Valuation of a North Sea Oil Assets

Anonymised Operator

List of fields (anonymised field name)

Platform	T-field 1
Subsea Tieback	T-field 2
Subsea Tieback	T-field 3

Location: North Sea Oil Offshore Platform
Field Type: Matured oil fields with associated gas used for gas lift&fuel (no sales gas)
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Updated on Sep 09 2022

Recommendation

Negative NPV after accounting for decommisioning Cost is -£274 million for Economics_Base scenario. If the current owner agrees to bear the future decomm. Cost, then the NPV is £226million. Offer can be made as purchasing price if agreed. There could be unidentified upside in synergy, cost-cutting or improved operational efficiency. Field recovery factor is relatively low (<30%) and can be improved with additional drilling

Introduction

T-field is an old oil platform in the UK North Sea with production start date of Oct 1996. Production primarily from 3 fields with two of the fields connected via subsea tie-back. Initially, production from these fields were supported by water injection system, however, this was discontinued in 2012 due to cost of maintenance, poor performance, high opex per barrel, and gross losses.

Source and Assumption

Production data is downloaded from open-source website provided by UK governmental agency, North Sea Transition Authority NSTA
Production forecast of the base production is based on decline curve analysis, check this link: Forecast.xlsm

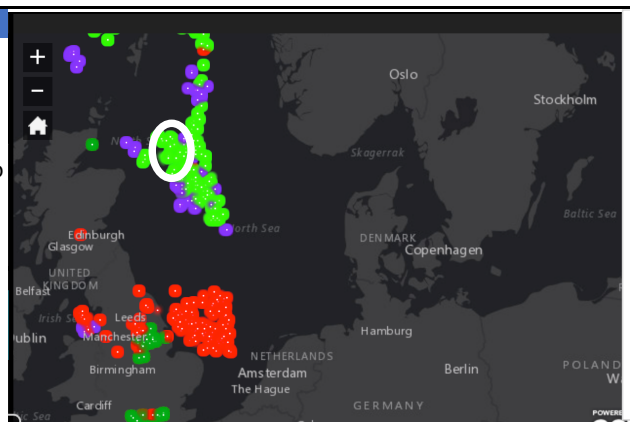
Key input assumptions

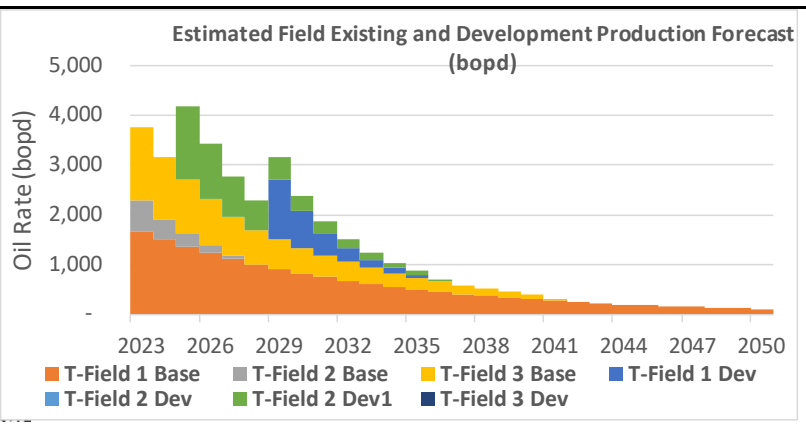
Fx USD/GBP	0.86847	Source: Forbes: Spot rate on Sep 02,2022
PV Total Decomm (milion GBP)	500	Based on rough estimate from peersonal experience and publicly available information such as https://www.nstauthority.co.uk/media/8321/decom_cost-estimate-2022_020822_final_v3.pdf
Tax rate*	15%	Tax rate is based on combination of corporation tax (CT), Petroleum Revenue Tax (PRT) and Suplementary Charges (SC). Tax rate is complicated because most firms have backlog of tax refund. Firms are allowed to deduct investment such as sustainable cost from pre-tax profit as part of government drive to increase investment in the North Sea.
Discount factor	10%	Rough estimate of WACC from a weighted average of cost of debt (from bond yield) and cost of equity (from CAPM) of an anonymised operator in the north sea.

Assumes opex and future development costs are 100% financed with retained earnings and not borrowing.
Assumes decommission would commence when revenue can no longer cover operating cost (when gross profit becomes <0)
PV Total Decomm (mil.) is an important consideration in the valuation of any oil and gas asset because it is a considerable Capex. Used as the final adjustment factor to arrive at Ass

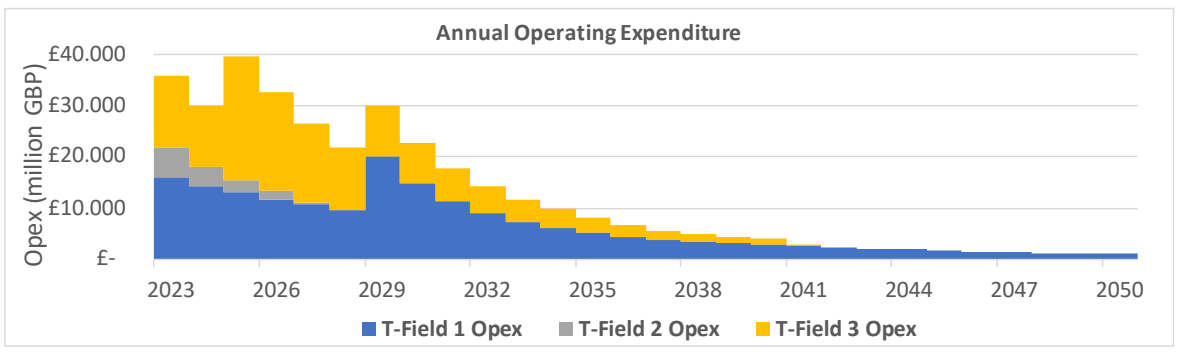
Field Production and Location

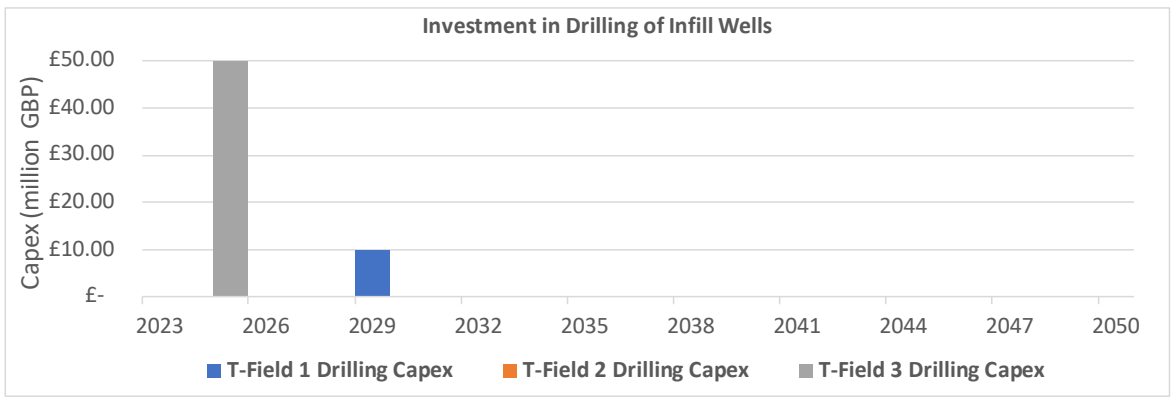
Future production is assumed to be primarily due to natural depletion only. No sales gas because associated produced gas is used for gas lift and fuel.





Economics Analysis (Cost)





Key Metrics		
Opex per barrel	£ 26.05	assumed
Water depth	420 feet	
Block	16/17a	

Note:
opex per barrel is based on a rough estimate.
Avg opex per barrel has been gradually declining over time in the UK but vary across operators

Source: https://oilprice.com/Energy/Energy-General/Operation-Costs-In-Oil-Gas-Are-Falling-Globally-And-This-Country-Is-Leading.html

Drilling Cost Per well

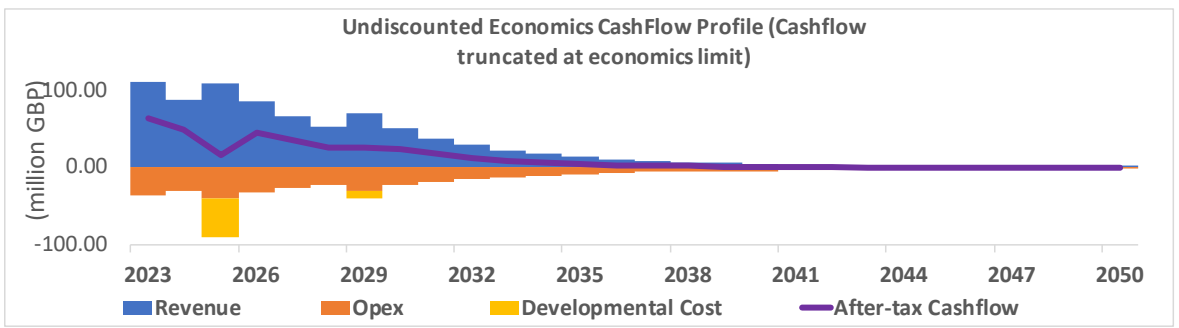
Platform	£ 5.00	million	T-Field 1
Subsea	£ 25.00	million	T-Field 2, T-Field 3

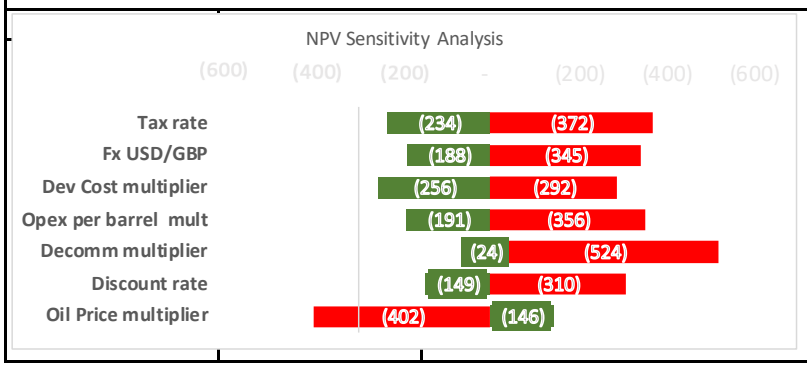
Subsea wells are considerably more expensive to drill compared to platform wells

Assumed future driling campaign

Field	No of wells	Year
T-Field 1(Platform)	2.00	2029
T-Field 3(Subsea)	-	NA
T-Field 3(Subsea)	2.00	2025

Economics Analysis (Cashflow)





million GBP	NPV Sensitivity		Input Range
Oil Price multiplier	(402)	(146)	Low *0.7, High *1.3
Discount rate	(149)	(310)	Low =0%, High =15%
Decomm multiplier	(24)	(524)	Low *0.5, High *1.5
Opex per barrel mult	(191)	(356)	Low *0.5, High *1.5
Dev Cost multiplier	(256)	(292)	Low *0.5, High *1.5
Fx USD/GBP	(188)	(345)	Low =1, High =0.7
Tax rate	(234)	(372)	Low =0%, High =30%

Use drop-down to view summary of different scenarios Economics_Base

Key Indicators Economics_Base	
Economic Limit (Cutoff year)	2043
Remaining Reserve (MMbbl)	12.85

Undiscounted Summary	
Revenue (million)	£806.16
Opex (million)	-£332.76
Gross Profit (million)	£473.41
Developmental Cost (million)	-£60.00
Pre-tax NPV (million)	£413.41
After-tax NPV (million)	£351.40

Undiscounted Summary	
Revenue (million)	£503.41
Opex (million)	-£195.03
Gross Profit (million)	£308.73
Developmental Cost (million)	-£42.70
Pre-tax NPV (million)	£266.04
After-tax NPV (million)	£226.13
PV Decomm Cost (milion)	£500.00
NPV (million)	-£273.87

Economics_Base

Assumed Development Cost

Platform	£ 5.00	million	per well
Subsea	£ 25.00	million	per well

Capital Expendinture Cost Breakdown (million)

	Year	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Platform	**T-Field 1 Drilling Capex**	£ -	£ -	£ -	£ -	£ -	£ -	£ 10.00	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -
Subsea	**T-Field 2 Drilling Capex**	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -
Subsea	**T-Field 3 Drilling Capex**	£ -	£ -	£ 50.00	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -
	Total	-	-	**50.00**	-	-	-	**10.00**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Opex per barrel £ 26.05 per barrel UK North Sea Oil Platfrom Average (2019) https://www.energyvoice.com/oilandgas/north-sea/206442/north-sea-costs-on-the-rise-report-says/

Operating Expendinture Cost Breakdown (million)

Year	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
T-Field 1 Opex	£ 15.902	£ 14.389	£ 13.020	£ 11.781	£ 10.660	£ 9.646	£ 20.154	£ 14.831	£ 11.355	£ 9.022	£ 7.404	£ 6.239	£ 5.289	£ 4.338	£ 3.926	£ 3.553	£ 3.215	£ 2.910	£ 2.633	£ 2.383	£ 2.157	£ 1.952	£ 1.767	£ 1.599	£ 1.447	£ 1.310	£ 1.185	£ 1.073
T-Field 2 Opex	£ 5.897	£ 3.761	£ 2.399	£ 1.531	£ 0.543	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -
T-Field 3 Opex	£ 13.907	£ 11.970	£ 24.280	£ 19.225	£ 15.308	£ 12.258	£ 9.872	£ 7.994	£ 6.508	£ 5.326	£ 4.380	£ 3.619	£ 3.003	£ 2.386	£ 1.707	£ 1.470	£ 1.266	£ 1.090	£ 0.408	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -
Total	**35.71**	**30.12**	**39.70**	**32.54**	**26.51**	**21.90**	**30.03**	**22.82**	**17.86**	**14.35**	**11.78**	**9.86**	**8.29**	**6.72**	**5.63**	**5.02**	**4.48**	**4.00**	**3.04**	**2.38**	**2.16**	**1.95**	**1.77**	**1.60**	**1.45**	**1.31**	**1.19**	**1.07**

Brent Crude Forecast (2023 to 2025 available) USD 93.33 USD 87.42 USD 82.42 USD 79.46 USD 76.50 USD 73.54 USD 70.58 USD 67.63 USD 64.67 USD 61.71 USD 58.75 USD 55.79 USD 52.83 USD 49.88 USD 46.92 USD 43.96 USD 41.00 USD 38.04 USD 35.08 USD 32.13 USD 29.17 USD 26.21 USD 23.25 USD 20.29 USD 17.33 USD 14.38 USD 11.42 USD 8.46

https://sproule.com/price-forecast/ **assumes to drop by about $3 per annum after 2025**

Key assumptions

	Fx USD/GBP (02/08/22)	0.86847
Present value (estimate)	Total Decomm (mil.)	£ 500
	Tax rate*	15%
	Discount factor	10%

https://www.forbes.com/advisor/money-transfer/currency-converter/usd-gbp/

Based on rough estimate from peersonal experience and publicly available information such as https://www.nstauthority.co.uk/media/8321/decom_cost-estimate-2022_020822_final_v3.pdf

Tax rate is based on combination of corporation tax (CT), Petroleum Revenue Tax (PRT) and Suplementary Charges (SC).

Tax rate is complicated because most firms have backlog of tax refund

Firms are allowed to deduct investment such as sustainable cost from pre-tax profit as part of government drive to increase investment in the North Sea.

Rough estimate of WACC from a weighted average of cost of debt (from bond yield) and cost of equity (i.e. CAPM) of a anonymised operator in the north sea.

Assumes opex and future development costs are 100% financed with retained earnings and not debt.

Assumes decommission would commence when revenue can no longer cover operating cost (negative gross profit)

Decommision cost is equally divided between the number of years after cease of operation till 2050

Sensitivity	Low	High
Oil Price multiplier	-30%	30%
Discount rate	0%	15%
Decomm multiplier	-50%	50%
Opex per barrel mult	-50%	50%
Dev Cost multiplier	-50%	50%
Fx USD/GBP	1.04	0.72
Tax Rate	0%	30%

Undiscounted Economics Summary (without Decommision Cost)

	Total (million)	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Revenue	**806.16**	111.08	87.77	109.06	86.18	67.60	53.70	70.64	51.45	38.50	29.51	23.08	18.33	14.60	11.18	8.81	7.36	6.12	5.07	3.56	2.55	2.10	1.71	1.37	1.08	0.84	0.63	0.45	0.30
Opex	**(332.76)**	-35.71	-30.12	-39.70	-32.54	-26.51	-21.90	-30.03	-22.82	-17.86	-14.35	-11.78	-9.86	-8.29	-6.72	-5.63	-5.02	-4.48	-4.00	-3.04	-2.38	-2.16	-1.95	-1.77	-1.60	-1.45	-1.31	-1.19	-1.07
Gross Profit	**473.41**	75.38	57.65	69.36	53.64	41.09	31.79	40.62	28.63	20.64	15.16	11.29	8.47	6.31	4.45	3.18	2.34	1.64	1.07	0.52	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Developmental Cost	**(60.00)**	0.00	0.00	-50.00	0.00	0.00	0.00	-10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pre-tax Profit	**413.41**	75.38	57.65	19.36	53.64	41.09	31.79	30.62	28.63	20.64	15.16	11.29	8.47	6.31	4.45	3.18	2.34	1.64	1.07	0.52	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
After-tax Cashflow	**351.40**	64.07	49.00	16.46	45.59	34.93	27.02	26.02	24.33	17.55	12.89	9.60	7.20	5.36	3.79	2.70	1.99	1.40	0.91	0.44	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Discounted Economics Summary (2022 as base year)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Total (million)	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Revenue **503.41**	100.98	72.53	81.94	58.86	41.98	30.31	36.25	24.00	16.33	11.38	8.09	5.84	4.23	2.94	2.11	1.60	1.21	0.91	0.58	0.38	0.28	0.21	0.15	0.11	0.08	0.05	0.03	0.02
Opex **(195.03)**	-32.46	-24.89	-29.83	-22.22	-16.46	-12.36	-15.41	-10.65	-7.58	-5.53	-4.13	-3.14	-2.40	-1.77	-1.35	-1.09	-0.89	-0.72	-0.50	-0.35	-0.29	-0.24	-0.20	-0.16	-0.13	-0.11	-0.09	-0.07
Gross Profit **308.73**	68.53	47.64	52.11	36.64	25.52	17.95	20.84	13.35	8.75	5.85	3.96	2.70	1.83	1.17	0.76	0.51	0.33	0.19	0.08	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Developmental Cost **(42.70)**	0.00	0.00	-37.57	0.00	0.00	0.00	-5.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pre-tax Cashflow **266.04**	68.53	47.64	14.55	36.64	25.52	17.95	15.71	13.35	8.75	5.85	3.96	2.70	1.83	1.17	0.76	0.51	0.33	0.19	0.08	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
After-tax Cashflow **226.13**	58.25	40.50	12.37	31.14	21.69	15.25	13.35	11.35	7.44	4.97	3.36	2.30	1.55	1.00	0.65	0.43	0.28	0.16	0.07	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PV Decomm Cost **500.00**																												
NPV **(273.87)**																												