

Commercialization of the AGF Process

Over the past eleven years Dennis Burke of the Environmental Energy Company has researched, developed, and patented an innovative process to greatly enhance the anaerobic digestion of municipal sewage sludge. The anoxic gas flotation process (AGE) concentrates anaerobic bacteria and undigested solids in the digester resulting in less sludge and more methane.

Washington State University Energy Program (Energy Program) is the state entity responsible for delivering energy programs. The Energy Program managed a project funded by the Pacific Northwest and Alaska Bioenergy Regional Program (Regional Program) to build a pilot plant demonstration of the AGF process at the Renton Washington wastewater treatment plant. The demonstration compared the digestion or thickened primary and waste activated sludge in an AGF equipped digester and a conventional digester set up side by side. The hydraulic retention time (HRT) of the anoxic system dropped to 6 days compared with 31 days for the conventional digester. The AGF process also destroyed 67% of the solids when operated at a 19-day HRT, while solids destruction in the conventional system was 54%. Methane production was 18% higher.

The Energy Program worked with Mr. Burke, the Regional Program, and Southwest Suburban Sewer District (District), in Burien Washington to install a commercial scale AGF unit at the Districts' Salmon Creek wastewater treatment facility. The Regional Program provided funding for Mr. Burke to design, provide construction oversight, and start-up assistance. The District funded the capital and construction costs. The District was facing potentially large costs in order to handle increased loadings to the plant and digesters as well as steadily increasing costs associated with sludge handling.

The AGF process offers the following demonstrated advantages:

1. Greater solids destruction, resulting in 30% - 50% less sludge with disposal cost savings estimated by the District at \$50,000 annually.
2. Increased capacity through reduction in hydraulic retention time.
3. Savings in polymer cost, reducing consumption by 50%
4. Greater methane production as more solids are converted to gas increasing the possibility of economic use of the gas.

The Energy Program recently responded to a DOE solicitation limited to state programs. The collaborative project with Capstone Microturbine Corp., Southwest Suburban, Environmental Energy Company, and the Energy Program will install two Capstone microturbines at the Salmon Creek facility to produce electricity and to provide thermal energy for the AGF Pasteurization process that will produce Class A biosolids. This project will result in additional cost savings and the production of green energy.