

Environmental Research in the Metal and Mineral Products Industries



RTI International has provided decades of technical leadership in the development and implementation of air pollution regulations for numerous industries. We apply our knowledge of metal and mineral industrial processes to offer a broad range of environmental and economic research services.

Overview

RTI helps federal, state, and local governments as well as private organizations (1) identify cost-effective strategies for reducing air pollutant emissions and (2) implement innovative solutions for other environmental challenges from the metals and minerals sector. RTI engineers, scientists, and economists offer the full range of environmental services to facilities in the metals and minerals sector, including comprehensive environmental assessments; fugitive source pollution control evaluations; waste minimization, recycling, and pollution prevention services; energy use, audits, and efficiency opportunities; and greenhouse gas (GHG) inventory and reductions.

Areas of Expertise

Our environmental research experience and process knowledge include the following sectors:

Coke ovens (pushing, quenching, and battery stacks)

Electric arc furnace steel making

Ferroalloys

Hard and decorative chromium electroplating and chromium anodizing tanks

Integrated iron and steel

Iron and steel foundries

Metal plating and polishing

Primary aluminum

Primary copper smelting

Primary lead smelting

Secondary aluminum and aluminum processing

Secondary lead production

Steel pickling

Metal Products Sectors

Asbestos

Brick and structural clay products

Clay ceramics

Clay processing

Coal cleaning

Concrete products

Crushed stone processing

Friction products

Glass manufacturing

Hot mix asphalt preparation

Lightweight aggregate

Lime

Mineral wool and wool fiberglass

Portland cement

Ready mix concrete

Refractory products

Soda ash

Various other nonmetallic minerals industries

Project Highlights

Greenhouse Gas Reporting Program (GHGRP). RTI provides support for implementation of the GHGRP. This program collects annual GHG emissions data from stationary combustion at all types of metal and mineral processing facilities, along with GHG emissions data from zinc, lead, magnesium, soda ash, titanium dioxide, glass, aluminum, lime, cement, ferroalloy, and iron and steel material processing activities. We assisted with development of the GHGRP requirements. We review and verify the annual GHG data submissions, and we assist with preparing GHG data summaries to inform various programs.

Technical Support for Environment Agency—Abu Dhabi (EAD). RTI supports Abu Dhabi's environmental programs by reviewing environmental studies for new and existing facilities in various metals and minerals industries (including cement, hot mix asphalt, and iron and steel). We also support these programs by evaluating industrial, infrastructure, and development project compliance with government regulations and requirements. We assist with permit conditions and apply our knowledge of U.S. air regulations to draft air pollution standards for the EAD.

Multipollutant Regulatory Strategy for Portland Cement Manufacturing. RTI supported a multipollutant regulatory strategy to develop national emission standards for hazardous air pollutants (NESHAP) and new source performance standards (NSPS) for the Portland cement manufacturing industry. We collected and compiled information, developed a database, and analyzed multiple regulatory scenarios. We used statistical methods to develop national emission standards for mercury, total hydrocarbons, hydrogen chloride, and particulate matter (PM) based on the best-performing sources while allowing for natural variability in emissions. For new cement plants, we supported the development of emission standards for PM, nitrogen oxides (NO_x), and sulfur dioxide (SO₂) by identifying and evaluating the best available control technologies. We also coauthored a document evaluating alternative control techniques for NO_x emissions from preheater/precalciner cement kilns. We analyzed the economic impacts of the proposed and final rules—including employment, potential closures, changes in product cost, and imports and exports.

Alternative Control Technology Documents for NO_x Emission from Stationary Sources—Iron and Steel Mills, Glass Manufacturing, and Cement Manufacturing. RTI developed alternative control technique documents to provide information about the control of NO_x emissions from cement kilns, glass melting furnaces, and emission sources at iron and steel mills. These documents identified emission control techniques applicable to each of these source categories and provided information on control efficiencies, costs, and energy and other environmental impacts associated with the NO_x emission control devices.

Nonmetallic Mineral Processing Plant NSPS review. RTI gathered and compiled permit conditions and emissions data from states to review and update the requirements of the nonmetallic minerals processing NSPS that regulates PM emissions from 18 different mineral processing industries.

Brick and Structural Clay Products Manufacturing. RTI gathered and analyzed emissions data and prepared documentation for development of maximum achievable control technology standards for brick and structural clay products manufacturing.

Primary and Secondary Aluminum Manufacturing. RTI assembled emissions inventory data and prepared rulemaking documentation for the residual risk and technology review of two NESHAP affecting the aluminum industry.

Baseline and Monitoring Measurement Methodologies for an Iron and Steel Production Project. RTI identified candidate projects for reducing GHG emissions from iron and steel production facilities and developed a performance standard (or baseline) for one selected project. We identified and evaluated monitoring methodologies applicable to the selected project based on their cost and accuracy. This baseline will serve as a template for future GHG offset project analyses and documentation.

More Information

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