Behind the scenes, Japanese chemical companies invest heavily in innovation and R&D to produce next-generation materials that make everyday products greener and more energy efficient.

Sony’s Compact Disc, the Walkman, the Nintendo Gameboy, Nikon’s digital SLR camera, the Toyota Prius, 3D-printers, bullet trains, robots…the list of Japanese technology and innovations over the past few decades could go on.

But while household names like Sony, Nikon and Toyota may typify Japanese innovation, working behind the scenes are Japan’s ‘silent heroes’: the companies behind innovative chemical products, which help to make everything, from air conditioning and thermal insulation units, to light bulbs, construction paints and LEXUS cars, more energy efficient and less harmful to the environment. Through their continuous investments in R&D and innovation, these companies have positioned themselves at the forefront of pertinent issues such as climate change and food security.

“The advances in chemistry make the world a better place for everyone. Our mission is to give shape to the unlimited possibilities of chemistry for our customers, and as such, we are responsible for supplying innovative products all over the world,” says Takao Ando, President and CEO of Sanyo Chemical Industries.

By supplying essential materials to fields such as automotive and electronics, the chemical industry is the backbone of Japanese manufacturing, employing some 860,000 people and making up 14 percent of the shipment value of all manufacturing industries. It also accounts for 22 percent of the manufacturing sector’s total spending on R&D, which has helped to make Japan’s chemical industry a world leader.

“In terms of competitiveness our main strategy is to produce high-end-value products. In order to create this excellent market position, we put a large portion of the workforce into the R&D sector. Thirty percent of our employees are involved in R&D,” says Mr. Ando, whose company develops materials for the health, petroleum, automotive, plastic, textiles and construction industries, amongst others.

“We are currently focusing our efforts on medical applications. This is something new and different from what we have created so far and was made possible after we were approved as a medical device business operator in 2011.”

One special feature of Sanyo Chemical’s R&D is, what it calls, ‘The NeeSeeds-Oriented’ approach – a combination of needs-oriented R&D and seeds-oriented R&D.

“We achieve diverse performance by combining the needs with multiple seeds (existing technologies, products and know-how),” says Mr. Ando. “A technique developed to meet a certain need is combined with another technique to create another new seed technology for new products. The ‘NeeSeeds-Oriented’ approach has helped us to broaden our range of technologies to as many as 3,000 different types of products.”

If you’re the owner of a Lexus, you’ll be more familiar with one of these ‘NeeSeeds’-developed products than you think. Sanyo Chemical’s specially developed polyurethane is used to make the leather-like material that covers Lexus’ instrument panels in its vehicles, which is far superior to the PVC the U.S. car company used before, according to the Sanyo Chemical president.

“The superior polyurethane powder, developed by a mixture of our various seeds and new technologies, has the benefits of being soft and pleasing to the eye by resembling genuine leather with thread stitching,” says Mr. Ando.

“Lexus used to adopt PVC for instrumental panels, but now it uses our polyurethane materials. The benefits of switching from the use of PVC to polyurethane are the lightweight properties, the leather-like texture, and the lower melting temperature, which saves the processing energy and contributes to the car’s performance.”

Sanyo’s polyurethane material is a small touch, but one which, aside from being pleasing to the eye of a Lexus luxury car owner, also helps to make the vehicle lighter and more energy efficient, and thus helping to reduce its CO2 emissions.

Another company helping to lower emissions is KH Neochem, whose high-performance materials can be found in a range of consumer products, from cars, TVs and laptops, to food and drink packaging, paints and cosmetics.

The company is also a leader in the production of materials used to produce R32 refrigerant lubricant, which is used in air conditioning units. R32 is a much environmentally friendlier alternative to the current standard R410A lubricant and its predecessor R22, an
ozone-depleting substance which is now being phased out in the U.S. "R22 is being eliminated because it has a significant impact on ozone deterioration," says Keiichi Asai, President and CEO of KH Neochem. "The current standard refrigerant R410A does not deteriorate the ozone layer. However, R410A has a high GWP (Global Warming Potential) rate of 2080, which is even higher than R22 with 1080 GWP. R32, is mainly being introduced in Japan. R32 refrigerant’s GWP rating is 675; a third less than R410A.

"One of our strengths is that we produce raw materials for synthetic base chemical lubricants for R32. And we are proud to be indirectly contributing to the protection of the ozone layer and global warming reduction with the production of these products."

The middle classes in developing countries are growing, and so to are their demands for home appliances such as air conditioning, particularly in warmer countries. The use of “greener” refrigerant lubricants like R32 will be imperative in order to mitigate environmental impact. "With the expected growth of the middle-class segment, this type of refrigerant might be used even more," adds Mr. Asai. "In 2016 about 90 million air conditioners were produced for residential use and this is expected to increase to 113 million in 2025, so there is a big opportunity for business in this market."

"It is essential for companies to be environmentally friendly. We are proud to be indirectly contributing to the protection of the ozone layer and global warming reduction”

Keiichi Asai, President and CEO, KH Neochem

"We embrace globalization not only for profit margin but to educate employees and to create quality products all over the world. Our mission is to give shape to the unlimited possibilities of chemistry”

Takao Ando, President and CEO, Sanyo Chemical

Japan’s chemical companies are leading the charge, not just by producing greener products, but also ensuring the production processes to make these products adopt the best technologies in order to increase energy efficiency. "One of the environmental concerns that we are successfully addressing is in the field of energy saving. Our results show that the energy we use to make one ton of product per year has been continuously declining," says Mr. Yuji Fukuyama, President and CEO of Honshu Chemical, which produces specialized materials for the automobiles, IT and healthcare industries.

"Our core generation system enables us to make and supply our energy. We concentrate on reducing such things as air consumption, waste water, waste disposal and gas and we have excellent control on water temperature. The software system that we use enables us to plan production and energy use so usage is kept to a minimum and high levels of production efficiency are maintained."

"Speciality bisphenol is used in the engineering of plastics which are extremely hard, similar to the hardness of metal or iron. However, unlike these metals they are lightweight – leading to high fuel efficiency – and have a higher heat resistance. The plastic is much easier to use than metal and so it is possible to make very unique car door designs,” explains Mr. Fukuyama. "With the introduction of eco-cars and driverless cars, the next step will be to introduce high-performance lenses and cameras that will be used in these types of vehicles. We would like the overall target of our companies to be capable of providing more reliable and efficient products for the customer."

Proudly Sponsored By:

KH NeoChem Co., Ltd.

Realizing a brighter tomorrow for society through the power of chemistry

KH NeoChem manufactures unique fine chemicals that meet global needs. Our raw materials are used in a variety of fields, from refrigeration lubricants in eco-friendly air conditioners, to cosmetics that are gentle and moisturizing, and high-purity solvents that are indispensable in the electronic materials industry. Our high-performance products respect the global environment and provide comfortable living.

Honshu Chemical Industry Co., Ltd.

#JapanTheWorldfolio
#TheWorldfolio
DISCOVER MORE AT THEWORLDFOOLIO.COM

PRODUCED BY GLOBUS VISION
Antoine Azoulay – Country Director
Aline Duraline – Project Director
Alexis Ambrizano – Editorial Director
Alexandre Marland – Editorial Associate
Andreas Conde – Project Coordinator
Naoko Mai – Project Assistant
Fabrizio Fitzgerald Farina – Regional Institutional Director

www.khneochem.co.jp/en/
With the world’s population expected to reach 9.7 billion by 2050, the U.N.’s World Food Programme estimates that global food production must increase by 60 percent. This will require the use of more land, more water, more energy, more agrochemicals, and more investment in agri-science and innovation. Therefore, the major challenge for the agricultural industry, and the agrochemical companies that supply farmers with seeds, growth stimulants, fertilizers and pesticides, will be to find innovative ways to dramatically increase production, while ensuring sustainability and mitigating the impact on the environment.

While many proponents of organic food criticize the use of pesticides in farming, the fact is that 40 percent of global crop yields are currently lost to pests and diseases; and it is estimated that these losses could double without the use of pesticides. Such losses would be detrimental to global food security, particularly over the coming decades as the world demand for food grows rapidly.

"Organic crops and vegetables sound appealing to consumers, but farmers recognize the important role that agrochemicals play in increasing productivity," says Mr. Yoshitomo Koike, President of Kumiai Chemical Industry Co., a Japanese firm which produces agrochemicals.

The majority of players in the agricultural industry agree that the use of pesticides is the best solution to pest problems and for food security. However, public concerns over health and environmental issues must be addressed. This has compelled agrochemical companies to invest in R&D and innovation to produce more environmentally friendly synthetic pesticides, as well as bio-pesticides, the market for which is expected to grow 16 percent annually through 2026.

The agrochemical industry is dominated by the five largest players: Bayer, Monsanto, Dow/DuPont, Syngenta, and BASF, which together control nearly 75 percent of the global pesticide market. Dow and Dupont came together after a merger in September; while Bayer has struck a deal to acquire Monsanto. These large mergers and acquisitions have been a cause for public concern, with the biggest worry being that a lack of competition could stifle the innovation needed to develop new products. Furthermore, these large western companies that dominate the agrochemical industry suffer from a large level of public distrust; and many citizens in the U.S. and Europe do not perceive these companies to be leading the drive for greener and more sustainable agricultural practices.

Such factors present a huge opportunity for smaller industry players in Japan. By combining their traditional focus on innovation, R&D and sustainable corporate practices, these companies could assume international leadership in the agrochemical industry, developing new innovative, environmentally friendly agrochemical products.

"In Japan, the primary focus is innovation. Our company aims to improve efficacy, safety and the quality of pesticides, seeds with GM technology, fertilizer and others, that will increase crop yields," says president of Meiji Seika Pharma, Daikichiro Kobayashi.

"Currently, the agrochemical industry is dominated by a handful of enormous corporations which possess around 60-80 percent market share," says Mr. Hironori Kushibiki, President of Agro-Kanesho.
“But Japan is the global leader in terms of agrochemical patent ownership. Our patents give us a long-term advantage to increase our shares on a global level. Half of the 40 new agrochemicals that underwent full R&D and are currently waiting to be registered on the global market originated in Japan.”

Agro-Kanesho is an R&D-based agrochemical company and distributor with a robust reputation in the domestic market, which focuses on dealer channels rather than co-ops. Most of the products are used for horticultural fields such as fruit orchards, industrial crops, vegetables and ornamentals. These products include: Basamid, a soil treatment protecting crops and vegetables from roundworm and other soil-based diseases; and Kanemite, a miticide for orchard trees, vegetables and ornamental crops, which it exports to the U.S.

“Our hope is to be able to directly communicate with U.S. growers on the usage of our products by providing them with precise and detailed information,” says Mr. Kushibiki.

“Two or three years ago, we received a considerable order from an American farmer for our miticide, Kanemite. Because our product has been met with great success abroad, the demand for our miticides increased drastically, and it has become a profitable side of the business. As a matter of fact, demand from the U.S. became larger than the demand from any other country.”

Agro-Kanesho says its competitive advantage is, what it calls, its “farmer-oriented approach” to product development – actively involving growers in its R&D efforts and listening to their specific needs to develop solutions.

“Ever since its inception 60 years ago, Agro-Kanesho has always worked collaboratively with farmers and growers alike to ensure top-quality products,” says Mr. Kushibiki.

“Being attentive to our users’ opinions and views is a core component of our corporate philosophy. We never push our product upon a client against his demands and without his clear understandings of our products. We are an R&D-focused company, and as such, we are always pursuing the development of new products to meet our clients’ demands.”

The corporate philosophy of another Japanese agrochemical firm, OAT Agrio Co., is focused on “contributing to the world with our agro-technology and sincerity”, according to its president and CEO, Akihei Mori.

“We have a so-called ‘Green Products’ series of agrochemicals. Green products do not kill all insects and bacteria, leaving the helpful ones alive. They are able to prevent damages by insects while simultaneously remaining very eco-friendly. It is our R&D policy to develop new products in this area. The use of conventional agrochemicals is necessary but they should be used only as a final resort.”

In 2012, OAT Agrio completed the acquisition of Asahi Chemical Manufacturing, which produces a popular product called Atonik. Sold under the name of Aegis ESR in the U.S, Atonik is a residue-free plant biostimulator. Plants treated with Atonik show better growth and generative development, improved biomass accumulation, and higher efficiency of photosynthetic apparatus, water status, membrane integrity and cell wall lignification.

“Atonik is the representative of our green products,” states Mr. Mori. “The components of Atonik exist in nature, and strengthen plants to help them to protect themselves. No residuals are found in almost all plants after application of Atonik, which also proves its safety.”

OAT Agrio is also concerned with water conservation, and has developed “Fertilizer and Fertilization through drip irrigation systems”, which are made to automatically supply the minimum amount of required water and fertilizer to plants and crops, thereby contributing to conservation of resources.

“The soil on the earth has been deteriorating because of the shortage of water supply that leads to its dry-up. This is a very difficult problem to solve for a small private company. However, our proposal to this problem is to use much less water and much less fertilizer,” says Mr. Mori, whose company’s products are widely available to U.S. farmers.

“Our eco-friendly products, Cyflumetofen, Kaligreen and Atonik have been marketed and are catching market needs in America. We plan to introduce another in the next few years. Under this strategy, I hope that more OAT Agrio products will be seen in North and South America in the future.”

Akihei Mori, President and CEO, OAT Agrio