

## An Example Conventional Oil Field

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

	2017	2018	2019	2020	2021	2022
Revenues	0	0	0	0	0	0
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	0	0	0	0	0
Depreciation	0	0	0	0	0	0
EBIT	0	0	0	0	0	0
Tax on EBIT	0	0	0	0	0	0
<i>Corporate Tax Rate</i>	<i>20%</i>					
Post tax cashflow	0	0	0	0	0	0
CAPEX	0	-500	-750	-800	-1000	-1000
Free Cashflow (FCF)	0	-500	-750	-800	-1000	-1000
Cumulative FCF	0	-500	-1250	-2050	-3050	-4050
Discount Rate	9.3%					
Discount Factor	1.00	1.09	1.19	1.31	1.43	1.56
Discounted Cashflow (DCF)	0	-457	-628	-613	-701	-641
NPV (\$mm)	1820					
IRR (%)	14.3%					
Payback (years)	10	When does cumulative cashflow turn positive				
Excel Calculation	\$1,820					

*Breakeven Oil Price*      **\$60.00**      *After Goal Seek Function in Data:What If*

Alternative NPV (terminal value)

FCF for 10 years	0	-500	-750	-800	-1000	-1000
Terminal Value						



Base  
High  
Upside  
Low  
Downside

Results		
NPV	1820	US\$mm
IRR	14%	%

2023	2024	2025	2026	2027	2028	2029	2030	2031
449	898	1347	1796	2245	2245	2245	2245	2245
-43	-87	-130	-173	-217	-217	-217	-217	-217
-33	-65	-98	-131	-163	-163	-163	-163	-163
-64	-129	-193	-257	-321	-321	-321	-321	-321
309	617	926	1235	1543	1543	1543	1543	1543
-74	-147	-221	-294	-368	-368	-368	-368	-368
235	470	705	941	1176	1176	1176	1176	1176
-47	-94	-141	-188	-235	-235	-235	-235	-235
262	523	785	1047	1308	1308	1308	1308	1308
-500	-350	-150	-100	-20	-20	-20	-20	-20
-238	173	635	947	1288	1288	1288	1288	1288
-4288	-4115	-3480	-2533	-1245	43	1331	2620	3908
1.70	1.86	2.04	2.23	2.43	2.66	2.91	3.18	3.47
-140	93	312	425	529	484	443	405	371
-238	173	635	947	1288				

-238	173	635	947	1288	10804
-140	93	312	425	529	4062

<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>
43	87	130	173	217	217	217	217	217
33	65	98	131	163	163	163	163	163
64	129	193	257	321	321	321	321	321
47	94	141	188	235	235	235	235	235
0	173	635	947	1288	1288	1288	1288	1288
-500	-350	-150	-100	-20	-20	-20	-20	-20

2032	2033	2034	2035	2036	2037	2038	2039	2040
2245	2245	2133	2026	1925	1829	1737	1650	1568
-217	-217	-206	-196	-186	-176	-168	-159	-151
-163	-163	-155	-148	-140	-133	-126	-120	-114
-321	-321	-305	-290	-276	-262	-249	-236	-224
1543	1543	1466	1393	1323	1257	1194	1135	1078
-368	-368	-349	-332	-315	-299	-285	-270	-257
1176	1176	1117	1061	1008	958	910	864	821
-235	-235	-223	-212	-202	-192	-182	-173	-164
1308	1308	1243	1181	1122	1066	1012	962	914
-20	-20	-20	-20	-20	-20	-20	-20	-20
1288	1288	1223	1161	1102	1046	992	942	894
5196	6485	7707	8868	9970	11015	12008	12949	13843
3.80	4.15	4.53	4.96	5.42	5.92	6.47	7.07	7.73
339	311	270	234	203	177	153	133	116





## Time Value of Money

	At Jan 1						
	2018	2019	2020	2021	2022	2023	2024
US\$	100						
US\$						100	
US\$							
Interest Rate	3%	3%	3%	3%	3%	3%	3%
Multiplier	1.03	1.06	1.09	1.13	1.16	1.19	1.23

## Real versus Nominal

Costs	At Dec 31						
	2018	2019	2020	2021	2022	2023	2024
US\$ Nominal	1	1	1.00	1.00	1.00	1.00	1.00
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	100.0	0.0	0.0	0.0	0.0	0.0	0.0
----------------	-------	-----	-----	-----	-----	-----	-----

**US\$ Real (2018)**

Money Available  
Cost of Choc Bar



2025	2026	2027	2028
------	------	------	------

			100
--	--	--	-----

3%	3%	3%	
1.27	1.30	1.34	

2025	2026	2027	2028
1.00	1.00	1.00	1.00

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

0.0

0.0

0.0

0.0

## 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	0
Discount Factor								
Discounted Cashflow								
NPV	0.0							
Discount Rate	0%							
Excel Calculation	0.0							

### Example 2

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	
Capital Cost	-100	-100	-100					
Revenue				30	60	120	150	
Operating Cost				-5	-5	-5	-5	
Net Cashflow	-100	-100	-100	25	55	115	145	
Discount Factor	1.08	1.17	1.26	1.36	1.47	1.59	1.71	
Discounted Cashflow	-92.6	-85.7	-79.4	18.4	37.4	72.5	84.6	
NPV	173.2							
Discount Rate	8%							
IRR	18.66%							
Excel Calculation	173.2							

Year 8	Year 9	Year 10
0	0	0

Year 8	Year 9	Year 10
150	150	150
-5	-5	-5
145	145	145
1.85	2.00	2.16
78.3	72.5	67.2



**Domestic Oil Price**

Base Case	30.0	30.0	30.0	30.0	30.0	30.0
Scenario 2	34.5	34.5	34.5	34.5	34.5	34.5
Scenario 3	39.0	39.0	39.0	39.0	39.0	39.0
Scenario 4	25.5	25.5	25.5	25.5	25.5	25.5
Scenario 5	21.0	21.0	21.0	21.0	21.0	21.0

**Domestic Gas Price**

Base Case	2.0	2.0	2.0	2.0	2.0	2.0
Scenario 2	2.3	2.3	2.3	2.3	2.3	2.3
Scenario 3	2.6	2.6	2.6	2.6	2.6	2.6
Scenario 4	1.7	1.7	1.7	1.7	1.7	1.7
Scenario 5	1.4	1.4	1.4	1.4	1.4	1.4

**Export Gas Price**

Base Case	6.0	6.0	6.0	6.0	6.0	6.0
Scenario 2	6.9	6.9	6.9	6.9	6.9	6.9
Scenario 3	7.8	7.8	7.8	7.8	7.8	7.8
Scenario 4	5.1	5.1	5.1	5.1	5.1	5.1
Scenario 5	4.2	4.2	4.2	4.2	4.2	4.2

9

0









30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
34.5	34.5	34.5	34.5	34.5	34.5	34.5	34.5
39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0
25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5
21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0

2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4

6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9
7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8
5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1
4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2

2040

34.9

19.2

15.7

30

60

576

943

1519

17.5

2.0

6.0

14

3

28

21

49

1568

34.9

40.2 +15%

45.4 +30%

29.7 -15%

24.4 -30%

17.5

20.1 +15%

22.7 +30%

14.8 -15%

12.2 -30%

60.0

69.0

78.0

51.0

42.0

30.0  
34.5  
39.0  
25.5  
21.0

2.0  
2.3  
2.6  
1.7  
1.4

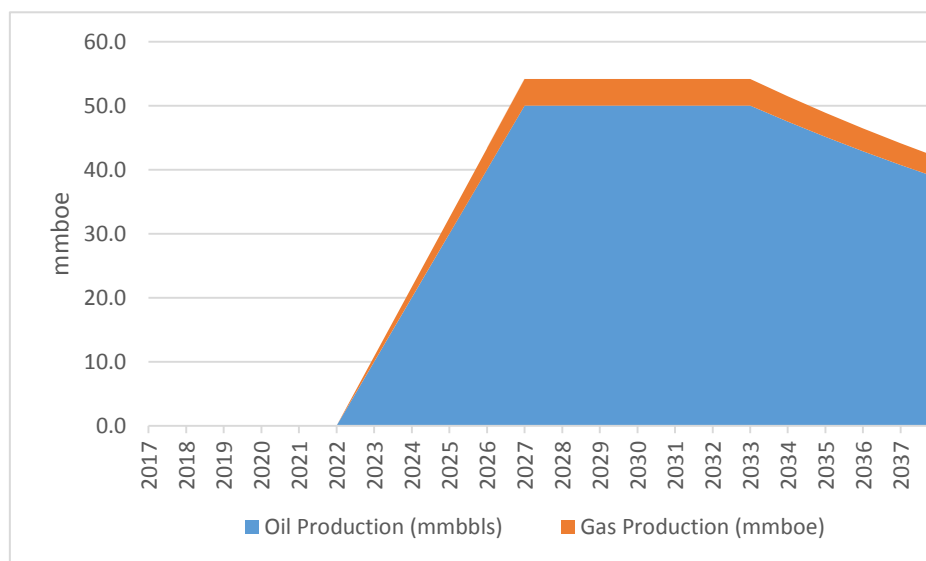
6.0  
6.9  
7.8  
5.1  
4.2

**Production**

	<b>Oil</b>		
	mmbbls	kbpd	
Resources	0		
Recovery Factor	0%		
Reserves	1000		
Start date	5 years after first capex		Peak as % Reserves
Peak Production (mmbbls)	50	137	5%
Time to Peak (yrs)	4		
Length of Peak (yrs)	7		
Decline rate (%)	5%		

	<i>First capex</i>					
	2017	2018	2019	2020	2021	2022
Oil production						
<b>Total oil produced to 2040</b>	<b>736.6</b>					
Barrels per day		0	0	0	0	0
Gas Production						
<b>Total gas produced to 2040</b>	<b>368.3</b>					

	2017	2018	2019	2020	2021	2022
Oil Production (mmbbls)	0.0	0.0	0.0	0.0	0.0	0.0
Gas Production (mmboe)	0.0	0.0	0.0	0.0	0.0	0.0
Total (mmboe)	0.0	0.0	0.0	0.0	0.0	0.0



Production Scenarios

Total Produced

Oil Production Scenarios

1	736.58
2	847.07
3	957.55
4	626.09
5	515.61

Gas Production Scenarios

1	368.29
2	423.53
3	478.78
4	313.05
5	257.80

**Gas**  
Bcf

500

5 years  
after first  
capex

25

4

7

5%

**Total**

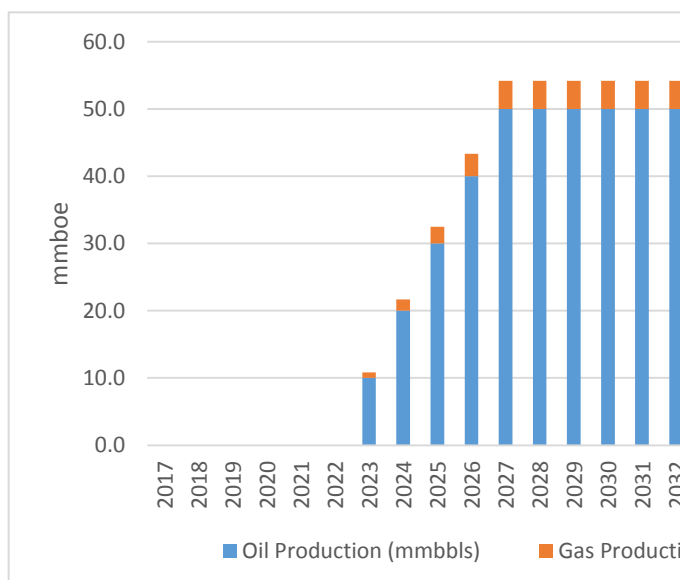
1083

68

1st year

2023	2024	2025	2026	2027	2028	2029	2030	2031
10.00	20.00	30.00	40.00	50.00	50.00	50.00	50.00	50.00
27397	54795	82192	109589	136986	136986	136986	136986	136986
5	10	15	20	25.0	25.0	25.0	25.0	25.0

2023	2024	2025	2026	2027	2028	2029	2030	2031
10.0	20.0	30.0	40.0	50.0	50.0	50.0	50.0	50.0
0.8	1.7	2.5	3.3	4.2	4.2	4.2	4.2	4.2
10.8	21.7	32.5	43.3	54.2	54.2	54.2	54.2	54.2

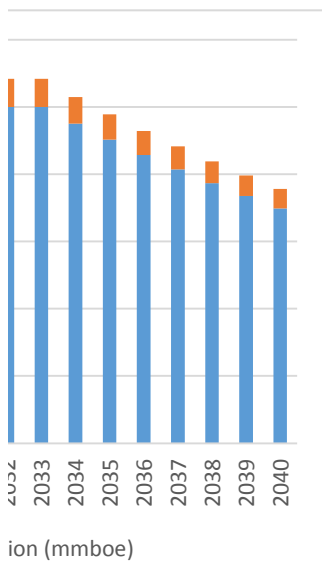






2032	2033	2034	2035	2036	2037	2038	2039	2040
50.00	50.00	47.50	45.13	42.87	40.73	38.69	36.75	34.92
136986	136986	130137	123630	117449	111576	105997	100698	95663
25.0	25.0	23.8	22.6	21.4	20.4	19.3	18.4	17.5

2032	2033	2034	2035	2036	2037	2038	2039	2040
50.0	50.0	47.5	45.1	42.9	40.7	38.7	36.8	34.9
4.2	4.2	4.0	3.8	3.6	3.4	3.2	3.1	2.9
54.2	54.2	51.5	48.9	46.4	44.1	41.9	39.8	37.8



## Capital Expenditure

Reserves	1083	
Capex per bbl	5.00	
Total capex	5417	
% before first oil	75%	4063
% first oil to peak	20%	1083
Maintenance capex	5%	271

	First Capex					
	2017	2018	2019	2020	2021	2022
US\$mm		500	750	800	1000	1000
Before first oil	4050					
First oil to peak	1100					
Maintenance	280					
Total	5430					

## Sensitivities

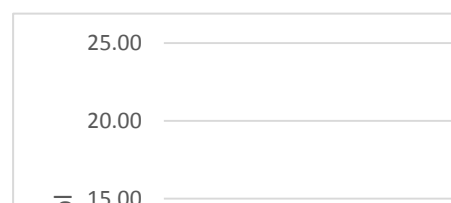
2	0	575	863	920	1150	1150
3	0	650	975	1040	1300	1300
4	0	425	638	680	850	850
5	0	350	525	560	700	700
+15%						
+30%						
-15%						
-30%						

## Field Comparisons

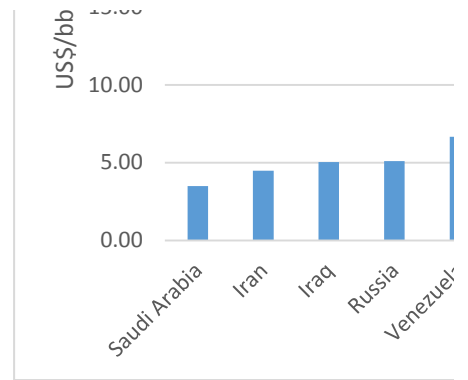
	Cost /bbl	Capex	Reserves	Peak Prod	Peak Prod
	US\$/bbl	US\$mm	mmbbls	kbpd	mmbbls
Kashagan ( Kazakhstan)	10.46	136000	13000	1500	547.5
ACG (Azerbaijan)	4.00	20000	5000	620	226.3
Thunderhorse (Gulf of Mexico)	5.00	5000	1000	250	91.25
Novy Port (Russia onshore)	3.25	4500	1385	161	58.64
Ghawar (Saudi)	3.50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

## 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

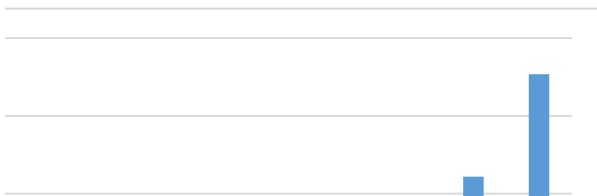
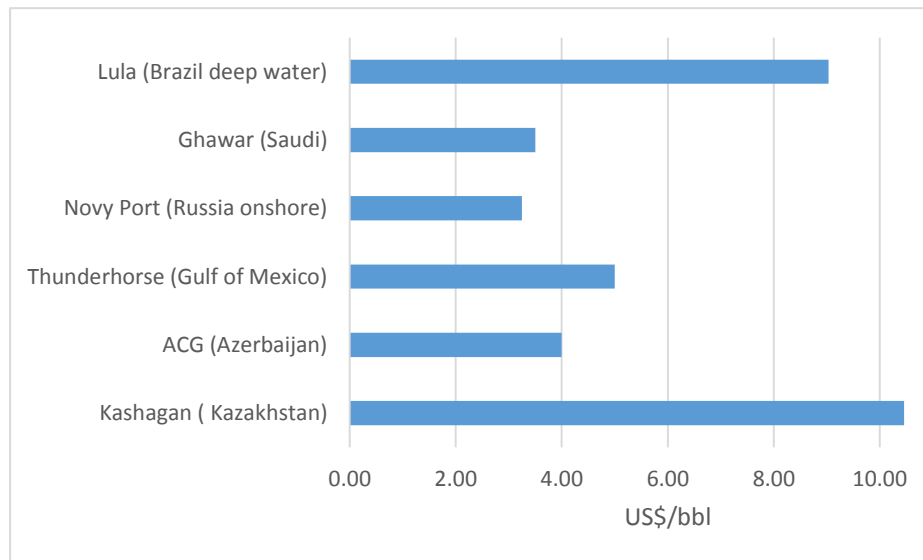


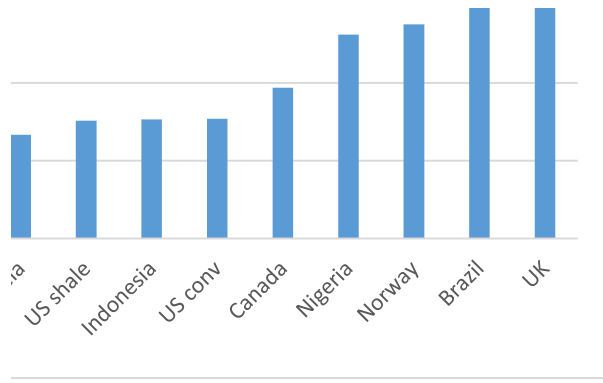
First Oil		Peak Oil						
2023	2024	2025	2026	2027	2028	2029	2030	2031
500	350	150	100	20	20	20	20	20

575	403	173	115	23	23	23	23	23
650	455	195	130	26	26	26	26	26
425	298	128	85	17	17	17	17	17
350	245	105	70	14	14	14	14	14

Capex/  
peak bbl  
US\$/bbl

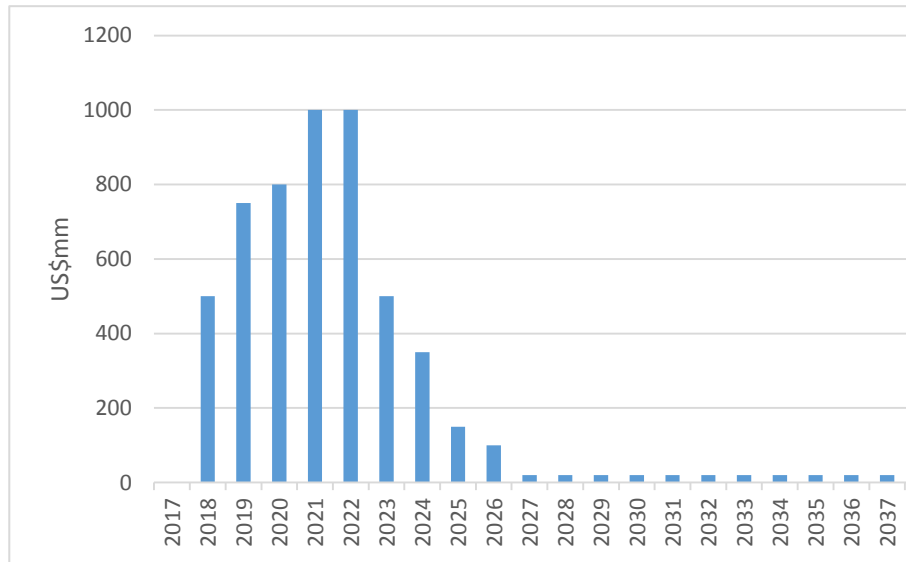
248  
88  
55  
77  
136  
411





2032	2033	2034	2035	2036	2037	2038	2039	2040
20	20	20	20	20	20	20	20	20

23	23	23	23	23	23	23	23	23
26	26	26	26	26	26	26	26	26
17	17	17	17	17	17	17	17	17
14	14	14	14	14	14	14	14	14









## Depreciation

### Straight Line

Total Capex	5417
Years of Production	18
Annual Depreciation (US\$mm)	301

	2017	2018	2019	2020	2021	2022
Depreciation	0	0	0	0	0	0
<i>Production</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>
Total	5417					

### Unit of Production

Total Reserves	1083
Total Produced	798
Total Capex	5417
Depreciation per barrel	6.79

	2017	2018	2019	2020	2021	2022
Depreciation	0	0	0	0	0	0
Total	5417					

<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>
301	301	301	301	301	301	301	301	301
<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>

<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>
74	147	221	294	368	368	368	368	368

<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>
301	301	301	301	301	301	301	301	301
<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>

<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>
368	368	349	332	315	299	285	270	257

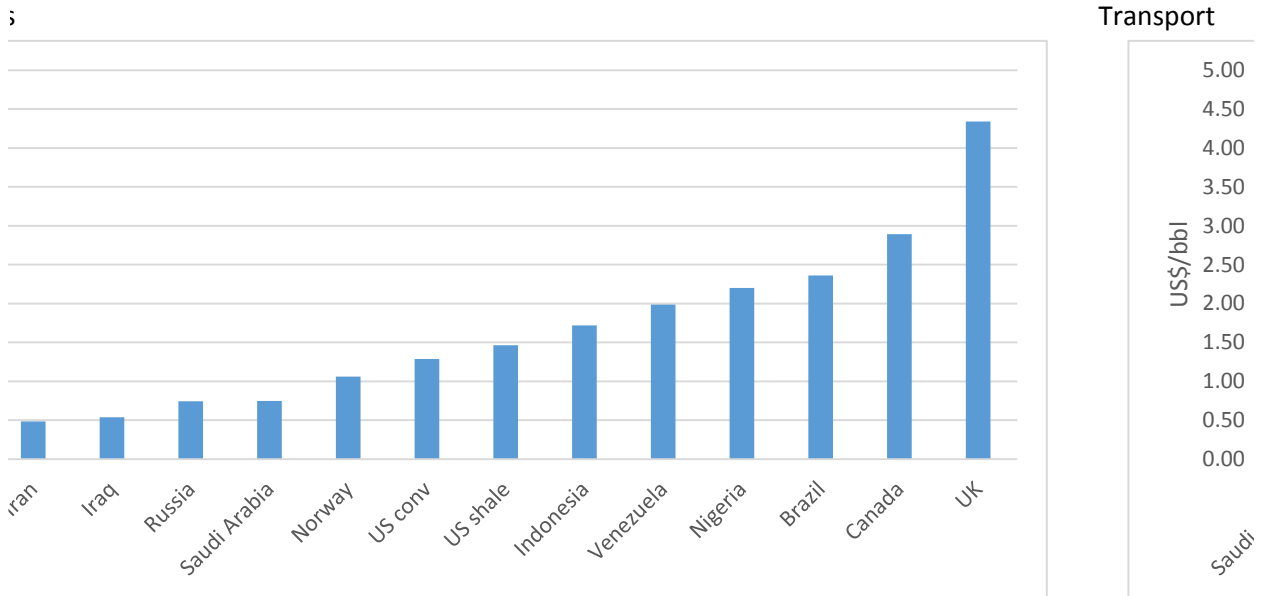


Gas (US\$mm)	0.0	0.0	0.0	0.0	0.0	0.0	2.5
Total (US\$mm)	0.0	0.0	0.0	0.0	0.0	0.0	32.7

**Sensitivities**

1	3.02
2	+15%
3	+30%
4	-15%
5	-30%

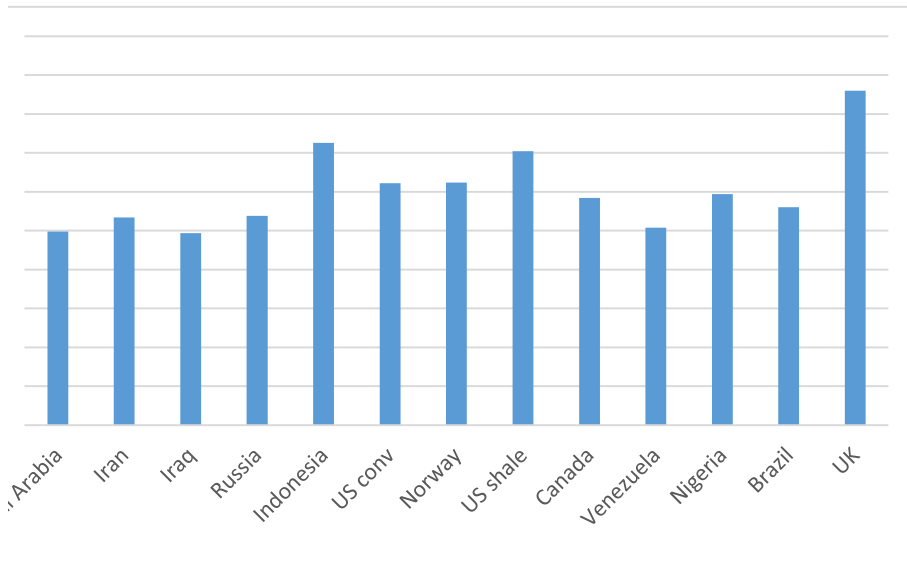
2024	2025	2026	2027	2028	2029	2030	2031
86.7	130.0	173.3	216.7	216.7	216.7	216.7	216.7



2024	2025	2026	2027	2028	2029	2030	2031
60.4	90.5	120.7	150.9	150.9	150.9	150.9	150.9

5.0	7.5	10.1	12.6	12.6	12.6	12.6	12.6
65.4	98.1	130.8	163.5	163.5	163.5	163.5	163.5

2032	2033	2034	2035	2036	2037	2038	2039
216.7	216.7	205.8	195.5	185.8	176.5	167.7	159.3



2032	2033	2034	2035	2036	2037	2038	2039
150.9	150.9	143.3	136.2	129.4	122.9	116.8	110.9



12.6	12.6	11.9	11.3	10.8	10.2	9.7	9.2
163.5	163.5	155.3	147.5	140.1	133.1	126.5	120.2

**2040**  
151.3

**2040**  
105.4

8.8  
114.1

## Operating Taxes

### Oil Tax

Export Tax	Sliding	of export barrels
Royalty	5.0%	of oil revenues
Other taxes	1.0%	of total revenues

Export Oil Price	60	60	60	60	60	60
------------------	----	----	----	----	----	----

	2017	2018	2019	2020	2021	2022
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	30	US\$/bbl
Tax	25%	above cut-off point

Export Tax (\$/bbl)	7.5	7.5	7.5	7.5	7.5	7.5
---------------------	-----	-----	-----	-----	-----	-----

### Gas Tax

Export Tax	30%	export revenues
Royalty	0.5	US\$/mcf

	2017	2018	2019	2020	2021	2022
Export Tax	0	0	0	0	0	0
Royalty	0	0	0	0	0	0
Total	0	0	0	0	0	0

Total Operating Taxes	0	0	0	0	0	0
-----------------------	---	---	---	---	---	---

Total US\$/boe

### 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









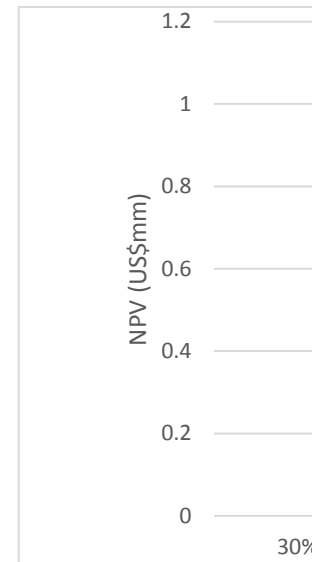
## WACC Calculation

Risk Free Rate	1.75%		
Corporate Interest Rate	4.25%		
Equity market return	10.50%		
Company Beta	1.2		
Corporate Tax Rate	20%		
Debt:Equity Split	Debt 40%	Equity 60%	
Cost of Debt	3.40%		
Cost of Equity	12.25%		
WACC	8.71%		

## Sensitivities

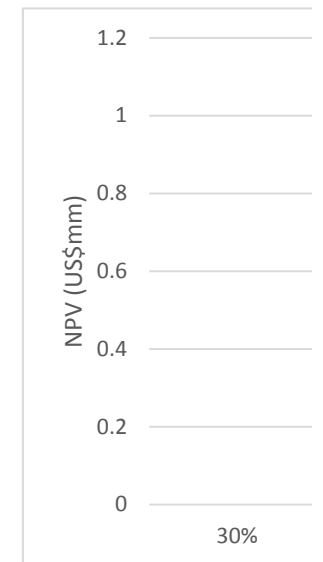
### Oil Price

NPV  
30%  
15%  
0%  
-15%  
-30%



### Production

NPV  
30%  
15%  
0%  
-15%  
-30%



### Capex

NPV  
30%  
15%  
0%  
-15%  
-30%

### Opex

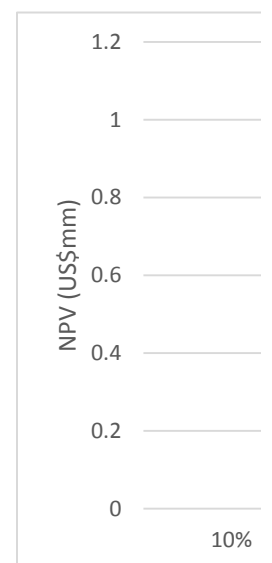
NPV  
30%  
15%  
0%  
-15%  
-30%

### Corporate Tax Rate

NPV  
10%  
15%  
20%  
25%  
30%

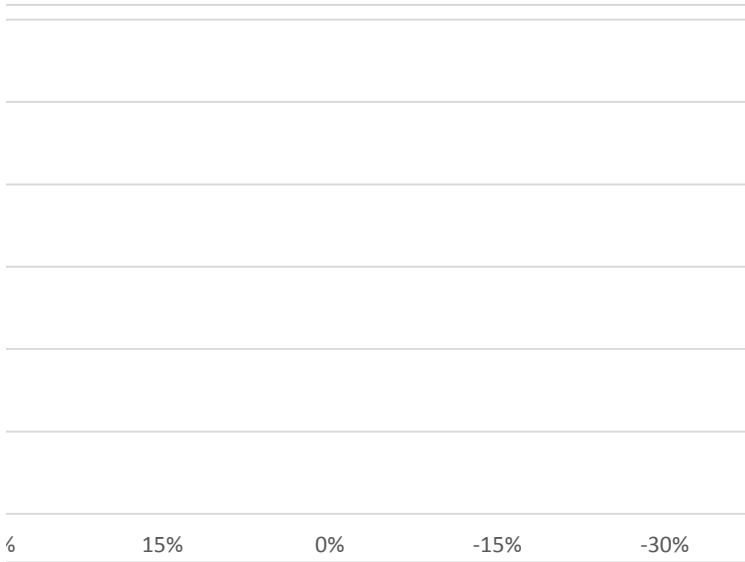
### Discount Rate

NPV  
5.0%  
7.5%  
10.0%  
12.5%  
15.0%

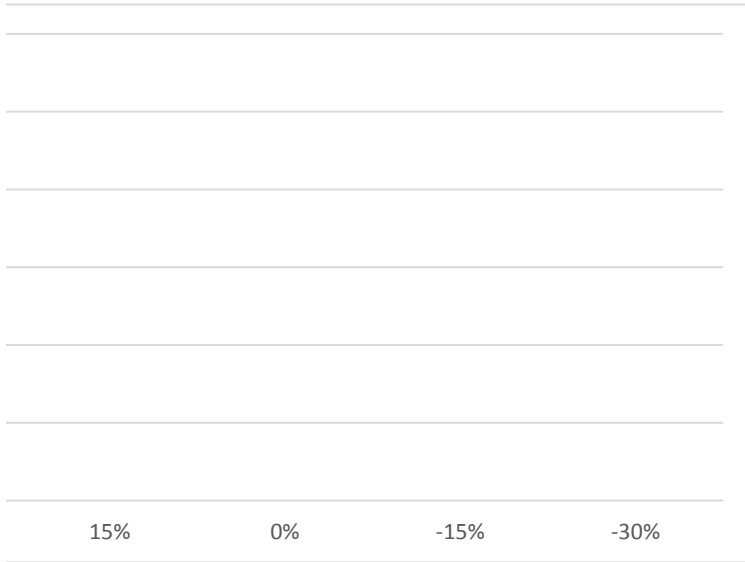


Summary

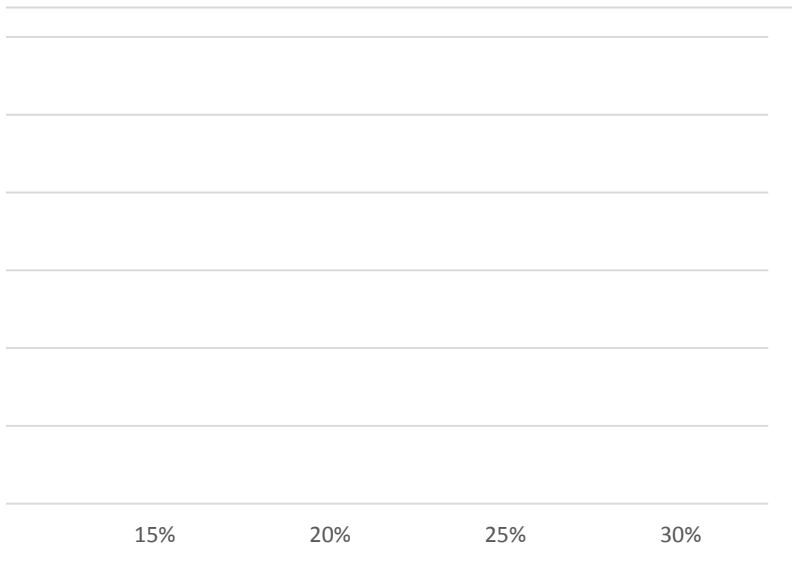
	Oil Price	Production Capex	Opex	Corp Tax	Disc. Rate	
Downside	0	0	0	0	0	0
Low	0	0	0	0	0	0
Base	0	0	0	0	0	0
High	0	0	0	0	0	0
Upside	0	0	0	0	0	0



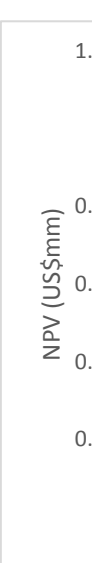
Oil Price

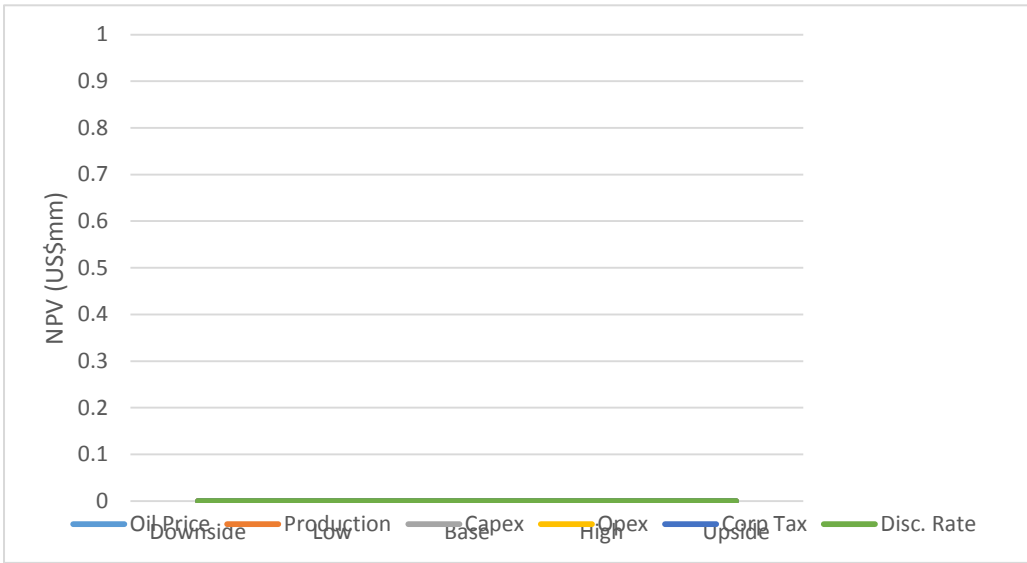


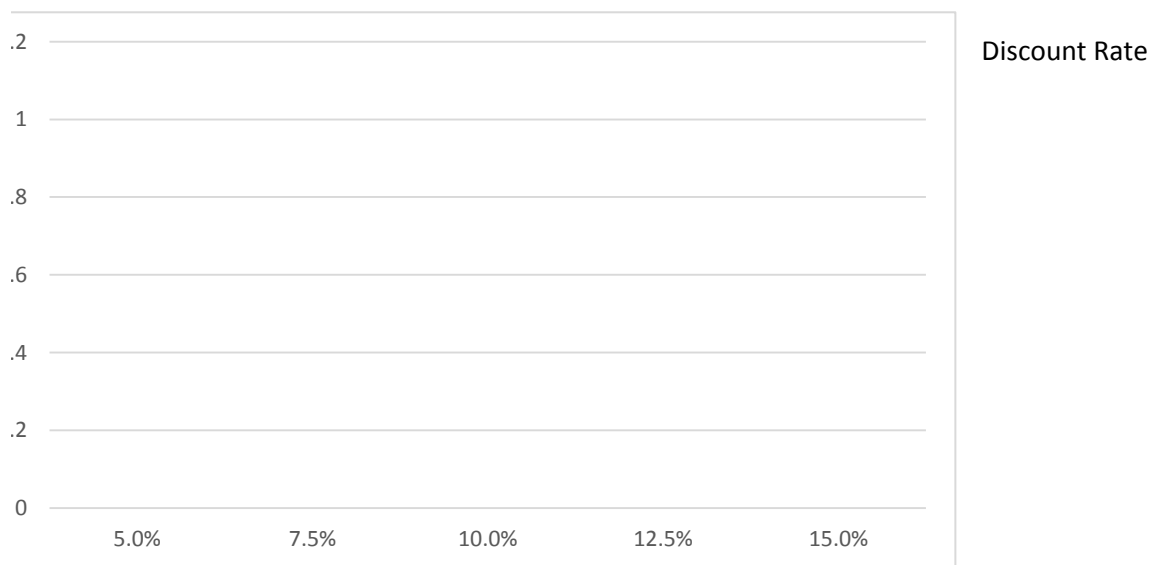
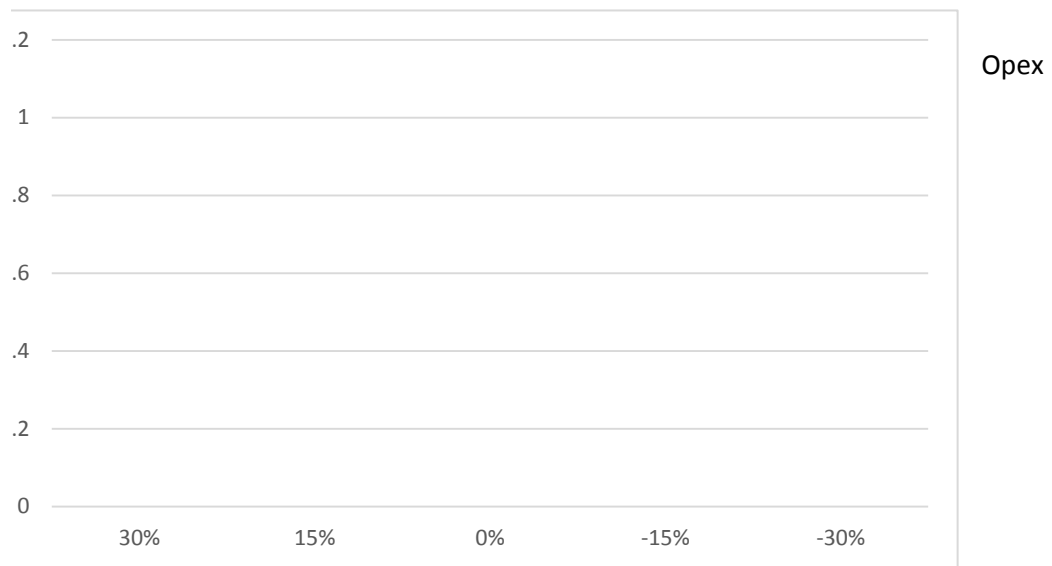
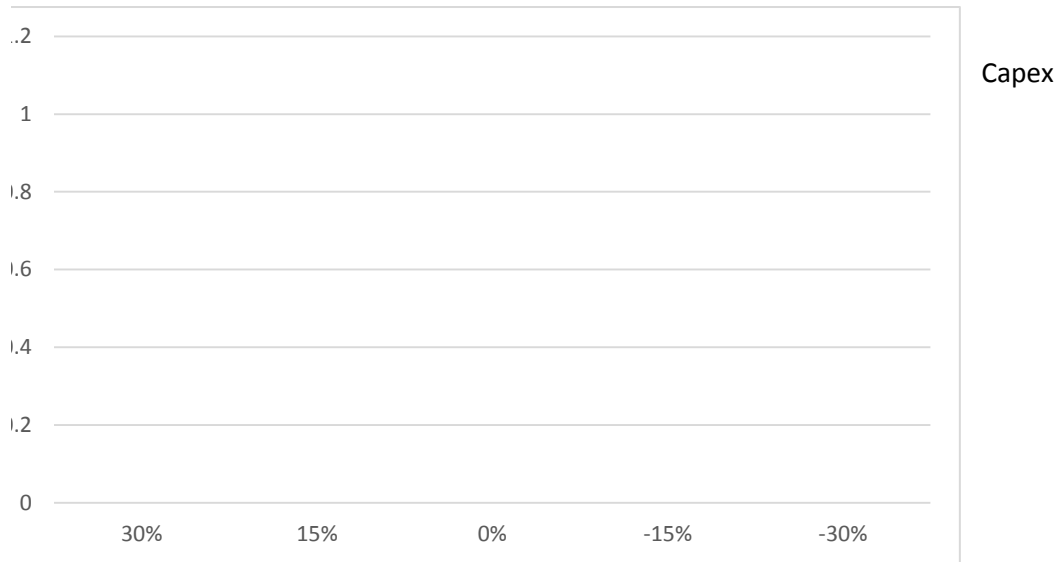
Production



Tax Rate







**PSA Regime**

	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>
Company Revenues	0	0	0	0	0	0	400
Operating Costs	0	0	0	0	0	0	-43
Transport Costs	0	0	0	0	0	0	-33
Operating Taxes	0	0	0	0	0	0	0
EBITDA	0	0	0	0	0	0	324
Depreciation	0	0	0	0	0	0	-74
EBIT	0	0	0	0	0	0	250
Tax on EBIT <i>Corporate Tax Rate</i>	0 20%	0	0	0	0	0	-50
Post tax cashflow	0	0	0	0	0	0	274
CAPEX	0	-500	-750	-800	-1000	-1000	-500
Free Cashflow (FCF)	0	-500	-750	-800	-1000	-1000	-226
Cumulative FCF	0	-500	-1250	-2050	-3050	-4050	-4276
Discount Rate	10%						
Discount Factor	1.10	1.21	1.33	1.46	1.61	1.77	1.95
Discounted Cashflow (DCF)	0	-413	-563	-546	-621	-564	-116
NPV (\$mm)	-106						
IRR (%)	10%						

**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>	<b>2023</b>
Total Revenues	0	0	0	0	0	0	449
Govt Royalty	0	0	0	0	0	0	4
Taxable Revenues	0	0	0	0	0	0	445

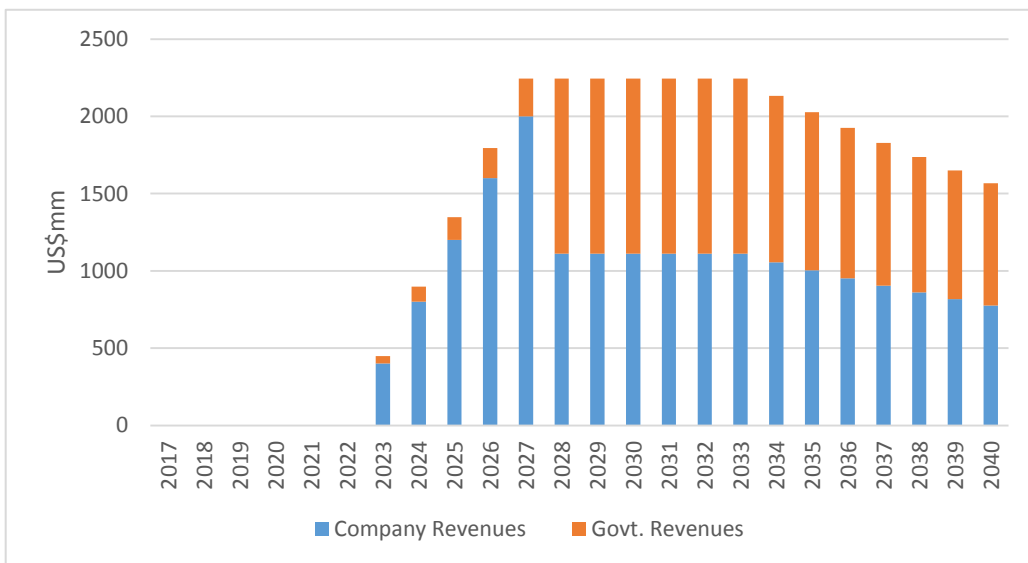
**Cost Oil**

80% of Revenues	0	0	0	0	0	0	356
Accumulated Cost Oil		0	0	0	0	0	356
Annual Costs		-500	-750	-800	-1000	-1000	-576
Accumulated Costs		-500	-1250	-2050	-3050	-4050	-4626
Payback		-500	-1250	-2050	-3050	-4050	-4270
		0	0	0	0	0	0
<b>Cost Oil to Company</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>356</b>
Profit Oil	0	0	0	0	0	0	89
<b>Profit Oil</b>							
Company	0	0	0	0	0	0	44
Govt	0	0	0	0	0	0	44
<b>Total Company Revenues</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>400</b>
	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>
Company Revenues	0	0	0	0	0	0	400
Govt. Revenues	0	0	0	0	0	0	49





711	1067	1422	1778	1778	1778	1778	1778	1778
1067	2134	3556	5334	7112	8890	10668	12446	14224
-502	-378	-404	-400	-400	-400	-400	-400	-400
-5128	-5506	-5910	-6310	-6711	-7111	-7511	-7911	-8311
-4061	-3373	-2354	-976	402	1780	3157	4535	5913
0	0	0	0	1	1	1	1	1
<b>711</b>	<b>1067</b>	<b>1422</b>	<b>1778</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
178	267	356	445	2223	2223	2223	2223	2223
89	133	178	222	1111	1111	1111	1111	1111
89	133	178	222	1111	1111	1111	1111	1111
<b>800</b>	<b>1200</b>	<b>1600</b>	<b>2000</b>	<b>1111</b>	<b>1111</b>	<b>1111</b>	<b>1111</b>	<b>1111</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>	<b>2032</b>
800	1200	1600	2000	1111	1111	1111	1111	1111
98	147	196	245	1134	1134	1134	1134	1134



<b>2033</b>	<b>2034</b>	<b>2035</b>	<b>2036</b>	<b>2037</b>	<b>2038</b>	<b>2039</b>	<b>2040</b>
1111	1056	1003	953	905	860	817	776
-217	-206	-196	-186	-176	-168	-159	-151
-163	-155	-148	-140	-133	-126	-120	-114
0	0	0	0	0	0	0	0
731	695	660	627	596	566	537	511
-368	-349	-332	-315	-299	-285	-270	-257
363	345	328	312	296	281	267	254
-73	-69	-66	-62	-59	-56	-53	-51
658	626	594	565	536	510	484	460
-20	-20	-20	-20	-20	-20	-20	-20
638	606	574	545	516	490	464	440
2770	3375	3950	4494	5010	5500	5964	6404
5.05	5.56	6.12	6.73	7.40	8.14	8.95	9.85
126	109	94	81	70	60	52	45

<b>2033</b>	<b>2034</b>	<b>2035</b>	<b>2036</b>	<b>2037</b>	<b>2038</b>	<b>2039</b>	<b>2040</b>
2245	2133	2026	1925	1829	1737	1650	1568
22	21	20	19	18	17	17	16
2223	2111	2006	1906	1810	1720	1634	1552

1778	1689	1605	1524	1448	1376	1307	1242
16002	17691	19296	20821	22269	23645	24952	26193
-400	-381	-363	-346	-330	-314	-299	-285
-8711	-9092	-9455	-9801	-10131	-10445	-10744	-11030
7291	8599	9841	11019	12138	13200	14207	15164
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>
2223	2111	2006	1906	1810	1720	1634	1552
1111	1056	1003	953	905	860	817	776
1111	1056	1003	953	905	860	817	776
<b>1111</b>	<b>1056</b>	<b>1003</b>	<b>953</b>	<b>905</b>	<b>860</b>	<b>817</b>	<b>776</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>
1111	1056	1003	953	905	860	817	776
1134	1077	1023	972	923	877	833	792

**Exploration Well Analysis**

Chance of Success	20%
Cost of Well	50 US\$mm
NPV of Success	1820
Dry Hole	-40.0
Successful Well	364
EMV	324

## 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
----------	----	-------	-------	-------	-------	-------

### 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