

# 1 Introduction

Rock-Tenn Company operates a paper mill in St. Paul, Minnesota, that processes over 1,000 tons per day of recycled fiber. It represents a significant local recycling market for solid waste management programs and a significant employer in the local economy.

To process recycled fibers into new paper products requires a large amount of energy—process steam and electricity. Historically, Rock-Tenn has received steam via a dedicated steam line with the steam produced at an Xcel Energy power plant fueled by coal. To reduce air emissions, Xcel is converting the power plant to use natural gas as the fuel and will no longer produce steam as part of their electrical generation process.

Rock-Tenn is losing their steam source and must develop a cost-effective alternative. They are evaluating various biomass sources and processes. The selected approach must be very reliable 24 hours per day, every day of the year to meet their process steam demands. One potential approach includes the use of biomass fuels produced from solid wastes such as refuse-derived fuel (RDF) or biomass fuels produced by separating wood and fiber from construction & demolition wastes (C&D).

Rock-Tenn is evaluating their options and holding preliminary discussions with various parties, including Ramsey/Washington Counties (Counties) because of the counties role in solid waste management and interest in waste processing. The Ramsey/Washington Counties Resource Recovery Project Board (Project) desired to have an “independent” analysis of the feasibility of a biomass/RDF based energy recovery facility at Rock-Tenn and authorized this study.

The scope of this analysis of a Biomass/RDF Facility at Rock-Tenn included:

- ◆ A market assessment of Rock-Tenn’s needs for steam and electricity;
- ◆ Fuel analyses for RDF from the Newport Resource Recovery Facility and a processing facility for recovering biomass fuel from C&D wastes;
- ◆ Cost estimates for:
  - ▶ A power plant at Rock-Tenn
  - ▶ RDF from the Newport Facility (serving just Rock-Tenn plus continuing RDF for the Xcel plants)
  - ▶ A C&D waste processing facility to recover biomass;
- ◆ Revenues associated with energy and materials recovery;
- ◆ Related transportation and residue disposal;

- ◆ Review of the important regulatory and permitting process; and
- ◆ A financial analysis to place the various capital and operating cost estimates into context for energy use and solid waste disposal.

The report contains ten (10) sections, including this introduction.

- ◆ Section 2 addresses Waste Stream/Fuel Source issues. Information on the Newport Facility, its historical RDF production and availability; expansion potential and solid waste quantities required to meet the RDF needs of Rock-Tenn along with Xcel; C&D waste availability; and summary information on waste stream security approaches available to the counties.
- ◆ Section 3 covers the energy market assessment of Rock-Tenn for steam demand and value plus electrical demand and value.
- ◆ Section 4 compares the seasonal fluctuation in fuel supply to the seasonal demand for energy at Rock-Tenn.
- ◆ Section 5 covers several areas related to fuel production and costs. Cost estimates are provided for operating the Newport Facility; an estimate of the purchase cost of the Newport Facility; capital and operating costs estimated to expand RDF production at the Newport Facility; and the description, capital, and operating costs for a C&D processing facility to produce biomass fuel.
- ◆ Section 6 provides a description of a potential biomass/refuse-derived fuel power plant to service Rock-Tenn.
- ◆ Sections 7 and 8 address the fuel transportation and residue disposal costs.
- ◆ Section 9 describes the permitting process that would be required for the facilities considered in this analysis. It will be important to meet the regulatory requirements and permit development procedures. This will be a lengthy and critically important process.
- ◆ Section 10 provides the financial analysis. There are numerous capital and operating cost estimates developed in the report. Implementation will be a complex process and there will be many variables to consider. The financial analysis in the report pulls together the various cost estimates. A base case and three sensitivities are developed to show the impact of changes in the approaches or assumptions for energy revenues and tipping fees.