



NO ORDINARY LANDFILL

— *Madison County's Alternative Energy Programs*

By Mary Roy and Eileen Stegemann

Photos by James Clayton, unless otherwise noted

Clean, green solar energy. The last place you might associate this with is a landfill, but that's exactly what you'll find in Madison County, New York.

A visit to this rural site can be an eye-opener. Located on a portion of a nearly 700-acre solid-waste management site, surrounded by rolling hills and farmland, this picturesque setting contains a state-of-the-art facility that uses a solar cap to capture and produce energy. This is cutting-edge technology and Madison County Landfill is the *first* and currently *only* municipal landfill in the country to produce energy this way. Only two other landfills in the U.S. have solar caps—a private landfill in Texas and another private one in Georgia.

After receiving a \$228,000 stimulus grant from the New York State Energy Research Development Agency, Madison County installed flexible photovoltaic film panels over an acre of a closed portion of its active landfill during the summer of 2011. The solar cover is capable of producing approximately 40 megawatt hours per year—enough to offset half of the electricity needed to run the recycling center located on the site—and is designed to

produce power even in lower light, a seasonal factor in upstate N.Y.

“By offsetting electrical needs at this facility, the solar green energy provides a significant benefit to the county,” explained Madison County Department of Solid Waste (DSW) Director James A. Zecca. “The stimulus grant funded about three-quarters of the project. In-house labor for the project totaled about \$60,000—a solid



Madison County staffers explain how the solar cap works.

investment by local government during tight economic times.”

But sunshine isn't the only thing being collected at Madison County Landfill; they also collect methane gas, which is turned into low-cost electricity and heat. Methane is a natural by-product of decomposition of organic solid waste in landfills, and Madison County's methane gas-to-energy project uses that gas to power an onsite internal combustion engine owned by a major waste management company. The engine produces one megawatt of electricity—enough to power 1,000 homes.

Not stopping there, the county also captures and uses the excess heat from this engine. The excess heat is piped to the recycling center and two other buildings at the DSW site to reduce heating costs. Capturing the methane produces energy 24 hours a day, 7 days a week, which benefits the county and prevents the release of methane (a greenhouse gas 20 times more potent than carbon dioxide) into the atmosphere.

The county encourages other local businesses to make use of the consistent excess heat as well. In fact, a lumber company located in Cazenovia, NY plans to break ground next spring for construction of two new facilities that will use the landfill's heat: kilns to dry lumber destined for furniture and flooring; and a

hydroponic greenhouse operation. NYS Empire State Development awarded the company a \$150,000 grant for construction of these facilities.

park would be situated on almost 150 acres of landfill property, and would offer the opportunity to diversify the business base in the county.

...a holistic, sustainable approach to economic development...

By building such partnerships with local businesses and municipalities, Madison County is planning to “grow” an Agricultural and Renewable Energy-based Business Park (ARE Park). The

The foundation for some enterprises in the ARE Park could be the available low-cost, green-energy base. Future business prospects include a construction and demolition waste recycling operation, and



Top: To construct the Madison County Landfill gas-to-energy facility, the county received a \$998,000 grant from the U.S. Department of Energy; the remainder of the \$3 million total cost was paid by the private waste management company which owns the internal combustion engine. Madison County DSW crews provided some of the labor to install pipes.

Bottom: Most electricity generated by the engine in the gas-to-energy facility is sold to the grid. The county receives revenue from the sale of methane which fuels the engine.



Landfill gas (methane) is collected through a system of pipes and then used to produce green electricity. Tire chips are stockpiled (in background) for future landfill liner drainage.

an innovative technology that converts waste plastics into their base petroleum ingredients. The conversion of waste plastics would reduce disposal of bulky material at the landfill—thereby prolonging the life of the landfill—and also create valuable fuels.

“These green initiatives demonstrate Madison County’s drive to have a holistic, sustainable approach to economic development and the betterment of our community,” said Kipp Hicks, executive director of the Madison County Industrial Development Agency.

Everyone involved in these green projects in this rural county (population:73,000 people) agree that partnerships are key to success. Collaboration has meant pooling resources and virtually reaching out to shake the hands of the business and academic communities as well as other government entities. Building strong public/private and government-to-government partnerships has resulted in energy production from a landfill, energy savings for county government, and grant awards to further business innovation that are beneficial to Central New York.

At a time when alternative energy sources are being sought, and green space is highly desired, Madison County’s innovative energy projects may make people rethink what a landfill can be.

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