

Appendix E – Tension leg platform with drilling facilities

E1 TECHNICAL REPORT

Tesla Date: 09.06.2015 Cost year: 2015 Currency: NOK Region: North Sea South

Topsides

Resume

Project name	Tesla
Location	th Sea South
Development	Stand Alone
Water Depth	115 m (MSL)
Reservoir De	2290 m (MSL)

Platform

Concept	TLP
Number of riser	1
Living quarters	40 beds
Liquid capacity	16000 Sm ³ /d

Cost

Capex facilities	10278 mill.NOK
Capex wells	974 mill.NOK
Opex per year	537 mill.NOK
Lease costs	1905 mill.NOK
Removal and abandonment	0 mill.NOK
Cost Reference Year	2015
Currency	NOK
Currency Factor	6,00 NOK/USD

Topsides Weight Summary (tonnes)

	LQ	WH/riser	Drilling	Utilities	Process	Other	percent	Weights
Equipment	49	85	1555	589	318	247	24,07	2844
Electrical	15	18	105	127	26	0	2,46	290
HVAC	17	9	29	32	0	0	0,74	87
Instrument/telecom	8	45	56	53	55	0	1,84	217
Piping	6	155	288	184	249	13	7,56	893
Surface protection, fire proof	6	18	66	24	12	0	1,06	125
Safety and loss prevention	6	45	31	21	23	0	1,06	126
Architectural	210	18	144	116	12	0	4,22	499
Structural steel/aluminium	524	501	2675	1221	464	1351	57,00	6736
Total dry weight	840	893	4949	2367	1158	1610	100,00	11817
Variable loads	21	134	4493	237	232	81	43,98	5197
Operating weight (ex riser)	861	1027	9441	2604	1390	1691	143,98	17014

TECHNICAL REPORT

Tesla Date: 09.06.2015 Cost year: 2015 Currency: NOK Region: North Sea South

Topside – Stand Alone

	Procurement			Fabrication/installation				Total	
	Weight	kUSD/t	mill.USD	mhr/t	mhr	USD/mhr	mill.USD	kUSD/t	mill.USD
Equipment	2844	87,17	248	13	36509	103	4	88	252
Electrical	290	54,33	16	289	83875	103	9	84	24
HVAC	87	43,47	4	193	16802	103	2	63	6
Instrument/tel	217	114,10	25	289	62651	103	6	144	31
Piping	893	65,20	58	225	200712	103	21	88	79
Surface protec	125	32,60	4	1027	128568	103	13	138	17
Safety and loss	126	32,60	4	193	24174	103	2	52	7
Architectural	499	32,60	16	77	38434	103	4	41	20
Structural alun	0	6,52	0	183	0	103	0	0	0
Structural stee	6736	4,89	33	64	432372	103	44	11	77
Total	11817	-	408		1024097		105	43	513
Hook-up (offsi	11817	-	-	3	35452	265	9	1	9
Commissionin	11817	-	-	5	59087	200	12	1	12
Commissionin	11817	-	-	5	59087	265	16	1	16
Engineering	11817	-	-	130	1536259	216	332	28	332
Total	11817	-	408	0,00	2713982	0,00	474	75	882

Marine Operations

	mob/demob	operation	duration	Day-rate	mill.USD
Transportation/logistics	5	59	74	0,13	9
Total topsides installed					891
Living quarters material	Steel			0 tonnes of aluminium	

TECHNICAL REPORT

Tesla Date: 09.06.2015 Cost year: 2015 Currency: NOK Region: North Sea South

Substructure

Platform selected: TLP 2

ENG

Design parameters

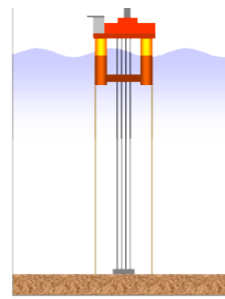
Water depth	Tesla
Operating topside weight	115 m
Dry topside weight	17014 tonnes
Oil storage volume	11817 tonnes
Loads from flexible risers, umbilicals and cables	0 m ³
	0 tonnes

2

Tension Leg Platform

Maximum op	17707 tonnes
Number of w	7 0
Operating dr	29 m
Air gap	27 m

Column dian	20 m	
Number of tr	16	0
Displacemen	51318 tonnes	
Hull dry weig	14152 tonnes	
Tether weigr	768 tonnes	
Anchor piles	897 tonnes	
Weight of all	118 tonnes	
0	0	0
0	0	0
0	0	0



TECHNICAL REPORT TLP with drilling facilities

Tesla

Parameters and indicators

Summary of weights (steel and metals)	tonnes
Topside weight	11817
Substructure weight	14152
Conductors	0
Tensioned well risers	118
Piles or anchors	897
Mooring lines	768
Subsea equipment and structures	0
Other subsea structures	0
Flowlines	0
Flowline risers and J-tubes	0
Umbilicals and cables	0
Export pipelines	0
Wells	7709
Total weight	35462

Summary of marine operations - vessel days	days
Platform construction and installation	121
Mooring system installation	111
Subsea templates	0
Other subsea equipment	0
Flowlines/pipelines (S-lay and J-lay)	0
Flowlines/pipelines (Reel-lay)	0
Umbilicals and cables	0
Risers	0
Gravel dumping	0
Trenching	0
Surveys	0
Total number of vessel days	233

Summary of costs	mill.USD	mill.NOK
Platform	1713	10278
Subsea production	0	0
Export pipelines	0	0
Wells	162	974
Total costs	1875	11252

Average cost per tonne of steel	
USD/tonne	52882
NOK/tonne	317289

Use of steel and metals	tonnes	kg/boe
All facilities	27753	0,552
Wells	7709	0,153
Total	35462	0,705

Fuel consumption (tonnes) - project execution	
Drilling rig	1976
Drilling services	2344
Platform installation	1978
Subsea equipment installation	0
Pipelines, umbilicals, cables, risers	0
Gravel dumping, trenching, surveys	0
Total for project execution	6298

Fuel consumption (tonnes) - production phase	
Production operations per year	19401
Production operations services per year	4866
Well maintenance operations per year	96

E2 COST REPORT

Date: 09.06.2015



Resume

Project name	Tesla
Location	North Sea South
Development Concept	Stand Alone
Water Depth	115 m (MSL)
Reservoir Depth	2290 m (MSL)

Wells	Number
Producers	4
Water Injectors	2
Gas Injectors	0
Total	6

Platform

Concept	TLP
Number of inlet systems	1
Living quarters capacity	40 beds
Liquid capacity	16000 Sm ³ /d

Cost

Capex facilities	10278 mill.NOK
Capex wells	974 mill.NOK
Opex per year	537 mill.NOK
Lease costs	1905 mill.NOK
Removal and abandonment	0 mill.NOK
Cost Reference Year	2015
Currency	NOK
Currency Factor	6,00 NOK/USD

Price and tariff

Oil price	71,76 USD/bbl
Oil tariff	1,79 USD/bbl
Gas price	0,00 NOK/scm
Gas tariff	0,00 NOK/scm

COST REPORT

Tesla

Cost year: 2015

Currency: NOK

Region: North Sea South

Capex Facilities Overview

mill.NOK

Cost element	Engineering	Procurement	Construction	SUM EPC	Marine op	SUM EPCI	Management	Base estimate	Contingency	Total
Topsides	1993	2447	852	5293	56	5348	749	6097	915	7011
Substructure ii	358	894	395	1647	423	2070	290	2360	354	2714
Piles, anchors	0	132	0	132	289	421	59	480	72	552
Sum Platform	2351	3472	1248	7071	768	7840	1098	8937	1341	10278
Subsea produc	0	0	0	0	0	0	0	0	0	0
Flowlines	0	0	0	0	0	0	0	0	0	0
Flowline/pipel	0	0	0	0	0	0	0	0	0	0
Umbilicals/rise	0	0	0	0	0	0	0	0	0	0
Riser bases, Pl	0	0	0	0	0	0	0	0	0	0
Sum Subsea	0	0	0	0	0	0	0	0	0	0
Export pipelin	0	0	0	0	0	0	0	0	0	0
Power cables/r	0	0	0	0	0	0	0	0	0	0
SUM Facilities	2351	3472	1248	7071	768	7840	1098	8937	1341	10278

Capex Wells Overview

	days per well	days	mill.NOK
Drilling	38	227	737
Completion	11	63	237
Sum Drilling and completion	48	291	974

COST REPORT

Tesla

Cost year: 2015

Currency: NOK

Region: North Sea South

Removal Cost Overview

mill.NOK

	Engineering	Decommissioning	Removal operations	Dismantling	Sub-total	Management	Base estimate	Contingency	TOTAL
Well plugging and abandonm	18	0	427	0	445	45	490	73	563
Platform topsides	38	94	0	170	302	30	333	50	383
Platform substructure	37	22	39	68	166	17	183	27	210
Mooring lines, piles, anchors	1	5	60	2	68	7	75	11	86
Risers, conductors	0	0	19	0	21	2	23	3	26
Flowlines, umbilicals and cab	0	0	0	0	0	0	0	0	0
Export pipelines	0	0	0	0	0	0	0	0	0
Subsea equipment and struct	0	0	0	0	0	0	0	0	0
Sea bottom clean-up	1	0	25	0	26	3	29	4	33
TOTAL	96	122	570	241	1029	103	1132	170	1301

COST REPORT

Tesla

Cost year: 2015

Currency: NOK

Region: North Sea South

Cost Phasing Assumptions

Capex Facilities

Number of months from project sanction to production start-up:	40	mill.NOK
Expenditure in year	1	2148
Expenditure in year	2	4639
Expenditure in year	3	3269
Expenditure in year	4	222
Total expenditure		10278

Capex Wells

Number of months for drilling and completion	10	mill.NOK
Expenditure in year	1	0
Expenditure in year	2	0
Expenditure in year	3	974
Expenditure in year	4	0
Expenditure in year	5	0
Expenditure in year	6	0
Expenditure in year	7	0
Expenditure in year	8	0
Expenditure in year	9	0
Total expenditure	0	974

COST REPORT

Tesla

Cost year: 2015

Currency: NOK

Region: North Sea South

Drilling and Completions Costs

Time for drilling	227 days	8 months
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Time for completion	63 days	2 months
Total time for drilling and completion	291 days	10 months
Drilling cost	114 mill.USD	686 mill.NOK
Completion cost	37 mill.USD	220 mill.NOK
Planning and other costs	11 mill.USD	68 mill.NOK
Total cost for drilling and completion	162 mill.USD	974 mill.NOK
Total number of wells	6	
Average well cost	27 mill.USD	162 mill.NOK
Drilling expenditure per month	17 mill.USD	101 mill.NOK
Total steel weight of all wells	7709 tonnes	
Average steel weight per well	1285 tonnes	
Diesel consumption of MODU	5811 tonnes	20 tonnes/d
Fuel gas consumption of platform rig	2905 tonnes	10 tonnes/d

Rates	Basis K USD/day	Index	Cost K USD/day
Platform drilling	59	1,11	66
Platform light intervention	24	1,11	27
MODU drilling – semisub	525	1,11	584
MODU drilling – jack-up	350	1,11	390
Service rate for drilling	400	1,09	437
Service rate for completion	440	1,09	481
Service rate for plugging and abandonment	260	1,09	284

OPEX REPORT

Tesla Cost year: 2015 Currency: NOK Region: North Sea South

Basis for cost phasing – OPEX				mill.NOK
Preparation for operation – last year before production start				360
First period; start-up	Duration – years	1		720
Second period; drilling and production	Duration – years	2		525
Third period; production, maintenance and modification	Duration – years	8		544
Fourth period; preparation for abandonment	Duration – years	2		-31
Total	Duration – years	13		4296

Opex Overview	mill. USD	mill.NOK
	OPEX per year	OPEX per year
Offshore personnel	28	166
Catering	2	11
Production materials, chemicals and diesel	2	11
Communication	0	1
Maintenance materials/spare parts	3	16
Onshore base, purchase and contracts	1	7
Supply vessels	8	46
Stand-by vessels	16	97
Helicopter transportation	3	20
Well maintenance and well monitoring – platform wells	1	5
Well maintenance and well monitoring – subsea wells	0	0
Subsea inspection and maintenance	0	0
Stand-by maintenance of drilling package	3	16
Onshore organization, administration/support	4	23
Onshore organization, subsurface and licence adm	1	4
SUBTOTAL 1	70	422
Modifications/optimization/upgrading	1	8
Reservoir area fee	0	0
Contingency	7	42
SUBTOTAL 2	79	472
Insurance	5	33
CO2 tax	5	32
TOTAL OPEX	89	537
"Day-rate" (USD/day)	245195	1471167
Contingency (percent)	10	10

E3 NPV REPORT

Tesla Cost year: 2015 Currency: NOK Date: 09.06.2015 Region: North Sea South

Recoverable Volumes – metric units	
Recoverable volume of oil	8,00 mill.scm
Recoverable volume of gas	0,00 bill.scm
Daily Production – metric units	
Oil	8219 scm/d
Gas	0,00 mill scm/d

Case Description	
Concept	TLP
Water depth	115 metres
Reservoir depth	2290 metres
Number of producers	4 P
Number of water injectors	2 WI
Number of gas injectors	0 GI
Gas/oil – ratio	0 scm/scm
Field life (production)	8 scm/scm
Plateau length oil	1,0 years
Plateau length gas	1,0 years
Average number of streamdays	340,0 years

NPV Report TLP with drilling facilities

Recoverable Volumes – oil field units	
Recoverable volume of oil	50,3 mill.bbl
Recoverable volume of gas	0,0 bill.scft
Daily Production – oil field units	
Oil	51693 bpd
Gas	0 mill scft/d

Basis for NPV calculations

Capex facilities	10278 mill.NOK
Capex wells	974 mill.NOK
Opex	537 4296 mill.NOK
Lease costs	1905 mill.NOK
Removal and abandonment	0 mill.NOK
Cost reference year	2015
Currency (NOK/USD)	6 NOK/USD
Discount rate	10,00 percent

Price and Tariff

Oil price	71,76 USD/bbl
Gas price	0,00 NOK/scm
Oil tariff	1,79 USD/bbl
Gas tariff	0,00 NOK/scm

NPV Report TLP with drilling facilities
Economic Indicators (pre-tax)

NPV	NPV	IRR	PI	Capex	Opex	Tariffs	TUC	TUC
mill.NOK	mill.USD	percent	-	USD/boe	USD/boe	USD/boe	USD/boe	NOK/scm
5	1	10,02	0,00	37,27	20,54	1,79	71,73	2707

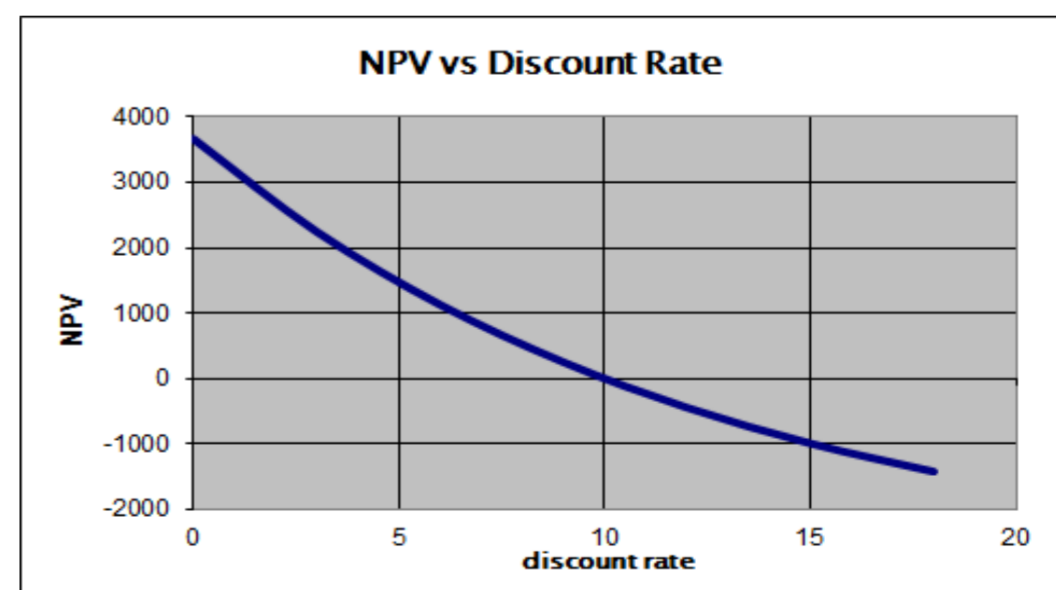
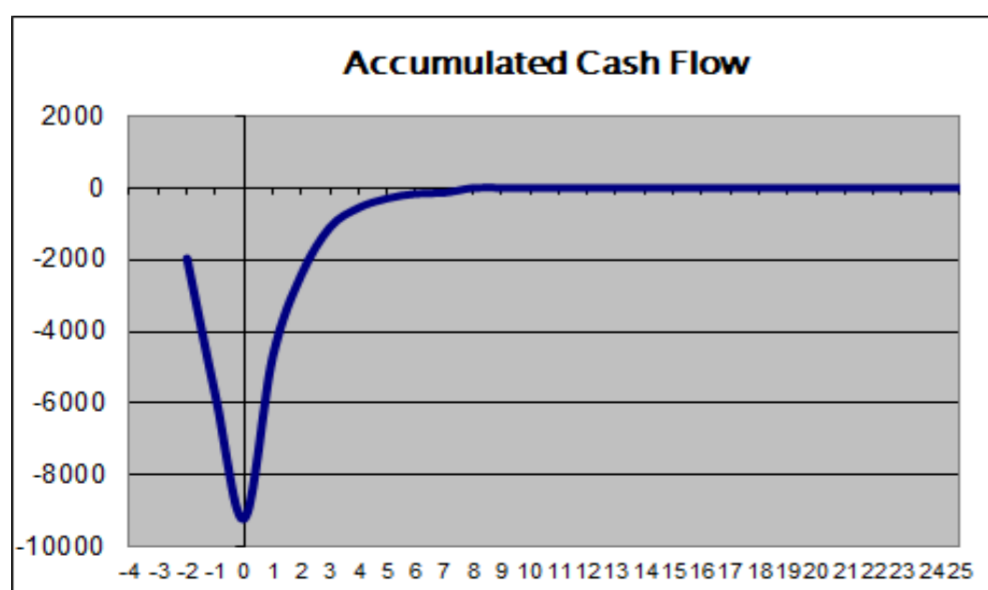
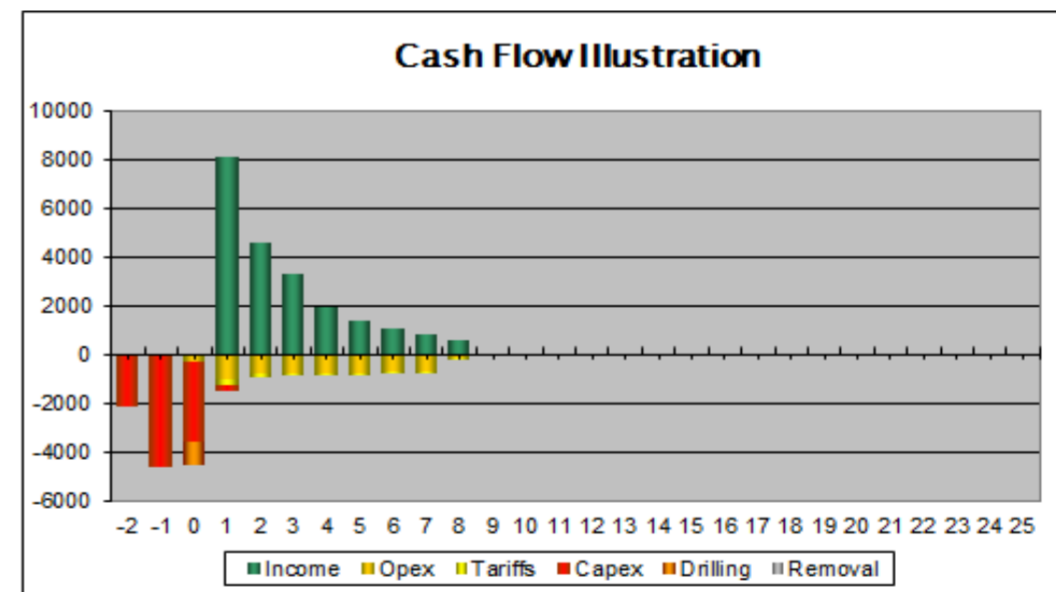
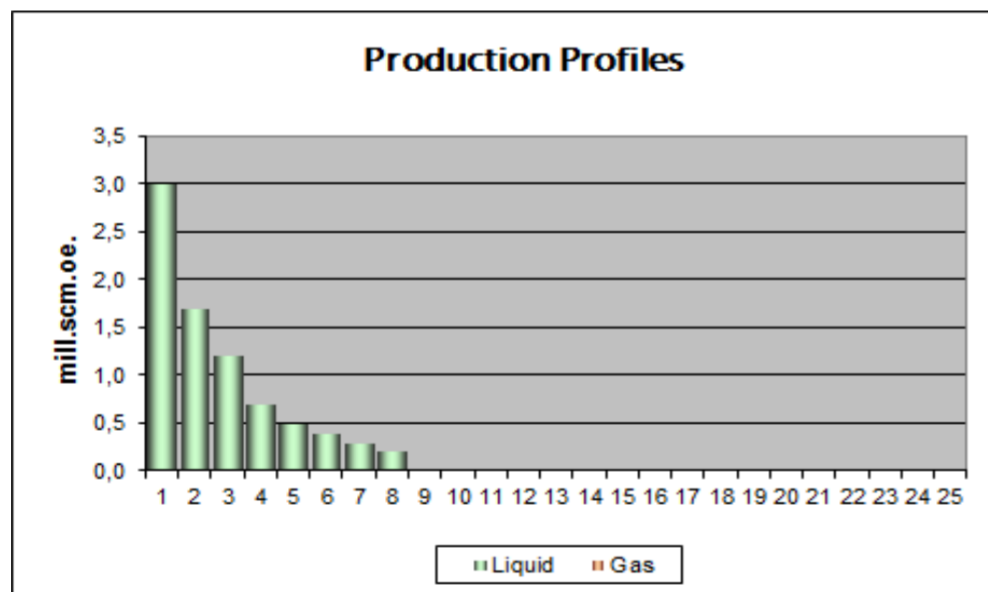
NPV REPORT

Tesla Cost year: 2015 Currency: NOK Region: North Sea South

Year	mill.scm Oil prod	bill.scm Gas prod	mill.NOK Oil inc	mill.NOK Gas inc	mill.NOK Income	mill.NOK Oil tariff	mill.NOK Gas tariff	mill.NOK Opex	mill.NOK Lease	mill.NOK Capex(f)	mill.NOK Capex(w)	mill.NOK Removal	mill.NOK Net CF
1	0	0	0	0	0	0	0	0	0	2148	0	0	-2148
2	0	0	0	0	0	0	0	0	0	4639	0	0	-4639
3	0	0	0	0	0	0	0	347	0	3269	974	0	-4590
4	3,00	0,00	8124	0	8124	203	0	752	305	222	0	0	6643
5	1,70	0,00	4603	0	4603	115	0	539	286	0	0	0	3664
6	1,20	0,00	3250	0	3250	81	0	548	267	0	0	0	2354
7	0,70	0,00	1896	0	1896	47	0	538	248	0	0	0	1062
8	0,50	0,00	1354	0	1354	34	0	534	229	0	0	0	557
9	0,40	0,00	1083	0	1083	27	0	532	210	0	0	0	314
10	0,30	0,00	812	0	812	20	0	531	191	0	0	0	71
11	0,20	0,00	542	0	542	14	0	-26	172	0	0	0	382
12	0,00	0,00	0	0	0	0	0	0	0	0	0	0	0
13	0,00	0,00	0	0	0	0	0	0	0	0	0	0	0
14	0,00	0,00	0	0	0	0	0	0	0	0	0	0	0
15	0,00	0,00	0	0	0	0	0	0	0	0	0	0	0
16	0,00	0,00	0	0	0	0	0	0	0	0	0	0	0
17	0,00	0,00	0	0	0	0	0	0	0	0	0	0	0
18	0,00	0,00	0	0	0	0	0	0	0	0	0	0	0
19	0,00	0,00	0	0	0	0	0	0	0	0	0	0	0
20	0,00	0,00	0	0	0	0	0	0	0	0	0	0	0
21	0,00	0,00	0	0	0	0	0	0	0	0	0	0	0
22	0,00	0,00	0	0	0	0	0	0	0	0	0	0	0
23	0,00	0,00	0	0	0	0	0	0	0	0	0	0	0
24	0,00	0,00	0	0	0	0	0	0	0	0	0	0	0
25	0,00	0,00	0	0	0	0	0	0	0	0	0	0	0
26	0,00	0,00	0	0	0	0	0	0	0	0	0	0	0
27	0,00	0,00	0	0	0	0	0	0	0	0	0	0	0
28	0,00	0,00	0	0	0	0	0	0	0	0	0	0	0
29	0,00	0,00	0	0	0	0	0	0	0	0	0	0	0
30	0,00	0,00	0	0	0	0	0	0	0	0	0	0	0
31	0,00	0,00	0	0	0	0	0	0	0	0	0	0	0
32	0,00	0,00	0	0	0	0	0	0	0	0	0	0	0
33	0,00	0,00	0	0	0	0	0	0	0	0	0	0	0
34	0,00	0,00	0	0	0	0	0	0	0	0	0	0	0
35	0,00	0,00	0	0	0	0	0	0	0	0	0	0	0
SUM	8,00	0,00	21663	0	21663	540	0	4296	1905	10278	974	0	3670
NPV	4,73	0,00	12808	0	12808	319	0	2365	992	8394	732	0	5
NPV	5,20	0,00	14089	0	14089	351	0	2602	1092	7085	805	0	2154

NPV REPORT

Tesla Cost year: 2015 Currency: NOK Region: North Sea South



NPV REPORT

Tesla Cost year: 2015 Currency: NOK Region: North Sea South

Lease rate for production and storage units		
Capital cost of leased unit:		1996 mill.NOK
Contractor's interest rate (base unit)		8 percent
Contractor's interest rate (special equipment)		10 percent
Contract duration (equal field life)		8 years
Lease rate first year		139091 USD/day
Lease rate base unit		69742 USD/day
Sum of lease costs		1905 mill.NOK
NPV of lease costs		992 mill.NOK
NPV of lease costs; year 3 ref		1321 mill.NOK
Capital cost of equipment to be leased:		1996 mill.NOK
Capital cost of base unit		1500 mill.NOK
Capital cost of special equipment		496 mill.NOK
Economical life of base unit		20 years
Contract duration (special equipment)		8 years
Interest rate for base unit		8,0 percent
Interest rate for special equipment		10,0 percent
Lease rate for base unit	152,7 mill.NOK	69742 USD/d
Lease rate for special equipment	93,1 mill.NOK	42489 USD/d
Leased Storage Tanker included?		Yes
Leased Production Unit included?		Yes

Leasing of Storage Tanker or Production Unit	percent	mill.NOK
Production unit – base unit	26,4	2714
Production unit – special equipment	73,6	7563
Storage tanker – base unit	75,1	1500
Storage tanker – special equipment	24,9	496