Africa: Great Frontier: World Hydrocarbons
Past, Present, and Future*

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Abstract

The oldest and original continent, Africa has been central to the world exploration saga. It has a long track record in the shaping of the industry and its evolution. The various phases of exploratory drilling and hydrocarbon discovery span over a century. Africa remains today’s great uncharted frontier in world oil and gas. Sequential scrambles for Africa’s endowment embrace a long struggle for oil played out between many Great Powers and inside African states before, during, and after the Cold War. The contemporary corporate oil quest engages over 500 companies drawn from all over the globe, including state oil companies from six continents. Yet Africa is a diverse landmass and island domain containing vast and little known ancient subsistence worlds on which the quest for Africa’s oil prize has had only marginal impact. More African countries have today encountered larger acreage leasing, rising discovered reserves, oil and gas development, and fast-expanding production and exports. Corporate, investment, and financial stakes have grown substantially across the oil and energy value chain, including those in gas ventures and LNG, during the dynamic cycles experienced from the 1960s into the 21st century. Yet oil historiography, economics, and fragmented geopolitics have left uneven exploration and social landscapes inside the African oil game. A cast of thousands seeks to arbitrate and capture this large resource that has become the key locomotive for the continent’s economic future. Multiple dynamics and strategies drive this unprecedented rush for oil and gas assets as Africa’s guardians and gatekeepers, as well as players involved in this epic search, all seek their piece of its lucrative prize. This shifting collage is reshaping modern Africa and its ancient economies. The story sheds new light on myths around Africa’s presumed “oil curse” and its 21st century rediscovery in the enduring scramble for the Dark Continent’s crude bounty.
Africa: World’s Great Frontier

Africa’s Prize
- Global Quest Afoot
- Rising Oil/Gas Reserves
- LNG Growth Potential
- Investment Stakes
- Great Power Interests

“Medieval Africa”
- Challenges Ahead
- Pressured States
- Africa’s Oil Patrimony
- Oil Wealth Significance
- Darkness or Destiny

“Discovered” Africa
- La Longue Duree
- Exploration Saga
- 100 Years Effort
- Modern Scramble

Corporate Impact
- Exploration Space
- Acreage Uptake
- New Frontiers Opened
- State Players: Grow

State Oil Companies
- More State Companies
- Global Entry to Africa

Africa’s Oil Patrimony
- Oil Wealth Significance

Darkness or Destiny
“Discovering Africa”
100 Years Exploration
African Landmarks

- 1850s: Portuguese Find Oil Seeps: Angola
- 1884/1900: Onshore Seeps: Gulf of Guinea
- 1900/10: Ghana Shallow Drilling
- 1910/50: Drilling In West Africa
- 1960s: Shift Offshore
- Century of Exploration
Africa: Crude Continent

- African Petrodollar Boom
- New Ventures Flood
- Corporate Refocus On Africa
- Resource Nationalism Era
- Chongololos Discover Africa
- Years of Living Dangerously
- Rising Crude Price Era
## Exploration Wells 2007/08

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New Producers
Next 5 Years
Uganda
Niger
Madagascar
Africa: Exploration Wells

Major Exploration Drive: 21st Century
Corporate Quest For Africa

Top Ten: Super Majors
ExxonMobil, BP, Shell, Chevron, Total
ENI, COP, Repsol YPF
Lukoil, StatoilHydro

Foreign State Players
Grand Strategy
CNPC, Sinopec, CNOOC
ONGC, TPAO
Petrovietnam, PTTEP
Pertamina, Gazprom
African State Players

“Super Independents”

“Top 25” Players Growing Portfolio

Minnows in Africa
500 Juniors
Chongololos
Quoted & Unlisted
Foreign Domiciled
Mixed Morphologies
“Born In Africa”
Corporate Quest

Worldwide Independents
50+ Key Companies
Producers: Explorers
Corporate Oil

Africa Impact

- Exploration Frontiers
- Oil Prize Search: Stakes
- Unexploited Potential
- Corporate Presence
Namibia: Players

Some Acreage Later Relinquished
OFFSHORE
ANGOLA:
FIELDS 1960S
OFFSHORE ANGOLA:
FIELDS 1990s
1978
"The Majors"

1988
"The Doldrums"

1998
"The Entrepreneurs"

2000
"The Mid Caps"
2004
"Return of the Majors"

Atlantic
Ocean

Canary Islands
Western Sahara
Cape Verde Islands

Exploration
Seismic only

0
500
kilometres
CARTE DES BLOCS EN MAURITANIE

Bassin Côtière

Bassin Taoudeni
Ethiopia

21 Blocks Leased: 2008

Only 4 Open: Ogaden
Kenya
14 Blocks Leased: 2008
Now 20 Open

Kenya Exploration Block Lease Status - January 2008
Africa: Acreage Licensed/Open

1. North Africa: 1076 Licensed, 220 Open Blocks
2. Sub Saharan: 868 Licensed, 1997 Open Blocks
3. Open: Includes Applications + Force Majeure
4. Potential: Eventual EEZ + Demarcations + New

Estimates: Sept 2008: Deloitte

Africa: World’s Great Frontier
Company Interests: Held Across Africa

Massive Acquisition

Growth
Acreage
Assets
Deals
Africa

Coastal states: 43
(world =155)

Potential maritime boundaries: c. 79
(c. 365)

Boundary agreements:
22 (28%)
(160 – 44%)

200 nm territorial sea claims:
• Congo
• Liberia
• Somalia
Companies: Africa *
Minnows, Independents, Super Majors
Foreign State Players, African State Companies

* Projection: Global Pacific & Partners
“Born in Africa”

- **Nigerians**
  - Allied
  - Amni
  - Atlas: Oranto
  - Camac
  - Equinox
  - Fruitex
  - Moni Pulo
  - Nigerian Express
  - Oando plc
  - Sahara Group
  - Sapetro
  - Transcorp

- High Tech: Sudan
- IPG: Mauritania
- Kalahari Gas: Botswana
- Lushan: Ghana
- Mvela, IDG: South Africa
- Mwana Africa, Energetic
- Pamue: Namibia
- Somoil, Falcon, ACR: Angola

- **Plus In:**
  - Congo, Kenya, Gabon, Mocambique, Ethiopia, DRC, Tunisia, Egypt

African Independents From 15 Countries
Nigerian Independents

1956
1st Oil: Oloibiri

1962
Fed. Govt and Agip JV

1968
Henry Stephens Petroleum Nigerian Oil Resources

1982
Nigus Petroleum

1987
Dubri Oil NPDC

2002
32 E & P Companies Allotted Marginal Fields

2008
More Players: Go Regional

1992
38 Indigenous E & P Companies Awarded OPLs

AMNI ALLIED ATLAS EXPRESS FAMFA MONI PULO YFP

Pioneer Indigenous Companies
National Oil Companies
Africa, Asia, Latin America, MidEast
Africa: Foreign State Players

MidEast & Russian
- Kufpec
- TPAO
- Gazprom/Rosneft
- Gulf Players/QP
- Private/State

African State Companies
- Sonatrach
- PetroSA
- NPDC
- ETAP
- Others

Asian Lunge
- Petronas
- China
- India
- East Asian
- Southeast Asia

Europe
- StatoilHydro
- Hellenic
- MOL
- Other

Latin American
- Petrobras
- Sipetrol
- PDVSA

Other
State Companies: Africa
Includes Foreign Ventures: African National Oil Companies

Chinese
Indian
Southeast Asia
Russian
Latin
MidEastern
Europe

More
Acreage
Assets
Deals

2000
2008
African National Oil Companies

- Mauritania
- DPR, Nigeria
- GNPC, Gambia
- Madagascar
- Kenya
- GNPOC
- ONHYM
- Tanzania Petroleum Development Corporation
- GNPC
- EPA
- APPEA
African State Companies: 21st Century

PetroSA (Merger)
Petroguin
GEPetrol: Sonagas
Sonangas: Angola
Mocambique: CMH
Gambia National Petroleum Company
Mauritania: SMH
SHT (Chad)
Napcon
NilePet: GOSS
NatOil (Uganda)
Zambia ZNOC

Only 15 States Lack State Oil Company For Upstream

12 New State Entities This Century
National Oil Companies: Africa
Outside Own Country

- Sonatrach: Peru & Africa Ventures
- PetroSA: Diverse Africa Assets
- NPDC: WAGP, EG + Venture Targets
- ETAP: Targets
- Sonangol: Gabon + Intent
- NOC: Africa Venture Targets

Foreign State Oil Companies
Dominate In Upstream Africa
Eating Africa’s Lunch

- Petronas: Widespread Africa
- CNPC: Sudan + PetroChina Assets
- CNOOC: Morocco, Kenya, Nigeria+
- Sinopec: Gabon, Nigeria, C-I ++
- OVL: Sudan, Libya, Cote d’Ivoire+
- Pertamina: Libya + Sudan
- Petrovietnam: Algeria, Madagascar
- PTTEP: Algeria, Egypt
- KNOC: North Africa, Congo
- Gazprom: Africa Targets
- Tatneft: Libya
- Kufpec: Tunisia, Mauritania
- Petrobras: Angola, Nigeria, Tanzania, Algeria, Libya, Mocambique
- StatoilHydro: Algeria, Angola, Libya, Nigeria ++
- Sipetrol: Egypt + Exit Guinea
- Gulf Players: Growing Portfolio
Corporate Quest: Africa’s Prize

Future Fuels: Potential
- Pre Salt Plays
- Synfuels + GTL
- Coal To Liquids
- Heavy Oil Plays
- Tar Sands
- Biofuels + Jatropha

Investment Stakes
- Portfolio
- Investment
- Financings
- Equity Markets
- Listed Companies

Great Power Interests

Oil Reserves: Assets + Potential
- Proven: 120 BBLS
- YTF: 50+ BBLS
- Underexplored Zone
- Frontier Basins
- EEZ + Interiors

Gas Ventures
- Gas Discoveries
- Gas/Power + IPP
- Inter State Gas Deals
- Gas Players

LNG Prospects
- More LNG Plants
- Increased Capacity
- North Atlantic Markets
Africa: Proven Oil Reserves: BBLs

Reserve Significance
Russia: 120/150 BBLs
Arctic Yet-To-Find: 90 BBLs
African Oil + Gas
Reserves BBOE

Africa
> 200 BBOE
Growing

North Africa
Libya
Algeria

West Africa
EG
Gabon
Angola
Nigeria

East Africa
Sudan
Congo

Southern Africa
Africa: Oil Production: MBOPD *

* Projection: Global Pacific & Partners
African Proven Gas Reserves: 2008

Proven Gas: **510+ TCF**
- 50% Non Associated
- 6 Countries = 95% Proven Gas
- Cut Off > 5.0 TCF Reserves
- More Countries Discover Gas
- Major Exports: Atlantic LNG
- Emerging African Gas Game
Africa

Energy Investment Stake *

World’s No 1
Energy Capex Destination

Investment 2001 - 2030
USD 1.25 Trillion

* OECD Estimates
Africa: Upstream Investment: USD Billion

Africa Upstream 2001-30 USD 345 Billion

Africa Energy/GDP Ratio: 4% To 2030

Oil & Gas Investment: 48% Total: USD 600 Billion

Total FDI 2007 USD 50 Billion
Will Oil “Save” Africa?

Can Oil Companies Fix African Poverty?
Africa/World GDP 2008: USD Trillion *

* Estimates Based On IMF: PPP Basis

Africa: Economic Dimension
“Medieval Africa”

Ancient Economies

Subsistence Modes

“Feudal” Continuity

Underdevelopment

Pre Modern + Modernity

Exist In Long Transition
Africa, Medievalism, Roman Empire

Relative Real Income Index

After Greg Clark, A Farewell To Alms, 2007

1. Medieval Europe: Above England < 1800
2. Roman Empire: Material Standards = England < 1800
3. Agrarian Societies: No Gains From 1800 BC To 1800 AD
4. “Povo”: Africa’s 50% Poor: 475 Million @ < $1-Day
Sub Saharan Africa
Long Run Growth: Real GDP per Capita
*PPP Adjusted 1990 Dollars*


1. Caveat: based on scaled up estimates (Ghana, South Africa)
2. No account made for known distributional effects
3. Most probable: Malthusian level subsistence for vast majority
4. Worst performance: Sub-Saharan outside South Africa
Demographic Shift 2025

Projected: 2 Billion Africa 2050
To Double In 40 Years

Sub Sahara: Income 2008*

Wealth/Income Inequality Coefficients Rarely Shift

Poverty Reduction Can Only Come Via Growth

Poorest 20%
Richest 20%

Africa GDP
USD 3.18 Trillion

USD 111 Billion
USD 2.1 Trillion

Estimated: IBRD
Sub Sahara Africa: USD 2 Trillion
3.5% World (USD 57 Trillion)
“Contested Africa”

*Pressured States: Subsistence Worlds*

- Western Sahara: “Closed Zone”
- Chad/CAR: Rebellions
- Sudan: Darfur, South Sudan
- Tuareg: Niger, Mali, Algeria, Libya
- Somalia: Ultra Failed State
- Horn of Africa: Ethiopia/Eritrea
- Eastern Rifts: Comoros
- DRC Great Lakes: Legitimacy
- Zanzibar + Kenya Fracture
- Barotseland, Cabinda, Others
- Niger Delta: Warlords, Conflict
- Cote d’Ivoire: Bifurcation ?
- Country Instability: Nigeria ++
- Implosions: Zimbabwe ++
- Offshore + EEZ Contested Zones
**Africa: Investment/Costs USD Billion**

- **E & P Investments 2001-2030:** O/G Capex 600 Billion
- **War Costs 1990-2008:** Estimated @ Triple 1960-90
- **Foreign Aid Flows:** 1956-2008: Excludes Debt Relief

**AU Estimate Annual Corruption Costs**
USD 148 Billion: 4.65% GDP
Africa’s Oil Patrimony

* Output @ 11 MMBOPD, 2008
Reserve Lifespan = 30 Years @ 4 BBLS/Year
** YTF @ 50 MMBLS: Adds 10 Years To Lifespan
Africa’s Oil: Relative Significance

* Current Gross Revenues: Billion Dollars
** Oil Wealth/USD Head-Annual @ $100/Barrel
Over 30 Years With Population @ 1.3 Billion

Gross Annual Revenue/Year *
Oil Wealth Per Head 30 Years**

Oil/Gas Could Make Africa
Great Power Interests

Geopolitics
- Security Issues
- UN Security Council
- Africa Relationships
- Strategic Partners

Oil + Energy
- Acreage Access
- Oil/Gas Reserves
- Corporate + State
- Gas/LNG Projects
- Crude Oil Imports
Africa’s Landscape
Contestation In Transition

Realities + Issues In Oil Debates ++

Poverty, slavery, wars (“blood oil”), oil reserve depletion, social tension, bribery, human rights, corruption, environment destruction, rainforests, resource control, transparency, humanitarian aid, militia, fundamentalism, ecosystems, climate change, diversity, ethnic survival, nomads, autochthonous rights, arms, racism, equity, security, endangered species, conflict, wilderness, debt, currency stability, biospheres, ideology, political risks, offshore funds, theft, media, anarchy, divestment, ethical investment, oil financed politicians, governance, sanctions + more
“Africa’s Future: Endogenous”

Real $Y/P^{Povo}$: 2050

\[ Y/P^{Povo} = f \left( GDP^R, Pop^N, Gini^{W/Y}, S^{GI-Yrs}, ISWC, M^{U+HDI} - X \right)^T=42 \]

$Y/P$ = Real Income/Capita: After Inflation
$Povo = 50\%$ Africa’s Poor @ $1$/Day Constant

$GDP = \text{Growth Rate: Secular Trend} = R$
$Pop = \text{Population Povo: Rising Numbers} = N$
$Gini = \text{Coefficients: Wealth/Income Inequality}$
$S = \text{Stability: Governance/Investment (Years)}$
$I = \text{Incidence: Social Conflict/Wars/Coups}$
$M = \text{“Misery Index”: Unemployment + HDI}$
$X = \text{Costs: Droughts, Famines, Economic Crises}$
$T = \text{Time: 42 Years}$
Which Way Africa?

*Darkness: Destiny*
Global Pacific & Partners

London, The Hague, Nicosia, Johannesburg

www.petro21.com