

PROJECT ABSTRACT

(No more than 20 lines. Every word over 20 lines will constitute a one point deduction.)
(do not delete the instructions on this page)

The project proposes to collect waste vegetable oil (WVO) from small businesses as well as residential users and process the WVO into biodiesel using a renewable energy source. Current uses of WVO in Florida include rendering for fuel oils and food by-products for such uses as pet food. There is also some biodiesel production but this has been limited to regional production around population centers. Lee County represents a unique geographical area as it does not easily support any regional organizational efforts. Other population centers are at least two hours from the subject area. This project proposes to use the relative geographic isolation to develop a mini-regional production system for WVO collection and biodiesel generation and distribution. Additionally, all energy (electricity and heat) for conversion of recycled WVO to biodiesel will be derived from the beneficial use of landfill gas from a local landfill. Renewable energy and renewable fuel have been popular topics in the national culture as efforts to diversify fuel consumption away from imported foreign oil. Biodiesel is generated from the transesterification of vegetable oils from numerous sources. These sources can include virgin oils from soybeans and other oil generating plants but also from waste vegetable oil (WVO) from industrial and commercial generators, the most common being restaurants and institutional food services. Current estimates indicate that several hundred thousand to one million gallons of biodiesel could be produced annually which would be sufficient to provide a B50 blend biodiesel product for all of the Solid Waste Division transfer vehicles and heavy equipment plus provide biodiesel to various County operated transportation services such as school buses and public transportation. The net effect of this project would be to provide a cost effective collection system for a waste product (WVO) within a target segment that may not be handling their waste in an optimal manner. Additionally, County operating expenses and the air emission contribution of equipment using the final biodiesel product will decrease.

PROJECT DESCRIPTION

(1 page)

This project will consist of the installation and operation of a plant to recycle WVO into biodiesel at a local landfill utilizing landfill gas (LFG) as an energy source.

Project Site: The facility for this proposed project will be situated on a two-acre parcel adjacent to the Gulf Coast Landfill, owned and operated by Waste Management Inc. of Florida. Lee County currently owns the gas rights to the methane produced as a function of waste decomposition. The site will include connections to mover equipment for LFG transfer, a boiler for biodiesel plant energy, storage tanks for the recycled WVO as well as finished product and by-products. The primary by-product is glycerin. Although not the primary focus of this project, LCSWD will also investigate secondary markets for the use of glycerin. Some examples include fuel, soap manufacturing, and in the florist industry. Lastly, the County will investigate the potential for electrical generation from excess LFG for plant electrical needs with excess energy possibly delivered to the electrical grid.

Site Design: The County will secure engineering design services to prepare site drawings and specifications for development of the biodiesel plant with the option of operation. The engineering company will work with the biodiesel developer to secure required permits for the facility, including but not limited to, FDEP solid waste permits, Title V air permits, and biodiesel fuel related permits (storage and transportation).

Plant Manufacturer/Operator/Developer Solicitation: The County will procure the services of a biodiesel development company to construct and/or operate the biodiesel plant. The contract specifics will be determined during contract negotiations with the biodiesel development company upon contractor selection.

WVO Collection: The County will evaluate available recycled WVO sources and establish agreements for the procurement of WVO. Options for this include customer drop-off programs, self-performed collection services and as a last resort purchase of WVO from WVO collection companies which tend to work with large volume producers. Materials will be screened for suitability with the operation and will be part of a public advertising campaign to garner local commercial business's support and assistance. Ideally, drop-off or self-performed collection of donated WVO would keep production costs minimal. Another program will target household collection of WVO centered on the holiday season with a "Turn Turkey Frying into Fuel" campaign. A specific slogan will be developed to best capture this market.

Coordination of Biodiesel Distribution: With the biodiesel developer's assistance, the LCSWD will seek an agreement with local fuel distribution companies for storage and blending services as necessary to handle excess inventory prior to LCSWD or other County departmental use. Depending on production rates, this may be minimal and may only require acquisition of additional storage tanks at fueling facilities.

Public Tours and Education: The facility design will incorporate the ability for public tours catering to local groups such as LeeGROWS as well as educational tours for schools. The County will also make the facility available for tours by other communities with similar development potential. The County will plan on making the facility available during regional meetings such as SWANA's Florida Chapter Annual Summer Conference as well as other state and local conferences that are attended locally.

Report: After the establishment of the WVO collection system and start-up of the biodiesel plant, the County will present FDEP with a project report detailing the project progress and status as well as identifying variations from original intent as well as the reasons for these variations.

Criteria 1: TECHNOLOGIES or PROCESSES

(1 page)

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(20 points) The range of scoring is between 0 and 20 points, with up to 10 points for meeting one of the following sub-criteria, up to 15 points for meeting two, and up to 20 points for meeting all three. Note: applicant may adjust space used to address each sub-criteria.

Sub-criteria 1 – Not in common use in Florida.

Currently there are a few companies that collect WVO. This is typically in concert with virgin oil drop-off. One of the targets of this program are those users whose oil quantity does not justify an elaborate collection/drop-off systems. One aspect of this program is to encourage WVO recycling from these smaller businesses as well a residential users, as applicable. Secondly, although there is some biodiesel production in Florida, the production is limited and is concentrated to large scale operations around large population centers. The larger plants tend to utilize higher quality product input streams such a virgin vegetable oils for biodiesel production. The proposed project, on the order of several hundred thousand to a million gallons per year of WVO collection and biodiesel production is unique in that it allows for facilities with access to LFG or other renewable fuels to generate biodiesel for their own use. The plant will focus on smaller waste streams from small commercial and industrial food service businesses. This approach is similar to CESQG collection events but is targeting an often overlooked waste stream in these collections. Recycling of WVO for biodiesel production using LFG is not currently being undertaken by anyone in Florida.

Sub-criteria 2 – Novel application of an existing technology or process.

The unique aspect of this project is the use of a renewable energy source, LFG, for the total energy needs in creating the biodiesel. The energy required for heating the biodiesel production process as well as electrical needs of the plant will be provided by LFG.

Sub-criteria 3 – Overcoming obstacles to recycling/waste reduction in new or innovative ways.

The waste product, WVO, is often a difficult product for small commercial customers to handle. All too often, this material is discarded through the sewer system or other unauthorized disposal methods. The County, in its promotion of this project will target small businesses similar to CESQG collection events intended to capture quantities that can be legally disposed but preferably should be diverted from disposal. The program will also provide the ability for residential recycling of WVO.

Criteria 2: TARGETS

(1 page)

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(10 Points) Demonstrate innovative processes to collect and recycle or reduce these targeted materials/sectors: Construction and Demolition Materials, Commercial/Institutional Sectors, Hurricane Debris, Pay-As-You-Throw and Waste Tires. Note: if the proposed project also includes materials/sectors other than those targeted by this criteria, the project will receive less than the maximum 10 points allocated for the criteria.

The primary target sector for this project will be small commercial businesses that generate smaller quantities of WVO. All too often, these are facilities that may dispose of their WVO in 5-gallon buckets along with their regular waste or are disposing of the WVO through the sewer system or other illegal disposal methods such as direct discharge to the ground. When quantities are small enough, the impact of these disposal methods is not readily apparent. This target sector is similar to the demand for CESQG collection events held in most communities across the state. The project will promote recycling of WVO as a cost effective management of these business' waste.

Criteria 3: BENEFITS/ COST-EFFECTIVENESS

(1 page)

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(25 points) Demonstrate the potential economic, environmental, and cost-effectiveness of the program's approach. Note: applicant may adjust space used to address each sub-criteria.

Sub-criteria 1 - Environmental Benefits (5 points).

- **Methodology:** This project will result in the recycling of WVO through the use of a renewable energy source, LFG. LFG is a recognized renewable energy source derived from biomass. The use of LFG reduces fugitive emission potential at the landfill as well as reducing precursors to ozone depletion. As WVO from the target sector, small commercial food service, is often generated in small quantities, this project will encourage proper disposal of these materials and seek to eliminate disposal via sanitary sewers and other illegal methods such as direct land discharge. Cost efficient disposal options will encourage WVO generators to recycle the WVO. Disposal of WVO in sanitary sewers is responsible for failure of sanitary systems due to pipe clogging.
- **Toxicity:** The use of LFG for energy demands results in destruction of methane which is 23 times more damaging to the ozone than carbon dioxide. The creation of biodiesel from recycled WVO generates a fuel that has a net negative impact on the quantity and quality of air emissions from diesel engines. The manufacturing process is relatively emission free as most volatiles from the process can be collected and recycled or blended as a process fuel source.

Sub-criteria 2 – Economic Benefits (5 Points).

Biodiesel, depending on current economic conditions, has held closely to retail rates for diesel fuel. The operation of the plant as well as support services is likely to create 5-10 full time positions. Additionally, the collection service will provide a cost-effective means for WVO disposal, thus providing small commercial businesses an incentive to properly handle their WVO. This benefit is expected to assist small, non-franchised restaurants and other food service companies. With increasing biodiesel use statewide, development of oil rich agricultural crops for feedstock into this process may increase thus spawning increased economic growth in the state.

Sub-criteria 3 – Cost-Effectiveness (15 Points).

The project is expected to be self sustaining. Understanding that LFG generation over time will slowly decrease at the Gulf Coast Landfill, the system will be designed to be modular and portable, allowing future placement at either the Lee Hendry Landfill (LFG), Lee County Resource Recovery facility (waste heat, electricity) or other locations where a waste product can be utilized for plant operation. With the self production and use of renewable energy sources, the anticipated costs for use of biodiesel are estimated to be 10-20% below retail diesel costs. Overall LCSWD expects a net decrease in operational costs as well as potential reduced maintenance costs due to increased lubrication provided to engines with biodiesel use.

Criteria 4: SUSTAINABILITY:

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(25 points) Demonstrate the sustainability of the proposed program.

Lee County is one of the fastest growing counties in Florida. It is anticipated that the population will increase by 100,000 people (15-20%) between 2005-2010. With this growth comes an increase in food services in the form of fast food as well as other restaurants. The current WVO generation estimate for Lee County is approximately 400,000 gallons of WVO per year. With the predicted population growth, the WVO generation should increase to 500,000 gallons by 2010. Even if the project only concentrates on LCSWD equipment, usage of biodiesel will be on the order of 200,000 gallons/yr which indicates that there is excess available WVO in the market place for recycling. Operationally, the biodiesel cost and use will be a net reduction in LCSWD costs from not only a cost savings from biodiesel use but also base expenses would fund the operational costs. Additionally, due to the use of LFG, the project will not be subject to fluctuations in the energy market and production costs will be relatively flat with the only adjustment due to inflation and labor related costs and benefits. This means that 5 years from now, the plant will be independent of current petroleum prices. From only the LCSWD perspective, an extended decrease in operational costs is perpetually sustainable.

An added benefit that may yield even greater sustainability on a statewide scale is the market encouragement of vegetable oil sources. The County has had discussions with entities interested in farming crops for virgin oil production to be used in generating biofuels. In demonstrating the feasibility of a project on this scale for local government, added public participation and an increase in demand for recycled WVO fuel products will encourage additional oil sources to be developed. From an economic perspective, increased biodiesel use in Florida could result in the creation of a cottage agriculture and manufacturing market segment further spawning increased economic growth for the state.

Criteria 4: TRANSFERABILITY

(1 page)

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(10 Points) Demonstrate transferability of technology and processes and specify how the project will promote transferability. Note: applicant may adjust space used to address each sub-criteria.

Sub-criteria 1 – Transferability of technology and processes (5 points).

Concurrent with plant design and construction, the County will evaluate and implement a WVO collection program consisting of drop-off and collection routes depending on the volume and type of businesses encouraged to use the program. This collection system will mimic HHW programs in intent. The collection system when implemented will be easily duplicated in other communities with similar demographics.

As the plans and specifications for recycling WVO-to-Biodiesel plant will be solicited publicly, other public entities will be able to utilize these documents as guidance for development of their own project. The biodiesel manufacturing process is well established and there are numerous vendors that can assist with development, installation and operation of the biodiesel production facility. The use of LFG for heat and electrical energy is fairly commonplace in the landfill industry although each use and landfill is unique and requires individual study to determine operational and economic feasibility. The key transferability of this project is the local scale of the development. Whether the technology is used to generate just enough fuel for on-site landfill equipment or for a public fleet, the cost effectiveness when utilizing available renewable fuels, such as LFG, assists in maintaining an economically viable operation at numerous generation levels.

Sub-criteria 2 – How project will promote transferability (5 points).

The results of the project, both operational and financial, will be transferred through presentations and educational tours at the facility. LCSWD will endeavor to present at the following conferences/meetings:

- Sunshine Chapter of the Solid Waste Association of North America Annual Meeting
- League of Cities and Association of Counties
- Recycle Florida Today Annual Conference
- American Public Works association Florida Chapter Annual Meeting

LCSWD will produce informational material for distribution to interested parties and will dedicate space on the County's website specifically for information regarding the project.

Throughout the project's operation, LCSWD will make available site tours for local community educational programs as well as out of county group tours.

Criteria 5: LOCAL SUPPORT

(1 page)

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(10 Points) Demonstrate local support for the proposed project in commitment of cash or in-kind matching funds. Please provide the name, address and phone number of ALL contributors. (Points will be allocated for only those contributors located within the jurisdiction of the applicant.)

- **00 points** **0% up to and including 1% of total project cost**
- **01 points** **Greater than 1% up to and including 10% of total project cost**
- **02 points** **Greater than 10% up to and including 20% of total project cost**
- **03 points** **Greater than 20% up to and including 30% of total project cost**
- **04 points** **Greater than 30% up to and including 40% of total project cost**
- **05 points** **Greater than 40% up to and including 50% of total project cost**
- **06 points** **Greater than 50% up to and including 60% of total project cost**
- **07 points** **Greater than 60% up to and including 70% of total project cost**
- **08 points** **Greater than 70% up to and including 80% of total project cost**
- **09 points** **Greater than 80% up to and including 90% of total project cost**
- **10 points** **Greater than 90% up to and including 100% of total project cost**

Total Grant Request = \$ 200,000

Total Local Matching Funds = \$ 1,205,560

Total Project Cost for Engineering, Construction and 1st yr operations = \$ 1,405,560

Total local support = 86%

Local support points = 9

BUDGET

(1 page using Budget Table Template)
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Describe the project's budget allocated by task and budget categories per the Budget Table Template available from DEP's Innovative Grants web site in Microsoft Excel digital format (www.dep.state.fl.us/waste/categories/recycling/pages/InnovativeGrants2007-08.htm).

Project Management:	\$50,000
Includes oversight of design and construction contracts and supervision of plant operations	
Facility Design and Permitting:	\$200,000
Includes consulting engineering expenses for integration into existing GCLF LFG collection system, plant layout and support and all applicable permits.	
Facility Construction:	\$650,000
Includes equipment purchase and construction/installation and start-up costs	
WVO Collection:	\$90,560
Includes collection equipment acquisition and personnel costs	
Facility Operation – First yr:	\$415,000
Includes operating personnel, tools and chemicals, contracted support services and miscellaneous plant operations and maintenance costs.	
Total Estimated Project Costs:	\$1,405,560