TECHNOLOGY PROVIDER
TECHNOLOGY INFORMATION REQUEST

Technology/Service:	Digester Project Development, including pre-project studies, feasibility and finance		
Information by:	Robert (Bob) Joblin	**Date:**	05/09/2017

COMPANY INFORMATION

Company:	Cenergy USA, Inc.		
Phone:	(501) 868-6400	**Web Site:**	http://www.cenergy.us
Address:	11500 North Rodney Parham Road, Suite 9	**City:**	Little Rock
State:	Arkansas	**Zip Code:**	72212

TECHNICAL CONTACT

Name:	Bob Joblin
Phone:	(501) 868-6400
Email:	bob@cenergy.us
Address:	11500 North Rodney Parham Road, Suite 9
City:	Little Rock
State:	Arkansas
Zip Code:	72212

DEMONSTRATION SITE CONTACT

Site Name:	Big Sky Dairy
Contact:	Bob Joblin
Title:	Developer
Phone:	(510) 868-6400
Email:	bob@cenergy.us
Address:	11500 North Rodney Parham Road, Suite 9
City:	Little Rock
State:	Arkansas
Zip Code:	72212

INITIAL TECHNOLOGY OVERVIEW

This information is to guide in the development of a more specific and detailed Technology Information Request.
Please answer the following questions for each Technology or Service Provided.

What is the name of the technology or service you provide?

Digester Project Development

Describe how this technology is used in a larger Nutrient Management System. *Please be as detailed as possible.*

Cenergy has the ability and experience to manage all aspects biomass-powered energy project development including manure and food waste digester projects at dairy farms and processing plants. We specialize in working with dairy farmers to develop systems that process organic waste streams to produce renewable energy, process heat, bedding, and crop nutrients including commercial products designed to repurpose nutrients as organic fertilizers and commercial peat moss replacement.

How many systems do you have installed on dairy farms or other livestock operations?

SYSTEMS	NUMBER OF SITES	SIZE OF INSTALLATIONS
Dairy – digesters	3	4,100 and 15,000 wet cow equivalents

Poultry (pending)	1	25,000 million animal units

Do you have a preferred region or area for the location of projects?

West, Southwest, and across the country

Location of farm(s)?

Idaho

What's the smallest and largest farm using your system?

4,100 and 15,000 wet cow equivalents

Input and output of your unit/system – do you have a mass balance analysis?
If a mass balance is available, please include below or attach as a separate document.

A mass balance is available for each digester project.

Input material description and characteristics:
For example: raw manure, digestate, screened digestate, suitable non-farm feedstocks, other.

We are most experienced with scrape and flush manure collection systems. The manure slurry can be mixed with food waste for processing in DVO Liner Vortex digesters. The digester produces renewable energy, fiber and liquid recovery as fertilizer. The fiber can be used as cow bedding and a commercial peat moss replacement.

Does the technology treat the full manure stream for a farm or a fraction of the stream?

Cenergy systems treat the full manure stream for a dairy.

Do you consider this a mature system or ongoing farm development?

The technology is mature with 80 DVO systems opening for over a decade on U.S. dairy farms. We are researching and commercializing new products derived from manure.

Any weather constraints? **Yes** ☐ **No** ☑ *If so, please describe.*

Any bedding constraints? **Yes** ☑ **No** ☑ *If so, please describe.*

No sawdust

Output material description and characteristics:
Please include the % of the total stream for each material, i.e. 10% fiber and 90% screened liquid by weight.

10% pathogen free solids and fiber and 90% screened liquids for lagoon storage and field application

Do the Outputs of the process have a resale market identified? **Yes** ☑ **No** ☐
If so, under what brand name or who is the contract with?

Fiber extracted from DVO digester effluent can be used as a soil amendment and peat moss replacement. For commercial product information see http://www.magic-dirt.com

Is this process scalable and to what extent (top and bottom limits)? **Yes** ☑ **No** ☐ *If so, please describe.*

The digester system can be sized for 400 to no upper limit because the system is modular.

Do you have a known scaling factor? **Yes** ☐ **No** ☑ *If so, please describe.*

Sizing and scaling factors are not a matter of technology but of economics.

Does this technology require any air input? **Yes** ☑ **No** ☐

Air enriched in carbon dioxide is necessary. Input is made through a low energy vacuum system.

What is the preferred air connection? *For example: psi, fitting size, air quality.*
If not distributed by the system, please list each connected device.

Outside air without treatment for the engine-generator.

Does this technology require any water input? **Yes** ☑ **No** ☐ *If so, please describe.*

Some additional water is needed for cleaning

What is the preferred water connection? *For example: psi, fitting size, water quality, gpm.*
If not distributed by the system, please list each connected device.

Standard fittings

Does this technology require any electrical input? **Yes** ☑ **No** ☐ *If so, please describe.*

The digester system requires electrical input for controls, pumps and other equipment.

What is the preferred electrical connection? *For example: phase #, voltage, full load amps.*
If not distributed by the system, please list each connected device.

Three phase

Does this technology require any mechanical input? **Yes** ☐ **No** ☑ *If so, please describe.*

What is the preferred mechanical connection? *For example: horsepower, connection, rpms.*
If not distributed by the system, please list each connected device.

Per specification of purchased mechanical equipment

Does this system require any special plumbing? **Yes** ☐ **No** ☑ *If so, please describe what is required.*

Does this system require any special foundations or pads? **Yes** ☑ **No** ☐ *If so, please describe.*

The DVO digester is an in-ground concrete vessel and the engine/mechanical building has normal concrete foundations

Do you consider this technology part of a larger system that you provide? **Yes** ☐ **No** ☑ *If so, please describe.*

The digester can be designed as a stand-alone system or can incorporate solids separation and nutrient extraction systems

Does your system require any other components that you do not provide or are not included in your proposal? **Yes** ☐ **No** ☑
If so, please describe.

Additional components can be included such as receiving tanks, filters, separators, scrubbers, etc.

How is the system delivered to the site? *For example: skid mounted, assembled on site, constructed on site.*

Assembled on site with additional on-site construction

Is this system portable or configured in such a way that it could be easily transported for use in several locations?
Yes ☐ **No** ☑ *If so, please describe.*

Small units can be removable or mobile

Has your technology been accepted by the NRCS and is it included into a practice standard? **Yes** ☑ **No** ☐
If so, please describe if necessary.

Are there any unusable or hazardous byproducts of this process? **Yes** ☐ **No** ☑
If so, please describe the product and recommended means of disposal.

What spare parts and redundant components are included with the system?

Spare parts are industry standard and available.

How is the system controlled and what are the components and capabilities of the control system?

The system is automated for 24/7 operation using on-line SCADA and PLC systems.

What is the usable life of the system?

With proper O/M the system should operate 20-30 years

What is the salvage value at the end of the usable life?

Main mechanical components such as the gen-set, blowers, valves, meters, etc. have salvage value

What is the educational and technical level of competence for the operation of the system?

Trained labor should be able to operate the system. Outsourced O/M contractors are available

What level of maintenance is required for the system?
Please indicate if rebuilds or major components must be replaced and what the frequency is for these components.

Component parts require maintenance and replacement per maintenance schedule. Daily walk through inspections and periodic response to system upsets are required.

Are consumables used in the process? Yes ☐ No ☑
Please provide the nature and purchase relationship for these consumables. For example: proprietary, special contract, generally available.

No consumables other than oil for the engines

Which of these NRCS codes would your technology be classified under? *Check all that apply. Add if necessary.*

CODE	NRCS DESCRIPTION	CHECK ALL THAT APPLY
472	Access Control	☐
560	Access Road	☑
309	Agrichemical Handling	☑
371	Air Filtration and Scrubbing	☑
591	Amendments for the Treatment of Agricultural Waste	☐
366	Anaerobic Digester	☑
672	Building Envelope Improvement	☐
372	Combustion System Improvement	☑
317	Composting Facility	☐
554	Drainage Water Management	☐
375	Dust Control from Animal Activity on Open Lot Surfaces	☐
373	Dust Control on Unpaved Roads and Surfaces	☐
374	Farmstead Energy Improvement	☐
512	Forage and Biomass Planting	☐
561	Heavy Use Area Protection	☐
516	Livestock Pipeline	☑

590	Nutrient Management	☑
521A	Pond Sealing or Lining, Flexible Membrane	☐
533	Pumping Plant	☐
588	Roof Runoff Structure	☐
367	Roofs and Covers	☐
318	Short-Term Storage of Animal Waste and By-Products	☐
570	Stormwater Runoff Control	☐
606	Subsurface Drain	☐
635	Vegetated Treatment Area	☐
601	Vegetative Barrier	☐
360	Waste Facility Closure	☐
632	Waste Separation Facility	☐
313	Waste Storage Facility	☐
634	Waste Transfer	☐
629	Waste Treatment	☐
359	Waste Treatment Lagoon	☑
22132	Sewage Treatment Facilities	☐
		☐
		☐

Can you provide an estimate of the capital required for the installation of this technology?
Please include all components and designate if provided by you or others.

Capital and O/M estimates are available on a project basis

Can you provide an estimate of the operational costs required for this technology?
Please include all costs and designate if provided by you or others.

Estimates available on request

Is there financing available for this system? **Yes** ☑ **No** ☐ *If so, what are the conditions for this financing?*

Financing and grant options can be discussed on a project by project basis

Is the system available for lease? **Yes** ☐ **No** ☑ *If so, please describe.*

The system is not available for lease. However, third party build, own, operate business models can be considered

What sort of warrantee or guarantee do you provide with this technology?
Do you provide any performance guarantees or strictly defects in parts and materials?

Warranty discussion on a project by project basis.

Explain how this system is unique or transformative and how does it improve upon or go beyond other technologies that are currently available.

The DVO system provides the benefits of both the plug-flow and complete mix digester technologies. The in-ground design is excellent for insulation to help maintain proper heating inside the digester. The unique mixing system minimizes parasitic loads and allows for use of a variety of organic feedstocks to be added to the manure.

Would you be willing to provide a location for a site visit by Newtrient? **Yes** ☑ **No** ☐ *If so, please provide location.*

Big Sky West dairy, Gooding, ID

TECHNOLOGY REFERENCES

Please provide customers with whom we can discuss this technology and its performance.
Include a company name, location, contact name and contact information.

Reference 1

Company Name:	DVO, Inc.
Company Location:	P.O. Box 69; Chilton, WI 53014
Contact Name:	Steve Dvorak, P.E.; President
Contact Information:	Office: (920) 849-9797 SteveD@dvoinc.net

Reference 2

Company Name:	Regenis
Company Location:	6920 Salashan Pkwy A-102; Ferndale, WA 98248
Contact Name:	Craig Frear, Director of Research & Technology
Contact Information:	866-578-8630 office craigf@regenis.net

Reference 3

Company Name:	US Environmental Protection Agency (EPA)
Company Location:	Washington, DC
Contact Name:	Chris Voell; International Lead - Ag & Wastewater AgSTAR and Global Methane Initiative
Contact Information:	Phone: (202) 343-9468 voell.christopher@epa.gov

Reference 4

Company Name:	Big Sky West Dairy
Company Location:	Gooding, ID
Contact Name:	Marty Toll
Contact Information:	martybigsky@gmail.com

Are there any other facts about this technology that you feel should be included in this document?