

# Sustainable Development

An Interview with Denise C. Johnson,  
Resource Industries Group President, Caterpillar Inc.



Denise C. Johnson

**EDITORS' NOTE** Denise Johnson joined Caterpillar in 2011 and initially served as the General Manager of Specialty Products within Caterpillar's Reman & Components Division. She previously had a career with General Motors. In 2012, the Caterpillar Board of Directors named Johnson Vice President of the Diversified Products Division. In 2013, Johnson was named Vice President of Integrated Manufacturing Operations, and in 2014, she was named Vice President of Material Handling & Underground Division. Johnson graduated from Michigan State University in 1989 with a bachelor's degree in mechanical engineering. She earned dual master's degrees in mechanical engineering and business administration from the Massachusetts Institute of Technology in 1997.

**COMPANY BRIEF** For 90 years, Caterpillar Inc. ([caterpillar.com](http://caterpillar.com)) has been making sustainable progress possible and driving positive change on every continent. Customers turn to Caterpillar to help them develop infrastructure, energy, and natural resource assets. With 2015 sales and revenues of \$47.011 billion, Caterpillar is the world's leading manufacturer of construction and mining equipment, diesel and natural gas engines, industrial gas turbines, and diesel-electric locomotives. The company principally operates through its three product segments – Construction Industries, Resource Industries, and Energy & Transportation – and also provides financing and related services through its Financial Products segment.

## Would you discuss your role at Caterpillar and your main areas of focus?

My first area of focus is being a strong champion for our mining products and the mining industry as a whole. We are now in the fourth year of an industry decline in mining. Still, we continue to fund significant research and development – driven from a customer perspective – that positions us well for the future. By development I mean sustainable development to help customers become more productive by providing products, services, and solutions that use resources more efficiently. We are also continuously working on ways to better serve our mining customers in the aftermarket, helping them attain the lowest cost of ownership.

The second is the stewardship of innovation for technology and products to help provide our customers with advanced solutions, autonomy, and analytics. We know the future holds many challenges for Caterpillar customers. That's why it's so important that we continually consider how and where Cat® products will be working over the long term. Increasingly, that means identifying and developing technologies that our customers will need to be successful, such as improving fuel consumption and reducing greenhouse gas, increasing machine uptime and operator efficiency, and enabling remote, autonomous, and semi-autonomous product operation.

My third area of focus is on “right sizing” the business, aligning our structural cost with the market reality. Over the past year, with the significant reduction in demand, Resource Industries has had to make tough decisions in support of cost reduction and restructuring activities. These actions include rationalizing our product portfolios, reducing and consolidating a number of our factories, and focusing resources on

those segments and markets where we can provide differentiated value to our customers. Many of Caterpillar's competitors serving the construction and mining industries are also restructuring to lower their costs, and we intend to remain cost competitive for the long run. That said, we are preserving as much funding as possible for our future development – of both our products and our people.

**Would you highlight the four divisions in Resources Industries – Advanced Components & Systems, Product Development & Global Technology Division, Surface Mining & Technology, and Material Handling & Underground?**

Surface Mining & Technology and Material Handling & Underground are focused on developing products and solutions that primarily support the mining industry. We have an expansive product reach with three main classes of mining products – Ultra Class, Material Handling, and Underground. Our Ultra Class products are used in surface mining. Material Handling covers the industrial and waste industries. Underground serves underground mining. In addition to mining, we also do significant business with the construction, quarry, and aggregates industries.

The sophistication of our products means we do a lot of advanced engineering work, which is done mainly through our mining design centers. In fact, we recently announced the development of a new engineering design hub in Tucson, Arizona, that will put our engineers in closer contact with our customers and dealers in the southwestern United States. Even though the markets for mining are suffering, we are committed to the mining industry and partnering with customers to help them address their challenges and achieve the best business results.

Technology plays an ever-growing role in how we are supporting our customers. One example is Cat® MineStar™ Command for dozing, our semi-autonomous tractor system. It removes the operator from the cab and enables remote control operation of the machine. Many mining companies own or control operations that stretch across hundreds, even thousands, of miles. Technologies that optimize fleets, monitor productivity, improve ore recovery, and gather machine information go a long way toward building the efficiencies that mining companies want.

Resource Industries also serves the Caterpillar enterprise through two organizations critical to our customers and our future – Advanced Components & Systems and Product Development & Global Technology. Advanced Components & Systems is focused on delivering technology-enabled solutions and the support of Caterpillar's digital strategy. That includes work on site automation and autonomy technologies, systems integration, electronics, and software – plus hydraulics, drivetrain, fabrications, and machine cabs. Advanced Components & Systems serves not only mining products but all of our machine and engine business partners at Caterpillar. The same holds true for our Product Development & Global Technology division, which is responsible for the implementation of Caterpillar's Enterprise Technology Strategy.

Conceived in 2011 and introduced in 2012, our Enterprise Technology Strategy defines the key technologies and areas of research and development investment necessary to meet customer needs and sustain Caterpillar's competitive advantage well into the future. The strategy focuses on four themes: Energy & Transportation, Machines & Machine Systems, Automation & Enterprise Solutions, and Factory Technology Solutions.

# An Analytical Competitor

## What have been the key factors in the consistent strength and leadership of these four divisions within the industry?

First and foremost, we are focused on customer success. Increasingly, that means identifying and developing technologies that our customers will need to be successful. Many technology projects are in various stages of the research and development process at present, but in recent years, our enterprise technology strategy has given life to several proven, innovative technologies and products with customer value outcomes in four key areas: Energy & Transportation, Machines & Machine Systems, Automation & Enterprise Solutions, and Factory Technology Solutions.

In today's mining industry, companies are looking for a strong partner who can help them lower their total cost of ownership. For Caterpillar, it's about combining our expertise with the knowledge of our dealers to help customers survive – and thrive – in challenging times. It's about helping customers do more with less by getting the most out of the equipment they already have. It's also about working safely and efficiently. Leveraging technology and data to optimize customer operations is also critically important. "Leveraging" is the key here. Yes, the machines provide the data, but it's our knowledge and expertise at Caterpillar that makes the data more valuable to our customers because we can help them focus on outcomes across entire operations.

## You are the executive sponsor of Caterpillar's Women in Leadership initiative. Would you provide an overview of this initiative and its mission?

The Women in Leadership strategy is comprised of several work streams and focus areas and, within each of these work streams, we have developed robust change plans and associated metrics of success. This project is designed to intentionally focus on recruiting, pipeline development, career development, and a thorough review of policies, procedures, and practices. We are targeting several key areas specifically increasing our total female population to 30 percent and the number of female leaders to 26 percent. Growing our total female population to 30 percent represents an increase of approximately 10 percent. We will also have a dedicated focus on our external recruiting efforts with a bold goal to attain an external hire ratio of 50 percent females.

Without question, we must improve the gender balance throughout our company and at all levels of the organization. While we have intentionally focused past efforts to leverage diversity on our most senior leadership positions, we recognize and understand the value of broadening this strategy to encompass our total pipeline. We must have a diverse and deep talent pool from which to develop and draw upon for the future. For this reason, we have set aggressive goals focused on growing our total female population and our female leadership pipeline.

## You are personally focused on supporting female engineers. What do you tell young women about the opportunities that exist for a career as an engineer?

Caterpillar – and the world – needs engineers. There has never been a better time to become an engineer because the need for their talents and skills is so great. We need more female engineers for so many types of careers. Just at Caterpillar, engineers have so many career paths to pursue. It's not just about research and development. Take U.S. manufacturing for example. While women make up approximately half of the overall work force, only about 25 percent of U.S. manufacturing roles are held by women. The need for qualified manufacturing professionals increases each year in fields such as engineering, technology development, logistics, and manufacturing.

Caterpillar works with more than 50 schools and universities on talent development and research, but where it all starts is engaging girls in STEM when they are very young. Caterpillar supports programs related to STEM in many of the communities where we operate. The best ways to develop our female engineers is to give them opportunities for vibrant, challenging careers. Last year Caterpillar ranked #8 on *Woman Engineer* magazine's "Top 50 Employers" in 2015. The magazine's readers selected the top companies in the United States for which they would most like to work or that they believe would provide a positive working environment for women engineers. This is good news, but we still have a lot of work to do. ●

## An Interview with Morgan Vawter, Chief Analytics Director, Caterpillar Inc.



Morgan Vawter

**EDITORS' NOTE** Morgan Vawter has held her current post since April of 2016. Before this, she was Data Management and Analytics Practice Lead for Accenture Interactive and other top analytics positions at leading firms. She's consulted for over 40 Fortune 500 companies on Analytics. She also serves as adjunct faculty, Analytics at Columbia University. She received her Bachelor's Degree from Oglethorpe University.

## You recently joined Caterpillar. What excited you about the opportunity and made you feel Caterpillar was the right fit for you?

I wanted to work for a company that was committed to being an analytical competitor and was willing to invest in the talent, tools, and technology to become a data-driven business. I also wanted to work for a company with strong values – namely integrity, accountability, and excellence. Caterpillar embodied those factors, and that's why I accepted the opportunity to become the Chief of Analytics.

## You have broad experience in the field of digital and analytics. Would you discuss this field and how it has evolved?

The biggest evolution over the past 20 years is that digital has moved from a single delivery channel to an omni-channel experience. Digital has become a pervasive part of our lives from our communications, to our entertainment, our education, our lifestyles, and our tools. In response, a "digital first" mentality is no longer isolated to the technology companies – it's how every company has to design their products, market to their consumers, and deliver their experiences.

Using analytics, we've developed more sophisticated techniques and tools to process the myriad of signals we receive from our customers, our environment, our business processes, our devices, and our machines. Because of this evolution, superior analytics and predictive optimization is no longer a "nice to have" option in business – it's essential for winning in a highly competitive marketplace.

## How critical are digital and analytics to Caterpillar's business?

Digital is, and will continue to be, a competitive advantage for Caterpillar. We've developed digital platforms and tools our customers can use to optimize the performance of their machines, their fleet, and their entire operation.

We also use analytics to optimize our end-to-end business, making all of our business units – from mining and energy to transportation and construction – more effective.

Underlying our growth in both digital and analytics is our focus on building a culture and talent base that enables the success of this strategy.

## What are the key priorities in your role and how will you measure the success of your efforts?

I was pleased to step into a division with strong talent that's already on the cutting edge of many business analytics applications. My goal is to maximize the use of analytics against highest impact opportunities for the bottom line.

Quantitative factors, like dollar value delivered from analytics initiatives, will always be an important measure, but, I'm also driving a transformational effort – changing the mechanics of doing business and go-to-market strategy to a more data-driven model. In that respect, the most effective measurement is total shareholder value. ●