

# Appendix D – Semi-submersible platform

## D1 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	Semi-Submersible
Number of riser	1
Living quarters	40 beds
Liquid capacity	16000 Sm <sup>3</sup> /d

#### Cost

Capex facilities	7896 mill.NOK
Capex wells	2085 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	44	0	440	316	247	19,25	1095
Electrical	15	18	0	94	25	0	2,67	152
HVAC	17	9	0	27	0	0	0,93	53
Instrument/telecom	8	44	0	42	55	0	2,61	148
Piping	6	176	0	145	247	13	10,31	586
Surface protection, fire proof	6	18	0	18	11	0	0,93	53
Safety and loss prevention	6	44	0	15	23	0	1,55	88
Architectural	210	18	0	88	11	0	5,75	327
Structural steel/aluminium	524	510	0	944	460	748	56,00	3185
<b>Total dry weight</b>	<b>840</b>	<b>879</b>	<b>0</b>	<b>1812</b>	<b>1149</b>	<b>1007</b>	<b>100,00</b>	<b>5687</b>
Variable loads	21	132	0	181	230	50	10,80	614
<b>Operating weight (ex riser)</b>	<b>861</b>	<b>1011</b>	<b>0</b>	<b>1993</b>	<b>1379</b>	<b>1058</b>	<b>110,80</b>	<b>6302</b>

## 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	1095	96,28	105	13	14058	103	1	98	107
Electrical	152	54,33	8	289	43896	103	5	84	13
HVAC	53	43,47	2	193	10133	103	1	63	3
Instrument/tel	148	114,10	17	289	42815	103	4	144	21
Piping	586	65,20	38	225	131704	103	14	88	52
Surface protec	53	32,60	2	1027	54602	103	6	138	7
Safety and loss	88	32,60	3	193	16982	103	2	52	5
Architectural	327	32,60	11	77	25190	103	3	41	13
Structural alun	0	6,52	0	183	0	103	0	0	0
Structural stee	3185	4,89	16	64	204441	103	21	11	37
<b>Total</b>	<b>5687</b>	<b>-</b>	<b>202</b>		<b>543821</b>		<b>56</b>	<b>45</b>	<b>258</b>
Hook-up (offsi	5687	-	-	3	17062	265	5	1	5
Commissionin	5687	-	-	5	28437	200	6	1	6
Commissionin	5687	-	-	5	28437	265	8	1	8
Engineering	5687	-	-	130	739368	216	160	28	160
<b>Total</b>	<b>5687</b>	<b>-</b>	<b>202</b>	<b>0,00</b>	<b>1357126</b>	<b>0,00</b>	<b>233</b>	<b>77</b>	<b>435</b>

### Marine Operations

	mob/demob	operation	duration	Day-rate	mill.USD
Transportation/logistics	5	28	38	0,13	5
Total topsides installed					440
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: Semi-Submersible

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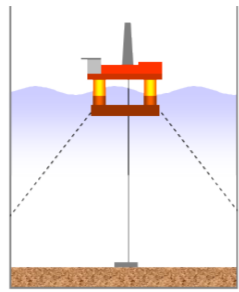
Design parameters	Tesla
Water depth	115 m
Operating topside weight	6302 tonnes
Dry topside weight	5687 tonnes
Oil storage volume	0 m <sup>3</sup>
Loads from flexible risers, umbilicals and cables	64 tonnes

3

### Semisubmersible platform

Maximum op	6444 tonnes
Number of riser	6 0
Operating draught	19 m
Air gap	20 m

Column dim	10 m		
Displacement	20574 tonnes		
Hull dry weight	5024 tonnes		
Number of risers	16	0	
Mooring line	1991 tonnes		
Anchor weight	653 tonnes		
	0	0	0
	0	0	0
	0	0	0
	0	0	0



## TECHNICAL REPORT Semi-submersible

Tesla

### Parameters and indicators

Summary of weights (steel and metals)	tonnes
Topside weight	5687
Substructure weight	5024
Conductors	0
Tensioned well risers	0
Piles or anchors	653
Mooring lines	1991
Subsea equipment and structures	1329
Other subsea structures	181
Flowlines	198
Flowline risers and J-tubes	58
Umbilicals and cables	97
Export pipelines	0
Wells	7589
<b>Total weight</b>	<b>22807</b>

Summary of marine operations - vessel days	days
Platform construction and installation	119
Mooring system installation	21
Subsea templates	17
Other subsea equipment	92
Flowlines/pipelines (S-lay and J-lay)	0
Flowlines/pipelines (Reel-lay)	18
Umbilicals and cables	31
Risers	17
Gravel dumping	5
Trenching	3
Surveys	1
<b>Total number of vessel days</b>	<b>324</b>

Summary of costs	mill.USD	mill.NOK
Platform	834	5005
Subsea production	482	2891
Export pipelines	0	0
Wells	347	2085
<b>Total costs</b>	<b>1663</b>	<b>9980</b>

### Average cost per tonne of steel

USD/tonne	72932
NOK/tonne	437590

Use of steel and metals	tonnes	kg/boe
All facilities	15218	0,302
Wells	7589	0,151
<b>Total</b>	<b>22807</b>	<b>0,453</b>

### Fuel consumption (tonnes) - project execution

Drilling rig	4847
Drilling services	2344
Platform installation	1188
Subsea equipment installation	926
Pipelines, umbilicals, cables, risers	564
Gravel dumping, trenching, surveys	76
<b>Total for project execution</b>	<b>9945</b>

### Fuel consumption (tonnes) - production phase

Production operations per year	8659
Production operations services per year	4996
Well maintenance operations per year	237

## D2 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
<b>Total</b>	<b>6</b>

### Platform

Concept	Semi-Submersible
Number of inlet systems	1
Living quarters capacity	40 beds
Liquid capacity	16000 Sm <sup>3</sup> /d

### Cost

Capex facilities	7896 mill.NOK
Capex wells	2085 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	959	1212	442	2613	29	2642	370	3011	452	3463
Substructure ii	127	305	139	571	389	960	134	1094	164	1258
Piles, anchors	0	93	0	93	123	216	30	246	37	283
<b>Sum Platform</b>	<b>1086</b>	<b>1609</b>	<b>581</b>	<b>3276</b>	<b>541</b>	<b>3817</b>	<b>534</b>	<b>4352</b>	<b>653</b>	<b>5005</b>
Subsea produc	190	1139	36	1365	84	1448	203	1651	248	1899
Flowlines	13	39	31	82	55	138	19	157	24	181
Flowline/pipe	13	65	14	92	59	150	21	172	26	197
Umbilicals/rise	22	64	18	104	109	213	30	243	36	279
Riser bases, Pl	8	26	0	33	222	256	36	291	44	335
<b>Sum Subsea</b>	<b>246</b>	<b>1333</b>	<b>98</b>	<b>1676</b>	<b>529</b>	<b>2205</b>	<b>309</b>	<b>2514</b>	<b>377</b>	<b>2891</b>
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
<b>SUM Facilities</b>	<b>1332</b>	<b>2942</b>	<b>679</b>	<b>4953</b>	<b>1070</b>	<b>6023</b>	<b>843</b>	<b>6866</b>	<b>1030</b>	<b>7896</b>

## Capex Wells Overview

	days per well	days	mill.NOK
Drilling	37	221	1168
Completion	26	159	916
<b>Sum Drilling and completion</b>	<b>63</b>	<b>380</b>	<b>2085</b>

# 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	39	0	893	0	931	93	1024	154	1178
Platform topsides	18	45	0	82	146	15	160	24	184
Platform substructure	13	8	27	24	72	7	79	12	91
Mooring lines, piles, anchors	2	8	29	3	42	4	47	7	54
Risers, conductors	0	0	17	0	18	2	19	3	22
Flowlines, umbilicals and cab	0	2	16	0	18	2	20	3	23
Export pipelines	0	0	0	0	0	0	0	0	0
Subsea equipment and struct	6	24	76	9	114	11	126	19	145
Sea bottom clean-up	1	0	23	0	24	2	27	4	31
<b>TOTAL</b>	<b>79</b>	<b>88</b>	<b>1081</b>	<b>118</b>	<b>1366</b>	<b>137</b>	<b>1503</b>	<b>225</b>	<b>1728</b>

# 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:	38	mill.NOK
Expenditure in year	1	1858
Expenditure in year	2	3716
Expenditure in year	3	2275
Expenditure in year	4	48
<b>Total expenditure</b>		<b>7896</b>

### Capex Wells

Number of months for drilling and completion	13	mill.NOK
Expenditure in year	1	0
Expenditure in year	2	111
Expenditure in year	3	1974
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
<b>Total expenditure</b>	<b>0</b>	<b>2085</b>

# COST REPORT

Tesla

Cost year: 2015

Currency: NOK

Region: North Sea South

## Drilling and Completions Costs

Time for drilling	221 days	7 months
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Time for completion	159 days	5 months
Total time for drilling and completion	380 days	13 months
Drilling cost	181 mill.USD	1087 mill.NOK
Completion cost	142 mill.USD	852 mill.NOK
Planning and other costs	24 mill.USD	145 mill.NOK
Total cost for drilling and completion	347 mill.USD	2085 mill.NOK
Total number of wells	6	
Average well cost	58 mill.USD	347 mill.NOK
Drilling expenditure per month	27 mill.USD	165 mill.NOK
Total steel weight of all wells	7589 tonnes	
Average steel weight per well	1265 tonnes	
Diesel consumption of MODU	7603 tonnes	20 tonnes/d
Fuel gas consumption of platform rig	3802 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			323
First period; start-up	Duration – years	1	646
Second period; drilling and production	Duration – years	2	468
Third period; production, maintenance and modification	Duration – years	8	578
Fourth period; preparation for abandonment	Duration – years	2	-34
<b>Total</b>	<b>Duration – years</b>	<b>13</b>	<b>4294</b>

Opex Overview	mill. USD OPEX per year	mill.NOK OPEX per year
Offshore personnel	26	156
Catering	2	10
Production materials, chemicals and diesel	2	11
Communication	0	1
Maintenance materials/spare parts	2	11
Onshore base, purchase and contracts	1	6
Supply vessels	8	46
Stand-by vessels	16	97
Helicopter transportation	3	19
Well maintenance and well monitoring – platform wells	0	0
Well maintenance and well monitoring – subsea wells	5	32
Subsea inspection and maintenance	5	30
Stand-by maintenance of drilling package	0	0
Onshore organization, administration/support	3	20
Onshore organization, subsurface and licence adm	1	8
<b>SUBTOTAL 1</b>	<b>75</b>	<b>447</b>
Modifications/optimization/upgrading	1	6
Reservoir area fee	0	0
Contingency	7	45
<b>SUBTOTAL 2</b>	<b>83</b>	<b>498</b>
Insurance	4	24
CO2 tax	2	14
<b>TOTAL OPEX</b>	<b>89</b>	<b>537</b>
"Day-rate" (USD/day)	245069	1470416
Contingency (percent)	10	10

## D3 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	Semi-Submersible
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 Semi-submersible

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	7896 mill.NOK
Capex wells	2085 mill.NOK
Opex	537 4294 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 Semi-submersible  
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
1094	182	15,11	0,14	33,06	20,53	1,79	65,63	2477

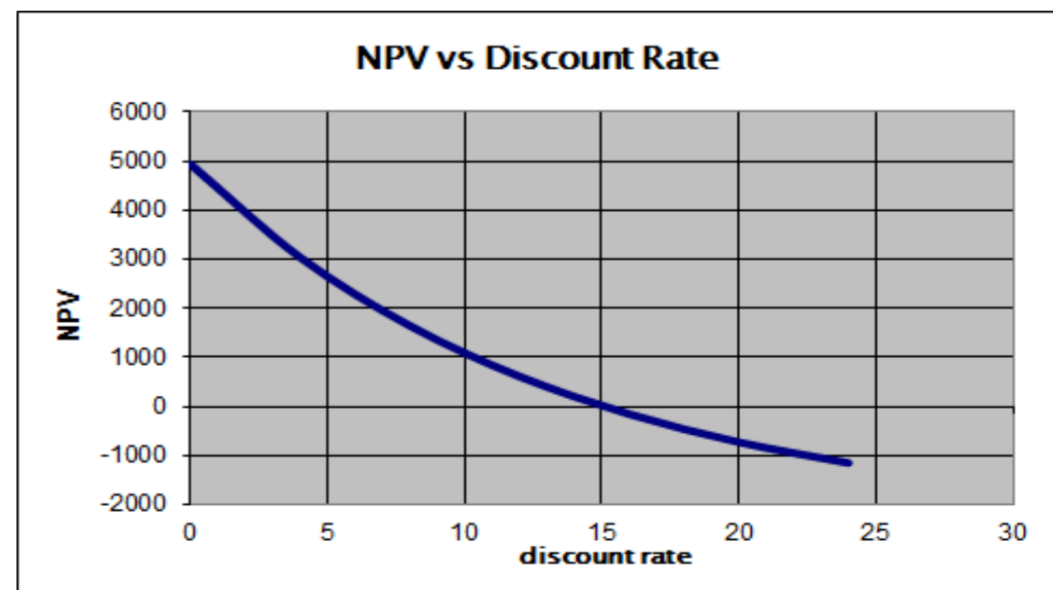
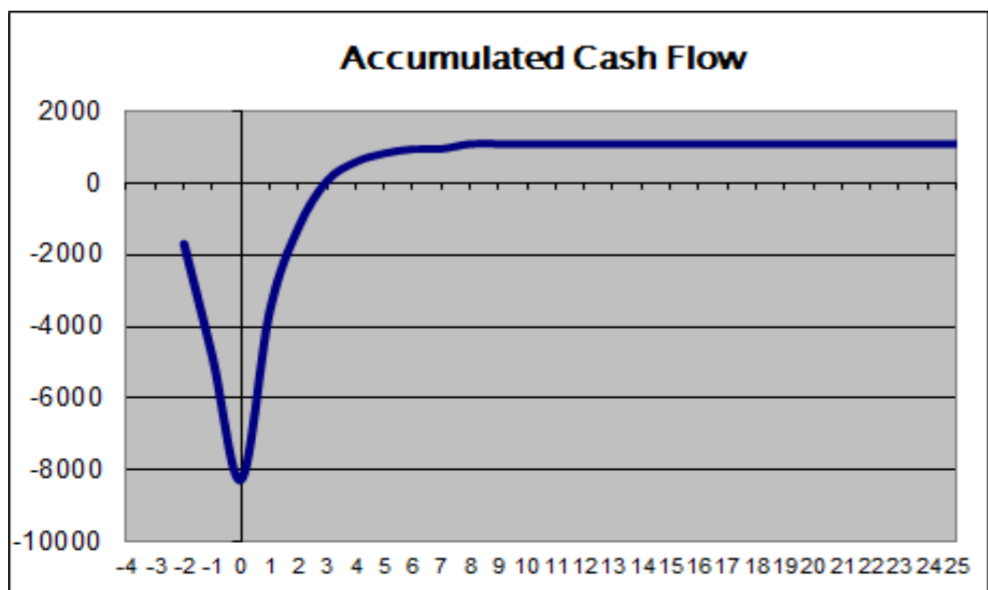
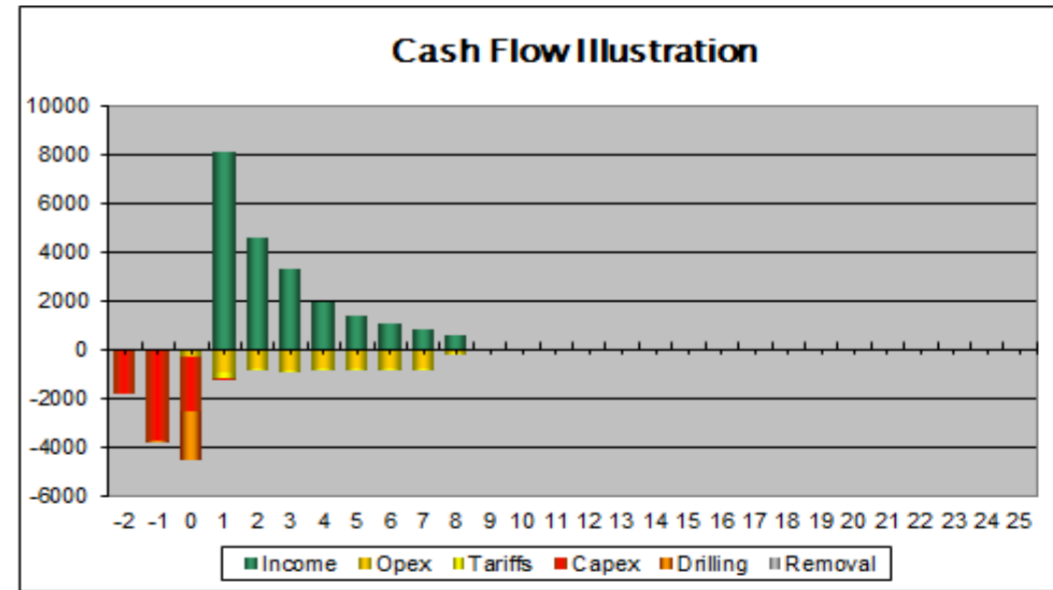
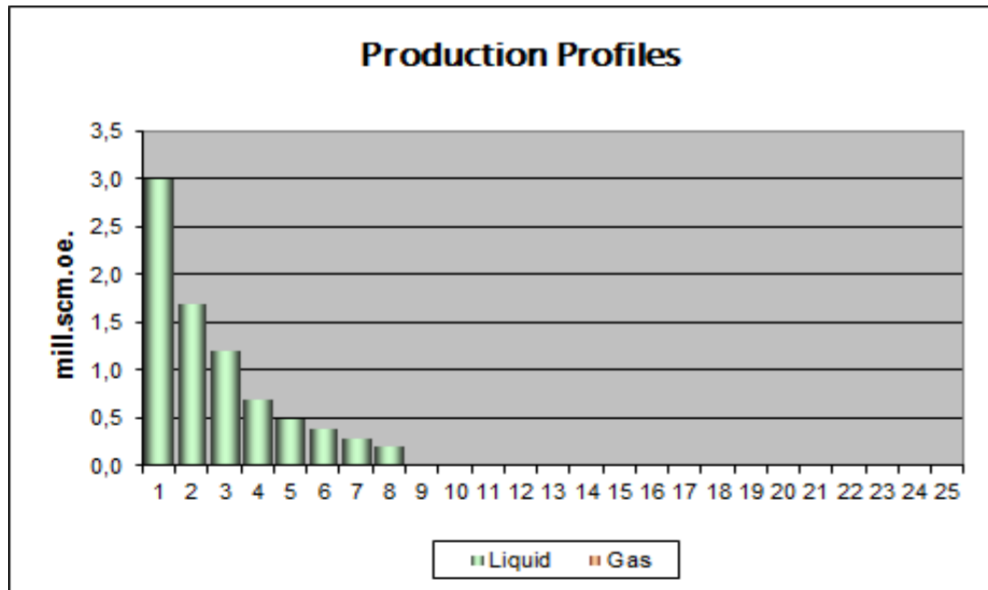
# NPV REPORT

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	1858	0	0	-1858
2	0	0	0	0	0	0	0	0	0	3716	111	0	-3826
3	0	0	0	0	0	0	0	318	0	2275	1974	0	-4567
4	3,00	0,00	8124	0	8124	203	0	662	305	48	0	0	6907
5	1,70	0,00	4603	0	4603	115	0	475	286	0	0	0	3728
6	1,20	0,00	3250	0	3250	81	0	579	267	0	0	0	2323
7	0,70	0,00	1896	0	1896	47	0	575	248	0	0	0	1026
8	0,50	0,00	1354	0	1354	34	0	573	229	0	0	0	519
9	0,40	0,00	1083	0	1083	27	0	572	210	0	0	0	274
10	0,30	0,00	812	0	812	20	0	571	191	0	0	0	30
11	0,20	0,00	542	0	542	14	0	-31	172	0	0	0	388
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	4294	1905	7896	2085	0	4944
NPV	4,73	0,00	12808	0	12808	319	0	2327	992	6501	1575	0	1094
NPV	5,20	0,00	14089	0	14089	351	0	2560	1092	5293	1732	0	3061

# NPV REPORT

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



# NPV REPORT

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

<b>Lease rate for production and storage units</b>		
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

<b>Leasing of Storage Tanker or Production Unit</b>	<b>percent</b>	<b>mill.NOK</b>
Production unit – base unit	25,1	1258
Production unit – special equipment	74,9	3746
Storage tanker – base unit	75,1	1500
Storage tanker – special equipment	24,9	496