



Arab-German Yearbook 2018

Construction and Consulting

Arab-German Yearbook 2018

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Preface

Due to the growth of the Arab population the need for sustainable, safe and intelligent city-concepts, including the creation of new places of residence is increasing. The seventh edition of the Arab-German Yearbook "Construction and Consulting" sets its focus specifically on urban development topics, where different chapters focus on the idea of the creation of a "smart-city".

Since 2011, Germany has generated a continued annual growth which amounted to 2.2% in 2017. The German economy is obviously booming more than ever. Germany is also the world champion in exports. Last year, Germany reached an all-time high with more than EUR 1,279 bn. With its GDP standing at € 3,263 bn, Germany is the biggest contributor to the European Union's economy, accounting for more than 20% of the GDP. This is exemplified by the execution of infrastructure projects in the GCC countries, as well as in sustainable environmental and energy projects in North Africa.

German companies and institutions have been long-term business partners for the Arab world and are well known for their high-quality services. To ensure a balanced and sustainable exchange, they are not only exporting top-notch products, but also bringing education and know-how along with it. Due to their unique and globally renowned experience and knowledge, German engineers, architects and constructors have a considerable impact on the construction sector in the Arab world.

In this publication, jointly accomplished Arab-German projects illustrate the continuing intensification of cooperation between Arab and German partners. The increasing attention for cooperation is also reflected by the success of the Arab-German Business Forum, which is organised by the Ghorfa for the 21st time this year.

The Ghorfa Arab-German Chamber of Commerce and Industry has a powerful network consisting of both institutional and entrepreneurial decision makers from Arab countries and from Germany. As the competence centre for business relations between Germany and the Arab world, Ghorfa promotes and strengthens business relations between Germany and the Arab countries in the fields of trade, industry, finance, and investment.

We would like to thank the German companies for their valuable contributions, Ms. Tatjana Arnold for her commitment and dedication to the publication and also Mr. Fahdl Al-Romaima for layout and design. We hope you enjoy reading this book and wish you inspiration for further reference projects.



Dr. Peter Ramsauer



Abdulaziz Al-Mikhlaifi

A handwritten signature in blue ink, appearing to read 'Dr. Peter Ramsauer'.

Dr. Peter Ramsauer
*President
Federal Minister ret.*

A handwritten signature in blue ink, appearing to read 'Abdulaziz Al-Mikhlaifi'.

Abdulaziz Al-Mikhlaifi
Secretary General

»As a true 21st century resource efficient city, Badya City's sustainability strategy fully addresses the demands of the energy and power sector as well as the water and land use sector. Accordingly, the buildings will significantly reduce the power demand through an integrated design approach including passive shading devices, improved insulation levels of the outer envelope and an optimised air handling system. «

Joachim Schares, Managing Partner and Jürgen Häpp, Project Director, AS+P Albert Speer + Partner GmbH



Urban Building and Planning



Polycentrical and multi-faceted: one urban core, six district clusters
 © AS+P Albert Speer + Partner GmbH, visualization: HHVISION

Badya City, Cairo - A Smart Approach for a Smart City

AS+P Albert Speer + Partner GmbH

The new mixed-use development Badya City, situated 30 kilometres west of Central Cairo within the capital city's strategic extension area, is a smart approach. As part of the 6th of October City, Badya City will be developed on an area of approximately 1,260 hectares by Palm Hills Developments in collaboration with the Government of Egypt and New Urban Communities Authority.

Its integrated planning, digital tools and well-thought-out infrastructure, add to the development of a human-centred, 24/7, all near-by home base for about 150,000 inhabitants, offering about 48,000 workplaces.

Developed by an Integrated and Complete Design Team

The interdisciplinary design team of AS+P Albert Speer + Partner (AS+P) included urban planners and designers,



Smart Urban Design Tools for Mitigating the Urban Heat Island Effect

HTW Berlin - University of Applied Sciences

Smart Urban Design Tools can help to mitigate urban heat and are at the same time environmentally friendly. But which of the tools fits best? The following article will give some answers.

Introduction

Cities are under threat from Climate Change. Raising sea levels put many coastal cities under pressure and the

increasing frequency of extreme weather events is already a challenge for urban development. Furthermore, an increase of the average temperature can cause problems for those parts of the population which are highly vulnerable against



Construction of the spillway © STRABAG International GmbH

Flood Protection for the City of Sur

STRABAG International GmbH

In the Sultanate of Oman, STRABAG built one of the country's biggest dams: The story of a special partnership project.

Oman. The sultanate on the south-eastern coast of the Arabian Peninsula is mostly desert. Nevertheless, flood protection is an important issue here. The country has several dams designed to collect the sudden bursts of water that can accumulate when it rains. The geographical location means that annual monsoons reach the coastal regions with rain that lets the sand dunes bloom – a unique display of nature that draws many tourists every year.

But things can get really dangerous when a cyclone hits the country. In 2007, Cyclone Gonu hit Oman with such force that it caused numerous casualties and flood damage in the billions. The destructive force of this very rare weather phenomenon led to the revision of several dam projects that were already in planning and to the development of several new projects. The coastal city of Sur, where Gonu had also caused flooding, received a new flood protection system. An important pillar is the con-

Khalifa Port Industrial Zone and a New Truck Road, Abu Dhabi

Bilfinger SE

Bilfinger Tebodin Middle East executed the Front End Engineering Design (FEED) for the gas network in KIZAD Area-A.

KIZAD - Khalifa Port Industrial Zone – Abu Dhabi

Location: Abu Dhabi, United Arab Emirates | Pipelines

KIZAD, with its 417 km² of industrial land will be creating a wealth of opportunities on a global scale. The entire Khalifa port area that includes KIZAD is being managed by ADPC (Abu Dhabi Ports Company). Under a framework contract Bilfinger Tebodin Middle east executed the Front End Engineering Design (FEED) for the gas network in KIZAD Area-A. Objective of the project was to supply sales gas to the different industrial consumers in the area. The design included the review of pipeline corridor, hydraulic analysis of the pipeline network, developing the network design, metering of the gas and several HSE studies.

KIZAD Infrastructure in Abu Dhabi - Taweelah, United Arab Emirates
© Bilfinger SE



Detailed design for KIZAD Secondary Infrastructure comprised of roads, combined wastewater, potable and process water, storm and groundwater, irrigation, landscaping, electrical and telecommunication systems and utility service corridors

Abu Dhabi Department of Transport (DoT)

Project: New truck road

Location: Abu Dhabi, United Arab Emirates

The scope of work consisted of project management, conceptual design, preliminary and detailed design, construction tender preparation and construction management for a 20 Km long carriageway (3x3).

New truck road © Bilfinger SE





Irrigation pumping station with surrounding farms © Dorsch Gruppe

Bringing Visions to Life through German Engineering and Specialized Project Management

Dorsch Gruppe

Great feats are accomplished when German engineering is combined with the creative architectural vision of the Arab world and the management style of world class project managers.

For over 65 years, since 1954, the Dorsch Gruppe has been providing its services in the Middle East, which was the first region outside of Germany where it operated following its founding in 1951. Throughout the ensuing period, we have presided over key, landmark projects that were essential cornerstones in the growth of the region. We have also built up our market knowledge through a strong understanding of the regional culture and local needs, while focusing on how different countries perform, grow and succeed within the distinct social, economic and environmental conditions they face. Our continued success is a testament to our deep insight and ability to adapt by providing innovative solutions to suit evolving needs.

Dorsch Middle East allocates its substantial resources through a fully integrated approach that provides a solid

platform for providing its different core engineering services, as well as various management and planning competences. Operating in a complex and dynamic market, Dorsch Middle East has a long standing, recognised track record of execution excellence. With a workforce of over thousands of qualified professionals in the region, we are well equipped to deal with a whole spectrum of challenging projects. This distinction in performance is further reinforced by our determination to forge a corporate culture where common values are shared with our people, as well as the clients we work with and the countries in which we operate.

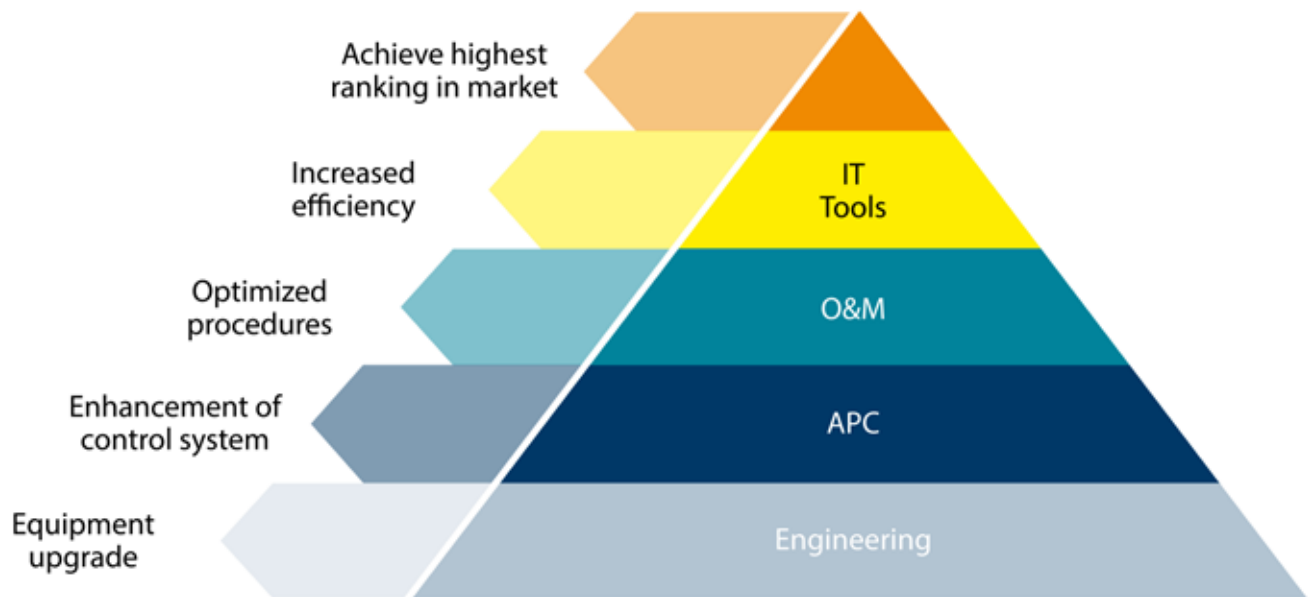
This unique experience gained from different projects and contextual settings is what truly distinguishes us from our competitors, and provides a stellar foundation for continued success in the region.

» The global trend of energy transition results in a tremendous increase of fluctuating power generation by solar and wind energy. Looking on Arabian countries the conditions for solar energy as well as wind are excellent. But there are also challenges to be handled such as misalignment of available renewable power to the peak demand and grid stability. «

Dr.-Ing. Dipl.-Wirt. Ing. Jens Reich, Head of Sales Energy Technologies, STEAG Energy Services GmbH



Urban Energy Efficiency



Pyramid of levers to facilitate flexibilisation © STEAG

Energy Systems of the Future

Facilitating the energy transition and securing stable and efficient power supply

STEAG Energy Services GmbH

Frequency control reserve from large-scale battery systems and improved flexibilisation of exiting generation schemes help to mitigate increased levels of fluctuating renewable sources to the benefit of grid stability. The described battery project reflects an investment of 100 million Euros into six large-scale battery systems totaling 90 MW in Germany.

Introduction

The global trend of energy transition results in a tremendous increase of fluctuating power generation by solar and wind energy. Looking on Arabian countries the conditions for solar energy as well as wind are excellent. But there are also challenges to be handled such as misalignment of available renewable power to the peak demand and grid stability.

In our view it is beneficial to review the learnings from Germany's energy transition. The German framework in the generation sector is not the masterpiece, but there are several approaches, which may be adaptable to the situa-

tion in the Arabian countries. Today's electricity supply in Germany is decreasingly based on the existence of large central power plants that in the past ensured electricity supply and stability of the grid. As a consequence of the nuclear phase-out and the progressive energy transition, 55 % - 60 % of the German gross electricity demand is to be covered by energy from renewable sources by 2035. The decreasing proportion of energy fed into the grid by conventional power plants and the increasing proportion of fluctuating infeed from renewable energy sources require a flexibilisation of power generation and grid operation, especially in lower-level voltage systems.

» The Ministry of Health awarded the design of the new generation of primary care health centres to the Joint Venture of BW-Engineers and Office Mohamed Al Guwaihes. Over the next years the Ministry of Health plans to build hundreds of communal health centres across Saudi Arabia, to provide an easy and direct access to primary care to citizens. «

Marc Eggert, Managing Partner Healthcare & Architecture and Albrecht Meyer,
Project Manager, bw Engineers GmbH



Urban Healthcare Facilities



An artist's impression of the new "Type L" centre with semi-translucent shading © BW-Engineers GmbH

A New Generation of Health Centres in Saudi Arabia

BW-Engineers GmbH

The Ministry of Health awarded the design of the new generation of primary care health centres to the Joint Venture of BW-Engineers and Office Mohamed Al Guwaihes.

Over the next years the Ministry of Health plans to build hundreds of communal health centres across Saudi Arabia, to provide an easy and direct access to primary care to citizens. The design reflects the Ministry's new corporate identity of modern and bright design, which is supported by the architects' selection of materials, colours and indirect daylight. The health centre prototype design is organized in three different sizes, which will be implemented in various cities and rural areas according to the local demand.

With this large repetition on various sites across the country, the project is predestined for BIM technology

(Building Information Modelling) by revealing efficiencies during design, construction, and operational phases. The implementation process is driven by BW-Engineers BIM group that is partly represented on the ISO BIM chapter.

Supporting the Saudi Vision 2030

Following the concept of diversification and privatization, some centres will include complementary private sector functions such as health club, pharmacy and coffee shop. This will offload the capital costs from the ministry to focus on its core services of public health care.



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WORK

» This paper proposes a study of smart off-grid water distribution networks to ensure energy independent, optimal, sustainable water management and water distribution for agriculture and food processing located in rural near-desert areas. «

Horst Schulte, Department of Engineering I, Control Engineering Group,
HTW Berlin - University of Applied Sciences



Urban Water Management

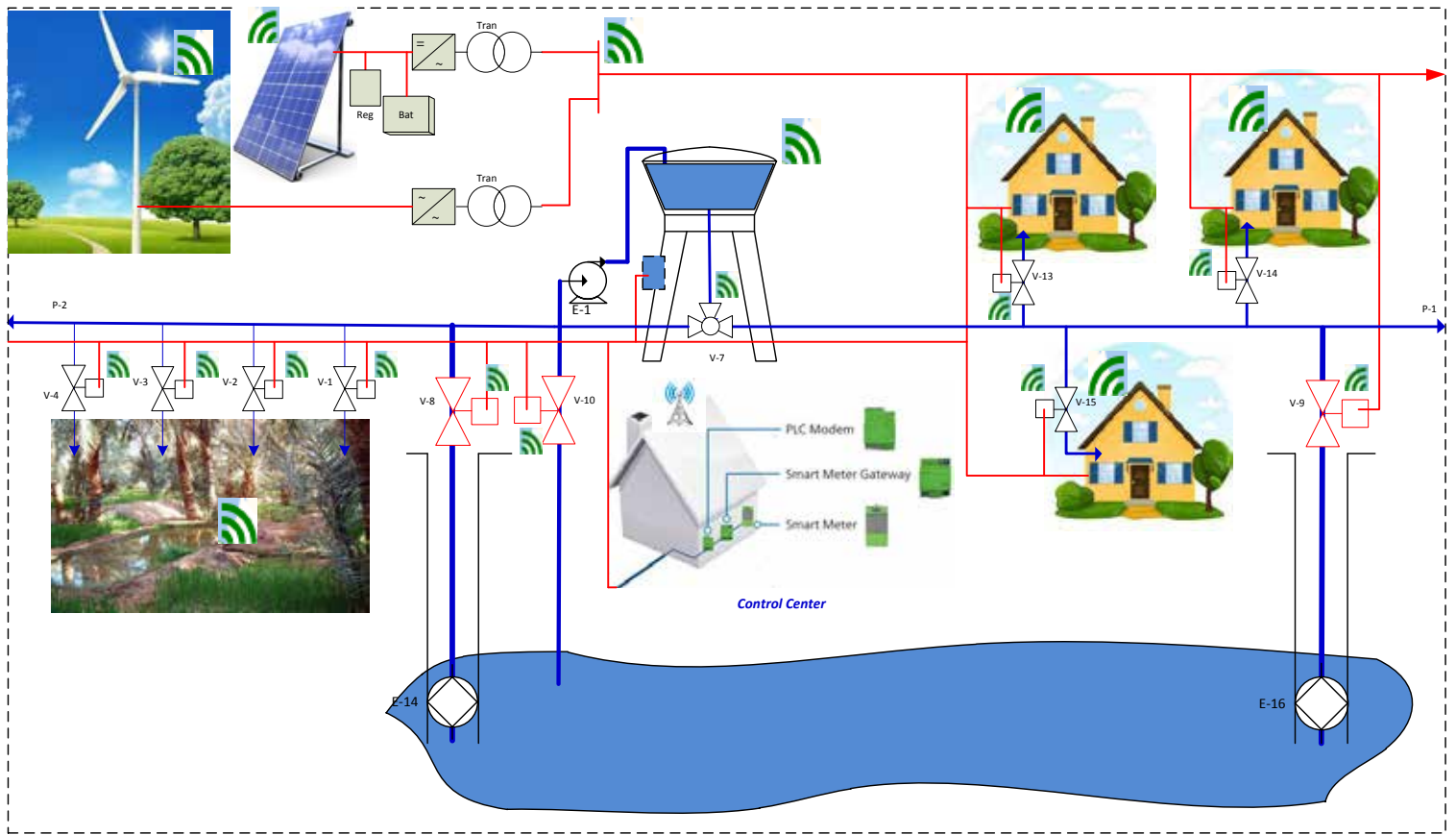


Figure 1: Schematic diagram of a smart off-grid water networks for agricultural systems and small food processing

Smart off-grid water networks for agricultural systems and food processing in near-desert regions

HTW Berlin - University of Applied Sciences

This paper proposes a study of smart off-grid water distribution networks to ensure energy independent, optimal, sustainable water management and water distribution for agriculture and food processing located in rural near-desert areas.

Abstract

To ensure the reliable supply of water, the safety of water quality, and the energy independence of water distribution, the smart off-grid water network should integrate five prime research areas: (1) model-based fault-tolerant platform design in both - water and electrical networks, (2) self-sustaining reliable supply of electrical units like pumps, sensors of the water network and auxiliary units

of agricultural systems with regenerative energy sources, (3) intelligent control of water flow using bi-directional communication in the water infrastructure, (4) digital control scheme dealing for water reuse with risk-minimization in the water infrastructure, and (5) energy efficiency in operating and maintaining water infrastructure. The scenarios under investigation are interesting for farms and food production factories that adopt sustainable models and methods of production with low

» Digitisation is currently one of the most influential drivers in the real estate industry. Despite intensive efforts and substantial investments in the IT landscape, a variety of IT projects do fail. [...] With its innovative character, the degree of crosslinking and the virtually unlimited amount of data, IT projects include an extraordinary degree of complexity and instability.«

Prof. Dr. - Ing. Regina Zeitner, Founder, Competence Center Process Management Real Estate,
Professor of Facility Management, HTW Berlin - University of Applied Sciences



Special Topic

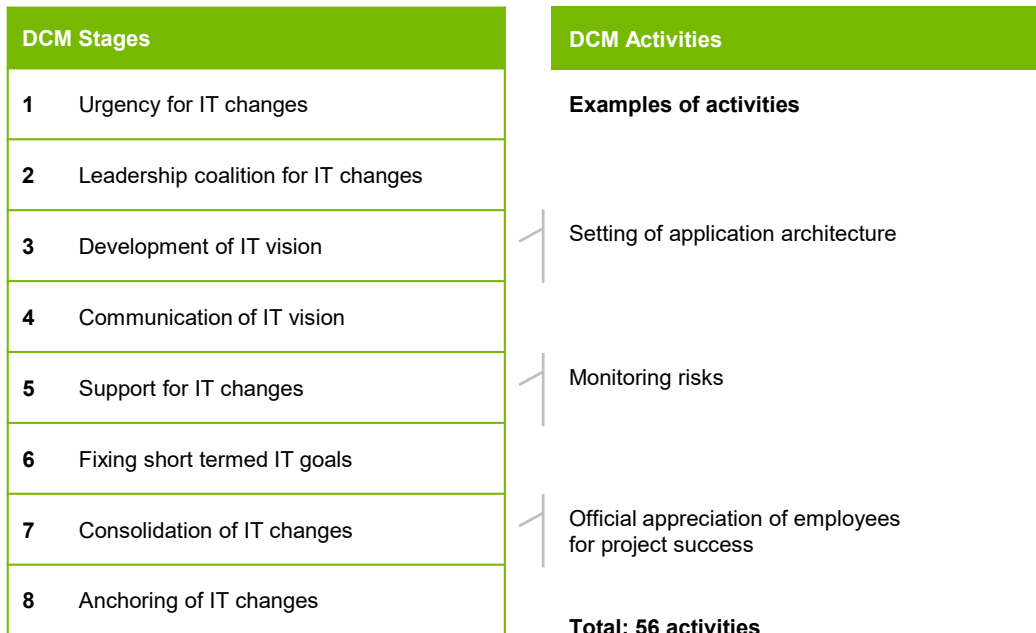


Fig. 1: DMC-8-Stages-Model based on Kotter

Why IT projects fail - and what makes them successful

HTW Berlin - University of Applied Sciences, Competence Center Process Management Real Estate

Digitisation is currently one of the most influential drivers in the real estate industry. Despite intensive efforts and substantial investments in the IT landscape, a variety of IT projects do fail.

A study by the University of St. Gallen confirmed a high dropout rate for IT projects and estimates the annual financial loss in the EU at about € 142 billion. The IT costs per workstation are significant. In the real estate industry, they range between 7,000 and 10,000 € annually and topped the burden rates (without IT) clearly.

Looking for the causes of these mistaken investments, the nature of IT projects must be analysed. With its innovative character, the degree of crosslinking and the virtually unlimited amount of data, IT projects include an extraordinary degree of complexity and instability. Complexity and instability have been extensively studied at the theoretical level in terms of "dynamic systems". The results show that to control these "dynamic systems" strong leadership managers are required, who are challenged to take the fears of their staff and mobilise fellows for transformation processes.

With a focus on the digital transformation process, studies of the MIT point out that technology is not only the key to IT success, but the accompanying project management is. Under the slogan "We need better managers, not more technocrats"¹, scientists demonstrate that the design of the change process is the primary success factor. However, another study shows: Change Management is currently not a strong topic within the German real estate industry².

Due to the high lost investments in the IT sector and the first indications that a structured digital change management could help, a research model was developed. The underlying hypothesis is: Digital change management leads to increased IT success. The new Digital-Change-Management-Model (DCM) based on the established

¹ Westermann/Bonnet/Mc Afee, *Leading Digital*, 2014

² Weißbach/Finn, *Change Management in der Immobilienwirtschaft*, Bachelor Thesis HTW Berlin, 2015

Ghorfa

BUILDING BRIDGES
BETWEEN GERMANY
AND THE ARAB WORLD



Ghorfa Arab-German Chamber of Commerce and Industry

Building Bridges between Germany and the Arab World

Economic relations between the Arab world and Germany are traditionally excellent and have experienced a boom. Trade balance between the Arab world and Germany has more than doubled in the past years and reached around EUR 50 billion in 2016.

Germany has the largest economy in Europe and accounts for around 21% of the EU's GDP and 16% of the EU's population. Thanks to its central location in Europe, its first-class infrastructure and its excellent business climate, Germany is the perfect hub for companies entering the European market with 500 million potential customers. The strong, knowledge-driven and well-diversified German industry holds a leading position in many sectors worldwide.

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 mission

The Ghorfa pursues non-profit goals to enhance and strengthen business relations between Germany and the Arab world in the fields of trade, industry, finance and investment. Strategic partnerships based on mutual benefit and understanding, create new business opportunities that facilitate economic benefits for both sides. The Ghorfa, therefore, mainly focuses on networking, consulting and on providing information about relevant economic and industrial developments.

left to right: Karlfried Bergner (German Ambassador in Kuwait), Dr. Peter Ramsauer (Federal Minister ret., MoP), Sheikh Jaber Al-Mubarak Al-Hamad Al-Sabah (Prime Minister of Kuwait), Ali Thuyan Al-Ghanim (President, Kuwait Chamber of Commerce and Industry), Abdulaziz Al-Mikhlaifi (Secretary General, Ghorfa)



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CONTRIBUTING COMPANIES AND INSTITUTIONS

AS+P

AS+P Albert Speer + Partner GmbH

AS+P opts for a comprehensive approach: Our interdisciplinary team of 200 experts develops and plans projects from regional planning through to small architectural details. From our offices in Frankfurt and Shanghai we are active worldwide. In the process, we emphasise the expectations people will have of their living environment in the future while prioritising resource and energy efficiency.

Projects: A Smart Approach for a Smart City: Badya City, Cairo

Contact: Joachim Schares, Managing Partner

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Bilfinger SE

Projects: Khalifa Port Industrial Zone and a New Truck Road

Contact: Ali Vezvaei, President and CEO for Bilfinger Middle East

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bw • engineers

BW-Engineers stand for innovative interdisciplinary performance and transfer German engineering standards across borders. BW-Engineers member companies employ over 2,000 planners and engineers in the areas of Project Management, Facility Management Consultancy, Geo and Environmental Engineering, Regional and Urban Planning – Traffic and Transport, Water, BIM / MEP, Structural Engineering, Architectural Design.

BW-Engineers

Project: A New Generation of Health Centres in Saudi Arabia

Contact: Dr. Thomas Ertel, Managing Director

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COMPETENCE CENTER PROCESS MANAGEMENT REAL ESTATE

Competence Center Process Management Real Estate HTW Berlin

The Competence Centre Process Management Real Estate (CC PMRE) is a research institute of the HTW Berlin. CC PMRE collects and bundles knowledge for effective real estate management, whether it is for more efficient processes, forward-looking organisations or powerful IT systems. Investors, asset and property managers and facility managers will find here the relevant information for setting the course for the future.

Project: Why IT-Projects fail - and what makes them successful

Contact: Prof. Dr.-Ing. Regina Zeitner, Founder, Competence Center Process Management Real Estate & Professor of Facility Management, University of Applied Science (HTW Berlin)

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Dorsch Gruppe – Middle East

For over 65 years, the companies of Dorsch Gruppe have been respected consulting and engineering partners for industrial clients, private investors and public institutions. The Dorsch Gruppe with more than 2,000 employees is Germany's largest independent planning and consulting company. Our experts work in a future oriented and quality conscious way for people in all Arab countries. They offer an entire performance spectrum in the fields of project development, infrastructure, architecture, airports, oil and gas, urban planning, water, transport and environment as well as asset management and operation maintenance.

Project: Bringing Visions to Life through German Engineering and Specialized Project Management

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**Hochschule für Technik
und Wirtschaft Berlin**

University of Applied Sciences

University of Applied Sciences, HTW Berlin

HTW Berlin is the youngest publicly funded university of applied sciences in Berlin. Thanks to a wide range of attractive study programmes, experienced researchers and a highly motivated administrative team, it has established itself as one of the biggest and most diverse universities of applied sciences in Germany. More than 13,000 students, 270 professors, 800 freelance lecturers from business and industry, and 450 staff employed in service, administration and scientific projects work together hand in hand to deliver excellence in teaching and research.

Project 1: Smart Urban Design Tools for mitigating the Urban Heat Island Effect

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Project 2: Smart off-grid water networks for agricultural systems and food processing in near-desert regions

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Project 3: Why IT-Projects fail - and what makes them successful

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STEAG Energy Services GmbH

STEAG Energy Services is the engineering arm of STEAG GmbH, among the leading IPPs in Germany. 2,000 energy professionals globally provide services in project development and design, construction, operation and optimization, both for new builds as well as for efficiency improvement and modernization of energy generation facilities of all kinds. The design engineer with hands-on operating experience is our trademark.

Project: Energy Systems of the Future

Contact: Dr.-Ing. Dipl.-Wirt. Ing. Jens Reich,
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The STRABAG Group's international activities executed by its subsidiaries STRABAG International GmbH and ZÜBLIN International GmbH comprise Transportation Infrastructures, Building Construction and Civil Engineering. Both international units are part of the strong network of STRABAG Group covering the entire value chain in the construction industry. We offer tailored solutions meeting our clients' individual requirements – professionalism is our top priority from technical execution to economic efficiency.

Project: Flood protection for the city of Sur

Contact: Jürgen Raschendorfer, Managing Director

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The Art of Civil Engineering made in Baden-Württemberg Germany

Germany's southwest is one of the economically strongest regions in Europe. The main reason for this is the inventiveness of its engineers: the first automobile, the first television tower, the spectacular Olympic Games roof in Munich or the world's first active house with a positive energy balance – all this was invented here and much more besides. The excellent reputation of Baden-Württemberg engineering all over the world stems directly from this. The Baden-Württemberg Chamber of Engineers (INGBW) officially represents the interests of engineers in the southwest.



Baden-Württemberg Chamber of Engineers
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