

ENRTF M.L. 2021, First Special Session, Chp. 6, Art. 5, Sec. 2, Subd. 10 Emerging Issues Account; Wastewater Renewable Energy Demonstration Grants
 Staff Review of Proposals Received in Response to RFP
 6/24/22

	Brainerd Public Utilities	City of Albert Lea	City of St. Cloud
Does project meet the statutory Definition of Renewable Energy MS 216B.2422?	Yes	Yes	Yes
Brief description	Solar array adjacent to WWTP; financed through a Power Purchase Agreement (PPA) with a 3rd party that will own and operate the project and would sell generated power back to BPU over a 30 year term with option to purchase.	Solar array adjacent to WWTP to serve the WWTP only (i.e. not connected to the grid); direct construction & power generation by the city	Capturing and splitting WWTP biogas into hydrogen battery storage & generators and using oxygen to offset energy use for WWTP aeration processes
Emerging Issues Criteria (examples of urgent need)			
Addressing environmental or disease issue where delay will threaten natural resources or human health			Threats due to emissions, inefficient use or capture of resources (flaring)
Enhance natural resource management in timely manner	Efficiencies to do now at same time as an installation at the airport	Upgrades now due to failing equipment; efficiency in doing installation at same time	Xcel currently developing its gas innovation plan
Calculations (these are very quick estimates based on very limited information)			
\$ Requested	\$1,095,000	\$1,095,000	\$1,095,000
\$ Total project	\$5,000,000	\$2,100,000	\$3,000,000
Energy benefit estimate	3,129,000 kWh / yr	902,700 kWh/yr	3,750,000 kWh / yr
Energy rate estimate	\$.07/kWh	\$.07/kWh	\$.06/kWh
Economic Value of Energy	\$219,000/ year	\$63,200 / year	\$225,000/ year
Grant Fund Payback period	5 years	17.3 years	4.86 years
Review Group Criteria			
Replicability	Solar installations are generally replicable. This is an example of a municipality that would need financing to complete a project	Solar installations are generally replicable. This is an example of a municipality putting up funding to construct and generate its own power.	This type of project is replicable at other wastewater facilities.
Cost Effectiveness	5 year payback period	17.3 year payback period	4.86 year payback period
Impact in terms of energy savings/benefit	3,129,000 kWh/year	902,700 kWh/year	3,750,000 kWh/year*
Feasibility	Solar installations are feasible.	Solar installations are feasible.	The project technology is feasible. Innovative in its application of this technology to WWTP. St. Cloud is highly capable to undertake the project.
Readiness	Project appears to be ready.	Project appears to be ready	Project appears to be ready.
Other questions & comments			
	This seems like a good project but less cost effective than another proposal.	Most simple and direct; While this seems like a good project, it has less energy benefit per grant dollar than the other project proposals.	This seems to be the most cost effective and innovative project proposal received. Through quick search of literature, it appears there are few examples of this application in existence.
	Questions related to the PPA agreement. O&M and risk are generally covered in PPAs by the 3rd party, however the 3rd party is receiving tax credits and we don't have enough information to know how savings/benefits are distributed. Dept of Commerce could assist by reviewing PPA Agreement if needed		Truly is an experimental pilot/ demonstration, including with potential partnerships for using the hydrogen storage One could argue that more energy is lost when extracting the hydrogen fuel energy than is lost when utilizing the electric energy from the solar panels.
	Questions about Single Source Contract with AEPES		Additional calculation details: *(3,180,000 kWh in hydrogen, 575,000 kWh in oxygen, assuming all RNG is used for electrolysis, assuming biogas is 60% methane and 95% skid efficiency and 70% electrolysis efficiency. If the plant is actually planning to utilize PEM (Polymer Electrolyte Membrane) electrolysis, that efficiency would be closer to 80% resulting in larger energy benefit.) It may also be worth mentioning that if this hydrogen is planned for use in fuel cells, that will reduce local emissions while other projects are more likely to reduce point source power plant emissions. Hydrogen fuel efficiency is typically 50% compared to gasoline fuel efficiency which is closer to 25%.
Final Ranking			
Rank order (1 = favorite)	2 (if questions can be addressed)	3	1