

compact

2/2008

The company magazine of ThyssenKrupp Steel

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Energy: more expensive than ever before

ThyssenKrupp Steel
provides ideas and products
for saving energy



ICAMS
New materials
research center



IAA Commercial Vehicles
New underride guard
for trucks

Thinking the future of steel

ThyssenKrupp Steel



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About our cover picture:

The energy market is in unprecedented motion: demand is rising worldwide and driving the price spiral to undreamt-of heights. The fact is, however, that affordable energy is of enormous importance to our future – and jobs and prosperity depend on it.

ThyssenKrupp Steel is taking exemplary action where energy is concerned. For example by self-sufficiently generating the power supply at its headquarters in Duisburg, developing electrical steel capable of converting and distributing energy without any losses worth mentioning, and coming up with further innovative products towards creating an optimal basis for the energy mix of the future derived from natural sources such as sun, wind and water. You will find more information on this topic in the cover story commencing on page 10.

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Dear Reader,

Around one third of the steels produced in Germany come from the iron and steel mills on the banks of the rivers Rhine and Ruhr – with quality playing a decisive role. Whether ThyssenKrupp Steel can maintain its position in the global market with excellent carbon flat steel products very much depends on the capability to innovate. And that is a very good reason behind the calling into being of a globally unique materials research center, namely the Interdisciplinary Centre for Advanced Materials Simulation – ICAMS for short – at Ruhr University in Bochum. This new facility is set to play a decisive role towards ensuring an innovative edge over our competitors.

ThyssenKrupp is supporting ICAMS as lead member in an industrial consortium which accounts for around half of the start-up financing volume of 24 million euros and includes internationally high-profile companies from the materials sector in the Rhine and Ruhr regions, the Max Planck Institute for Iron Research in Düsseldorf, and RWTH Aachen University. Within the framework of this public-private partnership the federal state of North Rhine-Westphalia is providing the other half of the financing for the start-up phase.

For us as a steel producer, the opening of ICAMS is a groundbreaking event. Computer-assisted simulation procedures are in actual fact already in use in a number of technology areas, but are still in their infancy where applications in the development of new materials are concerned. Up to now it has not been possible to make adequately accurate forecasts in terms of essential technological characteristics and properties such as firmness, toughness or corrosion resistance, and these have to be determined instead in long, outlay-intensive series of experiments and tests. ICAMS will now help us to penetrate these areas which have been closed to us till now, and we shall be comprehensively modeling materials at the computer and carrying out reliable simulations of their characteristics and properties. We shall thus be able to develop technologically superior materials and

bring them to market faster than before, while using less resources in the process and being enabled to meet customer requirements on a custom-tailored and precise basis.

A further benefit lies in the area of education: a total of three scientific professorships have been set up at ICAMS, and the scientists working there provide tutoring as university professors for a new generation of materials engineers who, right from the outset, will be growing up with a broad “multiscaled” view of the world. They will be as well acquainted with the principles of quantum mechanics as with the forming characteristics of steel sheet bars in the deep-drawing presses of automobile manufacturers. We’re building a lot of hopes on these specialists. As know-how carriers in terms of highly innovative simulation engineering they will ensure that the success of the work at ICAMS and the participating companies will be of a sustained nature.

Besides ICAMS, a further materials research institute in the Ruhr region is the DOC Dortmunder OberflächenCentrum, a facility we set up in 2000 for the development of steel surfaces and which now enjoys an international repu-



“ICAMS will play a decisive role in ensuring an innovative edge for ThyssenKrupp Steel in the future as well.”

tation. At the same time, the region boasts three universities, various Fraunhofer institutes and the Max Planck Institute for Iron Research, in which know-how in the fields of materials and applications is being developed on an ongoing basis. All this provides a first-class basis for a sustainable position at the head of the international field.

You can see this for yourself in this issue, and also look forward to a number of other stimulating articles on interesting topics concerning our company ThyssenKrupp Steel. For example the cover story gives you a detailed insight into our efficient energy management activities as well as a look at modern products for energy production and the saving of energy, and there is also a report on new investments in China. And now may I wish you enjoyable reading.

Yours,

Dr. Karl-Ulrich Köhler

Member of the Executive Board of ThyssenKrupp AG and Chief Executive Officer, ThyssenKrupp Steel AG

Christa Thoben, Economics Minister
for North Rhine-Westphalia

“ThyssenKrupp is an ambassador for our state”

Ms Thoben, you were born in the Ruhr region; what memories do you have of the economy in those days?

Already as children we saw that everything revolved around coal and steel in our part of Germany. I still have very vivid memories of the effects on the environment: when returning from our holidays on the North Sea coast there was already a dark cloud to be seen on the horizon before we'd even reached Münster, and we knew that the Ruhr region then lay before us. But that's long been a thing of the past.

The blue skies over the Ruhr were made possible by a structural transformation, which was also not without pain for the companies based there and their employees. This is why many connect structural change with complaining. After all, the “old” coal and steel industry – but also the textile and furniture industries – provided livelihoods for a large number of people over a period of decades. We have now taken what is a historical decision to back out of subsidized coal production by 2018, though we are taking our time because we aim to shape the adaptation process on a socially acceptable basis. This effectively means: the whingeing has to come

Personal profile

Christa Thoben has been Minister of Economic Affairs and Energy for the federal state of North Rhine-Westphalia since June 2005. A graduate in political economics, she spent the period 1966-1978 with the RWI economic research institute in Essen as scientific expert, after which she joined the Chamber of Industry and Commerce (IHK) in Münster as managing director. She represented the CDU (Christian Democratic Union) party in the state parliament of North Rhine-Westphalia from 1980 till 1990, becoming deputy parliamentary party leader. She then returned to Münster as general manager of the IHK until 1994, after which she entered the world of federal politics as state secretary of the Federal Ministry of Regional Planning, Building and Urban Development. This was followed by various activities in Berlin and North Rhine-Westphalia until taking over at the helm of the Ministry for Economic Affairs and Energy in the state government headed by Premier Jürgen Rüttgers.



to an end. Processes of change are the order of the day in industry and commerce and society.

What is the distinguishing characteristic of the economic transformation?

This transformation is greater than we have known up to now: A modern structural transformation involves putting state-of-the-art industrial plant such as Blast Furnace 8 in Duisburg-Bruckhausen into operation, based on the knowledge gained from traditional steel production and, with all the product innovation and technology that lies behind it, thereby positioning the region among the most competitive locations worldwide. The Ruhr region is thus becoming "normal" as a result, and can adapt itself to the requirements of a future-oriented economic system.

Is this the development that you are now looking to make for with the "Creative Economy" as credo and location concept for North Rhine-Westphalia?

Yes and no. On the one hand the state-of-the-art production processes and products constitute essential parts of the concept, but these alone are not sufficient. We are increasingly progressing from pure functionality to forward looking products and product design, style, user-friendliness, attractive architecture and workplace design. And this is where the term creativity comes into play with an increasingly important role. This is not twaddle: on the contrary, the companies are in this context developing new solutions based on their traditional competences and then presenting them to the customers.

Creativity was long regarded at the intra-company level as little more than a suggestion scheme. Today, it means putting the question at each and every workplace as to "what can we additionally do with what we can already do?" Even machine builders have in the meantime arrived at the conclusion that products are sold no longer on the basis of competence alone but also due to user friendliness and design – in other words emotionally, as is the case with cars and fashion.

You have identified the 3 T – namely talents, technology and tolerance – as constituting a key precondition for the Creative Economy. However, especially where talents are concerned, Germany seems to have a lot of catching up to do ...

The economic upswing has shown that we are looking for people with enthusiasm for technology. The lack of people going into the engineering trades and professions underlines the probability that we are not getting enthusiastic about technology early enough. The ThyssenKrupp Group's initiative for already addressing children and juveniles on these matters at an early stage via the Ideas Park concept is excellent. Equally important is that we have depicted the abilities that we need for arriving at innovative solutions in an excessively sober manner, and above all women have been left out in the cold, so to speak. However, the demographic change that we are experiencing demands that it is precisely they who we need to enthuse for technology and engineering and later give them the chance to combine career and family. A "Girl's Day" as offered by ThyssenKrupp as well is something that should be organized and offered by more companies – and above all more frequently. We politicians can only help in this context with targeted communication, promotion, support and encouragement.

North Rhine-Westphalia is a late starter in terms of building up its university landscape. For a long time it was said that universities were beds of unrest and rebellion, for which reason this landscape was left in a completely fallow state ...

It's not like that anymore. We have excellently positioned universities which, not least with support from trade and industry, are working on interesting projects and in the areas of fundamental and applied research. What is important in this respect is the knowledge transfer between trade and industry and the universities, with companies such as ThyssenKrupp providing support for scientific activities at universities by setting up professorial chairs or making research funds available.

You seek the partnership of business enterprises in the university sector?

Yes indeed. Expanding our education and science policy in the interests of keeping our jobs and our standard of living is something that cannot be done by the state alone; this calls for transparent public-private partnerships, for example like ICAMS, in other words the Interdisciplinary Centre for Advanced Materials Simulations at Ruhr University in Bochum. In cooperation with the federal state of North Rhine-Westphalia, an industrial consortium headed by ThyssenKrupp is sponsoring the setting up and equipping of a centre for materials simulation, involving an amount of 24.1 million euros.

And what about the talents who come here to us?

It goes without saying that we need talented people from elsewhere. The results of recent research in the USA show that a society has to be open and culturally interesting in order to facilitate creativity. We are optimally positioned in this respect, given our cultural landscape with its multicultural nature which has been given special status by the fact that Essen will bear the title of European Capital of Culture in 2010.

What contribution can ThyssenKrupp make to the "Creative Economy" concept?

ThyssenKrupp is headed in the right direction, on the one hand attaching importance to the architecture and planning with color concepts, and, with locations such as Duisburg, Bochum and Dortmund, on the other hand being in a position to manufacture flat steel products of matchless quality and sell them in spite of enormous competitive pressure at the international level. In addition there is the knowledge transfer between company and universities and a high level of commitment in a diversity of spheres of society. ThyssenKrupp is very much like an ambassador for what we want to link to our state internationally.

The interview was conducted by Dr. Bettina Wieß, business journalist

Talent, technology and tolerance

What makes economy and businesses creative?

North Rhine-Westphalia is preparing itself for the future. According to the state government, the findings derived from the economic model known as "Creative Economy" are to be taken as basis of general orientation in terms of economic development. In addition to this, the annual economic report for 2008 states that "traditional value-adding structures between industry, services and science are breaking up and new forms of networking are coming into being. These processes are leading to differentiated, high-quality products and services that are successful in the markets".

Creativity as new engine of the transformation. The quintessence in this context is the promotion and encouragement of creative human capital via diversified and excellent research and educational facilities, an environment that is conducive to innovation, and attractive arts and cultural facilities.

Creativity not only in the areas of science, architecture, design – but also in industry? This is something of which ThyssenKrupp is firmly convinced: "A

modern industrial business enterprise today is a bit of everything: it involves itself in research, builds in a modern and design-oriented manner, produces sophisticated products and is a pioneer in the field of technology in which it is active", stresses Dr. Karl-Ulrich Köhler, ThyssenKrupp Executive Board member. "We see it as a matter of quality rather than quantity. Our employees constitute our biggest asset in this respect, since we would otherwise be unable to manufacture any competitive products in this high-wage industrial location that is Germany." After all, the high-tech products from ThyssenKrupp Steel not only reflect the state of the art in materials research but also the interplay of materials, design and production technology oriented to the needs and requirements of the company's customers. "We encourage and assist creative employees who network the results of our research with what our customers need today but will also continue to need in the future in order to make them more competitive", continues Köhler. And the company involves itself at the locations in which it is active. "Our participation in scientific

research facilities and our role as committed "corporate citizen" means that we are not only represented in economic terms in a number of regions."

Parent company ThyssenKrupp is building its new headquarters in the North Rhine-Westphalian city of Essen and regards the federal state as a matter of top priority. CEO Dr. Ekkehard Schulz is a member of the "Commission on the Future" called into being by state premier Jürgen Rüttgers and, under the leadership of Baron Prof. Dr. Ralf Dahrendorf, given the task of drawing up a report to be completed by spring 2009 under the title "North Rhine-Westphalia 2025 – Innovation, Employment, Quality of Life". Schulz: "Being an industrial group with close links to a region but at the same time internationally positioned is not a contradiction in terms. The requirements on the world of politics and the economy are changing rapidly, and only those who already think into the future today have any chance whatsoever of shaping it."

Dr. Bettina Wieß, business journalist



◀ ThyssenKrupp Steel CEO Dr. Karl-Ulrich Köhler stresses: "We see it as a matter of quality rather than quantity." Which is something the company substantiates with its products.



▶ Creativity in research leads to creativity in design: Dr. Ekkehard Schulz is on the North Rhine-Westphalia Committee on the Future.

ThyssenKrupp Steel and
Ruhr University Bochum

ICAMS – new institute for the world of material atoms

ThyssenKrupp Steel has already cooperated with Ruhr University Bochum (RUB) for years with the targeted advancement of the engineers of the future in mind. The ICAMS beacon project just realized represents a very special form of cooperation – namely a new research institute with three endowed professors. But this is not only a key topic in terms of steel.

Premieres like this are not an everyday occurrence. Early June saw the inauguration of ICAMS – with an opening speech by Prof. Dr. Ralf Drauz and a panel discussion in front of over 100 invited guests. Drauz is managing director of the new “Interdisciplinary Centre for Advanced Materials Simulations”, the task field of which covers the scope “from atom to material”, as Drauz put it in simple terms. Then it got more complicated. “We use high-performance computers to analyze and establish the finest structures of materials on the electronic length scale, then we draw conclusions as to the microstructure, enabling us to predict macroscopic behavior. By means of simulations at the atomistic level we aim to find out, for example, why steel ruptures in a partic-

ular place – and then we’ll react accordingly.”

ICAMS is RUB’s newest institute, and its activities are focused on a completely new direction in the area of research, namely the analysis of materials on all length scales, “starting out from numerical solution of the fundamental equations of quantum mechanics”, Drauz told us. ICAMS is thus a rarity, and not only ranks as an important “Think-Tank” for RUB, North Rhine-Westphalia and Germany, but also for material-related sciences worldwide. That leading materials companies are of this opinion as well is reflected in the considerable support they are giving ICAMS via the consortium they have formed, comprising Bayer Material Science, Bayer Techno-

logy Services, Salzgitter Mannesmann Forschung, Robert Bosch, and, not least, ThyssenKrupp Steel. The steel producer is the consortium’s lead member and is providing eight million of the consortium’s contribution of 12.1 million euros for the start-up financing, with the other 12 million euros of start-up capital coming from the North Rhine-Westphalian government. Dr. Karl-Ulrich Köhler, member of the Executive Board of ThyssenKrupp and CEO of ThyssenKrupp Steel, took part in the opening ceremony of ICAMS and referred to it as “a ground-breaking event. There’s nothing comparable in the whole of Europe. The work performed at ICAMS will lend wings to the entire materials industry on the Rhine and Ruhr.”

► The new ICAMS materials research centre is based at Ruhr University in Bochum, with its activities focused on the in-depth analysis of materials.



ICAMS
INTERDISCIPLINARY CENTRE FOR
ADVANCED MATERIALS SIMULATION





▲ Engineering science is one of RUB's four main faculties, the others being natural sciences, medicine and the arts.

Virtually all sectors of industry will benefit from the new institute, stressed North Rhine-Westphalia's Innovation Minister Prof. Dr. Andreas Pinkwart who was also present at the inauguration. "The materials producers in the chemical and ceramic industries, the steel and metal processing sector, as well as the sectors that actually put the materials to use – electrical engineering and machine and automobile manufacture right through to the construction industry." Köhler emphasized: "We as steel producers see the stimuli generated by ICAMS as particularly important for our industry. Our competitiveness at the international level depends to a very great extent on our capacity to innovate. ICAMS will be playing a key role in ensuring an innovative edge over our competitors at the global level in the future as well."

The activities at the new institute can be described as abstract high-bar gymnastics on new ground – cross-disciplinary in the fields of engineering, sciences and mathematics. The scientific intellect is bundled into three professorships which are held by Prof. Dr. Drautz, Prof. Dr. Alexander Hartmeier and Prof. Dr.

Ingo Steinbach. The trio of academics work together with scientific and non-scientific personnel and highly dimensioned computer capacities, both internally as well as externally. ICAMS will be educating engineers with its own masters degree course, in other words enabling key qualifications towards securing the availability of highly qualified young engineers in the future. This is the obligation to which the institute is bound under the terms of the framework agreement.

This agreement also specifies that the institute is to forge links between the areas of university and industrial research in the interests of developing innovative materials and optimizing ones that already exist. The researchers and developers think out in advance what they will subsequently simulate, derive parameters from this initial work and input them into the high-performance computers which then make any necessary adjustments. It is then up to the researchers to evaluate this simulation and develop innovative materials on the basis of the results in cooperation with the respective companies' development

Targeted canvassing and recruitment of talented young people

ThyssenKrupp has been cooperating officially with RUB since 2002 in the interests of fostering students and enthusing talented young people for the company, for example with awards for the best preliminary diplomas in mechanical engineering and economic sciences, with the innovation prize and the opportunity to do a practical traineeship and dissertations at ThyssenKrupp Steel. The company has been sponsoring the management game competition for economists since as far back as 2000, in which RUB students manage a virtual company for twelve months and the professionals from ThyssenKrupp provide assistance with practical tips. The winning team is rewarded with an excursion to Tongji University in Shanghai.

► With a good 32,000 students, RUB is among the ten biggest universities in Germany. It is also one of the country's leading universities in terms of research activities, and in 2007 reached the final round of the government-sponsored Excellence Initiative.

June saw the seventh "ThyssenKrupp meets University" meeting take place, with workshops, rounds of talks and lectures on the topic of the automobile, in addition to which human resources personnel provided assistance via job application training sessions. Via Bilstein, one of its subsidiaries, the

cooperation partner also sponsors RUB's Formula Student Team with technical know-how for its racing car. Surveys show that all these cooperation projects have in the meantime helped make ThyssenKrupp the most popular employer among the students in Bochum.



Echo

ICAMS researches into new materials

There's a new prestige institute at Ruhr University since Friday: Experts rate the ICAMS materials research center as "unique throughout Europe". ICAMS stands for "Interdisciplinary Centre for Advanced Materials Simulation", where scientists from various specialist realms develop and test new materials, for example high-strength light steel for the automobile industry, or other high-tech materials. "The center is of extraordinary importance in terms of expanding our in any case concentrated scientific competence in the sphere of materials.", said Prof. Elmar Weiler, Rector of Ruhr University Bochum (RUB) in emphasis of the research institute's orientation. The start-up costs of around 24 million euros are being borne by North Rhine-Westphalia and a consortium of industrial partners, with ThyssenKrupp at the forefront (...).

Ruhr Nachrichten Bochum, 7 June 2008

ICAMS officially opened at Ruhr University

ICAMS, the Interdisciplinary Centre for Advanced Materials Simulation, was officially opened today at the Ruhr University in Germany with an inauguration ceremony and podium discussion. "For us as a steel producer in North Rhine-Westphalia (NRW), the opening of this institute is a groundbreaking event," said Dr. Karl-Ulrich Köhler, Executive Board Chairman of ThyssenKrupp Steel AG and member of the Executive Board of ThyssenKrupp AG. ThyssenKrupp is the lead company in an industrial consortium (...) which is providing half of the 24 million euro start-up financing for ICAMS. The other half is being provided by the state of North Rhine-Westphalia. ICAMS will use multi-scale computer simulation to develop new materials – an approach which combines the previously separate worlds of natural science and engineering science.

Nano-techwire, 7 June 2008



▲ ICAMS' trio of academics (from l.): Prof. Dr. Alexander Hartmeier (chair of micromechanical and macroscopic simulation, researches the behavior of materials), Prof. Dr. Ralf Drautz (chair of atomistic modeling and simulation, researches interatomic potentials in order to be better able to predict the design and characteristics/properties of materials), and Prof. Dr. Ingo Steinbach (researches cross-scale thermodynamic and kinetic simulation).

departments – where ThyssenKrupp is concerned, this means with the Materials Competence Center.

The traditional approach stands in contrast: the microstructure of a material which fails in terms of function and/or performance is analyzed on a length scale of several micrometers for the purposes, for example, of determining exactly how hydrogen acts in steel and why the steel corrodes too rapidly at the end. These findings are contributive factors in the development of new, high-strength steels, but, according to Drautz, the fact is that this line of action costs a lot of time and other resources. The groundbreaking aspect of the new research path is that – on the basis of multi-scale modeling – it takes precisely the opposite direction, starting with basic research, gaining an understanding of behavior and enters the macroscopic area with higher scaling. The approach starts out from the established laws of nature and from the knowledge base that atoms enter into chemical bonds to which the materials' mechanical and plastic behavior can in all cases be ultimately ascribed. ICAMS delves into the microcosm of electronic and atomistic structures on an interdisciplinary basis and on the nano scale from 0.1 to 10 nm. "This is our unique characteristic; it makes effective multi-scale modeling possible in the first place", says Drautz.

All this activity is not undertaken in tedious, outlay-intensive experiments but rather within the framework of sophisticated material simulations on upscaled mainframe computers with bundled performance equivalent to that

of several thousand PCs. ThyssenKrupp Steel CEO Chef Köhler: "We are expecting to see optimizations in the functioning of alloy elements and in material design in the interests of making steels that are harder, stronger and lighter. By these means we aim to be able to minimize damage mechanisms more rapidly, especially as ICAMS can even perform computer-based simulation of individual interactions, for example those involved in hydrogen embrittlement. Intriguing possibilities indeed." Given the new, extensive and complex nature of such activities, the institute is cooperating with advanced study groups from Aachen, Jülich and Düsseldorf, as well as the universities of Oxford and Pennsylvania.

Newcomer ICAMS is financially secured for the coming five years, the perspectives for the future thereafter look rosy and the expectation are high. "The competitive edge enabled by ICAMS is obvious – for the region, for all materials manufacturers and for their customers." As RUB Rector Prof. Dr. Elmar Weiler stressed: "ICAMS is taking on a centrally important role for the future concept of the university." Minister Pinkwart expressed his opinion that "we need institutes like this if North Rhine-Westphalia is to become Germany's number-one state in terms of innovation by 2015."

Ulrike Wirtz, freelance journalist

www.ruhr-uni-bochum.com



Everything's flowing –
or maybe not

Will energy remain affordable in the future as well?

The energy market is more in motion than in a long time – a fact of which German motorists are especially aware at the moment, with diesel fuel costing more than petrol for the first time. Prices of between 1.5 and 1.6 euros per liter are the norm. A development that brings joy to no-one, but which might well have a good side as well. After all, it is making everyone aware of just how important affordable energy is for our future. Not only for the daily drive to work but also for prosperity and jobs.

The daily drive to work, shopping, taking the children to school, but also holidays and personal contacts – a life without the car is inconceivable for most people. It is not by chance that the price of petrol has become a sort of bread price of the industrial nations. Alone the current debate covering topics ranging from the commuting allowance right through to the impacts of bio fuels on global fuel prices reflects the role maintaining customary mobility plays among the general public. Much more than in a long time, people are again becoming aware that a secure, affordable energy supply doesn't necessarily have to remain a matter of course.



◀ Electricity must continue flowing in the future because a future without affordable energy is inconceivable.

Oil and other familiar sources of energy are not boundlessly available, and are becoming increasingly coveted in a dynamically growing global economy. Just one example in this context is China, which itself has enormous coal deposits but recently switched roles from coal exporter to importer. There can be no doubt, therefore, that the energy prices are going to continue their upward trend throughout the world. Industrial nations such as Germany without sufficient resources of their own have justified reason for concern – especially given the fact that individual sources such as native coal in every case constitute no more than a mere facet of possible problem-solving approaches. Electricity produced from lignite has a disproportionately negative impact on the environment, German's bituminous coal production needs subsidies – and neither of the two sorts enable the production of any economically viable fuels. Solar power and wind energy are not without their snags either. What, then, is the use of high investments if power is urgently needed but the wind doesn't happen to be blowing or there's not enough sunshine?

Almost fifty percent of Germany's electricity consumption is accounted for by the industrial sector alone. This in effect means that, for a large number of jobs in Germany, electricity is of almost greater crucial importance than oil or gas. "Had the electricity prices in 2006 been 30 percent lower, this would have meant 0.4 percent higher economic growth – and that in turn equates to 80,000 additional jobs", comments Jürgen R. Thumann of the Federation of German Industries (BDI).

Against this background, it might come as a surprise that there is hardly any public awareness to date of a study recently published by the prestigious German Energy Agency GmbH (Dena), according to which there will already be far too little electricity available in Germany in the foreseeable future. Managing Director Stefan Kohler: "We're saying clearly: We shall be facing a big problem by 2020 if no new, high-efficiency power stations on coal or natural gas base are built." Realistic estimates put the lack of power in such a situation as equating to the output of 15 large-scale power station blocks.

Possible savings through greater energy efficiency – as advocated and pressed for by Dena – will not be of adequate help either. However, whilst there is still quite a lot of potential in private households and parts of the economy, the fact is that in the industrial sector it is not possible to save more than 2.5 percent electricity through greater efficiency. The steel industry as example: "We at ThyssenKrupp make use of each and every opportunity to achieve highly efficient – which also means energy-saving – production, for instance we supply our own energy on a self-sufficient basis. The gases accumulating during production are utilized for generating electricity which we then use for manufacturing our products," says Dr. Gunnar Still who is responsible for environmental protection at ThyssenKrupp Steel.

However, it remains to be seen whether building new, conventional power stations will be enough to make for a secured power supply in the future. The climate debate is already clearly showing its limits, with high CO₂ pollution levels on the one side of the balance sheet and ambitious targets on the other. The question as to the use of nuclear energy will remain a topic of discussion, and the calls for keeping them in operation as part of the energy mix until genuine alternatives have been found are becoming louder, given that the clean coal power station and economically viable, competitive solar energy are no more than projections at present. Nuclear power supporters not only argue to the effect that this technology has been subject to ongoing further development over the past 50 years but, even almost more important than this, also that nuclear power stations do not generate any CO₂ and they reduce the risk of political dependency. Whether with more or reduced nuclear energy – it is imperative that electricity continues to flow in the future as well. It will not be possible to solve the tasks at hand without the realization that our country has no acceptable future without secured, affordable energy. Even where the building of new nuclear power stations is concerned, the level of acceptance is still low in many places. Maybe there are still far too many people who still think that electricity comes out of the socket – though no-one would ever assume that petrol originates in the petrol pump.

Wolfgang Kessler, freelance journalist

Efficient energy management 400 measures for a better ecological balance

The energy debate is exercising people in politics, in business and down the pub. ThyssenKrupp Steel sets a good example in the sector, for example at its Duisburg plant. It converts byproducts created during production into electricity and even looks at the tiniest detail for optimizing the overall energy inflow and outflow.

The magic number is 400. This is the number of measures that the departments of ThyssenKrupp Steel in Duisburg have jointly instigated to put their environmental responsibility into practice at the site. The package extends from using the latest energy-saving bulbs through to switching off standby functions on computers as well as working out the latest blast furnace technologies. "The latter of these approaches is aiming to achieve nitrogen-free blast furnaces, and ThyssenKrupp Steel is researching this together with other European steel producers. It's a completely innovative system and will take at least 15 years to come to fruition," emphasizes Dr. Michael Joksch, the head of Energy and Asset Management at ThyssenKrupp Steel in Duisburg.

But in the here and now, the challenge is to optimize the ecological balance by working in a way that is kind to the climate and natural resources. The company is helping to achieve this above all by producing the electricity and gas it needs at this traditional industrial base itself – from byproducts that cannot be avoided during steel production. One of the major power sources is from the gases created during production. Instead of burning them off in flares as in the past, they have long since been converted into sources of energy. The other source is from process vapors. Smelting steel produces enormous quantities of vapor from waste heat in the boilers. This is fed into a network inside the plant for heating the pickling baths of the coating lines, as well as providing power for the heating and air conditioning systems of the offices.

All this is made possible by producing steel in an integrated steel mill with a coating plant and two in-house power stations directly on the company premises. The integrated steel mill operated by ThyssenKrupp Steel in Duisburg is regarded as one of the largest and most modern of its kind in

the world, and also the most efficient in terms of energy use. For example, the in-house power plants generate a total of 750 megawatts. Joksch: "This gives us an optimum electricity balance in Duisburg." This is based on the combined system of the integrated plants in Beeckerwerth, Bruckhausen and Schwelgern, and demands an ingenious energy concept involving complicated process technologies, combined processes and energy conversion steps.

At the same time, the ingenious cycle is only operated using the quantities of coke and coal that are required in any case for iron and steel production: As raw materials for the coating plant, the sintering lines and, above all, the blast furnaces. "The cycle means that we only have to buy 8% of our gas requirement from external energy suppliers," says Jürgen Hoffman, the person responsible for energy supply in the steel company. "In the integrated group in Duisburg, we use the cupola gases to generate pretty much exactly the same amount of electricity on average every year that we actually consume."

The task of the energy manager is to ensure continuity and optimization for generation and consumption – across the board. "Investments in energy efficiency are intended to





▲ A labyrinth of pipes and tubes distributes the vapors from waste heat arising from steel production. This heats not only the pickling baths of the coating lines, but also the offices.

promote environmental friendliness, but they must also be economical,” says energy boss Michael Joksch. “We never stop looking for new ways of achieving this,” says Jürgen Hoffmann. The specialists think that there is attractive potential in reducing the use of natural gas even further. They are already implementing a new measure to achieve this, involving the heating-up processes in the strip galvanization lines. This involves increasing use of oxygen, in the form of the natural gas oxygen booster.

Therefore, the company is already working on a hot-dip galvanizing line at each of the plants in Finnentrop and Duisburg-Bruckhausen. At present, studies are being conducted as to which other systems would allow the process to be used. “This involves using electricity instead of gas for generating the oxygen,” explains Jürgen Hoffmann. “This permits savings of 40% compared to gas. However, we have to consider the electricity consumption. Optimization calculations are in progress.”

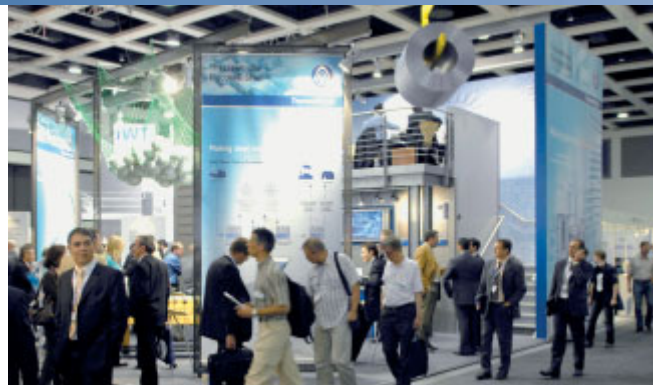
In addition, the efficiency of the company's own power plants is to be increased – without increasing the use of gas as fuel. Joksch: “This means using less fossil fuels in power stations for energy generation, involving a direct reduction in CO₂

emissions there.” Energy management is also looking at further processing. For example, primary material is increasingly being used in warm condition, for example in the casting rolling plant in Bruckhausen. This highly developed technology involves turning the liquid steel into rolled strip with minimum energy input, and has been practiced for years now. Consideration is now being given to other systems for reducing natural gas consumption and CO₂ emissions.

Another possibility might be opened by the new walking beam furnace at the hot strip mill in Bochum. Its heat losses generate steam that can be converted into cold water for cooling purposes using a steam jet refrigeration pump. Energy manager Joksch: “These are all known technologies. It is only necessary to adjust them to the technical requirements of the production processes in a steel mill, and for them to be economical.”

This is more than blue sky thinking, considering the situation of rising energy prices and sustained CO₂ issues. And the 400 measures show that energy efficiency means more than big price-tag schemes, because every little helps.

Ulrike Wirtz, freelance journalist



PowerCore® H electrical steel from ThyssenKrupp Electrical Steel: It features the lowest possible mains losses in conversion and distribution of energy.

Electrical steel – material of the future
PowerCore® H lets energy flow better – always

In mid-June, ThyssenKrupp Electrical Steel celebrated 50 years of grain-oriented electrical steel production in Gelsenkirchen. However, there was no time for sentimental reminiscences. Instead, the company is successfully moving into the future with its advanced PowerCore® H material.

“For us, responsible husbanding of electrical power takes absolute priority,” emphasizes Clemens Iller, the Managing Director of ThyssenKrupp Electrical Steel, thinking about the growing demand for energy worldwide. “Any loss during generation, conversion, transmission and distribution of energy, no matter how small, impacts on the bottom line, even as far as the environment is concerned. With our new PowerCore® H generation, we reduce this to an absolute minimum.” He lists the advantages: “Our grain-oriented electrical steel is of the highest possible quality. The arrangement of its crystals and its special magnetic properties mean the current flows in a certain direction. This is why it is as energy-saving as possible in operation. 100 percent of the energy that is input into a high-power transformer, for example, is converted at a rate of more than 99 percent – and that is what makes us so unique in the global market.” Also, the new electrical steel quality significantly reduces noise levels from the transformer, as well as offering its customers cost advantages. “Today, our product handles energy so efficiently that it is possible to build significantly smaller transformers with the same power.” And this saves more than just money – after all, a high-power transformer costs several million euros. The need for other material such as copper, oils and insulation materials is significantly lower. “That’s an important point,” explains Clemens Iller, thinking about ever-dwindling resources.

Electrical steel from ThyssenKrupp Electrical Steel has made huge progress over the past 50 years. In 1958, the Gelsenkirchen-based company started manufacturing the material under the name Orsi. The only material grade avail-

able at the time was Orsi 111-35, which is still in production and is situated at one end of the grade scale today. At the time, it replaced the hot-rolled dynamo strip grades that had been in use. Annual production was running at 1,600 metric tons. Today, it is not just the name of the product that has changed, the quality standard and production capacity have increased many times over since then. Expressed in figures: Voltage losses have been reduced by more than half, and the Gelsenkirchen plant today produces 120,000 tons of electrical steel every year. In addition, the Isbergues site in France provides a further 130,000 tons. “We are going to be developing our product in the future as well for our customers. The main objective in doing this is to continue optimizing the magnetic properties of our electrical steel,” says Executive Board member Heinz Pafferath. “To achieve this, we are investing in our facilities as well as in research and development.”

The customers for electrical steel had the chance to see for themselves the successful history of the company on the occasion of its 50th jubilee celebrated as part of the Coilwinding trade show in Berlin. One US customer, a pioneer in using highly permeable grain-oriented electrical steel of the PowerCore® H brand in the USA, was especially lucky. Taking part in a prize draw, it won the symbolic three millionth metric ton of the product which promptly rolled off the production line in Gelsenkirchen in time for the jubilee. Electrical steel is enjoying healthy demand from Europe, the USA, India and China, because the demand for electricity and energy is growing worldwide. “The next few years are looking very good,” observes Clemens Iller happily, although he is expecting capacity to increase, above all in Asia. “We’ll have to wait and see what effect this development will have on the market.”

Christiane Hoch-Baumann

www.tkes.com

► ThyssenKrupp Electrical Steel boss Clemens Iller (r.) and his colleague Heinz Pafferath are convinced of their product’s benefits: “We are going to continue developing and optimizing the quality of our electrical steel for our customers.”



A one-stop shop

Ametek: High-quality motors for every heart's desire

“Tutto completo” is the word at Ametek in Italy; the company develops and manufactures complete electro-mechanical motors to the very highest technical standards – with passion and to customers' specifications.

Ametek uses ThyssenKrupp Steel's non-grain oriented electrical steel – supplied by ThyssenKrupp Electrical Steel Italia – for the rotors and stators to ensure a long and reliable service life for their motors.

"We manufacture everything ourselves", explains Sergio Samanni, purchasing manager with Ametek Europe. "We don't outsource anything, so the high quality of the engines is guaranteed." His colleague Luciano Zarrantello who is responsible for the purchasing of input materials at Ametek Italia, nods in agreement. Ametek Europa and Ametek Italia belong to the Ametek Group, an American concern headquartered in Pennsylvania and which also manufactures electronic measurement instruments. "We have three production facilities here in Europe", continues Zarrantello, "here in Robecco sul Naviglio near Milan, in Ripalta Cremasca near Crema, and in Náchod in the Czech Republic." The American company acquired the already existing plants in Italy in 1990, and the Czech location seven years later.

The three plants each have their own focal spheres of activity, but together they only supply the European market: the activities in Robecco not only include pressing with the new machinery there but also the production of special motors for small domestic appliances. The colleagues at the plant near Crema are specialists for vacuum cleaner motors, and the entire development activities are also based in Italy. "And the colleagues at the Czech plant assemble all production lines," adds Samanni. A workforce of around 800 employees in all generates approximately 50,000 motors per day and annual sales of 100 million euros. "Zarrantello goes into enthusiastic detail: "That includes 3.5 million vacuum cleaner motors, 1.5 million hairdryer motors, 1.5 million motors for pressure washers, and a million lawn-mower motors." A diversity of documentary evidence can be found in the conference room, all completed according to individual customer requirements. They present the result almost modestly: "This makes us leaders in Europe."

This shows that the American way is possible in Italian as well. The Italians come over as down-to-earth, objective and goal-oriented. Not a trace of the stereotyped Latin way of going about things. The offices are functional, the plant's facilities tidy. "We concentrate on our competence", is their unanimous view. The secret lies in the fact that the

Italian plants were set up way back in the 1950s, so they had already made a name for themselves before being taken over. Knowledge transfer and autonomy where development is concerned are important factors. "25 colleagues in Italy design and modify the motors in line with our customers' specific needs and requirements", Samanni tells us. The customer portfolio includes Kärcher, Husqvarna, Metabo, Parlux, Hoover, Thomas and Stein. Big names, established brands. They have been registering continuous growth for years in the higher-value product sector. Zarrantello: "We consciously put the focus on quality".

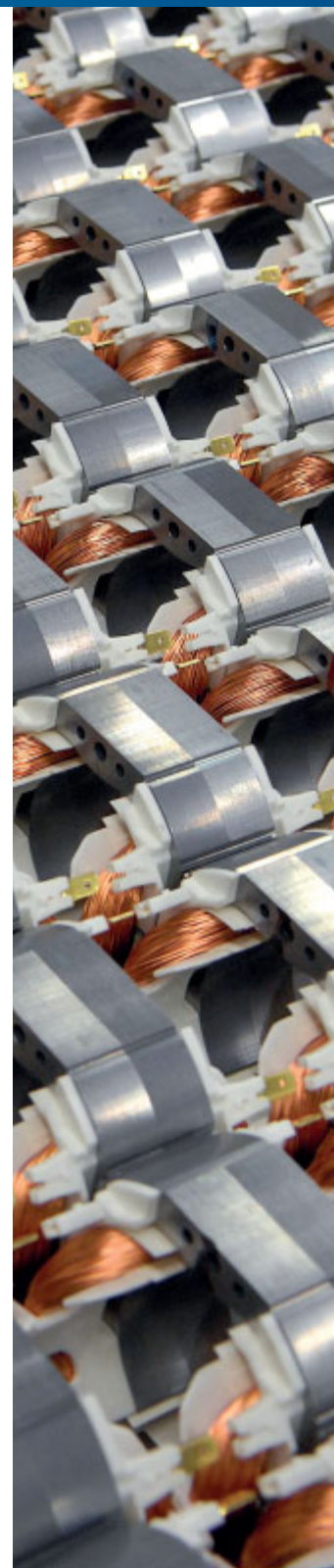
Irrespective of in which configuration, the stator and rotor – the non-moving and moving parts – form the core of a motor, and are manufactured from non-grain oriented electrical steel. ThyssenKrupp Electrical Steel Italia has been the exclusive supplier of this material since 1990 with an annual volume of 7,000 metric tons. "We have a high regard not only for the material's quality but above all for the intensive service and partner-like relationship as well", say Samanni and Zarrantello. The tone is equally positive on the other side as well: "What we have here is an excellent example of successful cooperation", stresses sales rep Paolo Bosotti and sales manager Antonio Galiero, both of ThyssenKrupp Electrical Steel Italia. Axel Duhr, customer consultant with and representative of ThyssenKrupp Steel, is likewise enthused about the trust placed by Ametek. Quality convinces. "We do everything to ensure excellent motors", says Samanni. "And the consumer determines the trend. It is precisely this that makes our work so exciting and challenging."

Daria Szygalski

www.ametek.it

► Whether in the office or production shop, they maintain a culture of open dialog: ThyssenKrupp Electrical Steel Italia sales rep Antonio Galiero (l.), Luciano Zarrantello und Mario Passoni of Ametek, and Axel Duhr, technical customer consultant with ThyssenKrupp Steel.

► The Italians work efficiently and effectively with their colleagues in the Czech Republic. A workforce of 800 employees in all makes for around 50,000 motors per day and annual sales of 100 million euros.



Energy mix of the future

Sun, wind and water – steel makes a lot possible

How do you see the future in terms of energy? Germany's government has an explicit answer to this question:

It aims to set a good example internationally where climate protection and a sustainable supply of power are concerned – and in doing so comply with the resolution adopted by the European Council in March 2007 on reducing greenhouse gas emissions in the European Union by at least 20 percent by 2020 as compared to 1990's levels.

According to the new brochure entitled "Renewable Energies" and published by Germany's ministry of the environment, two lines of action are being followed to this end: The aim on the one hand is to produce more heat, light, machine running time or transport performance per unit of energy by boosting energy efficiency and, on the other, to ensure that the renewable energies make a continuously increasing contribution to the country's power supply – with a targeted share of electricity generation of between 25 and 30 percent by 2020. Endeavors will be made to raise heat provision by 14 percent during the same period, and the supply of vehicles with bio fuels is going to be pressed ahead with as well.

▼ Unbroken, comprehensive power supply in accord with a clean environment: A good 280,000 visitors to the Ideas Park in Stuttgart – the world's largest technology experience exhibition – allowed themselves to be convinced by this perspective. And quite rightly so: ThyssenKrupp Steels is thinking the future of steel where energy is concerned as well, which is something the company impressively presented and enthused the young people already today for innovative technology.



Ambitious aims that, to a major extent, can only be achieved with steel. Steel's versatility makes it possible to use the natural energy resources of the sun, wind and water effectively. For example, there are plans for generating heat from facades in the future using steel. How? With SOLABS® from ThyssenKrupp Steel. Specially coated solar collectors are to clad entire facades of office buildings or hotels, for example, charging them up with a goodly portion of solar energy every day. Microscopic aluminum particles are distributed throughout the paint, causing every sunbeam to refract at their edges and resulting in significant heating of the steel covering. The heat is output directly to water-filled tubes underneath the steel which transport the energy. This allows the heating systems to be warmed up and process water to be heated. An initial prototype has already been built. The Dortmund Surface Center (DOC®) has been working with the paint industry to research solar-selective coating which it is planned to apply to flat steel strip in the future using continuous processes on what are referred to as coil coating lines. The strip is then used for the facade elements. "We are intending to launch low-cost solar thermal systems based on steel on the market, allowing architects as much freedom as possible," is how DOC® Managing Director Dr. Michael Steinhorst describes the objective.

Successful photovoltaic systems from ThyssenKrupp Solartec are already generating electricity from the sun. They are easily laid roof and facade modules on the basis of thin, galvanized and plastic-coated steel sheets with a bonded solar film. They can be fitted both to roofs and facades. Thanks to the highly sensitive silicon solar cells, it is possible to make use of the entire spectrum of sunlight. ThyssenKrupp Solartec also operates reliably even when the sky is cloudy. Furthermore, if the system is combined with thermally insulated steel construction elements with a polyurethane rigid foam core, this not only enables electricity to be generated from the sun, but also prevents too much heat energy from being lost from inside the building.

Steel can also be used for generating electricity from the air. One of the oldest energy sources used by human beings is currently once again in enormous demand: wind energy. Off-shore wind power systems will play a significant role in this in the future. The first offshore farms are already in operation, while onshore wind parks are also booming. For example, the German government is promoting energy generation in the country's coastal waters. With 23 offshore parks planned for the North Sea and Baltic Sea, the first of the systems have already been approved. Almost 1,500 wind turbines with a total capacity of about 7,000 megawatts (MW) will be entering service. In total, 5,400 turbines with a total capacity of more than 25,500 MW are planned. The "Borkum West" offshore test area, also known as "alpha ventus" is the pioneer. The first six newly developed power facilities in the five megawatt class are planned to link up with the grid shortly. They are mounted on three-legged structures, referred to as tripods, made from steel. The tripod is located under the water surface, the mast itself projects from the sea.

The power plant is planned to include 208 wind turbines with a total capacity of 1,040 MW. Around 210,000 metric tons of steel are being used for building the gondola, gearbox and tower. This is a market with a future particularly in view of the extremely ambitious objectives of the United Kingdom: By 2020, the UK is planning to supply electricity to all households from wind generations systems. This will require around 7,000 turbines with a capacity of 33 gigawatts – a blockbuster of a project.

Steel can also generate power from the force of water. No other material is better suited to withstand the ebb and flow in modern tidal power plants. Seagen, the tidal flow power station on the northern Irish coast, for example, has a capacity of 1 MW. This is sufficient for about 800 houses. Tidal flow power plants with 10 MW capacity are already on the drawing board. It is estimated that up to 20% of the UK's energy demand can be covered from these facilities. They use energy generated by oscillating columns of air that move with the swell of the waves. A prototype off the Scottish island of Islay has already been supplying electricity to 400 households since 2001. According to the World Energy Council, wave and tidal power stations could provide 40% of Scotland's electricity requirements by 2020.

Christiane Hoch-Baumann

▼ In the future, modern ThyssenKrupp SOLABS® solar collectors will be used for heating entire office buildings and hotels. They can also heat process water in an environmentally friendly way.



Solar energy pioneer from Switzerland

Heating entire houses with hot water storage tanks

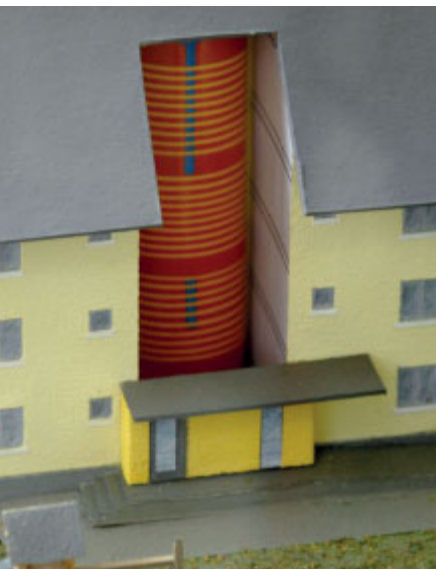
Josef Jenni, the CEO and creative head of the Swiss company, Jenni Energietechnik, was often laughed at because of his ideas. Now he's having the last laugh. The reason: His hot water storage tanks are booming.

"When I claimed it would be possible to heat a house with solar energy all year round, providing 100% of the necessary heat, no-one believed me," explains Josef Jenni. In 1976, he founded the company himself and has been working in the field of solar and environmentally friendly energy ever since completing his university degree. The company situated close to Berne mainly concentrates on solar thermal heating. His first product, and the biggest seller to date, is a hot water tank – called the Swiss Solar Tank.

The evidence is clear. Josef Jenni looks over the roofs of his company: "Over the year as a whole, we obtain 100% of our heat and electricity from the sun," he observes, pointing to a nearby house. It belongs to his brother, a joint manager of the company, and it also gets its electricity and heat for heating from the sun. "That's the sun house," he says proudly. It's his dream, built in 1989. For a long time, this idea was regarded as Utopian considering its location in central Switzerland where the weather is often foggy. "In winter, we had enough energy left over to heat a swimming pool." Another dream also took concrete form in November last year, in a nearby building. "The multiple dwelling unit gets 100% of its energy for heating and hot water from the solar tank."

Today, the company has about 60 employees. Every day, they produce up to ten small solar tanks (up to 5,000 liters) and one large tank (from 10,000 to 50,000 liters). Last year, the Swiss company built around 1,200 units, and taking its products and services together, achieved sales of 10 million Francs. In addition, there has been a shower of awards: For environmental protection, innovation and keeping the peace. The press, universities and other companies have been beating a path to their door – for training, lectures and tours of the establishment.

◀ Generous, inexpensive, environmentally friendly and self-sufficient with heat – these factors describe the first multiple dwelling unit to derive its entire thermal requirements for heating and hot water from the sun. Josef Jenni turned his dream into reality together with an architect. The secret: There is a 17 meter tall Swiss Solar Tank in the middle of the house, holding 205,000 liters of water. ▼



The secret of success is a plural: secrets – a mixture of creativity, persistence as well as reliable staff and suppliers. “I welded the first tank in 1982,” he says, “but it was flawed.” Three years and many optimizations later, the business finally got going with a national publicity campaign involving solar-powered vehicles. The current tanks are simple and ingenious at the same time. “The outer jacket is made from hot wide strip, except for the base,” he explains. In accordance with the AD 2000 code of practice, the hot wide strip is exclusively supplied by ThyssenKrupp Steel. Dr. Thomas Nießen, technical customer adviser from ThyssenKrupp Steel (IDS) is a qualified materials expert, and adds, “It’s important for the steel to have excellent even surface properties. That’s all the more difficult the wider and thinner the strip is.” Jenni nods: “It’s got to look good, be good to work with, safe and resistant to corrosion.” Cooperation with the Group has developed into a partnership since 1997, although the decisive factor was something quite different: “ThyssenKrupp Steel took me seriously.” Urs Steiger, ThyssenKrupp Materials Switzerland, is responsible for the sales of ThyssenKrupp Steel products in Switzerland, and understands him: “The solar market is growing.” Thomas Nießen and Urs Steiger emphasize: “Jenni Energietechnik is a visionary customer that makes high-tech products from our steel.”

This is how the solar tank is built: Coils are unwound by machines that Josef Jenni developed and built himself, then the strip is passed through straightening rollers, cut, rounded and welded. “Following this, we install the boiler and heat exchanger on the inside.” He defined the production method himself. “Then we attach the bases. Finally, the tank is provided with connection pipes.” It is then surface coated with red paint, and another Swiss Solar Tank is ready.

This is how it works: The solar collectors on the roof of the building can nowadays achieve temperatures of up to 250 degrees Celsius, and are connected to the tank using heat exchangers. The heat exchangers transmit energy to the water in the tank. The building can thus be heated or provided with hot water by separate water circuit systems. The trick: “The storage tank can be heated with oil, gas or wood-fired boilers if there is insufficient sunlight,” he explains. “In principle, electrical heating would also be possible.”

His ideas are not only contributing to a paradigm shift in energy policy – he is a committed politician – but also to palpable environmental protection. Nevertheless: “Global warming is underway, raw materials are running out and we won’t be able to plug our energy gap with nuclear power either. It’s time for a rethink.”

Daria Szygalski

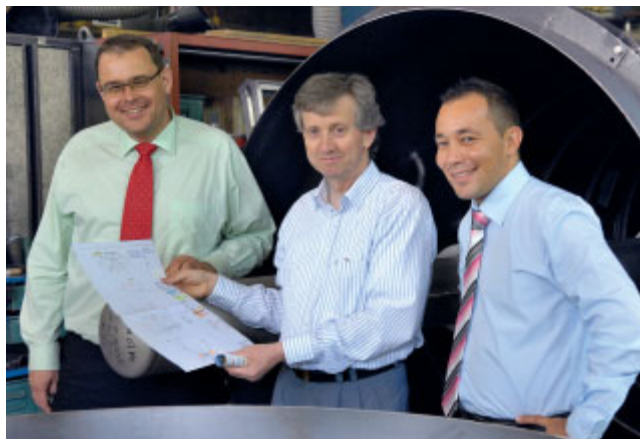
www.jenni.ch
www.thyssenkrupp-steel.de/industry
www.thyssen.ch

► To prevent the hot water tanks from rusting, they are painted red at the end of the production process. This paint has very good coverage and only one coat is required – leading to less environmental pollution.

▼ The interior of a Swiss Solar Tank is clearly structured and ingenious. The water heated by the solar collectors is used for heating the water in the tank via the heat exchangers, which means water is heated for the heating system and other applications.



▼ Josef Jenni (middle) is not only the CEO of the Swiss company Jenni Energietechnik, he is also the creative head of the company. His business and his inspiration is centered on heat from solar energy. Dr. Thomas Nießen, technical customer consultant at ThyssenKrupp Steel (left) and Urs Steiger, ThyssenKrupp Materials Switzerland and responsible for sales of products from ThyssenKrupp Steel, believe in Jenni’s idea and supply excellent hot wide strip for the tanks.



Eye-catching power station

Colored steel facades are all the rage

The Neurath brown coal power plant near Cologne and the Olkiluoto nuclear power station in Finland are only two of many: With their colorful facades made from steel, they make an optical statement while the modern envelope offers optimum noise protection and several other benefits besides.

“The times of heavy clinker linings and cement slab cladding are finally over, while expensive aluminum is also in decline in power station facades,” says architect Klaus Stange, describing the trend. Solutions with steel are used instead. Successfully: Almost 500,000 square meters of construction elements from ThyssenKrupp Bausysteme are currently being used in Neurath – the largest order the Siegerland-based company has received to date. The double-shelled steel sheet structure

▼ It will take three years to cover the entire facade of the brown coal power station using the colored steel sheets made from material provided by ThyssenKrupp Bausysteme. The whole effect should be able to be seen at Neurath near Cologne from the end of 2009 onwards.



is made in cooperation between the both companies G+H Fassadentechnik in Bochum and Züblin Stahlbau in Hosena, and offers plenty of advantages: “Filled with special mineral wool, it reduces noise in the power station and insulates it by almost 50 decibels (dB) in accordance with statutory regulations. To put it in context: A reduction of only 3 dB means the noise source is already halved. All that can be heard outside is a scarcely perceptible humming,” assures Klaus Stange. The facade elements can be coated in three blue metallic colors: basic-blue, medium-blue and sky-blue. “They blend into the landscape and make the 170 meter tall boilerhouse of the power station look relatively airy and light,” he emphasizes. The idea comes from the pen of Gerhard Feuser and his architectural bureau, fcg, in Munich. To prevent wind and weather leaving their mark over the years, individual elements are galvanized and provided with a special UV-resistant coating.

Getting the right coating is particularly important for the nuclear power station in Finland. ThyssenKrupp Bausysteme is supplying around 100,000 square meters of primary material to Züblin Stahlbau for the facade, which will be exposed to extreme climatic conditions in the far north. “To provide it with long-lasting protection, we have not only performed the usual galvanization against corrosion, but also added three layers of a UV-coating colored in a powerful red,” says Klaus Stange. In addition, the structure has even greater sound insulation than its counterpart in Neurath. Its peculiarity lies in a wider facade element: “As well as the standard cassette and trapezoidal plates, our customer Züblin Stahlbau in Finland has mounted a third thin metallic coating to protect against electromagnetic radiation.”

Klaus Stange sums it up: “We have another important argument on our side – environmental protection.” He explains, “Not only is steel always able to be recycled, the energy required for production is many times less than that used in the manufacture of aluminum, for example.”

Christiane Hoch-Baumann

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NewsFlash

Hot-dip aluminum coated strip for the automotive industry

After five months of construction time, the totally renovated and redesigned hot-dip coating line 3 at ThyssenKrupp Steel has recently returned to operation. Since restarting, not only can it be used for galvanizing hot and cold strip – as before – but it can also aluminum-coat these, which means providing them with an aluminum layer. The first hot-dip aluminum-coated strip has already been produced. The main customer is the automotive industry which uses the material for manufacturing high-quality safety components. In the future, around 100,000 metric tons will be produced in Fintentrop, and the trend is rising. The total capacity of the site remains at about 450,000 tons of processed steel strip every year.

Milestone in the Meilenwerk

ThyssenKrupp Steel set an unforgettable milestone early this year with its first Auto Day in the Meilenwerk exhibition center in Düsseldorf. In a high-class atmosphere around the exclusive automobile, experts from ThyssenKrupp Steel and ThyssenKrupp Technologies took part in detailed discussions with about 300 invited customers, talking about innovations in materials, surface coatings, tailored blanks and pressed part series production with metal forming as well as complete chassis systems. "We want to establish the Auto Day as an industry get-together," emphasized the responsible director, Dr. Henrik Adam from the Auto Division of ThyssenKrupp Steel. "We succeeded in having a first-class exchange of experiences in our opening event." Practical issues were not neglected either: On the second day of the event, the group relocated to Duisburg and Dortmund to see the research and development centers there.

www.thyssenkrupp-steel.de/auto/en

Supplier of the year I

Siemens Transformer Division has awarded ThyssenKrupp Electrical Steel with its "Supplier of the Year 2007" prize for the first time. The transformer manufacturer is one of the largest consumers of grain-oriented electrical steel from the Gelsenkirchen company, and at its supplier day the Managing Director Clemens Iller and Sales Director Georg Schneider, both of ThyssenKrupp Electrical Steel, accepted the award. "This prize is both a confirmation of our good delivery performance and also recognition for our workforce for the work they have done in all areas. The award shows us that our strategy over the past few years has been moving in the right direction," said Clemens Iller.

www.tkes.com

Supplier of the Year II

General Motors has nominated ThyssenKrupp Steel as Supplier of the Year 2007 in Jacksonville, Florida (USA). The company received the award for its contribution to product and service quality at the US car maker. General Motors has been giving awards to its suppliers since 1992. The winners are selected by an international team of experts from the areas of purchasing, design, production and logistics. ThyssenKrupp Steel supplies the US company with electrolytically galvanized and hot-dip coated thin strip as well as cold strip. Higher strength and modern molten-phase steels for lightweight automotive construction are also part

of the delivery range. The subsidiary, ThyssenKrupp Tailored Blanks, also supplies General Motors with laser-welded blanks made from steel.

www.thyssenkrupp-steel.de/auto/en

Computerworld Honors

ThyssenKrupp Steel and its "RFID slab identification" project was nominated at this year's Computerworld Honors Program at the start of June in Washington D.C. The innovative idea – using radio signals to scan slabs reliably for transport and distribution – won the acclaim of a blue-chip committee, the members of which included Bill Gates and Larry Ellison. The Computerworld Honors Program started life in 1988 as a charitable foundation set up by the International Data Group. Based on its own statements, it is the oldest of its kind in the world and gives awards for outstanding performance in creating and/or using progressive IT technologies. On average, something like 300 applications are received every year; even to be considered as a laureate is regarded as a signal honor.

Service center building in Krefeld

Normally, things start small – but not the ThyssenKrupp Steel Service Center. That's because the site in Krefeld where the new service center is going to be built by autumn 2009 has a total area of 150,000 square meters. It will have a capacity of around 600,000 metric tons of slit strip and blanks. The construction project in Krefeld is also taking great strides forward. The foundations have already been laid: Clearing the ground, removing the sand and stabilizing the soil with vibratory piles. Construction of the loop pits has just begun. The work of fitting out the halls is due to start by the end of the year.

www.thyssenkrupp-stahl-service-center.com/en

ThyssenKrupp DAVEX and Schüco

In Spring this year, ThyssenKrupp DAVEX, a subsidiary of ThyssenKrupp Steel, concluded a strategically important sales cooperation agreement for a product with Schüco International – a world market leader in solar, aluminum, steel and plastic systems for innovative building shells. The product concerned is the innovative VISS DAVEX® facade system – a further development of DAVEX® facade beams and the Schüco VISS attachment system. VISS DAVEX® lends facade construction a new, transparent face. The angular and delicate beams create an unusual aesthetic, flooded with light. The Bielefeld-based company has the exclusive sales rights for the steel facade market segment in Europe and Russia.

www.thyssenkrupp-davex.com

New face for Tailored Blanks

ThyssenKrupp Tailored Blanks has designed a totally new marketing and communication concept in cooperation with the in-house Marketing department and the Grey agency of Düsseldorf. The completely re-designed image is intended to be used in all foreign companies as well, and has been communicated inside and outside the company since August. The central feature is a new claim: "We tailor your success". This embodies the values that the blank manufacturer stands for: Innovative strengths and pioneering spirit, a reliable partner for the automotive industry and a team player for customers. Printed advertisements, information brochures, the website and image film are currently under revision. With its new face, Tailored Blanks is intending to draw attention to the range of its services and its magnificent position as a locomotive for progress in the automotive industry.

www.tailored-blanks.com

IAA Commercial Vehicles in Hanover

FUPS light – for even greater protection

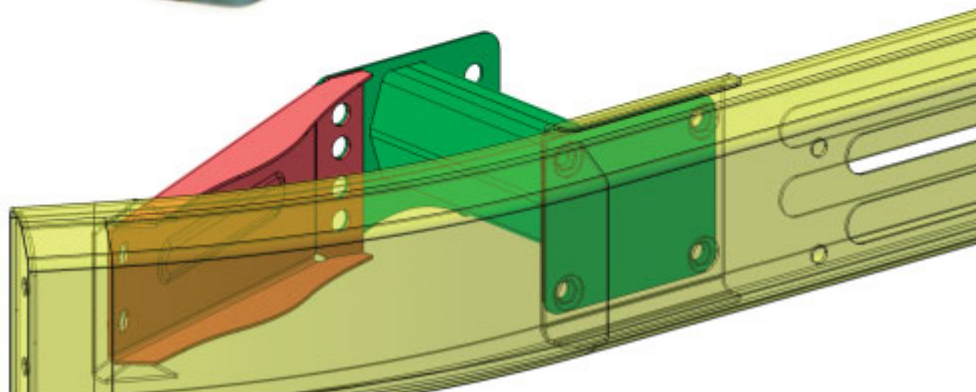
A special underride protection for trucks provides greater safety in road transport. This is also an objective of EU legislation. ThyssenKrupp Umformtechnik will be presenting an optimized solution at the IAA Commercial Vehicles – from 25 September to 2 October in Hanover.

Goods traffic on Europe's roads is on an enormous scale – not only the size of the volumes being moved, but also the severity of accidents. Again and again, it has been shown that frontal collisions involving trucks represent the greatest risk for occupants of cars. Therefore, the EU Commission initiated a series of research studies in 2003 looking into car-to-car collisions as well as car-to-truck collisions and at ways in which passive safety could be improved. The results led to stricter regulations from the EU – in terms of trucks, the EU standard ECE R 93.

This standard is intended to lead to an improved underride protection so that large trucks no longer ride over the top of small cars in a crash. ThyssenKrupp Umformtechnik has come up with an innovative feature that delivers precisely this effect as well as offering a range of other advantages, and will be presenting it at the IAA Commercial Vehicles at the end of September. "With this new component, trucks in all classes will be significantly safer, without weighing more," emphasizes Franz Helbrecht, the marketing boss of Umformtechnik in Bielefeld, a ThyssenKrupp Steel company. "This means the new solution does not reduce payload, so the same amount of paid freight can be loaded," continues Franz Helbrecht.

"FUPS" is the name of the EU-compliant safety system from the Bielefeld forming

▲ Every fold in the new crash box will absorb energy from a collision – protecting more vulnerable road users.



experts, the letters standing for Front Underride Protection System. "The special thing about our new FUPS is the crash boxes along the front bumper. These reduce the impact energy decisively," explains Stefan Ludewig, project engineer and in charge of the new development. This does not refer to the visible bumper made from plastic, but rather the invisible steel system behind it. Besides optimizing this, it was important that the product should not be heavier in spite of the boxes. "The bumper and boxes are made from high-tech steel from ThyssenKrupp Steel," says the FUPS developer Stefan Ludewig.

FUPS light is made of two crash boxes, two struts and a bumper. The boxes are made from dual phase steel DP-W[®] 600, the bumper from hardened HBL 27 from Hoesch Hohenlimburg, another company in the Steel segment. As well as this top grade steel, it takes the specialist skills of the Bielefeld engineers to form the high-strength steels into complicated component geometries. "We achieve light and safe crash components for sustainable mobility," declares Franz Helbrecht. The combination of safe and light makes the new frontal system efficient all round – also for the components supplier and its steel suppliers: Therefore, both make a significant contribution to passive safety of trucks. And they are upholding the commercial interests of truck manufacturers and their customers.

This is because conventionally designed systems are significantly heavier and increase the unladen weight correspondingly. As Stefan Ludewig says, "The bumper alone weighs 30 kg. Our

product made from HBL 27 is only 18 kg, however, while the entire system comprising the bumper, two crash boxes and two struts weighs only 28 kg." Therefore, transport vehicles of the future will achieve weight savings of 35 to 40 percent – with a positive effect on the payload. And every pound saved in weight delivers more pounds in money in the competitive transport business.

The boxes made from DP-W[®] 600 are ideal as energy absorbers, because the steel combines outstanding elongation values (A80: 24 percent) with a high ultimate yield strength (R_{p02} : 330-450 MPa). "This means an enormous amount of energy from the collision goes into deforming the boxes, and does not reach the car. The box absorbs the energy by concertinaing together, fold by fold," explains the developer Stefan Ludewig. This means the more folds, the greater the passive safety. "As a result, everything stays in position on the truck in spite of the impact. The bumper and struts made from ultra high-strength steel prevent the car being squashed under the truck. The folding of the crash boxes reduces the violence of the collision."

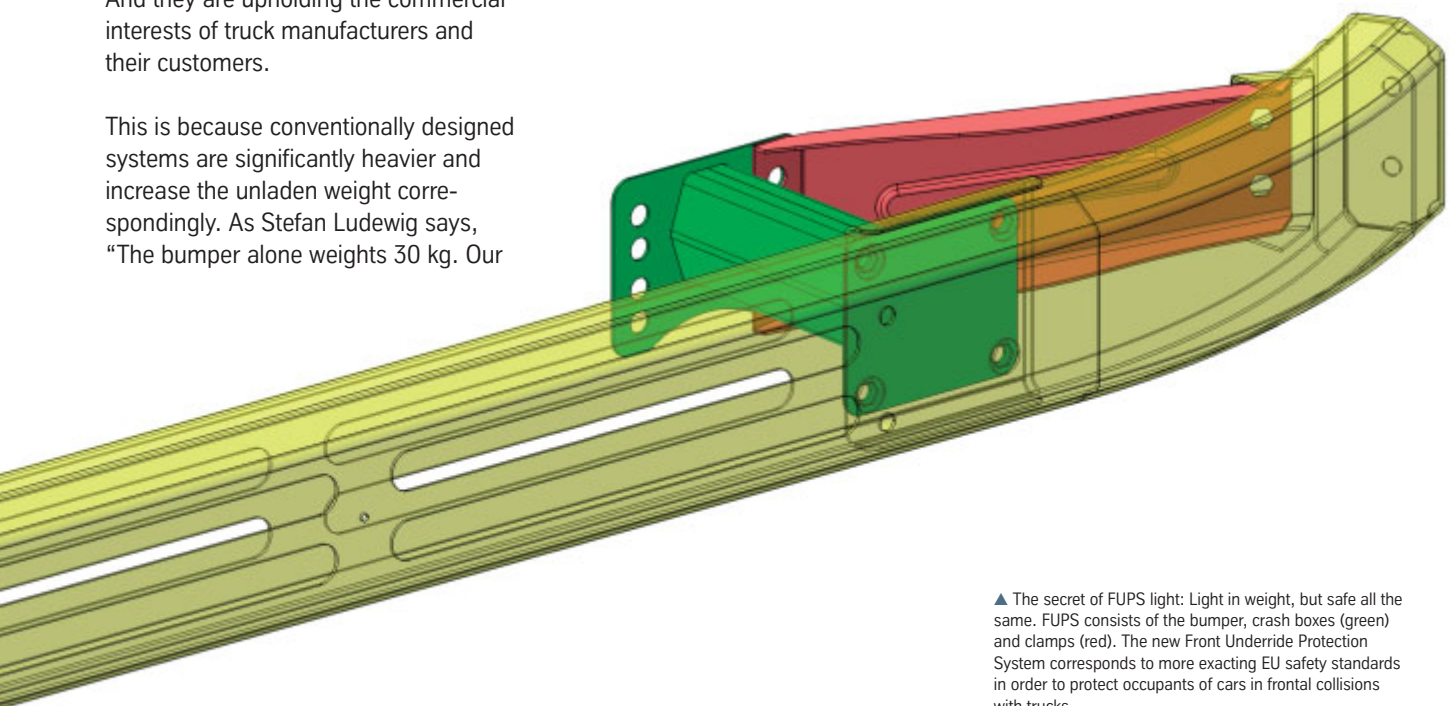
HBL 27 from Hoesch Hohenlimburg, the material used for the bumper, is a hot forming or tempering steel. In its delivery condition, it offers good forming

properties and achieves its high strength following the hardening process, with an ultimate yield strength of about R_{p02} : 1,250 MPa. The extreme strength in conjunction with an elongation of six percent means the wall thickness can be reduced to only 2.5 millimeters. Marketing boss Franz Helbrecht: "The good forming ability is also very important because various types and brands of truck have different installation spaces. We have to be able to adapt the new system to all of them without problems." The great level of flexibility makes this possible. ThyssenKrupp Umformtechnik has made optimum use of this potential with its forming expertise.

Currently, the new underride protection from Bielefeld is demonstrating its market readiness in a series of tests – on a test rig operated by DEKRA (the safety inspectorate company). The external safety experts are checking that FUPS light meets the requirements of EU standard ECE R 93. So far, the frontal system is living up to the promise already shown in internal tests. The first results and simulations indicate that the wall thickness and weight could be further reduced.

Ulrike Wirtz, freelance journalist

www.thyssenkrupp-umformtechnik.com



▲ The secret of FUPS light: Light in weight, but safe all the same. FUPS consists of the bumper, crash boxes (green) and clamps (red). The new Front Underride Protection System corresponds to more exacting EU safety standards in order to protect occupants of cars in frontal collisions with trucks.

Steel sandwich sheets for better noise protection

Automobile manufacturers are the target of new Bondal® variants



All good and new things come in threes: This also applies to the modern variants of the successful Bondal® composite material.

“Noise levels in cars are a decisive factor for pleasant driving without annoying noise,” observes Oliver Kleinschmidt from Sales/Engineering at ThyssenKrupp Steel. “With our new products Bondal® Car Body (CB), Bondal® Car Powertrain (CPT) and Bondal® Car Shims (CS), we have developed special variants of our solid-borne noise reducing composite material specifically for the requirements of automotive construction. This means we increase driving comfort even more.”

To understand how the composite material works, it is necessary to know what is responsible for solid-borne noise: The engine, gearbox, tires and chassis are responsible for vibrating above all the wide-area components of a car body, such as floor pans, roofs and engine partitions. “If the vibration is not combated using secondary damping

measures such as bitumen pads, this can quickly lead to an annoying droning noise inside the vehicle,” explains Oliver Kleinschmidt. However: Secondary damping measures are costly. Not only are they heavy and take up room inside the car, they also create expense due to the additional installation work involved, and often leave insoluble recycling problems behind them. “With Bondal®, we can solve these problems,” he says. “The material has a sandwich structure: A thin layer of viscoelastic plastic is sandwiched between two steel sheets, dampening vibration.” From a physics perspective, Bondal® therefore converts the vibration energy into heat, preventing the creation of solid-borne noise.

Based on this principle, the new Bondal® Car Body product is ideal for the low-frequency range from 50 to 200 Hertz in the body – specifically including

the front bulkhead, floor pan, wheel arch, roof, partition wall and spare wheel well. “Car Body also displays optimum properties at temperatures between 5 and 80 degrees Celsius,” says Oliver Kleinschmidt. “In the range between 500 and 1,000 Hertz and 40 to 110 degrees Celsius, the typical operating conditions of engines and gearboxes,” he continues, “Bondal® Car Powertrain provides excellent damping.” Both variants can be stove-enameled without difficulty, have good forming properties and are magnificently suited to spot welding. “Bondal® Car Shims has been specially developed for use as insulating sheet with disk brake pads – that explains the product name – and offers outstanding performance between -40 and 200 degrees Celsius at 500 to 1,000 Hertz.”

In contrast to the classic Bondal® products N, M and H that have proven their worth for years, the new variants have damping properties that are specifically adapted to the application conditions.

ThyssenKrupp Steel is aiming predominantly at the automotive industry with its three new Bondal® variants. The rightness of this approach is illustrated by the fact that the material supplier is already successfully supplying Bondal® bulkheads to the Mercedes A-Class.



However, it is not just the acoustic potential that has been optimized. "In addition, we have been able to improve the corrosion resistance of CB and CPT," he enumerates. The former product, incidentally, also has excellent crash properties. "We are also flexible as regards the selection of steel qualities for the covering sheets," continues Oliver Kleinschmidt. They are available in the following versions: Cold rolled, electrolytically galvanized, hot-dip galvanized, hot-dip aluminum coated, as strip-coated thin sheet and stainless steel.

The new variants are already attracting lively interest in the automotive industry. Oliver Kleinschmidt is certain: "Very soon now, many vehicles will be benefiting from the advantages of our composite material." His confidence is justified by success: The Mercedes A and B-Class have been fitted with Bondal®-dampened bulkheads for three years now. Ed.

www.thyssenkrupp-steel.de/auto/en

Steel Innovation Prize 2009

Wanted: New visionaries for steel ideas

If you are fascinated by steel, your attention is called for once again: For the eighth time, the German Steel Industry is giving the Steel Innovation Prize. The patron of this year's competition is Dr. Markus Miele, the CEO of Miele.

Right from now, anyone – whether engineer, architect, designer, inventor, artisan or technician – can enter the competition with innovative ideas for the material steel. The categories: "Products from steel", "Steel in research and development", "Components and systems from steel for construction" and "Steel design". The winners can look forward to prizes of up to 70,000 Euros. However, the most important – and non-monetary – award is the publicity given to the innovations.

Individuals, companies and development associations based in Germany are entitled to apply. The submitted projects must have been developed during the past five years. There is no entry fee. For further information and entrance forms, please contact the Steel Information Center, Postfach 10 48 42, D-40039 Düsseldorf. Entries must be submitted by 16 January 2009, the prizes are planned to be awarded in June 2009.

Ed.

www.stahl-info.de



ThyssenKrupp Stahl-Service-Center and EvoBus

Thinking outside the box for customized solutions

The cooperation between Mannheim's ThyssenKrupp Stahl-Service-Center and EvoBus characterizes a partnership which has grown over the years. The service center provides supply chain management solutions, supplies cut metal sheets and is the sole supplier for bus paneling to the leading bus manufacturer from Baden-Württemberg.

▼ A partnership which has grown over the years: Although initially the Steel Service Center only supplied hot-dip galvanized blanks for interior construction to EvoBus, it now also supplies small galvanized coils for the bus paneling on the roof and sides.



There is a great deal of lively discussion in Mannheim. A close partnership binds Frank Krüger, Supply Chain Manager of the ThyssenKrupp Stahl-Service-Center, Achim Peuster, Technical Customer Advisor from ThyssenKrupp Steel, and Günter Schuster of EvoBus Quality Assurance in Mannheim. “We do have a lively exchange,” comments Schuster. “In order to constantly make our buses safer and more environmentally friendly, it is essential that we come up with new developments of the materials used,” he adds. He sets high standards, especially for the bus paneling: “I need constant strength and the metal sheets must be flat and have a perfect surface.” In particular, the side walls of the buses represent a major challenge.

Achieving this is not at all easy. Peuster, who represents the iron and steel plant’s materials expertise, knows why: “These are contradictory characteristics.” However, Krüger adds: “We deliberately insist on these demanding challenges. Lots of companies can supply materials, but we only want the best quality for these buses.” This is why the three experts regularly sat round a table and discussed the matter until they came up with a suitable solution for the paneling. Employees from ThyssenKrupp Steel production and the ThyssenKrupp Stahl-Service-Center spent time at EvoBus specifically in order to gain an accurate idea of the requirements. Peuster says: “We gradually specified a production route at ThyssenKrupp Steel, which runs solely at one plant, namely hot-dip coating plant 3 in the Fintentrop plant.”

Although initially the ThyssenKrupp Stahl-Service-Center only supplied hot-dip galvanized blanks, hot and cold rolled strip were added to the portfolio of products supplied over time and these have been joined since 2006 by small hot-dip galvanized coils. At first, the material was used exclusively in the interior construction of invisible parts, but it is now used for the paneling on the roof and sides as well. Specialization has seen the number of grades used reduced from five to just two now in the case of hot-dip galvanized steel. All in all, ThyssenKrupp Steel supplies 4,500 metric tons to EvoBus each year and this volume is set to increase. “I’m

► (From left) Frank Krüger, Supply Chain Manager of the ThyssenKrupp Stahl-Service-Center, which is part of ThyssenKrupp Steel, Achim Peuster, Technical Customer Advisor from ThyssenKrupp Steel, and Günter Schuster of EvoBus Quality Assurance in Mannheim, know each other from years of intensive cooperation. Part of their success is an open and lively exchange of views, ideas and know-how. It was this which allowed them to develop a production route to ensure that the material complies with EvoBus’s high standards of quality.



delighted,” comments Schuster. “Not only can our input stock supplier and its service center see beyond the end of their proverbial noses, but they are able to respond to and answer our questions very quickly.” He is not just saying that, as EvoBus is highly critical when it comes to customer evaluation. EvoBus (the name is derived from evolution and bus) was established in 1995 with the merger of the Mercedes-Benz and Setra brands. Nowadays the company not only builds approximately 7,500 shells a year in Mannheim, from which city buses, coaches, long-distance coaches and double-decker buses are produced, but it is also a leading full-line supplier on the European bus and coach market and has a global presence.

An emergency situation prompted Schuster to contact the service center for the first time approximately six years ago: “I needed an expert in the vicinity of our Mannheim plant quickly, in order to slit coils.” He found one in Krüger approximately 13 miles away and therefore found himself, at the same time, enjoying the benefits which distinguish all ThyssenKrupp Stahl-Service-Centers. “Our group stands for many years of processing expertise, innovative steel technology in material and processing matters combined with a high degree of proximity to our customers,” explains Krüger.

Slit strips ranging from 0.4 to four millimeters thick and ten to 1,900 millimeters wide as well as blanks ranging from 0.5 to three millimeters thick and from 400 to 1,600 millimeters wide and six meters in length are processed in Mannheim. “The customer receives a customized solution from us – extending from material matters to intelligent logistics management.” Among the particularly distinguishing features of the Mannheim Service Center are not only the 300,000 metric tons of split strip and blanks each year, focusing on the automotive industry and its suppliers, but also the infrastructure. “We can reach our customers via water, rail or truck.” No matter what the distance, the service centers together with ThyssenKrupp Steel and the expertise of the iron and steel plant are always on hand to support their customers, with the binding elements often being customer advisors such as Peuster.

All three are keeping quiet about what the future holds. All they will say is: “We are working at full stretch on new technologies to use even fewer different grades and to save costs while increasing production.” And then discussions will be resumed on the “how” factor.

Daria Szygalski

www.evobus.de

www.thyssenkrupp-stahl-service-center.com/en

Chile – Mining country

Innovations made of intelligent special structural steel

The ThyssenKrupp Steel Heavy Plate Profit Center and its Chilean subsidiary, ThyssenKrupp Aceros y Servicios, have developed a new concept among other things for mining machinery. The so-called X-components® are produced from special structural steels.

“We are supporting the mining boom with innovative solutions,” says Emmanuel Lima of Heavy Plate Technical Marketing, with the central importance of mining, especially copper mining, for Chile and the rest of the world in mind. “The challenges we are facing in connection with this are wear resistance, mechanical properties and reduction of costs,” says his Chilean colleague, Juan Manuel Alvarado, Managing Director of ThyssenKrupp Aceros y Servicios, describing his extensive experience on the ground. This is exactly the right thing for X-components®. Alvarado explains: “These are intelligent and innovative solutions made from the wear-resistant and high-strength special structural steels XAR®, XABO® and N-A-XTRA®, such as, for example, individual components, parts subject to wear or entire components which are mainly used on large mining machines.”



◀ X-components® are intelligent and innovative solutions made of wear-resistant and high-strength special structural steels, such as individual components and entire components. They enable quick servicing of, for example, excavator buckets.

▼ Working in mines is a challenge: extreme climatic conditions are very demanding on both man and equipment. Mining machinery must operate reliably for long periods of time and be easy to repair.



The key to success – close cooperation, because mining is very demanding. “Mining machines are the largest machines on land,” says Lima. “They have to move vast amounts of rock and earth and withstand extreme climatic conditions.” Alvarado goes into detail: “The main challenges facing man and machine in Chile are found in the northern desert regions such as the Atacama Desert which is situated approximately 4,000 meters above sea level, namely cold nights, hot days and thin air, which not only makes breathing difficult, but also places particular demands on the operation of combustion engines. An additional challenge is the difficulty of accessing the mines, a problem which becomes particularly noticeable with the onset of winter.” The consequence is that mining machinery has to operate reliably for long periods of time and be easy to repair.

ThyssenKrupp Aceros y Servicios is therefore offering the open pit mining sector various repair kits in the form of complete replacement modules, thereby making it possible to carry out repairs quickly and efficiently and guaranteeing longer service lives. “During repairs to

excavator buckets and truck dump bodies welding has previously been carried out on numerous occasions on a patching basis, which necessitated a great deal of time, money and physical exertion and imposed additional weight on the equipment. Our repair kits have closed a gap on the market,” comments Lima. Alvarado and his team have developed, for example, the X-bucket®, an excavator bucket made of particularly wear-resistant XAR® steels for underground working. This means that greater quantities of ore can now be transported, combined with longer material service lives. “This increases the productivity of wheel loaders and reduces maintenance costs.”

Where innovations are concerned, Alvarado consciously and consistently relies on heavy plate from Germany. “ThyssenKrupp Steel provides top quality and has an extensive range of sizes, which gives us a great deal of freedom when we are designing new parts,” agree Lima and Alvarado. “As well as X-components®, you would search in vain for flame-cutting and underwater plasma cutting, four-roller bending machines as well as a metal cutting

center specializing in high-strength and wear-resistant heavy plate in South America.” In short: The Chilean company, which has its headquarters in the capital Santiago de Chile, is in an excellent position.

Even if the inspiration for X-components® arises from Chilean requirements, the products are not only suitable for use in South America. “The concept can be taken and used in various mining applications throughout the world,” says Alvarado. Innovation and quality are, in any case, well received on the market: “We are investing in two new locations: the focus will be on repairs and servicing in Antofagasta in Northern Chile; this is also the case in the Colombian coastal city of Barranquilla.” ThyssenKrupp Steel is involved: “We are supporting the growth from Germany.” Among other things, the delivery of materials will be adjusted to the increased production. “This is a special position,” says Alvarado, delightedly. He knows that special structural steels are very much in demand – and that this is the case all over the world.

Daria Szygalski

www.thyssenkrupp-steel.com/plate
www.thyssenkrupp.cl

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Juan Manuel Alvarado, ThyssenKrupp Aceros y Servicios, tel.: +56 24205510, e-mail: gerencia.tas@thyssenkrupp.cl

Key data on Chile

Capital:	Santiago de Chile
National language:	Spanish
Area:	756,950 square kilometers
Climate:	ranges from desert (North) to Mediterranean (Centre) to the moderate cold and damp zone (South)
Population:	16.6 million (2007)
Growth rate:	expected to be around five percent in 2008
GDP:	164 billion US dollars (2007)
Per capita income:	12,027 US dollars (2007)
Importance of copper:	90 percent share of mining, 40 percent share of exports
Currency:	Chilean peso
Type of state:	Republic and presidential democracy with two-chamber parliament
Head of state:	President of the Republic and head of government Michelle Bachelet has been in office since 2003

Chile declared its independence from Spain in 1810.



◀ Juan Manuel Alvarado has been at the helm of ThyssenKrupp Aceros y Servicios for ten years. The Service Center is expanding, not least because of its innovative X-components®.

Three questions for Juan Manuel Alvarado

“Convincing our customers through trust and quality”

Juan Manuel Alvarado is the managing director of ThyssenKrupp Aceros y Servicios. Colombian-born Alvarado, who graduated in business administration in Bogotá, took over at the helm of the ThyssenKrupp company in Chile a decade ago. Since then, he has focused on mining – with success: whereas previously 43 people were employed in the capital of Santiago, the company now has around 150 employees at four locations in Chile and two in Colombia.

You are continually expanding your presence in Chile and Colombia. Why?

The mining market is currently developing very well, because those countries which have a large demand for raw materials and which do not have enough of these are relentlessly pushing mining. This is not just the industrialized countries, but also Asia, particularly China and India. Their demand is allowing mining in the countries of Latin America as well to grow rapidly, because the latter are rich in primary materials.

We also want and are able to share in this boom by offering the established mining companies a completely new, flexible and cost-effective concept for

their machinery, for example with X-components®. By the way, as well as Chile and Colombia, we are also watching the mining industries in Brazil, Mexico and Peru. North America is also interesting.

What hopes do you have for your new X-components® concept?

The current claim of offering the customer greater productivity, so that, on the one hand, the customer conveys and transports ever greater quantities of raw materials but, on the other hand, spends less and less time and money on maintenance and repairs of mining machines, will become increasingly more important in the future. We have taken this into consideration in our sophisticated concept for X components®

and are thus already meeting tomorrow's requirements today. We are concentrating not only on the Chilean market, but also of course on the other countries in South America. However, marketing always takes a certain amount of time. You have to earn trust in the mining industry, where aggressive marketing and fashion trends are not the norm. That is why we rely unwaveringly on the high quality and efficiency of our innovations and benefit from the excellent reputation of our parent company, ThyssenKrupp Steel.

Germany and Chile are not exactly located close to one another. What is your assessment of the cooperation with the Heavy Plate Profit Center?

The cooperation with our German colleagues can be compared to a good marriage. We complement one another ideally. Therefore, geographical distance, language and culture do not constitute an obstacle to us. X-components® prove it: together we have developed a first-class concept and are successfully taking it into the future.

The interview was conducted by Daria Szygalski

www.thyssenkrupp.cl

Raw materials – a precious asset

“Supplies must be secured”

The technical progress of the industrialized nations and the associated social, economic and environmental changes in society have led to a continual increase in the global demand for energy and raw materials. This trend will continue in the future and is a basic prerequisite for life and a powerful economy. The deposits of mineral raw materials are distributed throughout the world and are still available in sufficient quantities. The countries of the European Union and, in particular, Germany are, however, poor in natural resources, which is why only approximately one-third of Germany's primary energy requirements are covered from local sources, with brown coal and hard coal still playing a central role.

The German supply contribution has, however, been declining for many years. The Federal Republic and Europe are

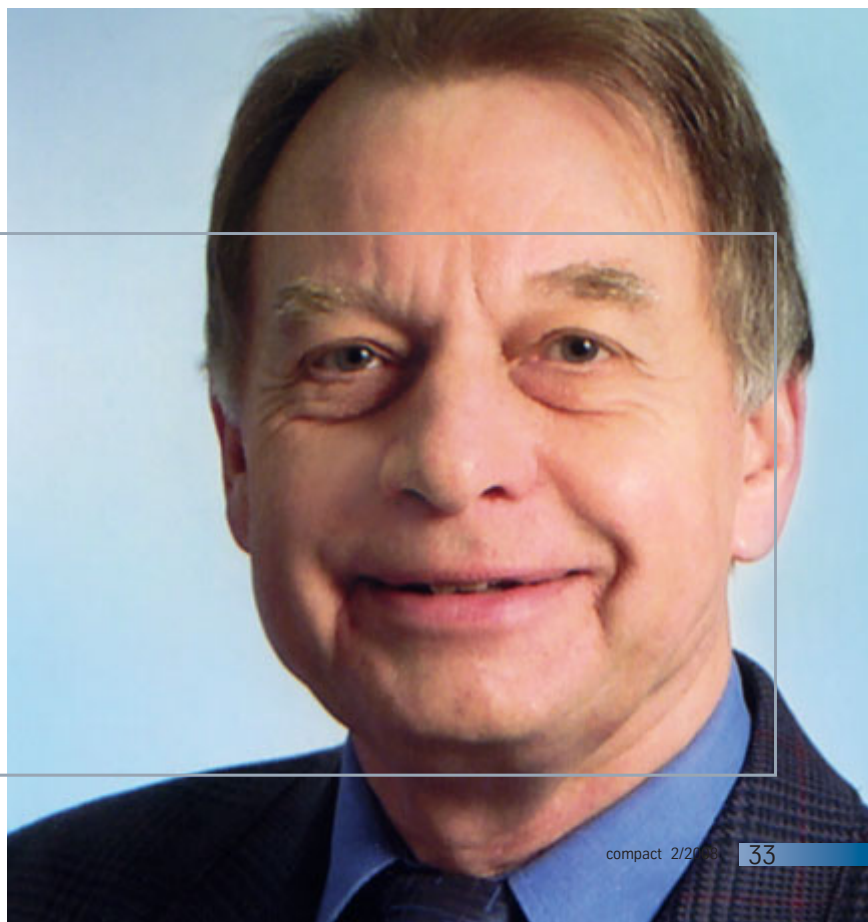
dependent on imports. However, our supply of raw materials will not be fundamentally adversely affected in the foreseeable future – apart from continually rising prices. These will increase the willingness to make new investments, carry out exploration and exploit previously unprofitable deposits. That applies both to operators in the respective mining country and to parties interested in foreign raw materials. The extractive industry's entrepreneurial activities extend to mining and interests abroad and to trade relations with supply contracts which are as long as possible. In addition, mining consultancy as well as supplies of mining machinery, including input stock, are nowadays very important for the global industry; no end is in sight here.

One hope for the future is marine mining. In the search for new sources of

raw materials to replace dwindling terrestrial deposit stocks, it is essential to investigate the marine area more closely, for example, for manganese nodules on the seabed. Processes need to be developed which make it possible to extract such stocks economically at sea depths of up to 6,000 meters – this is a task for experts in the realms of earth sciences, oceanography, biology, environmental research and engineering technology. The outlay and expenditure for marine mining is considerable. An additional consideration is the still largely uncertain effects on the ecosystems of the oceans. The possibility of international distribution disputes on using submarine deposits cannot be excluded either.

Personal information

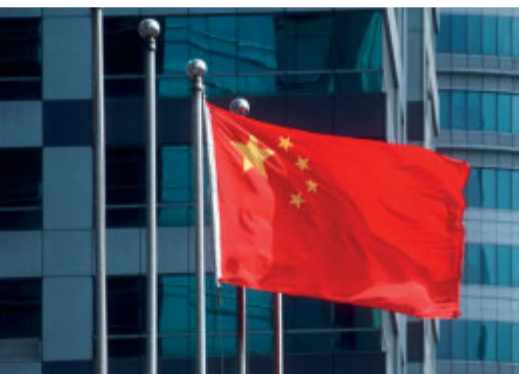
Karl-Heinz Kunert, mine surveying assessor – a mining-specific profession focusing among other things on deposits – dealt with energy and raw materials policy issues from 1973 to 1983 as the undersecretary in the Ministry of Economics of the federal state of North Rhine-Westphalia. After that – until 2001 – he was the Manager of the Department of Mining Surveying in the then North Rhine-Westphalia Mining Authority. He has gained practical experience of deposits from his work in the former Bong Range iron ore open pit in Liberia, West Africa, as well as from extensive travels around European and overseas mining operations. On a part-time basis he taught for over 30 years at the Technical College of Mining in Bochum and at the University of Clausthal.



China's economy continuing to grow

“Towards a win-win solution”

“China needs the world for its development, but the world also needs China for its prosperity,” so says His Excellency Ma Canrong, the ambassador for the People's Republic of China in Germany. In just a few years China has become an important emerging nation and a global player.



An increase in the gross domestic product of almost 12 percent in 2006 and 2007 – the highest figure for 13 years – and the high current account surplus and foreign exchange reserves amounting to more than 1.7 trillion US dollars clearly demonstrate just how important the country is to the world economy. According to the Institute of Economic Development, the country's contribution to global growth is around one-fifth. The Chinese economy is still on course for growth in 2008 as well. The Chinese Academy of Social Sciences (CASS) is expecting an increase in the gross domestic product of 10.7 percent. However, it remains questionable whether this will make China the third strongest economic power in the world, as some are speculating.

China's good economic shape is stimulating the entire Asian region. The International Monetary Fund (IMF) is expecting growth of 7.5 percent in this region this year, following growth of some 9 percent in 2007. A slight improvement is again being forecast for the coming year. During the most recent turmoil on the financial markets and the economic downturn, the demand from the emerging nations, especially Brazil, Russia, India and China, ensured that the downturn in growth in the USA and, in particular, in Europe was not as bad as would otherwise have been the case.

Nevertheless the question remains: Can Asia actually sustainably detach itself from an economic slowdown in the industrialized countries on the basis of its own momentum? The IMF views this possibility critically. Historically, a one percent decline in US growth has been reflected in a decrease of one-quarter to half a percentage point in Asia, but the financial and economic ties have become closer in recent years, so that there is now a growing correlation.

The same is true of the financial markets: they have already reacted with a downward correction, even though the Asian countries are only involved very slightly in structured financial products and are also only slightly affected, directly, by the subprime crisis: the stock markets have yielded significantly, the market for corporate loans has only

functioned in a very restricted fashion and IPOs have also become difficult.

The monetary and financial market turbulence resulting from the American real estate crisis also has other positive and negative repercussions for the Chinese economy. The importance of the USA as a sales market for Chinese exports has been falling for years. This is now being further reinforced by the weaker dollar. Currently, the country only purchases 17.5 percent of Chinese exports, which is gradually reducing the trade balance surplus with the USA. This is resulting in a more diversified export structure, as China's trade with other countries is expanding. Compared to the previous year, the first quarter of this year saw exports to Russia increase by almost 52 percent, to India by some 48 percent and to Germany by just under 24 percent. Overall, Chinese exports in the first quarter increased by more than 21 percent. The CASS is expecting an increase of 19 percent for the entire year for 2008. However, according to the most recent calculations, Germany's and China's race for the title of "world export champion" will probably be won again this time by the Federal Republic. The fact that Germany's exports in the first quarter of the current year increased by 21 percent to some 379 billion US dollars, compared to the previous period, means that it is no longer expected that the People's Republic will be able to catch up.

One of the main problems for Chinese economic and fiscal policy at the moment is the inflation rate. It was eight percent during the first quarter and has therefore almost tripled compared to the previous year. Further interest rate increases by the Central Bank and a stronger revaluation of the renminbi with respect to the US dollar are rather unlikely, because the government does not want to risk a greater economic collapse in the year of the Olympic Games. Nevertheless, it is the case for China and for all of the Asian countries that, as a result of the high inflation rates and increased food prices, the living conditions of people with low incomes are continuing to deteriorate. In the longer term Asia's problem will continue to be the large differences in income, both

within the individual countries and amongst themselves. For example, the annual per capita income in Singapore is approximately 33,000 US dollars, whereas in Bangladesh it is only approximately 2,000 US dollars. Almost 700 million people in Asia, 20 percent of the total population, still live in extreme poverty.

The Chinese government has recognized that the export success must be permanently supplemented by a great deal of investment in the infrastructure and environmental protection, and by supporting the domestic demand. As ambassador Ma Canrong comments: "China will convert to economic growth which is based on coordinated development of consumption, investment and export as well as agriculture, industry and service. Scientific and technical progress, better workers' qualifications and innovative management will also play an important role." The European countries are being relied upon as a model and as support for the great challenges along this path, such as saving energy and resources and protecting the environment, but also the economic and monetary integration of the Asian countries.

The Asia-Europe Meeting, ASEM, was launched in 1996 in order to institutionalize these subjects in a continuous process. In addition to annual meetings of ministers, the heads of government of Asian and European countries meet every two years, with this year's meeting scheduled for 24 and 25 October in Beijing. The coming together of the 27 states of the European Union and the EU Commission with the 16 ASEAN countries, representing more than half the world's population, is being heralded under the slogan "Vision and Action – Towards a Win-Win Solution". The title says it all – and this will certainly not end on 25 October.

Dr. Bettina Wieß, business journalist

An interview with Dr. Jürgen Hambrecht

“China represents opportunities for us”

Mr. Hambrecht, you know China very well. Do Germans understand the country?

The German people's knowledge of China has increased in recent years. However, many people here still perceive China as a threat, rather than seeing opportunities in cooperation. Also, we in Germany have scarcely any idea of the scale of the problems in China. The Chinese government has to provide work for 300 to 400 million people. It has to make sure that over one billion people have enough to eat, that the population is healthy and well educated. These are challenges that can hardly be compared with ours.

Is there not a risk that, in having so much understanding for the Chinese leadership, we might neglect the topics of democracy and human rights?

In Europe, it has taken us centuries to bring about democracy. We cannot expect China to make this transition overnight. We should respect what the Chinese have achieved in the past 20 years and the fact that they have opened up to the market economy. China is really trying to move in the right direction, step by step. And human rights are also being discussed in China. It is important to me that we do not talk about one another, but instead talk to one another, about this very issue. Incidentally, I think that the gradual changes in the behavior of the Chinese government are remarkable. There was much more open communication regarding the earthquake disaster than has ever been the case in the past.

What role do economic relations play in the relationship between Germany and China?

China is Germany's second most important trading partner outside Europe. German companies are successfully operating in China. The policy of the Chinese government to integrate the country more strongly into the international community and division of labor has changed a great deal for the better. Just take a look at the living conditions of many Chinese people yesterday and today. German companies are supporting this development through their investments and day-to-day work on the spot.

So change through trade?

We provide a good example to follow at our production sites, especially in the fields of labor protection, transparency, corporate social responsibility, environmental protection and social standards. The strategy “change through trade” is not a cure-all, but we are convinced that forces are germinating in an open China, which are promoting the emergence of a civil society. For instance, the Chinese government has now recognized the importance of environmental protection. The heavy impact on the environment is threatening to eat up growth profits. A Ministry of the Environment has therefore been set up for the first time, which is pursuing really progressive approaches to protecting the environment.

You worked for BASF in China yourself from 1995 to 1999. How did the country change during this time?

A great deal has already changed in China due to the presence of western companies alone. We at BASF want to set a good example and inform our neighbors, for instance, when we build new plants. This also rubs off, of

course, on Chinese companies. Take the example of industrial safety: when I arrived in China in the mid 1990s, you hardly saw any employees wearing safety goggles or a safety helmet. We, on the other hand, provided safety training courses for more than 100,000 workers during the construction of our plant in Nanjing. This gets about and increasingly changes awareness.

German companies are investing a great deal in China, but aren't today's joint venture partners tomorrow's competitors?

You're talking about globalization fears, which we have to take very seriously. German-Chinese economic relations are rich in success stories. German companies have now built up an inventory worth more than 11 billion euros in terms of industrial capacity in China. In addition, around one-third of the German industrial companies who are active abroad are planning to invest in China during the current year – in particular, to further tap the market there. Germany is benefiting from intensive economic relations with China and has every reason to be optimistic about the future.

The German economy has excellent technological know-how which will allow it to continue its success on the world market as well. We are global leaders in matters relating to resource and energy efficiency, in environmentally compatible production methods and environmental technology. These are precisely the strengths of the German economy as a partner in Asia. We therefore have to talk more about opportunities for both sides from working closely together.

Is Germany an attractive location for Asian companies?

But of course. As a country of ideas, Germany is an attractive partner for Asia and the ideal springboard to the European markets. Germany's advantages in innovative strength, the infrastructure and law and order cannot be ignored. We must therefore be open to investments from China.

How can politics and the economy bring even more investments to Germany?

We must encourage Asian companies even more strongly than before to invest here in Germany. Globalization is a two-way street. Anyone who only thinks about German exports for the growth markets in Asia is not thinking of the big picture. Companies from Asia are contributing to value creation in our country and creating jobs with investments in

Germany. Companies such as Toyota, Sony or Samsung have developed over the years into esteemed brands in Germany. Following the Japanese and Koreans, Chinese and Indian investments are now becoming important to us.

China is dominating the headlines. Is German industry sufficiently involved in other Asian countries as well, for instance in India?

The Asia-Pacific Committee (APA) was set up in 1993 under Chancellor Helmut Kohl in order to direct attention towards Asia following German unification. I believe that the APA was successful in discovering – or rediscovering – Asia as the growing, up-and-coming region. India is currently moving into the spotlight with growth rates which are almost as high as those of China. The question is all too frequently asked: "China or India?" These are not alternatives. For

us, given the size of both economies, it is a case of "China and India".

Relations with China concern more than just business contacts. What can Germany contribute to this?

There is a great deal of interest in Germany, as is demonstrated for instance by the success of the series of events "Germany and China – on the move together", in which Germany is presenting itself in numerous Chinese cities as a forward-looking and innovative country. In addition, there are major events such as the Olympic Games, but also smaller activities such as an increased youth exchange. These all contribute to the maintenance of German-Chinese relations. I am therefore very confident that Germany and China will continue to move forward together as partners and friends.

Ed.

www.corporate.basf.com

Personal profile

Dr. Jürgen Hambrecht has been Chairman of the Board of Executive Directors of BASF since 2003 and Chairman of the Asia Pacific Committee of German Business (APA) for two years. He studied at Eberhard-Karls University in Tübingen and obtained his doctorate in 1975. In 1976, he began his career at BASF in the plastics laboratory. From 1990 onwards he managed the Technical Plastics Division of BASF in Ludwigshafen. In 1995, he moved to Hong Kong and became manager of the East Asia area. Two years later, he was appointed a member of the Board of Executive Directors of BASF and was its first board member to be based in Asia. From November 2003 to November 2005 he held the post of Vice President of the Federation of German Industries (BDI).





▲ The priority at the TAGAL hot-dip coating plant in Dalian is the highest possible quality. With a capacity of 450,000 metric tons, it mainly serves the demanding automotive industry. A second, identical plant will shortly go into operation.

ThyssenKrupp Steel in China “Solid growth in a market of the future”

ThyssenKrupp Steel’s involvement in China reflects a solid and sustainable growth strategy in a market of the future,” stressed Dr. Karl-Ulrich Köhler, the company’s CEO, on the occasion of his most recent trip to China in early July.

China is a net exporter for flat steel in the lower quality segment and remains a net importer for higher-quality coated grades, and that will remain the case in the high-end sector in the medium term. "With our investments we are securing ourselves a place in the growth market of China in the high-value segment," continued Köhler. It is a strategic goal to pursue globally oriented key customers. "We are concentrating on the finishing, processing and service sectors."

Above all the automotive industry is a key customer for ThyssenKrupp Steel. The TAGAL hot-dip coating plant, which has been operated in Dalian in north China since December 2003 together with partner ANSC Angang New Steel Co., is serving this target group as well as the home appliances sector with a capacity of 450,000 metric tons. Sun Yu, General Manager of the joint venture, recalls the beginnings: "We wanted to see how such a renowned company as ThyssenKrupp Steel manages a steel location. We were also interested in a transfer of technology, which would of course also increase the value of our own products. We are satisfied with the result. We have now established ourselves on the market of the automotive industry instead of, as previously, offering our simpler products to the local construction sector."

Ralf Endres, Deputy Manager of the joint venture in Dalian, considers the project with the Chinese partner, which brings in the input material, a win-win situation: "80 percent of the production of our coated sheets goes to the automobile sector. We have now fully utilized our plant's capacity; we cannot increase it any further." In order to also guarantee a reliable supply base for an expansion into new customer markets, ThyssenKrupp Steel has decided, along with its partner Ansteel, to construct a second hot-dip coating plant at the same location. "The identical plant will double our capacity and we are certain that we will be able to accommodate these additional quantities in the market profitably," says Endres, describing the objective of the investment which is worth around 150 million US dollars.

ThyssenKrupp Steel is also represented in the further processing chain in China with its subsidiaries Tailored Blanks and Metal Forming. This year has seen ThyssenKrupp Zhong Ren starting further expansion work on its existing plant for pressed parts at the Wuhan site. ThyssenKrupp Tailored Blanks is simultaneously erecting its own production facilities for the manufacture of tailored blanks. Another site is already located in Changchun further north in China, where there is a joint venture between Ansteel and ThyssenKrupp Tailored Blanks in the form of a tailored blanks production plant and a steel service center. October 2007 marked the opening of the new construction which boasts an area of 28,000 square meters. "It is our goal, in the truest sense of the expression, to supply tailored and coated carbon flat steel products to demanding automotive customers," says Dr. Manfred Nagel, chairman of the companies at both locations, describing the progress of the projects.

The German automotive and supply sector has been well represented in Northeast China for years. The Dalian Economic & Technological Development Area and the Changchun Economic Development Zone are among the major settlement locations. An ambitious infrastructure and modernization program, which was adopted in August of last year as a "Plan for Revitalizing North-East China", demonstrates just how importantly the Chinese government is taking the northeastern region of the country. It makes provision for a great deal of investment in the expansion of the infrastructure, modernization of the industrial bases, and environmental protection. Nearly 150 German companies operate in the three northeastern provinces and the program will, according to Claudia Borkowsky, Regional Manager for Northern China of the German Delegate Office in Beijing, make the region even more interesting in the future.

The forecasts for the automotive industry also suggest a boom in the region. The People's Republic is the fastest growing automotive market in the world and the second largest after the USA. As a location for producing automobiles, the country is in third place after the USA and Japan. The "China Automotive Industry Yearbook" counted 117 automobile manufacturers and 1,971 supply companies at the end of 2006. 8.8 million vehicles were sold in the record year of 2007; in 2008 the ten million threshold should be reached. Foreign direct investments such as that by ThyssenKrupp Steel are supplementing domestic production. The number of automotive suppliers with foreign financial interests has now risen to 1,200 companies, 70 of the world's largest 100 supply companies now have their own production facilities in China.

The current topic in China as well is and remains environmental protection. ThyssenKrupp Steel Executive Board member Dr. Hans-Ulrich Lindenberg explained in detail at the 5th China International Steel Congress, which was held in Shanghai in June, what the company is doing and what special achievements are being brought about by products made of high-quality steel. He referred in particular to the development of weight-reduced body parts: "Our 'NSB® NewSteelBody', a concept for a steel auto body, is around 25 percent lighter than the production benchmark. Together with an additional weight saving due to indirect effects, we are achieving a reduction of CO₂ emissions of more than 1.5 metric tons per vehicle for a running performance of 200,000 kilometers per vehicle. As for the careful handling of our natural resources, steel is definitely not part of the problem – it is part of the solution."

In other words: if ThyssenKrupp Steel has anything to do with it, heavy auto bodies will soon be relegated to the museum. And there is already a place to exhibit them: an automobile museum designed by a German architectural firm opened in Shanghai in January 2007. It exhibits 70 collectors' items from 22 different makes of automobile from the last 100 years.

Bettina Wieß, business journalist



Visit us in Hanover

at IAA Commercial Vehicles

from 25 September to 2 October 2008

Deutsche Messe Hanover, Hall 15

Agenda

Technology presentations

17 September and 16 October

The ThyssenKrupp Steel, Technologies and Stainless segments and ThyssenKrupp Nirosta will be presenting their automotive expertise via selected automobile components and talks on 17 September in Weissach at Porsche and on 16 October in Japan at Honda.

Alihankinta 2008

17 to 19 September, Tampere, Finland

ThyssenKrupp Steel's Heavy Plate Profit Center will be represented as a joint exhibitor with high-strength and wear-resistant steel grades on the stand of its long-term trading partner Flinkenberg at this trade fair for the supply industry which is predominantly attended by guests from Scandinavia and Russia

62nd International Motor Show

IAA Commercial Vehicles

25 September to 2 October, Hanover

Shoulder to shoulder with its sister segment ThyssenKrupp Technologies, ThyssenKrupp Steel will be presenting technical highlights for commercial vehicle construction in Hall 15 at this year's commercial vehicles fair in Hanover.

ULCOS Symposium

1 and 2 October, Zeche Zollverein, Essen

Ultralight carbon oxide steelmaking – the international symposium highlights the theme of “reducing carbon dioxide emissions in steel production”. The host this year is ThyssenKrupp Steel, the venue is the World Heritage site of the Zeche Zollverein industrial complex.

20th International Sheet Metal Working

Technology Exhibition, EuroBLECH

21 to 25 October, Hanover

ThyssenKrupp Materials, ThyssenKrupp Nirosta and ThyssenKrupp Steel will be presenting innovative steel solutions for industrial production processes at the leading international trade fair for the entire sheet metal working and processing process chain, along with five other companies from the steel segment. In addition, the Duisburg steel producer will be inviting its customers to a Customers' Day in the “Whale” pavilion at the former Expo site on 22 October.

Internationale Zulieferbörse (IZB)

[International Suppliers' Exchange]

29 to 31 October, Wolfsburg

The IZB has become a national market place for automotive solutions under the motto “Connection Car Competence” and therefore offers a direct communications platform with VW and other automobile manufacturers. Five ThyssenKrupp companies will be making the most of this opportunity and demonstrating their expertise.

BAU 2009

12 to 17 January 2009, Munich

BAU is Europe's leading trade fair for architecture, materials and systems for industrial, property, housing and interior construction. The Construction Group of ThyssenKrupp Steel, ThyssenKrupp DAVEX as well as ThyssenKrupp Nirosta and Hoesch Contecna will be presenting their range of services on a joint stand in Hall B3.

About us

Thanks to our readers!

Our magazine compact is doing very well – that was the outcome of the first survey among our readers which ThyssenKrupp Steel's Marketing Department carried out with the last edition of the magazine. This survey was sent to around 3,500 customers at home and abroad and included questions on items such as presentation/layout, information content, scope and clarity.

All in all, we are delighted with the very good response rate and the extremely positive assessment of our work with average marks of between 1 and 2 (with 1 being “very good” and 2 “good”). The magazine achieved the best marks for layout and clarity.

Thank you very much again for taking part!

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Thinking the future of steel

ThyssenKrupp Steel

