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## **Technical/Business Planning: For Small-Scale Oilseed Processing and Biodiesel Production**

By

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## *Section 1: Introduction*

In addition to the oilseed processing and biodiesel production case study, several additional tools have developed. The first of these is the “An Overview of Federal and State Oilseed and Biodiesel Programs.” This document provides information about the numerous Federal and State of Montana programs that provide support for oilseed processing and biodiesel production. The second tool is an Excel-based software program, which allows small-scale oilseed processors to input data related to their current or potential operation. The software generates cash flow and income statements based on the inputs provided by the user. The software is populated with data from the case study, but users are encouraged to make changes to reflect individual circumstances and changing market conditions. Instructions for the program are also included. The third tool is another Excel-based software program, which generates cash flow and income statements based on user input for small-scale biodiesel production. This program is populated with data from the case study, but users are encouraged to make changes to reflect individual circumstances and changing market conditions. Instructions are provided for the program. These tools will allow students to investigate small-scale oilseed processing and biodiesel production beyond the information provided in the two case studies.

## *Section 2: An Overview of Federal and State Oilseed and Biodiesel Programs*

This report describes the major incentives and policies implemented by the federal government and the State of Montana with respect to biodiesel production and consumption. Federal incentives include the Biodiesel Blenders Tax Credit, Small Producer Tax Credit, Renewable Fuels Standard, Alternative Fuel Infrastructure Tax Credit and the Clean Fuels Program. Some of these programs encourage the production of biodiesel through tax credits or direct payments. Others encourage the consumption of biofuels by offering credits or direct payments for investments in infrastructure that allow biofuels to be utilized.

### **Federal Subsidies and Incentives**

This section describes federal subsidies, incentives and other programs provided for ethanol and biodiesel related activities.

#### ***Biodiesel Blenders Tax Credit***

This tax credit was established by the American Jobs Creation Act of 2004 and extended through 2008 by the Energy Policy Act of 2005. Producers of biodiesel created from virgin oil can receive an excise tax credit of \$1.00 per gallon of biodiesel produced. The virgin oil can be obtained from animal fats or oilseeds. Producers of biodiesel from recycled oil are granted a tax credit of \$0.50 per gallon.

These credits are available on a prorated basis if the product is sold as a blended product with petroleum-based diesel fuel. For example, a B20 (20% biodiesel and 80% diesel) biodiesel blend would be eligible for a \$0.20 per gallon credit if produced from virgin oil.

### ***Small Producer Tax Credit***

This income tax credit was introduced in the Energy Policy Act of 2005 and is available to producers of biodiesel or ethanol with annual production of less than 60 million gallons. The tax credit is \$0.10 per gallon for the first 15 million gallons of production (a maximum tax credit of \$1.5 million per year). The credit is due to expire on December 31, 2008.

### ***2008 Farm Bill***

The 2008 Farm Bill provides funding for several biodiesel-related programs. This legislation continues funding the “Biodiesel Education Program” at \$1 million per year for five years. This program focuses on educating the public about biodiesel attributes. The program also allocates \$500 million over five years for the Commodity Credit Corporation to help biodiesel producers offset feedstock costs. The program will begin in 2009, but operational details have yet to be released.

### ***Energy Policy Act of 1992 (EPACT)***

The Energy Policy Act was originally passed in 1992 and amended in 1998. The announced goal was to replace 30 percent of U.S. petroleum fuel usage with non-petroleum fuels by 2010 (Energy 2006). The main tool for achieving this goal was a mandate to state and federal agencies to purchase non-petroleum powered vehicles. The act required that 75 percent of new light-duty vehicles purchased for federal fleets be alternative fuel vehicles. Waivers could be granted if alternative fuels were not reasonably available, the cost of alternative fuel was unreasonably expensive or petroleum use reductions equal to those gained by using alternative fuels could be obtained by other methods. Both biodiesel- and ethanol-powered vehicles could be purchased by state and federal agencies to meet this requirement. In January of 2004, the Department of Energy exempted private and local government fleets from these regulations (Van Gerpen 2004; International 2005).

### ***Renewable Fuel Standard (RFS)***

The Renewable Fuel Standard as defined by the Energy Independence and Security Act of 2007 provides guidelines for U.S. renewable fuel usage through 2022. Beginning in 2009, the RFS provides both a total requirement and requirements for specific types of biofuels. The types of biofuels include conventional, advanced, cellulosic, biomass diesel and undifferentiated advanced biofuels.

For 2009, 11.1 billion gallons is required with a maximum of 10.5 billion gallons from conventional biofuels (mostly corn-based ethanol). In 2010, the standard is increased to 12.95 billion gallons with a limit of 12 billion gallons from conventional biofuels. By 2022, the standard increases to 36 billion gallons with a maximum of 15 billion gallons from conventional sources.

### ***Alternative Fuel Infrastructure Tax Credit***

This income tax credit was created by section 1342 of the Energy Policy Act of 2005. The tax credit is equal to 30 percent of the cost of alternative refueling property, up to a maximum of \$30,000 for businesses and \$1,000 for individuals. Biodiesel blends of B20 or more and ethanol blends of E85 or greater qualify as alternative fuels. The tax credit is effective for the period January 1, 2006 to December 31, 2009 (Energy 2006).

### ***Clean Cities Program***

The goal of the federal Clean Cities program is to promote environmental, economic and energy security by supporting local programs to reduce petroleum consumption. Grants and fact sheets are supported by this program. The program also maintains databases and offers technical support (Energy 2006).

The Greater Yellowstone-Teton Clean Energy Coalition is the only Clean Cities program currently operating in Montana.

### ***Petroleum Violation Escrow Account***

Fines paid by oil companies from 1973 to 1981 for violations of federal oil price limits funded this account. These monies are used for energy efficiency and renewable energy projects. For the most part, funds are directed to State Energy and Weatherization Assistance programs. Over \$4 billion have been distributed since the account's inception (Energy 2006).

In Montana, these funds are managed by the Department of Public Health and Human Services' Low Income Energy Assistance and Weatherization Program.

### ***Clean School Bus USA Program***

This program offers cost-sharing grants (\$7.5 million in 2005) to school districts for upgrading their diesel bus fleets, including modifications that allow buses to run on biodiesel or for the purchase of new buses that run on biodiesel. The main focus of this program is to reduce emissions and improve fuel economy (Energy 2006).

### ***Clean Fuels Grant Program (Dept. of Transportation)***

This program is designed to promote the use of advanced bus technologies to reduce emissions. The construction of alternative fuel stations and modifications to promote the utilization of biodiesel are covered by this program (Energy 2006).

### ***USDA Renewable Energy Systems and Energy Efficiency Improvements Program***

The Farm Security and Rural Investment Act of 2002 established this program, which offers grants and loan guarantees to eligible projects located in rural areas. Projects that generate energy from renewable sources (including biodiesel and ethanol) are eligible for grants of up to \$500,000 and loan guarantees of up to \$10,000,000. Grant requests are limited to 25 percent of total project costs and loan guarantees are limited to 50 percent of total project costs. Applicants must demonstrate financial need to be eligible for such grants.

### ***Conservation Innovation Grant Program (CIG)***

The Conservation Innovation Grant Program is administered by the Natural Resource Conservation Service. Total funding available for the national portion of the program is \$20 million for fiscal year 2008. Eligible applicants are awarded grants of up to \$1 million for projects that implement conservation innovations. Bio-based energy projects that maintain or improve air quality are eligible under this program.

The CIG program also allocates funds to be awarded at the state level. State-level grants are limited to a maximum of \$75,000. State CIG programs may have different eligibility standards than the national portion of the program. In fiscal year 2008, Montana distributed \$365,000 from the state-level CIG program.

### ***USDA Value-Added Producer Grant Program***

This program offers grants to producers, agricultural cooperatives and majority-controlled producer-based businesses for either planning activities or working capital expenses. The program requires that grant funds be matched at a minimum of a one to one ratio. An eligible project must qualify as a value-added project. Production of farm-based biofuels would likely qualify for the program.

## Montana Policies and Incentives

Montana offers the following direct incentives for oilseed crushing and biodiesel or ethanol production and consumption:

1. Oilseed Crushing Facility Tax Credit (Montana Code Annotated (MCA) 15-32-701)
  - This income tax credit is equal to 15 percent of the cost of depreciable property to crush oilseeds, up to a maximum of \$500,000.
2. Biodiesel or Biolubricant Production Facility Tax Credit (MCA 15-32-702)
  - This income tax credit is equal to 15 percent of the cost of depreciable property used in the construction and equipping of a facility to be used to produce biodiesel.
3. Biodiesel Blending and Storage Tax Credit (MCA 15-32-703)
  - This income tax credit is equal to 15 percent of the cost of storage and blending equipment, up to a maximum of \$7,500 for a retail location and a maximum of \$52,500 for a distributor.
4. Biodiesel Production Incentive (MCA 15-70-601)
  - This incentive provides \$0.10 per gallon for each gallon of biodiesel produced that represents an increase over the previous year's production. This incentive is available for the first three years of a production facility's operation. The program is due to expire on July 1, 2010.
5. Refund for taxes paid on biodiesel by a distributor or retailer (MCA 15-70-369)
  - This program provides a \$0.02 per gallon refund for biodiesel sold by a distributor during a previous quarter, if the biodiesel was produced entirely from ingredients produced in Montana. The refund is paid to biodiesel distributors.
  - This program also provides a \$0.01 per gallon refund for biodiesel sold by a retailer during a previous quarter, if the biodiesel was produced entirely from ingredients produced in Montana. The refund is paid to biodiesel retailers.
6. Tax Credit for Installation of a Non-Fossil Fuel Based Residential Energy System or Energy Generation Unit (MCA 15-32-201)
  - This program provides an income tax credit equal to 100 percent of the cost a non-fossil fuel based energy system or a non-fossil fuel based energy generation system. The tax credit is limited to a maximum of \$500.
7. Alternative Energy Revolving Loan Account (MCA 75-25-101)
  - The Department of Environmental Quality administers a loan account that offers loans of up to \$40,000 for building alternative energy systems.

### ***Other Montana Policies<sup>1</sup>:***

Montana also has an alternative fuels policy statement (MCA 90-4-1011) that encourages the Montana legislature and other policy makers to support the development of alternative fuels. It also indicates that these policies should benefit Montana citizens or its environment. However, no direct action is prescribed in the statement.

### **Summary**

The information presented here provides a summary of each specific program but does not provide comprehensive details about the management of each program. Consumers and businesses interested in these programs should seek additional information from each specific program agency about eligibility.

### **References**

Department of Energy, U.S. (2006). Alternative Fuels Data Center: Federal Incentives and Laws.

Farrish, B. (2006). Bioenergy Program. USDA Commodity Credit Corporation: 1.

Van Gerpen, J. (2004). Business Management for Biodiesel Producers. National Renewable Energy Laboratory. U.S. Dept. of Energy).

International, Promar. (2005). Evaluation and analysis of vegetable oil markets: The implications of increased demand for industrial uses on markets & USB strategy: 1-78.

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<sup>1</sup> Several other programs are offered by either state or federal agencies that may provide benefits for oilseed, biodiesel or ethanol development under the certain circumstances. This guide will not summarize these policies because, typically, they are not focused on the main issues presented in this guide, and eligibility under these policies may require that the applicant have special characteristics. These programs include but are not limited to: the loan program described in MCA 80-12-201, the Department of Natural Resources and Conservation's "Renewable Resource Grant and Loan Program," the Department of Agriculture's "Growth Through Agriculture Program," Montana Capital Companies tax credit (MCA 90-8-202) and USDA Rural Development's "Business and Industry Guaranteed Loan Program."

### *Section 3: Oilseed Crushing Worksheet Instructions*

The case study of Chris Fritz's oilseed processing operation discusses his reasons for entering the industry. This part of the case study is a narrative to accompany the software program that generates financial statements for small-scale oilseed processors. The software program is pre-populated with data from the case study. A printout of the software program using data from the case study is provided below. The program calculates financial statements based on user input. Therefore, once the case study has been examined, users are encouraged to make changes to equipment costs, seed costs, meal price, oil price and other inputs to simulate other situations and possible future market conditions. The software program titled "Oilseed Processing Cash Flow" is available as part of this case study.

Instructions for the software program are provided below:

#### Oilseed Processing Tab

- Enter a "P" or "R" in cells G10 to G16 for each crop processed. The "P" represents that seed was purchased from another producer and the "R" represents seed that was raised on your own farm. This cell instructs the program how to calculate cash flow for your oilseed processing operation.
- Enter the market price for seed (the price you paid for the seed or the opportunity cost of selling seed to another buyer) in cells H10 to H16. Enter this data even if the seed was raised on your own farm.
- Enter the amount (in pounds) of each crop processed during the year in cells I10 to I16.
- Enter the oil content of each crop processed in cells J10 to J16. The oil content is the amount of oil (expressed as a percentage) in the raw feedstock. Note: This is not the amount of oil recovered from the seed.
- Cells K10 to K16 and L10 to L16 are informational. They indicate the potential oil and meal content of the seed. The actual amount produced will depend on the efficiency of the press, moisture content and other variables.
- Enter the cost of production for any crops that were produced on your own farm in cells M10 to M16. This cost of production should include all costs of productions (land cost, seed, planting, harvest, fertilizers, pesticides, etc.) but should not include any profit that might be made by selling at market prices.
- Lines 17 to 34 are informational.
- Enter the tons of material that can be processed in a 24-hour period by the oilseed processing equipment in cell H37.
- Enter the number of hours per day the press will be operated in cell H38.
- Cells H39 to H41 are informational. They provide information about the number of hours to process a ton of feedstock and the number of days required to process all of the seed reported above.
- Enter the number of presses (1 or 2) in cell H42 that will be used in your operation. Enter 1 if a single press will be used. Enter 2 if two presses will be used and all seed will be processed by both presses. The two press system is utilized to increase overall oil recovery.
- Enter the oil recovery rate of press #1 in cell H43. The oil recovery rate is determined by measuring how much oil is recovered from particular feedstock. For example, if 100

pounds of seed with 40 percent oil content was processed and 30 pounds of oil were recovered, then the oil recovery rate would be 75 percent (30 divided by 40). The recovery rate should be entered as a percentage.

- Enter the oil recovery rate of press #2 in cell H44. Enter 0 if only a single press is being used. Otherwise enter the percentage of the oil recovered by the second press.
- Enter the percentage of moisture loss during processing in cell H45. Moisture loss is unavoidable when processing oilseeds. Moisture loss depends on the moisture content of the feedstock. Moisture loss is commonly 4-10 percent.
- Lines 48 to 51 are informational regarding the actual oil and meal recovered from the feedstock. The combined oil recovery rate is also provided.
- Enter the percentage of meal sold in cell H54. If some of the meal is used on your own farm, then the percentage will be less than 100 percent. This information helps determine the cash flow of your operation.
- Enter the price per ton at which meal was sold in cell H56. Do not include transportation costs in this cell.
- Enter the cost per ton for transporting and packaging meal in cell H57. For example, if you sell meal for \$180 per ton, enter \$180 in cell H56. But if you have to pay \$25 per ton to have it shipped to a buyer, enter \$25 in cell H57.
- Line 58 is informational.
- Enter the percentage of oil sold in cell H61. If some of the oil is used on your own farm, then the percentage will be less than 100 percent. This information helps determine the cash flow of your operation.
- Enter the price per gallon at which oil was sold in cell H63. Do not include transportation costs in this cell.
- Enter the cost per gallon for transporting and packaging oil in cell H64. For example, if you sell oil for \$3.00 per gallon, enter \$3.00 in cell H63. But, if you pay \$0.50 per gallon to have it packaged and shipped to a buyer, enter \$0.50 in cell H64.
- Line 65 is informational.
- Enter the cost of all equipment purchased in cells H68 to H79. Each component can be entered separately or purchases can be lumped together in cells H78 or H79.
- Enter the terms of the loan used to finance the capital purchase in cells H82 and H83. If no loan was used, then enter the opportunity cost of the funds used to purchase the equipment.
- Lines 84 to 88 are informational. They provide information about the principal payments, interest costs and depreciation.
- Enter the amount of any additional property taxes that are incurred related to the oilseed processing operation in cell H90.
- Enter additional insurance expenses incurred in cell H91.
- Enter hourly labor costs in cell H95. If wages are not actually paid, enter the value of labor provided.
- Enter the percentage of labor costs that are paid as cash in cell H96. The information helps calculate the cash flow statement.
- Lines 97 to 100 are informational.
- Enter the horsepower of the electrical motor that operates the press in cell H103.

- Enter the efficiency rating of the motor in cell H104. If you don't know the efficiency rating, leave this cell blank and the software will provide an estimate.
- Enter the cost per kilowatt hour of electricity in cell F106.
- Enter annual repair costs related to the oilseed operation in cells H109, H110 and H111.
- Lines 112 to 114 are informational.
- Enter any other revenue received in cells H117 or H118. Other revenue sources may include tax credits, grants or other government payments.
- Lines 124 to 153 are informational.

The data entry portion of the software is complete at this point. Select the "Income Exp & Cash Flow" tab to view the financial statement generated based on the data entered. The financial statements include a cash flow and income statement.

#### *Section 4: Biodiesel Production Worksheet Instructions*

The case study of Zack Wirth's biodiesel operation discusses his reasons for entering the industry. This part of the case study is a narrative to accompany the software program that generates financial statements for small-scale biodiesel producers. The software program is pre-populated with data from the case study. A printout of the software program using data from the case study is provided below. The program calculates financial statements based on user input. Therefore, once the case study has been examined, users are encouraged to make changes to equipment costs, oil costs, diesel prices and other inputs to simulate other situations and possible future market conditions. The software program titled "Biodiesel Production Cash Flow" is available as part of this case study.

Instructions for the software program are provided below:

- Enter data in cells with blue text or numbers
- Cells with black text are calculated based on data entered in cells with blue text
- Place the cursor over the green help menus for additional information about many of the data input cells
- Column F is required for "Year 1" calculations
- Column G allows users to enter expected changes for "Year 2." Equipment costs cannot be changed from "Year 1" to "Year 2"
- Enter the recipe for biodiesel equipment in cells F5 to F7
- Enter capacity of the biodiesel processor in cell F11 (in gallons)
- Enter the annual number of gallons processed in cell F12 for year 1 and G12 for year 2
- Lines 13 and 14 are informational
- Enter the cost per gallon of vegetable oil in cell F17 for year 1 and G17 for year 2
- Enter the cost per gallon of methanol in cell F18 for year 1 and G18 for year 2
- Enter the cost per pound of catalyst on line F18 for year 1 and G18 for year 2
- Enter the cost of all capital equipment purchases in cells F23 to F53. Equipment can be listed separately or entered as a single entry.
- Enter the terms of a loan used to finance the capital purchase in cells F56 and F57. If no loan was used, then enter the opportunity cost of the funds used to purchase the equipment.
- Lines 58 to 62 are informational
- Enter the cost of any additional taxes or insurance costs that are directly related to the biodiesel operation in cells F64 and F65
- Lines 69 to 73 are informational
- Enter operating costs in cells F75 to F88 for year 1 and G75 to G88 for year 2
- Enter hourly labor costs in cell F90 for year 1 and G90 for year 2. If wages are not actually paid, enter the value of labor provided
- Enter the number of hours required to produce a batch of biodiesel in cell F91 for year 1 and G91 for year 2
- Enter the percentage of labor costs that are paid in cash in cell F92 for year 1 and G92 for year 2
- Lines 93 and 94 are informational

- Enter the cost of fuel quality tests and their frequency in cells F97, F98 and F102 and F103 (G97, G98 and G102 and G103 for year 2)
- Lines 104 to 107 are informational
- Enter any per gallon payments received in cells F111 and F112 for year 1 and G111 and G112 for year 2
- Enter any lump sum payments received in cells F115 to F117 for year 1 and G115 to G117 for year 2
- Lines 118 to 120 are informational
- Enter any revenue received from glycerin in cell F122 for year 1 and G122 for year 2
- Enter state and federal fuel taxes in cell F126 and F127 for year 1 and G126 and 127 for year 2
- Enter the cost of diesel fuel not purchased due to the biodiesel production in cell F130 for year 1 and G130 for year 2

The data entry portion of the software is complete at this point. Select the “IncomeExp\_CashFlow” tab to view the financial statement generated based on the data entered. The financial statements include a cash flow and income statement for years 1 and 2.