



Wealth + Innovation + Natural resources

Abstract of the  
2020 Thuringia Trend Atlas



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## Dear Readers,

Thuringia is one of the most attractive investment locations in Germany. A few years ago, anyone who ventured to say this in public would probably have been greeted by disbelieving amazement and derisive comments. Bavaria, Baden-Württemberg, yes, probably also Hesse or Hamburg, maybe Saxony – but Thuringia?

Times have changed. The assertion that Thuringia is one of the most attractive investment locations in Germany does not by any means come from Thuringia. It is the result of an analysis by the renowned American trade journal 'Site Selection'.

The ranking by international experts demonstrates that a lot has been done since Thuringia moved to the centre of a united Germany in 1990. This success is primarily due to the people of Thuringia, the companies and the employees whose courage and determination, hard work and intelligent investments have resulted in the state staging an unparalleled economic comeback. However, our achievements should not give us cause for complacency. Whoever stands still falls behind; if we content ourselves with updating the past, we will end up on the losing side. The past 20 years have been greatly influenced by the 'Aufbau Ost' reconstruction programme in the former East German states. But this phase is now on the home straight. The sweeping



and simplistic view of the new federal states of Germany as the 'east' is no longer in keeping with the times; the same goes for the idea of their 'reconstruction'. Now we need to consolidate our achievements and every federal state has to find their own way of doing so. We are therefore moving from the decades of reconstruction in the east into Thuringia's phase of development.

The time has come to honestly take stock of the situation. How has Thuringia developed, what are its strengths, but also its weaknesses, and what are the central challenges that Thuringia is going to have to face in the coming years? We must get to the bottom of these questions to set the right course for the future. The Thuringia State Ministry for Economics, Labour and Technology has therefore commissioned the renowned Roland Berger Strategy Consultants to carefully examine Thuringia as a business location and produce recommendations for Thuringia's economic and location policies.

The analysis is not just limited to surveying Thuringia as a location and identifying

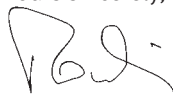
the strengths and weaknesses, risks and opportunities. The Roland-Berger study goes further, placing the economic development of Thuringia in a global context. On the face of it, this may seem presumptuous, but it is absolutely vital: merely considering Thuringia without looking at the bigger picture would be to neglect a vital element. Global developments take place globally – and even Thuringia needs to bear these in mind. The climate is also changing in our free state, medical progress happily does not stop at our state borders and the finite nature of fossil fuels also affects companies and private households in Erfurt and Jena, Gera and Weimar. Climate change, energy efficiency and medical progress: just three of the global megatrends that are also of great importance to Thuringia and offer potential for growth and employment.

That is why global megatrends must be reflected with the potential for Thuringia's economy. This makes it clear that we are well prepared in many areas. Our optics companies enjoy an excellent reputation worldwide and medical technology firms contribute to Thuringia's booming health sector. We are an important location for the solar power industry and universities in Jena, Ilmenau, Erfurt and Weimar prepare our young people for the challenges of the globalised labour market. In other areas, Thuringia still needs to catch up: from the very low investments in research and development to the struggle for the smartest minds which began long ago under the heading 'skills shortage'.

Roland Berger has produced a comprehensive report, the summary of which you have in front of you. The complete work in German, 'Trendatlas Thüringen 2020', is on sale in bookshops nationwide. We chose this title because the characteristic of the trend atlas is to primarily take into account those dynamic industries which particularly profit from the global megatrends. Of course, at the same time, we have to ensure that other industries which are not named explicitly, yet are still the primary pillars of the Thuringia economy, do not disappear from our field of vision and receive adequate support in our economic policies.

On the following pages, you will find the abridged version of the recommendations for the economic and location policies with which Thuringia can continue to defend its top position as one of the most attractive investment locations in Germany throughout this decade. We are delighted to invite you to join the dialogue concerning our economic policies. We are calling for everyone to work together with the players at local and regional level and business, the sciences and the state government on the 'Thüringen 2020' concept.

Yours sincerely,



Matthias Machnig  
*Thuringia Minister for Economy,  
Labour and Technology*

# 1 Growth for Thuringia

## Consolidating strengths and sustainably strengthening investments, innovation and internationalisation

Innovation is the key to securing the economic future. Modern economic policies are therefore also always innovation policies, because a sustainable economic policy is more than just the lack of an economic crisis. A self-supporting upturn and stable growth can only be achieved when we succeed in recognising the great challenges of the future as opportunities: globalisation, location competition, the acceleration of technological progress, dynamic employment oppor-

tunities, demographic changes, economic restructuring working to endorse an efficiency revolution (energy/resources).

Economic policies are never a question of dealing with current problems – economic policies are always about structuring the future. The more dynamic the changes, the greater the need to develop smart solutions.

Ideas that reach out beyond the short-term political events have to be developed, and a further horizon is needed. The idea is to deduce potential demand from the most significant and reliable trends for the next 20 years and thereby grant a long-term



*A sustainable economic policy engages current strengths with short-term potential and long-term trends.*

sustainable direction to the economic development in Thuringia and its economic policies.

Such an analysis requires the integration of both current strengths and short-term potential and long-term trends as well as the resulting markets.

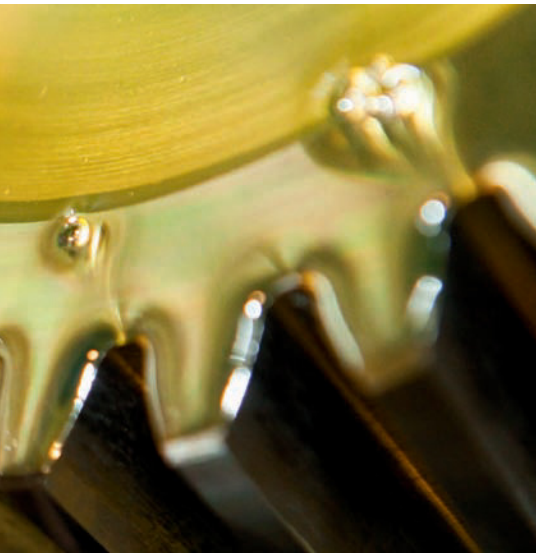
For this, the 'bottom-up' approach of the concepts, strengths and strategies that are familiar in Thuringia has to be supplemented with a previously neglected 'top-down' perspective. The aim is to look at the potential changes and derive from them opportunities for the regional economy. In a sustained

economic dialogue, global developments are taken into account by local actors.

Experience, expertise and objectivity are needed for this kind of analysis. That is why the Thuringian Ministry for Economy, Labour and Technology (TMWAT) has sought expert knowledge and expert experience. The Roland Berger Strategy Consultants (RBSC) have looked at the bigger picture for the TMWAT, investigating 30 global megatrends and 259 trend areas, and relating these to the free state. In doing so, they fell back on the expertise of other experts from research establishments and industry associations – some 4,500 Thuringia-based companies took part via a survey.

Finally, 11 areas of growth were identified for Thuringia's economy. The result is a portfolio strategy which consolidates existing strengths while developing new ones, concentrates on a few promising areas of growth and strengthens investments and support in the medium term.

These recommendations should serve as signposts for the future economic direction and development of the free state. Specific recommendations for Thuringia's economic policies have been developed taking into account Thuringia's recent history, the current challenges and potential of the federal state, future global megatrends and potential areas of growth.



# 2 Thuringia's return to the centre of Germany

## 2.1 Thuringia: making a comeback since 1991

The economic development of the last 20 years has been a success story – thanks to many company founders and employees, as well as federal and state policies that have also played their part.

Since reunification, the Free State of Thuringia has made a massive effort to successfully restructure its economy from a state-directed economy to the market economy and has laid stable foundations for further development in the 21st century. Nevertheless, substantial regional differences, continuing structural problems and a lack of modernisation require new responses.

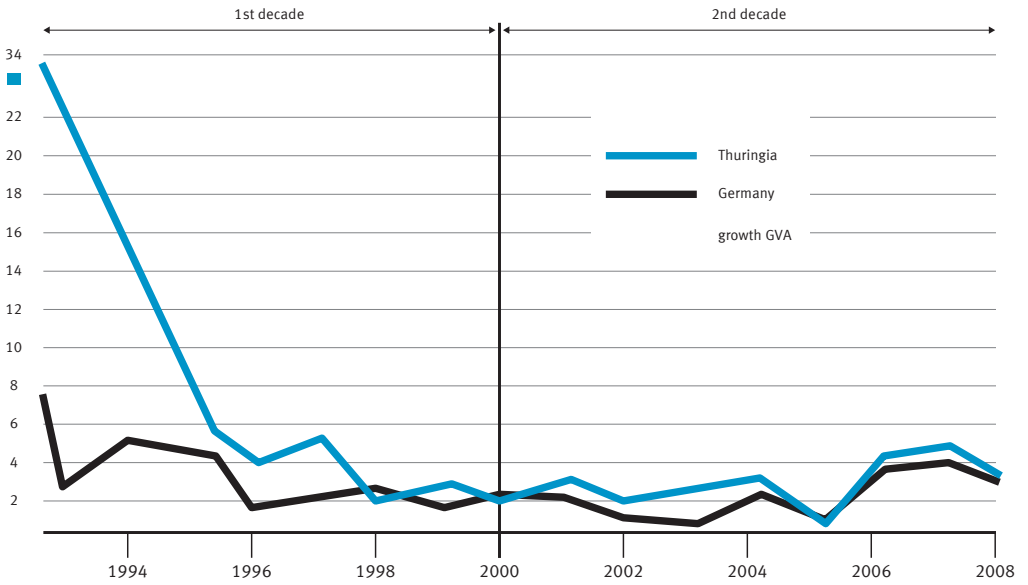
As Thuringia also started with a relatively low level of economic development, the ascent was initially very fast. The stunning comeback in the first ten years following the fall of the Berlin Wall was, however, followed by a slower second post-reunification decade. Between 2000 and 2008, the highest

speed of growth among the eastern German states to date approached the lower federal average. The development of productivity also slackened. In the two decades after the fall of the Berlin Wall, industry and production-related services were the drivers of growth in the free state. In the second decade, 75% of total growth in the Thuringian economy was already accounted for by these two areas.

Industry and production-related services are the basis of Thuringia's leading position in comparison with the other eastern German federal states. The free state is the captain of business growth. Yet the gross value added per earner in Thuringia today is around 12,000 euros below the national average.

But only by moving at a faster rate than the region in front can we close the ranks. The rate of growth in the Thuringian economy and in the industry, in particular, has to be accelerated again.





Annual growth rate of gross value added as a comparison between Thuringia and Germany (D) [%] (source: Destatis).

## 2.2 Thuringia today: challenges and potential for the future

En route to becoming one of the leading and most dynamic locations in Germany, there are structural problems that must be overcome. In addition to migration, the low level of research intensity and the lack of taxpaying ability, the small size of firms is a predominant factor. Only 0.3% of all Thuringia-based companies employ more than 250 people. Only a fraction of the few larger companies are listed on the stock exchange and only a few headquarters are based in the state. The lack of large companies means that the free state lacks the natural core of investment, innovation and also export strength. The results are low market power and innovation dynamics. An innovation-oriented economic policy must take account of these structural problems.

The five 'I's are the critical factors for a sustainable and successful economy for tomorrow:

- › Innovation.
- › Investment.
- › Infrastructure.
- › Internationalisation.
- › Integration of talented individuals and workers.

Growth is generated first and foremost where innovative developments and production

processes lead to competitive products. Innovations are also an essential key for productive and competitive workplaces.

Thuringia is significantly below the German average, both for the number of patents filed and the research and development expenditure (R&D) per earner as a measurement of innovation capacity. The lack of expenditure is in large part to be ascribed to the low level of research and development, due to the lack of large research-led companies.

As well as innovation, it is primarily investment that increases technical progress in the company. Without investment, innovation is unthinkable. Innovation is the natural prerequisite for the emergence of growth, and we therefore have to invest more in it. R&D expenditure as a share GDP is under two percent in the free state. A glance at the Lisbon Strategy goals reveals how inadequate the endeavours in Thuringia have been up to now: the three percent marker was the aim by 2010, in order to become one of the most dynamic economic regions in the world. A prerequisite for investment is for investors to be established here.

Investors need to be attracted; an attractive environment with high-performance and modern infrastructure contributes to this. Besides the economy-oriented infrastructure, such as sufficient industrial and commercial



*Here, investments are in demand: research and development are the driver of technological progress.*

premises, the entire transport infrastructure and connection to (high) capacity data networks form part of a location's attractiveness.

Initial, important steps have already been taken in this area with the large industrial space and broadband initiative. This extends the range of attractive industrial and commercial premises and increases the level of connection of the rural area to broadband. However, there is a further need for action –

for instance, by completing ongoing transport projects.

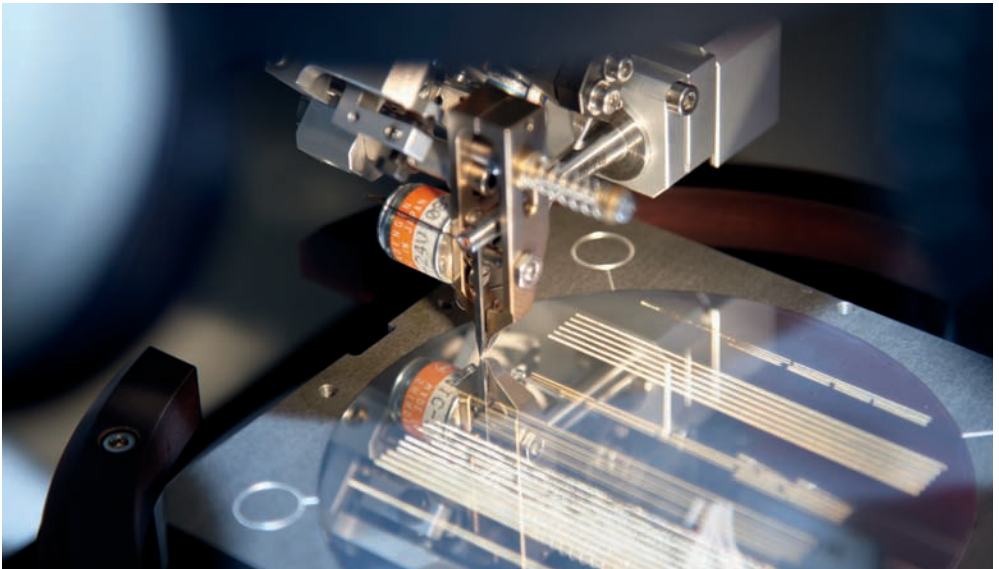
Apart from opening up new markets in Germany, the path to increasing economic growth also depends predominantly on participating in the above-average growth opportunities on the international market. As a result of the correlation between share of exports and growth in sales, energetic endeavours should be made to close the globalisation gap. Targeted and supported

development of foreign markets with the greatest growth prospects can generate additional growth in Thuringia. Measures such as the introduction of 'technology scouts' are appropriate methods.

Another necessary requirement for the increase in growth is, above all, the availability of sufficient skilled workers resulting from the integration of wide-ranging talents and skills in the labour market. In 2010, the population of Thuringia fell by 46 residents every day. The demographic change – and, in

particular, the emigration of well-educated young people – is leading to the deterioration of the workforce potential. Over the last ten years, a decrease of 11% has been recorded. In a few professional fields today, there is already a visible lack of highly qualified skilled workers, and this is only going to get worse. Talented young people must be attracted to Thuringia and encouraged to stay here.

The future belongs to the region that identifies the lead markets – in other words, those areas in which the greatest bursts of growth



*Innovation is an important key for modern, sustainable jobs.*

are to be expected in the coming years. First, we should stress that the strengths in Thuringia today are also the strengths of tomorrow. Innovation is an important key for modern, sustainable jobs.

Previous analyses leave no doubt that industry and production-related services will also continue to form the backbone of the Thuringia economy – especially due to the spillover effects. The areas that profit from this are those that are more geared to local and regional distribution such as agriculture and forestry, the building industry, trade, and the hotel and restaurant industry as well as household-related services.

Using the criteria strength (share of industrial employees in employment), dynamism (gross value added [GVA] and employment of growth) and sustainability (R&D activities and network structures), eight areas have been identified in industry and production-related services which could, and in all likelihood will, drive growth in the region. The focus is on four application-oriented technologies:

- › The automotive industry.
- › Life sciences.
- › Environmentally friendly energies and energy storage.

› Engineering.

In addition, there are four cross-sectional technologies:

- › Plastics and ceramics.
- › Micro- and nanotechnology.
- › Measurement and control technology.
- › Optics/Optoelectronics.

These fields of technology drive growth and jobs in all industries – significant synergies are also expected between these individual fields, thus amplifying the impact.

When listing the economic strengths of Thuringia, one industry above all cannot go unmentioned: the food industry. It is of huge economic importance, drives employment and supports innovation, thus making it vitally important to the free state. In Thuringia, it is the second sector in terms of industry turnover and third in terms of employment. To sustainably strengthen the food industry, a cluster must be formed in this sector. A cluster summit later this year will act as a catalyst in this process.

# 3 Opportunities for Thuringia: using global megatrends

## 3.1 2020: future growth from megatrends

A signpost for the future sustainable direction of Thuringia's economic policies naturally remains incomplete if we only analyse existing strengths.

The central question is: what are the decisive global areas of growth for tomorrow and the day after tomorrow, and what can be done to ensure that the free state, companies and the people of Thuringia take advantage of the dynamism of these markets?

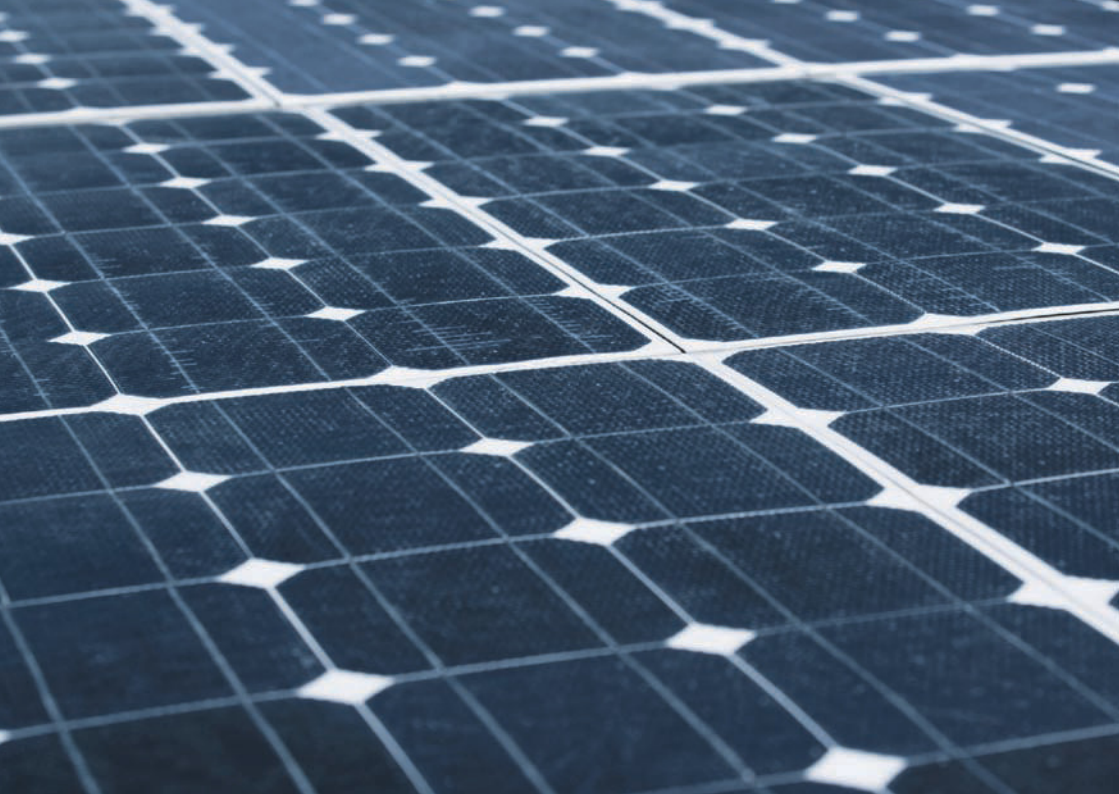
It is necessary to determine an exact road map for the economic-policy route to the year 2020. This is possible. The next decade is not entirely unknown terrain. Today, there are already clues for credible predictions. RBSC compiled a 'trend compendium' based on economics for the World Economic Forum in Davos that described which megatrends will shape future economic development. This compendium was also used to establish this roadmap. Complementary studies on global as well as regional aspects of economic and

technological development and a variety of interviews with experts have helped us predict how Thuringia can profit from the worldwide developments that are apparent today.

Through a complex process of analysis and deduction, we were able to determine that there are altogether 11 promising areas of growth with great potential for Thuringia's economy. Eight of them are old friends in Thuringia and are already listed above. In addition to these four application-oriented and four cross-sectional technologies, three budding areas – known as 'trend-induced areas of growth' – could be identified from the highly relevant megatrends. These are:

- › Green technology (excluding energy generation and energy storage).
- › Service robotics.
- › Creative industries / Edutainment.





*Which megatrends are shaping our future? According to predictions, the photovoltaic industry is one of the areas of growth.*

## 3.2 Potential areas of growth for Thuringia

It appears that Thuringia can adapt to the areas of growth driven by trends. There are eight sectors which are solidly established and from which economic momentum can be developed. It will be the task of future economic policies to increase the pace, on the basis of the five 'I's and with the right new additions. To ensure that the potential growth in the 11 sectors named is actually realised, the right course needs to be set.

In close collaboration with Thuringia experts, recommendations have been formulated that will help to change the positioning of companies in such a way that enables greater market success.

The prediction shows that the targeted development of the 11 areas of growth in Thuringia by 2020 can bring about an increase in gross added value of up to 67–77% in the

eight application-oriented and cross-sectional technologies, up to 89–100% in the trend-induced areas of growth and a rise in employment of up to 39–48% and up to 57–66% respectively. This means an outright increase



*Well positioned in the areas of growth: Thuringia can look to the future with optimism.*

in the added value of 2.9–3.3 and 1.0–1.1 billion euros respectively and the creation of almost 36,000–44,000 and 11,000–13,000 new jobs respectively.

Since green technology, a central key technology of the future, plays an important role in all areas and is closely interwoven with them, in the future it will no longer be possible to strictly separate the individual sectors and simply add them up. Below is an overview of the concepts for 2020 that are specific to areas of growth – in the sense of ‘future concepts’ – and the most important recommendations:

### Automotive

Automotive suppliers will concentrate on high-quality systems and be strongly integrated along the value chain. They will have to tackle the development of skills in the field of sustainable mobility together. The industry will develop its primary role as an employer in Thuringia by 2020.

#### *Priority measures:*

- › *Strengthening research and development expertise and increasing systems expertise through intensive use of the Thuringia Centre for Innovation and Mobility (ThIMo).*
- › *Setting up a support unit for collaborative research projects.*



	GVA change 2008–20 (in millions of euros)	Percentage change compared to 2008	Persons employed change 2008–20	Percentage change compared to 2008
<b>Application technologies</b>				
Automotive	+720–810	+80–90%	+10,500–12,400	+51–60%
Biotechnology	+140–150	+140–150%	+1,600–1,800	+100–113%
Medical technology	+270–300	+123–136%	+3,800–4,300	+83–93%
Energy and energy storage	+470–530	+104–118%	+7,100–8,100	+73–84%
Engineering	+220–300	+20–27%	+1,500–3,000	+6–13%
<b>Cross-sectional technologies</b>				
Plastics and ceramics	+520–610	+55–64%	+6,100–7,700	+30–38%
Micro- and nanotechnology	+90–100	+69–77%	+1,000–2,400	+34–55%
Measuring and control	+180–210	+72–84%	+2,100–1,300	+48–45%
Optics	+270–290	+135–145%	+1,900–2,600	+46–63%
<b>TOTAL</b>	<b>+2,880–3,300</b>	<b>+67–77%</b>	<b>+35,600–43,600</b>	<b>+39–48%</b>
<b>Trend-induced growth areas</b>				
Green technology	+820–930	+82–93%	+9,400–11,000	+52–61%
Service robotics	+8–9	+73–82%	+100–120	+48–52%
Edutainment	+120–130	+200–217%	+1,500–1,600	+167–178%
<b>TOTAL</b>	<b>+950–1,070</b>	<b>+89–100%</b>	<b>+11,000–12,700</b>	<b>+57–66%</b>

*Gross value added and number of persons employed in application and cross-sectional technologies, as well as the trend-induced growth areas for 2020 (source: Roland Berger Strategy Consultants).*

## Life sciences – biotechnology and medical technology

In 2020, the biotechnology sector will be present worldwide in markets for bio-instruments, sepsis diagnostics and therapeutics. To become niche leaders in technology, targeted existing strengths must be built on and tied in with the sector again. Thuringia can particularly profit from strong growth in ‘red’ biotechnology.

### **Priority measures:**

- › *Even closer cooperation between scientists and industry.*

## Improved access to venture and equity capital

In 2020, medical technology in Thuringia will be among the best in the world for optotechnological products and prosthetics. Science and industry will have to conduct joint research and convert ideas from practice into products. By 2020, medical technology will grow strongly and really drive growth, predominantly through exports.

### **Priority measures:**

- › *Foundation of an ‘Application and Development’ network for joint, practical research and development by scientists and the industry.*

## Environmentally friendly energies and energy storage

The photovoltaic industry in Thuringia will withstand the international competition through pioneering technology and economies of scale. A new research institution for process optimisation will help to reduce the costs.

### **Priority measures:**

- › *Development of a centre of excellence for solar production technology.*

## Engineering

In 2020, engineering will lead the field with energy-efficient machines and account for high-quality stages in the value chain. The theme of energy efficiency must therefore be promoted in R&D and simple production steps must be outsourced in the long term. Engineering will grow further to a high level by 2020 and create additional jobs.

### **Priority measures:**

- › *Foundation of an interdisciplinary application centre for manufacturing technology.*
- › *Promotion of close integration of engineering with other sectors and with the cross-sectional technologies in Thuringia.*

## Plastics and ceramics

In order to remain competitive, the plastics industry will concentrate on promising sectors like automotive engineering or 'green' building services engineering. Ceramics have attractive special applications. Plastics and ceramics will strongly increase in both added value and employment by 2020.

### **Priority measures:**

- › *Regular screening of innovative possible applications and trends for materials and joint related collaborative projects.*
- › *Close interconnection with the respective application sectors.*

## Micro- and nanotechnology

Close interlocking of excellent research and application will lead to strong growth in the micro- and nanotechnology industry.

The excellent research will be quickly converted into marketable products. Micro- and nanotechnology themselves will grow strongly according to conservative estimates and will have great upward potential.

### **Priority measures:**

- › *Production of common system capabilities within the network and the improvement of founding conditions.*
- › *Rise in the number of members in the Mikro-Nanotechnologie Thüringen e. V. (MNT) network.*



*Future from the laboratory: research as a foundation for the technologies of tomorrow.*

## Measurement and control technology

Measurement and control technology manufacturers will together implement innovative measurement and control technology solutions, e.g. for reducing the consumption of energy and resources in buildings and machines. To do so, measurement and control technology companies will have to dispel reservations about cooperation within their network structures and find joint projects. By 2020, the measurement and control technology industry will be growing through diverse applications and cross-sectional technologies.

### **Priority measures:**

- › *Complete maximisation of the potential for innovation within the industry, including through cooperation and collaborative projects in the Elektronische Mess- und Gerätetechnik Thüringen eG (ELMUG) network.*
- › *Joint research projects with areas of application.*

## Optics/Optoelectronics

In 2020, the Thuringia-based components suppliers will have become integrated systems manufacturers with problem-solving expertise that occupy future markets like green photonics. For this, the research

dynamism must be transmitted even more intensely into new products and establishments with new jobs. By 2020, the optics industry will have more than doubled its added value and be one of the cross-sectional technologies with the greatest potential for applications.

### **Priority measures:**

- › *Accelerated growth through the revival of the start-up impetus in a ‘second start-up wave’.*
- › *Support of the broad and rapid conversion of research results into products and applications.*

## Green technology

A shared ‘green’ industry identity connects companies from various sectors which, even at an international level, compete together for green projects and also implement them. Focal points are the fields of green building services engineering and sustainable water management.

In green building services engineering, the companies will build and renovate buildings in and around Thuringia together. By providing a ‘one-stop shop’ range, an efficiency platform will create demand for building restoration.

**Priority measures:**

- › *Foundation of an efficiency platform which brings together and communicates the offers of Thuringia-based companies.*

With innovative niche technologies, the water management sector in Thuringia will supply international markets according to their needs. In cooperation with cross-sectional technologies, the companies will be developing innovative, sustainable products. Today, water management is already an important sector and will be able to further grow through the ‘green’ development of foreign markets.

**Priority measures:**

- › *Creation of a state map of Thuringia-based expertise in the field of green technology by the Thuringia Energie- und GreenTech-Agentur (ThEGA).*
- › *Formation of working groups for specific needs of diverse foreign markets.*

**Service robotics**

In connection with other technologies from Thuringia and the rest of the world, pioneering products will be launched by the service robotics industry. The foundation of a robotics centre and the identification

of cooperation partners will be central for the development of pioneering products. Over the next few years, robotics will remain small, yet it has a high future potential.

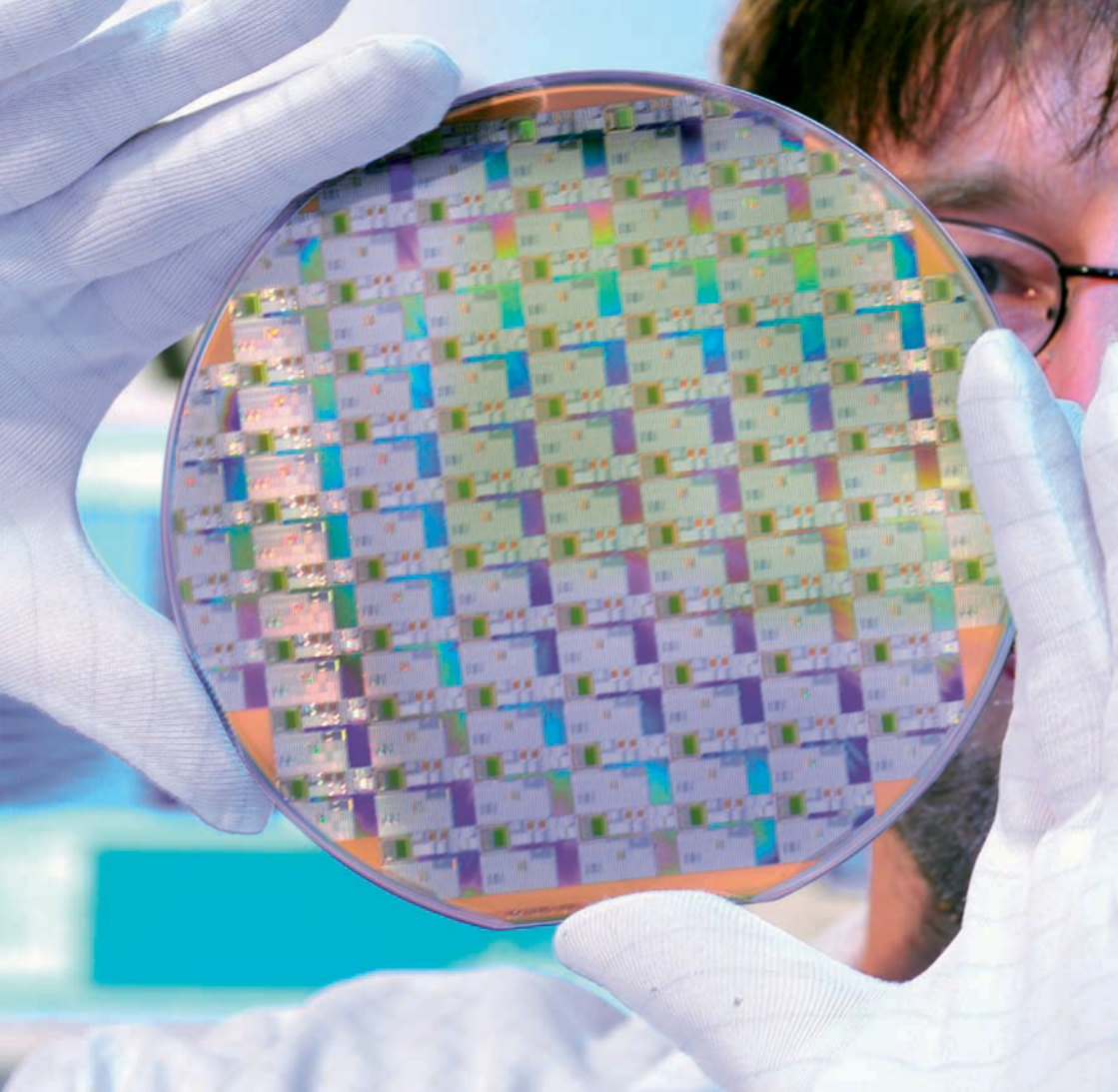
**Priority measures:**

- › *Foundation of a robotics centre.*
- › *Procurement of subsidies from the German federal government and the EU through a central contact point.*

**Creative industries / Edutainment**

Besides the prominent significance of production-related services for a sustainable burst of growth in the Thuringian economy, the combination of the sub-segments of the creative industries, software/games industry and film and broadcasting industries in the edutainment field of growth promise an exciting starting-point for potentially sensational growth.

‘Edutainment’ brings together ‘education’ and ‘entertainment’ to provide knowledge transfer in an amusing and playful way. It is a booming market. On the one hand, the need for (further) education will have significantly increased. On the other, increasing numbers of target groups will need products with different content, from which will arise various



*When products grow from ideas: in industries such as microelectronics, Thuringia demonstrates great potential.*

niches for children and schools, education-conscious adults, companies, etc. The trend for multimedia applications on mobile devices for learning and knowledge software will also kick-start growth.

**Priority measures:**

- › *Cooperation between various media producers.*
- › *Foundation of a central media marketing agency.*

## 4 Recommendations and impetus

### 4.1 Focusing economic promotion on the areas of growth

In the coming years, particularly after the end of the current programming period for the European Structural Funds, the funds available for measures of economic promotion will decline.

The state is therefore faced with the challenge of initiating a burst of growth while grants from the EU are declining and state subsidies specially tailored to eastern Germany are set to be phased out. It will therefore be necessary to concentrate resources on the areas that promise the most growth.

In the opinion of RBSC, these are the following 11 areas of technology:

- › Automotive.
- › Life sciences.
- › Environmentally friendly energies and energy storage.
- › Engineering.
- › Plastics and ceramics.
- › Micro- and nanotechnology.
- › Measurement and control technology.
- › Optics/Optoelectronics.
- › Green technology.
- › Service robotics.
- › Creative industries / Edutainment.

To realise this growth, it is also necessary:

- › To guarantee the co-financing of all instruments that promote the economy which are partially funded by the German federal government and the European Structural Funds until 2013.
- › Progressively to set up revolving funds.
- › To check funding instruments, create more transparency and put the focus on areas of growth.
- › To organise annual cluster summits.



*Automotive: in the future, the industry will further develop its primary role as an employer in Thuringia.*



## 4.2 Transforming the instruments for promoting economic development and establishing economic policy expertise

Whilst focusing on the potential for promoting economic development, a new focus should be developed in the form of funding instruments. With the decline in funds, the importance of grants will wane and, in the future, support will be provided more in the form of advice and guidance. Guarantees and if necessary loans may also bolster and protect industrial development without requiring direct subsidisation.

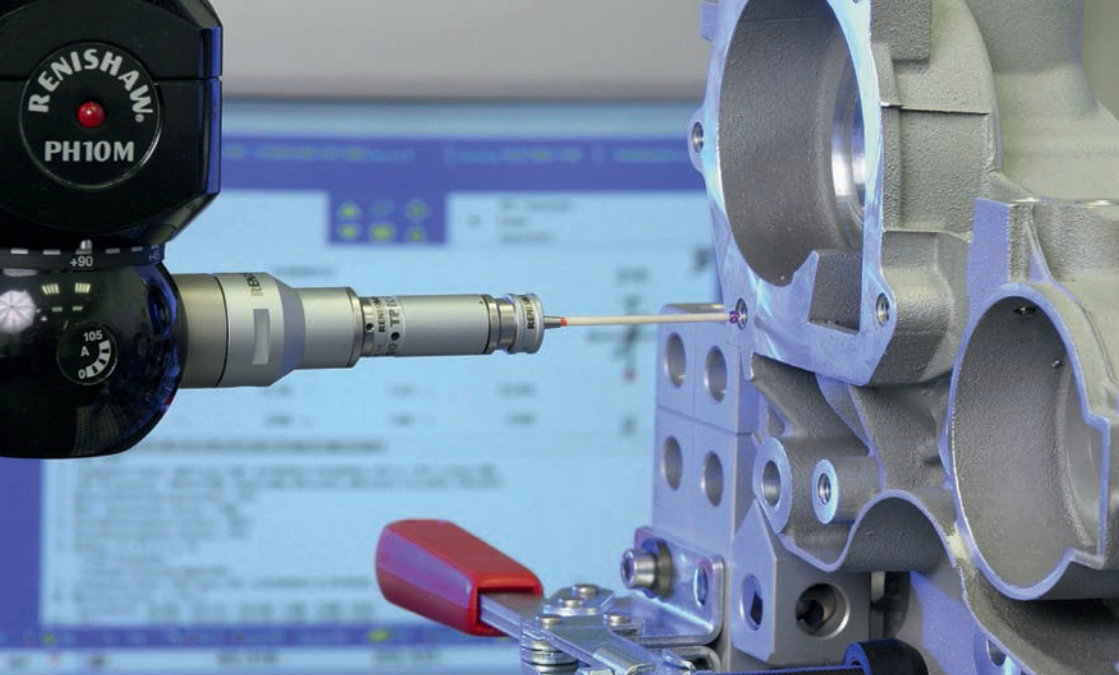
- › The state should develop practical economic policy expertise for this to support the reinforcement of the areas of growth, the regional implementation of the growth policy and its further development, both conceptually and specifically, for Thüringen.
- › A key part of the further development should be a dialogue between academics and companies, which would analyse the effects of the trends on the Thüringian economy and translate this into economic policy measures.
- › Regular reports on trends and areas of growth, with discussions regarding the possibility of putting them into practice to be held as part of a conference (e.g. the Weimar Economy Talks).
- › The state can furthermore adopt an orientation role and create ‘maps’ and ‘expertise atlases’ to clearly point out where in the state

companies with specific expertise in each of the technology areas are located. This would help cooperation between companies within and across all fields of technology.

In the past few years, the state has used the ‘technology scout’ to create an instrument that companies can use to more effectively determine sales opportunities for innovative products at home and abroad.

- › Scouts could possibly be used across companies who, together with SMEs, assess and develop business models for Thüringian companies using innovative technologies, helping to make them successful.
- › As an extension to the consultation services offered, approaches are conceivable in which the state provides support to companies in critical situations and assists in the formulation of measures, e.g. the financing of growth phases for the introduction of new products or for companies with liquidity problems. Companies should be able to go to a contact point and get a quick overview of what is on offer in Thuringia.
- › We also recommend the hosting of annual investor summits to provide information about the financial funding programmes and investment opportunities.





*In the central technology areas of Thuringia, growth rates are expected to be around or even above 50% by 2020 – automotive suppliers are playing an important role in this.*

## 4.3 Promoting company growth

The Thuringian economy suffers from the smallness of scale in its economic structure. Small companies run into more difficulties when commercialising ambitious innovations and accessing international markets. When it comes to network projects or centres of growth, larger companies are usually of crucial importance.

› Organic growth and growth from acquisitions can be considered as development opportunities. From the point of view of the state, the base and headquarters of the company must remain in Thuringia in the case of acquisi-

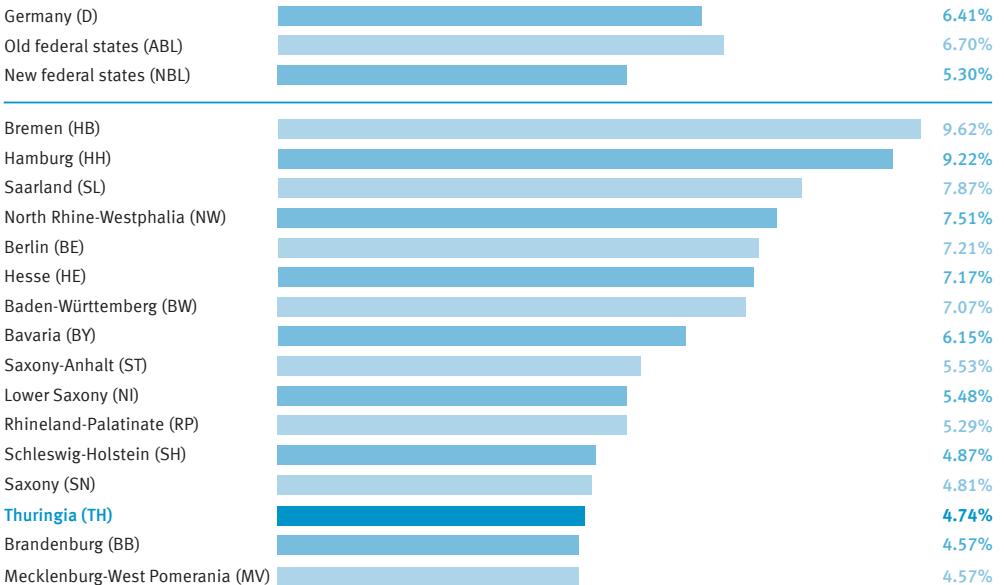
tions. The Thüringer Aufbaubank (TAB) and the Thüringer Industriebeteiligungs GmbH & Co. KG (TIB) need to develop corresponding financial instruments for this.

› When supporting organic growth, more consideration should be given to accessing new markets and the development of new products, e.g. through research and demonstration projects as well as promoting sales abroad. The acquisition of other companies can be made easier with guarantees or contribution of capital, e.g. through the investment company of the TAB.

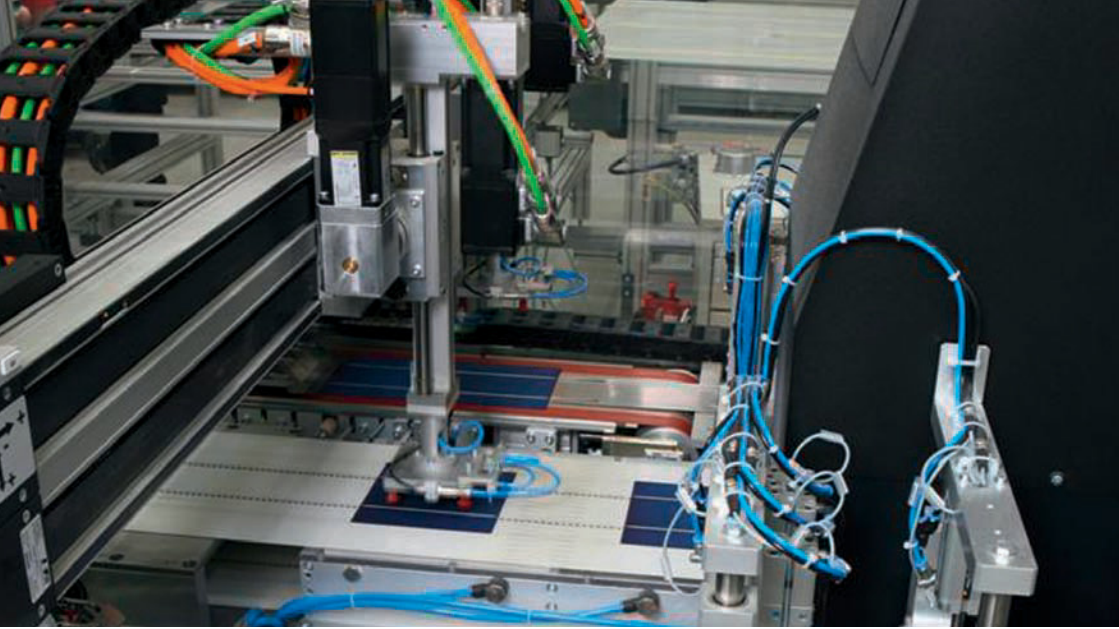
› Particularly for smaller companies (most prevalent in Thuringia), the equity base explains the existence of business risk and is much more than just a technical balance sheet quantity. It must therefore be sustained. A healthy equity base is also in the interests of the state, because weak companies can easily become the subject of acquisitions – a relocation of innovative business divisions out of Thuringia, however, runs contrary to the growth strategy outlined above.

Thus, the following measures are recommended:

- › Where possible, companies should gain the opportunity to develop new equity reserves.
- › Continuation of the start-up and growth financing interest rate reduction programme (GuW – Gründungs- und Wachstumsfinanzierung) through the TAB.
- › An equity assistance programme should be developed together with the Thüringer Aufbaubank, with the aim of enabling affected companies to strengthen their financial structures through instruments such as subordinated loans, offers for participations or mezzanine financings.



Proportion of large firms (250 or more employees) of all firms in 2008  
 (Source: Federal Employment Agency, Roland Berger Strategy Consultants).



*Collaborations between research, industry and service providers increase innovative power and improve market success.*

## 4.4 Promoting company cooperation

The depiction of seminal technology areas in Thuringia clearly shows one thing: cooperation between companies within and across all fields of technology offers huge potential. Thuringia has exhibited a unique combination of closely related application fields and cross-sectional technologies, which suggests the mutual development of products and ranges of services.

In the future, collaboration should be even more strongly promoted, particularly in three formats:

› A closer connection of application-oriented companies and research institutes can accelerate the commercialisation of research

results and lead to an environment of market-oriented research. A good example to mention here would be the integration of clinical research, effects and operational research, development and practical tests in the area of medical technology.

- › Integrated proposals for industrial products and related services promise considerable potential. Companies must cooperate for the long term, establish interfaces and emerge on the market as a virtual company with an integrated service portfolio (e.g. engineering/planning services and plant engineering).
- › Integrated systems provided by closely cooperating companies (e.g. measure-

ment technology, control technology and regulation technology with micro- and nanotechnology) is another area in which new markets could be accessed through close collaboration, even between small companies. Companies can work together in innovative niche markets in particular – from research and development to commercialisation abroad.

The analysis of areas of technology has shown that in nearly all of these areas, there

is still considerable potential to be tapped in the cooperation between companies and with research institutes.

Strengthening the network of Thuringian companies (support for syndication agreements, stimulating the formation of existing cooperation structures) would be productive, both for boosting innovative power and for improved market success. The efficiency of the collaboration should be measured regularly using concrete results.

## 4.5 Boosting business start-ups and entrepreneurial cultures

When it comes to the quantity of business registrations per capita, Thuringia lies below the country average.

The number of start-ups in Thuringia has gone down over the last few years in particular. This concerns start-ups in innovative and skill-intensive industries, which can be a key driver behind the development of jobs.

› In terms of the start-up potential in the areas of technology outlined above, the general conditions for company founders must be optimally mapped out. In areas where com-

mmercialisation has been low up to now (e.g. nanotechnology, and biotechnology to some extent) the foreseeable surge in the start-up of highly innovative companies should be contained and channelled into local successful company start-ups in Thuringia.

- › Consultation and support services must be offered directly to the research institutes.
- › The funding programmes for company founders are rich in terms of the instruments available in Thuringia and present the current instruments in a similar way to the

other German states. As part of the Thüringer Gründerinitiative (Thuringian start-up initiative [ThGi]), key activities have been combined together into a common project between the ministries for economics, labour and technology and for education, science and culture – in particular, the establishment of a consultation network, the development of a start-up prize, the provision of equity capital and the networking of founders in the Thüringer Netzwerk für innovative Gründungen (Thuringia network for innovative start-ups [ThürInG]).

- › In the Business Angels Network (THÜBAN), Thuringia has a consultation network that can offer founders valuable help in terms of business management.
- › In the future, technical support should be provided to potential founders through technology cluster networks and this should incorporate the skills and services offered by the Thüringer Aufbaubank, the chambers of commerce, the Kreditanstalt für Wiederaufbau, savings banks and private banks.
- › The possibilities of financing for start-ups must also be improved. The ThürInG is only the first step.
- › For founders who – due to technical requirements, for example – need to make considerable investments, appropriate financing

options should be made available. This does not have to be financing provided in full by the state – all that is needed is a commitment of partial financing and a guarantee to make other financial provisions accessible to founders.

- › Particularly in areas of technology where the assessment of business plans involves major technical requirements (e.g. nano- and biotechnology), it would be beneficial if the Thüringer Aufbaubank or the regional development company (LEG) could develop the relevant skills and carry out the assessment of business plans. Where a lack of expertise results, this will prevent decisions being made against a business idea in cases of doubt, also preventing promising start-ups from becoming operational.
- › Contact with existing successful companies in the same field of technology as well as the Business Angels Network could be beneficial when validating business ideas within the networks and the Thüringer Gründerinitiative. This would mean that market opportunities in the target market of the founders could be explored in a practical manner.

## 4.6 Actively opening up potential international markets and creating sustainable structures – primarily for SMEs

Today, Thuringia already has considerable success in the field of exports. Particularly in the automotive industry and the industries of optics, medical technology and measurement as well as control and regulation technology, sales in other countries play a key role and make a significant contribution to growth and employment. Yet the export rate in Thuringia is still significantly lower than the average for the whole of Germany.

Export companies expand quicker, create more employment and can expect the company's performance to be more positive. A stronger presence from Thuringian companies on world markets is therefore a promising starting-point.

- › The challenge for the state of Thuringia, in view of the limited resources, lies in paving the way for promotion on an international level which facilitates exports, helps to overcome the small-scale nature of the companies and assists the Thuringian economy in a targeted manner – where support is effective and can be employed in a resource-efficient manner. The topic of exports must be 'explored' for small companies, in particular.
- › Supporting companies in 'related' markets – e.g. in the USA, western Europe but also largely in central and eastern Europe – is

the first step towards more export business. Standardised procedures are feasible here and can help to achieve rapid success. Information packs should cover the main target markets, whereby extremely comprehensive information from existing services can be used for reference.

- › Grants should primarily be of a mobilising nature and not represent long-term support. It is a good idea to restrict the number of assisted trade fair visits per country and company, e.g. to two, after which business must be stable enough to be able to fund future trade fair visits.
- › For marketing aid, the proposal should be critically reviewed for financial aid in favour of a platform where companies can search for suitable private service providers (e.g. translators, Web designers, etc.).
- › New markets, different challenges: future markets which are often currently cited as 'exotic' yet difficult, e.g. the fast-growing Asian regions beyond China and India or Turkey, must continue to be explored by Thuringian companies. These represent key growth areas for the future. A 'Thuringia International' unit should be set up in the regional development company (LEG) for this to include the following activities:

- › The link-up of a strategic, industry-specific selection of target markets from a particular technology area with delegation trips and long-term support from the German institutions in the region can effectively promote access to future markets further.
- › Political support can also be extended through on-site representation. In view of the limited resources in Thuringia, close cooperation with the German embassies, economic bureaux and chambers of foreign trade are crucial here, and cooperation with other states in Germany would seem sensible.
- › The opportunities for growth in specific industries or areas of technology must be assessed, and the prospects for success in the target countries must be evaluated when selecting the right target markets.
- › It would also be extremely helpful in terms of guiding the companies if the target markets were regularly analysed across the key areas of technology in Thuringia.
- › The active exploitation of international markets and support for the development of sustainable and highly productive cooperation structures between companies mean that it will be necessary to boost foreign trade aid. Thuringia is poorly positioned in terms of resources in comparison with other German states.

## 4.7 Strengthening funding for technology

The TMWAT adopts a focused approach in the area of technology funding. The funds are applied to the technology areas identified as the most important, and key areas of technology such as green technology are also specifically funded.

For example, with the foundation of the Thüringer Energie- und GreenTech- Agentur

(ThEGA) in 2010, an institute was set up that can assist participants in the area of green technology with coordination and drive forward key priority projects.

RBSC sees improvement potential in the integration of SMEs in research projects and in the definition of strategic areas for collaborative projects with the participation of SMEs.

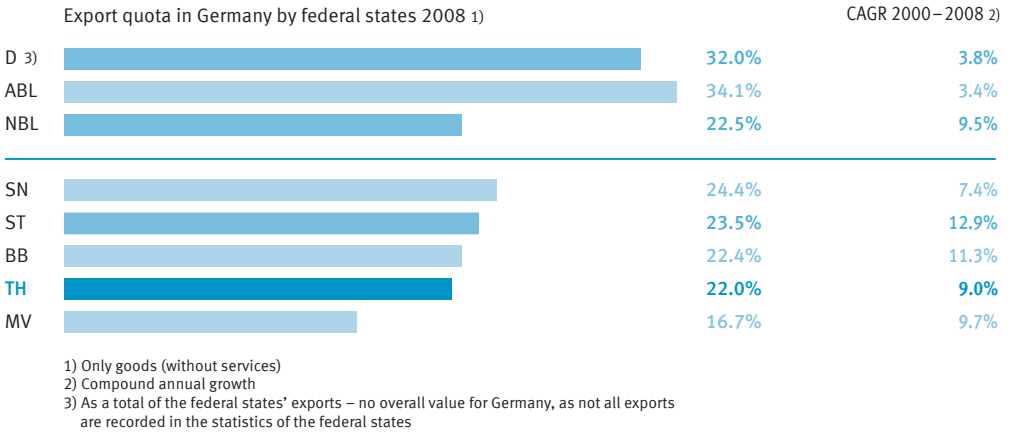


- › Setting up an industry board at management level under the aegis of the ministry of the economy, which incorporates both relevant state departments and TAB, TIB, LEG and representatives of the cluster.
- › The free state could establish a single point of contact for SMEs in particularly important research and application areas through coordinators, who could take part in research and development projects within the scope of collaborative projects.
- › The coordinators could also support the definition of strategic projects, which could be funded by the state, if possible through the contribution of national or EU funds.
- › In all, an increase of state funds in the area of technology funding that is clearly focused on growth rather than broad funding budgets would be preferable.
- › In addition, the transparency of running research projects (collaborative projects as well as individual operational measures) should be improved across all departments and the success of projects should be subject to regular assessment, also in terms of their value for the companies involved.

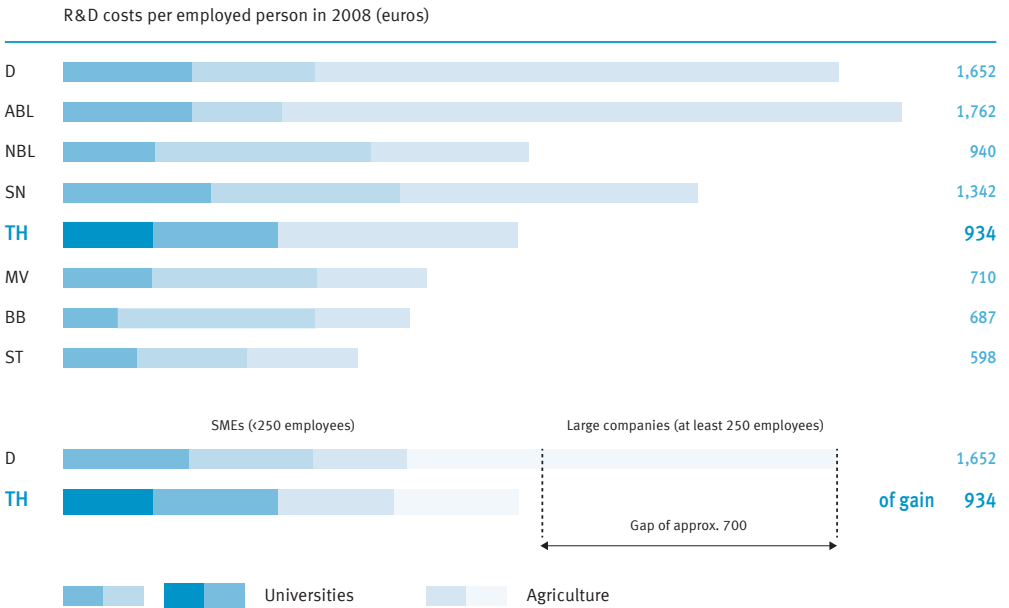


*Success abroad means growth at home. The automotive industry in Thuringia already has considerable success in exports today.*





Export quota in Germany by federal states 2008 (source: Destatis).



Research and development costs per employed person in 2008 (source: Destatis, Roland Berger Strategy Consultants).

## 4.8 Developing science and research

In recent decades, top-level research institutes in the particularly research-intensive fields of technology have taken up residence in Thuringia – for example, for optics, micro- and nanotechnology as well as biotechnology.

Federal and EU aid were acquired on a large scale to make this possible, both from research funding (like the BMBF ‘Entrepreneurial Regions’ programme) and from funding for infrastructure.

Since there will be a severe cutback in such funding in the future, third-party funds will have to be acquired with more zeal than to date from the ‘normal’ sources of research funding for Thuringia – for example, from the aid of the Deutsche Forschungsgemeinschaft (DFG) or from the EU research framework programme.

These efforts to acquire funding should concentrate on programmes that target the commercialisation of research results in the medium term such as collaborative projects, centres of growth, centres for innovation expertise or large demonstration projects from the EU research framework programme.

The acquisition of funding must be systematically supported by the state through:

- › Monitoring measures.
- › Establishment of a coordination centre which provides support by identifying suitable grants funds, accompanies applications strategically and collects particularly successful applications, provides them to other players and documents successes.
- › Strengthening of the research and education activity of scientific, technical and medical fields in Thuringia such as:
  - › Setting up microsystems and nanotechnology in Ilmenau.
  - › Sepsis research in Jena.
  - › Research facilities in the area of optical technologies (also in Jena).
- › Guaranteeing of co-financing for subsidies by the state.
- › Joint initiatives/overall strategies of the ministry for economy, labour and technology and the ministry for education, science and culture, including the development of a more focused profile and a clear direction for universities.

## 4.9 Systematising and accelerating the commercialisation of research results

The conversion of research results into economically usable developments is central for the economic progress in Thuringia and must be optimised. Network structures and innovation forums must be able to assume their function as links between research institutes and the economy.

A good example that can be mentioned here is the application centre at the TU in Ilmenau. Technically high-quality basic configurations, regional proximity to the research institutes and available rental area serve to reduce costs and integrate founders with other founders and with scientists. In addition, as part of an innovation forum promoted by the German ministry for education and research, an exchange takes place between representatives of the research institutes (for example, the MacroNano Centre for Innovation Competence) and interested companies as well as the MNT and ELMUG networks.

In its own way, this approach is exemplary and should also be widely copied in other areas. The elements are as follows:

- › Advice for small to medium-sized companies on successfully obtaining research and development aid.
- › Active monitoring of government funding programmes from the state, federal government departments and the EU (research

framework programme and programmes from the commissioners) and evaluation with regard to the areas of technology.

- › Networking of companies and research institutes and moderation of joint research and development applications.
- › Support in handling formal and administrative hurdles.



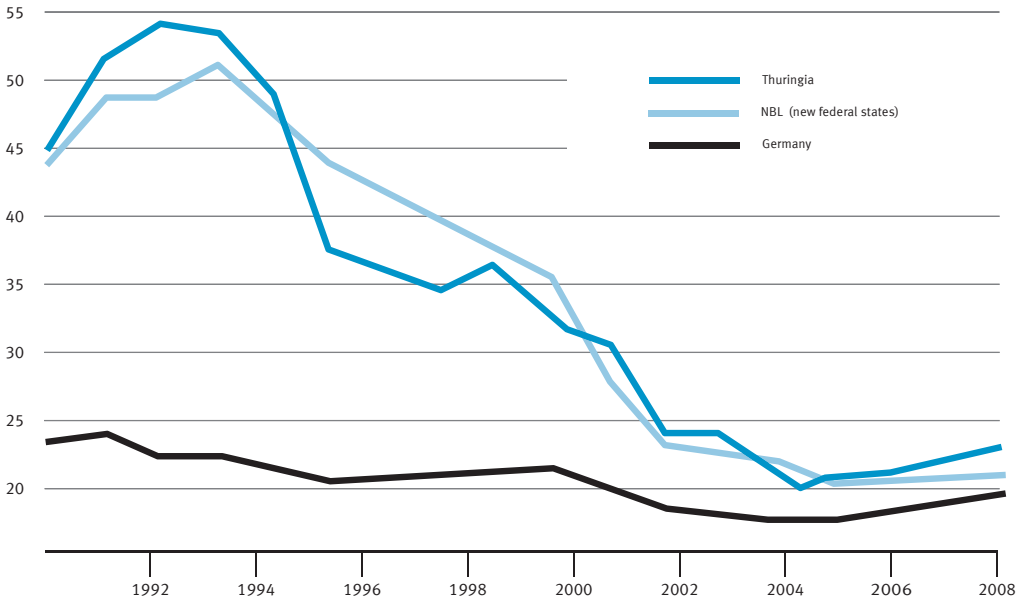
*Greater integration means that small to medium-sized companies also benefit from research projects.*

## 4.10 Guaranteeing effective infrastructure

Thuringia is at the geographic centre of Germany – however only when it is also the infrastructure centre of Germany can it become the centre of start-ups and relocated companies.

For this, the following are needed:

- › Medium-sized towns must be connected to the new transport axis Munich–Erfurt–Berlin with good timing and efficient regional connections (development of the MitteldeutschlandBahn which will connect Jena and Weimar to the ICE line).
- › The ‘grey areas’ in broadband coverage must be eliminated. This especially applies to the gaps in the basic service, predominantly in rural areas with up to 1 MBit/s, but also the low coverage rate at speeds of 6 MBit/s. This speed is imperative for most modern multimedia and communication applications.
- › Considerable progress must be made, particularly with the commercially important connection to high-speed networks with a bandwidth of 25 or 50 MBit/s. In comparison to the industrially strong areas North Rhine-Westphalia, Baden-Württemberg and Bavaria, Thuringia clearly needs to catch up.
- › The local authorities must be mobilised and put in a position where they can assume their responsibilities in developing broadband coverage.
- › Sound solutions must be developed for the continuity and expansion of Erfurt airport so as to be able to establish the connection to other important economic regions such as Hamburg or the Ruhr.
- › To support business start-ups and moves into the area, attractive and high-quality industrial and commercial premises must be available, particularly in the fast-growing regions.
- › It is therefore necessary to systematically establish a strategic pool of premises for businesses setting up in the area and promote it in a targeted manner (large industrial space initiative).



Gross fixed asset investments in % of gross domestic product 1991–2007  
(source: Destatis, without taking Berlin into account).

## 4.11 Securing and strengthening investment expenditure

In the coming years, it will be necessary to make up for the discontinuation of direct location promotion, which was a locational advantage of Thuringia in the past. It will also be necessary in the future for the federal government to invest in the creation of important infrastructure, but smart, individual solutions could also be developed. These include:

- › Securing the entire co-financing of EU and federal government programmes with state funding.
- › The more aggressive use of ‘soft’ location factors (for example, childcare infrastructure, education opportunities, etc.) for location marketing.
- › The provision of commercial premises which are already being promoted, e.g. as part of the large industrial space initiative.
- › The development of models which optimally use the public financing conditions by struc-

turing rent for companies accordingly.

- › Enhanced promotion of small to medium-sized companies in new business centres (e.g. through bills-only commercial units).
- › Using the available premises as a priority to close gaps in the value chain of future-oriented business segments in Thuringia with corresponding location incentives.

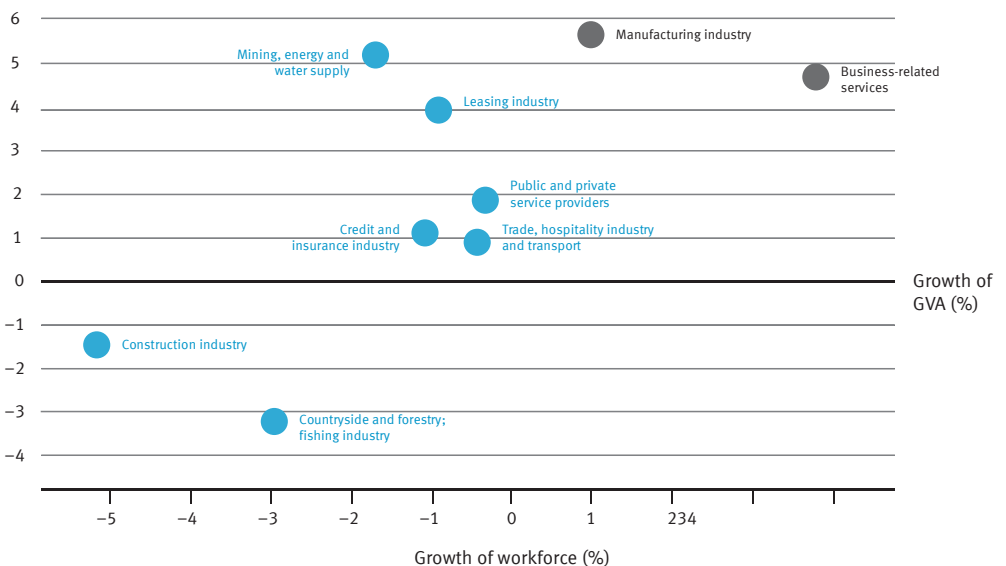


*New ideas for the labour market: Thuringia's economy sets store on experience.*

## 4.12 Prioritising industry and industrial services

Industry and production-related services will continue to drive growth for the next ten years. The following is therefore necessary:

- › This kind of company establishment must be handled as much as possible within the existing legal framework. This also applies to the efficient structuring of approval procedures and the designation of commercial premises or the use of subsidised rental spaces.
- › The ‘Mietfabrikprogramm’ premises rental programme must be used systematically as an instrument in the location competition for newly arrived companies.
- › Approval procedures and administrative structures must be checked for their grants from the EU; the importance of funding programmes financed by the state will increase.
- › Existing potential must be used, particularly in the close coordination of urban and regional planning and approval procedures between the agencies and local authorities involved and the effective execution of any necessary public involvement.



Development of the gross value added per person employed and the activity of selected Thuringian economic sectors (2000–2008), CAGR (source: TLS [Thuringian Office of Statistics], Roland Berger Strategy Consultants).

## 4.13 Developing the Thuringia Aufbaubank (development bank) into the Landesstrukturbank (regional structural bank)

Less money from Europe, more activity into and from Thuringia – this is the allocation of responsibilities for the future.

In the light of the conceivable decrease in grants from the EU, the importance of funding programmes financed by the state will increase.

- › In the future, the Thuringia Aufbaubank must take on the role of a Landesstrukturbank, converge on important projects and provide the financial resources for essential strategic projects in the state such as:
  - › Strengthening the equity base.

- › Committing still further to establishing companies.
- › Active participation in financing companies.
- › Acquiring financial interests which are strategically important for Thuringia.
- › Extending the financing portfolio of the TAB.
- › For this, there must be an increase in the equity of the TAB.
- › In parallel to the extension of the range of tasks, the risk management and monitoring structures must also grow and become more efficient.



## 4.14 Securing the supply of skilled workers

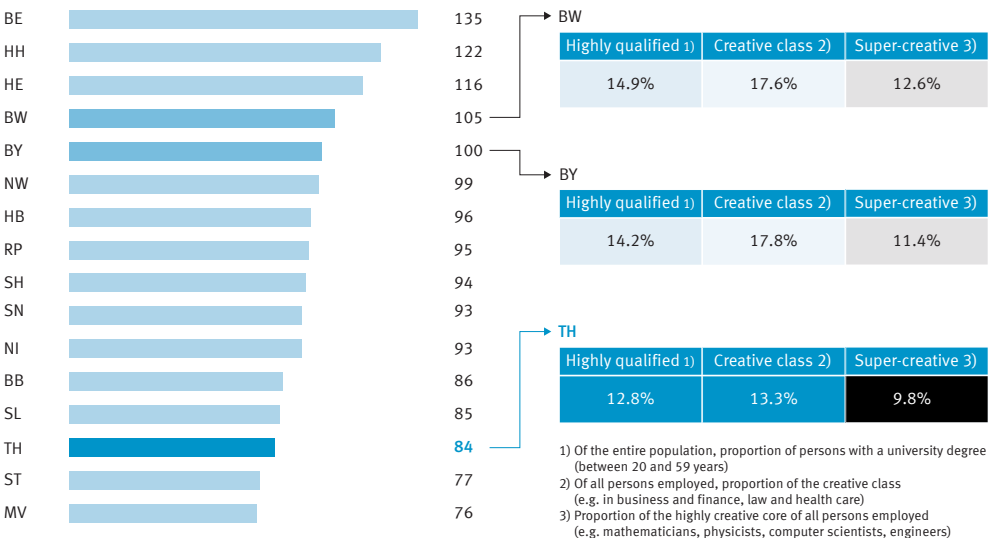
No growth without skilled workers! Thuringia must use the existing potential better, too. Employment policies must finally be understood correctly. Securing the supply of skilled workers is not only a socio-political issue; it is also an investment policy necessity.

Employees are future innovators – therefore, the importance placed on retraining and further education must noticeably increase. In total, we have identified four essential starting points:

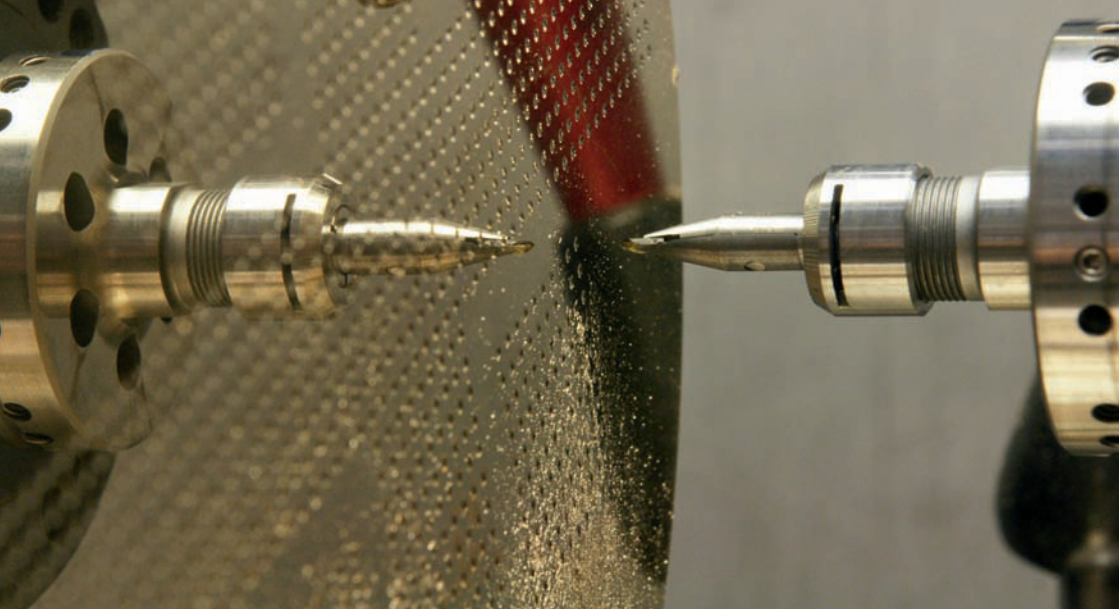
- › Provide early assistance with career guidance, increase the apprenticeship rate, further strengthen the relationships between industry and degree courses and reduce the school, apprenticeship and university dropout rates:
  - › Existing instruments of the free state must be checked and extended; in particular, the ‘BERUFSSTART plus’ programme must be secured beyond 2014.
- › Reduce the emigration of highly qualified individuals and support immigration:
  - › A joint initiative by the state government together with the chambers of commerce, universities and business associations is needed to bring students into contact with regional companies early on.
  - › As a starting point for reclaiming the 125,000 so-called ‘out-commuters’, the state should investigate the triggering factors and the individual motivation of employees as part of a study and use this as a basis for identifying starting points to ‘bring them back’.
- › More offers of help and orientation must be provided, both for companies and for skilled workers. The establishment of the Thuringia Agentur für Fachkräftegewinnung (ThAFF) as a service point, in which strategies to retain and win over skilled workers are merged, is a promising step in the right direction.
- › Measures such as the launch and use of Internet portals and fairs should be consolidated to bring together supply and demand for skilled workers.
- › Development of a joint ‘Welcome to Thuringia’ initiative with the Thuringia chambers of commerce and industry and the chamber of crafts to help skilled workers and academics who are recruited to move jobs and in homes, bring their families with them, find childcare, etc.
- › Significantly increase the labour market proportion of women and older employees and set up models of flexible working hours for all groups of earners; anchor family-friendliness in the consciousness of potential workers as a hallmark of Thuringia’s economy.
- › Family-aware, flexible working-hour models (e.g. flexitime accounts), industry-wide assistance with childcare and the introduction of home-office days are required.

- › The existing ‘Thüringer Allianz für Familie und Beruf’ needs to be further developed, together with the players concerned.
- › A forward-looking approach would be to make Thuringia a model state for employing older people. The aim of such a strategy would be to find practical ways to keep people employed for longer.
- › Advance the productivity of employees through continuing education and qualification:
  - › All age groups and qualification groups must benefit from further education measures.

- › Increase targeted precision: the existing range of the Thuringian continuing education sector must undergo a critical examination and be adapted to the needs of the economy as well as the requirements of growth trends.
- › The use of training consultants should be maintained and extended.
- › The introduction of a seal of quality for continuing education measures would guarantee quality and give direction.



Talent index presented as a nationwide comparison (source: Berlin Institut für Bevölkerung und Entwicklung [Berlin Institute for Population and Development], 2007).



*To come to the point: clustering resources is an important requirement for successful economic policies.*

## 4.15 Modernising administrative structures

Faced with increasingly tough location competition, an economy can only be successful if it has access to competent and professional – and therefore functioning – administrative structures. Administration is not just about enforcing laws; administration is also about services, advice and image promotion. The quality of administration is determined by the people it employs. Raising the awareness of employees throughout the administration of the needs of companies and their framework conditions, expectations and views is therefore of prime importance.

Business-friendly administration however always means doing more than all the others. A mixture of hard and soft measures must be offered such as:

- › The provision of location and market analyses, industry structure analyses or analyses of the economic and social area.
- › The provision of attractive infrastructure.
- › Help with location marketing.
- › Financial planning and advice about grants.
- › Faster processing, streamlining of approval procedures and increased transparency.
- › Measures to reduce red tape.
- › Attractive pool of qualified staff.

To achieve this goal, it is necessary to modernise the administration in Thuringia, including reform of administration and local government.

## 4.16 Improving cluster management and strengthening regional networks

The desired bundling of resources must make networks more functional. Comprehensive coordination or conceptual work to support and advance economic policy in the technology fields cannot be realised with the current staff resources.

The state must support strategic development planning for the cluster – for example, through:

- › The dedicated support of existing networks with resources.
- › An overall unit which drives the necessary reconciliation of the regional development company (LEG), the Thuringia Aufbaubank and other players at state level and initiates cooperation plans.

The aim should be for all clusters to work in the medium term on the basis of a road map, in which the goals, milestones and essential measures are presented for the players and the direction is given through the most important projects and challenges.

The implementation of the road map should be promoted professionally by the networks. Comparison with other federal states in

Germany demonstrates that cluster organisations in comparatively new areas (for example, green technology) with significant personnel expense, in particular, serve to build stable and sustainable cooperation structures.

In order to also expand the effects of growth throughout the region, it will be necessary for the regional networks and players (particularly the chambers of commerce, savings banks and cooperatives) to get involved with drafting development plans and road maps and to be taken into account.

For the regions, it will be important that:

- › A profile is determined concerning the development of commercial premises, (further) education services and transport infrastructure that fits the companies which are already domiciled there
- › A profile is determined supporting companies that plan to set up there

The corresponding plans should also demonstrate an explicit relationship to the areas of technology indicated and leverage those regional strengths.



## Be bold for the future

To use the potential outlined, concerted action is needed in Thuringia. The free state must and can expect its players to be more bold in their collaborative efforts than they have been in the past. State government, local authorities and administrative districts must work together for the future.

The analysis clearly shows: a change for the better is not only desirable in Thuringia – it is also possible. For this, however, the state needs a wake-up call. A project, 'Thüringen 2020', would be a sensible instrument to prepare the free state for the challenges ahead and provide the necessary answers.

Such an initiative is worth the investment – it will give the people of Thuringia a future. Let us boldly seize the chance to shape this future. It can only happen together – and only with optimism, ideas and innovation. We can win tomorrow. Be bold for the future.





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