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Dear Readers,

What do a high-wheel rider, a four-man bob pusher, the supervisor of a document management system and a sales representative in Moscow have in common? They all exemplify perseverance and dynamism – qualities with which they fulfil their responsibilities and carry projects through to a successful outcome. And they all feature in this magazine. We hope you enjoy reading their real-life stories as well as updates on the latest developments at CAC – reports from people and decision makers who get things done at our company.

The core theme of this year's edition is the way in which CAC is shaping the future of mobility with clean fuels that are environmentally friendly, inexhaustible and carbon-neutral. We describe how that works and the processes developed by our engineers in the magazine editorial under the heading 'Power to X'.

In addition, you will make the acquaintance of our Sales Director René Stahlschmidt who enjoys the multi-faceted and varied nature of his work and who values CAC's character as a family-run, medium-sized company.

In our Kaleidoscope column, we will tell you about the projects our company is involved in worldwide – from Norway to Spain and from Germany to Russia. We are proud that over the past 55 years large chemical companies from all around the world have come to appreciate CAC's expertise in plant construction.



Board of Management from left to right:  
Joachim Engelmann, Jörg Engelmann, Mike Niederstadt



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## International research project to reduce CO<sub>2</sub> emissions

The international ALIGN-CCUS project unites 34 industrial companies, research institutes and universities from Europe pursuing the goal of transforming six of Europe's industrial regions into economically robust, low-carbon centres with significantly reduced CO<sub>2</sub> emissions by 2025.

The partners have secured 15 million euros of European and national funding for six specific but interlinking areas of research into carbon capture, utilisation and storage (CCUS).

As a global first-of-a-kind project, ALIGN-CCUS will build and test a fully integrated CCU chain (carbon capture, utilisation) at pilot scale in a real industrial environment. Asahi Kasei Europe awarded us the implementation of a water electrolysis plant for the research area "CO<sub>2</sub> Re-Use". We are responsible for the engineering, procurement, installation and commissioning of the plant.

The aim of the research group is to develop a concept for reducing CO<sub>2</sub> emissions by reusing the CO<sub>2</sub>. In combination with water and electricity, a diesel substitute fuel will be produced which is associated with very low soot and nitrogen oxide emissions.

The highly efficient electrolyser module provided by Asahi Kasei uses renewable electricity to convert water into hydrogen and oxygen. The captured CO<sub>2</sub> from a plant of RWE and the hydrogen from Asahi Kasei will then be converted to methanol-based diesel substitute fuel, DME and OME.

**Note:** More detailed information on Power-to-X fuels can be found in our main topic section on pages 10 to 12.



Picture: © Mike\_kiev, <http://www.fotolia.com>

## Study for the modernisation of a chlor-alkali electrolysis plant

The European operator of a chlor-alkali electrolysis plant has commissioned us to carry out a study, including an on-site audit, to upgrade and expand the capacity of its existing plant. The first step is to replace two of a total of four electrolysers. The other two will follow later to expand capacity accordingly.

The special feature of this project is, on the one hand, to compare two electrolyser technologies and on the other to develop potential variants as to how the new electrolysers can be integrated into the existing plant without hindering the plant's ongoing operation at maximum capacity.



## New reference technology in Europe

A global market leader in the field of high purity quartz sand has commissioned us with basic and detail engineering as well as procurement services for the construction of a new quartz sand processing plant. High purity quartz sand is a versatile raw material for the semiconductor, coating and optic industry. The profound know-how of a renowned German licensor forms the technological basis of the process.

Basic engineering was started in January 2019. The plant is to be put into operation in autumn 2020, in order to meet the growing global demand for high purity quartz sand.



“ This assignment not only adds an exciting technology to CAC's range, but also a new country to our list of references in Europe. ”

Bild: © REDPIXEL.PL, <https://www.shutterstock.com>

# Construction of a new silica production plant

Grace GmbH in Worms, a subsidiary of the W.R. Grace & Co. Group headquartered in Columbia /Maryland, USA, has placed an order with us for the turnkey construction of a new silica production plant. Grace is a global manufacturer of catalysts and silica-based specialist products. Its scope means this order represents the largest EPC contract since Chemieanlagenbau Chemnitz GmbH was founded. We have assumed overall responsibility for all phases – from planning through to the turnkey handover of the large-scale project at the Chemical Park in Worms. With this plant, Grace GmbH wants to meet the growing demand for colloidal silica (silicon dioxide). Colloidal silica is used in a broad spectrum of industrial applications such as catalysts, functional coatings and precision investment casting. "We greatly value the trust that Grace has placed in us to deliver its major European project, a high double-digit million euro investment," says Mike Niederstadt, COO of CAC.



## FACTS AND FIGURES:

**165**  
positioned pieces of equipment

**850**  
pipelines

**2,100**  
measurement control and regulation points

**175,000**  
accident-free working hours to the start of September 2019

# Handover of a membrane electrolysis plant to Petkim in Turkey

The beginning of April 2019 saw the official acceptance of the membrane electrolysis plant of Petkim Petrokimya Holding A.S. in Turkey after successful commissioning. Petkim maintains its business operations as the first and only integrated petrochemical producer of Turkey. Its products are important elements of the construction, electricity, electronics, packaging, automotive, textiles, cosmetics and many other sectors.

The project was commissioned by Petkim in autumn 2016 and comprised the replacement of existing monopolar membrane electrolyzers with modern bipolar membrane electrolyzers made by the licensor Asahi Kasei Corporation. Our company assumed responsibility for basic and

detail engineering, supply of equipment and replacement parts for this assignment. Furthermore, we were responsible for the training of operating personnel as well as support during commissioning.

The new electrolyzers produce chlorine and caustic soda with a capacity of 300 tonnes per day (with regard to chlorine 100%). They work in a more energy efficient and environmentally friendly way than the monopolar electrolyzers, which have now been decommissioned. "With this assignment and more than ten electrolysis plants erected since the founding of the company in 2004 we were able to significantly improve our market position in the chlor-alkali industry", says Jörg Engelmann, CEO of CAC.



## FIGURES

**300**

300 tonnes per day  
Project duration:  
IV<sup>th</sup> quarter 2016 – II<sup>nd</sup> quarter 2019



CAC converts electrolysis plant into an energy efficient, environmentally friendly membrane plant for Petkim.

## Delivery of a chlorine drying plant to Siberia



In the second quarter of 2019, our long-standing customer JSC Sayanskhimplast placed an order with us for the design and delivery of a plant for drying chlorine produced by electrolysis. In addition to providing the basic and detailed engineering, we are also supplying the equipment and pro-

viding support during installation and commissioning. The planned future capacity expansion and the conversion of existing electrolyzers to the latest Zero Gap electrolyser technology from the Asahi Kasei Corporation of Japan have been factored into the capacity of the chlorine drying plant.

## CAC constructs one of the world's largest cumene plants for Ineos



Ground-breaking ceremony for one of the world's largest cumene plants being built for Ineos Phenol at Marl

One of the world's largest cumene plants is currently being built at Marl Chemical Park in North Rhine-Westphalia by CAC on behalf of Ineos Phenol, the global leader in the production of phenol, acetone and cumene. Cumene serves as an intermediate for the production of phenol and acetone. For CAC, this project constitutes the largest EPCM contract

since the company was founded 55 years ago. "We are very pleased to have been commissioned by Ineos with the implementation of this major and strategically important project," says CAC COO Mike Niederstadt. The capacity of the new plant is rated for 750,000 tonnes of cumene per year. With the planning and construction of a reactor weighing approximately 300

**FACTS AND FIGURES**

**750,000**  
tonnes: cumene production per year

**300**  
tonnes: weight of the reactor

**> 80**  
metres height of distillation column

**> 160**  
equipment items

**> 1,500**  
pipes

**> 3,000**  
signals (DCS)

tonnes and several distillation columns, the plant is set to become a prestigious reference project in the business segment of classic petrochemistry. The new plant will ensure the supply of raw materials to the Ineos works in Gladbeck and Antwerp for many decades to come. The plant is scheduled to commence production in the third quarter of 2021.

# Clean fuel from electricity, water and CO<sub>2</sub>

*Environmentally friendly, inexhaustible and CO<sub>2</sub> neutral – CAC researches into synthetic fuels which will make history*



Synthetic gasoline – a concept that has fired the innovative energy of researchers for decades. This bold vision became a reality as far back as the 1920s, with Fischer-Tropsch coal liquefaction synthesis. CAC has developed a process for producing synthetic gasoline from natural gas using synthetic gas and methanol. This process has been patented in Australia, China, India, Eurasia, Canada and Germany. With a high-octane rating, synthetic gasoline is comparable to gasoline manufactured from crude oil but it is more costly and as yet not substantially more environmentally friendly than the “traditional variety”. But is it possible to manufacture synthetic fuels from only carbon dioxide, electricity and water – entirely without fossil fuels? To answer this we have constructed the first fully functional demonstration plant. Automobile manufacturers are currently testing the fuels produced here in their vehicle fleets. And best of all, the synthetic fuels manufactured in the pilot plant are virtually CO<sub>2</sub> neutral! Dr Mario Kuschel, Head of Process Engineering and Stephan Schmidt, Product Manager for Synthetic Fuels at CAC explain how.

Dr Kuschel is convinced that synthetic fuels are the future of mobility. “We assume that cars in the future will increasingly run on synthetically manufactured gasoline or diesel,” says this doctor of Process Engineering. According to the Renewable Energy Directive (RED II), by 2030 14% of all fuels must be renewable – double the current target. Moreover, the requirement to reduce CO<sub>2</sub> will by no means affect the transport sector alone. Thousands of terawatt hours of energy are consumed in agriculture, heat generation and industry, too. “The major

advantage of synthetically manufactured gasoline, apart from the main objective of reducing CO<sub>2</sub> emissions, is that automobile manufacturers can continue to develop their gasoline and diesel engines,” says Dr Kuschel. Indeed, all the major automobile manufacturers are researching alternatives such as electric drives or fuel cells, yet the bottom line is they have greater potential for global warming. “With our process, gasoline can be manufactured almost CO<sub>2</sub> neutral as all we require for its production is CO<sub>2</sub>, water and electricity – ideally from renewable sources,” says Dr Kuschel describing the advantages.

This subject is generally known as Power-to-X. The X can mean many things here: in addition to gasoline, diesel, kerosene, methanol, gas and liquified gas can also be manufactured from CO<sub>2</sub> and water. All that is needed is electricity and different catalysts. Their deployment in the manufacture of synthetic gasoline is currently being tested and optimized in the company’s own in-house test plant. The key component here is an isothermal reactor. Isothermal reaction allows the quality and composition of synthetic gasoline to be directly influenced.

The CO<sub>2</sub> needed for the manufacture of hydrocarbons comes from the air or ideally even from industrial emissions. The CO<sub>2</sub> content of these emissions is up to 500 times that of “normal” air. If the carbon dioxide is captured directly from an industrial plant there are virtually no exhaust emissions – a win-win situation for both industry and the synthetic fuel manufacturer who needs this CO<sub>2</sub>. The CO<sub>2</sub> is separated by means of carbon capture. The hydrogen

required is extracted from completely normal water using electrolysis. This requires electricity – and if this also originates from a sustainable energy source, then the ecological balance is thoroughly positive. As a process engineering pilot project, CAC has developed and simulated a complete process chain, including the generation of electricity from hydroelectric power. The goal of the project is the manufacture of a synthetic high-octane fuel which is almost completely CO<sub>2</sub> neutral.

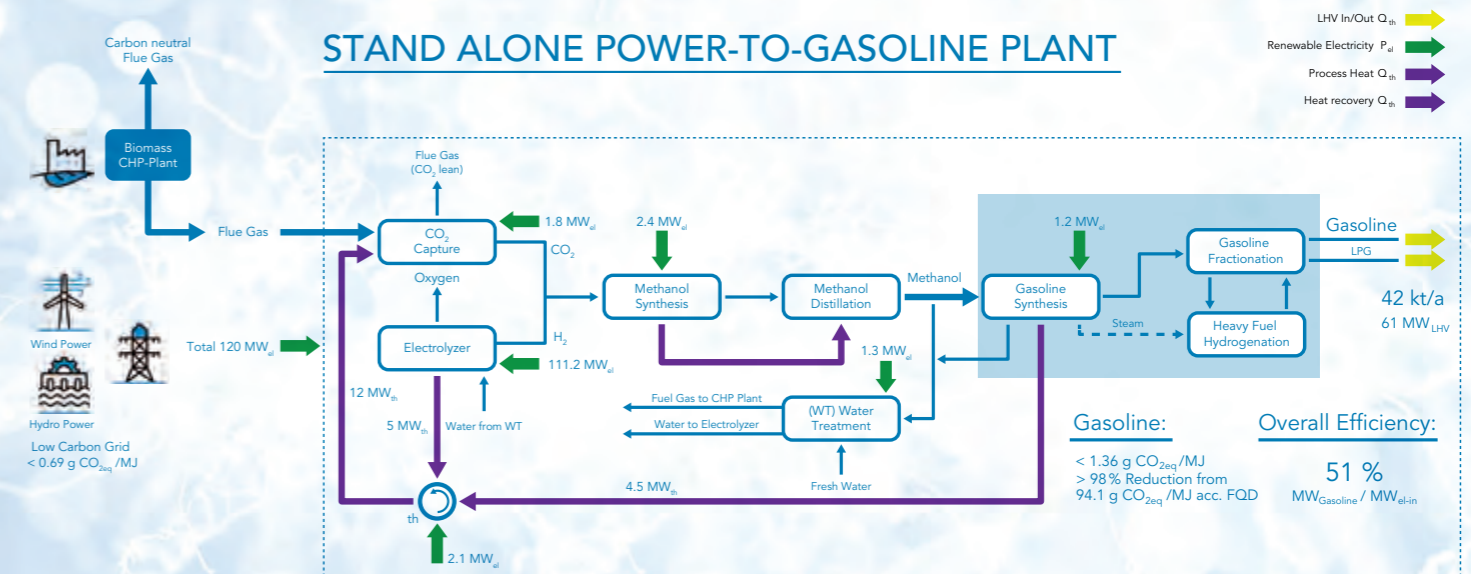
“The use of carbon dioxide as the basis for the manufacture of synthetic gasoline is a feature of CAC’s technology,” says Stephan Schmidt. “While we have global competitors who are also researching synthetic fuels and have constructed plants, they are still extracting CO<sub>2</sub> from coal or natural gas.” The idea of using waste CO<sub>2</sub> for the manufacture of fuels turns an undesirable by-product into a sought-after asset. Industrial enterprises with high CO<sub>2</sub> emissions would not even need to release the carbon dioxide into the environment in the first place but could introduce it directly into the fuel production cycle. The CO<sub>2</sub> saving could be offset with emission certificates. “No legislative basis, however, has yet been regulated in our favour,” says Stephan Schmidt, who hopes that legislation will soon recognize the advantages of this new process and classify the synthetic gasoline produced in the CAC demonstration plant as a clean fuel.

The end product is even “cleaner” if the origin of the CO<sub>2</sub> is biogenic rather than from an industrial plant. Together with electricity from alternative energy sources, the vision

of environmentally friendly gasoline has thus come within reach. “Many people are interested in our process,” says Dr Kuschel. “However, no large-scale plant has yet been constructed.” CAC engineers dream of building such a plant. “The technology is market-ready,” he says. He guides us through the demonstration plant which has been constructed in the grounds of the TU Bergakademie Freiberg and will be operated from there. Here, the findings and results from the company’s own in-house test plant will shortly be tried and tested in large-scale process components. The further optimization of the developed process technology will take place on this basis. Recently, at least 12 tonnes of synthetic fuel for various tests at automobile manufacturers were produced in this larger demonstration plant. The research and development work is being supported by the federal government

and the Free State of Saxony. But there is also a great deal of CAC’s own capital in the project. “We firmly believe that we have developed something unique,” says Joachim Engelmann, managing director and shareholder. “We have highly qualified process engineers in our company working in the

area of R&D. We recognize the potential and have every confidence in the innovative power of the technology we have developed. Collaborating with these specialists and bringing this forward-looking technology to the market gives me a great deal of pleasure.”



Graphic: © CAC, Mitsubishi

## 90 percent cut in emissions of CO<sub>2</sub> thanks to synthetic fuels

The use of CO<sub>2</sub> neutral gasoline produced on the basis of CAC’s technology results in carbon dioxide emissions being up to 90 percent lower than with a comparable fossil gasoline. First tests with Original Equipment Manufacturers (OEMs) on various vehicles confirm that the synthetic fuel meets the required application

characteristics. In the event of a market launch, the composition of the fuel only slightly changes and only the proportion of synthetic fuel is increased, the existing infrastructure up to the final consumer at the filling station however can remain in place - the best prerequisites for a market launch that can soon take place.





### Further fields of application

In order to cover the entire process chain of Power-to-X, we work together with renowned cooperation partners from the industry. In parallel, we are currently working with a renowned refinery operator to examine the integration of a gasoline synthesis unit using CAC's own techno-

logy into an existing complex. Within the framework of the joint KEROSyN100 project, CAC is also leading the research on a technology for the production of synthetic kerosene in cooperation with the University of Bremen and the refinery in Heide near Hamburg.

“The use of carbon dioxide as the basis for the manufacture of synthetic gasoline is the unique feature of CAC's technology.”

”  
Stephan Schmidt

„No two days are alike. The internationality that we experience every day sure adds to the excitement of our work.”

Name: Dr René Stahlschmidt  
 Age: 37  
 Family status: Married with 2 children  
 Job title at CAC: Head of Sales  
 Hobbies: Family, (local) politics, music



#### How long have you been at CAC, and what are your responsibilities?

I have been working at CAC since July 2014. I started out as a project engineer in tendering, and a year later I was appointed as manager of this department when my predecessor took his well-deserved retirement. Since 2017, I have been Head of Department and responsible for all sales at CAC.

#### How did you come across CAC as an employer?

I studied Mechanical Engineering at TU Bergakademie in Freiberg, specialising in Energy Technology. During my degree course at the Institute of Energy Process Engineering and Chemical Engineering at TU Bergakademie and in a subsequent period as a lab assistant, I was involved in several research projects. One of these concerned the production of synthetic gasoline from syngas and methanol. The industrial partner on this project was CAC. Having brought the new procedure to Freiberg, they planned, set up and operated the demonstration plant. In the course of writing my dissertation, I carried out analyses for this project, evaluated procedures and extrapolated additional fields of application. Working with CAC was so congenial and interesting that I joined them in Chemnitz even before I had finished my doctorate.

#### What prompted you to put your expertise at the service of CAC?

As a result of the aforementioned project with CAC, I had already managed to gain experience in the operation of a plant that by university standards was on a large scale. That experience aroused my interest in plant construction. Exciting projects, intriguing prospects and attractive development opportunities awaited me at CAC. And after only a short time, I was asked to take on the management of a whole department.

#### What does your work as Head of Sales involve?

My main responsibility is to coordinate and intensify the sales and marketing activities of CAC in terms of strategy and organisation, and to acquire new projects. I visit customers and attend conferences and trade shows in different countries. Our sales people are busy seeking opportunities in Europe, the Russian-speaking countries, the Middle East and South America. I coordinate all of their activities.

#### What is it about CAC that appeals to you most?

Its character as a family-run medium-sized company, and its accessibility and compactness right up to board level. Nobody gets above themselves here – everyone is approachable. The family ethos runs through the whole company.

I also love its many-sidedness and the variety. No single day is like another. The international diversity we experience every day also makes the work very stimulating. We encounter very different cultures and their idiosyncrasies. It could hardly be more varied.

#### What is your vision for the company?

I want to play my part in ensuring that the company remains successful for at least the next 55 years. Continuity and stability are things I value very highly. My job is to land worthwhile contracts, even when the global political situation sometimes doesn't make things easy.

#### Do you have a message for our readers that you are especially keen to communicate?

Sales only work if all the wheels mesh perfectly, if all departments work in concert, if all those involved work well together and if projects are organised professionally and everyone feels responsible for the big picture. This is certainly the case at CAC.

“Approachable, well-versed in his field and with a good sense of humour”

Marketing Manager Antje Wappler  
 talking about Head of Sales Dr René Stahlschmidt

# Management of project documents taken to a new level

How the PIRS document management system helped CAC to achieve a significant increase in efficiency within a period of eighteen months.

## PIRS: a Collaboration Software for Projects



### Is this your experience?

Whenever the company secures a new project, the purchasing department has the job of procuring all the necessary equipment. Various departments are involved, technical specifications are drawn up and multiple suppliers are asked to provide a quote. For each process there are cover letters and filing routines. Eventually, the same data will have been entered into the system in different versions five, six or seven times over.

Sascha Mühlhausen, who leads the team at CAC that is taking document management to a new level, knows that this can also be done differently. For several years, he has been seeking out a document management and communication system (DMS) that is a perfect fit for the workflows at CAC. In PIRS, he has found a system that 80 percent meets his expectations – which is actually a very good match in DMS terms: “Sobis is a company that specialises in software solutions for large projects such as plant construction, so they understand our procedures and special requirements.” The Sobis system which has been in use at CAC for eighteen months has come to be regarded as indispensable in all engineering projects. Sascha Mühlhausen and his team are currently working with Sobis to optimally map CAC processes on the system.



Mühlhausen. “Every member of staff can see the planning status of a document, i.e. is it a draft, is it currently being reviewed by the customer, or has it already been approved? Everyone accesses the same database, because every document exists only once, securely stored in the system.” Using full-text searches, every authorised person can locate any item at any time, even if the actual contact person is not available at that moment.

The cover letters (referred to internally as ‘Transmittel’) which accompany each communication are stored together with the document. It is clear from this to whom and when documents were sent. In this respect, the system not only provides greater transparency, it also enables significant savings thanks to more efficient work processes. Sascha Mühlhausen: “Up to now, when preparing a cover letter listing all the enclosed documents, our staff had to go through umpteen tiny steps. That took a lot of time. With PIRS, all of this happens completely automatically. You click on the documents you want to send and select a recipient from the list. All additional elements are generated by the system – from the index number of the letter to the accompanying text. According to a Sobis survey, two-thirds of their customers estimate time savings of up to 30



minutes a day. Because thousands of such letters are generated by our company every year, this means a saving of tens of thousands of minutes, equivalent to several thousand euros a year.”

The system also offers numerous advantages for customers. Deadline monitoring, correspondence, approval processes, legal assurances and the involvement of third parties – PIRS allows all of this to be regulated in a verifiable and secure fashion. “We can set up a separate ‘room’ for everyone involved in a particular project, which we then fill with documents,” adds Sascha Mühlhausen. Partners, suppliers and customers are securely integrated into the system by means of a Cloud-based platform hosted by a certified data centre. The system has been designed to be intuitive, so that training can take place within manageable limits.

“For many of our customers, the use of a document management system is an impor-

tant prerequisite for the implementation of their project,” Sascha Mühlhausen stresses. PIRS is therefore a key factor in meeting the high quality standards for document management that CAC sets itself.

Are other members of staff as convinced of the merits of the system as Sascha Mühlhausen? He gives a wry smile: “Of course, any system is going to seem like an obstacle course when first introduced. But we have to think ever more digitally and above all learn to work with it. This calls for a lot of support within the company. We train our staff, exchange ideas, hold regular meetings and talk about ideas and the latest developments. In each engineering discipline, we designate key users to whom colleagues can address any questions.” His conclusion: “Even though introducing a system like this is not always easy, in the end it leads to a considerable increase in efficiency, which we can now clearly see after eighteen months of PIRS.”

The document management system supplied by Sobis has been specially conceived with plant construction in mind. PIRS, standing for Project Information Retrieval System, facilitates the efficient management and distribution of all information generated by a project on a uniform and secure Cloud-based platform.



### FACTS AND FIGURES

**100 – 120**  
users per project

**8**  
projects since the introduction of PIRS

**25**  
customer and supplier portals ('rooms')

Amount of correspondence recorded per project

**2,500**  
e-mails before PIRS

**10,000**  
items of correspondence After 1½ years of PIRS

**100,000**  
items of correspondence Over a typical project duration of 3 years

“

The system not only provides greater transparency but also enables significant savings through more efficient work processes. After eighteen months of PIRS, we are seeing a significant increase in efficiency.

”

Sascha Mühlhausen,  
Head of Document Management at CAC



# Cultivating contacts

CAC has had a local sales office in Russia since 2004. Wolfgang Kamrad, a graduate in Politics and Law, took over as manager in 2005. The CAC predecessor companies already had representation in Russia in the 1990s. We talked to Wolfgang Kamrad about the Russian market, about mutual understanding ... and about crispy oven-roast pork.

## A portrait of the technical diplomat: Wolfgang Kamrad in Moscow



Wolfgang Kamrad

**About our interviewee:**

Wolfgang Kamrad (67) started out as a skilled machinist working in a factory. He later completed a degree in Politics and Law with a special emphasis on Foreign Policy at the Institute for International Relations in Potsdam. His qualifications made him the ideal candidate for a marketing role in Eastern Europe. As chief sales representative for various other companies in Russia and Central Asia, he gained experience in plant engineering which he then put to good use upon joining CAC in 2005. His unique combination of technical knowledge, diplomatic skills, fluent Russian and appreciation of the national culture stands him in good stead in his capacity as head of the CAC sales office in Moscow.

**How would you describe the current situation in the Russian market?**

The Russian market has recovered somewhat from the recession of recent years. Over 60% of its exports continue to be energy resources and raw materials. Russia is committed to growth and modernisation and is keen to create the right conditions for further inward investment. However, there are numerous barriers to overcome in respect of the international financial markets and its own national legislation before such investment can be secured. Current economic policy supports greater and more intensive processing of domestic resources within the country itself, including the petrochemical and chemical industries. This opens up new opportunities for CAC to build on the successes of previous years in its main business fields, despite growing competition and more challenging background conditions.

**How would you describe business relations between Germany and Russia?**

They are currently at a low, but there is some indication that they may be about to improve. After years of steady growth, there was a sharp decline in foreign trade and investment activity from 2012/13 onwards. This was exacerbated by the reciprocal sanctions policy, which also increased uncertainty in the business community. Since 2017, trade between the two countries has been on the increase again. There is now a sense of optimism.

**What are your hopes for the future?**

An improvement in political and economic relations.

**Why is having a sales office in Russia important for CAC?**

In order to do business in Russia over the long term, you need to have a local presence. Because of differences in business practices and legislative, cultural and linguistic idiosyncrasies, local representation can do a vital job in supporting communication and smoothing the path for new projects between the parent company and its customers. Our Moscow office provides a point of contact for our customers and our staff, where negotiations can take place and exhibitions can be prepared. Matters arising after the fulfilment of orders can also be professionally dealt with here. Furthermore, the office represents CAC's interests in the host country vis-à-vis state institutions and trade associations



**What are the main cultural differences that have to be watched out for in Russia?**

It is important that everyone involved in a negotiation comes away with the same understanding of what has been agreed. This is where I come in; my job is to make sure that everyone is on the same wavelength. In Russia, you have to clarify at the end of every long discussion what each person has understood or was trying to say.

**Tell us some of the places you have been to in Russia to meet CAC customers.**

Due to the sheer size of the country, we have acquired a broad geographical spread of customers over the years. This extends from the European part of Russia to the Baikal region in Siberia. With many of these customers, we have developed long-term, mutually beneficial and trusting relationships.

**Does CAC also work with suppliers based in Russia?**

CAC has always endeavoured to involve local suppliers in the realisation of projects. We have had a good experience with Russian manufacturers of process equipment and pressure vessels that we included in our recent deliveries to Belarus. In addition, there is good collaboration in the joint preparation of project documentation with Russian planning institutes.

**Which reference projects in Russia would you choose to highlight here?**

CAC as it is today and its predecessor companies can point to a large number of reference projects in petroleum, petrochemicals and inorganic chemistry implemented over a 55-year period of close business ties with Russian customers.

The ones I would single out from recent years are the long-term successful partnerships with JSC Sayanskhimplast, the leading PVC manufacturer in Russia, and with PJSC SIBUR, the Russian chemicals giant. In Sayansk, we were commissioned with the construction of Russia's first membrane electrolysis plant for the production of chlorine and caustic soda, and we are currently in the process of jointly implementing a further modernisation of the plant.

Two plants for the production of expandable foam polystyrene (EPS) were built for Sibur at their Perm site. In addition, we have carried out a number of analyses and studies for further investment projects and are optimistic about ongoing collaboration.

**You have been living in Moscow for almost 25 years now. What are the most striking characteristics of this city for you?**

Moscow is a vast city that never sleeps. Even at two o'clock in the morning, the stream of traffic on the broad boulevards of the metropolis continues unabated. Much has happened in Moscow in recent years. You're always discovering something new. Moscow is developing into a cosmopolitan city and is the hub of the largest country in the world by land mass. The culture on offer is incredibly diverse, which makes life here very stimulating.



**What is your personal insider tip for a visitor to Moscow?**

A stroll through the city centre and also through its parks. A visit to a ballet performance. And sampling the exceptionally good Russian cuisine. There have been some major developments in this regard in recent years. New restaurants on thematic projects serving food and drink at a high international level.

**Would you care to tell us a few personal things about yourself? For example, what do you like to do in your free time?**

I like to travel to other cities and regions of Russia and the former Soviet republics. And I like to cook for myself and my friends. I bring back new ideas from every trip I make, which I then try out in the kitchen. I like to cook classic German dishes for my Russian friends. A crispy oven-roast joint of pork with delicious brown gravy is relatively unknown in Russia.

# A fascination for historic bikes



Marco Köhler  
Process Engineer

wheels, a drive ratio of one to one, so utterly straightforward. But it works – and how!”

Our recommendation: The third weekend in September is the regular slot in the calendar when Marco Köhler joins the other members of Fahrrad-Veteranen-Freunde Dresden in the Stallhof of the Residenzschloss to demonstrate his penny-farthing. The public can also sign up for his ‘Hochrad-fahrschule’ (Penny-Farthing Academy) and learn the art of riding a high-wheeler.

“THE HIGH-WHEELER IS A MACHINE FOR HONING THE SENSES”

Marco Köhler’s girlfriend is a remarkable woman. While other men generally struggle to persuade their partner to allow even one beloved bicycle into the apartment, she tolerates no fewer than 14 of them within the four walls of their home. And that is not even half of his inventory. Marco Köhler’s collection consists of 30 bicycles ranging from racers to historic models and from a recumbent to a penny-farthing.

The high-wheeler is his favourite. As a member of Fahrrad-Veteranen-Freunde Dresden, a club for like-minded friends of veteran bikes, he wheels the penny-farthing out for club excursions, parades and public presentations. Isn’t it dangerous, we ask? “Yes,” he replies with a chuckle. “The high-wheeler has always been a sports bike. The rider needs strength and courage. The hardest part is not climbing onto the saddle but bringing the bike to a stop. That’s why you need to have all your senses in full receptive mode and to ride with total concentration and anticipation.” With one turn of the pedals, his 54-inch front wheel travels four and a half metres. Marco Köhler can reach speeds of up to 40 km/h on his high-wheeler. “I’m fascinated by the simplicity of the technology,” says the engineer. “Two



Picture: privat

**Marco Köhler** (33) conducts research into the production of synthetic gasoline (pp. 10-12) at the Chemnitz pilot plant as well as in the demonstration plant at Freiberg. He joined CAC straight from university where he graduated in Chemical Engineering. As plant manager, he has a thorough understanding of how these two production facilities operate, and he also enjoys the hands-on aspect of working there.

“I live for my job,” he says. “I always aim for 100% and more, but I know that you can only achieve that with a strong team, because you can’t construct a plant on this scale all on your own.”



## MARTIN GROTHKOPP: “OLYMPIC CHAMPION IS A TITLE THAT STAYS WITH YOU A LIFETIME”

Martin Grothkopp was a pusher in the four-man team captained by Francesco Friedrich which won gold in the 2017 and 2019 world championships and at the PyeongChang Winter Olympics in 2018. Emblazoned on the yellow jacket of the German Bobsleigh & Skeleton Federation (BSD) which Martin wears at award ceremonies is the logo of CAC. This sponsorship is essential for this particular water engineer. Fortunately, he gets excellent support from senior management at CAC who share his enthusiasm for the sport.

HERR GROTHKOPP, WHAT DOES IT FEEL LIKE TO HURTLE DOWN THE TRACK IN A BOBSLEIGH?

In a bob, you can really feel the speed. We sit on the bare carbon-fibre floor of the steel skeleton. The cornering exerts forces of up to 5 g. That means you have to sit tight and move as little as possible so as not to interfere with the aerodynamics. A run lasts between 50 seconds and one minute, and it’s all systems go. Each member of the crew has an active role to play. We have a mental map of every single twist and turn, because looking where you’re going is not an option when you’re speeding down an ice channel at more than 100 kilometres per hour.

IS THE PILOT THE BOSS?

Yes. It’s like running a company. There has to be one person who sets the direction. However, we are all involved in the choice of materials and other decisions. We have all been totally committed to this team for the past six years, and we spend six months a year travelling around together. We also have a very good mutual understanding and even go on holiday together.

DO YOU HAVE A FAVOURITE TRACK?

No question, it has to be St Moritz! It’s the oldest and only natural ice course in the world, constructed from natural ice blocks, water and snow. It blends in beautifully with the landscape and, at 1,600 metres, is exceptionally long. Its smooth curve radii make it a very enjoyable ride.

WHAT SORT OF TRAINING CAN A BOBSLEDDER DO IN THE SUMMER?

Athletics. Sprinting, jumping, weight training. Once a week, all four of us get together at the speed track in Riesa and train in a wheeled bob. Our homes and places of work are all over Central Germany, but we need to meet here regularly to stay in peak form.



Picture: © Grothkopp

DOES THIS PROGRAMME LEAVE YOU ANY FREE TIME?

I have a busy routine of work, training and physiotherapy, but I always make sure that I set aside time for the family. I try to pick up my daughter from kindergarten as often as possible. That’s really important to me.

YOUR BOBSLEIGH TEAM CAPTAINED BY FRANCESCO FRIEDRICH HAS WON JUST ABOUT EVERYTHING THERE IS TO WIN. WHAT ARE YOUR NEXT OBJECTIVES?

With Altenberg in the Erzgebirge staging the world championships next February – a home fixture for the German team – that is going to be an outstanding occasion. The venue in Altenberg is right on our doorstep and is known for pulling in super audiences and generating an amazing atmosphere. That really gets through to the competitors and gives us added motivation. As the home team, we will obviously be intent on defending our world champion titles in the two-man and four-man bobsleigh. We’ll be going flat out, and I’m really looking forward to it. Looking further ahead, of course, we also want to compete in the 2022 Olympic Games in Beijing and defend our title.

DOES HAVING AN OLYMPIC MEDAL FEEL VERY DIFFERENT FROM HOLDING A WORLD CHAMPIONSHIP TITLE?

It certainly does. I wouldn’t have thought so before, but it feels incredibly good. The moment you’ve achieved it, you can’t really take it all in. It’s like being in a dream. I keep watching the videos from the last run, which is incredibly motivating. All those great feelings come surging back. Olympic champion is a title that stays with you a lifetime.

HOW IMPORTANT IS THE CAC SPONSORSHIP FOR YOU?

I’m the only member of the entire German world championship squad who isn’t sponsored by the German police. I work 25 hours a week in an engineering office and then go training. In the winter months, my boss releases me from work obligations. It is therefore essential for me to have enthusiasts high up at CAC who enable me to pursue my sporting activities with their support. I am infinitely grateful for that.



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