

Preliminary Market Report

The anaerobic digester (AD) invented by Sharvelle and Loetscher has a number of competitive advantages compared to ADs currently in production; these advantages are an addition to the renewable energy production, pollution reduction, and national security benefits reaped by the creation of any biomass energy. Its advantages over other forms of AD are numerous:

- It requires less water than competing ADs to facilitate digestion of animal waste, lowering operating costs.
- The AD uses multiple leachate bay reactors (LBRs) to digest waste, allowing the operation to be scaled up or down based on need.
- The LBRs are individually monitored to ensure optimal conditions for digestion bacteria.
- The digestion process is under greater control than in other methods, and problems with the bacteria can be detected and remedied before the bacteria die, thus reducing operating costs.
- LBRs are smaller, so less waste must be thrown out in case of bacterial death or contamination.
- In the event of waste contamination or bacterial death in one LBR, another LBR's healthy bacteria may be transferred to start a new batch.

It is clear from the long list of advantages this AD holds over other ADs that there is currently a need in the market that is unmet. This AD opens up several new markets to anaerobic digestion, specifically in areas that experience water scarcity, such as the arid American West, Australia, Africa, and central China.

Market and financial factors play a role in shaping this AD's specific place in the market. Numerous market characteristics have been analyzed to determine the AD's market appeal:

- Energy cost
- Water cost
- Financial incentives for sustainable power generation
- Strict water runoff regulations
- Presence of niche markets or "green" consumers
- Precipitation amount

Countries and states best suited for this AD have been identified based on these characteristics and classified into a graduated level of potential markets. Governments' support of renewable resources have been assessed based on the existence and level of

feed-in tariff programs, which encourage investment by guaranteeing premium price levels for electricity. These government incentive programs help facilitate the introduction of new energy technologies and provide certainty in revenue streams for producers interested in developing ADs. Scarcity-of-water estimates were based on average precipitation records, and were considered secondary to the major drivers of energy costs and government incentive programs.

First, international markets were assessed to determine where AD implementation was most feasible. A number of countries emerged as obvious choices to build this AD:

- Germany
- Belgium
- The Netherlands
- Italy
- China
- Brazil

Domestic markets have also been assessed, and five states were chosen as the best candidates in which to introduce the AD:

- California
- Colorado
- Idaho
- New Mexico
- Arizona

It is impossible to overstate the importance of this digester's ability to function using far less water than other digesters. Many of the sources used to compile this report do not recognize the regions noted here as potential AD sites because they lack the water resources necessary for traditional forms of AD. Precipitation amounts in an area also affect this AD's feasibility: animal feeding operations in locations that receive much precipitation are more likely to flush manure from their feed lots rather than dry-scrape, as this AD requires.