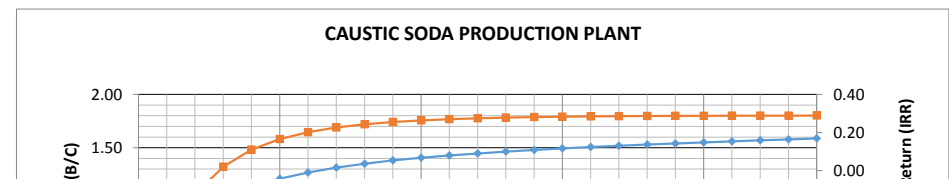
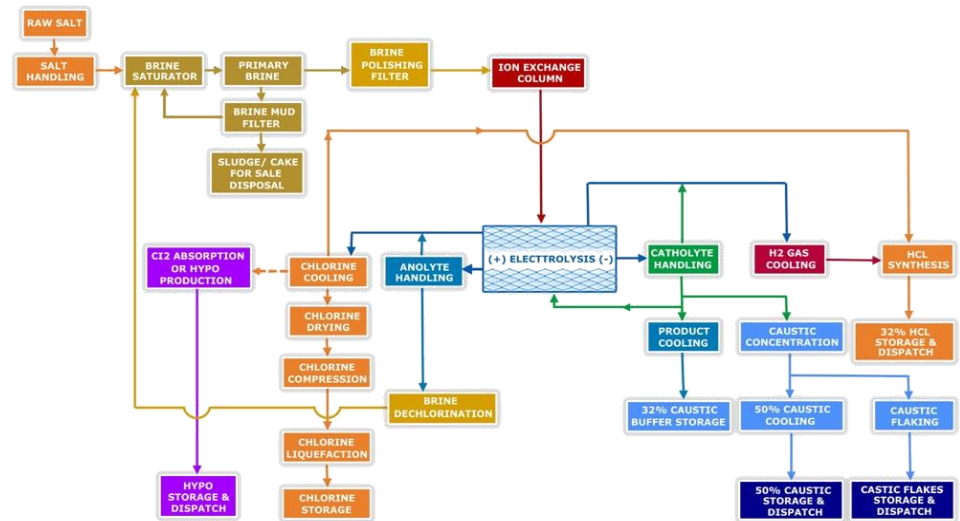


Malaysia Caustic Soda(NaOH) Production Plant 200KTA

Description	Values	Unit
Work Start Year	2018	Years
Operating Year	2021	Years
Location of Caustic Soda Plant	Green Field	Green Field, Brown Field
Site and Contry for Project	Malaysia	
Sensitivity of Golobal Financial Crisis	0	Years- Active Crisis Year, Otherwise = 0
Assumed Caustic Soda Product Capcity	200.00	KTA(KilloTon/Ann.)
Input of sodium chloride(NaCl)	350.00	KTA(KilloTon/Ann.) 1.75 ton/tonne
Input of hydrochloric acid(HCl)	5.00	KTA(KilloTon/Ann.) 0.025 ton/tonne
Input of sulfuric acid(H ₂ SO ₄)	10.40	KTA(KilloTon/Ann.) 0.052 ton/tonne
Input of soda ash(Na ₂ CO ₃)	5.40	KTA(KilloTon/Ann.) 0.027 ton/tonne
Input of water	1,600.00	KTA(KilloTon/Ann.) 8 ton/tonne
Transportation Speed	60.00	km/hr
One Trailer Quantities	38.00	m ³ /trailer
Distance from site to Plant	50.00	km
Raw Material Transportation Cost	1,388,345.22	USD/Year
Product of caustic soda(NaOH)	207.05	KTA 1.03526 ton/tonne
Product of chlorine(Cl)	183.76	KTA 0.9188 ton/tonne
Product of hydrogen(H ₂)	5.18	KTA 0.02588 ton/tonne
Product of Salt	4.01	KTA 0.02006 ton/tonne
Initial Inflation of Raw Material Price	0	%
Cost for Raw Material of Sodium chloride	39,011,088.11	USD/Annual 111.46025USD/ton
Cost for Raw Material of Hydrochloric acid(HCl)	962,558.71	USD/Annual 192.51174USD/ton
Cost for Raw Material of Sulfuric acid(H ₂ SO ₄)	3,909,549.27	USD/Annual 375.9182USD/ton
Cost for Raw Material of Soda ash(Na ₂ CO ₃)	1,886,807.58	USD/Annual 349.40881USD/ton
Cost for Raw Material of Water	3,627,248.26	USD/Annual 2.2670302USD/ton
Total Purchase Cost for Raw material	49,397,251.93	USD/Annual
Initial Inflation of Product Material Price	5	%
Sail Cost for Product of Caustic soda(NaOH)	96,148,982.61	USD/Annual 464.36954USD/ton
Sail Cost for Product of Chlorine(Cl)	70,850,400.26	USD/Annual 385.56089USD/ton
Sail Cost for Product of Hydrogen(H ₂)	12,924,749.27	USD/Annual 2496.9USD/ton
Sail Cost for Product of Salt	845,093.00	USD/Annual 210.65988USD/ton
Total Salse Cost for Product	180,769,225.14	USD/Annual
Unit Capex of Caustic Soda Production Plant	914,299.11	USD/1KTA
Total CAPEX of Caustic Soda Production Plant	182,859,821	USD - 일억팔천이백팔십오만구천팔백...
Required Electric Power(Diesel fired generator)	60.00	MW
Power Supply System	0	0 for Power Outer Supply, 1 for Site Gen.
Power Supply Unit Price	0.11	USD/kwh for Power Outer Supply only
Fixed and Various OPEX	66,558,338	USD/Year(With Transportation)
Storage Area	10598.72	m ² for stock days = 21days
Unit Caustic Soda Plant Land Size per 1KTA	821	m ² /KTA
Total Land Size	174,884	m ² - 43.21Acre
Unit Space Acquisition Cost	16	USD/m ² in Malaysia
CAPEX of Area Acquisition Cost	2,796,402	USD
CAPEX for Break Water Length is	0m	0 USD 100,000USD/m
CAPEX for Berthing Dolphine	23k DWT x 1 set	4,058,824 USD 176,471k DWT
CAPEX for Trestle and Piers	x 500m	6,636,798 USD 13,274USD/m
CAPEX for Unloading Crane	23k DWT x 1 set	2,300,000 USD 1,000,000k DWT
CAPEX for Conveyer System	x 500m	500,000 USD 1,000USD/m
CAPEX for onshore	Pipe x 24.00inch x 0m	0 USD 492USD/m
CAPEX for Transmission Line Length is	5km	888,725 USD -40.3kv --Single C 1 - Circuit

Materials	Density(ton/m ³)	Storage	STORAGE TANK				Required Space
			Nos of Tank	Diameters	Center Gap	Edge gap	
Sodium chloride	2.16	9,316m ³	1	27.4m	0.5D	0.5D	3,003.0m ²
Hydrochloric acid	0.45182	636m ³	1	11.5m	0.5D	0.5D	529.0m ²
Sulfuric acid	1.84	325m ³	1	9.2m	0.5D	0.5D	338.6m ²
Soda ash	2.54	122m ³	1	6.8m	0.5D	0.5D	185.0m ²
Caustic soda	2.13	5,589m ³	1	23.2m	0.5D	0.5D	2,153.0m ²
Chlorine	1.5625	6,762m ³	1	24.7m	0.5D	0.5D	2,440.4m ²
Hydrogen	0.07099	4,192m ³	1	21.1m	0.5D	0.5D	1,780.8m ²
Salt	2.17	106m ³	1	6.5m	0.5D	0.5D	169.0m ²
							10,598.7m ²



Total CAPEX for Construction and Fabrication	200,040,570	USD - 이익사만오백칠십달러
Construction and Fabrication Period	3	Years
Interest FEE during Construction and Fabrication	19,776,605	USD
TOTAL CAPEX AND INTEREST FEE DURING CONSTRUCTION	219,817,174	USD - 이익일천구백팔십일만칠천일백칠십달러
Fund Intrest	6.5	%
Return rate on investment of Net Profit, r	1	%
Operating Periods	25	Years
Project Design Life	50	Years
Benefit Cost Ratio (B/C)	1.59	≥ 1.1 GOOD For 25Years Operating
IRR(Internal Rate of Return)	28.88%	> 0 GOOD For 25Years Operating
NPV(Net Present Value)	1,599,453,959	USD with Asset value of Project for 25Years
Inflation of Raw material Purchased Price	0	% % , If Inflation = 0, the Raw/Product Unit price shall be quoted Forecast Price, otherwise consider inflation based on 2021Years Purchase/Sale Cost, If no consider Inflation, the value=10E-11
Inflation of Sale Product Price	0	%
Income tax rate for government	18	%
Inflation of Space Acquisition	1	%
First Project residual value	116,708,985	USD after 10 Years
Second Project residual value	48,965,046	USD after 30 Years
Final residual value on Design Life	22,605,394	USD after 50 Years
Net Payback Turn Over Periods	3.073	Years



Actual Payback turn Over Years	4Years	4Years	해 찾기
Initial Value(min 0%, max 25%)	21.568%	21.568%	0 Good
Limit of Initial Value	≤ 25%	≤ 25%	

End of Year	% of Return of Equity	% of Return of FUND	Return of Equity (USD) 20% of Equity	Return of FUND(USD) 80% of FUND	Remain Cost(USD)	Fund Interest 6.5%(USD)	OPEX(USD)	Yearly Revenue(USD)	Yearly Purchased Price(USD) of LNG W/ Inflation	Net Profit(USD)	(현재자산가치) Asset value=Residual Value(USD)	(순현재가치) Net Present Value	Benefit Cost Ratio (B/C)	(내부수익률) Internal Rate of Return (IRR)	
2021	1	21.57%	21.57%	9,482,193	37,928,770	219,817,174	14,288,116	66,558,338	180,769,225	49,397,252	2,553,936	174,815,762	-168,110,800	-0.30	-0.77
2022	2	23.86%	23.86%	10,487,970	41,951,880	172,406,212	11,206,404	66,558,338	182,871,610	49,891,224	2,276,151	167,070,448	-114,519,040	0.56	-0.37
2023	3	26.14%	26.14%	11,493,747	45,974,990	119,966,362	7,797,814	66,558,338	184,990,780	50,390,137	2,276,119	159,716,374	-56,625,268	0.86	-0.13
2024	4	28.43%	28.43%	12,499,525	49,998,099	62,497,624	4,062,346	66,558,338	187,126,902	50,894,038	2,553,936	152,722,712	5,802,471	1.02	0.02
2025	5	0.00%	0.00%	0	0	0	0	66,558,338	189,280,146	51,402,978	58,481,440	146,089,465	72,988,034	1.13	0.11
2026	6	0.00%	0.00%	0	0	0	0	66,558,338	191,450,683	51,917,008	59,839,776	139,636,572	141,053,448	1.21	0.17
2027	7	0.00%	0.00%	0	0	0	0	66,558,338	193,638,685	52,436,178	61,208,219	133,544,100	209,986,085	1.27	0.20
2028	8	0.00%	0.00%	0	0	0	0	66,558,338	195,844,329	52,960,540	62,586,870	127,631,989	279,773,485	1.31	0.23
2029	9	0.00%	0.00%	0	0	0	0	66,558,338	198,067,789	53,490,145	63,975,831	122,080,304	350,403,344	1.35	0.24
2030	10	0.00%	0.00%	0	0	0	0	66,558,338	200,309,245	54,025,047	65,375,205	116,708,985	421,863,523	1.38	0.25
2031	11	0.00%	0.00%	0	0	0	0	66,558,338	200,621,576	54,565,297	65,188,311	111,698,099	492,413,909	1.41	0.26
2032	12	0.00%	0.00%	0	0	0	0	66,558,338	202,627,792	55,110,950	66,385,973	106,867,585	563,549,118	1.43	0.27
2033	13	0.00%	0.00%	0	0	0	0	66,558,338	204,654,069	55,662,060	67,595,611	102,217,447	635,263,359	1.45	0.27
2034	14	0.00%	0.00%	0	0	0	0	66,558,338	206,700,610	56,218,680	68,817,345	97,747,687	707,550,901	1.46	0.28
2035	15	0.00%	0.00%	0	0	0	0	66,558,338	208,767,616	56,780,867	70,051,297	93,458,309	780,406,066	1.48	0.28
2036	16	0.00%	0.00%	0	0	0	0	66,558,338	210,855,292	57,348,676	71,297,588	89,529,379	853,823,235	1.49	0.28
2037	17	0.00%	0.00%	0	0	0	0	66,558,338	212,963,845	57,922,163	72,556,343	85,780,837	927,796,843	1.51	0.28
2038	18	0.00%	0.00%	0	0	0	0	66,558,338	215,093,484	58,501,384	73,827,684	82,032,624	1,002,321,381	1.52	0.29
2039	19	0.00%	0.00%	0	0	0	0	66,558,338	217,244,419	59,086,398	75,111,740	78,464,804	1,077,391,394	1.53	0.29
2040	20	0.00%	0.00%	0	0	0	0	66,558,338	219,416,863	59,677,262	76,408,635	75,077,383	1,153,001,481	1.54	0.29
2041	21	0.00%	0.00%	0	0	0	0	66,558,338	221,611,031	60,274,035	77,718,500	71,870,363	1,229,146,296	1.55	0.29
2042	22	0.00%	0.00%	0	0	0	0	66,558,338	223,827,142	60,876,775	79,041,463	68,843,747	1,305,820,544	1.56	0.29
2043	23	0.00%	0.00%	0	0	0	0	66,558,338	226,065,413	61,485,543	80,377,656	65,997,540	1,383,018,982	1.57	0.29
2044	24	0.00%	0.00%	0	0	0	0	66,558,338	228,326,067	62,100,398	81,727,211	63,151,680	1,460,736,422	1.58	0.29
2045	25	0.00%	0.00%	0	0	0	0	66,558,338	230,609,328	62,721,402	83,090,262	60,486,236	1,538,967,723	1.59	0.29
2046	26	0.00%	0.00%	0	0	0	0	0	0	0	0	0	0	0.00	0.00

2047	27	0.00%	0.00%	0	0	0	0	0	0	0	0	0	0	0.00	0.00
2048	28	0.00%	0.00%	0	0	0	0	0	0	0	0	0	0	0.00	0.00
2049	29	0.00%	0.00%	0	0	0	0	0	0	0	0	0	0	0.00	0.00
2050	30	0.00%	0.00%	0	0	0	0	0	0	0	0	0	0	0.00	0.00
2051	31	0.00%	0.00%	0	0	0	0	0	0	0	0	0	0	0.00	0.00
2052	32	0.00%	0.00%	0	0	0	0	0	0	0	0	0	0	0.00	0.00
2053	33	0.00%	0.00%	0	0	0	0	0	0	0	0	0	0	0.00	0.00
2054	34	0.00%	0.00%	0	0	0	0	0	0	0	0	0	0	0.00	0.00
2055	35	0.00%	0.00%	0	0	0	0	0	0	0	0	0	0	0.00	0.00
2056	36	0.00%	0.00%	0	0	0	0	0	0	0	0	0	0	0.00	0.00
2057	37	0.00%	0.00%	0	0	0	0	0	0	0	0	0	0	0.00	0.00
2058	38	0.00%	0.00%	0	0	0	0	0	0	0	0	0	0	0.00	0.00
2059	39	0.00%	0.00%	0	0	0	0	0	0	0	0	0	0	0.00	0.00
2060	40	0.00%	0.00%	0	0	0	0	0	0	0	0	0	0	0.00	0.00
2061	41	0.00%	0.00%	0	0	0	0	0	0	0	0	0	0	0.00	0.00
2062	42	0.00%	0.00%	0	0	0	0	0	0	0	0	0	0	0.00	0.00
2063	43	0.00%	0.00%	0	0	0	0	0	0	0	0	0	0	0.00	0.00
2064	44	0.00%	0.00%	0	0	0	0	0	0	0	0	0	0	0.00	0.00
2065	45	0.00%	0.00%	0	0	0	0	0	0	0	0	0	0	0.00	0.00
2066	46	0.00%	0.00%	0	0	0	0	0	0	0	0	0	0	0.00	0.00
2067	47	0.00%	0.00%	0	0	0	0	0	0	0	0	0	0	0.00	0.00
2068	48	0.00%	0.00%	0	0	0	0	0	0	0	0	0	0	0.00	0.00
2069	49	0.00%	0.00%	0	0	0	0	0	0	0	0	0	0	0.00	0.00
2070	50	0.00%	0.00%	0	0	0	0	0	0	0	0	0	0	0.00	0.00
	Summation	100%	100%	43,963,435	175,853,740	574,687,372	37,354,679	1,663,958,452	5,133,733,942	1,395,136,441	1,490,323,100	60,486,236	1,599,453,959	1.59	0.29

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