

Time Value of Money

Money	At Jan 1						
	2020	2021	2022	2023	2024	2025	2026
US\$ in wallet	0	0.0	0.0	0.0	0.0	0.0	0.0
US\$ in bank	0	0	0	0	0	0	0
US\$ (deflated)	0	0	0	0	0	0	0
Inflation	0%	0%	0%	0%	0%	0%	0%
Interest Rate	0%	0%	0%	0%	0%	0%	0%
Multiplier	1						

Cost of chocolate

	2020	2021	2022	2023	2024	2025	2026
US\$ flat	0	0	0	0	0	0	0
US\$ inflation	0	0.00	0.00	0.00	0.00	0.00	0.00
US\$							

Bars of chocolate

	2020	2021	2022	2023	2024	2025	2026
US\$	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
US\$	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
US\$							

Real versus Nominal

Costs	At Dec 31						
	2018	2019	2020	2021	2022	2023	2024
US\$ Nominal	0	0	0.00	0.00	0.00	0.00	0.00
Inflation Rate	0%	0%	0%	0%	0%	0%	0%
Multiplier		1	1.00	1.00	1.00	1.00	1.00

Money available

100

Chocolate Bars

Money Invested

100.0

Chocolate Bars

#DIV/0! #DIV/0! #DIV/0! #DIV/0! #DIV/0! #DIV/0! #DIV/0!

US\$ Real (2018)

Money Available
Cost of Choc Bar

2027	2028	2029	2030
0.0	0.0	0.0	0.0
0	0	0	0
0	0	0	0
0%	0%	0%	0%
0%	0%	0%	0%

2027	2028	2029	2030
0	0	0	0
0.00	0.00	0.00	0.00

2027	2028	2029	2030
#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

2025	2026	2027	2028
0.00	0.00	0.00	0.00
0%	0%	0%	0%
1.00	1.00	1.00	1.00

#DIV/0! #DIV/0! #DIV/0! #DIV/0!

Year 9	Year 10
0.00	0.00

Example Discounted Cashflow

Example 1

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	
Cashflow		0	0	0	0	0	0	0
Discount Factor								
Discounted Cashflow								
NPV								
Discount Rate		0%						
Excel Calculation								

Example 2

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Capital Cost							
Revenue							
Operating Cost							
Net Cashflow							
Discount Factor							
Discounted Cashflow							
NPV							
Discount Rate							
IRR							
Excel Calculation							

Year 8	Year 9	Year 10
0	0	0

Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16
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Year 17 Year 18 Year 19 Year 20

WACC Calculation

Risk Free Rate	1.75%	
Corporate Interest Rate	3.50%	
Equity market return	10.53%	
Company Beta	2	
Corporate Tax Rate	20%	
Debt:Equity Split	Debt 60%	Equity 40%
Cost of Debt	2.80%	
Cost of Equity	19.31%	
WACC	9.40%	

An Example Shale Gas Field

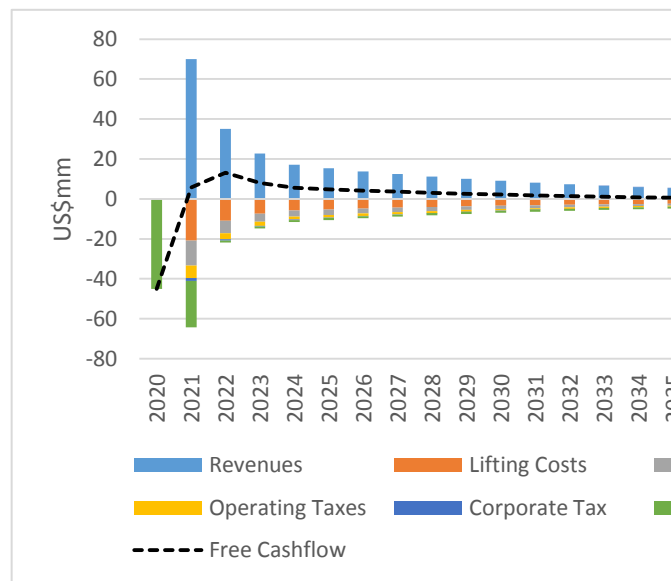
Sensitivities		1	0%
Oil or Gas Price	1	2	15%
Production	1	3	30%
Operating Costs & Transport	1	4	-15%
Capex	1	5	-30%

	2021	2022	2023	2024	2025	2026
Revenues	0	70	35	23	17	15
Operating Costs	0	-21	-11	-7	-6	-5
Transport Costs	0	-13	-6	-4	-3	-3
Operating Taxes	0	-6	-3	-2	-2	-1
EBITDA	0	30	15	9	7	6
Depreciation <i>Straight Line (0) or Unit of Prod (1)</i>	0 1	-23	-11	-7	-6	-5
EBIT	0	7	3	2	1	1
Tax on EBIT <i>Corporate Tax Rate</i>	0 20%	-1	-1	0	0	0
Post tax cashflow	0	29	14	9	7	6
CAPEX	-45	-23	-1	-1	-1	-1
Free Cashflow (FCF)	-45	6	13	8	6	5
Cumulative FCF	-45	-39	-26	-18	-13	-8
Discount Rate	9.4%					
Discount Factor	1.09	1.20	1.31	1.43	1.57	1.71
Discounted Cashflow (DCF)	-41	5	10	6	4	3
NPV (\$mm)	-6					
IRR (%)	5.4%					
Payback (years)	8	When does cumulative cashflow turn positive				
Excel Calculation	-\$6					

Breakeven Gas Price \$2.80 *After Goal Seek Function in Data:What If*

Breakeven cost per well 7.00
Breakeven Opex per barrel 6.00

	2020	2021	2022	2023	2024	2025
Revenues	0	70	35	23	17	15
Lifting Costs	0	-21	-11	-7	-6	-5
Transport	0	-13	-6	-4	-3	-3
Operating Taxes	0	-6	-3	-2	-2	-1
Corporate Tax	0	-1	-1	0	0	0
Capex	-45	-23	-1	-1	-1	-1
Free Cashflow	-45	6	13	8	6	5

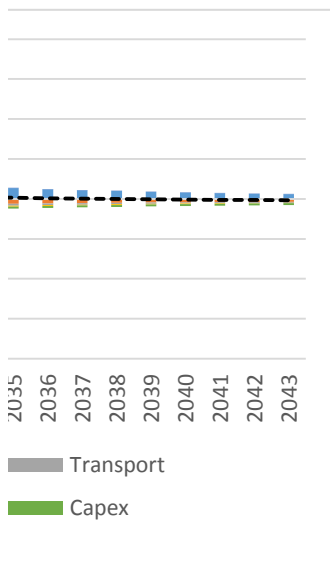


Base
High
Upside
Low
Downside

Results		
NPV	-6	US\$mm
IRR	5%	%

2027	2028	2029	2030	2031	2032	2033	2034	2035
14	12	11	10	9	8	7	7	6
-5	-4	-4	-4	-3	-3	-3	-3	-3
-2	-2	-2	-2	-2	-1	-1	-1	-1
-1	-1	-1	-1	-1	-1	-1	-1	-1
5	5	4	4	3	3	2	2	2
-5	-4	-4	-3	-3	-3	-2	-2	-2
1	1	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
5	5	4	4	3	3	2	2	2
-1	-1	-1	-1	-1	-1	-1	-1	-1
4	4	3	3	2	2	1	1	1
-4	0	3	5	8	9	11	12	13
1.88	2.05	2.25	2.46	2.69	2.94	3.22	3.52	3.85
2	2	1	1	1	1	0	0	0

2026	2027	2028	2029	2030	2031	2032	2033	2034
14	12	11	10	9	8	7	7	6
-5	-4	-4	-4	-3	-3	-3	-3	-3
-2	-2	-2	-2	-2	-1	-1	-1	-1
-1	-1	-1	-1	-1	-1	-1	-1	-1
0	0	0	0	0	0	0	0	0
-1	-1	-1	-1	-1	-1	-1	-1	-1
4	4	3	3	2	2	1	1	1

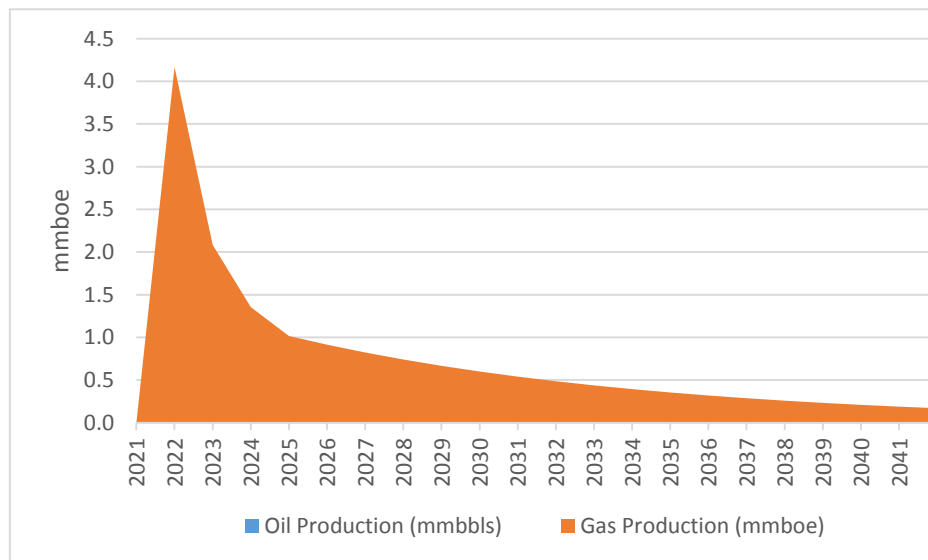


Production

	Oil		Gas	
	mmbbls	kbpd	Bcf	mmcf/d
Resources	0		1000	
Recovery Factor	0%		10%	
Reserves	0		100	
Start date	5 years after first capex		5 years after first capex	
Peak as % Reserves				
Peak Production (mmbbls)	0	0	25	68
Time to Peak (yrs)	0		0	
Length of Peak (yrs)	0		0	
Decline rate (%) Yrs 2,3,4,5+	0%		50%	35%

	2021	2022	2023	2024	2025	2026
Oil production	0.00	0.00	0.00	0.00	0.00	0.00
Total oil produced to 2040	0.0					
Barrels per day		0	0	0	0	0
Gas Production	0.00	25.00	12.50	8.13	6.09	5.48
Total gas produced to 2040	99.2					

	2021	2022	2023	2024	2025	2026
Oil Production (mmbbls)	0.0	0.0	0.0	0.0	0.0	0.0
Gas Production (mmboe)	0.0	4.2	2.1	1.4	1.0	0.9
Total (mmboe)	0.0	4.2	2.1	1.4	1.0	0.9



Production Scenarios

Total Produced

Oil Production Scenarios

1	0.00
2	0.00
3	0.00
4	0.00
5	0.00

Gas Production Scenarios

1	99.15
2	114.03
3	128.90
4	84.28
5	69.41

Total

17

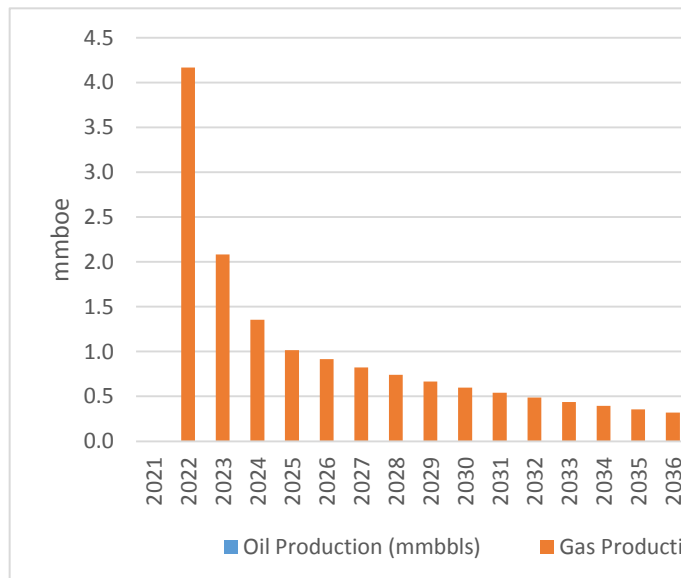
Peak as %
Reserves

25%

25% 10%

2027	2028	2029	2030	2031	2032	2033	2034	2035
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0	0	0	0	0	0	0	0
4.94	4.44	4.00	3.60	3.24	2.91	2.62	2.36	2.12

2027	2028	2029	2030	2031	2032	2033	2034	2035
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.8	0.7	0.7	0.6	0.5	0.5	0.4	0.4	0.4
0.8	0.7	0.7	0.6	0.5	0.5	0.4	0.4	0.4



2036	2037	2038	2039	2040	2041	2042	2043	2044
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0	0	0	0	0	0	0	0
1.91	1.72	1.55	1.39	1.25	1.13	1.02	0.91	0.82

2036	2037	2038	2039	2040	2041	2042	2043	2044
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.1
0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.1



Domestic Oil Price

Base Case	0.0	0.0	0.0	0.0	0.0	0.0
Scenario 2	0.0	0.0	0.0	0.0	0.0	0.0
Scenario 3	0.0	0.0	0.0	0.0	0.0	0.0
Scenario 4	0.0	0.0	0.0	0.0	0.0	0.0
Scenario 5	0.0	0.0	0.0	0.0	0.0	0.0

Domestic Gas Price

Base Case	2.8	2.8	2.8	2.8	2.8	2.8
Scenario 2	3.2	3.2	3.2	3.2	3.2	3.2
Scenario 3	3.6	3.6	3.6	3.6	3.6	3.6
Scenario 4	2.4	2.4	2.4	2.4	2.4	2.4
Scenario 5	2.0	2.0	2.0	2.0	2.0	2.0

Export Gas Price

Base Case	0.0	0.0	0.0	0.0	0.0	0.0
Scenario 2	0.0	0.0	0.0	0.0	0.0	0.0
Scenario 3	0.0	0.0	0.0	0.0	0.0	0.0
Scenario 4	0.0	0.0	0.0	0.0	0.0	0.0
Scenario 5	0.0	0.0	0.0	0.0	0.0	0.0

Slope 10%

0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0

0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

2044

0.0

0.0

0.0

0

0

0

0

0

0.8

2.8

0.0

1

0

2

0

2

2

0.0

0.0 15%

0.0 30%

0.0 -15%

0.0 -30%

0.8

0.9 15%

1.1 30%

0.7 -15%

0.6 -30%

0.0

0.0

0.0

0.0

0.0

0.0
0.0
0.0
0.0
0.0

2.8
3.2
3.6
2.4
2.0

0.0
0.0
0.0
0.0
0.0

Capital Expenditure

	Total mmboe	Oil mmbbls	Gas bcf	Bcf per well	
Reserves	17	0	100	8	12.5
Wells	13				
Capex per well	7.0				
Capex per bbl	5.46		0.91		
Total capex	91				
% before first oil	75%	68			
% first oil to peak	0%	0			
Maintenance capex	25%	23			

First Capex

	2021	2022	2023	2024	2025	2026
US\$mm	45	23	1	1	1	1
Before first oil	68.3					
Maintenance	21.8					
Total	90.0					

Sensitivities

2	52	27	1	1	1	1
3	59	30	1	1	1	1
4	38	20	1	1	1	1
5	32	16	1	1	1	1
15%						
30%						
-15%						
-30%						

Field Comparisons

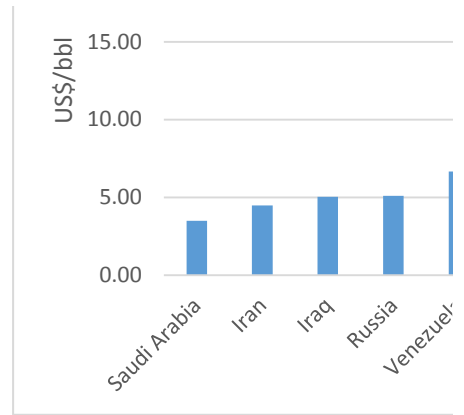
	Cost /bbl	Capex	Reserves	Peak Prod	Peak Prod
	US\$/bbl	US\$mm	mmbbls	kbpd	mmbbls
Kashagan (Kazakhstan)	10.46	136000	13000	1500	547.5
ACG (Azerbaijan)	4.00	20000	5000	620	226.3
Thunderhorse (Gulf of Mexico)	5.00	5000	1000	250	91.25
Novy Port (Russia onshore)	3.25	4500	1385	161	58.64
Ghawar (Saudi)	3.50	248500	71000	5000	1825
Lula (Brazil deep water)	9.04	75000	8300	500	182.5

US shale	\$7mm	per well
Ultimate recovery per well	8.0	bcf per well

Global Comparisons

	Capex US\$/bbl
Saudi Arabia	3.50
Iran	4.48
Iraq	5.03

Russia	5.10
Venezuela	6.66
US shale	7.56
Indonesia	7.65
US conv	7.70
Canada	9.69
Nigeria	13.10
Norway	13.76
Brazil	16.09
UK	22.67

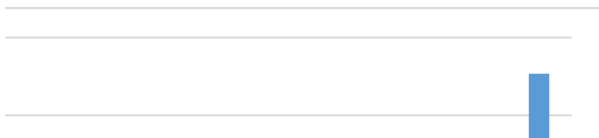
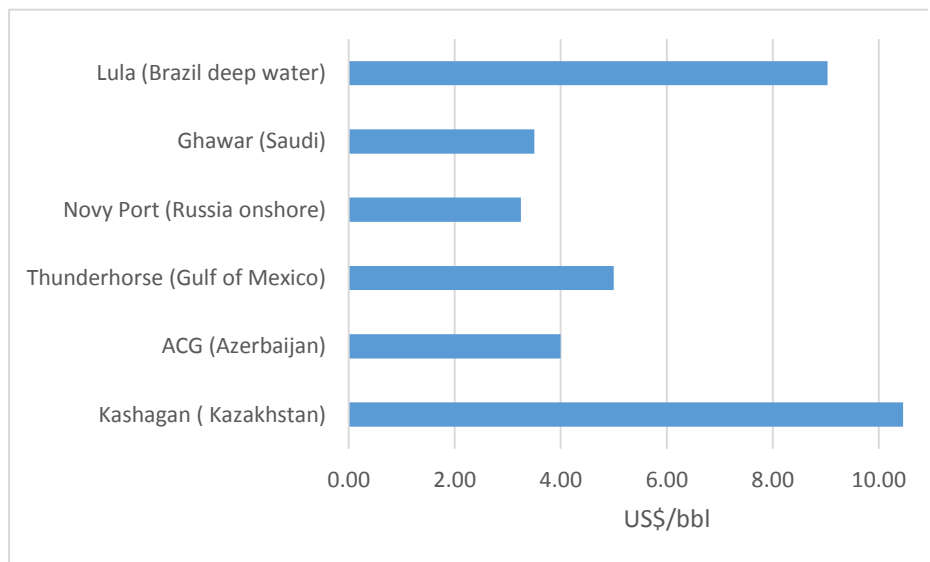


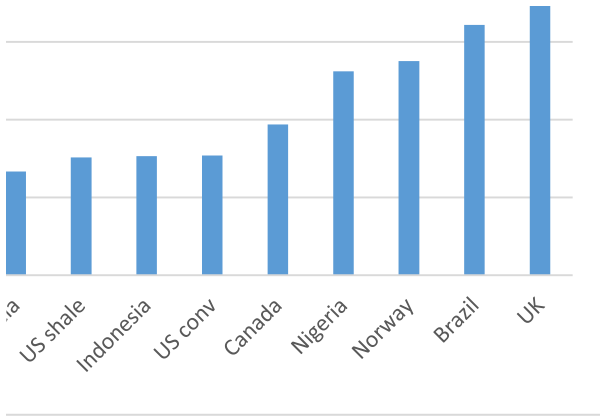
2027	2028	2029	2030	2031	2032	2033	2034	2035
1	1	1	1	1	1	1	1	1

1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1

Capex/
peak bbl
US\$/bbl

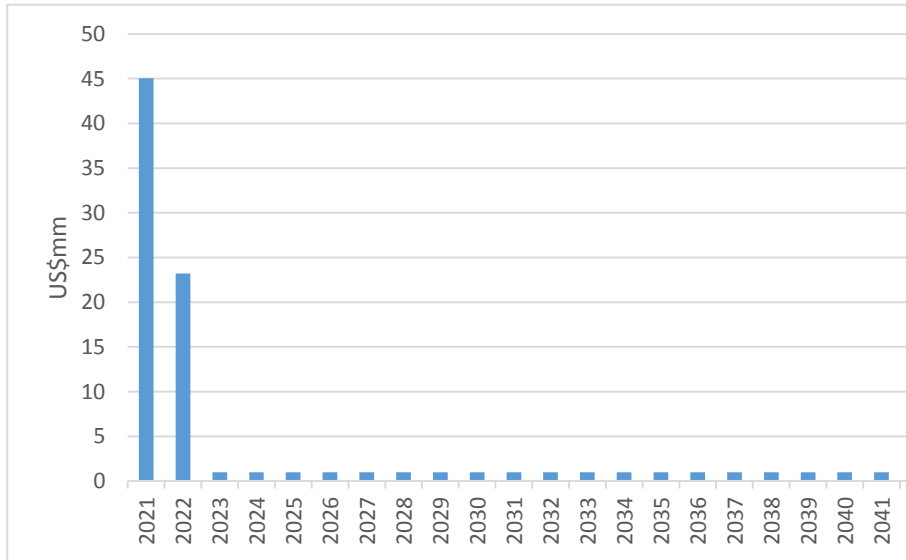
248
88
55
77
136
411

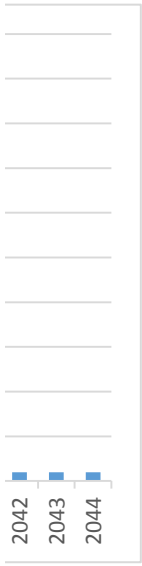




2036	2037	2038	2039	2040	2041	2042	2043	2044
1	1	1	1	1	1	1	1	1

1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1





Operating Costs

Lifting Costs	6.00 US\$/boe	real					
Total for model	99 US\$mm						
Variable	4.80 US\$/bbl		80%				
Fixed	20 US\$mm		20%				
Years production	23						
	2021	2022	2023	2024	2025	2026	2027
US\$mm	0.0	20.9	10.9	7.4	5.7	5.2	4.8
Total	99						

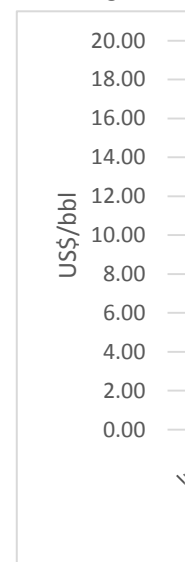
Base Case and Sensitivities

1	6.00
2	15%
3	30%
4	-15%
5	-30%

Global Comparisons

	Lifting US\$/bbl		Transport US\$/bbl
Iran	1.94	Saudi Arabi	2.49
Iraq	2.16	Iran	2.67
Russia	2.98	Iraq	2.47
Saudi Arabia	3.00	Russia	2.69
Norway	4.24	Indonesia	3.63
US conv	5.15	US conv	3.11
US shale	5.85	Norway	3.12
Indonesia	6.87	US shale	3.52
Venezuela	7.94	Canada	2.92
Nigeria	8.81	Venezuela	2.54
Brazil	9.45	Nigeria	2.97
Canada	11.56	Brazil	2.80
UK	17.36	UK	4.30

Lifting Costs



Company examples

Rosneft	3.10
Lukoil	4.26
BP	6.90
Chesapeake	2.92

Transport Costs

Oil	3.00 US\$/bbl
Gas	0.50 US\$/mcf

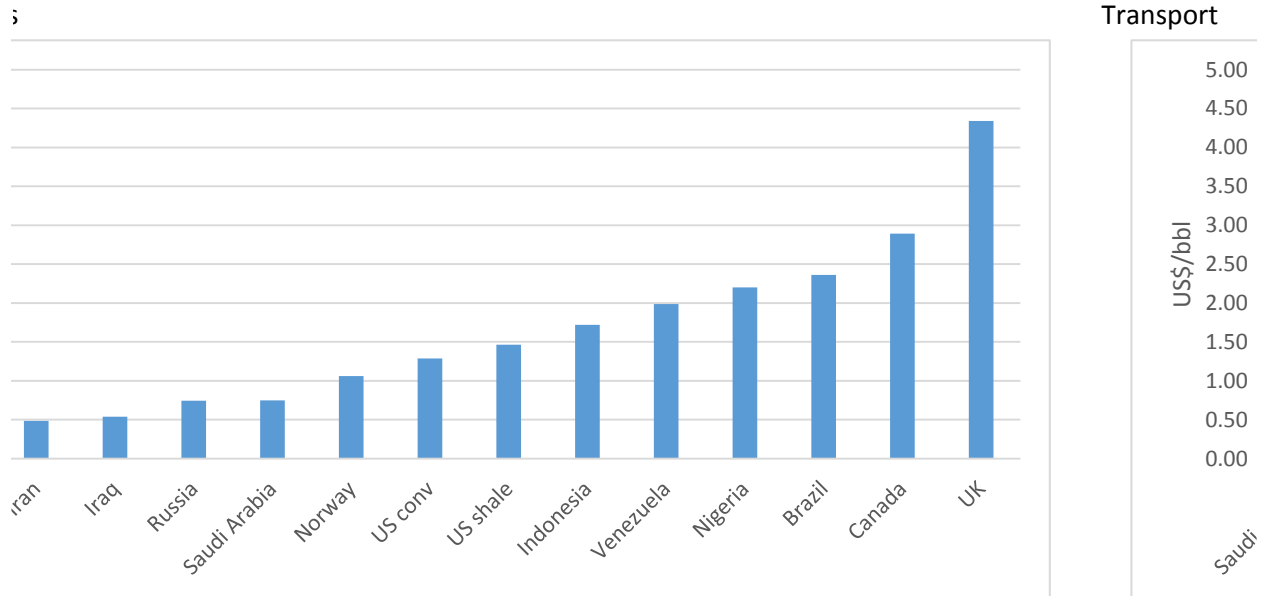
	2021	2022	2023	2024	2025	2026	2027
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Oil (US\$mm)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gas (US\$mm)	0.0	12.5	6.3	4.1	3.0	2.7	2.5
Total (US\$mm)	0.0	12.5	6.3	4.1	3.0	2.7	2.5

Base Case and Sensitivities

1	3.00
2	15%
3	30%
4	-15%
5	-30%

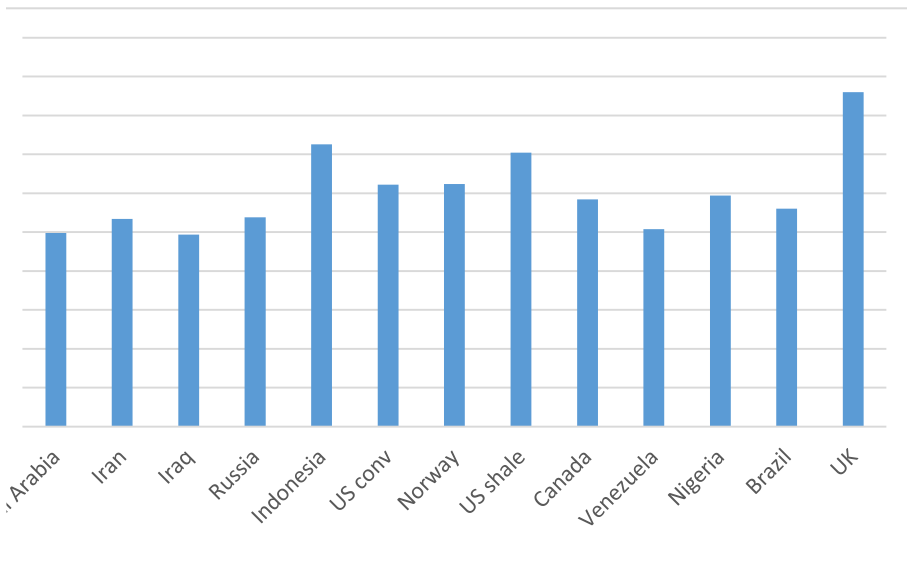
2028 **2029** **2030** **2031** **2032** **2033** **2034** **2035**
 4.4 4.1 3.7 3.5 3.2 3.0 2.8 2.6



2028 **2029** **2030** **2031** **2032** **2033** **2034** **2035**

0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.2	2.0	1.8	1.6	1.5	1.3	1.2	1.1
2.2	2.0	1.8	1.6	1.5	1.3	1.2	1.1

2036 2.4 2037 2.2 2038 2.1 2039 2.0 2040 1.9 2041 1.8 2042 1.7 2043 1.6



2036 2037 2038 2039 2040 2041 2042 2043

0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.0	0.9	0.8	0.7	0.6	0.6	0.5	0.5
1.0	0.9	0.8	0.7	0.6	0.6	0.5	0.5

2044

1.5

2044

0.0
0.4
0.4

Operating Taxes

Oil Tax

Export Tax Sliding of export barrels
Royalty 0.0% of oil revenues
Other taxes 0.0% of total revenues

Export Oil Price 0 0 0 0 0 0

	2021	2022	2023	2024	2025	2026
Export Tax	0.0	0.0	0.0	0.0	0.0	0.0
Royalty	0.0	0.0	0.0	0.0	0.0	0.0
Other	0.0	0.0	0.0	0.0	0.0	0.0
Total	0	0	0	0	0	0

Export Tax

Cut-off point 0 US\$/bbl
Tax 0% above cut-off point

Export Tax (\$/bbl) 0 0 0 0 0 0

Gas Tax

Export Tax 0% export revenues
Royalty 0.25 US\$/mcf

	2021	2022	2023	2024	2025	2026
Export Tax	0	0	0	0	0	0
Royalty	0	6.3	3.1	2.0	1.5	1.4
Total	0	6.3	3.1	2.0	1.5	1.4
Total Operating Taxes	0	6.3	3.1	2.0	1.5	1.4
Total US\$/boe		1.50	1.50	1.50	1.50	1.50

Gross Taxes

US\$/bbl

Saudi Arabia	0
Iran	0
Iraq	0.91
Russia	8.44
Indonesia	1.55
US conv	5.03
Norway	0.19
US shale	6.42
Canada	2.48
Venezuela	10.48
Nigeria	4.11

Brazil
UK

6.66
0

Depreciation

Straight Line

Total Capex	91
Years of Production	23
Annual Depreciation (US\$mm)	4.0

	2021	2022	2023	2024	2025	2026
Depreciation	0	4.0	4.0	4.0	4.0	4.0
<i>Production</i>	<i>0</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>
Total	91					

Unit of Production

Total Reserves	17
Total Produced	17
Total Capex	91
Depreciation per barrel	5.51

	2021	2022	2023	2024	2025	2026
Depreciation	0	22.9	11.5	7.5	5.6	5.0
Total	91					

2027	2028	2029	2030	2031	2032	2033	2034	2035
4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
1	1	1	1	1	1	1	1	1

2027	2028	2029	2030	2031	2032	2033	2034	2035
4.5	4.1	3.7	3.3	3.0	2.7	2.4	2.2	2.0

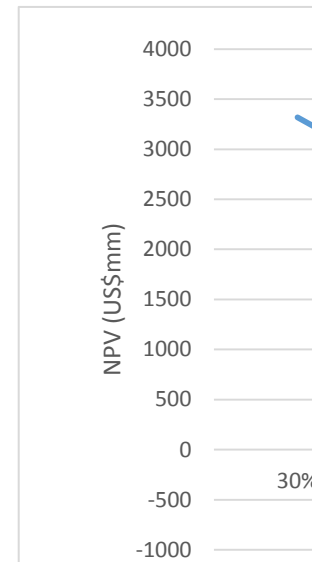
2036	2037	2038	2039	2040	2041	2042	2043	2044
4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
1	1	1	1	1	1	1	1	1

2036	2037	2038	2039	2040	2041	2042	2043	2044
1.8	1.6	1.4	1.3	1.2	1.0	0.9	0.8	0.8

Sensitivities

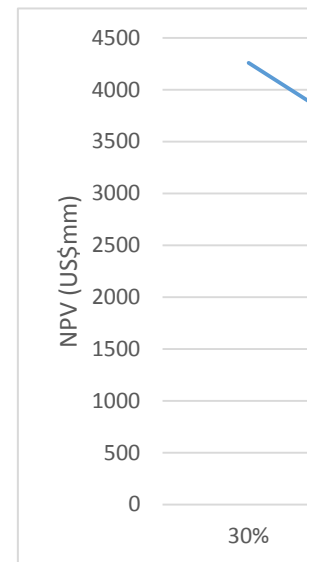
Oil Price

	NPV
30%	3318
15%	2392
0%	1465
-15%	539
-30%	-388



Production

	NPV
30%	4257
15%	3203
0%	2149
-15%	1094
-30%	40



Capex

	NPV
30%	1012
15%	1580
0%	2149
-15%	2717
-30%	3285

Opex

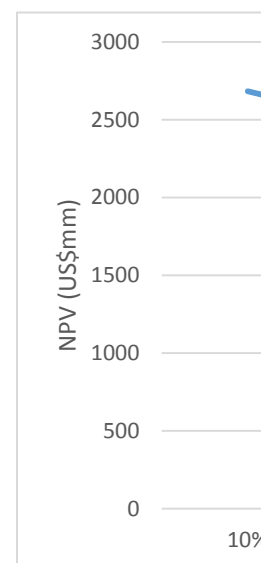
	NPV
30%	1735
15%	1942
0%	2149
-15%	2356
-30%	2563

Corporate Tax Rate

	NPV
10%	2682
15%	2415
20%	2149
25%	1882
30%	1615

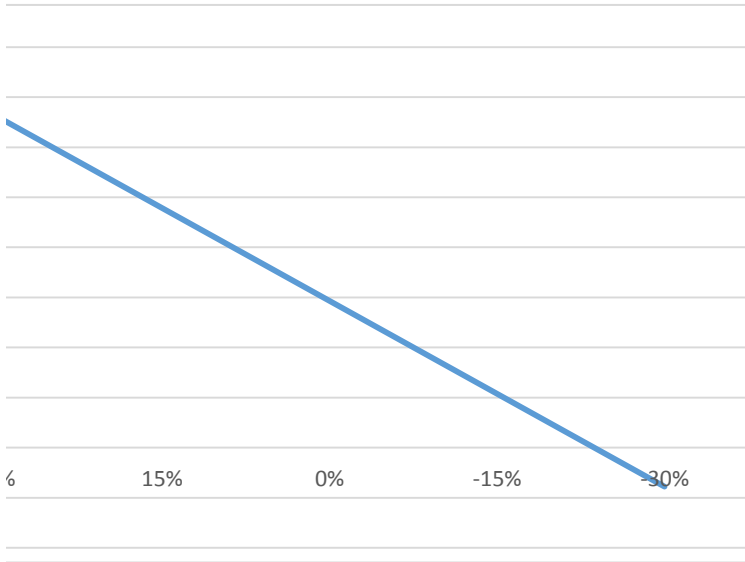
Discount Rate

	NPV
5.0%	5152
7.5%	2932
10.0%	2149
12.5%	496
15.0%	-154

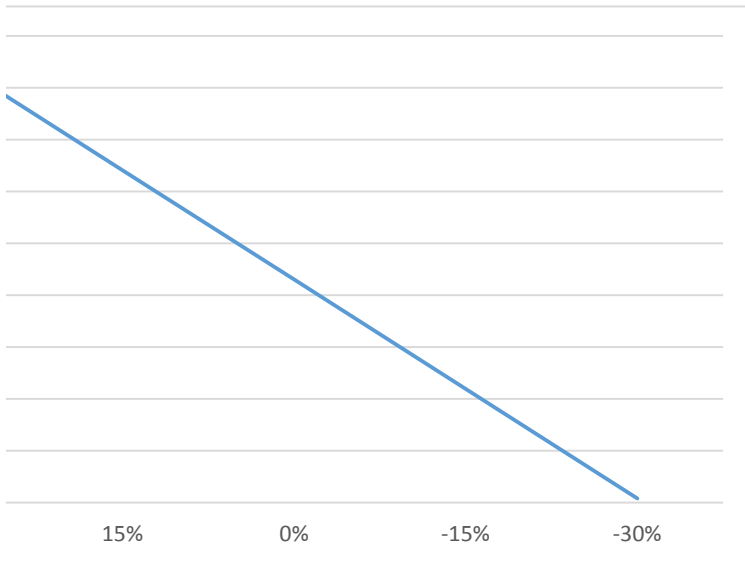


Summary

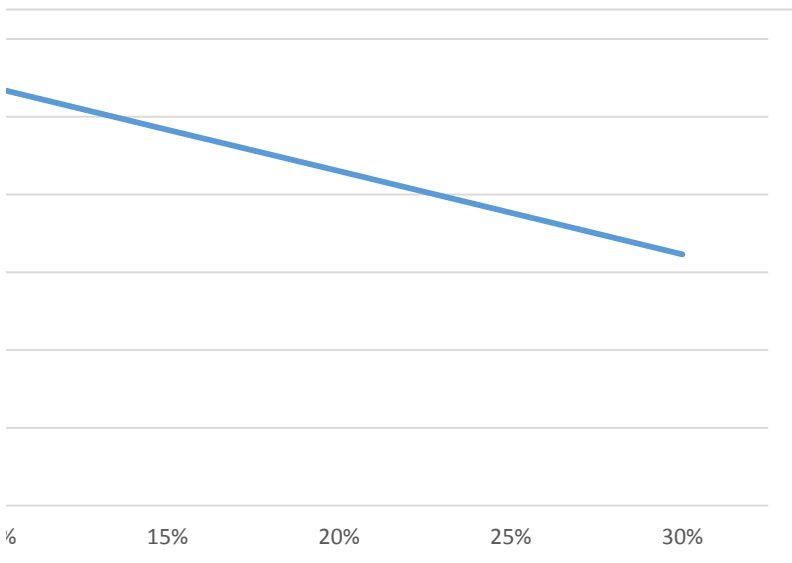
	Oil Price	Production Capex	Opex	Corp Tax	Disc. Rate	
Downside	-388	40	1012	1735	1615	-154
Low	539	1094	1580	1942	1882	496
Base	1465	2149	2149	2149	2149	2149
High	2392	3203	2717	2356	2415	2932
Upside	3318	4257	3285	2563	2682	5152



Oil Price

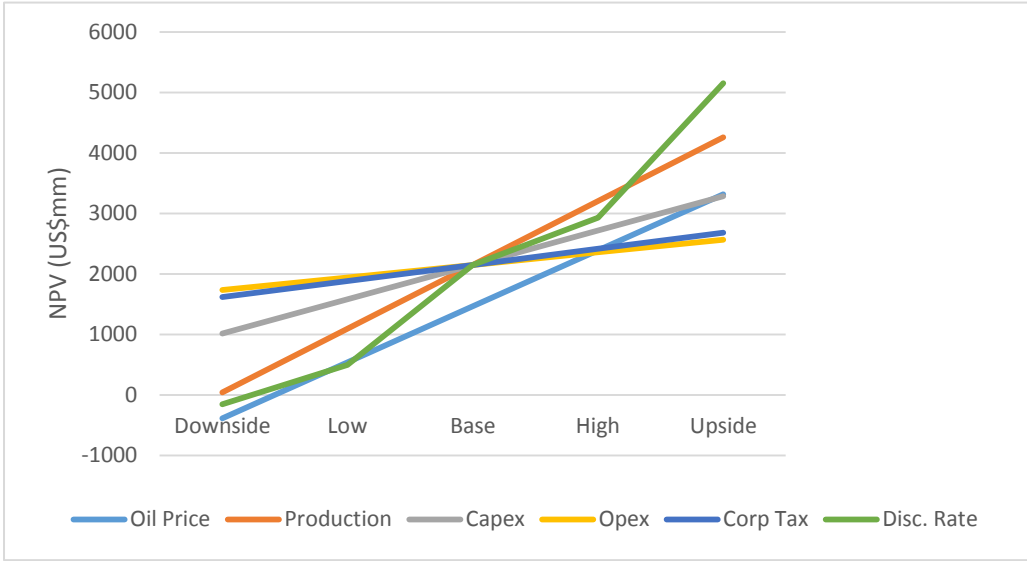


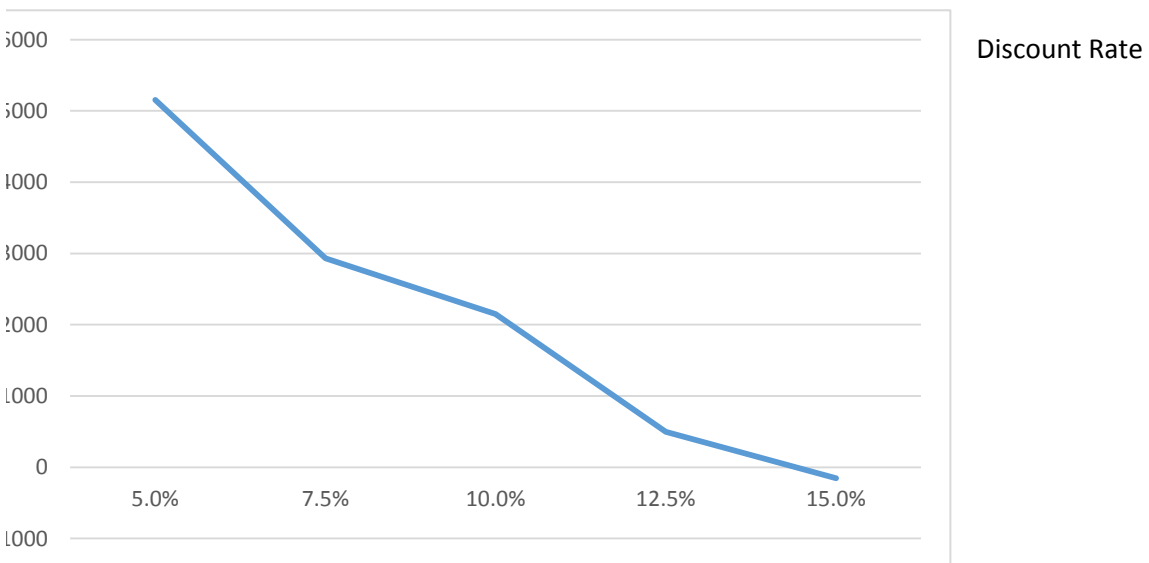
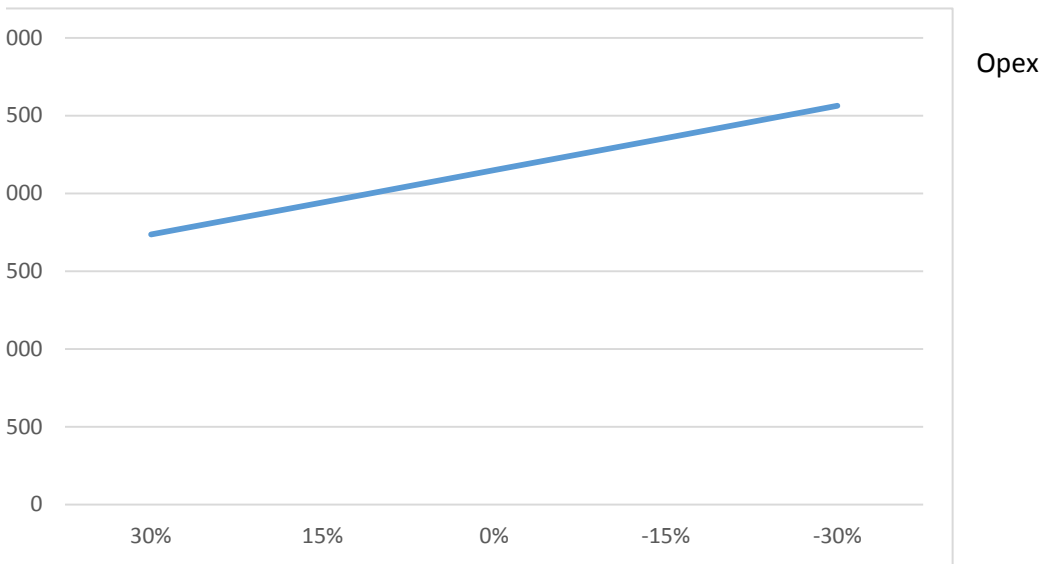
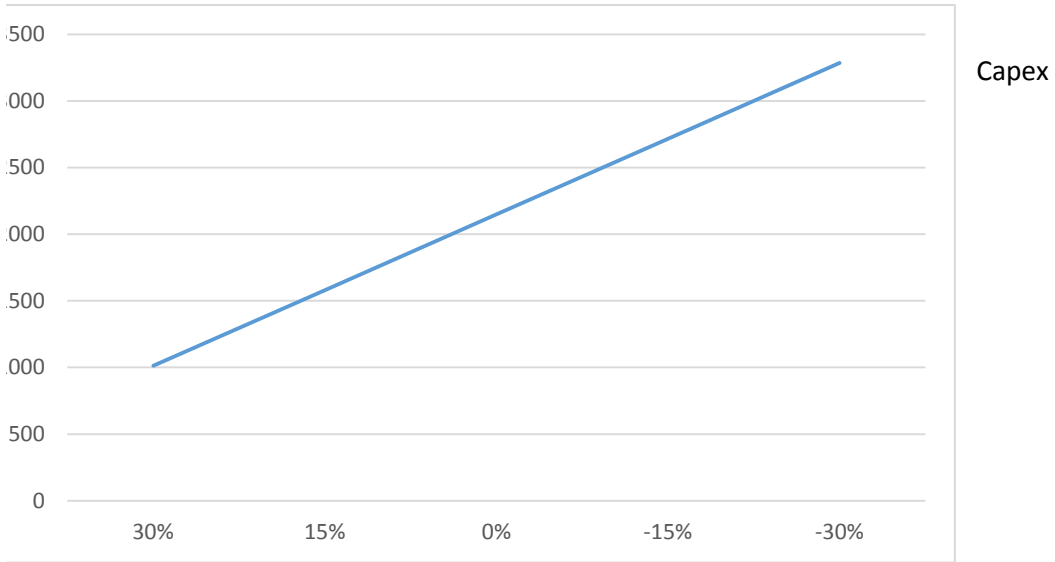
Production



Tax Rate







Exploration Well Analysis

Chance of Success	0%
Cost of Well	0 US\$mm
NPV of Success	-6
Dry Hole	0.0
Successful Well	0
EMV	0

PSA Regime

	2017	2018	2019	2020	2021	2022
Company Revenues	0	62	17	11	8	8
Operating Costs	0	-21	-11	-7	-6	-5
Transport Costs	0	-13	-6	-4	-3	-3
Operating Taxes	0	0	0	0	0	0
EBITDA	0	29	0	0	0	0
Depreciation	0	-22.9441	-11.4721	-7.45684	-5.59263	-5.03337
EBIT	0	6	-11	-8	-6	-5
Tax on EBIT <i>Corporate Tax Rate</i>	0 20%	-1.21273	2.251854	1.52406	1.186155	1.084784
Post tax cashflow	0	28	2	1	1	1
CAPEX	-45.045	-23.205	-0.98913	-0.98913	-0.98913	-0.98913
Free Cashflow (FCF)	-45	5	1	0	0	0
Cumulative FCF	-45	-40	-39	-39	-39	-39
Discount Rate	10%					
Discount Factor	1.10	1.21	1.33	1.46	1.61	1.77
Discounted Cashflow (DCF)	-41	4	1	0	0	0
NPV (\$mm)	-40					
IRR (%)	#NUM!					

Revenue Calculation

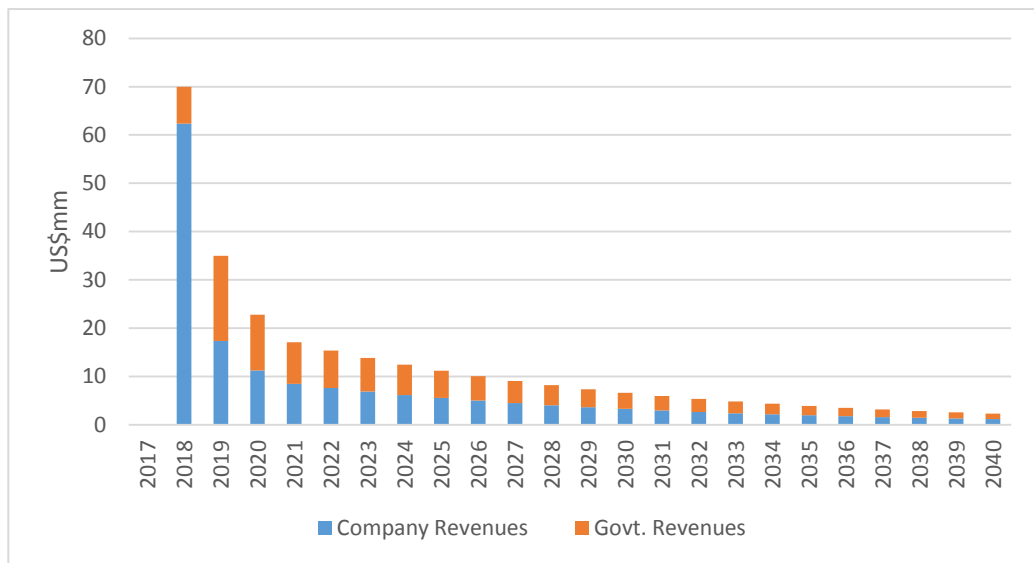
	Company	Govt				
Cost Oil	80%					
Profit Oil	50%	50%				
	2017	2018	2019	2020	2021	2022
Total Revenues	0	70	35	23	17	15
Govt Royalty	0	1	0	0	0	0
Taxable Revenues	0	69	35	23	17	15
	1%					
Cost Oil						
80% of Revenues	0	55	28	18	14	12

Accumulated Cost Oil		55	83	101	115	127
Annual Costs		-57	-18	-12	-10	-9
Accumulated Costs		-57	-75	-87	-97	-106
		-1	8	14	18	21
Payback		0	1	1	1	1
Cost Oil to Company	0	55	0	0	0	0
Profit Oil	0	14	35	23	17	15
Profit Oil						
Company	0	7	17	11	8	8
Govt	0	7	17	11	8	8
Total Company Revenues	0	62	17	11	8	8
	2017	2018	2019	2020	2021	2022
Company Revenues	0	62	17	11	8	8
Govt. Revenues	0	8	18	11	9	8

2023	2024	2025	2026	2027	2028	2029	2030	2031
7	6	6	5	4	4	4	3	3
-5	-4	-4	-4	-3	-3	-3	-3	-3
-2	-2	-2	-2	-2	-1	-1	-1	-1
0	0	0	0	0	0	0	0	0
0	0	-1	-1	-1	-1	-1	-1	-1
-5	-4	-4	-3	-3	-3	-2	-2	-2
-5	-5	-4	-4	-4	-3	-3	-3	-3
1	1	1	1	1	1	1	1	1
1	0	0	0	0	0	0	0	0
-0.98913	-0.98913	-0.98913	-0.98913	-0.98913	-0.98913	-0.98913	-0.98913	-0.98913
0	-1	-1	-1	-1	-1	-1	-1	-1
-39	-40	-41	-41	-42	-43	-44	-45	-47
1.95	2.14	2.36	2.59	2.85	3.14	3.45	3.80	4.18
0	0	0	0	0	0	0	0	0

2023	2024	2025	2026	2027	2028	2029	2030	2031
14	12	11	10	9	8	7	7	6
0	0	0	0	0	0	0	0	0
14	12	11	10	9	8	7	7	6
11	10	9	8	7	6	6	5	5

138	148	157	164	172	178	184	189	194
-8	-8	-7	-7	-6	-6	-5	-5	-5
-114	-122	-129	-135	-141	-147	-152	-157	-162
24	26	28	29	30	31	32	32	32
1	1	1	1	1	1	1	1	1
0	0	0	0	0	0	0	0	0
14	12	11	10	9	8	7	7	6
7	6	6	5	4	4	4	3	3
7	6	6	5	4	4	4	3	3
7	6	6	5	4	4	4	3	3
2023	2024	2025	2026	2027	2028	2029	2030	2031
7	6	6	5	4	4	4	3	3
7	6	6	5	5	4	4	3	3



2032	2033	2034	2035	2036	2037	2038	2039	2040
3	2	2	2	2	2	1	1	1
-2	-2	-2	-2	-2	-2	-2	-2	-2
-1	-1	-1	-1	-1	-1	-1	0	0
0	0	0	0	0	0	0	0	0
-1	-1	-1	-1	-1	-1	-1	-1	-1
-2	-2	-1	-1	-1	-1	-1	-1	-1
-2	-2	-2	-2	-2	-2	-2	-2	-2
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
-0.98913	-0.98913	-0.98913	-0.98913	-0.98913	-0.98913	-0.98913	-0.98913	-0.98913
-1	-1	-1	-1	-1	-1	-1	-1	-1
-48	-49	-50	-52	-53	-54	-56	-57	-59
4.59	5.05	5.56	6.12	6.73	7.40	8.14	8.95	9.85
0	0	0	0	0	0	0	0	0

2032	2033	2034	2035	2036	2037	2038	2039	2040
5	5	4	4	4	3	3	3	2
0	0	0	0	0	0	0	0	0
5	5	4	4	3	3	3	3	2
4	4	3	3	3	3	2	2	2

198	202	205	208	211	214	216	218	220
-4	-4	-4	-4	-3	-3	-3	-3	-3
-166	-170	-174	-178	-181	-185	-188	-191	-194
32	32	31	31	30	29	28	27	26
1	1	1	1	1	1	1	1	1
0	0	0	0	0	0	0	0	0
5	5	4	4	3	3	3	3	2
3	2	2	2	2	2	1	1	1
3	2	2	2	2	2	1	1	1
3	2	2	2	2	2	1	1	1
2032	2033	2034	2035	2036	2037	2038	2039	2040
3	2	2	2	2	2	1	1	1
3	2	2	2	2	2	1	1	1

Questions

Real and Nominal

	2018	2019	2020	2021	2022	2023
Q1	100	102.5	105.1	107.7	110.4	113.1

Q2

	2018	2019	2020	2021	2022	2023
Real	60	60	60	60	60	60
Nominal	60	61.20	62.42	63.67	64.95	66.24

Inflation 2%

Real +1%	60	60.60	61.21	61.82	62.44	63.06
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NPV and DCF

Q1

	2018	2019	2020	2021	2022	2023	2024	2025
US\$m	100	100	100	100	100	100	100	100
Discount factor	1.10	1.21	1.33	1.46	1.61	1.77	1.95	2.14
Discount Rate	10%							
DCF	91	83	75	68	62	56	51	47
NPV	614							
NPV Excel	614							

Q2

	2018	2019	2020	2021	2022	2023	2024	2025
Capex	-187.5	-187.5	-187.5	-187.5	-187.5			
Cashflow						100	150	200
Net Cashflow	-188	-188	-188	-188	-188	100	150	200
Discount Factor	1.1	1.21	1.33	1.46	1.61	1.77	1.95	2.14
Discount Rate	10%							
DCF	-170	-155	-141	-128	-116	56	77	93
NPV	381							
NPV Excel	381							
IRR	16%							
Cost Inflation	1.25							

2026	2027
100	100
2.36	2.59
42	39

2026	2027	2028	2029	2030	2031	2032	2033	2034
250	300	300	300	300	300	300	270	243
250	300	300	300	300	300	300	270	243
2.36	2.59	2.85	3.14	3.45	3.80	4.18	4.59	5.05
106	116	105	96	87	79	72	59	48

2035	2036	2037
219	197	177
219	197	177
5.56	6.12	6.73
39	32	26