

The Future Cluster Chemistry / Plastics Central Germany

cluster
mittel deutschland



The Future Cluster Chemistry / Plastics Central Germany

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Good chances on the right way

Future Chemistry/Plastics Cluster Central Germany

This, the first edition of the Cluster Atlas, acts as a guide to the emerging chemicals/plastics cluster in Central Germany and provides a comprehensive overview of the status and promising prospects of a growing industry at the heart of Europe.

The development of the chemical industry in Central Germany is rightly considered to be a success story. Because of the high degree to which the numerous businesses, especially the chemical parks, are linked-up and organized, the Central German chemicals/plastics cluster is one of the most highly developed clusters in the region, and the chemical plants in Saxony, Saxony-Anhalt, Thuringia and Brandenburg are among the most modern in the world. What is remarkable is the cross-sectoral cooperation between the chemical industry and the plastics processing industry, which provides an impetus for innovation in the value-added chain. The emerging chemicals/plastics cluster has now become a growth core with an international dimension. The

chemicals and plastics processing industries in Central Germany are heading in the right direction. The region has every opportunity to develop into a centre of excellence for plastics manufacturers and processors. This dynamic development is also reflected in the size of the workforce, which has increased by around one third since 1995. Thanks to massive investment, turnover has for many years been growing much more quickly than in the sector as a whole in Germany. Since 1990, almost 17 billion euros has been invested in the renewal and construction of sophisticated plants. The Federal Government and the new federal states have provided massive support to this boom in investment in the form of support schemes. The aim was not just to preserve the chemical and plastics industries as a core industrial sector in Eastern Germany, but also to give them a promising future in international competition. Investment by many international and German companies is now increasingly contributing to the successful results in Central Germany and throughout Eastern Germany.

This Federal Government will continue to focus special attention on the promotion of innovative clusters and networks, in order to support the emergence of such growth cores and to strengthen, in a targeted manner, existing economic competencies in a specific region or sector. This also includes measures to make regions more attractive places for businesses. A whole package of Federal Government and federal state financial assistance programmes is available for this purpose.

Innovative networks, intensive cooperation between businesses and between industry and the scientific community often result in internationally competitive products, which can be brought to commercial maturity in a rapid process. This is of paramount importance when it comes to enhancing the competitiveness of businesses and sectors and enabling Eastern Germany to catch up economically with the West.



Wolfgang Tiefensee

Federal Minister of Transport, Building and Urban Development

Development of the Chemistry/Plastics Cluster

Key element of economic policy in Saxony-Anhalt

The chemical and plastics industries in Central Germany boast a decade-long tradition and are again among the major growth branches in Central Germany. Central German chemical sites are pioneers in restructuring processes in the chemical industry in Germany and elsewhere in Europe. Due to its international importance Saxony-Anhalt was offered the presidency of the European Chemical Regions Network. Since the early 1990s, investments in the amount of 17 billion euros were made at the major sites in Saxony-Anhalt - Leuna, Schkopau, Bitterfeld-Wolfen, Zeitz, Piesteritz and Böhlen (Saxony) and Schwarzheide (Brandenburg) into rehabilitation and new construction of infrastructures and production plants.

The Central German Chemistry Triangle has a chemistry park area of more than 5,500 ha and ultramodern product integration schemes. These sites with their synergetic potentials provide best prerequisites for new business siting. According to industry sources, more than 30 new and extension investments have been completed or are being planned since 2005. Thus, another 650 million euros will be invested into the chemical sites and more than 1,200 new jobs created by 2008. It is the objective of politics, the business community and the Chemistry/Plastics Cluster to develop Central Germany again into a 'Competence centre for polymer chemistry and plastics processing' and moreover into a chemical location of European status. Basis of this effort is a high-performance efficient large-scale industry and innovative small- and medium-sized enterprises as well as well-reputed research potentials in the region. Key competence areas in the region include fine and specialty chemistry, polymer chemistry and plastics development, composite materials and agro-chemistry, while eminent international potentials are also available in the fields of nanotechnology and material research and development for the solar industry.

The inter-state cluster process is aiming at, inter alia, enhancing innovation capacities of SMEs and establishing extending value-added chains. This means, e.g. in the polymer chemistry, to step up development of the plastics industry as buyer of chemical products and enable these firms to carry out product and process innovations. The characteristic feature of this development is that chemical sites in their further development are seeking specific technological profiles while simultaneously using synergies of an integrated innovation scheme. Leuna site, for instance, is complementing siting of innovative chemical firms by biotechnology companies with large-scale production facilities. The Dow ValuePark is focusing on polymer processing and Bitterfeld-Wolfen is oriented on fine and specialty chemistry. In order to further these developments the state government, in coordination with and together with the Chemical Industry Association and the business community, intends to advance future profiling of the clusters by continuing the strategy dialog and implementing the outcomes under a 'Pilot Project Chemistry/Plastics'.



Dr. Reiner Haseloff

Minister for Economic Affairs and Labour of Saxony-Anhalt,
President of the European Chemical Regions Network (ECRN)

Structure – Central Germany is a land of chemistry

- A region of chemical industry and plastics processors
- A large variety of networks and cooperation schemes

The Chemistry/Plastics Cluster Central Germany was initiated by the business community as a platform of inter-state collaboration at the future conference of 'Economic Initiative for Central Germany' in 2003. Participants include large-, medium- and small-scale enterprises, their federations, education and research institutions, service providers as well as politics and administrations. The Future Cluster builds on established network and cooperation structures and promotes formation of value-added chains as are formed from research via feedstock materials to final products. One generic feature of clusters is a concentration of value-added chains. This applies in particular to Central Germany because the corporate landscape in Saxony, Saxony-Anhalt, Thuringia and Brandenburg is characterised by chemistry. The region between rivers Elbe, Saale, Havel, Spree and Neißة is a land of chemistry.

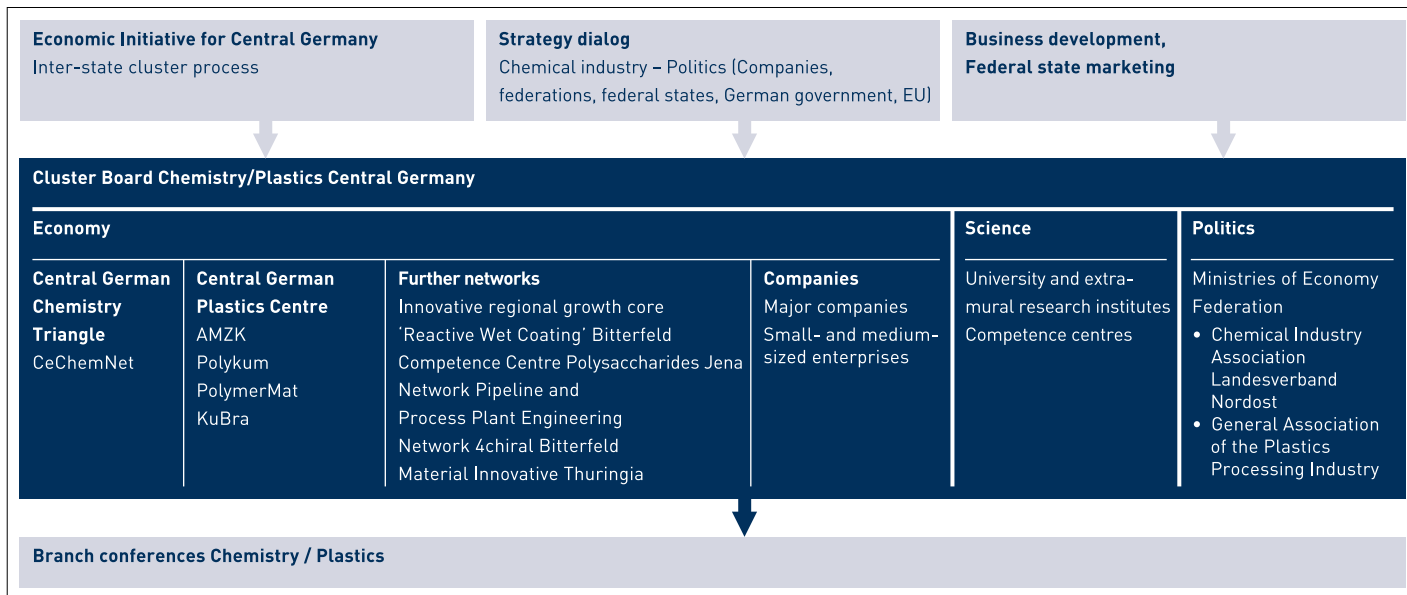
Stakeholders in the cluster process are twelve university and ten extra-mural research institutions as well as six competence centres with unique profiles plus more than 400 companies are indirectly involved into the cluster process. Practical work is above all performed through state-based networks of plastics processors - Network Plastic Automotive Component Suppliers Saxony (AMZK), Polykum e.V. in Saxony-Anhalt, PolymerMat e.V. in Thuringia and KuBra e.V. in Brandenburg – and in five networks, innovative growth cores and the Network of Chemical Sites in the Central German Chemistry Triangle, CeChemNet. The inter-state structure is managed by the cluster board as decision-making body made up of senior personalities from the business community, academia, politics and administrations and represented by the cluster spokesman, an elected business representative. The cluster management is responsible for work organisation and coordination. This task has been taken on by isw Scientific Consultancy and Service Company Halle supervised by the cluster board spokesman.

The cluster process is supported by strategy dialogs between the business community and its federations – Association of the Chemical Industry (VCI), Landesverband Nordost, the General Association of the Plastics Processing Industry (GKV) and the governments of the federal states concerned. In addition, individual site marketing activities are better harmonised between the federal states. The University of Applied Sciences (FH) Merseburg exercises a coordinating function for higher education institutions in the fields of chemistry/plastics in Central German and ensures the involvement of relevant academic departments and institutes into the cluster process.

Internationally the cluster is integrated in to the European Chemical Regions Network (ECRN) in which Central Germany takes on a leading role with Saxony-Anhalt. All activities are aimed at developing Central Germany into a Competence Centre for Plastics Manufacturers and Processors. The region shall so attractive that companies move their core research activities to Central Germany.

Special features of the Chemistry/Plastics Cluster:

- Pioneer in global structural changes in the chemical industry
- Trans-industry with chemistry and plastics processing
- Participation in industry federations VCI and GKV
- Inter-state with companies and networks from Saxony, Saxony-Anhalt, Thuringia and Brandenburg.
- Integration of networks in chemical industry and plastics processing
- Strategy dialogs involve federal state governments
- International positioning with active work in ECRN



Synergies – Future clusters shift into higher gear

- Cooperation across state borders and industries
- Collaboration with other networks

Collaboration in the Chemistry/Plastics Cluster across state borders provides chances at increasingly exploiting synergies between stakeholders. Cluster spokesman Christoph Mühlhaus believes that thus the competitiveness of companies and academic institutions are sustainably supported.

'Combination of the cluster process with developments in the automotive industry, biotechnology, logistics, mechanical and process plant engineering provide new impetuses for developments in Eastern Germany', says Mühlhaus. One particular close integration exists already among car-makers in Central Germany. Name vehicle manufacturers and their have formed the Automotive Cluster Eastern Germany (ACOD) and pursue similarly ambitious targets as the Chemistry Cluster. Also automotive production boasts a long tradition in the region that was revived with many investments by major groups, such as Volkswagen, Opel, BMW and Porsche.

Also the supplier industry gained momentum in the wake of those large-scale investments. Especially the plastics processing industry and related research activities experienced an upswing with the growth in automotive production in Central Germany. New plastics solutions were increasingly adopted in vehicles in recent years. Continual process and product developments have brought about permanent rises in uses of plastic material in cars. Many, often totally new properties of plastics provide several advantages over conventional materials. Thus, a combination of the two networks provides enormous chances. Plastics industry geared to innovations can be a growth driver for Central Germany. The cluster process both supports the field of chemistry/plastics and exploits potential synergies with car-making. Together, both clusters can shift into a higher gear. Similar prospects are opened by cooperation with clusters in biotechnology and life sciences, solar industry and the food industry.

Framework conditions – Conducive for chemistry and plastics

- Brief permission periods are a hallmark
- International logistics hub is being created

Central Germany boasts a large number of well-trained and highly motivated people. Many of whom are waiting for opportunities to prove their skills and capabilities. They are open for new challenges. Due to its long tradition in Central Germany the chemical industry enjoys a very high level of acceptance among the population. In addition, investors can rely on well-proven network structures. Purchase of resources is ensured by feedstock integration. Major chemical sites have been developed unique profiles as chemistry parks, characterised by excellent infrastructures. They offer their sited firms the entire range of chemistry-typical services at comparably low costs and can thus concentrate on their core business activities which enhances their competitive situation. All six chemistry parks are actively enticing new investors with fully developed and attractive siting areas that meet the large variety of demands by future investors. The region is among those with the most generous public grant rates in the European Union. In this top subsidy category companies are eligible to investment grants of up to 30 per cent. SMEs are even entitled to a maximum rate of 45 per cent in public financial assistance.

Central Germany is located in a favourable strategic position. It is situated at the heart of the 'new' Europe that has come into existence with the recent EU accession countries. Due to this strategic location advantage the region will become an international logistic hub in the foreseeable future. Reasons include not only a well-developed, dense motorway and rail network, also the Intercontinental Airport Leipzig/Halle with a 24-hour operating licence and two runways integrates the region excellently into European transport flows. Global players, such as DHL (logistics subsidiary of Deutsche Post) make already use of this advantage. Also the Cluster Chemistry / Plastics will profit since its goods can be transported via the shortest possible routes to any destination in the world. The future Airport Berlin Brandenburg International (BBI) will provide major impetuses for all of Eastern Germany.

Central Germany a large variety of so-called locational conditions in the fields of culture, education and tourism. Leipzig has an international school for optimal care of children of foreign staff members. Attractive cities, such as Leipzig, Halle, Erfurt and Gera as well as Potsdam and Berlin, provide high-quality culture of living by combining more than 1000 years of history with modern lifestyles. The theatre, opera, university or sports landscapes are as rich as real property offers in the region. This is why Central Germany is increasingly popular as a place to live.



Investors from Germany and abroad can expect favourable public financial assistance. Efficiently working public authorities provide swift and unbureaucratic support and assistance. Brief permission periods for investments have become a hallmark of the region.

The so-called 'Strategy dialog' in the chemical industry between the business community and the federal state governments concerned has established a policy style that helps identify problems, develop and implement solutions. This approach has made a sustainable impact on improving competitive structures in the chemical/plastics industry. Thus, Central Germany provides attractive conditions in many respects for new investors from Germany and abroad.

Potentials – Main European economic area moves to the East

- Proximity to new markets opens growth chances for chemical industry
- East-West switching point provides advantages



In the first half of the 20th century, Central Germany was among the strongest economic regions in Europe. In early 21st century there are many indications that the region may again take on a similar role because the accession of Central and Eastern European countries to the European Union has extended the economic framework of Europe further to the East. The swift shifting of the main economic area from Western to Central and Eastern Europe is one of the essential processes that gains further momentum with EU enlargement and from which also the chemical and plastics industries will profit. Main causes for the migration of the so-called growth banana to the East are the enormous market potentials but also favourable costs and a vast offer of labour.

The process is already in full swing in major areas, such as automotive, chemical and plastics industry as well as aviation industry, in the CEE (Central and Eastern European) countries. There are, e.g., completely new product integration schemes established in the chemical industry. In this context, the position of Central Germany as that of the new federal states will undergo decisive changes since they will move from a position on the western EU border to the centre of the Community which will entail many opportunities for growth.

Central Germany also profits from the revalorisation of Berlin into the federal capital and metropolis of European dimension. The proximity to Central and Eastern European growth markets and the pertaining orientation to the Eastern European market make Berlin and Central Germany preferential locations for European headquarters of multinational companies. The shift of European economic activities towards the East tendentially enhances the role of Eastern German growth regions also as mediator in European trade. Besides Berlin, especially Central Germany will benefit from this increasing function as East-West switching point.

see Map on page 20

Success story – Chemistry / Plastics in Central Germany

- A success story has been written
- Remarkable increase in sales, employment rates and productivity

‘Central Germany is again becoming a competence centre for polymer production and processing. Innovative firms and reputed research institutions form the basis of the region’s sustainable development.’

Dr. Christoph Mühlhaus

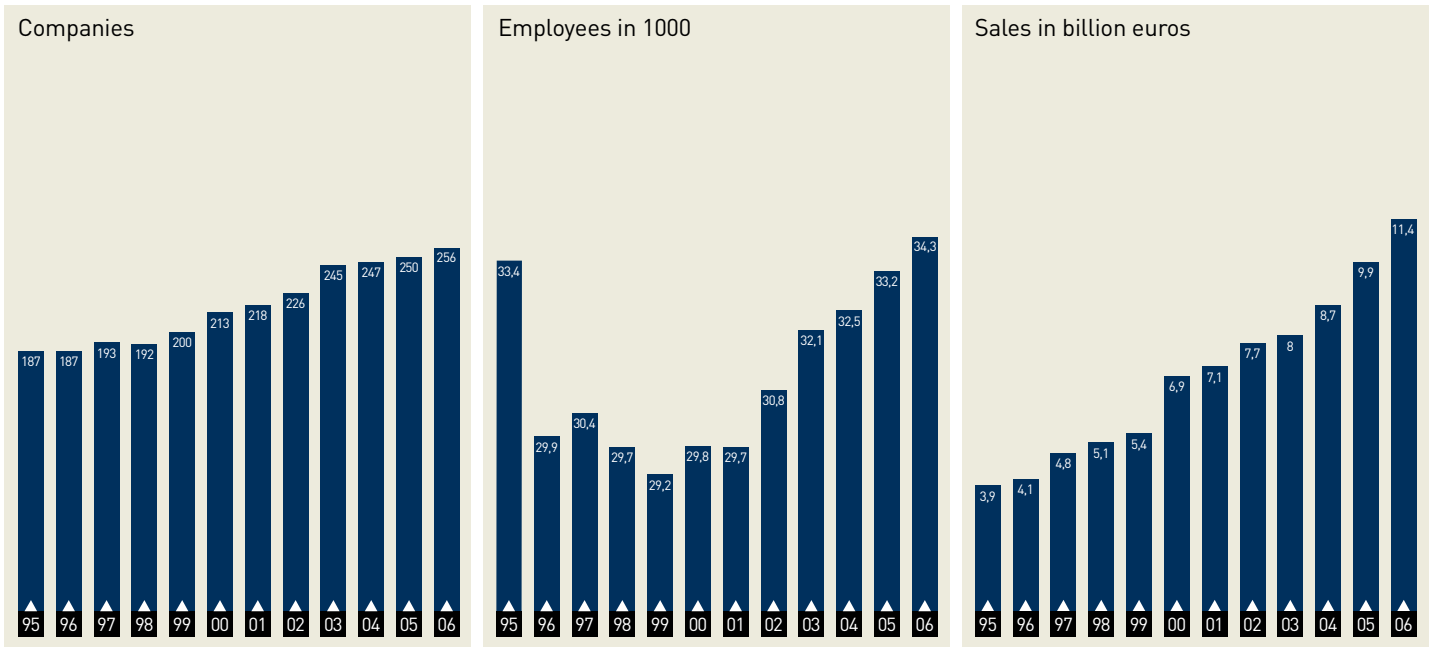
Spokesman of the Central German Cluster Chemistry/Plastics,
General Representative, Dow Olefinverbund GmbH

Chemical industry and plastics processing have written an impressive success story following introduction of market economy in Eastern Germany and today are among the major growth branches in Central Germany. This industry takes a combined share of about 14 per cent in the total sales of the processing trade in the federal states of Saxony, Saxony-Anhalt, Thuringia and Brandenburg.

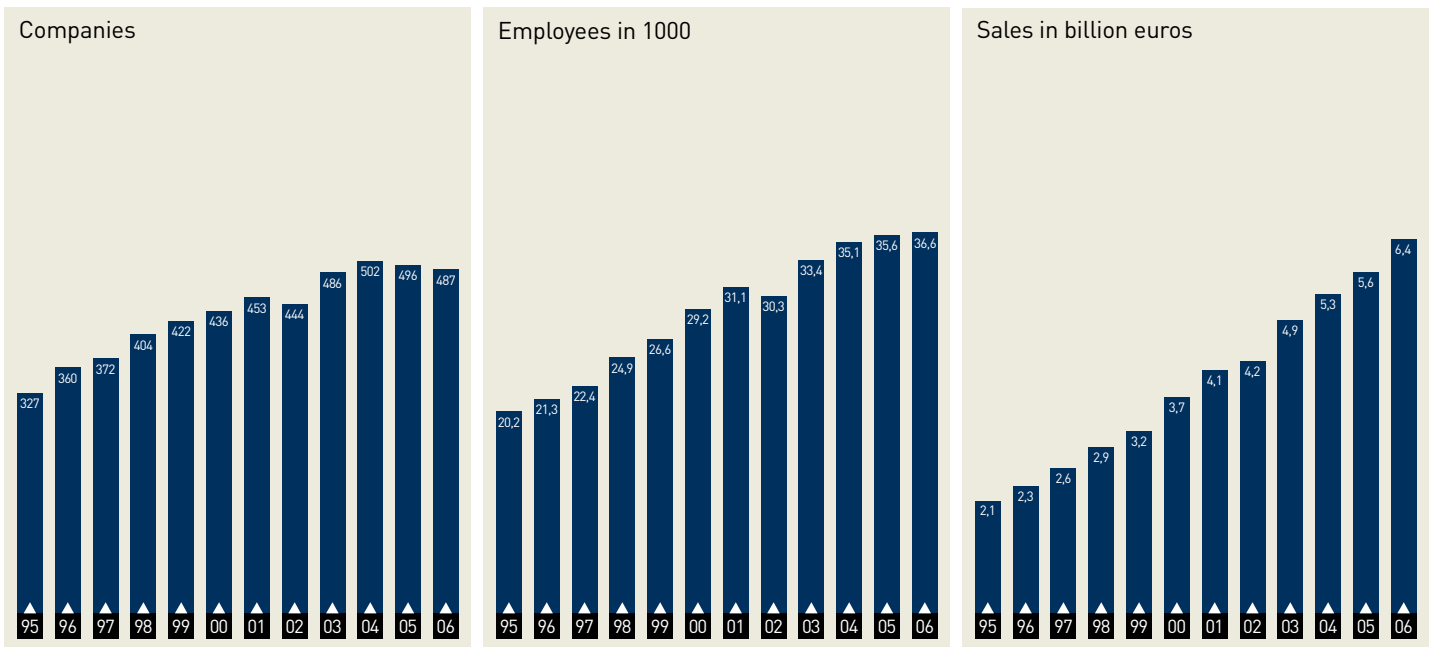
Some 750 chemical and plastics companies generated a turnover of ca. 18 billion euros in 2006 – an increase of some 15 per cent compared to previous year figures. Thus, a development was kept up that has continued for eleven years. Sales have risen by 200 per cent from 1995 to 2006.

The chemical and plastics industry in Saxony, Saxony-Anhalt, Thuringia and Brandenburg has also proven an employment motor and currently provides 71,000 jobs – a growth by more than 30 per cent compared to 1995. Another proof of the successful road is also the sharp rise in productivity which was 120 per cent in 2006 with sales of 251,000 euros per employee as compared to 1995. The leap becomes even more obvious when looking at the time before restructuring. In Leuna, for instance, 27,000 employees generated a turnover of the equivalent of 1.5 billion euros in 1990. In 2006, 9,000 staff generated six billion euros, i.e. quadrupled the economic performance.

Chemical industry Central Germany – Saxony, Saxony-Anhalt, Thuringia, Brandenburg



Plastics industry Central Germany – Saxony, Saxony-Anhalt, Thuringia, Brandenburg



Source: Federal State Statistical Offices in Saxony-Anhalt, Saxony, Thuringia, Brandenburg

Computations: isw GmbH

Value-added chain – Major development opportunities

- Strengths in research and processing of polymers
- Researchers, producers and processors are getting together



The strengths of the Central German Chemical and plastics industry are mainly in research and processing of polymers. There are excellent prerequisites for organising value-added chains from research via production of feedstock materials to final products. The region is not only a cradle of international chemistry research, it was in Schkopau that synthetic rubber was manufactured with the emulsion process in an industrial-scale plant for the first time in the world in 1937. Today, Dow Olefinverbund GmbH is employing five different processes for polymerisation of synthetic rubber, supported by the research department.

The opportunity of making the entire value-added chain from feedstock to final product a subject of research in Central Germany, is bringing many major companies engaged in polymer synthesis, medium-sized polymer-processing firms and research institutions. They can jointly pursue targets of research and development work. Network structures of plastics processors play a central role for enhancing integration of SMEs. Organisation of value-added chains provides the opportunity of sustainably improve competitiveness in the field of polymer technologies by allowing for a concentration of largely existing competences on subjects that are essential for economic development. All these efforts are geared to developing new plastics products with improved properties as well as innovative synthesis and processing technologies.

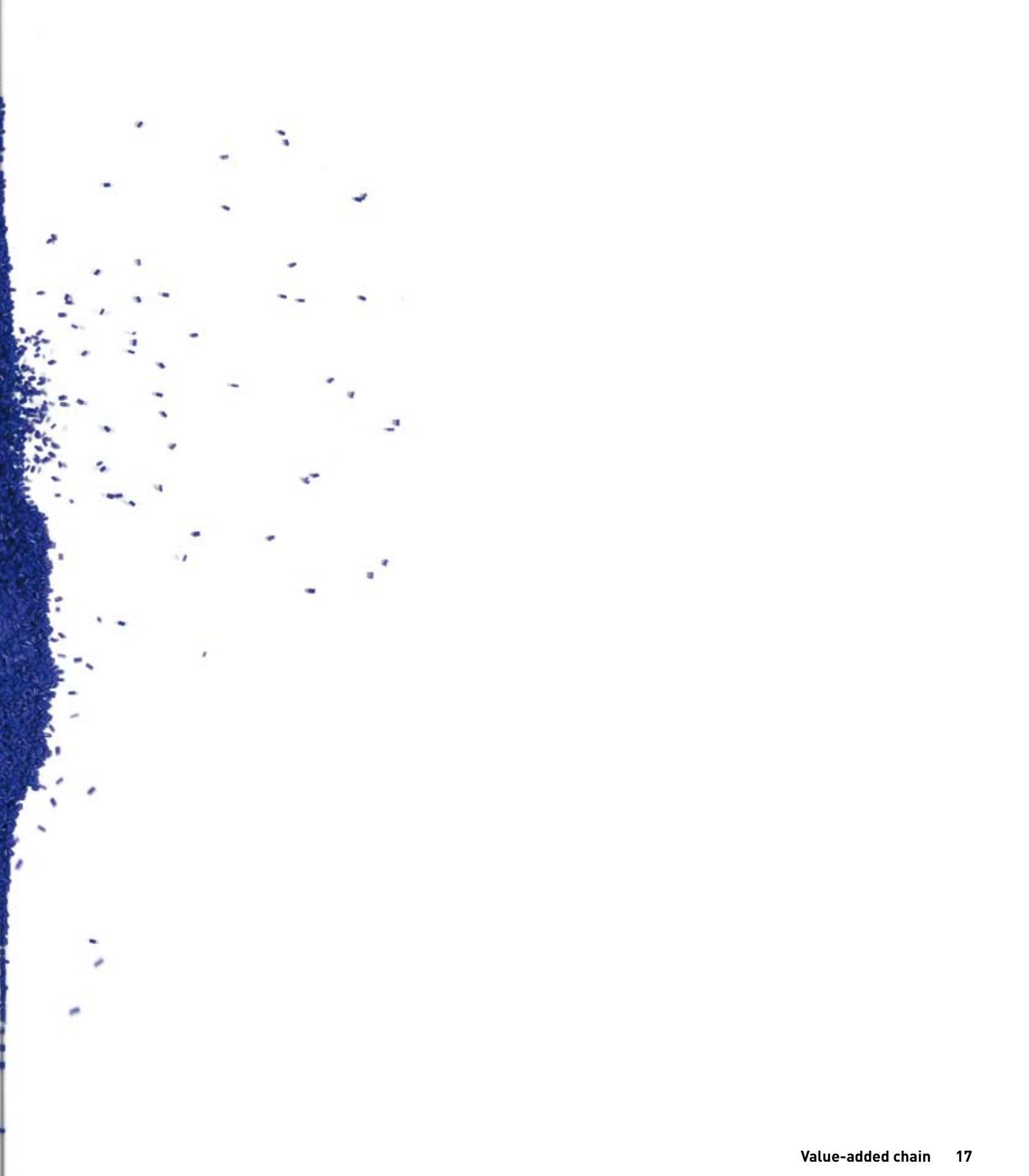


Research

Plastics research in Central Germany has been consistently aimed at materials for decades. Subjects of research are not only feedstock materials but also processing methods. This is why research is focusing on structures of materials and the resulting future component properties. Hence, one long-time characteristic of plastics research in Central Germany has been its concentration on changes of materials during processing. Intensive efforts are devoted to micro-structures of plastics, their stability, notch impact strength and elasticity. Examples are shock absorbers or interior door linings for cars whose quality was considerably improved by fibre reinforcement of plastics.

Production/feedstock

Feedstock in the value-added chain for plastics processors are granules that are produced in a synthesis process in reactors and is a final product of chemical companies. Transitions from feedstock to final product are flowing in the value-added chain. In Central Germany there are, inter alia, polymer value-added chains. Polypropylene, e.g., is produced by Dow Olefinverbund GmbH produced. BASF AG provides a large variety of polymers to processors. Ineos Vinyls Germany GmbH in Schkopau manufactures polyvinyl-chloride. So-called composites, i.e. combinations of plastics with other materials, are increasingly gaining importance. Research into such future-oriented materials, that are much sought after, e.g., in the automotive and aviation industry, is performed by Max Planck Institute for Microstructure Physics in Halle and the Fraunhofer Institutes for Mechanics of Materials in Halle and for Applied Polymer Research in Potsdam-Golm.



Sales/final product



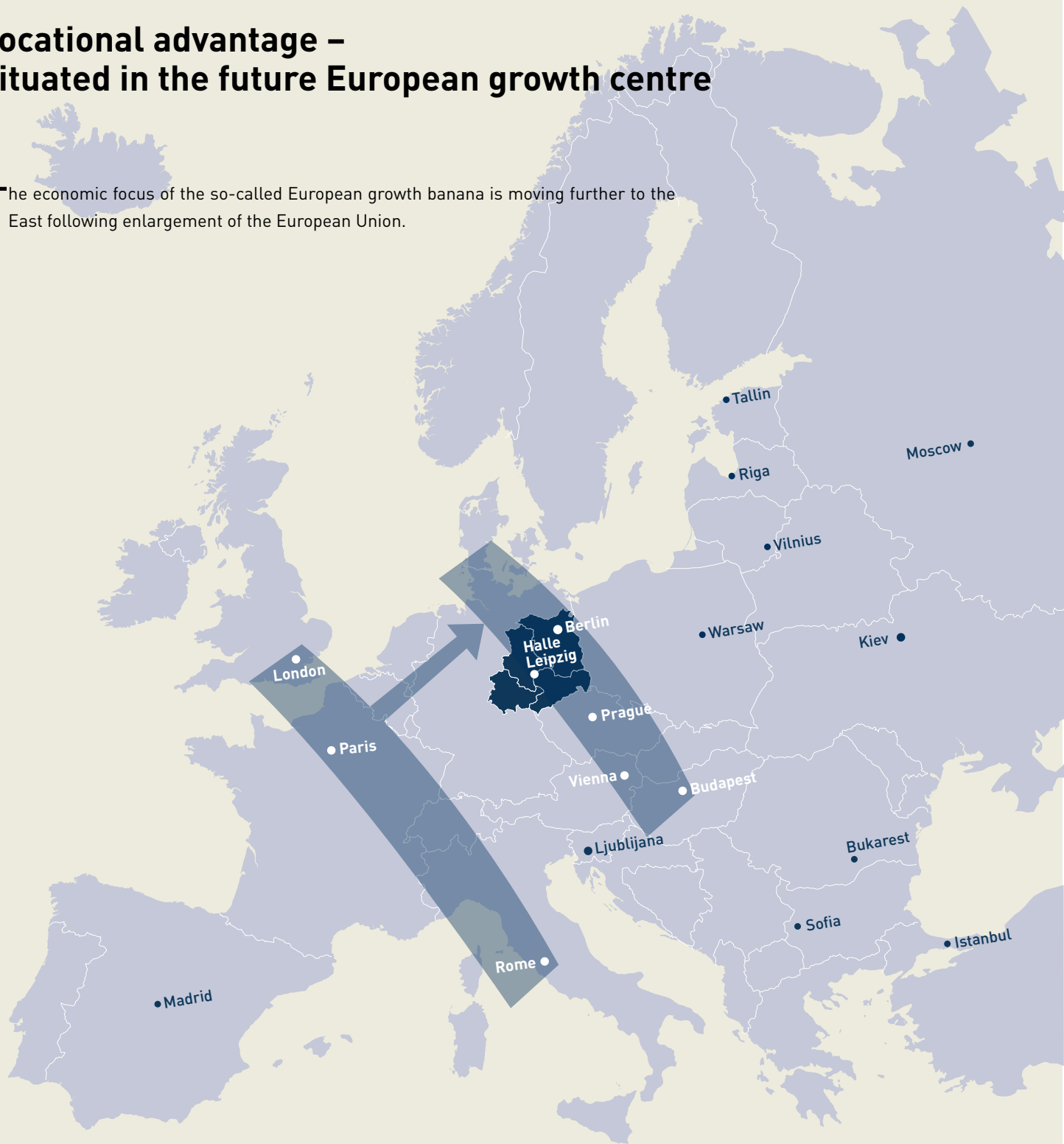
Exhibits of 'Automotive Award – parts & components' of the 'Society of Plastics Engineers Central-Europe'

Products from the Central German chemistry and plastics value-added chain are used in many everyday applications. This applies both to households and the world of industry. Such products can be found in kitchens and children's rooms. They are used in the clothing and beverage industries, in medical engineering, agriculture and vehicle construction. Their ranges of application appear to be unlimited. Plastics are increasingly substituting traditional materials. Front parts or load-bearing automotive components are more and more frequently no longer of steel but plastics. In terms of annual consumption quantities plastics have since superseded steel on a worldwide scale – with an upward tendency.



Locational advantage – Situated in the future European growth centre

The economic focus of the so-called European growth banana is moving further to the East following enlargement of the European Union.



THE FUTURE CLUSTER CHEMISTRY / PLASTICS CENTRAL GERMANY

ESTABLISHED **NETWORK STRUCTURES**, LARGE VARIETY OF SERVICES

SOME **750 COMPANIES** IN THE CHEMISTRY AND PLASTICS INDUSTRY

ANNUAL TURNOVER **18 BILLION EUROS**

MAJOR **GROWTH BRANCH** IN CENTRAL GERMANY

INTERNATIONAL SCHOOLS

QUALIFIED EMPLOYEES, **PREPAREDNESS TO LEARN** AMONG POPULATION

CURRENTLY SOME **71 000 PEOPLE** IN EMPLOYMENT

STRATEGIC **SITE ADVANTAGE** AT THE HEART OF THE ENLARGED EUROPE

Research location Potsdam-Teltow

Fraunhofer Institute for Applied Polymer Research IAP → p.44

Brandenburg Technical University Cottbus
Chair Polymer Materials → p.41

Fraunhofer Institute for Reliability and Micro-integration (IZM) – Branch Lab Polymer Materials and Composites Teltow → p.46

Research location Wittenberg

→ p.48

Agrochemical Institute Piesteritz e.V.

Research location Leipzig

Leipzig University, Faculty for Chemistry and Mineralogy → p.43

HTWK – Leipzig University of Applied Sciences → p.43

Leibniz Institute for Surface Modification Leipzig (IOM) → p.46

Plastics Centre in Leipzig gGmbH (KuZ) → p.47

Research location Halle-Merseburg-Bitterfeld

Martin Luther University Halle-Wittenberg,
Institute for Technical Chemistry and Macromolecular Chemistry,
Chair for Plastics Engineering → p.40

UAS Merseburg (FH), Department INW Engineering and Natural Sciences → p.40

Fraunhofer Institute for Mechanics of Materials IWM → p.44

Max Planck Institute for Microstructure Physics Halle (MPI) → p.44

Institute for Polymer Materials Merseburg registered association (IPW) → p.41

Plastics Competence Centre Halle/Merseburg (KKZ) → p.47

Polymer Service GmbH Merseburg (PSM) → p.41

Fraunhofer Pilot Plant for Polymer Synthesis and Polymer Processing Schkopau PAZ → p.47

CPI ChemiePark-Institut GmbH → p.48

Research location Dresden-Freiberg

Dresden University of Technology, Institute of Lightweight Structures and Polymer Technology (ILK) → p.42

Leibniz Institute for Polymer Research Dresden registered association (IPF) → p.45

IMA Materials Research and Application Engineering GmbH Dresden → p.45

Research Institute for Leather and Plastic Sheets gGmbH Freiberg (FILK) → p.45

Research location Jena-Rudolstadt

→ p.42, p.46

UAS Jena Department SCITEC → p.42

Friedrich Schiller University Jena, Institute for Materials Sciences and Materials Engineering → p.42

Thuringian Institute for Textile and Plastics Research Rudolstadt registered association (TITK) → p.46

Competence Centre Polysaccharide Research Jena → p.48

Research location Chemnitz

→ p.43

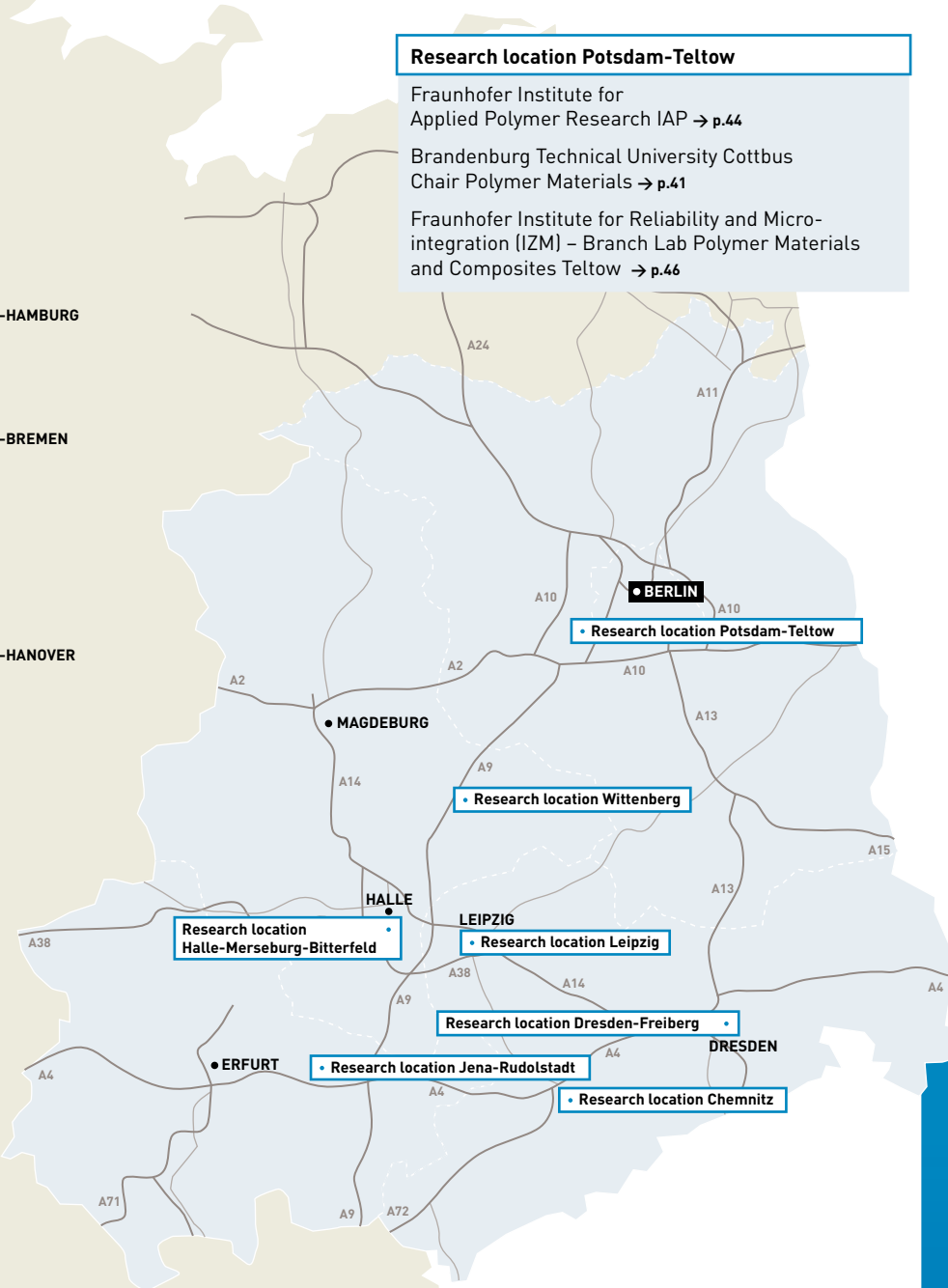
Technical University Chemnitz,
Professorship for Plastic Materials

Research competence chemistry/plastics

← HAMBURG

← BREMEN

← HANOVER



--- FEDERAL STATE BORDER
— MOTORWAY
— FEDERAL HIGHWAY

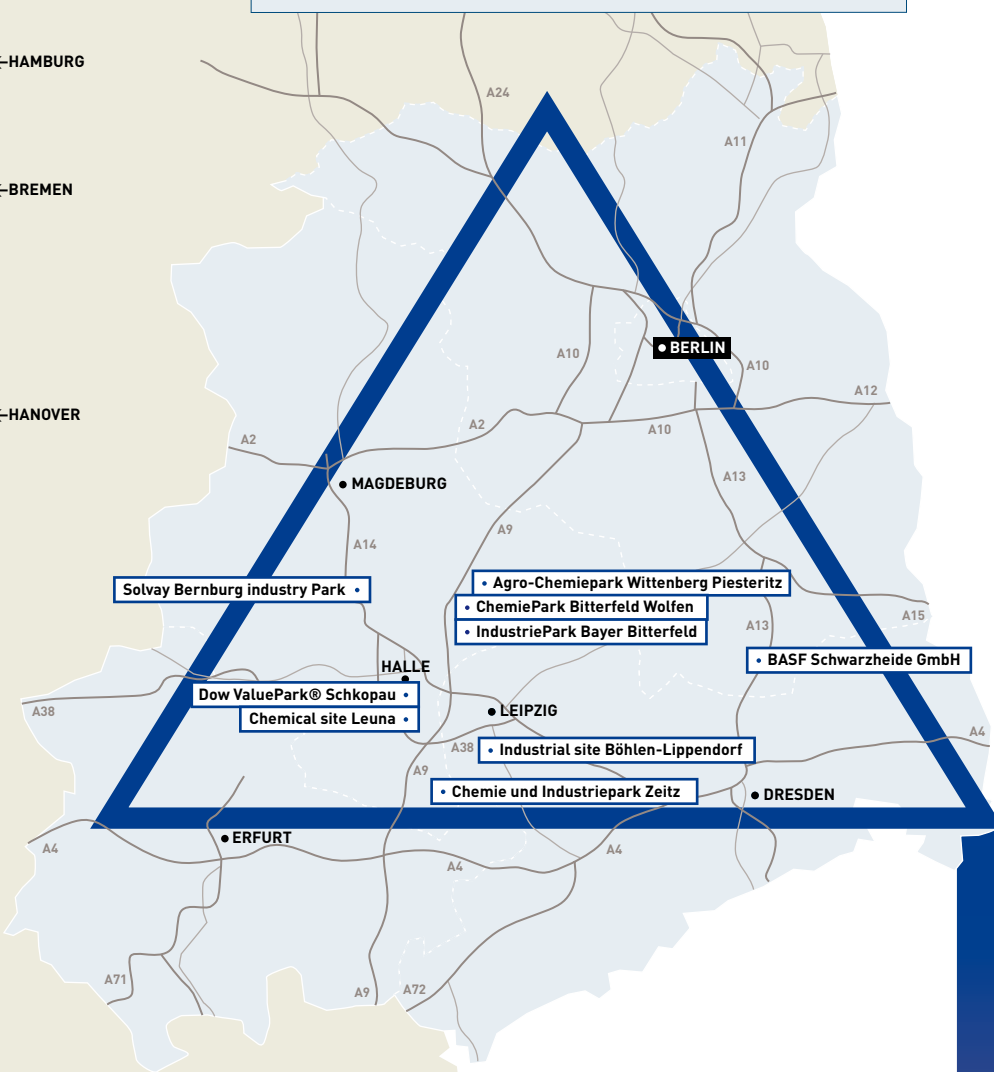
CeChemNet Central European Chemical Network  → S.30

Network of chemical sites in Central Germany with 7 partners:
 PD ChemiePark Bitterfeld Wolfen GmbH
 InfraLeuna GmbH (ValuePark® Schkopau, Böhlen)
 BASF Schwarzheide GmbH
 ZSG Zeitzer Standortgesellschaft mbH
 Verband der chem. Industrie e.V., Landesverband Nordost
 isw-GmbH Halle

← HAMBURG

← BREMEN

← HANOVER



Agro-Chemiepark Wittenberg Piesteritz → p.29

Nitrogen production (SKW)
 Melamine production (AMI)
 Agrochemical Institute (ACI)

ChemiePark Bitterfeld Wolfen → p.27

Chlorine chemistry, phosphorus chemistry, fine chemistry, specialty chemistry, metal treatment and processing, solar technology
 CPI ChemiePark Institute for Front-end Industrial Research, Materials research, Reactive Wet-coating, Chiral compounds

IndustriePark Bayer Bitterfeld → p.27

Varnish feedstocks, pharmaceutical products for self-medication, ion exchangers

Solvay Bernburg industry Park → p.29

Soda, sodium hydrogen carbonate, hydrogen peroxide

Dow ValuePark® → p.28

Dow: Synthetic rubber, PET, polypropylene, processing of polystyrene, polyethylene
 Plastics (granules) in ValuePark®
 Dow Competence Centre for Synthetic Rubber
 Dow Competence Centre for PET
 PAZ Fraunhofer Pilot Plant Centre for Polymer Synthesis and Polymer Processing

Chemical site Leuna → p.27

Production of mass-produced and specialty chemicals, plastics, plastics additives, adhesives, resins, fuels, chemical catalysts, lubricants technical gases, power generation

BASF Schwarzheide GmbH → p.26

Production centre for highly refined chemicals and plastics, polyurethane base products and systems, herbicides, water-based lacquers, engineering plastics, dispersions and Laromer brands, BASF R&D test facility: Polyurethane

Plastics Competence Centre (KKS)

Industrial site Böhlen - Lippendorf → p.28

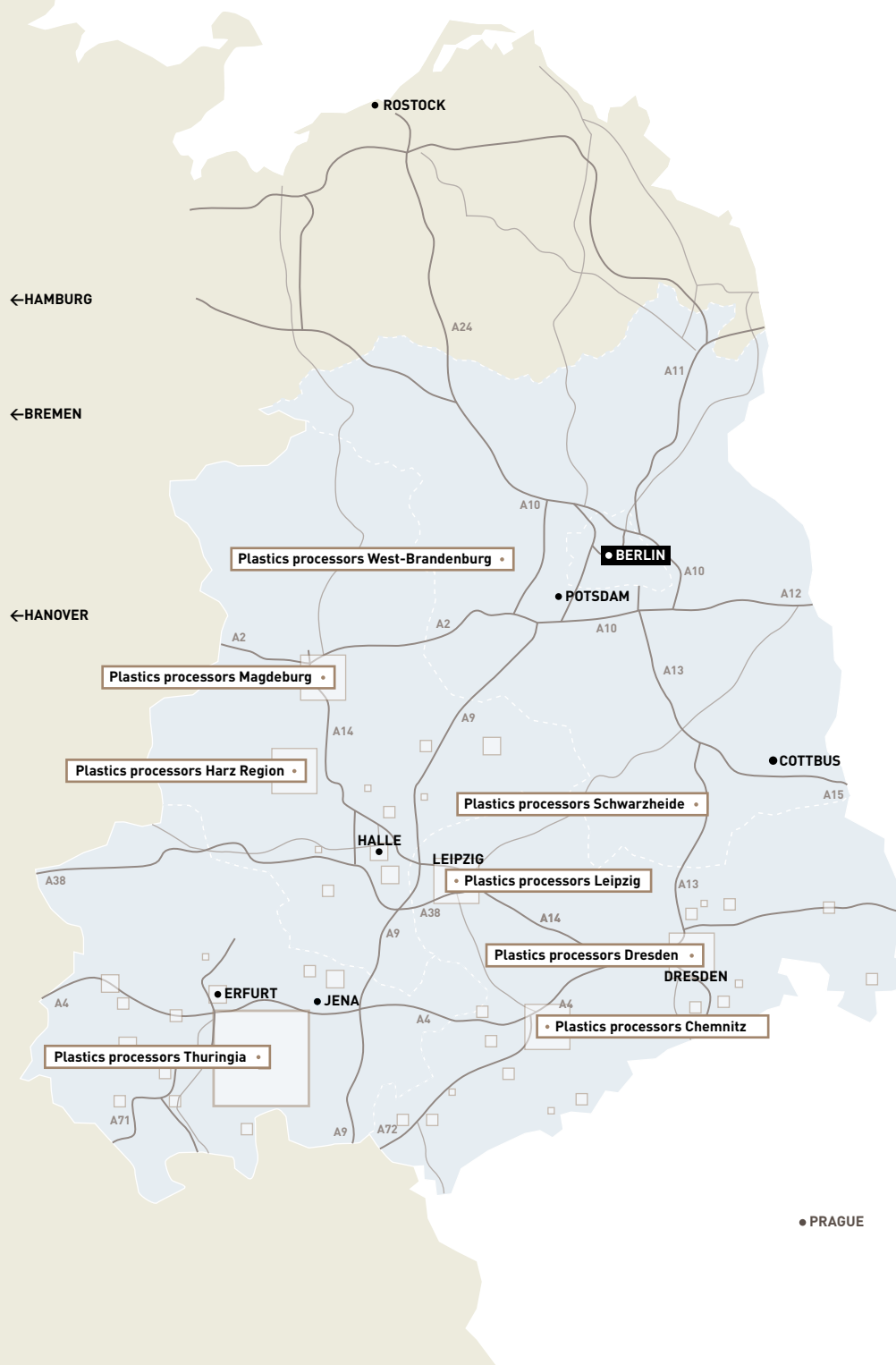
Dow: Cracker, ethylene and propylene as well as feedstocks for plastics, dyestuffs, adhesives, cosmetics

AirLiquid: Technical gases
 Plaster board production, stainless steel products

Chemie und Industriepark Zeitz → p.26

Adipic acid production (Radici), adhesive production, production of waxes and additives, Competence Centre for industrial-scale white biotechnology and biomass production

Locations and innovation potentials



Plastics processors and networks

Plastics processors Saxony-Anhalt

97 companies with more than 20 staff
 Total of about 8 300 employees
 Approx. 1.5 billion euros turnover

Plastics processors Thuringia

183 companies with more than 20 staff
 Total of about 13 700 employees
 Approx. 2.4 billion euros turnover

Plastics processors Saxony

146 companies with more than 20 staff
 Total of about 10 200 employees
 Approx. 1.4 billion euros turnover

Plastics processors Brandenburg

61 companies with more than 20 staff
 Total of about 4 500 employees
 Approx. 895 million euros turnover

Networks →p.33, 34, 35

- CeChemNet-Central European Chemical Network → p.30
- MKN - Central German Plastics Network → p.32, 33
 - AMZK-Saxony
 - Polykum Saxony-Anhalt
 - PolymerMat Thuringia
- Network FEKM → p.33
- KuBra Plastics Network Brandenburg → p.33
- Innovativer Regionaler Wachstumskern → p.34
- Funktionelle Nassbeschichtung „ReactiveWetCoating“
- 4Chiral Network → p.34
- FASA → p.35
- Working party "Material innovative Thuringia" → p.35
- Network Pipeline and Process Plant Engineering → p.35

Plastics potentials, total

487 companies with more than 20 staff
 36 618 employees
 6.4 billion euros turnover

Source: Computations by isw GmbH
 based on data by Federal State Statistical Offices

INNOVATION LANDSCAPE CHEMISTRY / PLASTICS CENTRAL GERMANY

GOOD OPPORTUNITIES

WORLD-SCALE RESEARCH POTENTIALS CHEMISTRY / PLASTICS IN CENTRAL GERMANY

HIGH-POTENTIAL SCIENCE SPACE

CONTINUATION OF TRADITIONS – NOBEL PRIZE LAUREATES IN CHEMISTRY

GLOBALLY ACTING TEAMS

KEY ACTIVITIES IN WORLDWIDE RESEARCH FUNCTIONS OF MAJOR INTERNATIONAL GROUPS

ULTRA-MODERN RESEARCH INFRASTRUCTURE

FOR THE SME SECTOR – TWELVE UNIVERSITY-BASED AND TEN EXTRA-MURAL RESEARCH INSTITUTIONS

SIX COMPETENCE CENTRES

WITH SPECIFIC PROFILES

DEVELOPMENT INTO INNOVATION CLUSTER POLYMER TECHNOLOGY

International cooperation – European network bundles interests

- 18 chemical regions collaborate in ECRN
- Access to foreign partners is eased

The European Chemical Regions Network ECRN was founded in 2003. Highlights of its manifold activities to date were four European congresses of chemical regions in Brussels (2003), Halle/Saale (2004), Milan (2005) and Tarra-gona (2006). Those European congresses are a platform for a continual dialog with high-ranking representatives of politics, the business community and its federations as well as authorities and science relating to common challenges and chances of chemical regions in Europe. Under the leadership of Saxony-Anhalt, 18 chemical regions (see Map) from nine countries (Germany, Spain, Italy, the Netherlands, UK, Belgium, Estonia, Czechia and Poland) are cooperating in ECRN. The current ECRN president is Dr. Reiner Haseloff, Saxony-Anhalt's Minister of Economics. The network looks after the interests of European chemical regions and promotes the exchange of experience between them. A specifically formed association shall enable enlargement of the network by further European regions and provide a long-term basis for their collaboration. The German federal states of Rhineland-Palatinate, Schleswig-Holstein and Hesse as well as the regions of Usti in Czechia and Flanders in Belgium have since joined the association. Further regions have signalled their interest. The network has made itself a name as advocate of interests of chemical regions in Europe by joint positioning vis-à-vis the European Union. Inter alia, it maintains a close cooperation with the European Chemical Industry Association CEFIC in developing the European technology platform 'Sustainable chemistry'. Moreover, ECRN is represented in working groups of the European Commission and, e.g., has intensively participated in discussions on the impacts of the EU-Chemicals

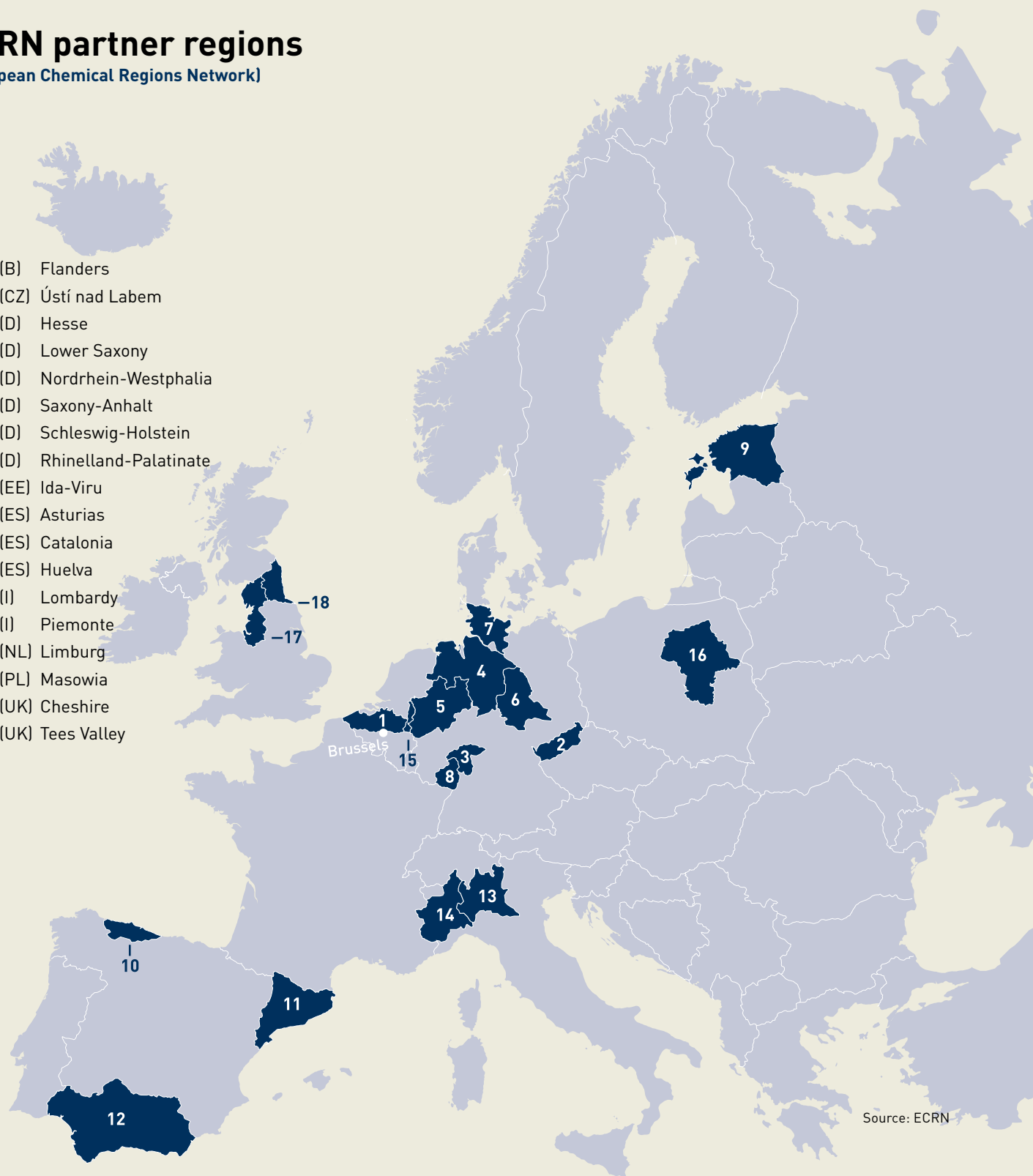
Directive REACH (Registration, Evaluation and Authorisation of Chemicals). During both REACH readings in the EU Parliament, suggestions for amendments were tabled, aimed at a higher practicability of the statutory rules. Current topics include support of initiatives for implementing REACH, in particular in SMEs. The semi-annual ECRN presidium meetings adopted further joint declarations, e.g. on EU research cooperation, emission trading, innovation and regional development. The network supports the dialog between participating chemical regions to exchange experiences on different subjects and advocate shared standpoints. Thus, ECRN is a platform of discussion for all aspects affecting chemical regions. Opportunities and challenges emanating from networking at the European level shall be further developed and made accessible to a broader public. A 'Who is Who' of European chemical regions was prepared. Studies have furthered exchange of experience between the regions. Work is focusing on subjects such as cooperation between economy and science, HR development, chemistry park management, environmental protection and legal safety as well as rehabilitation of industrial sites. The current activities of ECRN are concentrated on participating in the high-level group for enhancement of competitiveness of the chemical industry in Europe. This body is headed by the European Commission and discusses joint strategies towards strengthening the chemical location of Europe with high-ranking representatives of European institutions and the chemical industry. ECRN will open a representative office in Brussels in order to strengthen its position at the EU.

www.ecrn.net

ECRN partner regions

(European Chemical Regions Network)

- 1 (B) Flanders
- 2 (CZ) Ústí nad Labem
- 3 (D) Hesse
- 4 (D) Lower Saxony
- 5 (D) Nordrhein-Westphalia
- 6 (D) Saxony-Anhalt
- 7 (D) Schleswig-Holstein
- 8 (D) Rhineland-Palatinate
- 9 (EE) Ida-Viru
- 10 (ES) Asturias
- 11 (ES) Catalonia
- 12 (ES) Huelva
- 13 (I) Lombardy
- 14 (I) Piemonte
- 15 (NL) Limburg
- 16 (PL) Masowia
- 17 (UK) Cheshire
- 18 (UK) Tees Valley



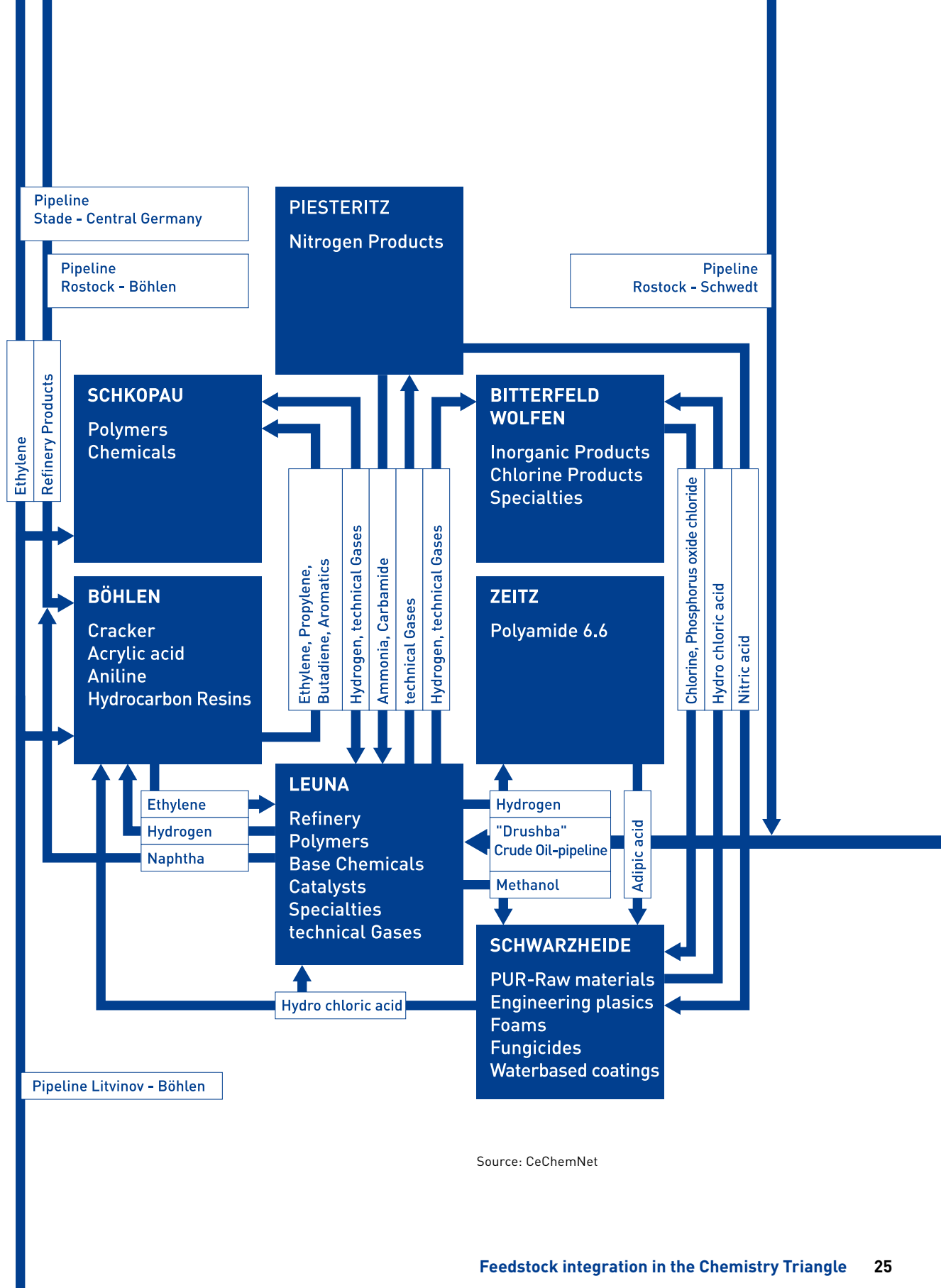
Source: ECRN

Competence – Feedstock integration of companies

- Birthplace of chemistry parks
- Specific know-how

Chemical sites in Central German are pioneers in the global restructuring process in the chemical industry. This role is based on more than 100 years of chemistry tradition and the most modern chemical plants in Europe as result of the restructuring processes in the Eastern German chemical industry. Since the early 1990s, 17 billion euros have been invested into rehabilitation and upgrading of infrastructure and production plants on major chemical sites in Saxony-Anhalt, such as Leuna, Bitterfeld-Wolfen, Schkopau, Zeitz, Piesteritz as well as in Böhlen (Saxony) and Schwarzheide (Brandenburg). The large chemical sites presently provide a total of 28 000 jobs. The Chemistry Triangle with a chemistry park surface totalling 5 500 hectares boasts comprehensive raw material and synergy potentials that are jointly used by local companies. A 430-km-long feedstock pipeline starting in the Baltic Sea port of Rostock connects the chemical sites of Dow Olefinverbund GmbH in Böhlen and Schkopau to global material and commodity flows. All this provides excellent preconditions for new business siting schemes. Since 2005 more than 30 new or extension investments have been made or are in the planning phase in the Chemistry Triangle. By 2008, another 650 million euros will be invested and more than 1 200 new jobs created.

The chemical competence of the region is characterised by specific know-how that is the result of successful coping with a complex transformation process. Central Germany is the 'birthplace' of the chemistry park concept which was implemented, e.g., by the formation of an infrastructure company, such as InfraLeuna GmbH, Zeitzer Standortgesellschaft, ValuePark® of Dow Olefinverbund GmbH, opening of the BASF site Schwarzheide for investors or Chemistry Park Company PD Chemiepark Bitterfeld-Wolfen. The chemical sites pursue new approaches in their cooperation. In 2002 they founded the chemical site federation Central European Chemical Network with the support of the state of Saxony-Anhalt. Chemistry park companies and chemical companies provide their experiences, services and products to help newly sited business swiftly concentrate on efficient manufacturing of innovative products. Following successful restructuring the chemical sites/chemistry parks in Central Germany have entered into a new phase which is characterised by an even stronger orientation on innovations. One specific strength of the Central German Chemistry Triangles is the feedstock integration of several sites, such as Leuna, Schkopau, Böhlen, Bitterfeld, Piesteritz and Schwarzheide (see Map).



Source: CeChemNet

Chemistry parks/chemical sites

Chemie und Industriepark Zeitz

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The Chemie- und Industriepark Zeitz was established in 1996 on the premises of a disused hydrogenation plant as a completely new developed industrial location with modern chemistry infrastructure. Industriepark Zeitz provides optimal framework conditions both for new large-scale firms and SMEs. Companies such as Radici Germany GmbH, Puralube GmbH, Jowat Klebstoffe GmbH, Deurex Micro Technologies GmbH have already sited on the 237-hectare site. In the future the site will implement projects for material and energetic utilisation of indigenous raw lignite by producing synthesis gas by modern coal gasification technologies. In addition, Investments for industrial utilisation of biomass and implementation of research results in large-scale production of organic chemical products and polymers from renewable raw materials are planned. The local 'Kompetenzzentrum für industrielle Verwertung von Biomasse GmbH Burgenlandkreis' (KIBV GmbH Burgenlandkreis) and the 'Forschungszentrum der Zeitzer Energie-Agentur GmbH' act as binding links between the innovation owners in this process.

BASF Schwarzheide GmbH

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Progress means for BASF Schwarzheide GmbH its consistent further development. Schwarzheide can look back on 70 years of chemistry history. BASF invested 1.3 billion euros in Schwarzheide in the past few years and profoundly modernised the site. With its numerous new plants the works has been presenting itself since as an attractive production centre for highly refined chemicals and plastics. The works premises Schwarzheide cover an area of 230 hectares. More than 2,100 staff in some 20 production companies are manufacturing a variety of products. The product portfolio includes PUR base products and systems, herbicides, water-based lacques, engineering plastics as well as dispersions and Laromer brands. Special emphasis in terms of innovation takes the research department of BASF which has been profiled as a development centre for fabricated materials for polyurethanes and is equipped with state-of-the-art analytical instruments and a modern R&D test facility.

Bitterfeld is one of the oldest chemical sites in Europe with large-scale chemical production commencing in 1893. In 2001 the Chemiepark Bitterfeld Wolfen GmbH was privatised to Preiss-Daimler Group. 230 million euros were spent on the complete renewal of the site infrastructure. The total area is 1 200 hectares of which 200 hectares are immediately available for new business siting. 360 firms with 11,000 staff are working here.

Some 3,5 billion euros have been invested to date by companies from Japan, the USA, Australia, Belgium and other countries. The industrial profile of the chemical park is characterised by chlorine, phosphorus, dyestuff, pharmaceutical, quartz glass, fine and high-tech chemistry as well as metallurgy. With Q-Cells AG the region has established as one of the highest performing solar locations in Europe. The chemical face of the site is characterised by comprehensive feedstock integration. One example of eco-friendly feedstock integration is the production of synthetic quartz glass. The ChemieParkInstitut is engaged in industrial front-end research in the fields of organic synthesis chemistry, inorganic and technical chemistry and pharmaceuticals.

Resins for lacquers and pharmaceutical products have been manufactured by Bayer Bitterfeld GmbH since the early 1990s. Other companies in IndustriePark Bayer Bitterfeld GmbH are producing methyl cellulose (Wolff Cellulosics Bitterfeld GmbH) and ion exchangers (IAB Ionenaustauscher Bitterfeld GmbH/Lanxess Germany). Presently some 800 staff are working on the industrial site. Bayer Bitterfeld GmbH is offering free land plots and services to further interested businesses.

Investments and competence have made Leuna into a leading industrial site in Central Germany. More than twenty international groups and numerous SMEs are relying on its location at the heart of Europe and have invested some 5.5 billion euros to date. InfraLeuna GmbH and its affiliated companies are owners and operators of the infrastructure facilities at the chemical site Leuna. The attractive range of services provided by InfraLeuna comprises, inter alia, power generation and supply, water supply and effluent disposal, security services, including fire brigade, analytics, logistics, telecommunications. InfraLeuna acts as site development company and supports and assists new firms in every respect.

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IndustriePark Bayer Bitterfeld

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Chemical site Leuna

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Dow ValuePark®

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The DOW works in Schkopau, Böhlen, Leuna and Teutschenthal employ 2,300 staff and are among the most modern chemical sites in the world. Starting point of the production chain is a cracker (Böhlen) where straight-run gasoline is cracked into chemical base materials ethylene and propylene. The major part of base products is processed within Olefinverbund, e.g. in Schkopau where synthetic rubber has been produced for over 70 years. Other products include PET, polypropylene, polystyrene, polyethylene. These plastics leave the plants as granules and are further processed in the ValuePark® and plastics processors around the world. Dow has developed with its ValuePark® a concept to site partners who form part of the material, logistic and services integration of site production. Dow acts as a 'one-stop-agency' for these contractors. To date, 14 new businesses have invested 400 million euros in the ValuePark® in Schkopau.

Industrial site Böhlen-Lippendorf

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The premises with a total of 600 hectares industrial land is the major chemical site in the Free State of Saxony and also an important power generation site (Vattenfall power station). The site has a modern, completely renewed infrastructure and chemical plants. Its profile is characterised by Dow Olefinverbund GmbH: Crackers, ethylene and propylene as well as feedstock materials for plastics, dyes, adhesives and cosmetics. One company that is incorporated into the material integration on site is Air Liquide, a manufacturer of technical gases. Air Liquide Ost is headquartered in Böhlen. Further firms on site produce plaster boards and stainless steel products. 100 hectares are still available for new business siting.

AgroChemistry Park Wittenberg Piesteritz

SKW Stickstoffwerke Piesteritz GmbH was founded in 1993. The product portfolio of the biggest urea and ammonia producer in Germany comprises a broad range of specialties of agro- and industrial chemistry and is continually further developed by the R&D department, focused on agricultural application research. Several new plants and further modern logistic functions were newly built in order to extend the range of specialties. In the field of industrial chemicals, SKW is a major supplier of base chemicals, such as ammonia, urea and nitric acid. The melamine works of AMI Agrolinz Melamine International Deutschland GmbH went on stream in 2005. Foundation of the Agrochemical Institute intensified cooperation between SKW and Martin Luther University Halle-Wittenberg and inaugurated development of the site into an AgroChemistry Park. The latest arrival is Neckerman Renewables Wittenberg GmbH which is presently building the largest combined biodiesel and pharmaceutical glycerine plant in the world.

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Solvay Bernburg industrial Park

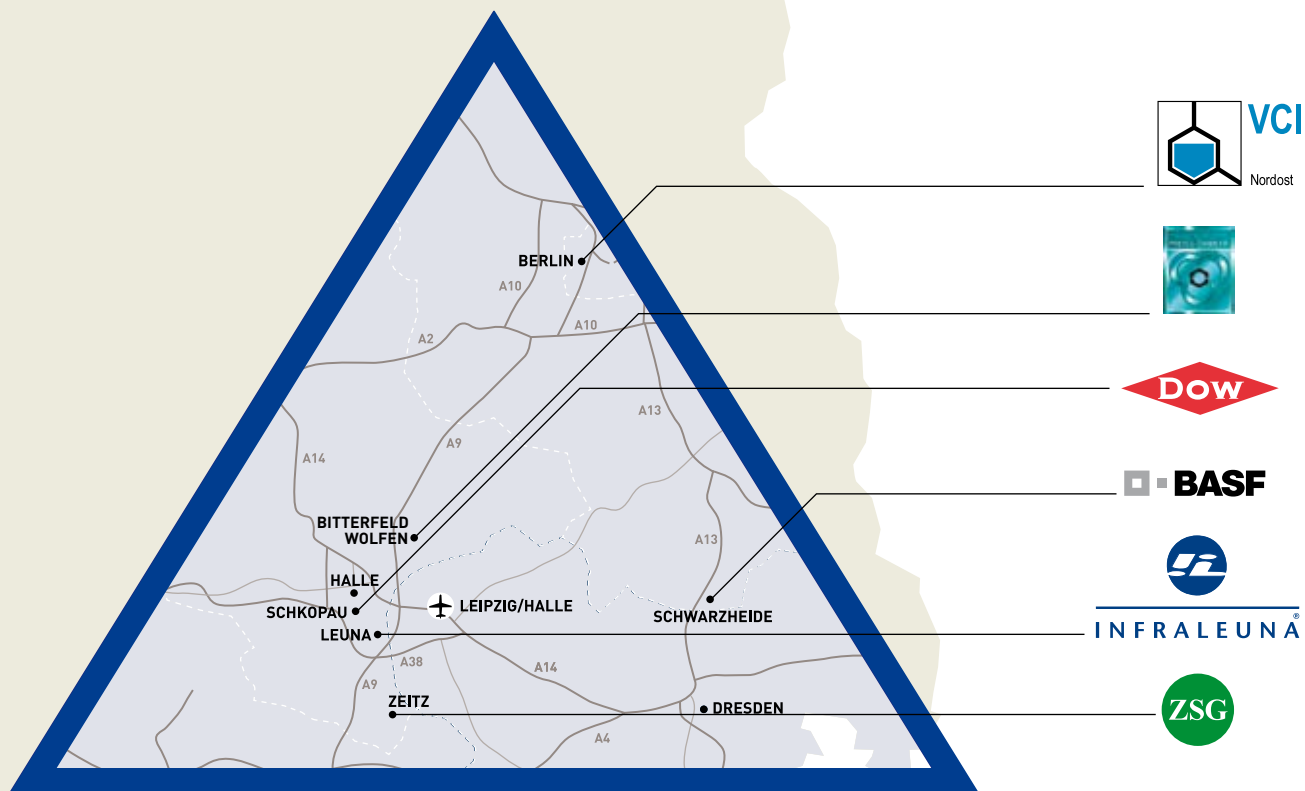
The Industrial Park Solvay Bernburg covers a total of 40 hectares. Solvay, the owner of the premises, has completely modernised the whole site since 1991 with an investment of more than 500 million euros. Siting in the industrial park is reasonable for companies that either use Solvay products or manufacturer products that can be used by Solvay. The product integration in Industrial Park Solvay comprises: Soda (light and heavy), / sodium carbonate (from technical to pharmaceutical quality), hydrogen peroxide (technical and ultra-pure quality), hydrogen, brine (NaCl) and limestone. The central Solvay lab performs routine monitoring tasks and special analyses while Solvay Infra GmbH provides a variety of site services. Solvay Chemicals GmbH produces hydrogen peroxide, soda and sodium hydrogen carbonate. Soda is particularly required in the glass industry; hydrogen peroxide is employed in the production of paper, detergents and, in a special quality, also in computer chip manufacture. To date, 20 service providers have sited in the park.

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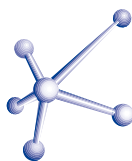
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CeChemNet – cooperation of chemical sites

- Network bundles chemistry competences and chemistry park management
- Cooperation of innovation sites is established



CeChemNet



Central European Chemical Network

Coordinated by **isw** GmbH

Graph: CeChemNet



CeChemNet – Central European Chemical Network

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CeChemNet, Central European Chemical Network, is a cooperation scheme of chemical sites in the Central German Chemistry Triangle. Chemistry park operators, chemical companies, specialist service providers, science and research institutions, chemistry-oriented educational institutions and business association are combining under this umbrella comprehensive chemistry competences and successful chemistry park management. CeChemNet partners include: PD ChemiePark Bitterfeld-Wolfen GmbH, InfraLeuna GmbH, Dow Olefinverbund GmbH (ValuePark®), BASF Schwarzheide GmbH, ZSG Zeitzer Standortgesellschaft mbH, Verband der chemischen Industrie e.V., Landesverband Nordost and isw - Gesellschaft für wissenschaftliche Beratung und Dienstleistung mbH. Chemistry parks and sites are a major pillar for development of an innovation landscape in Eastern Germany. They are continually stepping up their efforts towards developing new innovation potentials. Establishment of the Fraunhofer pilot plant centre for polymer synthesis and processing (PAZ) in Dow ValuePark® Schkopau is but one example that will be gradually extended into a Fraunhofer InnoCluster Polymer Technology Region Halle/Leipzig. Dow Olefinverbund GmbH expanded its research departments in the fields of synthetic rubber and PET into high-performing competence centres.

In the immediate vicinity, a Plastics Competence Centre (KKZ) will be established on the campus of UAS Merseburg (FH) and oriented on enhanced collaboration of university and extra-mural research institutions with companies in the chemical and plastics industry. InfraLeuna is seeking to site both innovative chemical firms that can be involved into the feedstock integration and biotechnology companies with large-scale production plants. Linde AG intends to set up a hydrogen cluster in Leuna. Chemie- und Industriepark Zeitz is planning to create a competence centre for industrial biomass utilisation. In Bitterfeld-Wolfen, the ChemiePark-Institut GmbH is engaged front-end industrial research in the fields of organic synthesis chemistry, inorganic and technical chemistry and pharmaceuticals. Bayer Bitterfeld GmbH constructed a technology centre in its pharmaceutical production. These sites are closely cooperating with research institutes of Fraunhofer and Max Planck-societies based on weinberg campus in Halle and Martin Luther University Halle-Wittenberg. The BASF R&D department in Schwarzheide operates as European development centre in the field of polyurethane base products. In addition, the KKS Plastics Competence Centre Schwarzheide was established next door to BASF. All these efforts provide good prerequisites to set up highly effective value-added chains. Hence, the chemistry parks have set themselves the objective of combining the sites into an innovation site network under the CeChemNet umbrella.

Central Germans Plastics Network MKN

Chemistry/Plastics Cluster Central Germany

Central Germans Plastics Network MKN, Innovation Network Research and Development Plastics Engineering Central Germany (FEKM)

AMZK Saxony

Polykum e.V. (Saxony-Anhalt)

PolymerMat e.V. (Thuringia)

Automotive Cluster Eastern Germany

The Central German Plastics Network (MKN) is a platform for collaboration of plastics processor networks in Saxony, Saxony-Anhalt and Thuringia: Automotive Component Suppliers Plastics Engineering Saxony AMZK (Saxony), PolymerMat (Thuringia) and Polykum (Saxony-Anhalt). Members include polymer manufacturers, polymer processors, university and extramural research institutes, plastics machine constructors, tool- and mould-makers, service providers and industry-related institutions. Objective of the network that was formed in 2004 is the advancement of the plastics industry in the three Central German federal states. Inter-state cooperation strengthens existing networks by bundling their potentials. Close ties to the automotive industry are deemed particularly promising on account of increased uses of plastic components. Its structure and manifold cooperation schemes make the Plastics Network example for inter-state networking in the Chemistry/Plastics Cluster. Besides the state-specific plastics networks, the MKN maintains close relations with the Plastics Centre Leipzig (KUZ) and the Innovation Network Research and Development Plastics Engineering Central Germany (FEKM).

Activities of the network are focusing on:

1. Qualification and advanced training

- Popularisation of career specifications in plastics industry
- Influencing control on training contents
- Support of training centres

2. Initiation and moderation of cooperation and pilot projects

- Joint projects of companies
- Research and development cooperation
- Innovation and technology transfer by improved collaboration of companies and R&D institutions

3. Public relations

- Representation of plastics as 21st-century materials in PR work
- Industrial sector representation body in economic policy institutions

4. Organisation and collaboration

with other networks and competence centres
Cluster Chemistry/Plastics Central Germany

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Netzwerk Automobilzulieferer

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PolymerMat e.V.

PolymerMat e.V.
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Kunststoffnetzwerk Brandenburg KuBra

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The Plastics Network Brandenburg, KuBra e.V., intends to bundle competences in the plastics industry. It was formed in 2005 on an initiative of Plastics Competence Centre Schwarzheide (KKS) as an association and has a membership of 40 companies employing a total of 4,500 people. Their range stretches from feedstock producers via compounders, injection moulders, extruders and further plastics processors to recycling firms and is rounded off by machine and plant constructors and service providers.

The network wants to contribute to enhancing the reputation of the plastics industry among the public in the state of Brandenburg. KuBra represents its members in regional and supra-regional federations and hosts events, seminars and workshops relating to plastics processing at special conditions. There are two annual network meetings and a 'Plastics colloquium in Schwarzheide' held. KuBra supports regional and supra-regional initiatives to increase the availability of skilled labour, technicians, engineers and mid-level management, launches and coordinates specific projects. In addition, member firms are assisted in wording terms of reference for third parties (e.g. research institutes) and preparing public grant applications. Searches for appropriate partners in and beyond Brandenburg shall be eased. The Plastics Network intends to develop into the voice of plastics industry in Brandenburg to enhance its perception among politicians and the business community in this federal state.

Innovative Regional Growth Core – ReactiveWetCoating

Innovativer Regionaler Wachstumskern – Funktionelle Nassbeschichtung „ReactiveWetCoating“

Dr. Roland Watzke

Spokesman for the Growth Core

c/o Technologie-Interessengemeinschaft

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The growth core 'ReactiveWetCoating' is an alliance of innovative SMEs that have sited in ChemiePark Bitterfeld-Wolfen. The firms intend to jointly develop an innovative technology for application of ultra-thin aqueous/organic phase layers to different carrier materials and apply the technology in practice. The alliance wants to develop a worldwide new process of 'ReactiveWetCoating' by means of capillary casting technology in which the chemical/biological reactivity of functional components conditions a defined functionality during the coating process. A residue- and excess-free application of ultra-thin layers at high coating speeds will be possible. Exact dosing will enable immediate adaptation to reaction sequences in coating fluids and combination with other application methods. Ultra-thin layers will be applied to different carriers and provide the latter with totally new properties.

Marked cost effects are above all in the following fields: Flat displays, packaging sheeting, polymer filter and membrane technology, upon uses in the glass industry, holographic foils, biologic-reactive layers and UV protection layers.

4chiral Network for Research, Production and Marketing of Chiral Compounds

4chiral Netzwerk für Forschung, Produktion

und Marketing chiraler Verbindungen

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Network Manager

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The network is made up of seven fine chemistry and biotechnology companies which are selling their products predominantly to the pharmaceutical industry. Associated partners to the network are Martin Luther University Halle-Wittenberg, Working Group on Organic and Bio-organic Chemistry and Leipzig University, Working Group on Organic Synthesis and Metallo-organic Catalysis. A sharp growth is forecast for the for the chiral compounds market. In the production of active pharmaceutical agents there will be increasingly only one of two enantiomers will be required because chiral compounds frequently have different physiological properties. Objectives of the network partners' cooperation are: Intensification of communication between the partners, with other networks and customers, enhancing competitiveness of the participating firms, more effective marketing of chiral compounds and raising capital.

Due to their different fields of expertise, the partners are capable of covering a wide range of demands: From development of new catalysts for enzymatic syntheses, development of new synthesis methods to production of interim products and active agents in tonnages.

Network Pipeline and Process Plant Engineering Central Germany

Following comprehensive modernisation of its large-scale industrial plants the region boasts excellent competences in pipeline and process plant engineering. Numerous companies and research institutions have been able to accumulate considerable know-how during their involvement in such major projects in recent years. Those potentials have been bundled since 2004 in the Central German 'Network Pipeline and Process Plant Engineering'. The network has a membership of more than 50 companies. Partners are firms engaged in pipeline and process plant engineering, planning/design, plants operators and representatives of scientific institutions. Specific working parties have been formed to keep the network partners up-to-date with needs, expectations and development trends in technology, science and society.

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Special-purpose Association for the Promotion of Mechanical and Process Plant Engineering in Saxony-Anhalt (FASA e.V.)

FASA is a cooperation network for innovations and system solutions in mechanical and process plant engineering. Objectives of this association is to allow SMEs to participate in investments and simultaneously qualify them for international markets, customers and customer demands. In order to realise this task FASA above all supports scientific guidance of network projects to promote networked, globally acting system providers by using innovative ICT. Also practical applications of scientific findings, e.g. by Fraunhofer Institute Factory Operation and Automation (IFF) Magdeburg or the newly established Virtual Development and Training Centre (VDTC), are assisted by FASA by bringing together people from applied research and practice.

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Internet: <http://www.fasa-ev.de>

Working Group 'Material innovative Thuringia' (AG MiT)

The Working Group 'Material innovative Thüringen' (AG MiT) is trans-sectorally bundling material-related activities by a broad range of stakeholders. Participants have included since November 2006, inter alia, OptoNet, PolymerMat, micromold.net, the growth cores fanimat nano and VERDIAN as well as SMEs and R&D service providers. Close interlinking – from development via production/processing to application of materials – shall make competition-deciding effects of modern material technologies more effective. AG MiT deems guidance and support of this mainly industry-driven process its main task. The 'Material' platform is aimed at a trans-institute and -industry promotion and coordination of material-specific activities. Work is currently focusing on five cross-sectional topics: Nanotechnology, interface and surface technologies, knowledge and process chains, life sciences/sustainability and training and advanced training.

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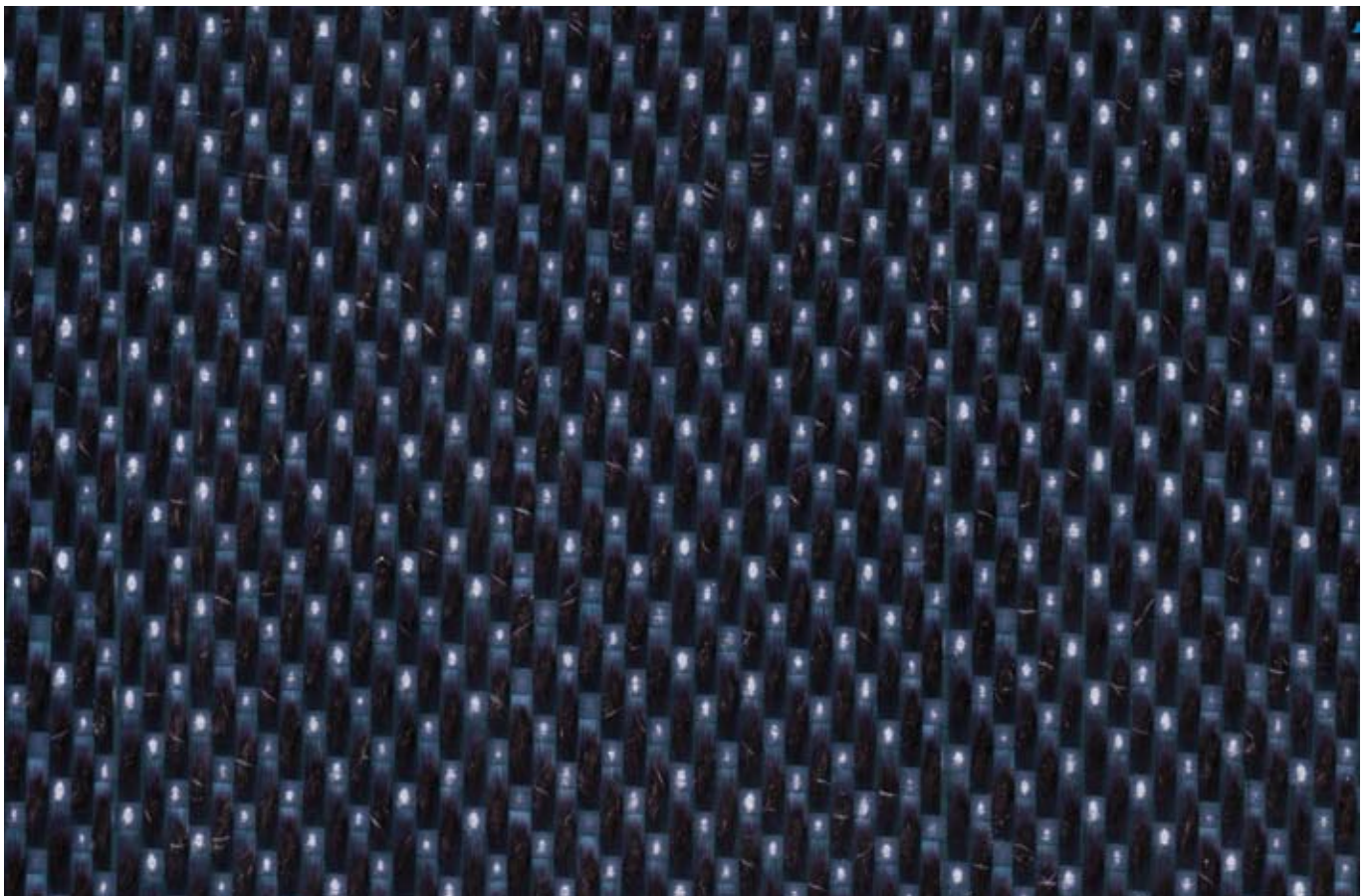
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Research and innovation potentials – Inviting multi-faceted research landscape

- Infrastructure facilitates enormous innovation and growth opportunities
- Orientation on future industrial topics

Central Germany is among the densest economic spaces in Europe. Higher education and research policies have been traditionally oriented on key elements and future topics of industry. There are 43 universities, technical universities, UAS and technical colleges as well as a total of 83 application-related institutes of national research societies in Saxony, Saxony-Anhalt, Thuringia and Brandenburg. The technical infrastructure is one of the most modern in the world. Thus, traditions from the past century are being continued when scientific research yielded several Nobel Prize laureates, also from chemistry.



Carbon-fibre laminate

The research infrastructure in the field of chemistry and plastics is also making a contribution to the success story of this industry. In the four federal states concerned, a total of twelve universities and nine extra-mural research institutions as well as six competence centres are dealing with topics related to the Chemistry/Plastics Cluster. Their potentials are deemed to be extremely seminal since they have considerable growth reserves. In terms of research density, regarding both spending of finance and number of researchers, the Central German chemistry sector lags however behind comparable regions. Hence, it is necessary to entice companies to move their research focuses to the Central German Chemistry Triangle with its concentrated, multi-faceted research landscape. It was only in 2005 that a new research institution was established with the Fraunhofer pilot plant centre for polymer synthesis and processing PAZ in Schkopau, a cooperation facility of Fraunhofer Institute for Mechanics of Materials in Halle (Saale) and the Institute for Applied Polymer Research in Potsdam-Golm. This collaboration is based on state-of-the-art equipment and allows for research and development projects along the entire value-added chain of polymers. In particular SMEs can benefit from the research facility of international standing.

The Pilot Plant Centre is a further step towards a Competence Centre Chemistry/Plastics in Central Germany. More steps will follow. Presently, the Plastics Competence Centre Halle-Merseburg (KKZ) is established on the campus of UAS Merseburg (FH) from a number of associate institutes in cooperation with Martin Luther University Halle-Wittenberg. The KKZ is located in the immediate vicinity of chemical sites and will provide for better interlinking with the business community.

The Plastics Centre in Leipzig has already been successfully collaborating with companies in the fields of research and Innovation since 1960. The Chemistry Park Institute in Bitterfeld is also a competent service provider engaged in front-end industrial research, not only for regional firms but also beyond.

Magdeburg's Science Port is home the Virtual Development and Training Centre (VDTC) of Fraunhofer Institute Factory Operation and Automation (IFF) Magdeburg. This institute extension specialises in latest virtual reality technologies for industrial applications.

Start-up companies are supported by a large number of business incubators (TGZ) where they can build their companies in close proximity to other budding firms with special public grants. Besides several competence centres Central Germany also boasts a large variety of research institutions whose work is related to development of the Chemistry/Plastics Cluster. In Halle (Saale), e.g., a Max Planck Institute researches into microstructure physics, while a Fraunhofer Institute deals with mechanics of materials.

Dresden-based IMA Material Research and Application Engineering GmbH, for instance, is involved in tests for construction of a super Airbus in Dresden. The Institutes in Fraunhofer-Centre Dresden-Winterbergstraße are engaged in material technologies as well as surface and layer technologies (incl. laser- and electron-ray technologies), including technologies for surface finishing of plastics, such as sheet coating. The Leibniz Institut for Polymer Research Dresden is another important research institution on the territory of the Chemistry/Plastics Cluster in Central Germany. Rudolstadt is home to the Thuringian Institute for Textile and Plastics Research and Freiberg in Saxony to the Research Institute for Leather and Plastic Sheets, while the Leibniz Institute for Surface Modification works in Leipzig. This large number of specialised institutions allows for innovation-oriented further development of materials and processes. Traditional academic institutions, such Leipzig University, Friedrich Schiller University Jena or Martin Luther University Halle-Wittenberg are centres of teaching and research as are the Technical Universities in Dresden and Chemnitz or practice-oriented Universities of Applied Sciences (UAS) in Jena, Merseburg and Leipzig.

Research for SMEs – firms get access to latest findings

- Financial bottlenecks are overcome
- Better use of research capacities

Many SMEs, above all in the plastics industry, do not have sufficient financial and personnel resources for in-house research. Several activities within the cluster are aimed at supporting research and development work in such companies. Research capacities are available: Investments in Central Germany were made in the past ten years both into extending existing and building of new, sophisticated research infrastructures. Excellent research capacities for SMEs have been established with industry-related research institutions, such as Fraunhofer pilot plant centre for polymer synthesis and processing in Schkopau, the Fraunhofer Institutes for Mechanics of Materials in Halle, for Applied Polymer Research in Potsdam-Golm and Fraunhofer Institute for Factory Operation and Automation in Magdeburg, ChemiePark-Institut in Bitterfeld, Plastics Centre in Leipzig and numerous other university and extra-mural institutions. These industry-associated ultra-modern research infrastructures and potentials of their scientists shall now be made better accessible for companies by extension and networking of competences and in concrete research cooperation schemes.

Many firms, however, have difficulties finding funds to use this sophisticated research infrastructure. The so-called Voucher System is one internationally proven example to promote such cooperation that has also been tested in Central Germany. It is based on research vouchers that are issued to companies and can be redeemed in a joint research project with a concrete research institution.

This system provides two essential advantages: An enticement for firms to start searching for research opportunities. They can use existing research capacities, conduct tests and jointly step up research efforts. In the best cases, new processes and products are developed. Also research institutions have an advantage: Their cost-intensive research capacities are better used.

This basis of cooperation, established and tried on a regional level, provides a chance for SMEs to make use of international competences and contact of established research institutions. Thus, they are also enabled to enter into international research cooperation projects. The objective is a shaping of framework conditions, business and research development so that further innovations will be successful and firms are encouraged to extend their research activities in Central Germany.

Corporate Potentials – Research is dominated by industry majors

- Concentration of capacities in the region
- Groups establish competence centres

Central Germany is increasingly developing into a competence centre for plastics manufacturers and processors. All stakeholders in the cluster process are agreed on this fact.

Attainment of this target requires concentration of more research capacities in the region. Besides many research institutions the corporate research departments play a decisive role. They make an essential contribution to enhancing competitiveness. Currently the two biggest chemical groups in the world, The Dow Chemical Company and BASF AG and, above all, major plastics manufacturers are performing key research activities in Central Germany. It is advantageous that, e.g., the research function of Dow Olefinverbund GmbH with its sites in Schkopau, Leuna and Böhlen forms part of the worldwide integrated research of the Group. Researchers in Schkopau or Böhlen are always also part of globally acting Dow work teams.

The Dow Group has established two competence centres in Central Germany: One for synthetic rubber in Schkopau. Its focus is on developing new, application-tailored rubbers for tyres, technical rubber products, golf balls and modification of notch impact strengths of plastics. Another field of research is application of rubber in shoe soles.

The Dow Competence Centre for PET is working on the same site. PET research in Schkopau is provided with comprehensive equipment and working facilities in labs as well as processing machines and synthesis reactors in an R&D test facility. Research work is aimed at further improving granules by identifying better processing methods, new fields of application, safeguarding standard-conforming qualities in production plants and intensive customer care. PET produced is predominantly used for beverage bottles.

BASF AG carries out own research activities in Schwarzheide (Brandenburg) and Leuna (Saxony-Anhalt). Also the BASF researchers in Central Germany form part of the worldwide BASF research function and have been profiling themselves, building on their decade-long experience, as European Competence Centre for Polyhydric Alcohols and Isocyanates in the fields of polyurethanes. Thus, they are forming a significant component in the global BASF polyurethane concept. Participation in 'Exploratory research' commissioned by BASF Aktiengesellschaft Ludwigshafen is gaining increasing importance. In addition, researchers become more and more service providers by attending processes outside of polyurethane chemistry. Polyurethanes are plastics with versatile applications, used e.g. in upholstery and insulation materials. BASF carries out in-house product development of engineering plastics at its site in Leuna for use in automotive engineering and the electrical industry.

Another major group working in the region is Bayer AG which, inter alia, produces its world-renowned 'Aspirin' in Bitterfeld. Bayer Bitterfeld GmbH has a chemical and a pharmaceutical operation with an in-house R&D test facility/technology centre where products that passed the research phase are prepared for industrial-scale processing.

University research institutions

Martin Luther University Halle-Wittenberg , Institute for Technical Chemistry and Macromolecular Chemistry

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Macromolecular chemistry at Martin Luther University Halle-Wittenberg is an interdisciplinary subject in the Department of Chemistry that carries out research in the fields of synthesis of macromolecules, physical chemistry of polymers and technological implementation of processes in polymer chemistry and imparts in this areas knowledge in basic and advanced study courses. Research work is mainly focused on new synthesis strategies for manufacturing new polymer materials and microstructure analyses of polymer chains in relation to properties and morphology formation.

Martin Luther University Halle-Wittenberg, Chair for Plastics Engineering

Martin-Luther-Universität Halle-Wittenberg
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Plastics Engineering at University Halle-Wittenberg conceives of itself as a complex special field focused on material science-, processing- and application-related components. Activities cover material selection, development and modification, plastics testing, selection as well as process design and optimisation of shaping processes, product engineering and design, determination of material application limits and plastics recycling.

Key subjects include development of new and application-adjusted polymer materials, process design and optimisation of conditioning and processing methods as well as descriptions of structure and morphology formation processes during processing.

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UAS Merseburg (FH), located in close proximity to ultra-modern chemical plants in Leuna and Schkopau, presently has more than 3,500 students tutored by about 85 professors and a large number of scientific assistants. The Department of Engineering and Natural Sciences is of particular importance in connection with the cluster process Chemistry/Plastics Central Germany. UAS Merseburg (FH) is a synonym of excellent research activities in individual subjects and inter-disciplinary settings. State-of-the-art technical lab equipment, co-funded by the business community, enables us to take on future technical and multi-medial challenges.

Institute for Polymer Materials Merseburg (IPW)

The Institute of Polymer Materials was established in 1992 as a scientific knowledge transfer and innovation centre as an associated institute of Martin Luther University Halle-Wittenberg in Merseburg. The institute is based on long-standing expertise and experience of internationally renowned teams of researchers, interdisciplinary work by integrating research potentials and state-of-the-art equipment. IPW is engaged in the development, fabrication, characterisation and testing as well as processing and application of polymer materials. Work is focused on analyses of problem, provision of solutions and, upon request, preparation of project schedules.

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Polymer Service GmbH Merseburg (PSM)

Polymer Service GmbH Merseburg (PSM) was founded in 2001. Its business activities comprise industrial and single-client research in the fields of polymer synthesis, plastics processing, plastics characterisation and testing. The broad range of services offered by PSM is possible due to utilisation of the innovation potentials of MLU through a cooperation agreement between the company as an associated An-Institute and Martin Luther University Halle-Wittenberg. In combination with the Institute of Polymer Materials (IPW) and the Demonstration Centre „Recyclability of Materials“, PSM is supporting the transfer of fundamental research outcomes to industrial uses and provides its engineering services in the field of plastics engineering.

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Brandenburg Technical University Cottbus, Chair for Polymer Materials

On a site in Teltow, scientists of the BTU Cottbus, Chair for Polymer Materials, develop highly cross-linked polymers (thermosets). The work is particularly focused on lightweight composites and on micro- as well as optoelectronics: new (nano) materials, prepregs, all kinds of fibre-reinforced materials, sandwich structures, bistable displays and integrated optical devices. Applications of such thermosets include adhesives, coatings, prepreg- and RTM-resins, as well as foams. The following properties can be designed into these resin systems: high flame retardancy, high fracture toughness, minimum volume shrinkage upon curing, and adjusted coefficient of thermal expansion, just to name a few. As those properties are often in contrast to each other, we focus particularly on the combination and optimum balance of material properties like high T_g (glass transition temperature) along with high fracture toughness in a single system, just to mention an example. There exists a close cooperation with the research unit Polymeric Materials and Composites of the Fraunhofer-Gesellschaft in Teltow.

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Friedrich Schiller University Jena, Institute of Materials Science and Technology (IMT)

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Optical sciences have traditionally played an eminent role in academia and research in Jena. Recently, Jena has also developed into a major centre of biotechnology and medical engineering. Besides non-linear and integrated optics, solid-state physics, materials sciences and theoretical physics make up the profile of the School for Physics and Astronomy at Friedrich Schiller University Jena. The School also comprises the Institute of Materials Science and Technology (IMT) that specialises in biomaterial science, interfaces and nanomaterials, and the departments of physics, chemistry, engineering as well as medicine and biology.

UAS (FH) Jena, Department SCITEC - Precision, Materials, Environment

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The University of Applied Sciences (FH) Jena was founded in 1991 as one of the first institutions of higher education of its kind in the new federal states and currently has more than 4 900 enrolled students. Cluster-relevant departments at FH Jena are in particular plastics engineering, manufacturing engineering and materials engineering where many R&D cooperation projects are carried out with companies. The study courses process-integrated environmental protection and materials engineering impart broad technical knowledge of the diversity and processing of materials. Materials engineering students are tasked with developing new and improved materials. Graduated materials engineers can be employed in all industries where technical products are developed, manufactured, tested and recycled.

Dresden University of Technology, Institute of Lightweight Structures and Polymer Technology (ILK)

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The Institute of Lightweight Structures and Polymer Technology (ILK) at TU Dresden is carrying out extensive research in the field of load-adapted lightweight structures. Work is based on a comprehensive approach both in terms of materials and products throughout the entire manufacturing chain – material, design, engineering, simulation, fabrication, component, quality assurance. Key research areas include materials characterisation and failure analyses, analytical and numerical (FE) modelling, simulation and optimisation of composite materials and materials compounds, design of lightweight, ultra-lightweight and adaptive lightweight structures, component testing, quality assurance, economic and ecological product design, prototyping and pilot trials. These activities are complemented by manufacturing equipment capable of series production.

Leipzig University, Faculty for Chemistry and Mineralogy

Over 30,000 students are currently enrolled in Leipzig University founded in 1409. Chemistry already had a great tradition at this university in the 19th century. Professors like Kolbe, Wislicenius, Ostwald, Beckmann, Hantzsch and Helferich were first rank in their subjects and eminent chemists have emerged from their schools. Chemistry/plastics activities are today assigned to the Faculty for Chemistry and Mineralogy. Besides a number of professorships, the faculty has several associated institutes, e.g. Institutes for Analytical Chemistry, Inorganic Chemistry and Organic Chemistry.

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HTWK University of Applied Sciences Leipzig

Characteristic for all study courses at HTWK is that its mission to educate and research is consistently oriented on requirements of a 'University of Applied Sciences'. Selected research and development key focuses in connection with the Chemistry/Plastics Cluster are, e.g., the topics: Treatment of waste air from plastics processing machines, time-of-flight mass spectrometer for residual gas analysis in UHV plants, production and application of new materials, preservation of structural assets, rehabilitation and upgrading techniques/materials for structures and subsoil, innovative building materials, process informatics and distributed systems, automation in process engineering, chemical sensors, optimisation of goods and data flows in logistics systems in industrial and services companies.

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Technical University Chemnitz, Professorship for Plastics

We are dealing with material engineering of plastics, above all in the fields of forming and jointing, in particular welding. Our work is focused on basic- and practice-oriented determination of processing-induced properties and identification of process-structure property relations as key to exploit material potentials. Thermoplasts and elastomers are the key subject of the working group. Processing and modification of duroplastics are another key area. Close collaboration with industry is important to us, above all with SMEs. We maintain international cooperation schemes and contacts, inter alia to Eastern European and Asian partners in industry and business.

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Associated institutes and extra-mural research institutions

Max Planck Institute for Microstructure Physics Halle (MPI)

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Research work of the institute is primarily focused on formation-related phenomena and properties of micro- and nano-solids structures both in fundamental and applied research. Special interest is devoted to small-dimensional systems, such as surfaces and interfaces, thin layers, quantum wires and points. Investigations cover the major solids classes, such as semi-conductors, insulators, metals, ferroelectrics, ferro- and anti-ferro magnets. Research findings are of particular relevance for the technology sector, e.g. for fabrication of new and enhanced materials in sensorics, opto- and micro-electronics and magnetic data storage.

Fraunhofer Institute for Mechanics of Materials IWM

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The Fraunhofer Institute for Mechanics of Materials IWM at Freiburg and Halle develops solutions to increase the safety, availability, and lifespan of components and systems. The Institute realises concepts to improve the use of new materials, to optimise their machining technologies and to investigate the deformation and failure behaviour of components. The business unit polymer application focuses on processing and prototyping of thermo-plastic composite materials. Lightweight constructions made from polymer fiber composites are assessed by considering real load parameters. Microstructure property relationships are investigated to determine reliable parameters for the description of mechanical behaviour of materials and components. Surface and interface properties will be investigated, modified e.g. by plasma technologies and designed according to their special technical application.

Fraunhofer Institute for Applied Polymer Research Potsdam-Golm IAP

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The Fraunhofer IAP is specialized on the targeted development of sustainable processes and materials based on natural and synthetic polymers. They are the basis for the development of new, efficient and sustainable materials, functional materials and additives. Key activities include biopolymers, synthesis and polymer technique, functional polymer systems for electronic and optical applications as well as water-born polymer systems. In the Pilot Plant Centre Schkopau (PAZ) we develop synthesis and processing operations in order to optimise the supply chain from monomer to polymer components in close cooperation to the Fraunhofer Institute for Mechanics of Materials (IWM).

IMA Material Research and Application Engineering GmbH Dresden

IMA Material Research and Application Engineering GmbH provides technical and scientific services and research in the fields of materials, component and product testing. Practice-oriented assignments in materials research, calculation, testing and quality assurance of materials, components and product, development of materials databases, material application consultancy and wearing protection in aerospace applications, mechanical, process plant and apparatus engineering, road and rail vehicle construction, plastics industry, iron and steel industry and structural steel and light-metal engineering. IMA has emerged in 1961 from the Dresden-based Aircraft Industry Institute for Light-weight Construction.

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Leibniz-Institut für Polymer Research Dresden e.V. (IPF)

The works of the Leibniz Institute of Polymer Research Dresden bridge the gap between fundamental research on macromolecules and their application as plastics materials or functional polymers in high-tech branches. A special feature is the interdisciplinary co-operation between chemists, physicists, and engineers. Research is focussed on interfaces which are of crucial importance in many technological processes, in the material's contact with the environment, and as internal interphases within materials. The studies include synthesis of new polymer structures and modification of commercial polymers, characterization and testing of materials, as well as technological investigations on processing of plastics (including composites and fibres).

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Research institute for Leather and Plastic Sheets gGmbH Freiberg (FILK)

The Research Institute of Leather and Plastic Sheeting (FILK) gGmbH is a branch institute of the leather and plastic sheeting industry. The institute is partner of the industrial economy. In particular, research and development projects are performed which are funded by the AiF within the framework of the industrial joint research and supported by the EuroNorm Ltd. The division Plastic Sheeting is mainly engaged in developing formulations and technologies for coating of laminar substrates with polymers. Objective is the attainment of functionalised surfaces of the material composites by coating. Thereby, the positive physical and mechanical properties are to be retained. Traditionally, research projects in the field of leather are conducted in the division Leather/Biopolymers. In addition, techniques for extracting and processing of biopolymers particularly collagen are researched.

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Leibniz Institute for Surface Modification Leipzig (IOM)

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The Leibniz Institute for Surface Modification (IOM) is engaged in application-oriented fundamental research aimed at gleaned scientific findings on physical and chemical mechanism that are of importance in fabrication and modification of special surfaces, thin layers and plastics. The IOM covers a broad range of different fields of research, such as fabrication of special polymer layer by radiation with electrodes or UV light and production of solvent-free, eco-friendly plastics. Further research work is conducted in the fields of electrically conductive polymers, catalytically active surfaces and surface structuring till into the atomic sphere. The institute also deals with ion- and laser beam-supported precipitations of epitaxial layers and synthesis of biocompatible surface areas.

Fraunhofer-Institut für Zuverlässigkeit und Mikrointegration (IZM) – Außenstelle Polymermaterialien und Composite Teltow

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Chemists, physicists, engineers and technicians of the Fraunhofer site in Teltow develop highly cross-linked polymers (thermosets) for all applications with particular reference to aviation, IT-Technology and instrumentation. The work is particularly focused on light-weight composites and on micro- as well as optoelectronics: new (nano) materials, prepregs, all kinds of fibre-reinforced materials, sandwich structures, bistable displays and integrated optical devices. Applications of such thermosets include adhesives, coatings, prepreg- and RTM-resins, as well as foams. The following properties can be designed into these resin systems: high flame retardancy, high fracture toughness, minimum volume shrinkage upon curing, and adjusted coefficient of thermal expansion, just to name a few. We develop polymer systems along the whole supply chain, beginning with the monomers up to the finished part. There exists a close cooperation with the Chair of Polymer Materials of Brandenburg Technical University Cottbus (BTU).

Thuringian Institute for Textile and Plastics Research Rudolstadt (TITK)

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The Thuringian Institute for Textile and Plastics Research (TITK) is an extra-mural research institute in the fields of textile and plastics research. Its work is focused, inter alia, on: Characterisation of polymer solutions and polymer melts, synthesis/modification, characterisation and shaping/processing of synthetic polymers to generate specific material functions, chemical modification and deformation of native polymers, synthesis of specific plastics additives for functionalisation and technology development for polymer-borne microelectronics and micro-systems engineering, production and application of nano-layers on flexible substrates (photovoltaic).

Competence centres

Fraunhofer pilot plant centre for polymer synthesis and polymer processing Schkopau PAZ

The Fraunhofer pilot plant centre for polymer synthesis and polymer processing (PAZ) at Schkopau is an initiative of the Fraunhofer IAP and IWM institutes. We boast modern polymer synthesis, processing and process control equipment under one roof and provide R&D projects along the entire polymer added-value chain. Key research and work spheres: Lab-scale development/adaptation of polymer systems; analysis of thermodynamic and kinetic parameters in polymer syntheses; process-engineering adaptation of lab syntheses in pilot plants; physical and chemical characterisation of polymers; toll syntheses: Production of small and test batches; reaction regime optimisation incl. reactor geometry; analysis of rheological properties of polymers, polymer blends and filler-reinforced polymer systems.

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Plastics Centre in Leipzig gGmbH (KuZ)

The guiding principle 'Together with industry – for the benefit of industry' determines the work of the Kunststoff-Zentrum in Leipzig gGmbH (KuZ). The KuZ is an independent institute for plastics technology, testing, and further vocational training. The core competencies are in injection moulding, polyurethane processing, and welding.

The internal structure of KuZ is similar to the whole processing chain. Hence, KuZ is able to offer complex innovations taking into account material development and their processing, part and mould design, welding, testing, failure analysis, and quality control. Present developments are, e.g., micro injection moulding and micro structuring, seamless polyurethane parts, highly effective welding technologies, flame retardant polymer materials and regenerating raw materials. KuZ coordinates the networks FEKM and AMZK Saxony belonging to the Network for Plastics Processing in Central Germany (MKN).

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Plastics Competence Centre Halle-Merseburg (KKZ)

The Plastics Competence Centre is a trans-university competence network for application-oriented research and development in the field of chemistry/plastics located on the campus of UAS (FH) Merseburg. There, besides UAS Merseburg also the competences of Martin Luther University and its associated institutes, the Institute for Polymer Materials (IPW) and Polymerservice GmbH Merseburg are bundled. Also a large number of further partners from regional and supra-regional plastics companies are involved. The focus-oriented competence centre shall help establish optimal prerequisites for developing new technologies and processes and facilitate knowledge transfer from academia to companies and institutions in the region.

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Chemical Park Institute for Front-end Industrial Research GmbH (CPI) Bitterfeld

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CPI ChemiePark-Institut GmbH is an industry-oriented research institute which provides service, expertise and specific solutions for the numerous industrial entities in the Central Germany and beyond. CPI works on the field of inorganic, organic and technical chemistry and in pharmaceuticals. As mediator between industry and science current results in fundamental research for solutions of industrial tasks are tapped in cooperation with the universities in Halle (Saale) and Leipzig. Present work is focused on improving economic efficiency of production processes, preparation of new synthesis and production processes, development of materials, analytical process monitoring as well as product and materials research to support growth and competitiveness of SMEs and major companies.

Competence Centre Polysaccharide Research Jena

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The Competence Centre Polysaccharide Research (KZP) is a high-performance research institution that was founded by six international groups at Friedrich Schiller University Jena and the Thuringian Institute for Textile and Plastics Research Rudolstadt in 2002 and is supported by the said groups of companies. Its activities are focused on joint R&D work on polysaccharides as functional raw materials of the future. Products and products are examined and developed both in fundamental and applied research. In its work the KZP pursues different strategies to derivatise biopolymers under homogeneous and heterogeneous reaction conditions and for region-selective functionalisation. Existing equipment also permits transfer of processes up to R&D test facility scale. The prime example is the ALCERU® technology. Moreover, the work of the KZP ensures education and advanced training of students in the field of bioorganic chemistry focusing on polysaccharides, organic and macromolecular chemistry in the long term. Several post-docs, doctoral candidate, graduands and students are actively involved into the research projects of the KZP.

Agrochemical Institute Piesteritz

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The Agrochemical Institute Piesteritz is a joint initiative of SKW Nitrogen Works Piesteritz, Martin Luther University Halle-Wittenberg and Business Development Agency Wittenberg. The institute works in research projects on the topic of fertilising, inter alia fundamental research into efficiency optimisation of nitrogen fertilisers. Close entwining of research topics shall bring about inter-disciplinary cooperation between farmers, chemists, process engineers and plant biologists. Integration with the research department of SKW Piesteritz enables combination of scientific expertise with industrial product management and infrastructure at a chemical site.



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Imprint

Status: 2007

Editing by:

isw Gesellschaft für wissenschaftliche Beratung und Dienstleistung mbH
Hoher Weg 3
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No liability is assumed for completeness and appropriateness of data and information relating to companies and institutions supplied by third parties.

Layout:

Maigrün Corporate Design
Wilhelm-Kütz-Straße 17
06108 Halle (Saale)
Photographs: Maigrün Corporate Design

Printed by

Repromedia Leipzig AG
Johannisplatz 21
04103 Leipzig

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With the support of:

Investitions- und Marketinggesellschaft Sachsen-Anhalt mbH,
Wirtschaftsinitiative für Mitteldeutschland GmbH,
isw Gesellschaft für wissenschaftliche Beratung und Dienstleistung mbH,
Polykum e.V.,
Statistical Office Saxony-Anhalt
coordinating for Statistical Offices Brandenburg, Saxony, Thuringia
and companies in the Chemistry/Plastics Cluster

Deadline 30.4.2007

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2007