

H2A Hydrogen Production Cash Flow Analysis Tool v2.1

Distributed Natural Gas Reforming 1500 kg/day Hydrogen Production Capacity - Current Timeframe

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Technical Operating Parameters and Specifications

Notes

Operating Capacity Factor (%)

70.0%

Plant Design Capacity (kg of H2/day)

400

Plant Output (kg/day)

280

Plant Output (kg/year)

102,200

based upon CaFCP assumption
varied: 100 kg/day and 400 kg/day

Financial Input Values

Notes

Reference year

2005

☒ H2a Default

Assumed start-up year

2005

Length of Construction Period (years)

1

% of Capital Spent in 1st Year of Construction

100%

% of Capital Spent in 2nd Year of Construction

Start-up Time (years)

0.5

Plant life (years)

20

☒ H2a Default

Analysis period (years)

20

☒ H2a Default

Depreciation Schedule Length (years)

7

Depreciation Type

MACRS

☒ H2a Default

% Equity Financing

100%

☒ H2a Default

Interest rate on debt, if applicable (%)

NA

Debt Period (years)

% of Fixed Operating Costs During Start-up (%)

75%

% of Revenues During Start-up (%)

50%

% of Variable Operating Costs During Start-up (%)

50%

Decommissioning costs (% of depreciable capital investment)

0%

☐ H2a Default

For Forecourt Production, salvage value is assumed to equal decommissioning costs.

Salvage value (% of total capital investment)

0%

☐ H2a Default

Inflation rate (%)

1.9%

☒ H2a Default

After-tax Real IRR (%)

10.0%

☒ H2a Default

State Taxes (%)

6.0%

☒ H2a Default

Federal Taxes (%)

35.0%

☒ H2a Default

Total Tax Rate (%)

38.90%

WORKING CAPITAL (% of yearly change in operating costs)

15%

☒ H2a Default

Capital Costs

Notes

H2A Production Process Total Direct Capital Cost

\$2,000,000

[Link to Detail Sheet](#)

H2A Compression, Storage, and Dispensing Total Direct Capital Cost

[Link to Detail Sheet](#)

Indirect Depreciable Capital Costs

Site Preparation (\$)

\$0

Engineering & design (\$)

\$0

Process contingency (\$)

\$0

Project contingency (\$)

\$0

Other (Depreciable) capital (\$)

\$0

One-time Licensing Fees (\$)

\$0

Up-Front Permitting Costs (\$)

\$0

Total Depreciable Capital Costs

\$2,000,000

Non-Depreciable Capital Costs

Click to enter details on the Refueling Station calculation sheet. If using the detail sheet, capital and operating costs will be zero here

H2A Default for 1500kg/day FC Prod.: \$74,344. Site Prep w/ GC: fire walls, foundations, etc. plus 20% for construction expenses and GC fee.

H2A Default for 1500kg/day FC Prod.: \$30,000

H2A Default for 1500kg/day FC Prod.: 0%

H2A Default for 1500kg/day FC Prod.: 5% of Total Direct Cap. Cost

H2A Default for 1500kg/day FC Prod.: \$30,000. Includes multiple visits to multiple agencies and a public review/ comment process.

Energy Feedstocks, Utilities, and Byproducts

Cost of land (\$/acre)	\$100.00		
Land required (acres)	600		
Land Cost (\$)	\$60,000		
Other non depreciable capital costs			
Total Non-Depreciable Capital Costs	\$60,000.00		
Total Capital Costs	\$2,060,000		

Fixed Operating Costs		Notes	
Production facility plant staff (number of FTEs)	0		
Burdened labor cost, including overhead (\$/man-hr)	\$0.00		
Production Facility Labor cost, \$/year	\$0		
Storage/Dispensing Labor required (Hours/Year)			
Storage/Dispensing Labor cost (\$/man-hr)			
Storage/Dispensing Labor cost (\$/year)	\$0		
G&A rate (% of labor cost)	20%	<input checked="" type="checkbox"/> H2a Default	
G&A (\$/year)	\$0		
Licensing, Permits and Fees (\$/year)	\$1,000.00		
Property tax and insurance rate (% of total capital investment)	2%	<input checked="" type="checkbox"/> H2a Default	
Property taxes and insurance (\$/year)	\$41,200		
Rent (\$/year)	\$3,370.13		
Material costs for maintenance and repairs (\$/year)			
Production Maintenance and Repairs (\$/year)	\$0.00		
Forecourt Maintenance and Repairs (\$/year)	\$125,000.00		
Other Fees (\$/year)	\$0.00		
Other Fixed O&M Costs (\$/year)	\$0.00		
Total Fixed Operating Costs	\$170,570		

H2a Default for 1500kg/day FC Prod.: \$1000. Water, electrical, fire equipment permits but will be site specific
H2a Default for 1500kg/day FC Prod.: 1% insurance rate, 1% property tax.
H2a Default for 1500kg/day FC Prod.: 1% insurance rate, 1% property tax
Based on \$3.23/m2/month and 936 ft2 dedicated for SMR H2 production.
(Square footage and rent for H2 dispensing operations are calculated on the Refueling tab.)
H2a Default for 1500kg/day FC Prod.: 5% of Production Initial Cap Inv. (installed, deprec.)

Variable Operating Costs	
Energy Feedstocks, Utilities, and Byproducts	
Select the Price Table to Use	
AEO 2005 High A Case	
Select the Feed	
Utility	Commercial Natural Gas_metric
Enter usage in	Nm3 @ 0°C
Utility	Commercial Natural Gas_metric
Lower Heating Value (GJ/Nm3 @ 0°C)	0.036623406
Price in Startup Year (\$2005)/Nm3 @ 0°C Use H2a Default	\$0.34
Usage (Nm3 @ 0°C/kg H2)	
Cost in Startup Year	\$0
Lookup Prices	yes
OR	Enter Price
OR	Enter Conversion Efficiency (%)
	Add Delete

RT_TOP					
Feedstock	Lower Heating Value (GJ/Nm3)	Price in Startup Year (\$2005)/Nm3	Usage (Nm3/kg H2)	Cost in Startup Year	Lookup Prices
Industrial Natural Gas_metric	0.036623406	0.242857295	4.488	\$0	no
Utility	Lower Heating Value (GJ/kWh)	Price in Startup Year (\$2005)/kWh	Usage (kWh/kg H2)	Cost in Startup Year	Lookup Prices
Commercial Electricity_metric	0.0036	0.081598698	1.11	\$0	no
Total				\$0	
Total Energy Feedstock Cost (\$/year)				\$0	
Total Energy Utilities Cost (\$/year)				\$0	
Total Energy Byproduct Credit (\$/year)				\$0	

Other Materials and Byproducts	
Select the Material	
Cooling Water	<input type="checkbox"/> Byproduct
Feed or utility	Cooling Water
\$(2005)/gal Use H2a Default	\$0.000079
Usage per kg H2 (gal)	
Cost in Startup Year	\$0
Lookup Prices	Yes
OR	Enter Price
	Add Delete

Energy Feedstocks, Utilities, and Byproducts

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Feed or utility	\$(2005)/gal	Usage per kg H2 (gal)	Cost in Startup Year	Lookup Prices
Process Water	0.0016654	5.77	\$0	No
Total Non Energy Utility and Material Costs (\$/year)	\$0			
Total Non Energy Byproduct Credits (\$/year)	\$0			
Total Feedstock Costs (\$/year)	\$0			
Total Utility Costs (\$/year)	\$0			
Total Byproduct Credits (\$/year)	\$0			
Other Variable Operating Costs		Notes		
Other variable operating costs (e.g. environmental surcharges) (\$/year)	\$0.00	changed	This covers waste disposal costs, non-feedstock fuels, environmental surcharges, etc. and is estimated at \$800/month with 50% being attributed to waste disposal costs.	
Other Material Costs (\$/year)	\$0			
Waste treatment costs (\$/year)				
Solid waste disposal costs (\$/year)				
Total Unplanned Replacement Capital Cost Factor (% of total direct depreciable costs/year)	0.00%	Enter Specific Costs		
Royalties (\$/year)	\$0.00	<input checked="" type="checkbox"/> H2a Default	Click to enter data for specific years on Replacement Costs Sheet	
Operator Profit (\$/year)	\$0.00	<input checked="" type="checkbox"/> H2a Default		
Subsidies, Tax Incentives (\$/year)	\$0.00	<input checked="" type="checkbox"/> H2a Default		
Refueling Station O&M costs (\$/year)				
Total Variable Operating Costs (\$/year)	\$0.00			
			Enter as a positive number See Capital Costs section above to link to the Refueling Station calculation sheet	