GFRC Meeting, 10 October 2017

1430-1530, ET Meeting Room, SJS

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Agenda:				
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1435	Cyber Security Risk Review • Legacy Infrastructure Review • Cyber Security Dashboard	SH	For review	5
1450	Dashboard: Liquidity & Financial Framework	KT	For review	walk-in
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1505	Discount rate review • Review of discount rate assumptions	KT/JHB	For review	23
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Pre-read only:				
	Dashboard: Tax		For info	101
	Dashboard: Economic risk		For info	103
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Attendees:

BG	✓	RC	✓	KMW	✓
DJB	✓	DJ	✓	JHB	✓
KT	✓	MOS	✓	MMA	dial-in
RS	✗	JCF	✓	JL	✗
AHH	✓				

Other attendees: Susan Dio, Rob Lawson

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Members of the Group Financial Risk Committee

GFRC Minutes – 18th September 2017 DRAFT

Attendees:

BG	✓	RC	✓	KMW	✓
DJB	✓	DJ	✓	JHB	✗
KT	✓	MOS	✓	MMA	✓
RS	✓	JCF	✗	JL	✗
AHH	✓				

Other attendees: Rob Lawson
Other apologies: Susan Dio

1. Review of Minutes and Actions from 11th July meeting

Previously distributed minutes and actions for the meeting on the 11th July 2017 were reviewed and agreed.

2. For Approval

- The proposals for alignment of Counterparty Due Diligence (CDD) processes, systems and teams were supported by the Group CFO. These include:
    - a basic minimum CDD procedure;
    - centralisation of all CDD activity in GBS, with an appropriate global process owner.

3. Other items & actions

- Year-end cash cover ratio (FFO/AD) expected to be 28% versus S&P expectation of 24%, with year-end net debt of $39.2bn;
    - a year to date impact of €/£ on net debt of $0.9bn;

- There are no outstanding actions from previous meetings.

Draft 2017 GFRC Forward Agenda							
Date	**Financial risk: Debt & Liquidity**	**Financial risk: Sources & Uses of Cash**	**Financial risk: Long-term liabilities**	**Financial risk: Investment effectiveness**	**Compliance & Control risks**	**Finance Operating risks**	**Cyber security risk**
1 Dec	Liquidity & Financial Framework Dashboard Debt Book review Financial Resilience risk review	Economic Risk Dashboard Tax Risk Dashboard Credit risk review, including a review of expected loss limits IST dashboard	Pensions		Risk factors for full year results IFRS-16 update	Finance group risks MBAC: Compliance with business regulations	CS Dashboard

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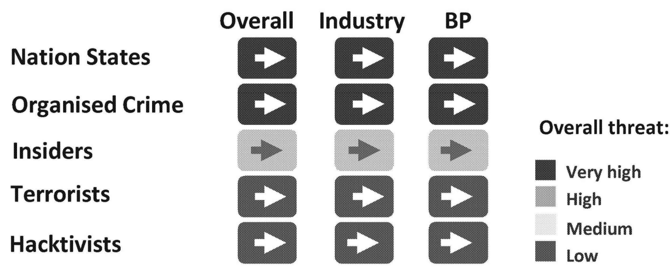
Members of the Group Financial Risk Committee

Cyber Security Threat Landscape Update – October 2017



Events within BP

BP continues to be targeted by a range of cyber attackers, including criminals using cyber to attempt fraud.

1. BP staff defeat attempted cyber attack by reporting suspicious emails. The emails claimed to be in relation to BP invoices and contained documents that, if opened, would have compromised user's PCs. BP's Cyber Security Operations Centre (SOC) analysed the suspicious emails and confirmed that existing controls on BP PCs would have prevented the malicious documents from working. As an additional measure BP's cyber defences were updated to block access to the websites used in the attack.

Oil and Gas industry

Cyber espionage from sophisticated nation-states remains the biggest threat to the oil and gas industry. Cybercriminals continue to exploit weaknesses in corporate processes and cyber defences.

1. UK National Cyber Security Centre publishes threat assessment for the energy sector. The report rates the threat of cyber espionage against the energy sector as severe. "*State actors maintain a committed intent to conduct cyber espionage against the sector which is combined with the formidable capability of extremely capable, well resourced and technically able foreign intelligence service.*" The report cites the 2016 power outage in Ukraine as an example of a destructive attack against the sector. The threat from cyber crime is rated as substantial, particularly in relation to attempted fraud using through compromised email accounts.

General cyber security landscape

Cyber criminals are using increasingly sophisticated techniques to attack companies holding large volumes of valuable information.

1. Deloitte suffer cyber breach. Cyber attackers gained access to Deloitte's global email system after apparently compromising an administrative account. The breach allegedly occurred in late 2016 and was discovered in March 2017, becoming public in September. There is little additional information available on the attack which is said to have focused on the firm's US business. Deloitte have so far notified six customers whose information they believe was compromised. Deloitte have confirmed that no BP data was accessed or stolen.

2. Cyber attackers compromise popular PC support software. Sophisticated attackers compromised software developer Piriform and modified their popular "CCleaner" utility to include malicious software. The modified software was available for around four weeks during which it was downloaded around 2.3million times. The attack is thought to have targeted major technology companies including Google, Microsoft, Samsung and Sony.

BP-CERT identified 122 installations of the affected software on BP systems however the malicious component was inactive due to BP's system configuration. All instances of the affected software have been removed from BP's systems and cyber defences updated to prevent reinstallation.

3. Securities and Exchange Commission reveals cyber attack. During 2016 attackers exploited a vulnerability in the EDGAR system that companies are required to use when submitting forms to the SEC. The attackers gained access to non-public information which they are suspected to have used in illicit trading. The SEC have been criticised for taking over eight months to disclose the attack at a time when cyber laws and regulations are demanding ever-faster reporting of cyber incidents.

Digital Security & Risk and Intelligence, Security, Crisis & Continuity
October 2017

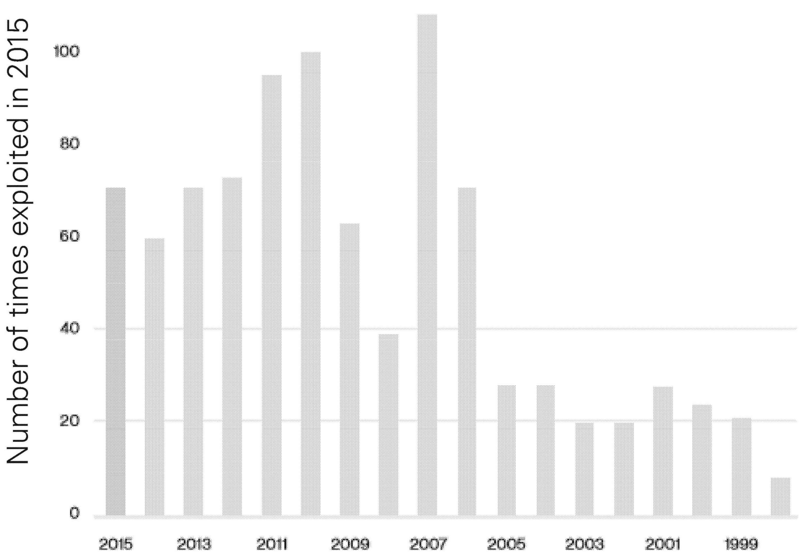
Confidential

Cyber security and the legacy IT estate

Group Financial Risk Committee Meeting

10 October 2017

Cyber threat landscape – vulnerabilities exploited



Year vulnerability first discovered

Source: Verizon Data Breach Investigation Report 2016

- The majority of cyber attacks exploit well known vulnerabilities, sometimes many years old
- Attackers target the weakest system in order to establish a foothold in a company
- A single source of vulnerability could lead to widespread compromise of a company
- The ongoing release of stolen nation-state developed cyber weapons is dramatically advancing the capability of most attackers

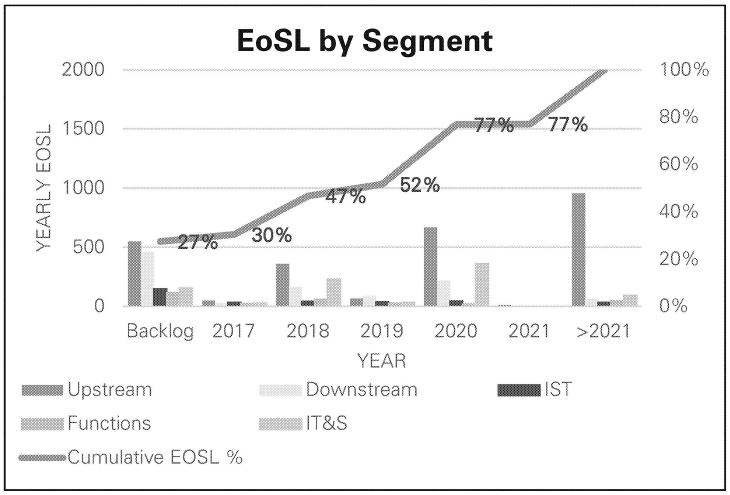
Cyber security threat increases focus on the IT end of serviceable life risk

- Many of BP’s systems were designed and implemented prior to the cyber threat existing
- Recent global cyber attacks have highlighted that legacy IT systems impact BP’s ability to respond to cyber attacks

Impacts:

- New vulnerabilities cannot be patched to defend against attacks due to lack of vendor support
- Anti-virus software or backup software no longer available
- Software or hardware needed to remediate issues may not be available
- No effective way to inoculate EoSL systems against new cyber attacks
- Infected systems can cause wider impacts across BP

End of serviceable life status



A significant backlog of applications and infrastructure with **known** End of Serviceable Life (EoSL) components exists and, without intervention, will more than double over the next 3 years (30% to 77%)

Key facts:

- BP has 4,500 production applications
- 30% of Production applications are currently EoSL
- 30% of Production servers use Windows 2003 which is EoSL
- 77% of estate will be EoSL by 2021 if no action taken
- Windows 2008 will be EoSL in 2020 (30% of estate)
- 90% of Databases are EoSL

Risk mitigation actions

- Prioritize IT&S investment based on EoSL risk
- Prioritize migration of EoSL systems to cloud
- Implement learnings from Wannacry, NotPetya, IST extortion and Hurricane Harvey incidents
- Cyber security risk impact and likelihood raised in Group RMR submission
- Group Leaders to manage the aggregated risk to their business as a result of EoSL
- Implement actions from 2016 EST exercise so that key businesses are ready to deal with a large scale IT outage if it were to occur

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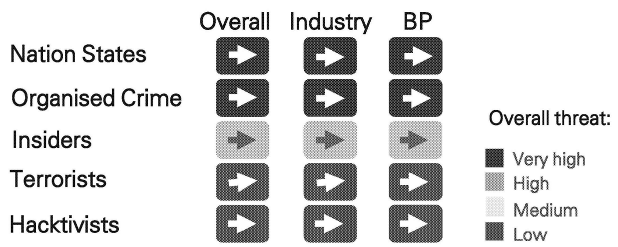
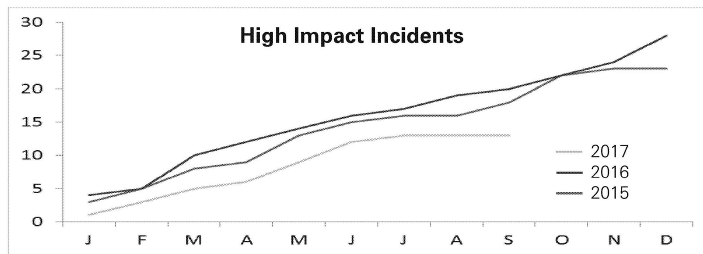
Cyber Security Dashboard – October 2017

Threat Intelligence



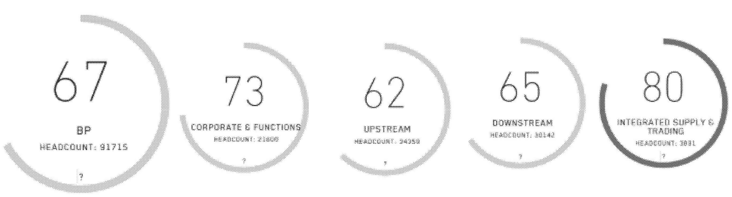
Commentary
Deloitte announced a breach of their global email system and the Securities and Exchange Commission reporting system was compromised. The UK's National Cyber Security Centre published their 2017 threat report and rate the nation state threat to the energy sector as Severe. Due to the changing nature of the threat, the cyber risk in the Group RMR submission has increased.

Incidents



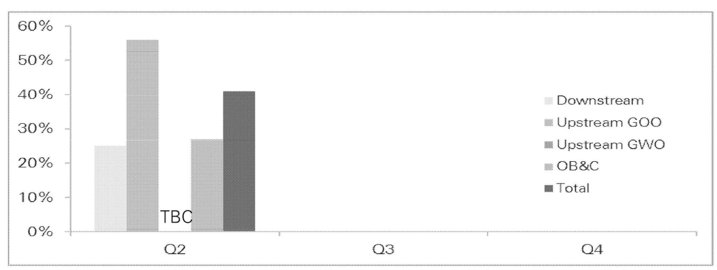
Commentary
Criminals continue to target BP with business email compromise and invoice fraud attempts. Suspicious emails reported by BP staff to the Security Operations Centre were confirmed to contain malware. BP's cyber defences were updated to block the websites used in the attack. It was confirmed that BP was not impacted by Deloitte's global email compromise.

Behaviours



Commentary
Cyber awareness week starts on 16 October to focus all staff on cyber security and their behaviours in protecting BP's information and systems. The theme of the event will be 'classify your information and keep it secure'. In support of the event, two videos and a new Protecting Our Information Security challenge have been produced. There will be an all employee webcast on 18 October and additional stand ups at major locations.

Process Control Networks



Commentary
The PCN security operations team in Westlake provided 24x7 operations during Hurricane Harvey by dropping back to their BCP positions. The PCN CoE team are experimenting with a SWAT team to drive the Group Practice conformance. This involves experts travelling to sites to help implement the controls, conduct training and update documentation. Initial feedback is positive.

Members of the Group Financial Risk Committee

Foreign Exchange Hedging update

The purpose of the FX corporate hedging programme has been to reduce the economic risk of material currency volatility at a minimal cost and without any initial cash outlay. On 1st March 2017, the EMIR regulation came into place which required daily variation margining on all financial derivatives executed by BPI as a Non-Financial Counterparty + (NFC+). The FX corporate hedging programme was paused until a workable solution could be implemented which did not require daily margining, which would reintroduce the cash volatility that the programme aims to limit.

BPI was able to formally notify regulators on September 27th that it was no longer an NFC+ in relation to the EMIR regulation which means that it no longer needs to complete variation margining.

The FX corporate hedging programme has historically utilised zero-cost collars through options in the derivatives market. The proposal is to re-start the FX corporate hedging programme: various approaches for execution are presented for discussion.

Kate Thomson
October 2017

Forex exposure hedging update

Group Financial Risk Committee

10th October 2017

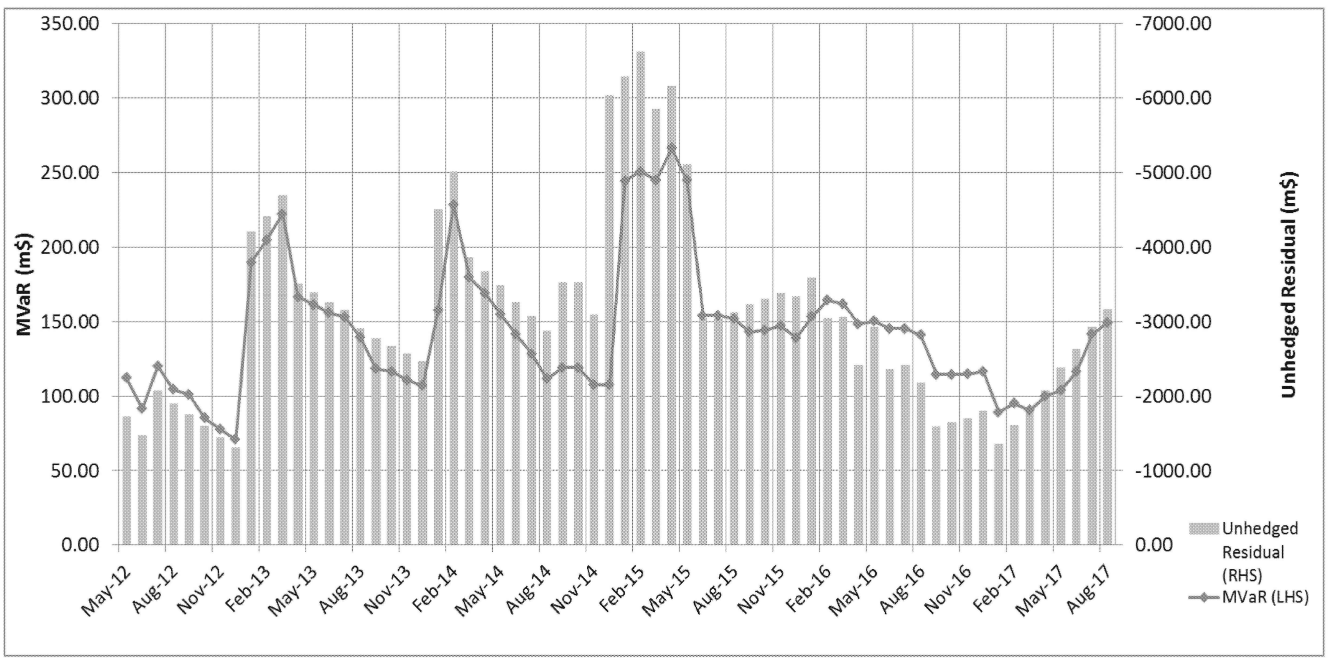
Corporate FX hedging programme
Background

- Large, discrete and predictable non-USD cash flows (M&A receipts; the sterling dividend, significant capex) are hedged individually
- Historically, the corporate hedge programme has aimed to:
  - Mitigate by around 50% the degree to which the group is exposed to cash and income statement fx impacts through EUR, GBP and AUD and provide time to react;
  - Be achieved through zero-cost collars, in effect protecting against a part of down-side exposure by selling upside opportunity
- During 1Q 2017, BP became NFC+ under European Regulations (EMIR) and as such zero-cost collars would have had to be margined, eliminating their cash realisation benefit, and the programme was paused
- BP became NFC- on 27th September and hedging under the programme can be resumed
- The period of January to September 2018 is currently unhedged and a decision on dealing with that exposure is required

FX hedges

Hedge type	Description	Purpose	Instruments	Post-EMIR
Corporate cashflow	FX exposure of cashflows to FX estimated from GFO, aggregated, and major net exposures hedged on a 12-month rolling basis. Hedge-accounted, so no mark-to-market impact on P&L.	• Give time to react to FX shocks • Give stable cashflows • Manage group FX VaR<$400m • Reassure businesses FX managed centrally, not locally	Previously zero-cost collars	CSA / margin calling will add cashflow volatility, defeating purpose. **Paused**
M&A, capex	For individual future cash flows (>$50m) that cause a discrete exposure, forwards are used to cover the FX risk to provide a known USD outcome upon completion.	• Reduce uncertainty in the reported figures for M&A and capex • Encourage use of preferred-currency bidding	Forwards	**Continue** – EMIR will add cashflow volatility Still satisfies aim to maintain value
IST exposures	Deal exposure to FX hedged back to desk trading FX	• "no FX exposure" DoAs • Simpler risk management	Forwards or futures	**Continue** – Shorter-term hedges unaffected
Dividend	Ord. dividends in GBP hedged from price-setting to payment	• Ensure no value cross-subsidy between ADR and ord. shareholders	Forwards	**Continue** – Hedges are very short term. All cashflows will be inside a quarter.

FX VAR

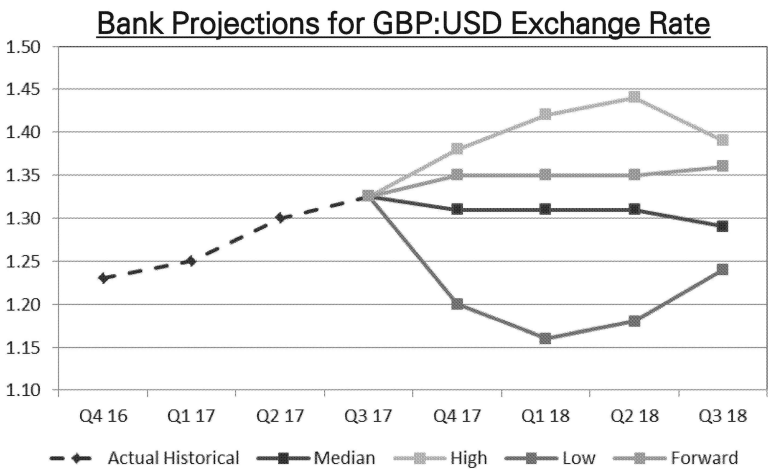


- ARA: BP "aims to manage such risk to keep the 12-month foreign currency value at risk below $400 million"

Corporate FX hedging programme

	Possible approaches	Comments
A	Do nothing	Group delivery exposed to forex movements.
B	Re-start hedging programme at the level of protection (50%) targeted previously	Resumption of previous programme.
C	Re-start hedging programme at the level of protection (50%) as before, but plan to incorporate additional responsiveness to monitoring.	Resumption of programme, but recognising ability to manage coverage through: (a) responding to material in-year changes in the GFO for the key currencies, and (b) increasing hedge amount if VAR is anticipated to go above a set threshold
D	Re-start hedging programme at percentages to be hedged based on forward rates, within boundaries of hedge accounting.	Within these constraints, adjust hedge percentage based on forward exchange rate to reduce expected opportunity loss. See illustration on next slide.

Approach D – illustration of GBP:USD hedging



£ / USD	<1.25	1.25-1.35	1.35 – 1.45	>1.45
View	Cheap	→	→	Expensive
Action	Zero cost collar	Zero cost collar	Zero cost collar	Zero cost collar
Size	60% (*)	50%	30%	10%
Band	Narrower	+ / - 0.05	+ / - 0.05	Wider

(*) contingent on amount available that can claim hedge accounting

EXPOSURE

- BP has more costs than revenues in the UK.
- If GBP weakens then costs are less on a USD basis
- If GBP strengthens then costs are more on a USD basis

APPROACH

- The percentages to be hedged could be adjusted to ensure that VAR is kept within the $400m limit and hedge accounting maintained
- Within these constraints, adjust hedge percentage based on forward GBP:USD exchange rate to reduce expected opportunity loss
- Two structures exist which have zero cost to implement and no margin requirement
- Structure 1 – zero cost collars (same as 2017)
  - Each month execute zero cost collar for maturity in 12 months time
  - Sell put and use premium to buy call e.g. strikes set +/-5c from spot price
  - P&L on options only generated if option expires outside of cylinder
  - Net realised exchange rate stays within cylinder range
- Structure 2 – sell swaps for future dates
  - P&L will be realised on any exchange rate from future date

Appendix

Corporate hedging programme

- Cash flows in each major currency estimated from GFO data.
- Aim to cover ~50% of net exposures in major currencies (GBP, EUR, AUD).
- Major capex procurement (incl. cost-based currency bidding) is hedged where practical.
- PSAs usually incorporate FX hedging in agreement, so hedging not needed
- $2-4bn sterling dividend is also hedged from fixing the exchange rate (2-3 weeks before payment).

2018 hedge illustration	GBP	EUR	AUD	Other
Upstream gas revenues	597	-	-	-
Upstream cash costs	(1,020)	(47)	(246)	(425)
Upstream capex	(1,903)	(514)	(191)	(1,297)
Downstream EBITDA	(160)	1,158	534	1,714
Downstream cash costs	(155)	(1,764)	(258)	(175)
Downstream capex	(160)	(751)	(220)	(213)
OB&C	(709)	(267)	(31)	(213)
Total Exposure	**(2,482)**	**(1,663)**	**(534)**	**524**
Corporate hedges	960	780	240	0
Procurement hedges	560	97	50	33
Total Hedges	**1,520**	**877**	**290**	**33**

FX exposures further defined in 2018 FX Hedge recommendation and based on 2017 GFO zero cash flows

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Members of the Group Financial Risk Committee

Discount Rate Review

The purpose of the attached note is to review the estimate for BP's Weighted Average Cost of Capital (WACC). The proposal is for the rate to remain at the current level of 6% post tax.

The review attached will highlight two notable changes to the WACC inputs - Group effective tax rate and lease liability. The note will also provide credit rating and environment based scenarios to illustrate directional impact on the Group WACC.

Request to the GFRC:

Approval of the Group WACC; to continue with a rate of 6% post tax.

Kate Thomson
October 2017

Group Financial Risk Committee, 10th October 2017

Discount Rate Review

We recommend maintaining BP's weighted average cost of capital ("WACC") estimate at 6% (post tax) as the discount rate to use for economic evaluation of investment projects.

The primary use of BP's WACC is as the discount rate to evaluate long-term BP business projects. Therefore, the WACC estimate is based on Treasury's judgment of mid- to long-term values of the components consistent with the timeframe of most BP projects.

Estimates of the parameters making up the long-term costs of equity and debt remain consistent to last year.

The intent of the main body of this report is to highlight notable changes to WACC factors as well as commentary of potential scenarios leading to a Treasury recommendation. Detailed commentary on each of the WACC components can be found in appendices along with associated sensitivities, benchmarking and historical BP WACC values.

A WACC of 6% is below the current range of analysts' estimates. The long-term estimates of financial parameters reflect the uncertainty of the return of more normal market conditions. Moreover, inflation remains low despite OECD central banks' beginning to unwind quantitative easing policies. Should either inflation pick up significantly, or a rise in global spending lead to a greater demand for capital, then an increase in the WACC could be expected.

There is an element of subjectivity in identifying the rates to use, but overall, this work achieves a reasonable outcome.

A more detailed analysis is attached.

Parameter	2017	Comments	2016
Net debt gearing ratio (market)	25%	Market-value gearing	20%
Lease gearing	7%	Based on capital value of assets under operating lease	10%
Effective tax rate	38%	Long-run average effective rate	30%
Risk-free return	2.75%	1.75% inflation forecast + 1.0% long-run real T-bill return	2.75%
Cost of Debt	***4.25%***	Risk-free rate + 0.5% swap spread + 1.0% BP credit spread	***4.25%***
Cost of Leases	**6.0%**	Based on current market rates	**6.0%**
Equity risk premium	4.5%	4% - 6% forward looking range	4.5%
Beta	1.1	Based on long term historical average	1.1
BP Cost of Equity	**7.7%**		**7.7%**
WACC	**6%**	Range is -0.5% to + 2%	**6%**

Yann-Alexandre Brulé
Silvio Mejia

BP Treasury

BP's discount rate review

1. Purpose

- To review and estimate the components of the weighted average cost of capital (WACC) to be used as the discount rate for economic evaluation of capital projects.
- To consider whether the present environment of low interest rates has reached an inflection point or to what extent it is more permanent.
- To advocate a defensible WACC, cross-checking the estimate against other observations.

The primary use of BP's WACC is as the discount rate to evaluate long-term BP business projects. Therefore, the WACC estimate is based on Treasury's judgment of mid- to long-term values of its components consistent with the timeframe of most BP projects.

2. The business school approach

The usual approach to deriving WACC is to take a weighted average of the estimate for the Group's Cost of Equity and Cost of Debt. Since 2009 this analysis has extended the classical WACC approach to include Off Balance Sheet (OBS) funding[1] from operating leases as these are in practice further sources of funding for the Group. Therefore, the Weighted Average Cost of Capital is given by,

$$\left(\frac{D}{D+L+E}\right)(1-r_{tax})r_{debt}+\left(\frac{L}{D+L+E}\right)(1-r_{tax})r_{lease}+\left(\frac{E}{D+L+E}\right)r_{equity}$$

Where,

- D and r_{debt} are the amount and cost of financing of debt respectively;

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[1] Other OBS funding elements were considered but not included, particularly Pension Debt and Asset Based LTCCs. Pension Debt is very volatile and in the medium term *funded* BP Pension schemes are assumed to achieve 100% funding. Asset Based LTCCs are difficult to quantify and, while debt-like, are not treated by ratings agencies as 'extended' debt.

- L and r_{lease} are the capital amount and effective cost of operating leases;
- r_{tax} is the effective tax rate on financings; and
- E and r_{equity} are the amount of shareholder equity and return on equity.

The required return on equity is set by using the Capital Asset Pricing Model,

$$r_{equity} = r_{risk-free} + \beta_{equity}\left(r_{market} - r_{risk-free}\right)$$

Where $r_{risk\text{-}free}$ is the risk-free rate of return and β_{equity} is the correlation of BP stock to the market.

3. Notable changes

Tax - The Group's reported Effective Tax Rate (ETR) increased from 30% to 38% particularly driven by the tax accounting of the Abu Dhabi Company for Onshore Oil Concession ("ADCO") concession executed in December 2016. The change has minimal impact on the WACC calculation.

Leases - Lease liability 2017 forecast ($12bn) used to determine lease gearing for the WACC calculation is lower compared to the 2016 forecast ($16.5bn). The reduction largely reflects fewer, less expensive and shorter rig commitments partially offset by property sale and leasebacks.

4. WACC scenarios

Central case - This case results in a WACC of 6.0% as the values of most parameters in this year's calculation remain close to those in the 2016 review, except for the tax rate and the level of lease liability. In keeping with long-standing practice in BP, this is rounded to the nearest whole percent.

The variability in the cost of capital is low, within ±1% for most parameters. Appendix 2 shows the impact of low and high values of key parameters on the cost of capital. The following table provides a summary of the assumptions of each scenario.

Parameter	2016 rate	Proposed 2017	Return to AA	Decline to BBB+	Monetary tightening
Risk free rate (R_F)	2.75%	2.75%	2.75%	2.75%	**3.25%**
Tax rate (T)	30%	**38%**	38%	38%	38%
Beta	1.1	1.1	**0.90**	**1.2**	1.1
Cost of debt (K_D)	4.25%	4.25%	3.90%	4.5%	**5.75%**
Cost of leases (K_L)	6.0%	6.0%	**5.75%**	**6.25%**	**7.50%**
Cost of equity (K_E)	7.25%	7.25%	6.80%	8.15%	7.25%
Net debt ($bn) / ($\%_D$)	32 / 20%	41 / 25%	**24 / 16%**	**53 / 29%**	38 / 24%
Lease liability ($bn) / ($\%_L$)	17 / 10%	12 / 7%	12 / 8%	12 / 7%	12 / 7%
Market equity ($bn) / ($\%_E$)	111 / 70%	115 / 68%	115 / 76%	115 / 64%	115 / 68%
WACC ($K_{D/L}$*$\%_{D/L}$)*(1-T) +K_E*$\%_E$	6.3%	6.17%	5.9%	6.3%	6.4%

Return to AA rating - This case results in a WACC of 5.8% and describes a scenario of improved credit strength for the Group most likely to arise from higher commodity prices. The case assumes a significant decrease in net debt over the central case; lower financing costs and Beta more closely related to that of XOM.

Decline to BBB+ rating - This case results in a WACC of 6.3% from circumstances requiring greater access to financial markets, potentially from lower commodity prices for an extended period; accelerated transition of the energy markets; or realization of other low probability/high impact events (e.g. geopolitical events, global financial crisis, etc.). This scenario is underpinned by changes to assumptions notably through higher net debt and financing costs, as well as a Beta reflective of more volatile peers.

Monetary policy tightening - This case results in a WACC of 6.4% and depicts a world where OECD central banks significantly decrease their balance sheets, raise short term rates and inflation returns to historical levels, i.e. "*return to the normal market*". This comes through assuming higher financing costs offset by a tighter equity risk premium yielding a slightly higher WACC.

5. Recommendation

The WACC is based on assumptions of mid-to-long term values of its components consistent with the time horizon of most BP projects. Since 2015, WACC estimates have drifted lower reflecting a reduction in the underlying risk-free interest rate. Despite efforts by OECD central banks to roll back quantitative easing and increase short-term interest rates, the impact on market interest rates and inflation has been minimal. Treasury will continue to monitor these factors and provide adequate update during the WACC guidance at the next periodic review.

Treasury recommends keeping the current estimate of BP's weighted cost of capital (WACC) at 6% to be used as the discount rate for economic evaluations of investment projects. Treasury also recommends maintaining BP's pre-tax cost of debt used for EEM purposes at 4.25%. Both provide consistency and avoid undue complexity in the business governance processes especially given WACC revisions implemented in each of the past two years.

Yann-Alexandre Brulé
Silvio Mejia

BP Treasury

APPENDIX 1

Valuing the components of WACC

The components are calculated as at end of 2Q 2017.

Debt Gearing

$$\left(\frac{D}{D+L+E}\right)(1-r_{tax})r_{debt}+\left(\frac{L}{D+L+E}\right)(1-r_{tax})r_{lease}+\left(\frac{E}{D+L+E}\right)r_{equity}$$

The weighted average cost of capital should be calculated using the market values for both debt and equity.

Since BP holds mostly floating-rate debt, the nominal stock of debt is a good estimation of fair market value.

BP's target book gearing (not including leases, and not adjusting cash for trapped cash or working cash) ranges between 20-30%. This gearing band corresponds to net debt between \$25bn and \$42bn at present book equity values. For this analysis, the mid-point of 25% book gearing has been used, implying effective net debt (adjusting for trapped cash and working cash) of approximately \$33bn at end 2Q17 equity values, and a market gearing (including leases and cash adjustments) of 21%.

BP's Market Gearing = 21%
BP's effective net debt at target gearing = \$33bn

Lease Gearing

$$\left(\frac{D}{D+L+E}\right)(1-r_{tax})r_{debt}+\left(\frac{L}{D+L+E}\right)(1-r_{tax})r_{lease}+\left(\frac{E}{D+L+E}\right)r_{equity}$$

Operating leases are similar to debt. As a lessee, BP commits to make periodic payments (fixed or floating rate) to the lessor (lender) over the term of the lease to service the lease financing (loan).

Discounting operating lease commitments at the cost of lease financing (see below) of 6%, gives the following year-end debt equivalents: 2014 $16.1bn, 2015 $12.9bn and 2016 $11.3bn. The 2016 reduction largely reflects fewer, less expensive and shorter rig commitments. End-2017 debt equivalent is currently forecast at $11bn, the slight decrease reflects continuing reductions in rig commitments partially offset by property sales and leasebacks.

Based on recent actual and forecast debt equivalents, a mid-term conservative assumption of $12bn debt value has been used to calculate the lease gearing effect, giving a lease gearing ratio Leases / (Debt + Leases + Equity) of 7%. The effect on BP's WACC of increasing or decreasing this figure by 2% is immaterial.

BP's Lease Gearing = 7%

Cost of Debt

$$\left(\frac{D}{D+L+E}\right)(1-r_{tax})\,\mathbf{r}_{\mathbf{debt}}+\left(\frac{L}{D+L+E}\right)(1-r_{tax})r_{lease}+\left(\frac{E}{D+L+E}\right)r_{equity}$$

The cost of debt is Treasury's estimate of the long-run average of mid-term borrowing rates. An estimated average over time is used rather than the current market rate to achieve greater stability in the calculated cost of capital, and we use mid-term rates as it is assumed that BP will be issuing debt primarily in the 5 and 10 year markets and so have an average on issuance of about 7 years. Current debt term averages 7-8 years.

Cost of debt is calculated by:

Cost of debt = Risk-Free Return + Swap Spread + BP Premium

Risk-Free Return

10 year US Treasury Bonds provide the benchmark for the risk-free return. Over the period since 1970, Treasury Bond rates have averaged

1% to 1.5% above the rate of inflation. BP has relied on these historical observations, and company forecasts of inflation, in previous years to estimate the risk-free rate.

Recent work by the Bank of England and industry players suggests that the 1.5% margin has been contracting over the past decade, and is currently below 0%. Some of the factors seem transitory or are one-off effects (low economic growth, central bank quantitative easing, a change in regulatory demand for government bonds, a cutting in infrastructure spending). Some are more likely to be more structural and long-term (demographics, the slowing of China's growth, a reduction in demand for US Treasuries by EM governments). Taking into consideration the longer-term effects, Treasury assumes the sustainable, long-term margin between risk-free 10-year debt and inflation to have dropped to 1.0%.

As in 2016, BP's Economics Unit forecast of inflation rates is below 2% over the medium term, rising in the long run to 2%, for most major currencies, including USD, Euro area and GBP. An inflation rate of 1.75% has been assumed. Therefore, keeping a risk-free rate of 2.75% is proposed. Note that this mid-point continues to remain above today's unusually low current rates, though several key countries are starting to switch to fiscal stimuli from monetary stimuli but rates continue to be low.

Risk-free rate = 2.75%

Swap spread

The swap spread is the difference between swap interest rates (LIBOR) and US Treasury rates. Since 1988, the US Swap Spread has averaged 0.5% for 7-year tenor.

Swap spread = 0.5%

BP premium
Assuming BP will term its debt book out to an average of 5-10 years, as an A-rated borrower we currently expect to issue bonds at an average of about 87.5 basis points above the swap rate.

Current rates are close to an expected mid-term range of 85-110 basis points. An average 100 point spread to LIBOR has been assumed to maintain this estimate of the mid-term range. This will change if BP targets a different credit rating.

BP premium = 1.0%

Cost of Debt
Based on the above figures BP's cost of debt is

2.75% + 0.5% + 1.0% = 4.25% (pre-tax, nominal, USD).

This is significantly different from the rates at which BP can raise debt in the market at present time – typically 2.6% for 5-year and 3.4% for 10-year. However, this note is estimating suitable parameters with which to judge long-term investments.

BP's cost of debt = 4.25%

Tax

$$\left(\frac{D}{D+L+E}\right)\left(1-\mathbf{r}_{\mathbf{tax}}\right) r_{debt} + \left(\frac{L}{D+L+E}\right)\left(1-r_{tax}\right) r_{lease} + \left(\frac{E}{D+L+E}\right) r_{equity}$$

As debt generally receives a tax deduction, BP's cost of debt should be measured on a post-tax basis using the cash tax rate achievable. Historically the Group's long-term effective tax rate has been used as an estimate for this figure, across the period 2017-2026 the ETR is forecasted to average 38%. Although BP's publicly issued debt may achieve a lower cash tax rate, the overall impact on the WACC calculation is not material and therefore the Group's long-term effective tax rate is considered an appropriate approximation for the purposes of the WACC calculation.

BP's Effective Tax Rate = 38%

Cost of lease financing

$$\left(\frac{D}{D+L+E}\right)(1-r_{tax})r_{debt} + \left(\frac{L}{D+L+E}\right)(1-r_{tax})\,\mathbf{r}_{\mathbf{lease}} + \left(\frac{E}{D+L+E}\right)r_{equity}$$

Bank quotes for ship structured leases indicate a margin of 2% over LIBOR (risk-free return and swap spread), estimated at 3%, to give 5% in total. The cost of leasing oil rigs and other assets is estimated to be slightly higher, and so average cost of leasing is estimated at 6%, which is slightly lower than the 7% used by Standard and Poor's to discount lease commitments.

The inclusion of the cost of leasing in the calculation of BP's WACC recognises BP's significant use of lease finance and is in line with the rating agencies' inclusion of operating lease commitments in the calculation of adjusted debt.

BP cost of leasing = 6%

Cost of Equity and the Equity Risk Premium

$$\left(\frac{D}{D+L+E}\right)(1-r_{tax})r_{debt} + \left(\frac{L}{D+L+E}\right)(1-r_{tax})r_{lease} + \left(\frac{E}{D+L+E}\right)\mathbf{r}_{\mathbf{equity}}$$

$$\mathrm{r}_{\mathrm{equity}} = \mathrm{r}_{\mathrm{risk-free}} + \beta_{\mathrm{equity}}\left(\mathbf{r}_{\mathbf{market}} - \mathbf{r}_{\mathbf{risk-free}}\right)$$

Equity Risk Premium

The equity risk premium - the excess returns that investors require in future for investing in equities rather than risk-free Treasury bonds - is normally estimated from the return that investors have accepted in the past. The average risk premium for a world index of equities since 1900 has been 4.5%-6%, and 5.3% for the US stock market alone.

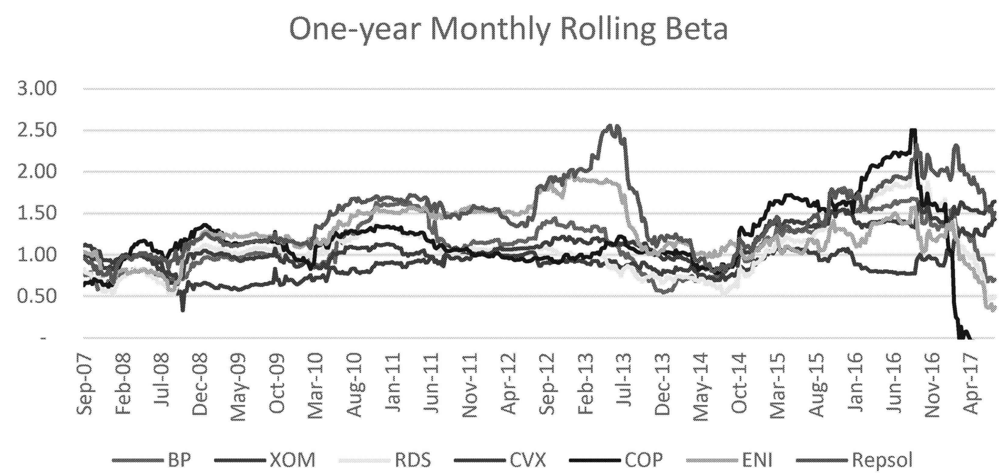
Work looking at long-term dividend expectations and at historic expected returns found both consistent with a market risk premium over US Treasuries in the range of 4% – 5%, with 4.5% being a reasonable figure to take.

Market Equity Risk Premium = 4.5%

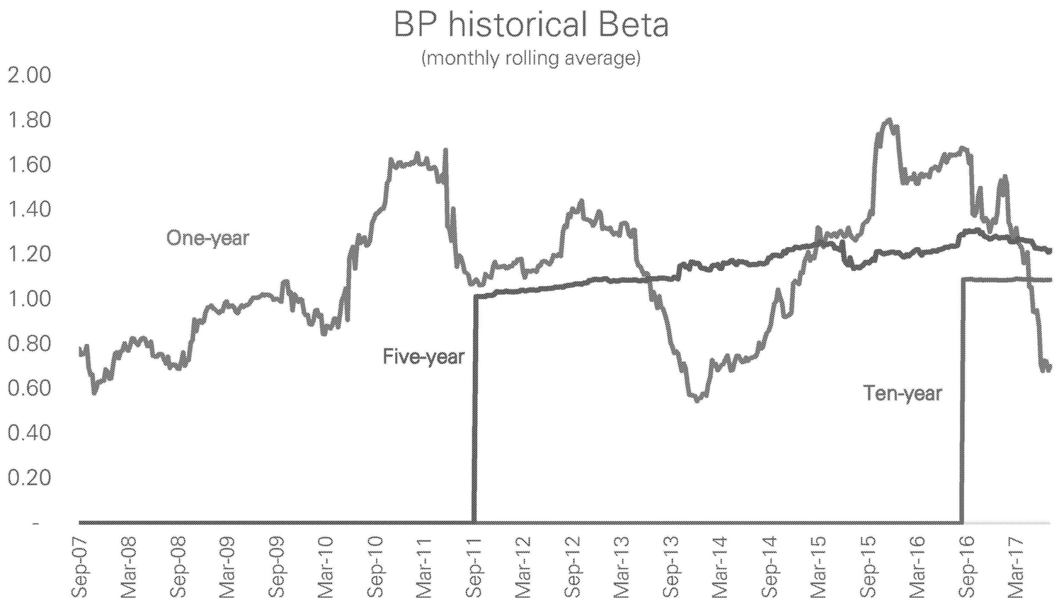
Beta

Beta is the ratio of that part of BP's share price movements that is related to overall market movements. It is a measure of the sensitivity of the share price to undiversifiable macro-economic risk. High-beta companies are therefore seen to be riskier than the market average, and will be expected to give a higher return on equity.

Unfortunately, periods of simultaneous, but coincidental, market and sector or stock-specific movement (e.g. Macondo impacts on BP shares coinciding with a general market turn-down, or the Saudi-triggered oil price crash of 2015 coinciding with the post-financial crisis economic loss of confidence) can lead to atypical jumps in the beta.



From 2008 to 2014, the typical non-crisis beta for oil companies has been approximately 1.0. Longer average (5 and 10-year monthly rolling averages) Betas confirm a more stable 1.1 figure, except for Exxon whose beta approximates to 0.9.



BP's Beta = 1.1

<u>Cost of Equity</u>

BP's cost of equity can be calculated by applying the above values to the capital asset pricing model (CAPM).

$$r_{equity} = r_{risk-free} + \beta_{equity}\left(r_{market} - r_{risk-free}\right)$$

= 2.75% + 1.1 * (7.25% - 2.75%)

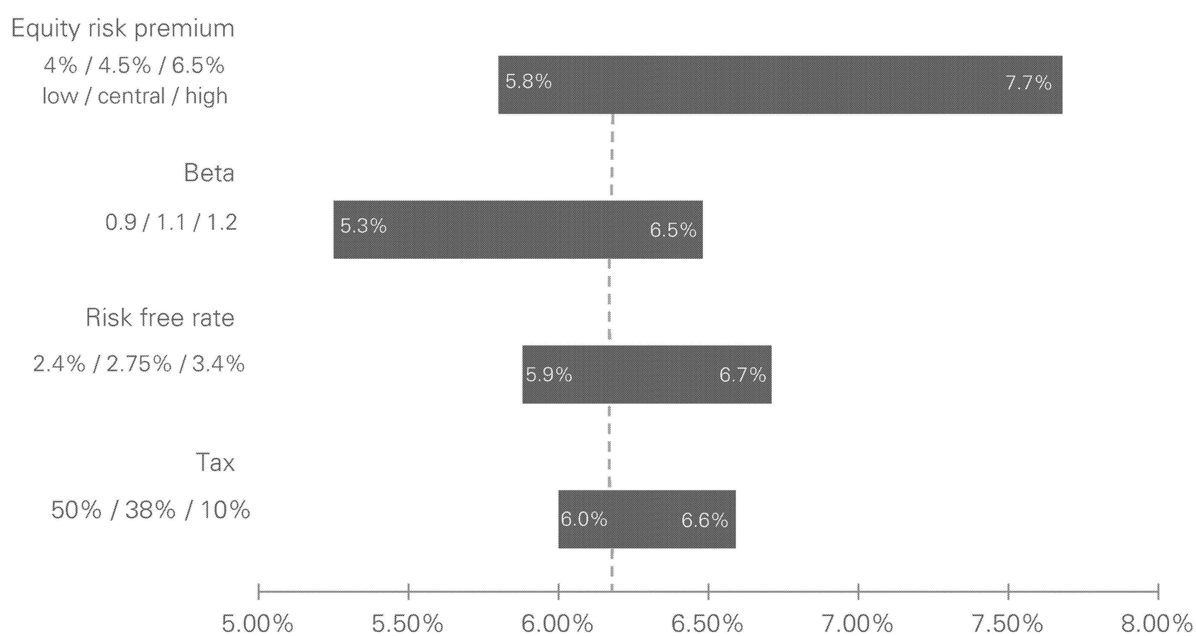
BP's Cost of Equity = 7.7%

Appendix 2

Sensitivities to Weighted Average Cost of Capital

The three parameters with the greatest impact on the cost of capital are the risk-free rate, the equity risk premium, and the equity beta.

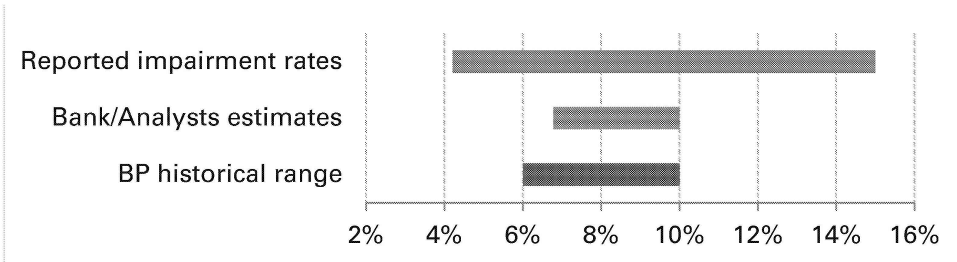
These three are unlikely to be highly correlated, and so it is not expected that all three are simultaneously at their highest or lowest levels. The values assumed for each of the parameters in the chart below are based on observed ranges rather than equally likely values (i.e. P10 and P90 values).



Appendix 3

Benchmarking and BP historical rates

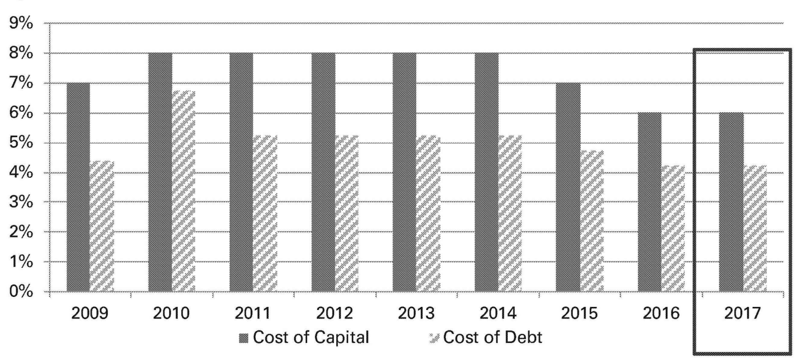
The chart below provides a summary view of the range of competitors' Costs of Capital based on reported impairment rates (see below), banks and analysts reports, and BP's historical range.



Also included is the detail of the rates used by other oil majors for impairment indicating a range of post-tax rates (i.e. before country and other premia added) between 6.5% and 7%. These figures are probably within the range of our competitors' estimates of their own weighted average cost of capital.

2016 IMPAIRMENT RATES	Pre-Tax	Post-Tax
Shell	6%	Not disclosed
Total	7% - 17%	7%
Eni	7.9% - 25.9%	4.8% - 15%
Repsol	Not disclosed	4.2% - 19%
Statoil	8% - 12%	6%
Rosneft	13.4%	Not disclosed
BHP Billiton	Not disclosed	6.5%
Anglo-American	Not disclosed	6.5%
BP	9%	6%

This chart provides BP's WACC and Cost of Debt rates back to 2009.



Members of the Group Financial Risk Committee – 10 October 2017

Review of discount rate assumptions for impairment testing and provisions

Introduction

The attached papers describe the outcome of the annual 2017 review of discount rates used for financial reporting purposes.

The papers are provided for the GFRC's preliminary review and feedback. The rates to be used for 2017 year-end reporting will be finalised and approved by the Group CFO in November.

There are three papers and a summary of discount rates attached:

1. The discount rate used for impairment testing.
2. The countries considered to be higher risk for which an additional risk premium is applied, and the size of that premium.
3. The discount rates used for provisions such as decommissioning.

The results of the review work performed to date can be summarised as follows:

- The discount rate to be used for impairment testing is unchanged (6% post-tax, 9% pre-tax).
- The list of countries for which an additional premium is applied is unchanged from 2016: Algeria, Angola, Argentina, Egypt, Indonesia, Iraq, Russia, Turkey. Azerbaijan, Brazil and Oman are not currently classified as higher risk but should be carefully considered as they have mixed indicators.
- The additional premium to be applied for higher risk countries is unchanged at 2%.

- The real discount rate for provisions (which is used in the majority of cases including for decommissioning) is currently 0.5%. Current data suggests this will remain unchanged but the rate to be used will not be known until closer to year end. Current data suggests the nominal rate will increase from 2% to 2.5% - this is only used in limited circumstances such as for asbestos provisioning.

Group Accounting and Reporting
3 October 2017

Discount rates for impairment testing and provisions

	Basis	%	Comments
Impairment tests	BP WACC and group ETR adjusted for Abu Dhabi	9% pre tax 6% post-tax	No change from current rates
Impairment tests (higher risk countries)	Country bond data, CDSs, risk ratings and Government and Political Affairs team review	2% additional premium	**No change to premium or impacted countries:** Algeria, Angola, Argentina, Egypt, Indonesia, Iraq, Russia, Turkey
Provisioning	10/30 year US Treasury bonds	0.5%*	Real discount rate used for significant majority of Group's provisions. Determine at year end – **current data suggests no change**
	10/30 year US Treasury bonds	2.5%*	Nominal Discount mainly used for asbestos provisioning. Determine at year end – **current data suggests increase to 2.5% from 2.0%**

* Based on current data; the rate to be used for 2017 year-end reporting will not be finalised until November

Group Financial Risk Committee Meeting, 10 October 2017

2017 Review of discount rate for impairment tests

Each year we review the discount rate that we use for impairment testing of BP group assets. In this paper we set out the results of the 2017 review.

Summary of recommendations

It is proposed that the discount rate for impairment tests carried out on a value-in-use basis is maintained at 9% pre-tax nominal. This rate is derived from the group's post-tax weighted average cost of capital (WACC) adjusted to a pre-tax rate using an effective tax rate of 30%. The estimated post-tax WACC, which is used for economic evaluation of capital projects, has recently been reviewed by BP Treasury who have proposed that the rate should be maintained at 6%; this is the discount rate used for impairment tests carried out on a fair value less costs of disposal basis. The review of the WACC is summarised in the BP Treasury "Discount rate review" paper which is also on the agenda for the 10 October 2017 GFRC meeting.

In addition, the list of higher risk countries, for which a higher discount rate is used for impairment tests, has been reviewed and updated and the results of this review are outlined in a separate paper.

1. Accounting requirement

IAS 36 'Impairment of Assets' requires an impairment test to be carried out for intangible assets with an indefinite life, for goodwill, and for property, plant and equipment which is assessed to have 'indications of impairment'.

In performing an impairment test, the carrying amount of the asset is compared to its recoverable amount, which is the higher of its 'value in use' (VIU) and its 'fair value less costs of disposal' (FVLCD). If the recoverable amount is lower than the carrying amount, an impairment loss is recognised.

The recoverable amount used in VIU impairment tests is determined using discounted cash flow techniques, calculated on a pre-tax basis. For FVLCD impairment tests the fair value may be based on market transactions if such information is available, or may be determined by using discounted cash flow techniques on a post-tax basis. In recent years, it has become increasingly common for the recoverable amount to be based on FVLCD using discounted cash flows, particularly in the Upstream segment including the review of Upstream segment goodwill.

Guidance on the discount rate to be used in VIU calculations is provided in IAS 36 as follows:

> 'The discount rate (rates) shall be a pre-tax rate (rates) that reflect(s) current market assessments of:
> (a) the time value of money; and
> (b) the risks specific to the asset for which the cash flow estimates have not been adjusted.' (IAS 36.55)
>
> 'As a starting point the entity may take into account the following rates:
> (a) the entity's weighted average cost of capital determined using techniques such as the Capital Asset Pricing Model;
> (b) the entity's incremental borrowing rate; and
> (c) other market borrowing rates.' (IAS 36.A17)

No specific guidance on the discount rate to be used in fair value less costs of disposal discounted cash flow calculations is given in IAS 36; we have also used the WACC for these tests. As the FVLCD test is performed on a post-tax basis, no gross-up for the effective tax rate is applied to this rate. The fair value calculation reflects assumptions that market participants would use when pricing the asset. Inclusion of tax cash flows is therefore appropriate, as market participants would consider the tax cash flows associated with the asset.

Asset specific risks are reflected by adding a 2% premium for the discount rate used in higher risk countries and by adjusting the underlying cash flows for other risks, for example by applying risk ratings to different categories of reserves.

2. BP's Weighted Average Cost of Capital (WACC)

BP's cost of capital has been reviewed recently by BP Treasury, resulting in a proposal to maintain the rate at 6% post-tax, nominal.

The analysis of the WACC uses a classical approach, being a weighted average of the estimate for the group's cost of equity and cost of debt, extended to incorporate off balance sheet financing from operating leases.

The Capital Asset Pricing Model (CAPM) was used to derive the required return on equity. BP Treasury has benchmarked the WACC result by considering rates used by stock market analysts in their valuations of BP.

The table below captures the values of the key parameters driving the assessment of BP's WACC. It should be noted that the analysis attempts to estimate long-run averages.

Parameter	2013	2014	2015	2016	2017
Gearing ratio (economic)	16%	15%	20%	20%	25%
Lease gearing (economic)	11%	11%	12%	10%	7%
Tax rate applicable to debt	36%	36%	36%	36%	38%
Risk free return	3.75%	3.75%	3.25%	2.75%	2.75%
BP cost of debt (pre-tax)	5.25%	5.25%	4.75%	4.25%	4.25%
Equity market risk premium	5%	5%	4.5%	4.5%	4.5%
Beta	1.0	1.0	1.2	1.0	1.1
WACC – post tax	**7.6%**	**7.8%**	**7.0%**	**6.0%**	**6.2%**
Tax rate (group ETR)	36%	35%	36%	30%	30%
WACC – pre tax	11.9%	12.1%	11.0%	8.6%	8.9%
Impairment discount rate	**12%**	**12%**	**11%**	**9%**	**9%**

We have used an estimate of the group's long-term effective tax rate (ETR) of 30% to gross up the post-tax WACC of 6% to arrive at a pre-tax discount rate of 9% to be used in VIU calculations. This ETR is unchanged from last year.

The ETR used for the gross-up calculation is derived from the "10-year shape" planning process. The ETR for the group has been affected in 2017 by the renewal in 1Q17 of the Abu Dhabi onshore concession. Under the renewed arrangement, BP reports income tax expense for Abu Dhabi based on a statutory rate of 87%, (in the prior arrangement the tax suffered by BP was accounted as a production tax i.e. a cost recognised in arriving at pre-tax profit). The Abu Dhabi income tax rate of 87% is significantly higher than the rates in other upstream regions which generally lie within the range 35-55%. Given the current BP mix of profits the inclusion of Abu Dhabi has contributed to a significant increase in the group's reported ETR. The pre-tax discount rate is applied when testing a variety of assets across the group and should not be overly influenced by the inclusion of activity in one upstream region. It is therefore considered appropriate to adjust for the distortion arising from the inclusion of Abu Dhabi in determining the ETR used in grossing up the discount rate to be used for VIU impairments tests across the group.

Based upon the latest long-term view of the ETR and adjusting for Abu Dhabi, it is considered appropriate to use a 30% group ETR in calculating the gross-up of the discount rate. Note also that an estimated group ETR in the range 30% to 36% would produce the same pre-tax discount rate of 9%.

Given that the impact of Abu Dhabi tax has been excluded from the determination of the group's pre-tax discount rate for impairments, a different pre-tax discount rate will be required to be used should an impairment test be performed for Abu Dhabi on a VIU basis. However, if an impairment test were to be carried out on a FVLCD basis, the group's post-tax rate of 6% would be used.

Although the Basis for Conclusions that accompanies IAS 36 suggests an iterative calculation should be performed to identify the pre-tax discount rate, EY's published guidance states that 'in many cases, a post-tax discount rate grossed up by a standard rate of tax may be a reasonable estimate of the pre-tax rate'[1]. We have previously concluded that this gross-up method is a practical expedient to derive a single pre-tax discount rate assumption from the group WACC, and we have used this approach for many years.

1 Impairment accounting - the basics of IAS 36 Impairment of Assets (EY)

3. Disclosure implications

The recoverability of asset carrying values is disclosed as a 'Significant accounting estimate or judgement' in Note 1 of the ARA/20-F, and the discount rate estimate is specifically noted therein as an uncertain matter requiring management judgement. This disclosure is required under IAS 1.125-126.

Additional specific disclosures for discount rates are also required in relation to impairment testing of goodwill and certain other assets.

BPA_HCOR_00205010

It is proposed to retain the same disclosure as 2016 for the purposes of the 2017 AR/Form 20-F, as follows.

From 2016 AR/Form 20-F, Note 1, page 130 (as updated for 2017):

Discount rates

For value-in-use calculations, future cash flows are adjusted for risks specific to the cash-generating unit and are discounted using a pre-tax discount rate. The pre-tax discount rate is based upon the cost of funding the group derived from an established model, adjusted to a pre-tax basis. Fair value less costs of disposal calculations use the post-tax discount rate.

The discount rates applied in impairment tests are reassessed each year. In 2017 the discount rate used to determine recoverable amounts based on fair value less costs of disposal was 6% (2016 6%). The discount rate used to determine recoverable amounts based on value in use was 9% (2016 9%). In both cases, where the cash-generating unit is located in a country which is judged to be higher risk an additional 2% premium was added to the discount rate.

Group Accounting and Reporting
October 2017

Group Financial Risk Committee Meeting, 10 October 2017

2017 Review of discount rate for accounting impairments in higher risk countries

This paper contains a summary of the results of the review of discount rates for 2017 impairment testing of BP group assets in higher risk countries.

Summary of recommendations

The proposed general group discount rate for impairment tests using value-in-use methodology is 9% pre-tax nominal. A 6% post-tax nominal discount rate is used for impairment tests performed using a fair value less costs of disposal methodology. These general rates are based on the group's weighted average cost of capital (WACC) which has been reviewed by BP Treasury in October 2017.

No changes to the list of higher-risk countries are proposed. Azerbaijan, Brazil and Oman are not categorised as higher risk but have mixed indicators and should be carefully considered.

It is proposed that maintaining the existing differential of 2% above the general group discount rate for impairment tests of assets in higher-risk countries is appropriate and consistent with longer-term trends.

Accounting requirement

IAS 36 'Impairment of Assets' requires an impairment test to be carried out for intangible assets with an indefinite life, for goodwill, and for property, plant and equipment which is assessed to have 'indications of impairment'.

Guidance on the discount rate to be used in value-in-use impairment test calculations is provided in IAS 36 as follows:

'The discount rate (rates) shall be a pre-tax rate (rates) that reflect(s) current market assessments of:

(a) the time value of money; and
(b) the risks specific to the asset for which the cash flow estimates have not been adjusted.' (IAS 36.55)

'As a starting point the entity may take into account the following rates:

(a) the entity's weighted average cost of capital determined using techniques such as the Capital Asset Pricing Model;
(b) the entity's incremental borrowing rate; and
(c) other market borrowing rates.' (IAS 36.A17)

We have used a consistent approach for determining the discount rate for both value-in-use and fair value less costs of disposal tests, basing both group-wide assumptions on the group's weighted average cost of capital.

Asset specific risks are reflected by adding a 2% premium for the discount rate used in higher risk countries and by adjusting the underlying cash flows for other risks, for example by applying risk ratings to different categories of reserves.

Country risk

It is proposed that a country risk increment should continue to apply where country-specific risks suggest a higher-risk profile to future cash flows than the norm, for both value-in-use and fair value less costs of disposal impairment tests. This approach has been used since 2007. The annual assessment of risk has three elements:

- a review of financial data, including market rates for credit default swaps (CDSs) and sovereign bonds, and also country risk ratings from The Economist Intelligence Unit (for countries where there is no available CDS and bond rate data). It is worth noting that some of the financial data, such as bond rates and CDS data, are lagging indicators and also that the EIU ratings that are readily available are typically 6-12 months old for most countries reviewed;

- an overarching assessment of perceived political and economic risk. We have included input from the Government and Political Affairs (GPA) team, to leverage their work in support of the Geopolitical board committee and to ensure a consistent and up-to-date view. In some cases specific comments from the GPA team are included in the country-by-country notes below, and all the proposed categorisations have been reviewed and endorsed by them;
- consideration of recent trends, in order to avoid countries moving in and out of the higher risk list on the basis of marginal short-term fluctuations. As a general rule we will look for consistent data over at least a two-year period unless there is an explicit event which indicates that a change is required.

Generally, we consider country risk where BP has gross assets in excess of $1 billion. We also obtain data for countries where our assets are below $1 billion but above $0.5 billion and include them in our analysis if they are locations where major capital investment is expected to increase assets above the threshold in future. At 2Q17, Turkey had gross assets below the $1 billion threshold, however we have retained it in our analysis as it remains close to the threshold ($942 million).

Each country is ascribed a risk ranking – simply, Low, Medium or High – and the relevant increment is added to the pre-tax discount rate for impairment testing for assets located in those countries in the High category.

Appendix 1 includes the list of those countries considered to fall into the medium and higher-risk categories. Appendix 2 shows the financial data behind the classifications.

Some countries, including Algeria, Angola, India, Iraq and Trinidad do not have complete CDS and bond rate data available. In these cases we consider a judgemental analysis of the country's political and economic situation, and also look to Country risk ratings from The Economist Intelligence Unit for corroboration of our conclusions (this data is also included in Appendix 2). A higher numerical rating implies a higher relative country risk.

Certain countries are considered in more detail below. Note again that we use a higher discount rate only for those countries in the higher-risk category. Countries identified as medium risk have the potential to move to higher risk in a future year and are therefore subject to enhanced review compared to lower risk countries.

Angola (2016: high; 2017 proposal: high)
Some bond data was available for the first time last year, for a 10-year US$ bond. Whilst this bond rate has improved from around 9% to around 8% this year, it continues to be the highest of all the US$ bond rate data for all the countries considered in this review. For the first time this year there is also CDS data available for Angola: similarly this is the highest amongst all the countries included in the review and is well above our threshold to be considered indicative of higher risk. The EIU risk rating of 68 represents a three-point deterioration since last year, and the S&P credit rating has been downgraded from B to B-, following a similar downgrading last year. There are no indications that Angola should be removed from the list of higher risk countries.

Azerbaijan (2016: medium; 2017 proposal: medium)
It should be noted that the initial proposal last year was to move Azerbaijan from a medium rating to higher risk, but the final decision was to maintain it at medium. At that point the data had been mixed (medium/high) for a period of two years, but had worsened slightly within these ranges. There were also mixed views around the general economic environment and political climate, but the overall view of the GFRC was of increasing confidence in the country, supported in part by a visit of the BP main board to Baku in 2016, including meetings with business leaders and government representatives.

USD 10-year bond rate data has been available now for Azerbaijan for three years. Over this period the rate has improved, and this year the differential against the US bond rates has improved quite significantly, moving from the high to medium range within our thresholds. In 2017 there is also 20-year USD bond rate data available for the first time, and this is just within our high range. Azerbaijan's EIU rating has deteriorated by 1 point this year (in the high range), whilst the S&P credit rating is unchanged at BB+ (in the medium range). There is no CDS data available for Azerbaijan. It is proposed to retain Azerbaijan in the medium risk category.

Brazil (2016: medium; 2017 proposal: medium)
Brazil has been maintained as medium risk in the past though economic data has been borderline between medium and high, as there was no sustained deterioration of indicators into the higher risk range. In addition, last year's input from the GPA team provided a more optimistic outlook than previously. Recent input from the GPA team indicates that Brazil has now come out of recession and the government is in the process of passing pension and labour reforms as well as taking action to stimulate upstream oil and gas investment.

Brazil's bond rates have reduced since 2016 for local currency bonds and 10-yr and 30-yr US$ bonds, although by comparison to US bonds these remain in the higher risk category. In common with all other countries under review, CDS data for Brazil shows an improvement and has moved into the medium range. Overall the economic data for Brazil is therefore slightly improved and is at the top end of the medium range / bottom end of the high range.

Given that the position has not deteriorated since last year and two-year period data does not consistently suggest higher risk, and the GPA input, it is proposed to maintain Brazil in the medium risk category for the time being.

Indonesia (2016: high; 2017 proposal: high)
Indonesia has been at the lower end of the higher risk category in recent years. Bond rates have been fairly stable since last year in absolute terms and the differential to US bonds has narrowed, though these indicators are still a mix of medium and high. The EIU rating and the S&P credit rating both remain medium. It is therefore proposed to retain Indonesia on the higher-risk list.

Oman (2016: medium; 2017 proposal: medium)
Oman was moved from the low risk category to medium risk in 2016. Bond data for Oman continues to indicate higher risk, whilst other indicators, including a downgraded S&P credit rating, continue to indicate medium risk. Oman is considered to be borderline medium/high risk given the mixed economic information including ratings downgrades, coupled with input from the GPA team around succession uncertainties and regional tensions. It is proposed to retain Oman in the medium risk category but this will need to be monitored closely in future years.

Russia (2016: high; 2017 proposal: high)
Russia was moved to the higher-risk list in 2014. Bond rates have generally improved slightly since last year and US$ bonds are now mixed medium and high compared to the US. In common with all countries under review, CDS data for Russia has improved and now suggests a medium rating, whilst other indicators continue to show a mix of medium and high. It is proposed to retain Russia on the higher-risk list as any improvement is yet sufficient or sustained enough to warrant a change to medium.

South Africa (2016: medium; 2017 proposal: medium)
Bond data for South Africa, both for local currency and US$ bonds, has deteriorated overall since 2016, and the differential versus US bond data continues to indicate a higher risk. The CDS data has improved and moved from high to medium, whilst other indicators still show medium risk. No change is proposed for this year to the medium rating.

Trinidad (2016: medium; 2017 proposed; medium)
We have data for a 10-yr USD bond for Trinidad, which has worsened slightly in absolute terms and the differential against US bonds remains just in the high range. Whilst the S&P credit rating has also deteriorated for the second year running (from A- to BBB+), this is still within our low-risk range. There is no CDS data or EIU rating for Trinidad. It is proposed to retain Trinidad in the medium risk category for this year.

Turkey (2016: high; 2017 proposal: high)
Turkey was moved from medium to higher risk in 2013. Turkey's bond rates have increased slightly during the year and continue to indicate higher risk by comparison to US bond rates. The 5-yr CDS rate has improved whilst the S&P credit rating and the EIU rating have remained static. It is therefore proposed to keep Turkey on the higher-risk list.

Risk premium for higher risk countries

The approach of using an increment to the general group discount rate for higher-risk countries has been used since 2007, and the increment used has been 2% since that time. The 2% premium was arrived at as an estimate of the average amount by which the available bond rates for the higher-risk countries exceeded average risk for all countries, but it is not the result of a precise calculation. This approach is considered to be an acceptable simplification, compared to having different rates for each country, in order to have a process that is practical to implement across the group.

An analysis has been carried out using the most recent information available to ensure that the 2% premium remains appropriate. Over the last few years more bond rate data has become available for many of the higher risk countries and this data supports the continued use of the 2% premium. We calculated the average of the USD bond rates available for the 8 countries classified as higher risk, and compared this to the overall average of the USD bond rates for all countries in our portfolio. The average rate for the higher risk countries was greater than the overall average by 1.25-1.55% for 10-30 year bonds, supporting the 2% premium used for these countries above the group WACC which implicitly represents average risk for the group as a whole.

Conclusion

It is proposed that the following countries will add a 2% higher-risk premium to the relevant discount rate (9% for value-in-use impairment tests and 6% for fair value less costs of disposal impairment tests) for 2017: Algeria, Angola, Argentina, Azerbaijan, Egypt, Indonesia, Iraq, Russia and Turkey. This list is unchanged from last year.

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Appendix 1 – Increment to discount rate for country risk

Informed by credit default swap spreads and sovereign bond rates, the following hierarchy of "country risk" is suggested for "Medium" and "Higher" risk countries. A default +2% increment to the standard discount rate for higher-risk countries is suggested as a practical expedient for including risks specific to the assets in the impairment analysis.

Current and proposed

Medium risk	Higher-risk
Azerbaijan	Algeria
Brazil	Angola
India	Argentina
Oman	Egypt
South Africa	Indonesia
Trinidad	Iraq
UAE (Abu Dhabi)	Russia
	Turkey

Appendix 2 – Sovereign bond rates, CDS data and summary data

	CURRENT DATA								
	Local currency bonds			US$ bonds				Latest EIU	S&P credit
Country	10yr	20yr	30yr	10yr	20yr	30yr	5yr CDS	rating	rating
UK	1.04	1.68	1.70				21		AA
US	2.11	2.42	2.73	2.11	2.42	2.73	26		AA+
Germany	0.35	0.85	1.14				13		AAA
Algeria							130	51	
Angola				8.10			590	68	B-
Argentina				5.84	6.74	6.94	285	57	B
Australia	2.69	3.21	3.52				23	21	AAA
Azerbaijan				3.93	4.59			56	BB+
Belgium	0.67	1.17	1.75	2.65		3.15	19		AA
Brazil	10.00			4.42	6.57	5.64	190	47	BB
Canada	1.88	2.23	2.29						AAA
China	3.70		4.25	3.11			58	45	AA-
Egypt	16.60			6.13	6.90	7.58	355	59	B-
India	6.50		7.15				77	40	BBB-
Indonesia	6.63	7.15	7.79	3.43	4.46	4.50	100	45	BBB-
Iraq				6.42			449	65	B-
Netherlands	0.49	0.84	1.19				17		AAA
New Zealand	2.85						23	18	AA
Norway	1.52						15		AAA
Oman				4.76		6.08		40	BB+
Poland	3.23			2.51	3.36		54	37	BBB+
Russian Federation	7.71	8.06	8.17	3.91		4.96	140	48	BB+
Singapore	2.04	2.31	2.36					23	AAA
Spain	1.55	1.86	2.78				67		BBB+
South Africa	8.46	9.49	9.71	4.63	5.30	5.29	170	41	BB+
Trinidad and Tobago				4.41					BBB+
Turkey	10.65			4.75	5.52	5.57	160	49	BB
UAE (Abu Dhabi)				2.81			53	46	AA

	HIGH / MEDIUM / LOW - RATING BASED ON CURRENT DATA							
	US$ bonds						2017 risk	2016 risk
Country	10yr	20yr	30yr	5-yr CDS	EIU rating	S&P	rating	rating
Algeria				M	H		H	H
Angola	H			H	H	H	H	H
Argentina	H	H	H	H	H	H	H	H
Australia				L	L	L	L	L
Azerbaijan	M	H			H	M	M	M
Belgium	L		L	L		L	L	L
Brazil	H	H	H	M	H	H	M	M
Canada						L	L	L
China	L			L	M	L	L	L
Egypt	H	H	H	H	H	H	H	H
India				L	M	M	M	M
Indonesia	M	H	M	L	M	M	H	H
Iraq	H			H	H	H	H	H
Netherlands				L		L	L	L
New Zealand				L	L	L	L	L
Norway				L		L	L	L
Oman	H		H		M	M	M	M
Poland	L	L		L	M	L	L	L
Russian Federation	M		H	M	H	M	H	H
Singapore					L	L	L	L
Spain				L		L	L	L
South Africa	H	H	H	M	M	M	M	M
Trinidad and Tobago	H					L	M	M
Turkey	H	H	H	M	H	H	H	H
UAE (Abu Dhabi)	L			L	H	L	M	M

	US$ bonds	5yr CDS	EIU	S&P
L	< US +1%	< 120	<36	>BBB
M	US +1-2%	121-199	36-45	BBB - BB+
H	> US +2%	> 200	>45	<BB+

L	Green shaded boxes = improvement since prior year
H	Bordered boxes = data available (no data in prior year)
L	(red = high; green = low)

Group Financial Risk Committee Meeting, 10 October 2017

2017 Review of Discount Rate for Provisions

Introduction

IAS 37 'Provisions, Contingent Liabilities and Contingent Assets' requires that provisions should be reviewed at each balance sheet date and adjusted to reflect the current best estimate of the expenditure required to settle the obligation. Where the effect of the time value of money is material, the amount of a provision should be the present value of the expenditures expected to be required to settle the obligation.

Guidance on discount rate to be used

Under IFRS the discount rate should be a pre-tax rate that reflects a current market assessment of the time value of money and the risks specific to the liability. An acceptable alternative is to adjust the cash flows for risk and to discount them using a risk-free rate (e.g. a government bond rate). BP uses this alternative approach.

IAS 37 requires a current market assessment of the time value of money to be used. The discount rate for provisions is determined by using six-month average US bond rates.

If the cash flows to be discounted are expressed in current prices, a real discount rate will be used. If the cash flows are expressed in expected future prices, a nominal discount rate will be used. BP generally uses real discount rates when discounting provisions, with only a small number of specific exceptions.

BP's methodology for determining the discount rate

BP's practice is to discount provisions that are likely to be settled in whole or in part more than three years from the balance sheet date or which have an undiscounted value of greater than $10 million. The provisions discounted are decommissioning obligations, environmental liabilities, legal provisions, and other provisions such as obligations under onerous contracts.

For simplicity BP uses one discount rate for all provisions derived from the yield on US government bonds whose maturities reflect the timescales for settling the Group's liabilities. The use of US bonds reflects that the majority of the Group's provisions are in the United States.

Time period over which costs are expected to be incurred

We have considered the time periods over which the expenditure to settle the obligations is expected to be incurred. For decommissioning obligations, data provided by the Upstream segment indicates that the weighted average time period to decommissioning is now approximately 17 years (2016: 18 years).

Decommissioning provisions represent over three-quarters of the Group's total provisions. The remaining provisions for the Gulf of Mexico oil spill relate predominantly to economic loss claims which are short term in nature and are not discounted. We adopt a simplified approach of using a discount rate appropriate to the estimated weighted average term of decommissioning obligations only, and applying this rate to all provisions – the impact of applying this longer term rate to shorter duration environmental liabilities is not considered to be material At 30 June 2017, total provisions unrelated to the Gulf of Mexico oil spill amounted to $22.0 billion, of which $16.7 billion related to decommissioning, $1.5 billion environmental, $0.7 billion litigation and $2.6 billion for other provisions.

The most significant liabilities associated with the Gulf of Mexico oil spill relate to the settlement agreements for which discount rates are fixed and not impacted by rate changes. These liabilities are recorded as payables in the Group balance sheet.

Latest data on rates

As in previous years, we have obtained 10-year and 30-year US Treasury bond rate data from BP Treasury, and we have interpolated the data to arrive at a rate appropriate for the estimated weighted average term of 17 years (2016: 18 years).

There is also a published price for a 20-year inflation-linked US Treasury bond, but the market for this bond is not as liquid as the markets in 10-year and 30-year bonds. Furthermore, there is no price data available for a nominal, non-inflation-linked 20-year bond. We interpolate a rate, therefore, from the 10- and 30-year bonds.

The following table shows the relevant rates at 28 September 2017:

	Rates as at 28 September 2017		
	Nominal %	Real %	Implied inflation %
10-year bond (6-month ave)	2.25	0.43	1.82
30-year bond (6-month ave)	2.86	0.93	1.93
17 years (interpolated)	2.46	0.60	1.86
Rounded data (to 0.25%)	**2.50**	**0.50**	**2.00**
2016 rates	2.00	0.50	1.50
Proposed change in rate	0.50	-	0.50

The 17-year interpolated real rate of 0.60% as shown above is, however, close to the point at which an increase in the rate would need to be considered (i.e. 0.625%) and it is possible that a change could be required for year-end reporting.

Estimated impact of a rate change

A high-level estimate of the impact on the balance sheet and income statement of the proposed nominal rate change indicated above has been made by reference to the actual effects of the discount rate change made in 2016. The impacts are limited as the significant majority of the Group's provisions are discounted using the real rate. The estimate indicates the following:

- A decrease in decommissioning provisions of approximately $65 million, with a corresponding decrease in decommissioning assets.
- A decrease of $20 million in legal provisions with a resultant credit to the income statement.

Outcome

Current data suggests that the nominal discount rate for the group's provisions has increased to 2.5% and the real discount rate is unchanged at 0.5%. Any changes will be made in the fourth quarter; existing rates will be used for third quarter reporting. The calculations will be re-performed using 6month average data through to 31 December 2017 and any changes required will be notified at that time.

Group Accounting and Reporting
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Members of the Group Financial Risk Committee

IST Trading Compliance & Control Risk Review

IST is looking forward to hosting MBAC at 20 Canada Square on 26 October 2017.

The draft pre-read for the October 2017 meeting is attached for your review. It consists of a paper which we intend to submit as pre-read for the meeting and a slide deck which will be used in the formal review session on the day.

This pre-read covers the following areas:

- developments in the external environment and IST's response;
- identification of key risks and improvements IST made to effectively manage risks in 2017; and
- an update regarding regulatory developments and legal cases.

We will also visit the trading floors with MBAC again this year. The following topics have been selected for discussion in this context:

- Blockchain application in IST;
- Crude trading and Oil Market Analytics; and
- Virtual Utility Strategy rollout in the European Gas & Power business.

We welcome the opportunity to review with you at the GFRC meeting on 10 October and are looking forward to receiving your input and guidance.

David Bucknall
October 2017

Main Board Audit Committee Meeting, 26 October 2017

Group Risk: Trading Compliance & Control

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Main Board Audit Committee Meeting, 26 October 2017

Group Risk: Trading Compliance & Control

1 Introduction

This paper summarises key changes in the business environment, key risks for IST, as well as improvements implemented since the last MBAC review in October 2016.

2 Environment and IST's response

Since the October 2016 meeting at Canada Square, oil prices have remained within a range of $45 to $55 per barrel, with Henry Hub gas remaining around $3 per MMBtu. Prices across the crude oil and products markets have been influenced by financial market fund flows as well as physical market fundamentals. This environment has created both opportunities and challenges for IST. The oil business is slightly behind plan year to date, with a strong performance in 1Q offset by a weak 2Q. The gas business has delivered rateably through the year.

US crude exports are now running at record levels, driven by strong demand in Asia. The light sweet nature of US shale crudes has caused a structural shift in crude quality, opening up blending opportunities. IST has a strong market share in this export and blending activity. However, the new opportunities are counterbalanced by a reduction in trading value in the US onshore business, as the market becomes less constrained physically.

OPEC cuts eventually moved the Brent market from shallow contango into backwardation in 3Q 2017. Furthermore, OPEC cuts of heavier, higher sulphur crude has narrowed differentials. Global demand for products continues to surprise, with China and the East continuing to dominate demand growth.

In this trading environment, the Global Oil trading benches were, generally, holding bullish crude and products structure, crack spread, and locational arbitrage positions throughout 2017. This strategy produced a strong result in 1Q. However, 2Q results were subdued by a sell off in the oil price driven primarily by financial investors withdrawing capital. This also put pressure on product spreads.

Hurricane Harvey accentuated the bullish fundamentals in 3Q. Global Oil MVaR increased to $51m – the highest value observed in 2017. The Gasoline and Distillate books triggered gain alerts at the end of August. However, the crude book saw gains on spreads and outright length offset by losses as WTI declined in value relative to Brent, due to unexpected strength in the East.

Environmental products prices strengthened through the year, allowing the Global Environmental Products (GEP) business to deliver incremental value from the Clean Energy acquisition, combined with new transactions in biogas.

The relatively warm winter in the United States and healthy natural gas supply resulted in low volatility and range-bound natural gas prices in the United States. IST's North American Gas & Power (NAGP) business continues to deliver value through its focus on customer margin-based activities and its Virtual Utility Strategy. The European Gas and Power (EG&P) business continues to execute deals with Retail Energy Providers (REPs) to grow its presence as energy supplier providing customised innovative solutions for retailers. The EG&P performance in 2017 was also driven by strong earnings related to the investment in the Bahia de Bizkaia Electricidad (BBE) power station in Spain.

While the LNG market is expected to be oversupplied in the longer term, the Global LNG business generated value from continuous portfolio optimisation and the short-term tightness in LNG spot markets on the back of bullish near-term LNG positions, on account of delays to new supply and Chinese buying.

Putting performance in context, The Oliver Wyman competitor benchmarking review for the year 2016 showed that IST outperformed various competitor groups including the average top three Oil & Gas Majors, Independent Traders, and Banks in terms of gross margin growth. IST profited particularly from its diversified portfolio with Global Gas performance compensating for tighter trading margins in Global Oil where the record year performance of 2015 could not be repeated.

3 Business update

3.1 New activity in the past year

The oil business made progress in a number of areas:

- Working capital is a critical resource in oil trading. We added and extended a number of working capital structures within the framework developed with Treasury. This enabled us to maintain oil inventories of around $6bn at competitive funding costs.
- We executed an agreement to build an industry-leading terminal connected via pipeline to BP's refinery in Rotterdam. This will be in operation in 2020 and will add significant value through a reduction in storage costs, lower freight and demurrage, and further trading and optimisation. This arrangement will be accounted for as a finance lease.
- In 1Q 2017, IST paid $155m for Clean Energy's existing biomethane production facilities, additional facilities under construction, and third-party supply contracts. The NPV of this transaction was $323m. Performance to date has been ahead of plan. In 3Q, we divested the producing assets to a 50% BP owned, non operated joint venture with Aria, Clean Energy's existing development partner. This was the final step in the transaction, ensuring that operatorship transferred from BP to an experienced operator. Future biogas projects will be developed by the JV.
- The Derivatives bench participated for the first time in the Mexican government hedging programme. The bench expects

to collect a risk premium as the deal prices out in November 2018.

- Jurong Aromatics Corporation (JAC) went into receivership in 2015 owing IST $190m. IST worked with the receiver to toll the plant and to recover some of the losses. The plant has now been sold to Exxon for around $1.6bn. Senior secured lenders will receive a payout of around 70%. Unsecured creditors will generally receive no payout, though IST's recovery totalled over $100m due to the effective management of the tolling agreement.
- Collaboration with Downstream's Fuels Value Chains, whereby infrastructure is optimised by IST, has reached record levels ($275m forecast in 2017, a 200% increase on 2014).

Selected natural gas business highlights for 2017 are summarised as follows:

- The LNG business successfully participated in a competitive process to purchase 18 cargoes per year from Oman LNG from January 2018 for 7 years. This gives IST's LNG business access to flexible supply from the Middle East at a highly competitive price and a potential backfill option for an existing LNG sale to Kuwait.
- Mozambique LNG supply volumes have been confirmed through the Coral Floating LNG project, with the final investment decision (FID) being taken in 2017.
- Trading in merchant LNG cargoes has increased 30% since 2016.
- The European Gas and Power business has replicated the Virtual Utility Strategy previously developed in North America. In 2016, EG&P invested in a new market entrant, Pure Planet, launched by former founders of Virgin Mobile in the UK. The commercial launch of Pure Planet occurred in May 2017, and the entity is now focussed on growing its customer base. Further retail energy provider (REP) transactions have been progressed in the UK, Germany, and Italy.

- BBE performance exceeded plans in 1H 2017. This was mainly driven by successful arbitration outcomes.
- NAGP started a natural gas marketing business in Mexico making BP one of the first private companies to supply natural gas to this key strategic market. Delivery is at least 200,000 MMBtus per day to 8 states in Mexico in 2017, making BP the largest new entrant. The gross margin from NAGP activities in Mexico is predicted to grow to $34m per year in 2022.

3.2 Looking forward

IST is focussed on achieving earnings stability and growth. A number of new initiatives will support these objectives in 2018 and beyond:

- The oil business will continue to grow access to high value crude and product flows through partnerships and by participating in export finance structures used commonly in emerging markets. This approach will create opportunities to market crude to China and to sell products in West African markets.
- The LNG Greenfield strategy, to create incremental and diversified sales, has been progressed further through Project Açu in Brazil. IST is in the process of negotiating an LNG sale for 23 years for 1.3 million tons per annum. This project will include optionality to sell LNG at premium power netback prices, or use equity pipeline or third party gas to replace the LNG. IST also aims to build a Brazilian power trading platform through this project.
- The International Maritime Organization has announced a change to the Marine Pollution (MARPOL) Convention, reducing the sulphur limit from 3.5% to 0.5%, effective 1 January 2020. This change has the potential to cause a significant dislocation in global oil markets, impacting crude differentials, product spreads and refinery economics. IST is leading the BP response to this change.
- Progress has been made in emerging markets growth initiatives. India Gas Solutions (IGS) has updated its marketing

plans following further Upstream sanctions. IST is also targeting oil products markets in Latin America, the Caribbean and will extend its domestic Russian activity.

- The proposed acquistion of Woolworths in Australia will create a short of around 12 million barrels per year for gasoline and 3 million barrels per year for distillate. IST will allow BP to capture value across the full supply chain through close collaboration with the FVC and can build a significant blending business in the East on the back of this transaction.
- IST signed an agreement for strategic cooperation in Russia and beyond with Rosneft. IST will be able create value through significant natural gas flow arising from resultant supply and marketing collaboration in Europe and global LNG、
- IST has agreed to manage offtake from Aker-BP, giving IST access to some significant trading optionality

4 Risks and risk management

4.1 Key risks and health of our control environment

IST uses the Group's enterprise risk management process to identify key risks. The assessment of those risks is shown on the IST risk matrix in Appendix B. The overall risk profile of IST has remained broadly consistent with the 2016 assessment.

Some structural changes were introduced in the 2017 risk profile to simplify and to reflect how IST management addresses risks. These are summarised as follows:

- A combined risk related to "Failure to deliver Trading Performance (RCOP)" was introduced – this risk includes several previously identified risks including Major Shift in Market Structure, Market Risk Exposure, and Term LNG Market & Credit Risk
- Cash-related risks are captured in a combined risk related to "Failure to deliver IST Operating Cash" – this risk includes Commercial Impact from Loss of Group Liquidity, Failure to

Deliver Annual Planned Cash Flows, as well as Counterparty Credit Risk
- The Business Regulations risk was redefined and now captures "Legal & Regulatory Compliance" risk
- Rail & Truck Transportation exposure risks were combined into a single risk called "Onshore Transportation Exposure"
- All asset-related risks were combined into a single "Major Projects" risk – this risk includes prior year risks related to Engineering Procurement and Construction (EPC) Completion Risk, Freeport, Clean Energy Assets, and Coral FLNG
- The "Adverse Regulatory Change" risk now covers both financial and physical regulation aspects

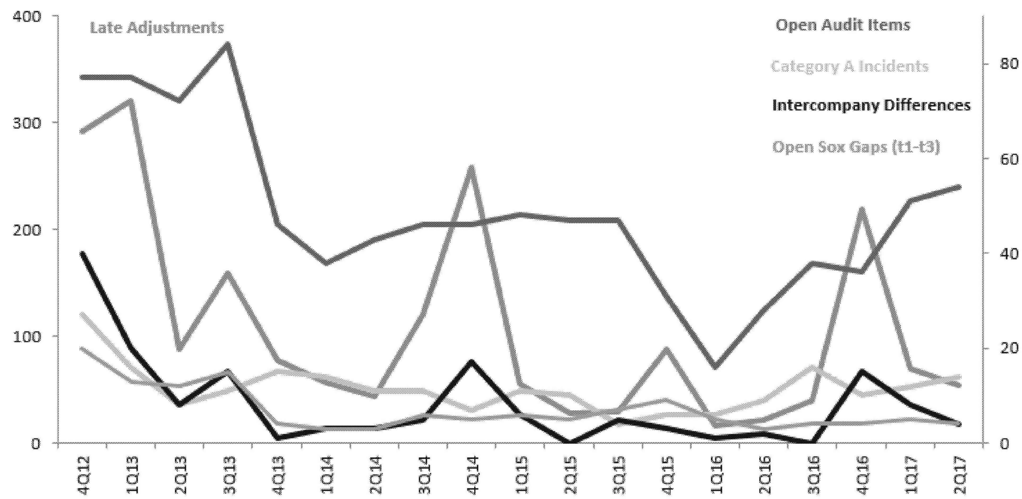
For the combined risks mentioned above the underlying component risks are still managed at a disaggregated level within IST.

The following key risk assessment and mitigation changes are noted in comparison with the submission in 2016:

- Rogue Trader – rollout of Interlocking Accountabilities (ILA) reporting and Palantir continues
- Cyber Risk – recognition that there is likely to be a higher frequency of lower impact events
- Marine Transportation Exposure – reduction of likelihood driven by safety improvements in the industry and the reduction of marine movements

IST continues to manage market price risk using Market Value at Risk (MVaR). Additional tools and metrics including PnL and Cash stress testing, volumetric limits, drawdown and gain alerts, and the Long-term Framework based on Net Present Value (NPV) and Net Present Value at Risk (NPVaR) are applied to complement MVaR.

IST has managed to sustain the robust control environment which has been in place in previous years as can be seen from the evolution of selected key performance indicators shown in the chart below.



IST continues to complete and close audit findings on time, with no overdue management actions outstanding. The number of audit findings has increased from a low point in 1Q 2016. We look to learn from audit findings and Category A incidents, using these to drive improvements in the control environment.

4.2 Key risk management improvements

Progress has been made in the following key areas since the last update to MBAC in 2016:

- A "Stay Safe Campaign" and "Learning Organisation" have been launched in 2017, with a focus on personal safety, compliance and cyber risk
- In 2Q 2017 a review of IST's Information Security Framework was initiated for implementation through 2018
- IST market risk concentration analysis was performed in the Commodity Risk teams from 2Q 2017 – analysis of MARPOL trading strategies was initiated
- New stress testing scenarios were added to reflect current events and resultant market risks arising from these events – scenarios covered included events in Qatar and North Korea

Rogue trader risk and core system infrastructure:

- IST continues to roll out ILA reporting functionality using Palantir – the inclusion of the Emissions and Treasury Trading businesses is nearing completion and NAGP will be implemented in 1Q 2018.
- The second phase of the Simpler Scalable Standardised (S3) programme has been kicked off in NAGP in 2017. This remains a multi-year programme to reduce the number of transaction systems and to align and simplify business processes across IST.

Counterparty credit management:

- Although IST's average credit exposure has increased in line with the flat price environment from $9.3bn (2016) to $10.7bn (YTD 2017), IST's credit risk profile has improved. The sub-investment grade portion of our portfolio has decreased from an average of 43% to 36%. Expected Loss (EL) levels have decreased from an average of $43.7m to $27.8m. Gross credit losses are trending lower than last year with $24m YTD 2017 compared with $63m for 2016.
- The IST net derivative balance has decreased since our last meeting from a net asset position of $2.1bn to $1.5bn as of end of 2Q 2017.
- The credit reserve methodology and associated system development is on schedule to achieve compliance with IFRS9 and related requirements by year-end.
- Additional systems improvements and consolidation are ongoing, with the 2017 delivery agenda addressing letter of credit management, physical MTM exposure and financial oil Potential Future Exposure (PFE).

Cyber risk mitigation:

- Workplace modernisation and the rollout of Windows 10 will lead to information classification tools being deployed in IST. With these tools employees will label and encrypt IST's most sensitive documents to prevent them from inappropriate use.

- A Cyber Business Continuity Planning (BCP) exercise has been scheduled for 4Q 2017 for the IST EXCO team members. The key objective of the exercise is to test the command and control structure of IST in the event of a global cyber incident.
- Lessons learned from the insider extortion attempt are being applied, especially controlling access to shared files, and archive of historic data

Organisational changes:

- Geir Robinson joined IST as Chief Risk Officer (CRO) in London in April 2017. The CRO role was added to provide leadership in the areas of risk speciality. A new role of Performance Director has been created to foster a culture of learning across IST's operations. No change was made in terms of the underlying regional Finance and Risk teams as part of this appointment. The CRO is responsible for policies related to market, credit, and operational risk, organisation of the global risk networks in these areas, coordination of the IST risk management matrix, and oversight of HSSE and NOJV risks.
- The migration of high-volume and lower-complexity activity to BP's Global Business Services centre in Budapest continued in 2017. After a period of transition key performance indicators now show that this move has achieved the goals outlined.

Blockchain initiatives:

- IST has participated in Blockchain proof of concept initiatives in 2017 to determine how this emerging technology can be applied within IST. Project Forcefield is the first project to reach critical mass of market participants with Energy Majors, Trading Houses, and Banks participating in the initiative geared towards creating a fully digitised cross-industry back office platform using distributed ledger technology and smart contracts.
- The benefits arising from this technology are reduced operating costs including reduced working capital needs, a reduction of

inefficiencies in post trade execution, and improved operational risk management including fraud prevention.

5 Compliance risk management updates

Redacted - First Amendment

Redacted - First Amendment

5.2 Controls and processes

IST closely monitors regulatory changes and has controls and processes to ensure compliance, both of a regulatory and ethical nature.

- Transaction and Order Book Monitoring: In 2016, the EU Market Abuse Regulation was introduced which required the implementation of surveillance models to analyse order book activity such as bids and offers. IST worked with Palantir in 2016/2017 to implement 7 surveillance models to monitor for particular types of market abuse (eg spoofing) in BP's order books, which are now operational in the UK. A new vendor, Scila, has been chosen to deliver enhanced surveillance models to monitor the order book activity of all IST businesses – this work is expected to be completed by end 2Q 2018.
- Mobile phone recording: Mobile phone recording was implemented in London in August 2017. Mobile phones remain a non-approved channel for business communications except when out of the office and approval has been obtained.
- Personal Account Dealing (PAD): Further to completion in London in 2016, an annual certification-based compliance system for PAD has been rolled out to all IST locations outside of London in 2017. Questions on the attestation arose in connection with investments in non-public companies active in the same commodity markets as IST, dealings in shares of customers/counterparties, speculative trading of foreign exchange and the definition of "acting on behalf of". We are working to clarify ambiguous language regarding

these areas in the Global Trading Guidelines and related FAQs to ensure consistency across the regions.

5.3 Relationships with regulators

UK: IST has a new relationship manager at the FCA; the relationship remains constructive and BP has been advised that the FCA will decrease the frequency of regular supervisory meetings and instead conduct visits focused on reviewing particular areas of business on an irregular basis. Recent interactions have included:

- Following the FCA Culture and Incentives Thematic Review in 2016, IST received feedback that IST is amongst the top quartile of firms visited by the FCA in this review. There were limited suggestions for improvement which included using metrics as monitors of culture, including a claw-back to the cash element of the bonus and the creation of a "Culture Dashboard". IST is developing such a dashboard for consideration at its Q4 Exco;
- IST attended a meeting at the FCA in July to present its strategy – the meeting is an annual fixture and forms a standard part of the supervision of an FCA "fixed portfolio" firm. Included discussion on the IST business model, current group and IST initiatives, IST financial performance and key drivers of revenue as well as regulatory implementation and compliance. No actions arose from the meeting;
- FCA requested an overview of IST and BP technology arrangements and a meeting was held in September covering risks, budget, resource, dependency on third parties, resiliency, contingency arrangements, management information, governance, functional input to new IT developments and challenges to delivery. The engagement was positive with FCA appreciative of the information received; and
- In September 2017, the FCA met with E&C to review BP's preparation for MiFID II in the areas of governance structure, programme assurance, management information and implementation progress. The FCA was satisfied with the

status of the preparations and will return post implementation for an update.

Redacted - First Amendment

5.4 Significant IST concerns in 2017

There were two incidents concerning release of BP proprietary information. The first arose in Chicago and BP filed a lawsuit against a BP crude market analyst in May relating to theft of BP trade secrets and confidential information. After being informed of the incident the new employer of the analyst informed BP that it revoked the job offer. The analyst recently died in a fatal accident and BP has withdrawn the lawsuit. Interviews with other market analysts as witnesses to the case led to a London analyst being suspended and then dismissed for her failure to cooperate fully and honestly in the investigation and a failure to act with good judgement and integrity and in the best interests of BP.

The second incident related to a market analyst in Singapore who had recently resigned. An initial review of his laptop showed that he had created a number of files prior to his departure which appeared to be in preparation for export and we were aware that he printed documents whilst in the office at a weekend. Forensic analysis was inconclusive as to whether the files were exported from his laptop. The analyst was interviewed and was forced to return the hard and soft copy documents to BP.

We are working with the Digital Security & Risk team to enhance our ability to protect commercially sensitive information by using the Azure Information Protection tool. This is a classification tool which allows the document owner control over who can receive/open/edit/print specific documents. We are also considering the addition of the Market Analytics and the Marketing & Origination teams to the Must Record List (MRL) to ensure regular monitoring of Instant Messaging and email.

Global Oil Americas was also involved in a bitcoin extortion to release BP data (personal and commercially sensitive information). There was no known impact on trading activity and markets and BP worked with the National Crime Agency and the FBI to identify the perpetrator. The person was identified as a BP employee in the Chicago office, the FBI searched the employee's home under warrant and data is being gathered by the FBI in preparation for possible arrest. Data monitoring software (Veronus) is now being rolled-out to all files, which will enable faster interrogation of data in the event of unauthorised access.

Cyber Security will be one of the topics covered in the 2017 Safety Compliance Stand-Down in October 2017. The Stand-Down focuses on three areas – personal safety, cyber safety and compliance safety – using incidents to highlight unsafe and unacceptable behaviours.

IST has a few significant legal cases pending and an update is provided in Appendix A.

6 Conclusion

Our strategy of building a platform of stable margin-based income supplemented by accessing more diversified trading opportunities and optimising group flows is succeeding. We have been able to withstand changes in the market through our integrated business and analytical capability, although we are still working to improve the timing of creating our trading positions, by better understanding financial fund flows.

We continue to strengthen our control environment and manage our key risks, through organisational alignment, leveraging big data, credit and working capital management improvements, as well as by strengthening our compliance culture and monitoring activities.

We look forward to a fruitful meeting with you in October.

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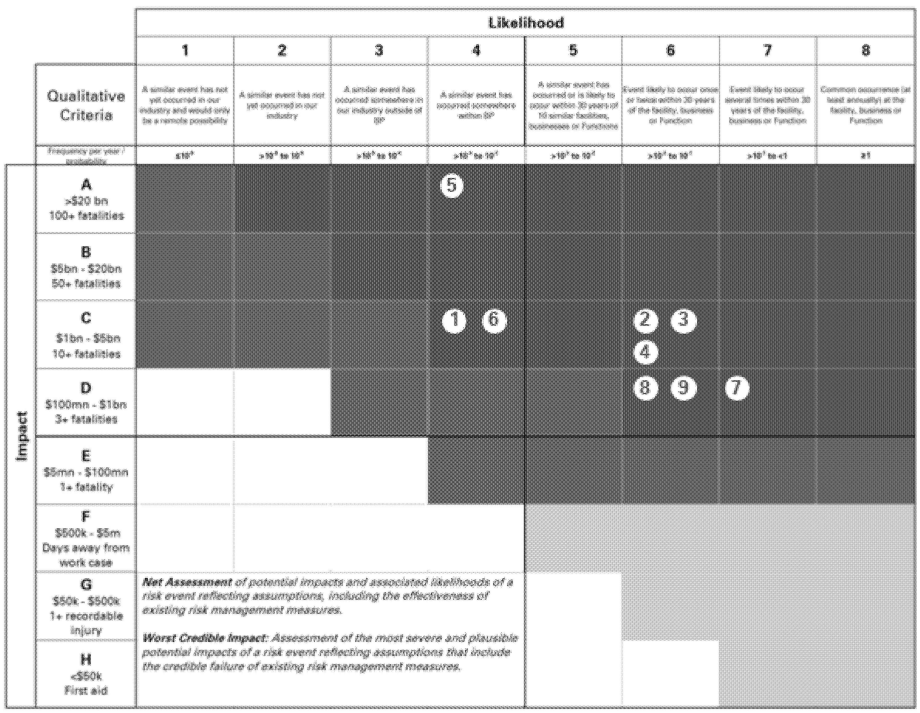
Appendix B: IST's 2017 risk matrix

Worst Credible Assessment

#	Risk description
1	Rogue Trader
2	Legal & Regulatory Compliance
3	Failure to deliver Trading Performance (RCOP)
4	Failure to deliver IST Operating Cash
5	Marine Transportation Exposure
6	Onshore (Truck & Rail) Transportation Exposure
7	Tax Risk
8	Cyber Risk
9	Business Disruption



IST Trading, Compliance & Control

Main Board Audit Committee

October 2017

Agenda – October 26th 2017

Agenda items	Time	Lead Speakers
Introduction	09.15	Alan Haywood
Strategy and Commercial Environment		Alan Haywood/David Bucknall
Risks and Controls		David Bucknall/Geir Robinson
Illustrations - Carbon Trading and Clean Energy acquisition - Houston BCP - Cyber Incident		David Bucknall/Geir Robinson
Regulatory Developments		Tom Nuelle
Floor Walk - Blockchain (3rd floor) - Crude and Market Analytics update (1st floor) - Virtual Utility Strategy (2nd floor)	10.15	John Jimenez/Saad Rassak Dan Wise/James Davis David Knipe/Jason Tate
Close	11.00	Alan Haywood

IST Strategy

IST's Strategy continues to be to grow RCOP and cash delivery through:

- Supporting Group Segment strategies through providing **operational resilience** and **optimised** supply and offtake;
- Growing Downstream value across the **Integrated Midstream**;
- Growing incremental value on **Upstream production**
- **Focused origination** to build bridgeheads into growth markets and key flows, to broaden optimisation opportunities and add traded market insight;
- Investing in **analytical and trading capability** to identify and capture distinctive market opportunities;

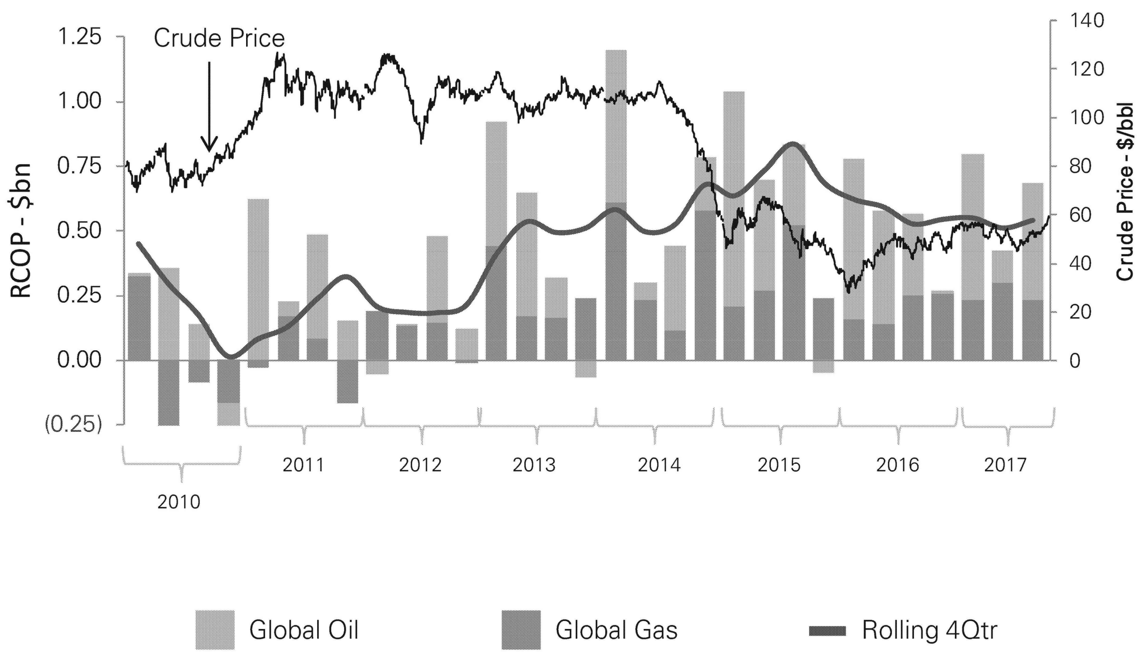
Underpinned by:

- **A strong compliance culture**;
- Disciplined use of the **Groups resources**;
- Enabled by a **cost base** aligned with **benchmarks**.

IST Financial Contribution

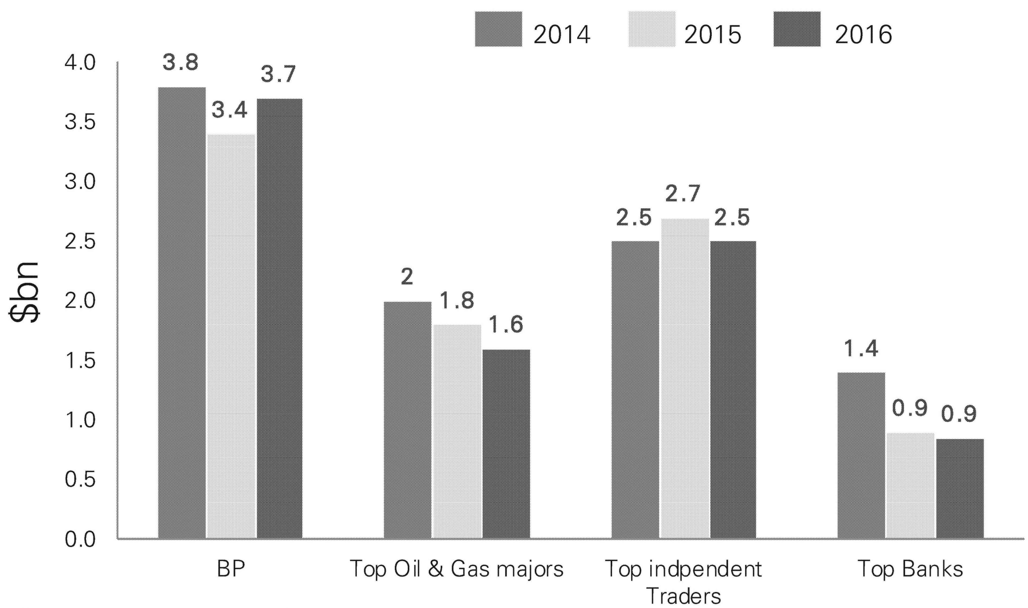
2017 3Q YTD Financial Delivery

- RCOP $1.9bn
- OpCash $3.0bn



IST outperforms competitors in trading GM growth – significant oil trading exposure curbs performance for top independent traders

Top-3 competitor average gross margins



Gross margin growth

2013-14	15%	20%	5%	50%
2014-15	(10)%	(10)%	5%	(35)%
2015-16	10%	(10)%	(10)%	(5)%

Data sourced from Oliver Wyman

IST activities support BP today and for the future

BP's Strategic Pillars	IST activities – business as usual	IST activities - growth
Shift to gas and advantaged oil in the upstream	• Segment support • Crude and products trading • LNG trading • Gas Value Chains • Greenfield LNG	• NOC partnerships • Gas Value Chains and downstream gas • New Greenfield LNG
Market led growth in the Downstream	• Midstream support • Mexico • Woolworths • MARPOL	• China • India • Russia • Latin America
Modernising the whole group	• Core systems infrastructure • Big Data • GBS • End to end cost to trade	• Blockchain • Quantum computing • Emerging disruptive technologies
Venturing and low carbon across multiple fronts	• Clean Energy acquisition • Global Environmental Products trading • Support Lower Carbon Taskforce	• Global Power trading • Biofuels • Additional biogas projects
Financial Framework	• $0.25bn CAPEX p.a. • Self Funded Inventory ($5bn in oil) • $1.3bn Fixed Assets	• Partnerships (External Funding) • Incremental CAPEX and leases • Incremental Self Funded Inventory • Long Term Commercial Commitments and tolling

Carbon Trading and Clean Energy

Carbon Trading

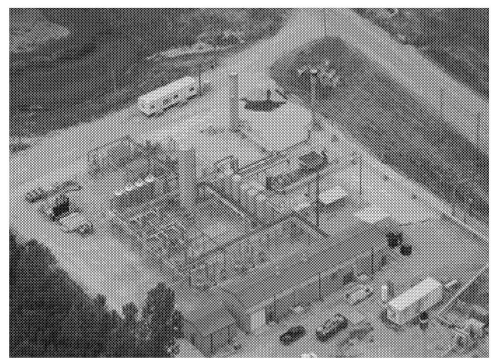
Objectives are to:-

- Manage BP Group's renewable certificate compliance requirements;
- Originate renewable energy credits through third party transactions;
- Take limited proprietary trading positions based on market view;

Markets traded by Global Environmental Products (GEP) business include:-

- Europe - EUA/EUAA
- US – RINS
- California – LCFS
- China – various exchanges and CCER
- New Zealand
- Australia

Clean Energy acquisition



Shelby landfill gas facility

1Q 2017
Paid $155m for Clean Energy's biomethane production facilities, facilities under construction, and third-party supply contracts

3Q 2017
Divestment of producing assets to non operated JV with Aria, an existing development partner of Clean Energy

Original NPV of $323m, with 2017 ahead of plan
Biogas business underpins 2018/2019 growth
Additional Biogas projects being developed though Aria JV

Per Group Scorecard	2013	2014	2015	2016	2017	2018	2019
Renewable markets trading earnings ($m)	15	10	65	82	145	180	194

IST RMR 2017 – Overview

Key Risk	Comments/Mitigation	2016	2017
Failure to deliver Trading Performance (RCOP)	• Combined risks: Market Risk Exposure, Major Shift in Market Structure, Competitive Threats Environment, Term LNG Market & Credit Risk, Country Risk, Optimisation of BP Value Chain, and elements of Counterparty and cash risks	n/a	C6
Failure to deliver IST Operating Cash	• Combined risks: Commercial Impact from Loss of Group Liquidity, Failure to Deliver Annual Planned Cash flows, Counterparty Credit Risk, and Working Capital Optimisation	n/a	C6
Rogue Trader	• Continuation of ILA/Palantir rollout	B	C4
Cyber Risk	• Recognition that there is likely going to be a higher frequency of lower impact events	C	D6
Legal & Regulatory Compliance	• Redesigned Business Regulations risk	n/a	C6
Marine Transportation Exposure	• Reduction driven by safety improvements in the industry, embedding of ISM code requirements and the reduction in marine movements • IST Global Oil have also completed Major Accident Review (MAR) assessment and results support the change	A	A4
Onshore Transportation Exposure	• Combined Rail and Truck Transportation exposures	n/a	C4
Tax Risk	• No change	D	D7
Major Projects	• Combined risks: Engineering Procurement and Construction (EPC) Completion Risk, Freeport, and Coral FLNG	n/a	C2
Business Disruption	• No change	D	D6

IST Risk Profile – Summary

Key Risk	Indicator	Range of value observed where application - YTD 2017
Market Risk	- Market Value at Risk (MVaR) - PnL stress - Cash stress - Drawdown and gain alerts - Net Present Value (NPV) - Net Present Value at Risk (NPVaR)	- \$15m – \$55m - Typically 2 – 15 times MVaR - Managed with Treasury - ~10 drawdown and ~30 gain alerts recorded - \$7bn as of end of Q2 2017 - \$3.3bn as of end of Q2 2017
Credit Risk	- Exposure - Expected loss (EL)	- \$8.6bn – \$12.8bn - \$20m – \$36m
Operational Risk	- BCP invoked in Houston before Harvey - Cyber incident resolution - Continuation of ILA/Palantir rollout - Move of Settlements to GBS (Budapest)	2 – 8 Cat A incidents per month 20 – 50 Cat B incidents per month No overdue audit findings actions

NAGP Houston BCP – Hurricane Harvey

BP's Westlake 1 Houston campus after Harvey

Dallas NAGP BCP Site

NAGP employees back at Helios on September 20^{th}

August 23^{rd}

NAGP BCP leadership requests BCP team to prepare for Dallas – IT&S staff start preparing the Dallas trading site.

August 24^{th}

- **BCP activated; team travels to Dallas.**
- August 25^{th} – BCP team starts work in Dallas.

WE of August 27^{th}

Torrential rains lead to flooding across the city – BST activated on August 27^{th}

August 30^{th}

BP Houston campus is closed

September 6^{th}

Hurricane Irma path watched

September 7^{th}

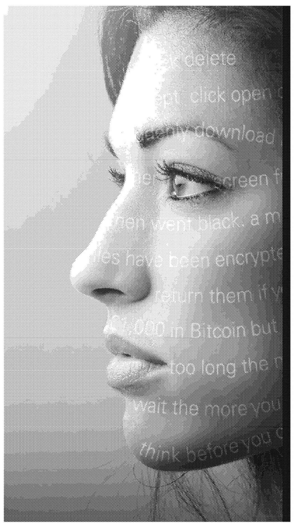
Water levels decrease and **restack plans start** for Helios Plaza and Westlake.

September 20^{th}

- All NAGP staff in Helios
- 262 NAGP staff were at BCP
- BCP site hosted 14 staff from GOM and SOC
- Roughly 250 non-Helios staff in building

Aug. 23^{rd} → Aug. 24^{th} → Aug. 25^{th} → Aug. 30^{th} → Sept. 6^{th} → Sept. 7^{th} → Sept. 20^{th}

Cyber Incident



Actions taken during incident resolution

- Restricted server access
- Increased monitoring efforts
- Full analysis of all data sources and review of all possibilities of penetration by individuals both inside and outside the organisation
- Close partnership with NCA and FBI

1. Extortion e-mail received
2. Internal investigation launched
3. Townhall recording received
4. **Insider threat suspected**
5. Additional data requested
   Suspects reviewed and eliminated from enquiry
6. Individual identified FBI raid initiated

Lessons learned from the incident

- High volume of unstructured data increases risks and makes monitoring more difficult
- Potential for increased monitoring and control

Further actions identified

- Enhance Information Security Framework
- Simplify IST's data footprint
- Improve coordination between Functions (HR, E&C, Legal, Business Integrity & Digital Security)
- Continue assessment of effectiveness of safeguards in place to protect IST's information – people, technology and data related controls
- Adoption of additional tools

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Regulatory Developments

In the EU:

- Key areas of EU change impacting BP under MiFID II (go live 3 January 2018) and EMIR RTS (go live 1 November 2017):
  - Regulatory reporting simplification and implementation
  - Implementation of position limits
  - Legal entity change of permissions
- BP interaction with the FCA is strong with feedback in 2017 that IST is amongst the top quartile for firms reviewed by the FCA for Culture and Incentives. Recent meetings include an Annual Strategy meeting, a technology overview and a MiFID II program review

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In Singapore:

- Awaiting final MAS rules in relation to reporting requirements for commodity derivatives. It is expected that BP Singapore will be required to report OTC derivative transactions from November 2018

Appendix

DRAFT
Floor Walk – Blockchain: Project Forcefield and BP Internal

Project Forcefield

- Create a fully digitalised cross industry back office platform
- Utilising distributed ledger technology and smart contracts
- First project to reach critical mass of market participants

BP Internal

- Exploring concept within BP Group

Forcefield Consortium – 12 Organisations

Majors (3): bp, Shell, Statoil

Trading Houses (6): KOCH, GLENCORE, TRAFIGURA, Gunvor, Vitol, MERCURIA

Banks (3): ING, ABN·AMRO, SOCIETE GENERALE

	Approach	Vision
Project Forcefield	• Scoping review to evaluate anti-trust/competition issues, define product use cases, technology feasibility and potential 'NewCo' structure & governance • October investment proposal for 'Newco', that builds and operates platform, owned by the participants • Ppriority cases are the BFOE, ARA Barges and US crude ppipeline markets – and scale post implementation	• Eliminate operational inefficiencies in post trade execution • Reduce the deal lifecycle (including Working capital) • Minimise opportunities for fraud due to the confidential structure of interaction of participants on the block chain • A platform that is auditable, adaptable, flexible and provides significant value to incentivize market participation
BP Internal	• Integrate with Finance Modernisation agenda • Exploratory analysis and engagement initiated • WIP to develop business case and TOR	• Develop Blockchain for Group intercompany supply chain: — Operational process efficiencies — Eliminate intercompany reconciliations • Devise internal governance to facilitate cross business adoption

IST RMR 2017 – Worst Credible Assessment

Risk description

1 Rogue Trader

2 Legal & Regulatory Compliance

3 Failure to deliver Trading Performance (RCOP)

4 Failure to deliver IST Operating Cash

5 Marine Transportation Exposure

6 Onshore (Truck & Rail) Transportation Exposure

7 Tax Risk

8 Cyber Risk

9 Business Disruption

		Likelihood							
		1	2	3	4	5	6	7	8
	Qualitative Criteria	A similar event has not yet occurred in our industry and would only be a remote possibility	A similar event has not yet occurred in our industry	A similar event has occurred somewhere in our industry outside of BP	A similar event has occurred somewhere within BP	A similar event has occurred or is likely to occur within 30 years of 10 similar facilities, businesses or Functions	Event likely to occur once or twice within 30 years of the facility, business or Function	Event likely to occur several times within 30 years of the facility, business or Function	Common occurrence (at least annually) at the facility, business or Function
	Frequency per year / probability	$\leq 10^{-6}$	$>10^{-6}$ to 10^{-5}	$>10^{-5}$ to 10^{-4}	$>10^{-4}$ to 10^{-3}	$>10^{-3}$ to 10^{-2}	$>10^{-2}$ to 10^{-1}	$>10^{-1}$ to <1	≥ 1
Impact	**A** >$20 bn 100+ fatalities				5				
Impact	**B** $5bn - $20bn 50+ fatalities								
Impact	**C** $1bn - $5bn 10+ fatalities				1 6		2 3 4		
Impact	**D** $100mn - $1bn 3+ fatalities						8 9	7	
Impact	**E** $5mn - $100mn 1+ fatality								
Impact	**F** $500k - $5m Days away from work case								
Impact	**G** $50k - $500k 1+ recordable injury								
Impact	**H** <$50k First aid								

Net Assessment *of potential impacts and associated likelihoods of a risk event reflecting assumptions, including the effectiveness of existing risk management measures.*

Worst Credible Impact: *Assessment of the most severe and plausible potential impacts of a risk event reflecting assumptions that include the credible failure of existing risk management measures.*

IST Balance Sheet – 2Q 2017

SEA Presentation

Balance Sheet

	$millions	Group	IST
	Non-current assets		
440	Property, plant and equipment	129,817	237
413	Goodwill	11,256	137
420	Intangible assets	18,366	469
	Investment in joint ventures	8,765	-
530	Investment in associates	15,484	430
	Other investments	1,011	47
540	Fixed assets	184,699	1,321
	Loans	550	112
555B	Trade and other receivables	1,448	113
575D	Derivative financial instruments	4,189	3,453
575B	Prepayments	1,022	38
	Deferred tax assets	4,883	-
535	Defined benefit pension plan surplus	1,162	-
616		197,953	5,036
	Current assets		
575L	Loans	259	97
545	Inventories	17,236	5,658
560	Trade and other receivables	21,004	6,709
575E	Derivative financial instruments	2,467	2,098
575A	Prepayments	1,092	27
555C	Current tax receivable	1,115	-
59520	Other investments	39	-
600	Cash and cash equivalents	23,794	-
615		67,006	14,590
6101000	Assets classified as held for sale	0	-
618		67,006	14,590
	Total Assets	264,959	19,626
	Current liabilities		
	Trade and other payables	37,548	11,547
634A	Derivative financial instruments	2,330	1,691
634B	Accruals	4,096	763
6306TOT	Finance debt	7,360	-
	Current tax payable	1,821	-
6309TOT	Provisions	2,971	110
639	**Total current liabilities**	56,126	14,111
	Liabilities directly associated with the assets classified as held for sale	0	-
		56,126	14,111
	Non-current liabilities		
	Other payables	13,067	91
664A	Derivative financial instruments	5,187	2,399
664B	Accruals	451	322
660F	Finance debt	54,472	-
682	Deferred tax liabilites	7,295	-
698	Provisions	20,272	320
	Defined benefit pension plan and otherpost-retirement benefit plan deficits	8,807	-
669		109,551	3,133
619	Total liabilities	165,677	17,244
	Net Inter-company balances		965
699	Net assets	99,282	3,348
	Equity		
	BP Shareholders' equity	97,640	
	Non-controlling interest	1,642	
		99,282	

Summary Balance Sheet

	$bn	% Group B/S
Fixed Assets	1.3	<1%
Inventory	5.6	~35%
Trade and Other Receivables and Payables	(4.8)	22%
Derivative fair value	1.5	>100%
Accruals	(1.1)	~23%
Other	(0.1)	<1%
Total excluding Inter-Company	**$2.4bn**	~2%
Net Inter-Company balances	1	-
Total Capital Employed	**$3.4bn**	~3%

Tax Risk Dashboard – October 2017

bp

Emerging Risks	Potential impact	Actions
→ **Brexit** – Possible DT & IDT impact, risk of Scotland trigger reduced post general election, limited information available.	To be quantified	Working group monitoring, risk assessment being networked. HMRC consultations.
→ **Australia multiple measures** - PRRT amendments soon, advocacy should restrict impact; ATO emboldened by Chevron's decision to discontinue appeal on intra group loan pricing dispute - no BP impact as facts different, in principle ATO alignment to settle on most issues. Continued pressure for more public disclosure of taxes paid.	Increased compliance requirements **(D4)**	Continue engagement with industry working groups, Treasury and ATO. Secure internal governance actions over compliance to underpin confidence of ATO and proactively strive to settle audit within provision.
→ **EU multiple actions** – **State Aid issue** – including push for public disclosure of country by country data. Further consultations, common tax base, and financial transaction tax occurring. Unclear whether consensus will be reached with member states.	Belgium $48m assessment paid and appealed, scrutiny of data/public reaction **(D5)**	Both the Belgium government and individual companies (including BP) have appealed against the State Aid decision of the EC. The team continues to monitor European policy changes.
→ **UK HMRC Consultations** – Policy changes moving towards legislation restricting interest deductions from April 2017; general election limited time to work through complex changes.	Potential restriction of UK debt relief **(E6)**	Date of implementation of changes depends on timing of enactment of Finance Bill No.2 2017, likely in 4Q17.
Redacted - First Amendment	To be quantified as proposals emerge	**Redacted - First Amendment**
↑ **Digitalisation of Tax** - Introduction of laws across multiple countries, requiring "real time" reporting of transactional data for tax purposes.	Costly systems changes and risk of non-compliance **(E8)**	
↑ **T&T fiscal change** – Fiscal Budget announced: Consultation on fiscal reform; New Revenue Authority and Property tax regime to be operational by 2018; Royalty increased to 12.5% and extended.	Adverse fiscal change **(D7)**	Continued engagement with GORTT to share alternative proposals to address the GORTT aim and to improve the predictability and competitiveness of the regime.

Update on Significant Exposures – 3Q17 Total Tax at Risk (TaR) $3.2bn, Amount Provided $0.9bn (2Q17 TaR $3.2bn, AP $0.8bn)

↑ **HMRC enquiry into captive insurance** – BP has taken the decision to enter into a formal resolution process (High Risk Corporates Program) - $40m provision made for transfer pricing adjustments and $95m for diverted profits tax (including $54m already paid).

↓ **Angola Presidential Decree** – BP's settlement ($314m) has been paid. 2002-09 are formally closed, awaiting withdrawal of court cases. 2010-16 audit reports are now aligned with the settlement, awaiting Fixation Committee to formally close. All actions expected to be completed by 15 October deadline (being 120 days after payment).

→ **Indonesia Branch Profits Tax** – $392m (incl. interest) paid so far in 2017 for FY 2002-16 BPT assessments. BP will pay FY17 BPT at the higher 20% rate under protest to reduce interest exposure. Litigation continues. Strategy review confirmed continue as for 2017 while minimising 3rd party costs.

→ **Brazil charter ships** – $266m TaR on payments abroad for drillship charters; WHT assessed for 2010-12; appeals lodged, no provision as we expect to prevail.

→ **Trinidad WHT on dividends** – $266m TaR from WHT assessed on Atlantic dividends, treaty benefits disregarded; no provision as we expect to prevail in court.

→ **Australia Swaps enquiry** - tax audit of funding with $97m TaR and provision of $18m at 2Q; ATO indicated a preference to settle and agree boundary conditions for future refinancing; BP submitted initial settlement offer of $19m in 3Q, ATO counter-offer of $25m, expected to settle shortly, 3Q dashboard revised to TaR and provision of $25m.

↑ **Trinidad Atlas** – Litigation by BIR - disputed the fixed TP of methanol from JV to BP. 2005 case expected to be heard by the court in spring of 2018, TAR by share $193m, AP zero.

Cash Tax Update

↑
- Cash tax forecast for full year 2017 is $4.3bn compared to $1.6bn in 2016. Key driver for the increase is renewal of Abu Dhabi concession ($1.6bn). Other significant increase is the Angola ($0.4bn) audit settlements.
- Risks: Inability to control timings of cash tax refunds and increased audit activity driven by current environment.
- Top three paying countries: Abu Dhabi ($1.6bn), Angola ($814m), Australia ($311m).

↑ *Increasing risk / threat*
→ *Ongoing exposure / risk under review*
↓ *Resolved issue / decreasing threat*

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Economic and Market Risk Summary

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Energy Markets

<u>Summary</u>: Sharp movements in oil prices in either direction remain the major risk emanating from energy markets. Oil prices will be impacted by OPEC's ability to deliver the agreed production cuts and the return of US tight oil production.

<u>Key risks</u>:

- Downside oil price risks (medium)
- Risk of oil price spike (low)

Group Financial Risk Committee Meeting, October 2017

Economic and Market Risk

I. The Economy

Recent economic data has surprised to the upside across both developed and emerging markets and consumer and industrial sectors, adding to evidence that the global economy is expanding at its most synchronised and fastest rate since 2010. In our central case, global growth is expected to be near trend (around 3% p.a.) this year and next. But significant economic risks remain. In the short-term, US policy and a gradual tightening in global monetary policy could increase risk aversion causing a fall in asset prices or a drying up of capital flows to emerging markets. China remains a stress point in the medium-term as leverage continues to build and restructuring and reforms are delayed.

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Risk from Emerging Markets (medium)

Description: Strains in indebted Emerging Market (EMs) economies remain, driven by a combination of structurally weaker commodity prices, geopolitical tension, country-specific political risks and the continuation of the Fed's rate hiking cycle. A sudden change to a more hawkish stance by the Fed risks increasing global yields and the dollar and so raising the cost of foreign funding.

Update: We have seen a synchronized pick-up in EM growth in recent months. Russia and Brazil are recovering after deep recessions, India is still growing (despite the 1H17 slowdown caused by demonetization), and policy loosening has permitted stronger growth in China. All EMs are benefiting from loose global monetary conditions and favorable global-risk sentiment. Net capital flows to EMs have turned from large net outflows to a small net inflow. EM central banks have thus started to accumulate reserves again after two years of reduction. But risks remain around the pace of monetary policy tightening from the major central banks and a sudden change in risk sentiment.

Uncertainty in the European Union (low)

Description: The UK referendum combined with increasing support for anti-establishment parties has intensified the debate about the future of the EU. If the sustainability of the Euro area is called into question this could trigger instability in the European banking system or a sharp correction in periphery countries' bond markets.

Update: While the anti-establishment sentiment across the continent has slowed since last year, a surge in support for the far-right *Alternative for Germany* (AfD) party in the recent German elections is a reminder that it still an important force in European politics. Merkel's fourth term in office, alongside a reformist minded Macron, has raised hopes that a new Franco-German alliance can reinvigorate the EU project. The vote in Catalonia and the Spanish government's handling of it will likely damage confidence and growth in Spain in the short-term. More significantly, sympathy for the independence bid may, for the first time, force the EU to address the issue of separatism within member states adding another potential fault-line in EU unity. The economy however is doing well, unemployment is at its lowest level in eight years and the Eurozone as a whole is expected to grow by over 2% this year - its fastest rate for almost a decade.

Risk from a China slowdown (low)

Description: The Chinese authorities face a difficult challenge of reforming an increasingly large and complex economy while ensuring that growth is maintained at a level that supports employment and living standards. High corporate debt levels, overcapacity in key industrial sectors and a mixed real estate market all pose challenges. A slowdown in Chinese growth would have large implications for global commodity and financial markets.

Update: Concerns about China's economy in the near term have generally receded as public investment and credit growth has supported the economy. Capital outflows have declined significantly and foreign investors have raised their exposure to Chinese equity and debt. As a result, reserves have increased over $80 billion since the start of the year. The supportive policy approach is likely to continue until at least the end of the Party Congress this month with enough stimulus to meet the 'around 6.5%' growth objective. The counterpart is that the pace at which policy addresses the significant underlying economic imbalances and required supply-side reforms remains slow.

II. Energy Markets

Sharp movements in oil prices in either direction remain the main potential risk emanating from energy markets. Oil prices will be impacted by OPEC's stance concerning a possible extension of their production cuts beyond March 2018 (to be agreed at the group's next meeting on 30 November) and the direction of US tight oil production. The ongoing hurricane season could further impact US and global markets, although the impact can vary depending on whether hurricanes strike oil/gas producing- or consuming-regions.

Downside oil price risk (medium)

Description: OPEC along with 11 non-OPEC countries agreed to cut production by 1.8 Mb/d from October 2016 levels and agreed to extend the cuts through 1Q18. Even though prices increased by $10/bbl after the original announcement, much of these gains have since been lost and downside risks could recur if compliance slips, US tight oil grows more quickly than expected, supply disruptions ease, or if any of the macroeconomic risks (discussed above) materialize.

Update: OPEC compliance continues to be very strong. In August, OPEC's production was only 0.1 Mb/d higher than the agreed-to production ceiling, with Saudi Arabia cutting more than promised. Compliance from non-OPEC producers remains solid with Russia meeting its agreed cut. However, disrupted supplies from Libya and Nigeria have started to ease; output in these countries has risen by 0.6 Mb/d since the OPEC agreement was reached. The US rig count has stopped growing, but production is rising on the back of the increase in drilling seen earlier this year; if sustained, this could pose upside risks for US production (and downside risks for prices). While inventories have begun to correct, concern that the overhang will persist is driving speculation as to whether OPEC will extend the current production cuts beyond 1Q18.

Risk of oil price spike (low)

Description: Additional supply disruptions would increase the risk of an upward movement of prices. Tensions between Saudi Arabia and Iran – as well as between Saudi/UAE and Qatar – also heighten supply concerns, and low oil prices could threaten the stability of vulnerable oil producing countries, most acutely Venezuela. Moreover, the possibility of further hurricanes could cause short-run disruptions.

Update: The recovery in Nigerian and Libyan supply has reduced global supply disruptions to less than 2 Mb/d, nearly 0.5 Mb/d below the 2016 average. Qatari production has not been impacted so far by the ongoing dispute with Saudi/UAE; the country produced 1.9 Mb/d of crude and condensates in 2016. US production has largely recovered from Hurricane Harvey but the impact lingers for Gulf Coast refineries, supporting refining margins and a wider Brent-WTI differential.

Group Economics
October 2017

Egypt Update

At the end of 2Q'17, BP's total exposure fell compared to YE'16 and, both receivables and Egyptian Pounds were below the agreed boundary ranges. The combined exposure of $0.44bn was below the established ceiling of $2.3bn previously discussed with MBAC.

Table 1: Total Exposure

Exposure $bn	YE'15	YE'16	1Q'17	2Q'17	Aug'17
	Actual	Actual	Actual	Actual	Actual
Receivables	0.41	0.45	0.52	0.44	0.51
Egyptian Pounds (excl. interest)	0.70	0.11	0.02	-	-
Total Exposure	**1.11**	**0.56**	**0.54**	**0.44**	**0.51**
Overall net FX Gain/(Loss) *ITD 1/1/2013*	19	(220)	(211)	(208)	(208)

3Q Progress on Mitigation Plan

- EGP received from EGPC has been fully consumed and we have started to consume accumulated interest, which is expected to be depleted by end September (ca$27m)
- Overdue has decreased from $225m at 1Q'17 to $57m at August'17. However, the net overdue would be zero after factoring long standing historical receivables disputes with EGPC of ca$0.1bn
- Started negotiating with EGPC on swap cargos for 2018 to cover Gupco's oil entitlement, expecting award by end of September

West Nile Delta (WND) LC

- LC for full life of field has been secured in 2Q covering all 5 fields
- EGPC is paying the WND invoices on time

Forward Plan

The long-term goal is to maintain balances at normal levels as market conditions and regulations allow. We will update on an on-going basis as appropriate.

Iraq Update

Following a significant reduction of BP's total exposure on Rumaila through the second half of 2016; the exposure at the end of 3Q'17 is $485m. Volatility within the year is caused by cargo volume and price assumptions, and the alternating oil liftings with Rumaila partner CNPC. 3Q17 Aged balance includes 2mmbbl BP cargo in late September (valued at $86m) that will lift in October. Iraq is paying on time.

Table 1: Total Exposure

BP net $m	4Q15	1Q16	2Q16	3Q16	4Q16	1Q17	2Q17	3Q17
Tot Service Fees	853	1,017	1,004	678	360*1	439	408	485
Aged Balance*2	326	458	359	135	49	82	51	141

*1 In 4Q16 BP restated Iraq with-holding tax (WHT) on Rem Fee ($239m) from the Iraq underlift account to a tax pre-payment account
*2 Aged Balance is Total Service Fees, less Fees under 90 days, less disputed amounts.

Iraq's fiscal position stabilized in 2016, in part through reduction to the domestic budget and through Iraq's agreement to the IMF "Stand By Arrangement" (SBA). The SBA will deliver up to $15bn (over 3 years), total IMF disbursements to date have been $2bn. A key condition in this agreement is Iraq's full and timely settlement of IOC receivables; IMF will regularly monitor Iraq's level of debt to the IOCs ahead of subsequent loan releases. BP will continue its monthly dialogue with the IMF throughout 2017.

2017 Update

- Rumaila's 2017 gross oil allocations YTD have averaged 4mmbbls/month (with 8mmbbls allocated in October). This is keeping the Receivable flat over the year.

- BP has allocated net spend of $0.88bn [equivalent gross $1.7bn] to Rumaila for 2017 [3QPF], a level that we believe Iraq can repay, and is sufficient to maintain production at 1.45mmbd.
- Rumaila continues to account for ~40% of Iraq's revenue.
- Every effort is being made to mitigate under-lift risk in 4Q by lobbying Iraq's Ministry of Oil for Nov/Dec allocations, supporting field production levels and coordinating with IMF leverage on Iraq to keep IOC payments current.

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