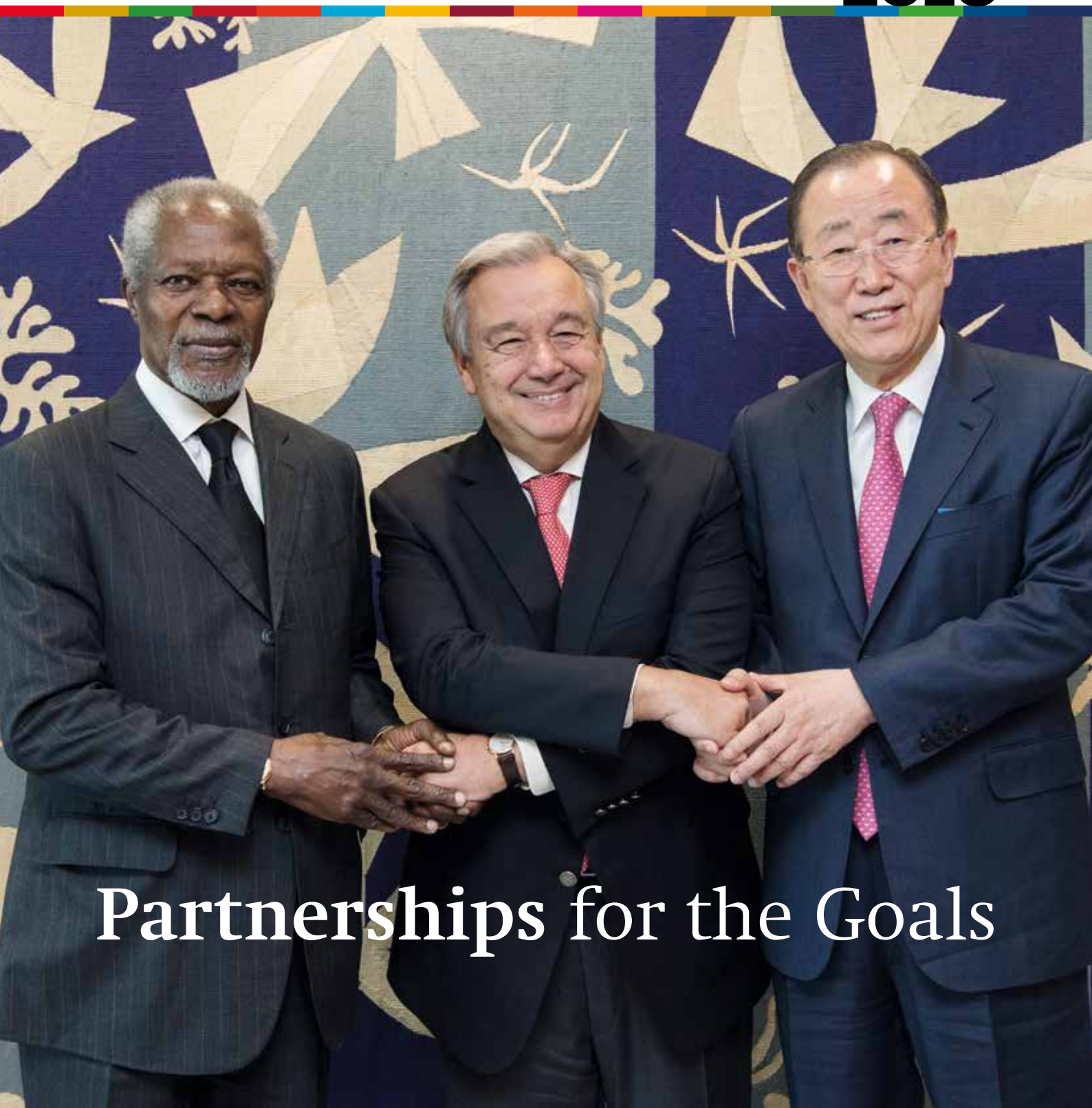
Global Goals Yearbook

2018



Partnerships for the Goals

CIRCULAR ECONOMY: THE CONTRIBUTION OF THE CHEMICAL INDUSTRY

At BASF, we combine economic success, social responsibility and environmental protection – and we state this in our corporate purpose: "We create chemistry for a sustainable future". The concept of the circular economy, which is gaining in importance, may hold the key to a more sustainable future by more firmly decoupling value generation from virgin fossil resource use and waste generation.

By Dr. Brigitte Dittrich-Krämer, Dr. Christine Bunte, Dr. Andreas Kicherer, and Talke Schaffrannek, BASF

BASF is committed to the economically efficient and ecologically effective use of resources — through our production and our products. These aspects come together in the "circular economy" concept, in which growth is decoupled from resource consumption. The efficient use of raw materials has been implemented in our production processes for decades, yet the transition from a linear to a more circular economy can bring significant changes to the way we do business. It can provide additional value across industries and to society at large. BASF is already applying the circular economy concept in a number of ways by pursuing two complementary approaches: "Keep it smart" and "Close the loops."

Examples of our contribution to a circular economy

- *"Keep it smart"*

"Keep it smart" implies continued efforts to increase efficiency within BASF's own production processes, in our customers' production processes, and for the end-user as well. The smart use of BASF solutions has reduced waste along the value chain and introduced more efficient resource use for our customers. One example is our resource- and energy-efficient Verbund production system, which we operate at six sites around the globe. It creates efficient value chains from basic chemicals right through to high-value-added products such as coatings and crop protection products. While doubling our sales volumes since 1990, we have also been able to cut our greenhouse gas emissions by half in absolute terms, and by 75 percent when measured per metric ton of product. To support a stronger decoupling of production from the use of fossil resources, BASF has developed the "biomass balance"

A car tire made of dandelions? Initial tests have determined that the roots of the Russian dandelion can be used as a raw material source for natural rubber. These are the findings of a joint project between the tire manufacturer Continental and the Fraunhofer Institute for Molecular Biology and Applied Ecology in Münster, Germany, along with other partners. BASF sees growing demand for bio-based plastics and expands its portfolio of biodegradable materials.

approach. Meanwhile, we are offering more than 40 products for which raw fossil materials are replaced by sustainably sourced biomass. As the bio feedstock is mixed with the fossil feedstock in our integrated production site, the amount of substituted feedstock is allocated via a certified process — comparable to the green electricity concept. With this approach, BASF manages to combine the resource savings of the Verbund with a diversification of feedstock.

Moreover, many of BASF's products enable our B2B customers to conserve resources in their production processes through an efficient use of our materials. Over their lifecycles, the utilization of many chemical products reduces the amount of resources consumed during production by many factors.

In this way, we can help make the transition to renewable energies economically viable and reduce energy consumption and CO_2 emissions in other sectors, such as construction and transportation.

- *"Close the loops"*

The second approach, "Close the loops," aims at reducing virgin raw material consumption by, for example, extending the lifespan of products and closing loops in production processes by turning waste into resources. Examples are solvents that can be recycled and used again as raw materials in production, or take-back systems for certain chemicals that can be reprocessed. Biodegradable products reduce waste at the end of the lifecycle of the product.

Recycling of plastics

The challenges faced when recycling plastics are technical feasibility, price, and collection and sorting infrastructure. To date, not all materials can be recycled economically with existing technologies, and not all obstacles can be cured by "design for recycling." Hence, new technologies to deal with such materials need to be developed and proven on a large scale. Price is certainly an issue, as recyclates have to compete with virgin materials, and recycling is not always economical. Also, if recycling quotas continue to rise, large investments in collection, sorting, and recycling facilities are required. The European Commission, for example, estimated that ambitious recycling targets, as announced in the recent strategy on plastics, will require between €8.4 and €16.6 billion in investments. Last but not least, any recycling technology requires steady, high-volume, and reliable input. Value-chain collaboration is key to reducing this risk. In the long run, new recycling technologies will be required that can recover those materials which are not being recycled today. One possible way could be feedstock/chemical recycling, that is, the cracking of plastic waste into raw materials for the chemical industry. These technologies require the know-how of the chemical industry to enable this recycling process. BASF is therefore thoroughly evaluating different options for chemical recycling.

Multistakeholder engagement in the circular economy

The circular economy demands massive transformations that can only take place if corporations in the value chain collaborate to jointly implement solutions. The processes along the value chain are highly interconnected, and the circular economy concept encourages businesses to think not only about their individual production steps, but also to consider the supply and value chains involved in their product development.

To further advance and realize our circular economy solutions faster, we joined two Ellen MacArthur Foundation programs in 2017: the "New Plastics Economy" and the "Circular Economy 100" initiatives. Together with other members, BASF aims to drive circular economy solutions further: from innovative product designs to improved production processes, extended use phases, and smart recovery afterwards. BASF joined the foundation's "Circular Economy 100" program to drive not only the concept within our own operations but also the realization of the circular economy, together with other innovators and organizations. The foundation's "New Plastics Economy" initiative brings together key stakeholders to rethink and redesign the future of plastics, starting with packaging. BASF will work closely with the initiative's participants to accelerate the transition toward a circular economy for plastics, while ensuring that benefits such as food protection are upheld.

These initiatives complement other activities such as BASF's membership in Factor 10, WBCSD's initiative on circular economy, or in the World Plastics Council (WPC) which promotes industry topics of global relevance like the responsible use of plastics, efficient waste management and solutions to marine littering. For BASF, which is present in all markets, these widespread actions are implemented throughout all regions to contribute toward a circular economy.

Outlook

The transition from a linear to a more circular economy could bring significant changes to business models and value drivers across many industries. The degree and speed of "circularity" will depend on the pace of technological development, regulatory incentives, new business models, the availability of transition investments, and the willingness of consumers to change behavior. ■