



# Energy Benchmarking in Wastewater Treatment Plants

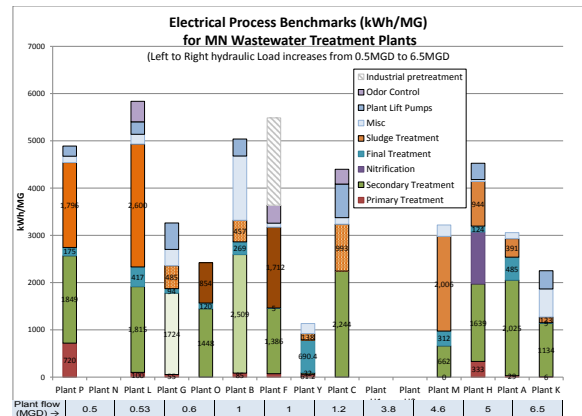
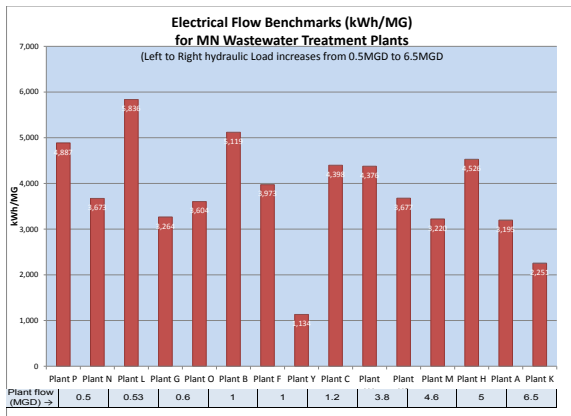
**Choose one of 3 options to identify energy conservation opportunities at your facility**



Energy is a significant part of plant operating cost. Estimates suggest energy accounts for 25–40 percent of the operating budgets of most wastewater utilities<sup>1</sup>, and energy has the greatest potential for reduction. Energy use at wastewater treatment plants varies considerably even accounting for plant size difference. Energy benchmarking is a way to normalize and compare operations. There are a number of different ways to benchmark energy performance, but using appropriate benchmarks allow you to judge whether significant opportunities to reduce energy operating expenses exist, and roughly what the dollar amount might be. Benchmarking does not tell you how easy or expensive it would be to achieve better energy performance.

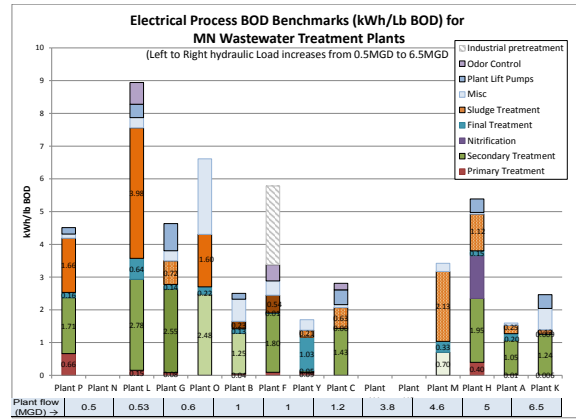
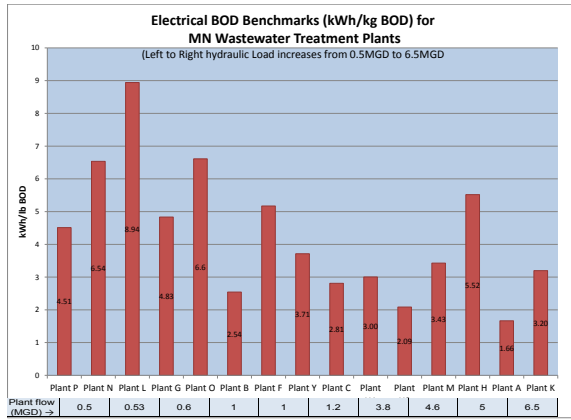
## Types of benchmarks for Wastewater Plants

### Electrical Process Assessment



The simplest benchmark method, takes the electricity consumed by a plant in a month or a year and divides it by the volume of water treated in that month or year. This method provides an overall energy use per volume treated and can be good to get a general idea of how energy/cost intensive your process may be. It is adequate for comparing smaller plants and those with largely residential loads.

# Biological Oxygen Demand Assessment



A second method, takes the electricity consumed by a plant in a month or a year and divides it by the volume of BOD treated in that month or year (BODin – BODout). This accounts for differences in organic loading between plants.

A more sophisticated tool for benchmarking wastewater facilities is available through Energy Star Portfolio Manager (ESPM). To use the Energy Star tool you will need: electrical & gas bill information, influent flow, influent and effluent BOD. The ESPM benchmark adds in factors for climate, and operations like nutrient removal and trickle filters. ESPM provides a percentile rank score compared to a large group of wastewater facilities nationally. The EnergyStar benchmark is derived from statistical correlations and the most important factors affecting energy were in order of importance:

- Influent BOD
- Plant load factor (inflow/design flow)
- Presence of trickle filtration
- Heating Degree Days
- Effluent BOD
- Cooling Degree Days
- Presence of nutrient removal
- Average Influent Flow