

ECONOMIC IMPACT OF SOY DIESEL IN MINNESOTA

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Executive Summary

In 2002, the Minnesota legislature mandated that all diesel fuels sold in the state must contain at least 2 percent bio-diesel by year 2005 (MS§ 239.77 [BIODIESEL CONTENT MANDATE]). The bio-diesel mandate became a catalyst for Minnesota's soy-diesel industry, which emerged to fulfill the 16-million-gallon-a-year mandate requirement, and later grew into a 60-million-gallon-a-year industry.

This economic impact analysis estimates soy diesel's impact on Minnesota's economy and the economic contributions of an expanded soybean production and processing industry in Minnesota. Two previous soy diesel impact studies in 2002 and 2004 were based on the state-wide use of soy diesel blended with petroleum diesel at 2 percent and 5 percent ratios. This impact study, however, is based on Minnesota's current soy diesel production of 60 million gallons a year.

The economic impacts are measured to include the direct, indirect, and induced impacts. ***Direct impact*** represents the effect on the soybean production and processing output. ***Indirect impact*** represents the effect on all other economic sectors due to purchases by the soybean industry to generate the added output. ***Induced impact*** represents the effect on all economic sectors due to the expenditures of new income generated by the direct and indirect impacts. ***Total impact*** is the sum of direct, indirect and induced impacts.

This report examines Minnesota's soybean production and processing industry, and estimates the statewide economic impact of the 60-million-gallon annual soy diesel production, as summarized below:

1. Minnesota's Soybean Industry

Soybean Production

- Minnesota ranks third in soybean production among all U.S. states.
- In 2005, Minnesota produced 306 million bushels of soybeans from 6.8 million acres.
- The state contributes 10 percent of the total U.S. soybean production. Only Illinois and Iowa produced more soybeans than Minnesota.
- Soybeans are Minnesota's second largest crop, generating \$1.7 billion in cash receipts. This represents 34 percent of Minnesota's total crop income or 17 percent of Minnesota's total farm income.
- Soybean acreage accounts for 26 percent of Minnesota's total farmland. Minnesota had 4.7 million acres of soybean crop in 1990; by 2006, soybean acreage increased to 7.3 million acres.

- Minnesota's soybean production increased by an average of 6.4 percent annually from 1990 to 2005. This is the highest growth rate among the top five soybean states.

Soybean Processing

- Minnesota ranks third in soybean processing in the U.S.
- In 2005, Minnesota processed 173 million bushels of soybeans in-state, about 57 percent of Minnesota's annual soybean crop.
- Approximately 26 percent of Minnesota soybeans are shipped out of state, to domestic and international markets.

Soybean Exports

- Soybeans are the largest export commodity for Minnesota's agriculture.
- At an estimated export value of \$877 million, soybeans represented 31 percent of the state's total agricultural exports (2005).
- The largest foreign market for Minnesota soybeans is China, with a market-share of 37 percent.
- From 1990 to 2005, Minnesota's soybean exports grew an average of 7.6 percent per year.

Soybean Prices

- Grower prices averaged \$5.79 per bushel from 1980 to 2005, with a high of \$7.70 (1983) and a low of \$4.32 (2001).
- Minnesota's soybean prices are generally \$0.12 lower than the national average.
- Among America's five leading soybean states, Minnesota has the lowest soybean prices while Illinois has the highest, with an average price difference of \$0.22 per bushel.
- This price difference may reflect the level of soybean processing. In Illinois, about 62 percent of its annual soybean crop is processed in-state (2000-2005 average), compared to 53 percent in Minnesota.

2. Minnesota's Diesel Fuel Market and the Potential of Soy Diesel

- In 2004, Minnesota consumed 1.1 billion gallons of diesel fuel (latest data available).
- Diesel prices in Minnesota are generally 4.5 cents higher than the national average.
- Minnesota's lower soybean prices and higher diesel fuel prices provide an ideal climate for developing alternative fuels from agricultural feedstock such as soybeans.

3. Economic Impact of Soy Diesel in Minnesota

Soybean Production and Supply

- At the 60-million-gallon soy diesel production level, soybean demand will increase by 39 million bushels a year.
- Approximately 13 percent of Minnesota's annual soybean crop will be used to produce soy diesel.
- Total output impact of soybean production is estimated at \$410 million.

Soybean Processing

- Soybean processing capacity in Minnesota will increase 31 percent.
- Soybean oil production will increase by 438 million pounds, adding \$104 million in output value.
- As the co-product, soybean meal production will increase by 1.8 billion pounds, adding \$164 million in output value.
- Total output impact of soybean processing is estimated at \$517 million.

Total Output Impact on Minnesota's Economy

- Total output impact includes direct, indirect, and induced impacts on all economic sectors due to increased output associated with soybean production and processing for soy diesel.
- Total output impact is estimated at \$928 million.

Total Employment Impact on Minnesota's Economy

- Total employment impact represents the number of jobs in all economic sectors associated with soy diesel production, including direct, indirect, and induced impacts.
- Total employment impact is estimated at 5,668 jobs.

Conclusion

At the 60-million-gallon a year production level, soy diesel in Minnesota generates various economic impacts that include:

- Increased demand for Minnesota's soybean crop by 13 percent annually.
- Increased in-state soybean processing capacity by 31 percent.
- An annual output impact of \$928 million.
- Employment opportunities for 5,668 jobs.
- The "multiplier impact" will benefit various economic sectors, such as agriculture, manufacturing, construction, transportation, trade, services, finance, insurance, and real estate.



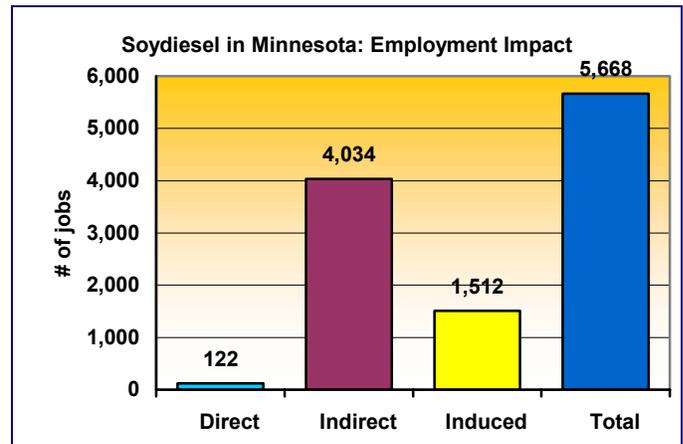
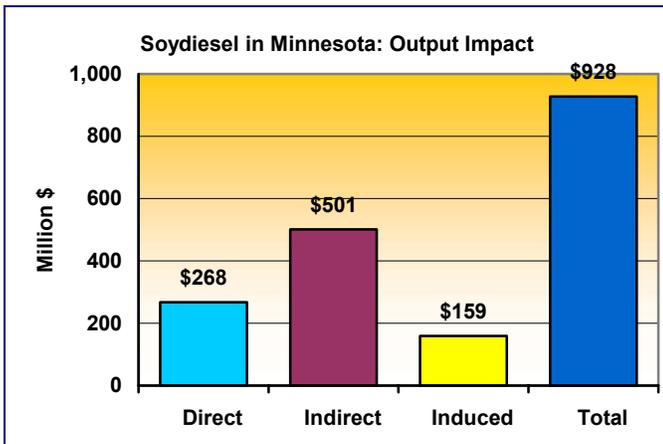
ECONOMIC IMPACT OF SOY DIESEL IN MINNESOTA

TOTAL ECONOMIC IMPACTS¹⁾

SUMMARY TABLES

(Based on Minnesota's 2006 Soy Diesel Production of 60 million gallons)

| Total Impacts | 2006 |
|---|----------------------|
| Output Impact²⁾ (\$ Million) | |
| Direct | \$268 million |
| Indirect | \$501 million |
| Induced | \$159 million |
| Total | \$928 million |
| Employment Impact²⁾ (# of jobs) | |
| Direct | 122 jobs |
| Indirect | 4,034 jobs |
| Induced | 1,512 jobs |
| Total | 5,668 jobs |



¹⁾ *Total economic impacts include the Direct, Indirect, and Induced impact. **Direct Impact** represents the effect of the soybean production and processing output. **Indirect Impact** represents the effect on all other economic sectors due to purchases by the soybean industry to produce the afore-mentioned output. **Induced Impact** represents the response by all economic sectors caused by the expenditures of new income generated by the direct and indirect impacts. **Total Impact** is the sum of direct, indirect and induced impacts.*

²⁾ *Output is the value of production of the soybean industry. Output impact is the change of production levels of all industries due to the change in production of the soybean industry. Employment is the number of jobs in the soybean industry. Employment impact represents the change in the number of jobs of all industries due to the change in production of the soybean industry.*

ECONOMIC IMPACT OF SOY DIESEL IN MINNESOTA

SECTOR IMPACT: SOYBEAN PRODUCTION & PROCESSING

(Based on Minnesota's 2006 soy diesel production of 60 million gallons)

| Sector Impact | 2006 |
|---|----------------------|
| Output Impact <i>(Million dollars)</i> | |
| Soybean Production | |
| Direct | 0 |
| Indirect | \$344 million |
| Induced | \$67 million |
| Total | \$410 million |
| Soybean Processing | |
| Direct | \$268 million |
| Indirect | \$158 million |
| Induced | \$92 million |
| Total | \$517 million |
| Employment Impact <i>(# of jobs)</i> | |
| Soybean Production | |
| Direct | 0 |
| Indirect | 3,171 jobs |
| Induced | 636 jobs |
| Total | 3,807 jobs |
| Soybean Processing | |
| Direct | 122 jobs |
| Indirect | 862 jobs |
| Induced | 876 jobs |
| Total | 1,860 jobs |

For more information, please contact:

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