

Energy and Water Guide 2017/18

Partnerships and Perspectives of Arab-German Cooperation

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Energy & Water Guide 2017/18

Partnerships and Perspectives of Arab-German Cooperation



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Preface

We proudly present the second edition of the Energy and Water Guide. This publication highlights some of the most interesting and promising energy projects in the Arab World in which German companies are participating.

The energy transition is Germany's pathway into a future that is secure, environmentally-friendly, and economically successful. Almost one third of German electricity is generated by wind, solar and biomass. By digitizing the energy transition with smart meters, the generation and consumption of energy will be brought more in line with each other, and potential for energy conservation can be developed.

At the same time, the demand for energy is rapidly increasing in the Arab world. Renewable energies play an ever more important role for power generation. On the other hand, there are still huge investments in the Oil & Gas industry, especially in the GCC countries. For the entire energy sector, the projected MENA expenditures are estimated at USD 622 for the next five years. Technical advancements and innovative service solutions, as well as concepts for improved energy efficiency and diversification plans for energy sources, are in more demand than ever. With their experience and state of the art technology, German companies play a major role in this context and can offer a sustainable contribution to this development.

The Arab-German Chamber of Commerce and Industry has a powerful network, consisting of both institutional and entrepreneurial decision-makers from the Arab countries and from Germany. As the representative of all Arab Chambers of Commerce and Industry in Germany, our role is to support the promising Arab-German business relations in close cooperation with our members and partners. Next to our publications, we also organize comprehensive events, such as the annual Energy Forum, which will take place in Cairo in March 2018. The working group "Energy and Water" meets regularly to facilitate Arab-German cooperation in this field. It offers a valuable platform to share information, to exchange experiences and to facilitate cooperation.

We would like to thank the contributing German companies for their valuable reports, Ms. Tatjana Arnold for her commitment and dedication to the publication and also Mr. Fahdl Al-Romaima for layout and design. We wish you an informative and instructive reading and hope to see you at one of our energy-related activities.



Dr. Peter Ramsauer



Abdulaziz Al-Mikhlafi

Dr. Peter Ramsauer President Federal Minister ret.

Abdulaziz Al-Mikhlafi Secretary General





Conventional Energy

Value Based Maintenance within SEC

Horváth & Partners Management Consultants

Saudi Electricity Company is currently undergoing a huge transformation process to become a world class utility. One of the cornerstones of this process is to improve its capabilities within electricity generation.

The "generation excellence" program drives significant performance enhancements through the implementation of advanced maintenance practices - the Value Based Maintenance program (VBM). The program was successfully implemented by the generation excellences team and the SEC Value Based Maintenance Champions and created a positive value change for the generation assets

Initial situation and objectives

One of the major pillars to become a world-class utility is to create operational excellence along the value chain. The business unit generation launched therefor the initiative "value based maintenance - VBM" to make one big step forward. The value based maintenance (VBM) initiative is part of the ASTP (Accelerated Strategic Transformation Program) Program and endorsed by the Vice President of Generation. Asset management, particularly maintenance practice, is evolving: From "repair it after it brakes" techniques over "planned and scheduled maintenance" to "Value Based Maintenance" as the best companies are moving towards that practice. SEC has been involved in a number of business improvement initiatives in recent times. VBM, as an over-arching, coordinating technique by which to focus its through-life asset management improvement efforts, is a key component of the overall SEC "generation excellence program". Most notably, SEC wishes to reduce capital expenditure remarkably without compromising reliability and service quality. Besides CAPEX optimization, the VBM program has the following objectives:

- Lower cost of production, operation and maintenance of generation assets through consistent maintenance and working to leading international practice
- Improve plant reliability, availability and efficiency through a program of maintenance aligned to leading practice to deliver value from the assets
- Change mindset of SEC maintenance professionals to focus on maintenance improvement
- Accelerate adoption and improvement of maintenance optimization

Value Based Maintenance (VBM) is a modern technique that incorporates elements of best practice maintenance management tools and techniques to provide clear value for SEC. VBM drive maintenance optimization to increase the value delivered by assets over their useful lifetime. VBM differs from more traditional maintenance approaches in that it is far more profit-oriented than cost-oriented. was positively recognized to contribute effectively to the material cost reduction initiative.

One of the major benefits of the VBM program is to initiate a mind shift about the role and contribution of maintenance related to the overall asset management and the value contribution for SEC in general as the VBM program generally supports to increase the awareness of operation and cost.

VBM program is not a onetime project but designed as a permanent program and to get the full effect of the program. Continuous application and improvement paired with ongoing training efforts is a key success factor.

"Value Based maintenance changes the way we think about our generation assets. VBM helps us to calculate the value of an asset based on reliable financial, operational and maintenance data. So far, at least 10% reduction in maintenance cost, material and contracts, are expected after completing the implementation of the VBM approach on our assets. Due to the VBM project with Horváth & Partners, we could improve our decision making process: Decisions are now based more on evidence and less on habits. We got a clear picture and directions how to get more value out of our assets." Khalid Al-Tuaimi, Program Sponsor, Generation EVP, Saudi Electricity Company



Gerhard Gottlieb Principal

Horváth & Partners Middle East

Kamal A. AlRefaie VBM Champion

Saudi Electricity Company

Tap the potentials of the digital world for your company!

Horváth & Partners support utility companies in the Middle East and worldwide in improving their performance and customer experience by creating a competitive advantage from the opportunities inherent in digitization.

Together we can realize the full potential of your company!

We look forward to talking with you about your digital future.

Stephan Haller, +971 52 509 7925, shaller@horvath-partners.com Gerhard Gottlieb, +971 55 358 9016, ggottlieb@horvath-partners.com HORVÁTH & PARTNERS





Renewable Energy



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SIEMENS

Power to the People

Siemens LLC

Together with Egypt, Siemens is building a foundation for progress to unlock Egypt's vast potential

The big deal

03 June 2015 – the red-letter day when Siemens was awarded record energy orders to boost Egypt's power generation by 50%. It was the single biggest order ever for Siemens in the company's history. The awarded projects will add an additional 16.4 gigawatts (GW) to Egypt's national grid to support the country's rapid economic development and meet its growing population's demand for power.

Together with local Egyptian partners Elsewedy Electric and Orascom Construction, Siemens would supply on a turnkey basis three natural gas-fired combined cycle power plants, each with a capacity of 4.8GW, for a total combined capacity of 14.4GW. Each of the three power plants –- Beni Suef,



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Lahmeyer International and Tractebel Dubai -Expanding the Energy System of Kuwait

Lahmeyer International - A company of Tractebel

In January 2017, the Ministry for Energy and Water (MEW) awarded Lahmeyer International, a company of Tractebel, with the contract for the development of a master plan to cover Kuwait's demand for electricity and water through 2040. The demand gap is to be closed with appropriate measures. This marked the project start of five technical feasibility studies for power stations and desalination plants utilizing a Building Information Modelling (BIM) process. The layouts of the power stations and the desalination plants are designed as 3D models.

In recent weeks, Tractebel Dubai was awarded the "Integration of Distributed Electricity Generation Resources for sustainable Future Power Grid"-Project by the Kuwait Institute of Scientific Research (KISR), which focuses on the integration of Renewable Energies in the energy system.

Forecasts show demand

The cooperation with the Ministry for Energy and Water (MEW) and the Kuwait Institute of Scientific Research (KISR) started with an up-to-date long-term demand forecast along with an economically and technologically optimal generation expansion plan for gas-fired and renewable energies.





Competence and Passion for Your Projects

Experience, quality and innovative power – this is what Lahmeyer has been standing for in the Middle East for the past several decades. Together with our parent company TRACTEBEL, our 4.500 specialists worldwide are your experienced partners in all project phases, from planning to implementation to operation. With passion for the highest engineering expertise, we are realising the visions of our clients in future-oriented projects.

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Germany and the Middle East: Perfect Partners for a Sustainable Future

Siemens LLC

Siemens' relationship with the Middle East dates back to the mid-1800s when the company's founder, Werner von Siemens, personally led a team to lay telegraphic cables under the Red Sea. Since then, Siemens has been a growth development partner to the region for more than 150 years.

In recent times, Siemens has shown that leading companies from Germany will help the region take its next important steps. Whether through the megaproject in Egypt, which will boost power generation capacity by 50 percent to reach a total of 16.4 gigawatts, or through the company's commitment to developing local skills in the United Arab Emirates (UAE) with an in-kind software grant of up to 100 million euros, Siemens is a perfect partner to the region. prehensive control by the plant operators. As an example, the company's Sinamics VFDs were used to pump the thermal oil and run cooling fans during the charging/discharging cycles of the TES.

Aside from simplified plant operation, the Siemens SCADA complemented the research of Masdar Institute and EnergyNest, for instance by enabling EnergyNest specialists in Norway to remotely monitor the TES parameters. The system also allowed the transmission of critical alarms to the Masdar Institute research personnel by SMS, during out-of-office periods.

EnergyNest's pilot TES project is just one example of how the UAE is supporting the incubation of innovative technologies and is a critical project in that it is geared towards supporting the country's ambitions for a varied and sustainable energy mix. Technology and knowledge sharing are key not only to the UAE and the GCC achieving their ambitions, but also for countries across the world looking for bold leadership in combatting climate change and maintaining prosperous economies.

Siemens - as a barometer of continued economic success in Germany - will continue to work to bring markets together. The countries of the Middle East are an important partner to Siemens and Germany and it is this spirit of collaboration that will help us to prosper together.



Lisa Kamin Head of Marketing and Strategy Oil & Gas

Siemens Middle East







Energy Efficiency



Energy Efficiency Project – Remediation of Groundwater Wells in Jordan

BAUER Resources GmbH

The Middle East is one of the most arid regions in the world. Jordan relies fully on groundwater to supply its 9.5 million people but is developing alternatives to guarantee the water supply in the future. It is therefore all the more important that existing groundwater wells deliver water reliably and efficiently.

Introduction

The Middle East is one of the most arid regions in the world. In the Hasemite Kingdom of Jordan for example, supplying people with drinking water is a major problem because water is scarce. Jordan is considered as one of the ten most water scarce countries in the world. High population growth, the depletion of groundwater reserves and the impacts of climate change are likely to aggravate the situation in the future. The population has grown by more than 50 percent in the last ten years due to the country's accommodation of and loyalty to refugees. The accessible water sources can hardly meet the requirements any longer, the rivers, e.g. river Jordan, are exploited in excess. These are the only natural water sources, Jordan relies fully on groundwater to supply its 9.5 million people but





Water



FRÄNKISCHE uses 8,040 plastic Rigofill ST-V modules to make the newly emerging port of Doha in Qatar flood-safe © FRÄNKISCHE Rohrwerke

Infiltration System "Made in Germany" for Qatar

The stormwater management expert uses a Rigofill ST-V stormwater tank as a means of flood protection

FRÄNKISCHE Rohrwerke

Despite high temperatures and desert terrain, stormwater management is an important issue in the Gulf States as well. For this reason, FRÄNKISCHE Rohrwerke installed an infiltration basin consisting of 8,040 Rigofill ST-V modules at the newly emerging port of Doha, the capital city of Qatar. To ensure stormwater handling that is efficient in every respect, the system provider offers an ideal complete end-to-end solution for every initial situation and requirement. The German enterprise pursues four major tasks of stormwater management: Transportation, treatment, storage and discharge.

Sand stretching as far as the eye can see and a hot desert climate with temperatures of over 50 °C at times: Qatar is one of the driest countries on earth. It rains merely five to ten days in the period between winter and spring – torrential rainfall though corresponds to around 25 percent of the annual precipitation in Germany. In Doha, directly at the Persian Gulf, the proportion of paved areas in urban zones keeps on growing and the investments of the city into stormwater drainage have long been insufficient. Due to this, rainfall often results in floods with more and more salt water from the soil emerging on the surface. To avoid this phenomenon at the port of Doha, the German stor-

FRÄNKISCHE



4 challenges – 1 solution

This is how stormwater management is done today.

Where stormwater falls on paved surfaces it cannot drain away naturally. FRÄNKISCHE provides a system of perfectly matched components to ensure a reliable and efficient collection, treatment, storage and discharge of stormwater in any terrain.

Responsibility towards mankind, nature and the economy: Systematic stormwater management.



Clean water is being collected from the wetland on the left and either reused for agriculture or transferred to the evaporation areas on the right © BAUER Nimr LLC

Nimr Water Treatment Plant – Environmentally Friendly Water Treatment

BAUER Resources GmbH

The Nimr water treatment plant project is located in the middle of the desert south of Muscat in the Sultanate of Oman. It is the world's biggest commercial water treatment plant treating formation water in the oil field of Nimr in Oman with upstream oil recovery and an energy saving of 98%. The idea is to use a plant based sustainable water purification system to clean the water, which is extracted together with the oil to make the oil production environmentally friendly.

Introduction

The Nimr water treatment plant (NWTP) project is located in the middle of the desert south of Muscat in the Sultanate of Oman. The distance from the capital of the sultanate to the site is more than 700 km. The temperatures in the region can be as high as 60°C in the summer months, making it a harsh environment to work in. This water treatment project was co-executed by Bauer Nimr LLC an Omani-Germany Joint Venture Company and Petroleum Development Oman (PDO), the leading oil and gas exploration and production company in the Sultanate. 27th-28th March 2018

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Special Topics



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Emirati sustainability leaders explore sustainable water and energy solutions at BASF headquarters in Germany

BASF

Eight members of the Young Future Energy Leaders (YFEL) program visited the Ludwigshafen headquarters of the largest chemical producer in the world, BASF, to learn how innovations in chemical engineering are helping to solve some of the world's biggest challenges, like providing clean water to a growing population and achieving energy efficiency. YFEL is an outreach program of the Masdar Institute, part of Khalifa University of Science and Technology.

During the three-day visit, the YFEL members toured various BASF site facilities, including one of the largest wastewater treatment plants in Europe and the BASF Competence Center Fuels and Lubes. They also received firsthand insights from BASF's experts in water chemicals and ultrafiltration on how the company manages wastewater from BASF's production process and discussed with the experts new and simple solutions to



[©] Kuwait Foundation for the Advancement of Sciences

KFAS Initiatives in Energy and Water in Kuwait

Kuwait Foundation for the Advancement of Sciences

The Kuwait Foundation for the Advancement of Sciences (KFAS), a private non-profit organization, as a catalyst and a stimulant towards the advancement of Science Technology and Innovation (STI) system, has initiated pilot projects that demonstrate the application of proven technologies in Kuwait. These projects address national priority areas such as energy and water. In response to the directives of His Highness the Amir Shaikh Sabah Al-Ahmad Al-Jaber Al-Sabah, the Emir of Kuwait and Chairman of KFAS' Board, to prioritize the use of renewable energy to reach 15% of the total electricity demand by the year 2030; KFAS has initiated two pilot projects to accelerate the deployment of renewable energy and lay a foundation for policies and regulations related their application.

Introduction

The Kuwait Foundation for the Advancement of Sciences (KFAS) is a private non-profit organization dedicated to supporting the progress and advancement of science and

technology. Established by an Amiri decree in 1976, H.H. the Amir of Kuwait Sheikh Sabah Al-Ahmed Al-Sabah continues to chair the Foundation's Board of Directors,



© KWS PowerTech Training Center

Flexible Operation of Power Plants and new Challenges for Staff Training

KWS PowerTech Training Center

Renewable energies are rapidly evolving as an increasingly crucial part of the energy economy in many countries around the world. The volatile and unpredictable nature of wind and solar power, however, makes highly flexible conventional power plants indispensable for a steady, safe energy supply. Operating such plants under extremely dynamic circumstances requires skilled, expertly trained personnel. The instruction tools of choice are state-of-the-art simulators that reproduce every possible operating condition of a power plant in a lifelike control room environment.

Solar and wind power generation is characterized by volatility, intermittency and reduced predictability. A variety of measures, as possible options (e.g. energy storage, grid expansion, demand-side management, flexible operation of thermal power plants) will enable power systems worldwide to counter the impact of such detrimental factors in the future. In this regard, the flexibility option will be the most important countermeasure that permits immediate implementation. Flexibility can be described as a cluster of capabilities such as faster load sequencing (ramp up and down), faster startup and shutdown (two- and multi-shifting) and lower minimum load operation without support firing. This load pattern will lead to higher operational cost due to fuel and lifetime consumption.

The need for an expansion of electricity generation as a direct result of economic and population growth (urbanization and industrialization) coincides with challenges to meet growing

BUILDING BRIDGES BETWEEN GERMANY AND THE ARAB



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About us

The Ghorfa Arab-German Chamber of Commerce and Industry is the competence centre for business relations between Germany and the Arab world. It was founded in 1976 and has been located in Berlin since August 1, 2000. For over 40 years, the Chamber has been committed to promoting business relations between Arab countries and Germany and serves as the primary centre of expertise within the Arab-German business community.

Our network

Based on its invaluable heritage and its ambitious commitment, the Chamber has a powerful network consisting of both institutional and entrepreneurial decision-makers from Arab countries and from Germany. The Ghorfa operates under the umbrella of the Arab League and the Union of Arab Chambers. Our chamber is the official representative of all Arab Chambers of Commerce and Industry in Germany. We work closely with the Arab embassies in Germany, the Arab League and related governmental bodies in Arab states. It is part of the worldwide organisation of Arab foreign Chambers of Commerce and Industry. The Ghorfa cooperates with German governmental bodies on a federal and regional level and with the most important German industrial associations.



What we do

We actively promote and strengthen business relationships among our members and within the wider Arab and German business community. We pave the way for stronger business cooperation in the fields of trade, industry, finance and investment between Arab and German business partners. Strategic partnerships, based on mutual benefits and understanding, create new business opportunities to facilitate economic benefits for both counterparts. We therefore mainly focus on networking, communication and on providing information about relevant economic and industrial developments.





Building Bridges between Germany and the Arab World

Networking

- Quick access to economic and political decision-makers
- Connecting with matching business partners
- Forwarding business enquiries to relevant recipients from our database with 15,000 contacts
- Participation in high-ranking events, conferences and further networking platforms (e. g. Arab-German Business, Energy, Health, Education and Vocational Training Forum)
- B2B meetings with high-ranking business people through events, delegation visits and upon special request

- Exclusive member events such as roundtables and working groups
- Professional all-round assistance for trade fair participation

Consulting

- General and business-related intercultural consulting
- Specifying possible business cooperation and evaluation of potential business partners
- Country and branch-specific analysis

- Comprehensive and detailed market information
- Competent market entry assistance
- Mediation and arbitration in cases of business disputes
- Advice and guidance through the multitude of offers and competing products in the German and Arab market
- Raising the presence and visibility of Ghorfa member companies in the competitive market
- Visa and commercial documents support

Information

- Regular reports with relevant information about economic and business trends
- Information on the latest economic developments, promising markets and sectors, legal and political background
- Quarterly bilingual business magazine SOUQ, providing an overview on cooperation possibilities and activities within the Arab-German business community
- Complimentary copy of our Business Guides, Sector Specific Books (e. g. health, education, energy or infrastructure) as well as the Arab-German Business Directory



We welcome you to become part of the high-level network that we provide for professionals and business leaders from the Arab world and Germany. Join us and share our vision of prospering Arab-German business relations. For further information concerning membership in our chamber please contact us:

Ghorfa

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CONTRIBUTING COMPANIES AND INSTITUTIONS



At BASF, we create chemistry for a sustainable future. We combine economic success with environmental protection and social responsibility. The approximately 114,000 employees in the BASF Group work on contributing to the success of our customers in nearly all sectors and almost every country in the world. Our portfolio is organized into five segments: Chemicals, Performance Products, Functional Materials & Solutions, Agricultural Solutions and Oil & Gas. BASF generated sales of about €58 billion in 2016. BASF shares are traded on the stock exchanges in Frankfurt (BAS), London (BFA) and Zurich (BAS).

BASF

- **Project:** Emirati sustainability leaders explore sustainable water and energy solutions at BASF headquarters in Germany
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BASF FZE

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BAUER Resources GmbH

- Project: Energy Efficiency Project remediation of groundwater wells in Jordan
- Project: Nimr Water Treatment Plant environmentally friendly water treatment
- Contact: Dennis Alexandersen, International Business Development Phone: +968 22009-560 | Dennis.Alexandersen@bauer.de BAUER Nimr LLC | P.O.Box 1186 | P.C 114 | Al Mina Muscat | Sultanate of Oman

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FRÄNKISCHE Rohrwerke

- Project: Infiltration System in Qatar "Made in Germany"
- Contact: Horst Dörr, Head of Sales Export Drainage Systems at FRÄNKISCHE Rohrwerke

FRÄNKISCHE Rohrwerke

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BAUER

Under the umbrella of BAUER Resources GmbH, several business divisions and subsidiaries such as Esau & Hueber, German Water and Energy Group (GWE) or Site Group act as full service providers within the sectors water, environment and natural resources. Their competences are water treatment, automation, environmental remediation and waste management, drilling technologies as well as well drilling and constructed wetlands.

FRÄNKISCHE

FRÄNKISCHE develops, produces and sells a wide variety of pipes, accessories and various system components for the structural and civil engineering industry, as well as automotive and industrial applications. The owner-managed family enterprise currently employs 3,500 people worldwide, around half of them at the headquarters in Königsberg in Germany.

HORVÁTH A PARTNERS

Horváth & Partners are the specialists for the corporate performance management and performance optimization of private and public sector organizations. As such we offer our clients consulting services from developing the business concept through to anchoring the solution in the company. Horváth & Partners is German based with additional offices in Abu Dhabi, Riyadh and Jeddah.

Horváth & Partners Management Consultants

Project: Value Based Maintenance within SEC

Contact: Stephan Haller, Managing Director Horváth & Partner Middle East GmbH

Horváth & Partner Middle East GmbH

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The Kuwait Foundation for the Advancement of Sciences (KFAS) is a private non-profit organization dedicated to supporting the progress and advancement of science and technology. The main objective of KFAS is to stimulate creative initiatives and build a solid scientific and technological base while at the same time creating an environment that encourages innovation. Current projects include widening the public awareness of science, creating an environment in which innovation can flourish, and enhancing private and public sector research capacities.

Founded in 1957, KWS PowerTech Training Center (KRAFT-

WERKSSCHULE E.V. in German) is Germany's leading vocational training institution for the power industry. In keeping with its pur-

pose of always providing state-of-the-art power plant personnel

training for its clients from around the world, the school's training

contents, tools and methods constantly evolve both in scope, depth



Kuwait Foundation for the Advancement of Sciences

Project: KFAS Initiatives in Energy and Water in Kuwait

Contact: Dina AlNakib

Kuwait Foundation for the Advancement of Sciences

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KWS PowerTech Training Center

Project: Flexible Operation of Power Plants and new Challenges for Staff Training

Contact: Uwe Möller, Senior Project Manager, International Activities Dr. Dariush Hourfar, Lecturer, Consultant

KWS PowerTech Training Center

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and volume.

Lahmeyer offers a broad range of planning and consultancy services in the fields of energy, hydropower and water resources as well as the building and transportation sectors. Over the last 50 years, the company became one of the leading worldwide operating engineering companies with projects in more than 100 countries. Since December 2014 Lahmeyer belongs to Tractebel, and thus is part of the ENGIE Group.

Lahmeyer International GmbH

Project: Lahmeyer International and Tractebel Dubai - Expanding the Energy System of Kuwait

Contact: Sabine Wulf, Head of Marketing Communications & CSR

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Siemens LLC

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- **Project:** Power to the People
- Project: Germany and the Middle East: Perfect Partners for a Sustainable Future
- Contact: Mariam Arsanios, Head of Communications, Siemens Egypt

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Imprint

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LAYOUT AND TYPESETTING

Fadhl Al-Romaima Technical Director Ghorfa Arab-German Chamber of Commerce and Industry

Energy & Water Guide 2017/18

Partnerships and Perspectives of Arab-German Cooperation



PASSION FOR PROGRESS



SERVICES OF BAUER RESOURCES

- Water Well Drilling
 - Exploration Wells
 - Process Water Treatment
- Waste Water Treatment
- Ground Water Treatment
- Produced Water Treatment
- Constructed Wetlands
- Decontamination (NORM)
- Remediation
- Hazardous Waste

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www.watersolutions.basf.com

We create chemistry