Senate TAPS Throughput Committee

Alaska Hydrocarbons Fiscal Systems

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Part 1:
Oil & Gas Company Decision Making: Capital Allocation, Budget, and Long-Range Planning

Points to Address: Discussion of Company Behaviors and Decision Making

• Key considerations for companies in making investment decisions, including decisions on whether to develop particular resources in the near term or postpone development
• Key metrics including ROCE, NPV, IRR, consideration of asset metrics versus portfolio metrics, and differences between integrated vs non-integrated companies
Annual Planning Cycle

Oil and gas companies follow a standardized process linking the annual Budget cycle to the Long Range Plan and corporate Strategy.

- **Q1: Strategy Review and Update**
  - Annual strategy review, basin positioning, operating environment
  - Long range plan update

- **Q2: Planning Approval, Execution Research**
  - Board Approval
  - Special projects analysis, new business lines, research stemming from strategy review

- **Q3: Budget Preparation**
  - Corporate input to key planning variables; Business Units prepare capital & operating budgets
  - Update 5-year plan

- **Q4: Budget Approval**
  - Budget roll-up and Corporate approval
  - Board approval of budget
  - Allocation of investment capital to approved projects
Strategy, Planning and Positioning

Future of the World: Planning Scenarios

- Global Economic Performance
- Energy Supply/Demand Balances
- Geopolitical Considerations

Atlantic Basins:
- US GOM
- Brazil
- Alaska North Slope
- UK North Sea
- Shale Gas Plays
- Other Basins: Africa, Asia

Above Ground Operating Environment

Market Outlook and New Source Activity

Competitor Landscape in Target Segments

IOC Targets, Objectives, and Filters

Strategic Options:
- Robust across scenarios
- Consistent with Objectives and Filters

External Planning Environment: Identifying key uncertainties and forcing factors that will impact company Strategy and Long Run Planning

Preferred Operating Regions and Basins

Above ground risk, Potential “No Go” Geography

Blockers, Enablers, Gaps, Logjams; Determine materiality “Size of the Prize”

Identify Filters for Option Selection
Annual Planning Cycle

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- Annual Planning Cycle
Planning Cycle and Capital Allocation

Corporate Input: Common Assumptions on External Environment

Gulf of Mexico Business Unit

UK North Sea Business Unit

Alaska North Slope Business Unit

Eagle Ford Shale Gas Business Unit

Angola Deepwater Business Unit

Long-Range Plan, 5-year Plan, Budget

Long-Range Plan, 5-year Plan, Budget

Long-Range Plan, 5-Year Plan, Budget

Long-Range Plan, 5-Year Plan, Budget

Long-Range Plan, 5-Year Plan, Budget

Corporate Roll Up: Discretionary and Non-Discretionary Capex

Board Approval, Capital Allocation, Project Approval, Program Execution
Annual Planning Cycle

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Q1: Strategy Review and Update
- Strategy Review and Update

Q4: Budget Approval
- Budget Approval

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- Budget Preparation

Q2: Planning Approval, Execution Research
- Planning Approval, Execution Research
Attracting Capital: The Project Approval Process

- Materiality, total capex exposure, full-cycle economics/metrics, are all considerations in determining whether an IOC will position, or continue to invest, in a particular asset or basin.
- Each project is disaggregated into “discrete investment decisions”, in the form of Project Approval Requests (PARs), creating a natural stage-gate for capital approval and allocation.
  - A PAR can extend beyond a single fiscal year budget, depending on scope of the work program.
  - Each PAR has one or a series of associated Approval for Expenditure (AFE) documents for a specific activity or capex element.
  - Sum of AFEs for a calendar year = capital Budget
- Each stage-gate creates an opportunity for Management/Board to determine whether to continue, amend, suspend, or exit/divest

Asset Modelling and Decision Process: Materiality and Total Capex Exposure

- Request for capital budget allocation; decision to continue, amend, suspend, or divest
Business Control Architecture:
PAR => AFE => Budget

Year One:
- AFE - Ex
- AFE - App
- AFE - Entry
- Budget Y1

Year Two:
- AFE - Ex
- AFE - App
- AFE - Entry
- Budget Y2

Year Three:
- AFE - App
- AFE - Dev
- AFE - Ex
- Budget Y3

Year Four:
- AFE - App
- AFE - Dev
- AFE - Ex
- Budget Y4

Year Five:
- AFE - Dev
- AFE - Ex
- Budget Y5

Year Six:
- AFE - Dev
- AFE - Ex
- Budget Y6
Question: On what basis does an E&P company allocate investment capital to opportunities?

• There are a core set of metrics that allow comparison of projects and investments within a given basin/area, and across the portfolio of available investment opportunities.

• For example, an enhanced recovery project in Alaska will compete for capital against:
  – Capex investments in Alaska;
  – Enhanced recovery projects elsewhere in the portfolio;
  – Capex investments elsewhere in the portfolio.

• Capital programs must also compete against debt repayment, share buyback, and dividend policies.
Upstream Financial Metrics: Measuring Performance

- **Growth** .. Ability to manage the “top line”
  - CAGR in Production and Reserves relative to target
  - Quality of growth .. Where, how, consistent or not (room to run)
  - Plowback Rate. .. Showing relative growth intentions between different regions

- **Profitability** .. Ability to manage the “bottom line”
  - Upstream Cash Flows
  - Upstream Net Income
  - Upstream Production Costs

- **Efficiency** .. Ability to manage capital
  - Upstream ROCE
  - Finding costs, F&D costs, Replacement Costs

- **Cash Flow** .. Ability to manage investment/re-investment in the portfolio
  - Financial Strategy (debt targets, debt/capital ratio, dividend requirements)
  - Self-financing nature of portfolio (free cash flow versus capex: regional and global)

- **Risk** .. Ability to manage a diversified portfolio
  - Financial Risk: Debt-to-Capital ratio, financial flexibility
  - New Source Risk: Thinner margin barrels dominating new source volumes
Project Selection and Decision Metrics

Energy companies employ a variety of Benchmarks or Metrics to rank investment opportunities and to allocate financial capital. Some of the more common include:

- **Pay-out period**: length of time required to recoup financial capital being placed at risk. Simplest selection metric, important to firms with scarce capital resources. No reference to project value after pay-out.

- **Internal Rate of Return**: discount rate at which PV of costs = PV of revenues.

- **Net Present Value**: PV of costs less PV of revenue flows (using discount rate reflecting cost of capital, cost of borrowing, or other);
  - \( \text{NPV/boe} \): measure of investment efficiency
  - \( \text{NPV/Investment (or PVPI)} \): assessment of return to the investment dollar.

- **Recycle Ratio**: Profit per boe divided by F&D cost per boe. A measure of project or corporate profitability (target >1).

- **Discounted and Undiscounted Net Cash Flow Profiles**: measure of availability of free cash flow for follow on or alternative investments.

- **Maximum Negative Cash Flow Exposure**: useful in situations where access to financial capital is an issue. Measures the maximum exposure being committed to by the firm.

- **Net Booked Reserves**: contribution of the projects to corporate value (based on bookable reserves, amongst other measures).

- **Capex/boe**: cost per barrel of production capacity. Burdens the projects by the cost of infrastructure, facilities, etc. Tends to favor less complex, more mature capex alternatives.
Project Metrics: Net Present Value

- **Net Present Value (NPV):** The estimated value of a project when all future net cash flows are discounted to the present at an appropriate rate (the “discount factor”).
- NPV > 0 => project is expected to deliver a return greater than the cost of development, including a return on capital invested (accounted for in the discount factor).
- Advantages:
  - Time value at corporate rate included
  - Can be calculated exactly
  - Can accommodate risk through discounting of costs and/or revenue flows
  - Useful for valuing projects
  - Discount factor reflects corporate preference for *opportunity cost of investment capital* (e.g., market interest rate, cost of equity capital, weighted average cost of capital (debt and equity))
- Disadvantages:
  - Difficult to rank projects. Significantly different capital and expenditure profiles can deliver the same NPV, due to the effect of discounting.
    - E.g., very large cash flows in a future time period can have the same “present value” as small cash flows in forward years. This may not, however, have the same impact and value for the company treasury
Project Decision Variables: Internal Rate of Return

- **Internal Rate of Return (IRR):** The discount rate that equates all future cash inflows to outflows at a point in time (usually the present).

- **Advantages:**
  - Easy to understand.
  - Incorporates time value.
  - Can be compared to a required minimum (or hurdle rate).
  - Independent of magnitude of cash flows.

- **Disadvantages:**
  - Multiple rates of return are possible in cases of material cash flow volatility (e.g., large positive and negative swings over project life); uncomfortable for decision makers looking for unique decision criteria.
  - Doesn’t measure absolute worth of the project.
  - Not useful for single project analysis.
  - Implicit assumption that interim cash flow is invested at calculated IRR (issue for high return projects) => overstates the true project value.
Capital Allocation: IRR Hurdle Rate

- Eligible projects ranked by IRR:
  - “Eligibility” normally a function of a number of discrete project metrics within each PAR
  - Examples:
    - NPV10 > 0
    - PVPI > 1.3
    - Payback < 3 years
  - NOTE: These metrics will change over the project cycle, as risks are addressed and estimates become more certain (e.g., 60:40 to 80:20)

- Corporate establishes a “hurdle” IRR number. Projects with IRR’s in excess of the hurdle rate attract budget capital, while those below the hurdle rate are not funded

IRR Hurdle at $60/b
Capital Allocation: IRR Hurdle Rate

• Issues with IRR Hurdle Rate:
  – Increase in free cash flow (due to, say, rise in energy prices) => increased capital budget => lower Hurdle rate in order to undertake additional projects => reduce overall portfolio quality and lower efficiency of capital employed.
  – Evidenced in cycles of value destruction within the industry
    – E&P companies will create capital scarcity by increasing share buyback programs, paying down debt, and/or increasing dividends
  – Gaming the system: Project managers have an incentive to overstate the “size of the prize” or understate costs, in order to attract investment capital to proposed projects
  – IRR ranking does not speak to materiality => equivalent IRR’s can have substantially different capex and revenue profiles
**Return on Capital Employed**:  
- ROCE = \(\frac{[(\text{Net profit before interest and taxes})]}{(\text{Gross Capital employed})]\times 100\)  
- Where:  
  - Gross capital employed = Fixed assets + Investments + Current assets  
  - Gross capital employed = Share Capital + General & Capital Reserves + Long term loans  
  - (+) Correlation with production, commodity prices  
  - (-) Correlation with upstream spending  
- Indicates how well management has used the investment made by owners and creditors into the business.  
- The higher the return on capital employed, the more efficient the firm is in using its funds. Over time, ROCE reveals whether the profitability of the company is improving or eroding.

**Global Players Average Upstream ROCE**: 20.4%  
**Tier I Independents Average Upstream ROCE**: 11.4%
• Issues with ROCE:
  – Major capital project investments increase the denominator in advance of revenue (profit) impacts in the numerator => penalizes the IOC for major capital investment undertakings
    ▪ Explains in part why it is unusual to find companies with high ROCE and high growth metrics
  – Once commissioned, the scale of major capital project investments tend to deliver superior ROCE performance => bias toward large asset portfolios
    ▪ Exception is deepwater developments, where high, short plateaus and steep production declines can result in highly volatile ROCE outcomes
  – Depreciation creates bias in favor of mature portfolio: More mature the asset base, the lower the denominator (capital exposed) and the higher the ROCE (all else being equal)
Questions & Discussion
Part 2:
Global Strategy & Portfolio Overview of Major Alaska Producers
- BP
- ConocoPhillips
- ExxonMobil

Points to Address: Discussion of Portfolio Composition and Growth/Capex Focus
- Where are these companies looking to grow. Which plays and basins are attracting investment capex
- What is the position and role of Alaska within these portfolios
BP: Company Overview

**Strategic Signature**

- Global integrated company; production in 23 countries, upstream operations in an additional 6 countries.
- 2011 worldwide production of ~3,400 mboe/d, making it the second largest company in the peer group (after ExxonMobil with ~4,513 mboe/d).
  - The Russia & Central Asia (RCA) and North America regions = ~55% of 2011 production.
- Post-Macondo portfolio rationalization program (~$28 bn in asset sales and ~$17 bn in GOM production allocation to Macondo fund) completed in 2013. The result is a pared down and more focused geographic portfolio.
- Executing on a 3-pronged growth strategy:
  - **Deepwater Basins**: US GOM, Angola, Egypt, Brazil
  - **Global Gas**: US, Trinidad & Tobago, North Sea
  - **Giant Oil Fields**: Alaska, Iraq, others.
- Committed ~$20 bn net investment to 16 projects sanctioned over 2010-2011. Will curb ROCE performance for the coming 2-3 years.
- Sale of TNK-BP (~$22 bn proceeds) => ~1 mmboe/d production decline in 2013 from 2012. BP will be hard pressed to outperform its peers on any key metrics.

**Company Overview**

- **HQ**: London
- **Employees**: 83,400
- **2011 Reserves**: 17,750 mmboe
- **2011 Production**: 3,400 mboe/d
- **3 Yr Production Growth**: -3.53% CAGR (2009-2011)

**Technological Competence**

<table>
<thead>
<tr>
<th>EOR &amp; Recovery</th>
<th>Offshore</th>
<th>Heavy Oil</th>
<th>Unconventionals</th>
<th>Oil Sands</th>
<th>LNG</th>
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**Partnership History**

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<tr>
<th>Date</th>
<th>Partner</th>
<th>Region (or Country)</th>
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<td>2007</td>
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<td>Sunrise Oil Sands</td>
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<td>2008</td>
<td>Chesapeake</td>
<td>US</td>
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<tr>
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<td>CNPC</td>
<td>Iraq</td>
<td>Rumaila TSA</td>
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<tr>
<td>2011</td>
<td>Reliance</td>
<td>India</td>
<td>Offshore Gas</td>
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### BP: Global Areas of Upstream Operations

<table>
<thead>
<tr>
<th>Designation</th>
<th>Country</th>
<th>2011 Total (mboe/d)</th>
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<tr>
<td><strong>Core</strong></td>
<td>United States</td>
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<tr>
<td></td>
<td>Trinidad &amp; Tobago</td>
<td>397</td>
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<td></td>
<td>United Arab Emir..</td>
<td>216</td>
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<td></td>
<td>Angola</td>
<td>123</td>
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<td><strong>Exit/Potential Exit</strong></td>
<td>Russia</td>
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<td></td>
<td>Argentina</td>
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<td></td>
<td>Venezuela</td>
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<td><strong>Focus</strong></td>
<td>Egypt</td>
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<td>Azerbaijan</td>
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<td><strong>Harvest</strong></td>
<td>United Kingdom</td>
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<td></td>
<td>Libya</td>
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<td></td>
<td>Namibia</td>
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<td></td>
<td>Uruguay</td>
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Legend:
- Core
- Exit/Potential Exit
- Focus
- Harvest
- New Venture
Total Portfolio Evolution:
BP vis-à-vis the Competition


In 2011, BP was the second largest producer of the peer group. BP and COP are the only two companies forecast to deliver production declines over the 2010-2015 period.

2001-2011: Production increases from ~3,080 mboe/d to ~3,400 mboe/d due to addition of Russia (~960 mboe/d), Trinidad & Tobago (~250 mboe/d) and Angola (~170 mboe/d). This expansion offsets declines from Europe (-660 mboe/d and North America -350 mboe/d), and portfolio divestitures.

2012-2016: BP was forecast to show modest production gains over the period. The sale of its stake in TNK-BP lowers this outlook by ~1 mmboe/d, a volume that would be offset (with improved upside) should the 19.74% equity positioning in Rosneft be concluded.
BP: Regional Trajectories

Asia-Pacific: ~246 mboe/d in 2011, centered on LNG feedstock. Expanding deepwater exploration acreage and a growing exposure to CBM. Reliance partnership in India offshore coinciding with divestiture of Pakistan and Vietnam portfolios.


Latin America: ~561 mboe/d in 2011 (~34% of global gas volumes). Sale of assets in Colombia, reduced exposure in Venezuela (sold to TNK-BP); shift in regional strategy to South Atlantic deepwater exploration and development (Brazil, Uruguay).

Middle East & North Africa: ~410 mboe/d in 2011, a decade high. Large development portfolio (Iraq, Oman, Egypt deepwater) challenged by above ground issues.

North America: ~764 mboe/d in 2011, 2nd largest production region, focused on Deepwater GOM. Sale of conventional oil and gas assets in Onshore L48, growing focus on shale gas and oil sands development (first oil from the in-situ (SAGD) Sunrise project expected in 2014).

Russia & Central Asia: ~1,099 mboe/d in 2011; dominated by TNK-BP in Russia (divested 2013). Leave Azerbaijan as the sole source of medium-term volume growth.

Sub-Saharan Africa: ~123 mboe/d in 2011, sourced from Angola deepwater. New source volumes from a suite of multi-field deepwater development projects. Positioned to test the pre-salt analog in the Kwanza basin in Angola and further south in Namibia.
### Alaska Designation

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<th>Activity</th>
<th>PFC Energy Assessment</th>
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| Harvest Area | • Asset concentration on the **North Slope**, where production volumes have generally declined because of the maturity of the asset base and/or gas infrastructure constraints. Liquid production has declined from ~224 mboe/d in 2006 to ~153 mboe/d in 2011, while gas production has fallen from ~67 mmcf/d to ~22 mmcf/d over the same period.  
• BP’s largest source of production is the **Greater Prudhoe Area** (26% w.i., operated), covering ~150,000 acres with more than 1,000 active wells. Gas resources are currently stranded. BP and ConocoPhillips withdrew the 4 bcf/d **Denali** pipeline proposal (Prudhoe Bay => western Canada => US markets) in May 2011, citing the lack of long-term purchase contracts.  
• In March 2012 ExxonMobil, ConocoPhillips and BP settled litigation with the Alaskan government over the development of Point Thomson gas reserves, publicly announcing their interest in gas commercialization and export opportunities from Alaska.  
• BP and partners are moving forward with the development of gas liquids on the ~8 tcf **Point Thomson** field (32% w.i., non-operator). The gas cycling project is expected to produce ~10 mb/d of liquids; first production is targeted for 2014. Full field development awaits gas transport infrastructure.  
• In the **Beaufort Sea**, BP has suspended work on the extended-reach drilling program on the **Liberty** oil field (100% w.i.), pending revision of project design and schedule.  
• BP is also seeking to develop viscous (**Kuparuk**) and heavy (**Milne**) oil resources on the North Slope. | Current production volumes are modest and declining. Significant potential lies in the long-term commercialization of Prudhoe Bay and Point Thomson gas resources. Cancellation of the Denali gas pipeline proposal leaves BP as a potential supplier to an alternative pipeline/LNG export option, should one be approved and developed. |
PFC-Identified Challenges

- **Bring a close to the portfolio rationalization process:** With ~$16 bn in upstream asset divestitures announced since June 2010 and another $17 bn in royalty over-rides redirected to the Deepwater Horizon Oil Spill Reparation Fund, BP indicated in 2Q:2012 a further ~$12 bn in total portfolio asset sales before end-2013 – excluding the net ~$22 bn from the TNK-BP sale. The portfolio repositioning represents an exchange of secure production and proved reserves for higher-risk, less certain, but potentially more material future growth opportunities (Krishna-Godavari basin offshore India, Kwanza pre-salt analog offshore Angola, Equatorial Margin analog offshore northern Brazil). Both analysts and shareholders are looking for a clearer read of where this repositioned portfolio will lead BP over the coming years.

- **Secure a new Core Area:** With positioning in both Russia and the UAE in question, BP faces the prospect of a diminished number of Core areas capable of delivering material, sustained production and free cash flow. This places significant pressure on the transitioning of Focus areas into larger, stable Core operations in order to remain above the targeted 2.3 mmbpd production floor (ex-TNK-BP volumes). BP is betting heavily on the potential of nascent deepwater plays in the South Atlantic and Asia-Pacific – a strategy that will hinge on exploration success and performance of newly established and uncertain partnerships.

- **Execute the exit from TNK-BP JV and Repositioning in Russia:** Russia production tied to TNK-BP accounted for ~29% of BP’s global production in 2011 (and ~25% of total production since 2004), and the second largest source of free cash flow after the US. BP will look to secure a position in Russia’s emerging Arctic Resource play through equity positioning (19.74%) in Rosneft – a move with greater upside than TNK-BP, but markedly less control.

- **Develop deepwater partnership with Petrobras:** Having secured Brazil government approval for its acquisition of the Devon asset portfolio (potentially the largest operated pre-salt portfolio outside Petrobras), BP has moved to deepen its ties with the Brazil NOC, farming into Petrobras operated licenses in the pre-salt analog basin areas offshore Angola and Namibia. Subsequent partnering in the Brazil Equatorial Margin suggests a budding deepwater strategic alliance between the two premier deepwater developers, with the prospects of substantial, long term rewards.

  - **Accelerate development of US Onshore unconventional gas resource:** BP received a very competitive price for the Permian Basin and Western Canada conventional gas assets sold to Apache (totaling ~75 mboe/d of production and ~340 mmbboe of reserves, equivalent to ~$24.60/boe of reserves in the ground or ~$109,000/flowing boe of production). This is particularly so given what is shaping up to be an extended period of gas price weakness in the North America market. To make up for lost volumes, BP may look to accelerate production from its ~10 tcf of reserves in the Woodford, Fayetteville, Haynesville, and Eagle Ford shale gas plays.

  - **Accelerate development of BP’s oil sands leases:** BP has built up a material oil sands lease portfolio in Western Canada, including 50% w.i. in the Sunrise in situ development project (sanctioned in November 2010), a 75% w.i. in the Terre de Grace in situ project (secured in March 2010 from Value Creation for ~$900 mn), and 50% w.i. in the Kirby in situ oil sands leases (with the other 50% divested to Devon in March 2010). Full development of these projects could represent 500-600 mbo/d of stable, long-life oil production, complementing the “Giant Oil Fields” growth platform and providing a portfolio buffer against the steep decline production profiles associated with deepwater developments.
ConocoPhillips: Company Overview

**Strategic Signature**

- March 2010: new strategic pathway => ~$15 bn asset and joint venture divestment program, targeting:
  - Debt reduction;
  - Near-term shareholder returns;
  - Shift out of downstream; and
  - Growth from smaller, higher-value portfolio position.

- 2010-2012 Restructuring Plan:
  - ~$7 bn in asset sales
  - Divested i20% equity interest in LUKOIL
  - Proceeds to debt reduction and share repurchase.

- July 2011: Announces restructuring into two separate corporate entities, Downstream (Phillips 66) and a pure play, E&P company (ConocoPhillips).

- Net impact:
  - Production decline to ~1.5 mmboe/d in 2012, recovering to 1.64-1.69 mmboe/d by 2015.
  - Portfolio focus in OECD countries (US, Canada, Australia, UK, and Norway, which accounted for ~75% of worldwide production in 2011).

- Grow 0.5% per annum from 2012 through 2015 from Global Gas/LNG, SAGD Oil Sands, and Unconventional Resource developments.

**Company Overview**

- HQ: Houston, TX
- Employees: ~16,000
- 2011 Reserves: 8,387 mmboe
- 2011 Production: 1,610 mboe/d
- 3 Yr Production Growth: -30.68% CAGR (2008-2011)
- Jan 2013 Market Cap: $74 bn
- Jan 2013 P/E Ratio: 7.5
- 2011 Corp Revenue: $235 bn
- 2011 Upstream Capex: $13.5 bn

**Technological Competence**

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**Partnership History**

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<td>LNG</td>
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## ConocoPhillips: Global Areas of Upstream Operations

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<td>Poland</td>
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<tr>
<td><strong>Grand Total</strong></td>
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</table>
Total Portfolio Evolution: ConocoPhillips vis-à-vis the Competition

- The Tier I peer group is comprised of Independents with portfolios capable of delivering ~1 mmboe/d of production over the next 5-7 years.
- ConocoPhillips joined the Tier I peer group following its de-integration. Will see production continue to slide, before recovering to slightly above 2011 levels by 2016.
- Production increases over 2001-2011 driven by the merger of Conoco and Phillips in the beginning of the decade (growing volumes from 698 mboe/d in 2000 to 1,082 mboe/d in 2002); the Burlington Resources purchase in 2006 (growing volumes from 1,824 mboe/d in 2005 to 2,358 mboe/d in 2006); and the gradual acquisition of a 20% stake in LUKOIL later in the decade.
### ConocoPhillips: Regional Trajectories

**Asia-Pacific:** ~247 mboe/d in 2011. Core area of operations and future growth. Commissioning of APLNG will add long-term volumes, offsetting decline from conventional shallow water assets.

**Europe:** ~279 mboe/d in 2011. Mature asset portfolio with satellite field development slated to offset base declines and maintain free cash flows from this Harvest region.

**Latin America:** 0 mboe/d in 2011. Position secured through Burlington transaction. Not material to global operations.

**Middle East & North Africa:** ~106 mboe/d in 2011. Legacy oil positions in Libya and Algeria augmented by commissioning of Qatargas III LNG project => long-life, cash generating production to the region.

**North America:** ~903 mboe/d in 2011 (~56% of global volumes). New Ventures in Oil Sands, Unconventional Onshore resource plays, and GOM deepwater will provide regional growth.

**Russia & Central Asia:** ~29 mboe/d in 2011. Following sale of LUKOIL equity stake, production is sourced entirely from the Polar Lights and NMNG joint ventures in Russia. New Source volumes come from Kazakhstan’s Kashagan development.

**Sub-Saharan Africa:** ~45 mboe/d in 2011; sourced from legacy assets in Nigeria, which are likely to be divested by mid-2013.
ConocoPhillips in North America—Alaska

ConocoPhillips' Interests
- ConocoPhillips Operated
- ConocoPhillips Non-Operated

Chukchi Sea Area

Greater Prudhoe Point

Greater Kuparuk

Alpine

Alpine West

Greater Point McIntyre

Point Thomson

National Petroleum Reserve - Alaska

Alaska

Produced with PetroView®
<table>
<thead>
<tr>
<th>Alaska Designation</th>
<th>Activity</th>
<th>PFC Energy Assessment</th>
</tr>
</thead>
</table>
| Core Area          | • Legacy portfolio acquired from Arco Alaska in 2000; includes the Greater Prudhoe Area (largest production), Greater Prudhoe Bay Area, Greater Kuparuk Area, Western North Slope, and Cook Inlet Area.  
  • Production from the mature Alaska portfolio has been in slow decline since the late 1980s. In 2011, net production from Alaska averaged 215 mb/d of oil and 61 mmcf/d of gas, accounting for ~35% of US production.  
  • Activity in the ConocoPhillips-operated Greater Kuparuk Area (GKA), has recently focused on development of viscous oil resources. The GKA, located 40 miles west of Prudhoe Bay on the North Slope, includes the Kuparuk field and its satellites: West Sak, Tarn, Tabasco, Meltwater, and Palm. Heavy oil resources **West Sak** and **Ugnu** (52.2% w.i., operated) are potential projects currently in the appraisal phase. Expected gross peak production is ~23 mboe/d.  
  • While ConocoPhillips has three primary gas fields in the Alaska region—the North Cook Inlet, Beluga River, and Point Thomson—**Point Thomson** (5% w.i., non-operated) remains the only potential new source development. In 2010, development activities continued with the drilling of two appraisal wells. First production of gas liquids is anticipated in 2015-2016. Longer-term growth potential lies in commercialization of the gas reserves, which is in turn dependent on construction of a long-distance gas trunk line. | Alaska ‘s largest oil and gas producer. While continuing to target smaller projects within the GKA (West Sak and Ugnu) and NPR-A (Alpine West, Greater Moose’s Tooth unit and Fiord West), ConocoPhillips will ultimately need expanded access to Asia gas markets in order to reverse the downward production trend in Alaska. |
In the Western North Slope, ConocoPhillips faces regulatory challenges surrounding project development in the NPR-A region. In order to offset declines at the Alpine field (78% w.i., operated) and its three satellites, Nanuq, Fiord, and Qannik, ConocoPhillips is exploring development of additional satellite fields in the adjacent NPR-A, an area that requires distinct permit approval. Alpine West (or CD-5), a proposed Alpine satellite project, has been significantly delayed due to local opposition and regulatory barriers. Most recently, in early 2010, the U.S. Army Corps of Engineers denied a permit for a bridge that would provide access to the CD-5 site, a move that will further delay the project (originally planned for 2012) and several additional developments that would depend on the infrastructure. Other possible projects on the NPR-A include the Greater Moose’s Tooth unit and Fiord West, which are both in appraisal phases.

In 2010, ConocoPhillips and Statoil engaged in an asset swap wherein ConocoPhillips sold a 25% w.i. in 50 of its Chukchi Sea leases to Statoil in exchange for financial payment and a 50% w.i. interest in 16 Statoil-operated Gulf of Mexico leases, as well as Statoil’s 25% w.i. in five additional GOM leases already operated by ConocoPhillips. All of the involved GOM blocks are in the emerging Lower Tertiary play. ConocoPhillips plans to begin exploratory drilling on its Chukchi acreage in 2014.
Competing as a “Pure Play” E&P Company: Repositioned as the largest Independent E&P company by a considerable margin. In the near-term, COP is a smaller company with limited near-term production growth and improved, but unlikely to be leading, ROCE and financial performance.

- Has the company simply re-introduced its prior dilemma—too large to compete with the smaller International Independents on volume growth, and too small to compete effectively with the Global Players on efficiency metrics? Or can the company successfully deliver both volume and value/efficiency performance form its high-graded, down-sized asset portfolio?

Effectively Positioning in High Value Assets: Sale of low margin, non-core (and largely non-OECD) assets => loss of optionality and diversity within its portfolio that can act as a hedge against commodity cycles and changing market conditions over the long term. Targeting of low risk (OECD) and high margin assets (such as US unconventional oil plays) raises the risk of destroying value by overpaying for competitive assets.

Defining Operational Strengths: Strong partnerships => majority of growth will come from non-operated and/or JV related activity with specialized developers – FCCL JV with Cenovus in the Canadian Oil Sands; Australia Pacific LNG JV with Origin Energy; non-operated assets in the US GOM; Shell in the Malaysia deepwater. Also building considerable expertise in unconventional resource exploitation (both shale gas and tight oil) in the US Onshore.

- Successful leveraging to unconventional resource plays outside North America could deliver the differentiating competitive advantage and volume growth required for ConocoPhillips to compete effectively within the Independent E&P peer group over the long term.

Effectively Managing Base Production: Minimizing the decline in production from the company’s base portfolio—which has a high proportion of gas production exposed to continued weak North American gas prices—is essential for the company to deliver simultaneous production and margin growth.

Delivering Production Growth: Production has fallen by 30% since 2009 (2,286 mboe/d to 1,610 mboe/d in 2011). New source developments basically keep pace with mature asset declines in the MENA, Europe, and RCA regions => material net growth must come from North America and Asia Pacific. US Onshore unconventional liquids plays are currently projected to deliver ~22% of total worldwide new source volumes in 2021.
## ExxonMobil: Company Overview

### Strategic Signature

- Largest of the Global Players
  - ~4,513 mboe/d in 2011; production in 21 countries, with upstream operations in an additional 20 countries.
- Growth strategy based on scale, basin dominance, and execution excellence => continuously seek access to investment opportunities of adequate size and materiality.
- Move into unconventional resource plays was a default for ExxonMobil:
  1. Commissioning of the final elements of the company’s Qatar project portfolio in 2011
  2. Declining production from its Europe and Asia-Pacific portfolios
  3. Roadblocks to materiality in Brazil deepwater, Venezuela extra-heavy, and Equatorial Margin
  4. Already holding a considerable stake in the Canadian oil sands, ExxonMobil took an aggressive move into unconventional shale gas exploitation.
- 2009 acquisition of XTO Energy brings materiality to ExxonMobil’s technical expertise in tight gas, CBM, and shale oil and gas exploitation (~2.3 bcf/d and 87 mboe/d of production, proved reserves of ~2.3 bn boe, resource base of 7.5 bn boe).
- Leveraging XTO into a global unconventional portfolio.

### Company Overview

<table>
<thead>
<tr>
<th></th>
<th>ExxonMobil</th>
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<tbody>
<tr>
<td>HQ</td>
<td>Irving, Texas</td>
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<tr>
<td>Employees</td>
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<td>2011 Production</td>
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<td>3 Yr Production Growth</td>
<td>4.53% CAGR (2008-2011)</td>
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<td>January 2013 Market Cap</td>
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<td>January 2013 P/E Ratio</td>
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<td>2011 Corp Revenue</td>
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<td>2011 Upstream Capex</td>
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### Technological Competence

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### Partnership History

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<td>Rosneft</td>
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*ExxonMobil has a limited history of partnership, preferring instead to purchase and operate material positions independently*
ExxonMobil: Global Areas of Upstream Operations

<table>
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<tr>
<th>Designation</th>
<th>Country</th>
<th>2011 Total (mboe/d)</th>
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<td>Vietnam</td>
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<td>Grand Total</td>
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Total Portfolio Evolution: 
ExxonMobil vis-à-vis the Competition


Averaging ~4.5 mmboe/d in 2011, ExxonMobil continues to lead its peer group in terms of production.

**2001-2011:** Production oscillated through the decade, landing in 2009 at roughly the same level as 2001 (~4.0 mmboe/d), before rising 13% in 2010 (~6% excluding the XTO acquisition) to ~4.45 mmboe/d. The XTO acquisition marked a considerable departure from ExxonMobil’s longstanding organic growth strategy.

**2011-2016:** Modest volume growth, reaching ~4.69 mmboe/d in 2016. While PFC Energy estimates are lower than ExxonMobil targets, the absence of guidance regarding growth projects associated with the XTO portfolio makes the pace of future growth uncertain.
ExxonMobil: Regional Trajectories

**Asia-Pacific:** ~256 mboe/d in 2011. Focus on strengthening gas position in the region, to offset rapidly declining oil production base. Several MT/LT gas export projects including Gorgon and PNG LNG.

**Europe:** ~845 mboe/d in 2011. Mature asset decline and accelerating divestiture program have eroded region production from 1,393 mboe/d in 2001. New source volumes not expected to reverse this downward trend.

**Latin America:** ~8 mboe/d in 2011. Sole new source production is forecast from Argentina’s Neuquen Basin, where ExxonMobil is a relatively early entrant to the unconventional shale gas play.

**Middle East & North Africa:** ~1,277 mboe/d in 2011. Growth over the last decade driven by LNG projects in Qatar (stalled by ongoing moratorium on North Field development). Large legacy position in the UAE, a challenged upstream position in southern Iraq, and new exploration in Kurdistan.

**North America:** ~1,389 mboe/d in 2011. Expanded positioning in the US Onshore shale gas plays, material deepwater US GOM portfolio, development projects in the Canadian Oil Sands combine to deliver material production growth over the long term.

**Russia & Central Asia:** ~229 mboe/d in 2011. Growth from a small portfolio of large-scale assets, most of which face above ground challenges. Project execution on unsanctioned development queue remains critical.

**Sub-Saharan Africa:** ~509 mboe/d in 2011. A “treadmill” operation, with robust new source volumes centered in deepwater Nigeria and Angola keeping pace with field declines.
ExxonMobil in North America: Alaska

ExxonMobil's Interests

- ExxonMobil Operated
- ExxonMobil Non-Operated

Alaska

Greater Prudhoe
Greater Point McIntyre
Greater Kuparuk
Point Thomson

Created using Petroview®
<table>
<thead>
<tr>
<th>Alaska Designation</th>
<th>Activity</th>
<th>PFC Energy Assessment</th>
</tr>
</thead>
</table>
| Harvest Area       | • In Alaska, ExxonMobil holds interests in the **Greater Prudhoe, Greater Point McIntyre**, and **Greater Kuparuk** areas. The company is one of the largest North Slope producers, although production from the region is declining; 2010 net production averaged 114 mb/d of liquids.  
• Development activities continued at **Point Thomson** in 2010 (35% w.i., operated), and first production of gas liquids is anticipated in 2015-2016. Longer-term potential lies in commercialization of the gas reserves, which is dependent on building a gas pipeline and accessing export markets. | *Material harvest position. As the largest holder of discovered gas resources on the North Slope and a co-operator of the Prudhoe Bay Western Region development, ExxonMobil holds a leading position in Alaska. Maintaining and growing upstream investment increasingly hinges on a gas commercialization/export scheme.* |
PFC-Identified Challenges

- **Adapting to the unconventional resource play business environment**: The XTO Energy acquisition and subsequent shale gas acreage transactions have made ExxonMobil a force in the North America unconventional resource play, shifting growth focus to a business model that is quite different from the large-scale, major capital projects that have driven core growth for the company over the last decade. With more than two-thirds of its unconventional resource acreage holdings (excluding the oil sands) positioned in gas plays, the company is clearly challenged by the ongoing weakness in natural gas realizations in North America. This is reflected in the company’s growing interest in US LNG exports—both from Alaska and the US Onshore. However, this is a long-term fix for a near-term challenge, and one with considerable arbitrage risk in the form of firming Henry Hub gas prices over the latter half of the decade.

- **Delivering on a new growth strategy based on strategic partnerships and frontier exploration opportunities.** The development moratorium on the Qatar North Field has left ExxonMobil searching for new engines of growth. One response has been a shift in strategy towards strategic partnerships and frontier exploration – reflected in the Rosneft strategic agreement covering frontier exploration in the Russia Arctic.

- **Execution or rationalization of challenged reserves and/or developments positions.** These include:
  - Monetization of captured frontier gas resources in North America (Alaska North Slope, Mackenzie Delta);
  - Development of captured oil reserves in the Caspian region, plagued by delays, cost over-runs, and accelerating resource nationalism;
  - Delivering on the West Qurna I redevelopment project in Iraq, which remains challenged by export infrastructure constraints. The securing of six exploration licenses in the northern Kurdistan region is the latest signal of ExxonMobil’s concern over the ability of Iraq to evolve into a Core area for the company.

- **Maintain leadership in share buy-back and dividend performance**: ExxonMobil has been a clear peer group leader in returns to shareholders, distributing ~$29 bn through dividends and share buy-backs in 2011 and spending ~$109 bn on share repurchase over the 2007-2011 period. With the increased emphasis being placed on unconventional gas resources to deliver future volume growth, shareholders will be looking for ExxonMobil to continue its leading dividend and share buy-back performance, as the core differentiator from its faster growing (in volumetric terms) peer group companies.
### Questions & Discussion

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<th>% Global</th>
<th>% Trend</th>
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<td>XOM</td>
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Alaska’s Fiscal Regime in a Global Competitive Context
Fixed-Royalty Jurisdictions in US Lower 48 Are A Key Competitor to Alaska for Investment Dollars

It is now an exception not to be targeting unconventionals in North America as a major growth platform.
Alaska’s Days of “Easy Oil” Are Gone: High Costs and High Government Take Present Challenges

Costs are significantly higher in Alaska than the Lower 48 – even compared to unconventionalls. Meanwhile, Alaska’s Government Take has risen significantly over recent years, meaning new project economics can be very challenging.
Relative Government Take = Government Take / Divisible Income

Divisible Income equals Gross Revenues less costs, including capex and transportation costs.

Government Take includes all payments the government mandates in its function as a sovereign:
  • Royalties
  • Land rental fees, property taxes
  • Production taxes
  • Income taxes

Government Take does not include amounts the government earns via a direct equity stake.
Fixed Royalty v Profit Based Fiscal Systems

Incidence of a 30% Fixed Royalty on 5 Different Price Environments

Incidence of a 50% Profit-Based Tax on 5 Different Price Environments
Regime Competitiveness: Average Government Take at $60/bbl

Average Government Take of Global Fiscal Regimes at $60/bbl

- Alaska
- OECD

Countries listed vertically:
- Bolivia
- Syria
- Pakistan
- Uzbekistan
- Oman
- Trinidad
- Azerbaijan
- Vietnam
- Indonesia
- Turkmenistan
- Venezuela
- US - TX (Eagleford)
- Malaysia
- Algeria
- US - LA (Haynesville)
- Norway
- Kazakhstan
- Egypt
- Angola
- Congo, Rep. of the
- US - ND (Bakken)
- India
- China
- Australia
- ACES (New Development)
- Russia
- Netherlands
- Cote d'Ivoire
- US - LA (conventional)
- Yemen
- UK
- UAE
- ACES (Existing Producer)
- US - TX (Barnett)
- Libya
- US - TX (conventional)
- Thailand
- Philippines
- Canada - Alberta Conv.
- Nigeria
- US - GOM
- Brazil
- Equatorial Guinea
- Argentina
- Gabon
- Canada - Alberta OS
- Colombia
- Denmark
- Canada - Nova Scotia
- New Zealand
- Peru
- Ireland
Regime Competitiveness: Average Government Take at $80/bbl

Average Government Take of Global Fiscal Regimes at $80/bbl

OECD
Alaska

Syria
Uzbekistan
Bolivia
Pakistan
Oman
Trinidad
Azerbaijan
Turkmenistan
Vietnam
Indonesia
Norway
Angola
Algeria
Malaysia
Kazakhstan
Venezuela
ACES (New Development)
Congo, Rep. of the
US - TX (Eagleford)
US - LA (Haynesville)
Russia
China
India
Thailand
ACES (Existing Producer)
US - ND (Bakken)
Cote d'Ivoire
Netherlands
Yemen
US - LA (conventional)
Egypt
Australia
UK
UAE
Canada - Alberta Conv.
Libya
Nigeria
US - TX (conventional)
Philippines
US - TX (Barnett)
Argentina
Brazil
Equatorial Guinea
Colombia
Canada - Alberta OS
US - GOM
Gabon
Denmark
Canada - Nova Scotia
New Zealand
Peru
Ireland

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
Regime Competitiveness: Average Government Take at $100/bbl

Average Government Take of Global Fiscal Regimes at $100/bbl

OECD
Alaska
Regime Competitiveness: Average Government Take at $120/bbl

Average Government Take of Global Fiscal Regimes at $120/bbl

OECD
Alaska

Ireland
Peru
New Zealand
US - GOM
Canada - Nova Scotia
Denmark
Gabon
Brazil
Canada - Alberta Conv.
Colombia
Equatorial Guinea
US - TX (Barnett)
US - ND (Bakken)
US - LA (Haynesville)
US - LA (conventional)
US - TX (conventional)
Canada - Alberta Conv.
US - TX (Barnett)
Equatorial Guinea
Colombia
Canada - Alberta ONS
Brazil
Gabon
Denmark
Canada - Nova Scotia
US - GOM
New Zealand
Peru
Ireland

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
Regime Competitiveness: Average Government Take at $140/bbl

Average Government Take of Global Fiscal Regimes at $140/bbl

The chart illustrates the average government take of global fiscal regimes at $140/bbl. Countries and regions are listed along the y-axis, and the government take ranges from 0% to 100% along the x-axis.

Key observations include:
- OECD countries generally have lower government takes compared to non-OECD countries.
- Alaska has one of the highest government takes, indicating a significant portion of revenue is retained by the government.
- Other notable regions include US - GOM, Canada - Alberta OS, and Venezuela, which also show high government takes.
- Smaller countries like Ireland, Peru, and New Zealand have relatively lower government takes.

The chart provides a comparative analysis of government revenue collection across various global fiscal regimes.
Regime Competitiveness: Average Government Take at $160/bbl

Average Government Take of Global Fiscal Regimes at $160/bbl

- Uzbekistan
- Syria
- Turkmenistan
- Azerbaijan
- Angola
- Algeria
- Oman
- Trinidad
- Pakistan
- ACES (Existing Producer)
- Venezuela
- Bolivia
- Norway
- Kazakhstan
- Vietnam
- Indonesia
- Malaysia
- Russia
- Congo, Rep. of the
- India
- China
- Thailand
- US - LA (Haynesville)
- Libya
- Cote d’Ivoire
- Argentina
- Netherlands
- Yemen
- Egypt
- US - TX (Eagleford)
- Nigeria
- UK
- Equatorial Guinea
- US - LA (conventional)
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- US - GOM
- New Zealand
- Peru
- Ireland

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

OECD
Alaska
ACES & SB 21
Table 1: Level & Composition of Relative Government Take (ACES, Existing Producer)

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<tr>
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<th>Royalty</th>
<th>Production Tax</th>
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Figures reflect percentages of divisible income, and sum horizontally to Total Relative Government Take (undiscounted).
Table 1: Level & Composition of Relative Government Take (ACES, New Development)

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Figures reflect percentages of divisible income, and sum horizontally to Total Relative Government Take (undiscounted).
### Cash Flow Analysis - $100 ANS West Coast

**Price** | **NPV12** | **NPV/Bbl** | **IRR**
--- | --- | --- | ---
40 | (174) | (3.49) | 1.3%
50 | (78) | (1.56) | 7.7%
60 | (11) | (0.22) | 11.4%
70 | 45 | 0.91 | 14.4%
80 | 95 | 1.91 | 17.1%
90 | 118 | 2.35 | 18.2%
100 | 151 | 3.03 | 19.9%
110 | 193 | 3.86 | 21.8%
120 | 228 | 4.56 | 23.4%
130 | 261 | 5.22 | 24.9%
140 | 302 | 6.03 | 26.9%
Table 1: Level & Composition of Relative Government Take (SB 21 Existing, Existing Producer)

<table>
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<tr>
<th>Price</th>
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Figures reflect percentages of divisible income, and sum horizontally to Total Relative Government Take (undiscounted).
Table 1: Level & Composition of Relative Government Take (SB 21 New, New Development)

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Figures reflect percentages of divisible income, and sum horizontally to Total Relative Government Take (undiscounted)
SB 21 – New Development – Cash Flow Analysis

Cash Flow Analysis - $100 ANS West Coast
(SB 21 New, New Development)

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Regime Competitiveness: Average Government Take at $60/bbl

Average Government Take of Global Fiscal Regimes at $60/bbl

OECD
Alaska
Regime Competitiveness: Average Government Take at $80/bbl

Average Government Take of Global Fiscal Regimes at $80/bbl

OECD
Alaska
Average Government Take of Global Fiscal Regimes at $100/bbl

- Alaska
- OECD

Countries included in the chart:
- Pakistan
- Bolivia
- Oman
- Trinidad
- Azerbaijan
- Turkmenistan
- Angola
- Algeria
- Vietnam
- Norway
- Indonesia
- ACES (New Development)
- Kazakhstan
- Malaysia
- Venezuela
- Russia
- ACES (Existing Producer)
- Congo, Rep. of the
- US - LA (Haynesville)
- China
- US - TX (Eagleford)
- India
- Cote d’Ivoire
- Netherlands
- Yemen
- Egypt
- US - ND (Bakken)
- US - LA (conventional)
- UK
- SB 21 (Existing Producer)
- Libya
- Australia
- UAE
- Nigeria
- Canada - Alberta Conv.
- Philippines
- US - TX (conventional)
- Argentina
- US - TX (Barnett)
- SB 21 (New Development)
- Equatorial Guinea
- Colombia
- Canada - Alberta OS
- Brazil
- Gabon
- Denmark
- US - GOM
- Canada - Nova Scotia
- New Zealand
- Peru
- Ireland

Regime Competitiveness: Average Government Take at $100/bbl
Regime Competitiveness: Average Government Take at $120/bbl

Average Government Take of Global Fiscal Regimes at $120/bbl

OECD
Alaska
Regime Competitiveness: Average Government Take at $140/bbl

Average Government Take of Global Fiscal Regimes at $140/bbl
Regime Competitiveness: Average Government Take at $160/bbl

Average Government Take of Global Fiscal Regimes at $160/bbl

- OECD
- Alaska

Countries listed include:
- Uzbekistan
- Syria
- Turkmenistan
- Azerbaijan
- Angola
- Algeria
- Oman
- Trinidad
- Pakistan
- ACES (Existing Producer)
- Venezuela
- Bolivia
- Norway
- Kazakhstan
- Vietnam
- ACES (New Development)
- Indonesia
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- New Zealand
- Peru
- Ireland

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
### Level & Composition of Relative Government Take (SB 21 Existing Prog, Existing Producer)

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Figures reflect percentages of divisible income, and sum horizontally to Total Relative Government Take (undiscounted).

Includes .01% Progressivity from $30 PTV/bbl to maximum of 35%
Includes .01% Progressivity from $30 PTV/bbl to maximum of 35%

**Table 1: Level & Composition of Relative Government Take (SB 21 New Prog, New Development)**

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<th>Royalty</th>
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Includes .01% Progressivity from $30 PTV/bbl to maximum of 35%

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Credits and Deductions

- Current credit system necessary in ACES to offset high government take, but introduces numerous distortions and unintended consequences
- In low price environments, or in the case of significant success attracting new producers to the North Slope, poses significant cashflow risk to the state
- Eliminating 20% capital credit may pose greater issues for smaller, more capital-constrained producers
- If capital credit were to be retained in some form, may be desirable to end ability to claim directly from the state
- While some further targeting of credits may be possible, often difficult to differentiate between maintenance and development spending
- Limiting deductions – for instance in the case of pipeline tariff – also likely to be problematic – added complexity for little gain
Alaska’s Future Petroleum Revenues: Sensitivities to Oil Price, Production Decline, and Fiscal Terms
The major factor determining Alaska’s future petroleum revenue is not oil & gas fiscal terms, or even, in the short run, production levels, but rather something entirely outside Alaska’s control: the crude oil price.

Restricting a sensitivity analysis only to the range of oil prices observed in the last 5 years, and holding future production constant (based on DOR forecasts) the potential variation in possible future petroleum revenue is substantial:

- In a $140/bbl environment, revenue in 2022 under ACES would approach $10bn
- In a $60/bbl environment, revenue in 2032 under ACES would be as low as $1.8bn

In reality, the potential for variation is even greater than this, since production also responds to price:

- In a sustained high price environment, more projects would be economic, and long-run production would improve
- In a sustained low price environment, fewer projects would be economic and sustaining capital would be lower, resulting in a more rapid decline in long run production
Decline Rate is the Other Major Determinant

- The Base Forecast anticipates an average annual production decline between 2017 and 2022 of ~6% (including the contribution from new producing areas brought on-stream), yielding production of ~344 mb/d in 2022.
- Increasing the average decline rate by half to 9% in every year from the base case would see production declining to ~280 mb/d in 2032.
- Reducing the average decline rate by half to 3% in every year from the base case would see production of ~419 mb/d in 2032.
- In the low decline scenario, more robust production combined with the impact of inflation mean that nominal revenues would continue to grow beyond 2017, reaching ~$7.8 bn at a nominal crude price of $100/bbl.
- In the high decline scenario, 2022 nominal revenues would fall well below the $4 bn level anticipated in the Base Forecast case, reaching less than ~$4 bn even with nominal crude prices at $100/bbl.
Even significant changes to fiscal terms, by contrast, have a far smaller impact on future revenues than either oil price or future production declines.

- Under the Base Forecast decline case, at $100/bbl crude oil, SB 21 results in a parallel shift of the revenue curve, reducing the state’s petroleum revenue by a little over $1 bn each year.

- If an improvement in fiscal terms can stimulate sufficient new investment to stem declines, it has the long run potential to increase revenue, despite the near-term cost of the change.

To maintain revenues to the state at a steady level in real terms, a reduction in government take such as that under SB 21 would need to spur sufficient investment to reduce the North Slope base decline from 6% as currently forecast to 1%.
Fiscal Terms Changes and Investment Impacts

- Re-introducing 0.1% progressivity into SB 21 (to a maximum of 35% Production Tax) would require lower additional production post 2017 to be revenue neutral.
- To maintain revenues to the state at a steady level in real terms, a reduction in government take such as that under SB 21 with 1% progressivity would need to spur sufficient investment to **reduce the North Slope base decline from 6% as currently forecast to 2%**
Fiscal Terms Changes and Investment Impacts

<table>
<thead>
<tr>
<th>Incremental Additional Production (mboe/day)</th>
<th>Year</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
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<td>SB 21</td>
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<td>18</td>
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<tr>
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<td>16</td>
<td>19</td>
<td>21</td>
<td>19</td>
<td></td>
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</tbody>
</table>

- The table shows incremental production needed to added every year for SB21 and SB21 (w/progressivity) regimes.
- SB21 (w/progressivity) would require marginally fewer investments and leads to earlier revenue neutrality.
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