Securing California's Clean Energy Future with Renewable Natural Gas

Developing RNG Efforts

Tom Hintz – Seahold LLC

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info@seahold.com
http://www.seahold.com

Your Presenter

Thomas Hintz, is the senior/managing partner at SeaHold LLC. Tom is a seasoned business executive with a solid background of achievements in profit generation, product/project development. Tom's main focus is "Renewable Energy", working with farmers, private industry, universities, innovative entrepreneurs, and government agencies. Tom's greatest strengths are the conceptualization, visualization and implementation of "waste to energy" projects that yield significant revenue, while maximizing environmentally sound practices. Tom is recognized for his expertise in the field, and regularly advises local, regional and state regulatory agencies and commissions that govern "Renewable Energy" projects.

Since 2009, Team Biogas has worked with the leading anaerobic digestion researchers in North America to validate their findings and accelerate the movement of technology from laboratory to field research to commercial production. Providing an overview of strategies, with both conventional and innovative methodologies, Team Biogas has helped its clients understand the technology options available and has successfully recommended solutions to fit the particular needs of each research facility. The biggest key to the success of a project is to find and implement the technology solution that not only fits with the operational strategy of the facility, but, at the same time, doesn't disrupt the operations of the facility.

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A Quick Review – Anaerobic Digestion

- Anaerobic Digestion is simply the controlled breakdown of organic matter without air, used to manage waste and/or to release energy. It is a biological process that produces an energy-rich biogas, principally composed of methane (CH_4) and carbon dioxide (CO_2), which can be used as a fuel.

Feedstock Makes Energy

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Energy from Feedstock

- Feedstock is necessary to make biogas
- Biogas can make electricity, heat, bio-fuel, and MONEY!!!
- Natural Gas is used to produce **18.67%** of all electricity in the USA. It is estimated that by 2035, it will be **25%** (US Energy Information Administration)

Feedstock Sources

- Typical feedstock sources include:
  - Animal Manure
  - Pre and Post Consumer Food Waste
  - Green waste
  - Animal mortality waste

Natural Gas and Renewable Energy – Friend or Foe?

There is no fight!!!

- Natural gas and renewable energy have been positioned as the key elements for a cleaner and more secure energy future.
- The development of the renewable energy project is attractive to the energy consumer, large and small institutions, land and real estate owners.
- These entities realize the economic, environmental and security potential of renewable energy.

Project Development Basics

Key Project Development Steps

- Project Motivation – gauge the fundamental market characteristics that create the conditions for success
- Don’t set yourself up for failure!

Key Project Development Steps

- Project Baseline
  - Why are we doing this
- Economics
  - Be reasonable; look at both sides. Don't expect miracles
- Policy
  - Know your local, state and federal regulatory requirements
- Technology
  - There is no "one size fits all." Your project is unique.
- Consensus
  - All of the involved stakeholders must agree on the project fundamentals, unified purpose, investments, and compromise

The Importance Of Feedstock Testing

- It cannot be stressed enough that the technology selection and operation be driven by the results of your feedstock testing
- Many labs do BMP – Biomethane Potential Testing; however, their results are often not standardized for temperature and pressure at the time of biogas creation. This is essential when testing multiple substrates and “recipes”
- Find a lab that uses the “Automatic Methane Potential Testing System” (from Bioprocess Control) protocol and equipment for the most accurate testing and repeatable results

Current Project Portfolio

- **Biodico – Red Rock Ranch – Five Points, CA**
  - Novel feedstock's – organic non-food crops; non-edible based. Includes algae, glycerin, Jatropha, and other bio-fuel crops
  - Testing carbon absorption method of biogas clean-up lowering the cost of vehicle fuel production and increasing life for CHP (combined heat & power) technology
  - Working in conjunction with Cogenera Solar to conceptualize an integrated solar/bio-fuel hybrid system

Current Project Portfolio

- **North State Rendering – Oroville, CA**
  - Family owned rendering facility processing animal mortality, restaurant grease trap waste, slaughterhouse waste, and more.
  - Biogas from digester is used to produce electricity for plant, and vehicle fuels for fleet
  - North State Rendering will be testing carbon adsorption method of biogas cleanup to lower cost of vehicle fuel production and increasing useful life of CHP (combined heat and power) technology

Insuring Project Success

Make your project successful !!

Reason For Failure	Strategy For Success
• Operators did not have the skills or the time required to keep a marginal system operating.	•Do your homework, get the training and skills needed for long term success
• Developer selected digester systems that were not compatible with facility operations.	•The biggest key to success of a project is to find and implement the technology solution that not only fits with the operational strategy of the facility, but that the technology solution doesn't DISRUPT the operations of the facility
•Some designer/builders sold "cookie cutter" designs to operators	•"One Size Fits All" does not work for biogas solutions.
• The systems became too expensive to maintain and repair because of poor system design.	•"Proprietary" and "One Of A Kind" technology solutions are not necessarily the best investments
• Operators did not receive adequate training and technical support for their systems.	•Do your homework, get the training and skills
• There were no financial returns of the system or returns diminished over time	•"Financial Success" isn't necessarily measured on the amount of "income" a system generates; look to the long term returns (environmental, etc) that will assist

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THANK YOU

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23551 Rose Quartz Drive
Perris, CA 92570
951-943-9697
info@seahold.com