

Appendix B – Jacket with wet trees

B1 TECHNICAL REPORT

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

Topsides

Resume

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

Platform

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

Cost

Capex facilities	8008 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	47	0	440	316	247	19,98	1098
Electrical	15	19	0	94	25	0	2,79	153
HVAC	17	9	0	27	0	0	0,97	53
Instrument/telecom	8	47	0	42	55	0	2,75	151
Piping	6	188	0	145	247	13	10,89	598
Surface protection, fire proofing	6	19	0	18	11	0	0,99	54
Safety and loss prevention	6	47	0	15	23	0	1,66	91
Architectural	210	19	0	88	11	0	5,97	328
Structural steel/aluminium	524	544	0	944	460	497	54,00	2967
Total dry weight	840	938	0	1812	1149	756	100,00	5495
Variable loads	21	141	0	181	230	38	11,11	611
Operating weight (ex riser loads)	861	1079	0	1993	1379	794	111,11	6106

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	1098	96,20	106	13	14097	103	1	98	107
Electrical	153	54,33	8	289	44243	103	5	84	13
HVAC	53	43,47	2	193	10249	103	1	63	3
Instrument/telecom	151	114,10	17	289	43684	103	4	144	22
Piping	598	65,20	39	225	134408	103	14	88	53
Surface protection, fire proofing	54	32,60	2	1027	55838	103	6	138	8
Safety and loss prevention	91	32,60	3	193	17562	103	2	52	5
Architectural	328	32,60	11	77	25283	103	3	41	13
Structural aluminium	0	6,52	0	183	0	103	0	0	0
Structural steel	2967	4,89	15	64	190473	103	20	11	34
Total	5495	-	202	0,00	535837	0,00	55	47	258
Hook-up (offshore)	5495	-	-	10	54951	265	15	3	15
Commissioning (onshore)	5495	-	-	5	27476	200	5	1	5
Commissioning (offshore)	5495	-	-	5	27476	265	7	1	7
Engineering	5495	-	-	130	714366	216	154	28	154
Total	5495	-	202	0,00	1360106	0,00	237	80	439

Marine Operations

	mob/demob	operation	duration	Day-rate	mill.USD
Transportation/logistics	5	27	37	0,13	5
Total topsides installed					444
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: **Jacket** /

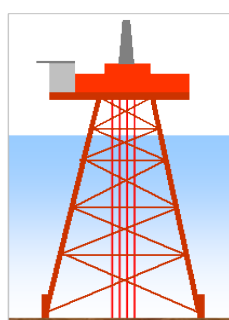
ENG

Design parameters

	Tesla
Water depth	115 m
Operating topside weight	6106 tonnes
Dry topside weight	5495 tonnes
Oil storage volume	0 m ³
Loads from flexible risers, umbilicals and cables	6 tonnes

Steel jacket

Maximum operating topside weight	6106 tonnes
Number of conductors	0
Jacket height	137 m
Top width	28 m
Top length	28 m
Bottom width	55 m
Bottom length	55 m
Jacket weight	8150 tonnes
Conductors/J-tubes/risers	121 tonnes
Piles	2498 tonnes
	0
	0
	0



0	0	0
0	0	0
0	0	0

TECHNICAL REPORT

Tesla

Parameters and indicators

Summary of weights (steel and metals)	tonnes
Topside weight	5495
Substructure weight	8150
Conductors	0
Tensioned well risers	0
Piles or anchors	2498
Mooring lines	0
Subsea equipment and structures	1329
Other subsea structures	181
Flowlines	198
Flowline risers and J-tubes	102
Umbilicals and cables	97
Export pipelines	0
Wells	8353
Total weight	26403

Summary of marine operations – vessel days	days
Platform construction and installation	67
Mooring system installation	0
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	0
Gravel dumping	5
Trenching	3
Surveys	1
Total number of vessel days	234

Summary of costs	mill.USD	mill.NOK
Platform	875	5252
Subsea production	459	2755
Export pipelines	0	0
Wells	347	2085
Total costs	1682	10092

Average cost per tonne of steel	USD/tonne	NOK/tonne
	63707	382241

Use of steel and metals	tonnes	kg/boe
All facilities	18050	0,359
Wells	8353	0,166
Total	26403	0,525

Fuel consumption (tonnes) – project execution	
Drilling rig	4847
Drilling services	2344
Platform installation	567
Subsea equipment installation	926
Pipelines, umbilicals, cables, risers	417
Gravel dumping, trenching, surveys	76
Total for project execution	9177

Fuel consumption (tonnes) – production phase	
Production operations per year	8659
Production operations services per year	4996
Well maintenance operations per year	237

B2 COST REPORT Jacket wet trees

Date: ###



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

Cost

Capex facilities	8008 mill.NOK
Capex wells	2085 mill.NOK
Opex per year	537 mill.NOK
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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

Cost element	Engineering	Procurement	Construction	SUM EPC	Marine op	SUM EPCI	Management	Base estimate	Contingency	Total
Topsides	927	1215	494	2636	28	2664	373	3037	456	3493
Substructure incl conductors/risers	275	315	236	826	193	1018	143	1161	174	1335
Piles, anchors and mooring lines	0	131	0	131	193	324	45	369	55	424
Sum Platform	1202	1661	731	3593	414	4006	561	4567	685	5252
Subsea production equipment	190	1139	36	1365	84	1448	203	1651	248	1899
Flowlines	13	39	31	82	55	138	19	157	24	181
Flowline/pipeline risers	23	2	4	30	17	47	7	54	8	62

Umbilicals/risers	22	64	18	104	109	213	30	243	36	279
Riser bases, PLETs, PLEMs	8	26	0	33	222	256	36	291	44	335
Sum Subsea	256	1270	88	1614	487	2102	294	2396	359	2755
Export pipelines	0	0	0	0	0	0	0	0	0	0
Power cables/risers	0	0	0	0	0	0	0	0	0	0
SUM Facilities	1457	2931	819	5207	901	6108	855	6963	1044	8008

Capex Wells Overview

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

COST REPORT

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

Removal Cost Overview

	Engineering	Decommissioning	Removal operations	Dismantling	Sub-total	Management	Base estimate	Contingency	TOTAL
Well plugging and abandonment	39	0	893	0	931	93	1024	154	1178
Platform topsides	18	52	304	79	453	45	499	75	573
Platform substructure	21	13	400	59	492	49	542	81	623
Mooring lines, piles, anchors	0	0	0	0	0	0	0	0	0
Risers, conductors	0	0	19	0	20	2	22	3	25
Flowlines, umbilicals and cables	0	2	16	0	18	2	20	3	23
Export pipelines	0	0	0	0	0	0	0	0	0
Subsea equipment and structures	6	24	76	9	114	11	126	19	145
Sea bottom clean-up	1	0	24	0	25	2	27	4	31
TOTAL	85	92	1730	147	2054	205	2260	339	2599

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	1884
Expenditure in year	2	3768
Expenditure in year	3	2307
Expenditure in year	4	48
Total expenditure		8008

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
Total expenditure	0	2085

COST REPORT

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

Drilling and Completions Costs

Time for drilling	221 days	7 months
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	8353 tonnes	
Average steel weight per well	1392 tonnes	
Diesel consumption of MODU	7603 tonnes	20 tonnes/d
Fuel gas consumption of platform rig	3802 tonnes	10 tonnes/d

Rates

	Basis	Index	Cost
	K USD/day		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

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
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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	4300	1905	8008	2085	0	4826
NPV	4,73	0,00	12808	0	12808	319	0	2330	992	6593	1575	0	998
NPV	5,20	0,00	14089	0	14089	351	0	2563	1092	5369	1732	0	2982

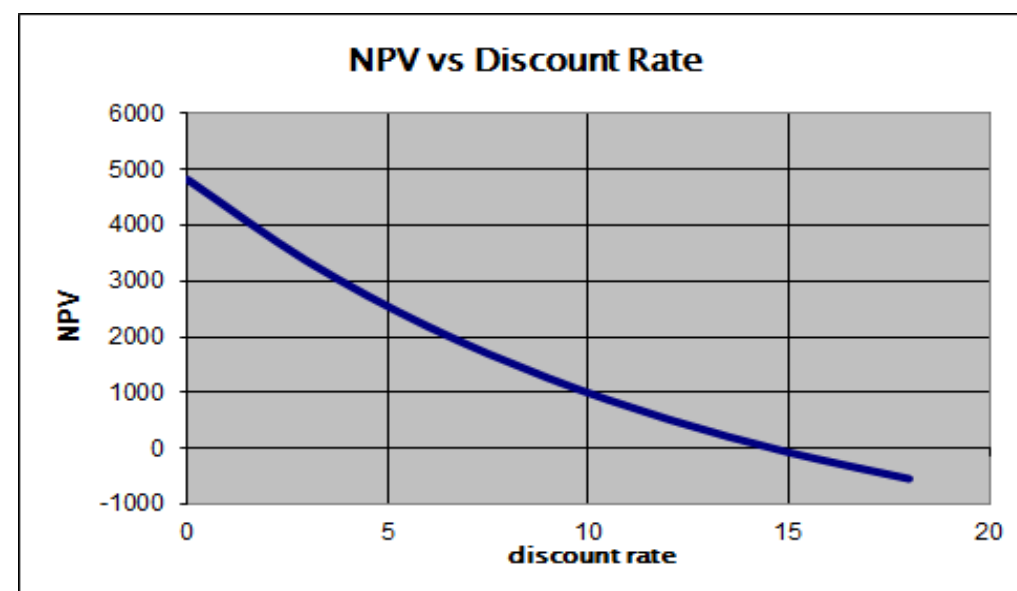
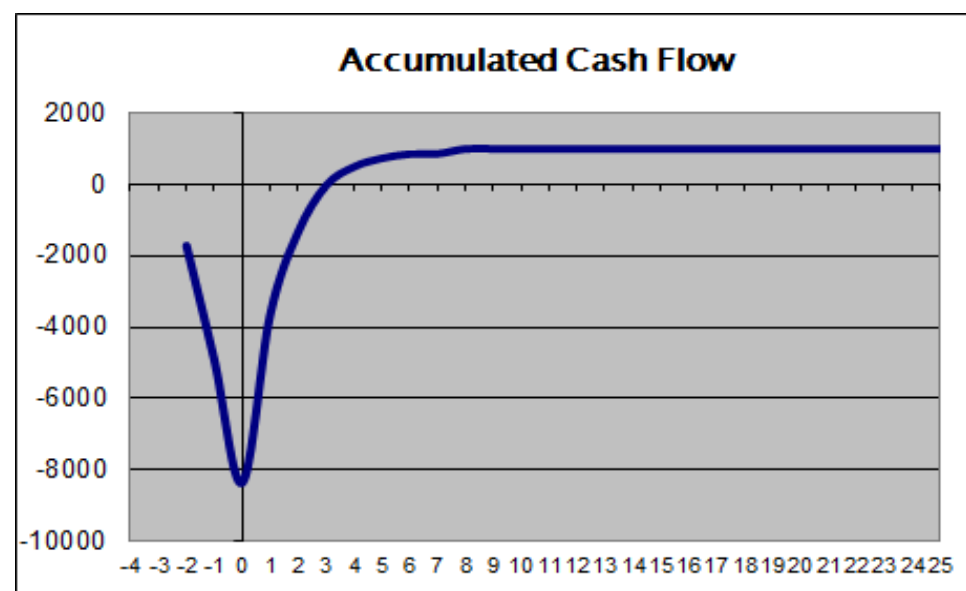
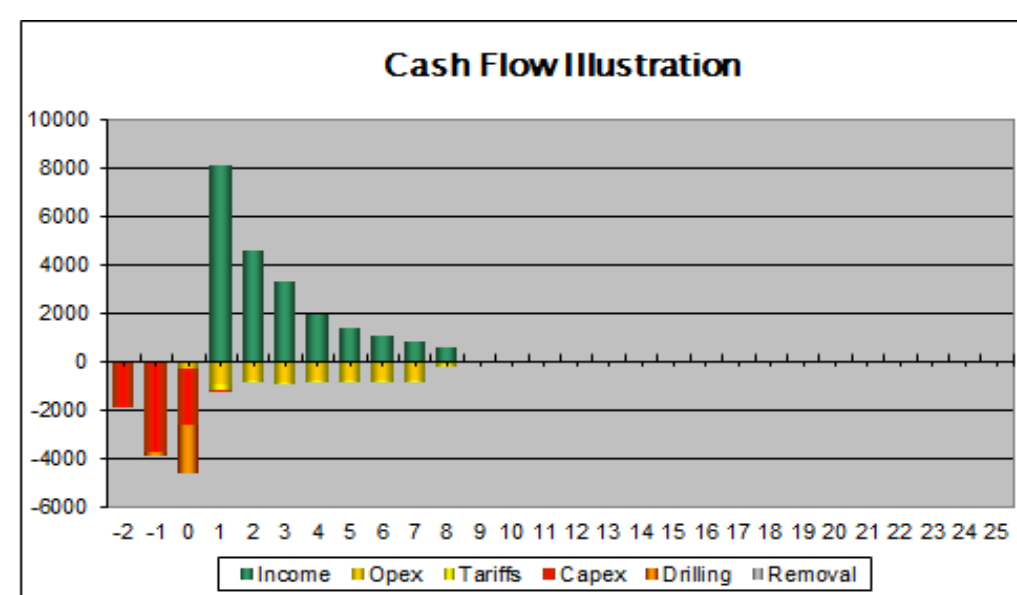
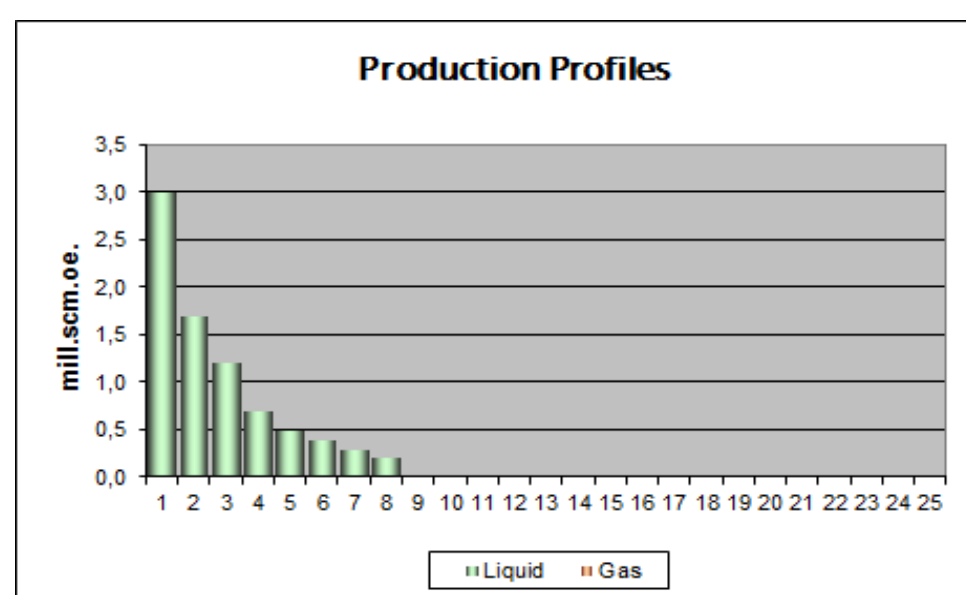
NPV REPORT

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	25,4	1335
Production unit - special equipment	74,6	3917
Storage tanker - base unit	75,1	1500
Storage tanker - special equipment	24,9	496