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Reprint: Reaping the Rewards of Industrial Ecology

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—Dr. Richard Tsang, CDM vice president

Catawba County, North Carolina, is putting a new twist on “reduce, reuse, recycle.” The current site of the Blackburn landfill is becoming an ecocomplex, a modern green industrial park where treatment facilities and industry unite to recover resources and maximize renewable energy.

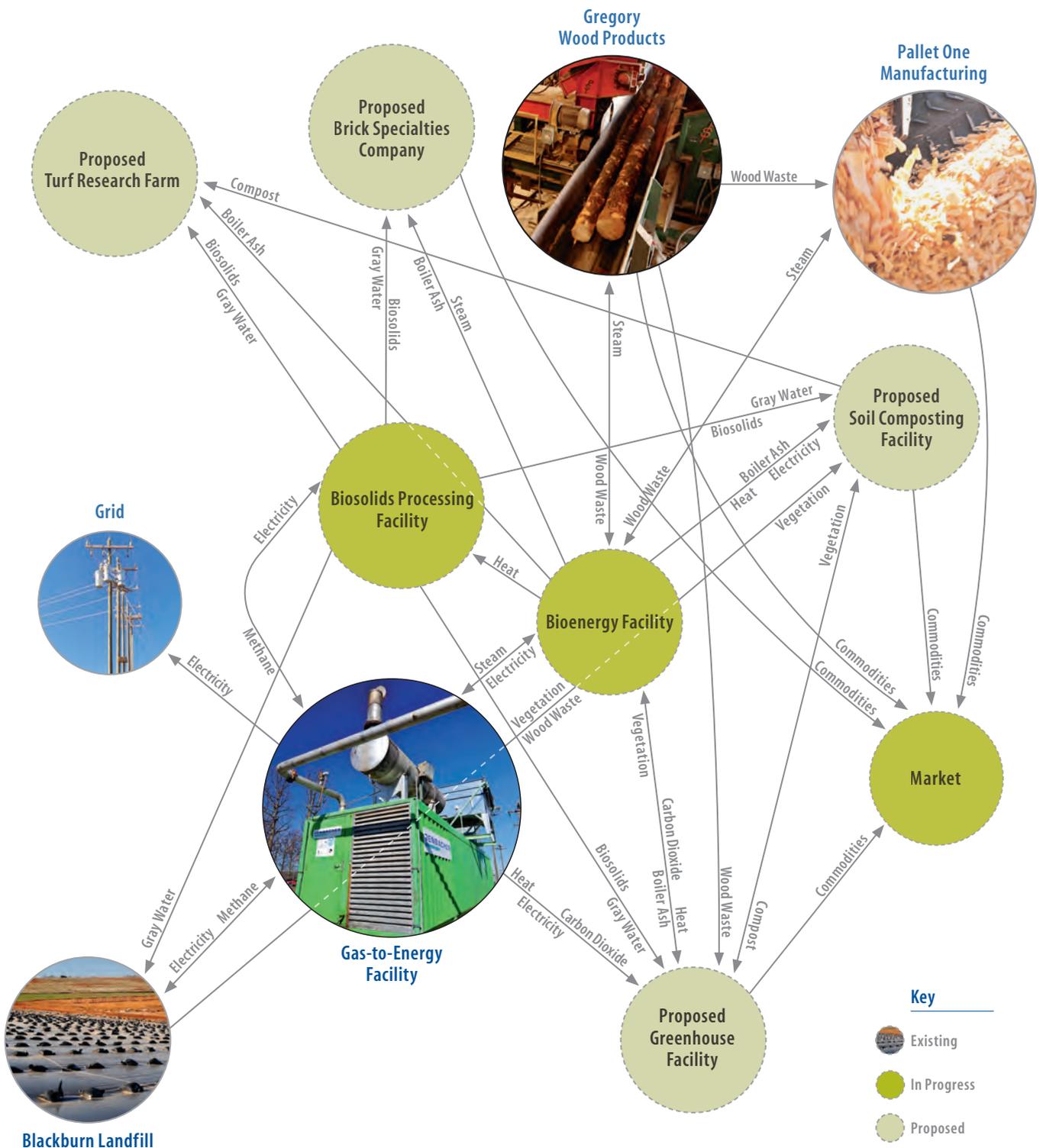
What began as a study researching alternative means for processing biosolids from the local wastewater treatment plant—run by a regional consortium that includes the cities of Hickory and Conover, and Catawba County—has evolved into the Catawba County Regional EcoComplex and Resource Recovery Facility.

With the current biosolids composting facility near maximum capacity and in need of costly upgrades, CDM is designing a new biosolids

processing facility to be built at the ecocomplex. According to Barry Edwards, director of utilities and engineering for Catawba County, “The concept is based on the idea of industrial ecology. We wanted to marry the new biosolids facility with the landfill in a sustainable way.”

The new facility—with capacity to serve the area’s wastewater biosolids management needs for the next 20 years—will dry biosolids with waste heat recovered from engines that convert landfill gas into electricity.

“This is really beneficial to the county,” says Dr. Richard Tsang, CDM vice president and biosolids specialist, who has worked with Catawba for many years. “Using renewable energy to process biosolids into a product that can be used as fertilizer for various agricultural needs, and can potentially be used as feedstock to a biomass gasifier or fertilize the biofuel crop production, is an innovative and sustainable concept.” In addition, replacing the aged composting facility will result in long-term cost savings for the county.



Based on the idea of industrial ecology, the Catawba County Regional EcoComplex and Resource Recovery Facility demonstrates the connection between materials, waste, reuse, and energy.

The county currently collects and combusts landfill gas, creating approximately 3 megawatts of electricity that is sold to the local utility grid to help power 1,100 to 1,500 area homes. In the future, liquid waste from the biosolids drying process may be injected into landfill cells to create a bioreactor landfill effect, increasing the rate of decomposition and amount of energy generated.

Collaborating for Research

Catawba County is also collaborating with nearby Appalachian State University on a biodiesel research facility that will enable faculty and students to create biodiesel fuel. Employing 3D/4D technology, CDM designed the 7,000-square-foot building to Leadership in Energy and Environmental Design® Silver standards.

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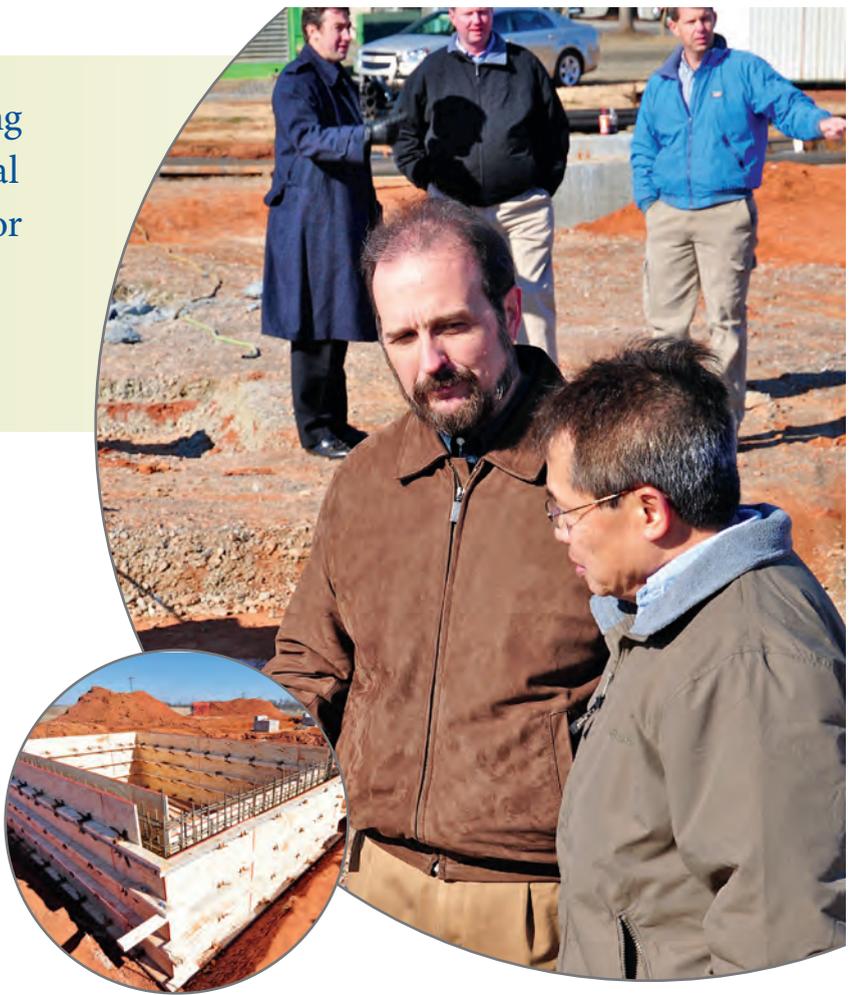
In a buffer area outside the landfill, feedstock crops—such as sunflowers and canola—are grown and harvested for use in fuel production. Various mixtures will be studied and tested at the facility. Keeping with the reuse concept, recovered heat from landfill gas engine generators will be used and some biodiesel will be provided to the county each year to help run the landfill equipment.

Edwards says this has been a positive collaboration for the community. “We are bringing a stronger university presence to our county. We have been able to bring an important research and education component to the area. And, we have had a lot of tour groups come through here.”

Expanding Energy Generation

Through public-private partnership, Catawba County is teaming with a local lumber processing company that is located on county-owned land adjacent to the landfill. The company provides wood waste to a neighboring pallet builder that uses the materials to produce new pallets. In the future, wood waste will also be gasified at the future bioenergy facility and used to generate electricity, while steam heat will be harnessed and used by both companies to dry wood.

Through the bioenergy facility, the county will explore additional ways to capture and beneficially use heat, steam, and other byproducts. Proposed ecocomplex components include a greenhouse; recycled plastic pelletization and anaerobic digester facilities; and industrial businesses, such as a local brick production company. CDM is conducting preliminary engineering for the digester facility, which will process wastewater, as well as animal and food waste, into biogas to create electricity.



Inspiring Lasting Solutions

The ecoconcept has garnered positive attention—public outreach has attracted local industries and municipalities who are interested in using green energy. Local elected officials are recognizing the benefits of this model and are excited by the prospect of a system that recovers and reuses as much as possible. In addition, due to the project’s sustainable nature, it is eligible for federal stimulus funding.

Edwards concludes, “What we are doing here is employing industrial ecology to protect natural resources and our environment, and in doing so, we are generating electricity and heat from renewable resources. And, we are able to control solid waste management costs, providing waste collection services at an economical rate. This is a good thing for the environment and community.”

Barry Edwards and Richard Tsang discuss the benefits of the ecoconcept as Rodney Miller, Catawba County finance director (right), Rodney Hamby, landfill superintendent (left), and CDM’s Joe Wiseman (center) look on.



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