

## **How to build a garbage-gas-to-electric system and three large solar arrays with low or no cost PPAs**

Recently a contingent of concerned citizens from Chenango County took a trip to Madison County to see what they have done to encourage the build-out of renewable energy in the county.

I found a more impressive program than I had expected. Not only have they installed solar at their landfill but they have also diverted globally warming waste methane to an electric generating plant that also supplies heat to a lumberyard drying kiln.

The methane is recovered by a piping system installed in the landfill that delivers the gas to a power generating facility. The gas is de-watered, filtered, pressurized and then burned in a 20 cylinder engine built and operated by Waste Management, Inc. It generates 1.4 megawatts of electricity, enough to power nearly 1,200 homes annually.

The waste heat from this power plant is then piped to five lumber-drying kilns built by Johnson Brothers. The five kilns can dry 25 tractor trailer loads of hardwoods at a time, worth \$375,000. The savings that Johnson Brothers achieves by using that free residual heat is about \$100,000 annually.

The generator/kiln interconnect was incentivized with a \$395,000 NYSERDA grant which paid for 25 percent of the cost. The grant was tied to a 1.7 million dollar investment by Johnson Brothers and their agreement to create jobs.

The mixed hardwoods cut from a 90 mile radius of the Cazenovia mill are sold both nationally and internationally. About 30 to 40 percent of their lumber is sold overseas. The kiln dried wood is made into flooring, furniture and kitchen cabinets.

A third phase of this waste-to-power-to-heat project is still in the planning stage, but might be a greenhouse or a fish farm.

Madison County is the only facility in the state to develop a DEC approved 100 year plan for their landfill. They have been maximizing their “reduce, reuse, recycle” program in order to extend its life.

As part of that program they are now shredding and compacting styrofoam packing, not only to divert this high volume material from the waste stream but also to sell it to the salvage market at a value second only to aluminum cans.

They have also installed piping from their landfill to their wastewater treatment plant to transport their leachate and save on the cost of 600 tanker truck trips hauling over 5 million gallons of leachate per year.

Their crowning achievements, other than having diverted large amounts of greenhouse gas from the landfill, are their solar arrays. Their first was a 40 kW thin-film, flexible photovoltaic (PV) landfill cover. The system is grid-tied and supplies 50% of the needs of their recycling facility buildings.

They also have a 50 kW ground mounted system made up of 210 3x5 foot solar panels financed with a Power Purchase Agreement (PPA) that allows the county a reduced cost per kWh. That system provides 100 percent of the power needed for the Landfill's maintenance operations building.

Madison County's most recent venture into renewables is a 10 acre, 2 megawatt, 7000 panel solar array that will supply 73% of the county government's electricity needs. The Madison County Planning Department was able to finance that project through a Power Purchase Agreement that requires no upfront costs for the county and allows for greatly reduced electric rates for the next 25 years. They expect they will save \$140,000 per year.

I strongly urge the Chenango County Board of Supervisors to emulate Madison County's renewable energy programs by working with their own Planning Department, the IDA and Commerce Chenango to develop similar creative programs to save energy, save money, create jobs and help save the planet. Madison County has developed a motherlode of cost and energy saving ideas with information that could and should be replicated here in this county.