

LEAD PRESENTER:

Ademola Adeyemi-Bero
(Managing Director / CEO)



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SPE OLEF
SOCIETY OF PETROLEUM ENGINEERS OLOIBIRI LECTURE SERIES AND ENERGY FORUM

**OLOIBIRI
LECTURE SERIES &
ENERGY FORUM**

25th Anniversary

THEME:

**Technological Advances in Hydrocarbon
Exploration and Exploitation:
Solutions to Global Oil Price Stability**

Date: Thursday 3rd March, 2016 | Time: 9.00am | Venue: PTDF Tower (Auditorium)
2 Memorial Close, Central Business District, Abuja.



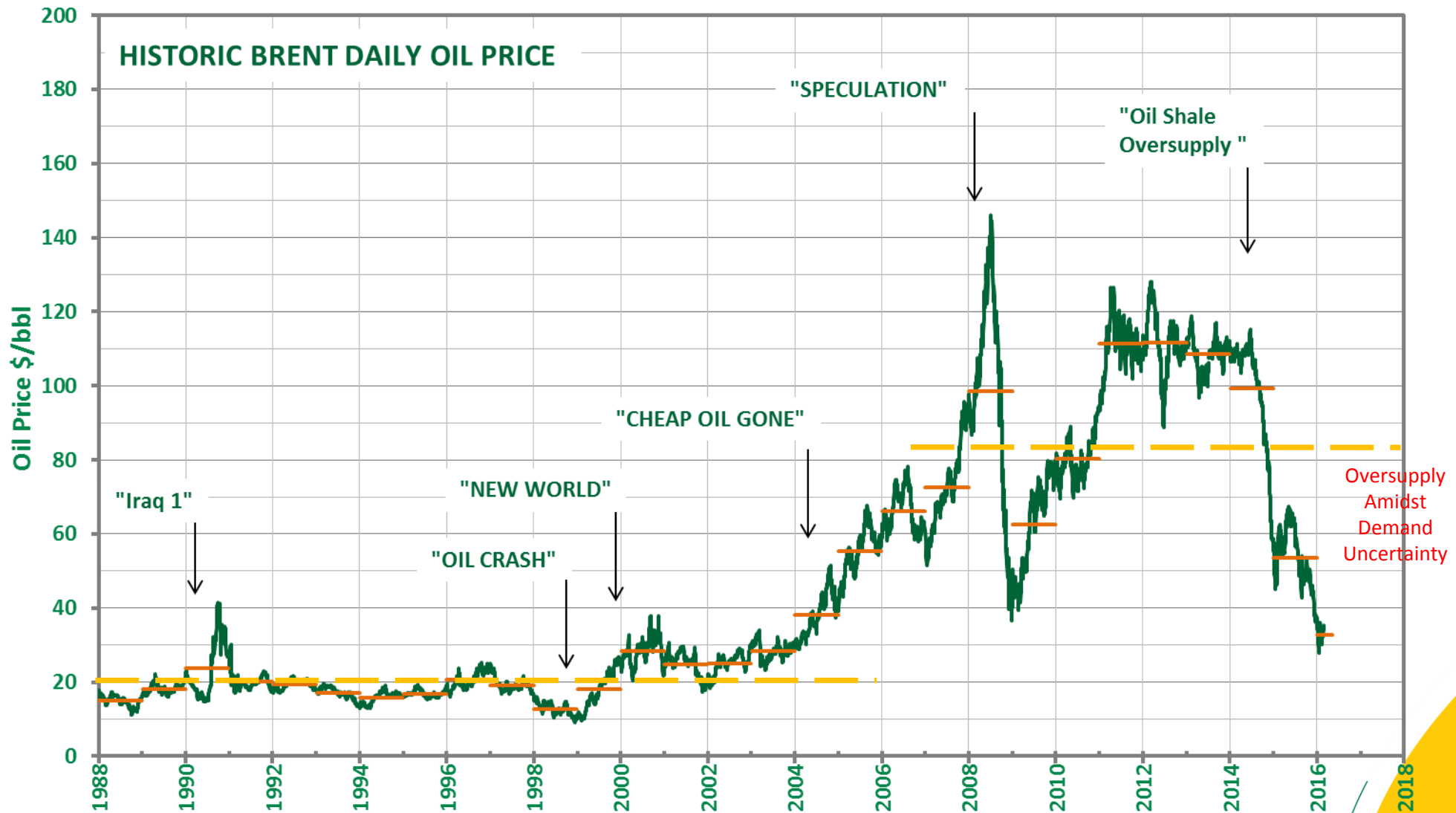
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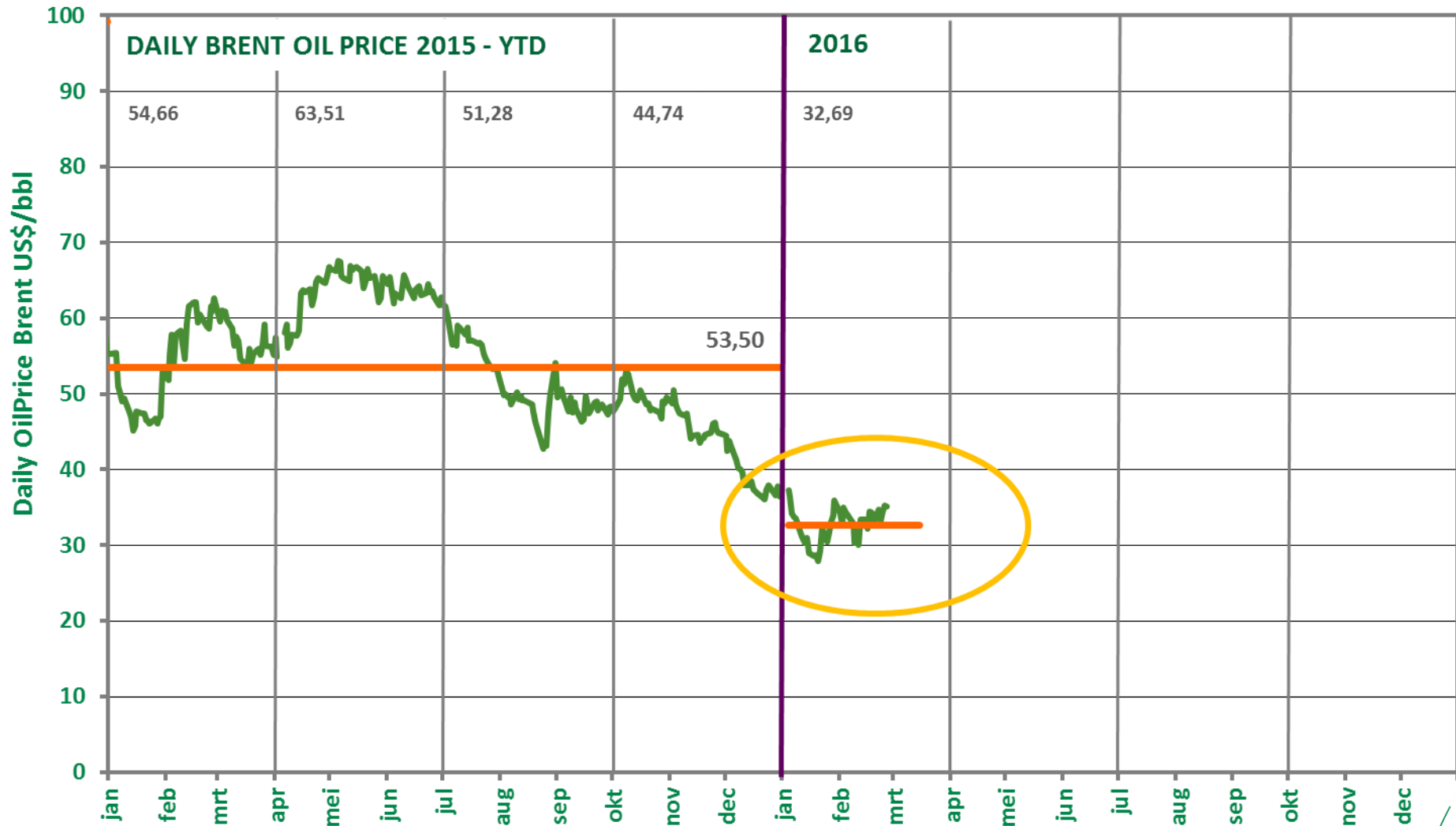
GLOBAL OIL PRICE (& GAS PRICE) (IN)STABILITY



BRENT HISTORIC YTD – STRONG TRENDS, BIG SWINGS

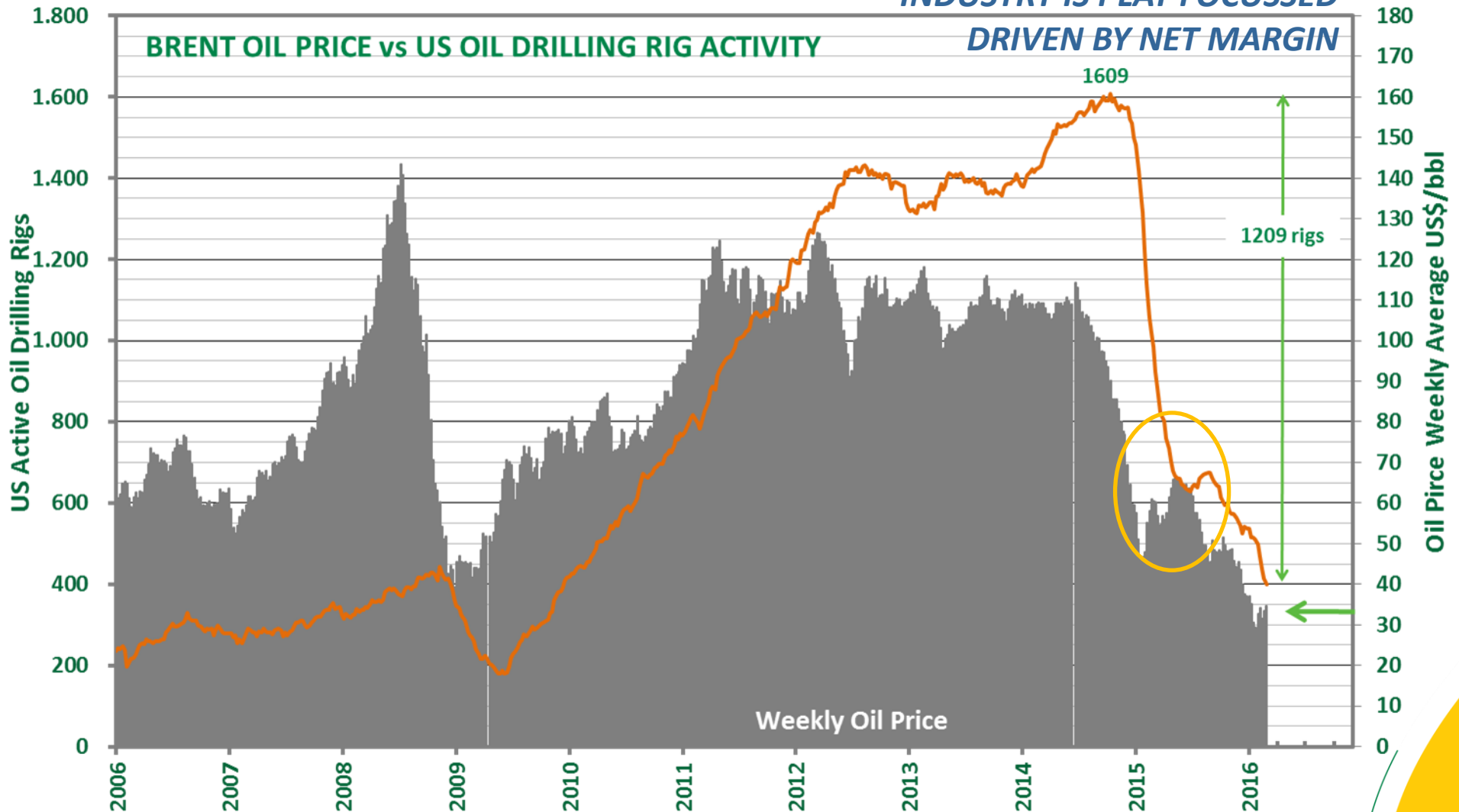


OIL PRICE UPDATE - A CLOSER LOOK AT 2015-16



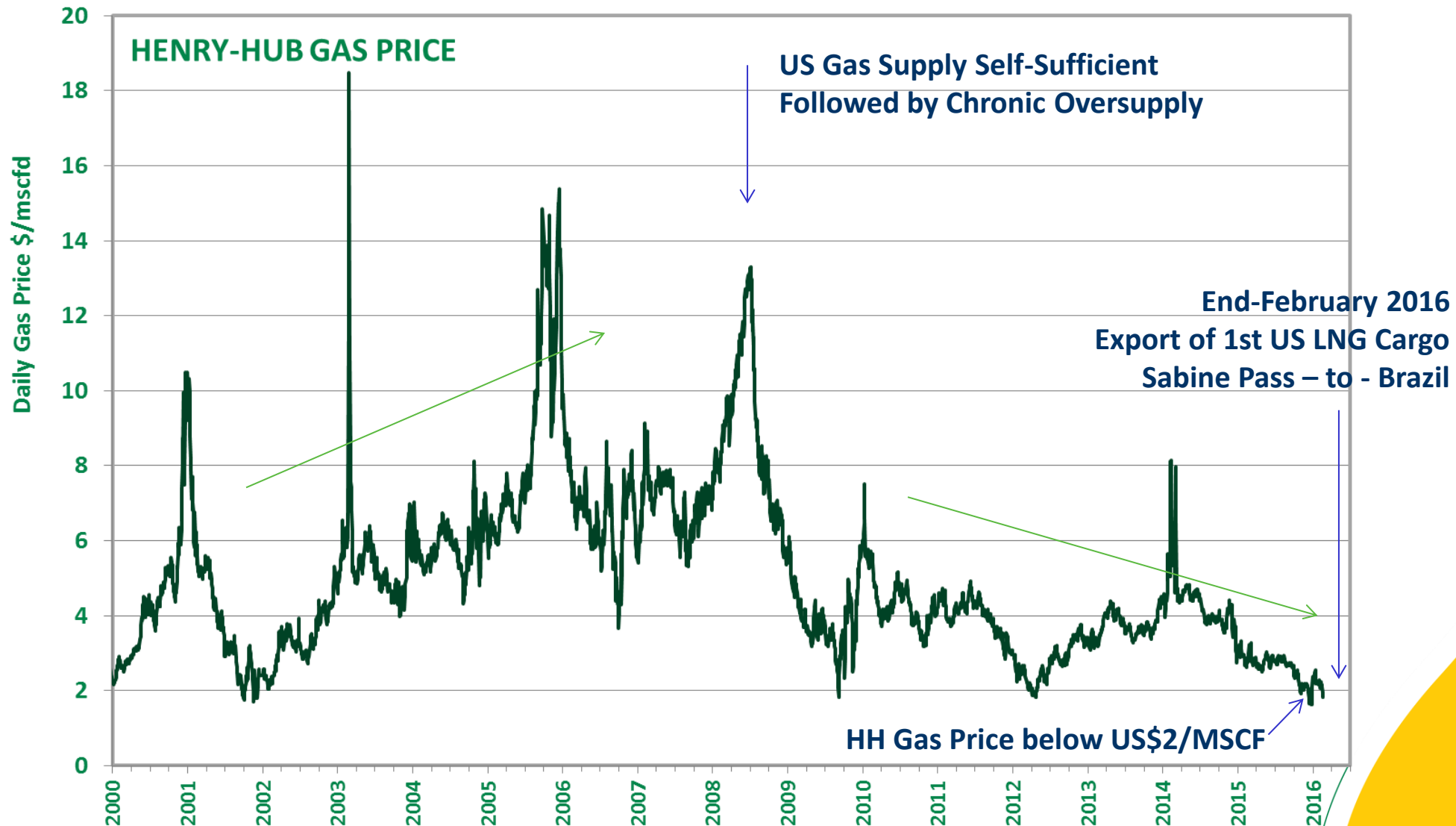
US OIL DRILLING ACTIVITY – A PREDICTIVE FACTOR

*HIGHLY EFFICIENT REGULATORY FRAMEWORK
INDUSTRY IS PLAY FOCUSSED
DRIVEN BY NET MARGIN*



HENRY HUB HISTORIC YTD – DEMAND AND SUPPLY!

NORTH AMERICAN PROVED RESERVES BASE TRIPPLED SINCE THE END 90'S



SUMMARY - FACTS

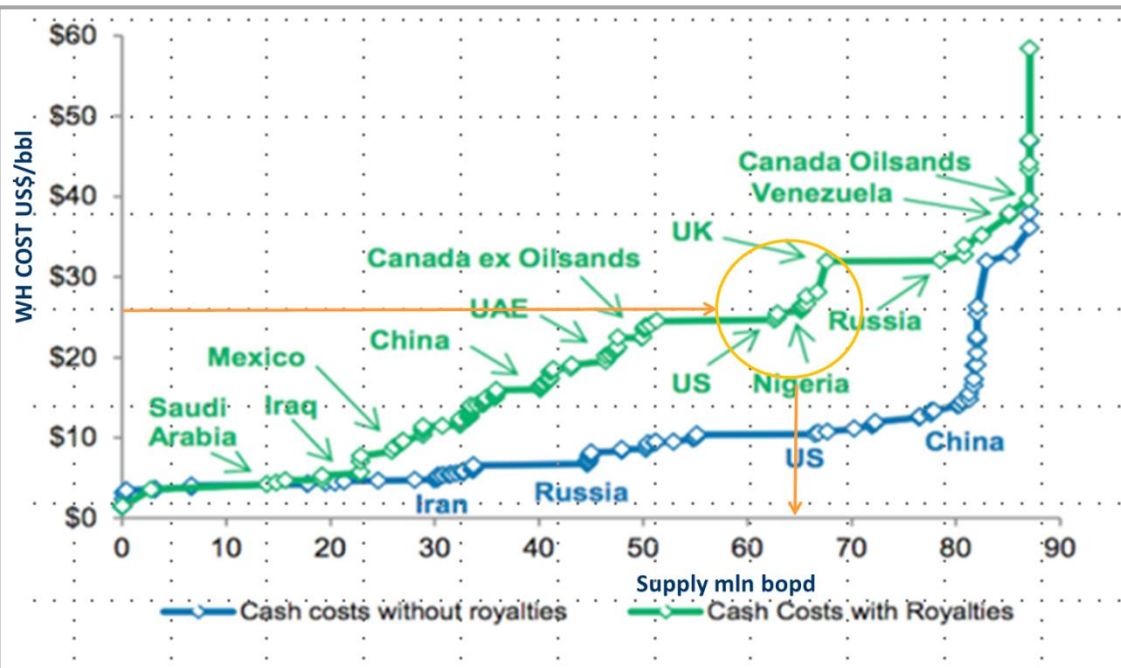
- GLOBAL DEMAND GROWTH CONTINUES STEADY AT ~ 1.2 MILLION BPD PER ANNUM
- GLOBAL OVER SUPPLY HAS BEEN DRIVEN BY THE US SHALE PLAY AND CANADIAN OIL SANDS MINES,
- US DRILLING OIL & GAS ACTIVITY EXPERIENCING A HISTORIC DROP, WELL BELOW 90'S LEVELS
- US OIL SHALE RESEVOIR DECLINE RATE ESTIMATED @ 6,8%/MONTH
- MOST IF NOT ALL PRIVATE PLAYERS ARE DRIVEN BY MAJOR BUDGET CUTS / SHORTAGES,
- VERY SIGNIFICANT NUMBER OF 2016/2017 SUPPLY PROJECTS HAVE ALREADY BEEN CANCELLED (> US\$600BLN)
- BRENT OIL PRICE HAS REACHED BOTTOM ????????
- HENRY HUB GAS PRICE TOUCHED BELOW US\$2/MSCF, LAST WEEK USA EXPORTED 1ST LNG CARGO

BUT;

- IMMEDIATE SUPPLY OVERHANG IS STILL AT RECORD LEVELS, 3 BLN BBLS IN STORE
 - THE GLOBAL SUPPLIER WILD CARDS ARE IRAN AND IRAQ!
 - THE PRIMARY DEMAND DRIVERS ARE CHINA, OECD AND INDIA ALL YET TO PICK UP
 - ALL PRODUCERS (OPEC AND NON-OPEC) ABLE TO GROW PRODUCTION ARE INCREASING SUPPLY
 - HIGHEST COST TAR PRODUCERS VENEZUELA AND CANADA ARE STILL SHOWING PRODUCTION GROWTH!
- REDRESS IN SUPPLY DEMAND BALANCE SHIFTS FROM Q4 16 → Q2/3 17
- WHAT DOES THIS MEAN FOR NIGERIA??????

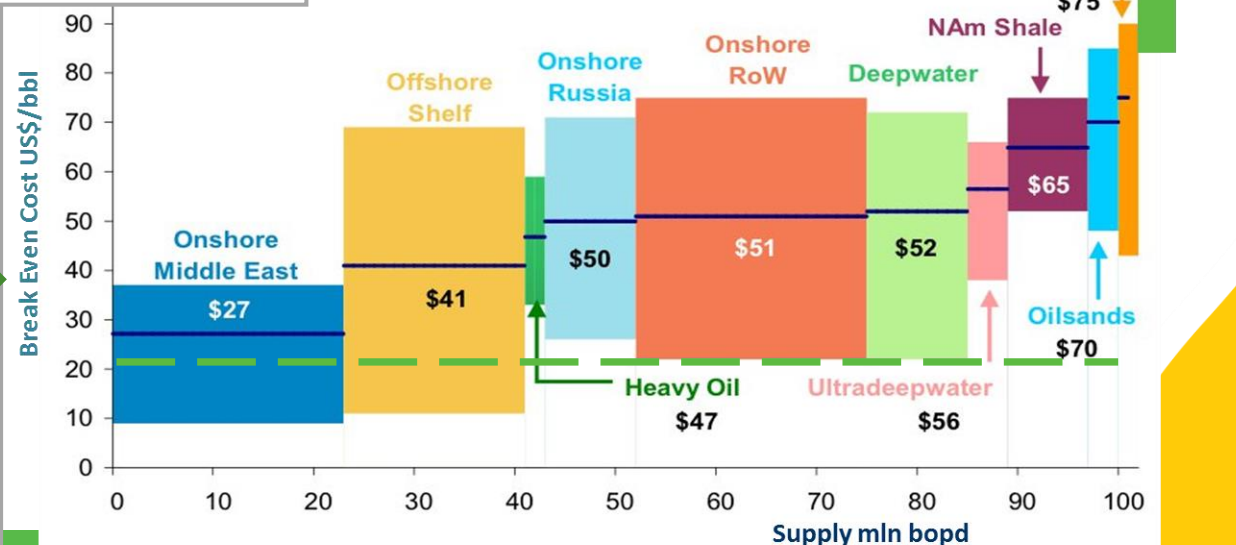
UOC, UDC & UTC - THE REALITY

NIGERIA NO LONGER IN THE LOW COST BAND!



**ESTIMATED ACTUAL
IN-FIELD AVERAGE
UNIT OPERATING COST
\$/BBL**

**ESTIMATED AVERAGE
LIFECYCLE TECHNICAL COST
\$/BBL**

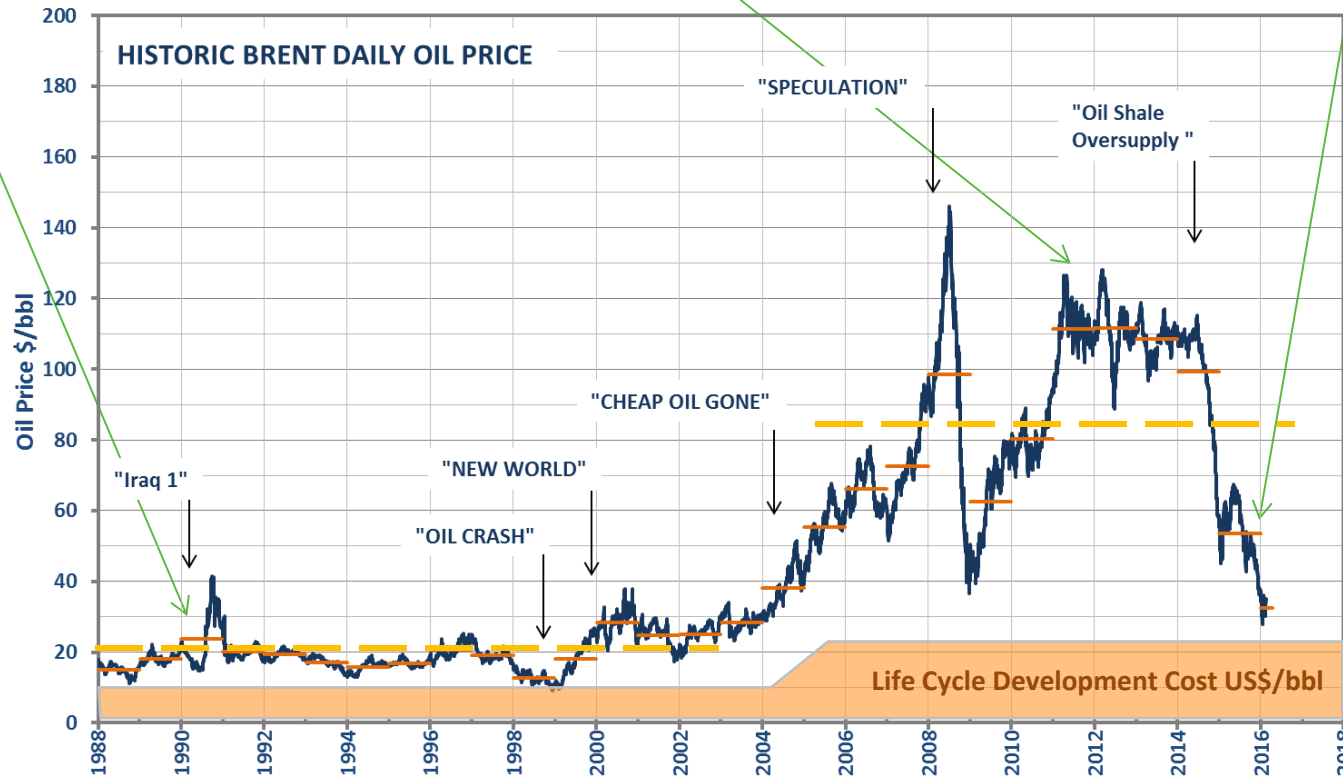
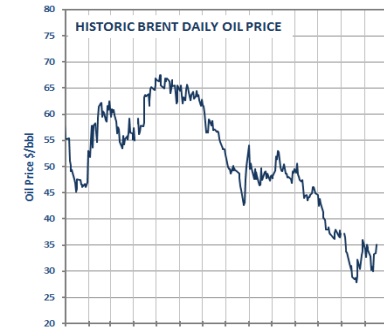
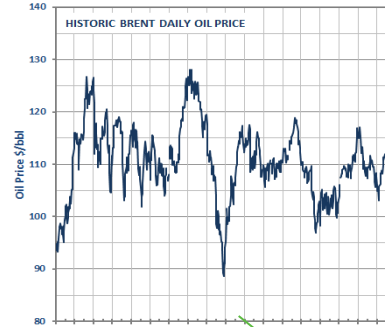
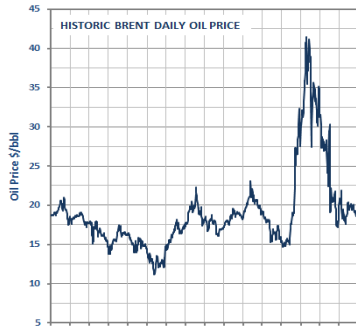


HISTORIC– STRONG TRENDS, BIG SWINGS

WHERE NIGERIA SHOULD PITCH DURING PRICE VOLATILITY!



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FROM
US\$ 18/BBL
With swings
of 50%
Robust UTC < \$10/bbl

TO
US\$ 80/BBL
With swings
of 60%
Robust UTC < \$20/bbl



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TECHNOLOGICAL ADVANCES EXPLORATION & EXPLOITATION





Approval & Contracting

- Current JV **Contracting & Procurement** and **Approval** process significantly erodes project value
- JV **Cash Call process** in last 10 years has killed GROWTH

Project Delivery

- Subsurface development – **Maximise hydrocarbon recovery**
- Wells and facilities development – **Minimise development costs**

Asset Operations

- High uptime for integrated facilities system – **minimise deferments through efficiency in operations and maintenance of equipment**
- Minimise production losses – **efficiency in export operations, production metering and reconciliation**
- Minimise production decline – **efficiency in wells, reservoir and facilities management**

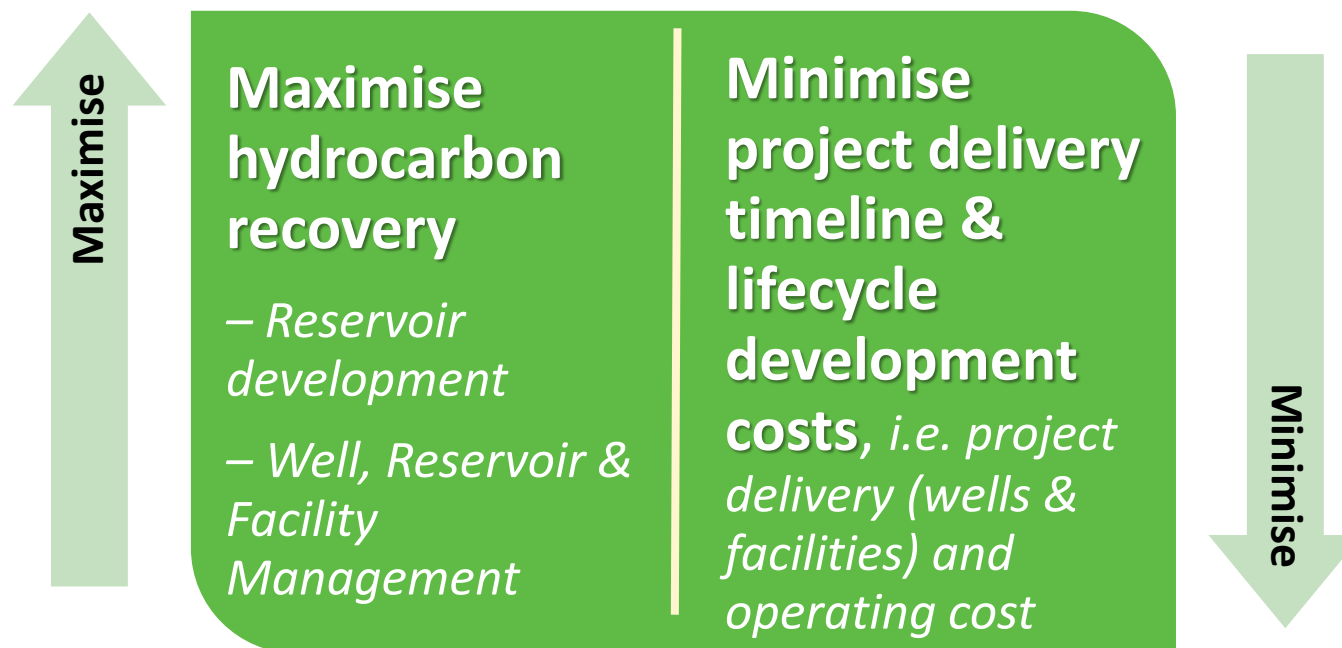
Regulatory Issues

- Requirements for technology application should evolve with latest robust technology – **multi-phase flow meter, risk-based facilities inspection, ultrasonic custody transfer meters**

COUNTERING OIL PRICE INSTABILITY (VOLATILITY)

To counter oil price instability SMART SOLUTIONS must be deployed to derive **MAXIMUM VALUE** during **PROJECT DEVELOPMENT / EXECUTION** and throughout **ASSET LIFECYCLE OPERATIONS**.

→ Low Unit Technical Cost (UTC)



ENABLING ENVIRONMENT & ELIMINATE 3rd PARTY INTERFERENCE

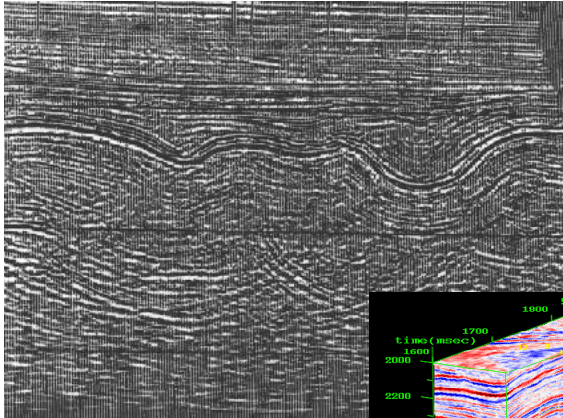
EXAMPLE -1

SEISMIC EVOLUTION – EVER BETTER DEFINITION

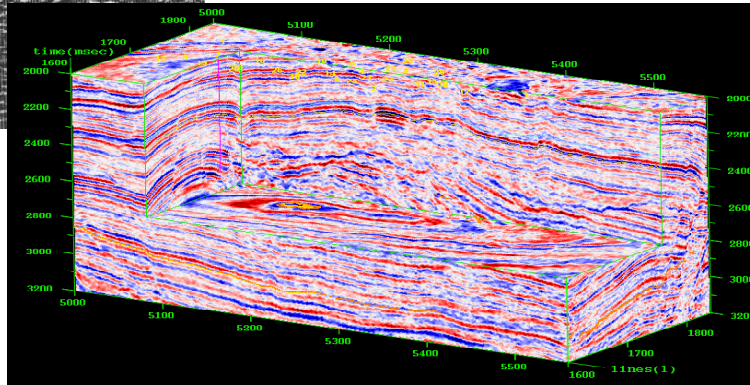


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Once all we had was 2D (80's)



Then 3D changed the way
we looked at things (90's)



Acquisition techniques ,

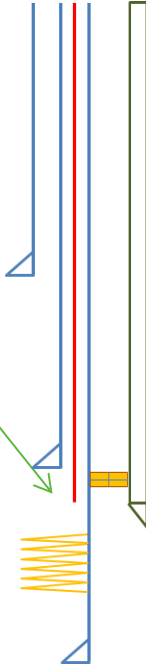
Processing capabilities,

Overpressure Definition,

Well to seismic Calibration,

Well Fibre-Optics,

= PDH Geophone



Now we are talking... (00's)

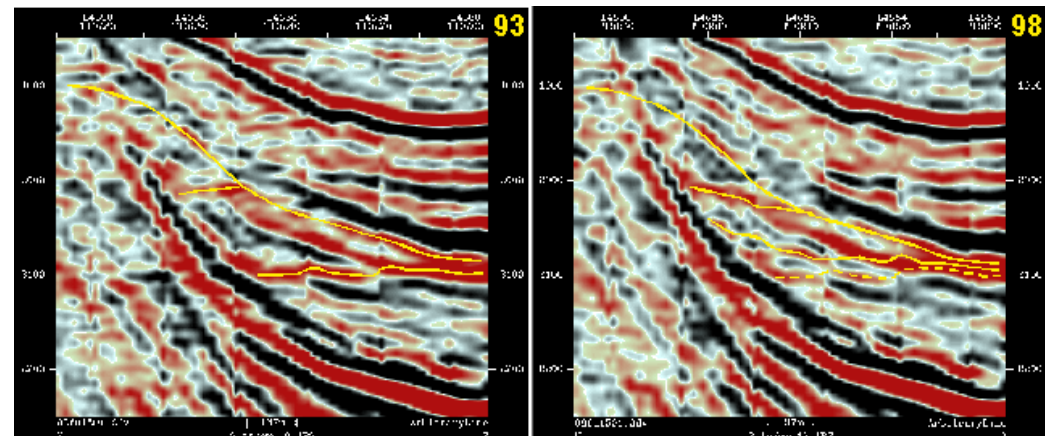
4D

for Development

By repeating seismic surveys (with similar parameters)
After several years of production, we **can monitor fluid
behaviour through time** and help plan new development wells.

AND NOW **5D Seismic Interpolation**:

has become an integral part of 3D seismic data processing workflow ; very popular method for reconstructing missing seismic data pockets before imaging and amplitude variation; could serve to decrease acquisition costs



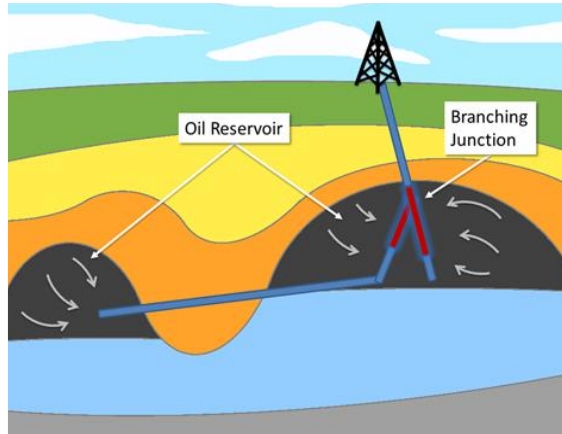
EXAMPLE -2

SUB-SURFACE DEVELOPMENT AND WELL MONITORING

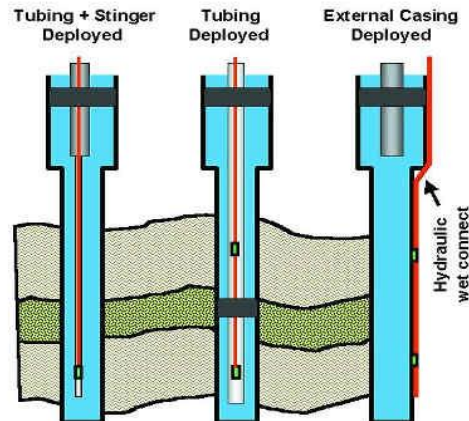


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Horizontal/multi-lateral wells enable access larger sections of reservoir and good drainage



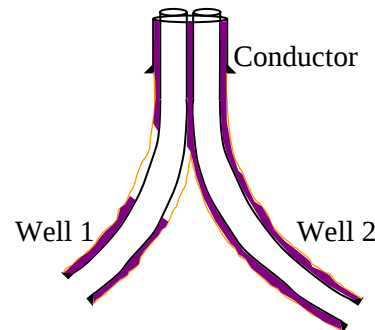
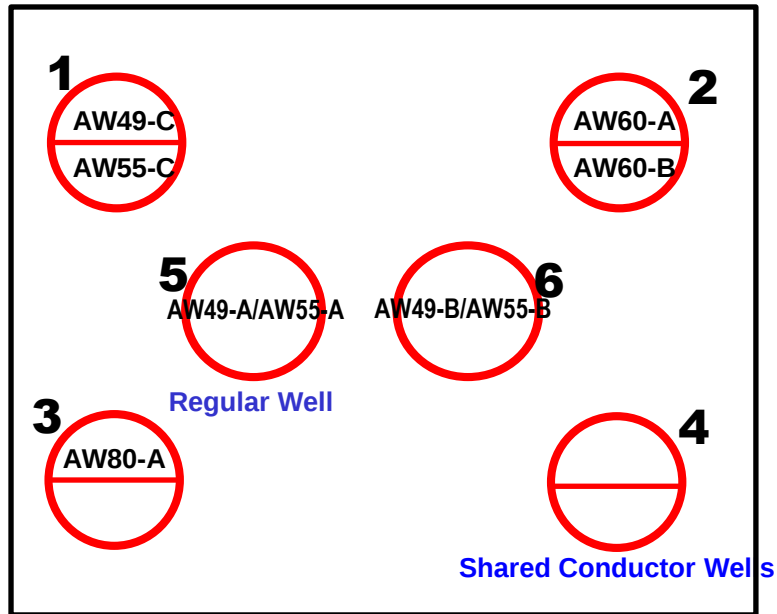
Fibre optics for low cost, efficient well & reservoir monitoring system for pressure, temperature, flow rates, 4-D seismic



Efficient & Intelligent completion system for high production rates and robust lifecycle well maintenance



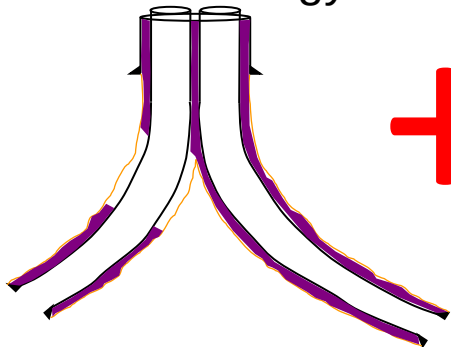
EXAMPLE -3: SPLITTER WELLHEAD TECHNOLOGY



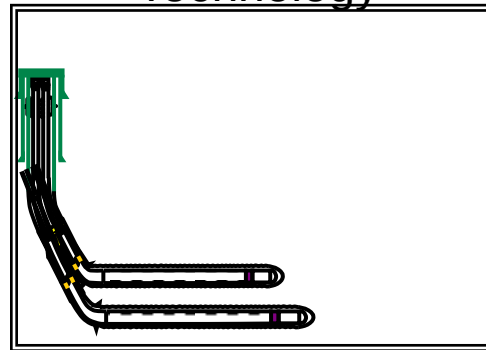
PROJECT CAPEX REDUCTION;

- Reduced number and size of platforms for field development
- Batch drilling
- Minimum Surface Infrastructure
- Reduced rig moves
- Minimal environmental Impact
- Lowest possible Unit Well Cost

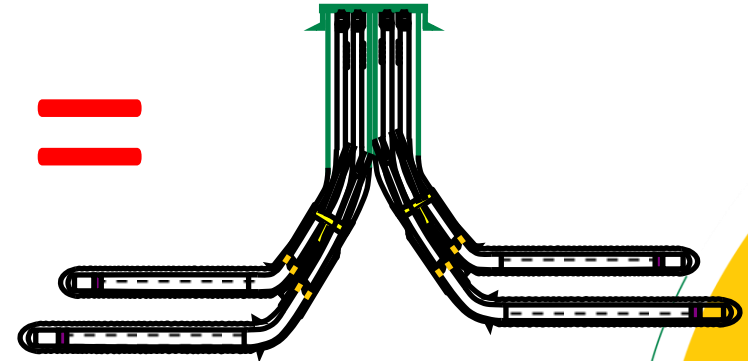
Splitter Wells Technology



Multilateral Well Technology



The Future
4-in-1



EXAMPLE -4A:

DEVELOPMENT OPTIONS FOR SHALLOW OFFSHORE



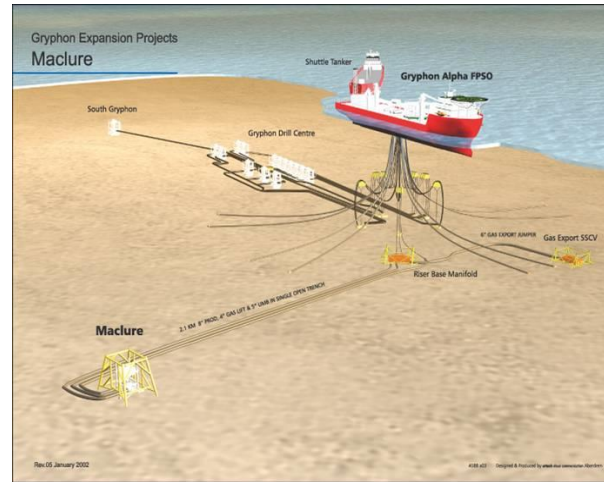
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CONVENTIONAL SHALLOW OFFSHORE DEVELOPMENT



- From design to First Oil : 5-7 yrs
- Highly Capital intensive
- Larger Footprint Required
- Project Schedule is Fabrication & Installation intensive, likelihood of Slippage (4 years delivery timeline)
- Requires heavy lifting during load-out and installation (Special Purpose Crane Barge)
- Weather window sensitive
- High Personnel manning level required
- High Operating Cost

SUBSEA COMPLETION WITH PURPOSE BUILT FPSO



- From Design to First Oil 6-9 yrs
- Highest Capital intensive
- Highest Field Operating Cost
- Build and delivery will take more than 4 - 5 years with potential for schedule slippage
- Complex Engineering and Maintenance
- Sophisticated High Cost Field Services Supply Chain

LIGHT WEIGHT MINIMUM FOOTPRINT DRY TREE DEVELOPMENT USING LEASED FPSO



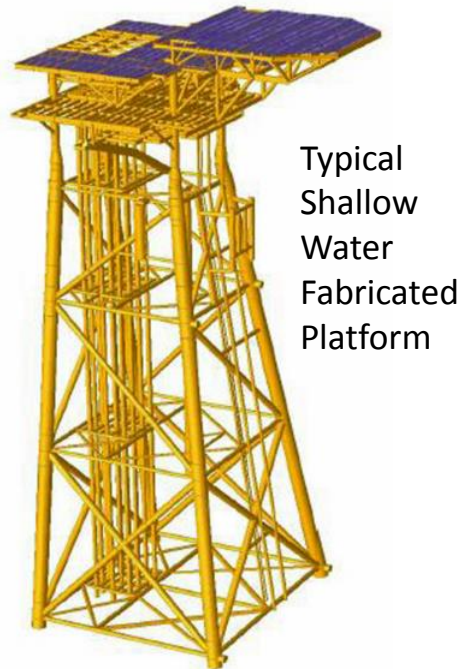
- From design to First Oil 1-3 yrs
- Lowest Capital requirement
- Conductor Supported Platforms - Simple design, Box frame on drilling conductors,
- Installation by RIG or SEWOP
- Low Cost Field Services Supply Chain.
- Production Well Intervention by SEWOP
- Execution schedule to First Oil is 15 mths
- Leased FPSO's readily available in the market

EXAMPLE - 4B:

SHALLOW WATER WELL HEAD PLATFORM – CSP CONCEPT



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Typical
Shallow
Water
Fabricated
Platform

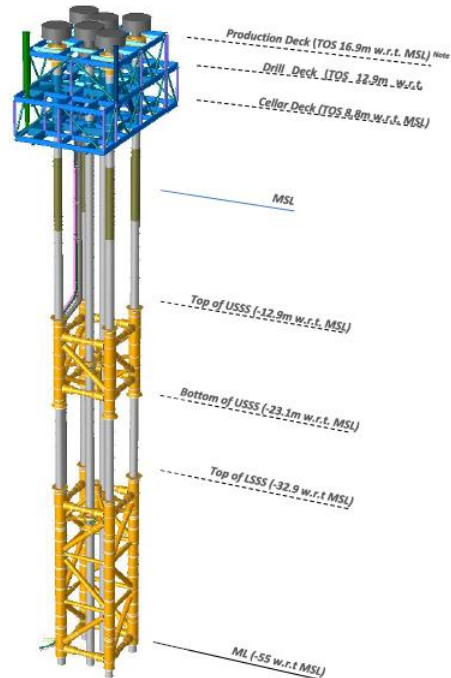
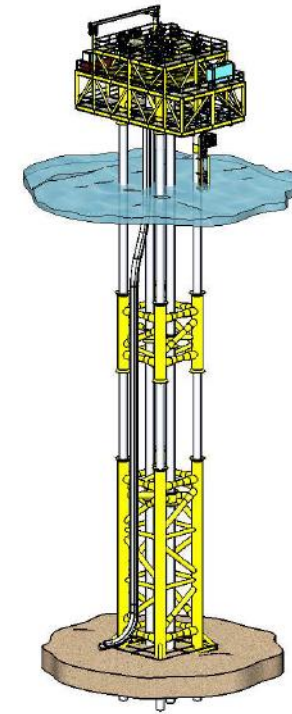
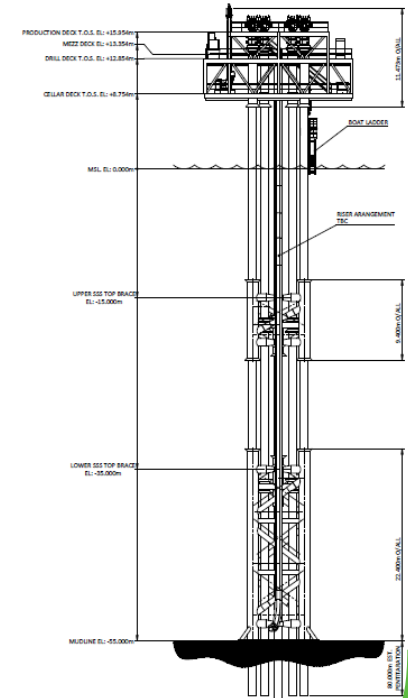


FIGURE 4-4 – ISOMETRIC VIEW OF THE GLOBAL STRUCTURE (INCLUDING



ISOMETRIC VIEW
SCALE 1:300



- **Water Depth 50 m, Jacket about 70 m's tall**
- **One Structure, ~1000 mt**
- **Bespoke design for every water depth**
- **Bespoke Topside Design to fit the Jacket**
- **Topside > 250 mt**
- **From Design to Delivery each 36-60 months**
- **Special Lifting Equipment**

- **Design 1 topside, 2 braces, the Legs are Scalable (Ready in 12months)**
- **Applicable from Shallowest to 75-90 m WD**
- **The Legs are Piled ,**
- **Topside and Brace are “Light Lifts”**
- **Installation with Drilling Rig or SEWOP in 2weeks**

EXAMPLE – 5A

OFFSHORE GAS PLANT – WEIGHT, EFFICIENCY, COST



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**Gas Plant with TEG Unit,
Gas 250 mmscfd,
Condensate 10,000 bopd
TEG Unit ~1700 MT
Total Gas Plant ~4100 Mt
Fully Manned Operations
Topside Weight 5000 MT**

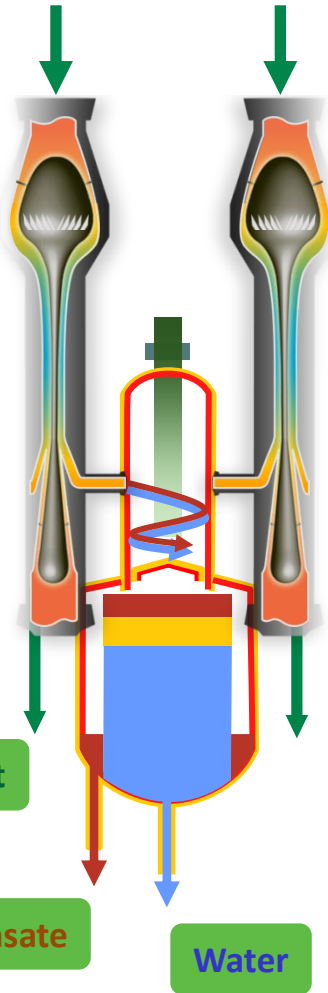
EXAMPLE 5B

OFFSHORE GAS PLANT – TWISTER TECHNOLOGY “SIMPLICITY”



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Raw Gas In



Dry Gas Out

Condensate

Water

Twister Technology



This Unit has 6 tubes of 20 makes 120 mmscfd

Benefits;

- Flexible, Modular Design,
- Minimum Footprint
- Simple to install,
- Light Lift @ 82 Mt
- No Rotating Parts
- Extreme High Uptime >99%
- Min Life Cycle Maintenance
- Twister No Chemicals
- Fully Remote Operations

A 250 mmscfd Gas Plant with Twister as Core, Topside ~2500 Mt



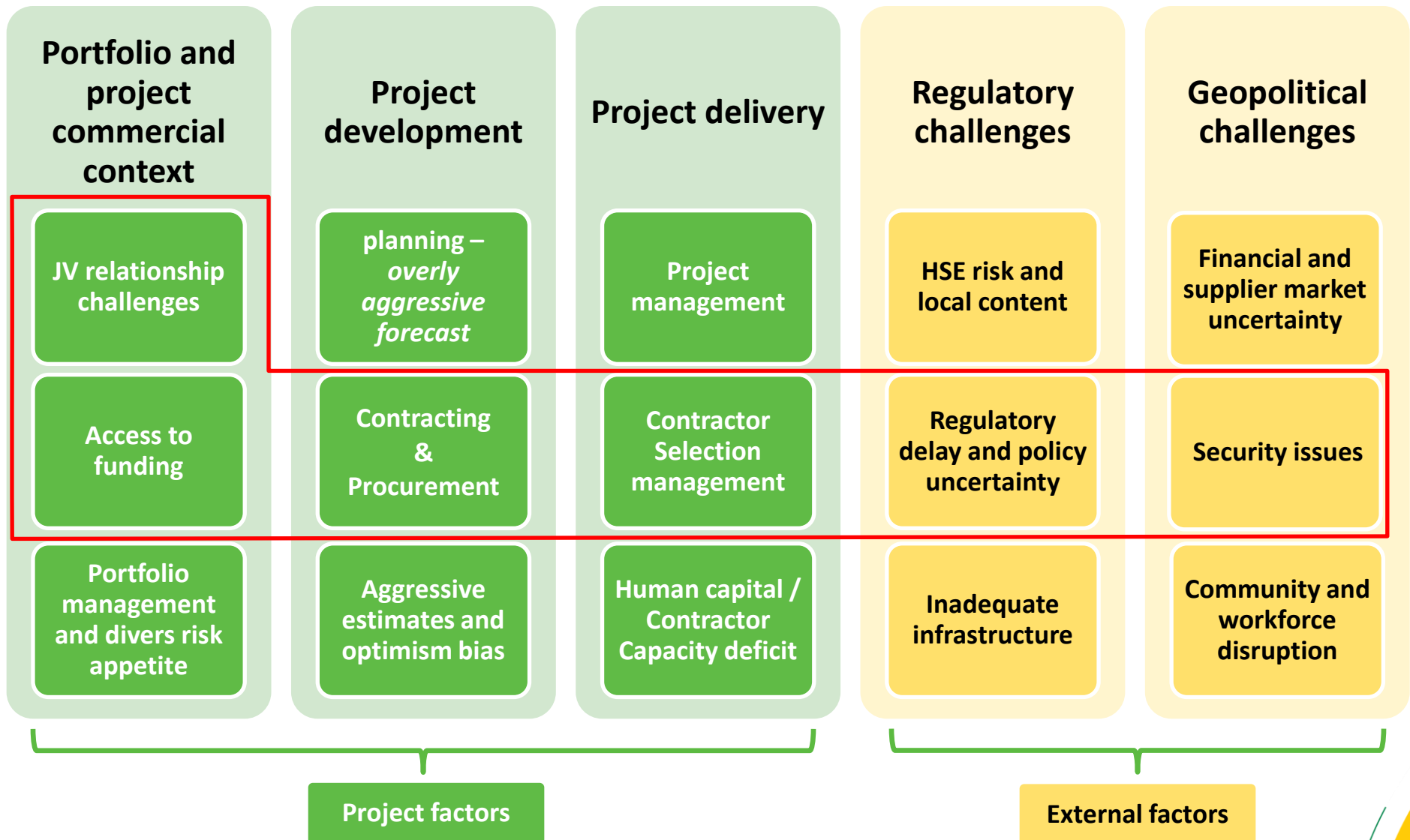
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FOCUS SOLUTIONS For NIGERIA

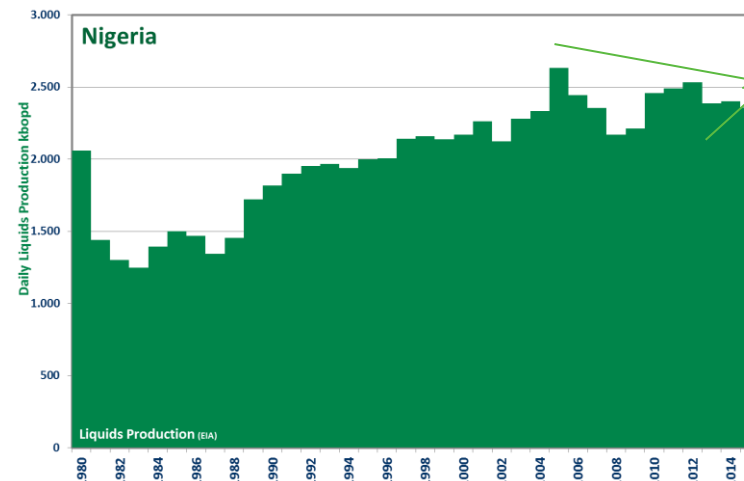
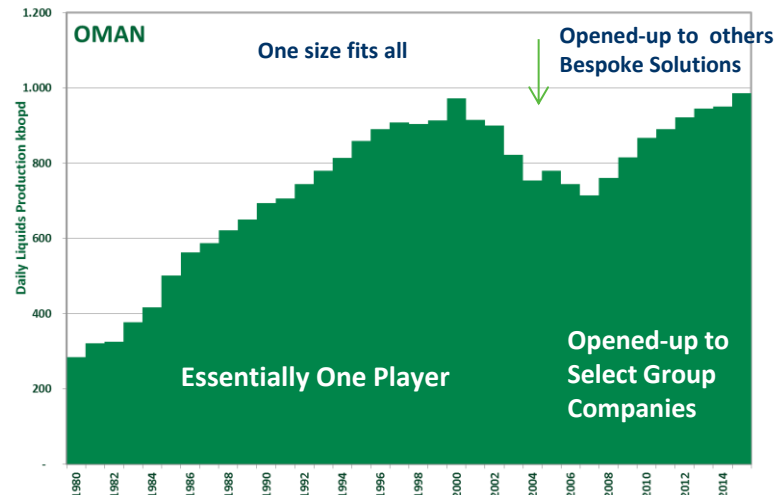
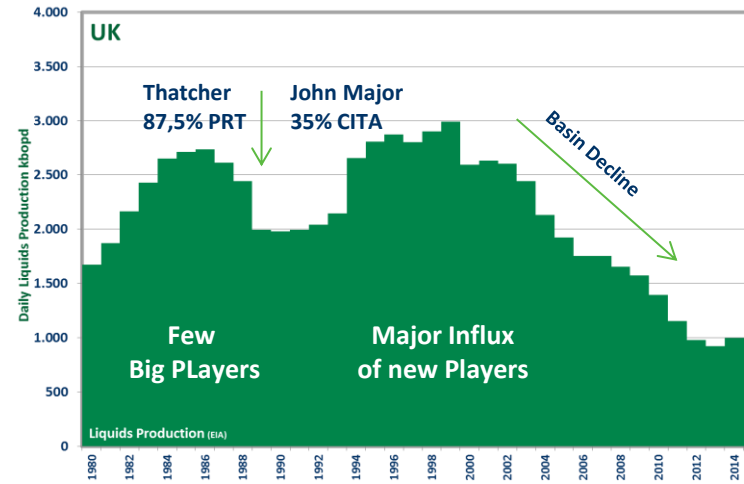
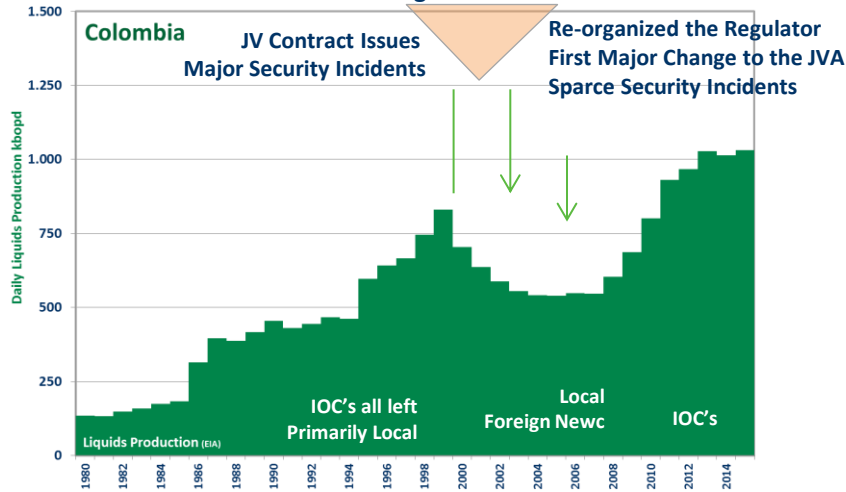


KEY AREAS WHERE SOLUTIONS ARE NEEDED



DIFFERENT ISSUES, DIFF. SOLUTIONS – SAME RESULT

Government & Industry Dialogue & Action Plan



**NIGERIA U/S
needs urgent
turn-around
to deliver
3MMBBLs/D**

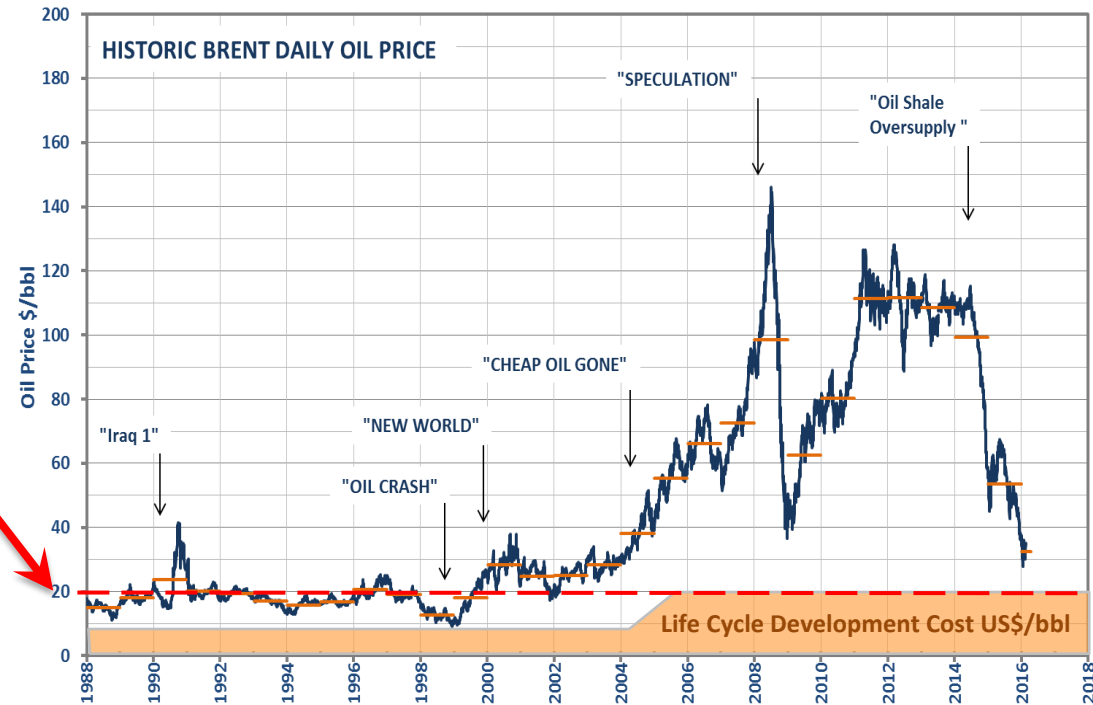
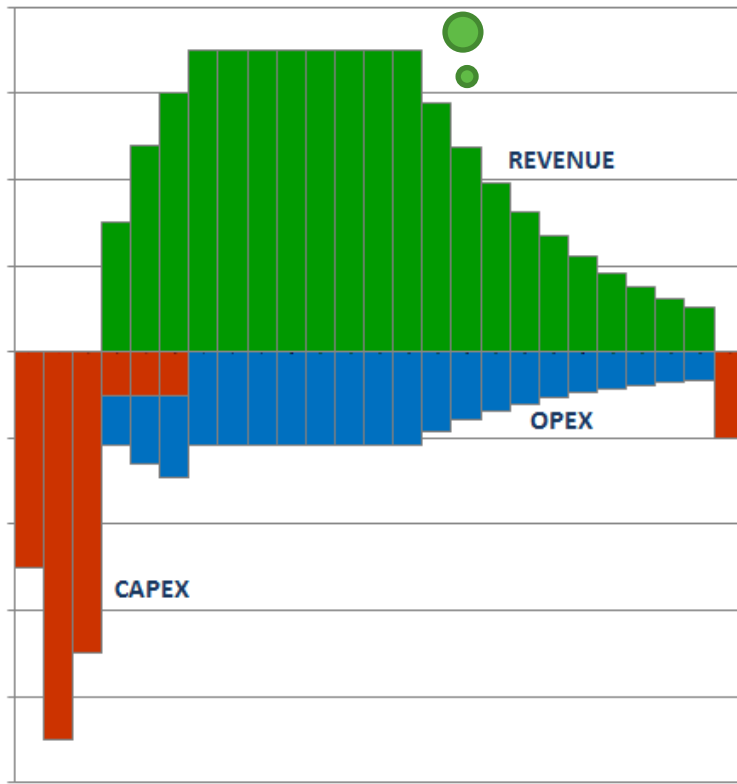
- MORE RIGS & FDPS
- Open to more credible players - Good Mix of IOCs and Strong Local Indigenous Coys
- JV Partnership that enables Funding & Improved Performance
- C&P process in line with top global practices
- Enabling environment

DON'T FORGET THE UTC BENCHMARK



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HOWEVER YOU DO IT,
MAKE SURE YOUR UTC IS
< US\$20/bbl





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Thank You

