



Maryland Green Registry MEMBER

The Maryland Green Registry promotes and recognizes sustainable practices at organizations of all types and sizes. Members agree to share at least five environmental practices and one measurable result while striving to continually improve their environmental performance.

Norfolk Southern Corporation



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Railroad Company
Member since October 2016

Management and Leadership



Environmentally Preferable Products and Services

Norfolk Southern is helping communities enhance air quality with Eco locomotives, a new class of low-emission yard locomotives. Branded "Eco" for their operating efficiencies in reducing emissions and fuel use, the locomotives were funded in part by federal Congestion Mitigation and Air Quality Improvement Program grants. These grants are available to projects that help states and localities reduce transportation-related emissions, improve air quality, and comply with federal Clean Air Act attainment standards.



Environmental Restoration or Community Environmental Projects

In 2015, Norfolk Southern completed a five-year community partnership to reforest 10,000 acres in the Mississippi Delta, the flagship project of the company's Trees and Trains initiative to mitigate carbon emissions the natural way. NS partnered with GreenTrees, the nation's leading reforestation program, committing \$5.6 million to plant more than 6 million trees.

The Trees and Trains project is generating income for about 50 landowners who agreed to plant cottonwoods and native hardwoods on former woodlands that were converted years ago to farm fields but became marginally productive and prone to flooding. Over 15 years, the trees planted through Trees and Trains will generate more than 1.1 million metric tons of carbon credits that NS agreed to purchase through the partnership. NS can hold the credits to offset its business-related carbon emissions or sell them to recoup its investment.

Participating landowners receive payments through NS' initial investment in the project.

The project, which supports a region long served by NS, is an innovative way to invest in conservation, resulting in positive environmental, economic, and social impacts for the railroad and its stakeholders.

Waste

Recycling

In 2015, Norfolk Southern recycled 100 percent of used oil collected at 26 locomotive and rail car shops across the network. The company's strategic sourcing group initiated this recycling program in 2013 as part of a life cycle sustainability initiative to control spending, enhance operating efficiencies, and improve stewardship of resources.

The program's goal is to reuse the oil to heat shop facilities to reduce utility costs or sell it to third-party vendors for recycling and reuse. A third-party vendor collected 1.14 million gallons of used oil from NS in 2015. The vendor resells the oil for use in heating, manufacturing asphalt, or producing lube oil products.

1.44 million gallons of used oil and oily water were recycled in 2015. This represents 86 percent of used oil generated by NS business operations. The remaining 14 percent includes oil recovered from track equipment in the field by NS rail gangs. NS reuses, recycles, or properly disposes of used equipment oils in accordance with environmental laws and regulations.

Energy

Energy Efficiency

Norfolk Southern's energy services group in 2015 continued a long-range plan to improve energy efficiency in railroad facilities. The effort aims to cut operating costs, decrease electricity use, and reduce environmental impacts associated with carbon emissions.

Lighting efficiency: In 2015, the group oversaw lighting and HVAC replacements that are expected to generate annual energy and maintenance savings of more than \$2.1 million. The lighting projects equipped 31 facilities across the system with replacement bulbs and fixtures that last longer, use less energy, and emit a spectrum of light that enhances safety and security of night

operations. The projects included seven NS intermodal facilities and yards in Chicago; its Harrisburg, Pa., intermodal facility; and its Shelbyville, Ky., auto mixing center.

2015 Lighting Projects:

9,692 fixtures replaced at 31 railroad facilities

\$4.9 million investment, 2.6 years average payback

13.6 million Kilowatt-hour electricity reduction

\$2 million annual energy and maintenance savings

9,539 metric tons annual estimated CO₂ savings

By reducing the demand for power generation, the lighting projects are generating carbon savings equivalent to the energy needed to provide electricity to 1,409 homes for a year.

HVAC efficiency: The energy group's systematic approach to its heating, ventilating, and air-conditioning efficiency program looks for total building solutions to replace aging, uneconomical HVAC systems. In 2015, the group completed projects targeting natural gas conversions from fuel oil, reconfiguration of ducting, and the addition of system controls. HVAC replacement systems had an average seasonal energy efficiency rating of 18, better than the industry standard 13. In addition to operational and environmental savings, the HVAC projects enhance working conditions for yard and shop employees.

2015 HVAC Projects:

14 HVAC systems replaced at 7 railroad facilities

\$251,539 investment

\$163,224 annual operational savings

Transportation



Fleet Vehicles

Norfolk Southern continues to advance its knowledge of CNG technology as an alternative to diesel fuel to power locomotives.

In 2015, employees at NS' Juniata Locomotive Shop successfully modified a GP38-2 switcher locomotive engine to run entirely on compressed natural gas. The unit, which has not been put into service, is paired with a locomotive slug housing CNG cylinders that supply the equivalent of 1,000 gallons of diesel.

NS is interested in the potential of CNG to reduce emissions of nitrogen oxides, particulate matter, and hydrocarbons compared with diesel-powered locomotives. NS in 2015 put the prototype through third-party emissions testing and is exploring ways to enhance its performance. Using CNG locomotives in

revenue service would require federal approval, a topic of ongoing discussion among the industry and regulatory authorities.



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