ABSTRACT

TITLE:	Food Waste Co-Digestion: The Potential Benefits of Utilizing Existing Infrastructure at Durango Wastewater Treatment Facility.
AUTHOR(S):	Austin , Dr. Rebecca ; Mallinger, Hunter
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ABSTRACT: Communities around the U.S. are beginning to see the ill-effects of traditional methods of waste disposal. Landfill sites are filling to the brim with wasted materials that have the potential to be re-used in non-traditional, sustainable practices of disposal. More than 25% of U.S. waste being buried and forgotten about is composed of organic material—material that is not only biodegradable, but material that has the potential to be used as a source of renewable energy. For the City of Durango, CO, harnessing this potential energy for the benefit of its residents is not an improbable idea. Durango Wastewater Treatment Facility (DWTF) is in possession of the primary infrastructure needed for capturing this energy, a technology called an Anaerobic Digester. Anaerobic Digestion (AD) is a process which breaks down organic content such as food waste and sewage sludge in an environment free of oxygen. After complex stages that continuously break apart the organic contents take place, a by-product of biogas and digestate are left-over, both with beneficial attributes. To fully understand this process, I have conducted interviews with the DWTF manager of operations Larry Clinton. Further secondary resources have also been used throughout my research, including case studies of community treatment facilities that already utilize AD for a source of renewable energy. DWTF is currently "energy-independent" as a result of the energy its Anaerobic Digester produces, meaning it relies on no outside resources for energy/electricity to heat and operate the facility. In fact, there is nearly a forty percent over-production of energy necessary to operate the facility on a daily basis. For the City of Durango, I suggest in this thesis that utilization of the existing Anaerobic Digester at DWTF could further maximize the capture of renewable energy from organic waste. Through the integration of additional organic contents (co-digestion) and the installation of a second methane turbine, the community can then make efficient use of locally generated food waste. A final analysis of the collected data will allow for a recommendation of the necessary steps to apply this source of renewable energy to Durango's power grid.