



The State's Role in Biomass Energy



Mission of the Minnesota Department of Agriculture is:

To work toward a diverse agricultural industry that is profitable as well as environmentally sound; to protect the public health and safety with regard to food and agricultural products; and to ensure orderly commerce in agricultural food products.



The Legislature has authorized several loan and incentive programs directed to the development of biomass energy.



All are designed to improve the farmer's comfort level in adapting a biomass or renewable energy project.

- **Grants**
- **Low interest loans**
- **Producer payments**
- **Tax credits**



SUCCESSFUL RENEWABLE ENERGY PROJECTS ARE:

- **Market Driven**
- **Technically Feasible**
- **Financially Viable**



OBJECTIVES

- Risk factors that impact financial viability of a project
- Calculate the profitability for a methane digester
- Calculate Debt Repayment Capacity for a methane digester
- State and Federal incentives directed to renewable energy
- State and Federal loans directed to renewable energy

CREDIT DECISION INVOLVES:

- **Who buys at what price?**
- **How long?**
- **A process of backing into the numbers and identifying the variables.**
- **Is there sufficient revenue to repay the debt obligation?**

The level of equity required in a project reflects the level of confidence in the project.

RISK FACTORS ARE:

- Market – that the generated electricity cannot be marketed competitively
- Construction – that the project cannot be built or operated in accordance with the business plan
- Technology – that the technology is not viable or competitive with other energy sources
- Operating – that the facility is not efficiently operated
- Political – the extent that the project relies on government policy, support or regulation
- Supply – fuel supply is adequate

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SUPPORTING DOCUMENTATION

What commercial lenders look for in making a credit decision

- **Business Plan**
- **Feasibility Analysis**
- **Power Purchase Agreement**
- **Performance Bond**
- **Satisfactory Review by an Engineer**

POWER PURCHASE AGREEMENT

The length of the
Power Purchase Agreement
must extend beyond
the length of the term
debt obligation.

KEY QUESTIONS ARE:

- **What is the size of the facility?**
- **What is the cost of the facility?**
- **What are the development costs?**
- **What is the level of equity?**
- **What are the credit terms?**
- **Who buys the power?**
- **At what price?**
- **How long is the contract?**
- **What are the performance standards?**
- **What is the estimated production capacity?**
- **What is the useful life of the facility or annual depreciation costs?**
- **What is the tax obligation?**

An example:

A 1,000 cow dairy farmer may utilize a plug flow anaerobic digester system to generate electricity. The dairy farmer will determine if installation of a methane digester system will be a money saving option.

For this example, the following assumptions are made:

- The digester will generate 2.5 kWh per cow per day.
- The digester will operate 24 hours per day, 350 days per yr.
- The digester has a ten-year life.
- Total installed cost (TIC) of the system is \$450,000.
- Operation and maintenance (O&M) cost is \$0.015 per kWh.
- The value of electricity sold to the utility is \$0.035 per kWh.
- The annual value of waste heat is \$4,000.
- The annual offset value of electricity is \$30,000.
- Development costs are 15 percent of fixed asset costs.
- Equity contribution is 40 percent.
- Interest rate is 7.0 percent.
- Length of the loan is 7 years.

Credit and Capital

Capital Cost Per Cow \$ 450

Number of Cows 1,000

Use of Funds	Fixed Assets	\$	450,000
	Development	\$	67,500
	Total	\$	517,500

Source of Funds	Equity	\$	207,000
	Loan	\$	310,500

Term Debt	Loan Term		7 years
	Annual Pmt.	\$	57,614
	Interest	\$	21,735
	Principal	\$	35,879

Repayment Model

Capital Debt Repayment Capacity (CDRC)

Est. Net Income	\$	3,728
Plus Depreciation	\$	25,875
Plus Capital Interest	\$	21,735
Minus Draw/Dividends	\$	-
Equals (CDRC)	\$	51,338

Available Cash \$ 51,338

Minus Capital Principal	\$	35,879
Minus Capital Interest	\$	21,735
Minus Capital Asset Repl.	\$	-
Minus Retirement Opr. Loss	\$	-
Equals (CDRC)	\$	

Use of Cash \$ 57,614

Equals MARGIN \$ (6,277)

CDRC PERCENTAGE **%89**

A Modification to the First Example

The dairy farmer will
use two state
incentives...

The first state incentive is:

Low interest loan program

- Amount - up to \$250,000
- Security - negotiable
- Interest rate - 0%
- Amortization - 10 years

The second state incentive:

**A producer payment of
1.5 cent per kWh**

- First ten years of electricity generation
- Small scale projects less than 2 MW

Credit and Capital Model

Capital Cost Per Cow \$ 450

Number of Cows 1,000

Use of Funds	Fixed Assets	\$ 450,000	
	Development	\$ 67,500	
	Total	\$ 517,500	

Source of Funds	Equity	\$ 207,000	
	Loan	\$ 310,500	

Term Debt	Loan Amount	\$ 110,500	\$ 200,000
	Loan Term	7 Years	7 Years
	Annual Pmt.	\$ 20,504	\$ 28,571
	Interest	\$ 7,735	\$ -
	Principal	\$ 12,768	\$ 28,571

Income Model

kWh per day	Days/Year	% Production	Dollars/kWh	Revenue
2,500	365	95%	\$ 0.050	\$ 43,344
Annual offset of electricity				\$ 30,000
Annual value of waste heat				\$ 4,000
Net Sales				\$ 77,344
Operating at \$0.015 per kWh				\$ 13,003
Depreciation (20 Years)				\$ 25,875
Operating Profit				\$ 38,466
Interest Expense				\$ 7,735
Profit Before Taxes				\$ 30,731
Taxes				\$ -
Net				\$ 30,731

Production - 2.5 kWh per cow.

Repayment Model

Capital Debt Repayment Capacity (CDRC)

Est. Net Income	\$	30,731
Plus Depreciation	\$	25,875
Plus Capital Interest	\$	7,735
Minus Draw/Dividends	\$	-
Equals (CDRC)	\$	64,341

Available Cash	\$	64,341
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Minus Capital Principal	\$	41,339
Minus Capital Interest	\$	7,735
Minus Capital Asset Repl.	\$	-
Minus Retirement Opr. Loss	\$	-

Use of Cash	\$	49,074
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Equals MARGIN	\$	15,267
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CDRC PERCENTAGE

131%

SUMMARY

A farmer's final decision will depend upon:

- Intrinsic risk factors
- Time commitment to manage the facility
- Financial obligations of the project
- Terms of the Power Purchase Agreement
- Offset value of heat and electricity
- Confidence of the commercial lender in the project