

Environmental Technologies in Germany

ISSUE 2018/2019

A long tradition in environmental technologies aligned to pioneering environmental policy and a supportive legal framework have helped establish Germany as a leading green economy player and home to one of the most advanced environmental technologies markets worldwide.

Growing Greentech Market

Climate change, growing populations, new technologies and increasing demand for scarce resources – many factors lead to the continually rising global demand for sustainable and environmentally friendly products. With a global trade share of 14 percent in 2016, German greentech products are especially sought after. It is a matter of fact that environmental protection and sustainability are imperatives for preserving our planet for future generations. What is less known is that the markets for environmentally friendly and protecting products are one of the key success factors of the German economy. In 2016, the markets for environmentally friendly energy generation, energy efficiency, resource efficiency, sustainable mobility, sustainable water management, waste management and recycling accounted for 15 percent of German GDP. This is expected to increase to 19 percent by 2025. The circular economy and the sustainable water industry are expected to experience growth of more than five percent per year – reaching a total market volume of EUR 110 billion by 2025.

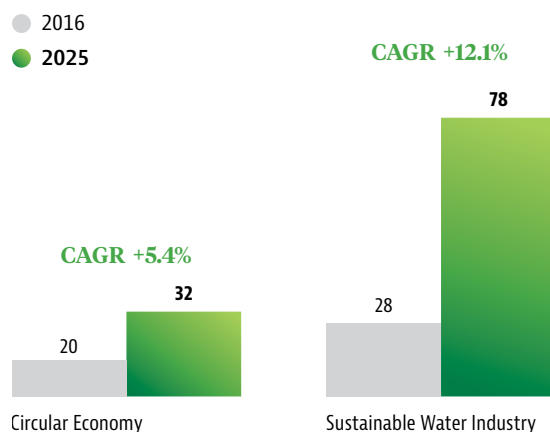
The field of sustainable water technologies with expected annual growth rates of more than 12 percent until 2025 represents the segment with the highest growth. With an estimated annual increase of almost 15 percent for the period 2016 to 2025, the market for recycling technologies offers the fastest-growing opportunities in the circular economy and waste management markets.

Environmental Technology Incentives

Germany offers incentives for all companies, with a large selection of programs designed to support a wide range

of business activities at different stages of the investment process. In the field of environmental technologies, there are a number of programs available to strengthen this increasingly important market. At the federal level, the *Umweltinnovationsprogramm* (Environmental Innovation Program) promotes the implementation of pilot projects with non-repayable grants of up to 30 percent of eligible costs. The “New Urban Agenda” program concentrates on sustainability and resilience issues arising from increasing urbanization. The federal government initiative aims to fund measures in order to develop and test locally adapted strategies for the sustainable development of urban regions and to increase urban resilience.

Germany's Environmental Technologies Markets: Market Volume and Annual Growth in EUR billion



Source: BMU and Roland Berger 2018

MARKET OPPORTUNITIES

Water Technologies in Germany

Germany is home to Europe's biggest sustainable water management market. A commitment to sustainable water innovation also makes it the continent's leading exporter of water treatment technologies as well as a major provider of solutions that guarantee higher efficiency and water quality standards for water-intensive industries around the world.

Europe's Biggest Sustainable Water Management Market

Germany is Europe's largest exporter of water treatment technologies, with an export volume of EUR 977 million in water and wastewater technologies in 2016. The German market for sustainable water management is Europe's largest, with EUR 28 billion volume equivalent to four percent of global market volume. German water protection policy sets the framework for development and innovation in the water sector. The Federal Water Act and corresponding legislation – including the Drinking Water Ordinance, the Waste Water Ordinance as well as a number of local federal state provisions – create the legal basis for a transboundary and sustainable water management market.

“Although we have been present through a partner for nearly 40 years, we have now decided to open up our own subsidiary. Germany Trade & Invest has assisted us in a very professional and effective way and securely guided us through any obstacles.”

Chris Engström, CEO, Eletta Group

Energy-saving Technologies

The German climate protection plan is premised upon an increase in demand for energy-saving technologies. This has created significant market opportunities for providers of sustainable water technologies that optimize processes, reduce wastewater levels, and augment water supply and water management systems. According to the Federal Environment Agency (UBA), water abstraction levels in Germany dropped perceptibly in the last 20 years. More efficient production processes and the reuse of water have enabled the manufacturing sector to significantly cut costs.

Sewage Sludge Treatment and Phosphor Recovery

Thirty-eight percent of sewage sludge was used in agriculture in 2014. Germany's sewage sludge ordinance (*AbfKlärV*) regulates the application of sewage sludge on agriculturally

€28 bn

Sustainable water technology market volume in Germany in 2016 – four percent world market share

€110 bn

Investment since 1990, creating Europe's biggest sustainable water management market

> 9,300

Number of public waste water treatment plants in Germany

€977 m

Export volume for water and waste water technologies in 2016

Source: BMU, BDEW, VDMA 2017

and horticulturally used soils. The use of sewage sludge for fertilization purposes is to be prohibited, and phosphor and other nutrients recovered. No specific recovery technologies have been defined. This will allow new market players that provide innovative recovery procedures the opportunity to successfully enter the market.

Micropollutants and Microplastics

In 2016, just 7.9 percent of German surface water and 63.7 percent of groundwater bodies achieved “good status.” There is an acute need for cost-effective and energy-efficient solutions to eliminate micropollutants, especially in municipal waste water systems. The introduction of the “fourth purification stage” within treatment plants is currently being tested; applying technologies such as adsorption on active carbon, nanofiltration, and reverse osmosis. Marine litter presents another challenging issue, with several action programs to counter the problem set up under German leadership. The “oceans without polluting waste” national action plan includes efforts to reduce the discharge of micro plastic particles. According to the German Federal Environmental Agency (UBA), the use of microplastics in cosmetics should be abolished by 2020.

Adapting to Climate Change

The pressing need to adapt to climate change is creating increased demand for forward-looking concepts, measures and strategies. In Europe, the minimum cost of not adapting to climate change has been estimated at EUR 100 billion a year in 2020, rising to EUR 250 billion in 2050. A commitment to further develop the German strategy on adaptation to climate change – and the provision of adequate resources – is enshrined in the 2018 coalition agreement of the country's current government.

Optimized Water Resource Monitoring

In Germany, climate change is creating increased demand for better monitoring of water resources and aquatic systems as well as extremes. The efficiency of water use, flood and sea protection and the appropriate infrastructure must be improved. A wide range of projects has already been initiated at the federal and local level, with projects promoting research, strategy development and the implementation of concrete measures. According to the UBA, more than 90 percent of all major German cities are actively developing concepts and strategies for adaptation to climate change. Companies offering adaptation technologies should approach the market now to provide solutions for the future resilient city. The German strategy on adaptation to climate change (DAS – *Deutsche Anpassungsstrategie an den Klimawandel*) sets out the optimal framework for projects and investments.

“Between 1980 and 2011, floods in Europe caused direct economic losses of more than EUR 90 billion. The minimum cost of not adapting to climate change is estimated at EUR 100 billion a year in 2020 and EUR 250 billion in 2050 for the whole EU.”

EU Commission – The EU Strategy on Adaptation to Climate Change

Drinking Water Management Solutions

The major source of drinking water in Germany is groundwater and spring water (70 percent). However, in some regions there are only few usable groundwater reserves. Water distribution systems are therefore integrated to balance supply and demand. Complementary rainwater management measures are implemented in urban areas. Decentralized rain water management has been demonstrated in Berlin as part of the KURAS project.

Flood Risk Protection Strategies

Technical flood protection plays an important role in a number of flood protection strategies in Germany. Major technical flood protection elements include retention measures (reservoirs, flood retention basins, polders (discharge areas) and river engineering measures (dikes and dams, coastal protection measures, walls, barriers, and mobile flood protection systems as well as flood forecast systems). Alongside those measures there is a need for improvement and innovation. Customized area management also needs to restrict the sealing of surfaces – especially in highly populated areas – to ensure that rainwater can soak away after heavy rain events. The "sponge city" concept which has been introduced in Hamburg, calls for urban areas to be adapted to collect rainwater on green roofs or in public places, allowing these areas to flood for a short time where there is excess water.

Quality of Life in Urban Centers

In order to counteract and prevent urban climatic effects, a number of measures can be implemented alongside "smart city solutions." These include, for example, the establishment of infrastructure; with vegetation and water areas within the cities, leading also to an improvement of air quality and a decrease in noise exposure. Moreover, customized area management needs to restrict the sealing of surfaces – especially in highly populated areas – thereby ensuring that there are adequate infiltration possibilities as well as fresh air "bubbles." As a highly relevant issue on the national agenda, this leads to rising investment volumes in the air quality technology sector. The Roof Water-Farm project in Berlin, supported by the German Federal Ministry of Education and Research (BMBF), demonstrates ways to decentralized urban water management and food production.

Climate Adaptation Tools

There are a number of support tools for assessing climate change impact available in Germany. These allow stakeholders to assess climate change impact, minimize risk and identify market opportunities. An overview of some of the most important tools and their target groups, as described by the UBA, can be found on our website.



Please visit our website to view a selection of current resources.

www.gtai.com/climatechange

Waste Management & Recycling in Germany

Germany's leading global recycling industry status has its basis in progressive waste management legislation that allows companies to thrive. The provisions of the Waste Management Act (*KrWG*) are the backbone of the growing attractiveness of the country's circular economy market.

Global Market Leader

In 2016, the German waste management and recycling markets totaled approximately EUR 20 billion – equivalent to 16 percent of global market volume. The German circular economy industry is expected to grow by 5.4 percent annually through 2025. In 2016, more than 411 million metric tons of waste was generated in Germany, with a recycling rate of just 68 percent. Building and construction materials represent the lion's share of waste; thereby making it one of Germany's most attractive recycling technology markets.

Progressive Environmental Regulation

The *KrWG* enshrines the notion of product responsibility by defining responsibilities along the product life cycle and offering incentives to manufacture durable products. The act was amended in 2012, with the goal of turning a waste management culture into a resource management culture, minimizing waste generation, and maximizing reuse and recycling. The five-step waste hierarchy of waste avoidance, reuse, recycling, energy recovery and disposal is one of the key measures to achieve these goals. Based on this hierarchy, the law ensures that precedence is given to the environmentally best option, namely prevention of waste, reuse and recycling.

Construction Materials Recycling

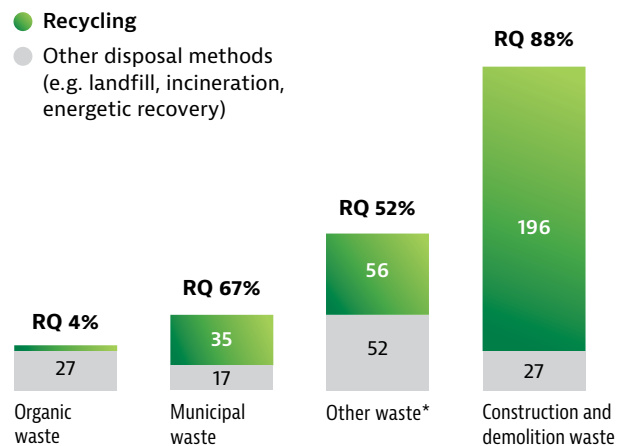
Germany's construction industry creates 223 million metric tons of waste every year, making it the country's largest source of refuse. In 2014, a large proportion of mineral construction waste was re-used. However, just 1.4 percent of 14.2 million metric tons of construction site waste was recycled. A number of federal programs – especially in research and development – promote resource efficiency in buildings. The main research program in the field of future buildings, *Zukunft Bau*, also puts an emphasis on improving building material recycling methods and maximizing the efficient use of mineral resources.

Packaging Recycling Technology

Demographic changes, such as the increase of one- and two-person households, a growing tendency to eat out, and the rise of mail-order and e-commerce business models, have led to a constant increase in packaging waste.

Waste Type Volume and Recycling Quota (RQ) Levels in Germany 2016

in million tons



*incl. production and manufacturing activities
Source: Federal Statistical Office 2017

Domestic packaging waste volume reached its peak in 2016 with 18.2 million tons – of which 70 percent was recycled. The German Packaging Act, which insists upon higher recycling quotas for packaging, poses a significant challenge for many industries. The ban of plastics waste imports to China aggravates the problem, especially for plastic packaging. All of these developments point to the pressing need for new and improved packaging recycling technologies.

Niche Market Opportunities

Innovations and new technologies are changing the demand for resources worldwide. In Germany, the energy transition, digitalization and a growing awareness for sustainability among consumers lead to the development of a series of niche markets offering growing potential for innovative foreign companies. Amongst others, the wind turbine and CFK recycling, electronics recycling, electric car battery recycling, and circular fashion markets present particularly attractive opportunities.



Please contact us to receive detailed information about these developing markets.

invest@gtai.com

Supporting Innovation

Innovation is key to Germany's leading role in the global environmental technologies market. The UFORDAT database (doku.uba.de) lists more than 120,000 research projects of more than 10,000 institutions researching in the fields of water, soil, air, nature, noise and energy as well as climate change, biodiversity, resource efficiency, and sustainability.

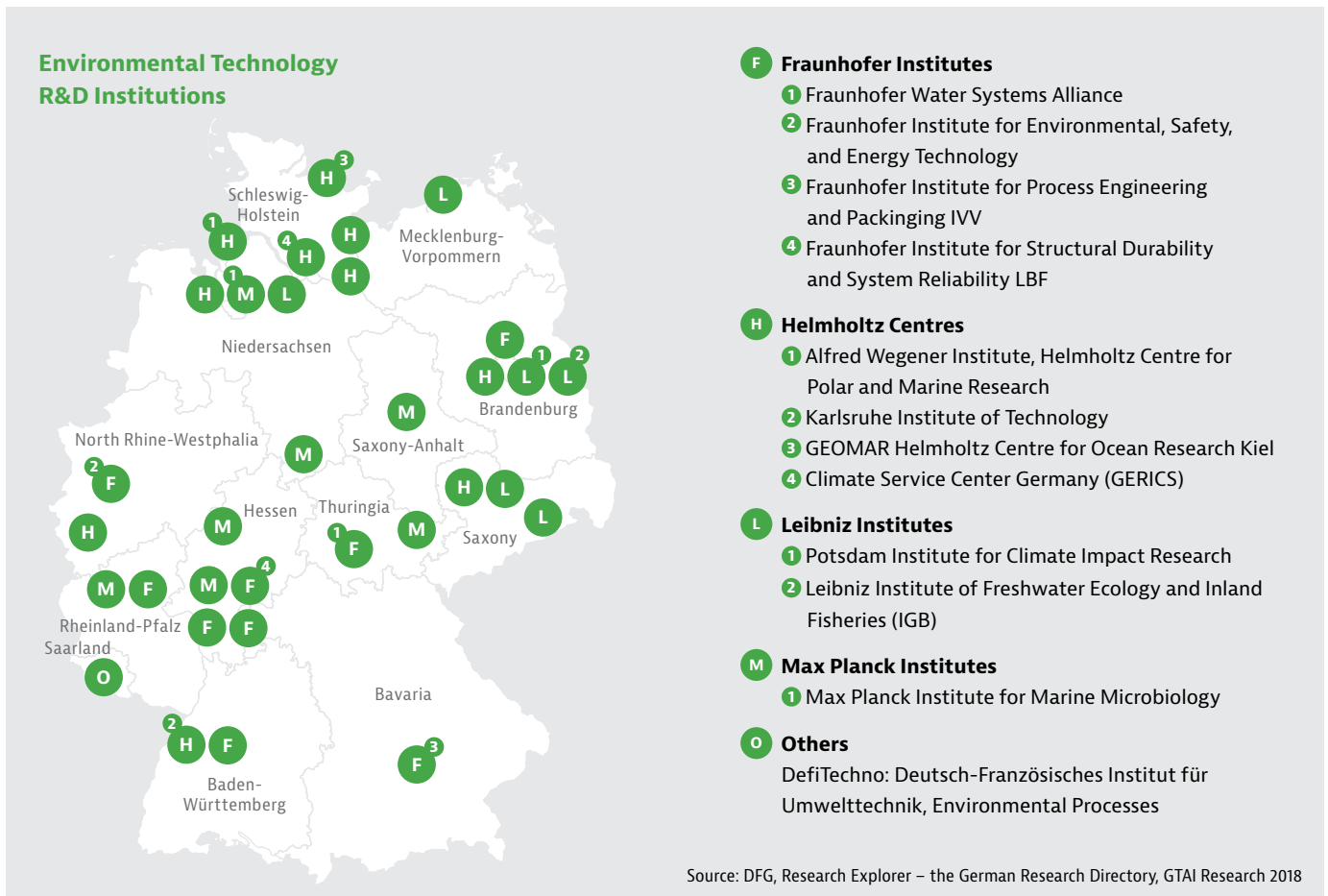
Research and development activities in the area of environmental technologies are supported by a number of government programs within Germany's overarching High-Tech Strategy which seeks to provide innovative technological solutions to global challenges.

To date, the BMBF has invested approximately EUR 100 million in sustainability research. Within the framework of the "Research for Sustainability" (FONA) program, numerous cooperation networks focus on areas including sustainable water management, marine and polar research, climate com-

modities, energy and resources, biodiversity, land, and soil. Some EUR 2 billion will be invested in the third renewal of the program (FONA³) for the period 2015 to 2020. The program especially welcomes "funding newcomers" under the umbrella of the "KMU-Innovativ" FONA initiative. Since its launch in 2007, more than EUR 1 billion has been granted to 1,500 projects involving a total of 2,500 SMEs.

As well as attractive governmental support, a highly skilled workforce and a varied research landscape offer ideal conditions for foreign companies planning the set-up of research and development facilities in Germany. World-renowned research facilities, institutions and universities represent potential partners for successful research collaborations.

➔ Whichever way you choose to bring your innovation to Germany, GTAI can support you. Contact us at invest@gtai.com



OUR SERVICES

About Us

Germany Trade & Invest (GTAI) is the foreign trade and inward investment agency of the Federal Republic of Germany. The organization advises and supports foreign companies planning to expand into the German market and assists German companies seeking to enter foreign markets.

Investment Location Germany

GTAI provides close-to-market information to international companies looking to enter German markets. Our specialist industry teams prepare all of the relevant information essential to business success in Germany. GTAI's comprehensive range of information services includes:

- Market and industry reports
- Market entry analyses
- Business and tax law information
- Business and labor law information
- Funding and financing information

Business Location Services

GTAI supports international companies from market entry to business start-up in Germany. Expert project teams advise and assist in the business establishment phase. GTAI's range of free services includes:

- Legal and tax-related project support
- Funding and financing advisory services
- Site visit organization
- Local partner and network matchmaking
- Public and private partner coordination

All investment-related services are provided entirely free of charge. Our specialist industry teams have hands-on experience in their respective industries and treat all investor enquiries with the utmost confidentiality.

Imprint

Publisher

Germany Trade and Invest
Gesellschaft für Außenwirtschaft
und Standortmarketing mbH
Friedrichstraße 60
10117 Berlin
Germany
T +49 30 200 099-555
F +49 30 200 099-999
invest@gtai.com
www.gtai.com

Executive Board

Dr. Jürgen Friedrich, Chairman/CEO
Dr. Robert Hermann, CEO

Editor

William MacDougall,
Germany Trade & Invest

Authors

Flérida Regueira Cortizo, GTAI
Annika Förster, GTAI

Layout

Danielle Röbbenack, GTAI

Print

Kern GmbH, 66450 Bexbach
www.kerndruck.de

Picture Credits

Front page:
GettyImages/spwidoff
Map of Germany:
fotolia/Artalis-Kartographie

Order Number

20993

Notes

All rights reserved.
©Germany Trade & Invest, April 2018

Reproduction, in whole or in part, only permissible with express prior authorization. All market data provided is based on the most current market information available at the time of publication. Germany Trade & Invest accepts no liability for the actuality, accuracy, or completeness of the information provided.

Supported by:



on the basis of a decision
by the German Bundestag