

## Time Value of Money

Money

	Year 1	Year 2	Year 3	Year 4	Year 5
US\$ in wallet					
US\$ in bank					
Inflation					
Interest Rate					
Cumulative Interest Rate					

Cost of printer ink

	Year 1	Year 2	Year 3	Year 4	Year 5
US\$ flat					
US\$ inflation					
Cumulative inflation					

Amount of printer ink

	Year 1	Year 2	Year 3	Year 4	Year 5
US\$ no inflation or interest					
US after inflation					
US\$ after inflation with interest					

	Year 1	Year 2	Year 3	Year 4	Year 5
Discount Rate					

## Real versus Nominal

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

## Money available

100

Chocolate Bars

## Money Invested

Chocolate Bars	100.0				
Chocolate Bars	100.0	0.0	0.0	0.0	0.0

**US\$ Real (2018)**

Money Available

Cost of Choc Bar

Year 6      Year 7      Year 8      Year 9      Year 10

Year 6      Year 7      Year 8      Year 9      Year 10

Year 6      Year 7      Year 8      Year 9      Year 10      2029

Year 6      Year 7      Year 8

2023	2024	2025	2026	2027	2028
1.00	1.00	1.00	1.00	1.00	1.00

0%	0%	0%	0%	0%	0%
1.00	1.00	1.00	1.00	1.00	1.00

0.0	0.0	0.0	0.0	0.0	0.0
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Real and Nominal

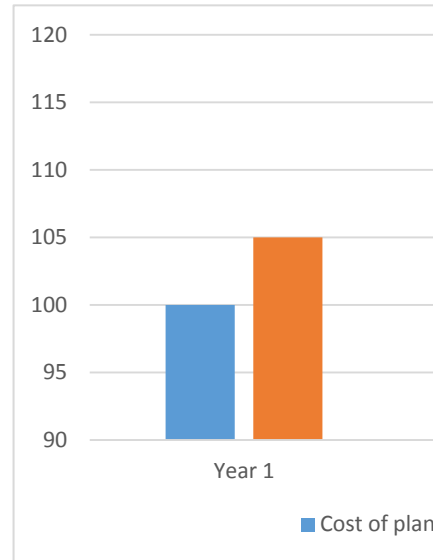
	Year 1	Year 2	Year 3	Year 4	Year 5
Real					
Nominal					
Inflation					
Inflation Factor					
Capex					
US\$2023					
Nominal					

Oil Price

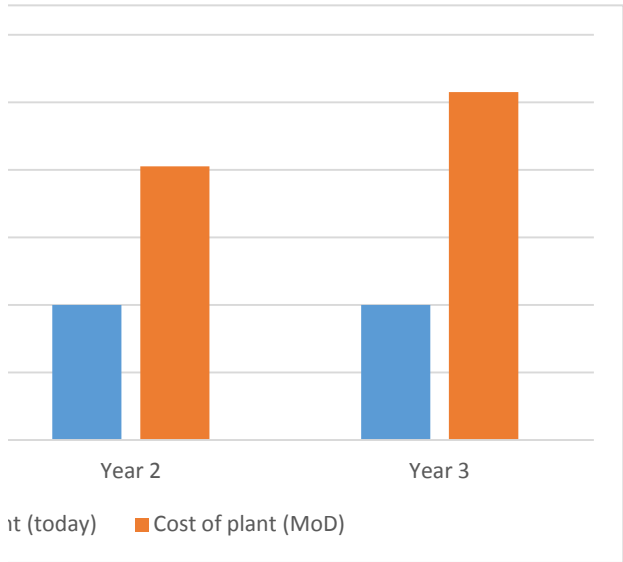
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Real							
Nominal							
Inflation							
Inflation Factor							

Cost of plant (today)  
Cost of plant (MoD)

Year 8      Year 9      Year 10



Year 1	Year 2	Year 3	Total
100	100	100	300
105	110	116	331



## Example Discounted Cashflow

### Example 1

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Cashflow	-10	-10	-10	20	20	20	20
Discount Factor							
Discounted Cashflow							
NPV (Net Present Value)							

Discount Rate 0%

Excel Calculation

IRR

### 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
20	20	20

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 0.00%

Corporate Interest Rate 0.00%

Equity market return 0.00%

Company Beta 0

Corporate Tax Rate 0%

	Debt	Equity
Debt:Equity Split	100%	0%

Cost of Debt 0.00%

Cost of Equity 0.00%

WACC 0.00%

## 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%

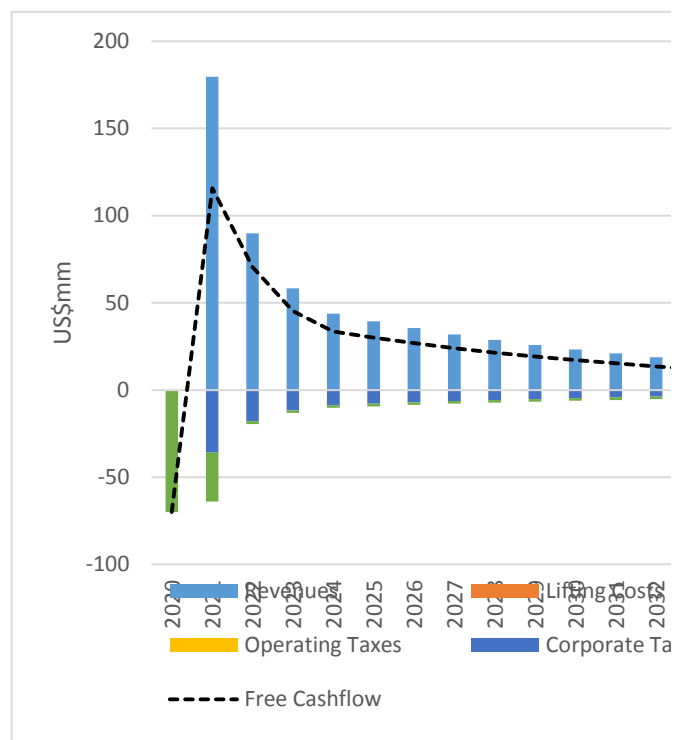
	2024	2025	2026	2027	2028	2029
Revenues	0	180	90	58	44	39
Operating Costs	0	0	0	0	0	0
Transport Costs	0	0	0	0	0	0
Operating Taxes	0	0	0	0	0	0
EBITDA	0	180	90	58	44	39
Depreciation <i>Straight Line (0) or Unit of Prod (1)</i>	0 1	0	0	0	0	0
EBIT	0	180	90	58	44	39
Tax on EBIT <i>Corporate Tax Rate</i>	0 20%	-36	-18	-12	-9	-8
Post tax cashflow	0	144	72	47	35	32
CAPEX	-70	-28	-2	-2	-2	-2
Free Cashflow (FCF)	-70	116	70	45	34	30
Cumulative FCF	-70	46	116	161	195	225
Discount Rate	0.0%					
Discount Factor	1.00	1.00	1.00	1.00	1.00	1.00
Discounted Cashflow (DCF)	-70	116	70	45	34	30
NPV (\$mm)	439					
IRR (%)	128.2%					
Payback (years)	0	When does cumulative cashflow turn positive				
Excel Calculation	\$439					

**Breakeven Gas Price**      **\$3.90**      *After Goal Seek Function in Data:What If*

Alternative NPV (terminal value)						
FCF for 10 years	-70	116	70	45	34	30

Terminal Value						
Implied FCF	-70	116	70	45	34	30
Implied DCF	-70	116	70	45	34	30
NPV	752					
Plus Cash	0					
Less Debt	0					
Total NPV	752					
IRR	128%					
<i>EBITDA Multiple</i>	<i>20</i>					

	2020	2021	2022	2023	2024	2025
Revenues	0	180	90	58	44	39
Lifting Costs	0	0	0	0	0	0
Transport	0	0	0	0	0	0
Operating Taxes	0	0	0	0	0	0
Corporate Tax	0	-36	-18	-12	-9	-8
Capex	-70	-28	-2	-2	-2	-2
Free Cashflow	-70	116	70	45	34	30



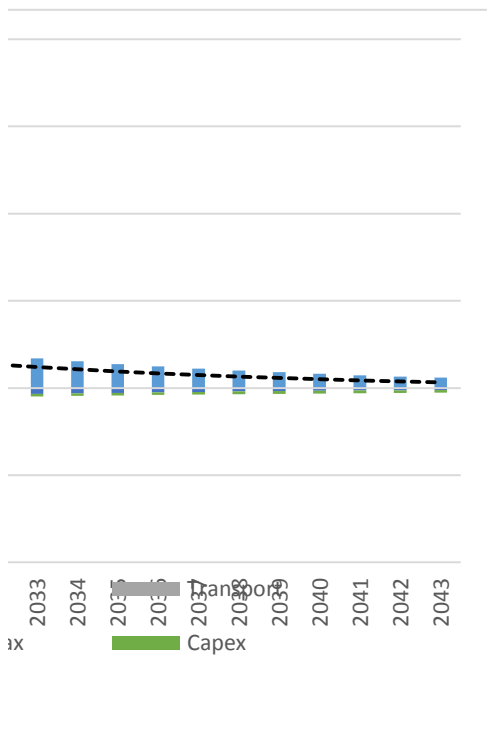
Base  
High  
Upside  
Low  
Downside

**Results**  
NPV 439 US\$mm  
IRR 128% %

2030	2031	2032	2033	2034	2035	2036	2037	2038
35	32	29	26	23	21	19	17	15
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
35	32	29	26	23	21	19	17	15
0	0	0	0	0	0	0	0	0
35	32	29	26	23	21	19	17	15
-7	-6	-6	-5	-5	-4	-4	-3	-3
28	26	23	21	19	17	15	14	12
-2	-2	-2	-2	-2	-2	-2	-2	-2
27	24	21	19	17	15	14	12	11
251	276	297	316	333	349	362	374	385
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
27	24	21	19	17	15	14	12	11
27	24	21	19	17				

					419
27	24	21	19	17	419
27	24	21	19	17	419

2026	2027	2028	2029	2030	2031	2032	2033	2034
35	32	29	26	23	21	19	17	15
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
-7	-6	-6	-5	-5	-4	-4	-3	-3
-2	-2	-2	-2	-2	-2	-2	-2	-2
27	24	21	19	17	15	14	12	11



2039	2040	2041	2042	2043	2044	2045	2046	2047
14	12	11	10	9	8	7	7	6
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
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
-3	-2	-2	-2	-2	-2	-1	-1	-1
11	10	9	8	7	6	6	5	5
-2	-2	-2	-2	-2	-2	-2	-2	-2
9	8	7	7	6	5	4	4	3
394	403	410	417	422	427	432	435	439
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
9	8	7	7	6	5	4	4	3

<b>2035</b>	<b>2036</b>	<b>2037</b>	<b>2038</b>	<b>2039</b>	<b>2040</b>	<b>2041</b>	<b>2042</b>	<b>2043</b>
14	12	11	10	9	8	7	7	6
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
-3	-2	-2	-2	-2	-2	-1	-1	-1
-2	-2	-2	-2	-2	-2	-2	-2	-2
9	8	7	7	6	5	4	4	3

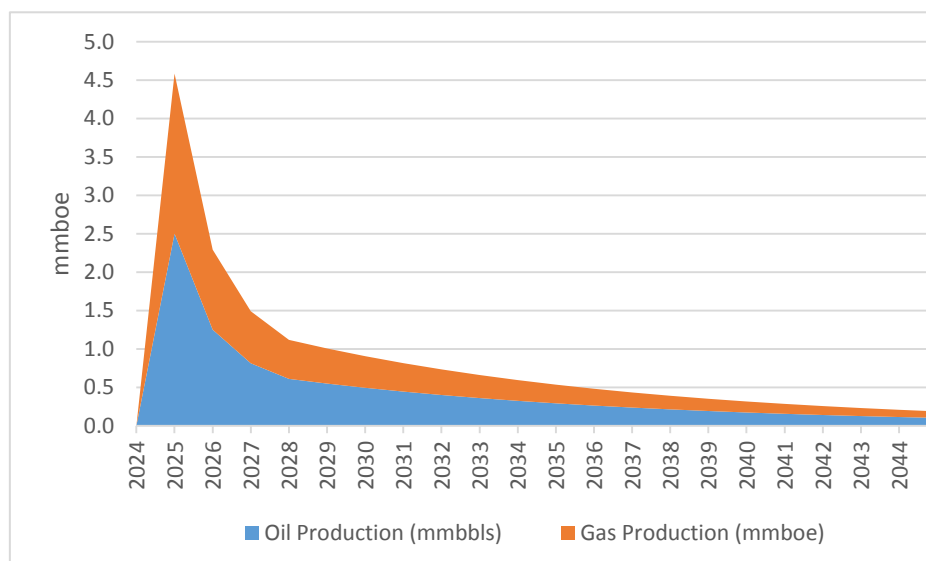


## Production

	Oil		Gas		
	mmbbls	kbpd	Bcf	mmcf	
Resources	100		500		
Recovery Factor	10%		10%		
Reserves	10		50		
Start date	5 years after first capex		Peak as % Reserves	5 years after first capex	
Peak Production (mmbbls)	2.5	7	25%	12.5	34
Time to Peak (yrs)	1			1	
Length of Peak (yrs)	1			1	
Decline rate (%) Yrs 2,3,4,5+	50%	35%	25%	10%	50%

	2024	2025	2026	2027	2028	2029
Oil production	0.00	2.50	1.25	0.81	0.61	0.55
<b>Total oil produced to 2040</b>	<b>9.9</b>					
Barrels per day		6849	3425	2226	1670	1503
Gas Production	0.00	12.50	6.25	4.06	3.05	2.74
<b>Total gas produced to 2040</b>	<b>49.6</b>					

	2024	2025	2026	2027	2028	2029
Oil Production (mmbbls)	0.0	2.5	1.3	0.8	0.6	0.5
Gas Production (mmboe)	0.0	2.1	1.0	0.7	0.5	0.5
Total (mmboe)	0.0	4.6	2.3	1.5	1.1	1.0



Production Scenarios

Total Produced

Oil Production Scenarios

1	9.92
2	11.40
3	12.89
4	8.43
5	6.94

Gas Production Scenarios

1	49.58
2	57.01
3	64.45
4	42.14
5	34.70

**Total**

18

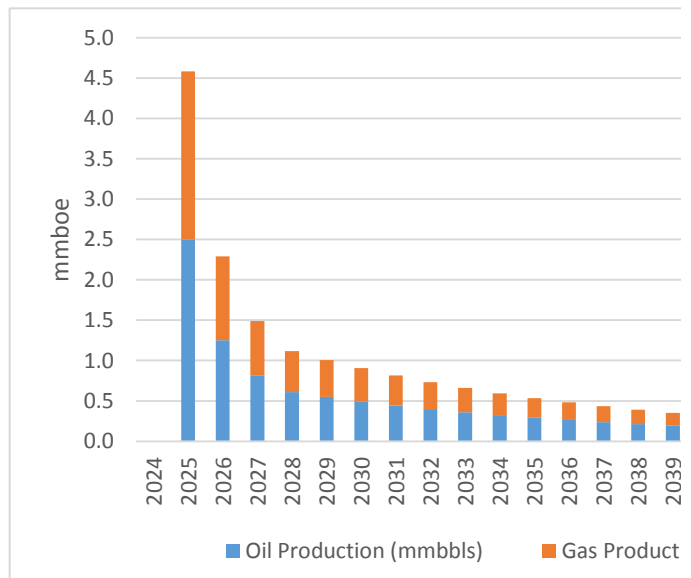
Peak as %  
Reserves

25%

25% 10%

2030	2031	2032	2033	2034	2035	2036	2037	2038
0.49	0.44	0.40	0.36	0.32	0.29	0.26	0.24	0.21
1352	1217	1095	986	887	799	719	647	582
2.47	2.22	2.00	1.80	1.62	1.46	1.31	1.18	1.06

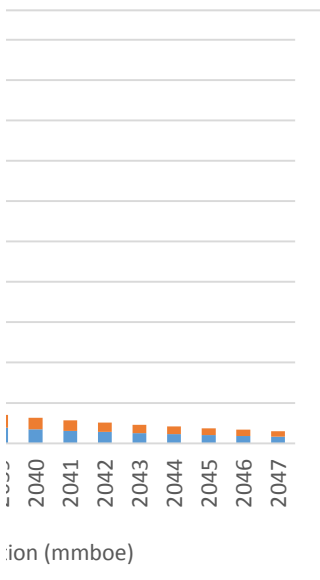
2030	2031	2032	2033	2034	2035	2036	2037	2038
0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.2	0.2
0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2
0.9	0.8	0.7	0.7	0.6	0.5	0.5	0.4	0.4





2039	2040	2041	2042	2043	2044	2045	2046	2047
0.19	0.17	0.15	0.14	0.13	0.11	0.10	0.09	0.08
524	472	424	382	344	309	278	251	226
0.96	0.86	0.77	0.70	0.63	0.56	0.51	0.46	0.41

2039	2040	2041	2042	2043	2044	2045	2046	2047
0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2





**Domestic Oil Price**

Base Case	37.5	37.5	37.5	37.5	37.5	37.5
Scenario 2	43.1	43.1	43.1	43.1	43.1	43.1
Scenario 3	48.8	48.8	48.8	48.8	48.8	48.8
Scenario 4	31.9	31.9	31.9	31.9	31.9	31.9
Scenario 5	26.3	26.3	26.3	26.3	26.3	26.3

**Domestic Gas Price**

Base Case	3.9	3.9	3.9	3.9	3.9	3.9
Scenario 2	4.5	4.5	4.5	4.5	4.5	4.5
Scenario 3	5.1	5.1	5.1	5.1	5.1	5.1
Scenario 4	3.3	3.3	3.3	3.3	3.3	3.3
Scenario 5	2.7	2.7	2.7	2.7	2.7	2.7

**Export Gas Price**

Base Case	9.8	9.8	9.8	9.8	9.8	9.8
Scenario 2	11.2	11.2	11.2	11.2	11.2	11.2
Scenario 3	12.7	12.7	12.7	12.7	12.7	12.7
Scenario 4	8.3	8.3	8.3	8.3	8.3	8.3
Scenario 5	6.8	6.8	6.8	6.8	6.8	6.8

Slope 13%









37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5
43.1	43.1	43.1	43.1	43.1	43.1	43.1	43.1
48.8	48.8	48.8	48.8	48.8	48.8	48.8	48.8
31.9	31.9	31.9	31.9	31.9	31.9	31.9	31.9
26.3	26.3	26.3	26.3	26.3	26.3	26.3	26.3

3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1
3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7

9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8
11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2
12.7	12.7	12.7	12.7	12.7	12.7	12.7	12.7
8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3
6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8

2047

0.1

0.1

0.0

38

75

2

1

4

0.4

3.9

9.8

0

0

1

1

2

6

0.1

0.1

15%

0.1

30%

0.1

-15%

0.1

-30%

0.4

0.5

15%

0.5

30%

0.3

-15%

0.3

-30%

75.0

86.3

97.5

63.8

52.5

37.5  
43.1  
48.8  
31.9  
26.3

3.9  
4.5  
5.1  
3.3  
2.7

9.8  
11.2  
12.7  
8.3  
6.8

## Capital Expenditure

	Total mmboe	Oil mmbbls	Gas bcf	Bcf per well	
Reserves	18	10	50	8	6.3
Wells	0				
Capex per well	0.0				
Capex per bbl	0.00		0		
Total capex	0				
% up to first prod	75%	0			
% first oil to peak	0%	0			
Maintenance capex	25%	0			

	First Capex		First gas			
	2024	2025	2026	2027	2028	2029
US\$mm	70	28	1.5	1.5	1.5	1.5
Before first oil	98					
Maintenance	33					
Total	131					

## Sensitivities

2	81	32	2	2	2	2
3	91	36	2	2	2	2
4	60	24	1	1	1	1
5	49	20	1	1	1	1
15%						
30%						
-15%						
-30%						

## Field Comparisons

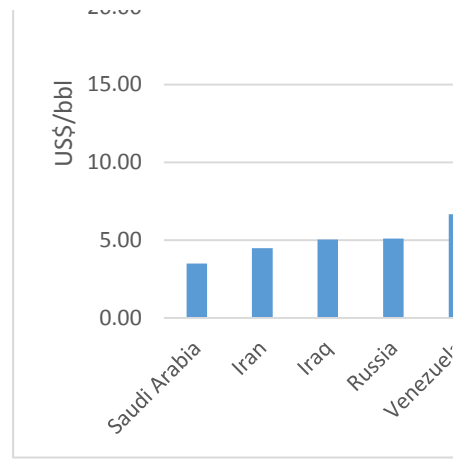
	Cost /bbl	Capex	Reserves	Peak Prod	Peak Prod
	US\$/bbl	US\$mm	mmbbls	kbpd	mmbbls
Kashagan ( Kazakhstan)	10.46	136000	13000	1500	547.5
ACG (Azerbaijan)	4.00	20000	5000	620	226.3
Thunderhorse (Gulf of Mexico)	5.00	5000	1000	250	91.25
Novy Port (Russia onshore)	3.25	4500	1385	161	58.64
Ghawar (Saudi)	3.50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

US shale	\$10mm	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

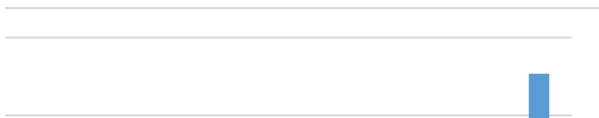
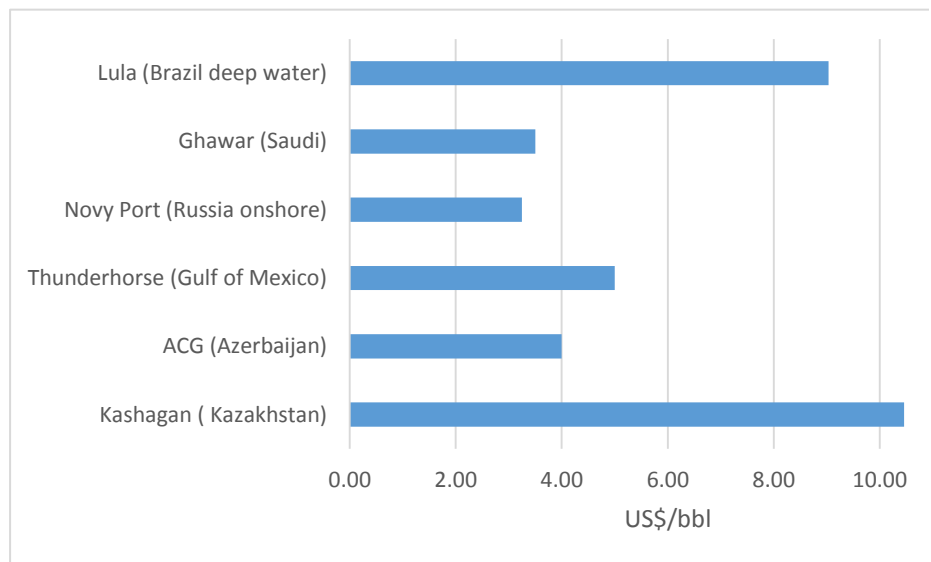


2030	2031	2032	2033	2034	2035	2036	2037	2038
1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5

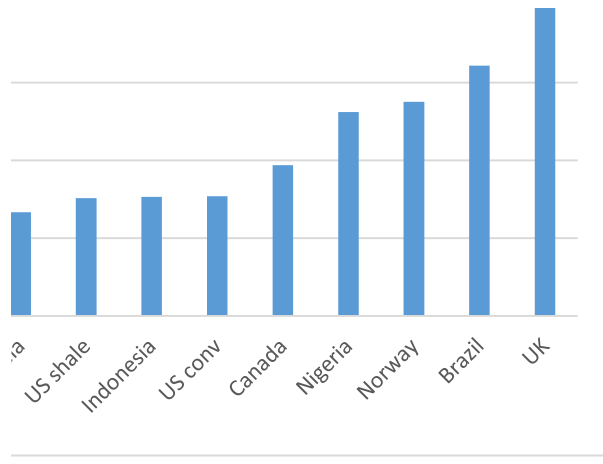
2	2	2	2	2	2	2	2	2
2	2	2	2	2	2	2	2	2
1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1

Capex/  
peak bbl  
US\$/bbl

248  
88  
55  
77  
136  
411

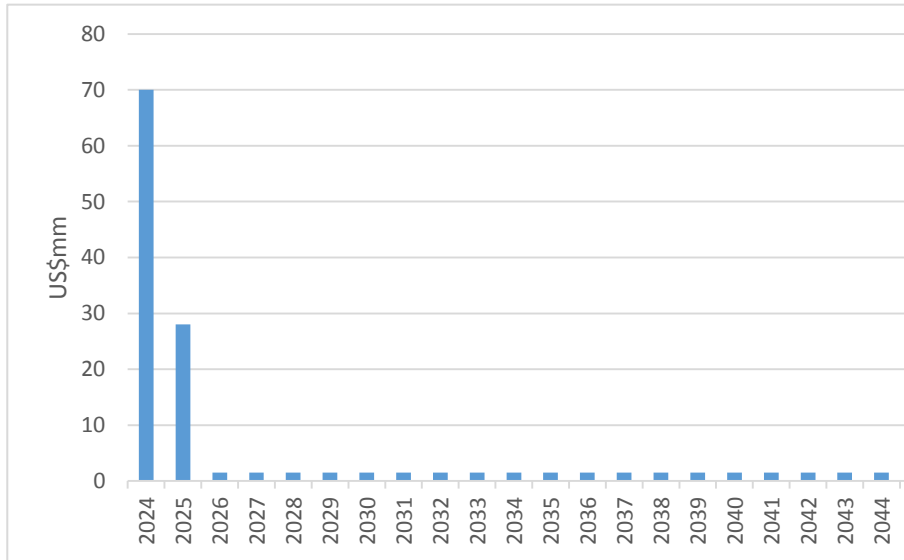






2039	2040	2041	2042	2043	2044	2045	2046	2047
1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5

2	2	2	2	2	2	2	2	2
2	2	2	2	2	2	2	2	2
1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1







## Operating Costs

Lifting Costs	0.00 US\$/boe	real					
Total for model	0 US\$mm						
Variable	0.00 US\$/bbl		80%				
Fixed	0 US\$mm		20%				
Years production	23						
	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>2027</b>	<b>2028</b>	<b>2029</b>	<b>2030</b>
US\$mm	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	0						

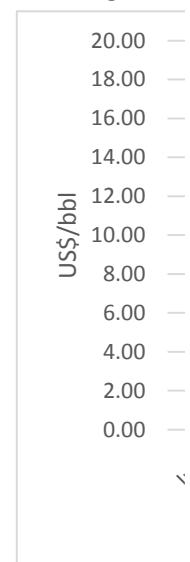
## Base Case and Sensitivities

1	0.00
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	0.00 US\$/bbl
Gas	0.00 US\$/mcf

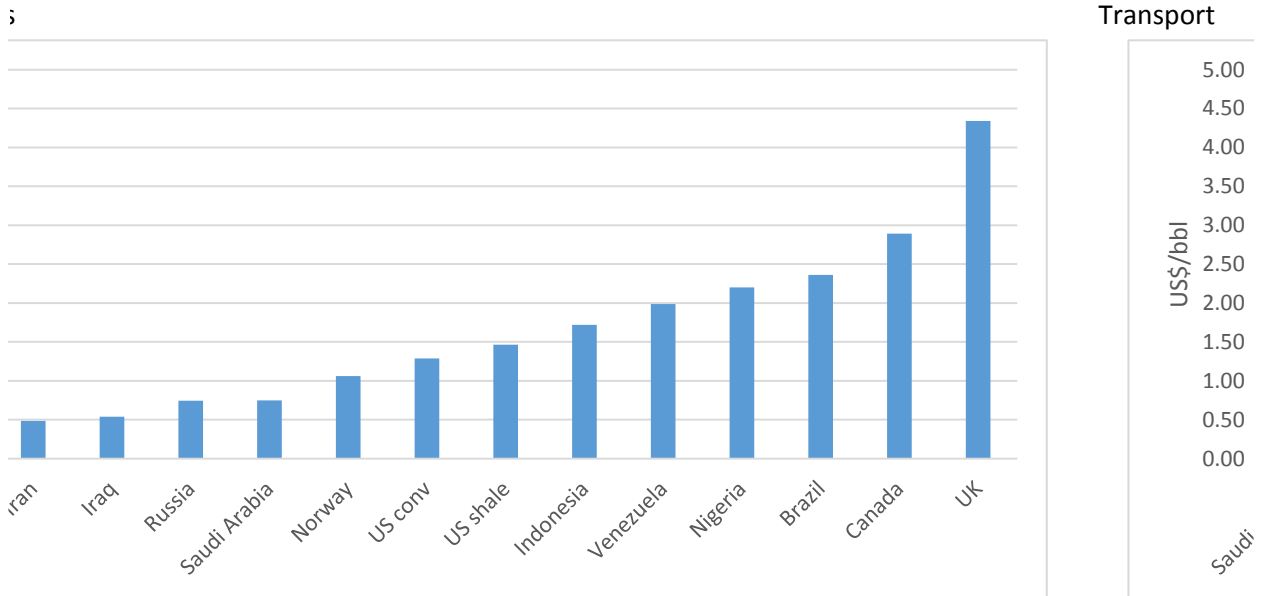
**2024      2025      2026      2027      2028      2029      2030**

Oil (US\$mm)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gas (US\$mm)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total (US\$mm)	0.0	0.0	0.0	0.0	0.0	0.0	0.0

**Base Case and Sensitivities**

1	0.00
2	15%
3	30%
4	-15%
5	-30%

2031 2032 2033 2034 2035 2036 2037 2038  
 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0

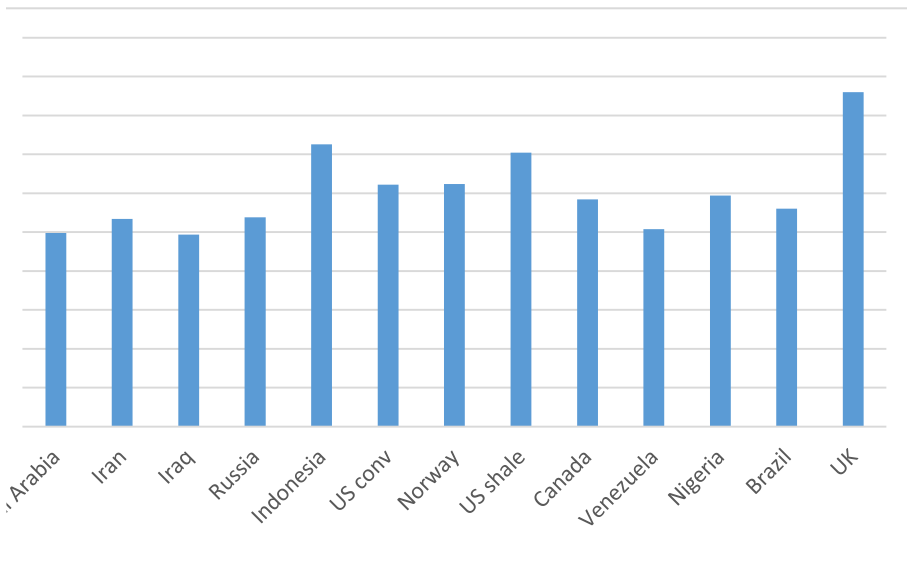


2031 2032 2033 2034 2035 2036 2037 2038

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



2039 0.0    2040 0.0    2041 0.0    2042 0.0    2043 0.0    2044 0.0    2045 0.0    2046 0.0



2039    2040    2041    2042    2043    2044    2045    2046

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

**2047**

0.0

**2047**

0.0  
0.0  
0.0

## 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	75	75	75	75	75	75
------------------	----	----	----	----	----	----

	2024	2025	2026	2027	2028	2029
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	US\$/mcf

	2024	2025	2026	2027	2028	2029
Export Tax	0	0	0	0	0	0
Royalty	0	0.0	0.0	0.0	0.0	0.0
Total	0	0.0	0.0	0.0	0.0	0.0
Total Operating Taxes	0	0.0	0.0	0.0	0.0	0.0
Total US\$/boe		0.00	0.00	0.00	0.00	0.00

### 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	0
Years of Production	23
Annual Depreciation (US\$mm)	0.0

	2024	2025	2026	2027	2028	2029
Depreciation	0	0.0	0.0	0.0	0.0	0.0
<i>Production</i>	<i>0</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>
Total	0					

### Unit of Production

Total Reserves	18
Total Produced	18
Total Capex	0
Depreciation per barrel	0.00

	2024	2025	2026	2027	2028	2029
Depreciation	0	0.0	0.0	0.0	0.0	0.0
Total	0					

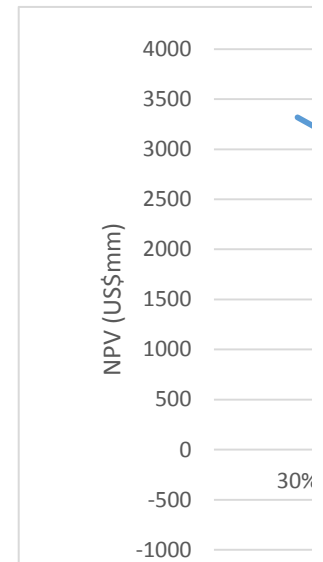




## Sensitivities

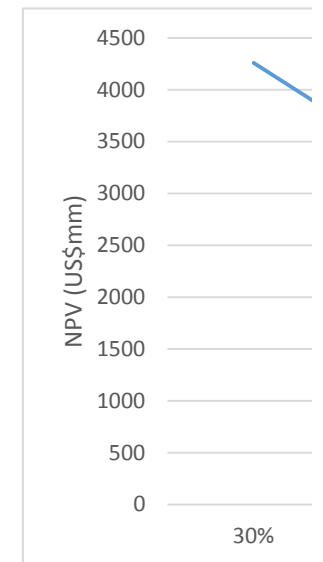
### Oil Price

	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

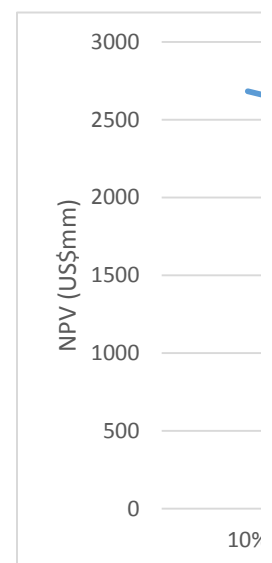
	NPV
30%	1735
15%	1942
0%	2149
-15%	2356
-30%	2563

### Corporate Tax Rate

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

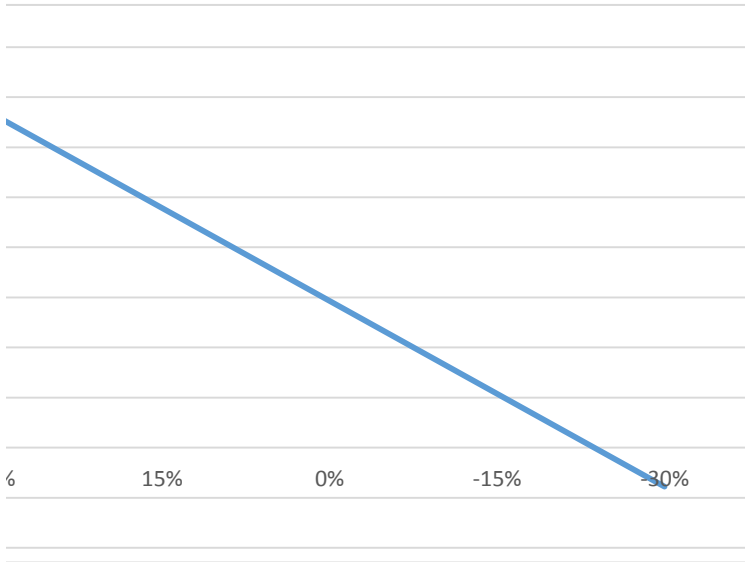
### Discount Rate

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

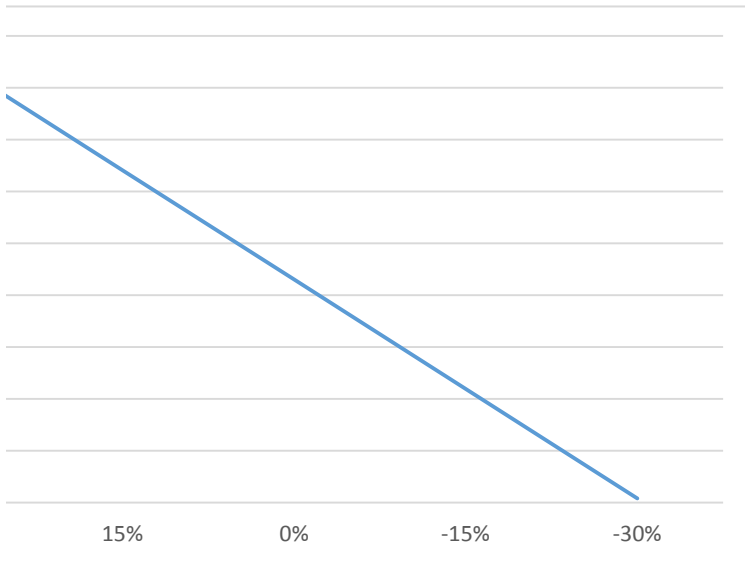


## Summary

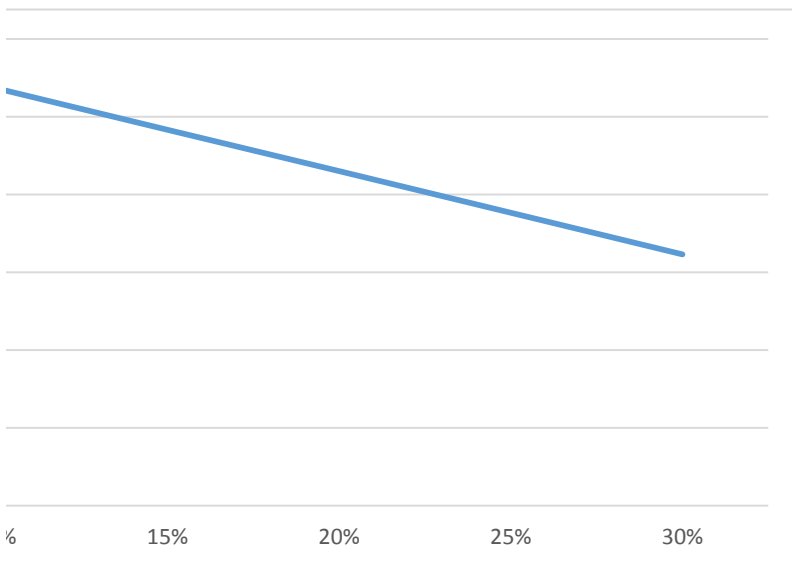
	Oil Price	Production Capex	Opex	Corp Tax	Disc. Rate	
Downside	-388	40	1012	1735	1615	-154
Low	539	1094	1580	1942	1882	496
Base	1465	2149	2149	2149	2149	2149
High	2392	3203	2717	2356	2415	2932
Upside	3318	4257	3285	2563	2682	5152



Oil Price

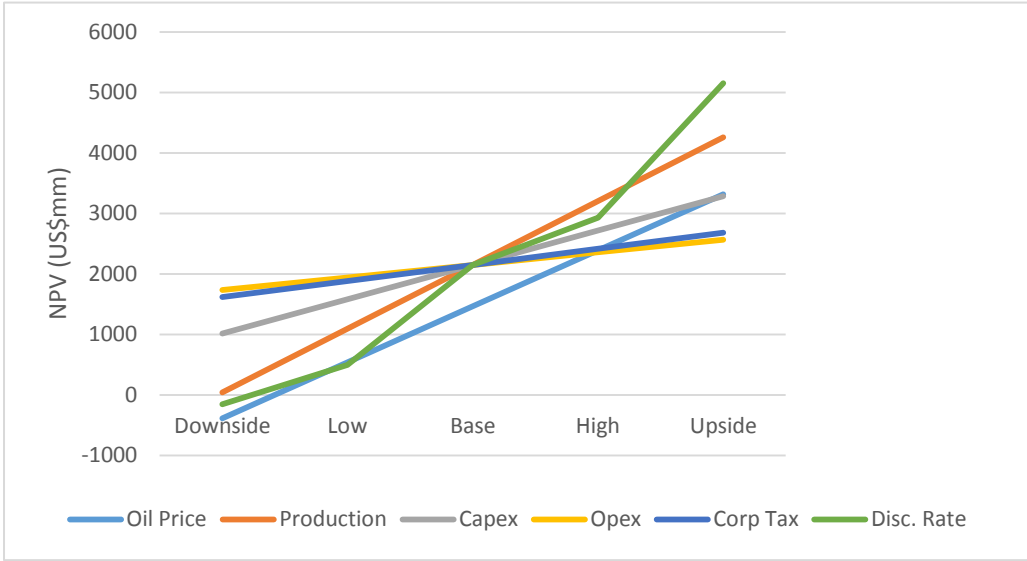


Production

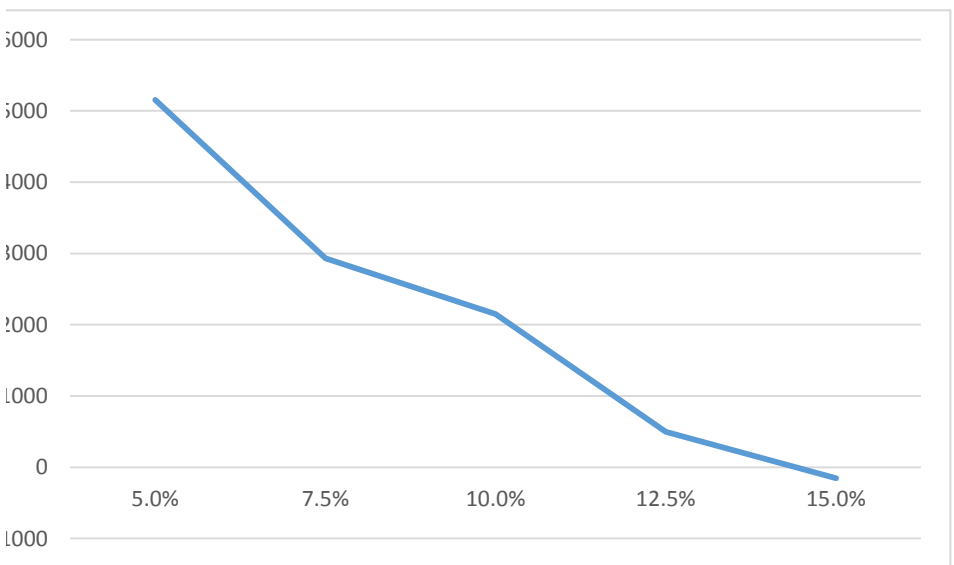
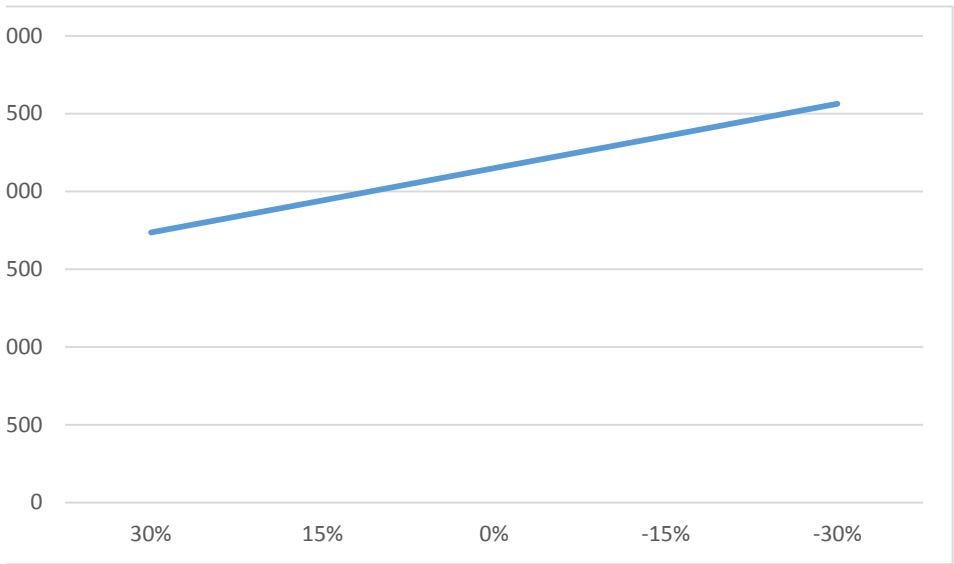
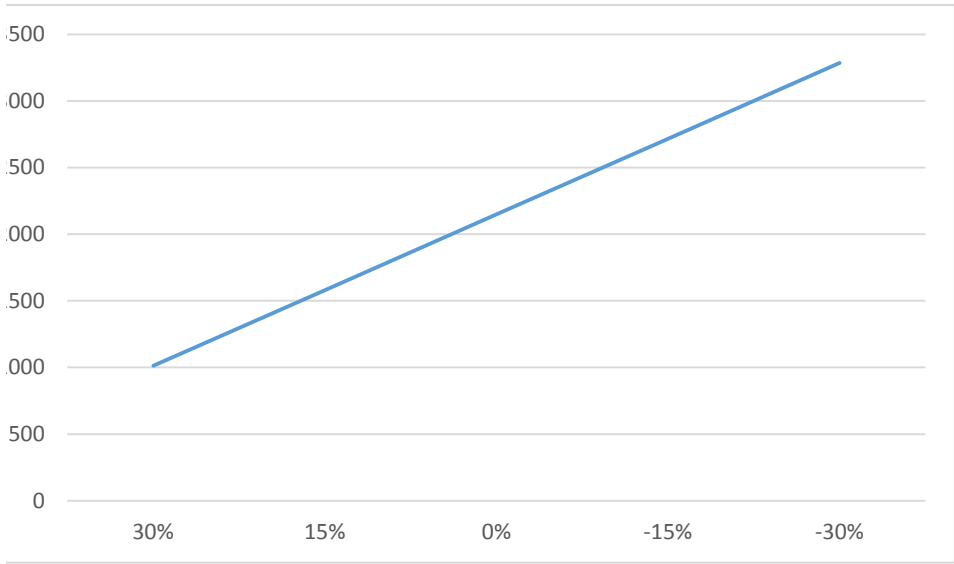


Tax Rate









**Exploration Well Analysis**

Chance of Success	0%
Cost of Well	0 US\$mm
NPV of Success	439
Dry Hole	0.0
Successful Well	0
EMV	0

**PSA Regime**

	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>
Company Revenues	0	89	44	29	22	19
Operating Costs	0	0	0	0	0	0
Transport Costs	0	0	0	0	0	0
Operating Taxes	0	0	0	0	0	0
EBITDA	0	89	44	29	22	19
Depreciation	0	0	0	0	0	0
EBIT	0	89	44	29	22	19
Tax on EBIT <i>Corporate Tax Rate</i>	0 20%	-17.7736	-8.8868	-5.77642	-4.33231	-3.89908
Post tax cashflow	0	71	36	23	17	16
CAPEX	-70	-28	-1.5	-1.5	-1.5	-1.5
Free Cashflow (FCF)	-70	43	34	22	16	14
Cumulative FCF	-70	-27	7	29	45	59
Discount Rate	10%					
Discount Factor	1.10	1.21	1.33	1.46	1.61	1.77
Discounted Cashflow (DCF)	-64	36	26	15	10	8
NPV (\$mm)	62					
IRR (%)	38%					

**Revenue Calculation**

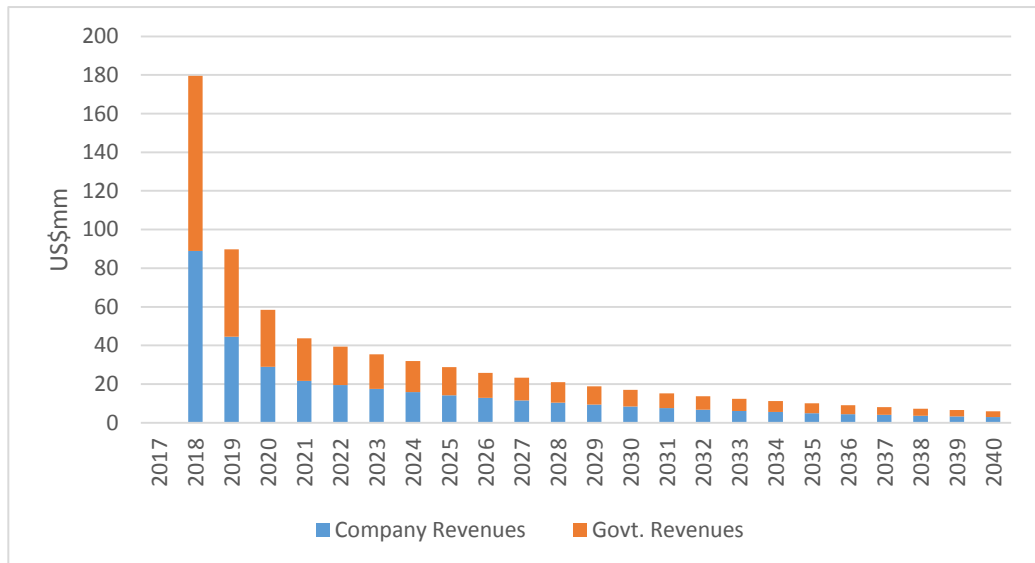
	Company	Govt				
Cost Oil	80%					
Profit Oil	50%	50%				
	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>
Total Revenues	0	180	90	58	44	39
Govt Royalty	0	2	1	1	0	0
Taxable Revenues	0	178	89	58	43	39
	1%					
<b>Cost Oil</b>						
80% of Revenues	0	142	71	46	35	31

Accumulated Cost Oil		142	213	259	294	325
Annual Costs		-28	-2	-2	-2	-2
Accumulated Costs		-28	-30	-31	-33	-34
		114	184	228	262	291
Payback		1	1	1	1	1
<b>Cost Oil to Company</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Profit Oil	0	178	89	58	43	39
<b>Profit Oil</b>						
Company	0	89	44	29	22	19
Govt	0	89	44	29	22	19
<b>Total Company Revenues</b>	<b>0</b>	<b>89</b>	<b>44</b>	<b>29</b>	<b>22</b>	<b>19</b>
	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>
Company Revenues	0	89	44	29	22	19
Govt. Revenues	0	91	45	29	22	20

<b>2023</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>2027</b>	<b>2028</b>	<b>2029</b>	<b>2030</b>	<b>2031</b>
18	16	14	13	12	10	9	8	8
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
18	16	14	13	12	10	9	8	8
0	0	0	0	0	0	0	0	0
18	16	14	13	12	10	9	8	8
-4	-3	-3	-3	-2	-2	-2	-2	-2
14	13	11	10	9	8	7	7	6
-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5
13	11	10	9	8	7	6	5	5
71	82	92	101	109	115	121	127	131
1.95	2.14	2.36	2.59	2.85	3.14	3.45	3.80	4.18
6	5	4	3	3	2	2	1	1

<b>2023</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>2027</b>	<b>2028</b>	<b>2029</b>	<b>2030</b>	<b>2031</b>
35	32	29	26	23	21	19	17	15
0	0	0	0	0	0	0	0	0
35	32	28	26	23	21	19	17	15
28	25	23	20	18	17	15	13	12

353	379	401	422	440	457	472	485	497
-2	-2	-2	-2	-2	-2	-2	-2	-2
-36	-37	-39	-40	-42	-43	-45	-46	-48
318	342	363	382	399	414	427	439	450
1	1	1	1	1	1	1	1	1
<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
35	32	28	26	23	21	19	17	15
18	16	14	13	12	10	9	8	8
18	16	14	13	12	10	9	8	8
<b>18</b>	<b>16</b>	<b>14</b>	<b>13</b>	<b>12</b>	<b>10</b>	<b>9</b>	<b>8</b>	<b>8</b>
<b>2023</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>2027</b>	<b>2028</b>	<b>2029</b>	<b>2030</b>	<b>2031</b>
18	16	14	13	12	10	9	8	8
18	16	14	13	12	11	10	9	8



<b>2032</b>	<b>2033</b>	<b>2034</b>	<b>2035</b>	<b>2036</b>	<b>2037</b>	<b>2038</b>	<b>2039</b>	<b>2040</b>
7	6	6	5	4	4	4	3	3
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
7	6	6	5	4	4	4	3	3
0	0	0	0	0	0	0	0	0
7	6	6	5	4	4	4	3	3
-1	-1	-1	-1	-1	-1	-1	-1	-1
5	5	4	4	4	3	3	3	2
-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5
4	3	3	2	2	2	1	1	1
135	138	141	144	146	148	149	150	151
4.59	5.05	5.56	6.12	6.73	7.40	8.14	8.95	9.85
1	1	1	0	0	0	0	0	0

<b>2032</b>	<b>2033</b>	<b>2034</b>	<b>2035</b>	<b>2036</b>	<b>2037</b>	<b>2038</b>	<b>2039</b>	<b>2040</b>
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

508	518	527	535	542	548	554	559	564
-2	-2	-2	-2	-2	-2	-2	-2	-2
-49	-51	-52	-54	-55	-57	-58	-60	-61
459	467	475	481	487	492	496	500	503
1	1	1	1	1	1	1	1	1
<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
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
<b>7</b>	<b>6</b>	<b>6</b>	<b>5</b>	<b>4</b>	<b>4</b>	<b>4</b>	<b>3</b>	<b>3</b>
<b>2032</b>	<b>2033</b>	<b>2034</b>	<b>2035</b>	<b>2036</b>	<b>2037</b>	<b>2038</b>	<b>2039</b>	<b>2040</b>
7	6	6	5	4	4	4	3	3
7	6	6	5	5	4	4	3	3



## Questions

### Real and Nominal

	2018	2019	2020	2021	2022	2023
<b>Q1</b>	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\$mm	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