



# Resource progression

James Dupree and Richard Herbert

Andrew, North Sea



# Resource progression - agenda

---

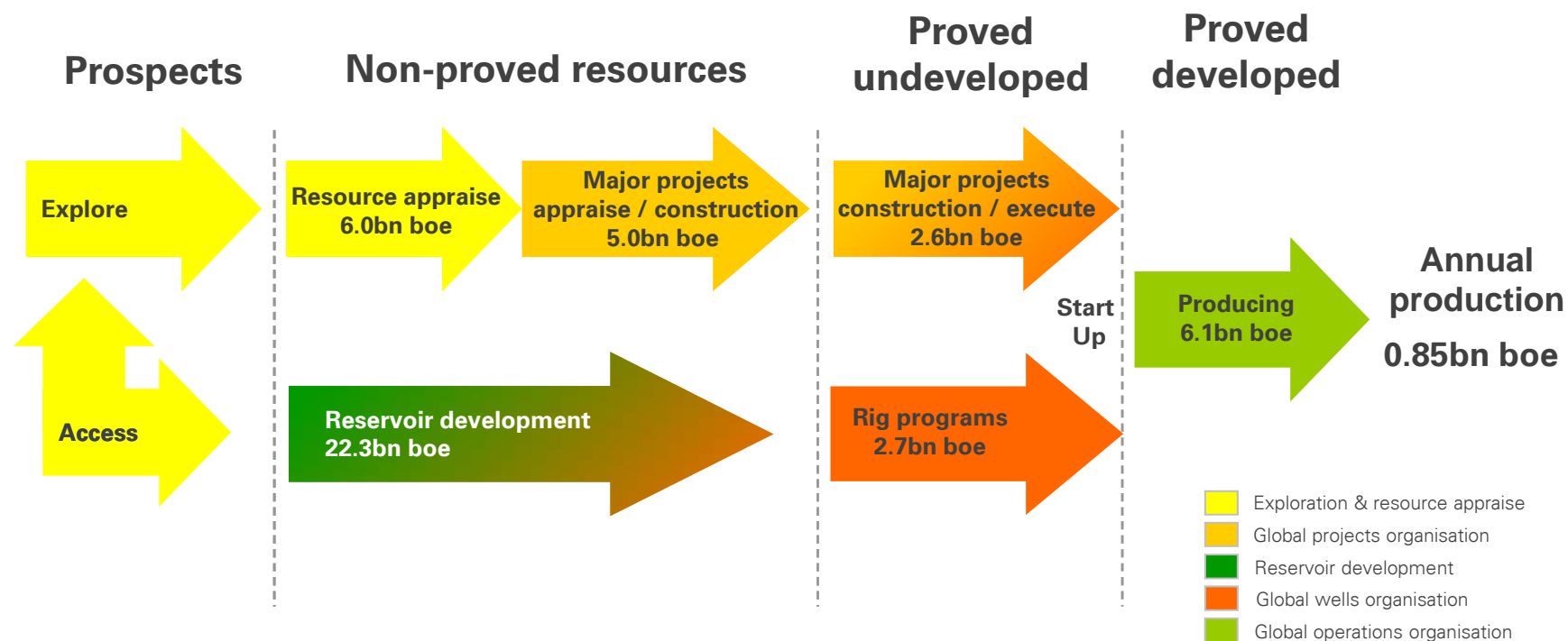
James Dupree, Chief Operating Officer for Reservoir Development & Technology

Richard Herbert, Chief Operating Officer for Exploration

- Resource progression conveyor belt
- Reserves / production competitive position
- Giant young fields and area development plans
- Exploration and resource appraisal portfolio
- Future exploration activity

# Progressing resources

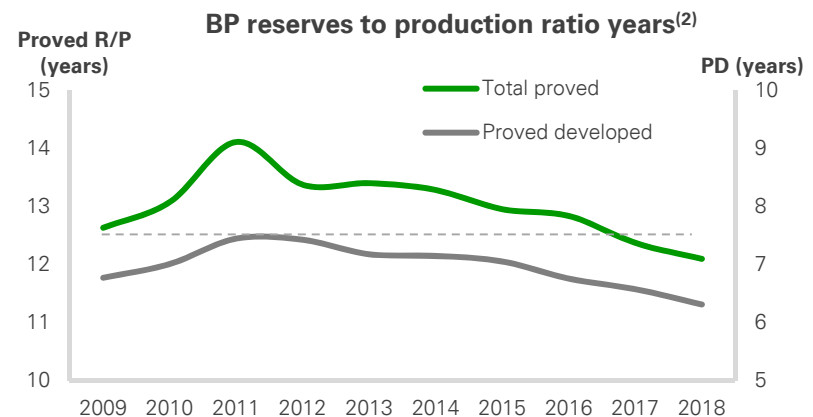
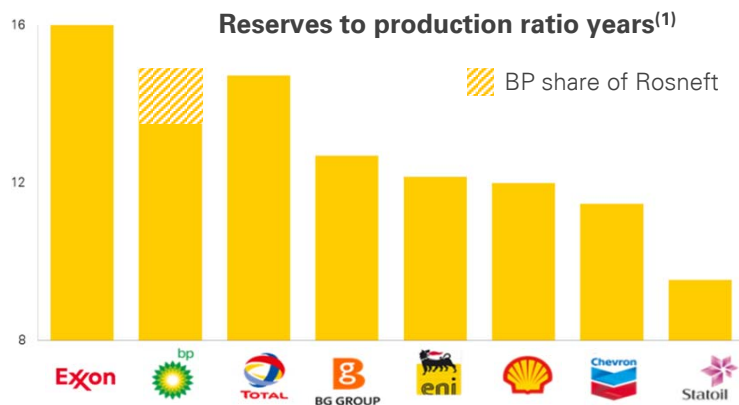
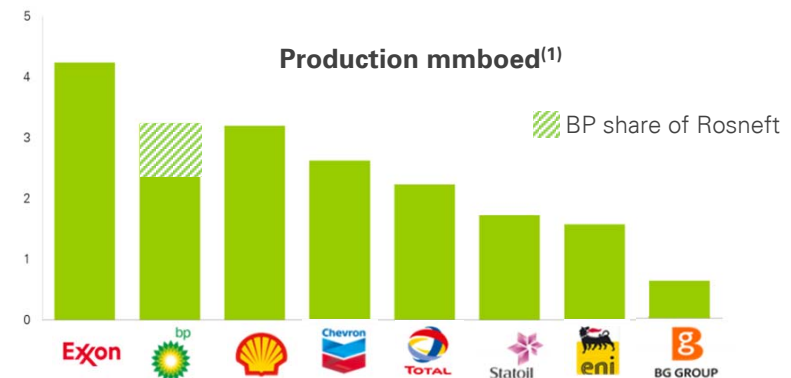
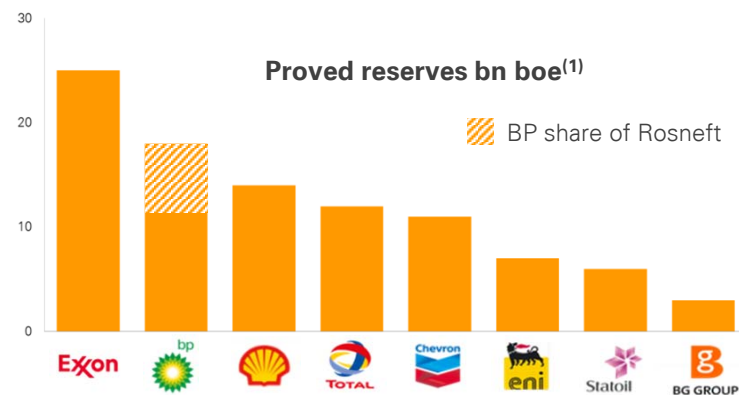
## BP's resource progression conveyor belt



Source: BP internal data. Year-end 2013 Volumes, excludes Rosneft

# Progressing resources

## BP reserves & production position versus competitors



1) Based on 2013 Annual Reports

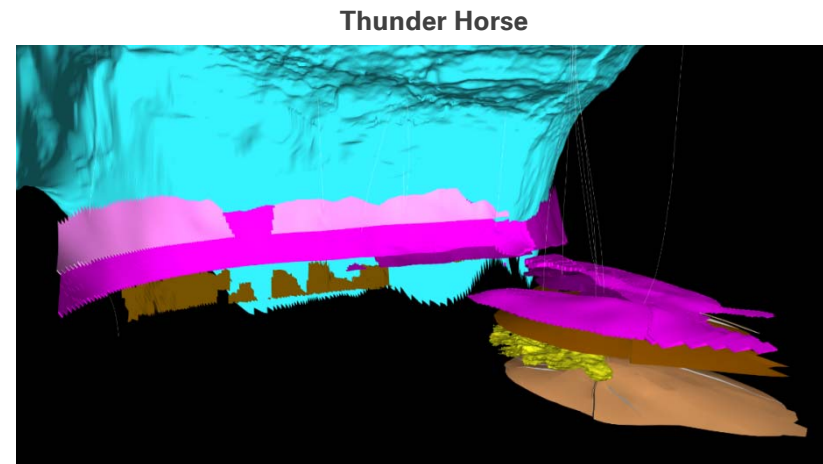
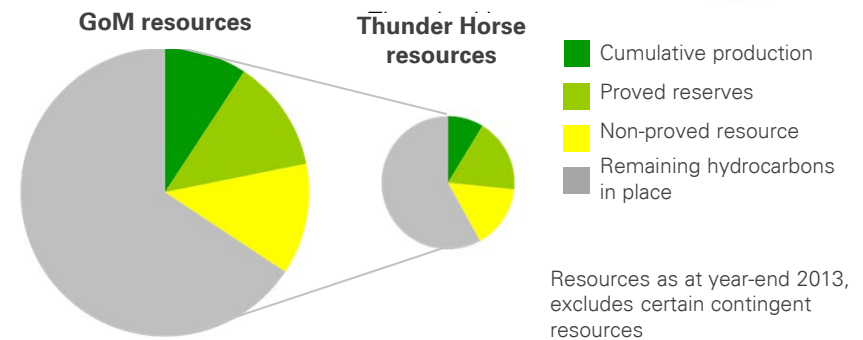
(2) Post-2013 data: BP internal estimates; BP group excluding Rosneft & TNK-BP

# Growth in deepwater fields

## Thunder Horse resource potential



- Early field-life operation in deepwater
- Near term focus on infill drilling and wellwork
- Water injection start-up for improved recovery
- Longer-term focus: subsea infrastructure expansion
- Technology: advanced seismic imaging via ocean-bottom seismic to optimise field potential



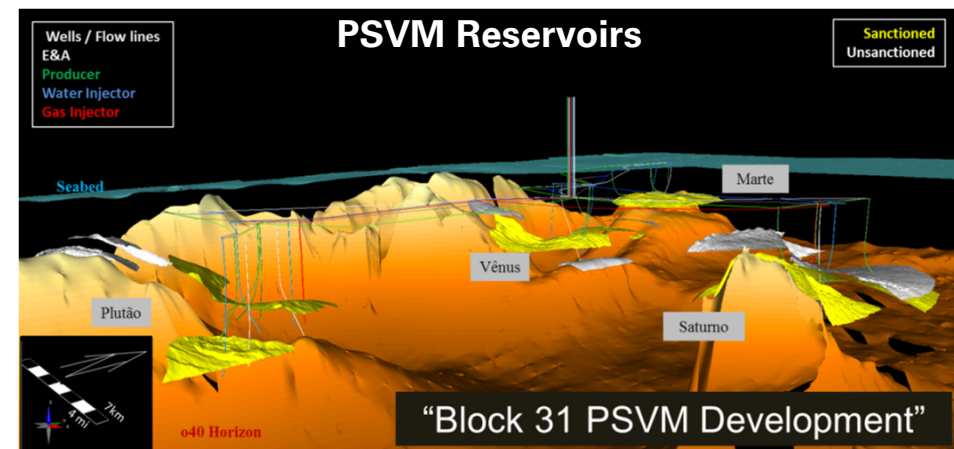
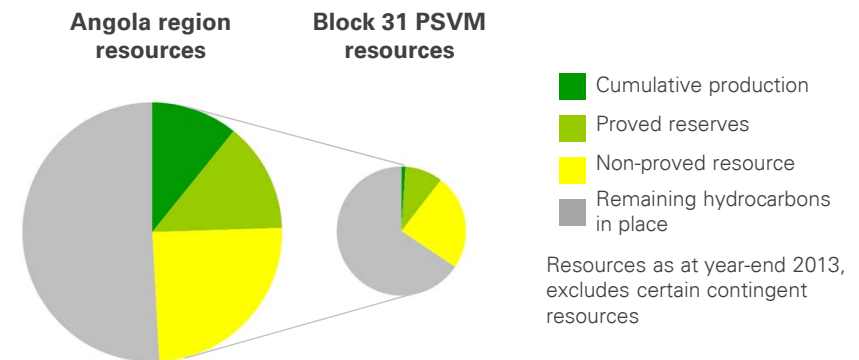
# Growth in deepwater fields

## PSVM resource potential - keeping our vessels full



- 6% recovery to date, early field life
- Strong production performance
  - Higher reservoir energy
  - 94% operating efficiency
  - 13% NPT<sup>(1)</sup> on new well drilling activity
- Water and gas injection underway
- Focus areas
  - Water injection rate increase
  - Evaluation of new reservoirs
  - Leda appraisal well in 2015

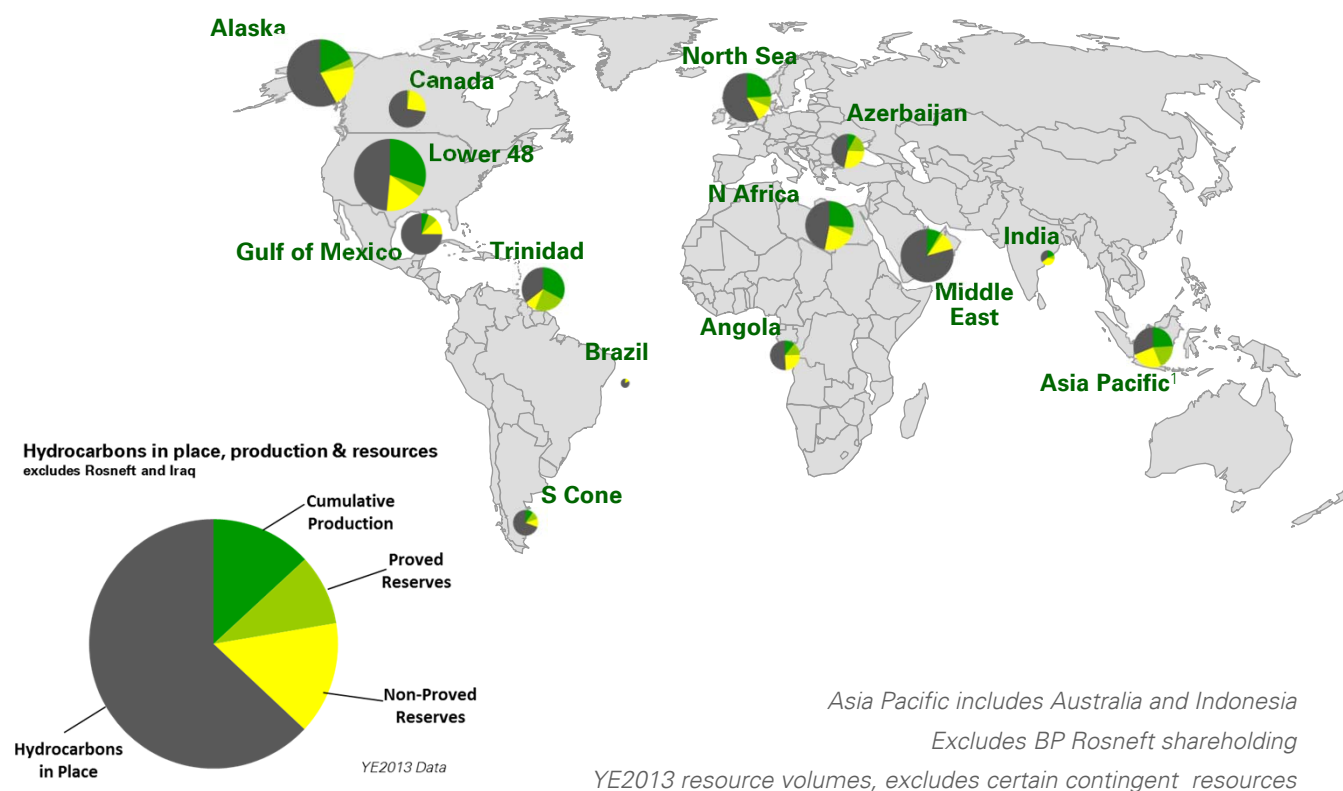
(1) Non-productive time



# Value investment decisions

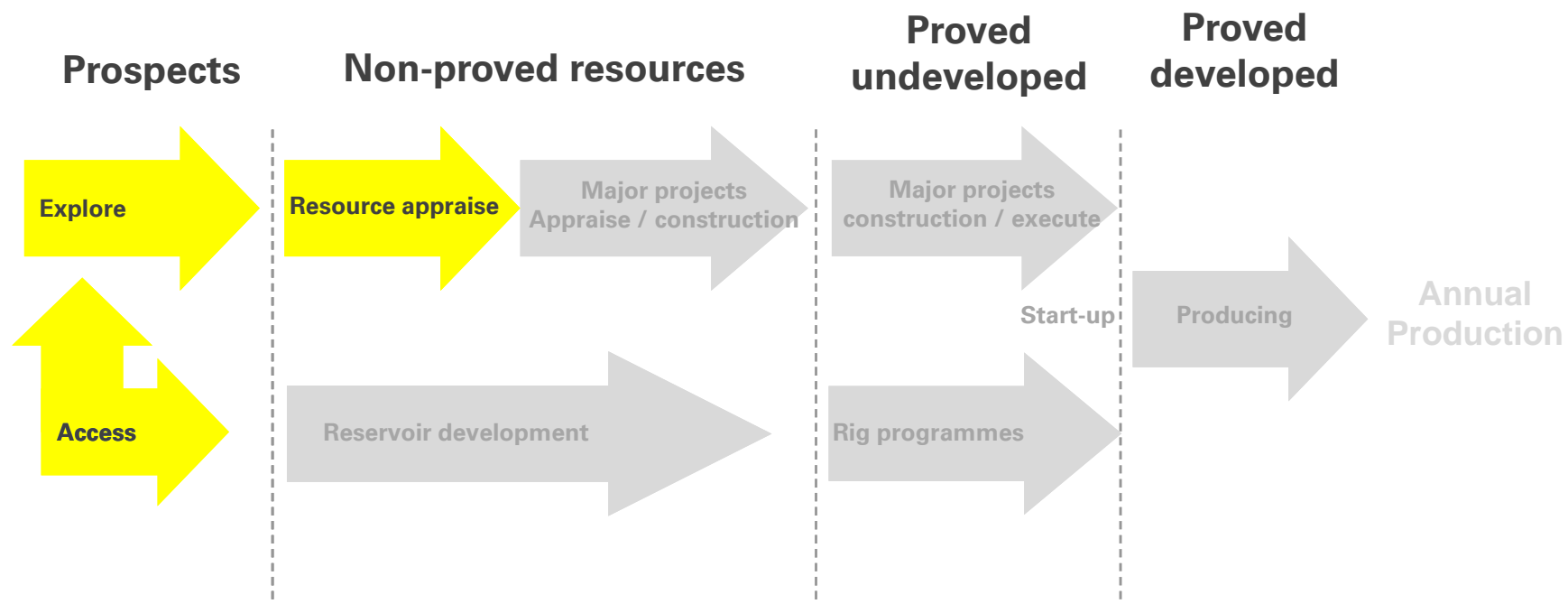


## Current portfolio, produced and remaining



- Quality through choice of activity aligned to a regional strategy
- Ensures executable (integrated) activity through cross-functional agreement of plan
- Drives deployment of BP technologies at scale: EOR, wells, advanced seismic and facility

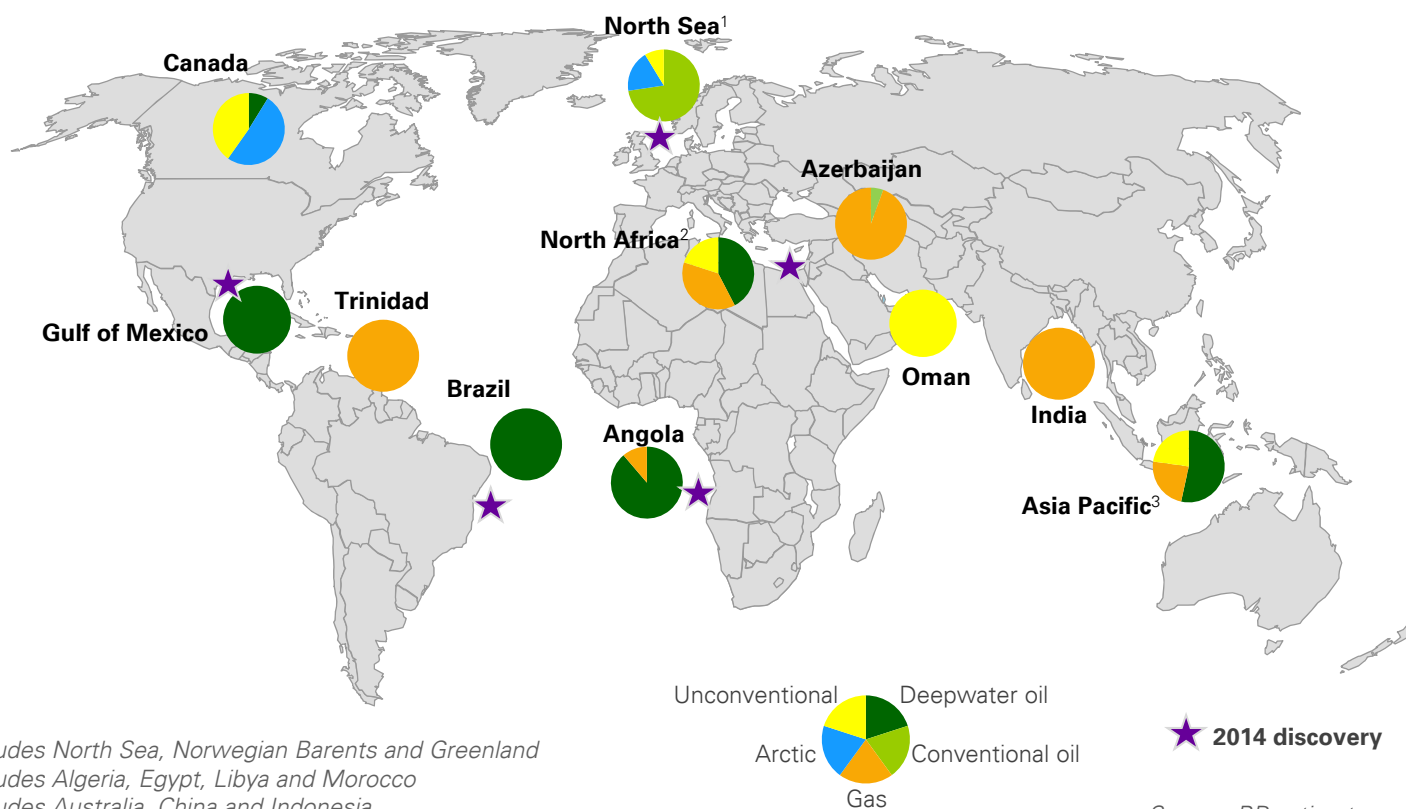
# Exploration access and appraise





# Exploration & resource appraisal

## Current portfolio

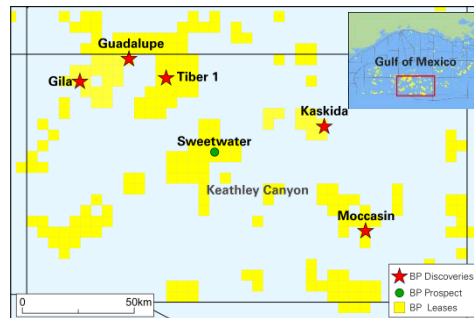


# Exploration & resource appraisal

## Deepwater oil & conventional gas

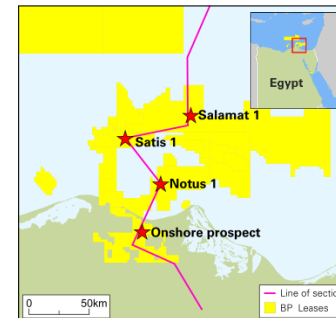


### Gulf of Mexico Keathley Canyon Paleogene



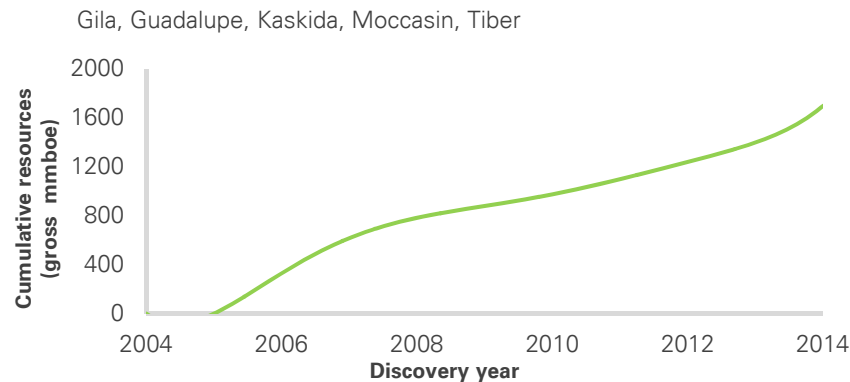
- Built strong Paleogene play position
- New development hub potential through exploration and appraisal

### Egypt Nile Delta

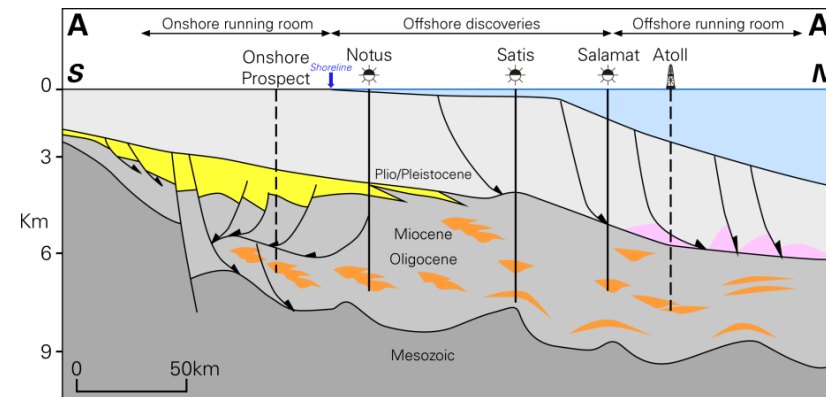


- Proved deep Oligocene play through material discoveries
- Large upside through play extension both outboard and inboard of discoveries

### Keathley Canyon BP gross volumes<sup>(1)</sup>

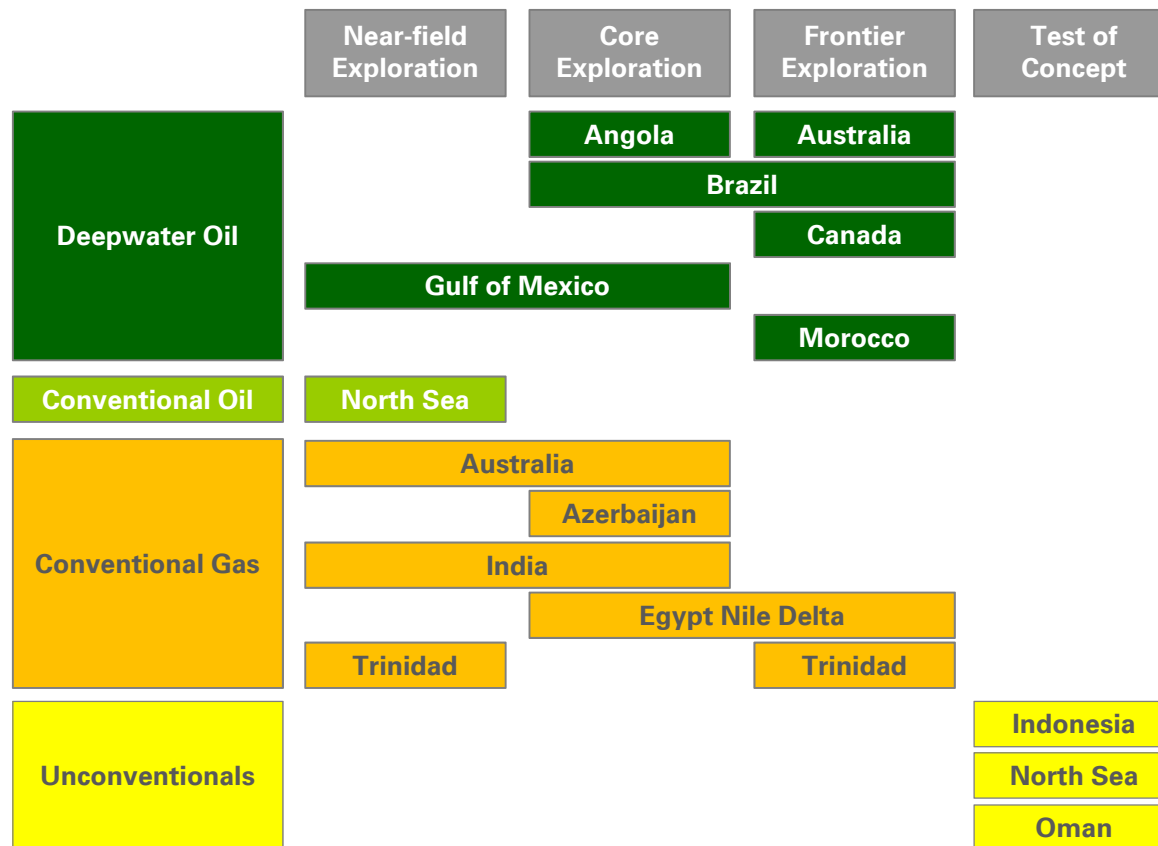


### East Nile Delta cross section



(1) Source: Wood Mackenzie

# Future exploration activity 2014 - 2018



- Balanced portfolio with diversity of future drill-out options
- Drill 15 to 20 wildcat wells per year on average
- Test 15 to 20 new plays
- Over \$2bn of capital investment per year

# Summary

---



- Reloaded exploration pipeline
- Successful 2013/2014 exploration programme
- 4% growth in our resource base despite divestments
- Existing portfolio underpins long-term underlying production growth
- Balanced portfolio of opportunities



# Execution in the base

Bernard Looney



Na Kika, Gulf of Mexico



## Execution in the base



### **Safely, profitably manage decline**

- Safety is our first priority
- Reservoir management
- Drilling efficiency
- Operations efficiency
- Operating expenditure efficiency

~350 oil and gas fields

~2mmboed production

~\$9bn production cost per annum

~20,000 people today

# Reservoir management

## Reservoir sweep

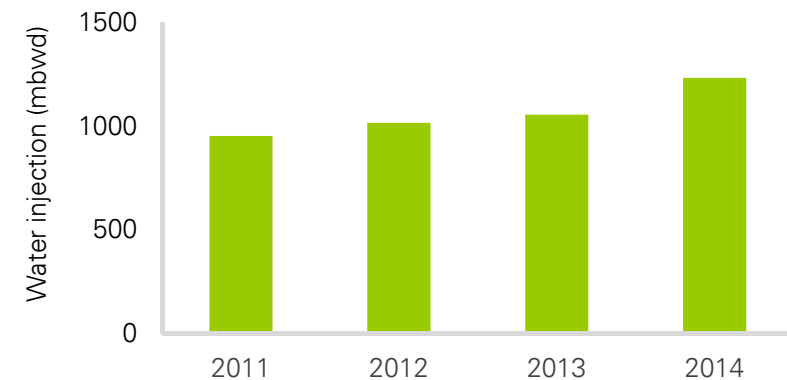


2014 water injection rates



- 78% of 2014 oil production supported by water and/or gas injection
- 5,500 mbd of water injected

Key area BP operated water injection rates

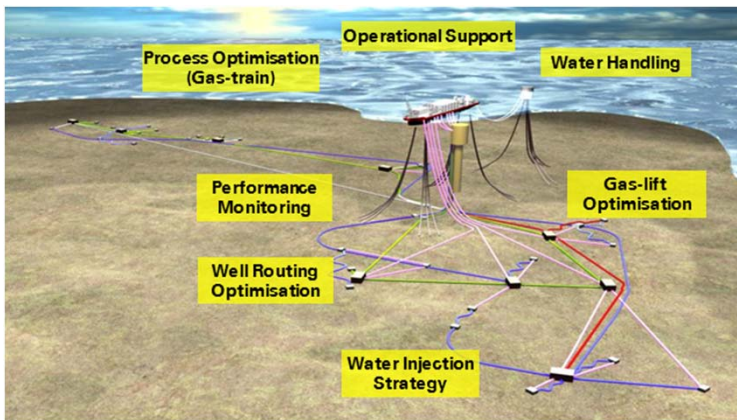


- Water injection volumes into key fields increased by 29%
  - Added 31 injectors since 2011
- Delivering systematic waterflood management
  - Right volume, right place, right quality, right time

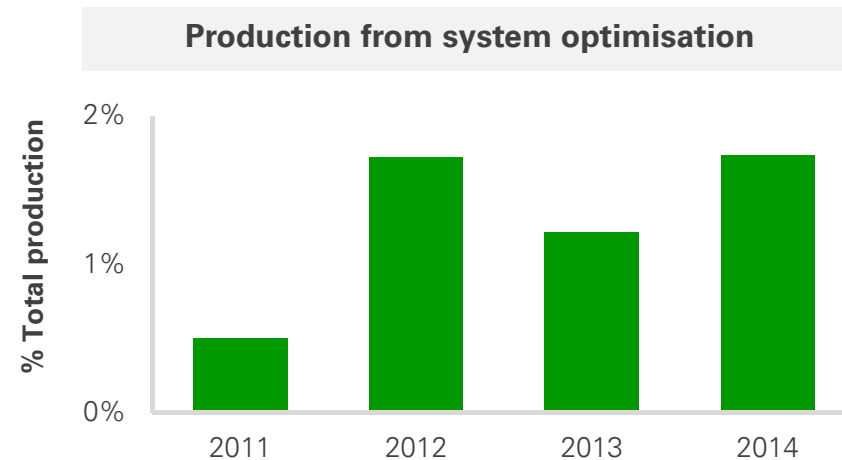
2014 represents BP estimate

# Reservoir management

## System optimisation



- Systematic identification of opportunities
- Targeted deployment of capability and technology
- System modelling and optimisation has delivered 1-2% of production each year since 2012



2014 represents BP estimate



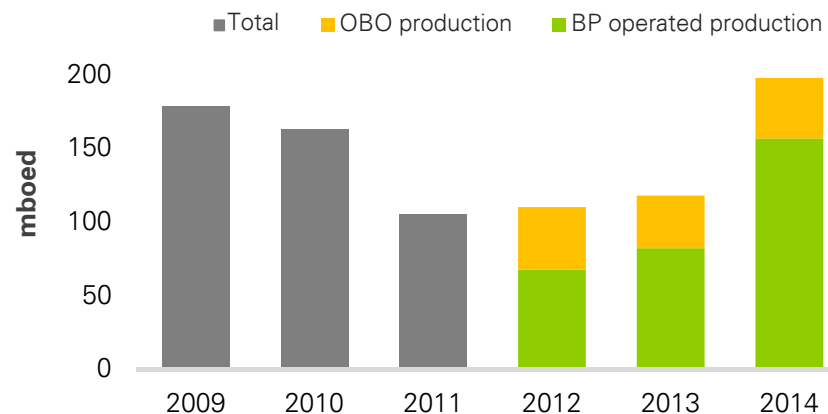
# Drilling Efficiency



- 42 operated rigs by end 2014
- 126 BP operated wells drilled
- Returns over 25%

*Source: BP Internal data; 2014 estimated  
All data excludes Lower 48*

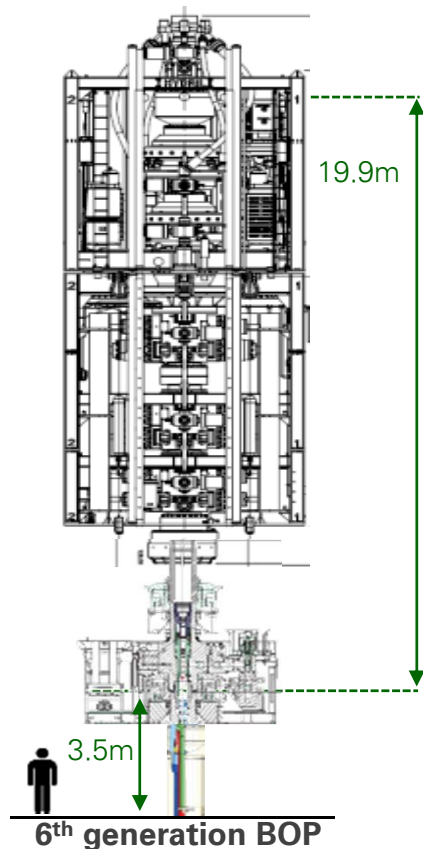
## New well delivery and wellwork production



- Highest new well delivery since 2009
- First time ahead of plan since 2009
- Wellwork highest since 2009
- BP operated non-productive time decreased 18% since 2012

# Drilling

## Blow Out Preventer reliability

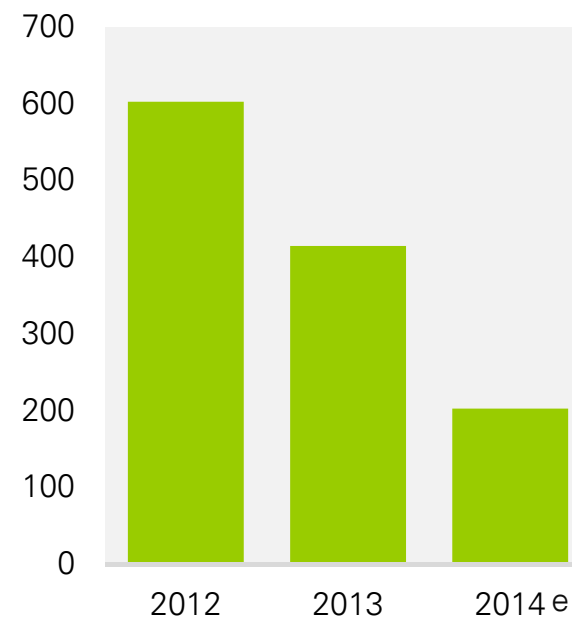


### BOP reliability team

- Dedicated team of experts
- 4 focus areas
  - Troubleshooting and risk assessment
  - Maintenance
  - Defect elimination
  - Contractor engagement

### Subsea BOP reliability

#### Non-productive time (days)



Source: BP Internal data

# Operations Efficiency



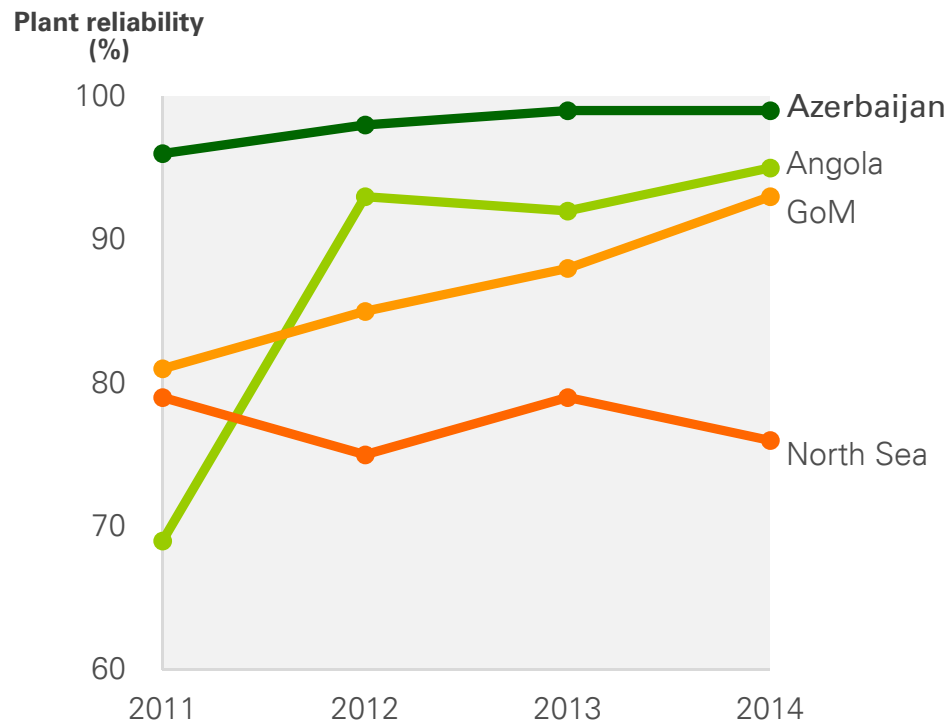
- Global operations priorities
  1. Embed the functional organisation
  2. Drive improvement in reliability and maintenance
  3. Manage process safety and plant integrity
  4. Strengthen control of work
  5. Instil operating discipline
- Simplification and efficiency – 2015 onwards



Source: BP internal data  
All data excludes Lower 48

# Operations Key regions

## Plant reliability



- Drive root cause failure analysis
- Eliminate defects
- Eliminate vulnerabilities
- Build capability

(1) Source: BP internal data; 2014 based on 3Q YTD

# Operating Expenditure Efficiency

---



## In action

- ~1,000 staff reduction due to divestments and restructuring by year end 2014
- ~1,200 reduction in agency staff by year end 2014
- Alaska and Lower 48 improvement plans

## Forward plan

1. Safety remains our top priority
2. Activity: amount and pace
3. Efficiency: right sized overheads and simplified processes
4. Specifications: “fit for purpose” & industry solution
5. Unit costs: rebid & consolidate, etc.



## Summary

---

- Safety continues to improve – remains our number 1 priority
- Safely, profitably manage production decline to compound annual 3-5%
  - Continue focus on reservoir health
  - Competitive drilling in every basin
  - Improve North Sea plant reliability
- Continue to drive operating expenditure efficiency



# Gas

Andy Hopwood and Paul Reed

Tangguh LNG Plant, Indonesia





# Gas

---

Andy Hopwood, COO Strategy and Regions

Paul Reed, CEO Integrated Supply and Trading

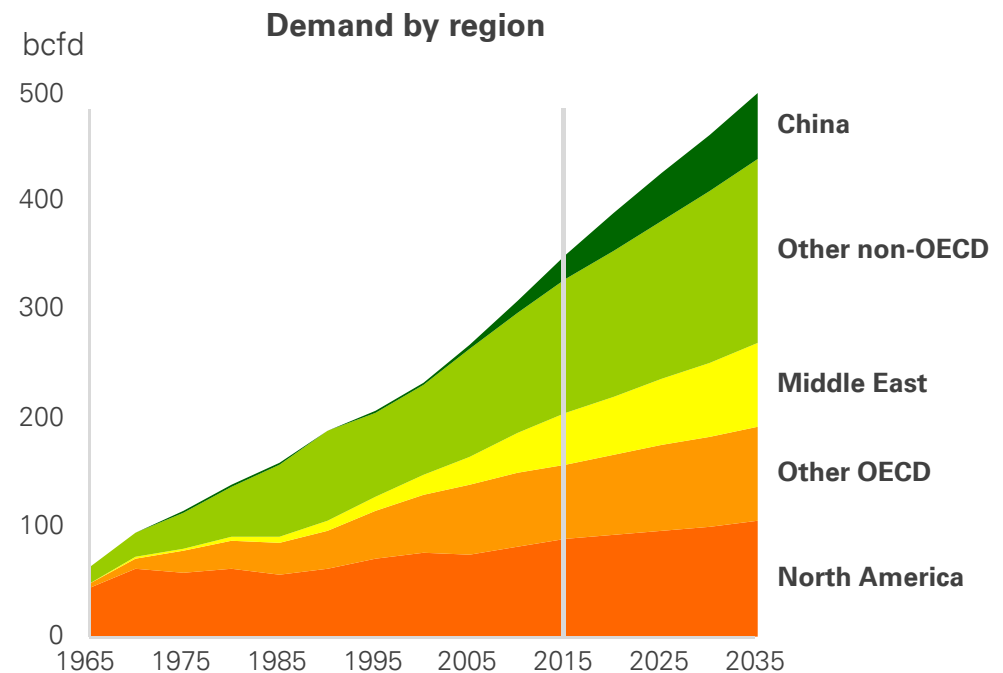
## **Agenda**

- Strategy
- Portfolio
- Business model
- Potential outcomes



## Demand for gas continues to grow

- Global gas demand grows at around 2% pa ~ double that of oil
- Global LNG demand grows at around 4% pa
- Demand driven by non-OECD countries
- North American unconventional supply growth continues



Source: Energy outlook 2035



## Our strategy for gas is focused on value

---

- **Access the lowest cost resources** in the basin
  - From incumbency in oil and exploration
- Be prepared to take on projects at **scale and complexity**
  - Deep water, pipelines, LNG, unconventional, technology
- Maintain a **deliberate balance** with a view to the long term
  - Resource type, price, geography, politics, and domestic and export
- Grow a **critical scale of LNG** business to manage risk and improve margins
  - Balanced equity and merchant position provides potential growth
- Use **knowledge of key markets** to provide value from trading
  - Three key hubs in North America, Europe and Asia
- Deploy **conversion technology selectively** only when it can add value

# Material portfolio of gas value chains



Estimates based upon BP planning assumptions

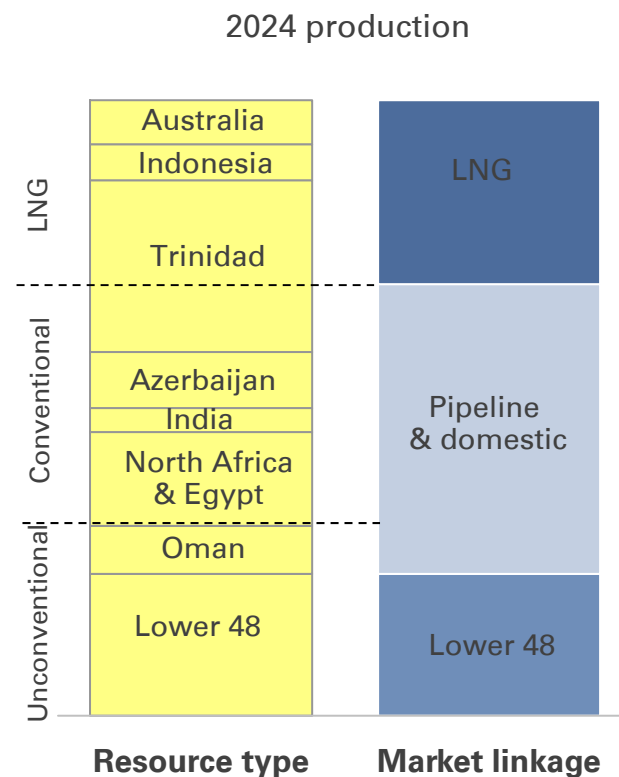
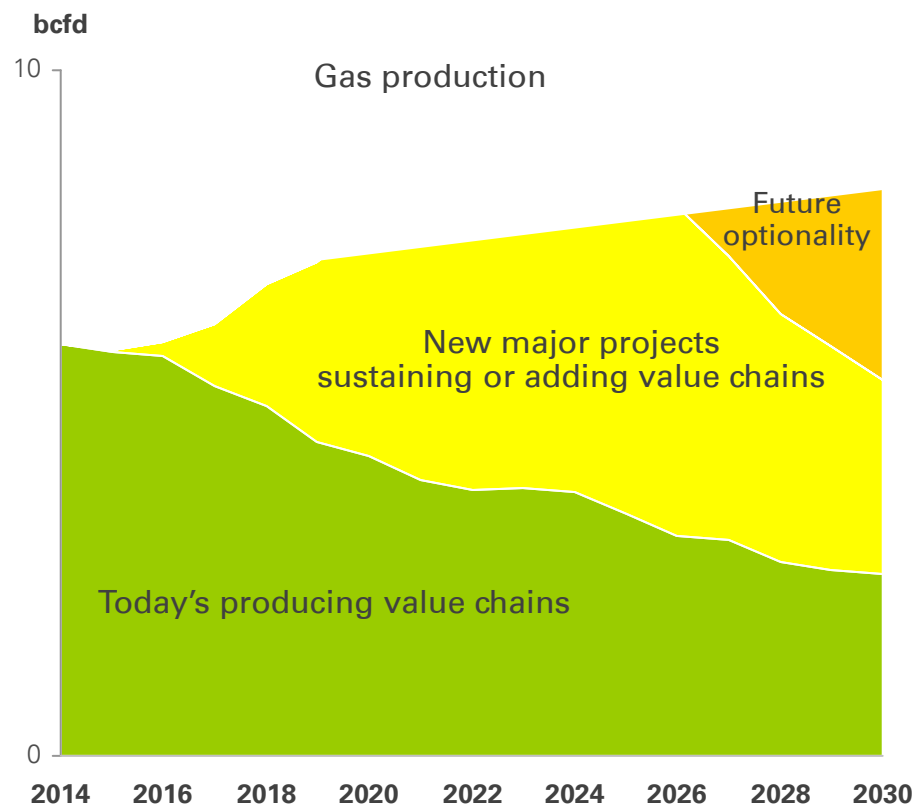


# Significant future investment potential

Value chain	2014 BP production (bcfd)	BP upstream production equity (%)	BP net plateau (bcfd)	Potential lifespan (yrs)	Optionality
Trinidad	2.3	BPTT (70% BP)	2.2 - 2.5	15-20	Potential to extend contracts and sustain production from infill, tie backs and further exploration
Lower 48	1.7	Various	1.8 - 2.0	>50	Drive growth through improved competitiveness of the newly separated Lower 48. Focused in five franchise plays
Azerbaijan	0.3	28.8% Shah Deniz 50% Shafag Asiman	0.7 - 0.8	>20	Expansion of the Shah Deniz field and potentially new basin discoveries into the newly built corridor
N Africa	0.6	50-60% Egypt 33-46% Algeria	1.0 - 1.3	>40	Offshore and deep Nile Delta reservoirs provide sustained resource pull through opportunities
Oman	0.0	60% Block 61	0.7 - 1.1	>40	Potential to expand processing capacity, and extend development within Block 61 to the North
India	0.1	30% of Reliance offshore blocks	0.4 - 0.5	10-15	Large resource base; R-series satellites and the D55 discovery. Requires gas price clarity
Indonesia	0.4	37.2% Tangguh VICO 50%	0.4 - 0.5	>20	Tangguh train 3 expansion through infill, tie-backs and exploration to support growing capacity
Australia	0.5	16.7% NWS 17.2 % Browse	0.4 - 0.6	>30	Potential to extend NWS plateau through new exploration, and third party tie-ins, enhanced by FLNG development of Browse.
Alaska	0.0	26% Prudhoe Bay 32% Point Thomson	0.7 - 0.8 (2025+)	>30	Potential new gas value chain via LNG to monetise significant Point Thomson and Prudhoe Bay gas resources
<b>9 hubs</b>	<b>6.0</b>		<b>8 - 9</b>	<b>&gt;40</b>	

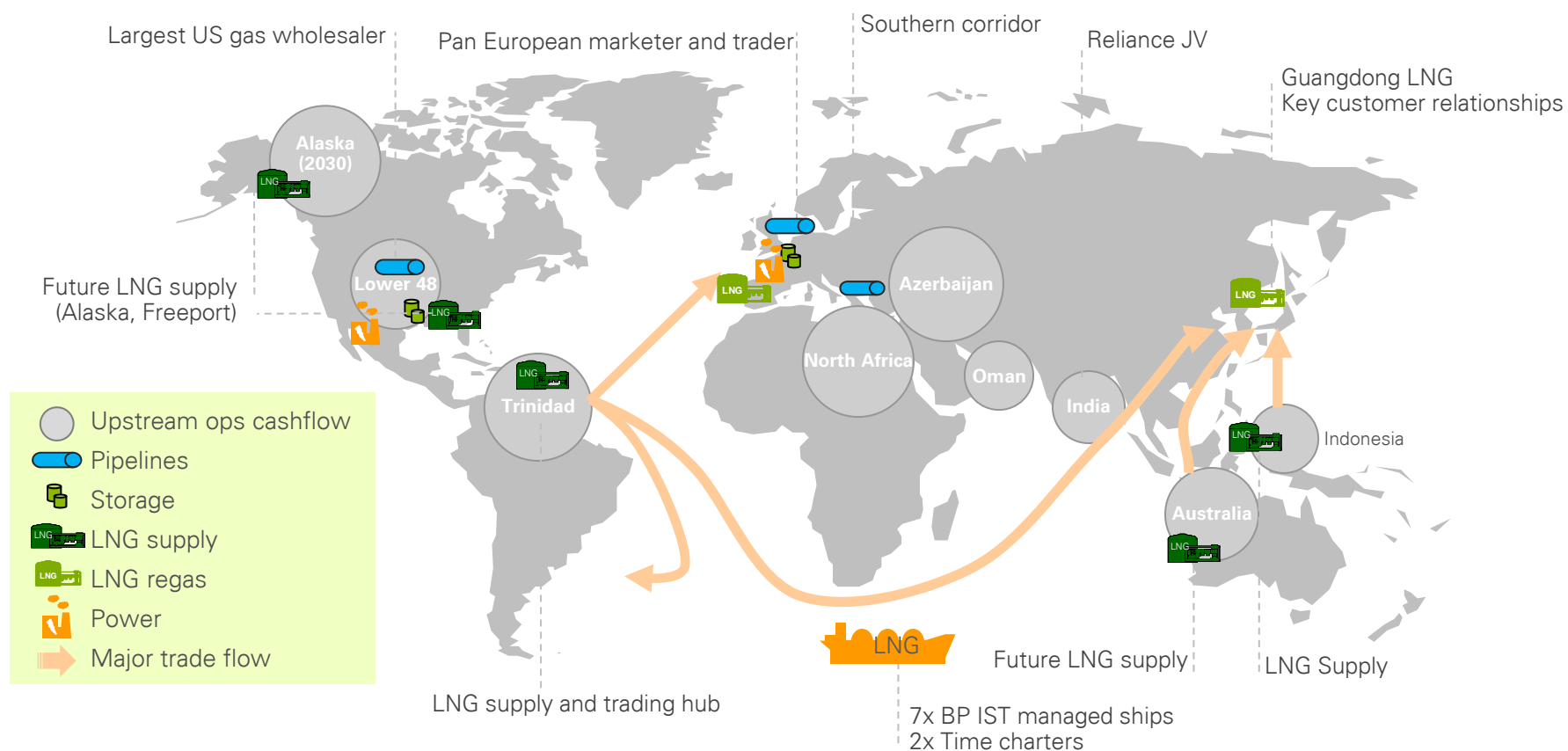


# Balanced production growth





## Supported by Integrated Supply & Trading assets



## A world class marketing and trading capability

---



Experienced global team of professionals

- Deep knowledge of market supply and demand
- Relationships with key global gas players and regional partners

Global scale and flexibility

- Largest wholesale gas trader in North America
- Pan-European presence in gas
- A leading LNG portfolio

Adding incremental value to BP's gas value chains

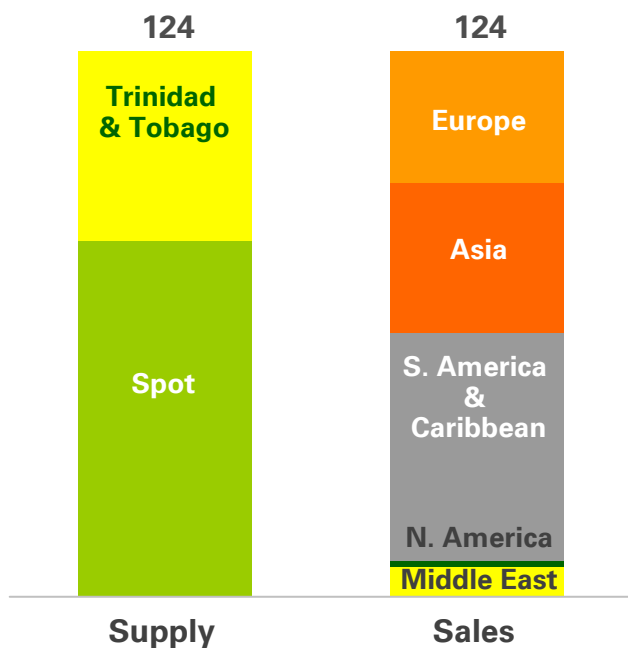
- Informed seller of equity gas
- Ability to capture value as market conditions change





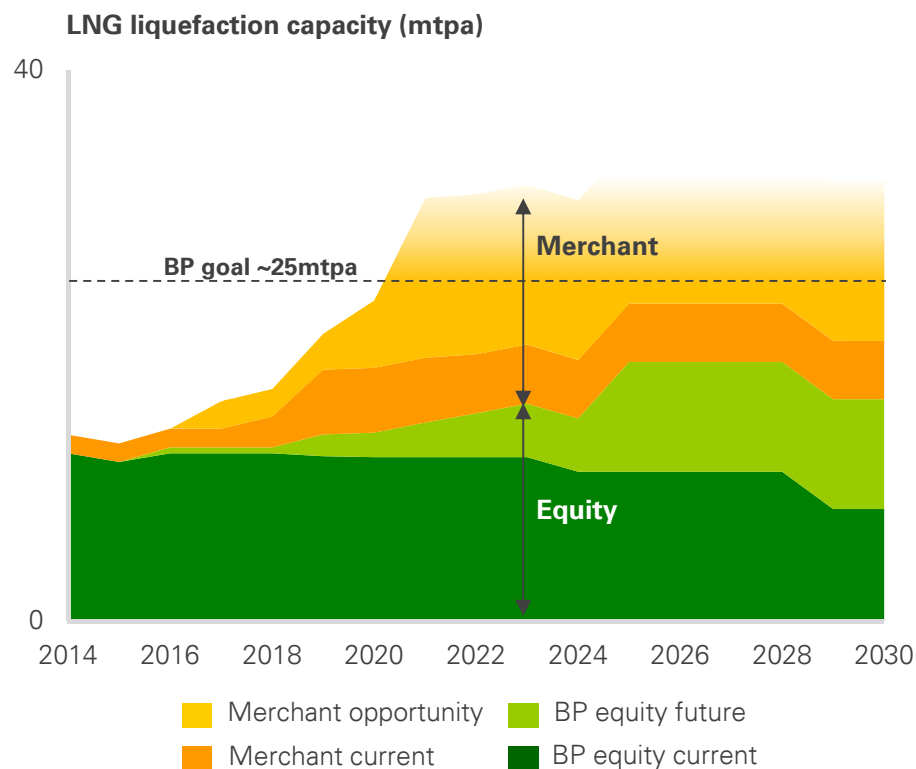
## Enables growth in our LNG portfolio

2014 year-to-date LNG cargo flows



Full year 2014 forecast  
~140 cargoes traded, 18 countries, 40 counterparties

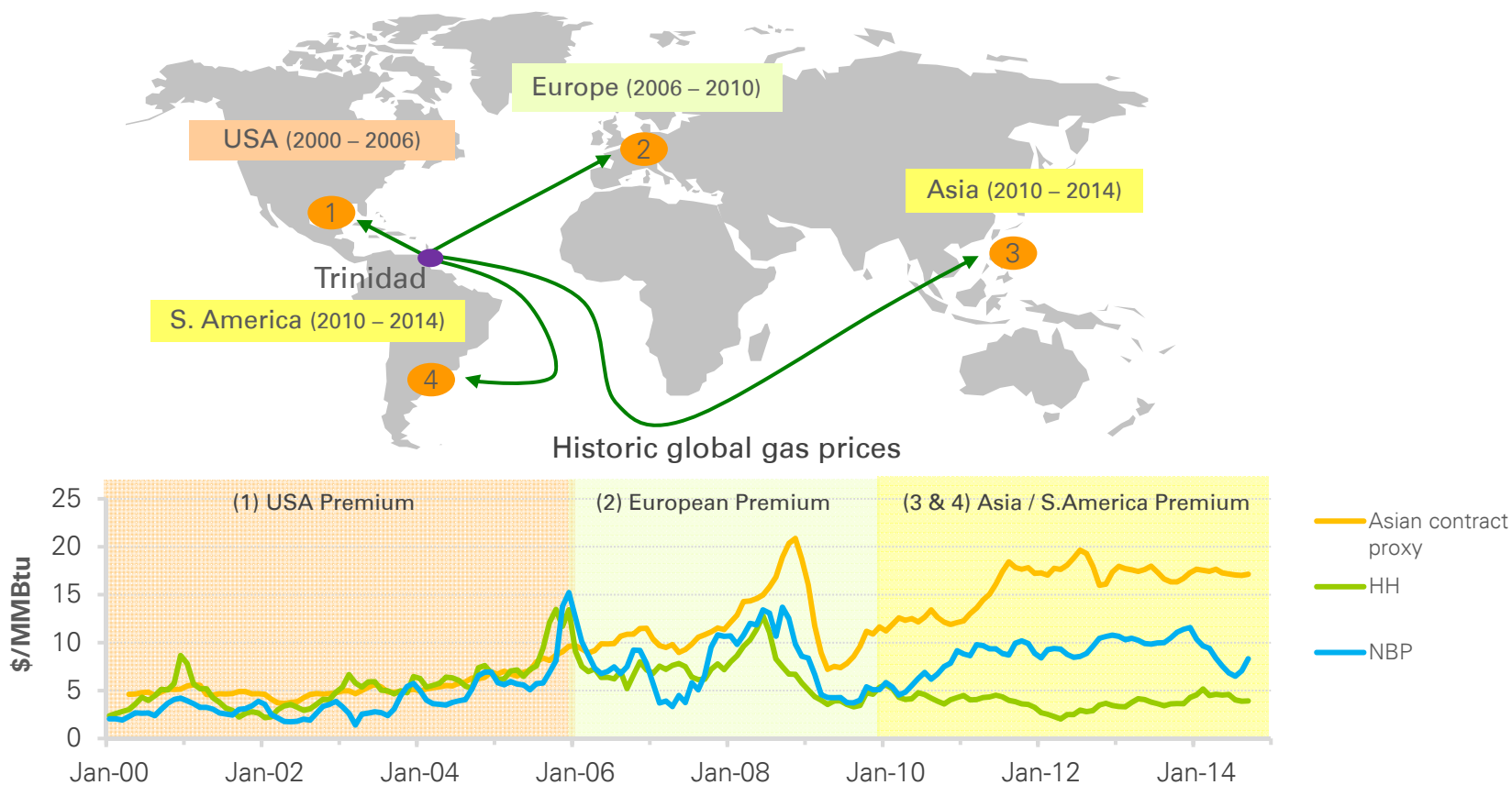
Potential BP portfolio



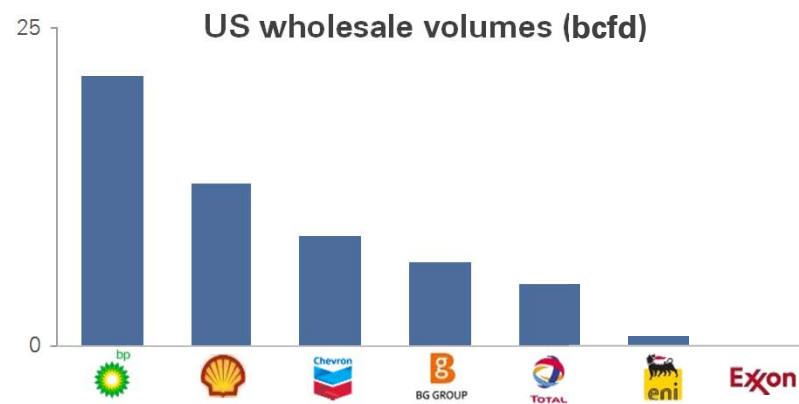
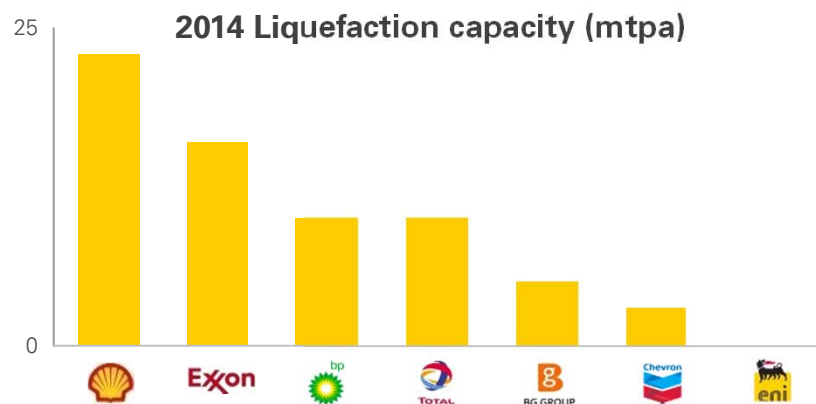
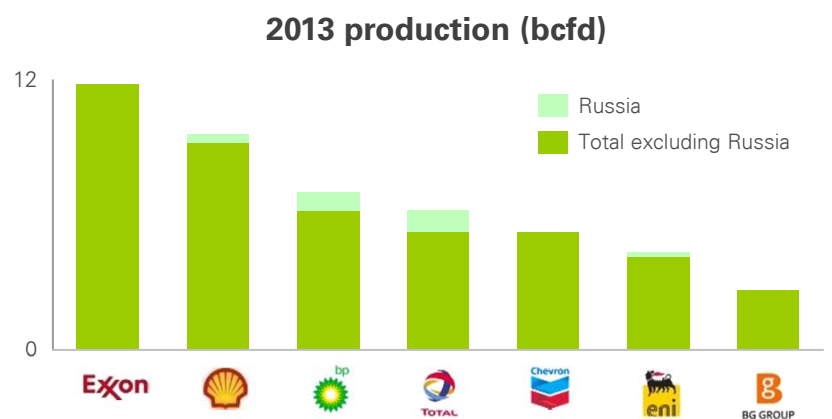
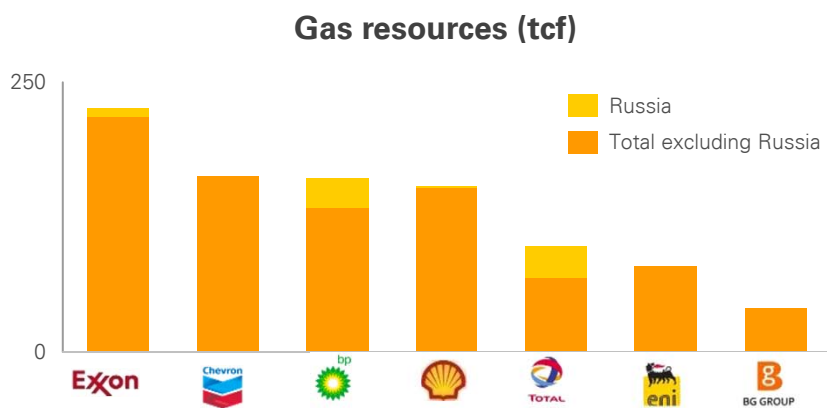


# Flexibility key as premium markets shift over time

## Trinidad & Tobago



# A business competitively positioned for value



Source: BP internal, Wood Mackenzie, FERC 552 returns, company information.

# Summary

## Material gas resources

- 133 tcf of BP entitlement resources

## Significant growth potential

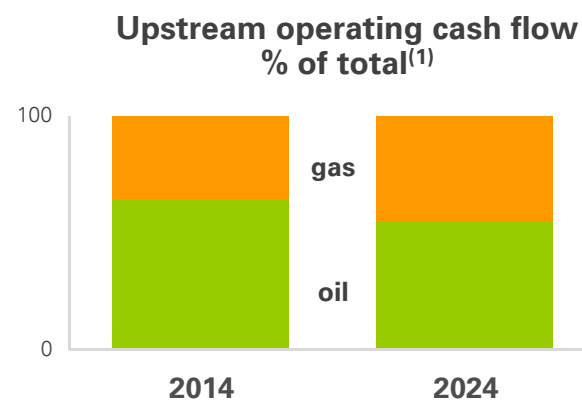
- Gas growth greater than oil

## Material cash conversion

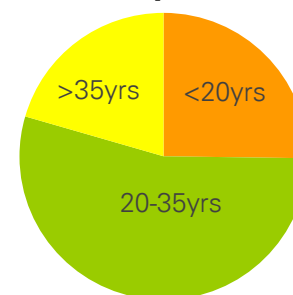
- Investment of ~\$100bn by 2024

## Margins expand and returns improve

- Lower development costs for gas



## BP major gas projects production profile length



(1) BP long-term planning price assumptions



# Projects

Neil Shaw

**Quad 204, North Sea**  
Under construction in Korea







# Track record of project delivery

## 2012 – 2014 Major projects start-ups

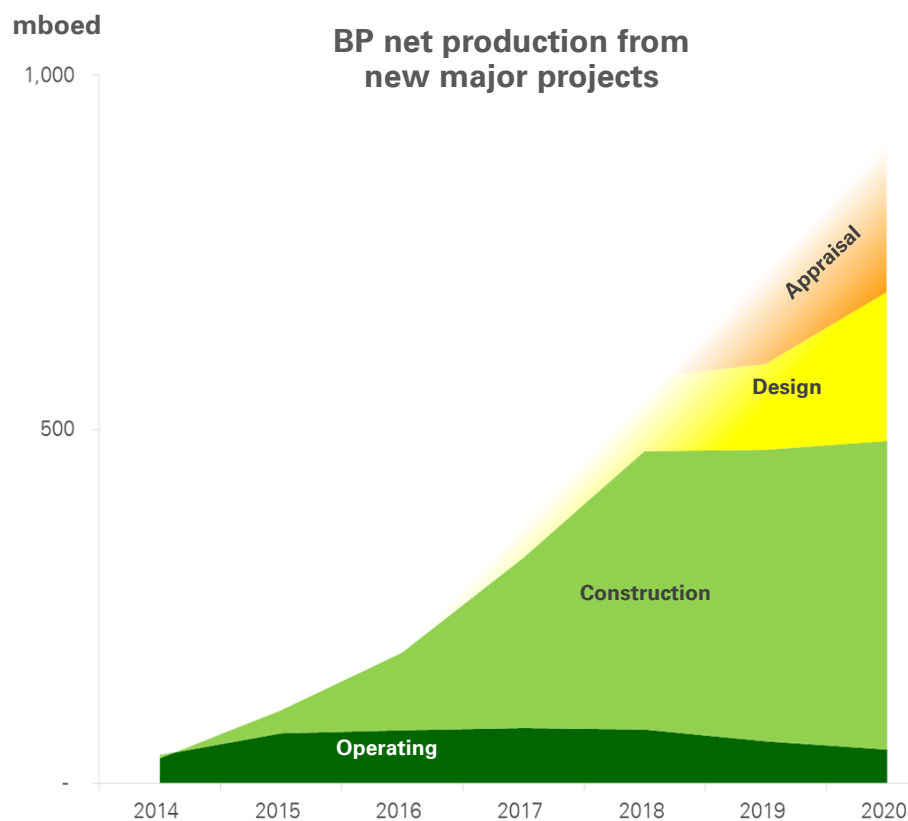
2012	2013	2014
<ul style="list-style-type: none"><li>✓ Clochas-Mavacola</li><li>✓ Galapagos</li><li>✓ Devenick</li><li>✓ PSVM</li><li>✓ Skarv</li></ul>	<ul style="list-style-type: none"><li>✓ ALNG</li><li>✓ Atlantis North Expansion 1</li><li>✓ North Rankin 2</li></ul>	<ul style="list-style-type: none"><li>✓ Chirag Oil</li><li>✓ Mars B</li><li>✓ Na Kika 3</li><li>✓ Atlantis North Expansion 2</li><li>✓ CLOV</li><li>Kinnoull</li><li>Sunrise 1</li></ul>

On track to deliver 15 major projects 2012 – 2014  
Top quartile first year operability performance





# Major projects growth to 2020



2014	2015
Chirag Oil Mars B Na Kika 3 Atlantis North Expansion 2 CLOV	Kizomba Satellites 2 In Salah Southern Fields Western Flank A Greater Plutonio 3
Kinnoull Sunrise 1	
2016	2017
Thunder Horse Water Injection ALNG Re-start In Amenas Compression Point Thomson Quad 204	Juniper Persephone Khazzan Thunder Horse South Expansion Clair Ridge
	West Nile Delta – Taurus/Libra West End Development
2018 - 2020	
Shah Deniz 2 Mad Dog 2 Zinia 2 Culzean West Nile Delta – Giza/Fayoum/Raven Western Flank B Pike 1 Sunrise 2 Tangguh Expansion KG D6 R-Series KG D6 Satellites Liberty	Atlantis Water Injection Expansion Kaskida Thunder Horse North West Expansion Dalia 1B Alligin Snadd East Nile Delta Angelin KG D6 D55 Itaipu Wahoo



# On track to deliver 15 projects 2015 – 2017



**In Salah Southern Fields (2015)**

Construction 78% complete



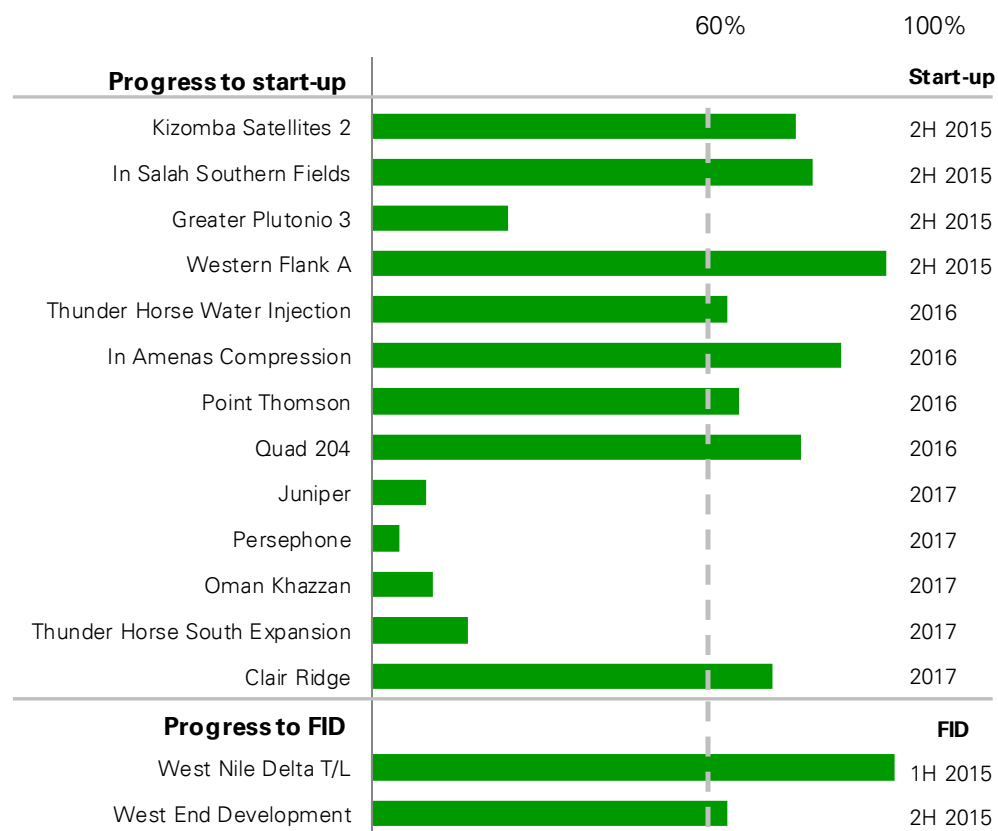
**Quad 204 (2016)**

Construction 75% complete



**Clair Ridge (2017)**

Construction 70% complete





# Improving project execution

- Global execution model
  - Organisation, systems and processes
  - Centres of expertise
  - Economies of scale
- Concept development re-engineered
  - Single global centre of expertise
  - Consistent and systematic approach to optimisation
  - Lean engineering in collaboration with supply chain

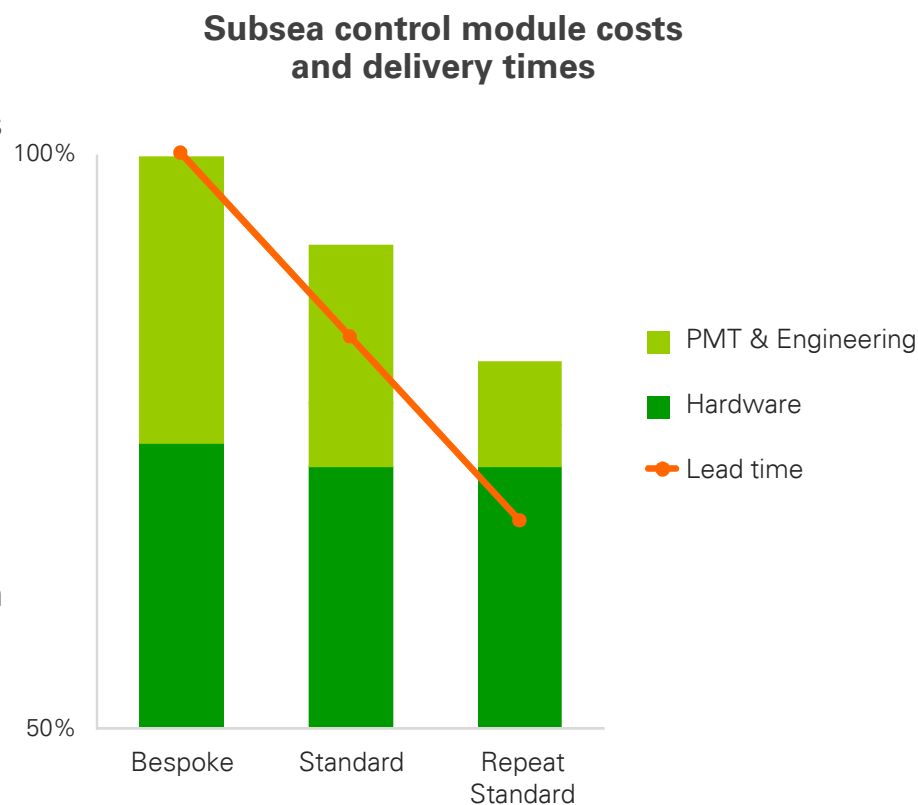
Input metrics (Ongoing projects)	BP relative performance (Quartile)	
	2010	2014
Reservoir FEL	1st	1st
Facilities FEL	1st	1st
Wells FEL	2nd	1st

Output metrics (Completed projects)	BP relative performance (Quartile)	
	2010	2014
Schedule predictability	2nd	1st
Cost predictability	3rd	3rd
1st year operability	3rd	1st



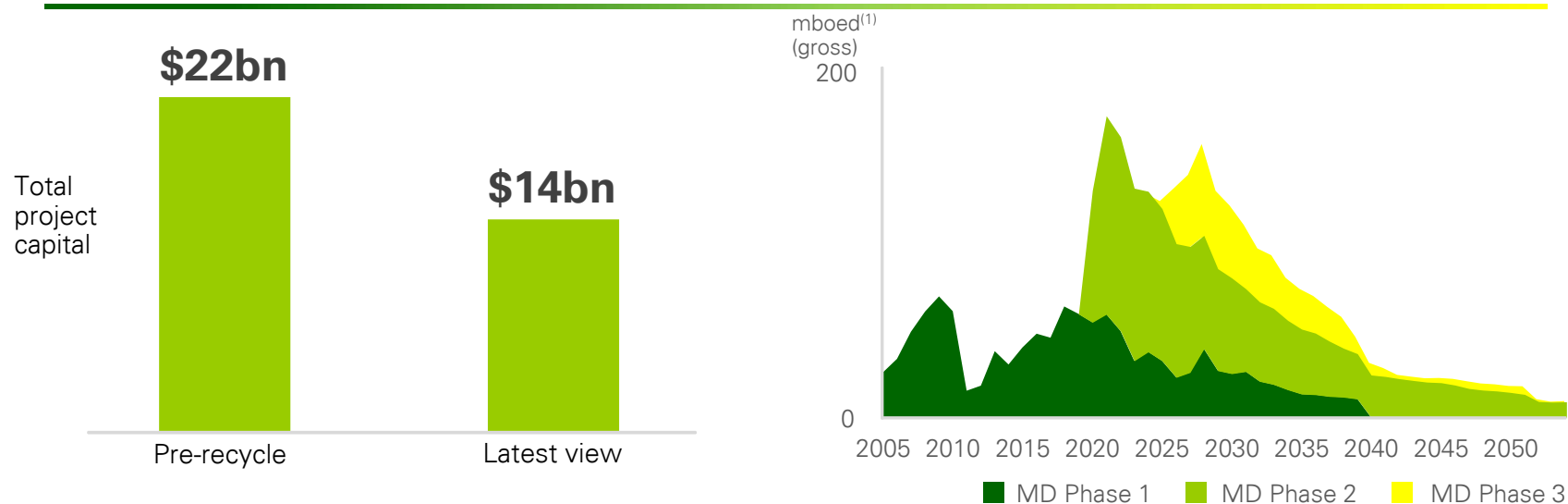
# Standardisation

- Organised to standardise
  - Global subsea and facilities hardware teams
  - Global concept development team
  - Multi-year programme to drive standardisation at scale across projects portfolio
- Circa 15% cost and schedule savings
  - Direct costs – lean engineering using standard industry solutions
  - Indirect costs – minimise through repetition
  - Managed competition across strategic suppliers





## Mad Dog 2

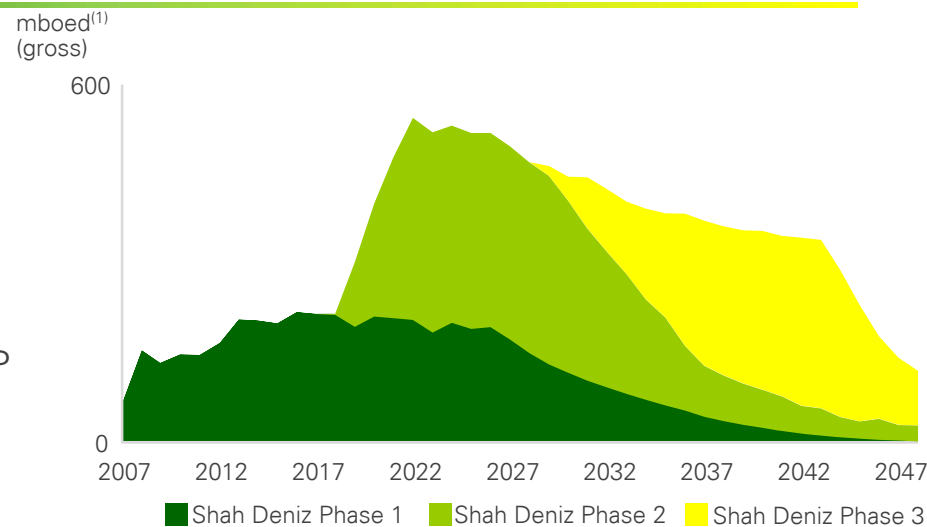


- **Material high-value project**, total field is 4 bn boe in place, only 12% recoverable oil produced to date
- **Focus on value**, ~90% of MD2 resources from 65% capital, retaining optionality for future expansion
- **Standardised solutions**, Re-engineered using proven Atlantis concept, worked with suppliers to challenge costs informed by industry benchmarks and solutions
- **Optimisation**, systematic optimisation of all technical trade-off decisions

1) BP internal data

# Shah Deniz 2

- **Material high-value project**, BP's largest ever gas discovery – 40 tcf gas and 2 bn barrels oil in place
- **Alignment across the value chain**, countries, partners and contractors working together with BP actively influencing TANAP and TAP execution
- **Strong project execution track record**, predictable delivery of six major projects in the region
- **Project execution on track**, overall 25% complete; all major contracts placed and construction ramping-up

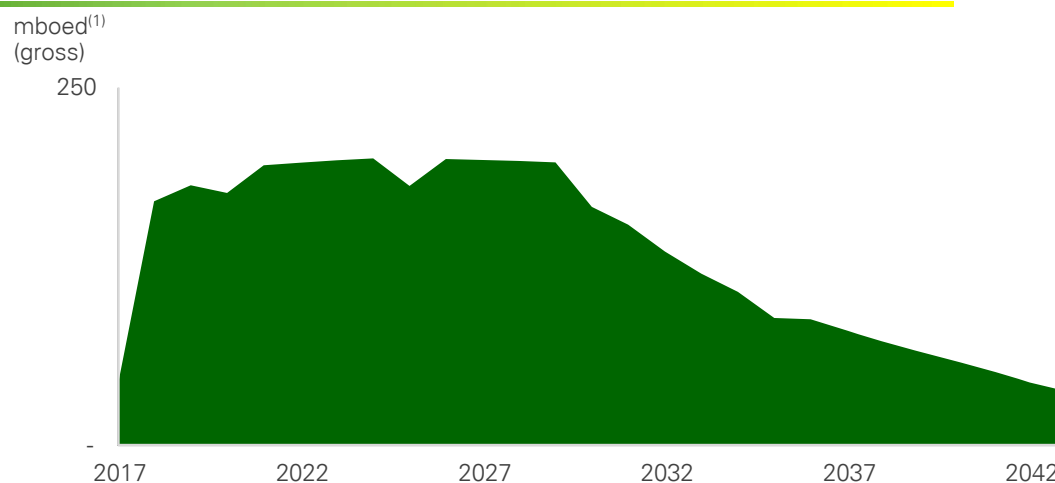


1) BP internal data



# Oman Khazzan

- **Material high-value project**, develops 7 tcf resources with peak production of ~1 bcfd
- **Technology**, leverages BP capability in tight gas development to optimise recovery
- **Project execution on track**, overall 12% complete with all major contracts placed and construction ramping-up



1) BP internal data



## Summary

---

- High-quality and material project portfolio to underpin growth to 2020 and beyond
  - Over 900 mboed of expected new net production by 2020
    - 50% under construction
    - next 15 projects on track for start-up in 2015 - 2017
  - 2015 - 2020 project margins over 35% greater than 2014 segment average
  - Deep portfolio – only do the best when they are optimised and ready to execute
- Global execution model improving project optimisation and execution
  - Re-engineered concept development to systematically optimise for value
  - IPA benchmarks BP project performance as first quartile on five of the six key metrics
  - We see potential to further improve