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The Landfill of the Future

By Taft Wireback

The buildings by the roadside are so average looking, so basic and unimposing, you'd never guess their distinction in a million years.

They make up the Catawba County EcoComplex. And they represent this nation's most advanced approach to landfill technology, an effort to transform the disposal of ever-controversial household and industrial wastes into something of communitywide value.

The fancy term for it is "industrial ecology," says Barry Edwards, who oversees the EcoComplex as director of Catawba's department of utilities and engineering.

"We're turning the waste stream into a commodity," Edwards said recently. "Everything in the EcoComplex must have a synergistic relationship with part of the waste stream or some other piece of the complex."

Welcome to the American landfill of the future in a rural setting 100 miles west of Greensboro, taking shape with a level of technology and foresight largely missing so far in the local debate about reopening the White Street Landfill or what else to do with the city's waste.

Edwards and his staff hope to find a use for every scrap of trash headed to Catawba's Blackburn Landfill, located within the complex, either by recycling it or turning it into biodiesel fuel or electricity made from methane, wood gas, algae and wastewater biogases, and other green sources.

They are years from achieving that, but county government has a long-range plan that Edwards actively pursues. The plan envisions a beehive of private businesses working in partnership with the EcoComplex's landfill, some using each other's wastes in making new products, some providing specific waste materials useful in producing fuel or electricity.

And it isn't just Edwards and his staff. The EcoComplex is being developed with help from the state university system, including students and professors from N.C. A&T versed in sciences that can unlock the economic potential of municipal solid waste — MSW, for short.

In fact, graduate students from Greensboro help grow specialized crops at the Catawba landfill and eventually will turn harvests of sunflower and canola seed into biodiesel at the EcoComplex's new biofuels research, testing and production facility.

The goal? Making enough fuel from landfill-grown crops to power the EcoComplex's fleet of heavy equipment, potentially saving county government hundreds of bucks a day.

"If it was up to me and I was governor, I would say all the counties need to have one of these," N.C. A&T graduate student Quentin Brown said recently of the EcoComplex, as he helped to install the biodiesel center's new production line.

A&T professor and biofuels expert Abolghasem Shahbazi said that eventually economics will force public officials to follow in Catawba's footsteps and use waste more intelligently: "The price of storing and landfilling MSW is getting higher and higher. At some point, the prices will be so prohibitive it will be a necessity."

Across the nation, only a handful of projects rival the EcoComplex in scope and innovation, said Dennis Grady, former director of Appalachian State University's energy program and the first academic administrator to work closely with the EcoComplex.

"I think it's a model that others can use," said Grady, now at Radford University. "It's got legs. Anybody who spends time in the field of renewable energy has heard of this project."

Despite its experimental bent, the EcoComplex operates in the black, not subsidized by property taxes or the county's general fund. It pays for itself with landfill tipping fees, energy production, and partnerships with businesses and universities, Edwards said.

"When I was hired, I was told, 'Your job is to run this like a business,'" he said of the operation he's led since 1995.

Edwards' initial task involved tapping the methane gas that all landfills create as their buried garbage deteriorates. Catawba installed three generators that make enough electricity from landfill gas to power 1,400 households. The EcoComplex earned $800,000 last year selling power to Duke Energy.

But Edwards and his staff weren't satisfied. They developed a series of interlocking relationships with companies producing waste that otherwise would end up buried in the landfill.

They started in 2006 when Gregory Wood Products opened a $20 million, fully computerized sawmill employing 115 full-time workers on county-owned property near the landfill.

Next door, Pallet One recently opened a plant capable of using the sawmill's finished lumber and waste to make shipping and warehousing pallets. The economy needs to improve before that's financially feasible, but Pallet One keeps 29 workers busy at its EcoComplex plant recycling damaged pallets from its customers and grinding up what can't be repaired for landscaping mulch.

"We might not have built the plant there to recycle," said Howe Wallace, Pallet One's president. "But once we were there, we found an opportunity to do it, and it's worked out for us."

Eventually, excess wood waste from Gregory Wood Products and Pallet One will go to the gasification plant scheduled for construction next year.

The plant, which will be the first of its kind in the nation, is being developed in partnership with GE Energy and Nexterra Energy Corp.

The wood-gas plant will produce huge amounts of steam in addition to nearly as much electricity as the EcoComplex's existing methane generators. Catawba officials plan to sell the excess steam to another manufacturing partner; they've talked with several but have not yet closed a deal.

"It will be another private company that creates jobs and moves another business here," Edwards said.

Other EcoComplex plans include an ethanol plant, a multi-feedstock anaerobic digester to make biogas, a new wastewater treatment plant to make fertilizer; a greenhouse to convert algae to green energy, and an expanded compost facility.

The EcoComplex has won numerous national governmental, environmental and industrial awards in the past five years. And it helps recruit new companies, said Scott Millar, president of Catawba's economic development program.

“In general, it means this area is not going to have waste issues for 75 years or more, so you know our landfill costs are not going through the roof,” Millar said. “But the opportunity to sell 100 percent green power being generated out there has been key in our ability to talk with a number of prospects.

“We get to talk green-energy credits. We’re leading the nation in this category. So we can truly say if you’re green, you need to contact Catawba County.”