



SHOWCASE PROJECT: SAINT-GOBAIN CORPORATION: ROXBORO GYPSUM WALLBOARD PLANT

SOLUTION OVERVIEW

CertainTeed Gypsum, a Saint-Gobain subsidiary, furthered its commitment to energy efficiency and the Better Plants Challenge by building a 500,000 square foot state-of-the-art gypsum wallboard manufacturing plant in Roxboro, North Carolina. The facility not only produces an important material in building construction, but also utilizes multiple energy efficiency innovations that contribute to a 11% reduction in both energy consumption and costs compared to conventional wallboard production plants.

The Roxboro facility was conceived during the height of the housing market boom, but just as design efforts began, the housing market suddenly collapsed and the demand for construction products—including gypsum wallboard—declined. Nevertheless, CertainTeed remained committed to the project and its potential as a showcase for energy-efficient manufacturing through the economic downturn. Despite project budget pressures and with the help of a \$300,000 grant from the One North Carolina Fund, which provides state financial assistance to business projects that stimulate economic activity, the facility had its grand opening in September 2012.

The primary raw material of the gypsum board manufactured at the Roxboro plant is synthetic gypsum, an engineered byproduct of the nearby power plant that may otherwise be landfilled. This material is made when a byproduct from the flue gas desulfurization process at the power plant is scrubbed, cleaned and filtered, and processed into synthetic gypsum and conveyed directly to the CertainTeed Gypsum plant. The beneficial use of this material helps produce a high quality, highly sustainable wallboard product that ultimately reduces environmental impacts. The proximity to the power plant—operated by Progress Energy Carolinas, a Duke Energy subsidiary—played a central role in the decision to locate the CertainTeed wallboard plant in the community because of the material's high purity and ability to reduce carbon emissions by transporting the raw material a short distance by conveyor.

Today, the Roxboro plant produces the complete offering of 1/2" and 5/8" gypsum wallboard products including CertainTeed®, Easi-Lite®, and M2Tech® brands in regular, fire-rated Type X and Type C. Gypsum wallboard, commonly known as drywall, is a key component in residential and commercial interior construction. CertainTeed Gypsum's Roxboro plant offers a highly sustainable portfolio of products with up to 99% total recycled content, moisture and mold resistance, fire resistance, and lighter weight for improved ergonomics during installation and reduced carbon footprint from outbound transportation. Saint-Gobain is the world's largest gypsum board manufacturer. With plants across the United States and Canada, the company can provide local gypsum materials for homes, schools, hospitals, offices, and retail buildings.

SECTOR TYPE

Industrial

LOCATION

Roxboro, North Carolina

PROJECT SIZE

500,000 Square Feet

FINANCIAL OVERVIEW

Project Cost > \$100 Million

SOLUTIONS

High performance was at the heart of the Roxboro gypsum wallboard plant-design from conception to construction. A host of smart design features improved the energy efficiency of the plant by 11%, including multiple heat recovery systems and a material recycling process. High-efficiency lighting, water heaters, and HVAC systems were also installed throughout the facility, along with direct contact calciners used to thermally decompose gypsum and reduce energy waste in the manufacturing process.

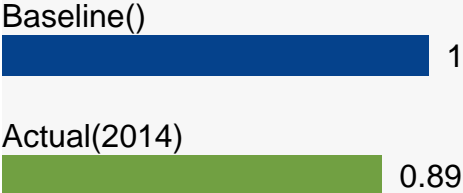
The CertainTeed plant was designed and built with industry-leading manufacturing technology, including high efficiency equipment that reduces energy usage. Gypsum drywall production is a highly energy-intensive process. Much of this energy is consumed in the calcination plant and in the drying of the wallboard. In building the Roxboro facility, Saint-Gobain employed heat recovery in every major product process step through the use of heat exchangers and the direct reuse of exhaust streams. Specific use of board dryer heat recovery improved efficiency by 15% over conventional processes.

In addition, unlike calciners that vent process gas, direct contact calciners were used to contain gas and reuse the latent heat in a closed loop system, leading to improved efficiency. Additional features, including a closed loop system to reduce process water usage and the reuse of in-plant wallboard scrap back into the manufacturing process, make the Roxboro plant among the most sustainable wallboard manufacturing sites in the United States.

OTHER BENEFITS

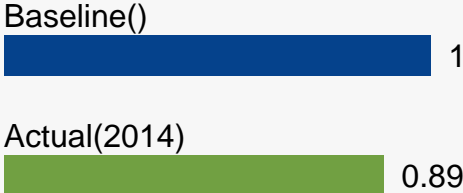
The location of the Roxboro site, specifically its proximity to the power plant, was chosen to greatly reduce the environmental impact typically associated with the long-distance transportation of raw materials. Additionally, the facility received Saint-Gobain's prestigious international CARE:4 (Company Actions for the Reduction of Energy by 4) award. Saint-Gobain instituted the award program to reduce carbon dioxide emissions of company owned office buildings by a factor of four by 2040.

Annual Energy Use (Source EUI)



Energy Savings
11%

Annual Energy Cost



Cost Savings
11%



Ribbon cutting at Roxboro plant