

TÜV Rheinland: The Business Streams

Projects – business areas – services: A selection at a glance

TÜV Rheinland stands for quality and safety in interacting with man, the environment and technology in nearly all industrial sectors and areas of life. The company tests and certifies technical systems, products and services, supports projects and designs processes for companies. In addition it provides services related to IT systems, occupational health and safety at work, training and professional qualifications. To this end, TÜV Rheinland has a global network of acknowledged laboratories, test and training centres with 500 locations in 61 countries.

TÜV Rheinland's operates in six Business Streams:

- Industrial Services,
- Products,
- Mobility,
- Life Care,
- Training and Consulting,
- Systems.

The services and technical testing offered by TÜV Rheinland are continuously adapted to new legal provisions as well as economic and social requirements. This applies, for example, if new products or test norms are developed or if the legal conditions for tests, qualifications and certifications change.

For example, TÜV Rheinland offers services in energy business, the production of consumer goods, the automobile industry, IT and communication, basic materials, investment goods, trade, construction, the food industry, aviation, logistics, the healthcare sectors, banks and financial service providers, agriculture, leisure and tourism.

Industrial Services

The Industrial Service Business Stream generated revenues of €377 million in 2010. This represents 27% of total revenues generated by TÜV Rheinland. The Industrial Services cover the Business Fields of Pressure Equipment and Materials Technology, Conveyor and Machine Technology, Elevators, Electrical Engineering and Building Technology, Industrial Engineering Safety, Civil Engineering, Energy and Environment as well as Project Management and Supervision. The services include testing industrial plants, support of industrial and infrastructure projects, testing pressure vessels, conveyor systems, elevators, electronic monitoring of road conditions, civil engineering and environmental and hazardous substance analysis.

The Industrial Services Business Stream includes pressure vessel testing, the service which goes back to the origins of systematic technical inspection in Germany. Because with the rapid industrialisation in 19th century Germany, safety in industrial engineering moved increasingly into the focus of the general public and politics as the result of several serious accidents. Today, TÜV Rheinland specialists still test pressure equipment throughout its entire service life, from the manufacturing stage to the moment it enters operation. The portfolio of services includes the worldwide certification of products, personnel and manufacturing companies. As a Notified Body, TÜV Rheinland also offers conformity assessments of pressure equipment in accordance with the Pressure Equipment Directive 97/23/EC. Furthermore, services related to materials and welding technology are also offered.

The largest individual investment of TÜV Rheinland in 2010 was the acquisition of Geris Engenharia e Servicos in Sao Paulo, Brazil. Geris offers technical services, particularly for the oil and gas industry, electricity producers and suppliers as well as for infrastructure projects, residential construction and logistics. The company was founded in 1993 and has more than 600 employees. It underwent strong growth and achieved annual revenues of around €30 million in 2010. South America, and especially Brazil, is one of the economic regions of the world that is developing at an extremely dynamic rate for us. In the coming years, Brazil will implement numerous large-scale infrastructure projects. The development is being accelerated by the World Cup in 2014 and the Olympic Games in 2016, both of which will take place in Brazil.

In addition to the traditional industrial testing business, demand is also growing for energy generation and energy usage services right up to the testing of Clean Development Mechanism climate protection programmes for implementation of the Kyoto protocol. TÜV Rheinland also performs quality assurance and project support functions in the planning and construction of conventional power stations as with solar and wind power stations and biogas systems. There is also a rise in demand for programmes for testing clean power supplies. TÜV Rheinland checks whether clean power supplies really do come from renewable energy, and it does so independently.

In order to increase energy efficiency, TÜV Rheinland customers are increasingly using the wide range of expertise offered by TÜV Rheinland in measuring and testing technical systems, structural engineering as well as the testing of management systems. There is considerable potential here to save energy and costs. Ventilation, heating and air conditioning technology as well as the energy-based renovation of buildings are of significance here. One example: using up-to-date technology, the operating costs of a lift system can be lowered by 10% to 20%. This also includes the analysis and improvement of energy consumption in companies at TÜV Rheinland. The services designed to promote the energy-efficient optimisation of computer centres and IT infrastructure are very successful. By measuring and optimising the energy efficiency of computer centres and offices, considerable saving potential of between 20% and 40% can be realised. IBM, SAP, Vodafone, REWE, Fiduca IT and RheinEnergie are some of the leading companies that work with TÜV Rheinland in this area.

The certification of energy management systems in the company is also a new service. In December 2010, TÜV Rheinland was recognised by the German Accreditation Office for the testing and certification of management systems in accordance with DIN EN 16001. The “Certified energy management” test mark makes TÜV Rheinland a pioneer in its field.

For the first time, TÜV Rheinland published defect statistics in Germany for lift systems, for which the more than 125,000 tests performed on lifts in 2009 were evaluated. More than half of the lifts have defects. While most of these are minor faults which initially do not impair user safety, the experts discovered serious

defects in 9% of the systems, and such defects must be removed promptly. Otherwise, the systems can prove dangerous for people.

One of the areas of competence of the Industrial Services Business Stream is civil engineering. This covers the support of major infrastructure projects in the building of pipelines, railways and roads. Our specialists, for example, perform tests on road conditions and in the process inspect well over 50,000 kilometres of road each year. Special measuring vehicles are employed in the inspections that measure the entire lane during a journey by for example laser measuring technology with accuracy to the nearest millimetre. All types of roads and motorways, foot and cycle paths and also the runways of airports are assessed. With the inspection and production of independent reports about bridges and tunnels, our experts ensure the upkeep and safety of the transport infrastructure. Furthermore, the specialists of TÜV Rheinland ensure the quality of construction work in the creation of private homes as well as for large public and commercial projects. Further areas of activity are formed by the inspection of building materials and building products, structural analysis as well as listed buildings and testing of electrical installations and service installations in buildings.

Products

TÜV Rheinland's Products Business Stream tests the quality, usability, ergonomics and safety of products and also certifies products as a condition for manufacturers, importers or trading companies being able to sell their products on certain markets. In 2010, this Business Stream generated revenues of €350 million, corresponding to 25% of TÜV Rheinland's revenues.

The Products Business Stream covers the testing of all articles for everyday use - whether these are consumer electronics, glass, furniture, textiles, toys, leisure articles or foodstuffs. In addition it performs e.g. tests related to environmental and hazardous substance analyses, mechanical testing, checks for electromagnetic compatibility as well as testing of electronic and electrical products, machines, medical products and the testing of solar modules, batteries and fuel cells.

Independent product tests are in ever greater demand as a service. Different global trends are contributing to this. The globalisation of goods and product flows is continuing its march forward and product cycles will shorten. Added to this is the ongoing development in former newly industrialised countries as well as the

growing and new demands of consumers worldwide. In all this, independent product tests play a fundamental role for uniformly high quality, safety and sustainability.

A TÜV Rheinland test seal can make a major contribution to market success. The experts test, assess and certify the safety and quality of products in nearly all categories from tools through to the state-of-the-art information technology and industrial machinery. If required, they can provide support for the entire product life cycle – from the concept through development, production and deployment to disposal or recycling – taking into account various aspects such as sustainability, freedom from hazardous substances or economic efficiency. Due to the TÜV Rheinland Group's extensive accreditations, once the product has been successfully tested, one-stop testing provides manufacturers, importers and trading companies with approval not just for a single market, but for all relevant target markets.

For the purposes of testing production plants and products, TÜV Rheinland maintains an international network of test laboratories as well as Global Technology Assessment Centres with sites in Budapest, Cologne, Nuremberg, Shanghai, Silicon Valley and Yokohama. In 2010, TÜV Rheinland opened a further ultra-modern test centre for products in the Thai capital of Bangkok. This centre belongs to the GTAC network. TÜV Rheinland invested around €3.6 million to build and equip the laboratory centre. The centre is used to test numerous products for export in accordance with international quality and safety standards. The product groups tested include electric household appliances and products as well as toys, vehicle components, furniture, textiles, shoes and office equipment. There are around 100 people working in the laboratory, which is 2,500 square metres in size.

In Germany, TÜV Rheinland has ten laboratories for product testing; the EMC laboratory in Nuremberg for testing the electromagnetic compatibility of products was expanded. Further test laboratories are located in the Netherlands, the USA, France, Italy, Australia and Brazil. Some 25 locations in China and a total of 40 laboratories in Asia, which specialise in product testing, already form part of this closely meshed network. At present, 2,500 people are employed by TÜV Rheinland in China and Taiwan alone. There are large laboratories for testing products at Shanghai, Shenzhen, Hong Kong, Qingdao, Ningbo, Wuxi and Guangzhou. Trading companies make use of TÜV Rheinland's international capacities in order

to optimise flow of goods in terms of product quality and safety, and in order to ensure the quality of production in countries where products are manufactured as well. An example of this is the REWE Group, which has non-food articles monitored by TÜV Rheinland under a customised test programme.

Photovoltaics is and remains a special market for TÜV Rheinland: the global competence team for the solar industry is now made up of some 200 experts. Around 80% of all manufacturers of solar modules worldwide have their products tested in TÜV Rheinland laboratories in order to obtain international market licences. The specialists from TÜV Rheinland inspect the safety, quality and performance of the modules. They develop new test methods, work on R&D projects for the use of solar energy, and support customers worldwide with the construction of solar power plants. There are test centres in China, Germany, Japan, Taiwan and the USA.

An Indian test laboratory was opened in 2010. TÜV Rheinland invested €2 million in the new solar test centre in Bangalore. This centre will offer services for the growing Indian solar industry, in particular. The test centre has 2,000 square metres of space, including an outside test field of 500 square metres, with equipment such as five climate chambers and two sun simulators. This makes it the most up to date and largest laboratory in the entire South Asian economic area. With the increasing investments in major photovoltaic plants and solar thermal power stations, demand from investors, banks and insurance companies for neutral advice and additional protection also increases. In supervising power station projects, TÜV Rheinland provides investment security by minimising risks and meeting the requirements for the necessary bankability.

TÜV Rheinland is also active in the testing of foodstuffs all over the world. There are laboratories in Germany, Argentina, China, Taiwan, Luxembourg and Vietnam. In Jülich, near Cologne, the specialists have specialised in the traceability of foodstuffs and virtually all organic products. This is made possible thanks to isotope analysis. This procedure is in demand not only in the foodstuffs retail industry but also in inspecting wood from sustainable forestry, for example.

Quality and safety with regard to products are being redefined by companies and consumers alike: issues relating to sustainable manufacture – environmental friendliness and social responsibility – are increasing in significance. One of many

examples is TÜV Rheinland's work for REWE with Pro Planet. The Pro Planet label indicates own-brand products from REWE, which are also particularly sustainable. Life cycle assessments of products, and of companies themselves as well, are going in similar directions. TÜV Rheinland is offering the voluntary assessment and certification of product and company carbon footprints according to the internationally recognised standard ISO 14064. The aim of testing is to accurately establish the total direct and indirect emissions of a product or company and thus to make the impact of the company's activities on the climate transparent and readily understandable. This is relevant in order to make systematic product and process improvements, thereby optimising cost structures.

Mobility

Guaranteeing personal mobility, also as an economic factor into the future, while at the same time improving safety for people and goods and reducing the environmental impact: these goals stand at the forefront of the work of the Mobility Business Stream of TÜV Rheinland. The Business Stream is responsible for Vehicle Inspection as well as Guided Transport Systems, Driver's License Testing, Car Services and Appraisal, Type Approval of Vehicles and Vehicle Components, Aviation, Transport Telematics and Logistics. In 2010, the Business Stream generated revenues of €311 million, representing 23% of total revenues.

The mobile and stationary vehicle inspection business with emissions and general inspections is a core area of competence of TÜV Rheinland with around 4 million inspections carried out across the world each year. In Germany, TÜV Rheinland performs around 2 million tests each year at 130 service stations, with the stationary inspection business being operated from TÜV Rheinland's own service facilities in Berlin, Brandenburg, North Rhine-Westphalia, Rhineland-Palatinate and Saarland. Since February 2011, TÜV Rheinland has had a presence in Bavaria, with three car test centres in Nuremberg with a workforce of 40. The car experts check all types of vehicles in the modern test centres of all three branches.

Services relating to car mobility for car dealerships, damage investigations and fleet management are growing strongly. In late 2010, TÜV awarded the Bluefleet certificate to one of Europe's largest company fleets, namely the fleet of Deutsche Telekom with over 33,000 passenger cars and service vehicles licensed in Germany. This means that the fleet is certified as "CO₂ checked". Bluefleet combines economy with ecology, thereby facilitating the environmentally-conscious use of company cars, resulting in lower fuel consumption and hence, lower operating costs.

This business in guided transport systems was expanded in 2010 with the take-over of Rail Science in the USA. This highly-specialised engineering company is active for customers in the rail industry throughout the world, but its focus is on the USA. The 30 or so experts run, among other things, a laboratory for materials engineering and testing and for metallurgical analysis in Nebraska.

The company's commitment to the aviation sector is also based in the Mobility Business Stream. In summer 2010, TÜV Rheinland concluded a major project with Lufthansa for keeping small children safe in aeroplanes. The technical issue at stake here was how child car seats with the attachment to three-point belts can be used with the lap belts which are a standard feature in aircraft. Which child seats are suitable for which airlines can be seen online at TÜV Rheinland. In Cologne, and Helmond, the Netherlands, TÜV Rheinland also checks the safety of equipment in aircraft interiors on a large scale. The TÜV Rheinland test laboratory has become the first provider worldwide to receive accreditation from aircraft manufacturer Airbus for dynamic and static acceptance tests of seat modules in accordance with AS 8049-B.

In Helmond (in the Netherlands), TÜV Rheinland operates TNO Automotive International (TTAI), which at present is the most up to date crash test centre for vehicles anywhere in Europe. The centrepiece of the test site is a 160-metre test track on which commercial vehicles up to 22 tons weight can be crashed under test conditions.

Safety tests and dynamic crash tests also play a major role in TÜV Rheinland's commitment to electromobility. In early 2011, TÜV Rheinland successfully tested the first electric car for Euro NCAP with the Mitsubishi i-MiEV. The aim of the commitment to E-mobility is to ensure that electromobility is just as safe as conventional forms of mobility currently in use. However, services for electromobility are not restricted to cars but also include the testing of hybrid bicycles, electrical bicycles and special vehicles, such as those for disabled people.

TÜV Rheinland offers electromobility services for producing energy, developing vehicles, infrastructure and charging systems, for storing energy in batteries and for the safe usage of electric cars, taking into account all aspects right through to

secure billing systems. The 50-strong core team for electromobility at TÜV Rheinland comprises a correspondingly broad range of specialists from Germany, China, Japan, the Netherlands and the USA. The team includes specialists for system safety, vehicle tests and homologation, training and staff qualifications as well as for cell and battery testing and IT security.

The work focuses on testing batteries. Cells and batteries are tested by TÜV Rheinland in the Chinese city of Shenzhen, and the Japanese city of Yokohama. In Yokohama, TÜV Rheinland created test stands for testing vehicle batteries in 2010 at a price of almost €700,000. A further test laboratory will follow in Nuremberg in 2011. TÜV Rheinland is also a partner in the European Union's Easybat research programme on the safe use of vehicle batteries. The aim of Easybat is to develop standardised automobile components and interfaces which are to allow the automobile industry to integrate the technology for changing batteries into their electric car platforms with ease.

Training and Consulting

In 2010, the Training and Consulting Business Stream generated revenues of €160 million (share in total revenues: 12%). This Business Stream supports customers – whether companies or private individuals – for example, with seminars for experts and managers or with further training services in state-of-the-art careers. Other Business Fields are Employment Market Services, Private Schools, Research and Development Management, Business Consulting and Publishing and Media.

Professional qualification and in-service training are extremely popular in Germany. The TÜV Rheinland Academy turned 40 in 2010. TÜV Rheinland is the third-largest private training provider in Germany and trains around 80,000 specialist and management staff each year with its seminars, courses, training programmes, workshops and e-learning courses. In addition, the Business Stream provides qualifications for short-time workers, job seekers and operates nine private vocational colleges for training young people. A new technical college was opened in 2009 in Düsseldorf. New services are constantly being developed in the area of personnel qualification. For example, since 2008, supervisory board members of medium-sized companies can be certified by TÜV Rheinland after a comprehensive training course. The objective is to improve the professional standards of board members of medium-sized companies. This initiative by TÜV Rheinland is

supported by among others Allianz Global Corporate & Specialty, A.T. Kearney, Deutsche Bank, Euler Hermes and PriceWaterhouseCoopers.

Traditionally the qualification of professional drivers has formed part of the range of services of TÜV Rheinland. In 2010, TÜV Rheinland invested in a new training and driving safety centre in Oranienburg. The training centre for cars, trucks and motorbikes is used for the advance qualification of professional drivers.

The entry of TÜV Rheinland into the primary training sector represents an extension of the field of activities. In Leipzig, TÜV Rheinland has opened a college, where pupils can obtain a secondary or school leaving certificate. TÜV Rheinland operates an elementary school in Görlitz. The TÜV Rheinland Campus in Cologne offers tertiary-level qualifications with the in-service course leading to a Bachelor of Engineering qualification. The state-recognised course was launched in cooperation with the Südwestfalen Technical College in 2008 with a focus on engineering. This was supplemented in 2009 by the addition of an electronic engineering course. In addition students can now qualify as Masters of Science in Applied IT Security.

TÜV Rheinland offers a comprehensive range of services for companies and public bodies in consulting. These include project management and coordination of national and federal state activities in developing a digital radio network for the police and emergency management services in Germany. TÜV Rheinland also compiled a broadband atlas on behalf of the German government. The atlas is part of the German government's broadband strategy and has been available to all interested parties at www.breitbandatlas.de since October 2010. Based on interactive maps, the atlas shows which technologies and bandwidths for data transfer are available locally in individual municipalities. In this way, the new online portal supports the development and usage of broadband Internet access technologies. The broadband atlas is aimed at private households and businesspeople as well as decision-makers in management and politics and the industrial companies involved.

Systems

The Systems Business Stream comprises the following Business Fields: Auditing and Certification of Management Systems, IT and Communication Systems Security as well as the TUVdotCOM internet service. In 2010, the Business Stream generated revenues of €123 million, representing 9% of total revenues.

The task of employees in the Systems Business Stream is to independently test management systems or IT processes, certain services or an entire company and in the case of positive results to confirm that the previously defined standards are consistently observed. Around 1,000 specially qualified auditors are employed for this purpose.

The specialists certify companies in accordance with cross-sector and sector-specific management systems or according to criteria tailored specially to customers and sectors. These include in particular quality management systems (e.g. ISO 9000) or environmental management systems (ISO 14000 and EMAS) of numerous companies, but also risk management systems, social standards, credit management, service quality, compliance management, energy management and the criteria of sustainable management.

In a globalised world, many industries are demanding a uniformly high standard in the safety and quality of processes for various markets. If a company has been successfully audited, customers all over the world can be more confident that the supplier, manufacturer or provider observes accepted standards. This creates confidence and transparency. Reliable management systems increase efficiency and reduce costs. In the process, “Second Party” audits, under which TÜV Rheinland tests suppliers on behalf of companies, are gaining importance.

As an independent test provider, TÜV Rheinland also creates more security in information systems and at present employs around 150 experts in the area of IT security. TÜV Rheinland has already inspected and certified 50 companies for data security and data protection on a voluntary basis. An independent organisational and technical inspection of the internal and external processes not only creates more security for the company itself but also for end users and customers.

With comprehensive advice, impartial analyses, tests, assessments and certifications in IT security and IT processes, TÜV Rheinland provides comprehensive support to its customers in quality assurance. The specialists concentrate on security risks as well as quality gaps and support companies in the set up and management of process- and service-orientated IT architectures.

Life Care

The Life Care Business Stream generated revenues of €55 million in 2010. This corresponds to a 4% share in total revenues. It provides a wide range of services relating to occupational medicine, occupational health and safety, health management, medical technology, healthcare and wellness.

TÜV Rheinland is one of the leading providers of occupational and health protection in Germany with 66 locations throughout Germany. Occupational medicine and comprehensive operational health management help employers and employees work in a safe and health-conscious manner. This is gaining in importance due to demographic change and ongoing shortage of skilled labour. A longer working life has a direct impact on people's health and productivity. This is where the expertise of the 140 occupational health specialist doctors and company doctors employed by TÜV Rheinland across Germany comes into its own. The occupational health management, ergonomics at the workplace or reintegration management after sickness are all key functions.

Occupational health management leads to increased employee satisfaction and motivation and prevents productivity losses, maintains the productivity of employees and at the same time raises employee loyalty. Modern health management relies on optimised prevention instead of rehabilitation. Health management must serve to prevent cardiovascular diseases, that is trying to influence known risk factors such as hypertension, overweight, stress, fat metabolism disorders or smoking. Other aspects are prevention of muscular and skeletal disorders and early intervention with psychiatric illness.

As at May 2011