

System 800xA Joins “Rubbish Revolution” ABB automation for an Alternative Waste Technology plant



A burgeoning world population, a mass exodus of people into cities, and a global economy characterized by industrialization – all these lend to an increase in the volume of waste. Landfilling remains the dominant means of waste disposal, and with landfill sites rapidly reaching critical mass, we may soon be overrun by waste and carbon dioxide emissions.

In a move towards a more responsible management of waste, AnaeCo developed a technology and process that creates new and renewable energy derived from municipal refuse or waste.

Policies around waste management have come to the forefront, with media, corporations and governments increasingly focusing on waste innovations in waste treatment and resource recovery. In Australia, the Commonwealth Government started an initiative to provide a national waste policy to deliver improved environmental, social and economic benefits associated with waste management.

AnaeCo, a Perth-based waste management solutions provider, leads the charge with its DiCOM® solid waste processing bioconversion technology – an Alternative Waste Technology (AWT) that processes organic waste to produce compost and biogas.

The DiCOM® process integrates bio-processing techniques and advanced waste segregation methodologies, backed by the flagship automation platform of ABB, the System 800xA.

ABB's state-of-the-art integrated solution permits room to grow with advances in waste technology

Scalable and Resilient

While reasonably mature “off-the-shelf” technologies are still most common within the waste management space, there have been successes in the establishment of facilities that combine different technologies such as AnaeCo's DiCOM® process which uses a new, locally developed hybrid aerobic/anaerobic system in its facility.

This two-stage commissioning stage is comprised of a waste sorting and preparation facility and three DiCOM® biological processing vessels, including associated ancillary equipment.

System 800xA, on which the facility's control system is based, supported this evolution path through its four-pronged Evolution Strategy that factors in solutions delivery, planning process, product development and system lifecycle programs

In the commissioning stage, ABB supplied the complete hardware, engineering and commissioning of the control system, drives, analyzers, instruments and field devices. The control system based on System 800xA is comprised of one AC 800M controller (PM861), a hundred I/O signals (S800) and one operator workplace. Another 300 I/O channels was commissioned for Phase 2.

ABB solution

- Process Control System based on System 800xA.
- Field instruments (safe and hazardous areas) integrated to 800xA through Profibus.
- Gas analyzers (safe and hazardous areas) integrated to 800xA through Profibus.
- Drives integrated to 800xA through Profibus.
- Design, supply, engineering, installation and commissioning of ABB equipment.

Drivers of Innovation

AnaeCo's chairman, Professor Michael Dureau, said the company is bullish on the trend towards conversion of municipal and industrial solid waste to high-value resources. “Increases in the cost of landfilling and community pressure to avoid landfilling are the driving forces behind innovation in waste management. Technology is the means by which this is being brought about,” he said.

Thomas Rudas, AnaeCo's managing director, said ABB was the preferred automation provider because of its state-of-the-art integrated solution. “Its solution permits room to grow with advances in technology by supporting diverse functionalities, both current and future processes.”



ABB's Hafeez Abdulaziz, the project proposal engineer, (ABB Australia) concurs: "The process is fully automated using System 800xA with extensive use of Profibus communication protocol for all the drives and field devices. The plant process data is monitored and controlled remotely from the AnaeCo staging facility. Sensors monitor the conditions within each vessel and set and vary the flow of air and water, thereby regulating moisture levels, temperature, pressure, oxygen, carbon dioxide and methane, as well as odor generation and control."

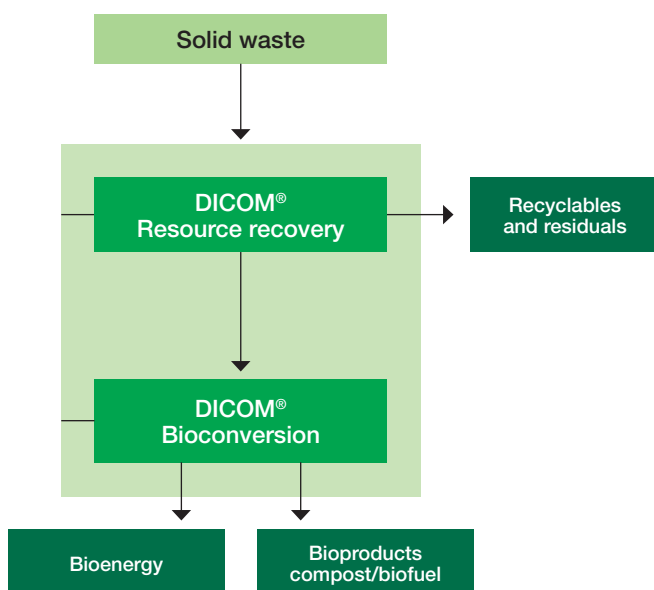
"AnaeCo benefits from a high degree of standardization for planning and documentation and an extremely flexible system in regards to operation, maintenance and future expansion opportunities," Rudas affirmed.

While there is still a need for research into improving recovery and reprocessing technologies, the main challenge in Australia is to improve the access to such technologies across the country.

AnaeCo plans to install Biomass plants in every city in Australia, as well as take the process worldwide.

With AdaeCo's breakthrough technology, and ABB automation backing it up, we are well on the path to creating a world without waste.

DiCOM® AWT Facility Process Overview



Step 1 Resource recovery

Municipal waste is deposited at the DiCOM® AWT facility. Inert, recyclable items such as metals, plastics and glass are recovered by predominantly mechanical sorting with minimal manual intervention. Approximately 80% of waste delivered to the facility can be diverted from landfill through this process.

Step 2. DiCOM® Bioconversion

A four-stage bioconversion process for the recycling of solid organic waste into organic fertilizer and renewable energy:

- **Aerobic processing.** After organic material is mixed and pulverized, it is loaded into a treatment vessel where it undergoes aerobic treatment.
- **Anaerobic processing.** This occurs in the same vessel through the introduction of carefully regulated bacterial inoculum in the form of inoculum solution. This part of the process produces methane gas which is used to generate electricity to meet plant needs. Surplus can be sold to the electricity grid.
- **Secondary aerobic processing.** After anaerobic processing, the inoculum is drained from the vessel, air is reintroduced and secondary aerobic processing occurs to convert the material into compost.
- **Removal.** Compost is removed from the treatment vessel available for retail sale, or agricultural use. Vessels and system are prepared for the next cycle. The DiCOM® bioconversion cycle occurs over a 21-day period and is managed by a fully automated control system that constantly monitors and adjusts vessel conditions to deliver an optimal result.

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