Influencing the Future of Transportation

Currently 3.5 percent of all automobiles are electrified in some way and use lithium ion batteries. Although electric vehicles (EVs) show great promise in the battle to cut carbon emissions worldwide, consumer adoption is slower than anticipated. Nonetheless, leading EV manufacturers and some industry analysts believe that EVs’ environmental and economic advantages eventually will accelerate consumer adoption.

As one of the world’s largest and most innovative lithium suppliers, FMC is an active participant in the effort to encourage EV use. We have a leading market share in advanced technologies for EVs and remain at the forefront of innovation with breakthroughs that extend EV driving range and battery longevity.

In addition to helping power EVs, FMC’s lithium solutions are used to make synthetic rubber for more fuel-efficient “green” tires. Although these tires have better gas mileage performance, we are challenged by the significant amount of waste generated in the production process. We have made marginal improvements in this area and continue to explore waste reduction opportunities.

Measuring and Reducing Impact

Life Cycle Analysis

To gain greater awareness of the impacts caused by production of specific FMC products, we initiated a life cycle analysis (LCA) program. An LCA quantifies a specific product’s environmental impacts throughout the resource chain.

In 2013, FMC performed an LCA of SeaGel® capsule technology from our Health and Nutrition business, and clomazone, one of our key active herbicide ingredients from Agricultural Solutions. Results are being used to understand at what stages in the development and manufacturing process our products have the largest opportunity for impact.

Process Innovation

Discovering innovative ways to make our operations more environmentally friendly and cost effective are high priorities. This is especially true in mining, where FMC is deriving significant benefits through solution mining at our Green River, Wyoming, facility. Using secondary recovery process technology, we inject recycled water into the old mine workings and then pump that water back to the surface. This process substantially improves the recovery of trona ore that remained after traditional dry mining.

We continually look for ways to improve our extraction technology. FMC recently partnered with a local university to conduct tests that would increase our understanding of hydrodynamic behavior in our solution mining. Testing results are being used to maximize trona recovery, allowing us to minimize energy consumption in our soda ash production process.

Connecting R&D to Sustainability Values

Our solutions, the chemistry behind them and the processes we have put in place have the potential to positively influence major global challenges. By aligning product and process R&D with sustainability, moving toward deeper cooperation with customers and measuring progress on our research goals, we expect innovation to continue shaping solutions for the future.
In 2013, FMC’s water intensity increased 5 percent. The increase was driven by drought conditions at our Green River site which necessitated increased water intake to maintain the proper water level in its containment lake.

Greenhouse Gas Emissions

Our natural soda ash mining and processing operation in Green River consumes the largest share of FMC’s energy usage and generates the most greenhouse gas emissions (GHG). Dur GHG emissions include both those occurring from fuel use, as well as process emissions – naturally occurring emissions released during the mining and processing of natural soda ash. FMC’s 2013 GHG emission intensity decreased 3 percent due to lower process emissions at this facility.

We will conduct an EMCOE audit in 2014 to find new ways to decrease Green River’s energy and greenhouse gas emissions. However, it is important to note that production of natural soda ash from our Wyoming site already uses 40 percent less energy and produces about 40 percent less GHG than production of the alternative synthetic soda ash.

Water Management

In 2013, FMC’s water intensity increased 5 percent versus 2012. The Green River site is our largest consumer of water, where in addition to use in solution mining, water sources are used to remove naturally occurring impurities that enter our process with the trona ore. We collect this process water in a containment lake, allowing us to recover any remaining soda ash value. Process water from the containment lake is also used as an extremely energy-efficient source of cooling capacity versus energy-intensive mechanical chillers. However, the lake depends on natural precipitation for level maintenance. With continued drought conditions in the Western United States, the containment lake reached critically low levels in 2013 and additional water intake was necessary to maintain the appropriate lake level. This maintenance was the primary driver for FMC’s increased water intensity in 2013.

It is well recognized that major global shifts involving population growth and climate change are creating substantial concerns about water availability. To understand FMC’s exposure and to determine how to mitigate potential risks, we conducted a Water Risk Assessment (WRA) that cross-referenced water use details from our manufacturing sites with the World Resources Institute’s “Aqueduct” water mapping tool. Based on those results, we analyzed the potential water source risk for our manufacturing sites, our key suppliers.

The WRA identified nine FMC facilities in water stressed areas with significant water dependency but only two – Green River, Wyoming, and Minera del Altiplano, Argentina – indicated future potential water instability. We are confident that we have adequate water availability in the near term. As a result of these findings we are working to better understand each situation and develop conservancy and contingency strategies to ensure long-term availability.

In addition, to ensure that potential water risks are considered in all future investment decisions, the WRA is being integrated into FMC’s long-term corporate planning. It will factor into decisions involving mergers and acquisitions and the Capital Deployment Process.

Waste Reduction

FMC’s 2013 waste intensity increased by 11 percent versus 2012. This was driven primarily by increased waste shipments from our Bessemer City, North Carolina, location in 2013 versus 2012. One of the site’s large volume by-products could not be distributed in a timely manner due to demand fluctuations necessitating disposal. Other significant factors included increased focus on elimination of out-of-service equipment and materials across all of our sites and, in some cases, tighter cross-contamination standards leading to increased rinsing of equipment and resulting wastewater.

Our decision to include Agricultural Solutions active ingredients contract manufacturers in our results also has a significant impact on waste. FMC employees work closely with these partners to continuously improve process yields and reduce waste intensity. In 2013, several significant reduction projects were implemented, including:

- Modification of process routes for several key active ingredients to improve overall yields and reduce waste loading.