

# Cost and Capital Efficiency – Making it Stick

June 2016

Deepwater Gunashli, Azerbaijan

### How we make the changes stick

bp

Our aim is to create a margin focused mentality irrespective of the price environment through:

- Rigorous capital allocation
- Simplified organisation with strict headcount management
- Striving for safe, top quartile performance in every basin on cost and capital efficiency
- Working with our suppliers to aggressively deflate our costs and collaborate for the most efficient solution
- Building a continuous improvement mentality

There is much more to do...

## Rigorous capital allocation – making choices



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- Refocusing exploration
- No compromising safety or integrity
- Optimising pre FID spend
- Using defined hurdle rates
  - New Greenfield projects mid teens return
  - Drilling Programmes > 20%
- Ability to flex capital spend

## Resetting production cost to top quartile





\* Total excludes Adco

# Improving capital efficiency – drilling execution





## Improving capital efficiency – examples



Individual wells drilled in the Nile Delta by all operators

Source: IHS Rushmore

\* BP West Nile Delta Taurus/Libra Development well program versus all wells drilled in Egypt's Nile Delta since 2002

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### Improving capital efficiency – examples







Oman Khazzan



# Working with suppliers to aggressively deflate costs



**Reduction range by Sector** *Includes 2016 spend (opex + capex)* 





## Collaborating with third parties



#### Standardisation & supplier collaboration

#### Expanding competitive source options





Water Injection Manifold

Valves

Piping

# Building a continuous improvement mentality



#### Initiating a step-change to embed continuous improvement into our DNA

Leverage functional expertise within a regional context



GWO & Sub surface- \$2/ bbl improvement in Q204 project economics Leverage global processes and cross functional integration



Tangguh Expansion Project - >\$3bn

### There is more to do..

![](_page_10_Picture_1.jpeg)

#### **Optimise Logistics**

![](_page_10_Picture_3.jpeg)

Create efficiency across our operations globally by optimising the plan and sharing wherever possible

![](_page_10_Picture_5.jpeg)

Step change to reduce inventory holdings and optimise our global warehouse footprint

#### Increase "Wrench Time"

![](_page_10_Picture_8.jpeg)

Global initiative to significantly improve wrench time and maximise efficiency across our offshore operations

## Modernise and standardise systems

![](_page_10_Picture_11.jpeg)

Modernise & standardise our purchasing systems. Use big data to efficiently manage our business

## Summary - how we make the changes stick

bp

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There is much more to do...

![](_page_12_Picture_0.jpeg)

### The base and our track record

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![](_page_13_Figure_2.jpeg)

![](_page_13_Figure_3.jpeg)

(1) Excludes Rosneft

## Regionally focused, globally connected

![](_page_14_Figure_1.jpeg)

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### **Reservoir Management**

Increasing water injected into key waterfloods mbwpd (excl GPB) Improving recovery at the giant Prudhoe Bay Field, Alaska

![](_page_15_Figure_3.jpeg)

![](_page_15_Picture_4.jpeg)

![](_page_15_Picture_5.jpeg)

Wedge delivery

![](_page_16_Picture_1.jpeg)

1000%

0%

2017

![](_page_16_Figure_2.jpeg)

#### Excludes: L48, Iraq, PAE

5

Wedge delivery

![](_page_17_Picture_1.jpeg)

**Target quality and execution efficiency** Wedge production rates mboe/d

![](_page_17_Figure_3.jpeg)

#### Better images at lower cost

BP Ocean Bottom Seismic

![](_page_17_Figure_6.jpeg)

Excludes: L48, Iraq, PAE

## **Operating Efficiency**

![](_page_18_Picture_1.jpeg)

![](_page_18_Figure_2.jpeg)

Source: BP internal data - Data excludes Lower 48

![](_page_18_Figure_4.jpeg)

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## **Production Optimization**

Optimization unlocks additional production % Production

![](_page_19_Figure_2.jpeg)

#### Application of leading edge technologies

![](_page_19_Picture_4.jpeg)

![](_page_19_Picture_6.jpeg)

## Managed decline forecasted at 3-5%

![](_page_20_Picture_1.jpeg)

![](_page_20_Picture_2.jpeg)

**Operating Efficiency** 

### Production Optimization

![](_page_20_Picture_5.jpeg)

![](_page_20_Picture_6.jpeg)

- Strong performance track record with more to come
- Managed decline target range of 3-5% to 2020 and beyond:
  - Giant field reservoir management
  - Capital Efficiency of wedge delivery
  - Operating Efficiency focus
  - Technology application

![](_page_21_Picture_0.jpeg)

# Projects

June 2016

Quad 204, North Sea Glen Lyon FPSO in tow

### Track record of project delivery

### 2014 – 2016 Major projects start-ups

2014	2015	2016
<ul><li>✓ Chirag Oil</li><li>✓ Mars B</li></ul>	<ul> <li>✓ Kizomba Satellites Phase 2</li> <li>✓ Greater Plutonio Phase 3</li> <li>✓ Western Flank A</li> </ul>	<ul> <li>✓ In Salah Southern Fields</li> </ul>
🗸 NaKika Phase 3		✓ Thunder Horse
<ul> <li>✓ Atlantis North Expansion Phase 2</li> </ul>		<ul><li>✓ Point Thomson</li></ul>
✓ CLOV		🗸 Angola LNG
<ul> <li>✓ Sunrise Phase 1</li> <li>✓ Kinnoull</li> </ul>		In Amenas Compression

### Top quartile schedule predictability Top quartile first year operability performance

![](_page_22_Picture_4.jpeg)

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### Major projects growth to 2020

![](_page_23_Picture_1.jpeg)

![](_page_23_Figure_2.jpeg)

### North Sea

![](_page_24_Picture_1.jpeg)

![](_page_24_Picture_2.jpeg)

![](_page_24_Picture_3.jpeg)

#### Quad 204

- New FPSO to extend life of Schiehallion field (BP ~36%)
- 14 new wells, 53 existing wells
- Peak production ~ 120 mboed, gross
- Project ~ 90% complete with start-up planned early 2017
- FPSO arrived safely from Korea with installation West of Shetland in progress

### Clair Ridge

- 2<sup>nd</sup> phase of the giant Clair field development (BP ~29%)
- New production, accommodations and drilling facilities
- Peak production ~ 100 mboed, gross
- Project ~ 85% complete with 2017 start-up planned
- All production modules are installed offshore and progressing with hook-up and commissioning

### Oman Khazzan: 10.5 tcf of gross recoverable gas resources

![](_page_25_Picture_1.jpeg)

![](_page_25_Picture_2.jpeg)

![](_page_25_Picture_3.jpeg)

- Acreage: 3,700 km<sup>2</sup>
- Production plateau 1.5 bcf/d by 2020
- Ph1 Facilities (2 trains) ~70% complete
  - ~30 wells drilled
  - 2017 start-up on track and on budget
- Khazzan Train3 and 125 wells with 2020 start-up
- BP technology enabled step change in well targeting and productivity

### West Nile Delta

![](_page_26_Figure_1.jpeg)

Two projects expected to develop 5tcf of gas resources, gross (BP ~83%)

- 21 total development wells
- Peak production ~ 290 mboed, gross

#### Taurus/Libra

- Production through BG's Burullus facilities
- Facilities ~ 55% complete with 2017 start-up planned
- 9 wells total all drilled and completions started
- First subsea tree successfully installed

#### Giza/Fayoum/Raven

- Deepwater long-distance tie backs to shore
- Existing Rosetta plant to be modified for Giza/Fayoum and integrated with a new onshore plant for Raven
- Facilities ~ 10% complete with 2019 start-up planned
- 12 wells total 3 drilled to top of reservoir

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### Juniper

![](_page_27_Picture_1.jpeg)

![](_page_27_Picture_2.jpeg)

New normally unmanned platform will produce gas from Corallita and Lantana fields (BP  $70\%)^1$ 

- First subsea development for bpTT, 5 subsea wells
- Production capacity of 590 million standard cubic feet per day
- Peak production ~95mboed gross
- Project ~75% complete with planned 2017 start-up
- Platform on track for installation early 2017 with offshore hook up and commissioning to follow
- 5 wells drilled with completions in progress, to be completed by end of 2016

![](_page_27_Picture_11.jpeg)

### Shah Deniz Stage 2

![](_page_28_Picture_1.jpeg)

![](_page_28_Picture_2.jpeg)

![](_page_28_Picture_3.jpeg)

Shah Deniz is BP's largest ever gas discovery with 40tcf of gas in place (BP ~29%)

- 2 offshore platforms and onshore processing and compression facilities
- 26 total development wells
- South Caucasus pipeline expansion
- Also includes two new pipelines, the Trans Adriatic Pipeline (BP 20%) and the Trans Anatolian Gas Pipeline (BP 12%)
- Peak production ~ 370 mboed, gross
- Project ~ 70% complete with 2018 start-up planned
- 9 wells drilled, onshore and offshore facilities are progressing as planned

# Enhancing project execution

![](_page_29_Figure_1.jpeg)

"...your efforts are clearly setting you up ahead of your peers to thrive in the current market and take advantage when the market picks up..." IPA Director

- Leveraging our global execution model
- Implementing supplier-led solutions to simplify and standardize
- Simplifying requirements and eliminating excess
- Working more efficiently with contractors

![](_page_29_Picture_7.jpeg)

![](_page_29_Picture_8.jpeg)

# **Optimizing pre-FID projects**

![](_page_30_Picture_1.jpeg)

### • We have around 40 projects in the pipeline for post-2020 start-up

- Balance of resource types and a range of development types
- Global portfolio with significant exposure to low development cost regions

#### • Centralized project creation – 'Global Concept Development'

- Single team ensuring consistency in approach 'value over volume'
- Deep expertise, integrating BP with supplier-led solutions to create highly competitive projects
- Maximize benefits of standardization through re-use of industry proven solutions
- Adhering to our hurdle rates mid teens returns for new greenfield projects at \$60

## Summary

![](_page_31_Picture_1.jpeg)

- High-quality and material project portfolio to underpin growth to 2020 and beyond
  - 4 major project start-ups achieved year-to-date, another on-track for start-up before year-end
  - 500 mboed of new net capacity by end-2017
  - 800 mboed of new net production by end-2020, ~85% under construction or already operating
  - Value over volume: current project portfolio margins 35% better than our current base assets
  - Deep portfolio only do the best when they are optimized and ready to execute

#### • Global execution model improving project optimization and execution

- IPA benchmarks BP project performance as first quartile on five of the six key metrics
- Partnering with suppliers to simplify, standardize and reduce costs
- Capturing accelerated deflation in the supply chain as we time our investment decisions

![](_page_32_Picture_0.jpeg)

LR5 Drilling Rig in Khazzan, Oman

### **Future Growth**

![](_page_33_Picture_1.jpeg)

Andy Hopwood, EVP, Chief Operating Officer Strategy and Regions Hesham Mekawi, Regional President North Africa Howard Leach, Head of Exploration

### Agenda

- Strong incumbent positions growing value
- Examples of real growth today Oman & Egypt
- Focused exploration extending positions and creating new profit centres

### Growing value with today's resources

![](_page_34_Figure_1.jpeg)

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### New Opportunities, returns focused

### Strong Incumbent positions to fuel growth

![](_page_35_Picture_2.jpeg)

Material Growth options

#### 2020 Base business inc future drilling wedge activity

- Drill-out of major hubs
- Lower 48 growth

- Existing post-FID major projects
- 2016 2020, Pre-FID major projects

#### Post 2020 Major Project Start-ups

- Mad Dog Phase2
- West Nile Delta Phase 2
- Atoll Phase 2
- Greater Clair

- ACG PSA Extension
- India Gas Projects
- Trinidad contract extension
- GoM Paleogene

#### Progression of E&A and new opportunities

- ILX in North Sea, Trinidad and NWS
- Egypt Exploration
- GoM Miocene

- Azerbaijan SWAP, Shafag Asiman
- China Shale
- Russia
- Eastern Canada

![](_page_35_Figure_26.jpeg)

Average 2016-25 pre-tax Ops cash/boe at equivalent price to 2015 actuals (\$52 Oil and \$ 2.7HH)  $_{oldsymbol{\Delta}}$
### Portfolio Balance providing resilience

Cumulative Capital (2016-20)



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### Oman – unlocking new growth







### Oman – continuous improvement



Cost savings from Phase 1 effectively pays for expansion

Integration of BP technologies illuminated reservoir quality for better well placement, optimized well design, and ultimately better recovery per well







### Egypt – deep portfolio





### Egypt – unlocking new growth







### Focused exploration and access





### Trinidad – extending incumbency



#### Seismic acquisition and imaging technology renewing drilling options in a mature play







# Azerbaijan – new growth opportunities – Shafag Asiman



#### Shafag Asiman - giant gas/condensate prospect



### Azerbaijan – new growth opportunities - SWAP



#### SWAP PSC – near shore oil potential





- Growing the business with the resources we have today
- New opportunities, returns focused Oman and Egypt
- Portfolio balance providing resilience
- We are focusing our exploration activity

# The Azerbaijan-Georgia-Turkey (AGT) Region

Shah Deniz Alpha, Azerbaijan

## BP's position in Region





#### Diverse portfolio:

- Giant oil and gas/condensate fields
- Oil and gas pipelines
- Exploration prospects

Key oil & gas assets in the Region are operated by BP

### AGT 20+ years of success





# Track record of developing and operating giant oil/gas fields





Notes:

1 Istiglal and Dada Gorgud drilling rigs are operated by Caspian Drilling Company

2 Heydar Aliyev drilling rig is operated by Maersk

### Top quartile safety and environmental performance





# Top quartile operating efficiency and plant reliability



- Plant Reliability and Operating Efficiency systematic investment into sustained plant and wells reliability
- **Turnarounds** near 100% scope and schedule attainment over last 4 years
- Managing deferrals Steady year-on-year improvement





# Top quartile drilling performance



Decreasing well delivery duration in ACG field, days/well



- Continuous improvement over the last 4 years
- **Optimized** Well Design and Construction
- Focus on **Execution Excellence**



## ACG – flat production





- Production **decline mitigated**
- Efficient new wells
- Continuous use of technology





Sand Control



**BP Well Advisor** 



Enhanced Oil Recovery



# Shah Deniz (Phase 1 and debottlenecking) - increasing capacity and top performing wells





- Reliable supplier to the market
- Top producing wells in BP portfolio
- **Optimized** early field development
- Near 100% operating efficiency for last 4 years

# Intense Cost Management

Gross operating costs are back to 2010 level...





- Cost efficiency being delivered without compromising safety and integrity
- Embedding the cost management culture making it "stick"
- Top down & bottoms up throughout the organization
- Driving for organizational efficiency and effectiveness
- Capturing **market** efficiencies and deflation

# Shah Deniz field and Southern Corridor – an integrated value chain





- New and expandable infrastructure, **linking Caspian** resources to Europe
- **Supported** by 6 transit countries, 11 shareholders and 11 gas buyers

- Initial capacity of 16 BCMA underpinned by **long** term gas sales agreements
- Unlocking future Caspian gas potential
- All projects in execute stage

### Shah Deniz field and Southern Corridor – diverse sources of value



#### Gas

Diverse markets Large producing wells Further volume upside

BP's equity and sources of value are **balanced through** whole value chain

#### Condensate

High return value stream

Established route to markets via Baku-Tbilisi-Ceyhan pipeline

**Midstream** 

Stable income source

BP is shipper and owner

Scalable for future supplies

# Shah Deniz 2 Project Progress

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- **30 months** post sanction
- Very strong safety performance
- 10% capital reduction via optimization
- 20% better drilling performance vs FID
- **On plan** to deliver 1<sup>st</sup> Gas in 2018



Production & Riser Deck



Subsea Construction Vessel



Waste Heat Recovery Units at Sangachal Terminal



Production & Riser Jacket



North Flank Manifold Foundation Base Structures Being Installed



Pipelay in Azerbaijan

# Beyond 2020 - future growth



#### Giant field extension and growth

- Shah Deniz
- ACG

#### **New Exploration**

- Shafag Asiman gas
- Shallow Water Absheron Peninsula (SWAP) - oil
- D230 block MOU is signed

#### Infrastructure

• Unlocking future gas potential for the Southern Gas Corridor



# **Future Growth Potential**

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- Potential for further >30 years of exploring, developing and operating projects in the Region
- **Strong** incumbent position
- Rich exploration portfolio coupled with experience and good knowledge of the basin
- Good reputation and relations with government and stakeholders



### Our Mission, Strategy and Commitment



- Build a **premier, market visible, competitive** onshore operating company
- Create a **high performance culture** based on empowerment, accountability and collegiality
- Deliver high rates of return and create value on our massive, largely untested acreage
- Drive **capital efficiency** through **innovative** drilling and completion techniques
- Maintaining BP's Core Values and strong commitment to Safety and the Environment

### **Our Assets Today**

- Five business units
- 6.0m net acres
- Produced 293 mboed in 1Q 2016
- 24,000 wells, 10,000 operated
- Resource base of 7.5 bn boe at YE 2015
  - 37 tcf gas and 1.2 bn boe liquids
- 15,000 horizontal laterals identified

#### L48 Relative to Other Independents



Source: BP Internal and Credit Suisse public company data

Note: L48 conversion rate: 5.8 mcfe = 100e. Estimated enterprise value as of 6/1/2016 pro forma for transactions as necessary.



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### Increasing Capital Efficiency Through Innovative Well Designs Evolution of Development Programs Leading to Multi-Lateral Horizontal Wells





**Conventional Vertical** 



Single Tight Gas Horizontal



Single Tight Oil Horizontal



"W" / "Winerack" Horizontal



Stacked Multilateral Horizontal



Coplanar Multilateral Horizontal

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# North - Greater Green River Basin

Material Horizontal Development Potential

- 500,000 net acres
- Six distinct petroleum systems
- 1.4 bn boe of resource potential
- Multiple stacked liquid rich targets
- ~2,000 horizontal locations identified



## North - Greater Green River Basin

### Liquid Saturated Stacked Reservoirs

~7,000′ TVD



Horizon	Hydrocarbon	Horizontals	
Fort Union	Wet Gas	~120	
Fox Hills	Wet to Dry Gas	~60	
Lewis	Oil to Condensate	~180	
Almond	Wet to Dry Gas	~1,600	



### North - Greater Green River Basin Early Horizontal Wells Creating Significant Value

- 2015 1<sup>st</sup> horizontal in eight years
- Eight horizontal wells since September 2015
- Horizontal wells delivering up to 45% IRR\*
- Aggressively building drilling inventory
- First multilateral to spud June 2016
- Multilateral development economics projecting >80% IRR and \$9.7/boe development cost at \$14m well cost in Tier 1 locations



#### \* At \$10m well cost

Economics are post tax, include capitalized overhead and were run at \$3HH and \$55WTI



### West - San Juan Basin World Class Gas Resource

- Applying innovative techniques to achieve premier returns
- 570,000 net acres
- Four prolific and discrete reservoirs with multiple intervals/seams in each
- 2.1 bn boe of resource potential
- 2,000 horizontal locations identified
- Additional untested intervals within and below producing stratigraphic column



### West - San Juan Basin

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Discrete and Prolific Reservoirs with Horizontal/Multilateral Potential

# West - San Juan Basin Coal Bed Methane

### Innovative well designs driving premier returns

- Highest multilateral production in the basin
- Average multi-lateral development cost of \$1.9/boe
- Successful tri-lateral accessing 14,600 ft of coal •
- Continuing to innovate with more and longer laterals





	Parry E2	Seibel A2	Seibel B2	Horther
D&C, m\$	2.0	1.7	1.8	2.6
IRR, %	47%	100%+	100%+	100%+
Max 30, mmscfd	2.2	5.7	5.5	5.5*
EUR, bcf ±\$55WTI	5	6 * Peak rate si	6 ince well still	11 ramping up

Economics are post tax, include capitalized overhead and were run at \$3HH and

10

bn

### West - San Juan Basin Mancos Early Mover in Emerging Play with Tremendous Potential

- Devon acquisition added material position
- 1,600+ horizontal locations identified\*
- Projecting >25% IRR and \$3.0/boe development cost, at \$6.8m well cost in Tier 1 area through improved targeting, execution and enhanced completions
- Evaluating potential of oil window



#### \* Based on 5,000 ft wells Economics are post tax, include capitalized overhead and were run at \$3HH and \$55WTI



Stacked targets in sweet spot



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### MidCon - Anadarko and Arkoma Basins Hydrocarbon Rich Regions with Stacked Oil and Gas Pay

#### Anadarko Basin

- 900,000 net acres
- 1,200 producing wells; 100 horizontals
- Production from 10+ different horizons
- 400 mmboe of resource potential; 30% oil
- 2,400+ laterals identified

#### Arkoma Basin

- 650,000 net acres
- 1,600 producing wells; 200 horizontals
- Production from 10+ different horizons
- 700 mmboe of resource potential; 95% gas
- 4,000+ laterals identified



### MidCon - Anadarko and Arkoma Basins Prolific Reservoirs Sourced by Woodford and Carboniferous Shales



• Wet to Dry Gas

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# MidCon - Anadarko Basin Industry First Innovations



### Cleveland Dual-Lateral, Cleveland Tri-Lateral and Onshore Junction Isolation



- > 8,000' of stimulated reservoir
- Projecting ~25% IRR and \$5.8/boe development cost at \$ 3.8m well cost
- Additional laterals decrease cost per lateral foot
- IP30 1,360 boepd (37% oil)
- Oil yield increases with multi-laterals



- > 12,000' of stimulated reservoir
- Projecting 30% IRR and \$5.8/boe development cost at \$5.1m well cost (42% oil)
- 48% capital cost reduction over single laterals
- Industry first onshore junction isolation system
- Expect first production in August 2016

Economics are post tax, include capitalized overhead and were run at \$3HH and \$55WTI

### MidCon - Arkoma Basin Development Performance Premier Execution in Woodford Shale



- 176,000 acres in the core area
- Projecting 25% IRR and \$2.8/boe development cost at \$4.0m well cost
- Evaluating multi-lateral potential





Economics are post tax, include capitalized overhead and were run at \$3HH and \$55WTI

### East - East Texas Basin

#### Large Lease and Mineral Position in a Prolific Basin

- 1,400,000 net acres, including 1,000,000 mineral acres
- Five discrete petroleum systems
- 950 mmboe of resource potential
- ~1,000 horizontal locations over three stacked pays
- Evaluating seven additional stacked pays



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### East - East Texas Basin

#### **Robust Opportunities in Stacked Plays**



Formation	Horizontals	Reservoir Type	Petroleum System
Cotton Valley	100	Tight Sands	Wet to Dry Gas
Bossier	400	Shale	Dry Gas
Haynesville	500	Shale	Wet to Dry Gas

#### Additional horizontal plays under evaluation:

- Travis Peak • Austin Chalk • Wilcox Pettit • Yegua
  - Woodbine

• James Lime



# East - East Texas Basin

#### Haynesville Results Delivering Premier Returns

- Integrating advanced technology to optimize completions design
- Projecting ~35% IRR and \$5.9/boe development cost at \$9.1m well cost
- Potential 50% IRR uplift on mineral acreage



Micro-seismic Imaging Integrated with 3D Seismic
Economics are post tax, include capitalized overhead and were run at \$3HH and \$55WTI







### South - Eagle Ford Development World Class Shale Gas Development Program

- 190,000 net acres
- Non-operated, average 41% WI
- Drilled > 400 horizontal wells in five years
- Proven value creating relationship with Lewis Energy Group, a vertically integrated operator in South Texas
- 1.6 bn boe of resource potential
- 4,800 horizontal locations
- Additional stacked reservoirs: Escondido, Olmos, and Austin Chalk



~80 miles

60 miles

2

hn

# South - Eagle Ford Development

#### Premier Stacked Pay Opportunities

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Formation	Horizontals	Reservoir	Petroleum System
Escondido	600	Tight Sand	Wet Gas
Olmos	350	Tight Sand	Wet to Dry Gas
Austin Chalk	Evaluating	Limestone	Oil to Dry Gas
Upper Eagle Ford	1,250	Shale	Oil to Dry Gas
Lower Eagle Ford	3,600	Shale	Oil to Dry Gas

### South - Eagle Ford Development Enhanced Frac Design Yields Step Change In Performance



- New enhanced fracture stimulations initiated
  - Increased number of frac stages
  - Increased proppant loading
  - First three wells producing a combined 36mmcfd
- IRR ~50% and \$2.1/boe development cost at \$5.1m well cost
- Offset operators include Noble Energy and SM Energy



## Improving Cost Structure





- Utilizing data analytics to increase efficiency and decrease deferment
- Hiring in-house data scientist and matching with engineering teams
- Staff reduction of 54% from 2012 to 1Q 2016

Production cost includes LOE (Lease operating expense), G&A (General and administrative expense) and midstream fees. It does not include depreciation, depletion and amortization, ad valorem and severance taxes and certain other costs.

## Profitable and Flexible Growth Vehicle

- 7.5 bn boe, short-cycle incumbent resource position
- 15,000 horizontal lateral locations identified
- Innovative approaches dramatically improving cost and capital efficiency
  - Data analytics
  - Advanced artificial lift
  - Multi-lateral wells
  - Custom completion designs
- 42% of yet to drill resources are economic at \$3 HH or below\*



\$4.00-\$5.00

>\$5.00

\$3.00-\$4.00

