



# 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