

Gettysburg Energy & Nutrient Recovery Project

Lessons for Ecosystem Services

Presented to the
Chesapeake Bay Commission
September 10, 2010
Lancaster, Pennsylvania
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Background

- The Gettysburg Energy & Nutrient Recovery Project is the result of over 4 years of R&D, engineering and project development
- The facility will process the manure from a large egg producing CAFO
- Construction will begin this year
- Benefits include improvements in environmental quality, public health & safety, and resource conservation
- Demonstrates technology's ability to provide significant, predictable, long-term and cost effective reductions in nutrient loading to the Chesapeake Bay

The Concept

- Daily collection – eliminates long-term storage and land application of manure
- Immediate processing – supply proximity eliminates need for interim storage
 - Dehumidify
 - Gasify organic solids, transforming N-compounds to non-polluting N_2 gas
 - Recover and recycle P and other minerals as fertilizer or food grade products
- Monitor N & P mass flow to calculate and document water quality benefit
- Commercial viability is derived from multiple revenue streams

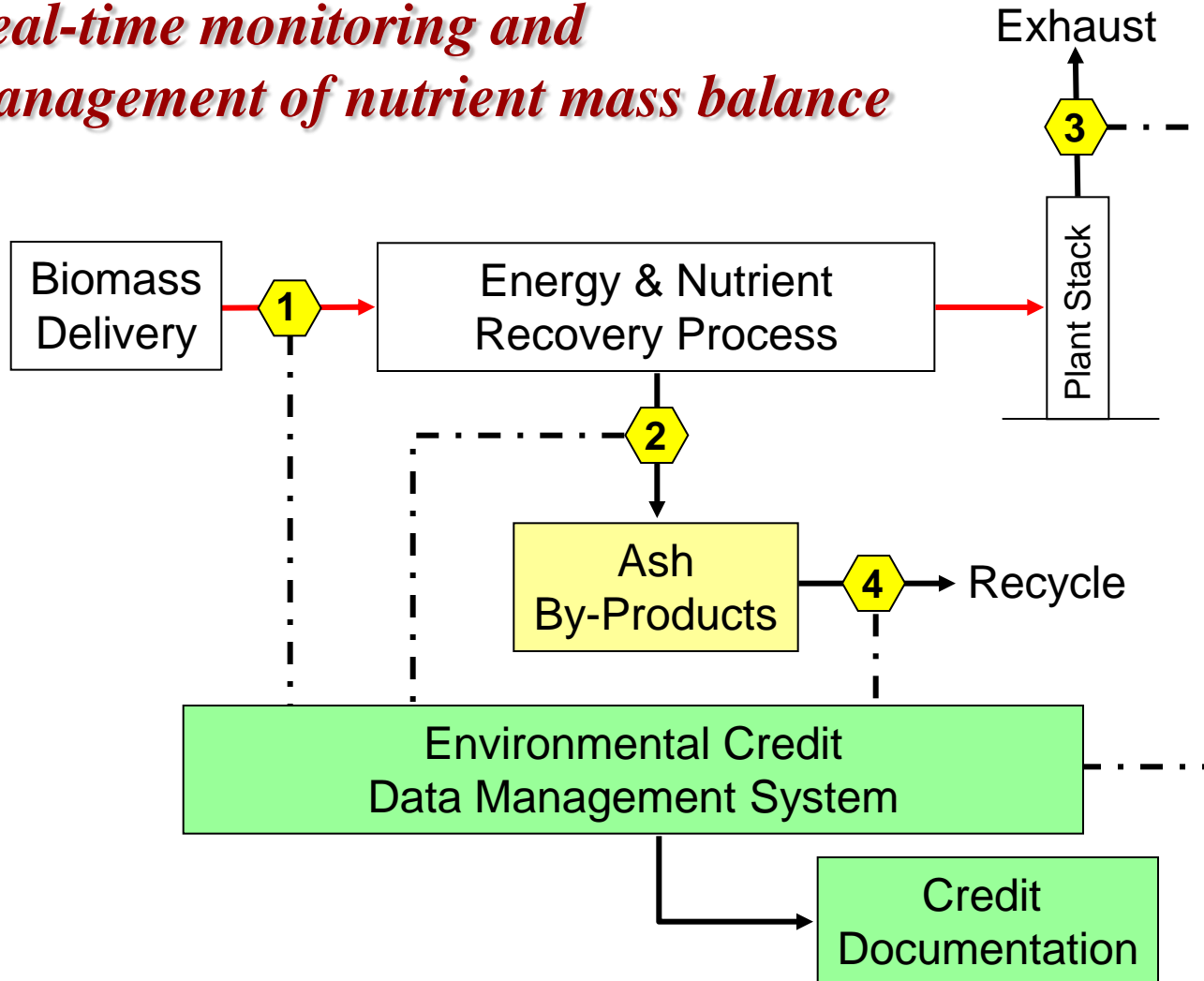
The Plant

Fully enclosed, LEED Certified, 30-year design life



Process Schematic

Real-time monitoring and management of nutrient mass balance



Projected Nutrient Load Reductions

Egg Layer Manure (ELM) processed annually = 87,500 Tons

	Nitrogen	Phosphorous
Nutrients Contained in ELM Processed Annually	5,965,670 lbs	3,049,763 lbs
Nutrients Captured or Converted Annually	5,577,902 lbs	3,049,650 lbs
Certified Credits Generated Annually	1,168,422 lbs	57,531 lbs
Credits Traded Annually	1,051,570 lbs	53,833 lbs
Traded Credits Share of PA 2025 Target Reduction	2.77% (Target = 38,020,000 lb)	4.34% (Target = 1,240,000 lb)

Ecosystem Services Profile

- Environmental Quality
 - Air: reduction of ammonia, odors, GHG releases
 - Water: reduction of ground water contamination and nutrient loading to the Chesapeake Bay
- Public Health & Safety
 - Local insect and rodent control
 - Regional pathogen control
- Conservation
 - Carbon neutral production of renewable Energy
 - Recovery and reuse of minerals and nutrients

Policy Implications

- Water pollution from animal agriculture can be managed by available technology
- Infrastructure can transform agricultural non-point pollutant sources into monitored point sources
- Infrastructure economics are marginal when revenues are limited to energy alone
- CAFOs provide scale for a variety of commercial ecosystem services
- The role of technology infrastructure should receive greater consideration in the formulation of policies to promote emerging ecosystems services markets