

Economics of Small Scale Biodiesel Production

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Small Scale Production

■ Oilseed Processing Assumptions

- Seed Cost \$0.151 per pound
 - 274,110 lbs. (250 acres @ 1,100 lbs per acre)
- Oil Content 40%
- Recovery Rate 72%
 - Consistent with an average mechanical crush
- Labor Cost \$10/hour
- Meal Revenue \$120 per ton
 - Net of transportation costs

Small Scale Production

- Assume 5 ton per day press
 - Installed Cost of \$7,435
 - Financed for 10 years at 6%

Labor Cost	\$6,579	72%
<u>Other Costs</u>	<u>\$2,548</u>	28%
Total Cost	\$9,127	
Cost per Ton	\$ 67	

Small Scale Production

Seed 274,110 lbs. @ \$0.151 per lbs.

Crushing 137 tons @ \$67 per ton

Meal 92.7 tons @ \$120 per ton

Seed Cost \$41,391

Crushing Cost \$ 9,127

Total Cost \$50,518

Meal Revenue \$11,124

Net Cost \$39,394

Net Cost Per Gallon \$3.94

Small Scale Production

■ Biodiesel Assumptions

- Based on 10,000 gallon per year
- With a 40 gallon batch processor
- Assumes 0% methanol recovery
- Labor at \$10 per hour

Small Scale Production

	<u>Cost/Unit</u>	<u>\$/gallon</u>
Oil	\$3.94/gallon	\$3.94
Methanol	\$2.32/gallon	\$0.44
Catalyst	\$1.85/lbs.	\$0.07
Labor	\$10/hour	\$0.75
Capital Costs	10 years @ 6%	\$0.10
Fuel Quality Testing		\$0.17
1 ASTM/Year & \$5 test/batch		
All Other Operating Costs		<u>\$0.02</u>
Total		\$5.49

Small Scale Production

Producer

Production Cost	\$ 5.49
Producer Profit	\$ 0.00
Small Producer Tax Credit	\$-0.10
Montana Production Incentive	\$-0.10
Transportation	<u>\$ 0.00</u>
Price to Distributor	\$ 5.29

Distributor/Blender

Purchase Price	\$ 5.29
Blender's Credit	\$-1.00
Federal and State Fuel Tax	\$ 0.53
Transportation Cost	\$ 0.00
Distributor Profit	<u>\$ 0.00</u>
Price to Retailer	\$ 4.82

Retailer

Purchase Price	\$ 4.82
Retailer Mark-up	<u>\$ 0.00</u>
Retail Price (B100)	\$ 4.82

Sensitivity Analysis

	<u>Price Change</u>	<u>Biodiesel Change</u>
Seed Cost	\$0.01/lbs.	\$0.27/gallon
Meal Revenue	\$10/ton	\$0.09/gallon
Crushing Cost	\$10/ton	\$0.14/gallon
*Labor Cost change of \$1 equals a \$0.07/gallon change		
Labor Cost*	\$1/hour	\$0.14/gallon
*Biodiesel Labor only		
Methanol Cost	\$0.50/gallon	\$0.10/gallon

Small Scale Production

■ Example #2

■ Oilseed Processing Assumptions

- Seed Cost \$0.151 per pound
 - 274,110 lbs. (250 acres @ 1,100 lbs per acre)
- Oil Content 40%
- Recovery Rate 72%
 - Consistent with an average mechanical crush
- Labor Cost \$10/hour
- Meal Revenue \$120 per ton
 - Net of transportation costs

Small Scale Production

- Assume 10 ton per day press
 - Installed Cost of \$11,485
 - Financed for 10 years at 6%

Labor Cost	\$3,289	47%
<u>Other Costs</u>	<u>\$3,704</u>	53%
Total Cost	\$6,993	
Cost per Ton	\$ 51	

Small Scale Production

Seed 274,110 lbs. @ \$0.151 per lbs.

Crushing 137 tons @ \$51 per ton

Meal 92.7 tons @ \$120 per ton

Seed Cost \$41,391

Crushing Cost \$ 6,993

Total Cost \$48,384

Meal Revenue \$11,124

Net Cost \$37,260

Net Cost Per Gallon \$3.73

Small Scale Production

■ Biodiesel Assumptions

- Based on 10,000 gallon per year
- With a 80 gallon batch processor
- Assumes 0% methanol recovery
- Labor at \$10 per hour

Small Scale Production

	<u>Cost/Unit</u>	<u>\$/gallon</u>
Oil	\$3.73/gallon	\$3.73
Methanol	\$2.32/gallon	\$0.44
Catalyst	\$1.85/lbs.	\$0.07
Labor	\$10/hour	\$0.37
Capital Costs	10 years @ 6%	\$0.14
Fuel Quality Testing		\$0.10
1 ASTM/Year & \$5 test/batch		
All Other Operating Costs		<u>\$0.01</u>
Total		\$4.86

Small Scale Production

Producer

Production Cost	\$ 4.86
Producer Profit	\$ 0.00
Small Producer Tax Credit	\$-0.10
Montana Production Credit	\$-0.10
Transportation	<u>\$ 0.00</u>
Price to Distributor	\$ 4.66

Distributor/Blender

Purchase Price	\$ 4.66
Blender's Credit	\$-1.00
Federal and State Fuel Tax	\$ 0.53
Transportation Cost	\$ 0.00
Distributor Profit	<u>\$ 0.00</u>
Price to Retailer	\$ 4.19

Retailer

Purchase Price	\$ 4.19
Retailer Mark-up	<u>\$ 0.00</u>
Retail Price (B100)	\$ 4.19

Sensitivity Analysis

	<u>Price Change</u>	<u>Biodiesel Change</u>
Seed Cost	\$0.01/lbs.	\$0.27/gallon
Meal Revenue	\$10/ton	\$0.09/gallon
Crushing Cost	\$10/ton	\$0.14/gallon
*Labor Cost change of \$1 equals a \$0.03/gallon change		
Labor Cost*	\$1/hour	\$0.07/gallon
*Biodiesel Labor only		
Methanol Cost	\$0.50/gallon	\$0.10/gallon

Small Scale Production

- How do I know what my costs will be?
- What if my situation is different from the small scale example?
- Answer: Use the “Biodiesel Cash Flow/Income Statement Worksheet”
 - www.ampc.montana.edu
 - Click on “energy information”

Questions?