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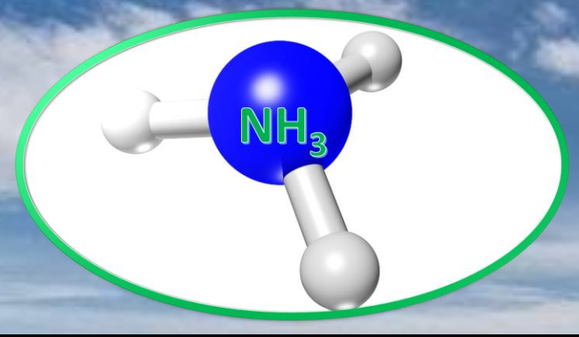

Toolkit for Renewable Energy Project Development

Green Ammonia from RE Powered Electrolysis & HB-ASU Plant

Pre-Feasibility Study

Levelized Cost of Ammonia
Financial Model Analysis

Version: 7
Date: 24/01/2021

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Toolkit

F2M2

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Disclaimer

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Green Ammonia from RE Powered Electrolysis & HB-ASU Plant - Levelized Cost of Ammonia (LCOA)	
Project Information Summary	
Project Communication Details	
Project Title	
Project Reference No.	
Project Location	
Project Sponsor Organization	
Contact Person	
Mobile	
Email	
Web	
Project Data Room Page Link	
Document Title	
Document Version	
Document Date	
Project Techno-Commercial Details	
Electrolyzer Plant Effective Capacity (kWe DC)	1,000,000
Electrolyzer Technology (ALK/PEM/SOEC/Other)	PEM
Estimated Commercial Operation Date (yr)	2025
Plant Annual Capacity Factor (%)	
Electrolyzer Plant Estimated Hourly Production (Kg H_2/h)	
Electrolyzer Plant Estimated Annual Production (Kg H_2/yr)	
Electrolyzer Plant H_2 Output Pressure (Bar)	
H_2 Buffer Storage Capacity in H_2 Production Days (day)	
H_2 Buffer Storage Capacity (Kg H_2)	
H_2 Buffer Storage Pressure (Bar)	
N_2 Production Process	Air Separation Unit (ASU)
NH_3 Synthesis Process	Haber Bosch (HB)
NH_3 Synthesis H_2 Inlet Pressure (Bar)	
NH_3 Synthesis Estimated Hourly Production (Kg NH_3/h)	
NH_3 Synthesis Estimated Annual Production (Kg NH_3/yr)	
NH_3 Storage Capacity (Kg NH_3)	
NH_3 Storage Design Temperature (°C)	
NH_3 Storage Design Pressure (Bar)	
NH_3 Synthesis Operational Flexibility Details	
NH_3 Synthesis Operational Flexibility Assumptions	
NH_3 Synthesis Operational Flexibility Mitigation	
Energy Supply (RE PV/Wind/Other)	
Grid Connection Capacity (MW)	
Grid Connection Voltage (33/132/220/400 kV)	
Water Supply (RO Plant/Process Water/Other)	
Water Supply Capacity (m^3/h)	
Estimated Water Consumption per Annum (m^3/yr)	
Project Land Plot Requirement (m^2)	
Project Structure Description	Special Purpose Vehicle (SPV)
Project Capital Structure Description	Equity Bridge Loan, Equity and Sr. Debt
Project Offtake Agreements Description	
Project Supply Agreements Description	
Other Info	
Other Info	
Other Info	
Other Info	
Other Info	
Other Info	
Other Info	
Other Info	
Other Info	
Other Info	
Other Info	
Other Info	
Other Info	

Green Ammonia from RE Powered Electrolysis & HB-ASU Plant - Levelized Cost of Ammonia (LCOA)		
PRE-FEASIBILITY ECONOMIC ANALYSIS - BASELINE CASE - INPUTS FORM GUIDE & NOTES		
INPUTS		**NOTES**
FILL IN INPUTS FOR WHITE BACKGROUND CELLS ONLY		FILL IN ADDITIONAL NOTES WHERE NECESSARY
General		
Analysis Period (years)	20	Variable period selection function up to 40 years is possible. Override is selectable for 20/30/40 years.
Reference Year for Technology & Costs (year)	2025	For Info.
Electrolyzer Technology	PEM	For Info.
H_2 Plant Economies of Scale (MWe)	1000	For Info. Provide plant concept design schematic diagram with attributes/specs for each process package.
Finance Structure		
Debt Percentage		Default 70%.
Equity Percentage		
Debt Interest Rate		Default 5%.
Return on Equity Rate		Default 10%
WACC / Nominal Discount Rate		
Capital Expenditure		
Electrolyzer Stack Package Cost ($/kWe DC)		Package includes installation.
Electrolyzer Stack Package Cost ($)		
Electrical & Mechanical BoP Packages Cost ($/kWe DC)		Package includes installation.
Electrical & Mechanical BoP Packages Cost ($)		
Overall Civil & Infrastructure Package Cost ($/kWe DC)		Package includes installation. includes plant buildings and associated facilities
Overall Civil & Infrastructure Package Cost ($)		
H_2 Buffer Storage Capacity in H_2 Production Days (day)		Based on plant design & sizing, NH_3 synthesis process flexibility, plant capacity factor and renewables energy supply profile. Set to zero if excluded
H_2 Buffer Storage Capacity (Kg H_2)		Calculated based on electrolyzer production for 24 hours.
H_2 Buffer Storage Package Cost ($/Kg H_2)		To be based on storage design details, temperature & pressure (not a universal benchmark per Kg). Includes installation.
H_2 Buffer Storage Package Cost ($)		
H_2 Buffer Storage Package Cost ($/kWe DC)		
H_2 Pre-Compression Package Cost ($/Kg H_2/h)		Based on plant design & sizing, NH_3 synthesis H_2 inlet pressure and flow rate requirement. To be verified with technology provider.
H_2 Pre-Compression Package Cost ($)		
H_2 Pre-Compression Package Cost ($/kWe DC)		
NH_3 Synthesis HB-ASU Package Cost ($/kWe DC)		Includes NH_3 Haber Bosch Process and N_2 Air Separation Unit. Includes installation. To be verified with technology provider.
NH_3 Synthesis HB-ASU Package Cost ($)		
NH_3 Storage Capacity in NH_3 Synthesis Production Days (day)		To be based on plant design & sizing, downstream delivery pathway & frequency, & end consumer demand schedules. Set to zero if excluded.
NH_3 Storage Capacity (Kg NH_3)		Calculated based on NH_3 synthesis production for 24 hours.
NH_3 Storage Package Cost ($/Kg NH_3)		To be based on storage design details, temperature & pressure (not a universal benchmark per Kg). Includes installation.
NH_3 Storage Package Cost ($)		
NH_3 Storage Package Cost ($/kWe DC)		
Other Infra Package Cost ($/Kg NH_3)		Spare allocation for any other infra requirements. Specify details (e.g. NH_3 liquefaction for storage at ambient pressure, etc.). Set to zero if not req
Other Infra Package Cost ($)		
Other Infra Package Cost ($/kWe DC)		
HV Substation Package Cost ($/kWe DC)		Set to zero if H_2 plant is co-located with RE Solar/Wind/Other plant. Package includes installation & connection to HV line.
HV Substation Package Cost ($)		
Plant Start-up Package Cost ($/kWe DC)		Package incl. consumables for testing & commissioning energy/water/etc., & min. fill up of delivery infra pipeline/storage, & plant min. mandatory s
Plant Start-up Package Cost ($)		
EPCM Service Package Cost ($/kWe DC)		Engineering, Procurement & Construction Management .
EPCM Service Package Cost ($)		
EPC Cost ($/kWe DC)		
EPC Cost ($)		
Project Developer Contingencies Allocation as % of EPC Cost (%)		1.5% to 3.0% for LSTK type EPC contracts.
Project Developer Contingencies Allocation Cost ($/kWe DC)		
Project Developer Contingencies Allocation Cost ($)		
Project Development Cost ($/kWe DC)		H_2 Production Project Developer Costs and Advisory Services Costs.
Project Development Cost ($)		
Total CAPEX Cost ($/kWe DC)		
Total CAPEX Cost ($)		
Taxes GST/VAT Rate During Construction (%)		Country specific (e.g. UAE 5%). Could be 0% if project is exempted.
Taxes GST/VAT ($/kWe DC)		
Taxes GST/VAT ($)		
Finance Cost During Construction as % of Total CAPEX w/ Taxes (%)		Calculated in separate module. To be based on previous experience (e.g. 18 months construction with advance payment & uniform drawdown).
Finance Cost During Construction ($/kWe DC)		
Finance Cost During Construction ($)		
Total Overnight CAPEX Cost w/ Taxes ($/kWe DC)		
Total Overnight CAPEX Cost w/ Taxes ($)		
O&M Expenditure		
Taxes GST/VAT Rate During Operation (%)		Country specific (e.g. UAE 5%). Could be 0% if project is exempted.
Weighted Avg. (PV &/or Wind &/or Other) Energy Unit Rate Net Cost ($/kWhe AC)		Weighted Average based on energy source combination & estimated plant capacity factor per annum. Applies to plant energy cost calc. GST/VAT
Energy Net Cost Annual Escalation Yr2+ (%)		Normally set to 0% (quoted cost is levelized).
Electrolysis Package Energy Consumption Yr1 (kWhe AC/yr)		
Electrolysis Package Energy Consumption Net Cost Yr1 ($/yr)		
H_2 Pre-Compression Package Specific Energy Consumption (kWhe AC/Kg H_2)		Based on plant design & sizing, NH_3 synthesis H_2 inlet pressure and flow rate requirement. To be verified with technology provider.
H_2 Pre-Compression Package Energy Consumption Yr1 (kWhe AC/yr)		
H_2 Pre-Compression Package Energy Consumption Net Cost Yr1 ($/yr)		
NH_3 Synthesis Package Specific Energy Consumption (kWhe AC/Kg NH_3)		Includes NH_3 Haber Bosch Process and N2 Air Separation Unit Consumption. To be verified with technology provider.
NH_3 Synthesis HB-ASU Package Energy Consumption Yr1 (kWhe AC/yr)		
NH_3 Synthesis HB-ASU Package Energy Consumption Net Cost Yr1 ($/yr)		
Other Infra Package Specific Energy Consumption (kWhe AC/Kg NH_3)		Spare allocation for any other infra requirements. Specify details (e.g. NH3 liquefaction for storage at ambient pressure, etc.). Set to zero if not req
Other Infra Package Energy Consumption Yr1 (kWhe AC/yr)		
Other Infra Package Energy Consumption Net Cost Yr1 ($/yr)		
General Fixed O&M Cost as % of EPC Cost (%)		Default is 3.11186% (estimate to be based on used technology & weighted average of all plant packages).
General Fixed O&M Annual Escalation Yr2+ (%)		Default is 2% (estimate to be based on CPI & Other Relevant Industrial Inflation Indexes).
General Fixed O&M Cost Yr1 w/ Taxes GST/VAT Yr1 ($/yr)		
RE Powered RO Desalinated Water Unit Rate Net Cost ($/$m^3$)		Based on economies of scale & "green water" (i.e. powered by renewables, RO desalination environmental impacts mitigated). GST/VAT is includ
Water Net Cost Annual Escalation Yr2+ (%)		Normally set to 0% (if quoted cost is levelized).
Specific Water Consumption (m^3/Kg H_2)		Based on selected electrolyzer technology.
Water Consumption Yr1 (m^3/yr)		
Water Consumption Net Cost Yr1 ($/yr)		
MMRA - Electrolyzer Stack Replacement Cost as % of Initial Package Cost (%)		Based on selected electrolyzer technology (Est. 32.27%). Net expenditure, Includes removal and residual value of used equipment (recycling).
MMRA - Electrolyzer Stack Replacement Year N, multi-interval (yr)	11	Fixed. Assumed Stack Life is 10 years and with one replacement cycle for 20 years plant life. Adjusted for multi-interval.
MMRA - Electrolyzer Stack Replacement Cost Allocation Yr1 to YrN-1, multi-interval ($/yr)		Major Maintenance Reserve Account (MMRA). Funded annually for N-1 years. Adjusted for multi-interval.
MMRA - NH_3 HB-ASU Major Overhaul Cost as % of Initial Package Cost (%)		Based on selected HB-ASU technology (Est. 10%). Net expenditure for major overhaul or modular capacity addition. Set to zero if not required.
MMRA - NH_3 HB-ASU Major Overhaul Year N, multi-interval (yr)	11	Fixed. Assumed major overhaul or modular capacity addition is 10 years and with 1 cycle for 20 years plant life. Adjusted for multi-interval.
MMRA - NH_3 HB-ASU Major Overhaul Cost Allocation Yr1 to YrN-1, multi-interval ($/yr)		Major Maintenance Reserve Account (MMRA). Major overhaul or modular capacity addition. Funded annually for N-1 years. Adjusted for multi-inte
Plant Leased Land Area (m^2)		Default estimate is 2 Hectares for 100 MWe plant. To be based on selected technology & project concept design.
Plant Leased Land Cost ($/$m^2$/yr)		Country Specific (e.g. default is 1 $/$m^2$). Could be 0 if project is exempted (free land grant/lease).
Plant Leased Land Cost ($/yr)		
System		
H_2 Electrolyzer Package Effective Capacity (kWe DC)		Applies to H2 production and CAPEX costing calculations. Degradation is applied to this effective capacity.
H_2 Electrolyzer Package Total Specific Energy Consumption Yr1 (kWhe AC/Kg H_2)		Net value kWh AC for complete package (Electrolyzer + BoP). Verify with selected technology provider.
H_2 Electrolyzer Stack Specific Energy Consumption Yr1 (kWhe AC/Kg H_2)		Calculated value: Net value kWh AC for Electrolyzer Stack Only. Verify with selected technology provider.
H_2 Balance of Plant (BoP) Specific Energy Consumption Yr1 (kWhe AC/Kg H_2)		Calculated value: Net value kWh AC for BoP Only. Verify with selected technology provider.
H_2 Electrolyzer Stack AC/DC Rectifier Efficiency (%)		Enter the efficiency of rectifier that powers electrolyzer stack.
H_2 Electrolyzer Stack Specific Energy Consumption Yr1 (kWhe DC/Kg H_2)		Calculated Net value kWh DC for Electrolyzer Stack Only. Based on selected technology.
H_2 Electrolyzer Package Specific Production Yr1 (Kg H_2/kWhe DC)		Calculated specific production value in Kg H2 per kWe DC plant effective capacity.
H_2 Electrolyzer Package Gross Production Rate (Kg H_2 per hr)		Calculated value. H2 electrolyzer gross hourly production rate capacity.
H_2 Electrolyzer Package Capacity Factor per Year (%)		Selected Capacity Factor shall match the available and used Weighted Average Cost of Energy (from VRE).
H_2 Electrolyzer Package Full Load Equivalent Operating Hours per Year (hr)		Calculated based on electrolyzer package capacity factor.
H_2 Electrolyzer Package Gross Annual Production Yr1 (Kg H_2)		Electrolyzer package gross production (excludes degradation and availability losses).
H_2 Electrolyzer Package Annual Production Degradation Yr1 (%/1000 hrs)		Linear Degradation. Verify with electrolyzer stack technology provider.
H_2 Electrolyzer Package Annual Production Degradation Yr2+ (%/1000 hrs)		Linear Degradation. Verify with electrolyzer stack technology provider.
Apply Degradation to H_2 Electrolyzer Package Annual Production ? (Yes/No)	Yes	Select "Yes" if stack degradation is to be accounted for ("Yes" is default setting). Select "No" if stack degradation is to be ignored.
H_2 Electrolyzer Package Annual Production Degradation Yr1 (%/year)		Linear degradation. Verify with electrolyzer stack technology provider. Calculated based on electrolyzer package annual capacity factor.
H_2 Electrolyzer Package Annual Production Degradation Yr2+ (%/year)		Linear degradation. Verify with electrolyzer stack technology provider. Calculated based on electrolyzer package annual capacity factor.
Plant Annual Availability (%)		Default is 99.5% if electrolyzer package default capacity factor is around 60%. If intended capacity factor is 100%, then set availability to max 97%
H_2 Electrolyzer Package Net Annual Production Yr1 (Kg H_2)		Includes electrolyzer package degradation losses (if applied) and plant annual availability losses.
NH_3 HB Synthesis Package Ideal NH_3 Production (Kg NH_3 per Kg H_2)		Value based on molar weights of N_2, H_2, NH_3.
NH_3 HB Synthesis Package Losses (%)		Conversion yield losses. To be verified with NH_3 synthesis package technology provider.
NH_3 HB Synthesis Package Estimated NH_3 Production (Kg NH_3 per Kg H_2)		Calculated value. Includes synthesis conversion losses.
NH_3 HB Synthesis Package Specific Production Yr1 (Kg NH_3 per KWe DC per hr)		Calculated value. NH3 synthesis hourly production rate capacity per kWe DC.
NH_3 HB Synthesis Package Gross Production Rate (Kg NH_3 per hr)		Calculated value. NH3 synthesis gross hourly production rate capacity.
NH_3 HB Synthesis Package Gross Annual Production Yr1 (Kg NH_3)		Calculated value. Accounts for plant annual capacity factor.
NH_3 HB Synthesis Package Annual Production Degradation Yr1 (%/1000 hrs)		Linear Degradation. Verify with NH_3 synthesis package technology provider.
NH_3 HB Synthesis Package Annual Production Degradation Yr2+ (%/1000 hrs)		Linear Degradation. Verify with NH_3 synthesis package technology provider.
Apply Degradation to NH_3 Synthesis Package Annual Production ? (Yes/No)	Yes	Select "Yes" if NH_3 synthesis degradation is to be accounted for ("Yes" is default setting). Select "No" if NH3 synthesis degradation is to be ignored
NH_3 HB Synthesis Package Annual Production Degradation Yr1 (%/year)		Linear degradation. Verify with NH_3 synthesis technology provider. Calculated based on plant annual capacity factor.
NH_3 HB Synthesis Package Annual Production Degradation Yr2+ (%/year)		Linear degradation. Verify with NH_3 synthesis technology provider. Calculated based on plant annual capacity factor.
Applied NH_3 HB Synthesis Package Annual Production Degradation Yr1 (%/year)		Calculated based on MAX value of: stack degradation & NH_3 synthesis HB degradation.
Applied NH_3 HB Synthesis Package Annual Production Degradation Yr2+ (%/year)		Calculated based on MAX value of: stack degradation & NH_3 synthesis HB degradation.
NH_3 HB Synthesis Package Net Annual Production Yr1 (Kg NH_3)		Calculated value. Plant capacity factor, plant annual availability, stack degradation, synthesis losses & degradation are accounted for.
Residual Value at End of Service Life		
Net of Decommissioning Cost & Residual Value, as % of EPC at EoL	0.00%	Fixed and set to 0% (deactivated function, Decom Cost = Residual Value).

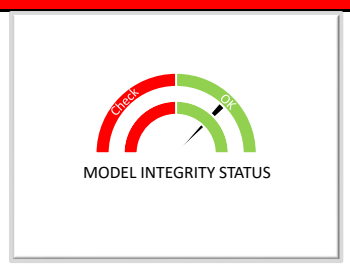
Green Ammonia from RE Powered Electrolysis & HB-ASU Plant - Levelized Cost of Ammonia (LCOA)

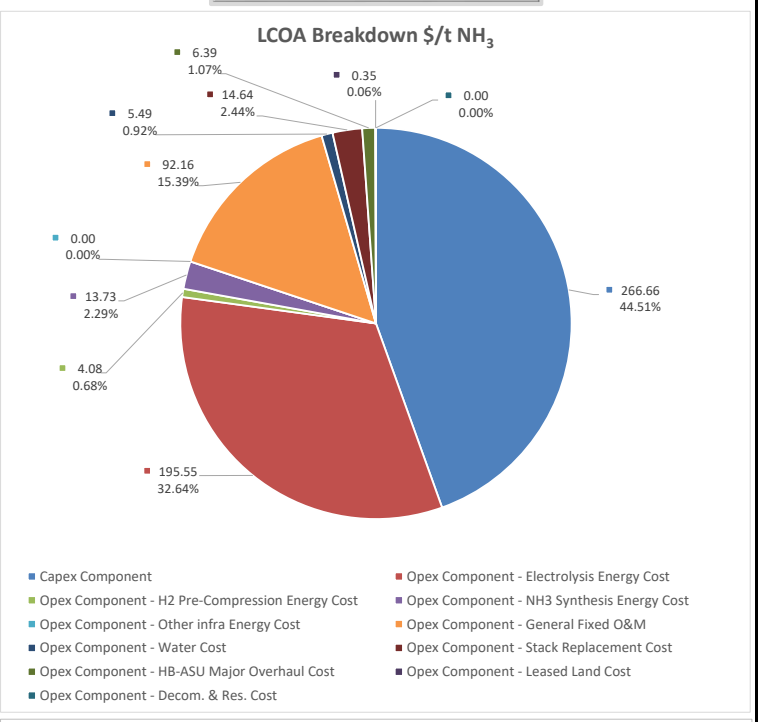
PRE-FEASIBILITY ECONOMIC ANALYSIS - BASELINE CASE - SUMMARY INPUTS & OUTPUTS

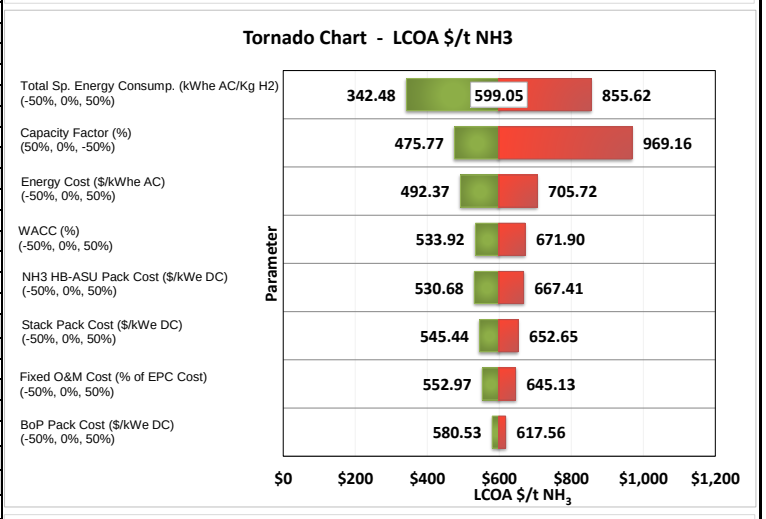
INPUTS	
	Fill In Inputs - White Background Cells Only
General	
Analysis Period (years)	20
Reference Year for Technology & Costs (year)	2025
Electrolyzer Technology	PEM
H_2 Plant Economies of Scale (MWe)	1000
Finance Structure	
Debt Percentage	70.00%
Equity Percentage	30.00%
Debt Interest Rate	5.00%
Return on Equity Rate	10.00%
WACC / Nominal Discount Rate	6.50%
Capital Expenditure	
Electrolyzer Stack Package Cost ($/kWe DC)	$375.00
Electrolyzer Stack Package Cost ($)	$375,000,000.00
Electrical & Mechanical BoP Packages Cost ($/kWe DC)	$150.00
Electrical & Mechanical BoP Packages Cost ($)	$150,000,000.00
Overall Civil & Infrastructure Package Cost ($/kWe DC)	$40.00
Overall Civil & Infrastructure Package Cost ($)	$40,000,000.00
H_2 Buffer Storage Capacity in H_2 Production Days (day)	1.00
H_2 Buffer Storage Capacity (Kg H_2)	488,499.90
H_2 Buffer Storage Package Cost ($/Kg H_2)	$305.00
H_2 Buffer Storage Package Cost ($)	$148,992,468.96
H_2 Buffer Storage Package Cost ($/kWe DC)	$148.99
H_2 Pre-Compression Package Cost ($/Kg H_2/h)	$2,624.00
H_2 Pre-Compression Package Cost ($)	$53,409,322.21
H_2 Pre-Compression Package Cost ($/kWe DC)	$53.41
NH_3 Synthesis HB-ASU Package Cost ($/kWe DC)	$528.00
NH_3 Synthesis HB-ASU Package Cost ($)	$528,000,000.00
NH_3 Storage Capacity in NH_3 Synthesis Production Days (day)	20.00
NH_3 Storage Capacity (Kg NH_3)	53,379,391.67
NH_3 Storage Package Cost ($/Kg NH_3)	$0.96
NH_3 Storage Package Cost ($)	$51,244,216.00
NH_3 Storage Package Cost ($/kWe DC)	$51.24
Other Infra Package Cost ($/Kg NH_3/h)	$0.00
Other Infra Package Cost ($)	$0.00
Other Infra Package Cost ($/kWe DC)	$0.00
HV Substation Package Cost ($/kWe DC)	$0.00
HV Substation Package Cost ($)	$0.00
Plant Start-up Package Cost ($/kWe DC)	$18.00
Plant Start-up Package Cost ($)	$18,000,000.00
EPCM Service Package Cost ($/kWe DC)	$60.00
EPCM Service Package Cost ($)	$60,000,000.00
EPC Cost ($/kWe DC)	$1,424.65
EPC Cost ($)	$1,424,646,007.17
Project Developer Contingencies Allocation as % of EPC Cost (%)	2.00%
Project Developer Contingencies Allocation Cost ($/kWe DC)	$28.49
Project Developer Contingencies Allocation Cost ($)	$28,492,920.14
Project Development Cost ($/kWe DC)	$40.00
Project Development Cost ($)	$40,000,000.00
Total CAPEX Cost ($/kWe DC)	$1,493.14
Total CAPEX Cost ($)	$1,493,138,927.31
Taxes GST/VAT Rate During Construction (%)	5.00%
Taxes GST/VAT ($/kWe DC)	$74.66
Taxes GST/VAT ($)	$74,656,946.37
Finance Cost During Construction as % of Total CAPEX w/ Taxes (%)	6.14%
Finance Cost During Construction ($/kWe DC)	$96.26
Finance Cost During Construction ($)	$96,262,666.64
Total Overnight CAPEX Cost w/ Taxes ($/kWe DC)	$1,664.06
Total Overnight CAPEX Cost w/ Taxes ($)	$1,664,058,540.32
O&M Expenditure	
Taxes GST/VAT Rate During Operation (%)	5.00%
Weighted Avg. (PV &/or Wind &/or Other) Energy Unit Rate Net Cost ($/kWhe AC)	$0.020000
Energy Net Cost Annual Escalation Yr2+ (%)	0.00%
Electrolysis Package Energy Consumption Yr1 (kWhe AC/yr)	5,656,488,195.55
Electrolysis Package Energy Consumption Net Cost Yr1 ($/yr)	$113,129,763.91
H_2 Pre-Compression Package Specific Energy Consumption (kWhe AC/Kg H_2)	1.1135
H_2 Pre-Compression Package Energy Consumption Yr1 (kWhe AC/yr)	117,904,251.22
H_2 Pre-Compression Package Energy Consumption Net Cost Yr1 ($/yr)	$2,358,085.02
NH_3 Synthesis Package Specific Energy Consumption (kWhe AC/Kg NH_3)	0.6864
NH_3 Synthesis HB-ASU Package Energy Consumption Yr1 (kWhe AC/yr)	397,099,575.81
NH_3 Synthesis HB-ASU Package Energy Consumption Net Cost Yr1 ($/yr)	$7,941,991.52
Other Infra Package Specific Energy Consumption (kWhe AC/Kg NH_3)	0.0000
Other Infra Package Energy Consumption Yr1 (kWhe AC/yr)	0.00
Other Infra Package Energy Consumption Net Cost Yr1 ($/yr)	$0.00
General Fixed O&M Cost as % of EPC Cost (%)	3.11%
General Fixed O&M Annual Escalation Yr2+ (%)	1.50%
General Fixed O&M Cost Yr1 w/ Taxes GST/VAT Yr1 ($/yr)	$46,549,643.50
RE Powered RO Desalinated Water Unit Rate Net Cost ($/$m^3$)	$3.000000
Water Net Cost Annual Escalation Yr2+ (%)	0.00%
Specific Water Consumption (m^3/Kg H_2)	0.010000
Water Consumption Yr1 (m^3/yr)	1,058,870.87
Water Consumption Net Cost Yr1 ($/yr)	$3,176,612.61
MMRA - Electrolyzer Stack Replacement Cost as % of Initial Package Cost (%)	32.27%
MMRA - Electrolyzer Stack Replacement Year N, multi-interval (yr)	11
MMRA - Electrolyzer Stack Replacement Cost Allocation Yr1 to YrN-1, multi-interval ($/yr)	$12,704,973.75
MMRA - NH_3 HB-ASU Major Overhaul Cost as % of Initial Package Cost (%)	10.00%
MMRA - NH_3 HB-ASU Major Overhaul Year N, multi-interval (yr)	11
MMRA - NH_3 HB-ASU Major Overhaul Cost Allocation Yr1 to YrN-1, multi-interval ($/yr)	$5,544,000.00
Plant Leased Land Area (m^2)	200,000.00
Plant Leased Land Cost ($/$m^2$/yr)	$1.0000
Plant Leased Land Cost ($/yr)	$200,000.00
System	
H_2 Electrolyzer Package Effective Capacity (kWe DC)	1,000,000.00
H_2 Electrolyzer Package Total Specific Energy Consumption Yr1 (kWhe AC/Kg H_2)	53.4200
H_2 Electrolyzer Stack Specific Energy Consumption Yr1 (kWhe AC/Kg H_2)	49.9289
H_2 Balance of Plant (BoP) Specific Energy Consumption Yr1 (kWhe AC/Kg H_2)	3.4911
H_2 Electrolyzer Stack AC/DC Rectifier Efficiency (%)	98.40%
H_2 Electrolyzer Stack Specific Energy Consumption Yr1 (kWhe DC/Kg H_2)	49.1300
H_2 Electrolyzer Package Specific Production Yr1 (Kg H_2/kWhe DC)	0.0204
H_2 Electrolyzer Package Gross Production Rate (Kg H_2 per hr)	20,354.1624
H_2 Electrolyzer Package Capacity Factor per Year (%)	60.00%
H_2 Electrolyzer Package Full Load Equivalent Operating Hours per Year (hr)	5,256.00
H_2 Electrolyzer Package Gross Annual Production Yr1 (Kg H_2)	106,981,477.71
H_2 Electrolyzer Package Annual Production Degradation Yr1 (%/1000 hrs)	0.10000%
H_2 Electrolyzer Package Annual Production Degradation Yr2+ (%/1000 hrs)	0.10000%
Apply Degradation to H_2 Electrolyzer Package Annual Production ? (Yes/No)	Yes
H_2 Electrolyzer Package Annual Production Degradation Yr1 (%/year)	0.52560%
H_2 Electrolyzer Package Annual Production Degradation Yr2+ (%/year)	0.52560%
Plant Annual Availability (%)	99.50%
H_2 Electrolyzer Package Net Annual Production Yr1 (Kg H_2)	105,887,087.15
NH_3 HB Synthesis Package Ideal NH_3 Production (Kg NH_3 per Kg H_2)	5.632581
NH_3 HB Synthesis Package Losses (%)	3.00%
NH_3 HB Synthesis Package Estimated NH_3 Production (Kg NH_3 per Kg H_2)	5.463603
NH_3 HB Synthesis Package Specific Production Yr1 (Kg NH_3 per KWe DC per hr)	0.1112
NH_3 HB Synthesis Package Gross Production Rate (Kg NH_3 per hr)	111,207.07
NH_3 HB Synthesis Package Gross Annual Production Yr1 (Kg NH_3)	584,504,338.76
NH_3 HB Synthesis Package Annual Production Degradation Yr1 (%/1000 hrs)	0.10000%
NH_3 HB Synthesis Package Annual Production Degradation Yr2+ (%/1000 hrs)	0.10000%
Apply Degradation to NH_3 Synthesis Package Annual Production ? (Yes/No)	Yes
NH_3 HB Synthesis Package Annual Production Degradation Yr1 (%/year)	0.52560%
NH_3 HB Synthesis Package Annual Production Degradation Yr2+ (%/year)	0.52560%
Applied NH_3 HB Synthesis Package Annual Production Degradation Yr1 (%/year)	0.52560%
Applied NH_3 HB Synthesis Package Annual Production Degradation Yr2+ (%/year)	0.52560%
NH_3 HB Synthesis Package Net Annual Production Yr1 (Kg NH_3)	578,525,023.03
Residual Value at End of Service Life	
Net of Decommissioning Cost & Residual Value, as % of EPC at EoL	0.00%

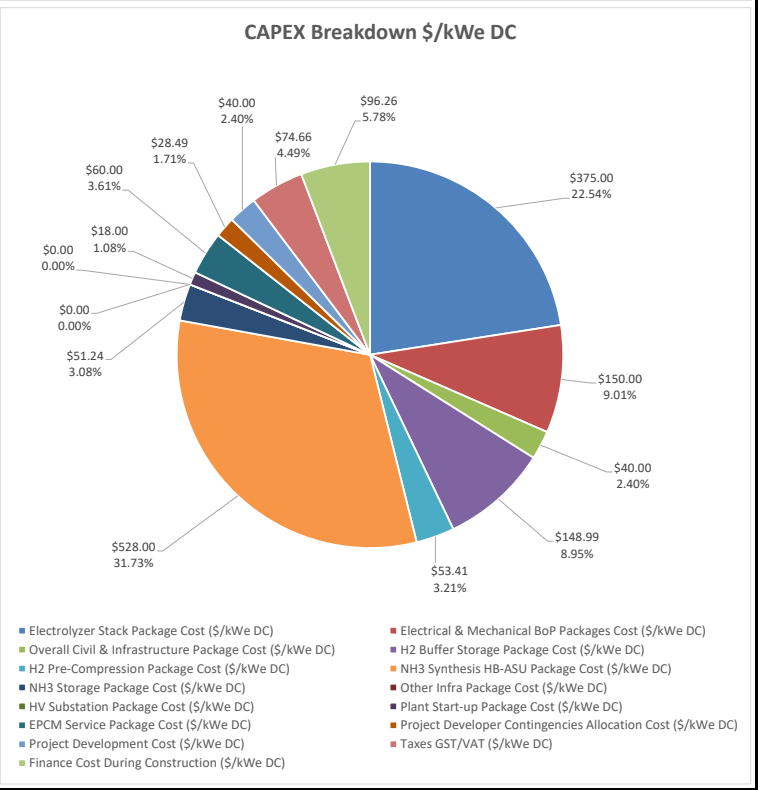
OUTPUTS - 20 Years

LCOA Component	Component $/t NH_3	Component Percentage
Capex Component	266.66	44.51%
Opex Component - Electrolysis Energy Cost	195.55	32.64%
Opex Component - H_2 Pre-Compression Energy Cost	4.08	0.68%
Opex Component - NH_3 Synthesis Energy Cost	13.73	2.29%
Opex Component - Other infra Energy Cost	0.00	0.00%
Opex Component - General Fixed O&M	92.16	15.39%
Opex Component - Water Cost	5.49	0.92%
Opex Component - Stack Replacement Cost	14.64	2.44%
Opex Component - HB-ASU Major Overhaul Cost	6.39	1.07%
Opex Component - Leased Land Cost	0.35	0.06%
Opex Component - Decom. & Res. Cost	0.00	0.00%
		Total Percentage Check
		100.00%
LCOA ($/t NH_3)	**599.05**	
LCOA (AED/t NH_3)	**2,201.50**	
Model Integrity OK? (True/False)	**TRUE**	









PRO-FORMA CASHFLOW — 20 Years

Year	NPV Calc.	0	1	2	3	4	5	6	7	8	9	10
Construction Period Flag		1	0	0	0	0	0	0	0	0	0	0
Operations Period Flag		0	1	1	1	1	1	1	1	1	1	1
H_2 Electrolyzer Package Gross Annual Production - (Kg H_2)	$1,178,776,187.51		106,981,477.71	106,981,477.71	106,981,477.71	106,981,477.71	106,981,477.71	106,981,477.71	106,981,477.71	106,981,477.71	106,981,477.71	106,981,477.71
Electrolyzer Package Net Annual Production - w/ Lin. Deg. & Avail. Losses - (Kg H_2)	$1,142,158,248.72		105,887,087.15	105,327,603.98	104,768,120.80	104,208,637.63	103,649,154.46	103,089,671.28	102,530,188.11	101,970,704.93	101,411,221.76	100,851,738.59
Electrolyzer Stack Cycle Number			1	1	1	1	1	1	1	1	1	1
Electrolyzer Stack Replacement Flag			0	0	0	0	0	0	0	0	0	0
NH_3 Synthesis Package Gross Annual Production - (Kg NH_3)	$6,440,365,292.72		584,504,338.76	584,504,338.76	584,504,338.76	584,504,338.76	584,504,338.76	584,504,338.76	584,504,338.76	584,504,338.76	584,504,338.76	584,504,338.76
Synthesis Package Net Annual Production - w/ Lin. Deg. & Avail. Losses - (Kg NH_3)	$6,240,299,406.97		578,525,023.03	575,468,229.00	572,411,434.97	569,354,640.94	566,297,846.91	563,241,052.88	560,184,258.85	557,127,464.82	554,070,670.79	551,013,876.76
NH_3 Synthesis Package Cycle Number			1	1	1	1	1	1	1	1	1	1
NH3 Synthesis Package Major Overhaul Flag			0	0	0	0	0	0	0	0	0	0
Operating Expenses												
Electrolysis Energy Consumption Net Cost ($/yr)	$1,220,281,872.93		113,129,763.91	112,532,012.09	111,934,260.27	111,336,508.44	110,738,756.62	110,141,004.80	109,543,252.97	108,945,501.15	108,347,749.33	107,749,997.51
General Fixed O&M Cost Yr1 w/ Taxes GST/VAT ($/yr)	$575,136,254.05		46,549,643.50	47,247,888.15	47,956,606.47	48,675,955.57	49,406,094.90	50,147,186.33	50,899,394.12	51,662,885.03	52,437,828.31	53,224,395.73
Water Consumption Net Cost ($/yr)	$34,264,747.46		3,176,612.61	3,159,828.12	3,143,043.62	3,126,259.13	3,109,474.63	3,092,690.14	3,075,905.64	3,059,121.15	3,042,336.65	3,025,552.16
MMRA - Electrolyzer Stack Replacement Cost Allocation Yr1 to YrN-1, multi-interval ($/yr)	$91,333,899.27		12,704,973.75	12,704,973.75	12,704,973.75	12,704,973.75	12,704,973.75	12,704,973.75	12,704,973.75	12,704,973.75	12,704,973.75	12,704,973.75
H_2 Pre-Compression Package Energy Consumption Net Cost ($/yr)	$25,435,644.08		2,358,085.02	2,345,625.44	2,333,165.86	2,320,706.28	2,308,246.69	2,295,787.11	2,283,327.53	2,270,867.95	2,258,408.36	2,245,948.78
NH_3 Synthesis HB-ASU Package Energy Consumption Net Cost ($/yr)	$85,666,830.26		7,941,991.52	7,900,027.85	7,858,064.18	7,816,100.51	7,774,136.84	7,732,173.17	7,690,209.51	7,648,245.84	7,606,282.17	7,564,318.50
Other Infra Package Energy Consumption Net Cost ($/yr)	$0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MMRA - NH_3 HB-ASU Major Overhaul Cost Allocation Yr1 to YrN-1, multi-interval ($/yr)	$39,854,874.75		5,544,000.00	5,544,000.00	5,544,000.00	5,544,000.00	5,544,000.00	5,544,000.00	5,544,000.00	5,544,000.00	5,544,000.00	5,544,000.00
[Spare]	$0.00											
[Spare]	$0.00											
[Spare]	$0.00											
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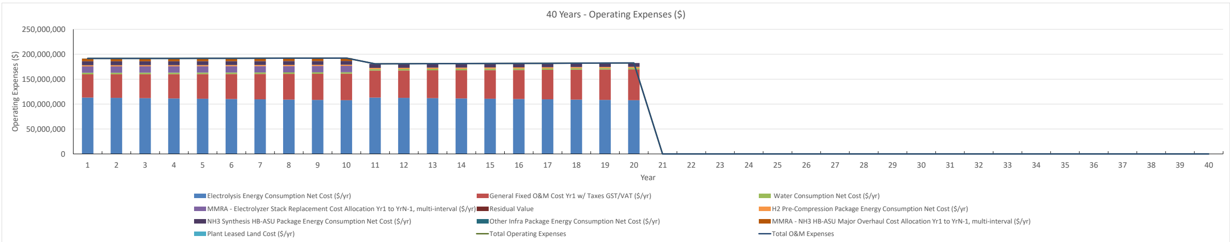
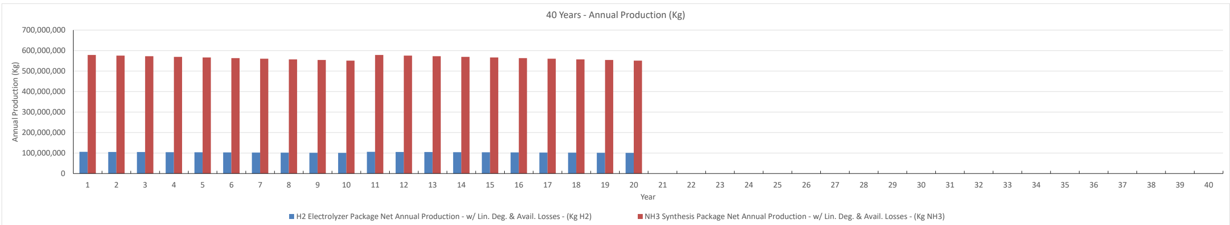
[Spare]	$0.00											
[Spare]	$0.00											
[Spare]	$0.00											
[Spare]	$0.00											
Plant Leased Land Cost ($/yr)	$2,203,701.45		200,000.00	200,000.00	200,000.00	200,000.00	200,000.00	200,000.00	200,000.00	200,000.00	200,000.00	200,000.00
Total O&M Expenses	$2,074,177,824.26		191,605,070.31	191,634,355.40	191,674,114.15	191,724,503.68	191,785,683.44	191,857,815.30	191,941,063.52	192,035,594.87	192,141,578.57	192,259,186.43
Residual Value	$0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Operating Expenses	$2,074,177,824.26		191,605,070.31	191,634,355.40	191,674,114.15	191,724,503.68	191,785,683.44	191,857,815.30	191,941,063.52	192,035,594.87	192,141,578.57	192,259,186.43
Cost Flow	($2,074,177,824.26)	-1,664,058,540.32	-191,605,070.31	-191,634,355.40	-191,674,114.15	-191,724,503.68	-191,785,683.44	-191,857,815.30	-191,941,063.52	-192,035,594.87	-192,141,578.57	-192,259,186.43
Revenue (check @ LCOA)			346,564,024.88	344,732,859.76	342,901,694.64	341,070,529.52	339,239,364.40	337,408,199.29	335,577,034.17	333,745,869.05	331,914,703.93	330,083,538.81
Operations cashflow		-1,664,058,540.32	154,958,954.56	153,098,504.36	151,227,580.49	149,346,025.84	147,453,680.96	145,550,383.99	143,635,970.64	141,710,274.18	139,773,125.35	137,824,352.38
Calculated IRR (unleveraged)	6.50%											
Equity		-499,217,562.10										
WACC	6.50%											
Logic & Calc Check: WACC = IRR (Unleveraged). True/False	TRUE											

Year	11	12	13	14	15	16	17	18	19	20
Construction Period Flag	0	0	0	0	0	0	0	0	0	0
Operations Period Flag	1	1	1	1	1	1	1	1	1	1
H_2 Electrolyzer Package Gross Annual Production - (Kg H_2)	106,981,477.71	106,981,477.71	106,981,477.71	106,981,477.71	106,981,477.71	106,981,477.71	106,981,477.71	106,981,477.71	106,981,477.71	106,981,477.71
Electrolyzer Package Net Annual Production - w/ Lin. Deg. & Avail. Losses - (Kg H_2)	105,887,087.15	105,327,603.98	104,768,120.80	104,208,637.63	103,649,154.46	103,089,671.28	102,530,188.11	101,970,704.93	101,411,221.76	100,851,738.59
Electrolyzer Stack Cycle Number	2	2	2	2	2	2	2	2	2	2
Electrolyzer Stack Replacement Flag	1	0	0	0	0	0	0	0	0	0
NH_3 Synthesis Package Gross Annual Production - (Kg NH_3)	584,504,338.76	584,504,338.76	584,504,338.76	584,504,338.76	584,504,338.76	584,504,338.76	584,504,338.76	584,504,338.76	584,504,338.76	584,504,338.76
Synthesis Package Net Annual Production - w/ Lin. Deg. & Avail. Losses - (Kg NH_3)	578,525,023.03	575,468,229.00	572,411,434.97	569,354,640.94	566,297,846.91	563,241,052.88	560,184,258.85	557,127,464.82	554,070,670.79	551,013,876.76
NH_3 Synthesis Package Cycle Number	2	2	2	2	2	2	2	2	2	2
NH3 Synthesis Package Major Overhaul Flag	1	0	0	0	0	0	0	0	0	0
Electrolysis Energy Consumption Net Cost ($/yr)	113,129,763.91	112,532,012.09	111,934,260.27	111,336,508.44	110,738,756.62	110,141,004.80	109,543,252.97	108,945,501.15	108,347,749.33	107,749,997.51
General Fixed O&M Cost Yr1 w/ Taxes GST/VAT ($/yr)	54,022,761.67	54,833,103.09	55,655,599.64	56,490,433.64	57,337,790.14	58,197,856.99	59,070,824.85	59,956,887.22	60,856,240.53	61,769,084.14
Water Consumption Net Cost ($/yr)	3,176,612.61	3,159,828.12	3,143,043.62	3,126,259.13	3,109,474.63	3,092,690.14	3,075,905.64	3,059,121.15	3,042,336.65	3,025,552.16
MMRA - Electrolyzer Stack Replacement Cost Allocation Yr1 to YrN-1, multi-interval ($/yr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
H_2 Pre-Compression Package Energy Consumption Net Cost ($/yr)	2,358,085.02	2,345,625.44	2,333,165.86	2,320,706.28	2,308,246.69	2,295,787.11	2,283,327.53	2,270,867.95	2,258,408.36	2,245,948.78
NH_3 Synthesis HB-ASU Package Energy Consumption Net Cost ($/yr)	7,941,991.52	7,900,027.85	7,858,064.18	7,816,100.51	7,774,136.84	7,732,173.17	7,690,209.51	7,648,245.84	7,606,282.17	7,564,318.50
Other Infra Package Energy Consumption Net Cost ($/yr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MMRA - NH_3 HB-ASU Major Overhaul Cost Allocation Yr1 to YrN-1, multi-interval ($/yr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Plant Leased Land Cost ($/yr)	200,000.00	200,000.00	200,000.00	200,000.00	200,000.00	200,000.00	200,000.00	200,000.00	200,000.00	200,000.00
Total O&M Expenses	180,829,214.74	180,970,596.59	181,124,133.57	181,290,008.00	181,468,404.93	181,659,512.21	181,863,520.50	182,080,623.30	182,311,017.04	182,554,901.08
Residual Value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Operating Expenses	180,829,214.74	180,970,596.59	181,124,133.57	181,290,008.00	181,468,404.93	181,659,512.21	181,863,520.50	182,080,623.30	182,311,017.04	182,554,901.08
Cost Flow	-180,829,214.74	-180,970,596.59	-181,124,133.57	-181,290,008.00	-181,468,404.93	-181,659,512.21	-181,863,520.50	-182,080,623.30	-182,311,017.04	-182,554,901.08
Revenue (check @ LCOA)	346,564,024.88	344,732,859.76	342,901,694.64	341,070,529.52	339,239,364.40	337,408,199.29	335,577,034.17	333,745,869.05	331,914,703.93	330,083,538.81
Operations cashflow	165,734,810.14	163,762,263.17	161,777,561.07	159,780,521.53	157,770,959.47	155,748,687.07	153,713,513.67	151,665,245.74	149,603,686.89	147,528,637.73

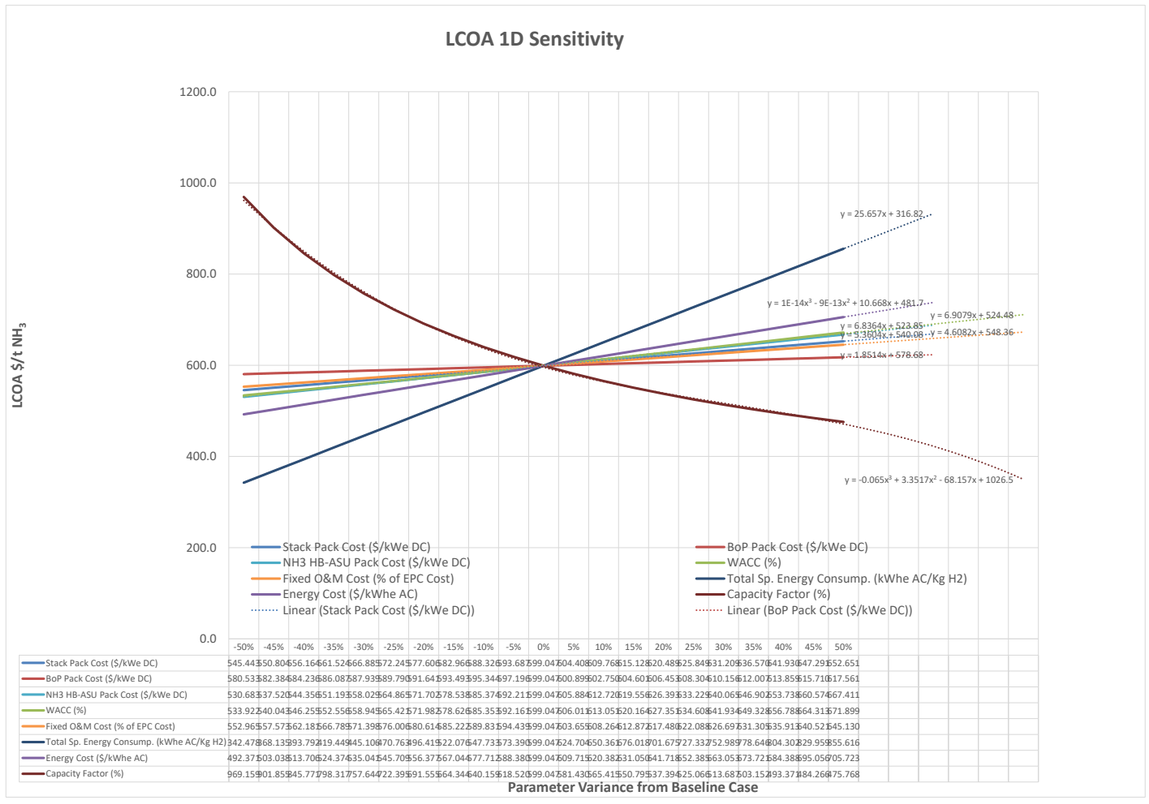
Year	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Construction Period Flag	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Operations Period Flag	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H_2 Electrolyzer Package Gross Annual Production - (Kg H_2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Electrolyzer Package Net Annual Production - w/ Lin. Deg. & Avail. Losses - (Kg H_2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Electrolyzer Stack Cycle Number	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Electrolyzer Stack Replacement Flag	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NH_3 Synthesis Package Gross Annual Production - (Kg NH_3)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Synthesis Package Net Annual Production - w/ Lin. Deg. & Avail. Losses - (Kg NH_3)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NH_3 Synthesis Package Cycle Number	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NH3 Synthesis Package Major Overhaul Flag	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Electrolysis Energy Consumption Net Cost ($/yr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Fixed O&M Cost Yr1 w/ Taxes GST/VAT ($/yr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Consumption Net Cost ($/yr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MMRA - Electrolyzer Stack Replacement Cost Allocation Yr1 to YrN-1, multi-interval ($/yr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
H_2 Pre-Compression Package Energy Consumption Net Cost ($/yr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NH_3 Synthesis HB-ASU Package Energy Consumption Net Cost ($/yr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other Infra Package Energy Consumption Net Cost ($/yr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MMRA - NH_3 HB-ASU Major Overhaul Cost Allocation Yr1 to YrN-1, multi-interval ($/yr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Plant Leased Land Cost ($/yr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total O&M Expenses	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Residual Value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Operating Expenses	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cost Flow	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Revenue (check @ LCOA)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Operations cashflow	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00



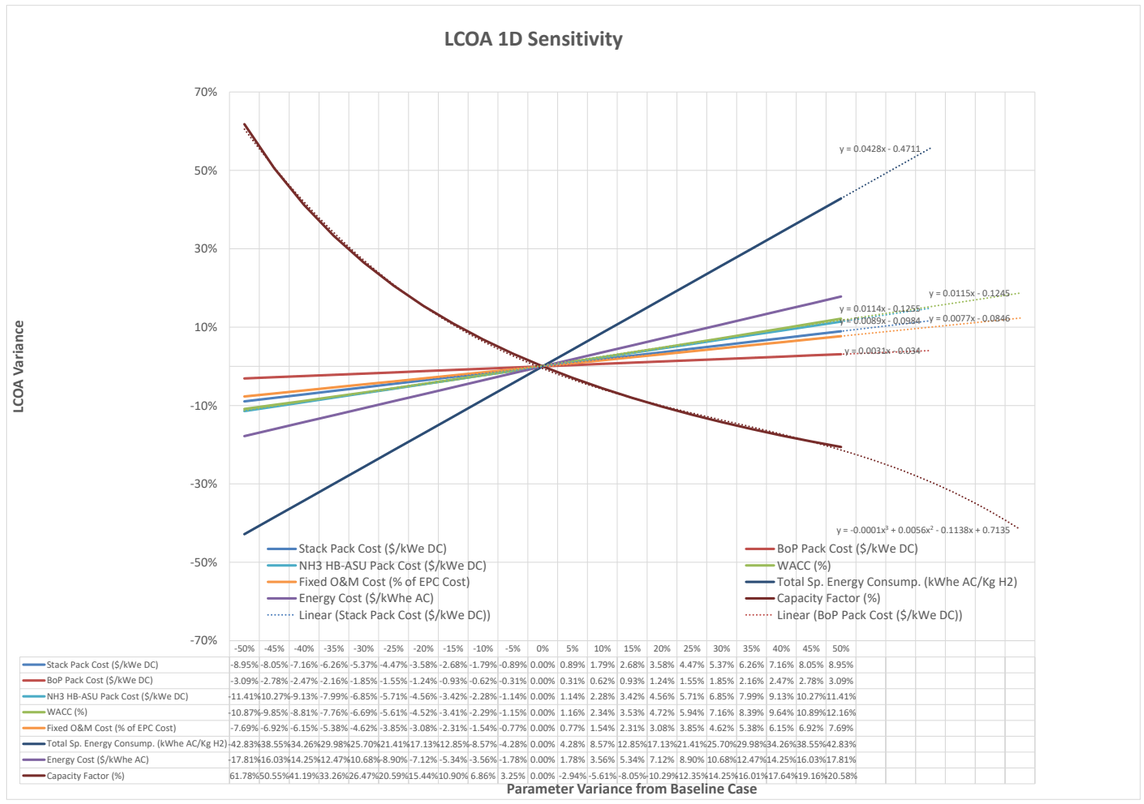


LCOA 1D Sensitivity Analysis

Parameter Variance	Stack Pack Cost ($/kWe DC)	LCOA	LCOA Variance	BoP Pack Cost ($/kWe DC)	LCOA	LCOA Variance	NH_3 HB-ASU Pack Cost ($/kWe DC)	LCOA	LCOA Variance	WACC (%)	LCOA	LCOA Variance	Energy Cost ($/kWhe AC)	LCOA	LCOA Variance	Fixed O&M Cost (% of EPC Cost)	LCOA	LCOA Variance	Total Sp. Energy Consump. (kWhe AC/Kg H_2)	LCOA	LCOA Variance	Capacity Factor (%)	LCOA	LCOA Variance
		599.0476			599.0476			599.0476			599.0476			599.0476			599.0476			599.0476			599.0476	
-50%	$187.50	545.4438	-8.95%	$75.00	580.5333	-3.09%	$264.00	530.6839	-11.41%	3.25%	533.9228	-10.87%	$0.010000	492.3713	-17.81%	1.56%	552.9652	-7.69%	26.71	342.4785	-42.83%	30.00%	969.1599	61.78%
-45%	$206.25	550.8041	-8.05%	$82.50	582.3847	-2.78%	$290.40	537.5203	-10.27%	3.58%	540.0436	-9.85%	$0.011000	503.0389	-16.03%	1.71%	557.5734	-6.92%	29.38	368.1354	-38.55%	33.00%	901.8558	50.55%
-40%	$225.00	556.1645	-7.16%	$90.00	584.2362	-2.47%	$316.80	544.3566	-9.13%	3.90%	546.2551	-8.81%	$0.012000	513.7065	-14.25%	1.87%	562.1817	-6.15%	32.05	393.7923	-34.26%	36.00%	845.7712	41.19%
-35%	$243.75	561.5249	-6.26%	$97.50	586.0876	-2.16%	$343.20	551.1930	-7.99%	4.23%	552.5562	-7.76%	$0.013000	524.3742	-12.47%	2.02%	566.7899	-5.38%	34.72	419.4492	-29.98%	39.00%	798.3171	33.26%
-30%	$262.50	566.8853	-5.37%	$105.00	587.9390	-1.85%	$369.60	558.0294	-6.85%	4.55%	558.9454	-6.69%	$0.014000	535.0418	-10.68%	2.18%	571.3981	-4.62%	37.39	445.1061	-25.70%	42.00%	757.6441	26.47%
-25%	$281.25	572.2457	-4.47%	$112.50	589.7904	-1.55%	$396.00	564.8657	-5.71%	4.88%	565.4212	-5.61%	$0.015000	545.7094	-8.90%	2.33%	576.0064	-3.85%	40.07	470.7630	-21.41%	45.00%	722.3959	20.59%
-20%	$300.00	577.6061	-3.58%	$120.00	591.6419	-1.24%	$422.40	571.7021	-4.56%	5.20%	571.9822	-4.52%	$0.016000	556.3771	-7.12%	2.49%	580.6146	-3.08%	42.74	496.4199	-17.13%	48.00%	691.5554	15.44%
-15%	$318.75	582.9664	-2.68%	$127.50	593.4933	-0.93%	$448.80	578.5385	-3.42%	5.53%	578.6269	-3.41%	$0.017000	567.0447	-5.34%	2.65%	585.2229	-2.31%	45.41	522.0769	-12.85%	51.00%	664.3448	10.90%
-10%	$337.50	588.3268	-1.79%	$135.00	595.3447	-0.62%	$475.20	585.3749	-2.28%	5.85%	585.3537	-2.29%	$0.018000	577.7123	-3.56%	2.80%	589.8311	-1.54%	48.08	547.7338	-8.57%	54.00%	640.1592	6.86%
-5%	$356.25	593.6872	-0.89%	$142.50	597.1962	-0.31%	$501.60	592.2112	-1.14%	6.18%	592.1612	-1.15%	$0.019000	588.3800	-1.78%	2.96%	594.4394	-0.77%	50.75	573.3907	-4.28%	57.00%	618.5208	3.25%
0%	**$375.00**	**599.0476**	**0.00%**	**$150.00**	**599.0476**	**0.00%**	**$528.00**	**599.0476**	**0.00%**	**6.50%**	**599.0476**	**0.00%**	**$0.020000**	**599.0476**	**0.00%**	**3.11%**	**599.0476**	**0.00%**	**53.42**	**599.0476**	**0.00%**	**60.00%**	**599.0476**	**0.00%**
5%	$393.75	604.4080	0.89%	$157.50	600.8990	0.31%	$554.40	605.8840	1.14%	6.83%	606.0114	1.16%	$0.021000	609.7152	1.78%	3.27%	603.6558	0.77%	56.09	624.7045	4.28%	63.00%	581.4303	-2.94%
10%	$412.50	609.7684	1.79%	$165.00	602.7505	0.62%	$580.80	612.7203	2.28%	7.15%	613.0511	2.34%	$0.022000	620.3829	3.56%	3.42%	608.2641	1.54%	58.76	650.3614	8.57%	66.00%	565.4159	-5.61%
15%	$431.25	615.1287	2.68%	$172.50	604.6019	0.93%	$607.20	619.5567	3.42%	7.48%	620.1649	3.53%	$0.023000	631.0505	5.34%	3.58%	612.8723	2.31%	61.43	676.0183	12.85%	69.00%	550.7952	-8.05%
20%	$450.00	620.4891	3.58%	$180.00	606.4533	1.24%	$633.60	626.3931	4.56%	7.80%	627.3512	4.72%	$0.024000	641.7181	7.12%	3.73%	617.4806	3.08%	64.10	701.6753	17.13%	72.00%	537.3941	-10.29%
25%	$468.75	625.8495	4.47%	$187.50	608.3047	1.55%	$660.00	633.2294	5.71%	8.13%	634.6084	5.94%	$0.025000	652.3858	8.90%	3.89%	622.0888	3.85%	66.78	727.3322	21.41%	75.00%	525.0661	-12.35%
30%	$487.50	631.2099	5.37%	$195.00	610.1562	1.85%	$686.40	640.0658	6.85%	8.45%	641.9348	7.16%	$0.026000	663.0534	10.68%	4.05%	626.6971	4.62%	69.45	752.9891	25.70%	78.00%	513.6876	-14.25%
35%	$506.25	636.5703	6.26%	$202.50	612.0076	2.16%	$712.80	646.9022	7.99%	8.78%	649.3288	8.39%	$0.027000	673.7210	12.47%	4.20%	631.3053	5.38%	72.12	778.6460	29.98%	81.00%	503.1529	-16.01%
40%	$525.00	641.9307	7.16%	$210.00	613.8590	2.47%	$739.20	653.7386	9.13%	9.10%	656.7888	9.64%	$0.028000	684.3887	14.25%	4.36%	635.9135	6.15%	74.79	804.3029	34.26%	84.00%	493.3718	-17.64%
45%	$543.75	647.2910	8.05%	$217.50	615.7105	2.78%	$765.60	660.5749	10.27%	9.43%	664.3130	10.89%	$0.029000	695.0563	16.03%	4.51%	640.5218	6.92%	77.46	829.9598	38.55%	87.00%	484.2662	-19.16%
50%	$562.50	652.6514	8.95%	$225.00	617.5619	3.09%	$792.00	667.4113	11.41%	9.75%	671.8998	12.16%	$0.030000	705.7239	17.81%	4.67%	645.1300	7.69%	80.13	855.6167	42.83%	90.00%	475.7685	-20.58%

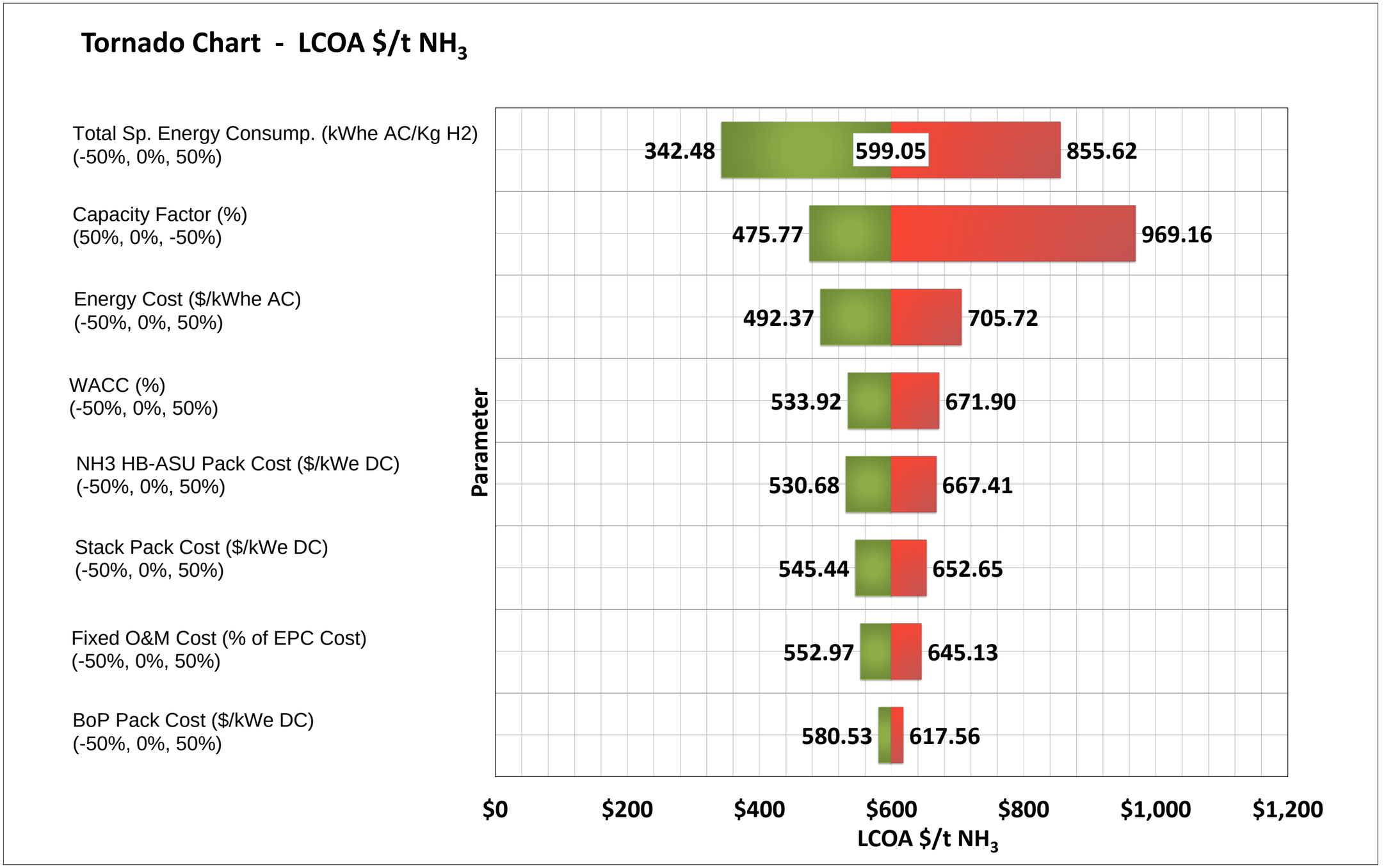


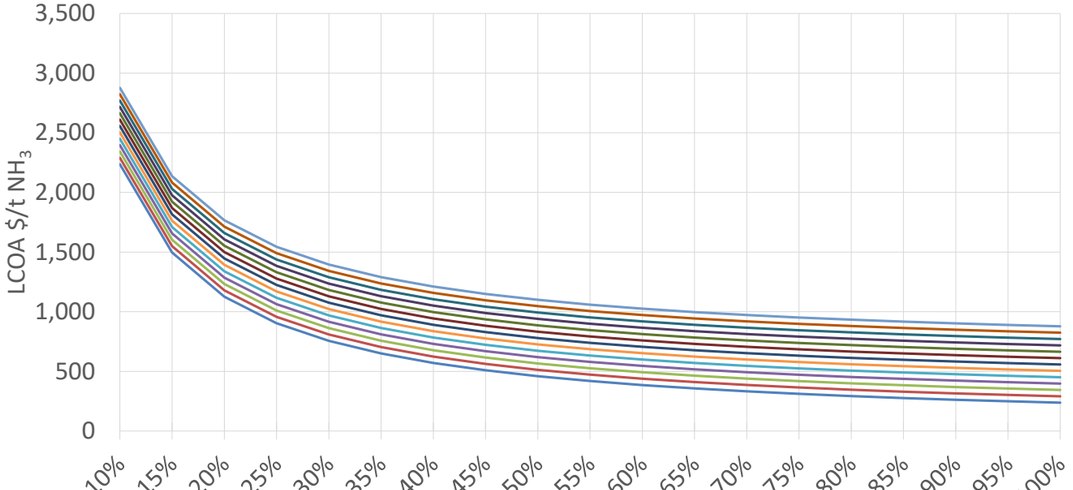
	-50%	-45%	-40%	-35%	-30%	-25%	-20%	-15%	-10%	-5%	0%	5%	10%	15%	20%	25%	30%	35%	40%	45%	50%
Stack Pack Cost ($/kWe DC)	$545.44	$550.80	$556.16	$561.52	$566.88	$572.24	$577.60	$582.96	$588.32	$593.68	$599.04	$604.40	$609.76	$615.12	$620.48	$625.84	$631.20	$636.57	$641.93	$647.29	$652.65
BoP Pack Cost ($/kWe DC)	$580.53	$582.38	$584.23	$586.08	$587.93	$589.79	$591.64	$593.49	$595.34	$597.19	$599.04	$600.89	$602.75	$604.60	$606.45	$608.30	$610.15	$612.00	$613.85	$615.71	$617.56
NH3 HB-ASU Pack Cost ($/kWe DC)	$530.68	$537.52	$544.35	$551.19	$558.02	$564.86	$571.70	$578.53	$585.37	$592.21	$599.04	$605.88	$612.72	$619.55	$626.39	$633.22	$640.06	$646.90	$653.73	$660.57	$667.41
WACC (%)	$533.92	$540.04	$546.25	$552.55	$558.94	$565.42	$571.98	$578.62	$585.35	$592.16	$599.04	$606.01	$613.05	$620.16	$627.35	$634.60	$641.93	$649.32	$656.78	$664.31	$671.89
Fixed O&M Cost (% of EPC Cost)	$552.96	$557.57	$562.18	$566.78	$571.39	$576.00	$580.61	$585.22	$589.83	$594.43	$599.04	$603.65	$608.26	$612.87	$617.48	$622.08	$626.69	$631.30	$635.91	$640.52	$645.13
Total Sp. Energy Consump. (kWhe AC/Kg H2)	$542.47	$568.13	$593.79	$619.44	$645.10	$670.76	$696.41	$722.07	$747.73	$773.39	$799.04	$824.70	$850.36	$876.01	$901.67	$927.33	$952.98	$978.64	$1,004.30	$1,029.95	$1,055.61
Energy Cost ($/kWhe AC)	$492.37	$503.03	$513.70	$524.37	$535.04	$545.70	$556.37	$567.04	$577.71	$588.38	$599.04	$609.71	$620.38	$631.05	$641.71	$652.38	$663.05	$673.72	$684.38	$695.05	$705.72
Capacity Factor (%)	$969.15	$901.85	$845.77	$798.31	$757.64	$722.39	$691.55	$664.34	$640.15	$618.52	$599.04	$581.43	$565.41	$550.79	$537.39	$525.06	$513.68	$503.15	$493.37	$484.26	$475.76

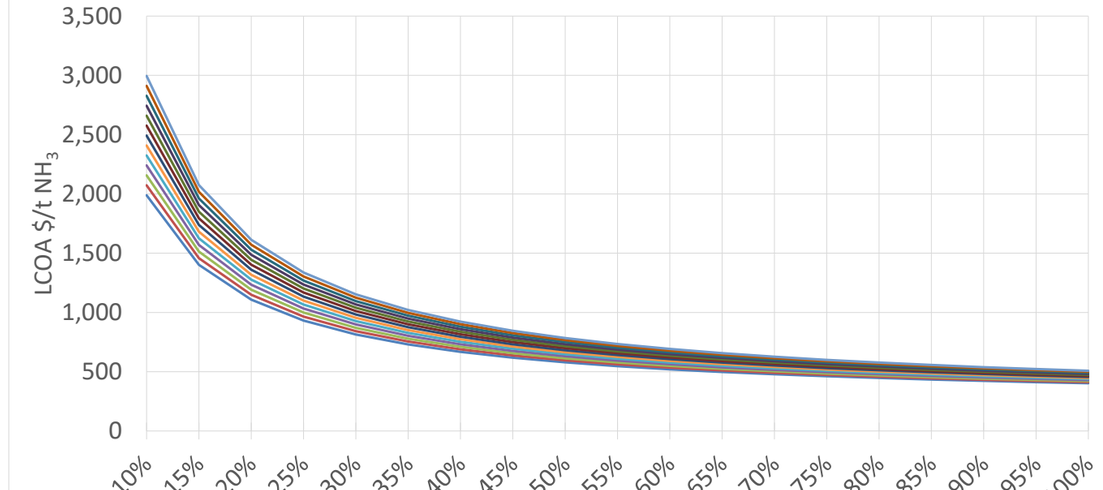


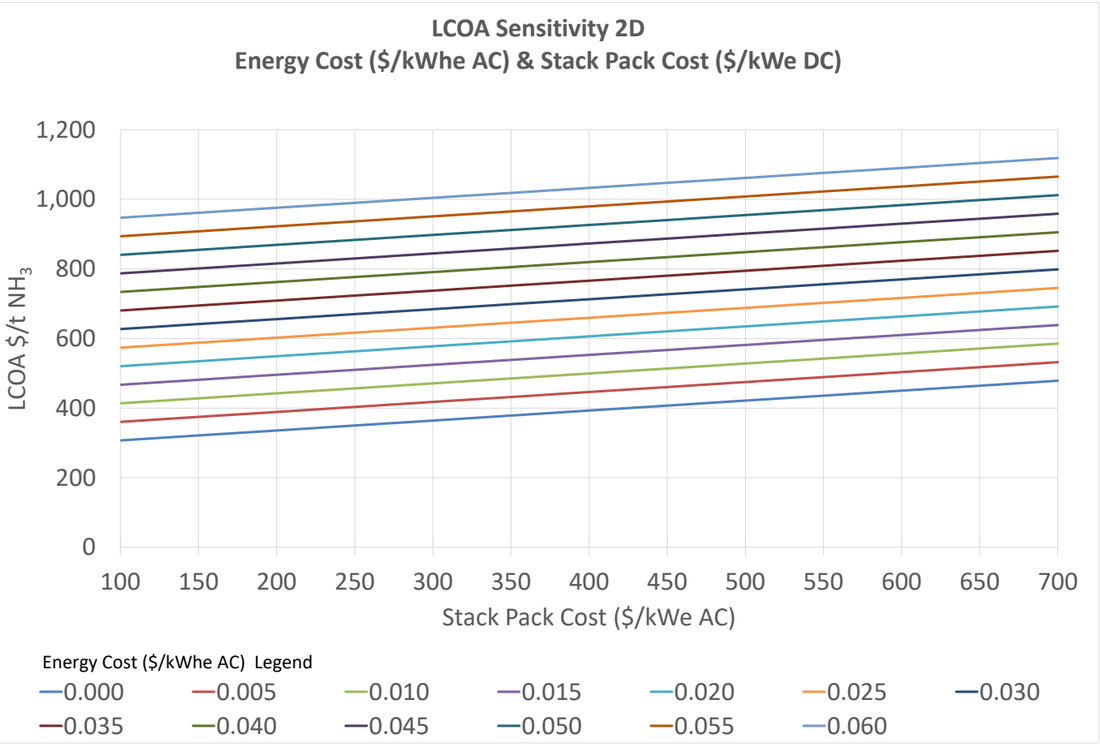
	-50%	-45%	-40%	-35%	-30%	-25%	-20%	-15%	-10%	-5%	0%	5%	10%	15%	20%	25%	30%	35%	40%	45%	50%
Stack Pack Cost ($/kWe DC)	-8.95%	-8.05%	-7.16%	-6.26%	-5.37%	-4.47%	-3.58%	-2.68%	-1.79%	-0.89%	0.00%	0.89%	1.79%	2.68%	3.58%	4.47%	5.37%	6.26%	7.16%	8.05%	8.95%
BoP Pack Cost ($/kWe DC)	-3.09%	-2.78%	-2.47%	-2.16%	-1.85%	-1.55%	-1.24%	-0.93%	-0.62%	-0.31%	0.00%	0.31%	0.62%	0.93%	1.24%	1.55%	1.85%	2.16%	2.47%	2.78%	3.09%
NH3 HB-ASU Pack Cost ($/kWe DC)	-11.41%	-10.27%	-9.13%	-7.99%	-6.85%	-5.71%	-4.56%	-3.42%	-2.28%	-1.14%	0.00%	1.14%	2.28%	3.42%	4.56%	5.71%	6.85%	7.99%	9.13%	10.27%	11.41%
WACC (%)	-10.87%	-9.85%	-8.81%	-7.76%	-6.69%	-5.61%	-4.52%	-3.41%	-2.29%	-1.15%	0.00%	1.16%	2.34%	3.53%	4.72%	5.94%	7.16%	8.39%	9.64%	10.89%	12.16%
Fixed O&M Cost (% of EPC Cost)	-7.69%	-6.92%	-6.15%	-5.38%	-4.62%	-3.85%	-3.08%	-2.31%	-1.54%	-0.77%	0.00%	0.77%	1.54%	2.31%	3.08%	3.85%	4.62%	5.38%	6.15%	6.92%	7.69%
Total Sp. Energy Consump. (kWhe AC/Kg H2)	-42.83%	-38.55%	-34.26%	-29.98%	-25.70%	-21.41%	-17.13%	-12.85%	-8.57%	-4.28%	0.00%	4.28%	8.57%	12.85%	17.13%	21.41%	25.70%	29.98%	34.26%	38.55%	42.83%
Energy Cost ($/kWhe AC)	-17.81%	-16.03%	-14.25%	-12.47%	-10.68%	-8.90%	-7.12%	-5.34%	-3.56%	-1.78%	0.00%	1.78%	3.56%	5.34%	7.12%	8.90%	10.68%	12.47%	14.25%	16.03%	17.81%
Capacity Factor (%)	61.78%	50.55%	41.19%	33.26%	26.47%	20.59%	15.44%	10.90%	6.86%	3.25%	0.00%	-2.94%	-5.61%	-8.05%	-10.29%	-12.35%	-14.25%	-16.01%	-17.64%	-19.16%	-20.58%

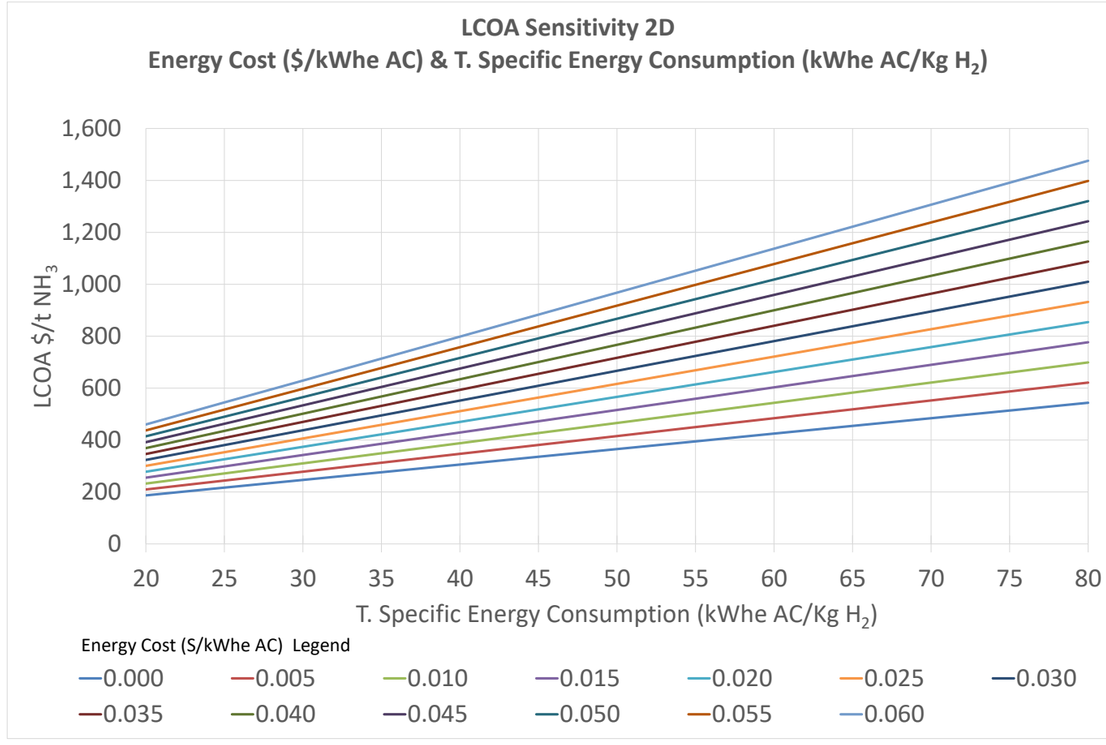
Tornado Chart - LCOA $/t NH_3

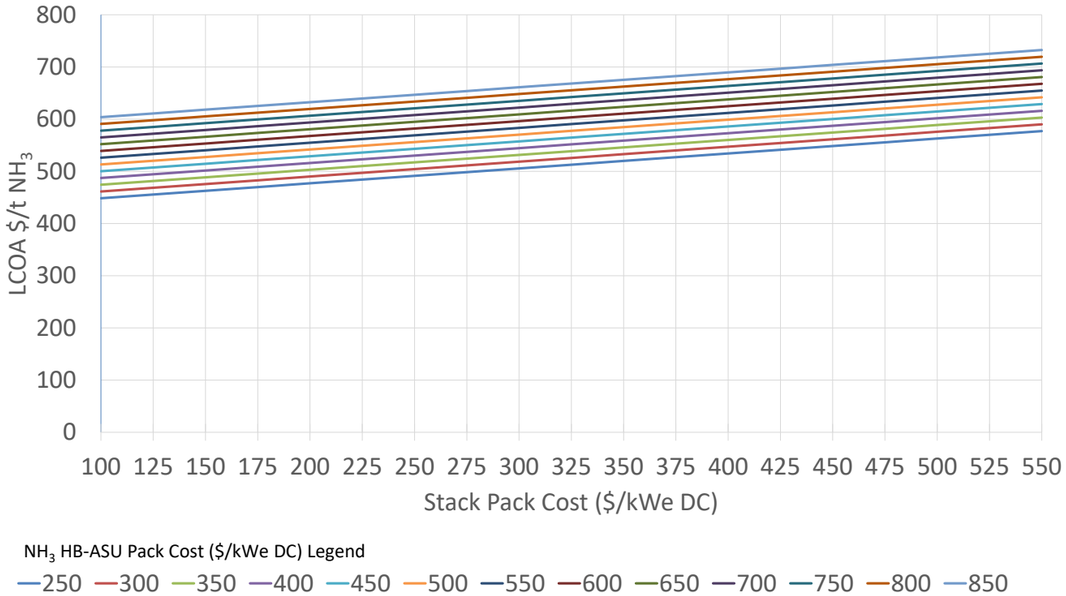


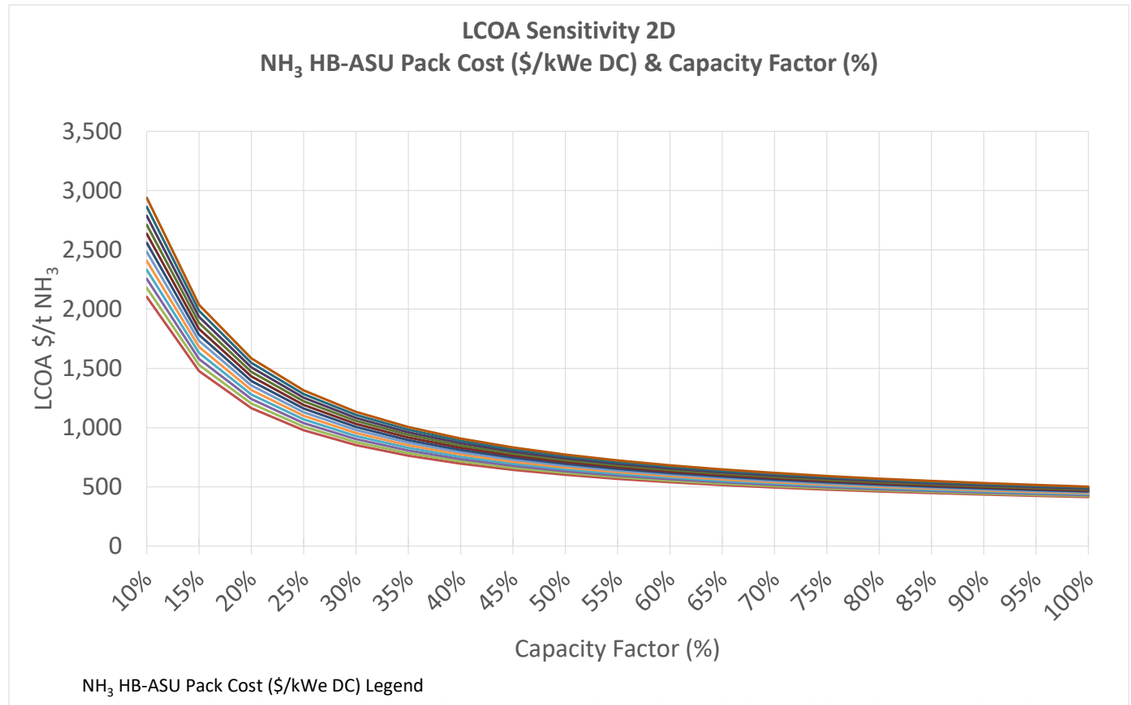


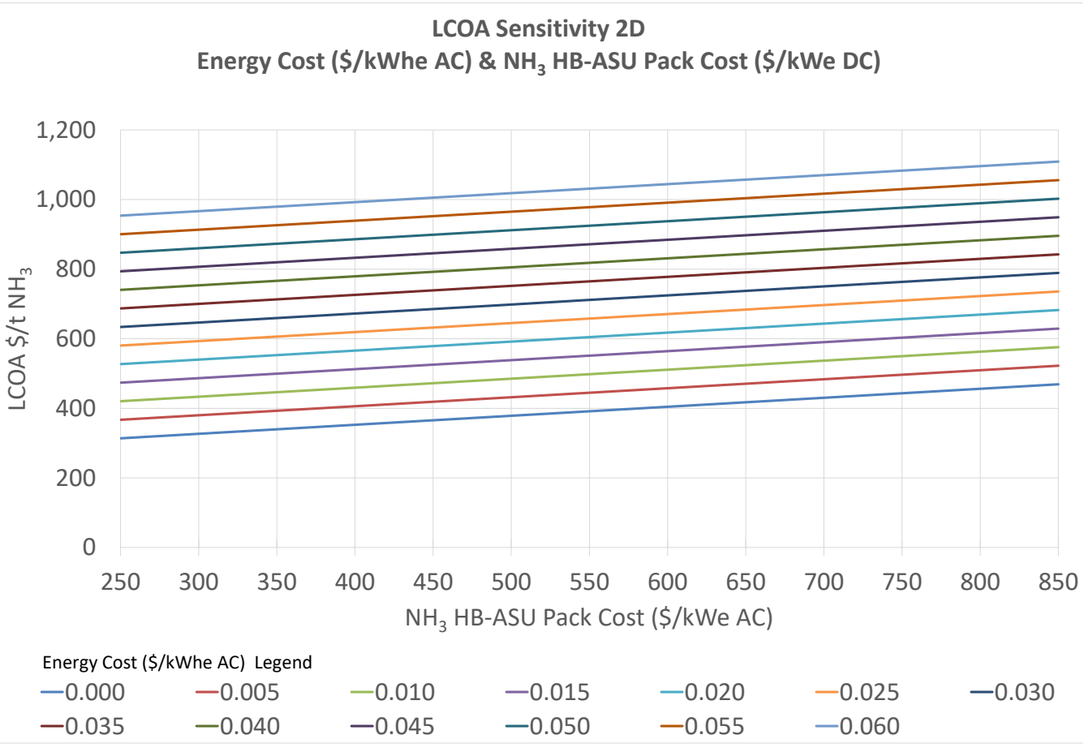


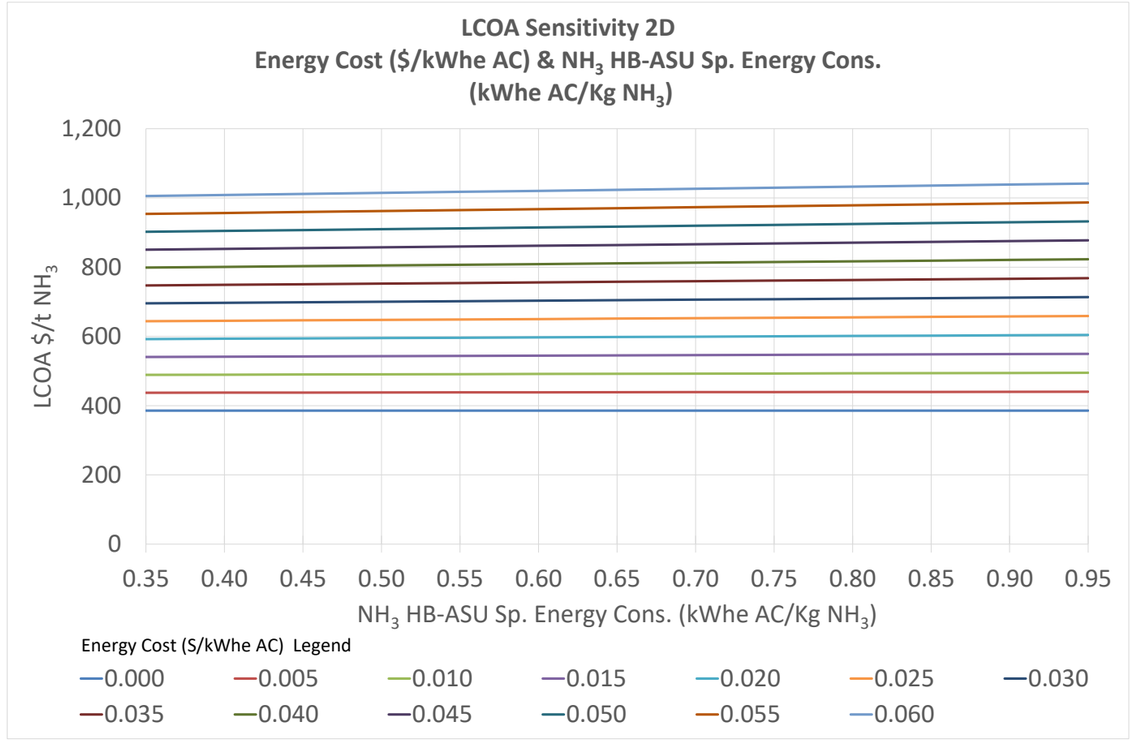


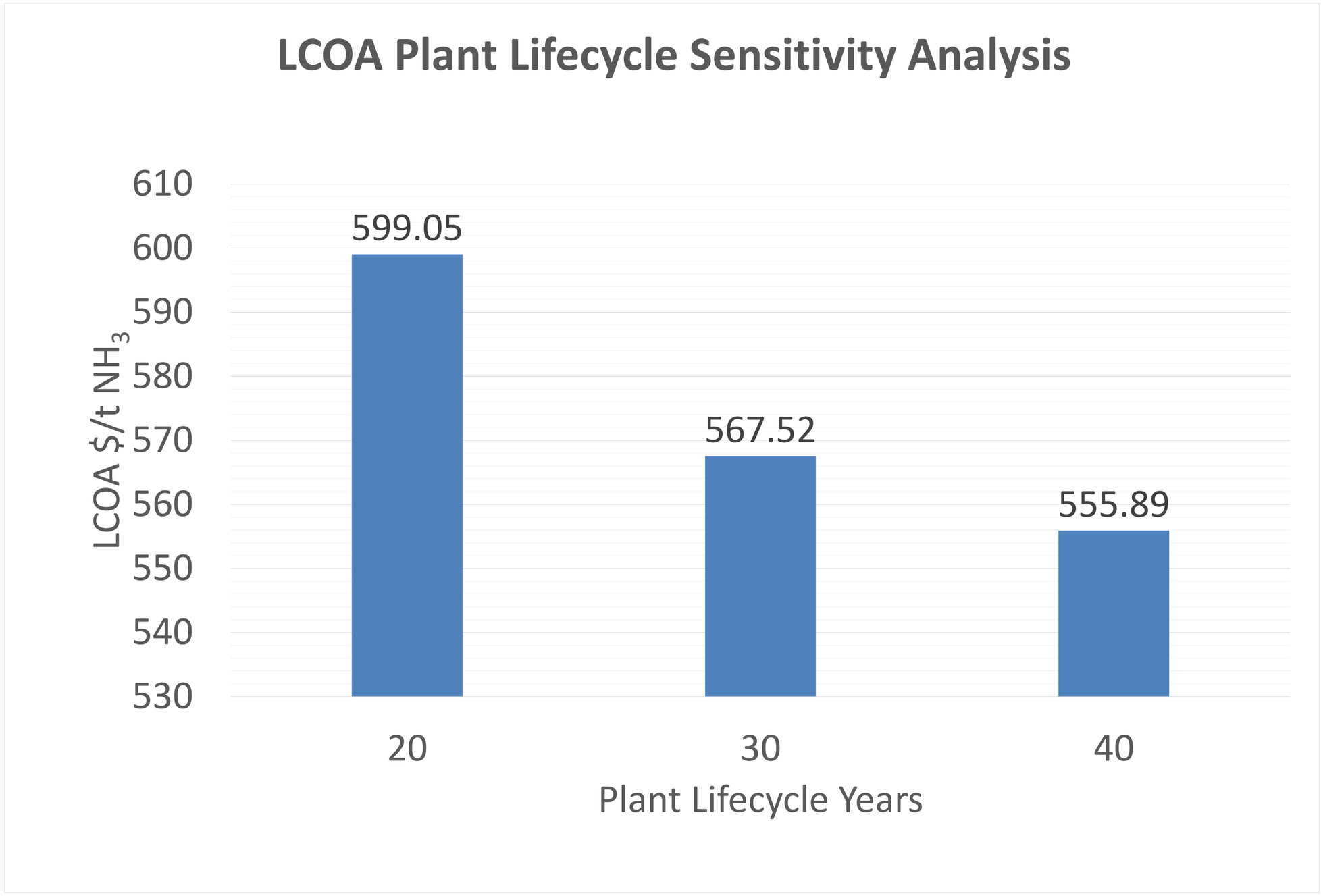












DATA TABLES - 2D

LCOA $/t NH_3 Sensitivity Analysis - 2D

Capacity Factor (%) \ Energy Cost ($/kWhe AC)	0.000	0.005	0.010	0.015	0.020	0.025	0.030	0.035	0.040	0.045	0.050	0.055	0.060
10%	2,236.70	2,290.04	2,343.38	2,396.71	2,450.05	2,503.39	2,556.73	2,610.07	2,663.40	2,716.74	2,770.08	2,823.42	2,876.76
15%	1,496.23	1,549.57	1,602.91	1,656.25	1,709.58	1,762.92	1,816.26	1,869.60	1,922.94	1,976.27	2,029.61	2,082.95	2,136.29
20%	1,126.01	1,179.35	1,232.68	1,286.02	1,339.36	1,392.70	1,446.04	1,499.38	1,552.71	1,606.05	1,659.39	1,712.73	1,766.07
25%	903.88	957.22	1,010.56	1,063.90	1,117.24	1,170.57	1,223.91	1,277.25	1,330.59	1,383.93	1,437.26	1,490.60	1,543.94
30%	755.81	809.15	862.48	915.82	969.16	1,022.50	1,075.84	1,129.17	1,182.51	1,235.85	1,289.19	1,342.53	1,395.87
35%	650.04	703.38	756.72	810.06	863.40	916.74	970.07	1,023.41	1,076.75	1,130.09	1,183.43	1,236.76	1,290.10
40%	570.73	624.07	677.41	730.74	784.08	837.42	890.76	944.10	997.43	1,050.77	1,104.11	1,157.45	1,210.79
45%	509.04	562.38	615.72	669.06	722.40	775.73	829.07	882.41	935.75	989.09	1,042.42	1,095.76	1,149.10
50%	459.70	513.04	566.38	619.71	673.05	726.39	779.73	833.07	886.40	939.74	993.08	1,046.42	1,099.76
55%	419.33	472.67	526.01	579.35	632.68	686.02	739.36	792.70	846.04	899.37	952.71	1,006.05	1,059.39
60%	385.69	439.03	492.37	545.71	599.05	652.39	705.72	759.06	812.40	865.74	919.08	972.41	1,025.75
65%	357.24	410.58	463.91	517.25	570.59	623.93	677.27	730.60	783.94	837.28	890.62	943.96	997.29
70%	332.85	386.19	439.52	492.86	546.20	599.54	652.88	706.21	759.55	812.89	866.23	919.57	972.91
75%	311.71	365.05	418.39	471.73	525.07	578.40	631.74	685.08	738.42	791.76	845.10	898.43	951.77
80%	293.22	346.56	399.90	453.24	506.58	559.91	613.25	666.59	719.93	773.27	826.61	879.94	933.28
85%	276.91	330.25	383.59	436.93	490.27	543.60	596.94	650.28	703.62	756.96	810.29	863.63	916.97
90%	262.42	315.75	369.09	422.43	475.77	529.11	582.44	635.78	689.12	742.46	795.80	849.14	902.47
95%	249.45	302.79	356.12	409.46	462.80	516.14	569.48	622.81	676.15	729.49	782.83	836.17	889.51
100%	237.78	291.12	344.46	397.79	451.13	504.47	557.81	611.15	664.48	717.82	771.16	824.50	877.84

Capacity Factor (%) \ Stack Pack Cost ($/kWe DC)	100	150	200	250	300	350	400	450	500	550	600	650	700
10%	1,988.68	2,072.57	2,156.45	2,240.34	2,324.22	2,408.11	2,491.99	2,575.88	2,659.77	2,743.65	2,827.54	2,911.42	2,995.31
15%	1,401.33	1,457.37	1,513.42	1,569.47	1,625.51	1,681.56	1,737.61	1,793.65	1,849.70	1,905.75	1,961.79	2,017.84	2,073.89
20%	1,107.66	1,149.79	1,191.91	1,234.04	1,276.17	1,318.30	1,360.42	1,402.55	1,444.68	1,486.81	1,528.94	1,571.06	1,613.19
25%	931.47	965.24	999.02	1,032.79	1,066.57	1,100.35	1,134.12	1,167.90	1,201.68	1,235.45	1,269.23	1,303.01	1,336.78
30%	814.01	842.22	870.43	898.64	926.85	955.06	983.26	1,011.47	1,039.68	1,067.89	1,096.10	1,124.31	1,152.52
35%	730.12	754.35	778.58	802.82	827.05	851.28	875.51	899.75	923.98	948.21	972.45	996.68	1,020.91
40%	667.20	688.45	709.70	730.95	752.20	773.46	794.71	815.96	837.21	858.46	879.71	900.96	922.21
45%	618.27	637.20	656.13	675.07	694.00	712.93	731.86	750.79	769.73	788.66	807.59	826.52	845.45
50%	579.13	596.21	613.28	630.36	647.44	664.51	681.59	698.67	715.74	732.82	749.90	766.97	784.05
55%	547.11	562.67	578.23	593.79	609.35	624.90	640.46	656.02	671.58	687.14	702.70	718.26	733.82
60%	520.43	534.72	549.02	563.31	577.61	591.90	606.19	620.49	634.78	649.08	663.37	677.67	691.96
65%	497.86	511.08	524.30	537.53	550.75	563.98	577.20	590.43	603.65	616.88	630.10	643.32	656.55
70%	478.51	490.82	503.12	515.43	527.74	540.05	552.35	564.66	576.97	589.28	601.58	613.89	626.20
75%	461.75	473.26	484.77	496.28	507.80	519.31	530.82	542.34	553.85	565.36	576.87	588.39	599.90
80%	447.08	457.90	468.71	479.53	490.35	501.17	511.99	522.80	533.62	544.44	555.26	566.07	576.89
85%	434.14	444.34	454.55	464.75	474.96	485.16	495.37	505.57	515.78	525.98	536.19	546.39	556.59
90%	422.64	432.30	441.96	451.62	461.28	470.94	480.60	490.26	499.92	509.58	519.24	528.90	538.56
95%	412.35	421.53	430.70	439.87	449.04	458.21	467.39	476.56	485.73	494.90	504.07	513.25	522.42
100%	403.10	411.83	420.57	429.30	438.03	446.77	455.50	464.23	472.96	481.70	490.43	499.16	507.90

Stack Pack Cost ($/kWe DC) \ Energy Cost ($/kWhe AC)	0.000	0.005	0.010	0.015	0.020	0.025	0.030	0.035	0.040	0.045	0.050	0.055	0.060
100	307.08	360.41	413.75	467.09	520.43	573.77	627.10	680.44	733.78	787.12	840.46	893.80	947.13
150	321.37	374.71	428.05	481.38	534.72	588.06	641.40	694.74	748.08	801.41	854.75	908.09	961.43
200	335.66	389.00	442.34	495.68	549.02	602.36	655.69	709.03	762.37	815.71	869.05	922.38	975.72
250	349.96	403.30	456.64	509.97	563.31	616.65	669.99	723.33	776.66	830.00	883.34	936.68	990.02
300	364.25	417.59	470.93	524.27	577.61	630.94	684.28	737.62	790.96	844.30	897.64	950.97	1,004.31
350	378.55	431.89	485.22	538.56	591.90	645.24	698.58	751.91	805.25	858.59	911.93	965.27	1,018.61
400	392.84	446.18	499.52	552.86	606.19	659.53	712.87	766.21	819.55	872.89	926.22	979.56	1,032.90
450	407.14	460.47	513.81	567.15	620.49	673.83	727.17	780.50	833.84	887.18	940.52	993.86	1,047.19
500	421.43	474.77	528.11	581.45	634.78	688.12	741.46	794.80	848.14	901.47	954.81	1,008.15	1,061.49
550	435.73	489.06	542.40	595.74	649.08	702.42	755.75	809.09	862.43	915.77	969.11	1,022.44	1,075.78
600	450.02	503.36	556.70	610.03	663.37	716.71	770.05	823.39	876.72	930.06	983.40	1,036.74	1,090.08
650	464.31	517.65	570.99	624.33	677.67	731.00	784.34	837.68	891.02	944.36	997.70	1,051.03	1,104.37
700	478.61	531.95	585.28	638.62	691.96	745.30	798.64	851.98	905.31	958.65	1,011.99	1,065.33	1,118.67

Total Spec Energy Consump (kWhe AC/Kg H_2) \ Energy Cost ($/kWhe AC)	0.000	0.005	0.010	0.015	0.020	0.025	0.030	0.035	0.040	0.045	0.050	0.055	0.060
20	187.01	209.76	232.52	255.27	278.02	300.78	323.53	346.29	369.04	391.79	414.55	437.30	460.06
25	216.73	244.06	271.39	298.72	326.05	353.38	380.71	408.04	435.37	462.70	490.03	517.36	544.69
30	246.46	278.37	310.27	342.18	374.08	405.99	437.89	469.80	501.70	533.61	565.51	597.42	629.32
35	276.19	312.67	349.15	385.63	422.11	458.59	495.07	531.55	568.03	604.52	641.00	677.48	713.96
40	305.91	346.97	388.02	429.08	470.14	511.20	552.25	593.31	634.37	675.42	716.48	757.54	798.59
45	335.64	381.27	426.90	472.53	518.17	563.80	609.43	655.07	700.70	746.33	791.96	837.60	883.23
50	365.36	415.57	465.78	515.99	566.20	616.40	666.61	716.82	767.03	817.24	867.45	917.65	967.86
55	395.09	449.87	504.66	559.44	614.22	669.01	723.79	778.58	833.36	888.15	942.93	997.71	1,052.50
60	424.81	484.17	543.53	602.89	662.25	721.61	780.97	840.33	899.69	959.05	1,018.41	1,077.77	1,137.13
65	454.54	518.48	582.41	646.35	710.28	774.22	838.15	902.09	966.02	1,029.96	1,093.90	1,157.83	1,221.77
70	484.27	552.78	621.29	689.80	758.31	826.82	895.33	963.84	1,032.36	1,100.87	1,169.38	1,237.89	1,306.40
75	513.99	587.08	660.17	733.25	806.34	879.43	952.51	1,025.60	1,098.69	1,171.77	1,244.86	1,317.95	1,391.04
80	543.72	621.38	699.04	776.71	854.37	932.03	1,009.69	1,087.36	1,165.02	1,242.68	1,320.34	1,398.01	1,475.67

DATA TABLES - 2D
LCOA $/t NH_3 Sensitivity Analysis - 2D

Stack Pack Cost (S//kWe DC) \ NH_3 HB-ASU Pack Cost (S//kWe DC)	250	300	350	400	450	500	550	600	650	700	750	800	850
100	448.44	461.39	474.33	487.28	500.23	513.18	526.13	539.07	552.02	564.97	577.92	590.86	603.81
125	455.59	468.53	481.48	494.43	507.38	520.33	533.27	546.22	559.17	572.12	585.06	598.01	610.96
150	462.73	475.68	488.63	501.58	514.52	527.47	540.42	553.37	566.32	579.26	592.21	605.16	618.11
175	469.88	482.83	495.78	508.72	521.67	534.62	547.57	560.51	573.46	586.41	599.36	612.31	625.25
200	477.03	489.98	502.92	515.87	528.82	541.77	554.71	567.66	580.61	593.56	606.51	619.45	632.40
225	484.18	497.12	510.07	523.02	535.97	548.91	561.86	574.81	587.76	600.70	613.65	626.60	639.55
250	491.32	504.27	517.22	530.17	543.11	556.06	569.01	581.96	594.90	607.85	620.80	633.75	646.69
275	498.47	511.42	524.37	537.31	550.26	563.21	576.16	589.10	602.05	615.00	627.95	640.89	653.84
300	505.62	518.56	531.51	544.46	557.41	570.36	583.30	596.25	609.20	622.15	635.09	648.04	660.99
325	512.76	525.71	538.66	551.61	564.55	577.50	590.45	603.40	616.35	629.29	642.24	655.19	668.14
350	519.91	532.86	545.81	558.75	571.70	584.65	597.60	610.55	623.49	636.44	649.39	662.34	675.28
375	527.06	540.01	552.95	565.90	578.85	591.80	604.74	617.69	630.64	643.59	656.54	669.48	682.43
400	534.21	547.15	560.10	573.05	586.00	598.94	611.89	624.84	637.79	650.73	663.68	676.63	689.58
425	541.35	554.30	567.25	580.20	593.14	606.09	619.04	631.99	644.93	657.88	670.83	683.78	696.72
450	548.50	561.45	574.40	587.34	600.29	613.24	626.19	639.13	652.08	665.03	677.98	690.92	703.87
475	555.65	568.59	581.54	594.49	607.44	620.39	633.33	646.28	659.23	672.18	685.12	698.07	711.02
500	562.79	575.74	588.69	601.64	614.59	627.53	640.48	653.43	666.38	679.32	692.27	705.22	718.17
525	569.94	582.89	595.84	608.78	621.73	634.68	647.63	660.58	673.52	686.47	699.42	712.37	725.31
550	577.09	590.04	602.98	615.93	628.88	641.83	654.77	667.72	680.67	693.62	706.57	719.51	732.46

Capacity Factor (%) \ NH_3 HB-ASU Pack Cost (S//kWe DC)	250	300	350	400	450	500	550	600	650	700	750	800	850
10%	2,027.59	2,103.57	2,179.55	2,255.54	2,331.52	2,407.50	2,483.48	2,559.47	2,635.45	2,711.43	2,787.42	2,863.40	2,939.38
15%	1,427.32	1,478.09	1,528.86	1,579.62	1,630.39	1,681.15	1,731.92	1,782.69	1,833.45	1,884.22	1,934.99	1,985.75	2,036.52
20%	1,127.20	1,165.36	1,203.52	1,241.67	1,279.83	1,317.99	1,356.15	1,394.31	1,432.47	1,470.63	1,508.79	1,546.94	1,585.10
25%	947.13	977.73	1,008.32	1,038.91	1,069.51	1,100.10	1,130.70	1,161.29	1,191.89	1,222.48	1,253.07	1,283.67	1,314.26
30%	827.09	852.64	878.20	903.75	929.30	954.85	980.40	1,005.95	1,031.51	1,057.06	1,082.61	1,108.16	1,133.71
35%	741.36	763.31	785.26	807.21	829.16	851.11	873.06	895.01	916.96	938.91	960.86	982.81	1,004.76
40%	677.06	696.31	715.56	734.80	754.05	773.30	792.55	811.80	831.05	850.30	869.55	888.80	908.04
45%	627.05	644.20	661.35	678.50	695.64	712.79	729.94	747.09	764.24	781.39	798.53	815.68	832.83
50%	587.05	602.52	617.99	633.45	648.92	664.39	679.86	695.33	710.79	726.26	741.73	757.20	772.67
55%	554.33	568.42	582.51	596.61	610.70	624.79	638.88	652.98	667.07	681.16	695.26	709.35	723.44
60%	527.06	540.01	552.95	565.90	578.85	591.80	604.74	617.69	630.64	643.59	656.54	669.48	682.43
65%	503.99	515.97	527.95	539.92	551.90	563.88	575.86	587.84	599.82	611.80	623.77	635.75	647.73
70%	484.22	495.37	506.51	517.66	528.81	539.96	551.11	562.25	573.40	584.55	595.70	606.85	617.99
75%	467.08	477.51	487.94	498.37	508.80	519.23	529.65	540.08	550.51	560.94	571.37	581.80	592.22
80%	452.10	461.89	471.69	481.49	491.29	501.09	510.89	520.69	530.49	540.28	550.08	559.88	569.68
85%	438.87	448.12	457.36	466.60	475.85	485.09	494.33	503.58	512.82	522.06	531.30	540.55	549.79
90%	427.12	435.87	444.62	453.37	462.12	470.87	479.62	488.37	497.12	505.87	514.62	523.37	532.12
95%	416.61	424.92	433.22	441.53	449.84	458.15	466.46	474.76	483.07	491.38	499.69	508.00	516.30
100%	407.15	415.06	422.97	430.88	438.79	446.70	454.61	462.52	470.43	478.34	486.25	494.16	502.08

NH_3 HB-ASU Pack Cost (S//kWe DC) \ Energy Cost ($/kWhe AC)	0.000	0.005	0.010	0.015	0.020	0.025	0.030	0.035	0.040	0.045	0.050	0.055	0.060
250	313.71	367.04	420.38	473.72	527.06	580.40	633.73	687.07	740.41	793.75	847.09	900.43	953.76
300	326.65	379.99	433.33	486.67	540.01	593.34	646.68	700.02	753.36	806.70	860.04	913.37	966.71
350	339.60	392.94	446.28	499.62	552.95	606.29	659.63	712.97	766.31	819.64	872.98	926.32	979.66
400	352.55	405.89	459.23	512.56	565.90	619.24	672.58	725.92	779.25	832.59	885.93	939.27	992.61
450	365.50	418.83	472.17	525.51	578.85	632.19	685.53	738.86	792.20	845.54	898.88	952.22	1,005.55
500	378.44	431.78	485.12	538.46	591.80	645.14	698.47	751.81	805.15	858.49	911.83	965.16	1,018.50
550	391.39	444.73	498.07	551.41	604.74	658.08	711.42	764.76	818.10	871.44	924.77	978.11	1,031.45
600	404.34	457.68	511.02	564.35	617.69	671.03	724.37	777.71	831.04	884.38	937.72	991.06	1,044.40
650	417.29	470.63	523.96	577.30	630.64	683.98	737.32	790.65	843.99	897.33	950.67	1,004.01	1,057.35
700	430.23	483.57	536.91	590.25	643.59	696.93	750.26	803.60	856.94	910.28	963.62	1,016.95	1,070.29
750	443.18	496.52	549.86	603.20	656.54	709.87	763.21	816.55	869.89	923.23	976.56	1,029.90	1,083.24
800	456.13	509.47	562.81	616.14	669.48	722.82	776.16	829.50	882.84	936.17	989.51	1,042.85	1,096.19
850	469.08	522.42	575.75	629.09	682.43	735.77	789.11	842.45	895.78	949.12	1,002.46	1,055.80	1,109.14

NH_3 HB-ASU Sp. Energy Cons. (kWhe AC/Kg NH_3) \ Energy Cost ($/kWhe AC)	0.000	0.005	0.010	0.015	0.020	0.025	0.030	0.035	0.040	0.045	0.050	0.055	0.060
0.35	385.69	437.35	489.01	540.66	592.32	643.98	695.63	747.29	798.94	850.60	902.26	953.91	1,005.57
0.40	385.69	437.60	489.51	541.41	593.32	645.23	697.13	749.04	800.94	852.85	904.76	956.66	1,008.57
0.45	385.69	437.85	490.01	542.16	594.32	646.48	698.63	750.79	802.94	855.10	907.26	959.41	1,011.57
0.50	385.69	438.10	490.51	542.91	595.32	647.73	700.13	752.54	804.94	857.35	909.76	962.16	1,014.57
0.55	385.69	438.35	491.01	543.66	596.32	648.98	701.63	754.29	806.94	859.60	912.26	964.91	1,017.57
0.60	385.69	438.60	491.51	544.41	597.32	650.23	703.13	756.04	808.94	861.85	914.76	967.66	1,020.57
0.65	385.69	438.85	492.01	545.16	598.32	651.48	704.63	757.79	810.94	864.10	917.26	970.41	1,023.57
0.70	385.69	439.10	492.51	545.91	599.32	652.73	706.13	759.54	812.94	866.35	919.76	973.16	1,026.57
0.75	385.69	439.35	493.01	546.66	600.32	653.98	707.63	761.29	814.94	868.60	922.26	975.91	1,029.57
0.80	385.69	439.60	493.51	547.41	601.32	655.23	709.13	763.04	816.94	870.85	924.76	978.66	1,032.57
0.85	385.69	439.85	494.01	548.16	602.32	656.48	710.63	764.79	818.94	873.10	927.26	981.41	1,035.57
0.90	385.69	440.10	494.51	548.91	603.32	657.73	712.13	766.54	820.94	875.35	929.76	984.16	1,038.57
0.95	385.69	440.35	495.01	549.66	604.32	658.98	713.63	768.29	822.94	877.60	932.26	986.91	1,041.57

LCOA $/t NH3 Sensitivity Analysis - 2D

HIGH RESOLUTION CHANGE STEPS FOR GIS INTERFACE

Find My LCOA		
	1- Select Capacity Factor (%):	60.00%
	2- Select Energy Cost ($/kWh):	0.0200
	Resultant LCOA ($/t NH_3):	599.05

Energy Cost ($/kWh)

Capacity Factor (%)	0.0000	0.0005	0.0010	0.0015	0.0020	0.0025	0.0030	0.0035	0.0040	0.0045	0.0050	0.0055	0.0060	0.0065	0.0070	0.0075	0.0080	0.0085	0.0090	0.0095
5.00%	4,458.145	4,463.479	4,468.812	4,474.146	4,479.480	4,484.814	4,490.148	4,495.481	4,500.815	4,506.149	4,511.483	4,516.817	4,522.151	4,527.484	4,532.818	4,538.152	4,543.486	4,548.820	4,554.153	4,559.487
6.00%	3,717.660	3,722.994	3,728.328	3,733.661	3,738.995	3,744.329	3,749.663	3,754.997	3,760.331	3,765.664	3,770.998	3,776.332	3,781.666	3,787.000	3,792.333	3,797.667	3,803.001	3,808.335	3,813.669	3,819.003
7.00%	3,188.744	3,194.077	3,199.411	3,204.745	3,210.079	3,215.413	3,220.746	3,226.080	3,231.414	3,236.748	3,242.082	3,247.416	3,252.749	3,258.083	3,263.417	3,268.751	3,274.085	3,279.418	3,284.752	3,290.086
8.00%	2,792.057	2,797.391	2,802.725	2,808.059	2,813.393	2,818.726	2,824.060	2,829.394	2,834.728	2,840.062	2,845.395	2,850.729	2,856.063	2,861.397	2,866.731	2,872.065	2,877.398	2,882.732	2,888.066	2,893.400
9.00%	2,483.524	2,488.858	2,494.192	2,499.526	2,504.860	2,510.194	2,515.527	2,520.861	2,526.195	2,531.529	2,536.863	2,542.196	2,547.530	2,552.864	2,558.198	2,563.532	2,568.866	2,574.199	2,579.533	2,584.867
10.00%	2,236.699	2,242.033	2,247.367	2,252.701	2,258.034	2,263.368	2,268.702	2,274.036	2,279.370	2,284.703	2,290.037	2,295.371	2,300.705	2,306.039	2,311.373	2,316.706	2,322.040	2,327.374	2,332.708	2,338.042
11.00%	2,034.752	2,040.086	2,045.419	2,050.753	2,056.087	2,061.421	2,066.755	2,072.089	2,077.422	2,082.756	2,088.090	2,093.424	2,098.758	2,104.091	2,109.425	2,114.759	2,120.093	2,125.427	2,130.761	2,136.094
12.00%	1,866.463	1,871.797	1,877.131	1,882.465	1,887.798	1,893.132	1,898.466	1,903.800	1,909.134	1,914.467	1,919.801	1,925.135	1,930.469	1,935.803	1,941.137	1,946.470	1,951.804	1,957.138	1,962.472	1,967.806
13.00%	1,724.066	1,729.400	1,734.733	1,740.067	1,745.401	1,750.735	1,756.069	1,761.402	1,766.736	1,772.070	1,777.404	1,782.738	1,788.071	1,793.405	1,798.739	1,804.073	1,809.407	1,814.741	1,820.074	1,825.408
14.00%	1,602.011	1,607.345	1,612.679	1,618.013	1,623.347	1,628.680	1,634.014	1,639.348	1,644.682	1,650.016	1,655.350	1,660.683	1,666.017	1,671.351	1,676.685	1,682.019	1,687.352	1,692.686	1,698.020	1,703.354
15.00%	1,496.231	1,501.565	1,506.899	1,512.233	1,517.567	1,522.901	1,528.234	1,533.568	1,538.902	1,544.236	1,549.570	1,554.903	1,560.237	1,565.571	1,570.905	1,576.239	1,581.573	1,586.906	1,592.240	1,597.574
16.00%	1,403.675	1,409.008	1,414.342	1,419.676	1,425.010	1,430.344	1,435.678	1,441.011	1,446.345	1,451.679	1,457.013	1,462.347	1,467.680	1,473.014	1,478.348	1,483.682	1,489.016	1,494.350	1,499.683	1,505.017
17.00%	1,322.007	1,327.341	1,332.675	1,338.009	1,343.343	1,348.676	1,354.010	1,359.344	1,364.678	1,370.012	1,375.346	1,380.679	1,386.013	1,391.347	1,396.681	1,402.015	1,407.348	1,412.682	1,418.016	1,423.350
18.00%	1,249.415	1,254.749	1,260.082	1,265.416	1,270.750	1,276.084	1,281.418	1,286.751	1,292.085	1,297.419	1,302.753	1,308.087	1,313.421	1,318.754	1,324.088	1,329.422	1,334.756	1,340.090	1,345.423	1,350.757
19.00%	1,184.464	1,189.798	1,195.131	1,200.465	1,205.799	1,211.133	1,216.467	1,221.801	1,227.134	1,232.468	1,237.802	1,243.136	1,248.470	1,253.803	1,259.137	1,264.471	1,269.805	1,275.139	1,280.473	1,285.806
20.00%	1,126.008	1,131.342	1,136.676	1,142.010	1,147.344	1,152.678	1,158.011	1,163.345	1,168.679	1,174.013	1,179.347	1,184.680	1,190.014	1,195.348	1,200.682	1,206.016	1,211.350	1,216.683	1,222.017	1,227.351
21.00%	1,073.121	1,078.455	1,083.788	1,089.122	1,094.456	1,099.790	1,105.124	1,110.457	1,115.791	1,121.125	1,126.459	1,131.793	1,137.127	1,142.460	1,147.794	1,153.128	1,158.462	1,163.796	1,169.129	1,174.463
22.00%	1,025.041	1,030.375	1,035.709	1,041.043	1,046.377	1,051.710	1,057.044	1,062.378	1,067.712	1,073.046	1,078.380	1,083.713	1,089.047	1,094.381	1,099.715	1,105.049	1,110.382	1,115.716	1,121.050	1,126.384
23.00%	981.143	986.477	991.811	997.145	1,002.478	1,007.812	1,013.146	1,018.480	1,023.814	1,029.148	1,034.481	1,039.815	1,045.149	1,050.483	1,055.817	1,061.150	1,066.484	1,071.818	1,077.152	1,082.486
24.00%	940.904	946.237	951.571	956.905	962.239	967.573	972.906	978.240	983.574	988.908	994.242	999.575	1,004.909	1,010.243	1,015.577	1,020.911	1,026.245	1,031.578	1,036.912	1,042.246
25.00%	903.883	909.217	914.551	919.885	925.219	930.552	935.886	941.220	946.554	951.888	957.222	962.555	967.889	973.223	978.557	983.891	989.224	994.558	999.892	1,005.226
26.00%	869.711	875.045	880.379	885.713	891.047	896.380	901.714	907.048	912.382	917.716	923.049	928.383	933.717	939.051	944.385	949.719	955.052	960.386	965.720	971.054
27.00%	838.071	843.405	848.738	854.072	859.406	864.740	870.074	875.408	880.741	886.075	891.409	896.743	902.077	907.410	912.744	918.078	923.412	928.746	934.079	939.413
28.00%	808.691	814.024	819.358	824.692	830.026	835.360	840.694	846.027	851.361	856.695	862.029	867.363	872.696	878.030	883.364	888.698	894.032	899.366	904.699	910.033
29.00%	781.337	786.671	792.005	797.338	802.672	808.006	813.340	818.674	824.008	829.341	834.675	840.009	845.343	850.677	856.010	861.344	866.678	872.012	877.346	882.680
30.00%	755.807	761.141	766.475	771.809	777.143	782.476	787.810	793.144	798.478	803.812	809.145	814.479	819.813	825.147	830.481	835.815	841.148	846.482	851.816	857.150
31.00%	731.925	737.259	742.593	747.926	753.260	758.594	763.928	769.262	774.595	779.929	785.263	790.597	795.931	801.264	806.598	811.932	817.266	822.600	827.934	833.267
32.00%	709.535	714.869	720.203	725.537	730.871	736.204	741.538	746.872	752.206	757.540	762.874	768.207	773.541	778.875	784.209	789.543	794.876	800.210	805.544	810.878
33.00%	688.503	693.837	699.171	704.505	709.838	715.172	720.506	725.840	731.174	736.508	741.841	747.175	752.509	757.843	763.177	768.510	773.844	779.178	784.512	789.846
34.00%	668.708	674.042	679.376	684.710	690.044	695.377	700.711	706.045	711.379	716.713	722.047	727.380	732.714	738.048	743.382	748.716	754.049	759.383	764.717	770.051
35.00%	650.045	655.379	660.713	666.046	671.380	676.714	682.048	687.382	692.715	698.049	703.383	708.717	714.051	719.385	724.718	730.052	735.386	740.720	746.054	751.387
36.00%	632.419	637.752	643.086	648.420	653.754	659.088	664.421	669.755	675.089	680.423	685.757	691.091	696.424	701.758	707.092	712.426	717.760	723.093	728.427	733.761
37.00%	615.745	621.079	626.413	631.747	637.081	642.414	647.748	653.082	658.416	663.750	669.083	674.417	679.751	685.085	690.419	695.753	701.086	706.420	711.754	717.088
38.00%	599.950	605.284	610.617	615.951	621.285	626.619	631.953	637.286	642.620	647.954	653.288	658.622	663.956	669.289	674.623	679.957	685.291	690.625	695.958	701.292
39.00%	584.964	590.298	595.632	600.966	606.300	611.634	616.967	622.301	627.635	632.969	638.303	643.636	648.970	654.304	659.638	664.972	670.306	675.639	680.973	686.307
40.00%	570.729	576.063	581.396	586.730	592.064	597.398	602.732	608.065	613.399	618.733	624.067	629.401	634.734	640.068	645.402	650.736	656.070	661.404	666.737	672.071
41.00%	557.188	562.521	567.855	573.189	578.523	583.857	589.190	594.524	599.858	605.192	610.526	615.860	621.193	626.527	631.861	637.195	642.529	647.862	653.196	658.530
42.00%	544.291	549.625	554.959	560.293	565.627	570.961	576.294	581.628	586.962	592.296	597.630	602.963	608.297	613.631	618.965	624.299	629.632	634.966	640.300	645.634
43.00%	531.995	537.329	542.663	547.997	553.331	558.664	563.998	569.332	574.666	580.000	585.334	590.667	596.001	601.335	606.669	612.003	617.336	622.670	628.004	633.338
44.00%	520.258	525.592	530.926	536.260	541.594	546.927	552.261	557.595	562.929	568.263	573.597	578.930	584.264	589.598	594.932	600.266	605.599	610.933	616.267	621.601
45.00%	509.043	514.377	519.711	525.045	530.379	535.712	541.046	546.380	551.714	557.048	562.381	567.715	573.049	578.383	583.717	589.050	594.384	599.718	605.052	610.386
46.00%	498.316	503.650	508.984	514.317	519.651	524.985	530.319	535.653	540.986	546.320	551.654	556.988	562.322	567.656	572.989	578.323	583.657	588.991	594.325	599.658
47.00%	488.045	493.379	498.713	504.047	509.381	514.714	520.048	525.382	530.716	536.050	541.383	546.717	552.051	557.385	562.719	568.053	573.386	578.720	584.054	589.388
48.00%	478.203	483.537	488.870	494.204	499.538	504.872	510.206	515.539	520.873	526.207	531.541	536.875	542.209	547.542	552.876	558.210	563.544	568.878	574.211	579.545
49.00%	468.762	474.096	479.430	484.764	490.097	495.431	500.765	506.099	511.433	516.767	522.100	527.434	532.768	538.102	543.436	548.769	554.103	559.437	564.771	570.105
50.00%	459.699	465.033	470.367	475.701	481.035	486.368	491.702	497.036	502.370	507.704	513.038	518.371	523.705	529.039	534.373	539.707	545.040	550.374	555.708	561.042
51.00%	450.992	456.326	461.660	466.994	472.327	477.661	482.995	488.329	493.663	498.997	504.330	509.664	514.998	520.332	525.666	530.999	536.333	541.667	547.001	552.335
52.00%	442.620	447.954	453.288	458.622	463.955	469.289	474.623	479.957	485.291	490.624	495.958	501.292	506.626	511.960	517.293	522.627	527.961	533.295	538.629	543.963
53.00%	434.564	439.898	445.232	450.565	455.899	461.233	466.567	471.901	477.235	482.568	487.902	493.236	498.570	503.904	509.237	514.571	519.905	525.239	530.573	535.907
54.00%	426.807	432.140	437.474	442.808	448.142	453.476	458.809	464.143	469.477	474.811	480.145	485.478	490.812	496.146	501.480	506.814	512.148	517.481	522.815	528.149
55.00%	419.331	424.665	429.999	435.333	440.667	446.000	451.334	456.668	462.002	467.336	472.669	478.003	483.337	488.671	494.005	499.339	504.672	510.006	515.340	520.674
56.00%	412.123	417.457	422.791	428.125	433.458	438.792	444.126	449.460	454.794	460.128	465.461	470.795	476.129	481.463	486.797	492.130	497.464	502.798	508.132	513.466
57.00%	405.168	410.502	415.836	421.170	426.503	431.837	437.171	442.505	447.839	453.172	458.506	463.840	469.174	474.508	479.842	485.175	490.509	495.843	501.177	506.511
58.00%	398.453	403.787	409.121	414.455	419.788	425.122	430.456	435.790	441.124	446.457	451.791	457.125	462.459	467.793	473.127	478.460	483.794	489.128	494.462	499.796
59.00%	391.966	397.300	402.633	407.967	413.301	418.635	423.969	429.303	434.636	439.970	445.304	450.638	455.972	461.305	466.639	471.973	477.307	482.641	487.975	493.308
60.00%	385.695	391.029	396.363	401.696	407.030	412.364	417.698	423.032	428.365	433.699	439.033	444.367	449.701	455.035	460.368	465.702	471.036	476.370	481.704	487.037
61.00%	379.630	384.964	390.297	395.631	400.965	406.299	411.633	416.967	422.300	427.634	432.968	438.302	443.636	448.969	454.303	459.637	464.971	470.305	475.639	480.972
62.00%	373.761	379.094	384.428	389.762	395.096	400.430	405.763	411.097	416.431	421.765	427.099	432.433	437.766	443.100	448.434	453.768	459.102	464.435	469.769	475.103
63.00%	368.078	373.411	378.745	384.079	389.413	394.747	400.081	405.414	410.748	416.082	421.416	426.750	432.083	437.417	442.751	448.085	453.419	458.753	464.086	469.420
64.00%	362.573	367.906	373.240	378.574	383.908	389.242	394.575	399.909	405.243	410.577	415.911	421.245	426.578	431.912	437.246	442.580	447.914	453.247	458.581	463.915
65.00%	357.237	362.571	367.905	373.238	378.572	383.906	389.240	394.574	399.908	405.241	410.575	415.909	421.243	426.577	431.910	437.244	442.578	447.912	453.246	458.579
66.00%	352.063	357.397	362.731	368.065	373.398	378.732	384.066	389.400	394.734	400.068	405.401	410.735	416.069	421.403	426.737	432.070	437.404	442.738	448.072	453.406
67.00%	347.044	352.378	357.712	363.045	368.379	373.713	379.047	384.381	389.715	395.048	400.382	405.716	411.050	416.384	421.717	427.051	432.385	437.719	443.053	448.387
68.00%	342.173	347.506	352.840	358.174	363.508	368.842	374.176	379.509	384.843	390.177	395.511	400.845	406.178	411.512	416.846	422.180	427.514	432.848	438.181	443.515
69.00%	337.443	342.776	348.110	353.444	358.778	364.112	369.445	374.779	380.113	385.447	390.781	396.115	401.448	406.782	412.116	417.450	422.784	428.117	433.451	438.785
70.00%	332.848	338.182	343.515	348.849	354.183	359.517	364.851	370.184	375.518	380.852	386.186	391.520	396.854	402.187	407.521	412.855	418.189	423.523	428.856	434.190
71.00%	328.382	333.716	339.050	344.384	349.718	355.052	360.385	365.719	371.053	376.387	381.721	387.054	392.388	397.722	403.056	408.390	413.724	419.057	424.391	429.725
72.00%	324.041	329.375	334.709	340.043	345.377	350.710	356.044	361.378	366.712	372.046	377.380	382.713	388.047	393.381	398.715	404.049	409.382	414.716	420.050	425.384
73.00%	319.819	325.153	330.487	335.821	341.155	346.488	351.822	357.156	362.490	367.824	373.158	378.491	383.825	389.159	394.493	399.827	405.160	410.494	415.828	421.162
74.00%	315.712	321.045	326.379	331.713	337.047	342.381	347.715	353.048	358.382	363.716	369.050	374.384	379.717	385.051	390.385	395.719	401.053	406.386	411.720	417.054
75.00%	311.713	317.047	322.381	327.715	333.049	338.383	343.716	349.050	354.384	359.718	365.052	370.385	375.719	381.053	386.387	391.721	397.055	402.388	407.722	413.056
76.00%	307.821	313.155	318.488	323.822	329.156	334.490	339.824	345.157	350.491	355.825	361.159	366.493	371.826	377.160	382.494	387.828	393.162	398.496	403.829	409.163
77.00%	304.029	309.363	314.697	320.031	325.364	330.698	336.032	341.366	346.700	352.034	357.367	362.701	368.035	373.369	378.703	384.036	389.370	394.704	400.038	405.372
78.00%	300.335	305.669	311.003	316.336	321.670	327.004	332.338	337.672	343.005	348.339	353.673	359.007	364.341	369.675	375.008	380.342	385.676	391.010	396.344	401.677
79.00%	296.734	302.068	307.402	312.736	318.070	323.403	328.737	334.071	339.405	344.739	350.073	355.406	360.740	366.074	371.408	376.742	382.075	387.409	392.743	398.077
80.00%	293.224	298.558	303.892	309.225	314.559	319.893	325.227	330.561	335.894	341.228	346.562	351.896	357.230	362.564	367.897	373.231	378.565	383.899	389.233	394.566
81.00%	289.800	295.134	300.468	305.802	311.136	316.469	321.803	327.137	332.471	337.805	343.138	348.472	353.806	359.140	364.474	369.808	375.141	380.475	385.809	391.143
82.00%	286.460	291.794	297.128	302.462	307.796	313.129	318.463	323.797	329.131	334.465	339.798	345.132	350.466	355.800	361.134	366.468	371.801	377.135	382.469	387.803
83.00%	283.201	288.535	293.868	299.202	304.536	309.870	315.204	320.538	325.871	331.205	336.539	341.873	347.207	352.540	357.874	363.208	368.542	373.876	379.210	384.543
84.00%	280.019	285.353	290.687	296.021	301.354	306.688	312.022	317.356	322.690	328.023	333.357	338.691	344.025	349.359	354.693	360.026	365.360	370.694	376.028	381.362
85.00%	276.912	282.246	287.580	292.914	298.248	303.581	308.915	314.249	319.583	324.917	330.251	335.584	340.918	346.252	351.586	356.920	362.253	367.587	372.921	378.255
86.00%	273.878	279.212	284.546	289.879	295.213	300.547	305.881	311.215	316.549	321.882	327.216	332.550	337.884	343.218	348.551	353.885	359.219	364.553	369.887	375.221
87.00%	270.914	276.247	281.581	286.915	292.249	297.583	302.916	308.250	313.584	318.918	324.252	329.586	334.919	340.253	345.587	350.921	356.255	361.588	366.922	372.256
88.00%	268.017	273.350	278.684	284.018	289.352	294.686	300.019	305.353	310.687	316.021	321.355	326.688	332.022	337.356	342.690	348.024	353.358	358.691	364.025	369.359
89.00%	265.185	270.519	275.852	281.186	286.520	291.854	297.188	302.521	307.855	313.189	318.523	323.857	329.190	334.524	339.858	345.192	350.526	355.860	361.193	366.527
90.00%	262.416	267.750	273.084	278.417	283.751	289.085	294.419	299.753	305.086	310.420	315.754	321.088	326.422	331.756	337.089	342.423	347.757	353.091	358.425	363.758
91.00%	259.708	265.042	270.376	275.710	281.043	286.377	291.711	297.045	302.379	307.712	313.046	318.380	323.714	329.048	334.382	339.715	345.049	350.383	355.717	361.051
92.00%	257.059	262.393	267.727	273.061	278.394	283.728	289.062	294.396	299.730	305.064	310.397	315.731	321.065	326.399	331.733	337.066	342.400	347.734	353.068	358.402
93.00%	254.467	259.801	265.135	270.469	275.803	281.137	286.470	291.804	297.138	302.472	307.806	313.139	318.473	323.807	329.141	334.475	339.808	345.142	350.476	355.810
94.00%	251.931	257.265	262.599	267.932	273.266	278.600	283.934	289.268	294.601	299.935	305.269	310.603	315.937	321.271	326.604	331.938	337.272	342.606	347.940	353.273
95.00%	249.448	254.782	260.115	265.449	270.783	276.117	281.451	286.785	292.118	297.452	302.786	308.120	313.454	318.787	324.121	329.455	334.789	340.123	345.457	350.790
96.00%	247.017	252.350	257.684	263.018	268.352	273.686	279.020	284.353	289.687	295.021	300.355	305.689	311.022	316.356	321.690	327.024	332.358	337.692	343.025	348.359
97.00%	244.636	249.969	255.303	260.637	265.971	271.305	276.639	281.972	287.306	292.640	297.974	303.308	308.641	313.975	319.309	324.643	329.977	335.311	340.644	345.978
98.00%	242.303	247.637	252.971	258.305	263.639	268.972	274.306	279.640	284.974	290.308	295.642	300.975	306.309	311.643	316.977	322.311	327.644	332.978	338.312	343.646
99.00%	240.018	245.352	250.686	256.020	261.354	266.687	272.021	277.355	282.689	288.023	293.356	298.690	304.024	309.358	314.692	320.026	325.359	330.693	336.027	341.361
100.00%	237.779	243.113	248.447	253.780	259.114	264.448	269.782	275.116	280.450	285.783	291.117	296.451	301.785	307.119	312.452	317.786	323.120	328.454	333.788	339.122

Capacity Factor (%)	0.0100	0.0105	0.0110	0.0115	0.0120	0.0125	0.0130	0.0135	0.0140	0.0145	0.0150	0.0155	0.0160	0.0165	0.0170	0.0175	0.0180	0.0185	0.0190	0.0195
5.00%	4,564.821	4,570.155	4,575.489	4,580.823	4,586.156	4,591.490	4,596.824	4,602.158	4,607.492	4,612.825	4,618.159	4,623.493	4,628.827	4,634.161	4,639.495	4,644.828	4,650.162	4,655.496	4,660.830	4,666.164
6.00%	3,824.336	3,829.670	3,835.004	3,840.338	3,845.672	3,851.005	3,856.339	3,861.673	3,867.007	3,872.341	3,877.675	3,883.008	3,888.342	3,893.676	3,899.010	3,904.344	3,909.677	3,915.011	3,920.345	3,925.679
7.00%	3,295.420	3,300.754	3,306.088	3,311.421	3,316.755	3,322.089	3,327.423	3,332.757	3,338.090	3,343.424	3,348.758	3,354.092	3,359.426	3,364.759	3,370.093	3,375.427	3,380.761	3,386.095	3,391.429	3,396.762
8.00%	2,898.734	2,904.067	2,909.401	2,914.735	2,920.069	2,925.403	2,930.737	2,936.070	2,941.404	2,946.738	2,952.072	2,957.406	2,962.739	2,968.073	2,973.407	2,978.741	2,984.075	2,989.408	2,994.742	3,000.076
9.00%	2,590.201	2,595.535	2,600.868	2,606.202	2,611.536	2,616.870	2,622.204	2,627.538	2,632.871	2,638.205	2,643.539	2,648.873	2,654.207	2,659.540	2,664.874	2,670.208	2,675.542	2,680.876	2,686.209	2,691.543
10.00%	2,343.375	2,348.709	2,354.043	2,359.377	2,364.711	2,370.044	2,375.378	2,380.712	2,386.046	2,391.380	2,396.714	2,402.047	2,407.381	2,412.715	2,418.049	2,423.383	2,428.716	2,434.050	2,439.384	2,444.718
11.00%	2,141.428	2,146.762	2,152.096	2,157.430	2,162.763	2,168.097	2,173.431	2,178.765	2,184.099	2,189.432	2,194.766	2,200.100	2,205.434	2,210.768	2,216.102	2,221.435	2,226.769	2,232.103	2,237.437	2,242.771
12.00%	1,973.139	1,978.473	1,983.807	1,989.141	1,994.475	1,999.809	2,005.142	2,010.476	2,015.810	2,021.144	2,026.478	2,031.811	2,037.145	2,042.479	2,047.813	2,053.147	2,058.481	2,063.814	2,069.148	2,074.482
13.00%	1,830.742	1,836.076	1,841.410	1,846.743	1,852.077	1,857.411	1,862.745	1,868.079	1,873.413	1,878.746	1,884.080	1,889.414	1,894.748	1,900.082	1,905.415	1,910.749	1,916.083	1,921.417	1,926.751	1,932.085
14.00%	1,708.688	1,714.021	1,719.355	1,724.689	1,730.023	1,735.357	1,740.691	1,746.024	1,751.358	1,756.692	1,762.026	1,767.360	1,772.693	1,778.027	1,783.361	1,788.695	1,794.029	1,799.363	1,804.696	1,810.030
15.00%	1,602.908	1,608.242	1,613.575	1,618.909	1,624.243	1,629.577	1,634.911	1,640.245	1,645.578	1,650.912	1,656.246	1,661.580	1,666.914	1,672.247	1,677.581	1,682.915	1,688.249	1,693.583	1,698.917	1,704.250
16.00%	1,510.351	1,515.685	1,521.019	1,526.352	1,531.686	1,537.020	1,542.354	1,547.688	1,553.022	1,558.355	1,563.689	1,569.023	1,574.357	1,579.691	1,585.024	1,590.358	1,595.692	1,601.026	1,606.360	1,611.693
17.00%	1,428.684	1,434.018	1,439.351	1,444.685	1,450.019	1,455.353	1,460.687	1,466.020	1,471.354	1,476.688	1,482.022	1,487.356	1,492.689	1,498.023	1,503.357	1,508.691	1,514.025	1,519.359	1,524.692	1,530.026
18.00%	1,356.091	1,361.425	1,366.759	1,372.092	1,377.426	1,382.760	1,388.094	1,393.428	1,398.762	1,404.095	1,409.429	1,414.763	1,420.097	1,425.431	1,430.764	1,436.098	1,441.432	1,446.766	1,452.100	1,457.434
19.00%	1,291.140	1,296.474	1,301.808	1,307.142	1,312.475	1,317.809	1,323.143	1,328.477	1,333.811	1,339.145	1,344.478	1,349.812	1,355.146	1,360.480	1,365.814	1,371.147	1,376.481	1,381.815	1,387.149	1,392.483
20.00%	1,232.685	1,238.019	1,243.352	1,248.686	1,254.020	1,259.354	1,264.688	1,270.022	1,275.355	1,280.689	1,286.023	1,291.357	1,296.691	1,302.024	1,307.358	1,312.692	1,318.026	1,323.360	1,328.694	1,334.027
21.00%	1,179.797	1,185.131	1,190.465	1,195.799	1,201.132	1,206.466	1,211.800	1,217.134	1,222.468	1,227.801	1,233.135	1,238.469	1,243.803	1,249.137	1,254.470	1,259.804	1,265.138	1,270.472	1,275.806	1,281.140
22.00%	1,131.718	1,137.051	1,142.385	1,147.719	1,153.053	1,158.387	1,163.721	1,169.054	1,174.388	1,179.722	1,185.056	1,190.390	1,195.723	1,201.057	1,206.391	1,211.725	1,217.059	1,222.393	1,227.726	1,233.060
23.00%	1,087.819	1,093.153	1,098.487	1,103.821	1,109.155	1,114.489	1,119.822	1,125.156	1,130.490	1,135.824	1,141.158	1,146.491	1,151.825	1,157.159	1,162.493	1,167.827	1,173.161	1,178.494	1,183.828	1,189.162
24.00%	1,047.580	1,052.914	1,058.247	1,063.581	1,068.915	1,074.249	1,079.583	1,084.917	1,090.250	1,095.584	1,100.918	1,106.252	1,111.586	1,116.919	1,122.253	1,127.587	1,132.921	1,138.255	1,143.589	1,148.922
25.00%	1,010.560	1,015.894	1,021.227	1,026.561	1,031.895	1,037.229	1,042.563	1,047.896	1,053.230	1,058.564	1,063.898	1,069.232	1,074.565	1,079.899	1,085.233	1,090.567	1,095.901	1,101.235	1,106.568	1,111.902
26.00%	976.388	981.721	987.055	992.389	997.723	1,003.057	1,008.391	1,013.724	1,019.058	1,024.392	1,029.726	1,035.060	1,040.393	1,045.727	1,051.061	1,056.395	1,061.729	1,067.062	1,072.396	1,077.730
27.00%	944.747	950.081	955.415	960.749	966.082	971.416	976.750	982.084	987.418	992.751	998.085	1,003.419	1,008.753	1,014.087	1,019.421	1,024.754	1,030.088	1,035.422	1,040.756	1,046.090
28.00%	915.367	920.701	926.035	931.368	936.702	942.036	947.370	952.704	958.038	963.371	968.705	974.039	979.373	984.707	990.040	995.374	1,000.708	1,006.042	1,011.376	1,016.709
29.00%	888.013	893.347	898.681	904.015	909.349	914.682	920.016	925.350	930.684	936.018	941.352	946.685	952.019	957.353	962.687	968.021	973.354	978.688	984.022	989.356
30.00%	862.484	867.817	873.151	878.485	883.819	889.153	894.486	899.820	905.154	910.488	915.822	921.156	926.489	931.823	937.157	942.491	947.825	953.158	958.492	963.826
31.00%	838.601	843.935	849.269	854.603	859.936	865.270	870.604	875.938	881.272	886.606	891.939	897.273	902.607	907.941	913.275	918.608	923.942	929.276	934.610	939.944
32.00%	816.212	821.546	826.879	832.213	837.547	842.881	848.215	853.548	858.882	864.216	869.550	874.884	880.218	885.551	890.885	896.219	901.553	906.887	912.220	917.554
33.00%	795.179	800.513	805.847	811.181	816.515	821.849	827.182	832.516	837.850	843.184	848.518	853.851	859.185	864.519	869.853	875.187	880.521	885.854	891.188	896.522
34.00%	775.385	780.718	786.052	791.386	796.720	802.054	807.388	812.721	818.055	823.389	828.723	834.057	839.390	844.724	850.058	855.392	860.726	866.060	871.393	876.727
35.00%	756.721	762.055	767.389	772.723	778.057	783.390	788.724	794.058	799.392	804.726	810.059	815.393	820.727	826.061	831.395	836.728	842.062	847.396	852.730	858.064
36.00%	739.095	744.429	749.763	755.096	760.430	765.764	771.098	776.432	781.765	787.099	792.433	797.767	803.101	808.435	813.768	819.102	824.436	829.770	835.104	840.437
37.00%	722.422	727.755	733.089	738.423	743.757	749.091	754.425	759.758	765.092	770.426	775.760	781.094	786.427	791.761	797.095	802.429	807.763	813.096	818.430	823.764
38.00%	706.626	711.960	717.294	722.628	727.961	733.295	738.629	743.963	749.297	754.630	759.964	765.298	770.632	775.966	781.300	786.633	791.967	797.301	802.635	807.969
39.00%	691.641	696.975	702.308	707.642	712.976	718.310	723.644	728.978	734.311	739.645	744.979	750.313	755.647	760.980	766.314	771.648	776.982	782.316	787.649	792.983
40.00%	677.405	682.739	688.073	693.406	698.740	704.074	709.408	714.742	720.076	725.409	730.743	736.077	741.411	746.745	752.078	757.412	762.746	768.080	773.414	778.748
41.00%	663.864	669.198	674.532	679.865	685.199	690.533	695.867	701.201	706.534	711.868	717.202	722.536	727.870	733.203	738.537	743.871	749.205	754.539	759.873	765.206
42.00%	650.968	656.302	661.635	666.969	672.303	677.637	682.971	688.304	693.638	698.972	704.306	709.640	714.974	720.307	725.641	730.975	736.309	741.643	746.976	752.310
43.00%	638.672	644.005	649.339	654.673	660.007	665.341	670.675	676.008	681.342	686.676	692.010	697.344	702.677	708.011	713.345	718.679	724.013	729.347	734.680	740.014
44.00%	626.935	632.269	637.602	642.936	648.270	653.604	658.938	664.271	669.605	674.939	680.273	685.607	690.940	696.274	701.608	706.942	712.276	717.610	722.943	728.277
45.00%	615.720	621.053	626.387	631.721	637.055	642.389	647.722	653.056	658.390	663.724	669.058	674.392	679.725	685.059	690.393	695.727	701.061	706.394	711.728	717.062
46.00%	604.992	610.326	615.660	620.994	626.328	631.661	636.995	642.329	647.663	652.997	658.330	663.664	668.998	674.332	679.666	685.000	690.333	695.667	701.001	706.335
47.00%	594.722	600.055	605.389	610.723	616.057	621.391	626.725	632.058	637.392	642.726	648.060	653.394	658.727	664.061	669.395	674.729	680.063	685.396	690.730	696.064
48.00%	584.879	590.213	595.547	600.881	606.214	611.548	616.882	622.216	627.550	632.883	638.217	643.551	648.885	654.219	659.553	664.886	670.220	675.554	680.888	686.222
49.00%	575.439	580.772	586.106	591.440	596.774	602.108	607.441	612.775	618.109	623.443	628.777	634.110	639.444	644.778	650.112	655.446	660.780	666.113	671.447	676.781
50.00%	566.376	571.710	577.043	582.377	587.711	593.045	598.379	603.712	609.046	614.380	619.714	625.048	630.382	635.715	641.049	646.383	651.717	657.051	662.384	667.718
51.00%	557.669	563.002	568.336	573.670	579.004	584.338	589.671	595.005	600.339	605.673	611.007	616.340	621.674	627.008	632.342	637.676	643.010	648.343	653.677	659.011
52.00%	549.296	554.630	559.964	565.298	570.632	575.965	581.299	586.633	591.967	597.301	602.635	607.968	613.302	618.636	623.970	629.304	634.637	639.971	645.305	650.639
53.00%	541.240	546.574	551.908	557.242	562.576	567.909	573.243	578.577	583.911	589.245	594.578	599.912	605.246	610.580	615.914	621.248	626.581	631.915	637.249	642.583
54.00%	533.483	538.817	544.150	549.484	554.818	560.152	565.486	570.820	576.153	581.487	586.821	592.155	597.489	602.822	608.156	613.490	618.824	624.158	629.492	634.825
55.00%	526.008	531.341	536.675	542.009	547.343	552.677	558.010	563.344	568.678	574.012	579.346	584.680	590.013	595.347	600.681	606.015	611.349	616.682	622.016	627.350
56.00%	518.799	524.133	529.467	534.801	540.135	545.469	550.802	556.136	561.470	566.804	572.138	577.471	582.805	588.139	593.473	598.807	604.141	609.474	614.808	620.142
57.00%	511.844	517.178	522.512	527.846	533.180	538.514	543.847	549.181	554.515	559.849	565.183	570.516	575.850	581.184	586.518	591.852	597.186	602.519	607.853	613.187
58.00%	505.129	510.463	515.797	521.131	526.465	531.798	537.132	542.466	547.800	553.134	558.468	563.801	569.135	574.469	579.803	585.137	590.470	595.804	601.138	606.472
59.00%	498.642	503.976	509.310	514.644	519.977	525.311	530.645	535.979	541.313	546.646	551.980	557.314	562.648	567.982	573.316	578.649	583.983	589.317	594.651	599.985
60.00%	492.371	497.705	503.039	508.373	513.707	519.040	524.374	529.708	535.042	540.376	545.709	551.043	556.377	561.711	567.045	572.379	577.712	583.046	588.380	593.714
61.00%	486.306	491.640	496.974	502.308	507.641	512.975	518.309	523.643	528.977	534.311	539.644	544.978	550.312	555.646	560.980	566.313	571.647	576.981	582.315	587.649
62.00%	480.437	485.771	491.104	496.438	501.772	507.106	512.440	517.774	523.107	528.441	533.775	539.109	544.443	549.776	555.110	560.444	565.778	571.112	576.446	581.779
63.00%	474.754	480.088	485.422	490.755	496.089	501.423	506.757	512.091	517.425	522.758	528.092	533.426	538.760	544.094	549.427	554.761	560.095	565.429	570.763	576.097
64.00%	469.249	474.583	479.917	485.250	490.584	495.918	501.252	506.586	511.919	517.253	522.587	527.921	533.255	538.588	543.922	549.256	554.590	559.924	565.258	570.591
65.00%	463.913	469.247	474.581	479.915	485.249	490.582	495.916	501.250	506.584	511.918	517.251	522.585	527.919	533.253	538.587	543.921	549.254	554.588	559.922	565.256
66.00%	458.740	464.073	469.407	474.741	480.075	485.409	490.742	496.076	501.410	506.744	512.078	517.412	522.745	528.079	533.413	538.747	544.081	549.414	554.748	560.082
67.00%	453.720	459.054	464.388	469.722	475.056	480.389	485.723	491.057	496.391	501.725	507.059	512.392	517.726	523.060	528.394	533.728	539.061	544.395	549.729	555.063
68.00%	448.849	454.183	459.517	464.850	470.184	475.518	480.852	486.186	491.519	496.853	502.187	507.521	512.855	518.189	523.522	528.856	534.190	539.524	544.858	550.191
69.00%	444.119	449.453	454.786	460.120	465.454	470.788	476.122	481.456	486.789	492.123	497.457	502.791	508.125	513.458	518.792	524.126	529.460	534.794	540.128	545.461
70.00%	439.524	444.858	450.192	455.526	460.859	466.193	471.527	476.861	482.195	487.528	492.862	498.196	503.530	508.864	514.197	519.531	524.865	530.199	535.533	540.867
71.00%	435.059	440.393	445.726	451.060	456.394	461.728	467.062	472.396	477.729	483.063	488.397	493.731	499.065	504.398	509.732	515.066	520.400	525.734	531.068	536.401
72.00%	430.718	436.052	441.385	446.719	452.053	457.387	462.721	468.054	473.388	478.722	484.056	489.390	494.724	500.057	505.391	510.725	516.059	521.393	526.726	532.060
73.00%	426.496	431.830	437.163	442.497	447.831	453.165	458.499	463.832	469.166	474.500	479.834	485.168	490.502	495.835	501.169	506.503	511.837	517.171	522.504	527.838
74.00%	422.388	427.722	433.056	438.389	443.723	449.057	454.391	459.725	465.058	470.392	475.726	481.060	486.394	491.728	497.061	502.395	507.729	513.063	518.397	523.730
75.00%	418.390	423.724	429.057	434.391	439.725	445.059	450.393	455.727	461.060	466.394	471.728	477.062	482.396	487.729	493.063	498.397	503.731	509.065	514.398	519.732
76.00%	414.497	419.831	425.165	430.498	435.832	441.166	446.500	451.834	457.168	462.501	467.835	473.169	478.503	483.837	489.170	494.504	499.838	505.172	510.506	515.840
77.00%	410.705	416.039	421.373	426.707	432.041	437.375	442.708	448.042	453.376	458.710	464.044	469.377	474.711	480.045	485.379	490.713	496.047	501.380	506.714	512.048
78.00%	407.011	412.345	417.679	423.013	428.347	433.680	439.014	444.348	449.682	455.016	460.349	465.683	471.017	476.351	481.685	487.019	492.352	497.686	503.020	508.354
79.00%	403.411	408.745	414.078	419.412	424.746	430.080	435.414	440.747	446.081	451.415	456.749	462.083	467.416	472.750	478.084	483.418	488.752	494.086	499.419	504.753
80.00%	399.900	405.234	410.568	415.902	421.236	426.569	431.903	437.237	442.571	447.905	453.238	458.572	463.906	469.240	474.574	479.908	485.241	490.575	495.909	501.243
81.00%	396.477	401.810	407.144	412.478	417.812	423.146	428.480	433.813	439.147	444.481	449.815	455.149	460.482	465.816	471.150	476.484	481.818	487.151	492.485	497.819
82.00%	393.137	398.470	403.804	409.138	414.472	419.806	425.139	430.473	435.807	441.141	446.475	451.809	457.142	462.476	467.810	473.144	478.478	483.811	489.145	494.479
83.00%	389.877	395.211	400.545	405.879	411.212	416.546	421.880	427.214	432.548	437.882	443.215	448.549	453.883	459.217	464.551	469.884	475.218	480.552	485.886	491.220
84.00%	386.695	392.029	397.363	402.697	408.031	413.365	418.698	424.032	429.366	434.700	440.034	445.367	450.701	456.035	461.369	466.703	472.037	477.370	482.704	488.038
85.00%	383.589	388.923	394.256	399.590	404.924	410.258	415.592	420.925	426.259	431.593	436.927	442.261	447.595	452.928	458.262	463.596	468.930	474.264	479.597	484.931
86.00%	380.554	385.888	391.222	396.556	401.890	407.223	412.557	417.891	423.225	428.559	433.893	439.226	444.560	449.894	455.228	460.562	465.895	471.229	476.563	481.897
87.00%	377.590	382.924	388.257	393.591	398.925	404.259	409.593	414.927	420.260	425.594	430.928	436.262	441.596	446.929	452.263	457.597	462.931	468.265	473.599	478.932
88.00%	374.693	380.027	385.360	390.694	396.028	401.362	406.696	412.030	417.363	422.697	428.031	433.365	438.699	444.032	449.366	454.700	460.034	465.368	470.702	476.035
89.00%	371.861	377.195	382.529	387.862	393.196	398.530	403.864	409.198	414.532	419.865	425.199	430.533	435.867	441.201	446.534	451.868	457.202	462.536	467.870	473.204
90.00%	369.092	374.426	379.760	385.094	390.427	395.761	401.095	406.429	411.763	417.097	422.430	427.764	433.098	438.432	443.766	449.099	454.433	459.767	465.101	470.435
91.00%	366.384	371.718	377.052	382.386	387.720	393.053	398.387	403.721	409.055	414.389	419.723	425.056	430.390	435.724	441.058	446.392	451.725	457.059	462.393	467.727
92.00%	363.736	369.069	374.403	379.737	385.071	390.405	395.738	401.072	406.406	411.740	417.074	422.408	427.741	433.075	438.409	443.743	449.077	454.410	459.744	465.078
93.00%	361.144	366.478	371.811	377.145	382.479	387.813	393.147	398.480	403.814	409.148	414.482	419.816	425.150	430.483	435.817	441.151	446.485	451.819	457.152	462.486
94.00%	358.607	363.941	369.275	374.609	379.942	385.276	390.610	395.944	401.278	406.612	411.945	417.279	422.613	427.947	433.281	438.614	443.948	449.282	454.616	459.950
95.00%	356.124	361.458	366.792	372.126	377.459	382.793	388.127	393.461	398.795	404.129	409.462	414.796	420.130	425.464	430.798	436.131	441.465	446.799	452.133	457.467
96.00%	353.693	359.027	364.361	369.694	375.028	380.362	385.696	391.030	396.364	401.697	407.031	412.365	417.699	423.033	428.366	433.700	439.034	444.368	449.702	455.035
97.00%	351.312	356.646	361.980	367.313	372.647	377.981	383.315	388.649	393.983	399.316	404.650	409.984	415.318	420.652	425.985	431.319	436.653	441.987	447.321	452.654
98.00%	348.980	354.314	359.647	364.981	370.315	375.649	380.983	386.316	391.650	396.984	402.318	407.652	412.985	418.319	423.653	428.987	434.321	439.655	444.988	450.322
99.00%	346.695	352.028	357.362	362.696	368.030	373.364	378.698	384.031	389.365	394.699	400.033	405.367	410.700	416.034	421.368	426.702	432.036	437.369	442.703	448.037
100.00%	344.455	349.789	355.123	360.457	365.791	371.124	376.458	381.792	387.126	392.460	397.794	403.127	408.461	413.795	419.129	424.463	429.796	435.130	440.464	445.798

Capacity Factor (%)	0.0200	0.0205	0.0210	0.0215	0.0220	0.0225	0.0230	0.0235	0.0240	0.0245	0.0250	0.0255	0.0260	0.0265	0.0270	0.0275	0.0280	0.0285	0.0290	0.0295	0.0300
5.00%	4,671.497	4,676.831	4,682.165	4,687.499	4,692.833	4,698.166	4,703.500	4,708.834	4,714.168	4,719.502	4,724.836	4,730.169	4,735.503	4,740.837	4,746.171	4,751.505	4,756.838	4,762.172	4,767.506	4,772.840	4,778.174
6.00%	3,931.013	3,936.346	3,941.680	3,947.014	3,952.348	3,957.682	3,963.016	3,968.349	3,973.683	3,979.017	3,984.351	3,989.685	3,995.018	4,000.352	4,005.686	4,011.020	4,016.354	4,021.688	4,027.021	4,032.355	4,037.689
7.00%	3,402.096	3,407.430	3,412.764	3,418.098	3,423.431	3,428.765	3,434.099	3,439.433	3,444.767	3,450.101	3,455.434	3,460.768	3,466.102	3,471.436	3,476.770	3,482.103	3,487.437	3,492.771	3,498.105	3,503.439	3,508.773
8.00%	3,005.410	3,010.744	3,016.078	3,021.411	3,026.745	3,032.079	3,037.413	3,042.747	3,048.080	3,053.414	3,058.748	3,064.082	3,069.416	3,074.750	3,080.083	3,085.417	3,090.751	3,096.085	3,101.419	3,106.752	3,112.086
9.00%	2,696.877	2,702.211	2,707.545	2,712.879	2,718.212	2,723.546	2,728.880	2,734.214	2,739.548	2,744.881	2,750.215	2,755.549	2,760.883	2,766.217	2,771.551	2,776.884	2,782.218	2,787.552	2,792.886	2,798.220	2,803.553
10.00%	2,450.052	2,455.386	2,460.719	2,466.053	2,471.387	2,476.721	2,482.055	2,487.388	2,492.722	2,498.056	2,503.390	2,508.724	2,514.058	2,519.391	2,524.725	2,530.059	2,535.393	2,540.727	2,546.060	2,551.394	2,556.728
11.00%	2,248.104	2,253.438	2,258.772	2,264.106	2,269.440	2,274.774	2,280.107	2,285.441	2,290.775	2,296.109	2,301.443	2,306.776	2,312.110	2,317.444	2,322.778	2,328.112	2,333.446	2,338.779	2,344.113	2,349.447	2,354.781
12.00%	2,079.816	2,085.150	2,090.483	2,095.817	2,101.151	2,106.485	2,111.819	2,117.152	2,122.486	2,127.820	2,133.154	2,138.488	2,143.822	2,149.155	2,154.489	2,159.823	2,165.157	2,170.491	2,175.824	2,181.158	2,186.492
13.00%	1,937.418	1,942.752	1,948.086	1,953.420	1,958.754	1,964.087	1,969.421	1,974.755	1,980.089	1,985.423	1,990.756	1,996.090	2,001.424	2,006.758	2,012.092	2,017.426	2,022.759	2,028.093	2,033.427	2,038.761	2,044.095
14.00%	1,815.364	1,820.698	1,826.032	1,831.365	1,836.699	1,842.033	1,847.367	1,852.701	1,858.035	1,863.368	1,868.702	1,874.036	1,879.370	1,884.704	1,890.037	1,895.371	1,900.705	1,906.039	1,911.373	1,916.706	1,922.040
15.00%	1,709.584	1,714.918	1,720.252	1,725.586	1,730.919	1,736.253	1,741.587	1,746.921	1,752.255	1,757.588	1,762.922	1,768.256	1,773.590	1,778.924	1,784.258	1,789.591	1,794.925	1,800.259	1,805.593	1,810.927	1,816.260
16.00%	1,617.027	1,622.361	1,627.695	1,633.029	1,638.363	1,643.696	1,649.030	1,654.364	1,659.698	1,665.032	1,670.365	1,675.699	1,681.033	1,686.367	1,691.701	1,697.035	1,702.368	1,707.702	1,713.036	1,718.370	1,723.704
17.00%	1,535.360	1,540.694	1,546.028	1,551.361	1,556.695	1,562.029	1,567.363	1,572.697	1,578.031	1,583.364	1,588.698	1,594.032	1,599.366	1,604.700	1,610.033	1,615.367	1,620.701	1,626.035	1,631.369	1,636.703	1,642.036
18.00%	1,462.767	1,468.101	1,473.435	1,478.769	1,484.103	1,489.436	1,494.770	1,500.104	1,505.438	1,510.772	1,516.106	1,521.439	1,526.773	1,532.107	1,537.441	1,542.775	1,548.108	1,553.442	1,558.776	1,564.110	1,569.444
19.00%	1,397.816	1,403.150	1,408.484	1,413.818	1,419.152	1,424.486	1,429.819	1,435.153	1,440.487	1,445.821	1,451.155	1,456.488	1,461.822	1,467.156	1,472.490	1,477.824	1,483.158	1,488.491	1,493.825	1,499.159	1,504.493
20.00%	1,339.361	1,344.695	1,350.029	1,355.363	1,360.696	1,366.030	1,371.364	1,376.698	1,382.032	1,387.365	1,392.699	1,398.033	1,403.367	1,408.701	1,414.035	1,419.368	1,424.702	1,430.036	1,435.370	1,440.704	1,446.037
21.00%	1,286.473	1,291.807	1,297.141	1,302.475	1,307.809	1,313.142	1,318.476	1,323.810	1,329.144	1,334.478	1,339.812	1,345.145	1,350.479	1,355.813	1,361.147	1,366.481	1,371.814	1,377.148	1,382.482	1,387.816	1,393.150
22.00%	1,238.394	1,243.728	1,249.062	1,254.395	1,259.729	1,265.063	1,270.397	1,275.731	1,281.065	1,286.398	1,291.732	1,297.066	1,302.400	1,307.734	1,313.067	1,318.401	1,323.735	1,329.069	1,334.403	1,339.736	1,345.070
23.00%	1,194.496	1,199.830	1,205.163	1,210.497	1,215.831	1,221.165	1,226.499	1,231.833	1,237.166	1,242.500	1,247.834	1,253.168	1,258.502	1,263.835	1,269.169	1,274.503	1,279.837	1,285.171	1,290.504	1,295.838	1,301.172
24.00%	1,154.256	1,159.590	1,164.924	1,170.258	1,175.591	1,180.925	1,186.259	1,191.593	1,196.927	1,202.260	1,207.594	1,212.928	1,218.262	1,223.596	1,228.930	1,234.263	1,239.597	1,244.931	1,250.265	1,255.599	1,260.932
25.00%	1,117.236	1,122.570	1,127.904	1,133.237	1,138.571	1,143.905	1,149.239	1,154.573	1,159.907	1,165.240	1,170.574	1,175.908	1,181.242	1,186.576	1,191.909	1,197.243	1,202.577	1,207.911	1,213.245	1,218.579	1,223.912
26.00%	1,083.064	1,088.398	1,093.732	1,099.065	1,104.399	1,109.733	1,115.067	1,120.401	1,125.734	1,131.068	1,136.402	1,141.736	1,147.070	1,152.404	1,157.737	1,163.071	1,168.405	1,173.739	1,179.073	1,184.406	1,189.740
27.00%	1,051.423	1,056.757	1,062.091	1,067.425	1,072.759	1,078.093	1,083.426	1,088.760	1,094.094	1,099.428	1,104.762	1,110.095	1,115.429	1,120.763	1,126.097	1,131.431	1,136.765	1,142.098	1,147.432	1,152.766	1,158.100
28.00%	1,022.043	1,027.377	1,032.711	1,038.045	1,043.379	1,048.712	1,054.046	1,059.380	1,064.714	1,070.048	1,075.381	1,080.715	1,086.049	1,091.383	1,096.717	1,102.051	1,107.384	1,112.718	1,118.052	1,123.386	1,128.720
29.00%	994.690	1,000.023	1,005.357	1,010.691	1,016.025	1,021.359	1,026.693	1,032.026	1,037.360	1,042.694	1,048.028	1,053.362	1,058.695	1,064.029	1,069.363	1,074.697	1,080.031	1,085.365	1,090.698	1,096.032	1,101.366
30.00%	969.160	974.494	979.828	985.161	990.495	995.829	1,001.163	1,006.497	1,011.830	1,017.164	1,022.498	1,027.832	1,033.166	1,038.500	1,043.833	1,049.167	1,054.501	1,059.835	1,065.169	1,070.502	1,075.836
31.00%	945.278	950.611	955.945	961.279	966.613	971.947	977.280	982.614	987.948	993.282	998.616	1,003.950	1,009.283	1,014.617	1,019.951	1,025.285	1,030.619	1,035.952	1,041.286	1,046.620	1,051.954
32.00%	922.888	928.222	933.556	938.890	944.223	949.557	954.891	960.225	965.559	970.892	976.226	981.560	986.894	992.228	997.561	1,002.895	1,008.229	1,013.563	1,018.897	1,024.231	1,029.564
33.00%	901.856	907.190	912.523	917.857	923.191	928.525	933.859	939.193	944.526	949.860	955.194	960.528	965.862	971.195	976.529	981.863	987.197	992.531	997.864	1,003.198	1,008.532
34.00%	882.061	887.395	892.729	898.062	903.396	908.730	914.064	919.398	924.732	930.065	935.399	940.733	946.067	951.401	956.734	962.068	967.402	972.736	978.070	983.403	988.737
35.00%	863.398	868.731	874.065	879.399	884.733	890.067	895.400	900.734	906.068	911.402	916.736	922.070	927.403	932.737	938.071	943.405	948.739	954.072	959.406	964.740	970.074
36.00%	845.771	851.105	856.439	861.773	867.107	872.440	877.774	883.108	888.442	893.776	899.109	904.443	909.777	915.111	920.445	925.778	931.112	936.446	941.780	947.114	952.448
37.00%	829.098	834.432	839.766	845.099	850.433	855.767	861.101	866.435	871.768	877.102	882.436	887.770	893.104	898.438	903.771	909.105	914.439	919.773	925.107	930.440	935.774
38.00%	813.302	818.636	823.970	829.304	834.638	839.971	845.305	850.639	855.973	861.307	866.641	871.974	877.308	882.642	887.976	893.310	898.643	903.977	909.311	914.645	919.979
39.00%	798.317	803.651	808.985	814.319	819.652	824.986	830.320	835.654	840.988	846.321	851.655	856.989	862.323	867.657	872.991	878.324	883.658	888.992	894.326	899.660	904.993
40.00%	784.081	789.415	794.749	800.083	805.417	810.750	816.084	821.418	826.752	832.086	837.419	842.753	848.087	853.421	858.755	864.089	869.422	874.756	880.090	885.424	890.758
41.00%	770.540	775.874	781.208	786.542	791.875	797.209	802.543	807.877	813.211	818.545	823.878	829.212	834.546	839.880	845.214	850.547	855.881	861.215	866.549	871.883	877.217
42.00%	757.644	762.978	768.312	773.646	778.979	784.313	789.647	794.981	800.315	805.648	810.982	816.316	821.650	826.984	832.318	837.651	842.985	848.319	853.653	858.987	864.320
43.00%	745.348	750.682	756.016	761.349	766.683	772.017	777.351	782.685	788.019	793.352	798.686	804.020	809.354	814.688	820.021	825.355	830.689	836.023	841.357	846.690	852.024
44.00%	733.611	738.945	744.279	749.612	754.946	760.280	765.614	770.948	776.282	781.615	786.949	792.283	797.617	802.951	808.284	813.618	818.952	824.286	829.620	834.954	840.287
45.00%	722.396	727.730	733.064	738.397	743.731	749.065	754.399	759.733	765.066	770.400	775.734	781.068	786.402	791.736	797.069	802.403	807.737	813.071	818.405	823.738	829.072
46.00%	711.669	717.002	722.336	727.670	733.004	738.338	743.671	749.005	754.339	759.673	765.007	770.341	775.674	781.008	786.342	791.676	797.010	802.343	807.677	813.011	818.345
47.00%	701.398	706.732	712.066	717.399	722.733	728.067	733.401	738.735	744.068	749.402	754.736	760.070	765.404	770.738	776.071	781.405	786.739	792.073	797.407	802.740	808.074
48.00%	691.555	696.889	702.223	707.557	712.891	718.225	723.558	728.892	734.226	739.560	744.894	750.227	755.561	760.895	766.229	771.563	776.896	782.230	787.564	792.898	798.232
49.00%	682.115	687.449	692.782	698.116	703.450	708.784	714.118	719.452	724.785	730.119	735.453	740.787	746.121	751.454	756.788	762.122	767.456	772.790	778.124	783.457	788.791
50.00%	673.052	678.386	683.720	689.053	694.387	699.721	705.055	710.389	715.723	721.056	726.390	731.724	737.058	742.392	747.725	753.059	758.393	763.727	769.061	774.395	779.728
51.00%	664.345	669.679	675.012	680.346	685.680	691.014	696.348	701.682	707.015	712.349	717.683	723.017	728.351	733.684	739.018	744.352	749.686	755.020	760.354	765.687	771.021
52.00%	655.973	661.307	666.640	671.974	677.308	682.642	687.976	693.309	698.643	703.977	709.311	714.645	719.978	725.312	730.646	735.980	741.314	746.648	751.981	757.315	762.649
53.00%	647.917	653.250	658.584	663.918	669.252	674.586	679.920	685.253	690.587	695.921	701.255	706.589	711.922	717.256	722.590	727.924	733.258	738.592	743.925	749.259	754.593
54.00%	640.159	645.493	650.827	656.161	661.494	666.828	672.162	677.496	682.830	688.163	693.497	698.831	704.165	709.499	714.833	720.166	725.500	730.834	736.168	741.502	746.835
55.00%	632.684	638.018	643.352	648.685	654.019	659.353	664.687	670.021	675.354	680.688	686.022	691.356	696.690	702.024	707.357	712.691	718.025	723.359	728.693	734.026	739.360
56.00%	625.476	630.810	636.143	641.477	646.811	652.145	657.479	662.813	668.146	673.480	678.814	684.148	689.482	694.815	700.149	705.483	710.817	716.151	721.484	726.818	732.152
57.00%	618.521	623.855	629.188	634.522	639.856	645.190	650.524	655.857	661.191	666.525	671.859	677.193	682.527	687.860	693.194	698.528	703.862	709.196	714.529	719.863	725.197
58.00%	611.806	617.140	622.473	627.807	633.141	638.475	643.809	649.142	654.476	659.810	665.144	670.478	675.812	681.145	686.479	691.813	697.147	702.481	707.814	713.148	718.482
59.00%	605.318	610.652	615.986	621.320	626.654	631.988	637.321	642.655	647.989	653.323	658.657	663.990	669.324	674.658	679.992	685.326	690.660	695.993	701.327	706.661	711.995
60.00%	599.048	604.381	609.715	615.049	620.383	625.717	631.050	636.384	641.718	647.052	652.386	657.720	663.053	668.387	673.721	679.055	684.389	689.722	695.056	700.390	705.724
61.00%	592.982	598.316	603.650	608.984	614.318	619.652	624.985	630.319	635.653	640.987	646.321	651.654	656.988	662.322	667.656	672.990	678.324	683.657	688.991	694.325	699.659
62.00%	587.113	592.447	597.781	603.115	608.448	613.782	619.116	624.450	629.784	635.118	640.451	645.785	651.119	656.453	661.787	667.120	672.454	677.788	683.122	688.456	693.789
63.00%	581.430	586.764	592.098	597.432	602.766	608.099	613.433	618.767	624.101	629.435	634.768	640.102	645.436	650.770	656.104	661.438	666.771	672.105	677.439	682.773	688.107
64.00%	575.925	581.259	586.593	591.927	597.260	602.594	607.928	613.262	618.596	623.930	629.263	634.597	639.931	645.265	650.599	655.932	661.266	666.600	671.934	677.268	682.602
65.00%	570.590	575.923	581.257	586.591	591.925	597.259	602.593	607.926	613.260	618.594	623.928	629.262	634.595	639.929	645.263	650.597	655.931	661.264	666.598	671.932	677.266
66.00%	565.416	570.750	576.084	581.417	586.751	592.085	597.419	602.753	608.086	613.420	618.754	624.088	629.422	634.755	640.089	645.423	650.757	656.091	661.425	666.758	672.092
67.00%	560.397	565.731	571.064	576.398	581.732	587.066	592.400	597.733	603.067	608.401	613.735	619.069	624.402	629.736	635.070	640.404	645.738	651.072	656.405	661.739	667.073
68.00%	555.525	560.859	566.193	571.527	576.861	582.194	587.528	592.862	598.196	603.530	608.863	614.197	619.531	624.865	630.199	635.533	640.866	646.200	651.534	656.868	662.202
69.00%	550.795	556.129	561.463	566.797	572.130	577.464	582.798	588.132	593.466	598.800	604.133	609.467	614.801	620.135	625.469	630.802	636.136	641.470	646.804	652.138	657.472
70.00%	546.200	551.534	556.868	562.202	567.536	572.869	578.203	583.537	588.871	594.205	599.539	604.872	610.206	615.540	620.874	626.208	631.541	636.875	642.209	647.543	652.877
71.00%	541.735	547.069	552.403	557.737	563.070	568.404	573.738	579.072	584.406	589.739	595.073	600.407	605.741	611.075	616.409	621.742	627.076	632.410	637.744	643.078	648.411
72.00%	537.394	542.728	548.062	553.396	558.729	564.063	569.397	574.731	580.065	585.398	590.732	596.066	601.400	606.734	612.067	617.401	622.735	628.069	633.403	638.737	644.070
73.00%	533.172	538.506	543.840	549.173	554.507	559.841	565.175	570.509	575.843	581.176	586.510	591.844	597.178	602.512	607.845	613.179	618.513	623.847	629.181	634.515	639.848
74.00%	529.064	534.398	539.732	545.066	550.400	555.733	561.067	566.401	571.735	577.069	582.402	587.736	593.070	598.404	603.738	609.071	614.405	619.739	625.073	630.407	635.741
75.00%	525.066	530.400	535.734	541.068	546.401	551.735	557.069	562.403	567.737	573.070	578.404	583.738	589.072	594.406	599.740	605.073	610.407	615.741	621.075	626.409	631.742
76.00%	521.173	526.507	531.841	537.175	542.509	547.842	553.176	558.510	563.844	569.178	574.512	579.845	585.179	590.513	595.847	601.181	606.514	611.848	617.182	622.516	627.850
77.00%	517.382	522.716	528.049	533.383	538.717	544.051	549.385	554.719	560.052	565.386	570.720	576.054	581.388	586.721	592.055	597.389	602.723	608.057	613.390	618.724	624.058
78.00%	513.688	519.021	524.355	529.689	535.023	540.357	545.690	551.024	556.358	561.692	567.026	572.360	577.693	583.027	588.361	593.695	599.029	604.362	609.696	615.030	620.364
79.00%	510.087	515.421	520.755	526.088	531.422	536.756	542.090	547.424	552.758	558.091	563.425	568.759	574.093	579.427	584.760	590.094	595.428	600.762	606.096	611.430	616.763
80.00%	506.577	511.910	517.244	522.578	527.912	533.246	538.579	543.913	549.247	554.581	559.915	565.249	570.582	575.916	581.250	586.584	591.918	597.251	602.585	607.919	613.253
81.00%	503.153	508.487	513.821	519.154	524.488	529.822	535.156	540.490	545.823	551.157	556.491	561.825	567.159	572.493	577.826	583.160	588.494	593.828	599.162	604.495	609.829
82.00%	499.813	505.147	510.481	515.814	521.148	526.482	531.816	537.150	542.483	547.817	553.151	558.485	563.819	569.153	574.486	579.820	585.154	590.488	595.822	601.155	606.489
83.00%	496.553	501.887	507.221	512.555	517.889	523.223	528.556	533.890	539.224	544.558	549.892	555.225	560.559	565.893	571.227	576.561	581.895	587.228	592.562	597.896	603.230
84.00%	493.372	498.706	504.039	509.373	514.707	520.041	525.375	530.708	536.042	541.376	546.710	552.044	557.378	562.711	568.045	573.379	578.713	584.047	589.380	594.714	600.048
85.00%	490.265	495.599	500.933	506.266	511.600	516.934	522.268	527.602	532.936	538.269	543.603	548.937	554.271	559.605	564.938	570.272	575.606	580.940	586.274	591.608	596.941
86.00%	487.231	492.564	497.898	503.232	508.566	513.900	519.234	524.567	529.901	535.235	540.569	545.903	551.236	556.570	561.904	567.238	572.572	577.906	583.239	588.573	593.907
87.00%	484.266	489.600	494.934	500.268	505.601	510.935	516.269	521.603	526.937	532.271	537.604	542.938	548.272	553.606	558.940	564.273	569.607	574.941	580.275	585.609	590.942
88.00%	481.369	486.703	492.037	497.371	502.704	508.038	513.372	518.706	524.040	529.373	534.707	540.041	545.375	550.709	556.043	561.376	566.710	572.044	577.378	582.712	588.045
89.00%	478.537	483.871	489.205	494.539	499.873	505.206	510.540	515.874	521.208	526.542	531.875	537.209	542.543	547.877	553.211	558.545	563.878	569.212	574.546	579.880	585.214
90.00%	475.769	481.102	486.436	491.770	497.104	502.438	507.771	513.105	518.439	523.773	529.107	534.441	539.774	545.108	550.442	555.776	561.110	566.443	571.777	577.111	582.445
91.00%	473.061	478.395	483.728	489.062	494.396	499.730	505.064	510.397	515.731	521.065	526.399	531.733	537.067	542.400	547.734	553.068	558.402	563.736	569.069	574.403	579.737
92.00%	470.412	475.746	481.080	486.413	491.747	497.081	502.415	507.749	513.082	518.416	523.750	529.084	534.418	539.751	545.085	550.419	555.753	561.087	566.421	571.754	577.088
93.00%	467.820	473.154	478.488	483.822	489.155	494.489	499.823	505.157	510.491	515.824	521.158	526.492	531.826	537.160	542.494	547.827	553.161	558.495	563.829	569.163	574.496
94.00%	465.284	470.617	475.951	481.285	486.619	491.953	497.286	502.620	507.954	513.288	518.622	523.956	529.289	534.623	539.957	545.291	550.625	555.958	561.292	566.626	571.960
95.00%	462.801	468.134	473.468	478.802	484.136	489.470	494.803	500.137	505.471	510.805	516.139	521.472	526.806	532.140	537.474	542.808	548.142	553.475	558.809	564.143	569.477
96.00%	460.369	465.703	471.037	476.371	481.705	487.038	492.372	497.706	503.040	508.374	513.707	519.041	524.375	529.709	535.043	540.377	545.710	551.044	556.378	561.712	567.046
97.00%	457.988	463.322	468.656	473.990	479.324	484.657	489.991	495.325	500.659	505.993	511.326	516.660	521.994	527.328	532.662	537.996	543.329	548.663	553.997	559.331	564.665
98.00%	455.656	460.990	466.324	471.657	476.991	482.325	487.659	492.993	498.327	503.660	508.994	514.328	519.662	524.996	530.329	535.663	540.997	546.331	551.665	556.999	562.332
99.00%	453.371	458.705	464.039	469.372	474.706	480.040	485.374	490.708	496.041	501.375	506.709	512.043	517.377	522.711	528.044	533.378	538.712	544.046	549.380	554.713	560.047
100.00%	451.132	456.465	461.799	467.133	472.467	477.801	483.135	488.468	493.802	499.136	504.470	509.804	515.137	520.471	525.805	531.139	536.473	541.807	547.140	552.474	557.808

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