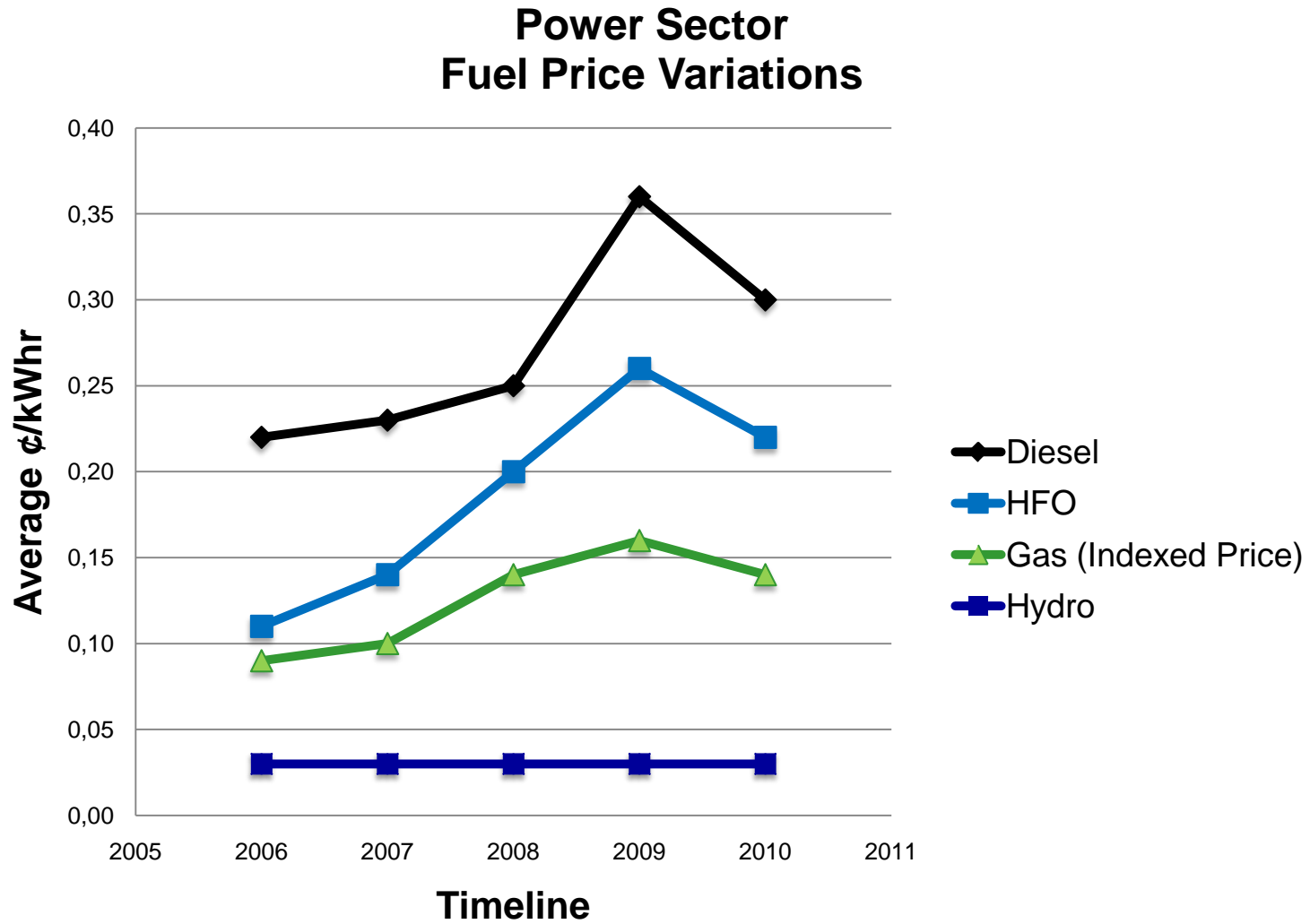
Pricing Hydrocarbons by BTU Heating Value

- **Gasoline**
- **Premium Diesel**
- **Commercial Diesel**
- **Heavy Fuel Oil**
- **Natural Gas**
- **Coal**

Sure, there are differences, but why would there be **Pricing Value Differences????**



Sénégal's Fuel Price Variation History



The Equation

A Correct African E&P Business Foundation Requires:

- Production: Cost-Effective Mix of Gas & Liquids
(+)
- Integration : Imbedded Tools & Capabilities At-Hand
(+)
- Human: People Working Together
(+)
- Finance: Seldom At-Hand When Needed
(+)
- Political / Legal: Enabling



= *Sustainable Business Plan*

The Imbedded Factor

The Commercial “Mix”: **Public vs. Private**

- A Main Beneficiary of GAS Production can be Public Power
 - Consistency of Supply
 - Cleanliness of Combustion
 - Lowering of Maintenance Costs
 - Government-Take from PSA ‘Profit Oil’
 - Employment in the Producing / Consuming Nation
 - ‘Take-or-Pay’ Pricing can be More Favorable than Oil ‘Spot Market’
- A Main Supporter can be Commercial Enterprises, especially Mining and Industrial Clients that require Large, Consistent Quantities of Competitive Fuel
 - Economic Growth of Private Enterprise In-Country – GDP Boost
 - Cost-Effectiveness of Local Developed Products in the Global Economy

Both are Needed for a Project to be Commercial and **BANKABLE**

Gas Project Complexities

Domestic GAS E&P Requires Everything Needed for Oil...

... except More of Everything with a Focus to Proper & Safe Handling Gas on the Surface...

... and Much Effort to Obtain Domestic Project Financing due to Non-Exportability

Therefore: a 'Selling Price' that permits a Sustainable Gas Supply!



Conclusion

The Balanced Solution requires

- **Domestic-Fuel Development Policy**
Endorsed by Government w/ No Restrictive Controls
- **Free Markets with Private and Public Customers**
To Establish Sustainable Domestic Gas Market
- **Payment Reliability & Assurance**
To Help Finance:
- **Sustainable E&P Efforts**



Thank You...

... from the 260 employees of *FORTESA INTERNATIONAL SENEGAL*,
PETROSEN and *AFRICA ONSHORE DRILLING SENEGAL*

