

STUTTGART REGION AUTOMOTIVE CLUSTER INITIATIVE – CARS (CLUSTERINITIATIVE AUTOMOTIVE REGION STUTTGART)

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Stuttgart region

Stuttgart region, the political and economic center of Baden-Württemberg (BW), consists of the City of Stuttgart and its five neighbouring counties, namely Böblingen, Esslingen, Göppingen, Ludwigsburg and Rems-Murr. The population of the region is around 2.7 million in an area of 3,700 square kilometres. Stuttgart is one of the twelve regions of the state of BW and its co-ordination seat is “Stuttgart Regional Association (Verband Region Stuttgart – VRS)”, which acts as the joint representation organ for the municipalities. VRS is composed of a democratically elected decision-making body and a functional unit that is responsible for the day-to-day regional planning, local transport, and business promotion among other topics. The Stuttgart Region Economic Development Co-operation (WRS) is the operational extension of VRS and its task is defined to provide support for established and new sectoral clusters.

The state capital city of Stuttgart hosts the state parliament, ministries and other government units and while occupying only approximately ten per cent of its surface area, the Stuttgart region accommodates 25 per cent of BW’s population and produces 28 per cent of its Gross Value Added (GVA, Table 1). Both Stuttgart region and BW outmatch national averages in basic economic indicators, and Stuttgart also scores quite well when compared to leading German metropolitan regions.

| Number | GVA per capita (2005, euro) | German metropolitan regions in comparison | | |
|-------------------|--------------------------------|---|--------------|-------------------------|
| | | +/- National average | Unemployment | +/- National average |
| Munich | 41,861 | 71 % | 6.1 % | -44 % |
| Hamburg | 31,742 | 29 % | 9.6 % | -11 % |
| Stuttgart | 31,171 | 27 % | 6.2 % | -43 % |
| Rhine/Main | 30,697 | 25 % | 8.7 % | -19 % |
| Baden-Württemberg | 27,388 | 12 % | 6.3 % | -42 % |
| Cologne/Bonn | 27,118 | 11 % | 10.8 % | 0 % |
| Germany | 24,525 | 0 % | 10.8 % | 0 % |
| Dresden | 20,200 | -18 % | 15.3 % | 42 % |
| Berlin | 19,610 | -20 % | 16.6 % | 54 % |
| Leipzig/Halle | 19,253 | -21 % | 17.8 % | 65 % |

(Source: Strukturbericht Region Stuttgart 2007, Statistik 2007 and own calculations)

The three leading industrial sectors automotive, machinery and electronics/electrical engineering create approximately 48 per cent of the industrial employment and 81 per cent of the industrial turnover in the region¹. Moreover, approximately 92 per cent of the industrial exports were sourced by these three industries, automotive plays an exceptional role at 63.7 per cent. Clearly, considering the degree of tertiarization of the European economy, these numbers are nothing less than striking. Nevertheless, manufacturing employment has been steadily receding since the end of the 1990's, as opposed to the increasing share of enterprise services. Between 1999 and 2006 the former slimmed down by 9.3 per cent (36,344 wage-employees), while the latter gained 29.8 per cent (32,500) (Strukturbericht Region Stuttgart 2007). Furthermore, the degree of functional tertiarization, calculated based on employee-tasks, 74.1 per cent for all sectors and 59.4 per cent for the automotive industry. This significantly high functional tertiarization is a sign of undeniable structural change and a proof that the regional firms now focus on more complicated manufacturing and assembly tasks, and knowledge-intensive services like design, R&D and management. This picture inevitably resembles the "Germany, the bazaar economy" the argument² of Sinn (2006).

In terms of investments in R&D and patent production, the Stuttgart region leads other metropolitan regions comfortably. In 2003, the R&D investments of private firms reached 5.2 per cent of the regional Gross Domestic Product (GDP), ahead of runner-up Munich (four per cent) and 2.5 times of the national average. In absolute terms, these investments reached nearly 4.8 billion euros, and thereof, the automotive industry was by far the highest spender with 72 per cent, followed by electrical/optical equipment, and machinery with 15.4 per cent and 8.7 per cent (Forschungs- und Entwicklungs- Monitor Baden-Württemberg 2006). The same order was to be seen for dedicated R&D employment, too: 66.7 per cent, 17.3 per cent and 11.1 per cent. As a measure, the Stuttgart region employs about half of the R&D staff in BW. Like in R&D investments and employment, Stuttgart also leads the German metropolitan regions in terms of patent intensity: with 3,312 patents issued per one million employees, Stuttgart leads followed by Munich (2,493) and Dresden (1,361) (Strukturbericht Region Stuttgart 2007).

Stuttgart automotive cluster

The Stuttgart region, birth place of the motor vehicle, is endowed with an exemplary and competitive automotive cluster. At the core of the cluster there are two renowned and successful OEMs (Daimler and Porsche), a group of very competitive suppliers, to which include the world's largest automotive supplier Bosch, and a concentration of innovative research establishments. Daimler, to which the brands Mercedes-Benz (MB), Smart and Maybach belong, has its headquarters for passenger and commercial vehicles (both EvoBus and Daimler Trucks) and two main plants in the region. The R&D activities for passenger vehicles are, to a large extent, carried out in the "Mercedes-Benz Technology Centre" (MTC) in Sindelfingen, which will be expanded till 2010 with additional functions that will be transferred in from other national locations. The central R&D operations of commercial vehicles are also located in Untertürkheim. All fuel-cell related R&D activities of Daimler are located in Kirchheim, which has led the development of a concentration of innovative firms in this field in the region.

The Porsche premises in Stuttgart-Zuffenhausen still host the main location where all 911-models (38,959 units in 2006/07) and engines for all three production plants are assembled. Indeed, Porsche is currently expanding its facilities (a larger painting facility among others) and will be opening its corporate museum next to the factory in 2008. The main R&D centre is in Weissach, where the subsidiary Porsche Engineering Services, which offers services to other carmakers as well, is located, too. Porsche Consulting (process and enterprise consulting) and MHP (process and IT consulting) are also located within Stuttgart Region.

Bosch, the world's largest automotive supplier in terms of sales, is at the top of a diversified supplier base located in the region, which includes Mahle (engine components and peripherals), Behr (air conditioning and engine cooling systems), Dürr (painting systems and facilities), Eberspächer (exhaust technology and heaters), Recaro (seats), Mann+Hummel (filter and air intake systems) and Beru (diesel cold start systems). These globally operating firms have their headquarters, R&D facilities and manufacturing operations in the region. An interesting feature of these firms is the degree of their openness they have displayed to adapt to globalization. Even the relatively smaller suppliers entertain links with low-cost locations in new EU member states. A group of foreign-owned suppliers (Modine, TRW, Valeo and Faurecia, among others) and a large number of smaller suppliers from second and third tiers complete the manufacturing oriented suppliers base. Numerous engineering firms, with varying degrees of automotive-focus, are active and are crucial members of Stuttgart's cluster. The depth of the services these firms deliver varies greatly, from tool-design to complete system development capabilities that include everything from predevelopment to production. These firms operate at different levels of "globalization", while household names like Bertrandt, Porsche Engineering Services and MB-Tech do operate globally; smaller engineering offices concentrate themselves strongly on regional customers.

According to yearly statistical records from 2006, there are 222 firms in the Stuttgart region that are active in the NACE group "Manufacture of motor vehicles, trailers and semi-trailers" and these

¹ For enterprises with 20 or more employees. Source: Statistik 2007.

² Sinn claims that the German economy is shifting manufacturing over to lower-cost locations and becoming increasingly dependant on services and assembly tasks. In this sense, Germany is a location where inputs from all around the world are collected as in a "bazaar economy".

Table 2 Total no. firms and employment in automotive in the Stuttgart region

| | Total | According to firm size | | |
|---|---------|------------------------|---------|---------|
| | | 0-9 | 10-249 | 250 < |
| Manufacture of motor vehicles, trailers and semi-trailers (WZ/NACE 34) | | | | |
| No. firms | 222 | 107 | 79 | 36 |
| No. employees | 134,691 | 194 | 5,447 | 129,050 |
| Private enterprises (WZ/NACE 10 – 74, 80 – 93) | | | | |
| No. firms | 125,675 | 106,733 | 11,609 | 458 |
| No. employees | 954,709 | 140,720 | 421,534 | 392,455 |

Table 3 Transport equipment employees according to the functional profile of their tasks

| | 2006 (%) | | | +/- 99/06 | | |
|----------------------------|----------|------|------|-----------|-------|-------|
| | G | BW | SR | G | BW | SR |
| Automotive industry | | | | | | |
| Production tasks | 55.4 | 51.9 | 45.7 | -2.6 | -5.6 | -9.6 |
| Direct | 26.6 | 24.2 | 21.5 | -8.6 | -12.4 | -10.1 |
| Indirect | 25.5 | 25.1 | 20.8 | 6.9 | 6.4 | -5.0 |
| Services tasks | 42.3 | 46.0 | 52.3 | 16.9 | 19.2 | 28.1 |
| Technical | 17.3 | 19.9 | 24.8 | 24.7 | 27.1 | 37.7 |
| Management | 12.8 | 13.8 | 14.8 | 22.3 | 21.8 | 25.0 |
| Logistics | 8.3 | 7.3 | 6.0 | -0.4 | 0.1 | 1.0 |
| Commercial | 1.6 | 1.5 | 1.8 | 16.7 | 20.0 | 52.7 |

(Source Strukturbericht Region Stuttgart 2007 p. 96)

(G: Germany, BW: Baden-Württemberg, SR: Stuttgart Region)

firms employ 134,691 individuals. Although most of these firms are micro enterprises, the bulk of the employment is concentrated on large firms (Table 2). Supporting evidence is also available on a list of the biggest employers in the region, published by the regional Chamber of Commerce, which reveals that OEMs Daimler (71,729 employees), Porsche (9,478) and Bosch (24,478)³ occupy the top three places. The “smaller” suppliers of the region Behr (4,643), Mahle (3,700), TRW (2,000), Mann+Hummel (1,600), Valeo (1,350), Allgaier (1,317) and Eberspächer (1,060) are also among the most significant regional employers.

The general functional tertiarization in the Stuttgart region applies to the automotive industry as well (Table 3). Despite this change being common to BW and Germany levels, it progresses more rapidly in the Stuttgart region and at 52.3 per cent overall, the functional tertiarization in the region is one fifth higher than the German average. The emphasis on technical tasks, which include R&D activities, is also striking.

German car manufacturers and suppliers have gone through a transformation since the dramatic structural crisis of the early 90's (Jürgens 2004). Although respective strategic paths of enterprises differ, some responses are common: concentration on selected core activities, outsourcing and sourcing from low-cost locations, especially from Eastern-Europe. In a sense, by leaving old Fordist practices behind, the cluster has survived the "critical point in its history" and managed to break out of the grow-peak-decline process (Morgan 1999).

At the same time, the challenges have changed much less than one would expect. In 1992, Böhm et al. reported the following trends and issues for the automotive industry in the "Stuttgart area": outsourcing of development tasks to suppliers, increasing awareness of environmental effects of motorization, cost-pressures, decreasing number of direct suppliers to OEMs, consolidation, "internationalization" (read globalization) as a threat to jobs in the region as firms move tasks to southern European countries. Clearly, the challenges have changed very little, achieving continuous innovativeness, quality and diversity is still the paramount task faced by the cluster.

Stuttgart Region Economic Development Cooperation

The negative effects of global economic fluctuations of the early 90's led the public actors who assumed the regional leadership to devise counter measures. It was clear at the time that the problems were not relating to regional innovation and manufacturing capacities as such, but to a case of cognitive and organizational lock-in. Following years of success, the enterprises in the region had closed down in their habitual ways of operation and the globalization had taken them by surprise. In order to transform the regional co-ordination functions and to give the regional industry a new impulse, two associated organizations were formed in the mid 90's. The first one is the Verband Region Stuttgart, which assumes the co-ordination and planning tasks for the whole region through an elected assembly and dedicated operational teams. A cluster management organization, Stuttgart Region Economic Development Co-operation (WRS) was established in 1995 by public and private bodies in order to break the lock-ins and to boost regional competitiveness. Since then, WRS has been supporting both, the traditional and new sectors in the region with cluster building activities and innovation support. The organization of WRS is structured around respective sectors and horizontal support activities: for instance, automotive, machinery, health, media and IT sectors and site selection and investor support services. There is no formal membership scheme for cluster management activities and all regional firms can benefit from WRS initiatives.

CARS initiative

With CARS initiative⁴, WRS aims to link and align the automotive relevant activities of WRS more closely with each other and to expand them into new areas. CARS is structured as a multidimensional and need-driven initiative that is flexible to react to dynamic changes of the industry and the region. In terms of operational content, the thematic areas cover different topics: regional communication, skilling, clean energies, sustainable mobility, and software services for the automotive industry. A focal concern for the design of this initiative was avoiding the creation of competition against the already existing commercial, public and WRS services offered within the cluster. For this reason, there

³ Includes persons employed in activities outside automotive.

⁴ On the internet: <http://www.cars.region-stuttgart.de>

is a certain focus in CARS to provide the crucial intangible support services that often attract less attention from the commercial service provision mechanisms.

Operating in networks where open communication takes place are drivers of co-operative innovation in the automotive industry. However, acute time pressures render it extremely difficult for enterprises to engage in the necessary level of interaction with peers, associated industries and research communities. One of the primary targets of the CARS initiative is to address this issue by facilitating regional channels and platforms of communication. In practice, three different types of activities with distinct but complementary profiles have been designed for this purpose. The first one of these is a platform titled “Treffpunkt Automotive (Meeting-point Automotive)”, where future-oriented technological and business visions are discussed. A key-note speech by a top-ranking automotive manager is the central piece of this event, which stimulates interactive discussions on visions of mobility and creates valuable networking opportunities. Secondly, interactive meetings are organized with the participation of OEMs', large suppliers' and academic institutions' representatives. During these exclusive events the aim is to address matters at the operational level (for example optimization of automotive supply chains) and to generate co-operative projects. The third component of communication support strategy is the regular site visits in the region. These visits are organized to regional research or manufacturing premises and they offer useful opportunities to get an inside into regional capabilities and the innovative potential of regional research institutions. These visits include an integrated discussion session with the management-level representatives of the host firm or institution. With this diversified strategy WRS makes use of its position, as a neutral agent in the region, to facilitate communication.

Another important goal of CARS is to strengthen the communication and target-oriented co-operation between research institutions and the firms. An example to this end is a regional voucher scheme that would co-finance the initial stage of co-operation between automotive SMEs and research institutions. The thematic focus of this campaign is the diffusion of new technologies along the automotive value chain. After a successful first implementation of this campaign, with a focus on the implementation of laser technologies for manufacturing in 2006 to 2007, the second phase will address additional areas. By requiring a 50 per cent own financing from SMEs, this scheme ensures the full commitment of beneficiary firms. This voucher scheme is conceptualised as an extension to a support tool by the Ministry of Economics of Baden-Württemberg.

Incoming investments certainly are an important factor for the growth and sustainability of the cluster. The hard regional factors like land or real-estate costs are definitely important elements in the investment decisions. However, for knowledge and skill-intensive manufacturing and service sectors the purely cost-oriented concerns are less important than the soft locational factors like availability of labour, connectedness and the quality of living. Although the Stuttgart region is not the most affordable region when it comes to pure costs, it is among the top league in Germany and Europe in terms of research infrastructure, availability of skilled labour, living standards and quality of office spaces. In order to communicate these strengths better to potential automotive investors, CARS acts as the initial contact point. The fundamental aim is to present the advantages of the region clearly and to make sure that investors have a smooth start in the region. These services are co-ordinated with the real-estate management team of WRS and other stakeholders in the region. The recently launched real-estate web-portal of WRS⁵ will be an important component of investor activities and it has already been received with enthusiasm by enterprises.

The increasing awareness on climate change and the increasing fossil-fuel prices practically force the automotive industry to develop new propulsion technologies and to adopt alternative energy resources. WRS is convinced that fuel-cell technology will have a future in the sustainable mobility mix of the future, and accordingly, ensuring the future competitiveness of the Stuttgart automotive cluster requires the development of regional skills in fuel-cell development and manufacturing. To this end a dual strategy has been devised and implemented as an integral part of the CARS initiative. The first dimension of the activities is to support the application-oriented development of the technology in the region so as to be positioned favourably during the commercialization phase. The Fuel-Cell Alliance Baden-Württemberg (Brennstoffzellen-Allianz Baden-Württemberg/BzA-BW⁶) acts as the facilitator for the co-operation between the firms and research institutions in this field, and the CARS initiative provides organizational and financial support to the BzA-BW activities. Creating the necessary awareness in the automotive industry and among future customers, is the second component of CARS' fuel-cell strategy. To achieve this, CARS co-organizes a congress, f-cell forum⁷, to provide an open communication and promotion platform for stakeholders. This annual event, which includes a widely-attended symposium and an exhibition area, has established itself as one of the most important meeting points for fuel-cell technology. Every year during the f-cell forum the CARS initiative also announces the winners of the f-cell awards, which are given to innovative ideas with potential for practical implementation. These awards include cash-prizes, as well.

A new addition to the CARS initiative is the group of activities that aim to support the automotive-oriented software service activities in the region. Software plays an essential role for the automotive industry today. The development and manufacturing activities are dependent on software tools, supply chains are kept together with IT-applications and, finally, modern motor vehicles are becoming increasingly infused with software. It is essential for the future competitiveness of the automotive cluster to ensure closer and efficient networks between automotive and software firms. In the Stuttgart region there is already a burgeoning sub-cluster in the automotive software domain and it is expected to grow in the coming years. However, its visibility does not correspond to the substance of its economic contribution to the region. The aim of the CARS activities is to help the development of a cluster identity. These activities, which will be carried out under the CARS-IT banner, will initially aim at the improvement of regional networks. Information and awareness-raising activities, as well as networking events will be the initial components to this end. Several areas of co-operative action are also considered. These could include practical activities like trainings on new standards, for example AUTOSAR and on quality assurance approaches CMMI and SPICE.

Last but not least, creating supra-regional links is also an important component of CARS initiative. For this reason, WRS has been playing an active role in the new Cluster South-West Initiative, which will bring stakeholders from the automotive industry at the level of Baden-Württemberg. This important initiative is currently being prepared for launch with the involvement of regional OEMs, suppliers, policy makers and research institutions. Activities at European level are also an important component of the CARS initiative. Projects like BeLCAR have proved, that the co-operation among European cluster practitioners brings positive outcomes at both sectoral and cluster management levels. WRS

⁵ More information available at: http://immo.region-stuttgart.de/sks_wrs/

⁶ More information available at: www.bza-bw.de

⁷ More information available at: <http://www.f-cell.de>

believes that the competitiveness of the European automotive industry can benefit a lot from matching the regional skills and capacities across the continent in innovative projects.

As it has been presented above, the fundamental objective of the CARS initiative is to bolster the Stuttgart automotive cluster and to assist the regional stakeholders to be better prepared for the future.

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