



BAK
economic intelligence

Regional Technology Trends

In which technologies are companies specialised and are they good at it?

Learn about your region's technological strengths
Find out more about your competitors
Act and communicate fact-based

Globalisation is stagnating and demographic change is in full swing, so technological progress is becoming the most important driver of growth and prosperity. It is therefore important for each region to be clear about the significance and potential of the most important future technologies regarding their regional competitiveness.

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Innovation capacity reimagined & comprehensively analysed

Technology analyses and assessments for every country, every region and every company worldwide

Technological progress is an important guarantor of competitiveness and prosperity. This is why BAK Economics has developed, together with the Swiss Federal Institute of Intellectual Property and PatentSight, a unique approach which enables for the first time the measurement, analysis and assessment of research and technology activities of all companies, regions and countries, in a global comparison. The approach is based on the international patent system and analyses and evaluates the quality of all patents across the globe, using a big data approach. The result is insight about who is active in future technologies and who is also successful in them.

BAK Technology Trends

The new technologies are changing the world

Consistent definition and differentiation of over 40 technological trends (such as smart city, smart grid, artificial intelligence, autonomous vehicles, quantum computing and many more).

Quality instead of quantity

World-class research

The analysis focuses on the quality of research and, in particular, world-class research.

Measure innovation where it is created

A close look at research regions

From a global perspective, through countries and metropolitan regions, right down to individual businesses, research performance is classified where it takes place, not just where it is registered. This enables precise differentiation between research sites.

New Technologies instead of classical industry sectors

Focussing on «how» and not «what is produced»

New technology profiles show structural changes brought about by technological progress, at business and regional level, more quickly than the traditional industry sector system.

Technological interdependencies

Which technology mix leads to better results?

For the first time, it is possible to show which technology combinations lead to better results and which role is played by cross-sector technologies, such as digitalisation.

Research cooperations

From basic research to applied research

Do cooperations between businesses and universities lead to better innovations and where is the transfer from basic research to application-orientated research successful.

For a better understanding of regions

In which technological trends are your region's businesses and research institutions active and successful?

The BAK analysis approach calculates research performance where it actually happens and puts the focus on world-class research that is really relevant. The results show the region's tangible innovative strength. Differentiating innovativeness by type of technology enables well-founded regional technology profiles to be drawn up, as well as comprehensive comparison with national and international

competing and reference regions. For example, it is possible to compare the metropolitan region of Munich with Zurich, Silicon Valley, Bangalore and Seoul with regard to their activities in the «Internet of Things» or «Artificial Intelligence».

We can give you comprehensive and well-founded answers to these questions

Which countries and regions undertake world-class research and where does your region fit it?

In which technology trends are your businesses active and competitive?

In which new technologies do your region's particular strengths lie and where are innovation gaps?

Where is the industry positioned in the innovation race with competitors from Europe, the USA, Japan, China and Korea?

Are the businesses prepared for the challenges posed by Industry 4.0 (industrial internet)? Where has the link between classic mechanical engineering technologies, process automation, networking and digitalisation progressed most and how far along are the competing regions in the USA, China, Korea and other countries?

Do certain industry sectors risk losing the connection to the most important cross-sector technologies, such as digitalisation and networking?

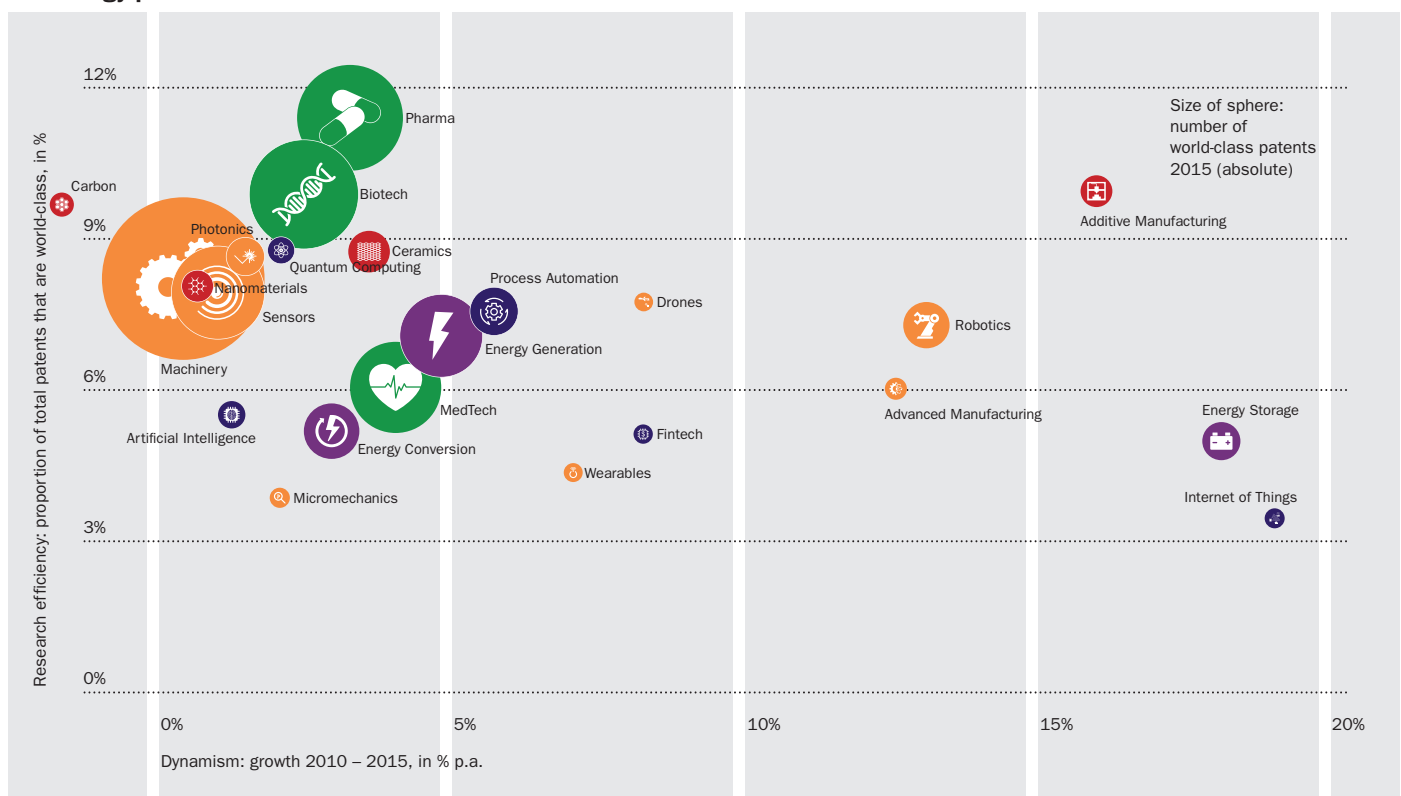
Can the businesses in your region translate research capabilities into production and added value?

Is innovativeness driven by a few large businesses or is it broadly supported by medium-sized businesses?

Does research cooperation between businesses and research institutions/universities in your region result in better innovations and who benefits most from basic research?

Which technologies generate better results in combination with other technologies and which technology mix is available for this in your region?

Technology profile of Munich



Source: BAK Economics, IPI, PatentSight

How to improve regions

Identify the starting points for strategic actions

Innovation is normally decentralised at business-level. It is the result of strategic business decisions about the use of a wide variety of production factors. From the point of view of regional economic policy, activities to promote and support businesses concentrate on providing an innovation-friendly environment with an attractive framework.

From a technological point of view, this means:

Improving Regional Networking

Making better use of existing strengths

Which combinations of technologies lead to better research results? Are there cross-sector technologies, such as digitalisation, that predominantly lead to better results? You can use this information to stimulate cooperations between businesses from a diverse variety of industry sectors and to put forward well-founded arguments.

In addition to combinations of technologies, research cooperations between universities and businesses can also be highlighted. It is possible to show technologies where the transfer of basic research into application-orientated research works well, as well as the research areas where it is less successful. It is similarly possible to examine whether research cooperations between businesses and universities essentially result in better innovations. Likewise, it is possible to show whether larger and established businesses are more likely to benefit from basic research or whether smaller businesses can also produce cooperations. The topic of inter-connections and cooperations can also be applied to individual businesses, for example in the analysis of the significance and development of the different research centres of international businesses. This can enable you to identify obstacles and put research cooperations better and more quickly into action, by highlighting tangible benefits and added value.

Improving Regional Marketing

Presenting tangible technological strengths

Your region's technology profile, presentation of dynamism and competence in technology trends give you new and powerful arguments for your economic region. This new, technology-driven perspective enables you to persuade interested investors and businesses. Technology profiles of competing regions can also be developed, along with your region. The new technological perspective also gives you powerful arguments for state and federal policy when it comes to comparing the regions' sustainability.

The Region as a whole

Closing technological gaps

The new technological approach also enables specific identification of technology-driven businesses across the world. Individual technology profiles can be drawn up for all businesses and their main technological focuses can be identified. This makes it possible to identify businesses around the world that match the technological profile of your region and that will find an attractive technological environment there. Also, the identification of businesses that can fill specific gaps in your region's technology profile is possible.

Systems



Sensors



Photonics



Wearables



Robotics



Drones



Machinery



Micromechanics



Pre Maintenance



Advanced Manufacturing

Materials



Additive Manufacturing



Carbon/Graphene



Nanomaterials



Ceramics

Life sciences



Pharma



MedTech



Biotech



Lab-on-a-chip



Biomechanics



Virus/Antibody

Energy technologies



Smart Grid



Energy Storage



Energy Generation



Energy Conversion

Digital technologies



Internet of Things



Process Automation



Artificial Intelligence



Fintech



Smart City



Smart House



Quantum Computing



Autonomous Vehicles

The BAK approach is new, different and better

An overview of the analytical approach

More than one industry

Technology profiles for businesses in your region

The informative value of industry sector analyses is limited, because it follows the classic economic logic of «what is produced». This completely conceals technological progress. For example, the printing and paper industry still quantifiably manufactures printed products from paper. The technological revolution that has taken place within the industry sector in recent years remains invisible from this perspective. The approach presented here follows the logic of «how is production done» and puts the main focus on technological progress. Technology analysis shows structural changes brought by technical progress at business level much more quickly. Furthermore, detailed technology portfolios and technological focal points can also be presented at aggregated level (region or country). They would not be visible from an industry perspective.

Quality instead of quantity

How world-class is measured

The analysis of technological sustainability is based on the international patent system. Using big data analyses for the first time the shortcomings of previous patent approaches are eliminated. Previous patent analyses normally yielded unsatisfactory results, because country-specific differences in patenting systems, for example the very early patenting in Japan or political pressure on patenting in China, have a distorting effect. This means that simple measurement of patent activities in terms of new registrations over-inflates the relevance of certain countries and distorts the overall picture. Furthermore, the relevance of the invention in question is not classified. Instead, every patent is counted. These traditional approaches correspondingly measure quantity, not quality. The BAK technology approach puts patent quality at the centre of the analysis, for the first time. The world's most important patents are identified for each technology and allocated to the respective countries, regions and businesses. This omits any insignificant and unknown patents, with world-class research as the result. Quality is calculated for each patent across the world. Accordingly, this new approach measures quality, not quantity.

Technologies that change the world

Clearly defined and differentiated

The world of technologies is complex and subject to constant change. The new BAK future technologies should firstly make reference to significant new developments and, secondly, be able to differentiate between hype and substance. The key added value is the consistent definition and differentiation of technologies, geographical assignment of activities to countries, regions or cities, as well as identification and analyses of individual businesses. A further advantage in comparison with other, more statistical analyses is that BAK Economics is constantly developing technologies and definitions together with the Swiss Federal Institute of Intellectual Property. This is the only way to keep pace with and portray technological progress.

Your benefits

The value chain from a single source

Finding your way in a fast-moving world

International competition for business locations is becoming increasingly intense. This poses major challenges for European, as well as global, cities and regions. BAK Economics addresses the resulting needs from two perspectives: Firstly, the further development of the region – you are further developing your

region strategically, you would like to achieve optimum development for the region and you regularly examine success. Secondly, the region's successes must also be known – you make your region known in the world as an attractive location. BAK Economics provides you with well-founded bases that are individually tailored to your needs, for both purposes.

Strategy

A solid basis for a sustainable regional economic strategy

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Benchmarking

Identify your strengths and weaknesses in comparison with competing and reference regions

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Cluster analysis

Identify your region's economic hot spots

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Potential analysis

Estimate your region's sustainability

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Smart specialisation

Use the latest findings of regional economic research for even more targeted development of your region

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Communication

Strong arguments for your economic region

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Attracting businesses

Convince interested investors of your region's strengths

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Mapping your region

Shape your region and generate shared awareness of and commitment to your region

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Strategic inputs

Convey your strategy and support its implementation

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Public sphere

Show within the public sphere how your region intends to develop

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Monitoring

Keep your finger on the pulse of development with the latest facts and figures

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Growth and prosperity

Know your region's position and what you have achieved, at any time

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Attractiveness of locations

Faster recognition of changes in the prevailing conditions in your region and competing regions

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Structure of the economy

Keep track of the structural change and the dynamic business world

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Evaluation

Check on the development and success of your projects and strategies and readjust them, at any time

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Correctly assign technology results with the BAK Benchmarking System

Fact-based and consistent analyses and assessments

Technology results are assigned to regional development using the long-standing and proven international benchmarking by BAK Economics. Only the combination of indicators of economic power and attractiveness reveals a comprehensive picture of the region, in national and international comparison with reference and competing regions. What are your strengths and weaknesses? How can you position yourself and successfully develop further in a competitive environment?

Combine the findings from the technology analysis with our international benchmarking system to obtain the comprehensive communication and strategy package. Globalisation, demographic change and technological progress are changing the world with increasing dynamism. While the trends are global, their effects can be felt regionally and locally. The need to act is increasing at the same rate as the competition, and the competition takes place internationally between functional regions, metropolises and economic areas. From the point of view of communication, it is often important to be in first place in a ranking, but from a

strategic point of view, the comparison with similar regions is more relevant. What can be learned from ambitious regions with similar promising industry sectors? How do other regions deal with decreasing populations and cut-backs? And how do industrial regions create structural change? These questions can only be answered with well-founded international benchmarking, enabling you to focus on your regional benefits, to identify new strengths and to sustainably develop.

What are the region's growth drivers: population, employment or productivity?

What are the region's key industry sectors?

How competitive and sustainable is the region's taxation system?

How attractive is the regulatory mix in the region?

How quickly can production and sales markets be reached?

How high are the effective tax rates for businesses and highly qualified workers?

How attractive is the region for skilled workers and talented individuals?

Which region performs world-class research?

Regions

Choose from over 1500 international regions

Industry sectors

Put together your specific economic structure from 115 sectors

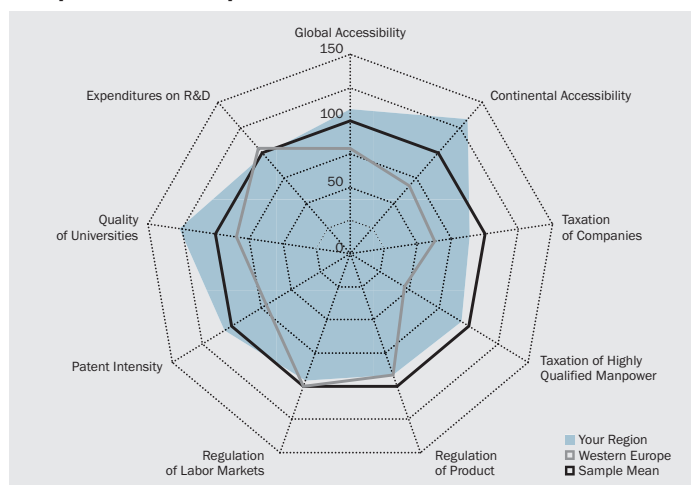
Performance

Analyse GDP, GDP per capita, added value, productivity and labour costs

Location factors

Identify your strengths and weaknesses in innovation, regulation, taxation, accessibility, highly qualified workers and quality of life

Comprehensive comparison



Source: BAK Economics

Our range of services

Product overview

Modular – flexible – expandable

Each region has its own economic, demographic and geographical profile, from which individual needs and requirements for action are derived. Our product range is thus adaptable to your requirements. BAK can provide basic services such as supply of data and charts, SWOT but also comprehensive strategic support. The range of services is rounded off by individual consultancy services. These

include participation in internal or external workshops, communication at public or media events, as well as personal sparring partners for methodological or strategic questions. Scientific support of your projects, for example «Smart Specialisation», is also possible.

Standard products

Data sets

- › Standardised or individualised data sets containing up-to-date, consistent data
- › Regional, national, international comparisons
- › Flexible data formats (excel, online delivery, data portals)
- › Quick deliveries (as of 3 days after date of order)
- › Non-recurrent orders and subscriptions
- › For internal and external communication

Chart sets

- › Informative and structured, attractive design, fully editable, including underlying data
- › User-definable samples
- › PowerPoint and Excel format
- › Delivery within 3 weeks after date of order
- › For internal and external communication

Reports

- › Well-founded analyses, visually attractive, implementation-oriented format, directly usable
- › User-definable samples
- › Word and Excel Format
- › Delivery within 2 – 3 months after date of order
- › For internal and external communication

Yearly data subscriptions

- › Authoritative data bases, multiple uses, customised, including background information
- › Extensive database access
- › Delivered as requested
- › 4 deliveries per year/standing orders
- › Extensive utilisation options
- › For internal and external communication

Individual consultation

Consultation & workshops

- › Shaping successful regional policy with BAK Economics: sound data, diverse methods and solid competencies
- › Consult us on regional economic issues
- › Drawing on macroeconomic expertise to answer your questions

Presentations

- › Standardised and individual presentations
- › Well-designed and visually appealing information and answers
- › Presentations tailored to your needs and your occasion: facts and figures in an attractive and informative package
- › Delivery: depending on subject/production time
- › For internal and external communication

MOOC

- › Massive Open Online Courses in cooperation with the Swiss Federal Institute of Technology in Lausanne (EPFL)
- › Smart specialisation: introduction & methods
- › Extensive online course for understanding and learning more about how to conduct smart specialisation projects

Commissioned studies

- › Data-based scientific analysis of your questions
- › Attractively designed reports in Word format with subject-specific underlying datasets where applicable
- › Multiple use options: strategy, communication, monitoring

Swiss Technology Trends Association (STTA)

The new STTA brings together experts, technological specialist knowledge and users in the regions. Be there and benefit from swapping ideas about the latest developments, data and facts, best practice, strategies and shared opportunities for communication, with other international top regions, in an exclusive network.



Capable – Switzerland’s most renowned private economic research institute

Relevant – economically and politically relevant analyses and forecasts

Global – international studies for public and private clients

Experienced – experience in regional economic analyses and consultancy since 1980

Focused – focus on the economy as a whole, industry sectors and regions

Comprehensive – comprehensive and detailed databases and models

Client-orientated – from the discovery to client-side implementation

Linked – capable international partner network and research network

Neutral – committed to Swiss neutrality

A selection of our clients

Regions, businesses, organisations, associations



think internationally – communicate across national boundaries – act regionally
BAK Economic Intelligence since 1980.

