Driving the Green Transition of Manufacturing

Evonik Industries AG

Executive Summary

Introduction

The ecological transformation of society and the economy is inevitable. For the chemical industry, climate protection is a central issue. We see it as a commitment to society and to future generations, and we also see it as a major opportunity for the future. The chemical industry is focusing on innovative and sustainable procedures and technologies and, in its role as a supplier industry, it is connected to many other industrial sectors. The areas of application for these technologies are numerous: The circular economy, battery technology, hydrogen and synthetic fuels, lightweight construction materials, bio-based plastics, insulating materials for buildings and the biotechnical optimization of agricultural crops are just some examples. The clear focus on the green transition means, for Evonik, taking responsibility. With our products and solutions, we are helping to overcome the major challenges of our time.

Background

China

Accelerating green transformation is the only way to achieve high-quality development of China's manufacturing industry. The “14th Five-Year Plan” of Industrial Green Development proposes to comprehensively improve the level of green manufacturing. The major strategic decision to achieve the “dual carbon” goal shows that China will more firmly take the path of green, low-carbon and circular development, putting forward new and higher requirements for the industrial transformation and upgrading. In the transformation of the global “green economy”, it is urgent for China to accelerate the green transition to a resource-saving and environment-friendly industrial system, rapidly improve green comprehensive national strength, and enhance green international competitiveness. Gradually transforming from a follower of green development to a leader at the forefront, China will progressively build up core competitiveness in its coordinated development of carbon reduction, pollution reduction, and economic growth.

European Union

The Green Deal is to deliver a climate-neutral Europe by 2050. To achieve this, an ambitious intermediate objective has been defined: Greenhouse gas emissions are to be reduced by at least 55% by 2030. “Fit for 55” is a package of proposals from the European Commission to help reach this target. These are comprehensive measures with which energy and climate policy are to be revised and adapted to the new climate goals. The “Fit for 55” package also includes a review of the renewable energy policy: The EU-level target of at least 32% of renewable energy sources in the overall energy mix is to be increased to at least 40% by 2030. The EU Commission’s RePowerEU Plan calls for an increase to 45%. For industry, there are to be defined and annually increasing targets for the use of renewable energy.

Germany

The German Climate Change Act was amended in June 2021: The climate protection target for 2030 now calls for 65% less greenhouse gas emissions. This was increased from 55%. The aim now is to achieve greenhouse gas neutrality in Germany by 2045. For effective climate protection, technologies and investments must be made available as quickly as possible. The industrial sector must reduce its current emissions level to 118 million tons of CO_2 equivalent by 2030.

For the chemical industry, this means making efficient use of energy and resources and taking advantage of climate-friendly products and new technologies to reduce CO_2 emissions. In order to become climate-neutral in the coming years, we must reduce our greenhouse gas emissions to zero and defossilize all our processes. In the past, the chemical industry has already made great efforts to make its industrial-scale processes more environmentally friendly and more energy efficient. Now the focus is on using technology to achieve climate neutrality in production by 2045. Calculations by the German Chemical Industry Association (VCI) show that the industry can reach this target even though the political and economic framework conditions ensure that there will be many challenges along the way. It is also important to navigate a socially acceptable route to the ecological transformation. The shift to a climate-neutral industrial society will only receive the necessary backing if it also becomes a social and economic success model.

A climate-neutral chemical industry could be achieved technically, but there are multiple conditions attached: Primarily, large amounts of renewable electricity will be required at competitive prices, and also adequate availability of green hydrogen. Furthermore, new sources of carbon must be mobilized for use as a material if fossil fuels are no longer in use. The Chemistry4Climate (C4C)

platform, established by the Association of German Engineers (VDI) and the VCI, sees the development of a new technology path to accelerate greenhouse gas neutrality once more with the goal of achieving this by 2045. This will require an enormous effort in terms of materials, technology and finance. It calls for a radical shift in our energy and raw materials base, our production processes, and the material cycles in the chemical industry.

With "Next Generation Evonik," Evonik is initiating the green transformation of the company. What is changing in production and processing at Evonik? We want to reduce our CO_2 emissions by approximately one third by 2030. To do this, we continue to expand our so-called Next Generation Technologies: In production and in our plants, Evonik is focusing more and more on new procedures and methods. Through the further development of our existing production processes and the commissioning of new plants, we are saving energy and significantly reducing our CO_2 emissions worldwide. To make this possible, we are making significant investments in our infrastructure.

Evonik is already the "enabler" of sustainability in a variety of markets and areas of life. This includes, for example, crosslinkers for windmills, gas separation membranes for biogas and hydrogen, pharmaceutical active ingredients, as well as natural-based active ingredients for cosmetics. The more innovative and sustainable products we deliver, the better we can meet the needs of society, industries, and customers.

Recommendations

China

It is necessary to support profound adjustment in the energy and industrial structure and force the reform of enterprise development models by improving the policy tools for green development of the manufacturing industry. The government should build a differentiated and targeted regional policy system, deepen the concept of green development through legislation, administration and other means, and provide resource allocation and support for common core technology research and development.

Besides acceleration of the green transformation and upgrading of traditional industries, a green whole industry chain in emerging fields should be established to enhance the green lifecycle of products and green management capabilities of enterprises, encourage the application of green energy and develop green trade. The key lies in the continuous innovation and promotion of major green technologies.

Digitalization is an important means to advance the traditional manufacturing industry to achieve green transformation. Now enterprises use digital technology

for intelligent perception of the manufacturing process, product lifecycle management, footprint tracking analysis and evaluation, energy management and emission monitoring, as well as supply chain resource recycling. To improve the green production level of industry, it is necessary to further strengthen the in-depth application of next-generation information technologies such as artificial intelligence, Internet of Things, cloud computing, blockchain and big data in the manufacturing field.

Germany / European Union

No additional burden on the chemical industry: The Green Deal has a multi-faceted approach. Due to the complexity and diverse interactions, it is important to pay attention to the consistency and feasibility of the objectives, to prioritize them, and to regularly review them. It is also important to resolve conflicts of objectives. Bearing in mind the geopolitical consequences of the war in Ukraine, every effort should be made to avoid any new impacts from the Green Deal, and industrial policy should be aimed toward supporting the economy. Only a strong industrial sector can support the transformation.

A key lever for rapid and market-economy-driven transformation is an internationally competitive European electricity price for industry. To prevent distorted competition impacting the industry, electricity prices must be lowered over the short and medium term – for example, through the reduction of the electricity tax to the European minimum level, and a review of state-initiated energy price components, power-purchase agreements, and the rapid expansion of cost-effective renewable energy capacity. In addition, massive expansion of the infrastructure for hydrogen and electricity is required.

For the green transformation to succeed, planning and approval procedures must be carried out quickly. The procedures to be negotiated before wind turbines and industrial plants can be commissioned are far too long and complex, and this applies even to minor changes to existing plants. Investments and innovations are being slowed by increasingly complicated procedures. Companies will have to update their plants at record speed in the coming years. To enable this, inflexible administrative procedures must become more flexible, bureaucracy must be reduced, and approval procedures must be accelerated. Accelerated planning and approval procedures are required to enable the expansion of a highly efficient energy infrastructure, which will ensure security of supply and achievement of our climate goals. As a matter of principle, for all transformation processes, technology neutrality should be prioritized.

Conclusion

Combating climate change is a global challenge, which can only be met through international cooperation. The community of nations must collaborate actively, and they must each take responsibility. This applies to Germany and the EU and equally to China and the US. We must work as partners to leverage economic potential, promote global economic and technological exchange, and collaborate in the struggle against climate change and other global challenges.

As we transition to a climate-neutral industrial society, the chemical industry can and will play a central role. Here at Evonik, we started out on this path a long time ago. By continuing to further develop products, processes, and our production with sustainability, we ensure profitability and growth. “Driving the green transition of manufacturing” means for us enabling our customers to solve the future problems. This is in line with our aspiration to improve the lives of people, day by day.