

**Project Report**

**Building an Economic Democracy:  
Starting a Worker Cooperative**

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## Table of Contents

Abstract .....	3
Executive Summary .....	4
I. Community & Needs Assessment .....	5
II. The Problem .....	7
1. Statement of the Problem .....	7
2. Project Goal .....	8
3. Objectives .....	8
III. Project Design .....	10
1. Literature Review .....	10
2. Method .....	13
3. Products and Outputs .....	13
4. Logic Model .....	14
5. Community Role & Stakeholders .....	15
IV. Project Implementation .....	16
1. Implementation Plan .....	16
1.1 Activities and Inputs .....	16
1.2 Gantt Chart .....	18
2. Implementation Report .....	20
V. Monitoring and Evaluation .....	21
VI. Sustainability Plan .....	22
VII. Conclusions & Recommendations .....	23
VIII. Appendices .....	26
1. Description of Business Activity .....	26
2. Capital Equipment List – Pilot Model .....	29
IX. Bibliography .....	30

## Abstract

The objective of this project was to conduct all of the necessary research in order to start a worker cooperative in a particular industry, and from this research to develop a business plan and other deliverables that will lay the foundation for the launch of the worker cooperative. The work involved was completed by this author and his business partner, who will be the first two worker-owners of the new business to be established. If initial success in the business is achieved, operations will be expanded and the worker cooperative will take on additional worker-owners. The co-op, Renewergy Cooperative Corporation, will be started in Erie, PA, in an effort to ease some of the economic hardships faced by workers in that city, and to provide an example of the benefits that democratic workplaces can offer as an alternative to capitalist, investor-owned businesses. The project administrators based their efforts on business development literature, seeking to create the best possible foundation from which to start the business, utilizing various professionals and resources in the field and others in the chosen industry. The success of this project will be measured by the completeness of the business plan and other deliverables, and also by reviews of these materials by business development practitioners.

## Executive Summary

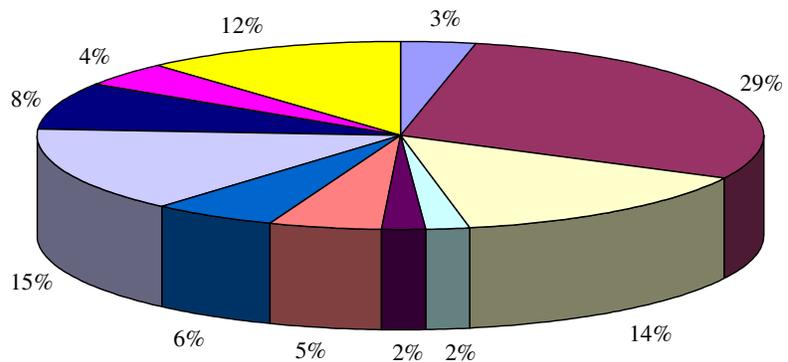
This project sought to address the problem of poverty and the unequal distribution of income in Erie, Pennsylvania, which is suffering from a decline in good paying manufacturing jobs. The specific path to do this was to develop a worker cooperative, a for-profit business which is owned and democratically controlled by those who work within it. Rather than intending to begin business operations, the goal of this project was to conduct all of the necessary research and develop a business plan, amongst other deliverables, that would enable the cooperative to start on a solid foundation. While all objectives were not fully completed, little work remains to finish them, and the project is in a good position to realize the long-term goal of a successful worker cooperative. Others interested in this type of project will find a useful method for developing a worker cooperative and should benefit from a careful review of this document.

# I. Community & Needs Assessment

The community in which this project took place is Erie, Pennsylvania. Erie is located in the upper-most portion of northwestern Pennsylvania. It sits on Presque Isle Bay of Lake Erie, one of the five Great Lakes which separate the U.S. from Canada. It is within a two-hour drive by interstate from Cleveland, Pittsburgh, and Buffalo. Erie and these three closest cities are part of the “rustbelt” that has formed in the northeastern United States – once strong centers of manufacturing that have lost a great many jobs and their most important economic base.

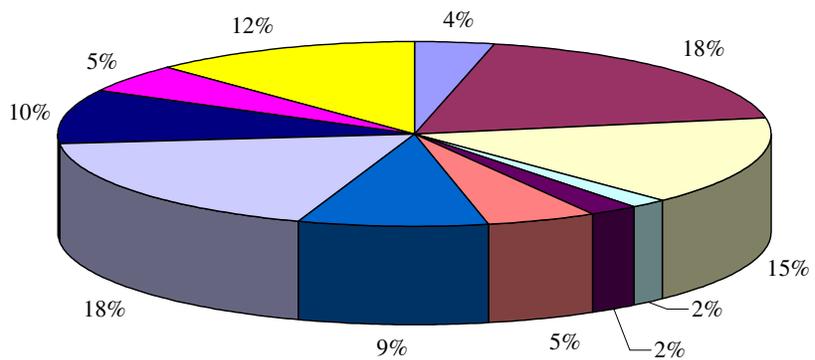
In 1990, Erie County<sup>1</sup> had about 35,500 manufacturing jobs, comprising 29.4% of total jobs. In 2004, Erie had just 24,400 manufacturing jobs, or 18.6% of the total, a reduction by more than 30% in this sector in only 14 years (*Current Employment Statistics Survey, 2006*). The charts below provide a fuller comparison of employment by industry in 1990 and 2004:

**Employment by Industry, Erie County, 1990**



- Natural Resources, Mining and Construction
- Manufacturing
- Wholesale and Retail Trade
- Transportation and Utilities
- Information
- Financial Activities
- Professional and Business Services
- Educational and Health Services
- Leisure and Hospitality
- Other Services
- Government

**Employment by Industry, Erie County, 2004**



<sup>1</sup> Data not available at the city level.

While manufacturing lost part of its share in the economy, naturally other sectors of the economy increased their shares. This occurred most notably in “education and health services,” “professional and business services,” and “leisure and hospitality.” Unfortunately for the workers in Erie, the weighted average of the average weekly earnings for production workers of these three sectors in 2004 was about \$460, whereas the average weekly earnings for production workers in manufacturing was over \$650 (*Current Employment Statistics Survey*, 2006). While manufacturing jobs may have been partially replaced by other jobs, these clearly do not pay as well.

In 2004, an estimated 40,291 people were living below the federal poverty line in Erie County, out of a population of 264,178 (*American Community Survey*, 2004). That figure represents 15.3% of the population. In 1989, 32,081 people were estimated to be living in poverty, at 11.9% of the population of 275,572. This is a direct result of the shift in the number and quality of jobs available in Erie.

The issue with poverty gets worse, however. According to the Economic Policy Institute (EPI, 2006):

most researchers now agree that a ‘poverty line’ income is not sufficient to support most working families. ‘Basic family budgets,’ individualized for communities nationwide and for type of family...offer a realistic measure of the income required to have a safe and decent, though basic, standard of living...It comprises the amounts a family needs to spend to feed, shelter, and clothe itself, get to work and school, and subsist in 21<sup>st</sup> century America. It includes no restaurant meals, no funds for emergencies—not even renters’ insurance to protect against fire, flood, or theft.

Using the basic family budget calculator on the EPI’s website, the following annual “basic family incomes” are needed for the Erie area:

<i>1 parent, 1 child:</i>	\$28,320
<i>2 parents, 2 children:</i>	\$39,924

Returning to the American Community Survey (2004) conducted by the Census Bureau, 54,205 out of 107,449 households (50.4%) in Erie County earn less than \$40,000 per year, while 18,146 households (16.9%) earn less than \$30,000 per year. Far too many people living in Erie don’t have enough income to adequately cover their basic needs.

## II. The Problem

### 1. Statement of the Problem

The main problem is not that there is a lack of wealth, but the way in which that wealth is distributed. In his book *The Ownership Solution*, Jeff Gates (1998, pp. 4-5) presents a vivid picture of the distribution of wealth in the United States:

- Research by Harvard University economic historians found that the share of the nation's overall net worth held by the wealthiest 1 percent of American households jumped from below 20 percent in 1979 to more than 36 percent in 1989. By 1995, they held 38.5 percent.
- Although the national net worth expanded \$5 trillion from 1983 to 1989, New York University professor Ed Wolff found that 54 percent of that was claimed by the half million families who make up the top one-half of 1 percent of the U.S. population. That works out to an average of \$5.4 trillion gain per already-wealthy household. That's three-quarters of a million dollars each year, \$65,000 per month, or \$90 per hour, twenty-four hours a day. And that's when the Dow-Jones industrial average was a small fraction of what it is today.
- Research by scholars at the Federal Reserve and the Internal Revenue Service found that the new worth of that top 1 percent is greater than that of the bottom 90 percent. The most well-to-do 1 percent now has a net worth 2.4 times that of the bottom 80 percent.
- Professor Wolff characterizes the current era as the most extreme level of wealth concentration since the late 1920s. Census Bureau data (1996) confirm that impression, documenting that the gap between America's have and have-nots is the widest since the end of World War II.
- According to the Congressional Budget Office, the top 1 percent of U.S. households claimed 70 percent of the total \$250 billion net increase in household income during the 1977-1989 period.
- The Census Bureau reported in 1996 record levels of inequality, with the top fifth of American households claiming 48.2 percent of the nation's income while the bottom fifth gets by on just 3.6 percent.
- Though aggregate household income climbed 10 percent between 1979 and 1994, 97 percent of that gain was claimed by the most well-to-do 20 percent. In 1973, the income of the top 20 percent of American families was 7.5 times that of the bottom 20 percent. By 1996, it was more than 13 times.
- Between 1989 and 1993, median household income in the United States fell more than 7 percent after correcting for family size and inflation. After adjusting for inflation, the annual income of households in the lowest quintile rose only \$76 from 1975 to 1994, while the median wage remained nearly 3 percent below what it was in 1979. For those in the bottom tenth percentile – someone earning just above minimum wage – their inflation-adjusted wages fell 16 percent between 1979 and 1989. The only group to enjoy positive gains in real income over the period 1983 to 1995 were households in the top 20 percent.
- Meanwhile, income tax returns for 1995 show that 87,000 Americans reported adjusted gross income of \$1 million or more. This upper-upper income group's income soared 25 percent from 1994 to \$227.6 billion, outpacing the overall 7 percent increase in income reported for the nation's 118.2 million individual returns.

United for a Fair economy is a non-profit organization that “raises awareness that concentrated wealth and power undermine the economy, corrupt democracy, deepen the racial divide, and tear communities apart.” (United for a Fair Economy website, [www.faireconomy.org](http://www.faireconomy.org)). It recently reviewed the results from the Federal Reserve's Survey of Consumer Finances (2004, <http://www.federalreserve.gov/pubs/bulletin/default.htm>) and noted the following:

- The wealthiest tenth saw their average net worth grow to three million dollars by 2004, up another 6% since 2001, and up 76% since 1995 (in 2004 dollars).
- By contrast, the poorest quarter by net worth fell backwards from being \$50 in the black in 2001 to being \$1400 in the red in 2004, not quite as bad as their 1998 situation of \$2100 in the red. (However, the poorest fifth *by income* took a leap forward in wealth from 2001 to 2004.)

In an era of advanced consumer capitalism with increasing globalization, free trade, and foot-loose capital, members of a community can no longer rely on the supposed loyalty of a company to their community. Shareholders far away concern themselves with profits, not the health of local economies. Businesses, being owned by these shareholders, must respond to their demand for not only profits, but the highest profits possible. Companies are leaving the United States for other countries that have cheaper sources of labor (and little to no labor movements), and often more lax environmental laws. Governmental policies make it easier for corporations to move out of the country, with fewer and fewer restrictions on capital mobility and trade. Companies are fully able to do this, because they are the owners of capital, and thus have full control over it. A new business model is needed that will replace the undemocratic capitalist firm. Worker-owned and managed businesses – worker cooperatives – would enable communities to have control over their economic destiny and to distribute wealth more equally in society.

## **2. Project Goal**

The goal of this project has been to lay the foundations for the creation of a worker cooperative in the Erie community. This type of business is being pursued, not only for its democratic nature, but also because worker cooperatives are highly unlikely to relocate to countries that have lax environmental and labor laws, and thus cheaper production costs, due to the fact that all those who work in the business are also its owners. For this reason, worker cooperatives are necessarily committed to the communities in which they operate.

## **3. Objectives**

In order to successfully realize this goal, several objectives had to be completed:

- A. Select business idea
- B. Conduct feasibility analysis to determine if the business idea selected is viable
- C. Create business plan
- D. Schedule pre-start-up activities, identified from the business planning process
- E. Create a proposal to obtain financing for business start-up

The table below provides more detailed information about these objectives.

<b>Objective</b>	<b>Prerequisites</b>	<b>Necessary Resources</b>	<b>Outputs and Products</b>	<b>Completion Date</b>
Select business idea	N/A	N/A	Business Idea	May 2005
Conduct feasibility analysis	Business idea	Skills in business research	Feasibility Analysis	August 2005
Create business plan	Business idea, feasibility analysis,	Skills in business research	Business Plan	April 2006
Conduct pre-start-up activities, develop plan to complete those that were not completed	Business Plan	Business Plan General and industry-specific governmental regulations research Accountant Lawyer	Prototype of production system By-laws of cooperative Articles of Incorporation Bank account Prototype of production system Letter of commitment from Erie Wastewater Treatment Plant Letter of interest from Erie Petroleum Plan to complete pre-start-up activities	April 2006
Create financing proposal	Business Plan, list of financing sources and their requirements	Finance skills	Financing Proposal	May 2006

### III. Project Design

#### 1. Literature Review

“The idea that workers could own, govern, and manage the means of production was put forward first in the 1840s as an alternative to the domination of labor by either capital or the state” (Adams & Hansen, 1992, p. 2).

The above quote provides part of the reason why developing a worker cooperative was chosen as the method to deal with the problem discussed. This author does believe that any other solution is viable in the long-term, as various reforms to the economic system do not deal with the root of the problem, which is the lack of worker ownership and control of the means of production. In addition, the amount of time and effort involved in starting a worker cooperative is within the scope of the project’s guidelines. On a slightly longer timeframe, this project will produce measurable results and provide an example to others on how to achieve a more just and sustainable economy.

Developing a worker cooperative is much like developing any other type of for-profit business, with the main differences being the governance structure and profit distribution. Thus, in developing this worker cooperative, business development resources were used as a guide to the planning process, literature on setting up a worker cooperative was reviewed, and existing worker co-ops’ structure was examined.

When attempting to start a business, naturally one of the first questions to be answered is whether or not the business can be operated profitably. In the business development literature, this is called a “feasibility analysis” or a “feasibility assessment.” This is a “preliminary evaluation of your business idea to see if it’s worth pursuing” (Reilly & Millikin, 1996, p. 1). This step in the business planning process involves assessing one’s own skills and also conducting preliminary market research on the demand for the product, the size of the market, the level of competition, and also determining if the product can be produced in a cost-effective manner. If the results of the feasibility analysis show that that the business can be operated profitably, then one can begin the important process of developing a business plan.

Bangs (1998, p. 1) lists 3 major reasons for creating a business plan:

1. The process of putting a business plan together, including the thought you put in before beginning to write it, forces you to take an objective, critical, unemotional look at your business in its entirety.
2. The finished product—your business plan—is an operating tool that, if properly used, will help you manage your business and work effectively toward its success.
3. The completed business plan communicates your ideas to others and provides the basis for your financing proposal.

Additionally, a guidebook for starting a business prepared by the Center for Entrepreneurial Assistance states that “although a business plan is time consuming, it is important to business

success. Completing the plan forces you to examine all decisions of management, marketing, personnel and finance in an objective and organized way” (2003, p. 6).

Formats of business plans vary widely, but they all cover basic information that is necessary to properly plan a business. The U.S. Small Business Administration states on its website ([www.sba.gov](http://www.sba.gov)) that a business plan’s body can be broken up into four major parts: 1) Description of the Business, 2) Marketing, 3) Finances, and 4) Management. Bangs (1998, pp. 2-3) divides the business plan into two sections: 1) The Business and 2) Financial Data. The complete outline provided by Bangs is as follows:

*Cover Sheet: Name of business, names of principals, address, and phone number*

*Statement of Purpose or Executive Summary*

*Table of Contents*

*Section One: The Business*

- A. Description of the Business
- B. Product/Service
- C. Market
- D. Location of Business
- E. Competition
- F. Management
- G. Personnel
- H. Application and Expected Effect of Loan (if needed)
- I. Summary

*Section Two: Financial Data*

- A. Sources and Applications of Funding
- B. Capital Equipment List
- C. Balance Sheet
- D. Breakeven Analysis
- E. Income Projections
  1. Three-year summary
  2. Detail by month for first year
  3. Detail by quarter for second and third years
  4. Notes of Explanation
- F. Cash Flow Projection
  1. Detail by month for first year
  2. Detail by quarter for second and third years
  3. Notes of Explanation
- G. Deviation Analysis

*Section Three: Supporting Documents*

Personal resumes, personal balance sheets, cost-of-living budget, credit reports, letters of reference, job descriptions, letters of intent, copies of leases, legal documents, and anything else relevant to the plan.

A more general view is provided in Frank T. Adams and Gary B. Hansen’s book, *Putting Democracy to Work: A Practical Guide for Starting and Managing Worker-Owned Businesses* (1992, p. 66):

Summary of the Plan

1. Product Plan
2. Marketing Plan
3. Raw Material Plan
4. Financial Plan
5. Taxation Plan
6. Personnel Policy and Staffing Plan

7. Governance Plan
8. Social Audit Plan
9. Education Plan

It should be noted that business development literature only provides a methodology to the business planning process and a basic guideline of items to cover. One cannot start a business after reading a particular “how to start a business” guide without conducting a large amount of research on the specific activity the business will undertake. The outlines above give a snapshot of all of the various components of a business plan that must be thought about, researched, and intelligently drawn together into a cohesive whole. Business development resources can help to organize this process and ensure that the business plan is comprehensive in scope.

As mentioned above, the largest difference between a typical business and a worker cooperative is the governance structure and the method of profit distribution. While typical capitalist businesses are owned by investors, a worker cooperative is owned by the workers within it. This difference in ownership allows for a worker cooperative to be democratically controlled by the workers, since they are also the owners. Just like a normal business, profits get distributed to the owners, who in this case are also the workers. It is the by-laws of the worker cooperative that details exactly how it will be democratically governed and also how the profits will be distributed.

With regard to governance, first and foremost each worker-owner gets one and only one share of stock in the worker cooperative, which entitles them to one vote in decision making matters (Adams & Hansen, 1992, p. 90). “In a worker-owned business, the worker-owners elect a board of directors who hire the management, then hold them accountable for the corporate success” (Adams and Hansen, 1992, p. 2). While this statement is given as fact, this is not the only way a worker cooperative can be set up. In this author’s opinion, this is little different from a traditional business. In this model, the only thing worker-owners do is elect a board of directors. It is a representative democracy, where the workers have only a very small role to play in decision making. Adams and Hansen provide a set of “model by-laws” (developed by the ICA Group) in an appendix in their book that would structure a worker cooperative in this manner. However, this author is not interested in representative democracies. To learn how others have set up a worker cooperative as a direct democracy, where workers actually govern themselves rather than electing someone to do that for them, contact was made with Rainbow Grocery, a worker cooperative grocery store in San Francisco, California. They provided a set of by-laws and a worker’s handbook that better suited this author’s principles.

Despite differences in how the worker cooperative is democratically governed, most worker cooperatives use a similar system for profit distribution. This is a system of “internal capital accounts” which is used to keep track of the profit distributed to each member of the worker cooperative. Each member has one of these accounts, with the initial amount in it being the cost of a membership share (Adams & Hansen, 1998, p. 90). Profits (or losses) are then allocated to this account, based usually upon the amount of hours worked in the time period in which earnings were made. Sometimes a combination of hours worked and rate of pay is used. The actual amount of profits that get distributed to worker-owners and that which is retained by the worker cooperative as a business varies according to the by-laws. Typically, however, 50 to 70% of profits get allocated to individual members, 20 to 40% is retained by the worker

cooperative, and 10% is used for membership education or charitable donations. The Mondragon Cooperative Corporation in the Basque region of Spain was the first to develop this system – in the 1960s – and it has been readily accepted by the worker cooperative community (Adams & Hansen, 1998, p. 20).

The product to be produced by the worker cooperative is biodiesel. Biodiesel is registered with the Environmental Protection Agency as a fuel suitable for production and consumption in the United States, meets all of the health requirements for fuels of the Clean Air Act, and has received full approval by the American Society of Testing and Materials (ASTM), the premier standard setting organization for fuels and fuel additives, under ASTM D 6751. Biodiesel is an alternative to diesel fuel, and can be sold either as a pure blend (termed B100), or in blends with diesel (such as B20, meaning 20% biodiesel, 80% regular diesel). B100 has been designated an alternative fuel by the Department of Energy and the Department of Transportation. In any blend, biodiesel typically sells at a slightly higher price than regular diesel.

Biodiesel is produced from renewable resources. The primary raw material needed for producing it is vegetable oil (“feedstock”). In this case, it will be oil from algae (algal oil). This business will grow its own algae, and extract the oil from it. The other two raw materials needed are alcohol and a catalyst. Methanol will be used as the form of alcohol (it is less expensive than the alternative, ethanol, and a smaller amount is required), and sodium hydroxide (lye) as the catalyst. The chemical process by which vegetable oil and these other products combine to form biodiesel is called transesterification. See the National Biodiesel Board’s website at [www.biodiesel.org](http://www.biodiesel.org).

## **2. Method**

The business development process described above in the literature review was followed closely in conducting this project. Essentially, there was little to no deviation in this process, although some activities overlapped and weren’t strictly followed in a linear fashion. A full report of the individual activities and results can be found below in the section on implementation.

## **3. Products and Outputs**

- Business idea
- Feasibility analysis
- Business plan
- Prototype of production system
- Letter of commitment from Erie Wastewater Treatment Plant
- Letter of interest from Erie Petroleum
- Incorporated business (articles of incorporation)
- Bylaws of worker cooperative
- Business bank account
- Plan to complete pre-start-up activities

- List of potential financing sources
- Financing proposal

#### 4. Logic Model

Objective	Inputs	Processes	Outputs	Short-term outcomes	Intermediate outcomes	Long-term outcomes
Select Business Idea	Interests, current knowledge of business	Brainstorm possible business ideas  Determine compatibility of skills with possible business ideas	Business Idea	Knowledge and skills necessary to start a worker cooperative	Operational worker cooperative  Creation of jobs	Empowered worker-owners  Increased income for worker-owners and the Erie community
Conduct Feasibility Analysis	Business Development Publications and Materials  Market and industry data  Computer/Internet	Analyze market research	Feasibility Analysis		Increased base of secure and stable jobs  Practical example of alternative form of business	
Create Business Plan	Feasibility Analysis  Business Development publications and materials  Market and industry data  Examples of business plans  Computer/Internet	Conduct necessary research  Organize research into business plan	Business Plan			
Schedule Pre-Start-Up Activities	Business Plan  Legal guidelines specific to industry	Prioritize and schedule pre-start-up activities that were identified in business planning process	Schedule and plan to conduct pre-start-up activities			
Create Financing Proposal	Business Plan  Examples of financing proposals	Summarize Business Plan and justify needs for funding requested	Financing Proposal			

## **5. Community Role & Stakeholders**

The Erie community is involved in several ways in this project. First, a couple of environmental non-profits have shown interest, one being the Western Pennsylvania Conservancy which initially allowed for some research to be conducted in their laboratory. Also, various individuals who are concerned about the environment have helped out in many ways, particularly by guiding the project managers to expert sources and possible grant opportunities, as well as by offering their opinions on the project as a whole.

The Assistant Bureau Chief at the Erie wastewater treatment plant has helped immensely with this project by providing numbers on the pollution and nutrient levels currently emitted by the plant, access to effluent for research purposes, suggestions about operating the pollution control/algae growth system, and genuine encouragement. He has also expressed a great deal of interest in us using the Erie wastewater treatment plant as our source of effluent for the system. Not only will this help the treatment plant meet its pollution limits, but it will also create political goodwill in the community.

The Small Business Development Center in Erie provided some help when the project was first conceived by informing the project managers about the generalities of starting a new business. In addition, the Chamber of Commerce was able to answer several questions about business development, and staff from the Community and Economic Development Department of the City of Erie were able to suggest several programs that could be utilized once this project was near implementation.

Finally, future worker-owners hired by the worker cooperative will be selected from the Erie labor force, and will be instrumental in its success.

## IV. Project Implementation

### 1. Implementation Plan

#### 1.1 Activities and Inputs

Activity	Responsibility*	Required Resources
<b>Objective: Select business idea</b>		
Brainstorm possible business ideas	KW & LM	Creativity and basic business knowledge
Analyze business ideas for compatibility with skills and values, profitability of business	KW & LM	Basic business knowledge
Select business idea	KW & LM	Results from above activities
<b>Objective: Conduct Feasibility Analysis</b>		
Research market for product	KW	Internet, business development (BD) publications
Research competition	KW	Internet, BD publications, newspaper
Research production operations	KW & LM	Internet, industry publications
Research start-up and operational costs	KW & LM	Internet, industry publications
Research legal requirements	KW	Internet, BD publications, industry publications
<b>Objective: Create Business Plan</b>		
Describe product	KW & LM	Industry and government publications
Design and describe business structure and management	KW & LM	BD publications, worker cooperative development guides
Research and describe market/industry	KW	Internet, industry and government publications
Develop marketing plan	KW	BD publications
Research and describe industry regulatory environment	KW & LM	Internet, industry and government publications
Research, design, and describe production and operations	KW & LM	Internet, industry publications, BD publications, academic research
Research and source all necessary equipment and contracted labor	KW & LM	Internet
Create projected financial documents	KW	BD publications
Create financial plan	KW	BD publications
Create taxation and regulatory plan	KW	BD, industry, and government publications
<b>Objective: Schedule Pre-Start-up Activities</b>		
Write and submit articles of incorporation	KW & LM,	Lawyer

	Lawyer	
Write and ratify bylaws	KW & LM	Examples of other worker cooperative bylaws
Start bank account	KW & LM	Bank
Research all required permits for product/industry	LM	Internet, government publications, SCORE, DEP, WWTP Deputy Bureau Chief
Research all required miscellaneous legal requirements and applications	KW & LM	Internet, government publications, lawyer, accountant
Acquire all necessary applications and resources to complete them, develop schedule to submit them	KW & LM	Results from above activities
Search for lawyer	LM	Yellow pages, personal contacts
Search for accountant	KW	Yellow pages
Contact Erie Wastewater Treatment Plant	LM	Personal connections
Discuss relationship with Erie WWTP, negotiate terms	KW & LM	Basic business idea
Request Letter of Commitment from Erie WWTP	KW & LM	Business Plan, lawyer
Contact Erie Petroleum (EP)	KW	Yellow pages
Discuss relationship with EP	KW	Understanding of product and distribution system
Request Letter of Interest from EP	KW & LM	Business Plan, lawyer
Investigate other potential major customers	LM	Internet, personal connections
Investigate potential suppliers	LM	Internet
<b>Objective: Create Financing Proposal</b>		
Determine total financial needs	KW & LM	Business Plan
Research all local financing options	KW & LM	SBDC, SCORE, Erie Department of Economic and Community Development, NW Commission, Erie Chamber of Commerce
Research product-specific financing options	KW & LM	Internet, industry publications
Research worker cooperative financing options	KW	Internet, personal connections
Research business start-up financing options	KW & LM	Internet, personal knowledge
Determine financing sources for specific applications	KW & LM	Requirements of financing sources
Write financing proposal to specific sources for specific applications	KW & LM	Results from above activities

\* KW = Kris Warner, LM = Lucas McConnell

## 1.2 Gantt Chart

Activity	Period (Apr 05 – Mar 06)											
	A p r	M a y	J u n	J u l	A u g	S e p	O c t	N o v	D e c	J a n	F e b	M a r
Brainstorm possible business ideas	█											
Analyze business ideas for compatibility with skills and values, profitability of business	█	█										
Select business idea		█										
Search for lawyer		█	█									
Write and submit articles of incorporation		█	█									
Research market for product		█	█									
Search for accountant		█	█	█								
Contact Erie Wastewater Treatment Plant (Erie WWTP)			█									
Research competition			█	█								
Research production operations			█	█	█							
Research legal requirements			█	█	█							
Design and describe business structure and management			█	█	█	█						
Contact Erie Petroleum (EP)				█								
Describe product				█	█							
Research start-up and operational costs				█	█	█						
Discuss relationship with EP				█	█					█		
Discuss relationship with Erie WWTP, negotiate terms				█	█	█	█	█	█	█	█	█
Research and describe market/industry					█	█	█					
Research, design, and describe production and operations					█	█	█	█				
Research and source all necessary equipment and contracted labor						█	█	█	█	█		
Research and describe industry regulatory environment						█	█	█				

Activity	A	M	J	J	A	S	O	N	D	J	F	M
	p	a	u	u	u	e	c	o	e	a	e	a
	r	y	n	l	g	p	t	v	c	n	b	r
Develop marketing plan												
Write and ratify bylaws												
Research all required miscellaneous legal requirements and applications												
Create projected financial documents												
Research all required permits for product/industry												
Create financial plan												
Create taxation and regulatory plan												
Investigate other potential major customers												
Investigate potential suppliers												
Acquire all applications, develop schedule to submit them												
Determine total financial needs												
Start bank account												
Research all local financing options												
Research product-specific financing options												
Research worker cooperative financing options												
Research business start-up financing options												
Request Letter of Commitment from Erie WWTP												
Request Letter of Interest from EP												
Determine financing sources for specific applications												
Write financing proposal to specific sources for specific applications												

## **2. Implementation Report**

The basic outline of activities provided above was followed, though not as orderly as planned. Given the finite amount of time to conduct this project, work and other responsibilities, and external factors (such as appropriate funding opportunities arising), some activities that had higher importance were conducted before starting or completing those that had initially been scheduled before them. Some activities have yet to be started, while others are partially complete. For instance, a great funding opportunity arose both in June (Pennsylvania Department of Environmental Protection, Energy Harvest grant program) and in August (PA DEP, Alternative Fuels Incentive Grant program). Although objectives three (business plan), four (pre-start-activities plan), and five (financing proposal) were not yet completed at those times – and are still not finalized – those opportunities could not be passed up. This turned out to be a good decision, as we were awarded a \$105,000 matching grant in February from the latter program. Applying to these grant programs also provided experience in the grant-writing process and also forced us to refine some of our ideas. This experience will be very useful in applying for additional grants. In the coming months, this project will be fully completed and business operations will begin.

## V. Monitoring and Evaluation

Being that this was mostly a project conducted by two people, there was a very informal monitoring and evaluation plan used. Mainly this consisted of regular communication to ensure that activities were being conducted within the time allocated to them and reporting back on results. Many of the activities required that previous activities were completed fully, so it was that they get done in time, and in proper sequence. Modifications were sometimes made to the initial implementation plan, updating the activities that needed to be conducted. The project was evaluated on whether or not the activities were completed, and the completeness of deliverables, with the main focus on the business plan. While not expected, the grant from the PA DEP's Alternative Fuels Incentive Grant provided external validation of the work involved in conducting this project.

## VI. Sustainability Plan

Since this is a business development project, there is a large difference in the requirements for sustainability compared to other community economic development projects. Once all of the objectives are met and the products and outputs are produced, this project will terminate as a business development project and will start a new phase in financing solicitation. This phase will decide whether or not the business is actually started. Part of this has been accomplished, as a \$105,000 matching grant from the Pennsylvania Department of Environmental Protection's Alternative Fuels Incentive Grant program was received. More funding is needed, but this initial grant will help to implement some of the start-up activities and will also greatly aid in receiving more grants. Once an adequate amount of financing is secured for start-up, the business must then generate enough revenue through the sale of biodiesel to cover all costs. If this break-even condition is not met, the business will ultimately fail and will have to be dissolved.

If the business gets funded and begins operations, there will be several circumstances that will affect its financial health. First, there is a possibility that some of the algae production estimates could be wrong. There is currently no existing commercial production of algae oil for biodiesel use. Most of the data in the business plan related to this aspect of the project are based upon laboratory studies and some experimental field work. Also, this project has taken a different path towards algae production than past projects, using closed bioreactors rather than open ponds. Although the secondary research has been fully analyzed and an effort has been made to create the best production system design possible, there is a chance that testing of the prototype will necessitate modifications to the first pilot the business undertakes. Additionally, the production will occur in the field, rather than the laboratory, so certain unexpected variables may affect production levels. This is partially the reason for the choice in a closed system over the open-pond method which allowed little control over external variables.

Second, with respect to biodiesel sales, falling prices of diesel (since biodiesel is its substitute) could affect the level of sales or the selling price. This is unlikely, though will still have to be watched carefully and adjustments will have to be made if it occurs. However, this should only affect the level of profits, not the existence of profits. If all financial projections are close to actual results, diesel prices would have to dramatically decrease in order to put the profitability of the business into question.

Finally, competition – which currently does not exist anywhere near the region – could cause adverse effects on the business. There are plans being talked about to put a biodiesel processing plant in Erie sometime in 2007. This facility would have a much larger production level than Renewergy Cooperative Corporation would, at least at the start. One advantage that RCC will have is that it has already developed a relationship with the only local petroleum distributor. A second advantage is that RCC has developed a structure (working in conjunction with a wastewater treatment plant to produce our main raw material) that should drastically reduce operating costs.

## VII. Conclusions & Recommendations

### *Results*

Initially this project was broader in scope than it currently is. At the conception of the project idea, the objectives included all that are included in this report with the addition of the objective to have begun business operations. Several months before implementation began, it was realized that the timeframe wasn't long enough to do this. Thus, the project was shortened to just include those objectives that related to the development of the business, with actual business operations to start at a later date. This was a good decision to make, because otherwise many of the current objectives would have suffered.

The first two objectives (select business idea and conduct feasibility analysis) were completed, while the rest remain incomplete. Of those, the business plan is nearly finished, with only a small amount of finalizing left to take place. A schedule of all pre-start-up activities is still in the works, though nearly completed. Many of these activities will need to be more fully reviewed, and more will probably need to be added. The financing proposal turned out to be less important than first thought, as the business plan will provide most of the details that will be needed for specific funding opportunities, as was realized when applications were created for the two grants discussed above.

So far, this project has been extremely successful. A great amount of knowledge has been gained on developing a worker cooperative, a grant of \$105,000 has been received, and prospects look very good for actually beginning business operations in the not-to-distant future.

### *Recommendations*

The following is directed to those who are interested in worker cooperatives but have little to no background or experience in business. I cannot offer much to others who have an education in business or who are entrepreneurs that have started or run a business, given my own limited knowledge, except the discussion about the structure of worker cooperatives earlier in this report.

First and foremost, I would suggest that those interested in worker cooperatives always keep in mind that a worker cooperative is a for-profit business. Although this probably seems obvious, I think that those who are interested in worker cooperatives might have a tendency to place too much focus on the social, egalitarian aspects of them rather than the research and planning that must be done in order to start a profitable business. My own interest in worker cooperatives spawns from their democratic and egalitarian nature, and my opposition to worker exploitation embodied in capitalist businesses. However, a worker cooperative cannot survive based solely upon ideals. In order to survive – and succeed – as a business, a worker cooperative must compete in the marketplace with other businesses in a manner which will bring in revenues beyond expenses. Even

though worker co-ops are dramatically different from other businesses, this basic premise still applies.

In this report, I believe I outlined a fairly accurate portrayal of how to go about starting a business: choose a business idea, conduct a feasibility analysis, create a business plan, schedule pre-start-up activities, and seek financing. This is not simply my own creation, but what I thought was the best breakdown of the steps identified in various business development materials.

Beyond selecting a business idea, one cannot do any of the above steps without some basic skills in business or economics. For those without these, I recommend spending some time familiarizing themselves with some basic business development literature. By this I mean reading a “how-to” guide or something similar that outlines the entire process. Reading through this material will enable one to understand what knowledge they need to accumulate before actually starting the process of developing the worker cooperative.

For instance, describing a market for a particular product or service is a very large part of a business plan. One cannot simply state that a large market exists without evidence that backs this claim up. The state of the market must be described, as well as its history and projections on its future. A plan must also be developed on how to break into this market. Quantitative data on markets – as well as the methods by which to find it – is a necessity when developing a business. While one could conceivably hire a consulting firm to conduct this research for them (given they have the pocketbooks to do so), nothing can replace the intimate knowledge of the targeted market by personally doing this research. At the same time, however, the most successful business person cannot create a profitable business around an idea that simply isn’t good. This is why the step before creating a business plan – conducting a feasibility analysis – is a must.

It should be noted that there are many free services that offer help to people when they are attempting to start a business. Small Business Development Centers (SBDCs) – run by the U.S. Small Business Administration – exist in many cities throughout the United States. There are also many regional and local programs that focus on business development, often in targeted industry sectors such as manufacturing. A comprehensive search of these services should be conducted, and contact made with them. SBDCs can often help to identify these other programs, and point out those which would be the best fit with the business idea. However, few if any probably have any special skills when it comes to starting a worker cooperative, particularly with respect to raising start-up capital. Nonetheless, much of business development isn’t specific to any particular form of business, so they should still prove to be valuable. Below is a small discussion of some resources that should be helpful for those interested in starting a worker cooperative.

The ICA Group (<http://www.ica-group.org>) of Boston, Massachusetts is a non-profit organization that focuses on both worker cooperatives and other forms of democratic workplaces (i.e. Employee Stock Ownership Plans or ESOPs). The National Center for

Employee Ownership is similar, though this organization only does work related to ESOPs. The University of Wisconsin Center for Cooperatives (<http://www.wisc.edu/uwcc/index.html>), although dedicated to all kinds of cooperatives (consumer, producer, marketing, etc.), has many good resources about worker cooperatives and should definitely be looked at. The newly formed U.S. Federation of Worker Cooperatives (<http://www.usworker.coop/>) should also be able to provide some good educational materials on starting worker cooperatives.

## VIII. Appendices

### 1. Description of Business Activity

Renewergy Cooperative Corporation is the worker cooperative that was incorporated in the state of Pennsylvania and which will serve as the business that will conduct the operations researched in this report. Below is a synopsis of the business activity this cooperative will conduct.

#### 1.1 Product

The product to be produced by this business is biodiesel. Biodiesel is registered with the Environmental Protection Agency as a fuel suitable for production and consumption in the United States, meets all of the health requirements for fuels of the Clean Air Act, and has received full approval by the American Society of Testing and Materials (ASTM), the premier standard setting organization for fuels and fuel additives, under ASTM D 6751. Biodiesel is an alternative to diesel fuel, and can be sold either as a pure blend (termed B100), or in blends with diesel (such as B20, meaning 20% biodiesel, 80% petrodiesel). B100 has been designated an alternative fuel by the Department of Energy and the Department of Transportation. In any blend, biodiesel typically sells at a slightly higher price than petrodiesel.

Biodiesel is produced from renewable resources. The primary raw material needed for producing it is vegetable oil (“feedstock”). In this case, it will be oil from algae (algal oil). This business will grow its own algae, and extract the oil from it. The other two raw materials needed are alcohol and a catalyst. Methanol will be used as the form of alcohol (it is less expensive than the alternative, ethanol, and a smaller amount is required), and sodium hydroxide (lye) as the catalyst. The chemical process by which vegetable oil and these other products combine to form biodiesel is called transesterification. Glycerine is the only by-product from the process, and can be sold on the market.

#### 1.2 Business Operations

There are three distinct processes involved in this business: 1) producing algae, 2) extracting the oil from this algae, and 3) producing biodiesel. Each will be discussed below.

##### 1.2.1 Producing Algae

Algae has been chosen as the feedstock for the production of biodiesel for two main reasons, associated with costs. First, algae has a higher oil content than the plants that other biodiesel producers use for their feedstock (typically soybean oil), and most other plants as well. Thus, we can expect higher amounts of oil from the same amount of plants. Second, algae is an aquatic plant, and the two main nutrients that algae needs for growth, nitrogen and phosphorous, are readily available in the effluent (discharged water)

of a wastewater treatment plant. In fact, treatment plants must take measures to reduce the amount of these nutrients they discharge into bodies of water for ecological reasons. Using the effluent from a wastewater treatment plant will enable us to produce algae at minimal costs, while also benefiting the treatment plant.

Aside from a water source containing nitrogen and phosphorous, algae also needs light, carbon dioxide, and the proper temperature for growth. A production system has been devised that incorporates all of these elements for maximum algae growth, and is described below.

A 10,000 gallon water tank will be the largest component of this system, and is also the location where the algae will grow. Attached to this tank will be a metal silo-type structure which will house various components necessary for its operation. This includes several metal halide light fixtures with fiber optic cables which will supply the tank with light; an air compressor for supplying air to an aeration fountain mounted at the bottom of the tank, to provide both carbon dioxide and to keep the algae in suspension for better growth; a rotating drum filter for algae filtration; and a diesel generator to power all of the equipment.

The process is as follows: A sump pump will direct a portion of the effluent from the Erie Wastewater Treatment Plant into the water tank, which will be situated on the property of the treatment plant. After the initial filling of water and algae, a constant flow of effluent into the tank will be maintained, and a corresponding flow of algae and nutrient-depleted effluent will be discharged. The algae will be held in a storage tank after being filtered from the effluent, while the effluent will be returned to the wastewater treatment plant through hosing, by the force of gravity. Once per day, the storage tank full of algae will be transported to a processing facility, and an empty storage tank will be hooked into the system.

### 1.2.2 Extracting Algal Oil

After the storage tank holding the algae is transported to the processing facility, it will be . From here, it will be pumped into a soft-squeeze screw press, which can process it at speeds up to 5 tons per hour. Electricity, a small air compressor, and labor is all that is needed in this process. The press will extract the oil from the algae by pressurized force. Algal oil will be discharged into one storage tank, while the algae solids will be discharged into another.

### 1.2.3 Producing Biodiesel

The algal oil will be used as the main ingredient in the production of biodiesel, with methanol and lye as the other ingredients. Through the process of transesterification, these ingredients will result in biodiesel, as well as a small amount of glycerine. Also, a small amount of methanol will be able to be recovered and reused, as an excess amount will be added in order to increase the speed of the process.

The storage tank holding the algal oil will be situated right next to the biodiesel processing equipment. This oil will be pumped into the reactor tank of the biodiesel processor, while methanol and lye will be held in smaller tanks above this. The methanol and lye will combine in another small tank and mixed to form sodium methoxide. The algal oil will be heated to 131 degrees Fahrenheit, and will then have the sodium methoxide added to it. Through the chemical process of transesterification, biodiesel and glycerine will have formed in about 8 hours and separated into two layers. The glycerine will be drained out from the bottom of the tank and placed into a storage tank for sale later. The biodiesel will be transferred to another tank for washing, a process which removes any contaminates from it. It will then be pumped into an exterior storage tank with a capacity of 10,000 gallons. This tank will serve as both the pickup point for wholesale customers, and also the source for filling the small mini-station to be used for retail customers.

## 2. Capital Equipment List – Pilot Model

Equipment	Units	Cost/Unit	Total Cost
<b>Manufacturing Equipment</b>			
Water tank – 10,000 gallon capacity	1	\$11,000	\$11,000
Diesel Generator	1	\$7,750	\$7,750
Metal Halide lighting system	N/A	\$10,000	\$10,000
IDEC Smart Relay	1	\$300	\$300
Ultraviolet sterilization device	1	\$8,500	\$8,500
Sump pump for filling water tank	1	\$2,500	\$2,500
Air Compressor - turbidity and CO2 injection	1	\$1,000	\$1,000
Hosing	N/A	\$650	\$650
Rotating Drum Filter	1	\$6,500	\$6,500
Storage tank for algae	5	\$1,000	\$5,000
KP10 Screw Press – for algal oil extraction	1	\$29,100	\$29,100
Air Compressor for screw press	1	\$350	\$350
1,000 gallon storage tank for algae solids	2	\$650	\$1,300
2,000 gallon storage tank for algal oil	2	\$1,200	\$2,400
10,000 gallon storage tank for biodiesel	1	\$15,000	\$15,000
Biodiesel Processing Equipment	N/A	\$20,000	\$20,000
<b>Total Manufacturing Equipment</b>			\$121,350
<b>Transportation Equipment</b>			
Flatbed Truck	1	\$15,000	\$15,000
<b>Sales Equipment</b>			
Biodiesel Mini Fueling Station	1	\$19,000	\$19,000
Register	1	\$400	\$400
Credit card reader	1	\$150	\$150
<b>Total Sales Equipment</b>			\$19,550
<b>Office Equipment</b>			
Laptop	2	\$2,500	\$5,000
Office Furniture	N/A	\$4,000	\$4,000
<b>Total Office Equipment</b>			\$9,500
<b>Total Capital Costs</b>			\$165,400

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