

GREENTECH MADE IN GERMANY

North Rhine-Westphalia is Leading
the Way towards a Green Economy



The Green Economy is the Economy of the Future

Without a doubt, the transition to a sustainable future is one of the most urgent challenges of our time. The need for change has been emphasized by initiatives such as the Green Deal of the European Commission, as well as by many industrial players who are driving the development forward. As this need for change grows, so does the demand for green solutions, offering highwomic potential.

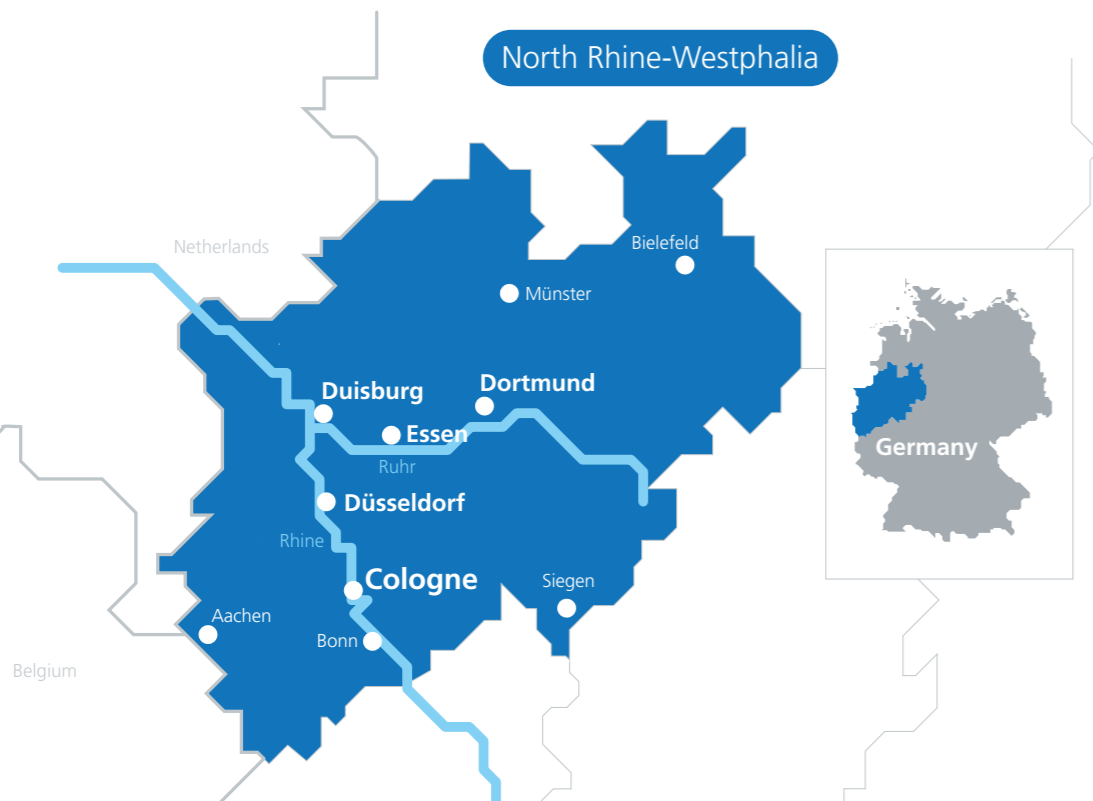
Green products and services are drivers and enablers for the ecological transition, and at the same time are embedded in the system and influenced by societal trends. A green economy is also the overall goal of the transition towards a sustainable society and depicts **an economy that is in line with our planetary boundaries.**

North Rhine-Westphalia (NRW) is home to a particularly high number of companies that provide sustainable products and services. From large industrial sectors to businesses in farming and forestry, environmentally friendly and resource-saving products and services are being developed in all key sectors of the green economy, **accounting for 7 % of the overall economy** (compared to the gross value added).

With its robust and growing green economy, NRW is well-positioned to play a **leading role in the global transition** to a more sustainable future. However, this thriving ecosystem also relies on businesses and innovators from abroad to complement its offerings.

The sectors of the green economy in NRW include:

-  Environmentally friendly energy conversion, transportation and storage
-  Energy efficiency and energy conservation
-  Materials, material efficiency and resource management
-  Green mobility
-  Water and sewage systems and management
-  Pollution monitoring, mitigation and restoration technologies
-  Sustainable forest management and wood industry
-  Environmentally friendly farming



North Rhine-Westphalia is Germany's Green Economy State No. 1

North Rhine-Westphalia has been going the way towards "green" for a long time. It was the first federal state in Germany to introduce the idea with a targeted green economy strategy starting in 2012.

This new policy-making approach in NRW is defined by its technological and social openness, creating an **environment conducive to innovation for change** e.g., through business awards, start-up support and the yearly Green Economy Summit.

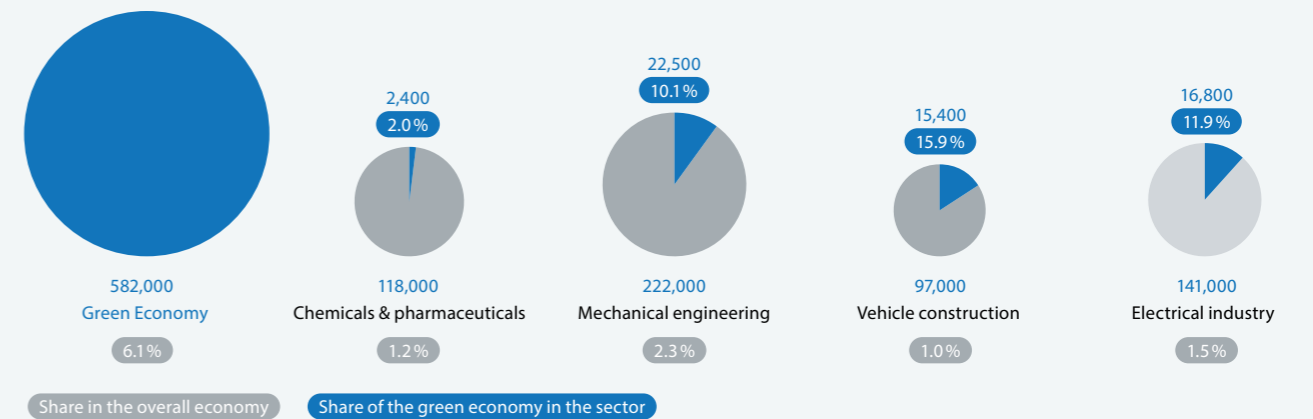
NRW has occupied the **top position in Germany** as a provider of eco-, resource- and climate-friendly products, services and technologies for the last ten years.



North Rhine-Westphalia was the **first federal state** to introduce the idea of a green economy as a **policy-making approach.**

With a labour force of 582,000, the green economy **employs 6 %** of the federal state's working population and more than important sectors like chemistry & pharma, mechanical engineering, vehicle construction and electronic industry all together and more than in other federal states in Germany. On top of that, the gross value creation per capita is 15 % higher than in the state's overall industry.

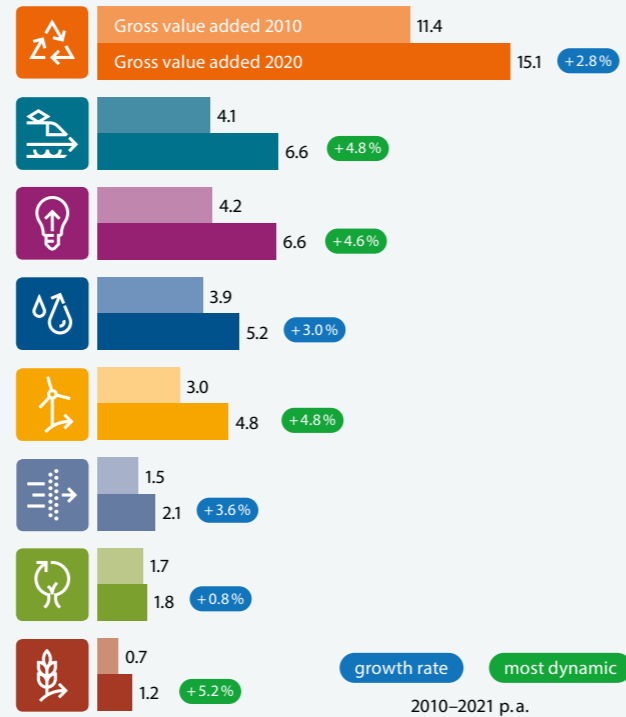
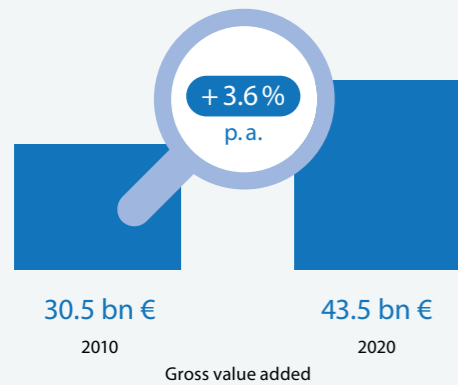
The number of people employed in the green economy has **grown by 1.5 %** per year compared to 2010. Even in the COVID-pandemic the growth of the green economy continued and proved its **resilience to crisis** as well as its contribution to social well-being.



NRW key sectors compared to the number of people in employment in 2021
Source: Prognos, own calculation. Database: Bundesagentur für Arbeit, IT.NRW

North Rhine-Westphalia is **Germany's largest provider** of products and services in the green economy (17.4%). In 2020, the sector accounted for 43.5 billion euros gross value added in NRW and around 7% of the federal state's gross value creation. Activities in the sub-sector of materials, material efficiency and resource management play the most important economic role.

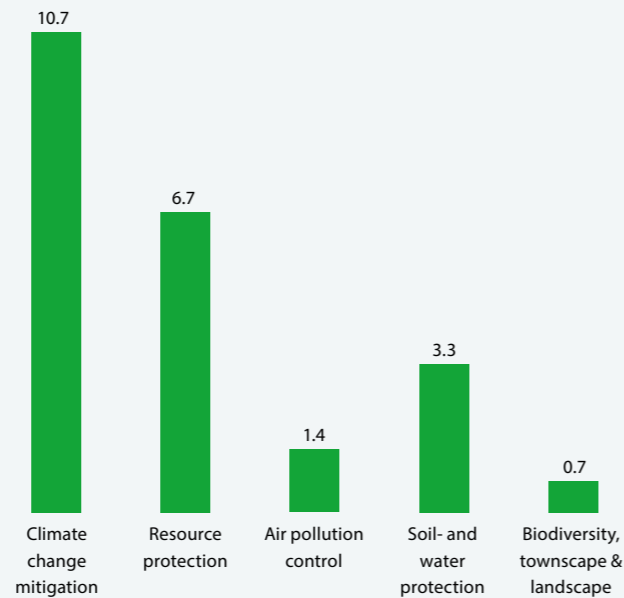
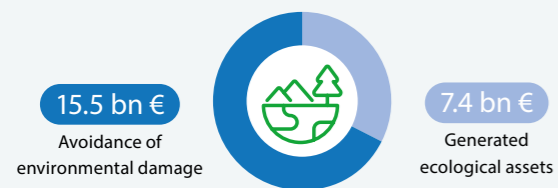
Between 2010 and 2020 the green economy in NRW **grew by 3.6% annually in comparison to 2.7% of the overall economy.** The sub-sectors of mobility, energy efficiency and renewable energies have developed most dynamically.



Gross value added in sectors of NRW's green economy in 2020 and growth rate since 2010 in billions of euros
Source: Prognos, own calculation. Database: Statistisches Bundesamt, Bundesagentur für Arbeit, IT.NRW

NRW's green economy strategy demonstrates that a commitment to sustainability can drive innovation, create new jobs and economic opportunities, while also protecting the environment.

Making it a **win-win for both the environment and the economy**, the gross value added of 43.5 billion euros is topped up with almost **23 billion euros** of ecological value added and of avoided environmental damage. In 2021, for example, nearly one-third of all activities in North Rhine-Westphalia's green economy was related to climate change adaptation services or technologies.



Ecological performance in billions of euros in the green economy of NRW
Source: Prognos/IÖW, own calculation

Innovation in NRW – the Story of a Successful Transition

Green innovations are important drivers of an urgently needed transformation towards a sustainable and future-proof economy at large. NRW with its former mining areas has been facing an immense structural change. Due to these changes, NRW has developed into a highly innovative region with each sub-region demonstrating a unique range of solutions for the questions of a fundamental change in resource, climate, and spatial behaviour. Key measures of the green economy strategy NRW are geared towards the promotion of these innovations.

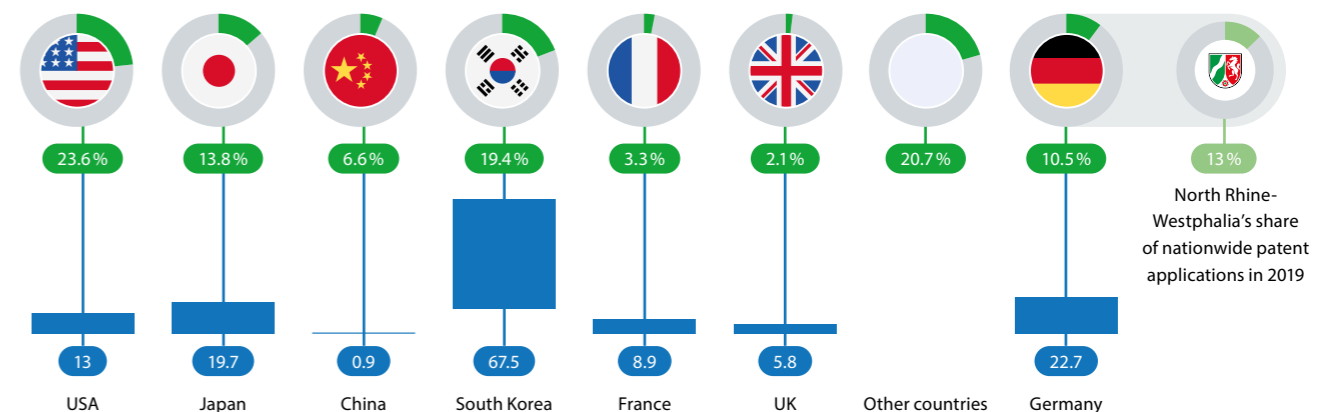
The region entails a vibrant network of universities and scientific institutions. **Europe's first quantum computer** of more than 5,000 qubits for example has been recently installed in Research Centre Jülich (Rhineland Mining Area) and provides locational advantage.

Almost **every fifth start-up** in Germany settles in NRW with its innovative hubs in its many cities like for example Cologne, Düsseldorf and Aachen. NRW also accounts **high diversity among its innovators: 27 companies** contribute to half of its registered patents, ranking best in Germany with this proportion.

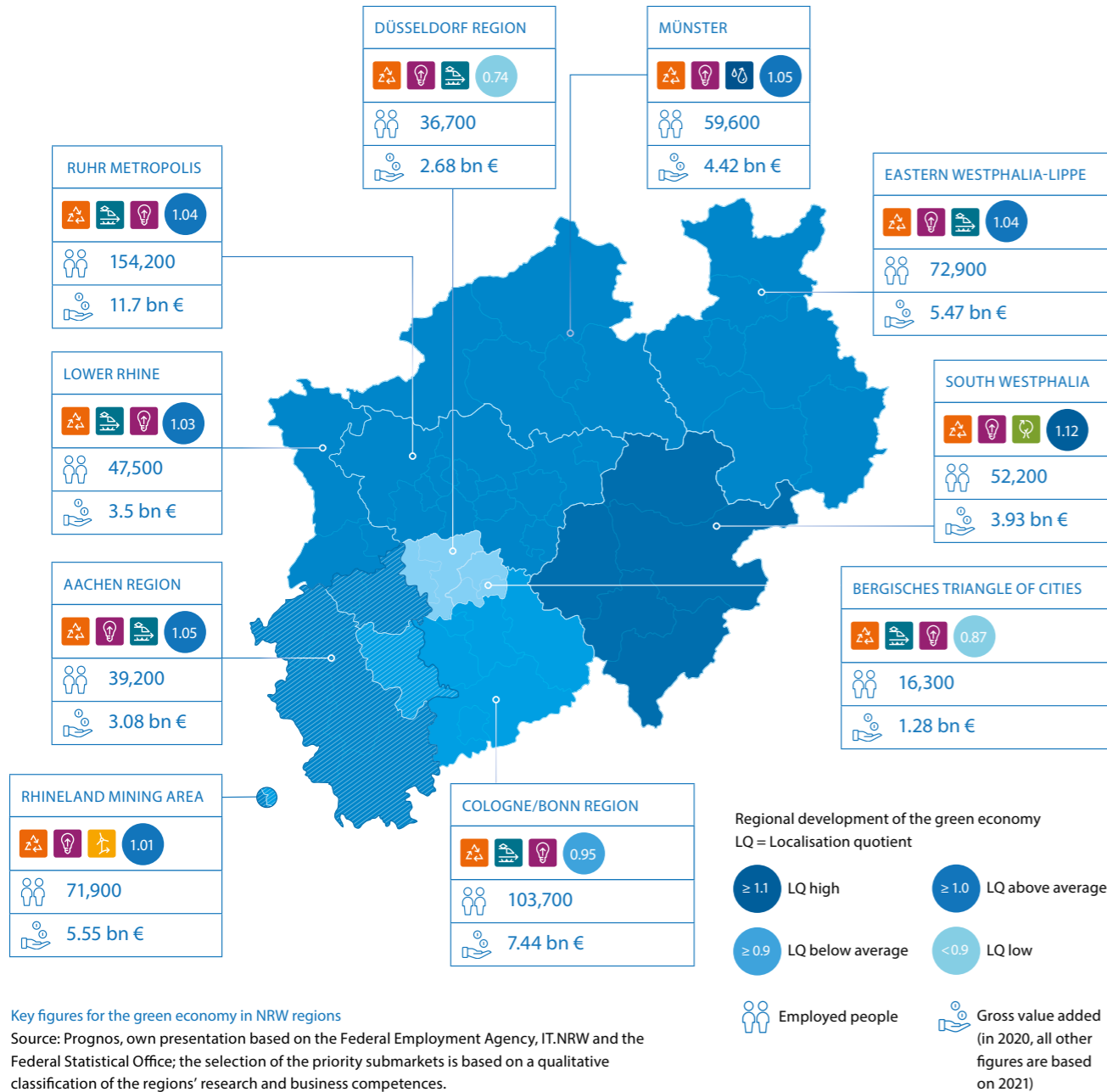
NRW can also be seen as one of the **global innovation leaders** for the transition towards sustainability when looking into patents. With a share of around 10.5% (2019) Germany registered the fourth most patents in the green economy after the USA, Korea and Japan. When relating the patents to the number of inhabitants, however, Germany **ranks second** after Korea. NRW accounts for **13% of Germany's patent registrations** ranking



3rd after Bavaria and Baden-Württemberg in the South. However, its patents are more often cited (18.4%) than patents from all other German federal states.



Share of worldwide patent registrations in the green economy in 2019, absolute (above), and per 100,000 inhabitants (below)
Source: Prognos, own calculation. Database: PATSTAT



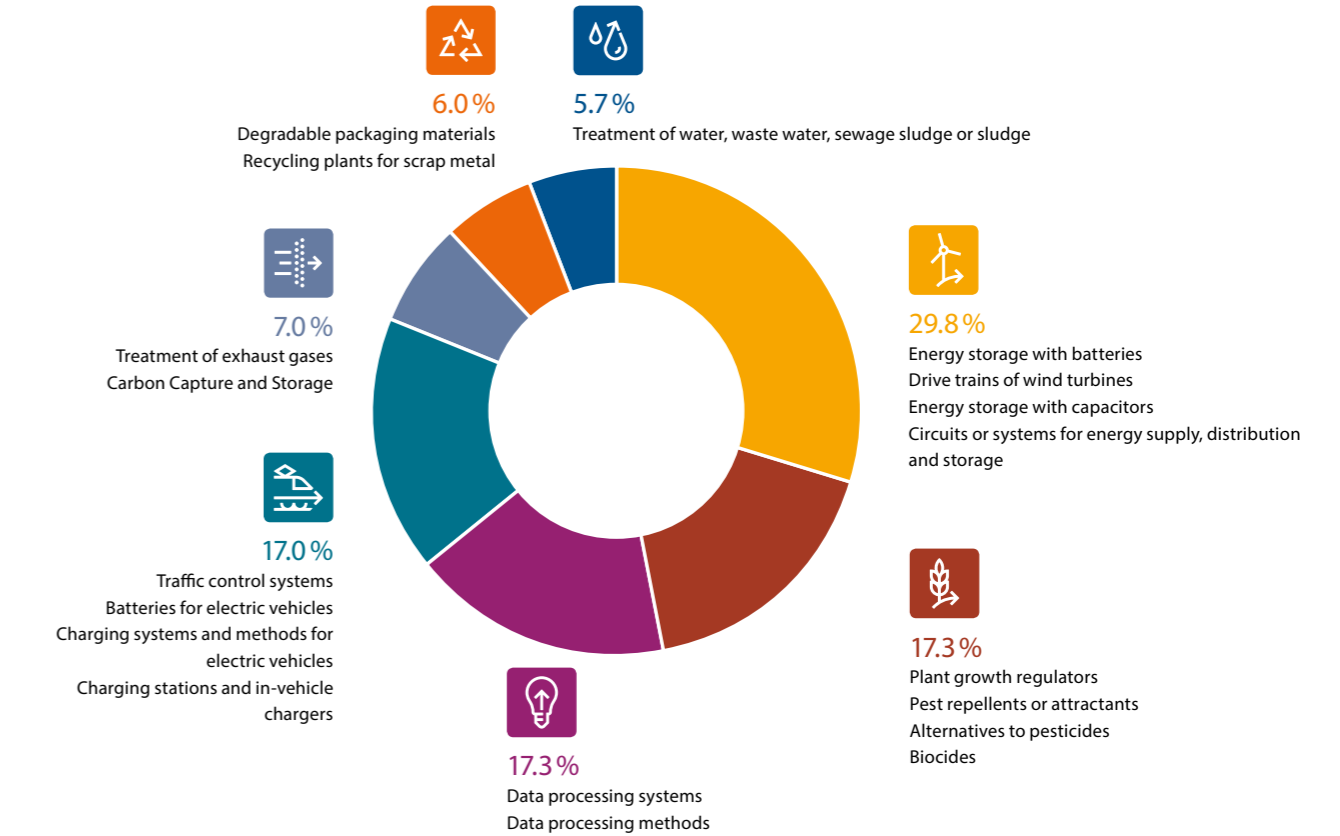
Key figures for the green economy in NRW regions
Source: Prognos, own presentation based on the Federal Employment Agency, IT.NRW and the Federal Statistical Office; the selection of the priority submarkets is based on a qualitative classification of the regions' research and business competences.

Almost one third of NRW's patents have been registered within the field of **renewable energies**, including energy storage, wind power and switch systems. The number of patents has particularly been growing in intelligent energy systems and grids. Many originate from hidden champions like the company Flender from Bocholt who continuously improves drive trains of wind turbines.

17.3 % of patents have been registered in the field of data processing systems and methods for **energy efficiency**. The start-up Lumoview from Cologne for example patented a sensor that can digitise the interior of building in just a few seconds to automate building analysis. The Deutsche Post is successful with innovations for the automation of transport.

The strength of innovation in **sustainable agriculture** (17.3 % of NRW patents) is a unique selling proposition even for the global market. Patents are related to plant growth regulators, pest repellents or attractants, alternatives to pesticides and biocides. The Excellence Cluster PhenoRob of the University of Bonn develops many digital technologies to support the transition for a more sustainable crop production.

17 % of patents in NRW have been registered in the field of **green mobility** with the highest growth rate (+9 %) in intelligent traffic management systems and infrastructures. To name only a few innovative companies from NRW: Magna Powertrain from Cologne develops electrification solutions for sustainable mobility, Evonik works on the processing of biofuels (amongst others) and Phoenix Contact contributes decisively to the safety of charging processes.



Insights into NRW's green economy patents: distribution of patent applications by sub-markets and outstanding innovation fields in 2019
Source: Prognos, own calculation. Database: PATSTAT. The sector of sustainable forest management and wood industry has not been accounted for in the patent analysis due to a lack of data.

NRW is national innovation leader in the market segment of **resource efficiency and materials**. Almost one third of German companies register their patents for a circular economy in NRW, such as on degradable packaging materials and recycling plants for scrap metal. Other examples include research on inverse production by Fraunhofer Institute for Laser Technology ILT and high-quality recycling of lithium-ion batteries in the project DemoSens at Münster University of Applied Sciences.

In the field of **water and sewage management** NRW registered around 6 % of its patents. The lighthouse project of renaturation of the river Emscher in the Ruhr Metropolis has gained international recognition. In addition, the water sector plays an important role for climate change adaptation and helps to avoid extreme floodings.

The Green Economy Network NRW regularly publishes the results of innovation screenings on the climate, resource and spatial transitions and provides insights into the innovation scene of the federal state. The innovation radars provide more information about the aforementioned and many other companies and their innovations.

It uses a multi-level research methodology, a large number of interviews and various science dialogues to identify the innovators. More information will soon be available in English, but direct contact details can already be found in the German innovation radars.

To the innovations for tomorrow:
www.knuw.nrw/unsere-services/innovationstransfer/innovationsradare.html



“GreenTech Made in NRW” Provides Solutions Worldwide

The economic strength of NRW’s green economy is as well represented in its export activities worldwide. Between 2010 and 2021, the annual export volume achieved by North Rhine-Westphalian companies in the green economy rose from 10.5 to 14.2 billion euros. The green economy is thus a growth stimulus for export making up 7 % of NRW’s foreign trade.

Export of products and services for energy efficiency and **sustainable mobility** has been growing higher (3.1 % and 1.4 %) than the global market in these segments (2.6 % and 1.2 %). Sustainable drive technologies are holding

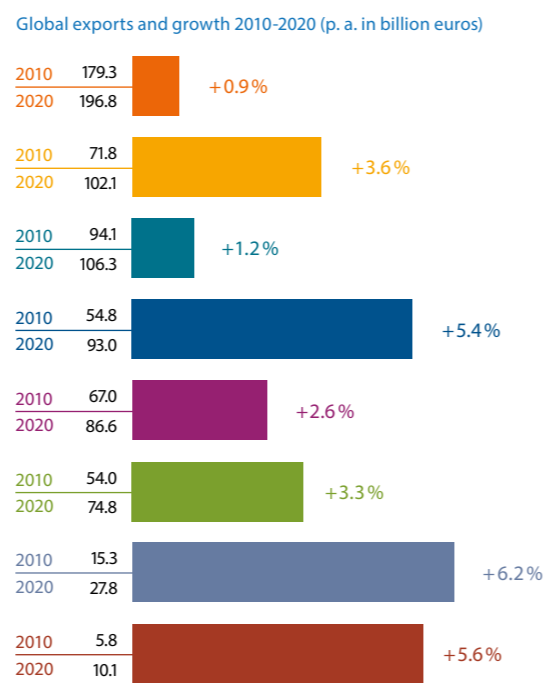
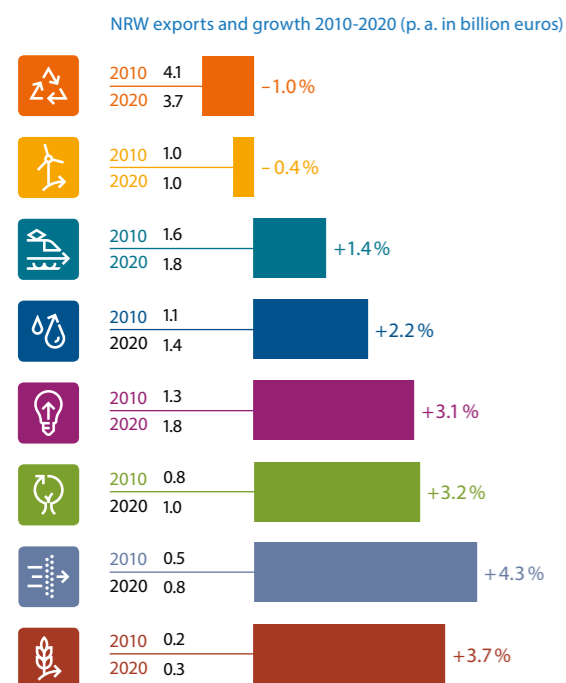
the record in export with a growth of 16.4 %. However, high prices for wood construction have recently led to a rising exports in **forestry**. Other strong export product are **water** and waste water grid components, secondary raw **materials and machinery** for the separation and treatment of waste.

to Belgium in 2021 the neighbouring countries play an even more important role.

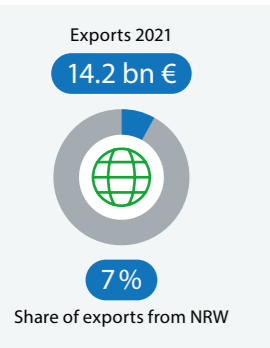
Companies can however still benefit more from the huge potential on the big global markets: By far the largest customer on the world market for environmental goods is the USA. Exports from NRW have almost grown as much as the global exports to the **USA** (4.8 % and 5.2 %). The second largest global market **China** continues to be an important market for NRW’s green economy with a current growth rate of 2.3 %. However, China’s demand has lately been declining and it is to be seen whether dynamics change here in the coming years. North Rhine-Westphalia has been losing ground in **South Korea**’s globally significant market as exports declined by 2.3 %.

NRW is eager to increase the export by foreign trade and is always looking forward to collaborating internationally.

Most important export partners for NRW’s green economy are still the **European countries** (60 %). With an export of 1.9 billion euros to the Netherlands and 1.3 billion euros



World market and North Rhine-Westphalian exports in billion euros in the Green Economy by submarkets, 2010 and 2020
Source: Prognos, own calculation, data basis: Bundesagentur für Arbeit, IT.NRW.



Want to Implement an Innovation from NRW or Market your Green Solution?

Find leading experts to help your business thrive!

The Green Economy Network NRW: we are happy to collaborate with you!



The Green Economy Network NRW is a hub for companies providing green technologies and services made in NRW. The Network also serves as a central point of contact for associations, universities, and economic development agencies in NRW.

To strengthen NRW’s green economy, the network identifies international market opportunities and promotes innovative technological solutions in the region and abroad.

- Innovation screenings and promotion
- Intersectoral dialogue with green economy partners
- International events and trade fairs to foster regional and international exchange



In the last years, the network has been strongly collaborating with European partners to discover and promote good practice examples of small and medium sized companies from all over the EU that have already implemented circular strategies.



www.knuw.nrw/green-economy-network-nrw.html

Here is a selection of other actors who support the transition to a green economy in NRW.

Visit the website of the Green Economy Network NRW at www.knuw.nrw/netzwerk/kooperationspartner-nrw.html to find the contact details of the partner institutions.

Greentech.Ruhr is a project of the economic development agency of the Ruhr metropolis. It is dedicated to the transformation of Germany’s former leading industrial area of coal and steel into a green innovation hub. It inter-connects contributors and relevant stakeholders on all levels and is always interested in companies that offer new skills and products.

KUER.NRW supports start-ups in the future-oriented sectors of climate, environment, energy efficiency and resource conservation. KUER mentors accompany them through all phases of their start-up – from brainstorming and the preparation of the business plan to the founding of the company, market launch and financing. KUER.NRW promotes innovations for a green economy in NRW.

The **Effizienz-Agentur NRW** gives industry and the skilled trades in North Rhine-Westphalia impetus for resource-efficient management and helps companies to implement circular design and circular economy approaches in their business models. The agency provides consulting services for resource efficiency, assistance with funding, and networking and learning opportunities.

:metabolon is a cutting edge waste plant and research facility. Its tested practices and internationally renowned research infrastructure can be of interest to any business at the technological frontier of waste treatment and circularity.

The **Network for Climate Adaptation in and from Companies NRW (NKU)** connects key stakeholders in the field of climate adaptation. It supports the development of innovative solutions to climate adaptation and offers support for companies that aim to increase the resilience of their branches or supply chains to changing climatic conditions. The network acts as a link between companies and other actors on the topic of climate adaptation at local and regional level and is always keen to involve new innovative partners.



Made in NRW: Eurostar highspeed trains

Contact points to set up your business in NRW:

NRW.Global Business, the state-owned trade and investment agency, is the partner for all companies when it comes to investment projects and settling in North Rhine-Westphalia, developing growth markets and networking with international business partners. NRW.Global Business conducts international location marketing for North Rhine-Westphalia and promotes foreign direct investment here worldwide. The experts analyse investment plans, identify suitable locations and accompany an investment project from the first step to successful settlement and beyond.

In its capacity as the promotional bank for North Rhine-Westphalia, **NRW.BANK** supports innovative green economy businesses in all financing-related matters – with promotional loans, equity finance and comprehensive, provider-independent and free promotional advice.

IHK NRW is the state association of the 16 chambers of commerce and industry (CCIs) in North Rhine-Westphalia, representing the interests of the CCIs and their member companies. In foreign trade promotion, the CCIs accompany enterprises in their foreign business activities as a reliable partner and offer a broad range of information and advisory services.

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The Green Economy Network North Rhine-Westphalia

The Green Economy Network NRW (KNUW), which is funded by the Ministry of the Environment, Nature and Transport of the State of North Rhine-Westphalia, supports the development of the green economy in NRW by providing opportunities for networking, information, research and development, internationalisation, and market development. The Green Economy Network NRW organises the annual Summit as the industry meeting place for North Rhine-Westphalia's green economy. The aim is to stimulate cooperation and networking, to promote the transfer of knowledge and market-ready technological solutions.

Further information:

www.knuw.nrw/green-economy-network-nrw.html

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