

OptiFacts



Optimatics

Water Systems Optimization

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Biogas Turbine Optimization

Power optimization for a wastewater treatment plant

OPTIMIZATION of operational aspects of a water utility provide immediate benefit as savings come straight off the bottom line. In this study, Optimatics works to identify where possible efficiencies could be made in the present operations of a treatment plant.

KEY POINTS

- Reduced operating costs by offsetting power costs
- Reduced greenhouse emissions
- Maximized benefits from an urban waste product

Background

Bolivar is the largest Wastewater Treatment Plant (WWTP) in Adelaide, processing on average 150ML of waste water per day and operated by United Water International.

The WWTP process involves four stages:

- Solid waste removed through sedimentation;
- Dissolved organics removed through a biological process;
- Organic sludge removed to digestion tanks for treatment; and
- Water treated for recycling in agriculture.



Organic Sludge Digester

The WWTP uses a significant amount of energy to transform wastewater into recyclable products. The process of breaking down the organic sludge produces a biogas mixture rich in methane, which is used to run a turbine generator to offset the cost of electricity to the WWTP.

The Project

It was the role of Optimatics to maximize the benefit a biogas turbine could offer to the WWTP. Optimization of sustainability was the goal, fulfilled by:

- Reducing operating costs by offsetting power costs;
- Reducing greenhouse emissions; and
- Maximising benefits from an urban waste product.

Key Outcomes

The Optimatics Genetic Algorithm was applied to a model of the digester tanks and turbines. The preliminary solutions indicate potential

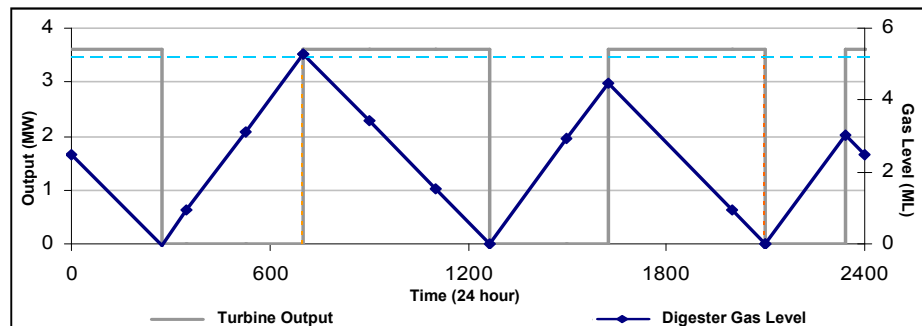
significant savings to the operator, United Water, and the WWTP owner, SA Water.

Benefits

- Greenhouse gas emissions reduced by reducing mains power consumption,
- Operating costs reduced by increasing power generation during peak tariff times; and
- Efficient management of the WWTP demonstrates social conscience.



Bolivar Wastewater Treatment Plant



Turbine Operations Schedule - Preliminary Solution