

# THE CIRCULAR GLOBAL SUPPLY CHAIN

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Worldwide consumer demand for products remains strong, driven by a rising middle class and growing world population. The World Economic Forum reported that more than 3 billion new middle-class consumers will enter the global economy by 2030, most from emerging market countries.<sup>1</sup>

Most manufacturers use a linear supply chain that extracts raw materials, manufactures products and distributes them to customers. At the end of the products' service life, little is done to recycle and re-use materials. However, as commodity prices continue to rise, many companies are beginning to re-think this traditional linear model.

Commodity prices increased nearly 150% between 2002 and 2010, wiping out real declines in prices over the 20th century.<sup>2</sup> Because commodities are key components in production, price increases affect all kinds of consumer goods. In particular, consumer demand for personal electronics has strained production of gold, silver, indium, iridium, tungsten and other materials that could be depleted in the next five to 50 years.<sup>3</sup>

## CLOSING THE LOOP TO FIND A BETTER WAY

Experts are advocating a shift to a circular or "closed loop" supply chain to keep limited materials in use for as long as possible through re-use and regeneration. With this shift, the supply chain is viewed as a continuous network of production and reclamation that sustains itself for ongoing production. A circular supply chain focuses on

product-to-service life cycle models, new recycling and resource recovery methods, and smarter raw materials management.<sup>4</sup>

Johnson Controls has used this new approach to re-think the automobile battery supply chain. Nearly 80% of the materials needed to manufacture an auto battery — including the metals, plastics and acid — can be derived from recycled batteries. By partnering with auto repair shops to collect old batteries, Johnson Controls is engaging with retailers and consumers in sourcing its raw materials. Through this program, Johnson Controls aims to make sure that 100% of auto batteries in the United States are safely recycled.<sup>5</sup>

Circular supply chains can be tricky to manage and require new approaches to problem-solving. Johnson Controls has learned that when every element of the supply chain is connected, one failure can affect the entire system.<sup>6</sup> Innovative approaches, flexibility and contingency planning are critical components for circular supply chains to succeed.

## GREEN BENEFITS OF SUPPLY CIRCLES

While circular supply chains may be driven more by commodity shortages and pricing considerations, they dovetail naturally into the realm of green supply chain management, which seeks to integrate environmental consciousness into the supply chain.

In 1994, Ricoh Company, Ltd. established its Comet Circle™ to reduce the environmental impact of its copiers and printers. This set the tone for Ricoh's approach to its product life cycle, including upstream and downstream business activities. Ricoh believes that all product parts should be



designed and manufactured so that they can be recycled or re-used. It purchases materials in line with Green Procurement Standards,<sup>7</sup> which promote the purchase of environmentally friendly products and services, the selection of environmentally conscious contractors, and the setting of environmental requirements in a contract.<sup>8</sup> The company also remanufactures, refurbishes and upgrades pre-owned copier machines.<sup>9</sup>

Though challenging to implement, the potential benefits of the circular supply chain are significant: judicious management of limited raw materials, tempering of commodity price increases, and development of innovative processes and practices.

**To discuss these topics in more detail, please contact your PNC Relationship Manager.**

<sup>1</sup> "Towards the Circular Economy: Accelerating the scale-up across global supply chains," a joint report by the Ellen McArthur Foundation and the World Economic Forum, January 2014. Available at: [http://www3.weforum.org/docs/WEF\\_ENV\\_TowardsCircularEconomy\\_Report\\_2014.pdf](http://www3.weforum.org/docs/WEF_ENV_TowardsCircularEconomy_Report_2014.pdf)

<sup>2</sup> "Towards the Circular Economy: Accelerating the scale-up across global supply chains," a joint report by the Ellen McArthur Foundation and the World Economic Forum, January 2014. Available at: [http://www3.weforum.org/docs/WEF\\_ENV\\_TowardsCircularEconomy\\_Report\\_2014.pdf](http://www3.weforum.org/docs/WEF_ENV_TowardsCircularEconomy_Report_2014.pdf)

<sup>3</sup> "Towards the Circular Economy: Accelerating the scale-up across global supply chains," a joint report by the Ellen McArthur Foundation and the World Economic Forum, January 2014. Available at: [http://www3.weforum.org/docs/WEF\\_ENV\\_TowardsCircularEconomy\\_Report\\_2014.pdf](http://www3.weforum.org/docs/WEF_ENV_TowardsCircularEconomy_Report_2014.pdf)

<sup>4</sup> "Five things that will help you develop a circular supply chain," by Christian Lanng, *Supply Management*, November 20, 2014. Available at: <http://www.supplymanagement.com/blog/2014/11/five-things-that-will-help-you-develop-a-circular-supply-chain>

<sup>5</sup> "Innovation Strategies: Closing the Loop on a Circular Supply Chain," by Edgar Blanco and Ken Cottrill, *Supply Chain Management Review*, September/October 2014. Johnson Controls. Available at: [http://www.johnsoncontrols.com/content/dam/WWW/jci/corporate/home\\_page/2015%20home%20page%20features/MIT%20InnovationStrategies.pdf](http://www.johnsoncontrols.com/content/dam/WWW/jci/corporate/home_page/2015%20home%20page%20features/MIT%20InnovationStrategies.pdf)

<sup>6</sup> "Innovation Strategies: Closing the Loop on a Circular Supply Chain," by Edgar Blanco and Ken Cottrill, *Supply Chain Management Review*, September/October, 2014. Johnson Controls. Available at: [http://www.johnsoncontrols.com/content/dam/WWW/jci/corporate/home\\_page/2015%20home%20page%20features/MIT%20InnovationStrategies.pdf](http://www.johnsoncontrols.com/content/dam/WWW/jci/corporate/home_page/2015%20home%20page%20features/MIT%20InnovationStrategies.pdf)

<sup>7</sup> Ricoh.com website: "Vision — The Comet Circle™." Available at: <https://www.ricoh.com/environment/management/concept.html>. And World Economic Forum: "Towards the Circular Economy: How it Works Up Close — Case examples of circular products," available at: <http://reports.weforum.org/toward-the-circular-economy-accelerating-the-scale-up-across-global-supply-chains/how-it-works-up-close-case-examples-of-circular-products/>

<sup>8</sup> Definition of Green Procurement Standards by the Global Development Research Center, found at: <http://www.gdrc.org/sustdev/concepts/14-gproc.html>

<sup>9</sup> "Towards the Circular Economy: Accelerating the scale-up across global supply chains," a joint report by the Ellen McArthur Foundation and the World Economic Forum, January 2014. Available at: [http://www3.weforum.org/docs/WEF\\_ENV\\_TowardsCircularEconomy\\_Report\\_2014.pdf](http://www3.weforum.org/docs/WEF_ENV_TowardsCircularEconomy_Report_2014.pdf)

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