



2017 STATE OF THE INDUSTRY

The Fertilizer Industry



2017 STATE OF THE INDUSTRY REPORT

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The future of the fertilizer industry depends on our ability to provide goods and services that help growers feed the world, while keeping the industry's colleagues, consumers, and communities safe. Each year, more member companies voluntarily contribute data and demonstrate their dedication to continuous improvement and sustainable growth.

In 2018, The Fertilizer Institute (TFI) will be working to deliver on a practical and intentional theme, "Out Front." I am proud that this - our third annual State of The Industry report - moves our industry forward. The report represents companies across the entire fertilizer value chain and accounts for 98 percent of total nitrogen and 95 percent of total phosphate production capacity in the United States.

Highlights of this report include:

- Across the fertilizer sector, the overall lost time incident rate has dropped from 1.1 to 0.8 cases per 100 full time equivalent employees between 2013 and 2016. As a whole, the fertilizer industry is two times as safe as our industry peers.
- Reporting companies collectively captured 8 million metric tons of CO₂. This is the equivalent of taking nearly two million cars off the road for an entire year.
- Reporting companies reclaimed approximately about 1.4 billion gallons of water, which could fill more than 2,100 Olympic-sized swimming pools.

- Reporting companies shipped almost 20 million tons of fertilizer by rail. It would take more than 800,000 trucks to move this same amount of fertilizer.
- TFI's 4R Fund and other partner resources invested nearly \$1 million in research aimed at strengthening fertilizer best management practices to reduce nutrient loss.

We track our industry's performance and provide stakeholders - including the public - the data that we collect to identify successes, target areas for improvement, and ensure our industry stays "On Front." Transparency is not a one-way street, and I invite you to contact us at sustainability@tfi.org with your questions or comments.

Sincerely,



Chris Jahn
President, TFI



A LETTER FROM THE PRESIDENT

SUSTAINABLE DEVELOPMENT GOALS

THE FERTILIZER INDUSTRY'S CONTRIBUTIONS TO THE UNITED NATIONS SUSTAINABLE DEVELOPMENT GOALS

In 2015, the United Nations adopted a set of goals aimed at ending poverty and promoting prosperity while protecting the planet. These 17 Sustainable Development Goals (SDGs) involve the work of governments, businesses and citizens to improve the lives of people

everywhere. The Fertilizer Institute and our members are working to achieve continuous improvement on environmental, economic, and social outcomes, and our industry is actively contributing to the following SDGs that align most closely to the sector.

Look for these icons at the beginning of each chapter to see which of the SDGs most closely link to the content in that chapter.



Clean, abundant natural gas powers many of the industries production operations, and waste heat recapture technologies make facilities more efficient.



The fertilizer industry supplies the nutrients needed to grow the crops that feed the world.



Capital investments to advance innovation and improve infrastructure have positive impacts on safety, environmental, and energy performance.



Sustainable water management practices and land reclamation are in place during fertilizer production. On the farm, fertilizer best management practice awareness, research, and implementation is a priority to in reducing environmental loss.



Practices are in place to capture and reuse CO₂ emitted during fertilizer production, and optimized fertilizer use to reduce nitrogen emissions is pursued on the farm.

Fertilizer is a key ingredient in feeding a growing global population.

Half of all food grown around the world today is made possible through the use of fertilizer. As demand continues to grow, the role of fertilizer in increasing production efficiency will only become more important.

Plants need 17 elements to reach their full nutritional potential. Three of these elements – carbon, hydrogen, and oxygen – are obtained through the air and water. The remaining 14 have to come from the soil through the

plant’s roots. These elements are what make up our modern day fertilizers. **They’re divided into three categories: macronutrients, secondary nutrients, and micronutrients.**

ABOUT THE

FERTILIZER INDUSTRY



Nitrogen, phosphorus, and potassium are macronutrients, and all must be present in soil in the right form and at the right rate, time, and place to grow healthy crops. **Macronutrients** make up the bulk of all fertilizer produced, and these three primary nutrients are necessary for plant growth.

Nitrogen is essential in the formation of vital proteins not just in the plants we eat, but all living things. The earth’s atmosphere is about 78 percent nitrogen by volume; however, most plants can’t get their nitrogen directly from the air and require nitrogen fertilizer. Nitrogen fertilizer is made by capturing nitrogen from the air and combining it with hydrogen derived from natural gas. This production method is called the Haber-Bosch process.

Phosphorus is involved in many processes critical to plant development. Key among them is photosynthesis, the process that plants use when converting sunlight to energy. The phosphorus in most commercial fertilizers comes from phosphate rock found in fossil remains originally laid down beneath ancient sea beds. Fertilizer manufacturers mine deposits of phosphate rock, which are converted into phosphate fertilizers.

Potassium, also known as potash, is essential for carbohydrate and starch synthesis, and it also helps plants resist wilting. Up to 98 percent of potassium in the soil is unavailable to plants in its existing form, making potash fertilizer essential for crop production. Potassium, like nitrogen, also helps plants produce protein as they grow. Like phosphate, potassium is mined from mineral deposits.

Secondary nutrients, while still essential for plant growth, are typically needed in smaller quantities than macronutrients.

Calcium is used to help reduce soil acidity and aids nutrient absorption within the plant itself. It also improves a plant’s ability to resist disease.

Magnesium is a component of chlorophyll so, like phosphorus, is necessary for photosynthesis. It’s also important to help the plant metabolize that very same phosphorus molecule.

Sulfur is another element that is already in the soil, but typically in amounts that are insufficient for many crops. Plants use sulfur to synthesize important amino acids, and it’s useful to boost winter hardiness.

Micronutrients may sound less important, but they’re not. The ‘micro’ means plants only require trace amounts, but they still can’t do without them. Together, they support all aspects of plant growth including structural integrity, vitamin production, and increasing yields.

	Boron		Manganese
	Chlorine		Molybdenum
	Copper		Nickel
	Iron		Zinc

The fertilizer industry is made up of companies who represent the entire supply chain from production to distribution to retail, all working together to deliver fertilizer to farmers in a safe, timely, and sustainable manner. The United States is the world’s third largest producer of nitrogen fertilizers and the second largest producer of phosphate.¹

 The U.S. fertilizer industry generates more than \$155 billion in economic benefit annually and provides more than 89,000 direct jobs and 406,000 indirect jobs for a total of more than 495,000 U.S. jobs.

This report tracks industry performance on environmental, economic, and social indicators across the entire value chain. Now in its third year, the State of the Industry report seeks to measure and evaluate industry efforts to identify successes and target areas for improvement.

This year, 33 companies participated in this report. Fourteen of these companies manufacture fertilizer and account for 98 percent of total nitrogen and 95 percent of total phosphate production capacity in the United States. This report gathers data across the entire value chain; 19 participating companies are retailers, wholesalers, and distribution companies.

AdvanSix Inc.	Harsco Metals and Minerals	The Andersons Inc.
Agrium (including Crop Production Services)	International Raw Materials	The McGregor Company
Apache Nitrogen Products Inc.	J.R. Simplot Company	The Mosaic Company
Bio Huma Netics, Inc.	K&S North America	TradeMark Nitrogen
CALAMCO	Koch Ag and Energy Solutions	Trammo Inc.
CF Industries	LSB Industries	Twin State, Inc.
CHS	MFA Incorporated	United Suppliers
Coffeyville Resources Nitrogen Fertilizers	Morral Companies	Wilbur-Ellis
Compass Minerals	OCI Fertilizers USA	Willard Agri-Service
Dakota Gasification	PotashCorp	WinField Solutions
GROWMARK	SQM North America	Yara North America

IF YOU ONLY READ
ONE PAGE OF THIS
REPORT, **MAKE SURE**
TO READ THIS ONE

Working for Solutions on the Farm

Commercial fertilizers supply half of the nutrients necessary to grow the crops that feed the world. However, using nutrients from either organic or commercial sources comes with risks to the environment, particularly nitrogen and phosphorus fertilizers. Through 4R Nutrient Stewardship, the fertilizer industry is working to achieve solutions.

))) Selecting fertilizer best management practices (BMPs) based on the right nutrient source, at the right rate, the right time, and in the right place is the first step to reducing nutrient loss.

When they are used in combination with other conservation practices, the 4Rs reduce nutrient loss to the environment and increase the return on a farmer's fertilizer investment.

FERTILIZER

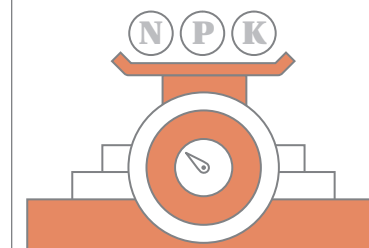
ON THE FARM



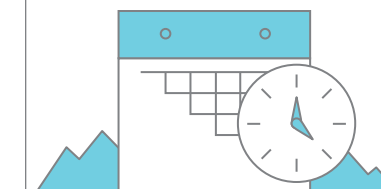
RIGHT
SOURCE



RIGHT
RATE



RIGHT
TIME



RIGHT
PLACE



SUCCESS THROUGH PARTNERSHIPS

In 2016, TFI and The Nature Conservancy (TNC) entered into a memorandum of understanding to enhance existing collaboration on 4R Nutrient Stewardship. Through this agreement, TFI and TNC are seeking opportunities to increase farmer adoption of BMPs by leveraging research and stakeholder outreach to increase understanding of 4R practice impacts.

TFI and participating member companies partner with government and non-governmental organizations to advance 4R implementation on the farm. Partnerships allow TFI to leverage and extend resources, amplify outreach for implementation, and advance research on innovative products and practices.

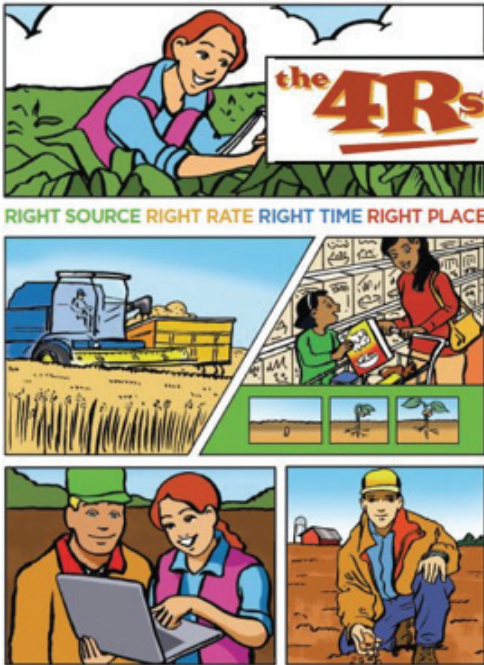
4R Research Fund	Illinois Nutrient Research Education Council
Ag in the Classroom	International Fertilizer Association
AgQuest	International Joint Commission
Agricultural Retailers Association	International Plant Nutrition Institute
American Society of Agronomy	Iowa Nutrient Research Education Council
Auburn University	Iowa State University
Conservation Technology Information Center	Mississippi State University
Ducks Unlimited	New Era Ag
Field to Market	North Carolina State University
Future Farmers of America (FFA)	North Dakota State University
Hubbard Ag Science	Nutrients for Life Foundation

Oregon State University	University of Florida
Purdue University	University of Illinois
Soil Health Institute	University of Maryland
Soil Science Society of America	University of Vermont
State Agribusiness Associations	University of Wisconsin-Madison
State Farm Bureaus	USDA Natural Resources Conservation Service
The Nature Conservancy	Utah St. University
UN Sustainable Development Solutions Network	Virginia Tech
University of Arkansas	Western Lake Erie Basin Nutrient Stewardship Council
University of California – Davis	Westwind Ag Research
University of California – Riverside	

NGO University

INDUSTRY SPOTLIGHT: NUTRIENTS FOR LIFE FOUNDATION

The Nutrients for Life Foundation (NFLF) works with educators in classrooms in all 50 states teaching the key concepts of sustainability and the importance of 4R Nutrient Stewardship. To complement its collection of sustainability resources for middle and high school students, NFLF released its 4R Reader in the spring of 2016. The activity booklet introduces the 4Rs in a way that relates to the students' lives: health and eating. Through colorful comic strips and a class experiment, students learn more about the 4Rs in the context of soil nutrition. In its first year, NFLF distributed 2,517 4R readers and impacted 45,884 students with the 4R Nutrient Stewardship message. Combined with its other sustainability resources, the key message specific to nutrient stewardship reached 55,519 students. Since its inception in 2004, more than 30 million people have been impacted by using NFLF's educational resources.



4R RESEARCH FUND

In 2013, the fertilizer industry created the 4R Research Fund to help establish sustainability indicators and environmental impact data to expand 4R nutrient stewardship implementation across North America. The fund provides needed resource support with a focus on measuring and documenting the economic, social, and environmental impacts of 4R nutrient stewardship. The industry is committed to providing growers the tools they need to remain profitable while protecting the environment.

In 2016, the U.S. fertilizer industry contributed \$996,500 to the research fund.

Efforts in 2016 included a research stakeholder workshop to assess proposed project areas, which led to development of a \$2 million, multi-state effort that was ultimately jointly funded in 2017 by the Foundation for Food and Agronomic Research and the 4R Research Fund.



COLLABORATING FOR A 4R FUTURE

IN THE WESTERN LAKE ERIE BASIN

4R Nutrient Stewardship can help reduce algal blooms linked to fertilizer loss in the Western Lake Erie Basin. This is the goal of TFI's partnerships with university and federal agency researchers, local agribusiness, conservation and agricultural organizations, and local farmers.

- Research efforts supported by a \$1.2 million grant from the industry's 4R Research Fund and other partner resources continued in 2016. The focus is aimed at evaluating fertilizer BMPs to reduce nutrient loss to the lake.
- In 2016, 38 4R Certified agronomic service providers were audited to verify 4R practice recommendations to farmers. The certified organizations provide 4R practice recommendations on 1,875,000 acres in the Western Lake Erie Basin watershed.
- Farmer and retailer 4R Advocates in the area help share information with their colleagues about practice implementation on farms in the Western Lake Erie Basin.



BECOME A 4R ADVOCATE

The fertilizer industry annually honors five pairs of crop advisors and growers as 4R Advocates, acknowledging their efforts to implement 4R practices on the farm.



INDUSTRY SPOTLIGHT: 4R ADVOCATE, THE ANDERSONS

Selling fertilizer and providing recommendations in the Western Lake Erie Basin (WLEB) means managing nutrient losses from farm fields to reduce the potential for algal blooms in the lake. In 2015, The Andersons' retail location in Fremont, Ohio, was one of the first retailers to receive recognition as a 4R Certified Agronomic Service Provider. In 2016, The Andersons' Fremont-based crop advisor John Fritz and his farmer customers Lowell and David Myerholtz were named 4R Advocates for their work in implementing 4R practices on the farm. "The Andersons work closely with our customers to encourage them to use best management practices in their farming operations," said Fritz.

Science-based 4R best management practices that optimize nutrient use efficiency and reduce the impact of fertilizer in the WLEB, can create economic savings on the farm. Practices include strip till farming to place phosphorus and potassium in the soil and prevent nutrient runoff, variable rate fertilizer application across the field to optimize placement and yield, side-dressing nitrogen in the spring to time application closer to crop needs, and planting cover crops to reduce erosion and nutrient loss during the non-growing season. The Myerholtz's estimate converting to strip till achieved a 20 percent savings in fuel costs, while precision nutrient application has reduced fertilizer use by 10 percent thru eliminating overlaps.



AGRONOMIC PROFESSIONALS

PUT THE 4RS TO WORK

Agronomic professionals work across the industry to spread science-based information on 4R practice implementation to their customers. Whether creating custom blends of bulk fertilizers or promoting precision agriculture techniques for soil analysis and crop mapping, agronomists are a valuable farmer resource. These individuals lead the way toward farmer adoption of the 4Rs with every fertilizer application.

Among reporting retailers, the industry employs 2.21 individuals per branch operation who provide agronomic services. Among the non-retail sector, the industry employs 2.15 individuals per organizational location who provide agronomic services.

Many industry agronomists are Certified Crop Advisers (CCAs), having met rigorous standards prescribed by the American Society of Agronomy. CCA certification provides assurance to farmer customers that their crop advisers are equipped to apply leading edge technical knowledge to fertilizer recommendations. For the reporting companies, 31 percent of the agronomic employees maintain a professional certification as either Certified Crop Advisors or Certified Professional Agronomists.

31%

31% of industry employees providing agronomic services are professionally certified as a CCA or a CPAg

2.21 AGRONOMISTS
retailer sector

2.15 AGRONOMISTS
non-retail sector

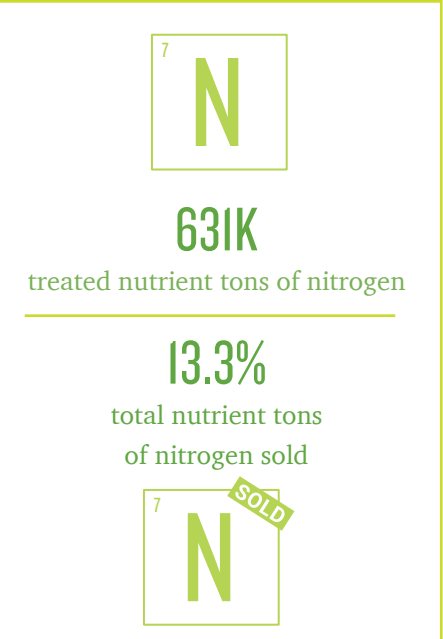
ENHANCED EFFICIENCY

FERTILIZERS

Enhanced efficiency fertilizer (EEF) products were developed to enhance plant nutrient uptake and reduce nutrient losses to the environment relative to similar fertilizers that don't use these additives. Selected and used properly, these products can increase crop productivity, offsetting their cost as a premium product.

In 2016, reporting fertilizer retailers sold more than 631,000 treated nutrient tons of nitrogen. This represents 3.3 percent of the total nutrient tons of nitrogen sold by the nine reporting companies combined.

These nine companies operate nearly 2,000 retail locations across the United States.



INDUSTRY SPOTLIGHT: MFA

Properly managed fertilizers support cropping systems that provide economic, social, and environmental benefits. On the other hand, poorly managed nutrient applications can decrease profitability and increase nutrient losses, potentially degrading water and air.

MFA is very focused on nutrient stewardship and the benefits for the company's member owners, specifically with a focus on enhanced fertilizer products. This includes nitrogen stabilization, variable rate technology recommendations and application, and uniform nutrient distribution products such as phosphorus and potassium infused with sulfur and zinc.

Nitrogen management is very important for producers to maintain yields. Nitrogen has several ways it can leave the system: volatility, denitrifying, or leaching. No matter the method in which nitrogen leaves the field, it is important to protect it and keep it in the soil where crops can use it. MFA recommends using Nitrapyrin, a nitrification inhibitor, in all anhydrous applications to protect the nitrogen from those below

ground organisms that break up nitrogen molecules and cause loss. MFA uses products with N-(n-butyl) thiophosphoric triamide (NBPT) and dicyandiamide (DCD) to help protect urea from losses above and below ground.

MFA also supports 4R Nutrient Stewardship, which prescribes the implementation of fertilizer best management practices that optimize the efficiency of fertilizer use. MFA's recommendations for the use of enhanced efficiency fertilizer products, which protect a large percentage of the nitrogen fertilizer MFA sells, is consistent with the 4Rs.

More than just fertilizer.

Consistent with its commitment to sustainability, companies in the fertilizer industry invest significantly in systems and processes that enhance worker and community safety.

PEOPLE

& COMMUNITIES



SAFE AND SECURE

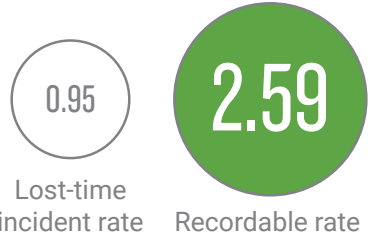
EMPLOYEES

Industry safety performance among participating TFI member companies continues to improve when compared to the 2013 State of the Industry report baseline. The fertilizer industry’s safety record continues to significantly outperform industry peers in the manufacturing and wholesale/blending sectors as reported by the U.S. Department of Labor’s, Bureau of Labor Statistics.

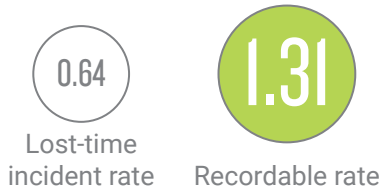
Across the fertilizer sector, the overall lost time incident rate has dropped from 1.1 to 0.8 cases per 100 full time equivalent employees between 2013 and 2016.

Employee Safety

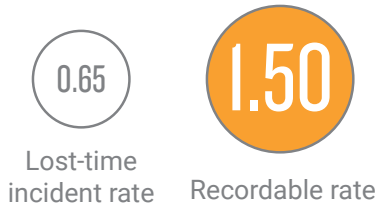
Blenders and Wholesalers Employees



Fertilizer Manufacturing Employees



Mining Employees



United States and must be kept under pressure at all times. Any sudden, accidental releases of ammonia are potentially hazardous, and Yara places a high value on ensuring the safety of employees and the local communities in which they operate.

Yara’s “Safe by Choice” platform trains and engages employees throughout the company to take an active role in creating their culture of safety. There is a disciplined, zero tolerance mindset proving safety performance and operational excellence go hand in hand.

That culture is put on display at Yara North America’s Tampa, Fla., import ammonia terminal. Ammonia moves through this terminal to service the production of phosphates and industrial applications in the area. By the end of 2016, terminal employees celebrated an impressive safety milestone of 11,875 days without a lost-time injury. That’s nearly 33 years!

That commitment extends to community safety and awareness through collaboration with local first responders and other community members. Yara employees routinely conduct community training events to ensure readiness if it is needed.

INDUSTRY SPOTLIGHT: YARA

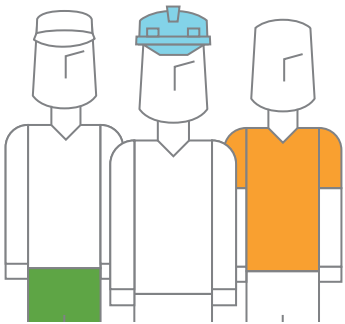
Location. Yara is the world’s largest producer of ammonia, nitrates, and NPK’s, distributing those products safely all around the globe. Ammonia is a major component of many fertilizers used in the

SAFE AND SECURE

COMMUNITIES

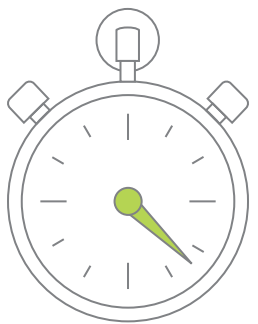
The fertilizer industry’s quest to be as safe as possible extends beyond the gates of its facilities and reaches into the communities in which it operates. Up and down the value chain, the industry invests in safety training to protect employees and surrounding communities. Training local emergency responders how to react to and mitigate accidents involving different types of fertilizers is an investment in the safety of the entire community.

External Safety



14,806

Number of people trained outside the organization



2,826

Number of hours of emergency responder training provided to community members

INDUSTRY SPOTLIGHT: ADVANSIX, INC.

“The safety of our citizens and the people who do business in our community is our first priority. The Hopewell Fire Department works closely with AdvanSix on extensive training, regular emergency drills, tours of the facilities and other activities to ensure we are ready for any kind of incident and have a swift and coordinated response. This cooperation is vital to us as we do our jobs.”

– Chief Donald Hunter, the Hopewell Fire Department, Hopewell, Virginia



RESPONSIBLEAG

EMPLOYEES

ResponsibleAg, Inc., is a non-profit organization founded by companies in the fertilizer industry to assist agribusinesses as they seek to comply with federal environmental, health, safety and security rules regarding the safe handling and storage of fertilizer products. The organization provides participating businesses a federal regulatory compliance assessment relating, recommendations for corrective action where needed, and a robust suite of resources to assist in this regard. Of the issues found during ResponsibleAg audits, it is reported that 99 percent are administrative or paperwork-related.

By the Numbers:

2,600

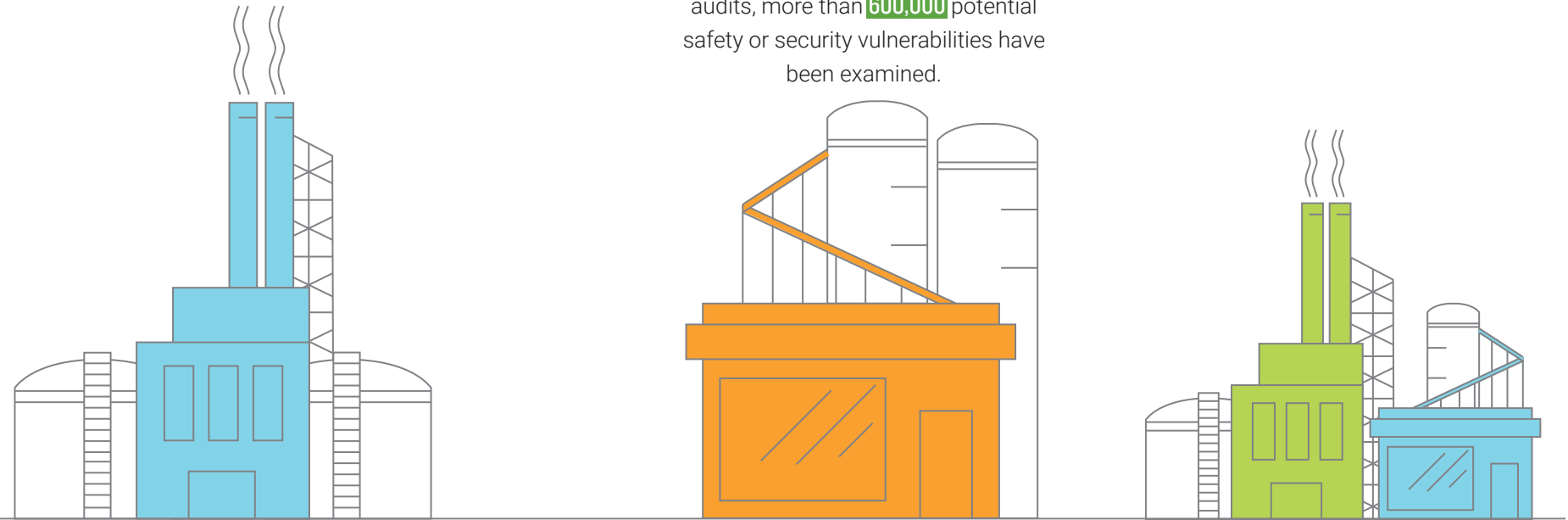
registered facilities

1,880

retail locations have been audited by ResponsibleAg. In the course of these audits, more than 600,000 potential safety or security vulnerabilities have been examined.

876

ResponsibleAg
Certified facilities



INDUSTRY SPOTLIGHT: RESPONSIBLE AG

Responsible Ag maintains an auditor training facility in Owensboro, Ky. The training program certifies that programs auditors are up to speed on federal compliance requirements and that they have experience with the safe handling and storage of fertilizer. High level personnel from the Department of Transportation, the Environmental Protection Agency, Department of Homeland Security (DHS), Occupational Safety and Health Administration, the Chemical Safety Board (CSB), and the offices of Reps. James Comer (R-Ky.) and Bret Guthrie (R-Ky.) participated in a tour of the facility. CSB Chairperson Vanessa Sutherland and DHS Infrastructure Security Compliance Division Acting Director Amy Graydon were among the attendees.



Responsible
AG

INDUSTRY SPOTLIGHT: RESPONSIBLE AG

“We always want to do the right thing and remain committed to our employees, our communities, and our environment. ResponsibleAg is a great resource and tool that provides comprehensive compliance information. It’s the most valuable resource our employees have.”

— KEVIN CHAMBERS, WILLARD AGRI-SERVICE

INVESTING IN SUSTAINABILITY

From 2014 through 2016, companies in this report invested an average of \$4.3 billion dollars annually in new facilities and in upgrades of existing infrastructure. These investments enhance safety, increase production efficiencies, reduce energy and water use, reduce greenhouse gas emissions, and strengthen the U.S. economy.

Capital investments by fertilizer retailers are equally important to industry sustainability.

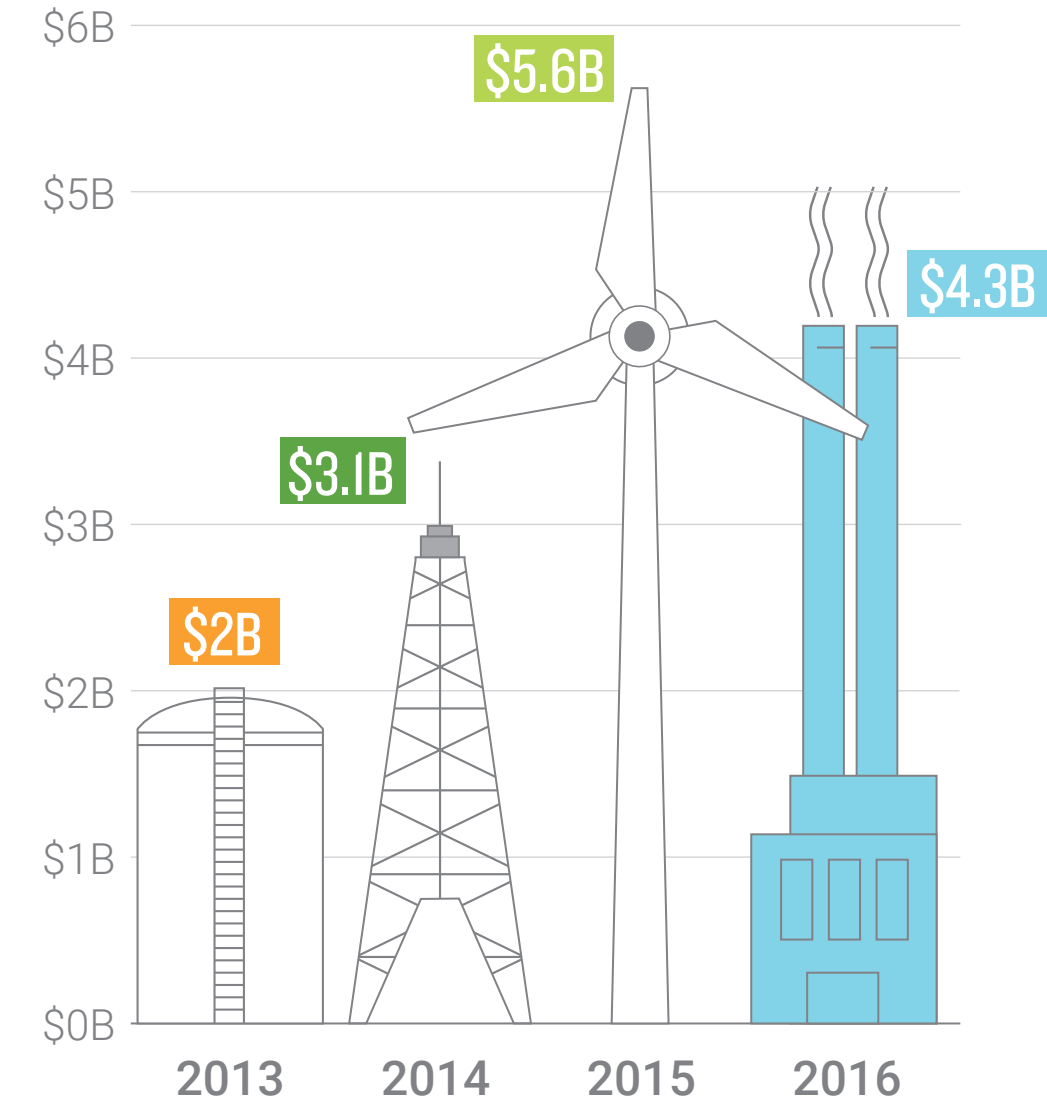
Retailers are investing in technology and tools to protect the environment by helping retailers assist farmers in applying 4R Nutrient Stewardship in nutrient management plans. High-tech farm equipment often comes with a price tag that extends well into six figures. By using the tools of precision agriculture on their customers' farms, retailers meet or exceed economic and environmental goals.

INDUSTRY SPOTLIGHT: RESPONSIBLE AG

“Making capital investments helps us ensure we are able to provide a reliable supply of products to our customers so they can in turn get resources to their farmer customers when and where they are needed.” -Vice President of Retail Business Barry Schmidt, GROWMARK, Inc.

- BARRY SCHMIDT, VICE-PRESIDENT OF RETAIL BUSINESS, GROWMARK INC.

Capital Investments (in billions)



INDUSTRY SPOTLIGHT: SIMPLOT

The J.R. Simplot Company regularly invests in operations, especially when innovative capabilities are obvious. A recent such investment includes a logistics and vehicle maintenance program that tracks, monitors, and reports on vital statistics and information about the fleet of mining equipment. Early reporting enabled an increase in load factors on haul resulting in a reduction in the number of haul truck trips, therefore reducing carbon emissions, improving road conditions, and contributing to employee safety.



INDUSTRY SPOTLIGHT: GROWMARK

Years of investment by CF Industries culminated in completed capacity expansion projects at its facilities in Donaldsonville, La., in September 2016 (now the largest nitrogen plant in the world), and Port Neal, Iowa, in December 2016.



ENVIRONMENT

& ENERGY

28

| Reduce, Reuse, and Sustain

Fertilizers come from natural ingredients, so it follows that their production requires significant use of natural resources including natural gas, water, and land. TFI's member companies reuse and reclaim the resources they use – not only does this make economic sense, it also enhances the sustainable production of fertilizer.

Fertilizer manufacturers use technologies and processes that capture greenhouse gases (GHG) and reduce emissions, achieve

zero water discharge, capture waste heat for energy production, and reclaim all mined lands.

As the total number of companies who participate in this report grows, so, too, does the quantity of reported resources used. Trends are best tracked when the presented data is given a common scale. Here data is scaled from many facilities to the amount of resources needed to produce one ton of fertilizer.



29

GREENHOUSE GAS EMISSIONS

Minimizing GHG emissions is a priority for companies in the fertilizer industry. Investment in capital improvements, including upgrades to existing production facilities and the construction of new, more efficient facilities, provides opportunities to implement state-of-the-art technologies that reduce GHG emissions.

High purity carbon dioxide (CO₂) is a byproduct of ammonia production, but it is also a necessary ingredient in the production of urea fertilizer; therefore, the industry captures CO₂ emitted during ammonia production and re-uses it during the urea production process. Excess captured CO₂ from fertilizer production

is also recycled for other industrial use, such as enhanced oil recovery and the carbonization of soft drinks.

The percentage of GHGs that were captured and not emitted into the atmosphere has increased steadily over the past four years, going from 9 percent in 2013 to 25 percent in 2016.

In 2016, participating companies reported capturing 8 million metric tons of CO₂. This is the equivalent of taking 1,713,062 cars off the road for a single year.*

TON
8 MILLION
metric tons of CO₂

1,713,062
cars a year

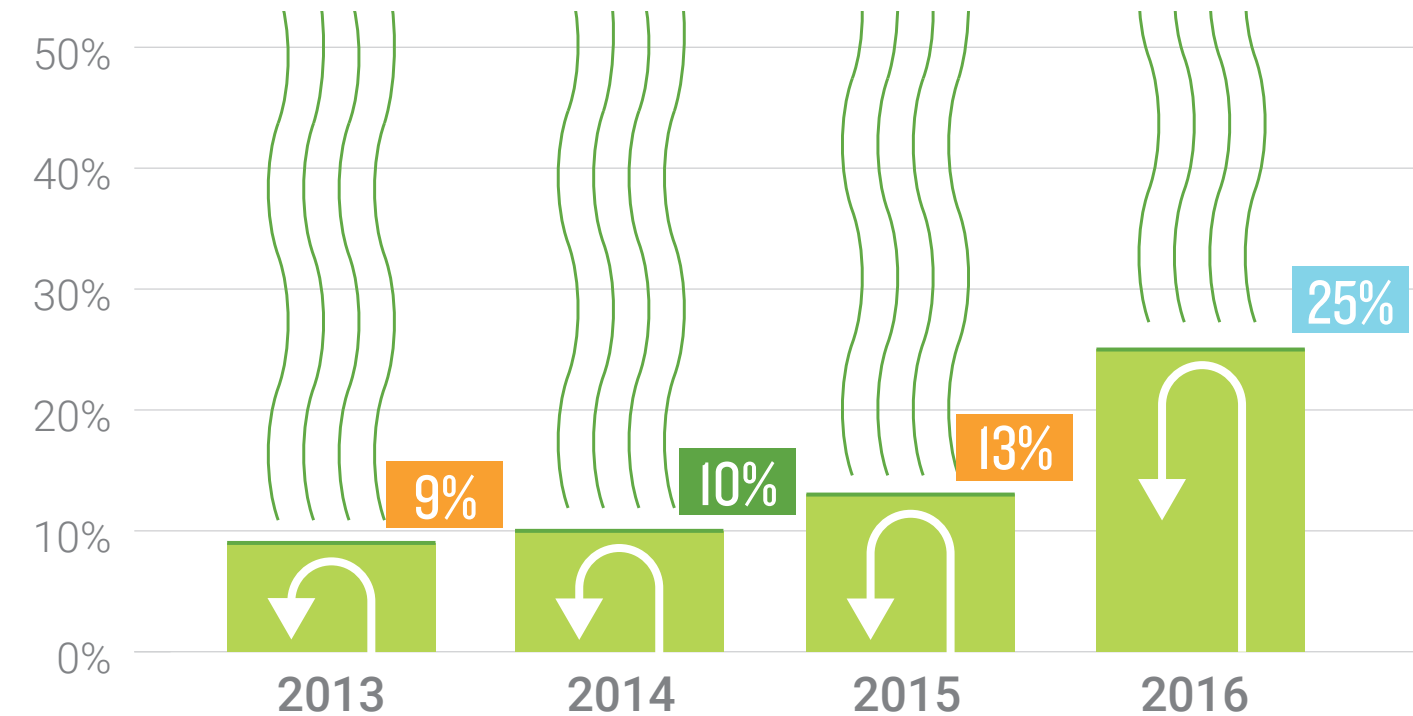


The amount of GHGs emitted per nutrient ton of fertilizer produced decreased from 1.6 metric tons of CO₂/nutrient ton in 2015 to 1.1 metric tons of CO₂/nutrient ton in 2016.

1.6
MILLION
metric tons of CO₂
total used by Nitrogen
Producers in 2016



Percentage of GHG emissions that were captured (not emitted)



INDUSTRY SPOTLIGHT: CVR ENERGY

Coffeyville Resources Nitrogen Fertilizers and Coffeyville Resources Refining & Marketing are reducing greenhouse gases and minimizing waste by recycling key byproducts of the plants' manufacturing processes.

Coffeyville Resources Nitrogen Fertilizers produces an average of 1.4 million tons of carbon dioxide (CO₂) annually at its Coffeyville, Kan., fertilizer plant. In 2013, a newly constructed compression station allowed the plant to begin capturing nearly all of the excess CO₂ and prevent it from being released to the atmosphere.

The fertilizer plant sells its excess CO₂ – more than 600,000 tons per year – to a nearby oil producer, which uses the gas to enhance its crude oil production. Coffeyville Resources Refining & Marketing then buys a portion of the producer's crude oil to help supply its refining operations.

Similar to the fertilizer plant, the refinery also creates a byproduct, petroleum coke, as a result of its

manufacturing process. Petroleum coke is traditionally used as a fuel in boilers and furnaces, similar to coal. Yet, petroleum coke is comprised of more than 90 percent carbon and has higher energy content than coal.

The refinery sells the petroleum coke to the fertilizer plant, where it is used in its state-of-the-art gasification process to make hydrogen, a key ingredient used in its fertilizer manufacturing process. The plant is the only commercial facility in North America that uses petroleum coke – as opposed to natural gas – to produce nitrogen fertilizers. The fertilizer plant also captures and sells the CO₂ made from the petroleum coke, starting the process all over again.

WATER

Sustainable water use is a key element in the industry’s conservation efforts. Water is a significant resource in the production of phosphate and potash fertilizers, and to a lesser extent for nitrogen. TFI gathered water-related data based on volume (in gallons) of water purchased and water withdrawn from wells and surface water.

Many fertilizer manufacturers have set water efficiency and zero discharge goals for their operations. In 2016, member companies reported they operated a total of 81 zero-discharge facilities. A zero-discharge facility is defined as having no direct liquid discharge to surface or ground water, other than stormwater drainage. These facilities

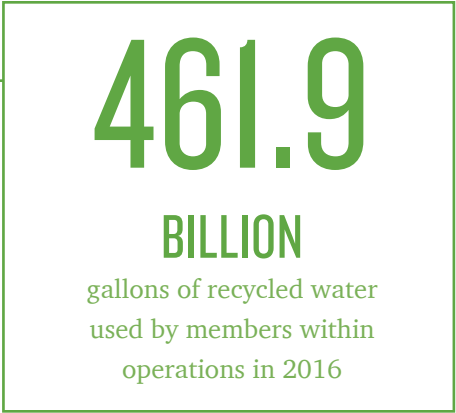
are beneficial because they avoid adding any pollution load to waterways, except for runoff from precipitation.

These goals include the use of recycled and reclaimed water. Recycled water generally refers to treated domestic wastewater that is used more than once before it passes back into the water cycle. Reclaimed water is not reused or recycled until it is put to a purpose.

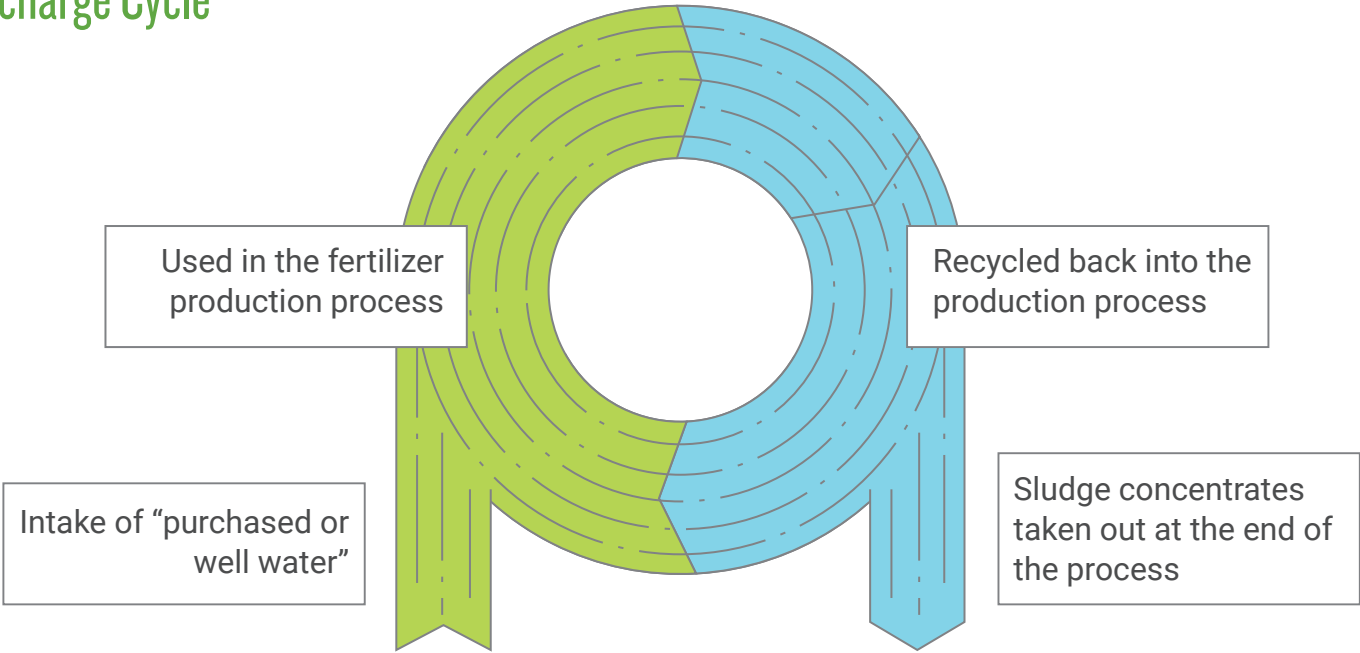
TFI members reported reclaiming about 1.4 billion gallons of water. That’s the same as one person taking one shower every day for 223,000 years.



Members also reported recycling 461.9 billion gallons of water within their operations in 2016.



Zero Discharge Cycle



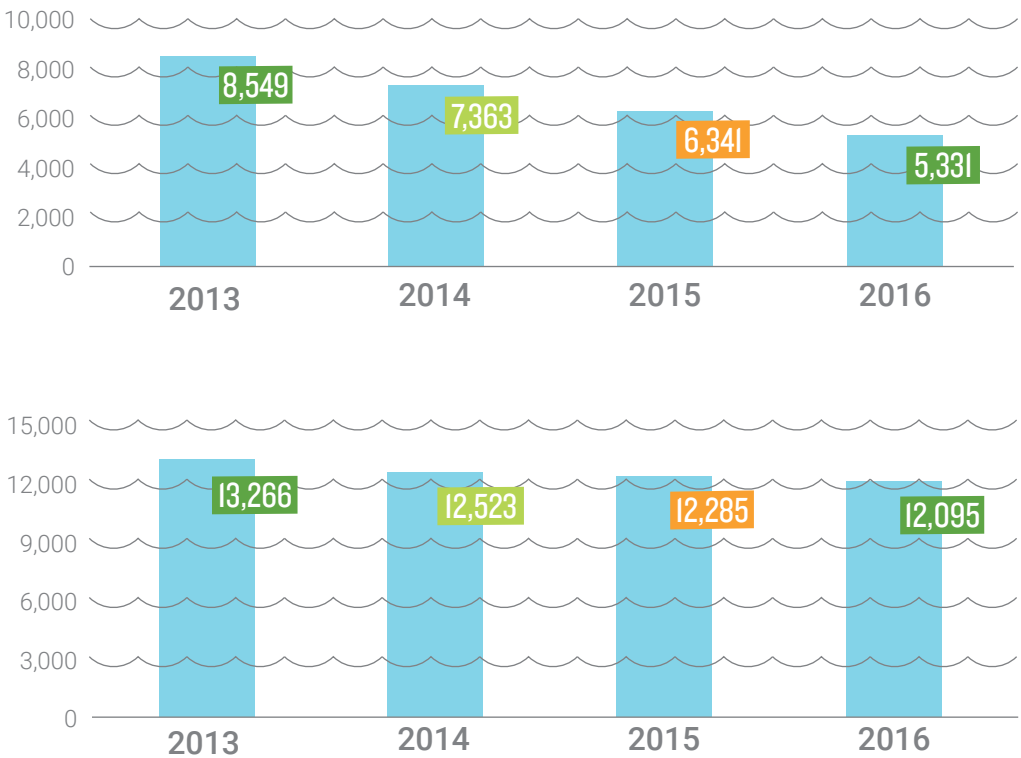
WATER

Water Usage Among Nitrogen Producers

Among nitrogen producers, water usage on a per-ton basis has decreased each year since reporting began in 2013. The amount of water used to produce one ton of nitrogen fertilizer is down 16 percent from 2015 to 2016 and down 38 percent since 2013.

Water Usage Among Phosphate and Potash Producers

Water use on a per-ton basis is declining for phosphate and potash producers, as facilities increase efficiencies and reuse water throughout the production process. The amount of water used to produce one ton of phosphate and potash fertilizer in 2016 has decreased by nearly 9 percent since 2013.



ENERGY

You cannot produce fertilizer without using energy, either in the form of natural gas or other fuels, electricity, or steam. Fertilizer manufacturers cogenerate energy or use other low impact energy sources, such as solar or steam from waste heat. Such steps contribute to sustainability goals by reducing the industry’s overall energy footprint. Energy efficiency improvements are generally undertaken when significant capital investment projects are undertaken, i.e., when facilities are upgraded or new facilities are built.

This report captures energy consumption and intensity. To help illustrate the magnitude of energy consumed and types of energy used in the industry, participating companies provided data for direct and indirect energy use. Direct energy use is either total fossil fuel consumption or a breakdown of the individual fuels used (diesel, propane, fuel oil, natural gas). Indirect energy use is reported as the electricity use generated offsite and purchased steam use.

INDUSTRY SPOTLIGHT: MOSAIC

Mosaic continuously looks for opportunities to improve the efficiency of and expand the output of its cogeneration assets. The company’s Uncle Sam production facility in Louisiana took a step toward energy independence in 2016 when it began operation of a new turbine generator that will provide additional power for its operations.

With the addition of this new turbine generator, the Uncle Sam facility has enough cogeneration capacity to reduce its consumption of fossil fuel-based imported power to less than 5 percent of total plant electricity consumption. The new turbine generator allows Mosaic to reduce its energy use and greenhouse gas emissions impact by reducing the amount of fossil-fuel based power provided by the local grid. The project is expected to result in savings of more than 65,000 gigajoules of energy and 9,000 tonnes of CO₂ annually.

Several system and operational improvements were designed into the installation to optimize steam production, usage, and condensate return.

“Not only did Mosaic’s addition of TG3 at our Uncle Sam facility make good business sense because it improves the facility’s efficiency and lowers our energy costs long-term – but it was a decision that was also good for the environment,” said Steve Davis, Mosaic’s Director of Energy Supply. “This investment and Mosaic’s broader efforts to power our operations with virtually GHG emissions-free cogenerated electricity demonstrate our ongoing commitment to environmental responsibility.”



INDUSTRY SPOTLIGHT: APACHE NITROGEN

As a cooperative, CHS exists to improve access to and delivery of the products its cooperative owners need for their retail and farming operations. As domestic nitrogen production increased and fertilizer market

dynamics changed, CHS recognized the opportunity to develop a trucking program to create new efficiencies. While the company continues to ship fertilizer via rail and barge, it intentionally moved more volume to trucks with a goal to maximize company-wide back-haul opportunities for grain or other products.

With increased focus on back-haul opportunities, more than 40 percent of fertilizer shipments now include two-way freight. This strategy allows CHS to offer a steady supply of fertilizer to cooperative customers via trucks and creates efficiencies in moving multiple products. Shipping both ways reduces overall freight costs and helps the company more competitively serve its fertilizer and grain customers versus

contracting multiple one-way loads. Because CHS also uses outside trucking services, many local trucking companies and/or individual truckers have seen a positive financial impact from the increased volume.

“With tight margins throughout the supply chain, we are pleased to have found a way to more competitively serve our retail and grower customers and owners,” said Michael Johnson, Director of Strategic Marketing. “Moving tons as efficiently as possible improves both economic and environmental aspects of fertilizer transportation.”

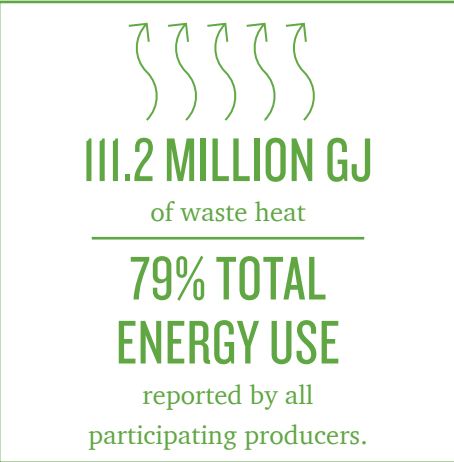


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Hero Images

ENERGY

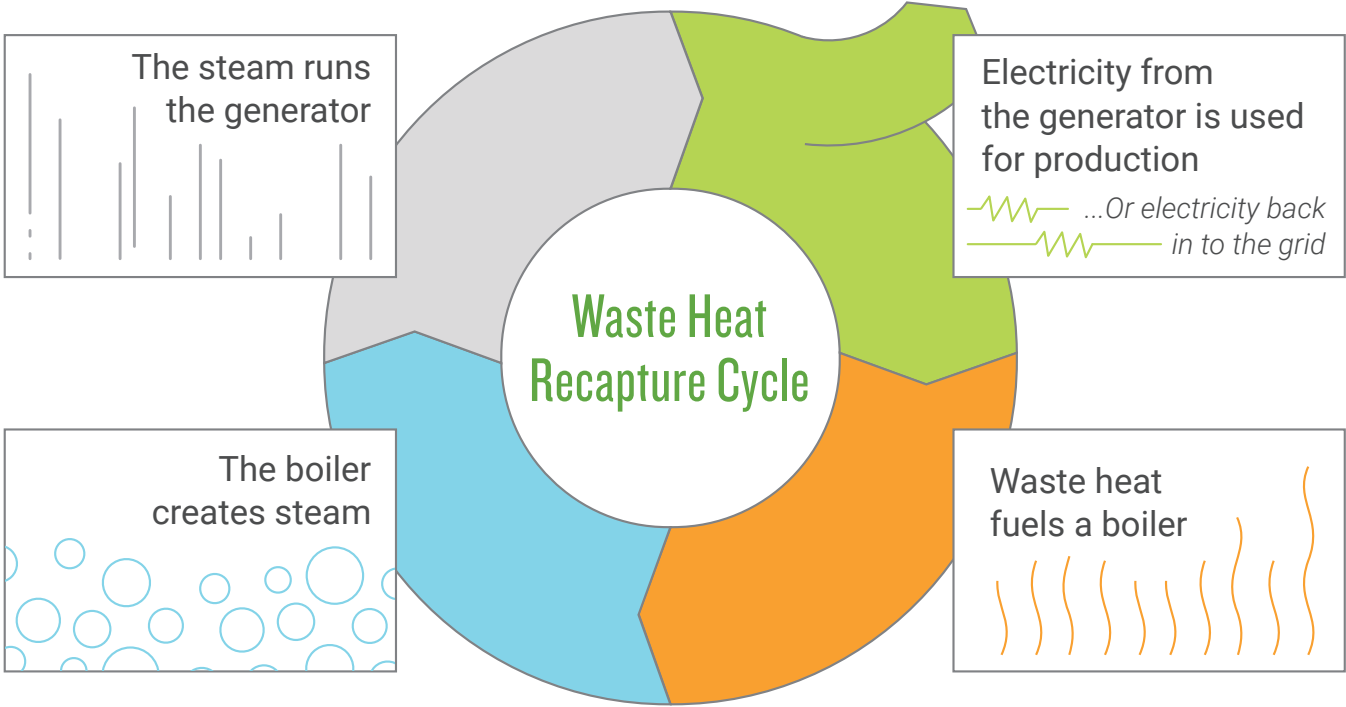
Participating companies reported using 10.0 gigajoules (GJ) of energy per ton of fertilizer produced. This is a 6 percent decrease from 2015, reflecting energy efficiency improvements.

During the fertilizer production process, heat is generated, captured, and used as thermal energy for heating and electricity generation.



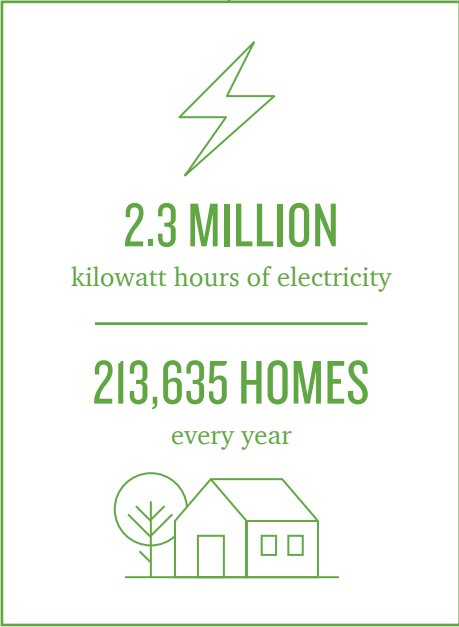
))) In 2016, companies reported capturing 111.2 million GJ of waste heat.

This is equivalent to 79 percent of the total energy use reported by all participating producers.



))) Companies reported generating 2.3billion kilowatt hours of electricity from the capture and reuse of this waste heat. This capture and reuse of waste heat is enough to power 213,635 homes for a year.¹

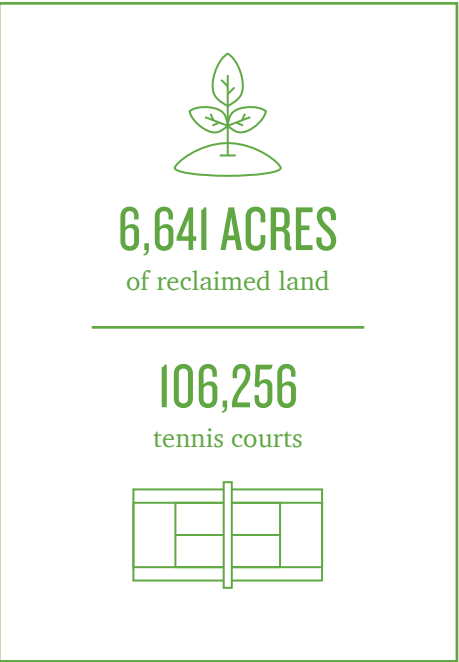
This is energy that manufacturers would otherwise have to purchase or supply by fuel combustion.



LAND RECLAMATION

Fertilizer production can have a significant physical footprint, especially in the mining sector. However, every surface acre mined is reclaimed, restoring such lands for productive uses for both wildlife and people. While land reclamation data is primarily focused on mine reclamation, it is applicable to any fertilizer producer who has disturbed and/or reclaimed land around their facilities.

In 2016, companies reclaimed 6,641 acres of land. Visualize 106,256 tennis courts; that's the amount of land members reported restoring to the environment.



FERTILIZER

TRANSPORTATION

| We're always moving

Fertilizer is on the move all year round. This report has discussed fertilizer production and application on the farm. But there is another necessary component: getting the fertilizer from the production facility to the retail outlet and finally to the farm.

Transportation is the key ingredient in getting fertilizer where it needs to be at the right time. The fertilizer industry distribution system is built to serve the farmer, so that the right amount of the right fertilizer product is safely delivered when the farmer needs it.

FPO:SDG

FPO:SDG

FERTILIZER TRANSPORTATION

Fertilizer production facilities operate 24-7, 365 days a year. These facilities have limited storage, and the end product must be transported to warehouses and terminals strategically located, like pieces on a chess board, throughout the nation. During the spring and fall, fertilizer inventories at warehouses and terminals are depleted as product is bought by farmers and transported to the farm. In the summer and winter, fertilizer inventories at warehouses and terminals are replenished as the industry prepares for the next spring planting or fall harvest season.

To accomplish the tall order of moving fertilizer throughout the year, the industry relies on many modes of transport, including rail, truck, waterways, and pipeline. No one mode is more important than the other. But there are some trends that stand out when we look at the data collected from the companies who participated in this report.

- When viewed by distances traveled, more than half of all fertilizer travels by rail.
- Rail and barge movements are virtually equal each quarter of the year.

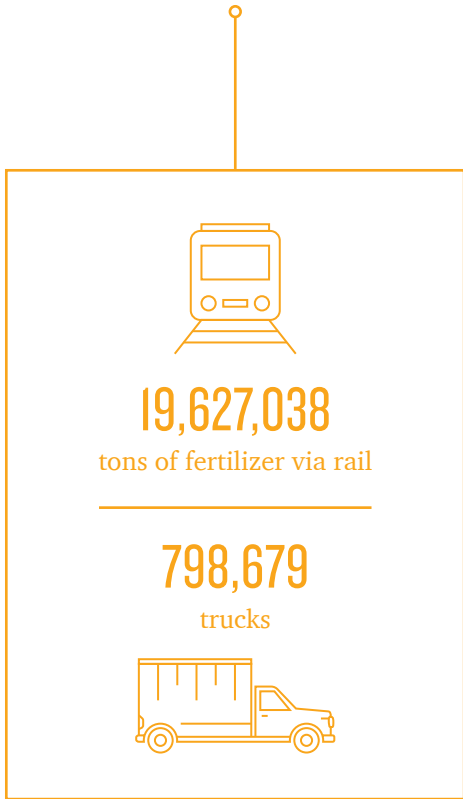
- Trucks are used multiple times throughout distribution and are key to the last legs of the journey to the farm.

Once produced, fertilizer might be transported via truck many times, including to the rail or barge loading facility, trucked between the barge and rail trips, and trucked from the barge and rail facility to the retailer, and eventually trucked to the farmer. Truck shipments increase in the spring and fall when farmers are applying fertilizer on their fields.

Rail plays a crucial role in the distribution of fertilizer across the United States. It is one of the safest and most efficient ways to transport fertilizer. The fertilizer industry continues to invest in new railcars that are more sustainable and move product safely across the country. Moving fertilizer by rail instead of truck reduces greenhouse gas emissions by 75 percent. One rail car carries the same amount of fertilizer as four truck loads.



In 2016, participating companies reported shipping 19,627,038 tons of fertilizer via rail. It would take 798,679 trucks to move this same amount of fertilizer every year.



INDUSTRY SPOTLIGHT: CHS

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“With tight margins throughout the supply chain, we are pleased to have found a way to more competitively serve our retail and grower customers and owners,” said Michael Johnson, Director of Strategic Marketing. “Moving tons as efficiently as possible improves both economic and environmental aspects of fertilizer transportation.”

INDUSTRY SPOTLIGHT: AGRIUM

After incidents in 2004 and 2005, the fertilizer industry, railroads, and regulators recognized the need to improve tank car safety. Agrium, a leading producer and retail supplier of fertilizer products, saw an opportunity to advance their leadership in the industry by incorporating design concepts from recent tank car research into a new car produced for anhydrous ammonia transportation. The company set out on an ambitious goal to put 600 new tank cars that feature industry-leading safety features into their fleet.

Working with Procor and Union Tank Car Company, Agrium arrived at an enhanced tank car design with improved puncture resistance and rollover protection. Both features play important roles in product containment in the event of an incident, such as a derailment. An industry first, stainless steel is used for the protective jacket and the head shields of the car. In comparison to conventionally used carbon steel, stainless is a tougher material that has the ability to bend more before it breaks.

Agrium seeks to be a true safety leader in the industry. Agrium fertilizer is distributed in these railcars from production plants to farming communities throughout North America. In the event of an incident, the goal of the new cars is to reduce the potential for release.

“We are proud to have been able to make a physical reality of the safety research and engineering conducted over many years and by many participants,” said Scott Thomson, P.Eng, Lease Fleet Supervisor. “Agrium, Procor, and Union Tank Car Company are advancing the tank car industry with this car.”



END NOTES

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APPENDIX

How we did it.

In an effort to be out in front of issues that impact the fertilizer industry, TFI initiated development of a State of the Industry report in 2015. This report is a mechanism for gathering data on the social, economic, and environmental impacts of members within the fertilizer industry. The aggregated data summarized in the annual reports is then used to support TFI’s various advocacy and outreach programs.

METRIC DEVELOPMENT:

FI contracted Environmental Resources Management (ERM) to facilitate development and identification of metrics to include in the report, define the metrics, and establish rules for reporting to the various metrics. ERM maintains third-party confidentiality while collecting, reviewing, and aggregating the data collected from participating companies.

PARTICIPATION:

Participation in the report is voluntary, meaning the fertilizer companies participating in this report volunteer their time to provide data to as many of the metrics as they have data available.

BOUNDARY:

The State of the Industry Report includes data provided by TFI member companies surrounding the fertilizer industry in the United States. Meaning, fertilizers manufactured in the United States and imported into the United States. This report represents the entire U.S. value chain of the fertilizer industry from fertilizer manufacturing sites, crop nutrient wholesalers, agricultural retail facilities, and the transport of fertilizer materials throughout the value chain in the United States.

REPORT DATA

PARTICIPATION

Data reporting year	2014	2015	2016
Participating companies	13	20	33
Participation as a percent of the total U.S. fertilizer nutrient production capacity	87%	93%	94%
Participating companies as a percent of the total number of U.S. fertilizer retail locations	15%	27%	33%

¹ Calculated using participants U.S. production capacity as reported for the year ending June 30, 2016 in the North American Fertilizer Capacity Report prepared by the International Fertilizer Development Center.

² Industry experts estimate a total of 6,000 manned retail facilities

AGRONOMIC PROFESSIONALS

Data reporting year	2013	2014	2015	2016
Participating companies	8	8	13	21
Participation as a percent of the total U.S. fertilizer nutrient production capacity	59%	59%	87%	88%
Participating companies as a percent of the total number of U.S. fertilizer retail locations	15%	15%	27%	33%

Agronomic Professionals at Retail Facilities				
Number of employees within the company who provide agronomic services and information as part of their regular job duties	2,568	2,573	3,438	4,414
Number of employees with Certified Crop Advisor (CCA) certification	576	578	910	1,153
Number of employees with Certified Professional Agronomist (CPAg) certification	10	10	27	28
Total number of retail locations served by the total number of agronomists identified above	875	875	1,618	1,996
Agronomists per location	2.93	2.94	2.12	2.21
Individuals Certified (CCA/CPAg) per location	0.67	0.67	0.58	0.64

Agronomic Professionals at Non-Retail Facilities				
Number of employees within the company who provide agronomic services and information as part of their regular job duties	47	48	321	405
Number of employees with Certified Crop Advisor (CCA) certification	18	18	217	265
Number of employees with Certified Professional Agronomist (CPAg) certification	3	3	37	46
Total number of non-retail locations served by the total number of agronomists identified	5	5	89	188
Agronomists per location	9.40	9.30	3.61	2.15

Individuals Certified (CCA/CPAg) per location	4.20	4.20	2.85	1.67
Retail & Non-Retail Facilities Combined				
Number of employees within the company who provide agronomic services and information as part of their regular job duties	2,615	2,621	3,759	4,819
Number of employees with Certified Crop Advisor (CCA) certification	594	596	1,127	1,418
Number of employees with Certified Professional Agronomist (CPAg) certification	13	13	64	74
Percentage of agronomic employees with professional certifications	23%	23%	32%	31%

Enhanced Efficiency Fertilizers (EEF)

Data reporting year	2013	2014	2015	2016
Participating companies			4	9
Participating companies as percent of the total number of fertilizer retail locations ¹			25%	33%
Number of treated nutrient tons of nitrogen sold (treated by an inhibitor, polymer, or other controlled release mechanism):				
Manufacturer			704,902	765,621
Retail			640,004	631,181
Retail: Total number of nutrient tons of Nitrogen sold, treated AND untreated			5,600,426	4,758,954
Percent of total nutrient tons sold treated with EEF			11%	13%

Employee Safety

Data reporting year	2013	2014	2015	2016
Participating companies	11	11	13	25
Fertilizer manufacturing participating companies			25%	33%
				13
Fertilizer wholesale and retail participating companies				12
			640,004	631,181
Participation as a percent of the total U.S. fertilizer nutrient production capacity	87%	87%	93%	94%
Recordable rate	2.10	1.96	1.76	1.98
Lost-time incident rate	1.05	1.18	1.04	0.79

Employee Safety Continued

Internal Safety - Breakdown by Industry Segment				
212391 and 212392 – Mining – Employees				
Recordable rate			0.99	1.50
Lost-time incident rate			0.40	0.65

325311 and 325312 – Fertilizer Manufacturing – Employees				
Recordable rate			1.27	1.31
Lost-time incident rate			0.64	0.64

325314 and 424910 – Blenders and Wholesalers – Employees				
Recordable rate			2.23	2.59
Lost-time incident rate			1.43	0.95

External Safety

Data reporting year	2013	2014	2015	2016
Participating companies	5	5	8	25
Participation as a percent of the total U.S. fertilizer nutrient production capacity	16%	16%	17%	94%
Number of people trained outside the organization	11,970	11,761	13,422	14,806
Number of hours of emergency responder training provided to community members	3,475	1,567	2,645	2,826

ResponsibleAg

(figures provided as a cumulative total through the end of the calendar year)	2015	2016	2017
Facilities registered	1,850	2,260	2,600
Facilities registered as percent of the total number of fertilizer retail locations	31%	38%	43%
Audits performed		1,330	1,880
Facilities certified		475	876

Capital Investment

Data reporting year	2013	2014	2015	2016
Participating companies	10	10	14	23
Participation as a percent of the total U.S. fertilizer nutrient production capacity	84%	84%	84%	88%
Fertilizer manufacturing participating companies	7	7	7	10
Fertilizer wholesale and retail participating companies	3	3	7	13
Capital investments (in billions)	1.99	3.07	5.57	4.25

GREENHOUSE GAS EMISSIONS

Data reporting year	2013	2014	2015	2016
Participating companies	8	8	10	14
Participation as a percent of the total U.S. fertilizer nutrient production capacity	64%	64%	91%	94%
Participation as a percent of the total U.S. fertilizer nitrogen nutrient production capacity	49%	49%	90%	98%
Participation as a percent of the total U.S. phosphate and potash nutrient production capacity	75%	75%	93%	95%

Greenhouse gas emissions reported to US EPA (in metric tons CO2equivalents)				
	2013	2014	2015	2016
GHGs actually emitted	23,764,734	24,104,982	26,796,119	24,391,160
GHGs reported but not emitted (i.e., captured)	2,315,274	2,639,017	4,090,710	8,105,299

	2013	2014	2015	2016
Percentage of GHG emissions that were captured (not emitted)	9%	10%	13%	25%

GHGs emitted normalized (metric ton CO2 equivalent per metric ton produced)	2013	2014	2015	2016
Nitrogen	1.20	1.24	2.27	1.24
Phosphate	0.28	0.29	0.36	0.36
Combined (nitrogen and phosphate)	0.84	0.87	1.59	1.05

WATER

Water Use for Nitrogen Production				
Data reporting year	2013	2014	2015	2016
Participating companies	6	6	7	11
Participation as a percent of the total U.S. fertilizer nitrogen nutrient production capacity			52%	53%

Surface water (million gallons)	25,296	22,308	20,621	21,696
Well water (million gallons)	2,165	2,142	2,323	4,333
Purchased water (million gallons)	3,343	3,671	3,313	4,973
Total use per ton (gallons per nutrient ton)	8,549	7,363	6,341	5,331

Water Use for Phosphate and Potash Production				
Data reporting year	2013	2014	2015	2016
Participating companies	4	4	4	4
Participation as a percent of the total U.S. phosphate and potash nutrient production capacity	95%	95%	95%	95%
Surface water (million gallons)	69,127	67,385	62,090	61,585

WATER CONTINUED

Well water (million gallons)	31,160	27,886	28,006	31,496
Purchased water (million gallons)	688	636	792	1,153
Total use per ton (gallons per nutrient ton)	13,266	12,523	12,285	12,095

Water reclaimed and recycled/reused for all nitrogen, phosphate, and potash production				
Data reporting year				2016
Participating companies				3
Reclaimed water use (million gallons)				1,373

Participating companies				5
Water recycling/reuse (million gallons)				461,870

ENERGY

Data reporting year	2013	2014	2015	2016
Participating companies	8	8	9	13
Participation as a percent of the total U.S. fertilizer nutrient production capacity	64%	64%	65%	68%
Participation as a percent of the total U.S. fertilizer nitrogen nutrient production capacity			52%	53%
Participation as a percent of the total U.S. phosphate and potash nutrient production capacity			84%	95%
Total energy use (in gigajoules)				
Direct (GJ)	103,423,400	105,328,042	112,562,213	114,106,043
Indirect (GJ)	17,510,756	18,666,439	24,274,043	27,563,219
Total (GJ)	120,934,156	123,994,481	136,836,255	141,669,263

Normalized	2013	2014	2015	2016
Direct (GJ per short nutrient ton produced)	8.36	8.33	8.73	8.03
Indirect (GJ per short nutrient ton produced)	1.42	1.48	1.88	1.94
Total (GJ per short nutrient ton produced)	9.78	9.80	10.61	9.98

			2015	2016
Natural gas as a feedstock (not for energy production) (billion GJ)			1.53	1.33
Normalized (GJ per short nutrient ton of nitrogen produced)			209	110

Waste heat captured (GJ)			107,046,657	111,230,244
Ratio of waste heat captured to total energy use (waste heat captured/ total energy use)			78%	79%

ENERGY CONTINUED

	2013	2014	2015	2016
Electricity generated onsite (cogeneration) (in billion kWh)				2.30

³ Calculated using participants U.S. production capacity as reported for the year ending June 30, 2016 in the North American Fertilizer Capacity Report prepared by the International Fertilizer Development Center.

LAND

Data reporting year	2013	2014	2015	2016
Participating companies			3	3
Participation as a percent of the total U.S. phosphate and potash nutrient production capacity			71%	71%
Acres reclaimed or released			5,581	6,641
Facilities certified		475	876	

TRANSPORTATION

Data reporting year	2015	2016	2017
Participating companies	13	21	2,600
Fertilizer manufacturing participating companies	8	11	43%
Fertilizer wholesale and retail participating companies	5	10	1,880
Participation as a percent of the total U.S. fertilizer nutrient production capacity	51%	50%	876
Participation as a percent of the total U.S. nitrogen production capacity	37%	39%	
Participation as a percent of the total U.S. phosphate and potash production capacity	71%	71%	

Annual Percentage of Mode Used (per ton, per mile)	2015	2016	
Anhydrous Ammonia			
Marine vessel	16%	0%	
Rail	44%	69%	
Motor vehicle	17%	19%	
Pipeline (ammonia only)	24%	11%	
Ammonium Nitrate			
Marine vessel		16%	
Rail		79%	
Motor vehicle		6%	

TRANSPORTATION CONTINUED

Other Nitrogen Fertilizer Materials			
Marine vessel	44%	9%	

Rail	49%	78%	
Motor vehicle	7%	12%	
Phosphatic Fertilizers			
Marine vessel	58%	23%	
Rail	37%	64%	
Motor vehicle	5%	13%	
Potassium Fertilizers			
Marine vessel	16%	21%	
Rail	79%	76%	
Motor vehicle	4%	3%	
Other NPK Fertilizers (not included in other categories)			
Marine vessel	1%	0%	
Rail	56%	62%	
Motor vehicle	43%	38%	

Average Distance per Shipment by Mode (miles)	2015	2016	
Anhydrous Ammonia			
Marine vessel	615	-	
Rail	1,209	1,176	
Motor vehicle	156	159	
Pipeline (ammonia only)	480	605	
Ammonium Nitrate			
Marine vessel		996	
Rail		1,066	
Motor vehicle		276	
Other Nitrogen Fertilizer Materials			
Marine vessel	1,074	963	
Rail	806	1,210	
Motor vehicle	121	240	

Phosphatic Fertilizers			
Marine vessel	1,095	930	
Rail	1,027	1,917	
Motor vehicle	191	389	
Potassium Fertilizers			
Marine vessel	738	1,396	
Rail	1,374	2,387	
Motor vehicle	168	185	
Other NPK Fertilizers (not included in other categories)			
Marine vessel	-	-	
Rail	1,053	1,966	
Motor vehicle	125	208	

Transportation: tons of finished material shipped	2015				2016			
(thousand tons of material transported)	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Anhydrous Ammonia								
Total short tons shipped	1,798	2,790	1,774	2,341	1,876	2,407	1,661	2,358
% fertilizer use	95%	97%	95%	97%	91%	93%	85%	91%
% non-fertilizer use	5%	3%	5%	3%	9%	7%	15%	9%
Marine vessel	222	232	187	213	136	180	159	170
Rail	369	377	413	329	323	290	296	297
Motor vehicle	598	1,582	592	1,195	708	1,191	465	1,188
Pipeline	608	599	582	604	535	573	500	480
Ammonium Nitrate								
Total short tons shipped	142	123	84	81	144	184	125	147
% fertilizer use	59%	61%	43%	54%	78%	83%	72%	72%
% non-fertilizer use	41%	39%	57%	46%	22%	17%	28%	28%
Marine vessel								
Rail	80	38	12	34	55	77	49	61
Motor vehicle	51	73	62	41	58	76	41	44
Other Nitrogen Fertilizer Materials								
Total short tons shipped	3,557	4,811	2,388	2,830	4,000	5,758	2,963	3,667
% fertilizer use	98%	98%	97%	97%	94%	96%	93%	94%

TRANSPORTATION CONTINUED

% non-fertilizer use	2%	2%	3%	3%	6%	4%	7%	6%
Marine vessel	912	1,045	680	882	945	1,027	591	772
Rail	1,454	1,402	976	1,223	1,542	1,749	1,186	1,344
Motor vehicle	1,135	2,293	724	699	1,287	2,751	983	1,314
Phosphatic Fertilizers								
Total short tons shipped	2,555	2,386	2,492	2,763	2,554	1,971	2,212	2,367
% fertilizer use	95%	94%	94%	95%	96%	94%	96%	96%
% non-fertilizer use	5%	6%	6%	5%	4%	6%	4%	4%
Marine vessel	2,240	1,333	1,744	1,927	1,882	1,338	1,495	1,754
Rail	1,636	1,658	1,711	1,697	1,771	1,581	1,818	1,633
Motor vehicle	1,245	1,298	1,516	1,310	1,044	1,018	1,068	1,349
Potassium Fertilizers								
Total short tons shipped	1,643	2,035	1,482	2,604	1,771	2,054	1,394	1,756
% fertilizer use	88%	86%	88%	94%	91%	92%	89%	92%
% non-fertilizer use	12%	10%	12%	6%	9%	8%	11%	8%
Marine vessel	374	714	450	510	597	513	405	422
Rail	1,896	1,960	1,436	1,805	1,646	1,283	999	1,436
Motor vehicle	501	688	528	717	472	698	438	588
Other NPK Fertilizers (not included in other categories)								
Total short tons shipped	352	432	316	259	282	389	165	235
% fertilizer use	91%	94%	92%	90%	100%	100%	100%	100%
% non-fertilizer use	9%	6%	8%	10%	0%	0%	0%	0%
Marine vessel	-	-	110	14	-	-	-	-
Rail	62	52	44	48	41	51	34	65
Motor vehicle	277	358	159	193	240	338	131	171

