Federal Ministry
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go-cluster
EXZELLENT VERNETZT!

Climate action, sustainability and resource efficiency

The role of cluster initiatives

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Foreword

Dear readers,

Industrial transformation, crises like the COVID-19 pandemic, the war in Ukraine – Germany, Europe and the world are currently being tested, and climate action and sustainability are gaining a new dimension, of which the rising energy prices are just one aspect. It is up to us to understand these challenges not least as an opportunity for a sustainable and climate-friendly transition – and to make use of this opportunity. Sustainability and climate action can enable us to prevent future disasters and to strengthen the resilience of the economy and society as a whole.

The expansion of the Economic Affairs Ministry's portfolio to include climate action means that we are addressing a task we view as a common challenge: we are all responsible for attaining climate neutrality by 2045. Germany is aspiring to a comprehensive growth strategy which combines climate action and a competitive and resilient economy.

To this end, we are deploying a range of instruments, and in particular are offering funding measures. For example, the Federal Ministry for Economic Affairs and Climate Action is supporting energy-intensive industry in Germany on the path to greenhouse gas neutrality via the new "Decarbonisation in Industry" funding programme. 200 innovative climate projects across Germany have already been approved in the context of the National Climate Initiative. Taken together, that corresponds to funding exceeding €300 million. Also, this year, in 2022, the German Innovation Prize for Climate and the Environment is being awarded by the Economic Affairs and Climate Ministry for the first time. The prizes will be won by ten German firms and research institutions with outstanding innovations.

In this context, a very special role is played by cluster organisations: they experience the challenges of sustainable transformation on a daily basis. At the same time, they can deploy their valuable structures as the transformation is handled at regional level, and thus generate ideas and serve as incubators for the successful transition of industry to climate neutrality and sustainable economic activity.

Against this background, it is a pleasure to offer you this publication of the "go-cluster" programme. The programme of excellence of the Economic Affairs and Climate Ministry brings Germany's most effective cluster initiatives together. I hope you will be inspired by the successful projects and efforts in the field of sustainability and climate action of the member clusters and by the success stories from other countries. Find out how industrial clusters are moving towards a net-zero future and learn more about the significance of the German Sustainability Code and the special importance of sustainability reporting for clusters.

You will see that sustainable economic activity is not only important, but also brings commercial success.

I hope you will enjoy reading this brochure.

Sincerely yours,
Dr Franziska Brantner
Parliamentary State Secretary
at the Federal Ministry for Economic Affairs and Climate Action

Successful international efforts to decarbonise industry

Transformation clusters en route to climate neutrality

Interview with Accenture about the Transitioning Industrial Clusters towards Net Zero initiative

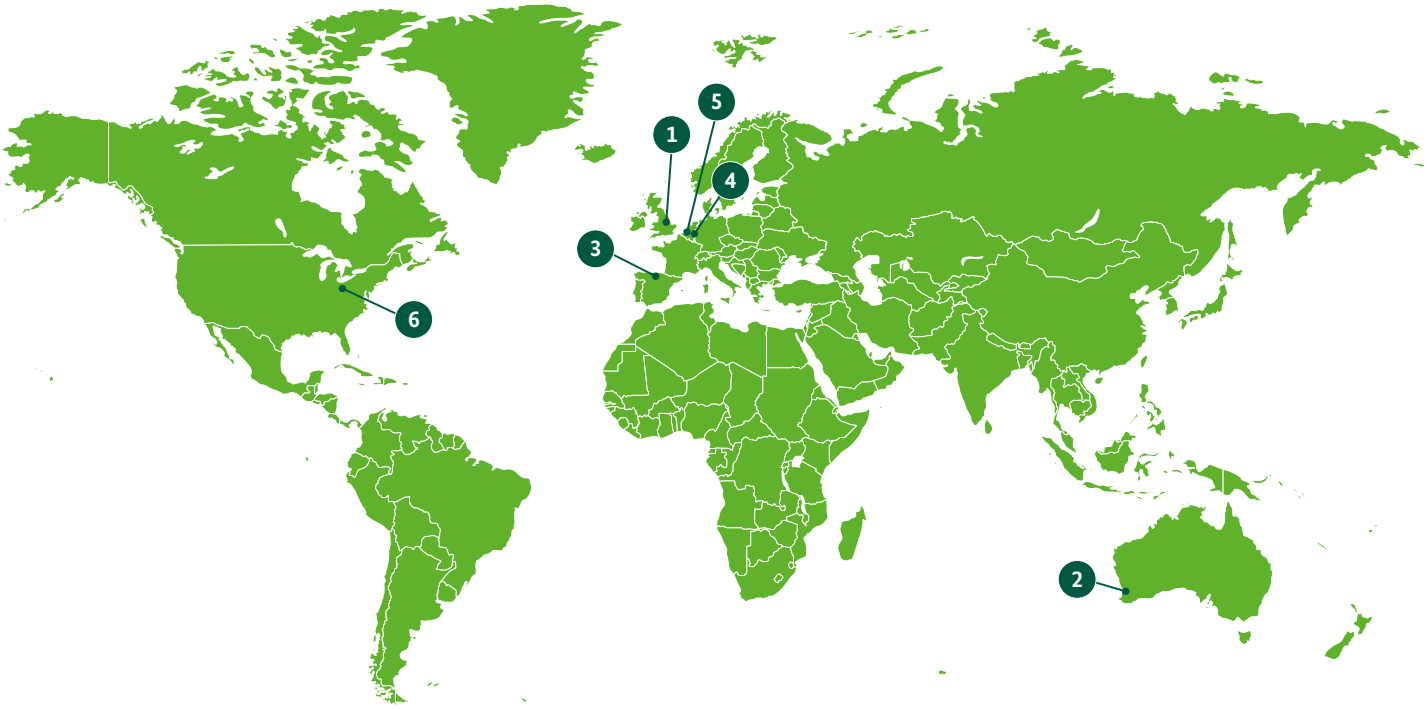
What led to the Transitioning Industrial Clusters towards Net Zero initiative?

In March 2021, Accenture published a report on various strategies to reduce industrial emissions in cooperation with the Energy and Materials Platform of the World Economic Forum and 38 partners from a range of sectors. It found that we can maximise the system value of the energy transition for industrials and their surrounding communities through industrial clusters with a cross-technology approach anchored on strong partnership, policy, financing, and technology strategies. Our organisations in collaboration with the Electric Power Research Institute (EPRI) went on to launch "Transitioning Industrial Clusters towards Net Zero" at COP26 in Glasgow in 2021, an initiative to promote the sharing of expertise amongst public, private and governmental agencies.

The Accenture, EPRI and the World Economic Forum's Transitioning Industrial Clusters towards Net Zero initiative takes a technology-impartial, collaboration-first approach to accelerate the progress of global industrial clusters in delivering holistic value while reducing emissions in hard-to-abate industrial sectors.

Who is taking part in the initiative?

Participating industrial clusters:



1. Zero Carbon Humber and Hynet North West (UK)
2. Kwinana Industries Council (Australia)
3. Basque Net-Zero Industrial Supercluster (Spain)
4. Brightlands Circular Space (Netherlands)
5. Antwerp-Bruges port (Belgium)
6. H2Houston Hub and Ohio Clean Hydrogen Hub Alliance (USA)

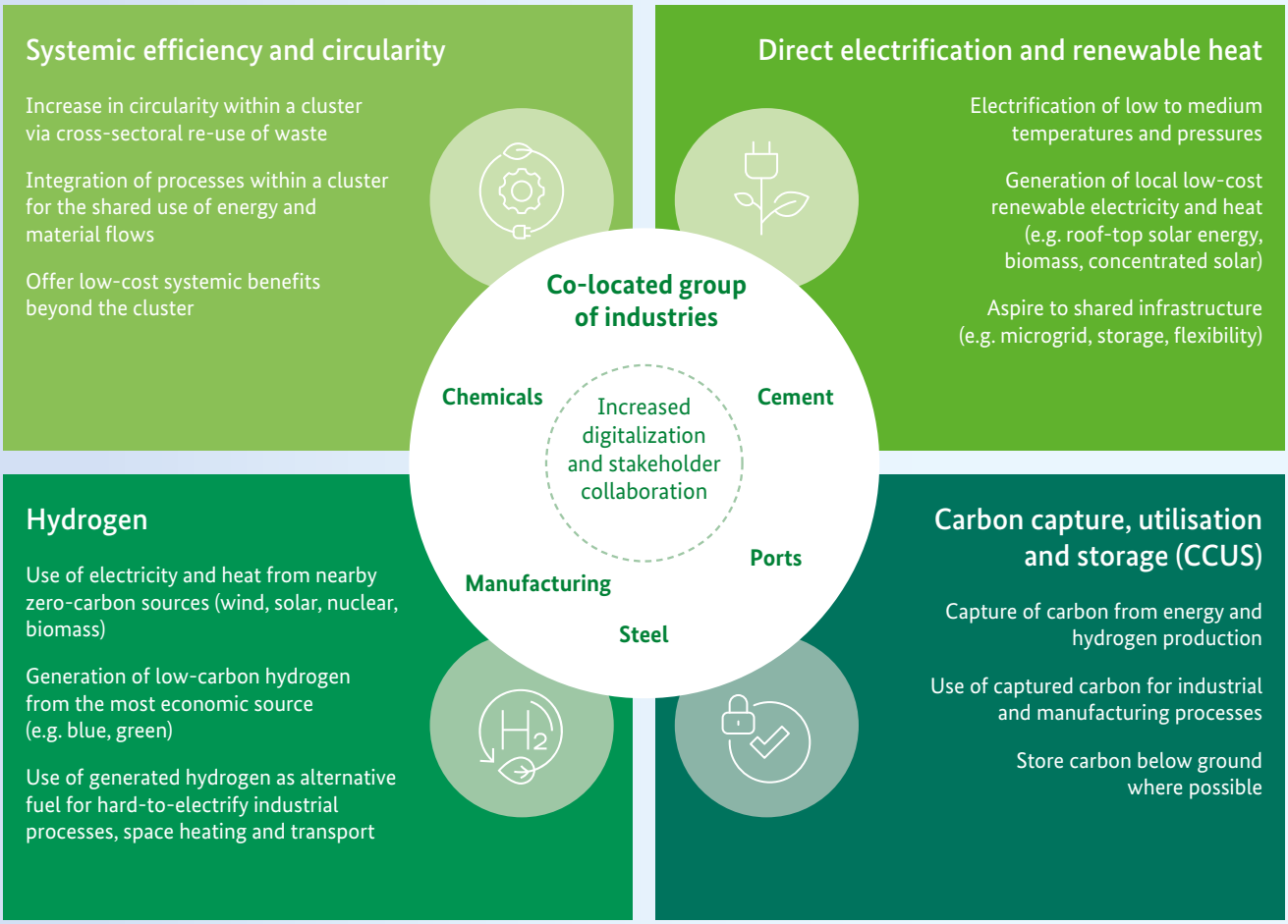
In total, it has already been possible to save more than 344 million tonnes of CO_2 and safeguard 1.1 million jobs.

What role do industry clusters play in decarbonisation?

Today, industrial clusters represent around 20% of Europe's GHG emissions (excluding transport). The role that industrial clusters play in decarbonisation depends on the proximity of the businesses in each cluster. The aggregation of energy demand across industries not only creates opportunities for systemic efficiencies, electrification, demand optimisation, and carbon capture, utilisation and storage (CCUS), but also an internal market for hydrogen – the most promising technology for decarbonising hard-to-abate sectors of the economy. In this way, the production and consumption of hydrogen can be co-located.

Net-zero solutions for industrial clusters

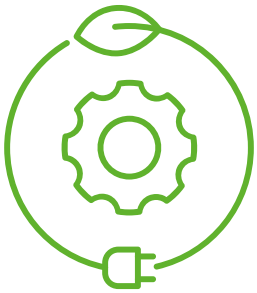
There is a range of possibilities to cut emissions, and a holistic approach is needed for industrial clusters in order to optimise emissions solutions and to create an integrated energy system which maximises the systemic value.



Source: Accenture (2021): Industrial clusters. Working together to achieve net zero.

How can industrial clusters save CO_2?

Increase circularity via cross-entity waste utilisation. Integrate processes to share energy, material streams, and provide cost-effective benefits.



Electrify low-to-medium temperature and pressure processes. Generate low-cost, renewable electricity and heat onsite and pursue shared infrastructure.

Capture carbon from energy/hydrogen production and use for industrial and manufacturing processes. Carbon can be stored underground where feasible.

Produce low-to-zero-carbon hydrogen from the most economical source. Use as alternative fuel for certain activities and storage/grid balancing.

Are there already "good practice" examples from different countries?

Denmark-based Kalundborg Symbiosis is the world's first example of functioning industrial symbiosis in which cross-sectoral cooperation boosts efficiency. It is a local partnership in which the members make joint use and re-use of more than 25 resource flows. The closed exchange of material, water and energy flows between the industrial partners minimises losses and waste, creates a local circular economy, boosts the partners' resilience, and cuts costs.

Another example is Suzhou Industrial Park (SIP), which delivers systemic efficiency and shared energy and resource infrastructure. The cluster covers more than 3% of the area of the Chinese city of Suzhou, and generates more than 13% of the city's gross output. The largest two industries are electronics and the manufacture of high-end equipment (with a turnover north of US$10 billion). In addition, there are three upcoming strategic sectors: bio-medicine, nanotechnology and cloud computing. Renewable energy sources currently cover more than 75% of SIP's energy consumption. The strategy's four carbon-cutting pillars are:

1. Circular use of industrial by-products and waste
2. Distributed micro-grid for clean energy
3. Omnipresent IoT services platform
4. Integrated green transport system

What does an integrated multi-sectoral approach look like? How can synergy effects be achieved?

Industrial corporates must collaborate as leveraging the clean energy solutions required to decarbonise requires the formation of clean energy markets. Hydrogen, CCUS, clean electrification and circular solutions all require supply-infrastructure-offtake to scale outside of very small pilot environments.

What support do clusters need for the green transformation?

Governments could set binding commitments for industrial clusters to cut carbon emissions within a specified time frame and combine this with incentives, such as tax credits. Also, innovative developments in technology could be subsidised with loans and grants. In this context, help could be given towards the development of alternative economic models to support low-carbon infrastructure and towards R&D investment into emissions reduction initiatives.

Our thanks go to Laura Duncan of Accenture for talking to us.

Zero Carbon Humber:

unique combined effort in the north of England

The grand vision: to decarbonise England's most carbon-intensive region

The Humber is the industrial heartland of the UK and there are ambitious plans to decarbonise the region through the East Coast Cluster. Key to that ambition is Zero Carbon Humber, a collection of international energy producers, major regional industries, leading infrastructure and logistics operators, global engineering firms and academic institutions. The collaboration can help decarbonise the Humber and deliver a net-zero future. This will be enabled by shared pipelines – delivered by the East Coast Cluster – for low-carbon hydrogen and captured carbon emissions, creating the world's first net-zero industrial region by 2040.

The project: Hydrogen to Humber

Specifically, Zero Carbon Humber is to construct facilities to produce low-carbon hydrogen and the necessary carbon capture, utilisation and storage (CCUS). Hydrogen to Humber (H2H) Saltend is Zero Carbon Humber's anchor project. It will establish the world's largest hydrogen production plant with carbon capture at the Saltend Chemicals Park. The H2H Saltend project will be the starting point for a CO_2 and hydrogen pipeline network developed by National Grid Ventures, connecting energy-intensive industrial sites throughout the region, offering businesses the options to directly capture their emissions or fuel-switch to hydrogen. All captured CO_2 will be compressed at the Easington site and

The Humber region is located on England's east coast. 10 million tonnes of carbon emissions a year mean that the Humber emits more CO_2 than any other industrial cluster, whilst the area is also one of those most affected by climate change. A quarter of the Humber's gross value creation and one job in ten depends on the local steel, chemicals, cement and oil industries. Safeguarding their competitiveness is of strategic significance both for the local economy and for the United Kingdom.

stored under the southern North Sea using offshore infrastructure shared with the East Coast Cluster. Going forward, other Zero Carbon Humber partners will connect their infrastructure to the pipelines.

Partners and supporters along the entire value chain

The cluster has 14 formal partners involved in every aspect of the value chain, including energy generation, onshore and offshore infrastructure owners and developers, industrial users and supply chain specialists. Zero Carbon Humber, Net Zero Teesside and the Northern Endurance Partnership come together as the East Coast Cluster, standing ready to remove 50% of the UK's industrial cluster CO_2 emissions.

Fostering jobs and training

The project is expected to protect 55,000 existing jobs in the Humber and create 49,000 new ones, while supporting skills, apprenticeships and educational opportunities across the region.

Ten examples of successful initiatives and projects of members of the “go-cluster” programme

Networked innovation projects to implement a major hydrogen strategy

***Commercial Vehicle Cluster – Nutzfahrzeug GmbH (CVC Südwest)*, a member of the "go-cluster" programme, is an important proponent of hydrogen-based propulsion. In 2019, *CVC Südwest* developed a hydrogen strategy and is now implementing this in several projects.**

Hydrogen technologies are opening up the possibility to store energy generated from renewable sources in a material form away from the place and time of generation – to fuel, and to manufacture, commercial vehicles. In view of this, *CVC* developed a hydrogen strategy for commercial vehicles in 2019. The WaVe project is a highlight of *CVC*'s hydrogen strategy: in this collaborative project, which is benefiting from €14 million of funding from the Economic Affairs and Climate Ministry, *CVC Südwest* has been working with 18 technology partners since July 2021 to develop hydrogen-based drive systems for commercial vehicles. The project takes a systemic approach. This finds expression particularly in the fact that not only zero-emission hydrogen engines are being developed, but also other systemic components such as tanking and conduit systems, control valves and safety concepts. The aim is to build demonstrators that can be trialled in conditions close to real deployment in a comparatively short time.

HyCoVe – the second stage of the CVC hydrogen strategy

The development of *CVC*'s hydrogen strategy and the WaVe project have paved the way to the development of hydrogen solutions for commercial vehicles. In another project, (HyCoVe, Hydrogen based Commercial Vehicles), *CVC* is aiming to trial the practical use of hydrogen-fuelled commercial vehicles in a selected region. The project addresses the many different issues which are currently blocking the overall development for vehicle manufacturers, vehicle users and hydrogen infrastructure operators: the main challenges are to make the vehicles fit for purpose and reliable, and to ensure the supply of hydrogen.

Dr Martin Thul, Managing Director of Commercial Vehicle Cluster Nutzfahrzeug GmbH

"The WaVe project not only helps us to strengthen the innovative capacities and competitiveness of the commercial vehicle sector, but also makes a crucial contribution towards climate neutrality. HyCoVe will enable us to design climate-friendly commercial vehicles that meet their users' needs and can be used on the roads."

Full hydrogen ahead

With a view to becoming a driving force for the spread of hydrogen technologies in the commercial vehicle sector, *CVC* established the Hydrogen based Commercial Vehicles network in 2020. The networking platform is to facilitate transfers of technology and expertise. Also, *CVC* is helping to shape the policy environment for the use of hydrogen-powered commercial vehicles at national and EU level so that their hydrogen engines can become successfully established on the market.

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Using digital tools to make value chains sustainable

The New Materials Cluster and *Chemie-Cluster Bayern GmbH* – member of the "go-cluster" programme – are working together in a cross-cluster project on the design of bio-based value chains in order to design and realise new sustainable to circular value chains in the bio-economy in Bavaria.

The project aims to establish the use of bio-based chemicals and materials, to identify new potential for cooperation on the use of sustainable raw and residual materials, and thus to drive the roll-out of the bio-economy in Bavaria.

Excellently networked by database-supported software

Database-supported software which the companies can use to link up their bio-based value chains is at the heart of the project. The Value Chain Generator (VCG) was developed in the EU-funded project "AlpLinkBioEco" and feeds the region's project partners with public information on relevant stakeholders in industry and research. The information contained in the database on feedstocks, end products, processes and bypass and waste flows make it possible – with the help of an algorithm – to generate cross-sectoral supplier-client links.

Networking ideas with a future

In the joint project funded by the Bavarian Ministry of Economic Affairs, Regional Development and Energy, *Chemie-Cluster Bayern* and the New Materials Cluster contacted specific Bavarian companies in 2021. The aim was to test the VCG with the support of the companies to see if it meets current and individual corporate challenges. There was a big and positive response from the companies. Discussions with them focused on the specific challenges of the future and their sustainability goals. Building on this, the VCG researched and presented specific ideas for improvements and suggestions for cooperation.

Model project with a supra-regional impact

Going forward, the aim will be to make the methodology and the digital tool accessible to as many regional clusters across Germany as possible so that more German firms can position themselves on the international bio-economy market. *Chemie-Cluster Bayern* also benefits from support from the Transnational Cooperation funding programme of the Federal Ministry of the Interior and Community. The year-long funding means that *Chemie-Cluster Bayern* can approach more German cluster bodies in 2022 and thus ensure the continuation of the project.

Dr Patrick Prühs, Managing Director of Chemie-Cluster Bayern GmbH

"The success of the networking ideas that have been generated is impressive. Project initiation meetings for a first discussion between potential partners have already taken place, and these have subsequently resulted in new business relations with well-matched partners."

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Green startup centre supports startups in the energy, greentech and sustainability sector

The NKubator – a project of the "go-cluster" member *ENERGIEregion Nürnberg e.V.* and the city of Nuremberg – offers a central point of contact for innovators in the field of energy, greentech and sustainability, thus boosting the competitiveness of the Nuremberg metropolitan region.

The NKubator, Innovation and Startup Centre for Energy, GreenTech and Sustainability is open to all innovators wanting to found a company and to boost the capacities of an existing company in the field of energy, greentech and sustainability. The NKubator enables budding entrepreneurs, startups and established companies to actively support and shape the transition to sustainable economic activity and sustainable corporate governance.

The goal: regional value creation

The NKubator aims to make innovative business ideas of the region's startups in the green economy better known and to strengthen the startup community in Nuremberg. It boosts the region's competitiveness by systematically networking potential startups with scientific institutions and existing firms. In this way, the city and metropolitan region of Nuremberg intends to position itself as a strong base for energy, greentech and sustainability, thus creating tomorrow's technologies and jobs. The NKubator is backed by the city of Nuremberg; it is managed by the *ENERGIEregion Nürnberg e.V.* excellence and cluster initiative, which has been progressing the fields of energy and the environment in the metropolitan region of Nuremberg for 20 years, and it serves as a central networking platform.

Andrea Sieglitz-Hoepffner, Director of the NKubator

"The NKubator aims to expand and focus the targeted and forward-looking development of the well-established services for potential entrepreneurs and startups in Nuremberg, and to broaden the services to include sustainability in tandem with the many other stakeholders supporting startups."

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Energy efficiency made easy by smart networking!

The aim of the innovative regional growth core "smood® – smart neighbourhood" is to use established and new products and services to generate added value in the energy-related restructuring of the neighbourhood, and thus to create efficient and environmentally friendly neighbourhoods which people want to live in. The smood® alliance consists of 16 companies, four research institutions and the "go-cluster" member *ThEEN e.V.*

A Thuringian alliance of energy researchers and companies

One of the key issues for our society is the decarbonisation of the energy system and in particular the shift towards renewable energy. This transition requires new technologies and creates potential for new business models. smood® is an innovative regional growth core for Thuringia which combines energy research with the expertise of specialised Thuringian companies. Specifically, the alliance achieves this via five projects which are developing special technologies for the planning, restructuring and management of energy-efficient neighbourhoods and which are networked in a value chain. smoodPLAN planning technologies are shaping efficient planning and analytical processes via the use of drones and the smoodQIM (standing for "smood neighbourhood information model") resulting from this. The consortium is also producing special hardware tools. For example, GeoHeatStorage will be a seasonal geothermal heat storage facility, and GeoHoP will become a new drilling technology for horizontal and oblique tunnelling processes. Via E-Storage, smood® is developing a safe, environmentally friendly and resource-efficient sodium nickel chloride neighbourhood storage system. In addition, smoodACT, the energy management system for realisation, facilitates data processing and interlinkage.

Jana Liebe,
Director of ThEEN e.V.
"We are proud that the efficient improvement of the energy performance of existing neighbourhoods using established and our new smood® technologies from Thuringia is being progressed and attracting supra-regional and international attention."

German Sustainability Award winner

In this way, the alliance funded by the Federal Ministry of Education and Research aims not only to boost energy efficiency, but also the (commercial) value and attractiveness of buildings and neighbourhoods. smood® therefore won the German Sustainability Award in the "Technology – Energy" category in 2021 as an innovative development resulting from the networking of partial solutions to form an overall concept. Its impact is felt in urban development and in the real estate and energy sectors. smood® was a much-admired exhibit in the German Pavilion at the World Expo in Dubai.

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Circular value creation for a sustainable future

***InnoZent OWL e.V.* and the *Food Processing Initiative (FPI)*, both "go-cluster" members, joined forces with three other innovation networks, Bielefeld University of Applied Sciences, the Ostwestfalen-Lippe Association of German Engineers and 60 supporters to launch the CirQuality OWL project in Ostwestfalen-Lippe (OWL) in 2019. The initiative aims to build a viable and forward-looking manufacturing and commercial base centred around the circular economy and circular value creation.**

The climate crisis, new political requirements, scarce and increasingly expensive raw materials, disrupted supply chains and bottlenecks, changing customer demands focusing more on sustainability – all of these developments are challenging companies to work on new products, production processes and business models.

The project concentrates on the potential of the circular economy: products, buildings, components and materials are designed from the outset to be used wherever possible in constant cycles. Companies are only able to influence parts of these processes themselves – here, it is important to consider value chains and networks between clients and suppliers, development, manufacture, trade and services. The OWL networks make this cross-sectoral cooperation possible.

A focus on raising awareness, training companies, and supra-regional networking

The presentation of regional best-practice examples can enable other companies to benefit from this experience. Information services and workshops on a broad range of topics enable participants to learn more about the issue. Another focus is placed on support for companies in the form of groups in which participants share their experiences. Here, consideration is given to all the factors which influence the integration of the circular economy into the (business) processes. These include technologies and design processes, as well as economic aspects and business processes, corporate cultures and guidelines, and regulatory policy. The supra-regional networking with other circular economy initiatives and with policy-makers and administration plays an important role in the discussions and joint efforts to promote the issue.

CirQuality OWL receives funding from the European Regional Development Fund (ERDF) and from North Rhine-Westphalia.

Ulrike Künnemann, InnoZent OWL e.V.
"Our experience in recent years has shown that a circular economy makes sense, can be realised, and brings commercial success! We are currently in the midst of the transition phase with the corresponding challenges which we are working on together with a wide range of stakeholders."

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Sustainable supply management based on DNK standard

NaLiMa stands for "Sustainable supplier management in line with the DNK standard – a purchasing pool en route to the sustainability report" of the *Netzwerk Industrie RuhrOst e.V. (NIRO)* (Industry Ruhrost Network) member cluster. It was funded for a year by the Economic Affairs and Climate Ministry in 2021 under the "go-cluster" programme as one of 16 "model projects to develop forward-looking cluster concepts and novel business models".

Netzwerk Industrie RuhrOst e.V. has made sustainability a key focus of its networking activities, designating it a strategic goal. In the successfully completed NaLiMa project, *NIRO focused on the sustainability of the companies supplying its purchasing pool. Numerous services helped NIRO* suppliers to draw up a sustainability report in line with the standards of the German Sustainability Code (DNK) and thus to make an active contribution to sustainable economic activity.

Many different aspects of sustainable economic activity

The aim was to make the cluster's internal purchasing pool fit for the future by anchoring sustainable supplier management. In the project, *NIRO* supported its partners at a range of events and facilitated a sharing of experience at all levels. The four training workshops on various key aspects of sustainability were particularly important: strategy, process management, the environment, and society. One of the learning effects was that there are many different ways to view sustainable commerce and that equal attention must be given to all pillars of sustainability – ecology, the economy and social aspects. By the end of the project, the suppliers had begun or completed their sustainability report and were awarded a certificate of participation. This enables them to make their sustainability efforts visible and to serve as role models for other companies. Going forward, *NIRO* will firmly anchor sustainable supplier management in its purchasing pool.

Support from a DNK training partner

The network and the participating suppliers were assisted by the Council for Sustainable Development, which started out by providing information about the DNK. In the course of the project, a DNK training partner coached the project participants in the workshops and explained all the issues surrounding the DNK, the statutory rules on sustainability reporting, how companies can produce a report in line with the DNK standard, and what first steps a company needs to take along this road. The DNK was used as the benchmark because it is easy to apply and builds on broader international standards.

Ludmila Riewe, Netzwerk Industrie RuhrOst e.V., project director

"NaLiMa has not only raised awareness amongst our suppliers, but has also developed a tried and tested instrument which our member companies will use. The DNK is helping us to build up a sustainability strategy which we can also make visible to the outside world."

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The Sustainable Aero Lab: all systems go for zero-emission aviation

The Sustainable Aero Lab brings German and international startups, researchers, industrial representatives and investors together to progress sustainable forward-looking aviation issues. The "go-cluster" member *Hamburg Aviation e.V.* is also involved in the initiative, which is supported by the Hamburg Authority for Economic Affairs and Innovation (BWI) and funded via the Hamburg Investitions- und Förderbank (IFB).

Experts in the sector are convinced that the next big leap in aviation will be towards a climate-neutral future. The aviation industry has always been at its most innovative when faced with a crisis. Climate change is the biggest global crisis today – and also has far-reaching effects on the aviation industry and its business models. At the same time, the challenges facing aviation also offer the opportunity to develop new technologies and fields of business. The founding of the Sustainable Aero Lab in Hamburg aims to take up and accelerate these sustainable development opportunities for the sector.

Community of startups, higher education institutions, companies and investors

The Sustainable Aero Lab is oriented to startups and innovation projects around the world which want to make a visible contribution to reducing aviation's carbon footprint. The lab brings startups together with experienced mentors from the aviation sector, greentech and finance in live sessions, thus facilitating an in-depth support process. In targeted individual coaching sessions, the projects receive feedback on specific issues and challenges of market entry from leading international representatives, e.g. from the industry or from universities. The lab is designed as an open innovation platform and opens doors for startups via this mentoring and cross-sectoral networking, helping them to find clients and new projects and partners.

Role model for sustainable aviation technologies

The Hamburg-based initiative is thus aiming to become an active driving force in the debate on sustainable aviation technology. This includes the use of Sustainable Aviation Fuel (SAF) and hydrogen as alternatives to fossil kerosene.

Lukas Kaestner, Hamburg Aviation e.V.
"The Sustainable Aero Lab is a community. It welcomes everyone who would like to contribute to the transformation of the aviation industry into a zero-emission sector."

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New climate action app encourages people to save CO_2

The LESS is more research project – funded by the Economic Affairs and Climate Ministry and including the "go-cluster" member *deENet e.V.* as a project partner – has developed an app to help the citizens of Kassel to identify and reduce their personal carbon footprint. The project serves as a model for other cities in Germany.

Supporting a secure and independent energy supply and accelerating the energy transition has become more important than ever and is a key issue for many people. The new "klimo app" gives people in Kassel the chance to play their own part by saving CO_2 and promoting regional climate action. It motivates them to change something themselves, and offers useful tips for various aspects of everyday life. Also, the app provides information about attractive events and projects in and around Kassel.

Working together to combat climate change

The klimo app is at the heart of the LESS is more project. It shows the citizens of Kassel what makes up their carbon footprint. The project is initially to last for three years, is backed by €1.7 million in funding from the Economic Affairs and Climate Ministry, and is being run by the House of Energy. The project partners are the "go-cluster" member *deENet*, the Berlin-based startup twigbit, and the *deENet* cluster members Kassel University and Fraunhofer IEE. Kassel University is analysing the behaviour of the users and bringing together ecological, economic and socio-cultural aspects. Fraunhofer Institute for Energy Economics and Energy System Technology (Fraunhofer IEE) has built the scientific platform for the CO_2 calculations within the app. The city of Kassel and local businesses are supporting the project.

Role model for other municipalities

Kassel wants the klimo app to become a role model for other municipalities. By setting a good example, the positive effects of Kassel's klimo app will encourage other municipalities to follow suit.

Dr Matthias Jahnke, Director of deENet e.V.
"The difference from other climate apps is that klimo drives the energy transition at a local level via the final consumers, and focuses on personal actions. The app also offers a platform for regional climate projects. This means that LESS is more is an important component in the progress of the energy transition in the north Hesse region."

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The new hydrogen hub in the north-west of Germany

HyWays for Future is to turn the north-west into a hydrogen hub. The innovation cluster, which is coordinated by the "go-cluster" member *Oldenburger Energiecluster OLEC e.V.*, is to progress the market roll-out of green hydrogen in the north-west of Germany. More than 250 partners from industry and government are involved. The HyWays for Future project is one of the prize-winners in the HyLand Hydrogen Regions in Germany contest for ideas initiated by the Federal Ministry for Digital and Transport. Including the public funding, around €90 million is to be invested in the region in the coming years.

Hydrogen is generating momentum not only in the transport sector, but also in the sectors of electricity, heat and industry. Here, green hydrogen can be usefully deployed both in industry and in long-distance and heavy-duty haulage – thus closing a gap left by electric mobility, which is primarily suitable for short and medium-range passenger transport. The HyWays for Future project focuses on how hydrogen can be used in the mobility sector: going forward, hydrogen fuelling stations are to be built, and hydrogen buses for local public transport, cleaning vehicles and hydrogen-powered cars and trucks are to be purchased. The motto is "Making climate-friendly hydrogen locally *and* using it locally", with the aim of establishing green hydrogen in industry, energy supply and transport in the north-west metropolitan region on a long-term basis. The hydrogen model region is centred around Cuxhaven, Wilhelmshaven, Bremerhaven, Oldenburg and Bremen.

A strong network in the innovation cluster and four thematic working groups

The project aims to draw up concepts and projects for regional value creation, to initiate new funded projects and to develop infrastructure and sales markets. It is fostered by the inclusion of regional stakeholders in the four thematic working groups: municipal vehicles and local public transport, goods haulage and logistics, maritime applications and port logistics, and infrastructure and hydrogen provision. *OLEC* is coordinating the working groups.

Excellent conditions

In view of its geographical situation, the north-west metropolitan region offers excellent conditions for a large-scale green hydrogen economy: green hydrogen can be generated from existing or new offshore and onshore wind farms, shipped in, stored in existing caverns, and used on a cross-sectoral basis.

Silke Timmer, Oldenburger Energiecluster OLEC e.V.
"Successful hydrogen projects need a strong network – and with more than 250 stakeholders in the innovation cluster, that's what we have in HyWays for Future!"

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Green value creation in the fibre-based supply chain

The *Allianz Faserbasierte Werkstoffe Baden-Württemberg e.V. (Baden-Württemberg Fibre-based Materials Alliance – AFBW)* has launched the CycleTex BW project to speed up the linear-to-circular transition in the fibre-based industry. The "go-cluster" member aims to take on responsibility and serve as a role model for the textiles industry

As one of the world's largest consumers of resources, the textiles industry is increasingly faced with the challenge of cutting its consumption of resources – particularly via a comprehensive circular economy approach. Once used, resources and materials must remain in use as long as possible. This requires a transition from linear economic activity to a resource-efficient, environmentally sensible circular economy. It necessitates adjustments along the entire value chain. The focus of the project is on the establishment of the CycleTex BW marketplace for manufacturing waste. The trading platform is to facilitate the transfer of expertise and experience, to initiate new ideas for projects, and to identify suitable partners. Further to this, materials can be traded on the platform, and requests posted for various recyclates.

A circular economy for stable supply chains and a strong economic base

The circular economy not only creates fresh potential for Baden-Württemberg, but also strengthens the competitiveness of the region's companies along the fibre-based value chain via innovations in recycled materials, innovative recycling solutions and new (secondary) sources of raw materials. Regional economic cycles support the establishment of resilient and flexible supply networks, and thus make a significant contribution to the stability of supply chains and the resilience of the manufacturing sector in Baden-Württemberg in terms of raw materials.

More than 70 companies and research institutions in the textiles value chain have agreed to back the CycleTex BW project. The main target group is small and medium-sized enterprises, which are to receive support as they develop new business models with a view to new value creation models and the establishment and expansion of a sustainable product portfolio.

Sadiah Steibli, Allianz Faserbasierte Werkstoffe Baden-Württemberg e.V.

"It is particularly important to take a cross-sectoral approach to recycling! We need networks like the AFBW which can provide a platform and facilitate networking. This is precisely what CycleTex BW offers: a wide range of information, trade in materials, matchmaking and the CycleTex pioneers as successful examples of transition. In this way, we aim to initiate alliances for cooperation!"

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Terms used in the various projects and initiatives of the member clusters

The importance of sustainability reporting for clusters

Isabelle Krahe, Coordinator, German Sustainability Code

More and more companies are understanding that their future depends not only on commercial success, but also to a great extent on ecological and societal contributions. In addition to growing regulatory requirements, customers, investors and staff are increasingly calling for companies to make their sustainability efforts transparent. The obligatory sustainability reporting is to be widened to include more companies in future, and European standards are to be developed (e.g. the proposed Corporate Sustainability Reporting Directive).

German Sustainability Code (DNK)

Deutscher NACHHALTIGKEITS Kodex

The German Sustainability Code of the German Council for Sustainable Development (RNE) is a tried and trusted, user-friendly reporting standard which offers ways to implement current statutory requirements. As a free-of-charge framework, the DNK offers 20 specific criteria – e.g. on a sustainability strategy, materiality, resource deployment and human rights – which help companies of all shapes and sizes to get a foothold in sustainability reporting and sustainability management. The DNK declarations (sustainability reports) are published in the DNK database and are freely available for viewing. Companies can thus use the database to compare themselves with others which are in the same sector or are facing similar challenges, and can learn from one another.

DNK figures

Approx. 800 companies have already published a DNK declaration	It takes approx. **6–8 weeks** from the submission of the declaration through to publication
Companies need **approx. 25 working days** to compile their first DNK declaration	**203 companies** have had their DNK declaration audited in terms of CSR reporting requirements

Quelle: Rat für Nachhaltige Entwicklung

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Facts and figures

German industrial emissions fell by around 37% between 1990 and 2020. A major factor here was a drop in output due to the COVID-19 pandemic. In 2021, emissions rose by 5.5% from 2020, not least due to the cyclical effects related to the pandemic and the increased use of fossil fuel.[1]

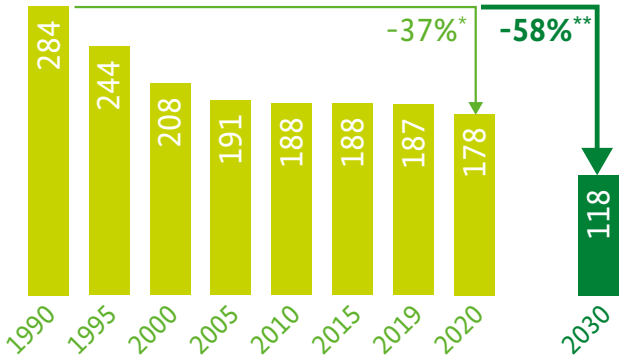
-37%

Industrial emissions dropped by 37% between 1990 and 2020

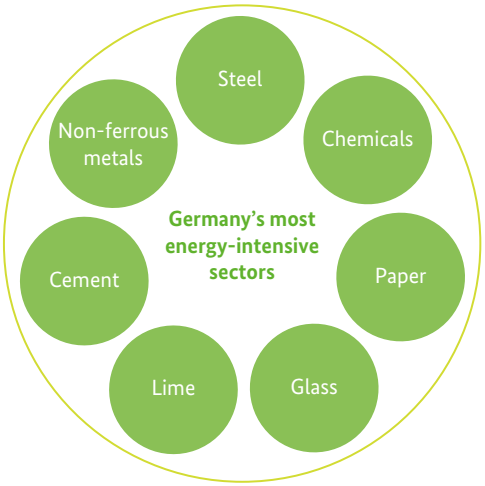
In 2020, the industrial sector was responsible for around 24% of total emissions. This equates to 178 million tonnes of CO_2 equivalents. Industry is thus the second-largest source of greenhouse gas emissions, behind the energy sector.[2]

Development of industrial emissions

Million tonnes of CO_2 equivalents



* Estimate
** Reduction target from 1990
Source: Federal Environment Agency (2021a), Federal Government (2021)



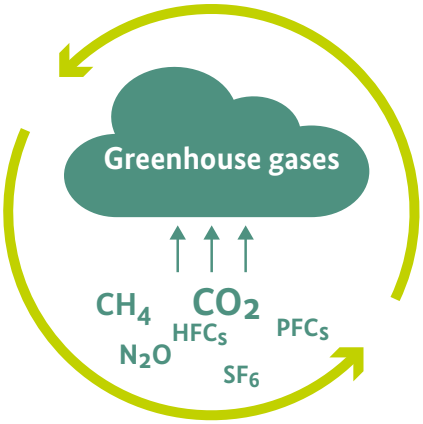
The most energy-intensive sectors of German industry include steel, chemicals, non-ferrous metals, cement, lime, glass and paper.[3]

1 Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (2021), Climate Action in Figures. P. 33
Federal Environment Agency and Federal Ministry for Economic Affairs and Climate Action (2022), press release "Greenhouse gas emissions rose by 4.5% in 2021" of 15 March 2022, accessed on 25 November 2022

2 Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (2021), Climate Action in Figures. P. 33

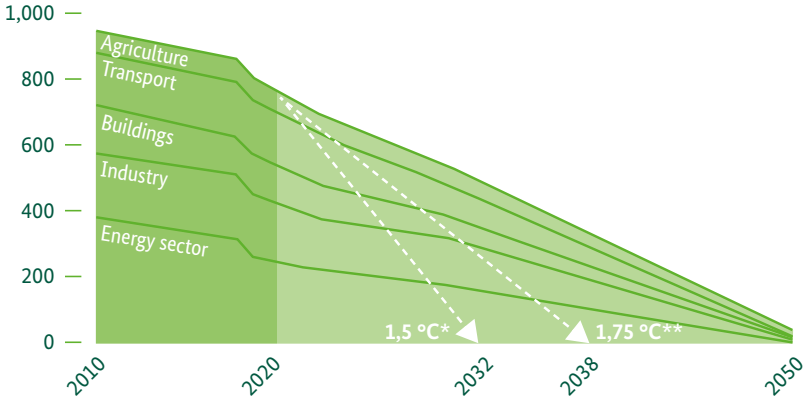
3 Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (2021), Climate Action in Figures. P. 33

Germany is to be largely greenhouse-gas-neutral by 2050. (Federal Government's Climate Action Plan 2050 and Federal Climate Change Act)



Emission targets in Germany up to 2050

Million tonnes of CO_2 equivalents



* Climate target with 50% probability
** Climate target with 67% probability
Sources: Federal Environment Agency, German Advisory Council on the Environment

Greenhouse gas emissions in Germany dropped by 40.8% to approx. 739 million tonnes of CO_2 equivalents between 1990 and 2020.[4]

Since 2011, more than 200 innovative climate projects have been approved in the context of the National Climate Initiative. They have attracted total funding of around €310 million.

200 innovative climate projects since 2011

Total funding volume: **€310** million

Since November 2021, the Decarbonisation of Industry Cluster (CDI)[5] in Lusatia has been providing ideas and serving as an incubator to support the successful transition of industry towards climate neutrality throughout Germany. The founding members are Brandenburg Technical University (BTU) Cottbus-Senftenberg, the Institute of Low-Carbon Industrial Processes of the German Aerospace Center (DLR), the Fraunhofer Research Institution for Energy Infrastructures and Geothermal Systems (IEG) and the Centre of Excellence on Climate Change Mitigation in Energy-Intensive Industries (KEI).

4 Federal Ministry for Economic Affairs and Climate Action (2022), Climate Action Plan 2050, accessed on 25 November 2022

5 Press and Information Office of the Federal Government, Germany remains on course for climate action, accessed on 25 November 2022

The “go-cluster” programme

Promoting cluster excellence: “go-cluster”

“go-cluster” is the cluster policy excellence measure of the Federal Ministry for Economic Affairs and Climate Action (BMWK), bringing together the best-performing national innovation clusters. These innovation clusters have excellent structures and support cluster players according to their needs in various fields of activity. The innovation clusters participating in the “go-cluster” programme are vanguards for innovation and reflect Germany’s high level of expertise in many sectors and fields of technology. The “go-cluster” programme provides advisory and other services to help innovation clusters develop into organisations with global excellence in their field. It therefore also supports innovative cluster services such as “cross-cluster” approaches and strengthens the networking of innovation clusters at European and international level.

Eligibility criteria

The programme is primarily addressed to all high-performance innovation clusters in Germany. In order to be admitted to the programme, companies need to fulfil a number of excellence criteria in the areas of structure and composition, cluster management and structure, activities and cooperation, and visibility and impact. There is an application process. The application documents can be found at www.go-cluster.de.

Service and advice

Whether it be for cluster managers, cluster players or representatives from the political field, research or business, the “go-cluster” programme offers services that are geared to the needs of the respective target group. For example, innovation clusters taking part in the programme receive the following free advisory and other services:

- The programme certifies the individual innovation cluster’s quality and productivity in line with standardised evaluation criteria that are based on European quality standards.
- Participating clusters can use the “go-cluster” mark and logo as a quality label.
- The programme covers the cost for the European benchmarking and certification procedures for the Bronze and Silver labels of the European Cluster Excellence Initiative (ECEI).
- The innovation clusters are showcased on the Federal Government’s “Clusterplattform Deutschland” internet platform. The clusters receive needs-based advice on issues including strategic development, financing, enhancement of the services portfolio, sustainability and stability of cluster structures.
- Workshops on current cluster management issues and cluster instruments are organised; the clusters’ work and selected innovation success stories are presented to the public via various channels (events, newsletters, websites).
- Clusters are incorporated into and given increased visibility in economic policy initiatives sponsored by the Federal Government.
- Networking activities with the most productive innovation clusters from Germany and Europe.

Cluster Platform Germany

Cluster Platform Germany is the joint information portal of the Federal Ministry for Economic Affairs and Climate Action and the Federal Ministry of Education and Research.

The portal www.clusterplattform.de offers a clear and concise overview of cluster-related activities at federal, Land, and EU level. In addition, a search tool offering a variety of search categories is used to reflect the diversity of Germany’s cluster landscape

Are you interested in the “go-cluster” programme, or do you have any questions about it?

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Would you like to receive the latest news (in German) from the “go-cluster” programme and the world of clusters?
→ Newsletter