

CCGT Economics

Capacity	MW	750
Load Factor	%	65%
Annual output	TWh	4.27
	MWh	4270500
	kW	750000
Construction time	years	3
Project life	years	20

Fuel

Efficiency		54%
Fuel consumed	MWh	7908333
Gas cost	US\$/mmbtu	3.5
	US\$/MWh	11.95

Convert mmbtu to MWh 3.413

NPV -873.2

US\$=€1

EIA Estimates

Capital Cost	US\$/kW	978	733.5 US\$mm
Fixed Cost	US\$/kW	11	8.25 US\$mm
Variable Costs	US\$/MWh	3.5	14.95 US\$mm
Gas Cost	US\$/MWh	11.95	94.5 US\$mm

Carbon output per MWh	Tonnes	0.18
Carbon price	US\$/t	30.00

Corporate Tax Rate 20%

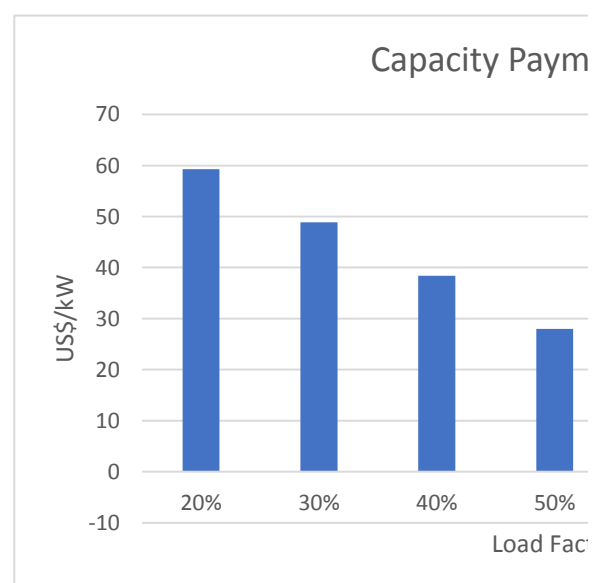
Electricity Price	US\$/MWh	30
Capacity Payment	US\$/kW	0

Project Economics

		2020	2021	2022	2023	2024
Utilisation					65%	65%
Output	MWh				4270500	4270500
Price	\$/MWh				30	30
Revenues	\$mm				128.1	128.1
Capacity Payment	\$mm				0.0	0.0
Capex	\$mm	-244.5	-244.5	-244.5		
Total	\$mm	-733.5				
Variable Cost	\$mm				-14.9	-14.9
Fixed Cost	\$mm				-8.3	-8.3
Fuel Cost	\$mm				-94.5	-94.5
Cost of Carbon	\$mm				-43.0	-43.0
Total Costs	\$mm				-160.6	-160.6
Operating Cashflow	€mm				-32.5	-32.5

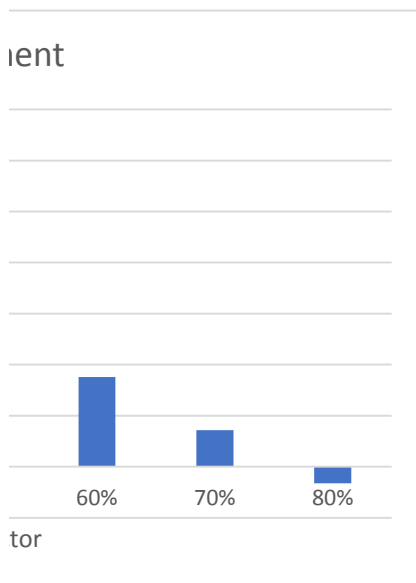
Depreciation		20 years				-36.7	-36.7
Pre-tax profit	€mm					-69.2	-69.2
Corporation Tax		20%				13.8	13.8
Net Income	€mm					-55.4	-55.4
Post-tax Cashflow	€mm					-18.7	-18.7
Net Cashflow	€mm		-244.5	-244.5	-244.5	-18.7	-18.7
Cumulative Net Cashflow			-244.5	-489.0	-733.5	-752.2	-770.9
Discount Rate		4.82%					
Discount Factor		1	1.05	1.10	1.15	1.21	1.27
Discounted Cashflow	€mm		-233.3	-222.5	-212.3	-15.5	-14.8
NPV	€mm		-873.2				
IRR	%		#NUM!				
Payback (Years)		15					
Breakeven Utilisation		77%					
Breakeven Gas Price		3.50					
Breakeven Electricity Price							
Breakeven Carbon Price							

	Load Factor					
	20%	30%	40%	50%	60%	70%
Capacity Payment	59.27	48.85	38.43	28.01	17.59	7.17



-36.7	-36.7	-36.7	-36.7	-36.7	-36.7	-36.7	-36.7	-36.7
-69.2	-69.2	-69.2	-69.2	-69.2	-69.2	-69.2	-69.2	-69.2
13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8
-55.4	-55.4	-55.4	-55.4	-55.4	-55.4	-55.4	-55.4	-55.4
-18.7	-18.7	-18.7	-18.7	-18.7	-18.7	-18.7	-18.7	-18.7
-18.7	-18.7	-18.7	-18.7	-18.7	-18.7	-18.7	-18.7	-18.7
-789.5	-808.2	-826.9	-845.6	-864.2	-882.9	-901.6	-920.3	-939.0
1.33	1.39	1.46	1.53	1.60	1.68	1.76	1.84	1.93
-14.1	-13.4	-12.8	-12.2	-11.7	-11.1	-10.6	-10.1	-9.7

80%
-3.25



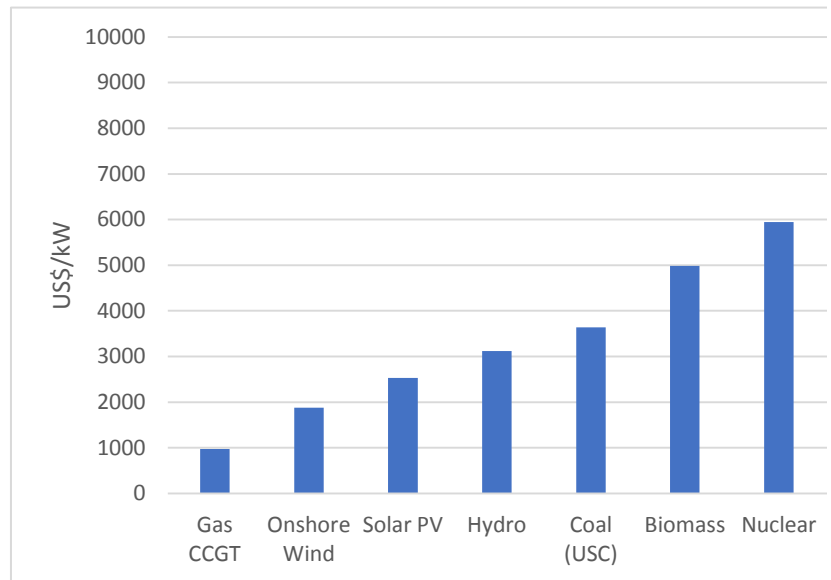
-36.7	-36.7	-36.7	-36.7	-36.7	-36.7	-36.7	-36.7	-36.7
-69.2	-69.2	-69.2	-69.2	-69.2	-69.2	-69.2	-69.2	-69.2
13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8
-55.4	-55.4	-55.4	-55.4	-55.4	-55.4	-55.4	-55.4	-55.4
-18.7	-18.7	-18.7	-18.7	-18.7	-18.7	-18.7	-18.7	-18.7
-18.7	-18.7	-18.7	-18.7	-18.7	-18.7	-18.7	-18.7	-18.7
-957.6	-976.3	-995.0	-1013.7	-1032.3	-1051.0	-1069.7	-1088.4	-1107.1
2.03	2.12	2.23	2.33	2.45	2.56	2.69	2.82	2.95
-9.2	-8.8	-8.4	-8.0	-7.6	-7.3	-6.9	-6.6	-6.3

WACC

Cost of Equity	
20-year return	10.53%
Risk Free Rate	1.75%
Beta	1.1
Cost of Equity	11.41%
Interest Rate	2.50%
Tax Rate	20%
Cost of Debt	2.00%
WACC	4.82%
% Debt	70%
% Equity	30%

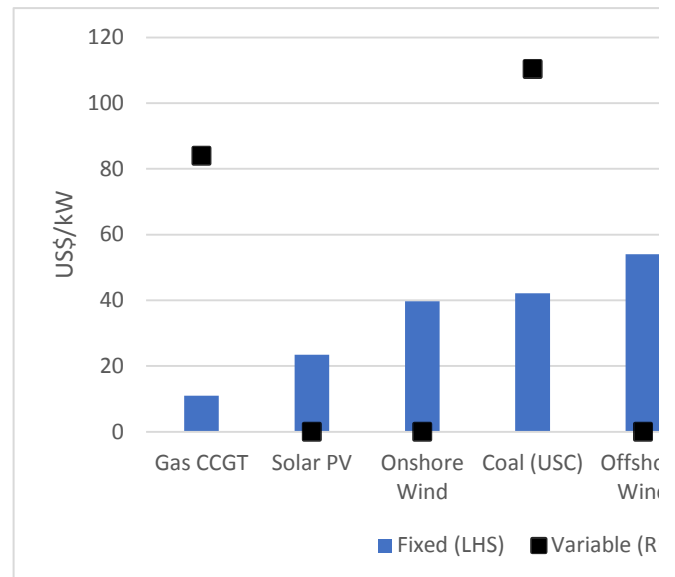
Capital Costs

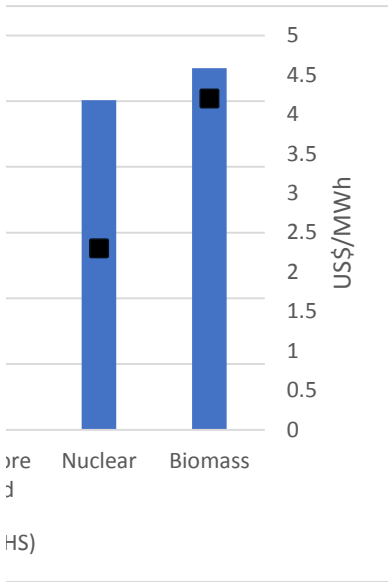
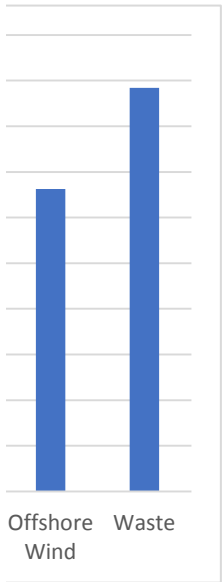
	US\$/kW
Gas CCGT	978
Onshore Wind	1877
Solar PV	2534
Hydro	3123
Coal (USC)	3636
Biomass	4985
Nuclear	5945
Offshore Wind	6628
Waste	8843



Operating Costs

	Fixed (LHS)	Variable (RHS)
Gas CCGT	11	3.5
Solar PV	23.4	0
Onshore Wind	39.7	0
Coal (USC)	42.1	4.6
Offshore Wind	54	0
Nuclear	100.3	2.3
Biomass	110	4.2





2.205

Pounds per mmBtu Tonnes per Tonnes per MWh

Gas	117.0	0.053	0.181
Gasoline	157.2	0.071	0.243
Diesel	161.3	0.073	0.250
Lignite	215.4	0.098	0.333
Coal	228.6	0.104	0.354

