Frequently Asked Questions . . .

Q Is "GHD" and "DVO" the same company?
A We are. As GHD began to export our system internationally we renamed ourselves to avoid being confused with another company, also called GHD, based in Australia. Of course we will always be *"Getting 'Her Done."*

Q Can I use the electrical power that I generate?
A Yes. You can use it and sell what you do not use to the power company. However, in the majority of cases it has been advantageous to sell all of it to your utility and buy what you need off the grid.

Q How large must my farm/waste stream be (to make economic sense)?
A A common question that receives the common response, "It depends." The major determining factors are how much energy is available in the waste stream, and what electrical rates are available from your utility. There are other factors as well. Our digesters are scalable and accommodate a wide range of waste volumes. Currently our dairy farm digesters range in size from 650 cows to over 10,000 head (and multiples for larger dairies).

Q What are your digester's products/revenue streams?
A Biogas, which can be used to create electricity or in a boiler to create steam. Or it can be scrubbed to create natural gas. Other revenue streams include a solid, a liquid and waste heat.

- The **digested solids** can be used as a high-quality animal bedding (replacing other bedding sources such as sand or sawdust). The solids can also be sold as a peat-moss replacement or a fertilizer.
- The **digested liquid effluent** can be applied to a growing crop, reducing the likelihood of runoff and increasing crop yield.
- Other revenue streams include the possible sale of **carbon credits**, **renewable energy credits**, and the **Federal Production Tax Credit**.
- **Waste heat** in the form of hot water is a byproduct that farmers are using to heat various parts of their operation (parlor, maintenance shop, etc.).

Q How much does it cost?
A The cost will vary considerably depending on the size and layout of the operation. We can provide a rough estimate after gaining an understanding of certain aspects of your operation. We work hard to keep our system costs down without impacting system performance or reliability (both are key requirements for any farm equipment).

Q What is the size of the digesters?
A The size depends on the volume of waste that needs to be generated. We have some latitude with the exact footprint which allows us to integrate them smoothly into existing operations.

Q As my operation expands, can my digester expand with it?
A Yes. There are two ways in which to expand your digester: One way is to lengthen the digester similar to the way one might lengthen a barn. The other way is to build a second digester right next to the first and have the two share a common wall.

Q Will the digester take in ALL my biowastes, including my parlor water?
A Yes. They are designed to accept a wide range of solids content.

Q Can I add additional substrates to my digester?
A Absolutely. Theoretically any organic substance can be digested. However, before adding any substrate for the first time, it is recommended that we perform a lab analysis on a sample to ensure that there are no bactericides, high salt concentrations, etc. that might disrupt the digestion process.

Q What happens to the nutrients in the manure/biowaste?
A No nutrients are lost. The digester only breaks down carbon-based molecules — it cannot break down any nitrogen, potassium or phosphorous. However, it does change the form of the nutrients take, from an organic state to an inorganic state. That means that the nutrients are more "plant-accessible", which is why the liquid coming from a digester can be applied to a growing crop without burning the leaves. In fact, the nutrients will act as an excellent starter fertilizer.

Q What do I do with the liquid from the digester?
A Since the digester changes the nutrients and waste from primarily organic to primarily inorganic, you can apply the digested liquid directly to a growing crop without fear of burning the leaves or killing the plant. As a result, our farmers typically hold their digested liquid for use during the growing season to increase their crop yield (often, significantly).

Q What will my utility pay for the electricity?
A This will differ greatly from state to state, and region to region.

Q Are financial grants available USDA (Federal)
A Yes, and we can assist you with the application process.

Q Are financial grants available from my state?
A Some states offer grants. We can determine if you qualify and help you apply for them.

Q Why has DVO's patented "Mixed Plug-Flow" design become the market leader?
A Put simply, it substantially outperforms the other technologies such as "complete-mix" and the even older "plug-flow" (non-mixing) systems, by producing more biogas per unit of feedstock, more efficiently and with reduced maintenance costs. It is also maintains a more robust and stable operation. Farmers appreciate that DVO digesters are designed to be operated and maintained by the farmer or farm employees, not technicians.

Q How do I know yours is a good design (everyone else claims theirs is "the best available)?"

- Don't take our word for it. The U.S. EPA keeps track of farm digester installations in the USA http://www.epa.gov/agstar/downloads/digesters_all.xls One can download this Excel spreadsheet, sort it by the "System Designer" column, and you will see how many DVO has sold in the previous few years (versus competing systems). And, you will also see repeat DVO customers – a key indicator of customer satisfaction.
- Talk directly to our customers. *Any* of them. Unlike others we don't provide a (carefully vetted) "referral sheet." Our customers are our "best salespeople", and we encourage you to ask them about their own experience with our system. For example, in the dairy industry some of the largest and most respected names (such as Fair Oaks, Bos, and Bettencourt) and operations of all sizes and configurations (scrape, flush, vac, sand etc.), employ our system.
- Compare actual performance figures. It's hard to find complete and accurate performance figures from other companies, especially for manure waste streams that *do not contain any substrates* (conveniently making valid apple-to-apple comparisons impossible). The EPA commissioned an extensive study at one of our sites, our first built – and the results are publicly available on our website. You can find it on our "Contacts" page, at www.DVOinc.net.

Q DVO avoids using mechanical mixers in favor of a proprietary, patented biogas recirculation system. Why?

A Mechanical mixers require more energy to adequately mix the same amount of liquid, which reduces the output and efficiency of the system. Furthermore, anything that is more mechanical and complex is inherently less reliable and will require more maintenance.

Q Why do DVO digesters see a much better pathogen reduction than the "complete-mix" or "plug-flow" designs?

A Again, here we make actual 3rd party figures publicly available (see above-referenced "EPA - Gordondale" report available on our website) where others typically do not. For pathogens that cause farmers problems such as E-coli and salmonella, we see a 97-99% removal. Often lab reports come back "none detected." This is only possible because our design offers a **guaranteed hydraulic retention time (HRT)** -- which means every unit of waste that goes into our digester is retained and processed for a guaranteed number of days. In a complete-mix digester this is impossible. Some waste leaves the system too soon (waste not fully digested will contain many more pathogens, and energy not harvested), and some is also left in and processed longer than necessary, which reduces system efficiency. And, you can't kill the same pathogen more than once.

Q Is this "Guaranteed HRT" also one reason why DVO digesters produce more biogas using the same feedstocks, than other designs?

A Yes.

Q And, when coupled with the superior pathogen reduction, also why DVO's biosolids have the reputation of being an excellent bedding material for animals?

A Exactly. For example, many dairies that originally bedded on sand have since switched to our biosolids.

Q What are the advantages to having a hard, insulated concrete top vs. the "soft top" seen on earlier designs?

- For one, concrete lasts a long, long time. Soft tops can be damaged (by high winds/lightning/storms, by the sun's UV rays, by farm tools/implements etc.) and sometimes need to be completely replaced.
- Heat mostly wants to escape through the top (which is why we wear hats in winter). A better insulated concrete vessel means reduced energy required to maintain the correct temperatures = higher operating efficiency = higher performance. Soft tops can sometimes be cheaper to install initially, but because of this loss of operational efficiency soft tops cost much more over time — even if you are fortunate to not have to replace them due to damage.
- Our concrete cover does not have to be removed should the digester ever need to be emptied or cleaned out (i.e. for a planned expansion of capacity). Accessibility is built into the design.

Q Who can I contact for more information?

A Contact Melissa VanOrnum, DVO's Marketing Manager, at 920-849-9797.
Or, email info@DVOinc.net.