ICCA & Sustainability

The Global Chemical Industry’s Contributions to Sustainable Development and the Green Economy

Prepared by the International Council of Chemical Associations (ICCA) for Rio+20—the United Nations Conference on Sustainable Development

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Sustainability & Responsibility

T WENTY YEARS AGO, the governments of 172 countries, along with thousands of concerned stakeholders, came together at the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro, to lay out a path toward more sustainable environmental practices, economic growth and global development. Today, Rio+20 offers a unique opportunity to assess our collective progress and to address new challenges that have emerged in the years since.

The world faces a daunting challenge: to meet the needs of a growing population and encourage opportunity for all, with increasingly fewer resources, in a way that does not harm our shared environment or our health and safety.

The global chemical industry is playing a vital role in meeting this challenge through development of new, innovative products and more efficient technologies. The International Council of Chemical Associations (ICCA) participated at the UNCED conference in 1992 and the World Summit on Sustainable Development in 2002 and is actively engaged in intergovernmental efforts to promote sustainability, safety and responsible use of chemicals in the industry and throughout the entire supply chain.

Around the world, the chemical industry is enabling the very solutions we need to meet global challenges by providing:

- More reliable and cleaner sources of energy,
- Improvements in the development and delivery of life-saving medicines,
- Safer, more efficient transportation options,
- Access to cleaner, safer drinking water and effective, non-polluting sanitation systems,
- Sustainable agricultural methods that enable more abundant, nutritious food,
- New construction materials that provide energy-efficient, low-cost alternatives for housing and infrastructure, and
- Enhancements and innovation in global manufacturing processes.
Rio+20 should catalyze government action toward providing the enabling environment necessary to accelerate and intensify deployment of innovative products and technologies to address sustainable development goals. The global chemical industry will be instrumental in the development, production and delivery of these products and technologies. At Rio+20, ICCA supports a flexible, pragmatic, integrated approach to global development and a roadmap to a green economy that accommodates all three dimensions of sustainable development—social equity, economic growth and environmental protection. Reform of the Institutional Framework for Sustainable Development must be pragmatic, and form must follow function.

This report offers examples of the contributions of chemistry in six core areas:

- Enhancing sustainability;
- Ensuring product safety and stewardship;
- Minimizing adverse impacts of chemicals;
- Enabling energy efficiency and renewable energy;
- Driving innovation and technological advances; and
- Economic development.

It also addresses the chemical industry’s role in helping to achieve the Millennium Development Goals (MDGs), including eradicating extreme poverty and hunger and improving global health.

“In these times of austerity and economic uncertainty, public sector efforts alone will not be sufficient. Limited public sector resources will need to leverage much larger pools of private sector financing and know-how... Rio offers a tremendous chance to expand economic opportunity, strengthen equity and protect the environment... We need everyone at the table—investors, CEOs, governments, civil society groups, technical experts and practitioners—working in common cause.”

—UN Secretary-General Ban Ki-moon
January 13, 2012
TO ACHIEVE TRUE GLOBAL SUSTAINABILITY, we have to eradicate poverty and encourage economic opportunity for all—in a way that does not harm our shared environment, health or safety. Partnerships and cooperation between the public and private sectors together with civil society will be key to progress, particularly in the face of persistent world poverty and lingering global economic uncertainty.

Innovative, efficient solutions are required to achieve sustainable development. And contributions of the global chemical industry play an essential role in the transition to a green economy envisioned by Rio+20.

Dow: Clean Water, Better Health

CLEAN, SAFE DRINKING WATER is essential to human health. Unsafe drinking water is a vicious and pervasive killer worldwide—UNICEF reports that 1.5 million children die every year from a lack of clean water and sanitation.

To address this challenge, we must kill waterborne bacteria and viruses, build water treatment facilities, and transport safe water to those who need it most. Advances from Dow are contributing to all these areas.

Dow provides the plastic resin for lightweight water purification devices that remove parasites, bacteria and viruses from contaminated water. One device can provide water to a household for 10 to 15 years at an annual cost of $1 per person. On a larger scale, Dow’s reverse osmosis technologies provide safe drinking water through desalination in coastal areas with limited fresh water resources.

Another innovation enabled by Dow is lightweight, durable “bricks” that can transport food and water and then be reused to create homes, schools or medical facilities. Dow’s resins reduce the weights of these containers, which can be air-dropped to remote regions during disasters or when road access is compromised.

To supply clean water to more than 11 million people in rural India and Africa, Dow has provided a $30 million loan guarantee to WaterHealth International (WHI) to help finance 2,000 water treatment systems.

Like many other ICCA members, Dow’s commitment to clean, safe drinking water around the world recognizes the complexity of the challenge and the responsibility of companies to respond.
The products and technologies of chemistry enhance sustainable development in a number of ways, by:

■ Promoting sustainable, local agriculture;
■ Improving human health through development and deployment of vaccines and medicines;
■ Developing technologies that supply clean drinking water to communities around the world;
■ Supporting global efforts to reduce energy use and enabling renewable energy;
■ Minimizing greenhouse gas (GHG) emissions; and
■ Lightening the human footprint on our earth and its resources.

ICCA and its members are strongly committed to continually improving sustainability through the safe management of chemicals throughout their lifecycle. Sound chemicals management is best achieved through a combination of transparent, cost-effective, science-based regulations and voluntary initiatives.

The industry carries out this commitment through two major initiatives: the Responsible Care® Global Charter and the Global Product Strategy, which were launched at the International Conference on Chemicals Management in 2006 in Dubai as the industry’s key contributions to the Strategic Approach to International Chemicals Management (SAICM).

“The main challenge facing humanity now is to sustain the process of poverty eradication and development while shifting gears. Developed countries must shrink environmental footprints as fast and as far as possible while sustaining human development achievements. Developing countries must continue to raise their people’s living standards while containing increases in their footprints, recognizing that poverty eradication remains a priority. This is a shared challenge with a goal of shared prosperity.”

— UN Secretary-General’s Report on the Objectives and Themes of the United Nations Conference
Responsible Care®

The chemical industry is committed to the safe, responsible and sustainable management and use of chemicals throughout their entire life cycle and for their intended end use. Responsible Care is the chemical industry’s unique global initiative to drive continuous improvement in the environmental, health and safety performance of our facilities and our products, with strong accountability and open, transparent communication with stakeholders. Responsible Care supports and strengthens our industry’s contribution to sustainable development.

With the participation of 60 geographies around the world, including virtually all the world’s leading chemical manufacturers, Responsible Care associations, their member companies and their employees commit to protect human health and the environment by:

- Continuously improving EH&S performance;
- Effectively managing chemicals throughout the value chain;
- Improving global harmonization of standards and practices;
- Maintaining open and transparent communication with stakeholders;
- Identifying and spreading good management practices; and
- Employing an increasingly rigorous system of performance indicators and verification procedures.

Through Responsible Care, the chemical industry shares best practices and information among national and transnational companies, and provides capacity building to company professionals as well as to government officials, community members and other stakeholders on health, safety and environmental issues related to chemicals and their safe use.
Global Product Strategy

Product stewardship means more than just managing the manufacture of chemicals; it requires the close cooperation of everyone involved in a product’s life cycle throughout the value chain, including transportation, storage, use and eventual recycling or disposal.

Responsible Care has fostered development of the Global Product Strategy, launched by ICCA in 2006 to improve the industry’s management of chemicals, including the communication of chemical hazards and safe handling conditions throughout the supply chain. GPS aims to reduce existing differences in the safe handling of chemicals among developing, emerging and industrialized countries and to ensure that industry’s products are managed and used safely.

More information about the Global Product Strategy follows in the upcoming chapter.

Braskem: Sustainable Methods, Sustainable Products

BRASKEM, the largest biopolymer producer in the world, is committed to a comprehensive strategy to: use more sustainable processes; provide a more sustainable product portfolio; and offer solutions for a more sustainable life.

Braskem has embraced the Responsible Care® model and implemented a program to reduce waste, conserve water, save energy and improve worker safety throughout its facilities in Brazil and abroad.

The results have been dramatic. Between 2002 and 2011, accident rates decreased more than 80 percent, to a level on par with the best performing chemical companies in the world. The company reduced its liquid and solid waste by more than 60 percent through innovative programs that capture rainwater and recycle inorganic effluent. And its emissions are now less than one quarter of the Brazilian chemical industry average.

On the product side, Braskem developed a new process for polyethylene production based on renewable raw materials by investing more than $250 million in a facility to produce polyethylene from sugar cane-based ethanol. Sugar cane, a renewable material, has the capacity to capture 2.5 tons of CO₂ equivalents per ton of polyethylene produced, because it takes carbon from the atmosphere during the natural photosynthesis process.

Another benefit: the plastics industry, which uses Braskem’s bio-polyethylene, does not need to change its equipment or processes because the performance characteristics of the material are the same. The product is being widely embraced, and Braskem has announced plans to develop a renewable based Polypropylene, the second most consumed polymer in the world.
PROMOTING SAFE MANAGEMENT and use of the essential products of chemistry is a shared responsibility of manufacturers, government and those who sell or use chemical products. Through the Global Product Strategy, ICCA and its members provide technical support for associations and companies that are actively working to build their risk management processes and harmonize them with international standards.

Working with the United Nations Environment Programme (UNEP), ICCA has promoted the Flexible Framework Initiative for Addressing Chemical Accident Prevention and Preparedness, and has developed a regulatory tool box to provide guidance to governments wishing to implement GPS at a national level.

Training & Best Practices

A key component of GPS is improving the product stewardship capacity of small- and medium-sized companies in emerging economies. ICCA has partnered with the European Commission and others around the world to conduct training workshops, where product safety specialists from leading chemical companies provide small business owners and government representatives with advice, tools and practical examples for improving chemicals management.

What Does ICCA’s Global Product Strategy Do?

- Defines a “base set of information” for chemicals in commerce.
- Shares information for safety assessment among companies.
- Promotes a tiered process for evaluating risk and identifying appropriate risk management actions for chemicals in commerce.
- Extends guidance for safety assessment on a global scale.
- Helps define safe-use conditions for chemicals and provides guidance to companies to enable them to meet safe-use conditions.
- Measures industry performance and public reporting.
- Improves product stewardship cooperation with downstream customers in the chemical industry.
- Supports partnerships with intergovernmental organizations and others to enhance product stewardship.
- Enhances outreach and dialogue with customers, the public and other stakeholders.
Since 2008, ICCA has sponsored more than 35 GPS workshops in Latin America, the Middle East, Africa, Eastern Europe and Asia, with an additional 10 workshops planned in 2012 in India, Mexico, Colombia, Singapore and other nations. ICCA also has developed a set of guidance materials, available in multiple languages, to help developing economies establish risk assessment and risk management programs. Corresponding web-based tools and seminars are being developed to help reach an even broader audience.

**Transparency & Information Dissemination**

GPS also promotes greater transparency and expanded public access to chemicals information to increase public awareness and confidence. The GPS Chemicals Portal currently provides more than 2,000 chemical product safety summaries written in layman’s language, and ICCA’s goal is to provide summaries for all high-priority chemicals by the end of 2012.
CCA WORKS TO CONTINUALLY IMPROVE the sustainability and safe management of chemicals throughout their lifecycle. As part of its commitment, ICCA has embraced the goal adopted by the World Summit on Sustainable Development in 2002: that by 2020 chemicals are produced and used in ways that minimize significant adverse impacts on human health and the environment. The Strategic Approach to International Chemicals Management (SAICM), a policy framework to promote chemical safety around the world, is the preferred international forum for making progress toward this goal.

ICCA is a strong supporter of SAICM and its innovative, multi-stakeholder framework, which has brought both governments and non-governmental stakeholders together to build trust and promote collaboration in addressing global challenges. The Responsible Care® Global Charter and the Global Product Strategy are the global chemical industry’s key contributions to SAICM.

By adopting SAICM, stakeholders recognized that the ability of developing and transitioning economies to make progress on safe chemicals management depends, in part, on the availability of financial resources. The Quick Start Programme (QSP), which supports activities to enable initial capacity building and implementation through grants administered by UNEP, is a tool to implement SAICM.

Between 2006 and 2011, the QSP trust fund approved funding for 139 projects totaling approximately $30 million. Approved projects involve activities in 101 countries, including 51 least-developed countries and small island developing states. These projects support development and strengthening of national chemicals policies, programs and legislation, identification of capacity for implementation and enforcement obligations, training, and capacity-building for the sound management of chemicals.

Key Components of SAICM

- Risk reduction
- Knowledge and information
- Governance
- Combating illegal international traffic
- Capacity-building and technical cooperation
As part of its commitment to SAICM, ICCA entered into a Memorandum of Understanding with UNEP in September 2010. ICCA works closely with UNEP on SAICM implementation, and this new partnership agreement consolidated and strengthened our cooperation to develop effective chemical management regimes around the world.

In 2011, ICCA and UNEP worked together on multiple capacity-building events in emerging economies. UNEP and ICCA jointly organized the African Regional Workshop on Chemical Safety Management that took place in Nairobi, Kenya, in October of that year. The goal of the two-day workshop, with representation from 25 countries, was to highlight approaches and tools to improve the safe management of chemicals on site and throughout the value and supply chains.

ICCA also is working with UNEP to develop guidance for governments on how to harmonize chemical management systems. In order to support local governments, ICCA and UNEP are developing a regulatory toolbox, which will provide guidance on integrating GPS elements into national legislative requirements.

These are just a few examples, of many, of how ICCA and its partners are pushing forward toward the 2020 goal. But considerable work remains to meet the ambitious goals set out for this decade. SAICM is uniquely qualified to address current and emerging challenges, but it must be strengthened, including within emerging economies.

As an outcome of Rio+20, the ICCA calls for strengthening SAICM to achieve its mandate that chemicals are produced and used in ways that minimize significant adverse impacts on the environment and human health. Specially, ICCA believes that there needs to be an increased focus on implementation of SAICM and greater individual accountability on the part of all stakeholders for demonstrating measurable progress.

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**International Support**

Below is a list of some of the international bodies that have endorsed SAICM:

- United Nations Environment Programme (UNEP)
- United Nations Industrial Development Organization (UNIDO)
- World Health Organization (WHO)
- United Nations Institute for Training and Research (UNITAR)
- International Labour Organization (ILO)
- United Nations Food and Agriculture Organization (FAO)
- Organisation for Economic Co-operation and Development (OECD)
Energy Efficiency & Renewable Energy

Without a clean, affordable, and secure global energy supply, it is not possible to eradicate poverty, develop the world economy and create shared prosperity. Even in the face of a sluggish economic recovery, global demand for energy will grow sharply in coming decades—according to some estimates, by as much as 53 percent between now and 2035—and much of this demand will come from large, transitioning economies.

A sustainable, green economy demands a new energy future. It requires making more and better use of renewable resources, dramatic changes to consumption patterns and developing innovative technologies that maximize scarce, non-renewable resources to vastly improve energy efficiency around the world. The chemical industry is already playing a crucial role in making this happen, but more needs to be done.

We need to make clean energy more globally accessible. Nearly all renewable and cleaner energy sources and technologies—such as wind, solar, natural gas, and new vehicle technologies—depend on further innovations in chemistry to become more efficient, affordable and scalable. Examples include: lithium ion batteries that will power the next generation of electric cars; advanced biofuels; more cost-effective materials for solar panels; and materials and production techniques for advanced wind energy technologies.

The global chemical industry also is transforming how we use energy, enabling technologies that increase energy efficiency in homes, offices, factories and vehicles—everything from lightweight auto parts, to energy-efficient windows, doors, lighting, and insulation, to lightweight packaging.

Walking the Walk: Playing Our Part in Energy Efficiency

The global chemical industry is improving energy efficiency and reducing GHG emissions:

- The European chemical sector emitted 49% less CO₂ equivalent in 2009 compared to 1990, while production climbed 60% over the same period.
- Between 1990 and 2007, the Japanese chemical industry improved energy efficiency by 16%, and reduced absolute GHG emissions by 17%.
- In the United States, the industry’s absolute GHG emissions fell 16% between 1990 and 2008. At the same time, chemical industry production rose 39%. As a result, GHG intensity fell by 39.4%.
- Since 1974, U.S. industry has improved energy efficiency by 53%.

A recent study found that for every unit of CO₂ emitted in the manufacture of the products of chemistry, two units of CO₂ are saved, largely through the energy efficiency gains enabled by the products, such as insulation and energy-efficient lighting. And by 2030, it is estimated that this GHG savings-to-emissions ratio could increase to four to one.

A third piece of the energy puzzle is reuse—using recovery technologies to transform discarded products into valuable, alternative energy. Every day, tons of high-energy-content products, like plastics, are buried in landfills.

Energy from discarded products can be recovered in traditional facilities that convert these materials into electricity, or through innovative technologies that convert plastics into alternative fuels. Modern energy recovery facilities meet some of the most stringent environmental standards and use some of the most advanced emissions control equipment available, producing less pollution than even the best landfills.

In all of these areas and many others, chemistry will continue to drive the world to a more affordable, efficient, clean energy future.

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**DuPont: Innovation Driving Energy Diversity and Efficiency**

AROUND THE WORLD, innovations in chemistry drive major improvements to the clean energy sector. Industries depend on chemistry to make the solar panels, wind turbines, fuel cells, and advanced fuels and vehicle technologies that will diversify our energy supply and make our global economy more efficient and green.

DuPont is a major provider of materials that make solar panels, including specialty films, electronic pastes and specialty plastics. The company sold $1.4 billion worth of U.S.-made products into the global solar market last year that helped increase the power output and lifetime of solar panels and reduce overall costs of PV systems. In addition, DuPont’s fire-resistant fibers, traditionally used to make protective clothing for first responders, also are being used, in a new form, to insulate the electrical components of wind turbine motors.

In the transportation sector, DuPont’s products make strong, lightweight specialty plastics for vehicles, improving their fuel efficiency. And a new nano-fiber sheet material is used to make lithium-ion batteries for hybrid and electric cars more energy rich, longer lasting and safer at high operating temperatures. DuPont is also commercializing two advanced, low-carbon biofuels—cellulosic ethanol and biobutanol.

While enabling a cleaner, more efficient and diverse energy future, these advances are creating and preserving jobs as well. DuPont expanded production of materials for solar panels in the midst of the recent recession, spending hundreds of millions of dollars on capital improvements and adding several hundred jobs. These are just a few of the many examples—from just one company—of how the chemical industry enables innovation in a changing global economy.
Enabling Innovation & Technology

**WIDE SPREAD INNOVATION ACROSS ALL SECTORS**, from agriculture to healthcare to advanced manufacturing, which brings new solutions to fast, evolving needs, is a critical element in building a sustainable world economy. Achieving a more efficient, clean, and equitable global landscape requires deploying new products and technologies to help a growing population make best use of the world’s scarce resources.

And chemistry will continue to enable the breakthroughs this new economy requires.

The global chemical industry invests in research to develop new technologies and processes that enable other industries and sectors to improve their environmental performance and the quality of their products.

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**Nalco: Helping Customers Save Water & Energy**

THE CHEMICAL INDUSTRY plays an important role in improving the efficiency and safety of manufacturing processes and facilities. Nalco (an Ecolab Company), a global leader in providing sustainable solutions in industrial water treatment and management, has worked with companies throughout South America to improve their plants, resulting in lower energy and production costs, less water usage, less waste and improved safety.

Nalco worked with a leading food and beverage company with a large brewery plant in Southeastern Brazil. The plant was struggling with high water and energy loss, and high breakage rates for its bottles during pasteurization. Nalco worked to assess, quantify and fix these problems using its patented 3D TRASAR® technology for cooling water and making other technology improvements. This technology saved customers more than 350 million cubic meters of water globally in 2011. The potential results at this brewery include:

- **Annual savings of 12,000 m$^3$ of industrial water;**
- **Annual reduction of 57,920 Nm$^3$ of natural gas in the boilers;**
- **Elimination of 511 tons of CO$_2$ emissions/year;**
- **Reduction of bottle breakage of over 200,000 units/year;**
- **Increase in the pasteurizer availability by over 200 hours/year for maintenance, improvement activities or production.**

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These goods and materials—including lightweight plastics, coating and adhesives, fertilizers, pharmaceuticals, textiles with specialist properties, building materials, advanced non-food-based fuels, improved crops for specific growing conditions and many more—are so pervasive across our world economy that we rarely think about their basis in chemistry. Consider the following examples:

- Use of advanced insulation foams in building save 2.4 billion tons of greenhouse gases each year. Efficient insulation can reduce energy costs by as much as 60 percent.

- Chemical products for vehicles save 230 million tons of GHG emissions every year through lighter plastic parts that reduce a car’s weight, tires that create less emissions, and gasoline and diesel additives that reduce fuel consumption.

- Modern compact fluorescent light bulbs offer more effective lighting and have a longer life than incandescent bulbs, saving 700 million tons of GHG emissions annually.

- Metallocene catalyst technology, which makes polyethylene films stronger and lighter, lowering direct emissions, is a major breakthrough in plastics manufacturing. Metallocene polymers also enable modified plastics to be used more widely in automotive applications, replacing steel.

- Detergent enzymes represent one of the largest and most successful applications of modern industrial biotechnology. Using enzymes reduces the amount of electricity needed to do a load of laundry by 30 percent. And the duration of the washing cycle, water consumption and use of harsh chemicals can all be reduced when enzymes are added to a detergent. Since enzymes are bio-degradable, their use also leads to a reduced environmental footprint.

The net effect of these innovative products and materials—and so many others enabled by chemistry—is a more sustainable, energy efficient, green economy.
The Business of Chemistry & the Green Economy

THE CHEMICAL INDUSTRY is a crucial component of global economic development—it is a science, technology and knowledge-based industry that is essential to a sustainable international economy and improved health and nutrition around the world.

The global chemical industry is not only important in terms of size, but also in terms of its features—it is a highly technical industry with significant capital investment. In addition, the business of chemistry is one of the most knowledge-intensive industries in the manufacturing sector, with well trained, educated employees.

These characteristics enable the business of chemistry to support families, communities and economies worldwide. Today, more than seven million people are directly employed by the global chemical industry, and including indirect employment, that number rises to more than 20 million people worldwide. Over 95 percent of all manufactured products are touched by chemistry, and globally, chemical sales were nearly €3 trillion (nearly $4 trillion) in 2011.

Economic growth is critical to addressing environmental and social challenges, including poverty reduction, and foreign direct investment from the chemical industry can play an important role in enhancing a region’s employment opportunities, economic development and environmental protection. The global chemical industry has a critical role to play in delivering the products, technologies, services and solutions required for the transition to a greener economy.

Transition to a green economy must also account for regional, national and local priorities and development challenges. ICCA supports the development of a flexible, customizable roadmap to a green economy as an outcome of Rio+20, based on the following core principles:

- Facilitate production, diffusion and deployment of products and technologies that enhance sustainable outcomes (i.e., tax incentives for research and development).
- Ensure that policies to create green jobs do not come at the cost of a net reduction in jobs across the economy. Emphasize greening all sectors of the economy, rather than identifying certain sectors as “greener” than others.
- Set clear, stable and predictable policy frameworks to give investors and financiers the confidence to foster innovation-led green growth and development.
- Focus on sustainable consumption as well as production—producing goods and services efficiently and consuming them differently, rather than simply producing and consuming less.
- Work within existing market systems to advance the green economy, taking care not to distort markets or limit market access.
- Ensure access to free and open trade as a means of facilitating sustainable development.
- Develop and deploy indicators, metrics, accounting measures and better disclosure and reporting mechanisms that make sense in economic terms and also include the cost of externalities. A flexible approach that balances costs and benefits is crucial for success.
In September 2000, world leaders met in New York to adopt a new global partnership to reduce extreme poverty and embrace a series of “Millennium Development Goals” (MDGs). With its focus on a more sustainable global economy for all, Rio+20 provides an opportunity to assess progress toward those goals.

Achieving the MDGs requires a comprehensive, global effort that includes all sectors. The challenges of extreme poverty, hunger, sanitation, maternal and child health, environmental sustainability and education are too vast and pervasive to be tackled by governments alone. The global economic crisis has not only exacerbated the challenge for so many, but also has complicated the fiscal picture for many governments. Innovative, effective and affordable solutions are needed.

BASF: Addressing Hunger through Sustainable Farming

How do we meet the world’s growing need for food while protecting our environment and preserving Earth’s biodiversity? A key challenge in the developing world is increasing crop yields sustainably, so small farmers can feed their families—and others as well.

BASF is taking this on by embracing a straightforward strategy: talk with farmers, find ways to boost their yields and profitability, and offer hands-on advice. In 2007, BASF launched the “Samruddhi” (“prosperity” in Sanskrit) project in the Madhya Pradesh in India, a major area of soybean cultivation where yields were extremely low—just a third of the worldwide average.

BASF sent 280 agronomists to work with thousands of local farmers. Starting months before planting and ending when the soybeans were sold to market, these experts conducted thousands of workshops, harvest days, market days, and visits to individual farms.

The results were amazing. In 2008, the soybean yield increased by 31 percent, with farmers increasing their net income by 60 percent. In 2009, comparative yield increases averaged 24 percent, despite a severe drought. By 2010, around 170,000 soybean farmers in India had collaborated with 700 BASF agronomists, and soybean yields were near the world average standard.

Encouraged by this success, BASF has started similar projects with thousands of potato and onion growers in India and has expanded the program to Indonesia, Sri Lanka and Africa. “Samruddhi” demonstrates how collaborative, sustainable farming methods can empower local farmers and their families to help feed the world.
Around the world, the chemical industry is developing the tools and the products needed to reduce poverty, improve human health, and build a more sustainable economy, thus contributing to the following MDGs:

**MDG 1: Eradicate Extreme Poverty and Hunger**

**TARGET**—Halve, between 1990 and 2015, the proportion of people who suffer from hunger.

**MDG 4: Reduce Child Mortality**

**TARGET**—Reduce by two-thirds, between 1990 and 2015, the under-five mortality rate.

**MDG 5: Improve Maternal Health**

**TARGET**—Reduce by three-quarters the maternal mortality ratio.

**MDG 6: Combat HIV/AIDS, Malaria and Other Diseases**

**MDG 7: Ensure Environmental Sustainability**

**TARGET**—Integrate the principles of sustainable development into country policies and programs and reverse the loss of environmental resources.

**TARGET**—Halve, by 2015, the proportion of the population without sustainable access to safe drinking water and basic sanitation.

**TARGET**—By 2020, to have achieved a significant improvement in the lives of at least 100 million slum dwellers.

The ambition to halve, between 1990 and 2015, the proportion of people who suffer from hunger remains a massive challenge, requiring development of new, efficient and environmentally friendly fertilizers to increase crop yields and improve global agricultural production, as well as sustainable methods for controlling insects, disease and rot.

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**Disaster Relief: Providing Clean Water**

EASTMAN CHEMICAL has partnered with Hydration Technology Innovations (HTI) to enable its development of the HydroPack™, an award-winning technology to aid disaster victims.

This 5-by-7-inch pouch can turn a dirty puddle of rainwater into a clean, flavorful drink in about 10 hours. The heart of HTI's innovative technology, which uses a forward osmosis process, is a membrane made from Eastman's cellulose acetate.

HTI's paper-thin HydroPack™ pouches are lightweight and readily transportable. They are packed with essential nutrients and electrolytes, offering timely relief to dehydrated disaster victims and sufferers of pervasive waterborne illnesses. HTI deployed 24,000 HydroPacks™ in the days following the January 2010 earthquakes in Haiti. And, working with the Kenyan Water for Health Organization and local government officials, HTI has distributed more than 20,000 packs in the village of Mudimbia, in Kenya's flood-prone Budalangi region.
Food also must be safely and efficiently transported around the globe. And local farmers must have access to the crops, tools and training they need to sustainably farm their own land and feed their families and communities. The chemical industry, in partnership with other industries and international nonprofits, contributes to each of these goals and will continue to look for ways to expand our partnerships at Rio+20 and beyond. At the same time, medical breakthroughs and innovative technologies made possible by chemistry and biotechnology provide a deeper understanding of the causes of, and how to prevent and treat, infectious diseases, enabling people to live longer, healthier lives. Wide-scale production and distribution of medicines is one clear contribution enabled by chemistry. But so too are: plastics used for delivery of vaccinations and other life-saving medicines, hydration and other treatments; mosquito nets treated with insect repellent and other tools to fight malaria and other diseases; and quick, clean, safe transportation of water and other vital supplies, especially in times of disaster.

Clean water is a vital component of improved world health and a major factor in reducing child mortality, improving maternal health and combating sickness. The World Health Organization estimates that diseases associated with dirty water kill 6,000 people every day. Chlorine chemistry is the most effective weapon against waterborne bacteria and viruses and is essential to safe drinking water.

**Sumitomo Chemical: Fighting Malaria, Empowering Communities**

**ACCORDING TO THE UN,** malaria kills a child in the world every minute. And nearly 90 percent of malaria deaths occur in Africa, where the disease accounts for a fifth of all childhood deaths. One essential strategy to fight this disease is the production, distribution and use of long-lasting insecticide-treated mosquito nets (LLINs).

Sumitomo Chemical developed an insecticide-treated mosquito net that contributes to malaria prevention. In one dramatic example: in Sauri village in Kenya, the number of people with malaria parasites is reported to have decreased from around half of the total population in 2005 to 8 percent by 2008, by using the Sumitomo Chemical mosquito net.

Sumitomo Chemical did more than just develop these life-saving nets. It also aided in their manufacture and distribution by providing the technology free of licensing fees to a local Tanzanian company and by establishing a joint venture, creating jobs for about 7,000 people. According to a 2011 report by the University of London, Sumitomo Chemical’s manufacturing operation accounts for 20 percent of all manufacturing jobs in the region. These jobs are enabling workers to enhance their financial stability, plan for the future, and ensure an education for their children.
Other critical areas of global need include sanitation and housing. Lightweight, easily transportable building materials are essential to improve living conditions for the millions of people who live in slums and other unsafe conditions. Chemical companies have teamed with organizations like Habitat for Humanity to build sustainable, affordable homes in countries around the world using innovative building materials that reduce natural gas usage and decrease electricity costs.

These are just some of the areas enabled by chemistry that are helping the world community meet the Millennium Development Goals. ICCA and its members also are working to create a more sustainable, clean, efficient and affordable energy future. And we remain strongly committed to continually improving the sustainability and safe management of chemicals throughout their lifecycle, particularly in developing and transitioning economies. A sustainable world economy benefits us all, and the ICCA and its members will continue to do our part, working with the United Nations and other partners around the world.
BUILDING A GREEN ECONOMY that addresses our most pervasive global challenges depends on innovative solutions from all sectors—industry, nonprofits and all levels of government. To get there, ICCA supports a flexible, pragmatic, integrated approach to global development. Our collective strategy must accommodate all three pillars of sustainable development: social equity, economic growth and environmental protection.

As we work together to build a sustainable future, the chemical industry will continue its efforts to safely and responsibly develop, produce and deliver products and technologies that make industries more efficient, drive improvements in pharmaceutical development and delivery, improve global energy efficiency, reduce the footprint of housing and transportation systems, and make global agriculture more sustainable and productive.

The ICCA and its members remain committed to continuously improving our industry and working together with governments and civil society to achieve truly sustainable global development.