Oil 101
Perspectives from a Research Analyst
Energy Markets
James K. Wicklund
Managing Director, Research

Source: Atwood

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A Primer, an Overview and an Opinion

- Oilifield Services is analogous to the sellers of picks and shovels during the gold rush.
- It was best to have the best claim.
- It was second best to sell everyone else their “ticket” to paradise.

The presentation will focus on the last two parts -
- Overview
- Company Specific Detail
- Investing in the Industry
- Current Trends
Oilfield Services: Industry Segments

Oil Service companies aid independent exploration and production companies (E&Ps), international oil companies (IOCs) and national oil companies (NOCs) in the exploration and production of oil and natural gas. Some of the largest Oil Service companies are SLB, HAL, BHI, and WFT.

The Industry is made up of several segments/life cycle categories. We list them by stage of a new oil & gas field:

1) Exploration/Seismic
2) Drilling
3) Completion
4) Production

2013 Western Service company total revenues: $392bn
OFS - Exploration: Seismic

Seismic services and equipment include:

- **Data Acquisition** - collection of seismic data
- **Data Processing** - third party processing of seismic data prior to interpretation
- **Library Sales** - *multiclient* sales of non-exclusive seismic data
- **Software** - software products for seismic processing, interpretation, mapping, reservoir modeling and characterization, petrophysical evaluation, and engineering analysis that can run on workstations or PCs
- **Geophysical Equipment** - data recorders, telemetry systems, geophones/hydrophones, energy sources (vibratory vehicles, air guns, etc.) used in data acquisition.

Source: Spears & Associates, BP Energy, Baker Hughes
**Wireline logging** includes both open and cased hole services.

- **Open hole logging** occurs during the drilling process and measures characteristics of the rock and the fluids contained therein.

- **Cased hole logging** refers to measurements taken in a well after a casing or liner has been set in the well. It is often applied in old wells to help operators determine what to do next (e.g. where to drill a side track well).

**Types of Log Measurements:**
- Electrical properties – resistivity and conductivity
- Neutron density (porosity)
- Pressure testing
- Sonic properties
- Dimensional measurements
- Formation fluid sampling
- Spectroscopy (lithography)

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Source: Spears & Associates, Schlumberger, American Association of Petroleum Geologists
**OFS – Contract Drilling: Land Rigs**

*Land Rigs* can be mechanical or electric and vary in terms of drilling depth and horsepower. They are used for onshore oil and gas drilling. Key equipment includes:

- **Derrick** – A structure used for lifting and positioning the drilling string and piping above the well bore and containing machinery for turning the drill bit.

- **Top drive** – A device suspended in the derrick that rotates the *drill pipe* in order to drill the well.

- **Draw works** – A steel spool device that is used to reel out and reel in the drilling line.

- **Blow Out Preventer (BOP)** – A large valve used to seal off a well being drilled or worked over at the surface to prevent the escape of pressure.

*Source: Schlumberger*
Drill bits come in two main categories: Roller-cone and fixed cutter (PDC). Technology advancement has led to steady share gains by PDC bits and is moving the market to buy on a $/ft drilled basis (i.e. a “rental” model).

—Roller cone bits have teeth typically made of milled steel or tungsten-carbon inserts mounted on three roller cone assemblies. They are best used in hard and medium strength formations.

—Fixed cutter bits usually use Polycrystalline Compact Diamond (PDC) inserts mounted on the body of the bit. Fixed cutter bits are often custom engineered for specific formation characteristics. PDC bits have typically been used for soft formations, but advancing technology now puts them in hard, abrasive rock.

Source: Spears & Associates
OFS – Drilling: Fluid System

The *drilling fluid, also known as drilling mud*, is one of the major factors in the success or failure of the drilling operation. Drilling fluid serves three functions:

- Lifts cuttings to the surface
- Cools the drill bit
- Supports the integrity of the wellbore and prevents hydrocarbon “kicks” by providing weight/pressure that is generally greater than that of the reservoir (known as an “over-balanced” condition).

The *fluids handling system* re-circulates the drilling mud and includes:

- Mud pump
- Mud mixer
- Shale shaker - to remove cuttings from the subsurface
- Mud pit – to collect used mud for recirculation
Directional drilling entails drilling in a direction other than vertical. There are two methods:

- **Conventional** uses a bend near the bit and a steerable mud motor. Drilling fluid is pumped through the mud motor, turning the bit and thereby allowing it to drill in the direction the bit points (unlike conventional [vertical] drilling, the drill string does not rotate).

- **Rotary Steerable Tools (RST)** allow the driller to “point” or “push” the bit without stopping drill pipe rotation, allowing for faster and smoother hole construction.

Drilling directionally entails use of steering systems (**Measurement While Drilling** or **MWD**) and **Logging While Drilling** or **FEWD** or **LWD**. LWD measurements are generally similar to those taken in wireline logging.

Source: www.horizontaldrilling.org, Halliburton
Completing the well is the process of accessing the reservoir including:

- Installation of casing and liner. *Casing* is large diameter steel pipe that is cemented into the well bore to ensure stability of the formation.
- Perforating the casing to access the reservoir. A series of “chargers” are deployed to where the well accesses the reservoir.
- *Stimulation* (see next page)

Other key products include:

- *Packers and plugs* to isolate zones
- *Screens* to keep sands away from production
- *Isolation valves* to manage flows from multiple completion zones

Source: Schlumberger, Halliburton
**OFS – Completion: Pressure Pumping**

*Pressure pumping* consists primarily of cementing and various forms of production stimulation.

— **Cementing of Casing** (approx 20% of P.P revenue)
  - As described in the completions section, casing is cemented in place in the well bore. Cement is pumped thru the casing to the end of the section and forced back up the well in the annulus (between outer wall and well) where it sets and hardens.

— **Stimulation** (80%) – Services include *hydraulic fracturing* (dominant), *acidizing* and *nitrogen injection*.
  - In fracturing, fluid is pumped at high pressures into the well bore to create/widen fractures in the formation so oil/gas can flow into the well. 
    - *Proppants* are used to keep fractures open and can be sand, resin-coated sand, and/or ceramic.
  - In acidizing, acids can be used to etch away...
OFS – Hydraulic Fracturing Equipment

*Treating Iron:* temporary surface piping, valves and manifolds required to bring fluid treatment down to wellbore from the pump. FMC Technologies’ (FTI) Weco™ and Chiksan™ and Forum Energy Technologies (FET).

*Frac Pump:* a high pressure, high volume pump used in hydraulic fracturing.

- Manufacturers include independents such as National Oilwell Varco (NOV), Gardner Denver (private), Weir SPM (WEIR.LN), Kirby Corp. (KEX) and vertically integrated providers such as Halliburton (HAL) and FTS International (private).

*Fluid End* Expected Lifespan: Ranges from 500 to 1,400 hours.

*Power End* Expected Lifespan: Up to 2 years.

*Engine*

*Cooling System*

*Transmission*

*Treating Iron*
2013 Pressure Pumping Market Share

Source: Credit Suisse estimates, company data, and Spears & Associates
## North America Hydraulic Horsepower Supply

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Source: Credit Suisse estimates, company data, and Spears & Associates
North America Hydraulic Horsepower Demand

17.5mm HHP in North America

Effective Capacity (85% of “boiler-plate”) is 14.8mm HHP

Implied Utilization is ~91%

~9% excess capacity

Pumping market tends to see pricing increases around 6.5% excess capacity

Spot market pricing increases seen in the Permian

Longer term contractual pricing just beginning

Source: Credit Suisse estimates, company data, and Spears & Associates
OFS – Production: Subsea

A **Christmas tree** is a set of valves that sit on top of the wellhead and control the flow of pressure of a producing well.

- **Surface trees** are installed on land and on offshore platforms.
- **Subsea trees** are installed on the sea bed.

**Manifolds** house equipment and pipes that control, direct and measure the flow of fluids to/from the subsea well.

**Umbilicals** are used for the control of subsea production systems. Umbilicals are made of either steel or thermoplastic tubes that contain fluid conduits for hydraulic power and chemical injection.

Source: FMC Technologies, Oceaneering International, Umbilical Manufacturers’ Federation
OFS – Subsea Equipment

Source: Company data and Quest Offshore
Offshore production infrastructure includes:

- **Fixed Platforms** consist of a jacket driven into the seabed with a deck; water depths up to 1,500ft.
- **Compliant Towers** can sustain significant lateral deflections; water depths 1,000-2,000ft.
- **Tension Leg Platforms** float but connected to the sea floor by vertical tendons; water depths up to 4,000 ft.
- **SPAR Platforms** have a large single vertical cylinder supporting a deck; water depths beyond 4,000 ft.
- **Floating Production Systems** are semi-submersibles anchored by wire rope and chain, or dynamically positioned; water depths beyond 4,000 ft.
- **Floating Production, Storage & Offloading Systems (FPSO)** are large tanker vessels moored to the seafloor; process and stow production from subsea wells and offload to a small tanker; suited for remote deepwater areas with no pipeline infrastructure; water depths beyond 4,000 ft.
OFS – Production: Artificial Lift

Artificial Lift is a technology for mature oil and gas wells that need to boost fluids out of the wellbore, particularly as they produce water. 90% of existing producing oil wells and gas wells requiring water removal utilize some type of artificial lift. Main types of artificial lift include:

- **Reciprocating rod pumps** – a plunger and valve assembly driven by surface motor (low tech)
- **Electric Submersible Pumps (ESPs)** – typically several centrifugal pump stages to access different wellbore sections driven by a downhole electric motor (highest tech)
- **Progressive Cavity Pumps (PCPs)** – a surface motor rotates the sucker rods using a stator and rotor to cause fluid to flow upward

Source: Spears & Associates, Weatherford, Independent Oil & Gas Service, Schlumberger
Artificial Lift has gained recent attention due to a global increase field decline. 95% of active oil wells utilize some type of artificial lift.

- **M&A, 2013** – **GE** bought Lufkin Industries, a primarily rod-lift oriented company, for $3.3B, or ~13.5x EBITDA. Although rod lift is lower tech, it is the favored technology for low flow wells. **WFT** sold its Russian ESP business for 8.5x EBITDA

- **Baker Hughes FLEXPump™** – In 2Q13 BHI announced its FLEXPump™ series, an ESP that can operate in low-flow wells similar to rod lift.

**Rod Lift Market Share**

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<th>Company</th>
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<tr>
<td>WFT</td>
<td>34%</td>
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<td>DOV</td>
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<tr>
<td>GE</td>
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<tr>
<td>Other</td>
<td>22%</td>
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**ESP Market Share**

- **BHI, 30%**
- **SLB, 32%**
- **Borets, 15%**
- **GE, 12%**
- **Others, 11%**
- **Other, 22%**

**Artificial Lift Spending by Type**

- **ESP** 54%
- **RRP** 25%
- **PCP** 7%
- **GL** 4%
- **PL** 3%
- **HL** 2%
- **Other** 5%

**Lift Type by Well**

- **Plunger Wells** 62%
- **PCP Wells** 15%
- **ESP Wells** 12%
- **Rod Lift Wells** 4%
- **Other / Natural Flowing Wells** 8%

Source: Spears & Associates and Credit Suisse

Source: Spears & Associates, Weatherford, Independent Oil & Gas Service, Schlumberger
OFS – Production: Compression

*Compression* raises the pressure of natural gas in the reservoir so that it will flow into pipelines and other facilities. There are three segments to the field compression market:

- Wellhead
- Gas gathering (production tank – vapor recovery)
- Processing

Compressors have historically been owned and operated by oil companies, but the U.S. is now approximately 1/3 outsourced to contract compression providers.

Source: TETRA Technologies (Compressco), Ariel
Unconventional Compression Services – Vapor Recovery

Used primarily in connection with oil and gas liquids production

- Vapor recovery captures gas vapors from oil storage tanks
- Casing gas systems enhance oil production by reducing down-hole pressure

Source: TETRA Technologies (Compressco)
**OFS – Production: Well Servicing**

*Well Servicing* refers to the maintenance procedures that take place on a well after the well has been completed and production from the reservoir has begun. It is done to sustain and enhance the productivity of the well. Key products/services include:

- **Workover** – the process of performing major maintenance or remedial treatment on a well (KEG and BAS).

- **Coiled tubing** – tubing used for the placement of fluids or manipulation of tools during workover (BHI, SLB, SPN, and KEG)

- **Snubbing** – the process of putting drill pipe into the wellbore when the BOPs are closed and pressure is contained in the well

- **Plug and Abandonment** – the process of preparing a well to be permanently closed

*Source: Schlumberger, MTG*
OFS – Offshore Drilling: Offshore Rigs by Type

- **Floaters**: A floating mobile offshore drilling unit that operates in midwater (MW), deepwater (DW) and ultra-deepwater (UDW).
- Floaters were constructed in Generations with each successive Gen adding new technology/capabilities
  - **Semisubmersibles** float on pontoons and are moored to the ocean floor or dynamically positioned (good for development drilling)
  - **Drillships** are independently mobile (do not need towing vessels) and are generally dynamically positioned (good for exploration)
- **Jackup**: A mobile offshore drilling unit that operates in shallow water and rests on the ocean floor when drilling.
  - **High Spec** Jackups are capable of drilling High Pressure, High Temp (HPHT) Wells (predominately in NW Europe and MENA)
OFS – Offshore Drilling: Offshore Rigs by Water Depth

- **Shallow Water (0-999’)**: Dominated by Jackup rigs and occasionally semis (harsh environments).
  - New Jackup construction is focused in the 350-400’ range.

- **Midwater (1,000-4,999’)**: Typically carried out by early generation semis or harsh environment semis in NW Europe.
  - Very few (11) midwater rigs have been ordered in the last 5 years

- **Deepwater/UDW (5,000’+)**: The deepwater and especially the UDW requires newer gen semis and drillships
  - The newest deepwater rigs are being ordered with dual BOPs and dual activity drilling capabilities with water depth ratings up to 12,000’

Source: Noble, Rowan, Atwood
OFS – Offshore Drilling: Rigs by Geography - Jackups

- **Middle East and Asia/Pac** are the largest jackup markets (50% of market).

  - Not All Jackups Are Created Equal - The North Sea is predominantly a premium market.
OFS – Offshore Drilling: Rigs by Geography - Floaters

- **The Golden Triangle (Brazil, US GoM and WAFA) are the largest basins for deepwater floaters**
**OFS – Offshore Drilling: Offshore Logistics**

*Helicopters* are used for transporting personnel between onshore bases and offshore platforms, drilling rigs, and installations. Operators include BRS, ERA and HELI.

*Lift Boats* are self-propelled, self-elevating vessels with a relatively large, open deck for carrying equipment in support of offshore exploration and production, and which can serve as a platform from which maintenance and construction work can be conducted. Operators include CKH and HERO.

*Supply Boats* are ships specifically designed to transport goods (i.e. drilling mud, cement, diesel fuel, chemicals, water, tools) and personnel to and from offshore oil rigs/platforms. Operators include TDW, HOS, GLF and CKH.
**OFS – Production: Offshore Construction**

*Pipelay vessels* use either the *S-lay* method in water depths <2K ft where pipe is laid into the water horizontally and bends twice in an S-shape, or the *J-lay* method in deep water where pipe is laid vertically and only bends once as it hits the seabed.

*Derrick barges* have cranes used to lift heavy structures such as platforms/topsides.

*Diving support vessels (DSVs)* support divers performing inspection, maintenance, repair (IMR) and welding. *Surface diving* can be performed in depths up to 200 ft; *saturation diving* can be performed in 200-1,000 ft depths.

*Offshore Support Vessels (OSVs)* are equipped with *Remotely Operated Vehicles (ROVs)*, tethered underwater robots used for IMR, construction and drill support in deep water.

Source: CalDive, Oceaneering
### OFS: Life Cycle Exposure and Selected Co’s

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<th>Examples of OFS Co’s</th>
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<td><strong>PRODUCTION</strong></td>
<td>Workover Rigs</td>
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<td><strong>Logistics Support</strong></td>
<td>Supply Boats</td>
<td>TDW, CKH, GLF, HOS</td>
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<td>Coiled Tubing</td>
<td>SLB, HAL, BHI, SPN</td>
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<td>ROV Services</td>
<td>OII, HLX</td>
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<td>Helicopter</td>
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<td><strong>Capital Equip.</strong></td>
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<td>Rig Equipment</td>
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<td>Seismic Equipment</td>
<td>IO, CGG</td>
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<td>Production Unit Equip.</td>
<td>NOV, OIS</td>
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<td>Engineering/Design</td>
<td>TEC.FP, SUBC.NO, SPM.IM</td>
<td><strong>Development</strong></td>
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<td>Installation</td>
<td>HLX, TEC.FP</td>
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<td>Umbilicals</td>
<td>OII, TEC.FP</td>
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<td>Risers/Flowlines</td>
<td>GE, DRQ</td>
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OFS: Diversified Service Segmentation

Geographic Revenue Segmentation

Diversified Service Revenue by Region (2013)

Diversified Service Revenue by Country (2013)

Source: Spears & Associates, Company data, Credit Suisse estimates
OFS: Market Shares for Key Services/Products

2013 Revenues
Artificial Lift = $13.2B
Coiled Tubing = $5.4B
Directional Drilling = $14.6B
Drill Bits = $5.1B

Source: Spears & Associates
OFS: Market Shares for Key Services/Products

2013 Revenues
- Completion Equipment & Services = $13.1B
- Downhole Tools = $3.7B
- Pressure Pumping = $34.5B
- Rig Equipment = $18.3B
- Subsea Equipment = $17.5B
- Wireline = $13.9B

Source: Spears & Associates
OFS: Market Shares for Equipment/Infrastructure

- **Offshore Contract Drilling**
  - RIG: 36%
  - ESV: 19%
  - SDRL: 19%
  - NE: 15%
  - DO: 11%

- **Land Contract Drilling**
  - PTEN: 14%
  - NBR: 27%
  - Ensign: 14%
  - Eurasia: 20%
  - HP: 25%

- **Supply Vessels**
  - Bourbon: 29%
  - HOS: 10%
  - CKH: 15%
  - Maersk: 18%
  - TDW: 28%

- **Well Servicing**
  - KEG: 36%
  - NBR: 28%
  - BAS: 11%
  - EPS: 12%
  - Eurasia: 15%
  - SPN: 10%

- **Petroleum Aviation**
  - BRS: 37%
  - Pet1 Hel: 12%
  - Era Avi: 13%
  - HELI: 43%
  - Pet2 Hel: 13%

**2013 Revenues**
- Offshore Contract Drilling = $54.5B
- Land Contract Drilling = $29.5B
- Supply Vessels = $8.0B
- Well Servicing = $6.4B
- Petroleum Aviation = $4.9B

Source: Spears & Associates
OFS – Offshore Drilling: Fleet Profiles

- **RIG** is the largest floater operator in the world with a mix of new and old generation floaters.
  - **SDRL, PACD, and ORIG** have premium UDW fleets.
  - **ESV and NE** have the largest JUs fleet – premium and standard rigs.
- **Stacking/Scraping** We expect older gen rigs to be idled and removed from the fleet.

Source: IHS Petrodata
OFS – Offshore Drilling: Supply Boats by Region
North America generally leads in a resumption in upstream spending because more of the activity is conducted by smaller (and therefore more nimble) operators (E&P companies). With shorter time horizons, generally, the North American operators are also the first to curtail spending in a downturn.
Production related services are the most resilient and the earliest to “revive”, but traditionally have the lowest Beta. Secular challenges related to hydrocarbon production have sustained higher-than-expected growth in the latest upcycle.

With more confidence in sustained higher commodity prices, drilling and completion related activity responds. Exploration is generally the last to strengthen and the first to fall in a downturn in oil prices.
**OFS – Offshore Drilling: Dayrates**

- **Dayrates and utilization** are key drivers of driller earnings power.

**Worldwide Floater Dayrate/Utilization**

- MW Dayrate
- DW Dayrate
- MW Util
- DW Util

**Worldwide Jackup Dayrate/Utilization**

- Dayrate
- Utilization

Source: IHS Petrodata
OFS – Offshore Drilling: Dayrates

- Dayrates Matter, But Sentiment More Important

Indexed Growth of Deepwater Dayrates and Driller Stocks

*Driller Basket includes NE, ESV, RIG, DO and ATW

Source: IHS Petrodata, Credit Suisse Estimates
OFS – Offshore Drilling: Shareholder Returns

• Dividends Matter – But Payout of Cash Flow Matters More

Indicated Yield on 2015 Dividend

Payout of Estimated 2015 OCF

Source: Company Data, Credit Suisse Estimates
OFS: Traditional Valuation Methodologies

- **Services** – as an earnings momentum group, we believe shares have generally been valued on forward year P/E and to a lesser extent forward EV/EBITDA. During trough periods, P/E or EV/EBITDA is applied to normalized or “mid-cycle” earnings estimates.

- **Equipment** – the backlog visibility, which can extend out as far as three years, lends itself to DCF. However, forward earnings metrics are also used.

- **Drillers** – with high asset intensity associated with owning the rigs, and different depreciation methods used by the companies, the industry tends to use forward year P/CF (EV/EBITDA). In the recent upcycle, backlog visibility lends itself to DCF. In troughs, replacement value metrics are also used.
OFS: Indicators

- **Leading Indicators**
  - *Seismic* – Licensing rounds, Oil company exploration budgets, Sustained higher commodity prices
  - *Drilling and Completion* – Oil company spending budgets (generally set early in the calendar year, although they are revised intra-year), Permitting activity

- **Coincident Indicators**
  - *Oil and natural gas prices*
  - *Earnings*. As a traditionally earnings momentum-driven group, quarterly earnings matter.
  - *Pricing (day rates for drillers)*. Contract drilling shares are generally highly correlated with the trajectory of day rates.
  - *Rig count*. North American rig counts are updated weekly (sources include Baker Hughes, M-I) or bi-weekly (The Land Rig Newsletter). Non-North American rig counts are updated monthly
Current Oilfield Service Trends
Technology Is King

- The larger OFS companies with better technology will continue to win share
- Technology creates value through a simple formula:

\[
\frac{\text{Efficiency}}{\text{More Production}} = \text{Cost per BOE}
\]

Source: Halliburton Investor Day 2013 Presentation
“Managed Shale” Will Revolutionize OFS in the Next Five Years

Managed Shale is a term used to describe a business model in which an OFS company takes over all aspects of development, Integrated Project Management (IPM), in return for a pre-determined fee or a profit-sharing agreement. We expect to see accelerated adoption of Managed Shale among National Oil Companies (NOCs) and in mature fields. The results:

– **Higher Returns for OFS and the Asset Owner** – lower costs and higher production will grow returns

– **Higher Margins for OFS** – less competition because fewer players can compete in this market and increase in risk leads to better reward

– **Diversified OFS Companies Reap the Rewards** – The large, diversified OFS companies with a full product service line offering are suited for these projects

60% of NOC’s production is declining at 8% p.a. which creates an opportunity for OFS companies to deploy their newest technologies to boost production.
# Efficiencies: Wells Count Up, Costs Down

## Summary
- Wells/Section up +220%
- Costs per well up < 5%
- Resource Potential up +256%

## Analysis

<table>
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<tr>
<th>Wells/Section (Unit)</th>
<th>April 2010</th>
<th>Feb 2012</th>
<th>Feb 2013</th>
<th>Feb 2014</th>
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<tr>
<td>Spacing Acres/Well</td>
<td>130 Acres</td>
<td>65 Acres</td>
<td>40-65 Acres</td>
<td>≈40 Acres</td>
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<td>Est. Reserves/Well, NAR</td>
<td>320 MBoe</td>
<td>450 MBoe</td>
<td>400 MBoe</td>
<td>450 MBoe</td>
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<td>Est. Reserves/640 Acres</td>
<td>1.6 MMBoe</td>
<td>4.5 MMBoe</td>
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<td>CWC/Well</td>
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<td>$6 MM</td>
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<td>Direct ATROR*/Well</td>
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<td>130%</td>
<td>100%</td>
<td>100%+</td>
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<td>NPV10/640 Acres</td>
<td>$23 MM</td>
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<td>2.2 BnBoe</td>
<td>3.2 BnBoe</td>
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Source: EOG Resources
Rising Costs for Majors Leads to Increase Focus on Returns

- Significant cost escalations since 2010
  - Key areas of cost increases:
    - Subsea equipment
    - Subsea installation and repair
    - Maintenance and labor

- BP’s notion of “Value over Volume”
  - Focused on returns
  - Separating their Lower 48 onshore O&G business in the U.S.

Source: ExxonMobil and BP plc
Upstream Capex Growth Slowing/Flatting; Shifting Onshore

CVX’s capital & exploratory (C&E) budget up +8.5% Y-o-Y

2014 Upstream C&E: $35.8

Anadarko’s ’14 capex is +12% YoY to $8.1-$8.5bn but 60% is going onshore vs. offshore
Majors focused on liquids-rich plays

- IOC's & Majors searching for “better wells”
- Near-term focus is on high-margin liquids production (onshore)
- ExxonMobil’s (XOM) focused on the Bakken, Woodford Ardmore/Marietta and the Permian; rig count from 30 or so up towards 45-70 rigs
- Chevron’s (CVX) Permian rig count to 50 from 25; adding in Duvernay over time too
  - “Small capital projects have high rates of return” (Chevron’s ‘13 Security Analyst Meeting presentation)

Source: Exxon Mobil Investor Day 2014 Presentation
OFS – Offshore Drilling: Lots of Rigs Delivering

- 2013-2015 record years for floater deliveries (2014 peak ~25 deliveries)
- 2014-2016 record year for jackup deliveries (2015 peak ~60 deliveries)

Source: IHS Petrodata, Company data, Credit Suisse estimates
OFS – Offshore Drilling: And Not Enough CAPEX

- Rig Rental Capex Growth of ~15% in 2012/2013 Kept Demand Tight
- Slowing CAPEX Growth 5-10% has lead to Floater Supply Outstripping Demand
- Ten major IOCs/NOCs make up ~70% of Rig Rental CAPEX

Source: IHS Petrodata, Company data, Credit Suisse estimates
OFS – Offshore Drilling: Rig Specs Matter

- Dual BOP and Dual Activity Drilling Are Gaining Momentum

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<tr>
<th></th>
<th>RDC</th>
<th>ATW</th>
<th>ORIG</th>
<th>DO</th>
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<td>8</td>
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</table>

Source: IHS Petrodata, Company data, Credit Suisse estimates
OFS – Offshore Drilling: Jackups Could Be Next

- Strong Jackup Demand Has Kept the Pricing Firm With Dayrates Up YTD

- A Pause in Jackup Demand (lower commodity prices) Should Negatively Impact Pricing

Source: IHS Petrodata, Company data, Credit Suisse estimates
OFS – Offshore Drilling: Jackup Opportunities

- Opportunities Worldwide for Jackup Backlog to Grow – Think NOCs
- Aramco average duration grew 60% in 2013

- High Utilization in Norway (HS Jackup) Has Pushed Dayrates Up Sharply ~50%
- Minimal Contract renewals in Norway should keep upward pressure on rates

Source: IHS Petrodata, Company data, Credit Suisse estimates
Disclosures
Companies Mentioned (Price as of 27 Mar-2014)
Atwood Oceanics, Inc. (ATW.N, $49.56)
Baker Hughes Inc. (BHI.N, $63.6)
Cameron International Corp. (CAM.N, $61.1)
Diamond Offshore Drilling, Inc (DO.N, $47.09)
Enrco Plc. (ENV.N, $92.57)
FMC Technologies, Inc. (FTI.N, $51.71)
Frank's International (FTI, $24.86)
GulfMark Offshore (GLF.N, $44.12)
Halliburton (HAL.N, $58.09)
Helmerich & Payne, Inc. (HPN.N, $105.88)
Hercules Offshore (HERO.OQ, $4.59)
Hi-Crush Partners, LP (HCP.N, $35.43)
Horizon Offshore (HOI.N, $39.48)
Nabors Industries, Ltd. (NBR.N, $24.43)
Norameet Offshore (NOV.N, $76.93)
 Noble Corporation (ME.N, $12.03)
Ocean Rig UK Offshore Co., Ltd (ORIG.L, $17.51)
Oceanseas Inct, Ltd. (OEX.N, $70.69)
Oil States International (OST.N, $95.94)
Pacific Drilling (PACD.N, $10.79)
Patterson-UTI Energy, Inc. (PTEN.OQ, $30.18)
Precision Drilling Corporation (PDN.N, $11.67)
Rowan Companies (RDC.N, $33.09)
SEACOR Holdings (SEAC.O, $65.53)
Schlumberger (SLB.N, $96.49)
Seaspan Corp. (SSP.N, $34.38)
Superior Energy Services, Inc. (SEP.N, $29.35)
Terra Technologies, Inc. (TTI.N, $12.2)
Tidewater (TDW.N, $48.25)
Transocean Inc. (RIG.N, $230.36)
Weatherford International, Inc. (WFT.N, $16.98)

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Underperform/Sell* | 14% | (45% banking clients)
Restricted | 2% | (50% banking clients)

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