

CHAPTER SIX

Capacity Assurances



York County's Long Term Commitment to Manage Waste by Recovering Energy

Pennsylvania counties are required to ensure that sufficient capacity is made available to manage the volumes of municipal waste generated within their jurisdictions. In fact, this is the single most important responsibility outlined for counties by the Municipal Waste Planning, Recycling and Waste Reduction Act (Act 101). The manner in which a county acquires capacity or fulfills that requirement differs from one jurisdiction to another. Many counties enter into contractual arrangements with third party disposal facilities, primarily landfills. Others own and operate their own landfills. York County is one of the counties in the Commonwealth where the important decision was made to construct and operate a facility to utilize municipal solid waste as a valuable asset in the production of renewable energy, rather than having it disposed.

In Chapter 3, the disposal and processing needs for York County were projected for the next 25 years. Justifications for the methods, which will be utilized to fulfill those needs, were discussed in detail. Here in Chapter 6, a brief refresher is provided of the future assurances and selected disposal and processing options. Greater focus however, is given to the York County Resource Recovery Center - the linchpin of the entire integrated municipal solid waste management system and the foundation upon which the York County Municipal Solid Waste Management Plan was developed.

Overview of the Selected Methods for Disposal and Processing

The York County Resource Recovery Center was conceived and developed with the purpose of providing the capacity required to manage the waste generated in York County. It was anticipated that the Center should also handle some portion of the waste originating in surrounding counties. The goal was to ensure the proper management of municipal solid waste with the added advantage of producing electricity.

The Center, which is situated on YCSWA's campus in Manchester Township, has been in operation since 1989. From its inception, the Center was designated as the primary facility to receive municipal solid waste from York County. The Center has fulfilled that role for more than 35 years. During the planning process, the Municipal Waste Advisory Committee acknowledged that the Resource Recovery Center should continue this function. Under current operating conditions, ongoing maintenance and future improvements, the Center has the capacity and ability to meet the waste management needs of York County for the next 25 years as well.

In 1989, a flow control mechanism, in the form was implemented as in conjunction with the provisions of Ordinance 89-4, the York County Flow Control Ordinance. It authorized a set of rules and standards for transporters to ensure that flow control is enforced. Ordinance 89-4 provided for municipal waste collection & transporter licensing. In recognition of Act 90, the Authority will replace its licensing program with a hauler registration program under regulatory provisions of the ordinance. Consequently, on

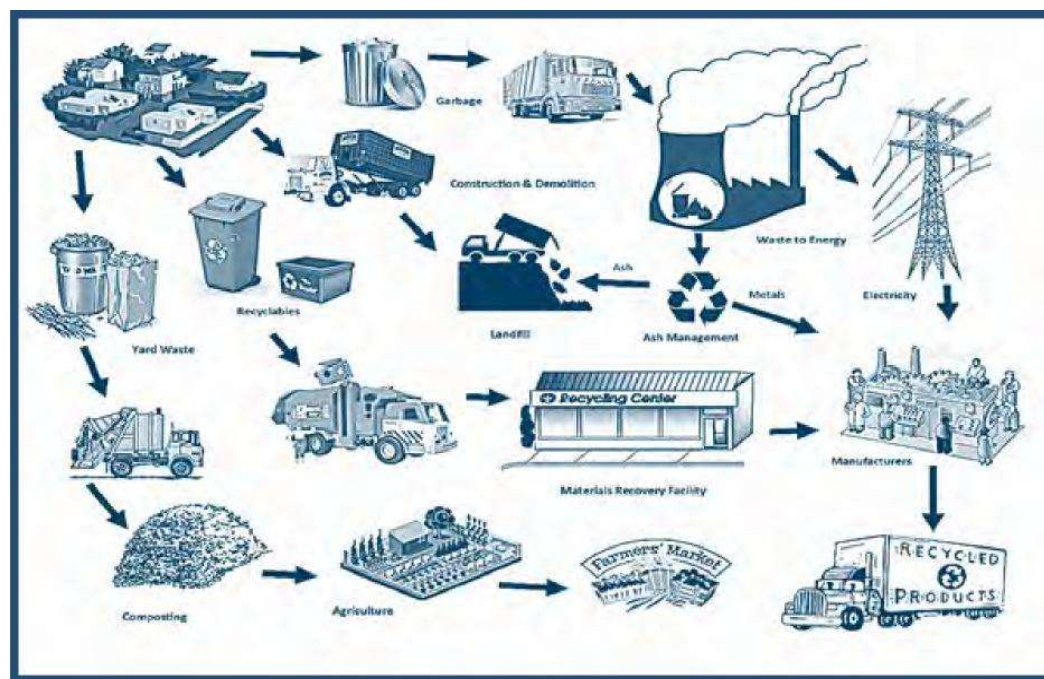
average, the Center processes approximately ninety-five to ninety-seven percent of the municipal solid waste discarded in the County each year. The remaining three to five percent of the municipal solid waste is considered non-processible. There are other subcategories of municipal waste also unsuitable to be processed at the Center. These include sewage sludge, regulated medical waste, and some components of construction & demolition waste. Therefore, the Center is not the sole recipient of all of York County's municipal solid waste.

Agreements are in place with the following disposal facilities to accept York County generated MSW, ash residue from the YCRRC, construction and demolition waste, and sewage sludge:

- Commonwealth Environmental Systems Landfill
- J.P. Mascaro Pioneer Crossing Landfill
- Waste Connections Blue Ridge Landfill
- WM Cumberland County Landfill
- WM Fairless Hills Landfill
- WM Grand Central Landfill
- WM Mountainview Reclamation Landfill

All the facilities mentioned in this subchapter are included in the York County Plan. Agreements between YCSWA and the facilities are considered implementing documents to the Plan.

Figure 6-1 York County's Integrated Waste Management System



From time to time this list may be updated as YCSWA enters contracts with additional disposal facilities to gain or extend disposal capacity and/or to improve system economics on behalf of York County ratepayers. When we do so, YCSWA will notify the Department and send contracts as implementing documents. Those facilities will then be in the Plan.

Two facilities YCSWA expects to soon add are Republic Services' Modern Landfill and Delaware County Solid Waste Authority's DCSWA Rolling Hills Landfill. Republic Services has verbally agreed to provide capacity at Modern Landfill for York County generated material. Final terms are currently being negotiated. YCSWA expects to finalize an agreement with Republic Services for the use of Modern Landfill before the end of the year. Also, DCSWA has verbally committed to accepting ash residue from the YCRRC and contract negotiations are under way.

Source separated recyclables must be managed by a materials recovery facility, end-user, or interim dealer/broker. Source separated yard waste and food waste must be processed at a facility permitted and/or approved to accept the materials for processing. Figure 6-1 shows the basic flow of municipal solid waste in York County.



The Center can generate up to 40 megawatts of electricity every day of the year...enough electricity to meet the demands of approximately 20,000 homes.

The York County Solid Waste and Refuse Authority owns the Center, which is currently operated and maintained under a contractual arrangement with Reworld. Turning municipal waste into energy involves a technically engineered facility design and process. It encompasses a number of safety and pollution control devices and procedures. The intricacies of each step of the mechanical process could be provided in the framework of technical and regulatory references and vocabulary. However, for the purpose of the Plan, a consolidated and simplified explanation of that process is offered.

The Center has three combustion units which use the municipal waste as fuel to heat boilers capable of producing 360,000 pounds of superheated steam per hour. Each unit is capable of producing 120,000 pounds of steam per hour and is rated at 448 tons of waste per day. The steam in turn causes a turbine to drive a generator that creates electricity. By volume,

the municipal waste is reduced by approximately 90% and a residual ash remains. The ash is processed to remove any remaining valuable metals, and the remaining materials are beneficially used or landfilled.

Practical Benefits of Converting York County's Waste into Energy

Aside from providing capacity to manage municipal solid waste, the Center has other advantages. The first and most obvious is the ability to generate power from domestic sources. Waste-to-energy facilities generate more renewable electric power from one ton of trash than any other waste management option. Up to 40 megawatts of electricity is generated at the Center 365 days per year 24 hours per day. That's enough electricity to power approximately 20,000 homes, which is equivalent to twelve percent of the housing units in York County.

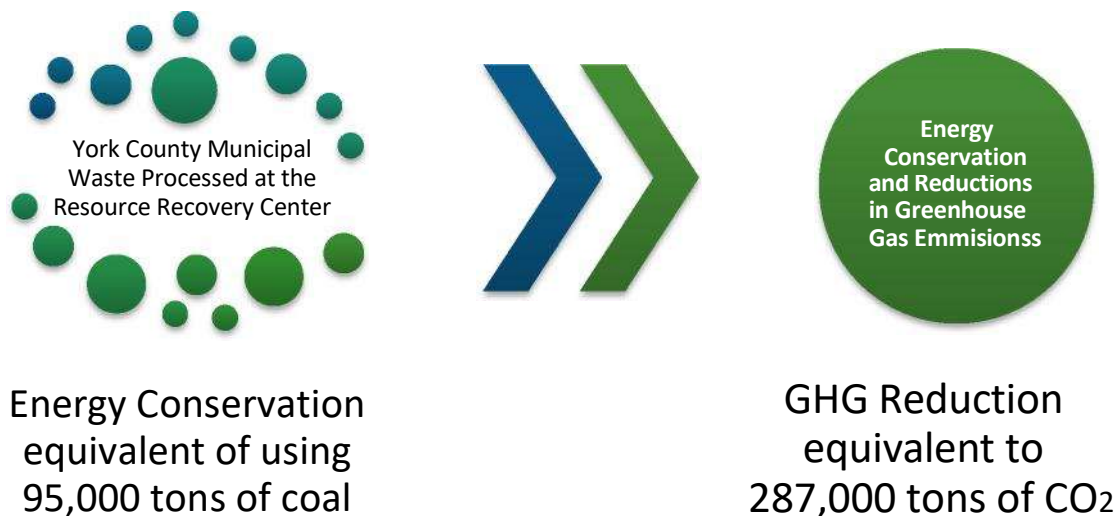
Metropolitan Edison purchases and distributes the electricity resulting from the conversion of waste into energy at the Center. Revenues from these transactions partially support the cost to operate the Center, including the wages and benefits of the employees. The economic sustainability of the system is supported by the Pennsylvania Alternative Energy Portfolio Standards Act of 2005. Pennsylvania law requires each electric distribution company and electric generation supplier by 2020 to incorporate into the electricity supply 18% from alternative energy sources. This includes 10% from resources such as large-scale municipal waste-to-energy operations like the York County Resource Recovery Center. The increasing cost of compliance for fossil fuel electricity sources continue to make waste-to-energy attractive in the marketplace.

The Role of the Resource Recovery Center in Mitigating Climate Change

A lifecycle analysis is the most accurate method for understanding and quantifying the complete accounting of any municipal solid waste management option. The ability of waste-to-energy to prevent greenhouse gas emissions on a lifecycle basis and mitigate climate change has been recognized globally. The York County Resource Recovery Center achieves the reduction of greenhouse gas emissions through three separate mechanisms; a reduction in fossil fuel consumption, the energy conservation from the recovery of materials, and the avoidance of methane gas generation.

Reducing Fossil Fuel Dependency

Domestic reliance on foreign oil, geopolitical unrest, and the prospect of future fuel shortages has inspired intense public dialogue and research into the potential for alternative energies. Municipal solid waste is among the best sources of feedstock for producing bio-renewable energy and other commodities in high demand. By generating electrical power or steam, waste-to-energy avoids carbon dioxide (CO₂) emissions from fossil fuel based electrical generation. Every ton of municipal solid waste processed in a waste-to-energy facility avoids the mining of one third ton of coal or the importation of one barrel of oil. For York County's municipal solid waste processed at the Center, this represents nearly 95,000 tons of coal or nearly 287,000 barrels of oil.



Source USEPA WARM Model

Energy Conservation from Material Recovery

Another effect of modern municipal solid waste combustion with energy recovery is the benefit of material recovery. The recovery of ferrous and nonferrous metals from municipal solid waste by waste-to-energy is more energy efficient than production from raw materials. Recycling metals also avoids CO₂ emissions that would have been emitted if virgin materials were mined and new metals, such as steel were manufactured. Metal processors recover approximately 18,000 tons of metal annually from the York County Resource Recovery Center's combustion ash residue. Brass, aluminum, copper and other base metals are the common metals that can be recovered and recycled. The remaining 145,000 tons of ash can be used in the construction and maintenance of landfills and as an aggregate in construction. Modern Landfill has PADEP approvals for the beneficial use of the Center's ash residue as an alternative to the soil required for daily cover of the working face of the landfill.

Eliminating Methane Gas Emissions

The USEPA has stated that waste-to-energy plants produce electricity with "less environmental impact than almost any other source of electricity." Numerous studies commissioned by the USEPA and other independent sources have determined that nearly one ton of carbon dioxide emissions is avoided for every ton of trash processed by a waste-to-energy facility rather than discarded conventionally. Modern waste-to-energy operations such as the York County Resource Recovery Center use state of the art air emission control technology to protect air quality.

The USEPA now recognizes a fourth "R" in the traditional "reduce, reuse, recycle" waste management hierarchy, RECOVER.

The York County Resource Recovery Center is representative of this component.

After reduction, reuse, and recycling efforts in York County occur, the Center recovers energy from the remaining municipal waste stream.

The Center not only generates substantial amounts of electricity, but also reduces energy consumption, which would be used to mine virgin materials by recovering metals from the resulting ash.

The waste-to-energy combustion process not only reduces carbon dioxide, it also effectively avoids all potential methane emissions from landfills. Biogenic material (material of biological origin), such as paper, food scraps and yard waste, typically constitutes a little over 50% of the municipal solid waste stream. When biogenic materials are disposed in a landfill, they decompose into nearly equal portions of carbon dioxide and methane gas. US EPA models claim that methane is twenty-one times more potent as a GHG than carbon dioxide. The Intergovernmental Panel on Climate Change (IPCC), an independent panel of scientific and technical experts that shared the Nobel Peace Prize with Al Gore, has determined that combusting the biogenic fraction of municipal solid waste results in a greenhouse gas (GHG) reduction when compared to landfill disposal. Considering the credentials and views of its members, IPCC's findings are an indication of the future importance that waste-to-energy will play in global efforts to minimize climate change. York County is already contributing to those goals.

Future Improvements and Enhancements to the Center

Further assurance that the Resource Recovery Center will be able to provide sufficient processing capacity for York County's municipal solid waste is the multi-phased site improvement project, which will be initiated in the immediate future. Many of the improvements will serve to control operating costs. Enhancements to the Center will include better traffic control measures to segregate the inbound and outbound flow of large commercial packer trucks from public access vehicles. Larger tipping areas to accommodate transfer trailers and the installation of additional scales will also ensure a safer and more controlled traffic pattern. Enlarged parking areas, and better access to the maintenance area and visitor's center also support the traffic safety plans. The consolidation of the various drop-off collection areas for yard waste, recycling and specialty collections is planned to provide a better user experience.

New sources and applications of the resources necessary to operate the Center are also being considered. Water and fuel are two major issues, which have been reviewed. During one phase of the site improvement project, the Center will likely convert from fuel oil to natural gas to initiate the combustion process. A smaller fuel oil tank will be installed to provide for other equipment needs. In addition, through the cooperative efforts of the York Water Company, the ability to tap into a new water main for emergency purposes will become a reality. The storage and use of storm water run-off for a variety of operational applications that require non-potable water is also planned.

One of the most significant operational issues for any combustion oriented waste-to-energy facility is the volume of ash residue that is produced. New processes are being explored with the intent of increasing the amount of metals that can be recovered from the ash, while reducing the cost of residuals management.

The site improvement project is expected to be a considerable expense. However, the ultimate result is anticipated to be a safer and more efficient operation which can facilitate future expansion. The return on investment, over the long term, will serve to control future operational costs. Thus, local residents and businesses will experience stable tipping fees, which directly fund the operation of the Center.

Summary

As has been demonstrated since the York County Solid Waste and Refuse Authority opened the Center in 1989, through its continued operation, York County will realize ongoing benefits. Not only does the Center provide a reliable method of managing the municipal solid waste generated in York County for the next 25 years, but it also provides processing capacity to neighboring counties. The technology used at the Center already serves to reduce the impact of greenhouse gases and minimize climate change. It also reflects the nation's goals of energy independence based on greater utilization of domestic renewable sources. The revenues generated by the operation of the Center support the local economy by providing employment opportunities. Additionally, the Center provides the funds that make the Authority's comprehensive educational programs and special collection services possible.

Based on past success, it makes sense for the County to continue with the Resource Recovery Center as its choice for the management of processible municipal solid waste. The Plan recommends this course of action. It also provides for adjustments to the Center and the way specific materials are managed based on future unforeseen conditions and observations made by the Authority.