INTEGRATED BIODIGESTER RESOURCE RECOVERY PROJECT

PROJECT TEAM:

Impact Bioenergy -

Project design, technology provider & developer

- Jan W Allen, P.E., CMQ/OE - Chief Technology Engineer

- Michael J. Smith Jr. JD, LEED AP - Project Development Role

- Tim Murphy, EIT - Engineering and Operations

- Taylor Knoblock, EIT - Engineering and Operations

- Andrew T. Corbin, Ph.D. - Senior Research Director, Agronomy

- Paco Joyce, Digester Operator

City of Tenino – Partnering WWTP

Mayor Wayne Fournier

David Waterson, former city councilmember, special projects

Troy Cannon, Public Works Director

Tenino High School – Student research and engagement

Geraldine Maxfield, Agriculture Education Teacher, Future Farmers of America Program Lead

Thurston County – Partnering host for biodigester

Aslan Meade, Director of Strategic Alliances

Washington State University (WSU) – Farm Liaison

Stephen Bramwell, WSU Thurston County Extension Director and Agriculture Faculty

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PROBLEM:

- The current design only allows for recovery of Class A Water.
- The sludge lagoons are limiting factors on increasing capacity, yet the system runs at ½ its capacity

SOLUTION:

- Install an onsite Aerated Static Pile Compost system to process all biosolids
- Convert to Class A EQ compost to recover nutrients
- Install a biodigester at the AgPark next store to recover renewable energy and food digested nutrients

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RECOVERED RESOURCES

This Project Design is a way to truly convert wastewater treatment into a local circular economy. A holistic approach to stay focused on local solutions and zero waste. This spawns a natural shift toward efficiency in a very natural way.

There are *eight value* (revenue) streams generated by this project, each of which helps foster a localized circular economy without waste export, or petrochemical material input.

1. Receiving and Recycling of Septage
2. Receiving and Recycling of Commercial Food Waste
3. Predictability and Resilience for the Beneficial Use of WWTP Biosolids
4. Sale and Use of Class A EQ Compost
5. Sale and Use of Registered Food Waste Digestate for Conventional or Organic Farming
6. Renewable Electricity Generation
7. Renewable Heat Generation
8. Climate Change Carbon Attributes for GHG Carbon Drawdown

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BUSINESS CASE

Each of these value streams mentioned above represents a change of practice and ongoing value to the land, farmers, WWTP, and global climate goals (atmospheric CO2 emission ‘drawdown’ or reversal).

The Capital Budget for the project is $2.46 million. The Operating Budget is $657,000 per year. The goal of monetizing the eight value streams is $1.24 million per year. This yields a Return on Investment of 15%. Incentives have not been applied to this Economic Model. They will, of course improve the Business Model by reducing the Capital and/or Operating Budgets and improve the Return on Investment.

The city will save money by not having to drain the lagoons. The compost system is designed to handle all of the biosolids produced and take the excess lagoon sludge.

The AgPark will benefit from the recycling of agri-processing waste and will work with the project development team to market the fertilizer outputs, which is directly in alignment with the intent of the AgPark development.

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CONCLUSION

The Integrated Biodigester Resource Recovery Project (Project) is part of citywide sustainable infrastructure plan that is a model for resiliency, innovation and economic development.

The projects include:

- An existing solar array on top of the High School
- A planned microgrid with solar, battery storage and possibly RNG and Hydrogen generated by the Project. The microgrid will serve the High School as the city's resiliency hub. In addition, the Project Team has already provided fertilizer product to the High School Greenhouse to conduct growth trial experiments with students.

- An innovative AgPark designed with and for the local agriculture community for value-add processing of crops and produce into final products (and the host site for the bioenergy system)

- The Project will only enhance and create synergy with the AgPark, the microgrid and the High School resiliency plan by providing locally generated renewable power and compost and digestate for local organic food production

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