

Catawba County, North Carolina

ECO-COMPLEX CASE STUDY

By Amble Johnson

Background

Catawba County sits in western North Carolina in the foothills of the Blue Ridge Mountains. Its 2010 population was 154,358, and it encompasses 405 square miles.³⁷⁰ Catawba County contains eight cities and towns, including Hickory and the county seat of Newton.³⁷¹

In 2006, *Forbes* declared Hickory, North Carolina the third best place in the United States in terms of Cost of Doing Business and number 20 for Cost of Living.³⁷² Nonetheless, the area's traditional manufacturing base has been in economic decline despite the county and city governments' efforts to attract new industries. These include expansion of water and sewer lines and roads (including improvements to I-40 and US Highway 321) and the establishment of the local Industrial Development Commission.³⁷³

Within this context of attracting new jobs in a shifting national employment climate, the government opened the Catawba County Regional Eco-Complex with the goal of developing "a system that recovers all usable products and by-products from a group of private and public partners located in a close-knit defined area" of the county.³⁷⁴ Maximizing waste reuse aims to serve Catawba County in both ecological and economic arenas by providing businesses with facilities where they have lower cost access to raw materials and can lower the costs associated with waste disposal.

Program Inception and Development

On February 6, 2006, Catawba County's Board of Commis-



Catawba County Landfill Gas-to-Energy Facility

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sioners approved a Letter of Intent with Petra Energy for the preliminary design of an Energy Recovery Facility at its existing Blackburn Landfill site, which was already the site of a County

methane recovery facility. This Energy Recovery Facility was the first phase in the development of a regional Eco-Complex that would attract certain industries to a central location wherein they could make use of the waste streams of the associated industries as the raw materials for their own prod-

ucts. The initial phase called for facilitating the location of a wood pallet company at the site that would supply its wood waste to a county facility that would burn the wood waste for energy to supply electricity, heat, and steam.³⁷⁵ Due to the evolutionary nature of the EcoComplex, an improved technology was discovered that will gasify the wood waste rather than burn it generating the same renewable energy benefits through a more ecologically sound process. This facility will be known as the Wood Gasification Facility.

The Eco-Complex will ultimately present an array of business and research opportunities, from by-products reuse to alternative energy production. Under the terms of the agreement with Petra, the County paid Petra Engineering \$25,000 for an initial feasibility study and agreed that if it was satisfied with

370 U.S. Census Bureau State and County Quickfacts; <http://quickfacts.census.gov/qfd/states/37/37035.html>

371 <http://www.catawbacountync.gov/about.asp>

372 <http://datacentersites.com/EcoComplex%20Marketing.pdf>

373 <http://www.catawbacountync.gov/about.asp>

374 <http://www.catawbacountync.gov/ecocomplex/index.html>

375 <http://www.co.catawba.nc.us/commish/agendas/20606min.pdf>

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the findings of the feasibility study and chose to proceed, Petra would be compensated for actual costs of the development and implementation of the Eco-Complex—with all costs verified by the County pursuant to Petra’s records and industry standards—plus 10% management and administrative cost at an amount not to exceed \$500,000. As the EcoComplex evolved, the Letter of Intent with Petra was terminated at the end of the feasibility study. However, Petra does continue to play a role in the continued development of the EcoComplex as a consultant to the County.

While the Department of Utilities and Engineering and the Board of Commissioners facilitated the initiation of the process, the County continues to head the Eco-Complex’s direction. Many of the Eco-Complex’s subsequent projects are the result of collaborations between outside groups such as the Catawba County Economic Development Corporation, Petra Engineering, Gregory Wood Products, PalletOne, McGill Associates, and CDM-Smith, as well as schools such as Catawba Valley Community College, Appalachian State University, the University of North Carolina - Charlotte, North Carolina A&T State University, and the North Carolina University System. This collaborative approach is a central tenet of the Eco-Complex’s success.³⁷⁶ By centrally locating the reuse of products, fuel and transportation costs are drastically reduced, which served as an early draw to the Eco-Complex.³⁷⁷

The Blackburn Resource Recovery Facility employs 21 people and handles around 415 tons of waste daily. The Gas-to-Energy Facility is another component of the Eco-Complex that is currently operational, and it houses three 1-megawatt generators that burn the landfill’s naturally-produced methane into enough electricity to power around 1,400 average-sized homes. Many of the by-products of Gregory Wood Products, which now employs 115 people, are used by Pallet One. Pallet One, in turn, employs 29 people in Catawba County in pallet recycling and manufacturing. Utilizing required buffer acreage for the Blackburn Resource Recovery Facility, Feedstock Crops of sunflower in the summer and canola in the fall are grown for use in the Biodiesel Research, Development and Production Facility. The Biodiesel Facility, fully operational since mid-August of 2011, is an example of the continuing partnership with Appalachian State University (ASU). It includes a 7,260-square foot process-

376 <http://www.aae.net/Website/E32011HonorEnvironmentalSustainability2.htm>

377 <http://www.bizjournals.com/charlotte/stories/2006/07/24/story8.html?page=all>



Catawba County & Appalachian State University Biodiesel Research, Development, and Production Facility, Certified LEED Silver

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ing building and a 800-square foot remote chemical storage building that ASU graduate students use to test biodiesel produced from on-site feedstock crops. Finally, Hmong Demonstration Site is a 1-acre plot of landfill buffer leased through the local North Carolina Cooperative Extension Office to the Hmong Association for use as a horticultural demonstration site.³⁷⁸

Future plans for the Eco-Complex feature a Biosolids (municipal wastewater sludge) Processing Facility to replace Catawba County's existing Regional Sludge Management Facility which operates at another location. This facility will meet Catawba County's wastewater sludge management needs for the next twenty years. Also, in order to maximize the reuse of waste and by-products from the Eco-Complex's manufacturing partners, the Wood Gasification Energy Facility will use sawdust and biomaterials to generate electricity, heat, and steam energy. It is expected to produce three megawatt hours of electricity and 15,000 pounds of steam per hour. Pending Federal grants, Catawba County and Appalachian State will pursue algae research on-site to explore and refine algae's potential for biodiesel production. Also, a Bioreactor Landfill may be developed to inject graywater residuals from the Biosolids Processing Facility into the existing landfill.³⁷⁹

Catawba County's longer term plans for the Eco-Complex include a composting/soils amendment facility to bag and sell compost/soil amendment products and possibly mulch. Also, 25 to 100 acres of greenhouse facilities are being discussed for growing vegetables and/or flowering plants once the site's expected waste streams are created. Preliminary engineering for an organic waste anaerobic digester facility is underway. This facility would process sewage (wastewater sludge) from

wastewater plants and process animal and food wastes. Biogas from the wastes would then be used to produce electricity and heat. Finally, a biofuel research project that integrates landfill gas, biodiesel, and other fuels into a combined fuel for generating green energy is being considered.³⁸⁰ (A map of current and proposed projects in the Eco-Complex may be found at: http://www.catawbacountync.gov/ecocomplex/EcoComplex_map.asp.)

Funding

Initial costs for the Eco-Complex were paid for through a combination of water and sewer and solid waste funds, along with Energy Facility monthly user fees, the sale of electrical power, as well as investment by the project's business and research partners.³⁸¹ County officials say that no local tax dollars have or will be used on the facility. By using the reallocation of waste, the Eco-Complex's progressive approach in making use of waste streams creates revenue without relying on programs with high initial costs. As a result, in 2010 Catawba County brought in \$688,353 primarily from electrical sales to the utility company. Additional revenues from Renewable Energy Certificates (RECs) and Federal Renewable Energy Production Incentives

enable Catawba County to grow its programs that offset and reduce its carbon footprint while continuing to save its taxpayers money.³⁸²

Results

Several outside groups have acknowledged and recognized

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378 <http://www.catawbacountync.gov/ecocomplex/existing.html>

379 <http://www.catawbacountync.gov/depts/u&e/existing.asp>

380 <http://www.catawbacountync.gov/depts/u&e/Impending.asp>

381 <http://www.catawbacountync.gov/depts/u&e/developing.asp> a 2007 estimate of costs is available at: <http://www.naco.org/programs/csd/Green%20Government%20Database/Catawba%20County%20NC%20EcoComplex%20overview.pdf>

382 <http://www.salisburypost.com/centerfortheenvironment/Catawba-County-EcoComplex--Opens-New-Biodiesel-Facility->

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the Catawba County Eco-Complex. One award was the 2007 Thomas H. Muehlenbeck Award for Excellence in Local Government, presented by the Alliance for Innovation. The Alliance for Innovation cited Catawba County's Department of Utilities and Engineering for promoting innovative thinking in government. In 2008, Catawba County added a National Association of Counties (NACo) Achievement Award for its work in the Eco-Complex.³⁸³ Also, the American Academy of Environmental Engineers presented the Eco-Complex with its 2011 Honor Award in Environmental Sustainability.³⁸⁴

On its web site, the American Academy of Environmental Engineers praises the Eco-Complex's long-term commitment to sustainability. Because of the Eco-Complex, Catawba County residents have reduced fees due to selling of electrical power to the grid, met wastewater biosolids management needs for the next twenty years, and realized economic benefits from attracting business. Environmentally, the Eco-Complex's extensive collaboration among local government, business, and research institutions encourages increased opportunities for reuse and for renewable energy creation.³⁸⁵

As a whole, the Eco-Complex's benefits to Catawba County are far-reaching, and they help generate more potential programs in the future. As Scott Millar, president of Catawba County's economic development program, says, "the opportunity to sell 100% green power being generated out there has been key in our ability to talk with a number of [business] 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."³⁸⁶

In July 2011, the Catawba County Board of Commissioners unanimously voted to rezone the land surrounding the Eco-Complex from residential use to industrial in order to allow the location of additional economic development in the area. In reaching their decision, commissioners considered the "economic successes" of the area, including the Eco-Complex, and the potential of the successes to serve as catalysts for further development in the area.³⁸⁷

383 <http://www.catawbacountync.gov/depts/u&e/ecoAwards.asp>

384 <http://www.aaee.net/Website/E32011HonorEnvironmentalSustainability2.htm>

385 *ibid.*

386 http://www.news-record.com/content/2011/07/30/article/landfill_of_the_future_turning_trash_into_treasure

387 <http://www2.hickoryrecord.com/news/2011/jul/11/rezoning-approved-near-eco-complex-ar-1198799/>

According to a 2011 article from the Charlotte USA Economic Development Guide, the Eco-Complex has so far created "\$35 million in taxable investments and more than 150 jobs, with an additional 115 jobs projected when other entities [within the Eco-Complex] begin operation."³⁸⁸ These numbers are significant in the context of Catawba County as a small population, striving to deal with tumultuous employment factors.

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388 <http://charlotteeconomicdevelopment.com/catawba-ecocomplex-feeds-charlotte-regions-green-ambitions>