Germany's innovative solutions for the energy transition in the Gulf region

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المجلس الألماني الإماراتي المشترك للصناعة و التجارة

Dear reader,

The Gulf Cooperation Council (GCC) countries are committed to renewable energy and are continuing to focus on the diversification of their energy sectors. The German companies are well positioned to serve these demanding markets with their innovative and leading technologies and services. This publication showcases the innovative technologies and solutions German companies have to offer in the field of renewable energy.

Bilateral business relations require a dedicated, hands-on approach. This is especially true for the Arabian Peninsula and its traditional, value-driven business communities. Germany has a well-established and deeply rooted business network operating in most GCC countries – the AHKs.

The German Chambers Abroad (Auslandshandelskammern, AHKs) are key partners for German business activities in the respective host countries. As non-profit organizations, they are trusted brokers of bilateral business relations. AHKs are officially mandated and supported by the German Federal Ministry for Economic Affairs and Energy (BMWi), based on a decision of the German Parliament.

The AHK network has had many successes in the Gulf region. The foundation of the German Saudi Arabian Liaison for Economic Affairs (GESALO) dates back to 1978. With the head office in Riyadh and German desks in Jeddah and Dammam, it constitutes the largest private bilateral business development organization in the Kingdom of Saudi Arabia.

The German Emirati Joint Council for Industry and Commerce was founded in 2009, based on German representative offices in the United Arab Emirates (UAE) being established already in the late 1990s. With satellite offices in four other Gulf countries, it covers a geographical area of great economic relevance for German companies.

The AHK offices are not only the first contact points for German companies from all sectors but also for local institutions and local companies. They talk and think business. The renewable energy sector is pivotal to the many activities carried out by the AHKs.

Supported by the German Federal Ministry of Economic Affairs and Energy and together with its umbrella organization in Berlin, the Association of German Industry and Commerce (DIHK), the AHKs have introduced a significant number of technology and service providers to the local GCC markets. Both AHKs support the energy dialogues and energy partnerships established between the BMWi and several GCC countries. The dialogues have significantly enhanced the relationship in the field of renewable energy, creating a valuable platform for regular exchanges, events, expert meetings and delegations to and from the Gulf region.

This publication adds another milestone in this special relationship.

Dr. Dalia Samra-Rohte
Delegate of German Industry & Commerce for Saudi Arabia, Bahrain and Yemen

Oliver Oehms
CEO German Emirati Joint Council for Industry and Commerce

1

Germany's Energy Transition

The Energiewende is Germany's path to a secure, environmentally friendly and economically successful future.

It represents the decision to fundamentally restructure energy supply, moving away from coal and nuclear energy towards renewable energy sources. Significant energy savings and the expansion of renewables are the key elements of Germany's Energiewende strategy. By the middle of the century, renewables are targeted to provide 80 % of the German electricity consumption. At the same time, total energy demand should be halved through significant energy savings. The energy transition is an essential contribution to the global efforts to reduce global warming to 1.5° C and a maximum of 2° C by the end of the century, in accordance with the Paris Agreement under the United Nations Framework Convention on Climate Change.

German engineering spirit and continuous policy development have positioned Germany as a pioneer and leader in the global energy transition.

The energy transition contributes to the diversification of the German energy supply and reduces the dependency on imports of fossil energy carriers. Green technology is driving sustainable development in Germany and around the world. For Germany as a global technology and industry hub, the importance of green technologies cannot be overstated. German companies – large industrial corporations as well as many small- and medium-sized companies (SMEs) and family-owned businesses – are leading in state-of-the-art sustainable energy and environmental technologies in the fields of renewable energy, efficiency, recycling, waste management and water treatment.

The energy transition enjoys broad support within the German population and among political parties.

Over 90% of the German population continuously support the energy transition.[1] This support is not only related to the environmental benefits of sustainable energy supply and efficiency, but also to the economic advantages and competitiveness stemming from innovative solutions in the energy transition. Renewable energy has become an important economic factor in Germany providing employment to 317,000 people in 2017.[2] Parallel to the ongoing expansion of domestic renewable energies, exports of German technology have become a second pillar for economic opportunities and securing employment across Germany. In 2017, German technology exports related to renewable energies amounted to about $9 billion. [3]

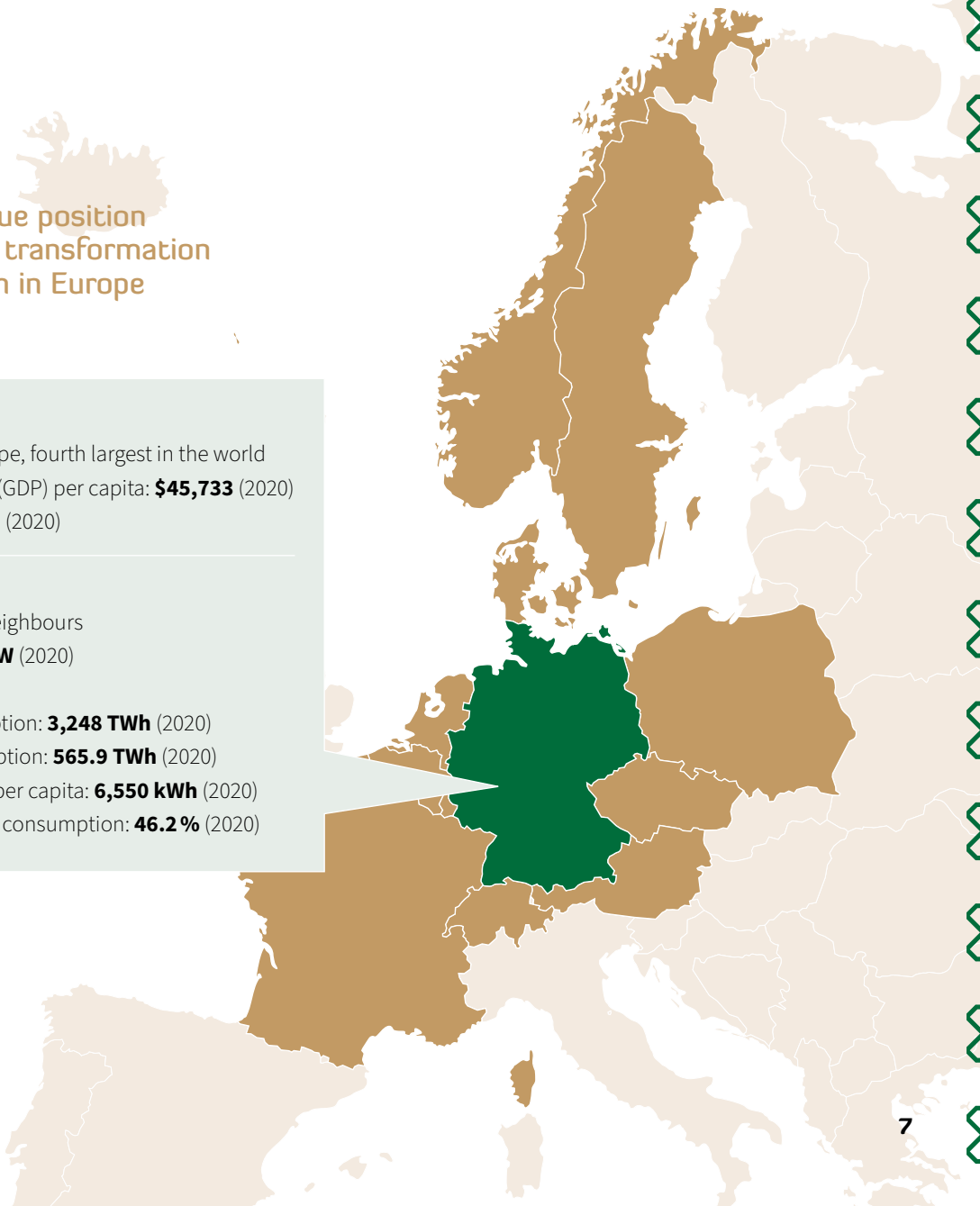
Germany is in a unique position to drive forward the transformation of the energy system in Europe

Economy

- Largest economy in Europe, fourth largest in the world
- Gross Domestic Product (GDP) per capita: **$45,733** (2020)
- Population: **83.2 million** (2020)

Energy sector

- 9 immediate electrical neighbours
- Installed capacity: **217 GW** (2020)
- Peak load: **69 GW** (2020)
- Primary energy consumption: **3,248 TWh** (2020)
- Gross electricity consumption: **565.9 TWh** (2020)
- Electricity consumption per capita: **6,550 kWh** (2020)
- Renewables in electricity consumption: **46.2 %** (2020)



To make sure that the ambitious targets of the Energiewende will be reached, the German government has implemented a stable policy framework.

A reliable and transparent long-term strategy with specific targets underpins the energy transition. The oil crises of 1973 and 1979 were the lightning bolt for the Energiewende in Germany. Skyrocketing energy prices led to a persistent and growing public and political desire for the use of renewable energy sources, also motivated by concerns for the global climate. This desire is reflected in the three pillars of the Energiewende: energy efficiency, renewables and sector coupling, that is to say the use of renewable energy in all end-use sectors.

1

Reducing energy demand is the primary pillar of the German energy strategy.

Energy efficiency measures in industry, buildings and transport sector have successfully decoupled Germany's economic development from its energy consumption. The German experience proves that significant energy savings and constant economic growth do not contradict each other. To the contrary, they are a competitive advantage for domestic industries and businesses due to energy cost reductions and technology advantages.

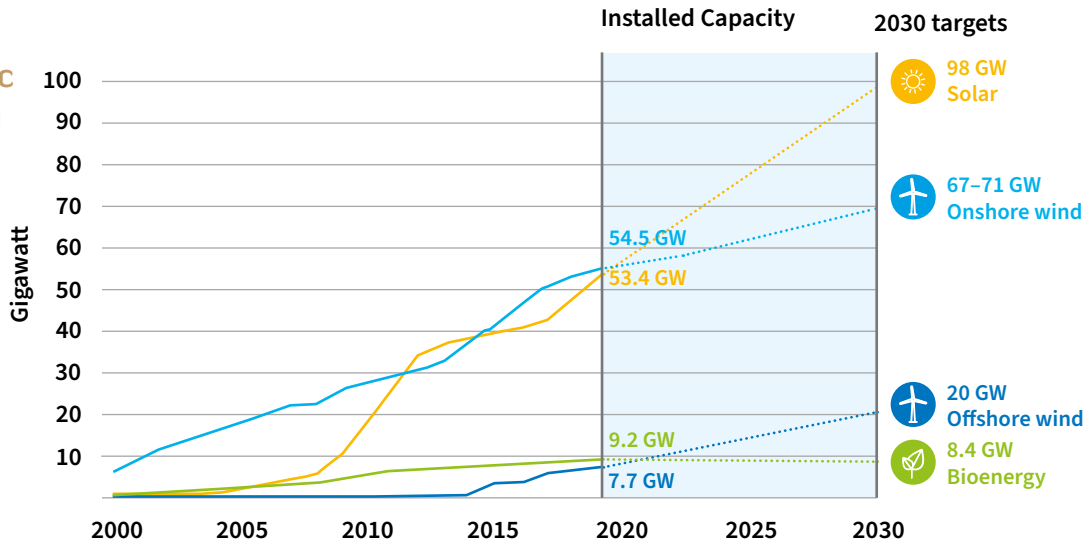
The energy transition follows a transparent, long-term strategy with specific targets.

		2020	2030	2040	2045	2050
Climate	Greenhouse gas emission (vs. 1990)	**-40.8 %**	-65 %	-88%	GHG neutral	carbon sink
Renewable Energy	Gross electricity consumption	**45.4 %**		65 %		80 %
	Gross final energy consumption	**19.6 %**		30 %	45 %	60 %
Energy Efficiency	Primary energy consumption (vs. 2008)	**-18.7 %**	-30 %			-50 %
	Final energy productivity (vs. 2008)	**1.5 % p. a.** (2008–19)	+2.1 % p. a. (2008–2050)			
	Primary energy demand in buildings (vs. 2008)	**-23.6 %** (2019)				-80 %
	Final energy consumption in transport (vs. 2005)	**+7.2 %** (2019)				-40 %

The German government set the goal to reduce primary energy consumption by 50% by the middle of the century.

In 2021, Germany's lawmakers decided to strengthen the Climate Action Law and to bring it into alignment with the new EU targets. The reform set the target date for reaching climate neutrality to 2045, moving it forward by five years. By 2050, the country plans to become a carbon sink. Primary energy consumption has already decreased by more than 18% through sustainable investment support programs and policy measures. By 2030, a 30% reduction is targeted compared to 2008 levels. Energy productivity has already improved significantly in Germany but still the potential for energy savings remains high, especially in the buildings sector.

Technology-specific capacity expansion targets make deployment of renewables plannable



2

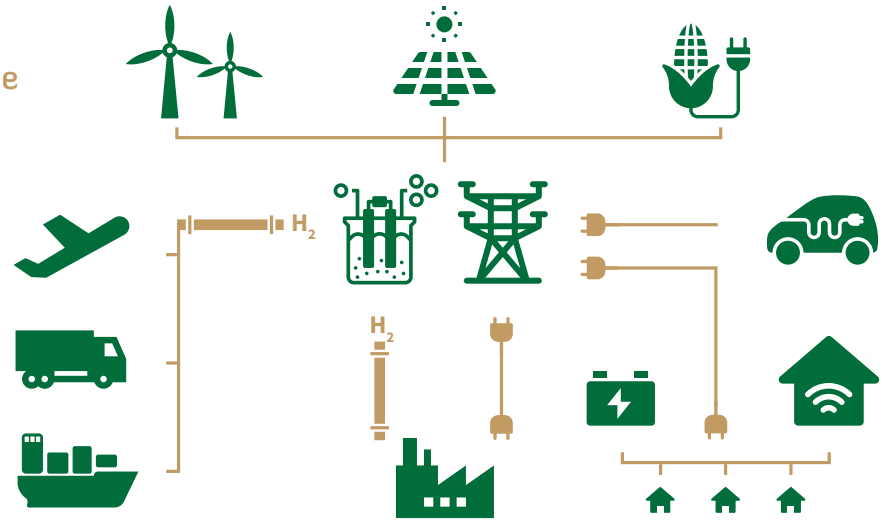
The expansion of renewables is the second pillar of the German energy transition.

Continuous policy development has fostered the deployment of renewables in Germany. The first law supporting electricity production from renewables already entered into force in 1990 and quickly became a blueprint for regulation in many other countries. Today, the support level given to new renewable energy installations is determined through competitive auctions to further incentivize the market integration of renewables. Smaller installations are exempted from participation in the auctions and receive an administratively determined feed-in premium to enable households and other actors to take part in the energy transition and generate their own energy. Despite the mediocre natural conditions, renewables are becoming competitive with conventional energy sources, as can be seen from auction results.

Renewable energy has already become the most important source of electricity in Germany.

In 2020, renewables provided 46% of German electricity consumption, overshooting the target by 11 percentage points. Until the middle of the century, the German government aims at a renewable energy share of 80% in electricity consumption with an interim target of 65% by 2030. Germany's Climate Action Programme 2030 set a target to reach at least 193 GW of renewable capacity by 2030 and specified technology-specific capacity targets that make deployment of renewables plannable for market actors.

Sector coupling implies the interconnection of energy production with energy consuming sectors



3 Sector coupling is the third pillar of the German Energiewende.

The decarbonization of the energy system also implies the need for emission reductions in end-use sectors through direct and indirect use of renewable energy. In order to decarbonize the economy, the industry and transport sectors as well as district heating and cooling for buildings need to be electrified via renewable electricity instead of using fossil fuels. As electricity production from renewables in Germany rises quickly, generation, grids, consumption and storage need to be combined in a smart way to provide for the increasing demand for flexibility and the decarbonization of various sectors.

The German government supports sector coupling through a variety of measures.

The direct use of renewable electricity, for example, in battery electric vehicles, is one of the key elements of the Energiewende. To accelerate the start-up of the electric mobility market, Germany is offering financial incentives for the purchase of electric vehicles in the form of subsidies and tax rebates. The stock of electric vehicles and the number of public charging points are rapidly increasing. Germany also recognizes the potential of digital technologies for a fully decarbonized energy system. The extensive funding programme SINTEG showcases the use of digitization for energy systems with 100% renewables in real-life laboratories across model regions in Germany.

Power-to-X technologies can supply several sectors with energy carriers and feedstocks based on renewable energy.

Power-to-Chemicals

Power-to-Liquid

Power-to-Heat

Power-to-Gas

In some sectors, solutions other than direct electrification are needed for technical or economic reasons. Green hydrogen, produced from renewable electricity, can replace fossil fuels in energy intensive industrial processes or in the chemicals industry. To decarbonize long distance transport, synthetic fuels based on green hydrogen can play an important role.
Germany's National Hydrogen Strategy emphasizes the need for green hydrogen and supports the development of international hydrogen markets. The strategy envisages a mix of investment support, relief on operating costs, carbon pricing and other beneficial regulatory conditions. Extensive funding of $ 11 billion is provided to scale-up hydrogen production and end-use technologies, with $ 2.4 billion earmarked for international projects to support hydrogen production plants in potential trade partner countries.

The Energiewende is part of an integrated European energy and climate strategy.

Due to the size of its economy and population and its central location, Germany is in a special position to drive the transformation of the energy system in Europe. Several regulatory frameworks at EU level exist such as the Energy Efficiency Directive, the Ecodesign and Energy Labelling Directive, the Energy Performance of Buildings Directive and the EU Heating & Cooling Strategy. These are being transposed into national law by each Member State. The German energy efficiency and renewable energy policy is aligned with the European policy framework.

Germany's security of electricity supply remains one of the highest worldwide.

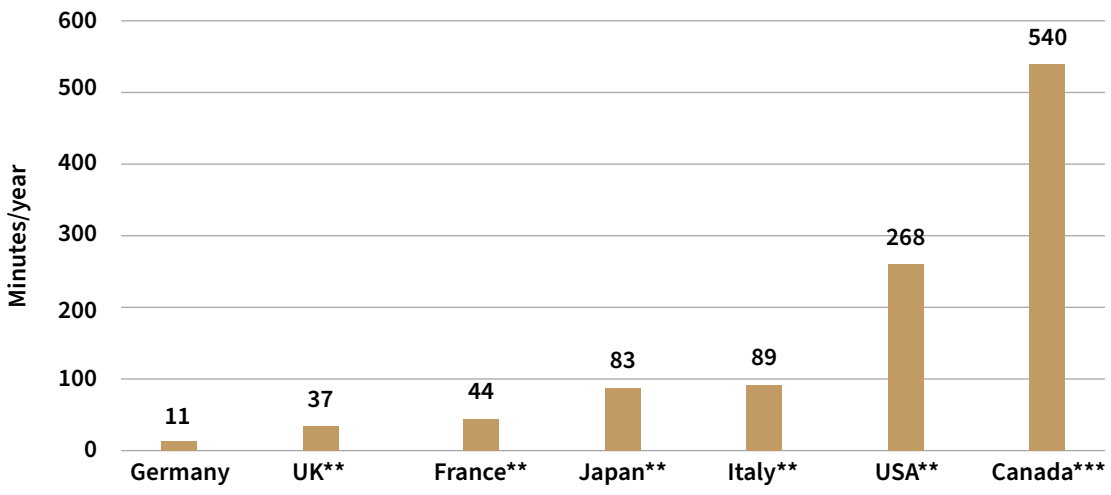
During the ongoing energy transition, Germany maintains its high security of supply standards. While German system operators have already handled hourly renewables shares of 100 %[4] in electricity supply, the duration of supply failures in Germany was as low as 11 minutes per customer in 2020[5], the best performance among the countries of the G7. Germany's ever-improving System Average Interruption Duration Index (SAIDI) proves that energy systems with high shares of renewables are reliable. Throughout the transformation of the energy system, Germany has even been a net electricity exporter since 2003. In 2019, it had the second-highest electricity exports in Europe after France.

Flexibility options are key to making the energy system renewables-ready.

With rising shares of variable renewable energy in the system fluctuations in energy supply increase. Different flexibility options can help balance demand and supply. The German power market supports a healthy competition between flexibility options like demand response, battery storage, sector coupling and Power-to-X. A well designed power market is a primary condition for the safe and efficient integration of renewables as interconnections to neighbouring countries. Grid expansion is an essential flexibility option, especially in the long term. In 2018, Germany planned grid investments of $ 11.3 billion, most of it in the distribution system. To balance fluctuations on a European level, an interconnection target of at least 15% of installed electricity production capacity by 2030 is pursued in EU member states. Germany reached an interconnectivity of 9 % to its electrical neighbours in 2017[6].

The security of Germany's electricity supply remains one of the highest worldwide

Annual average duration of unplanned electricity outages based on SAIDI* in 2020 for G7 countries



* SAIDI = System Average Interruption Duration Index ** 2019 value *** 2018 value

The energy transition creates a positive impact at various levels of the economy.

Infrastructure investments strengthen the domestic economy and enable innovative and highly competitive businesses in growth sectors. The implementation of climate-friendly and energy efficient technologies is part of electricity grid modernization, investments in heating and cooling networks, buildings, electric mobility and much more. Around $28 billion per year is directly invested in the German energy sector solely by the federal government. Investment focuses on the expansion of renewable energies, with an investment total of €15.7 billion. The investments create jobs, support economic development and incentivize innovation in the energy industry, alongside the value chain of providing energy and in various cross-sectors.

Innovation, research and development are spurred by the energy transition.

In Germany, real-world laboratory projects have been launched on a broad variety of topics such as sustainable development, urban development, renewable energy supply and much more. The energy transition is driving innovation in Germany. The German government intends to spend approximately $5.6 billion on R&D in the energy sector between 2019 and 2022. The scope of the practical implementation and economic advantages of new products is decisive and beyond the number of new patents that are filed in Germany every year.

The energy transition is a driver for employment and supports future proof structural change in the economy.

There has been a slow but perceptible shift in Germany from employment in traditional and conventional energy businesses to renewable energies. Jobs in the renewable energy sector tend to be created broadly, thus contributing to a smooth structural change by creating employment also in remote areas and in the German the coal regions, not only in economically developed areas. Employment in renewable energies has exceeded 300,000 individuals and is an important economic factor in the German energy transition. Investments in energy-saving building refurbishment contributed to the employment of more than 573,000 people, particularly in the construction business.[7] The integration of digital technologies into the energy system has the potential to create even more new occupational profiles and jobs in the energy sector.

Small- and medium-sized businesses are the driving force behind the energy transition and are providing innovation and employment in the energy sector.

Energy saving measures and the deployment of renewable energy installations all over the country are brought forward primarily by small- and medium-sized companies through their products and services. Around 95% of all businesses in Germany are small- and medium-sized.[8] The know-how and innovative strength of German medium-sized companies and industries is a huge asset and has played a pioneering role in managing the switch to sustainable technologies. Half of the hidden champions worldwide are small- and medium-sized businesses from Germany.[9]

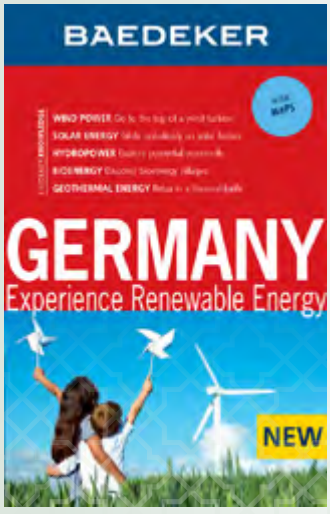
The ongoing expansion of domestic renewable energies and energy savings contributes to the diversification of energy supply and offers export opportunities.

Currently, Germany imports 70% of its energy carriers (fossil and nuclear fuels). Exports of German technology have become a second pillar for securing employment in the renewables sector. In 2017, German exports of technology goods related to renewable energies amounted to about $9 billion.[10] Germany has become a global leader in environmental technologies relating to renewable energy, recycling, waste management and water treatment. Green technologies are projected to account for 19% of the German GDP by 2025, which represents an annual growth of almost 7% in this industry.[11]

The energy transition involves all levels of government, the business community and society in general.

To ensure ownership and transparency of the German Energiewende, the Federal Ministry for Economic Affairs and Energy coordinates a close and ongoing dialogue between relevant stakeholders. The Ministry constantly exchanges information with representatives from the German federal states, business and industry, society and science and research. Regular consultations allow citizens and the private sector to comment on governmental strategies and actively participate in the decision-making process. Recent consultations were conducted on the German grid expansion plan, the national blockchain strategy, reactive power procurement and the design of the German electricity market.

Acceptance of the energy transition[12]



Travel Guide "Germany – Experience Renewable Energy"

Your guide to the home of Energiewende: From the windy North Sea shores to the sunny peaks of the Alps, this handy guide helps you exploring a country full of green energy!

- Over 190 destinations around Germany for families, explorers and afficionados
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2

Shared Opportunities: German-Gulf Cooperation

The Gulf region and its outstanding natural conditions for renewables offer vast potential for local value and job creation.

Renewable energy is increasingly competitive with other sources of electricity, especially in the Gulf region. The opportunities for solar and, where conditions allow for it, wind, are not only reflected in lower prices but also economic potential, amongst others, creating sustainable job opportunities. The UAE, Saudi Arabia, Oman and other countries in the region have developed strategies to transform their energy systems towards a growing share of renewables to capture these opportunities. Highly competitive prices for renewable energy production and the political commitment that manifests itself in ambitious diversification programs are key drivers for the emerging energy transition in the Gulf countries.

Renewable energy targets

The UAE has made significant progress in diversifying its energy sector.[13]

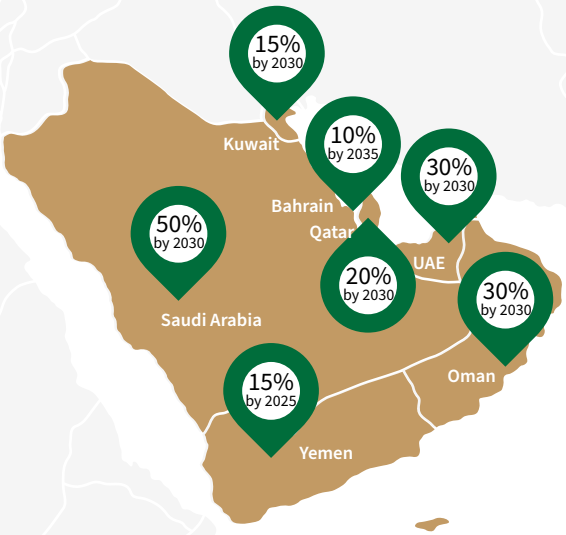
Targets for energy efficiency and the expansion of clean energy have been defined. The energy efficiency target aims at a 40% increase in consumption efficiency of individuals and corporates by 2050 compared to business as usual. Energy sources with no carbon emissions shall provide 27% of the total energy mix by 2021. By 2050, the UAE intends to reach a non-carbon energy share of 50% (44% renewables and 6% nuclear).[14]

The Kingdom of Saudi Arabia has set ambitious targets for the expansion of renewable energy.

By 2030, 50% renewable energy in electricity consumption is targeted, implying the installation of 120 GW renewable capacity.[15] The planned new metropolitan region of Neom in north-western Saudi Arabia is foreseen to be entirely powered by renewable energy and funded with $500 billion from Saudi Arabia's sovereign wealth fund.

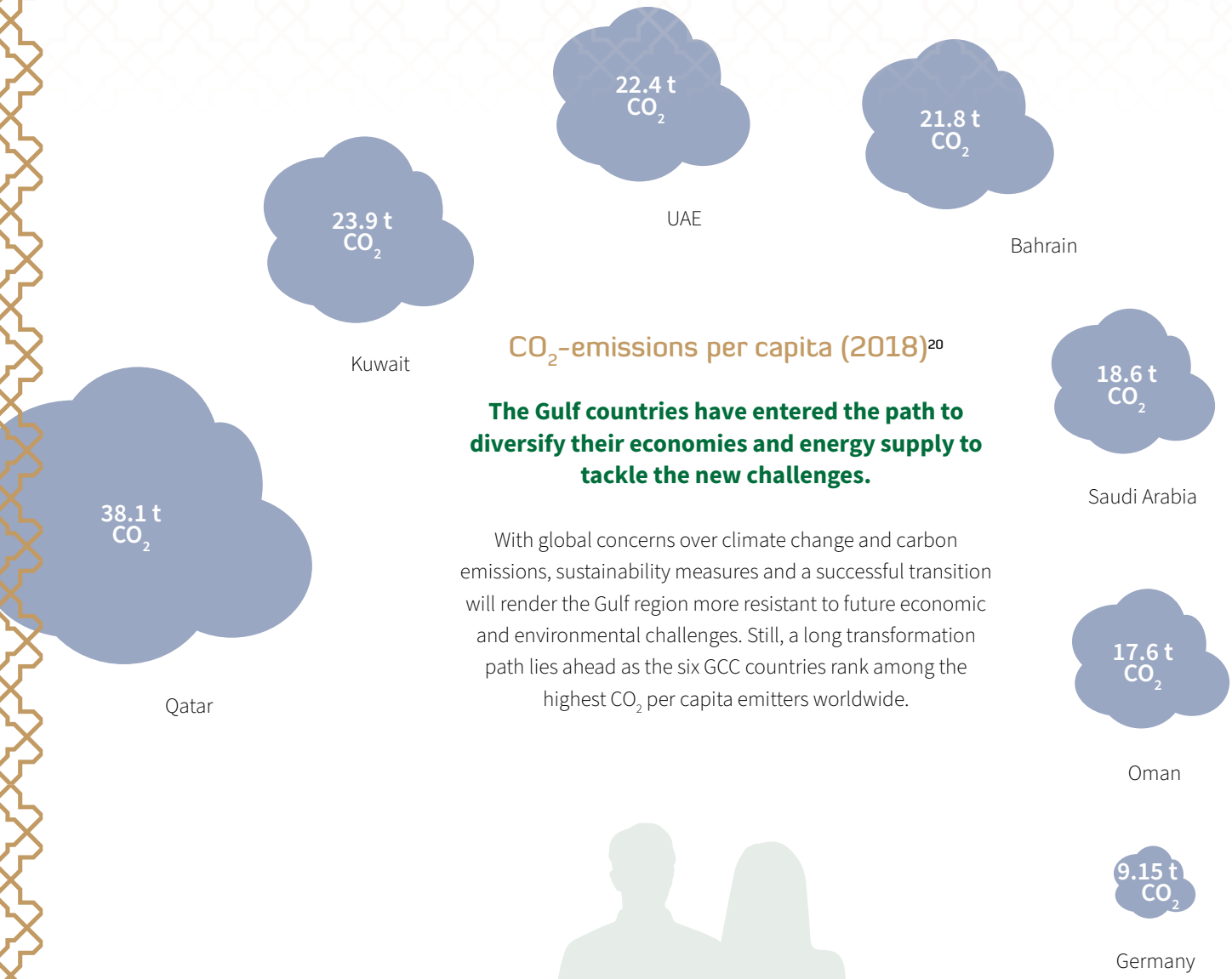
In the Sultanate of Oman, political momentum for renewables manifests itself in governmental expansion targets.

Oman recently increased its target for the share of renewable energy in its electricity generation mix to 30% by 2030.[16] Its national strategic vision also foresees the use of renewable electricity for Power to X technologies such as the production of green hydrogen. Other countries in the Gulf region have also set renewable energy targets. Qatar aims for 20% renewables by 2030.[17] Kuwait's targets a renewable energy share of 15% by 2030.[18] Bahrain defined a renewable energy target of 5% by 2025 and 10% by 2035.[19]



Renewable energy projects at utility scale are being realized with record-low energy prices across the entire Gulf region.

The world's largest solar power plant Noor Abu Dhabi with a generation capacity of 1.2 GW has been commissioned in the UAE in 2019. The Mohammed bin Rashid Al Maktoum Solar Park in Dubai with a planned capacity of 5 GW is set to become the world's largest solar farm by 2021. Renewable energy projects in the Gulf region are breaking records in solar tenders. In April 2020, the Al Dhafra solar PV tender in the UAE set the latest new world record with $0.0135/kWh. In comparison, the cheapest conventional energy sources in Europe start with energy production costs at around $0.04/kWh–$0.05/kWh.



CO_2-emissions per capita (2018)[20]

The Gulf countries have entered the path to diversify their economies and energy supply to tackle the new challenges.

With global concerns over climate change and carbon emissions, sustainability measures and a successful transition will render the Gulf region more resistant to future economic and environmental challenges. Still, a long transformation path lies ahead as the six GCC countries rank among the highest CO_2 per capita emitters worldwide.

Highest CO_2 emissions per capita worldwide except island- and city-states

The global energy transition is well under way and creates new sustainable economic structures and great chances for local value creation.

Global renewable energy employment reached 11.5 million in 2019. Solar energy was the largest renewable energy employer with about 3.8 million jobs worldwide. Germany remains the European country with the highest employment figures in the renewable energy sector.[21] The Gulf region is just beginning to reap the economic benefits of the energy transition and the scale up of renewable energies.

The transformation of the energy transition enables local employment and is a chance to empower women in the energy sector.

Educating on a vast array of skills and harnessing talent in all its forms fosters innovation and strengthens the economy. Promoting the participation of women in the local workforce can be an important accelerator for the energy transition and for economic and societal development. Renewable energy employs about 32 % women, compared to 22 % in the energy sector overall.[22]

Global Women's Network for the Energy Transition (GWNET)

The Global Women's Network for the Energy Transition (GWNET) aims to advance the global energy transition by empowering women in energy through interdisciplinary networking, advocacy, training, coaching and mentoring. GWNET seeks to address the current gender imbalances in the energy sector and to promote gender-sensitive action around the energy transition in all parts of the world. GWNET advances the role of women in the energy transition through various mentoring programmes. Furthermore, GWNET in partnership with other key actors such as IRENA focusses on producing data to document the status of women in energy as a basis for policy action in this field. GWNET also collaborates with regional and national Women in Energy networks from all around the world and organises networking events back to back with major energy events. GWNET's Women in Energy Expert Platform allows women working in energy to showcase their experience in the field and facilitates networking with their peers.

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International cooperation and trade will be essential for global decarbonization.

Germany is eager to intensify its collaboration to support its international partners in their efforts to transform their economies towards sustainability and renewable energies. Renewable energy and energy efficiency will shape the economic landscape in the upcoming decades. The innovative technologies and solutions developed by German companies and tested in the context of the German Energiewende can be of use in the Gulf region's transition. They offer new opportunities for new business relations and strategic partnerships.

Germany engages in numerous multilateral initiatives to promote the energy transition worldwide.

With climate change and the energy transition as global challenges, multilateral cooperation is important for exchanging best practices. Germany strongly supports multilateral initiatives in the area of clean energy and is proud to host the technology and innovation centre of International Renewable Energy Agency (IRENA), which is headquartered in Abu Dhabi – connecting the Gulf region and Germany in this important domain. Other institutions and formats such as the IEA, REN21 and the G20 are also used by Germany to promote a sustainable energy agenda. In the framework of these initiatives, cooperation between Germany and its partners in the Gulf region can make substantial contributions in multilateral cooperation formats to the ongoing global transformation of energy systems.

"Of course […], we will do everything possible for an international technology transfer to allow other countries to protect the climate and to adapt against climate change."

Dr. Angela Merkel,
Chancellor of Germany,
11. September 2019

International Renewable Energy Agency (IRENA)

The International Renewable Energy Agency (IRENA) is the lead intergovernmental agency for the global energy transformation that supports countries in their transition to a sustainable energy future, and serves as the principal platform for international cooperation, a centre of excellence, and a repository of policy, technology, resource and financial knowledge on renewable energy.
With 161 Members (160 States and the European Union) and 22 additional countries in the accession process and actively engaged, IRENA promotes the widespread adoption and sustainable use of all forms of renewable energy, including bioenergy, geothermal, hydropower, ocean, solar and wind energy in the pursuit of sustainable development, energy access, energy security and low-carbon economic growth and prosperity.

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Energy Partnerships and energy dialogues are the German federal government's central instrument in bilateral energy cooperation.

In the context of the Energy Partnership with UAE and its energy dialogues with Saudi Arabia and Oman, Germany continuously exchanges views on energy policy and economic issues with its partners. Sharing technological expertise and knowledge for the system integration of new energy sources and increasing energy efficiency will be important to make the global energy transition a success. Germany is committed to intensifying its energy cooperation with its partners and supports new and reliable business and trade relations.

Germany is seeking international partnerships on future hydrogen from renewable sources.

Despite all efforts to build renewable energy capacity, Germany will remain an energy importer due to its high population density, strong industrial energy demand and average solar irradiation. Energy scenarios show that Germany will require significant amounts of synthetic fuels, especially green hydrogen, to decarbonize challenging sectors like heavy transport or heavy industry. The German government is therefore looking for partner countries that have renewable energy potentials to export renewable electricity and green hydrogen.

Green synthetic fuels such as hydrogen bear the potential for new trade and business relations.

For countries on the Arabian Peninsula, these fuels present an opportunity with many potential applications in industry,


Dubai Electricity and Water Authority (DEWA), Strategy & Government Communications Office, www.dewa.gov.ae

transport and the electricity system. Additionally, the Arabian Peninsula has attractive conditions and can build on existing infrastructure to produce synthetic fuels, putting it in a good position to become a global renewable fuel supplier.

A reliable regulatory framework is essential to provide stable investment conditions for the private sector during the energy transition.

The German and EU energy and climate strategies with their long- and medium-term targets create a predictable economic environment that allows industries and businesses to participate with their own innovative solutions in this transformation. Significant investments are being made to make the energy transition a success. The EU plans to dedicate $1.1 trillion in the transformation of the EU energy system over the next 10 years. The EU and Germany are striving towards their ambitious targets for renewables in 2030 and together with numerous innovative companies are working hard to bring the energy transition to success for achieving decarbonization by the middle of the century.

3 Cooperation with partner countries

International cooperation has always been a central cornerstone of Germany's energy policy in the context of the energy transition, or Energiewende.

The countries of the on the Arabian Peninsula, which have also entered paths to a transformation of their energy systems, are important partners in the shared ambition to increase the share of renewable energy and to promote energy efficiency. Germany works closely with the UAE in an Energy Partnership agreed upon in 2017 and in Energy Dialogues with Saudi Arabia and Oman. Current focus topics in bilateral energy cooperation with the countries of the Arabian Peninsula comprise the following focus topics:

- Designing and creating electricity market elements
- Expanding and operating electricity grids, including at the regional level
- Supporting energy efficiency in various sectors, at increasing renewable energy penetration and
- Integrating solar and wind, electrification of the transport sector and Power-to-X technologies with a focus on hydrogen.

Essential to cooperation in these areas is the support of bilateral trade, business relations and shared opportunities in the private sector.

This brochure introduces the German energy transition to stakeholders in the Gulf region and showcases innovative solutions providers from all areas of the energy sector.

The publication has been prepared on behalf of the German Federal Ministry for Economic Affairs and Energy in the context of the Emirati-German Energy Partnership, the Energy Dialogues with Saudi Arabia and Oman, and the bilateral energy cooperation with the countries of the Arabian Peninsula. The Energy Partnerships and Energy Dialogues with the countries of the Arabian Peninsula are supported by Guidehouse, the German-Emirati Joint Council for Industry and Commerce, the German-Saudi Arabian Liaison Office for Economic Affairs, and the German Industry & Commerce Office Oman.

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About Germany's
Energy Partnerships and Energy Dialogues

Germany cooperates with its partner countries on various energy policy issues relating to the energy transition.

The Energy Partnerships and Energy Dialogues with more than 20 partner countries are key to the external energy policy of the Federal Ministry for Economic Affairs and Energy. They form a global, continually growing and valuable network linking Germany with countries that are striving to transform their energy systems.

In an energy partnership, Germany works directly with a partner country on various energy policy issues relating to the energy transition.

Each of the partnerships is based on a binding memorandum of understanding signed at a high political level. Cooperation at a practical level occurs within a formalized structure of dedicated groups. The political orientation of the cooperation is determined in joint steering group meetings. The specific project work takes place in bilateral working groups that meet on a regular basis and have significant involvement from the business community.

An energy dialogue has the same goals but is not based on a declaration of intent. The main topics and concrete activities are agreed upon by the respective partners.

Germany works closely with the UAE in an Energy Partnership agreed in 2017 and has Energy Dialogues with Saudi Arabia and Oman.

Current focus topics in bilateral energy cooperation with the countries of the Arabian Peninsula include design and creation of electricity market elements, expansion and operation of electricity grids at increasing renewable energy penetration and electrification of the transport sector and hydrogen. Another important aspect is the support of bilateral trade and business relations in the private sector. For the implementation of the German-Arab energy cooperation, the Federal Ministry for Economic Affairs and Energy is supported by the German Chambers of Commerce and Industry in the UAE, Saudi Arabia and Oman, and the consultancy Guidehouse. Formats for collaboration include bilateral study tours and delegation visits, expert presentations at conferences, bilateral expert and industry workshops and contact offices for stakeholders and bodies.

Ghorfa Arab-German Chamber of Commerce and Industry e. V.

The Ghorfa represents all Arab chambers of industry and commerce in Germany. For decades it has been successfully promoting economic relations between Germany and Arab countries. With its top-class network, it is the first point of contact for the Arab-German business community and an integral part of the global network of Arab Chambers. As such, it operates under the auspices of the Union of Arab Chambers. Ghorfa works closely with the Arab League, Arab ministries and embassies as well as with relevant business associations. In Germany, it cooperates with government institutions and industry associations.

www.ghorfa.de
+ 49 (0)30 27 89 07 11
Garnisonkirchplatz 1,
10178 Berlin, Germany
ghorfa@ghorfa.de

German Near And Middle East Association e. V. (NUMOV)

NUMOV/German Near And Middle East Association was founded 87 years ago. It is Germany's oldest and largest NGO for economic support between Germany and the Near and Middle East. This region offers companies exceptional opportunities for success. NUMOV has supported German companies in establishing and expanding business. The German Orient Institute is also part of NUMOV. Delegation trips to the region as well as delegations visiting Germany give German businesses a chance for successful partnerships with companies from the region. Former German Federal Chancellor Gerhard Schröder has been Honorary Chairman of NUMOV since 2005.

www.numov.de
+49 (0)30 206 41 00
Kronenstraße 1,
10117 Berlin, Germany
numov@numov.de

Euro-Mediterranean-Arab Association e. V. (EMA)

The EMA is a regional association for the German economy. It is committed to creating sustainable cooperation between Germany and the countries of the Mediterranean, Middle East and Arab Gulf regions, with a special focus on SMEs and start-ups. For this, the EMA connects decision-makers and multipliers from companies and associations, diplomacy and politics, as well as science and society. With this unique network and its cross-sector expertise the EMA offers regional and country-specific forums such as the German-Arab Environment & Energy Forum and releases market studies such as on renewable energy in the Arab Gulf countries.

www.ema-germany.org
+49 (0)30 25 35 92 72
Stresemannstraße 21,
10963 Berlin, Germany
info@ema-germany.org

North Africa Middle East Initiative (NMI)

As representative of German business in Germany and in the MENA region, the North Africa Middle East Initiative of German Business (NMI) strengthens the development and expansion of bilateral business relations. It shapes the substantive discussion on potentials and challenges in the areas of trade and investment and communicates the economic policy interests of German companies in relation to the MENA region. Further, it supports trips by the German government with business delegations to the region and advocates the dismantling of trade and investment barriers in the region and in the EU.

www.nm-initiative.de
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c/o BDI, Breite Straße 29,
10178 Berlin, Germany
b.godel@bdi.eu

4 Innovative solution providers

9 Association Profiles / 63 Company Profiles

Energy Efficiency

Integration of Renewables

Hydrogen

Solar

Wind

Biomass

German Association for Concentrated Solar Power (DCSP)

©DCSP – German Association for Concentrated Solarpower

The German Association for Concentrated Solar Power (DCSP) has been representing the corporate interests of the industry in Germany and international markets since 2013.

Concentrated Solar Power (CSP) can be used to generate green electricity, green heat and green hydrogen. The plants supply temperatures from 50° C. to 500° C. The great advantage of concentrating solar thermal energy is the possibility of effective storage, permitting a high degree of coverage and a seasonally more balanced supply of heat. In combination biomass or PV CSP power plants can then continuously provide energy in the base load range similar to a conventional power plant. CSP is a globally proven reliable, cost-effective and affordable power plant technology.

Most of the CSP technology is developed and manufactured in Germany. Members of the DCSP cover the whole value chain: consulting and engineering companies, manufacturers of components, owners and operators of power plants as well as research institutions.

www.deutsche-csp.de
+49 (0)30 23 25 65 30
Clausewitzstr. 7, 10629 Berlin, Germany
office@deutsche-csp.com

European Association for Renewable Energy e. V. (EUROSOLAR)

The European Association for Renewable Energy (EUROSOLAR e. V.) was founded in 1988 by Dr. Hermann Scheer (1944-2010) and is dedicated to the cause of completely substituting for nuclear and fossil energy through renewable energy. EUROSOLAR regards solar energy supply as essential to preserve the natural resources and a prerequisite for a sustainable economy. EUROSOLAR brings together expertise from the fields of politics, economy, science and culture. It develops and encourages political and economic action plans and concepts for the introduction of renewable energy from the local to the international level. This registered non-profit organization conducts its work independently of political parties, institutions, commercial enterprises and interest groups. As a membership-based organization, EUROSOLAR is financed from membership fees and donations only. In 13 European countries EUROSOLAR-sections are working for a successful energy transition in their country.

www.eurosolar.de/en
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info@eurosolar.org

Fachverband BIOGAS
German Biogas Association
Association Allemande du Biogaz
Asociación Alemana de Biogás
www.biogas.org

German Biogas Association e.V. (GBA)

The German Biogas Association (GBA) unites operators, manufacturers and planners of biogas plants, representatives from science and research and all those interested in the industry. Since its establishment in 1992, the association (more than 4,700 members) has become the most influential independent organisation in the field of biogas worldwide. It campaigns for the increased use of biogas and biomethane technology through political lobbying at EU, national and state levels. The Association encourages the exchange of information and knowledge, for instance by collecting, evaluating and spreading knowledge of scientific findings and practical experience and by means of conferences, exhibitions and other events. It works closely with international organizations, e.g. amongst others the GIZ and UNIDO. Thus, GBA actively promotes and stimulates the exchange of international experience. It has excellent expertise and knowledge in all biogas-related topics and cooperates with almost all official German bodies as well as many international ones where standards for biogas plants are discussed, developed and defined.

www.biogas.org
+49 (0)8161 98 46 60
Angerbrunnenstr. 12, 85356 Freising, Gemany
info@biogas.org

eaD
Bundesverband der
Energie- und Klimaschutzagenturen
Deutschlands e.V.

German Federation of Energy and Climate Protection Agencies e.V. (eaD)

The German Federation of Energy and Climate Protection Agencies is an organization to represent the joint interests of the regional and local Energy and Climate Protection Agencies in Germany. Their members advise public authorities, companies and private households in renewables, energy-saving potentials and develop individual solutions and services in minimizing energy consumption. This also includes planning and implementation of installations and systems as well as training and transfer of knowledge and skills.

www.energieagenturen.de
+49 (0)30 29 33 30 66
Französische Straße 23, 10117 Berlin, Germany
info@energieagenturen.de

German Renewable Energy Federation e.V. (BEE)

Founded in 1991, the German Renewable Energy Federation (BEE) is the umbrella organization for the renewable energy sector in Germany. Its mission is to improve the regulatory and legal framework for renewables and to promote a shift to renewable energy in the electricity, heating & cooling and transport sectors.

The BEE is the voice of 37 industry associations in the hydropower, wind energy, solar energy, bioenergy, geothermal power and ambient energy sectors, comprising more than 30,000 individual members and companies.

The BEE's primary objective is to develop policy by providing input to relevant stakeholders. Its activities address a broad public, including politicians, business leaders, citizens and the media. The BEE's services include expert studies, thematic working groups, policy projects, conferences and workshops, expert hearings, networking possibilities and position papers.

www.bee-ev.de
+49 (0)30 2 75 81 70 0
Invalidenstraße 91, 10115 Berlin, Germany
info@bee-ev.de

German Smart City Association e.V. (BVSC)

The German Smart City Association e.V. (BVSC) is the german holistic, interdisciplinary research platform for the intelligent city of the future called "smart city", which is characterized in particular by the merging of supply networks (energy, communication, mobility, transport, etc.) into one intelligent and highly networked infrastructure.

The main focus of the BVSC is on the rational generation and distribution of resources, in particular the environmentally friendly, sustainable and regenerative generation, storage, distribution and use of energy, new mobility concepts, innovative health prevention and care, as well as living and working in an ageing society (demographic change).
Aspects of data protection and security as well as the consideration of privacy and personal rights also play an important role. The involvement of all social groups - politics, research institutions, industry and above all the inhabitants of the smart city - in this research and development process is of crucial importance.

www.bundesverband-smart-city.org
+49 (0)40 35 58 38 30
Alte Gärtnerei 2, 55128 Mainz, Germany
info@bundesverband-smart-city.org

German Solar Association e.V. (BSW-Solar)

The German Solar Association (BSW-Solar) sees itself as a “tugboat”, a “pilot” and an “icebreaker” for an accelerated energy transition in Germany and beyond. By providing targeted policy advice, the association exerts a decisive influence on the creation and maintenance of suitable political framework conditions for the continuous growth of the solar energy market. In addition, the German Solar Association is committed to a positive industry and company image through regular media coverage as well as campaigns and provides numerous information services. BSW-Solar serves as a gateway to the German market and access point to German companies. Through a network of around 40 international partnerships with fellow associations, it is involved in a number of projects to develop the right framework for solar investments, financing and verified and time-tested business models.

www.solarwirtschaft.de
+49 (0)30 297 77 88 0
Lietzenburger Straße 53, 10719 Berlin, Germany
info@bsw-solar.de

German Wind Energy Association e.V. (BWE)

In the process, Germany is a role model for many countries. Since its founding in 1996, the German Wind Energy Association (Bundesverband WindEnergie e.V. or BWE) has played a major role in that process. With some 20,000 members, it is one of the world's largest associations in the renewables sector. For years, the BWE has been increasingly successful in efficiently expanding wind power in Germany for the long term. Furthermore, our experts work in such international associations as the European Wind Energy Association (EWEA), the Global Wind Energy Council (GWEC) and the World Wind Energy Association (WWEA) in developing wind energy within Europe and worldwide. In this way, the German success story of feed-in tariffs have since been adopted in more than 45 countries.

With its ambitious expansion targets, the wind power sector is the main driver behind the switch to renewables. The BWE and its members do their utmost to ensure that the success story of German wind power continues – and that the vision of "100 percent renewable power" becomes a reality in Germany soon.

www.wind-energie.de
+49 (0)30 21 23 41 210
Neustädtische Kirchstrasse 6, 10117 Berlin, Germany
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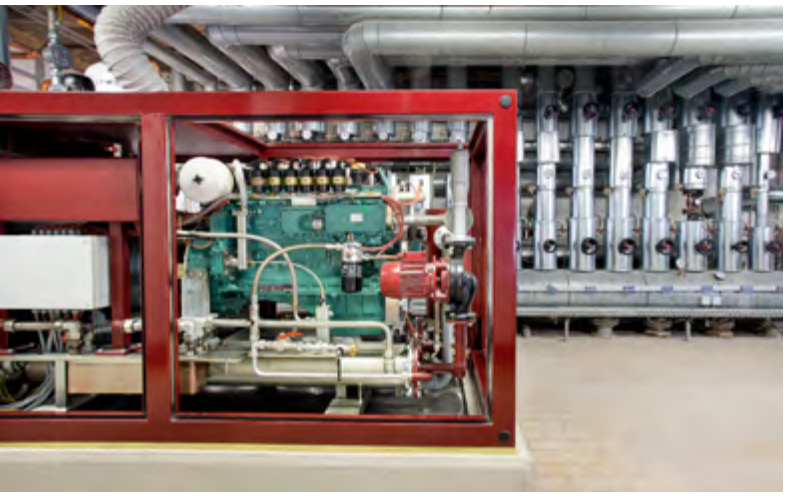
Mechanical Engineering Industry Association e. V. (VDMA)

The mechanical and plant engineering sector is Germany's largest employer with 1,3 million employees, and it is the backbone of the German economy. VDMA represents around 3,300 mostly medium-sized companies in the capital goods industry, making it the largest industry association in Europe. The Power Systems Association within VDMA is the information and communication platform for the manufacturers of engine systems, thermal turbines and power plants, hydropower and wind turbines. The VDMA Fuel Cell Working Group is the industrial network for all manufacturers of fuel cell systems and components in Germany. It offers 60 leading national and internationally active manufacturers and suppliers a platform for networking and joint representation of interests. In the Energy Forum, the VDMA manages the energy policy activities of the association and bundles the energy know-how of the industry.



www.vdma.org
+49 (0)69 66 03 0
Lyoner Straße 18, 60528 Frankfurt am Main, Germany
info@vdma.org

Air Liquide Engineering & Construction S.A.

Air Liquide is a world leader in gases, technologies and services for Industry and health. Air Liquide builds the Group's production units, mainly air gas separation and hydrogen production units, and supplies external customers with its portfolio of proprietary & exclusively licensed technologies. Providing innovative solutions for carbon capture, hydrogen refinery management and air separation among others, the company is helping customers satisfy stringent product regulations while enabling plant efficiencies, lower production costs & safe and reliable operations. Air Liquide's Yanbu Hydrogen Production Site in Saudi Arabia provides hydrogen to the Yanbu Aramco Sinopec Refining Company (Yasref) and a growing number of large- and small-scale industries in both Yanbu and Jubail (industrial cities) via Air Liquide's hydrogen pipeline networks.

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Main Projects/Clients

- Hydrogen production facility – over 300,000 Nm^3/h of H_2; Yanbu, KSA
- Hydrogen production facility using Cryocap – H_2 for capture of CO_2; Port Jerome, France
- H_2 Liquefaction plant – implementing PEM electrolyzer to supply carbon free H_2; Becancour, Canada
- LH_2 – renewable liquid H_2; West Coast, Nevada, USA

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+971 (0)4 205 55 00
Dubai Airport Free Zone, Building 5 East, Block A, Suite 301, P.O. Box 54368, Dubai, United Arab Emirates
hydrogen@airliquide.com

Ammonit Measurement GmbH

Ammonit Measurement offers high quality measurement equipment for the wind and solar industry since 1989. The product portfolio includes data loggers, meteorological sensors, remote sensing devices as well as communication and power supply systems. With AmmonitOR, the company provides a web platform to monitor measurement campaigns in accordance with international guidelines. Ammonit's measurement systems are designed to calculate energy yield forecasts, monitor wind and solar power plants as well as analyze power curves of wind turbines. Consultants, operators and research institutes in over 100 countries rely on the offered expertise and high quality measurement systems.

Main Projects/Clients

- 6 wind measurement projects, Petroleum Development Oman (PDO), along with GCC partner Firnas Shuman; UAE
- 13 solar measurement systems, Eurosol Energy Solutions WLL; Qatar
- 3 solar and wind measurement systems, King Abdullah University of Science and Technology; KSA
- Solar and wind measurement systems, ACWA Power; Dubai, UAE

www.ammonit.com
+49 (0)30 60 03 18 80
Wrangelstraße 100, 10997 Berlin, Germany
sales@ammonit.com

Apricum GmbH

Apricum is a globally active transaction advisory and strategy consulting firm focused exclusively on solar & wind, water, waste, energy storage, green mobility and digital energy. Established in 2008, Apricum offers a complementary suite of growth-oriented consulting services for companies and investors around the world. The international team at Apricum combines an impressive array of experts with backgrounds in cleantech, consulting and finance. The team has completed over 200 cross-border transaction advisory and strategy consulting projects with the highest levels of client satisfaction. Apricum is headquartered in Berlin with representatives in the USA, UK, Turkey, Saudi Arabia, India, China, South Korea, Japan, Indonesia, the Philippines, Thailand and Vietnam.

Main Projects/Clients

- NOMADD Desert Solar Solutions – strategic investment by CEPCO in NOMADD; KSA
- Greencells Group – strategic investment of a 50 % equity stake by Zahid Group in Greencells; KSA
- Al-Babtain – strategy and joint venture with the Haizea Wind Group and Metalogalva; KSA
- JGC consortium – financial advisory in the bid for the 300 MW Sakaka Solar PV IPP tender; KSA

www.apricum-group.com
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info@apricum-group.com

AREVA H2Gen GmbH

AREVA H2Gen is a technology supplier for Proton Exchange Membrane (PEM) electrolysis systems, who develops, produces, and distributes PEM electrolysis plants. With the PEM electrolysis system green hydrogen can be produced, which is used in industrial applications, markets of mobility or to store renewable energies. The applications are sold in the fields of electricity and gas management, neighborhood concepts, sector coupling, hydrogen mobility and filling stations. The CE certified systems range from a hydrogen production of 5 Nm^3/h up to 2.000 Nm^3/h. The systems are characterized by high dynamics and an overload capacity of up to 100 %. The young company draws on the knowledge of more than 30 years of research and development in PEM technology, which is unique in Europe.

Main Projects/Clients

- Lighthouse project supported by the German Federal Ministry for Economic Affairs and Energy, Frequency Containment Reserve for stabilizing the grid; Germany
- Store energy in remote areas facing grid export limitation, using energy from wave, tidal and wind; UK
- Hydrogen refueling station for utility vehicles; France
- Hydrogen refueling station for passenger vehicles, coupled with PV; Germany

www.arevah2gen.com
+49 (0)22 129 19 07 30
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Aspens GmbH

Aspens, located in Hanover Germany, develops systems and equipment to produce green hydrogen and its conversion into electricity by fuel cells. The company has a world leading technology in hydrogen processing, purification, storage and conversion and develops highly efficient technologies for the use of hydrogen energy in order to be able to offer customized solutions for the development of different energy applications. Aspen offers solutions in following fields: Power-to-gas (green hydrogen), hydrogen fuel cells for mobile and s tationary applications, separation of hydrogen from mixed gas. Aspens is a leading innovator in the field of hydrogen technology with the aim of being able to offer solutions for the entire hydrogen energy industry chain.

Main Projects/Clients

- Green hydrogen generation from renewables, decentralized hydrogen generation via electrolysis from wind turbines and photovoltaic systems, Germany
- Green hydrogen generation from waste, supply with high purity hydrogen for fuel cells and industrial usage out of biogas or gas from pyrolysis, China
- Portable power generation system with metallic hydrogen fuel cell stack, Germany

www.aspens.de
+49 (0)511 52 95 15 79
Feodor-Lynen-Straße 27, 30625 Hannover, Germany
info@aspens.de

AVL List GmbH

AVL List is with more than 11,500 employees the world's largest independent company for the development, simulation and testing of all types of powertrain systems. The AVL solutions for the Energy Transition are: concise description of global emission reduction strategies and global energy roadmaps, analysis of market trends, energy provision and portfolio strategies, identification of possible scenarios and impact on the industry and identification of technologies supporting the energy transition. AVL provides a complete and objective picture of all existing and potential global energy and fuel scenarios. AVL creates confidence by defining the right future technology roadmap and offers market specific and independent recommendations for qualified and balanced solution packages at the intersection of energy and Mobility.

Main Projects/Clients

- Hydrogen in mobility, strategy consulting; UK
- Sustainable energy, co-electrolysis and methanation; Austria
- Synthetic fuel production, efficient production technologies; Europe
- Hydrogen in mobility, public bus fleet planning; Austria

www.avl.com
+49 (0)2191 950 0
Dreherstraße 3-5, 42899 Remscheid, Germany
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AXITEC ENERGY GmbH & CO. KG

AXITEC ENERGY is one of the qualitatively leading global brands of solar modules and energy storages. The engineering department at the headquarter in Germany controls the global production capacities of 1 Giga Watt peak. The complete process chain from development and manufacturing through quality assurance to sales and service is AXITEC's core competence. The brand AXITEC is active in the solar business since 2001. Successful projects were realized over the years with AXITEC's solar modules all over the world. AXITEC has its own branches in the US, Brazil, Turkey, India and Australia.

Main Projects/Clients

- Sabic is a big supplier of raw materials of B+K BackFlex photovoltaic foil and at the same time customer of B+K industrial packaging; KSA
- Joint Venture with Alrajhi International Group; KSA
- Gulf Acrylic Industries; Oman
- Tata Solar; India

www.bk-international.com
+49 (0)5481 92 08 74
Rahestraße 47, 49525 Lengerich, Germany
info@bk-international.com

BASF FZE

BASF creates chemistry for a sustainable future, while combining economic success with environmental protection and social responsibility. More than 117,000 employees in the BASF Group work on contributing to the success of customers in nearly all sectors and almost every country in the world. The portfolio is organized into six segments: Chemicals, Materials, Industrial Solutions, Surface Technologies, Nutrition & Care and Agricultural Solutions. BASF has been producing sodium nitrate in Ludwigshafen for over 90 years. Along with its use in the solar industry, it is primarily used in the processing of glass and foods. BASF supplies its salt to all solar tower power plants around the world: clear proof of BASF's outstanding product quality.

Main Projects/Clients

- Noor 1, the world's largest solar project with a generation capacity of 950 megawatts will be commissioned by the end of 2022 in the UAE. BASF is the sole supplier of high-quality sodium nitrate for the solar tower power plant. Within three years since 2019, a total of roughly 100,000 tons of the inorganic salt produced in Ludwigshafen will be shipped to the UAE.

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+971 (0)4 80 72 222
BASF FZE, JAFZA One, Tower B, 15th floor, Dubai,
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Bischof + Klein SE & Co. KG

Bischof + Klein's (B+K) product range encompasses the entire range of flexible packaging – from traditional industrial packaging and consumer packaging to special films for technical applications Industrial packaging from B+K is used worldwide. Today, B+K is one of Europe's leading full-service suppliers of flexible plastic and plastic laminate packaging and technical films. B+K has developed a high technical backsheet for PV Module. Backsheets contribute to the efficiency of PV modules by reflecting sunlight. This contribution must not decrease or alter over time, e. g. due to weathering. B+K BackFlex PP demonstrates excellent reflection and no yellowing even after harsh accelerated weathering tests.

Main Projects/Clients

- Sabic is a big supplier of raw materials of B+K BackFlex photovoltaic foil and at the same time customer of B+K industrial packaging; KSA
- Joint Venture with Alrajhi International Group; KSA
- Gulf Acrylic Industries; Oman
- Tata Solar; India

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BlackForest Solutions GmbH

BlackForest Solutions (BFS) is a highly specialized consulting company providing tailored solutions for the handling, collection, transport, and disposal of hazardous waste worldwide. Additionally, BFS offers onsite facility assessments and complete solutions for municipal solid waste, medical waste, industrial waste, and waste electrical and electronic equipment streams. The company is also highly active in the fields of food waste recycling, biogas generation (wet and dry fermentation approaches), composting setups, biological waste treatment, and waste-to-energy approaches. BFS is based in Berlin, operates in 15 languages, and operates project offices in Rio de Janeiro and Kuwait-City.

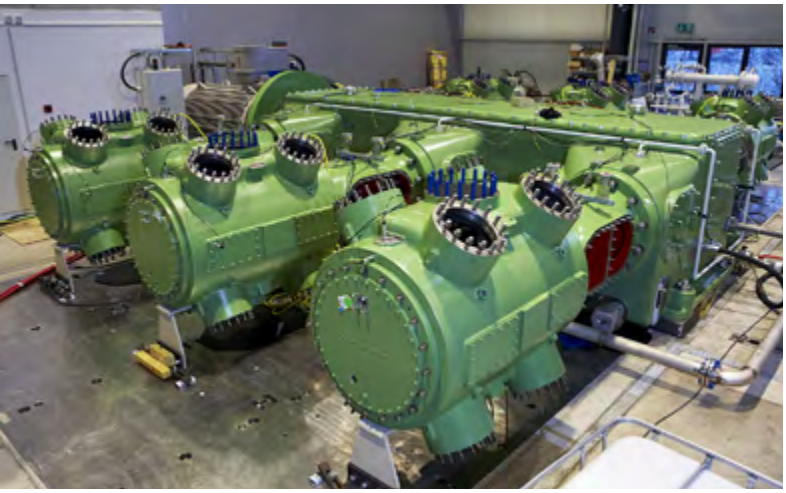
Main Projects/Clients

- Kuwait National Waste Masterplan 2040, strategy for the municipal, industrial & commercial sectors; Kuwait
- Emergency spill of mercury at Dubai Airport, clean-up, repackaging & export of the hazardous waste; UAE
- Alternative energies, waste co-processing & synergies; KSA
- Consultancy on hazardous waste treatment and export; Oman

www.blackforest-solutions.com
+49 (0)177 55 026 35
Kopenhagener Straße 60–68, Haus A 13407 Berlin, Germany
info@bfgroup.org

BORSIG ZM Compression GmbH

Borsig offers customized, innovative and high-quality solutions for reciprocating compressors for process gases (acc. API 618, horizontal and vertical design with up to 6 axes; discharge pressure: 1,000 bara, capacity/flow: 115,000 m^3/h, power: 21,000 kW); centrifugal compressors for process gases: multi-stage integrally geared centrifugal compressors (acc. API 617 & 672; discharge pressure: 150 bara, capacity/flow: 300,000 m^3/h, power: 25,000 kW); compressor control Borsig BlueLine (combines control system, machine protection and emergency shutdown for reciprocating and centrifugal compressors) and compressor services: installation, commissioning, spare parts, maintenance, overhauling, revamp and training. Borsig compressors are used in the power sector, oil and gas industries, chemical and petrochemical industries, refineries, and steel plants.



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Main Projects/Clients

- Saudi Aramco; Saudi Arabia
- Takreer; UAE
- Enppi; Egypt
- Suez Oil Processing Company; Egypt

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DEGER Energie GmbH & Co. KG

Deger is the leading manufacturer with the world's largest product portfolio for single and dualaxis solar tracking systems. Their market position is based on the unique, patented Maximum Light Detection (MLD) technology. The MLD-sensor constantly aligns the connected solar modules to the point that provides the greatest energy and achieves a 42,9 % greater yield on average than fixed systems. With more than 100,000 projects implemented in more than 75 countries since 1999, Deger is the world's market and technology leader for solar tracking systems.

Main Projects/Clients

- 5000NT dual axis solar tracking systems were used in a 2,8 MWp project; Escalon, Spain
- D100 dual axis solar tracking systems were used in a 1 MWp project; Kimberley, Canada
- S100-DR single axis solar tracking systems were used in a 1,14 MWp project; Adıyaman, Turkey
- S60H single axis solar tracking systems were used İn a 13,2 kWp project; Suurberg, South Africa

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econ industries services GmbH

econ industries offers solutions for the treatment of industrial hazardous wastes and contaminated soil, based on 20 years' experience and more than 30 industrial waste recycling plants. econ's aim is to avoid the elimination of waste through incineration and landfilling by achieving a resource-conserving material recycling instead. Thermal desorption technology is used in the plants, in which harmful substances (e.g. hydrocarbons, mercury) are separated under heat and vacuum in a fully encapsulated system. Particularly when it comes to energy efficiency, low carbon emissions and resource recovery rates, this method is far superior to other thermal desorption techniques and is accepted as state of the art by approval authorities world-wide. Tailor-made research, development, consulting, engineering, delivery and commissioning are econ's core competencies.

Main Projects/Clients

- World's largest drill cuttings treatment center for the recycling of synthetic drilling fluid; Azerbaijan
- Recycling of oily wastes including low and high-viscous sludges and contaminated soils; Australia
- Remediation of mercury containing crude oil based sludge; Brunei
- On-site naturally occurring radioactive material waste (NORM) treatment for safe final disposal; Germany

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Elia Grid International GmbH

Elia Grid is an international consulting company providing consultancy services in market development, asset management, power system operations and security, system and market operations, owner's engineering and investment advisory, to international clients in the power sector. It is a full subsidiary of the Elia Group, which is organized around two transmission system operators (TSOs): Elia in Belgium and 50Hertz, one of four German transmission system operators. Elia Grid benefits from its position as a subsidiary of two European TSOs and can offer proven expertise and hands-on experience based on the best practices of its parent companies. The company also plays a catalyzing role in the Elia Group by providing valuable international insights and innovative solutions to Elia and 50Hertz.

Main Projects/Clients

- Assessment of the impact of the integration of 60 GW of solar and wind into the national grid; KSA
- Set up of a management control center allowing to forecast and coordinate with RES power producer, KACARE; KSA
- Support the operational readiness of the load dispatch center for the arrival of RES; KSA
- Support the review of power purchase agreement, Saudi Power Procurement Company; KSA

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EMPURON AG

EMPURON is a software company that develops innovative, technical solutions of the highest quality for renewable energy systems, smart grids and increasing energy efficiency. EMPURON's Energy Management Software application can be parameterized according to the different needs. It includes a powerful process data warehouse, forecasting and predictive analysis, storage optimization and much more. EMPURON's Energy Management Software is the right choice for energy efficiency tasks. In utilities, it is also used for supporting ancillary services. EMPURON software modules and hardware for energy management can be extensively and very easily adapted to various requirements. Customers receive a perfectly and precisely tailored function for optimum benefit – also as a cloud service.

Main Projects/Clients

- DEWA – process data warehouse, visualization and reporting; UAE
- SEC – services for Siemens Spectrum Power; KSA
- Münch-Energie – management and optimisation of hybrid power plant with renewables and battery storages; Germany
- Austrian Power Grid AG – primary and secondary control reserve monitoring; Austria

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+49 (0)91 31 69 12 70
Am Weichselgarten 7, 91058 Erlangen, Germany
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Enapter GmbH

Enapter designs and builds AEM electrolysers, one of the most efficient types of green hydrogen generators. Enapter's electrolysers are standardized, scalable, and flexible. They run in over 30 countries across all sectors, striving to make electrolysers a commodity. Currently, the scale of production is to deliver low-cost devices that will produce hydrogen for industrial and commercial purposes, energy storage, transport, or fuel for heating. Enapter's team also developed a software-defined Energy Management System (EMS) for controlling decentralized energy systems. Enapter's approach is to build the EMS as an operating system that can be accommodated to individual needs via open collaboration tools for any energy system that offers core functionality.

Main Projects/Clients

- DNVGL – power-to-heat, first hydrogen project for residential heating; Netherlands
- ZeroAvia HyFlyer project – decarbonize medium range passenger aircrafts using hydrogen; UK
- [White label] – stand-alone hydrogen energy supply system using solar energy and AEM technology; Japan
- Southern Green Gas – power-to-gas; Australia

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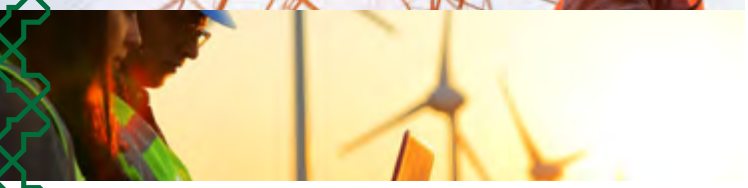
Energy & Meteo Systems GmbH

Energy & Meteo Systems (EMS) is amongst the internationally leading providers of energy-meteorological predictions and virtual power plants. They predict approximately 50 % of the installed wind and 40% of the installed solar power worldwide and offer further essential forecasts for grid operators, traders and IPPs. With their Virtual Power Plant (VPP) services, they support power aggregators and power utilities in efficient market and grid integration of power assets. The VPP collects real-time measurement and market data, manages production schedules and information on failures, controlling the many small power generators so these can be implemented as a service beneficial to the grid. EMS services are used by grid operators, power traders and Independent Power Producers from Europe, North and South America, Asia, Africa, Middle East and Australia.



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Main Projects/Clients

- Solar power forecasting for around 2000 MW in GCC, North Africa and Jordan
- Projects with ACWA Power a renewable energy power producer as their customer
- Projects with Sterling & Wilson a solar EPC contractor company as their customer
- Piloting the use of SKYCAM devices for tracking cloud movements to improve forecasting and better grid integration for a solar farm in UAE

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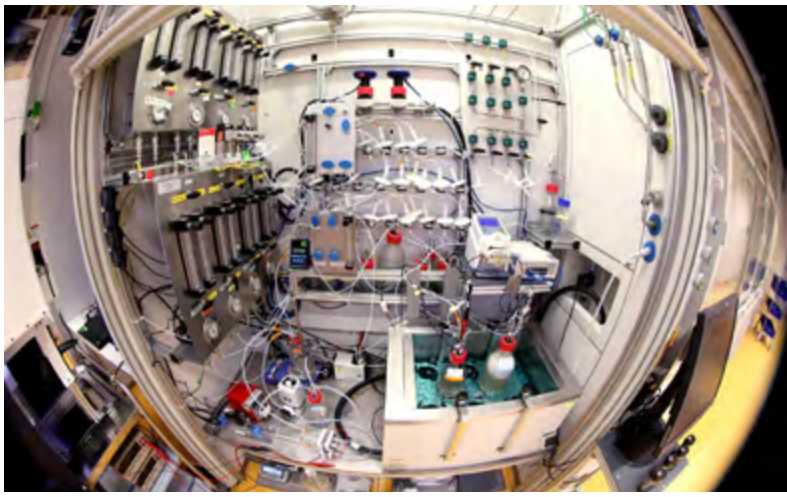

Evonik Industries AG

Evonik, one of the world's leaders in specialty chemicals, developed a new type of anion conducting membrane for the breakthrough of green hydrogen production by means of electrolysis. The new membranes consist of a resistant polymer with excellent performance indicators which is key to the effectiveness and efficiency of the electrolysis process used in the production of green hydrogen. The advantages of electrolysis with anion-conducting membranes include lower investment costs, high current density, efficiency and high flexibility. Green hydrogen is of great relevance to the renewable energy industry in the Middle East where massive solar energy projects are being developed such as Noor in Abu Dhabi, the world's largest solar project.

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FICHTNER

Fichtner GmbH & Co. KG

As a leading, independent engineering and consultancy enterprise active in the sectors of energy and infrastructure, Fichtner handles challenging projects in countries all over the world. Our highly qualified specialists provide engineering, consultancy and IT services for complex infrastructure projects, such as planning of power plants, energy transmission and distribution networks, drinking water supply and sanitation systems, and waste management facilities. For the renewable energies sector, Fichtner offers wide-ranging technical, commercial and economic expertise. Fichtner handles projects for the whole range of technologies and support its clients throughout all project phases, from feasibility study through to plant commissioning.

Main Projects/Clients

- National Renewable Energy Program, advisory services for 13 renewable energy projects; KSA
- PV-Diesel/HFO-Storage hybrid systems, feasibility study for industrial applications; KSA
- Sweihan 1170 MW Solar IPP and Al-Dhafra 1500 MW Solar IPP, technical advisory services; Abu Dhabi, UAE
- Hydrogen, electricity and heat generation from wind energy, feasibility study services; Germany

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GSR Ventiltechnik

GSR Ventiltechnik GmbH & Co. KG

GSR Ventiltechnik (GSR), a subsidiary of INDUS Holding AG, was founded in northern Germany in 1971. With a staff of over 130 employees GSR develops, produces and distributes solenoid and pneumatic-actuated valves, made in Germany. They have the right solution for virtually every application. Over 1000 valve options can be selected from their extensive add-on system. The GSR team is there to assist you in choosing the correct valve and is happy to advise you. If GSR is unable to find it in their comprehensive product range, a custom valve according to your specifications will be developed. GSR is certified in accordance with DIN standards and has several licenses for a variety of requirements needed for valves and coils.

Main Projects/Clients

- Supply of valve blocks for hydrogen-dispenser, pressure rating 1050 bar; USA
- Supply of solenoid valves for high pressure CNG service, DN 25, pressure rating 450 bar; India
- Supply of valve blocks for system of distribution of hydrogen on a boat, pressure rating 500 bar; Netherlands

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Im Meisenfeld 1, 32602 Vlotho-Exter, Germany
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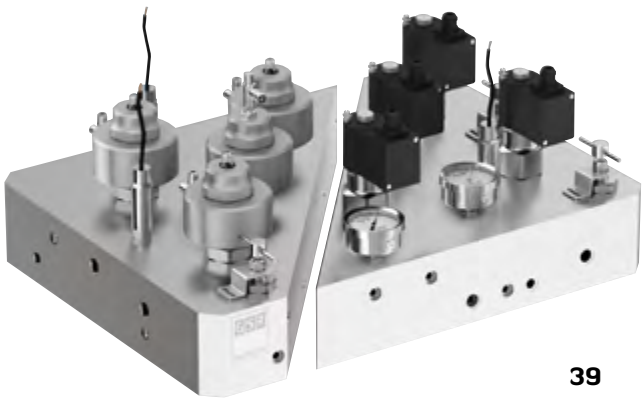

Guidehouse

Guidehouse LLP.

Guidehouse is a leading global consultancy with broad capabilities in management, technology and risk consulting. Working across the entire energy value chain, Guidehouse develops innovative solutions and strategies to support its clients in enabling the energy transition. With over 700 consultants, the global Energy, Sustainability, and Infrastructure segment is the largest in the industry. Guidehouse serves as trusted advisor to utilities and energy companies, large corporations, investors, NGOs and the public sector to help them thrive in the rapidly changing energy, resources, and infrastructure environment. Guidehouse helps customers to find effective solutions in the energy transition by connecting deep knowledge of technology, markets and policy to insights from working with governments, industry and the energy sector.

Main Projects/Clients

- Implementation of German Energy Partnership with UAE and Energy Dialogues with Saudi-Arabia and Oman
- ADDC Revenue Diversification and Beyond the Meter Services; UAE
- Demand Side Management Strategy for the Dubai Supreme Council of Energy; UAE
- ADDC Smart Grid Implementation Management; UAE

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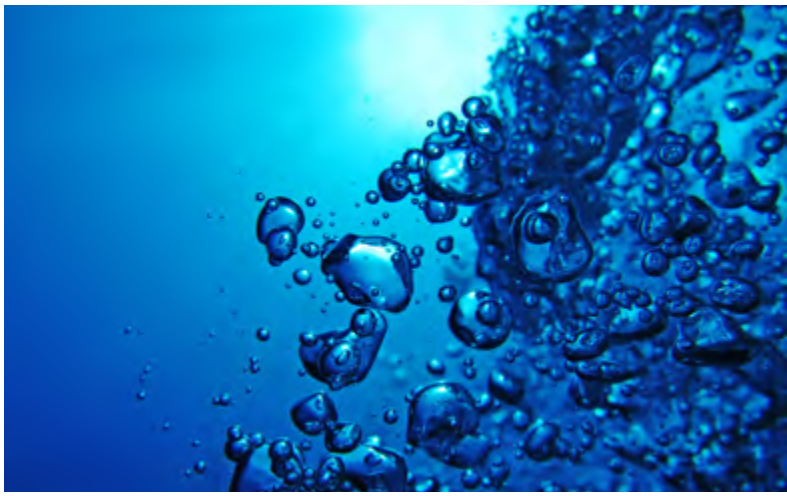

Heraeus

Heraeus Deutschland GmbH & Co. KG

Heraeus is a globally leading technology group headquartered in Hanau, Germany. Founded in 1851, it is a family-owned portfolio company. Today, Heraeus combines businesses in the environmental, energy, electronics, health, mobility, and industrial applications sectors. The global business unit Heraeus Precious Metals is one of the world's leading suppliers of precious metal services and products. We combine all activities resulting from Heraeus' comprehensive expertise in the precious metals cycle – from trading to precious metal products and recycling. Based on Heraeus' profound expertise in precious metal catalysts, we are offering customized catalysts for polymer electrolyte membrane electrolyzers and fuel cells as well as liquid organic hydrogen carrier (LOHC) and gas purification.

Main Projects/Clients

- Kopernikus Power-to-X, sector coupling – industrialization of green hydrogen as a starting point
- National Innovation program 2 – direct catalyst coated membrane (CCM), industrialization of catalyst production and CCM manufacturing

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HEROSE GmbH
Armaturen und Metalle

Herose provides safety around the world for the handling of technical gases, steams, and liquids. With more than 145 years' experience in the development, manufacture and sale of valves with a high level of innovation and modern production with certified quality management, their company is one of the world's leading manufacturers and suppliers for valves and safety valves for cryogenic technology, valves for small-scale liquefied natural gas and hydrogen applications, safety valves for general industrial applications and special valves for oil-immersed transformers.

Main Projects/Clients

- Hydrogen valves for the liquifying and shipping terminal, Kawasaki Heavy Industries; Australia
- Air Products – valve package for one of the largest air separation plants built; Jazan, KSA
- Valve package for one of the largest groups of LNG shaving stations built; Helfie, China
- LNG Vessel Fuelling – valve package for the fuelling of over 200 cruise and others shipping vessels

www.herose.com
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info@herose.com

Hydrogen is now.
H-TEC SYSTEMS

H-TEC SYSTEMS GmbH

H-TEC SYSTEMS is an international company in the field of renewable energy and hydrogen with offices in Braak and Augsburg in Germany. Since the company was founded in 1997, H-TEC SYSTEMS has been successfully developing innovative products for the production and supply of green hydrogen and is actively driving the energy revolution. Highly efficient electrolysers and stacks make H-TEC SYSTEMS one of the technology leaders in PEM electrolysis, which also contributes to making the customers value chain carbon neutral. Together with the investors GP JOULE and MAN Energy Solutions, the implementation and further development of innovative power to gas solutions are in progress.

Main Projects/Clients

- Hydrogen Refueling Station Westre – wind energy into green hydrogen; Germany
- eFarm – Germany's biggest green hydrogen mobility project; Germany
- H2 Project Haurup – electrolyser with a nominal capacity of 1 MW; Germany

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H2 MOBILITY GMBH & CO KG

H2 MOBILITY is responsible for establishing a nationwide hydrogen infrastructure to supply vehicles with fuel-cell drives in Germany. H2 MOBILITY is building a mobile future of rapid refueling, long ranges, clean and quiet mobility. This is truly one-of-a-kind: there is no comparable entrepreneurial initiative anywhere in the world that sees the introduction of a zero-emissions fuel as a national duty and works towards it in this spirit. Additionally, H2 MOBILITY is handling all of the operational tasks, including network planning, permitting, procurement, construction and operation. Shareholders of H2 MOBILITY are Air Liquide, Daimler, Linde, OMV, Shell and TOTAL associated partners: BMW, Honda, Hyundai, Toyota and Volkswagen, Germany's National Organization for Hydrogen and Fuel Cell Technology (NOW GmbH).

Main Projects/Clients

- 100 – the first goal is to operate 100 hydrogen stations in seven German metropolitan areas and along the connecting arterial roads and motorways.

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EUREF-Campus 10-11, 10829 Berlin, Germany
contact@h2-mobility.de

Hydrogenious LOHC Technologies GmbH

Hydrogenious LOHC Technologies has developed a commercially available Liquid Organic Hydrogen Carrier (LOHC) technology for safe handling of hydrogen. The innovative solution is based on a commercially available heat transfer oil. The LOHC technology is expected to become the backbone of a global renewable energy infrastructure. Hydrogenious' technology is applied to efficiently store and flexibly distribute hydrogen from sources to use points in industry and mobility. The utilization of the existing fuel infrastructure for the transportation of LOHC is a significant advantage.

Main Projects/Clients

- HySTOC – first European LOHC hydrogen refueling station, cost effective transport and storage of hydrogen; Finland
- Hydrogen refueling station with hydrogen LOHC underground tanks, hydrogen supplied via LOHC technology; Germany
- Industrial-scale H2 storage plant based on LOHC technology; Germany
- IPCEI EU-funded projects – green hydrogen import to central Europe by LOHC technology; Europe

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info@hydrogenious.net

Hydrogen Rise LLC

Hydrogen Rise is shaping the energy transition with Oman/ International industry and government partners towards an Oman hydrogen economy of the future.

Together with partners, Hydrogen Rise build and operate all key elements of long-term green hydrogen system solutions for Oman, with massive in-country value creation. This includes the infrastructure for green hydrogen production, its transport, storage, distribution and export all the way to the integration of various industrial applications in the areas.

Together with the technological focus, Hydrogen Rise lays the foundation for the systematic development of technological and academic competencies to enable competence development, job creation and new businesses (GUtech cooperation and the co-foundation of the new Oman Hydrogen Center).

Main Projects/Clients

- Injection in the gas grid
- green ammonia production
- green methanol production
- green steel production

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IAV GmbH

With more than 8,000 employees IAV is being active in the automotive industry, powertrain development, electro-mobility, renewable energies as well as product and technology-related life cycle assessments. IAV has 20 years of experience in the entire effects chain reaching from smart hydrogen production to the development and testing of fuel cells, fuel cell systems and integration of fuel cell powertrains. IAV also uses their experience in mechatronics and fluid mechanics to develop solutions in the water industry with respect to efficiency. IAV offers smart control solutions for variable-speed wind turbines that enhance energy production and reduce fatigue loads in design-critical components. We also offer virtual sensors that allow to estimate critical loads during operation, which are required for a lifetime assessment of the power plant.

Main Projects/Clients

- Development and realization of a scalable independent container-based electrolyzer family
- Development and establishment of a platform for supporting the introduction of renewable fuels into the passenger car market
- Development of a control solution for variable-speed wind turbines
- Development of approaches for smart grid management and energy management

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ib vogt GmbH

Established in 2002, ib vogt focuses on developing and delivering high-quality large-scale turnkey Photovoltaic plants worldwide. As a manufacturer-independent integrated developer with a strong worldwide network of local development partners, the company provides high quality turnkey PV plants, designed and engineered in Germany to end investors internationally. ib vogt employs over 260 experts in all areas of the solar power plant value chain. The family-owned company creates business in more than 43 countries, operating internationally from its headquarters in Berlin, Germany and offices in the UK, US, Australia, Panama, Poland, Spain, India and South East Asia, as well as several joint ventures across Africa.

Main Projects/Clients

- Infinity 50 for renewable energy, 64.1 MWp, ground-mounted, single axis solar tracking system, Benban, Egypt
- BSEP 50, 64.3 MWp, ground-mounted, single axis solar tracking system; Benban, Egypt
- Phoenix 50, 64.1 MWp, ground-mounted, single axis solar tracking system; Benban, Egypt
- MMID 30, 38.3 MWp, ground-mounted, single axis solar tracking system; Benban, Egypt

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ILF Consulting Engineers GmbH

For more than 50 years, ILF Consulting Engineers helps its clients to successfully implement technically demanding energy infrastructure projects. ILF provides its clients with innovative and individualized solutions. Energy transition must be reliable, sustainable, and environmentally friendly. ILF supports these objectives with energy concepts and energy system planning, design of wind, solar and hybrid power plants, modifying power grids to increasing power supply from renewables, and integrating energy storage such as hydropower, batteries or hydrogen both on-grid and off-grid. ILF delivers masterplans and concepts, executes different phases of design, assists during permitting, construction and commissioning and manages projects in the interface between owners, suppliers and contractors in order to lead project implementation to success.

Main Projects/Clients

- The Red Sea Development Project – The Red Sea Development Company; KSA
- Solar photovoltaic park, Industrial Development Company (INDEVCO); Benban, Egypt
- PV power plant for refugee camps, Ministry for Energy and Mineral Resources, KfW; Jordan
- Sheikh Mohammed Bin Rashid Solar Park Masterplan, DEWA; UAE

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energy-climate@ilf.com

Industrial Solar GmbH

Industrial Solar is a renewable energy and energy efficiency solution provider for industrial clients. The key focus is on solar process heating for which mainly, but not exclusively, Industrial Solar's own Fresnel collector is implemented. The Fresnel collector is optimized for industrial applications, providing temperatures of up to 400 degree Centigrade and has a long-proven track record. Based on client's requirements, turn-key solutions like solar power generation, waste heat recovery, absorption chillers as well as consultancy and engineering services are provided. Industrial Solar has a well-documented track record in the Middle East and North African region with the first projects implemented in 2009.

Main Projects/Clients

- Solar steam generation & solar thermal cooling, Japan Tobacco International; Amman, Jordan
- Solar Steam Generation, RAM Pharma Amman; Jordan
- Solar Thermal Cooling, Mobile Telephone Networks; Johannesburg, South Africa
- Solar Air Heating, Pfizer; Freiburg, Germany

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Baslerstraße 115, 79115 Freiburg, Germany
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INERATEC GmbH

INERATEC provides modular chemical plants for Power-to-X and Gas-to-Liquid applications and supplies sustainable fuels and products. Hydrogen from renewable electricity and greenhouse gases like CO_2 are converted into e-kerosene, CO_2-neutral gasoline, clean Diesel or synthetic waxes, methanol or SNG. The innovative reactors provide a high load flexibility as well as quick start-up and shut-down times. Therefore, the reactors are perfectly suitable for fluctuating renewable energy applications, e.g. wind or solar. Additionally, with this reactor concept a cost-efficient, modular numbering-up and technology scale-up becomes possible, meaning that standardized modules are multiplied to reach higher capacities.

Main Projects/Clients

- Kopernikus P2X: conversion of electricity into chemical energy
- Energy Lab 2.0: Power-to-Jetfuel plant in Karlsruhe, Germany
- Industrial Power-to-Liquid pilot plant in Werlte, Germany
- INERATEC plans an industrial pioneer plant for the production of sustainable synthetic fuels in Germany starting in 2022.

www.ineratec.com
+49 (0) 721 864 844 60
Siemensallee 84, 76187 Karlsruhe, Germany
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Jonsol GmbH

Jonsol is a PV panels manufacturer offering a wide range of polycrystalline and monocrystalline panels with different technologies and power classes. Custom made panels for specific projects with different shapes and colors are also provided. Jonsol offers storage systems, ranging from small off grid systems for telecom towers to large backup for industrial solutions, as well as charging stations for smart mobility. Jonsol aims to provide best technology at optimal prices for its clients worldwide.

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Main Projects/Clients

- Petromin Network of Gas Stations – equipping gas stations with solar energy and storage system to be grid independent
- Inwi Telecom – installing solar and storage in isolated sites of telecom towers to enlarge the telecom network in remote areas in the desert; Morocco
- American school of Tunis – installing rooftop PV modules to decrease the grid dependency and lower the energy bill; Tunisia

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KBB Kollektorbau GmbH

KBB Kollektorbau (KBB) was founded in 1993 in Berlin. KBB is a technology-oriented company specialized in the key components of thermal solar energy systems: absorbers, collectors and installation accessories. KBB distributes exclusively to OEM partners. KBB's goal is to encourage the use of solar thermal energy by manufacturing high-quality yet affordable products. That's why KBB has been concentrating on the laser welding process since 2004. Thanks to the specialists' knowledge and several years of experience, KBB Solar is able to supply premium solar products that meet market demands and use automated production processes conform to the highest industry standards.

Main Projects/Clients

- IKEA Singapore, solar cooling with large-scale collectors; Singapore
- Thermosiphon systems for big international hotels; Djerba, Tunisia
- Solar district heating, 2500 m^2, Châteaubriant; France
- Solar district heating for mountain region, 5000 m^2; Mürzzuschlag, Austria

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LED LIGHT Germany GmbH

LED LIGHT's high performance LED technology is designed, developed and made in Germany. LED LIGHT is a system partner for energy-efficient lighting systems and renovation. With the highest possible quality and service processes, LED LIGHT is a specialized manufacturer. LED LIGHT analyzes and develops the optimal solution for each project together with its customers. LED LIGHT equips hotels with all types of lightings as well as with antibacterial concepts for new buildings, especially for quick renovations of guestrooms. LED LIGHT also provides hospitals with antibacterial light concepts and human centric lighting as well as antibacterial light concepts for the food- and clean-room industry. LED lights can be used for architecture, monuments, public areas and landscape lighting.

Main Projects/Clients

- Sharjah World Book Capital Monument, high-performance LED-full-color, DMX controlling; UAE
- Kameha Grand Hotel, high-performance LED-full-color, DMX controlling, conference- and event hall lighting; Germany
- Humboldt Carre, conference and event building, high-performance LED-full-color, DMX controlling; Germany
- Hambacher Castle, customized restaurant lighting and landscape lighting; Germany

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Linde GmbH

Linde is a global leader in the production, processing, storage and distribution of hydrogen. It has the largest liquid hydrogen capacity and distribution system in the world. The company also operates the world's first high-purity hydrogen storage cavern coupled with an unrivalled pipeline network to reliably supply its customers. Linde is at the forefront in the transition to clean hydrogen and has installed over 180 hydrogen fueling stations and 80 hydrogen electrolysis plants worldwide. The company offers the latest electrolysis technology through its newly formed joint venture ITM Linde Electrolysis.

Main Projects/Clients

- Hydrogen liquefaction: Liquefaction plant with ongoing expansion project to double production capacity. Leuna, Germany
- Pre-combustion capture of CO_2: Capture of 600 tons per day of CO_2 and subsequent purification for further usage. Porvoo, Finland
- Hydrogen Refueling Station: next generation 100% renewable hydrogen refueling station for passenger cars. Fountain Valley, USA
- Upstream removal of CO_2 with pressure swing adsorption: 315 tons per day CO_2 are captured and purified for further usage. Leuna, Germany

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Ludwig-Bölkow-Systemtechnik GmbH

Ludwig-Bölkow-Systemtechnik (LBST) is an expert consultancy for sustainable energy and mobility. With expertise bridging technologies, markets and policy, LBST supports public and private international clients in strategy, feasibility and market assessments. International blue-chip companies trust in LBST's reliable judgment. The leading competence of LBST is based on over three decades of continuous experience and on the interdisciplinary team of leading experts. Hydrogen-related activities include techno-economic analyses, modelling, feasibility studies of large-scale hydrogen generation and supply infrastructure as well as detailed work on the associated regulatory and market environment. With deep understanding of developments and technologies and truly independent advice, LBST helps clients with sustainable decisions to secure their future.

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Main Projects/Clients

- Study on introducing hydrogen into the energy sector, project developer; Oman
- Feasibility study for a 100 MW power-to-gas project, transmission system operators; Europe
- Impact of international climate action targets on worldwide hydrogen demand; GCC
- Hydrogen market study and demand outlook, oil producer; GCC

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MAN Energy Solutions Middle East LLC

MAN Energy Solutions enables its customers to achieve sustainable value creation in the transition towards a carbon-neutral future. Addressing tomorrow's challenges within the marine, energy and industrial sectors, they improve efficiency and performance at a systemic level. They provide a unique portfolio of technologies, such as liquefied natural gas, hybrid, energy storage, hydrogen and Power-to-X solutions. Energy storage is key to combine sustainability and availability, their molten salt energy storage technology takes solar power plants to base load operation. Green fuels from Power-to-X can continuously replace fossil fuels, tackling climate change and fostering oil and gas assets for upcoming markets at the same time. MAN Energy Solutions provides complete facilities for hydrogen, synthetic natural gas or energy storage on an EPC basis.

Main Projects/Clients

- World's largest power-to-methane plant; Werlte, Germany
- Steam turbine for a 100 MW CSP plant; Shams, UAE
- World's first ship operation on synthetic natural gas (SNG); Wes Amelie, Germany

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meteocontrol GmbH

meteocontrol is one of the world's leading developers and providers of professional monitoring and control systems for PV power plants and solar parks. meteocontrol supports the operation of PV systems with precise system monitoring, direct remote control and feed in management to achieve optimal yields and returns as well as to minimize technical risks. meteocontrol offers holistic, high quality, flexible and innovative solutions – thanks to wealth of experience, expertise and professional in-house development activities. meteocontrol is represented internationally through branch offices in Europe and affiliated companies in the Middle East, Asia, South- and Central America, Australia and the US. meteocontrol products are available globally thanks to a growing network of sales and distribution partners.

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Main Projects/Clients

- Dubai DP World Phase One rooftop project, holistic monitoring system
- Dubai shopping mall rooftop project, monitoring system with building management system integration
- Dubai logistic warehouse, complete monitoring system and plant management software
- Egypt utility-scale project, complete local SCADA system

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MTU Middle East FZE

MTU, a Rolls-Royce solution, offers various products and services to deliver world class power solutions with complete life-cycle support. Through digitalization and electrification, MTU develops distributed power generation solutions that are even cleaner and smarter, thus providing answers to the challenges for energy and mobility. MTU delivers comprehensive, powerful and reliable systems based on both, gas and diesel engines as well as electrified hybrid systems. These clean and technologically advanced solutions serve customers in the marine and infrastructure sectors worldwide. MTU systems provide energy for the world's most important mission-critical applications. Through advanced solutions such as micro-grids and energy storage, MTU integrates renewable energies to increase the reliability of power solutions for customers.

Main Projects/Clients

- Stationary and mobile backup power for Barakah Nuclear Power Plant, Emirates Nuclear Energy Corporation; UAE
- Mobile Power Stations, Dubai Electricity and Water Authority; Dubai, UAE
- Emergency power station for new Kuwait International Airport Terminal 2; Kuwait
- Emergency back-up power plant King Khalid International Airport; Riyadh, KSA

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Multifilm Sonnen- und Blendschutz GmbH

Multifilm Sonnen- und Blendschutz has been producing highly efficient sun and glare protection systems for more than 25 years with many international references. Their focus is on the improvement of energy consumption and the ergonomics of buildings and offices. The high-quality sun protection systems offer optimal heat and glare protection, pleasant indoor climate and a substantial reduction of the energy consumption of buildings. The systems are robust and maintenance-free and offer economically sustainable solutions for advanced facility management and a calculable a return on investment. The high-performance films and technical fabrics combine effective heat and optimal glare protection while still providing views to the outside world and natural daylight to support the wellbeing of employees.

Main Projects/Clients

- Daimler VAN Technology Center; Germany
- Center for Virtual Engineering (ZVE); Germany
- Universities in Seoul, Peking, Stockholm, Bergen
- Airport Towers in Dubai, Abu Dhabi, Oman, London Heathrow, Frankfurt, Zurich, Oslo, Dublin

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NEUMAN & ESSER GmbH & Co. KG

NEUMAN & ESSER GROUP (NEA) is a leading manufacturer of piston, diaphragm compressors and compressor systems for process gases, technical gases and natural gas from 5 kW to 30 MW driving power. With the acquisition of HOFER and its hydraulically driven piston compressors and diaphragm compressors, NEA entered the market segments Power-to-X and mobility with hydrogen refueling stations. Since ever NEA compressors play a key role when it comes to transport, store and feed the natural gas grid. The recent takeover of Arcanum Energy Systems as consultant of biogas plants along its value chain is a perfect fit to NEA's biomethane compressor range. NEA, the experts in hydrogen compression, are stakeholder of the start-up Alternative Energy Driven Solutions as well, which develops mobility concepts based on CO_2 neutral charging and supply infrastructure.

Main Projects/Clients

- 25 HOFER TKH compressors and diaphragm compressors for vehicle refueling stations; Korea
- Two diaphragm compressors to refill trailers for HRS of taxi fleet; France
- Green H2 produced by electrolyzers will be used to refuel trains; Europe
- Six TKH compressors for HRS and two compressors to refuel trucks; California

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NEXT Kraftwerke GmbH

Next Kraftwerke operates one of the largest Virtual Power Plants (VPP) in Europe and is, as a certified power trader (e. g. on EPEX and EEX), one of the leading traders of electricity from renewable energies. Via its control system, the VPP networks over 8,700 electricity producing, consuming, and storing plants. These include biogas, natural gas cogeneration, hydroelectric, wind and solar power plants, but also consumers, e.g. water pumps, industrial processes, and batteries. The networked generation capacity of the VPP is currently over 7,700 MW. With NEMOCS, Next Kraftwerke also offers a software-as-a-service solution that enables third parties to implement their own VPP and monitor, forecast and steer decentralized assets.

Main Projects/Clients

- Power-to-gas monitored and steered by VPP control system, Greenpeace Energy; Haßfurt, Germany
- Control reserve through emergency power generators, Clinical Center; Dortmund, Germany
- Electric Vehicles: Pilot project to provide control reserve through the batteries, Jedlix; Netherlands
- Software-as-a-service in UK, Slovakia, Japan and South Korea. One client, Ecotricity, integrated a wind park into the system

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PI Photovoltaik-Institut Berlin AG

PI Berlin is the leading technical consultancy for complex PV projects. PI's service portfolio includes project development, risk management and quality assurance for PV power plants and components. The strength of PI results from the combination of expertise in the areas of factory production, laboratory testing, and PV power plant performance. The ability to carry out quality assurance from the factory to the field and to consider the interactions among the different areas creates a high degree of security and transparency for our customers. Internationally, PI is represented by subsidiaries in Germany, the US, Spain and China.

Main Projects/Clients

- Cleaning robots accelerated testing for large PV Solar Power Project with an international consortium; Dubai, UAE
- Technical Consultancy on Water Photovoltaic Plants (PV) for Pumping Stations; Jordan
- Factory Audit in China for a module manufacturer for a project based; Dubai, UAE
- 3rd Party inspection of PV modules for a rooftop project; Dubai, UAE

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RENK AG

RENK, headquartered in Germany with more than 2,500 employees, is the world's leading specialist for pioneering drivetrain solutions in industrial applications, energy production and beyond. Our innovative products and solutions set standards when it comes to quality, precision, and reliability. RECOVAR-E is a superimposed variable-speed drive used for compressors and pumps. The gear is an electromechanical drive system, being a hybrid of a converter and a mechanical drive. etaX is an evacuated high-speed gear for power generation and O&G applications. RENK also offers components for the wind sector.

©Societe Generale Bank: Al-Salt, Jordan

Main Projects/Clients

- RENK has relationships with leading engineering companies and end-users across the GCC's oil & gas industry. Across the GCC there is a shift towards more efficient equipment and RENK's products are therefore used to replace conventional gears and increase production efficiency.

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S:FLEX GmbH

S:flex is an international manufacturer of mounting systems for PV installations and a long established brand in the solar industry. Their founders look back to more than 20 years of experience in sales, planning and implementing solar power systems in Europe and the US. When developing the products, S:flex focuses on being able to satisfy customer requirements for easy and quick deployment with high compatibility for a variety of system applications. This results in a high-quality product portfolio based on a modular principle with prefabricated components. S:flex's offer is complemented by services and support for the local customer on site provided by the headquarters and its branch offices in Germany as well as its international subsidiaries from planning and developing project-specific solutions to fast and reliable deliveries.

Main Projects/Clients

- Dubai World Trade Center – 2 MWp photovoltaic rooftop system; Dubai, UAE
- ARAMEX – 7 MWp photovoltaic rooftop system; Dubai, UAE
- Sabhan Mall – 3,8 MWp photovoltaic rooftop system; Sabhan, Kuwait
- Jabal Allaith Island – 30 kWp ground mount photovoltaic system; KSA

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Schletter Solar GmbH

The Schletter Group is one of the world's leading manufacturers of solar mounting systems. Schletter develops and manufactures mounting solutions made of aluminum and steel for solar farms, flat roofs and pitched roofs. For 50 years, the name Schletter has stood for first class quality in metal processing – from its beginning as a family-owned enterprise to its present position as a global group of companies. With around 600 employees, production facilities in Germany and China as well as a global network of distribution and service companies Schletter today is one of the leading manufactures of solar mounting systems with plants and systems installed on all continents – from Germany to Saudi Arabia, from Cape Town to Sydney.

Main Projects/Clients

- 12 MW Almafraq, Client GSI; Jordan
- 55 MW Traker Project, Client M+W; Egypt
- 150 MW Ground mounting; Philippines
- 96 MW, Client Siemens; South Africa

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Schüco International KG

Schüco International KG is based in Bielefeld and develops and sells system solutions for windows, doors and facades in more than 80 countries. With more than 5,400 employees worldwide, the company strives to be the industry leader in terms of technology and service today and in the future.
In addition to innovative products for residential and commercial buildings, the building envelope specialist offers consultation and digital solutions for all phases of a building projects from the initial idea through to design, fabrication and installation. More than 12,000 fabricators, developers, architects and investors around the world are working together with Schüco.

Main Projects/Clients

- Atlantis the Palm Hotel; Dubai, UAE
- Dubai Mall; Dubai, UAE
- King Abdullah Financial District; Riyadh, KSA
- Riyadh Metro Stations; Riyadh, KSA

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Sharp Electronics GmbH

Having been in the solar market for 60 years, longer than any other company in the industry, Sharp's experience in the PV business is unrivalled. As a pioneer in the PV market, Sharp has been a driving force behind the use of PV technologies for decades and has delivered more than 50 million PV modules worldwide. With new solar applications in high-tech sectors of the industry including aviation and e-mobility, Sharp continues to demonstrate its aptitude for innovation. For residential, industrial and free-field installations, Sharp offers various sizes of poly- and monocrystalline half-cut cell high-performance solar panels. Sharp's solar business is part of a corporation with a broad range of products and a strong financial backbone, as confirmed by Bloomberg's Tier 1 listing.

Main Projects/Clients

- Sharp NSN Energy Solution JSC, procurement and construction business; Vietnam
- Yokohama Rubber nr.1 tire factory installation, solar power system on the rooftop of a production plant; Philippines
- Prius concept car, Sharp and Toyota collaboration for solar powered car; Japan
- Turnkey power plant for Utilitas Energy Group, largest Sharp PV installation in the Baltic states; Estonia

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Siemens Energy

Siemens Energy is one of the world's leading energy technology companies. The company works with its customers and partners on energy systems for the future, thus supporting the transition to a more sustainable world. Siemens Energy covers almost the entire energy value chain – from power generation and transmission to storage. The portfolio includes conventional and renewable energy technology, such as gas and steam turbines, hybrid power plants operated with hydrogen, and power generators and transformers. More than 50 percent of the portfolio has already been decarbonized. A majority stake in the listed company Siemens Gamesa Renewable Energy makes Siemens Energy a global market leader for renewable energies. An estimated one-sixth of the electricity generated worldwide is based on technologies from Siemens Energy.

Main Projects/Clients

- MENA's first solar-powered Green Hydrogen project in partnership with DEWA and EXPO2020, UAE
- Egypt Megaproject - 14.4 GW in 27.5 months, Egypt
- Iraq Roadmap – 11 GW National Grid Upgrade, Iraq
- Global First – Siemens H-class in EGA Aluminum Smelter

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SMA Solar Technology AG

As a leading global specialist in photovoltaic system technology, SMA Solar Technology (SMA) is setting the standards today for the decentralized and renewable energy supply of tomorrow. SMA's portfolio contains a wide range of efficient PV inverters, holistic system solutions for PV systems of all power classes, intelligent energy management systems and battery storage solutions as well as complete solutions for PV diesel hybrid applications. Digital energy services, as well as extensive services up to and including operation and maintenance services for PV power plants, round off SMA's range. SMA inverters with a total output of around 85 GW have been installed in more than 190 countries worldwide. SMA's multi- award-winning technology is protected by more than 1,500 patents and utility models.

©Izzat Marji Group

Main Projects/Clients

- Utility-scale PV power plant – UNHCR Refugee Camp Azraq, 2 MW; Jordan
- Commercial PV power plant – Central Body Shop, 827.4 KW, Geotech Environmental Services Company; Kuwait
- PV power plant – Societe Generale Bank, Al-Salt, 1 MW, Izzat Marji Group; Jordan

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Solarlite CSP Technology GmbH

Solarlite CSP Technology is a German manufacturer and EPC of parabolic trough systems which are able to produce heat for power plants and industrial applications up to a temperature of 550°C. Solarlite offers state of the art direct steam generation and thermic fluid systems. The project portfolio varies from process heat for industrial applications, solar air conditioning and desalination of seawater to enhanced heavy oil recovery and district heating & cooling networks. Solarlite has been engineering molten salt based power projects in Italy and Greece thereby providing constant daily solar heat and power. Solarlite is planning several high-temperature district heating networks in Europe.

Main Projects/Clients

- Process heat supply for a chemical plant in Oostende; Belgium
- Process heat application project for a chemical plant in the port of Antwerp; Belgium
- Duke – direct steam generation at high temperatures; Spain
- World's first solar direct steam generation power plant; Kanchanaburi, Thailand

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SOLMOVE GmbH

Solmove's core product is an innovative multi-functional surface for streets and other sealed areas. The modular system produces green electricity, light for more safety, data for better traffic management and later inductive charging for electric cars. Benefits are preserving the land available for agricultural use, added value for existing assets and enable each community to contribute locally to the energy transition and e-mobility. Solmove is certified for supporting the UN Sustainable Development Goals for clean energy; industry, innovation, and infrastructure and sustainable cities and communities. Solmove has entered the international market with a first project in the Dubai, where they want to support sensors for environmental data in a sustainable city area.

Main Projects/Clients

- Solarstreet 50m², RAG AG; Gelsenkirchen, Germany
- Sidewalk 3,3m², RheinEnergie AG, Cologne, Germany
- Bicycle lane 187m², City of Erftstadt; Germany

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SPG STEINER GmbH

SPG Steiner GmbH is a German based family-owned company with a history looking back to the year 1701. With our business units we are providing innovative technologies and supply of high-quality special turnkey components for the energy and petrochemical industry worldwide.

- Gas process packages
- Clean combustion technology (Flare System, Burners)
- Energy storage of low temperature & cryogenic products

Through integration of the business unit technologies, SPG Steiner provides as EPC contractor complete small and mid-scale plants and terminals.

For the global transition to a low-carbon future we focus on:

- Increasing brownfield plant efficiencies
- Modular design concepts for decentralized energy supply
- Storage technologies for low temperature and cryogenic products
- Distribution technology for low temperature and cryogenic products

Main Projects/Clients

- BASF Antwerp, Cold Ammonia Tank Replacement, current world's largest ammonia tank 53.000 tons
- Audi, Germany, Synthetic e-Fuel Project, production synthetic fuels
- Kuzey Marmara, Turkey, Underground Gas Storage Expansion Project, design, engineering and procurement of Silica Gel Adsorption Units
- Linde Portovaya, Russia, LNG Storage 42.000m³ Tank, record project execution time of 22 months only

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Sunfire GmbH

Sunfire is a global leader in the production of industrial electrolyzers based on pressurized alkaline (AEL) and solid oxide (SOEC) technologies. With its electrolysis solutions, Sunfire is addressing a key challenge of today's energy system: Providing renewable hydrogen and syngas from renewable electricity, water, and CO_2 as climate-neutral substitutes for fossil energy. Sunfire's innovative and proven electrolysis technology enables the transformation of carbon-intensive industries that are currently dependent on fossil-based oil, gas, or coal. The company employs more than 250 people located in Germany, Norway, and Switzerland.

Main Projects/Clients

- Sable Chemicals, Zimbabwe: 100 MW pressurized alkaline electrolyzer, H2 for ammonia/fertilizer production
- Demo4Grid, Austria: 4 MW next-generation pressurized alkaline electrolyzer, sector coupling and grid servicing
- MultiPLHY, Netherlands: 3 MW SOEC electrolysis, H_2 for biofuel refining
- GrInHy2.0, Germany: 1 MW SOEC electrolysis, H_2 for green steelmaking

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SYNLIFT Industrial Products GmbH & Co. KG

Synlift is a system integrator for smart technologies in water supply and water & energy combined supply with a special focus on flexible water treatment and water conveying systems as pre-engineered units with up to 10,000 m^3/d and tailor-made solutions with 100,000 m^3/d and more – directly and/or indirectly powered by solar and/or wind energy. For temporary and permanent use, Synlift is currently developing a floating REdesal (Desalination powered by renewables energies) unit with up to 50,000 m^3/d in cooperation with industry partners. Synlift is engaged in early stage investigations, technical planning, project and product development, turnkey implementation and operation management.

Main Projects/Clients

- Large-scale PV powered desal and pumping project, Trends; Chile
- Large-scale PV powered pumping project, SQM; Chile
- Large-scale wind powered floating desal units; worldwide
- Wind power project; Masdar, UAE

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thyssenkrupp Industrial Solutions AG

thyssenkrupp Industrial Solutions offers a unique set of solutions for synthesis of green chemicals. thyssenkrupp offers alkaline water electrolysis, which produces green hydrogen with high efficiency. With decades of experience in industrial application, thyssenkrupp's alkaline water electrolysis has been thoroughly designed and tested. The standardized modules easily add up to large installations needed for industrial application. With industrial scale, thyssenkrupp has a track record plus a unique portfolio of downstream processes: green ammonia, methanol, synthetic natural gas, fertilizers and more. thyssenkrupp can offer a full range of Power-to-X technologies and complete project execution from a single source, enabling green value chains for decarbonizing our society.

Main Projects/Clients

- Carbon2Chem project – water electrolysis plant
- STORE&GO pilot project – green methane produced by power-to-gas technology provides a keystone for the cross-sector energy transition
- Technology and EPC partner – realized more than 2,500 chemical plants worldwide

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Tractebel Engineering GmbH

For 150 year, Tractebel has been known as an engineering leader in power generation, transmission, and distribution around the world. Today, we are focused on engineering to decarbonize and decentralized energy for the clients we serve worldwide. Digital solutions are built in from end to end. We offer the complete, integrated range of engineering and advisory services to fuel zero-carbon transition: from development and design, through construction and commissioning up to operational support, rehabilitation, and decommissioning of all sizes of energy infrastructures. This expertise extends as well to EPC, EPCM and brown-field investment projects. Our hybrid solutions combine renewable energy generation with electrical storage, power-to-gas, waste-to-X and green gases like biomethane and hydrogen.

Main Projects/Clients

- Tihama Cogeneration Expansion, Technical Advisor and Owner's Engineer Mission in KSA
- HV Reconfiguration Implementation Phase II for Emirates Global Aluminum (EGA), Dubai, UAE
- Offtaker for CSP Phase IV IPP for DEWA, Technical Advisory to Support Off-taker Project Committee, Dubai, UAE
- Environmental Impact for Export Credit Agency Credeno, Marine Infrastructure Works, KSA & UAE

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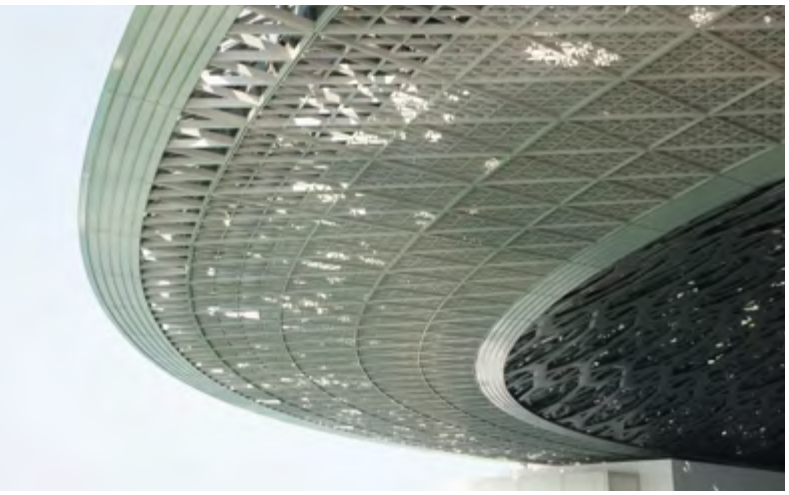
Transsolar KlimaEngineering

Transsolar KlimaEngineering GmbH

Transsolar KlimaEngineering is a diverse team of engineers focused on creating climate responsive built environments. Transsolar collaborates with their clients and partners to enhance the human experience while minimizing resource use following their self declared attitude: Transsolar consults for a variety of projects, ranging from residential and university buildings to museum design, campus planning and urban design. The firm also has a history of art collaboration where the knowledge and skill to manipulate a space's thermodynamic conditions are required. Notable examples are "cloudscapes" with Tetsuo Kondo and "lightscapes" with Anja Thierfelder at the 2010 and 2016 Architecture Biennale in Venice. Transsolar has been operating for almost 28 years with offices in Stuttgart, Munich, Paris and New York.



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Main Projects/Clients

- ARGE Deutscher Pavillion EXPO2020; Dubai, UAE
- Singapore Pavilion (Urban Redevelopment Authority (URA)) at Expo 2020; Dubai, UAE
- Louvre Abu Dhabi; UAE
- Masterplan Masdar City (Abu Dhabi Future Energy Company); Abu Dhabi, UAE

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TROX® TECHNIK
The art of handling air

TROX Middle East LLC

Trox is the leader in the development, manufacture and sale of components, appliances and systems for indoor air conditioning and ventilation since it was founded in 1951. The interaction between all technical building services can make or break the whole system, therefore Trox offers everything from a single source. Air handling units and ventilation components complement each other perfectly and this results in maximum energy efficiency while the coordination effort during the design and installation stages for a project is reduced to a minimum. Working closely with its customers, Trox develops specific systems that take the relevant criteria for each building into account and meet the requirements of its occupants. This close cooperation leads to sustainable solutions that help to increase people's well-being and to protect life and the environment.

Main Projects/Clients

- Burj Al Arab; Dubai, UAE
- Dubai International Airport; Dubai, UAE
- Riyadh Metro; Riyadh, KSA
- Etihad Museum; Dubai, UAE

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Viessmann Middle East FZE

The Viessmann Group is one of the leading international manufacturers of heating-, cooling-, steam- and climate control technology. The product range includes advanced heating systems for every type of fuel (oil, gas, solar, bio-fuel and natural heat) and for every output range from 1.5 to 116,000 kW, commercial cooling technology and temperature controlled rooms.
Viessmann Middle East is owned by Viessmann Werke GmbH & Co. KG Germany, an ISO 9001 & 14001 certified German manufacturer, listed with UN and WHO and with subsidiaries and representation in 74 countries and 120 sales offices around the world. The success comes from leading innovation through outstanding product development, high quality standards using advanced design principles, offering multi–range of products from a single source ensuring a perfect solution for every demand and every budget.

Main Projects/Clients

- Hilton The Pearl Residences, Domestic hot water supply by 3 pcs. cascade connected Vitoplex 200 gas fired boilers, Qatar.
- Marriott Mena House, food storage designed and delivered 11 freezer and cold rooms, Egypt.
- Deira Water Front, Solar thermal domestic hot water system - 61 pcs. of Vitosol 100-FM collectors and matched 5000 L calorifiers, UAE.
- Chemtech, cold rooms with antimicrobial Smart Protec coating for storing sensitive medical supplies, Mauritius.

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WAGO Middle East FCZ

The WAGO Group is an international, standard-setting supplier for electrical interconnection and automation products as well as for interface electronics. The company is the world market leader in spring pressure connection technology. Wago has continued to grow since being founded in 1951, with a worldwide workforce of more than 8,500. The company achieved sales of €932 million in 2018. The energy market needs to change towards something new and more CO_2 neutral. This leads to new ideas and new infrastructure for topics such as Power-to-X. To achieve this, control systems from production to consumption need to be integrated into intelligent communication networks. Wago supports the energy transition with state-of-the-art control and measurement technology and software solutions that enable simple and secure connection via telecontrol protocols or to any cloud.

Main Projects/Clients

- Automation systems and electrical components for Hydrogen refueling stations (HRS); UK
- Remote I/O systems incl. intrinsically safe I/O-modules for HRS (65kg/day); Brussels, Belgium
- Remote I/O systems incl. intrinsically safe I/O-modules for HRS (780kg/day); Hamburg, Germany
- Remote I/O systems incl. intrinsically safe I/O-modules for HRS (130kg/day); Stuttgart, Germany

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Wenger Engineering GmbH

As an external research and development center for thermodynamics, fluid mechanics and hydrogen technology, the Wenger Engineering team helps its clients in taking their products to a whole new level to a whole new level. Wenger operates in the following sectors: hydrogen technology; system and product development, simulation, heat exchangers and cooling systems: calculation, construction, and delivery, simulation: flow, heat transfer and multiphysics, software and IoT: electromobility, hydrogen and process engineering.

Main Projects/Clients

- Development and optimization of Power-to-X-plants, Germany
- Engineering services for hydrogen systems; US, Japan, France, Germany
- Hydrogen storage development for fuel cell vehicles and trucks; US, Germany, Japan

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List of Sources

1 Institute for Transformative Sustainability Research – IASS (2020). Soziales Nachhaltigkeitsbarometer der Energiewende 2019.
Available at: https://www.iass-potsdam.de/sites/default/files/2020-04/Online_IASS_Barometer_200422_FINALFINAL.pdf

2 German Federal Ministry for Economic Affairs and Energy – BMWi (2019). Second Progress Report on the Energy Transition – Energy of the Future – Reporting Year 2017.
Available at: https://www.bmwi.de/Redaktion/EN/Publikationen/Energie/second-progress-report-energy-transition.pdf?__blob=publicationFile&v=3

3 German Federal Ministry for Economic Affairs and Energy – BMWi (2019). Second Progress Report on the Energy Transition – Energy of the Future – Reporting Year 2017.
Available at: https://www.bmwi.de/Redaktion/EN/Publikationen/Energie/second-progress-report-energy-transition.pdf?__blob=publicationFile&v=3

4 Energy Brainpool (2018). Record! For the first time, renewable energies cover 100 percent of the demand for electricity - and the lights didn't go out!
Available at: https://blog.energybrainpool.com/rekord-erneuerbare-energien-decken-erstmalig-100-prozent-der-stromnachfrage/

5 German Federal Network Agency – BNetzA (2020). Quality of Supply.
Available at: https://www.bundesnetzagentur.de/EN/Areas/Energy/Companies/SecurityOfSupply/QualityOfSupply/start.html

6 Federal Ministry for Economic Affairs and Energy – BMWi (2019). Second Progress Report on the Energy Transition – Energy of the Future – Reporting Year 2017.
Available at: https://www.bmwi.de/Redaktion/EN/Publikationen/Energie/second-progress-report-energy-transition.pdf?__blob=publicationFile&v=3

7 Federal Ministry for Economic Affairs and Energy – BMWi (2019). Second Progress Report on the Energy Transition – Energy of the Future – Reporting Year 2017.
Available at: https://www.bmwi.de/Redaktion/EN/Publikationen/Energie/second-progress-report-energy-transition.pdf?__blob=publicationFile&v=3

8 Federation of German Industry – BDI (2016). Schlaglicht Mittelstand.
Available at: https://urbis.europarl.europa.eu/urbis/sites/default/files/generated/document/en/Schlaglicht-Mittelstand_Broschuere.pdf

9 Federation of German Industry -BDI (2016). Schlaglicht Mittelstand.
Available at: https://urbis.europarl.europa.eu/urbis/sites/default/files/generated/document/en/Schlaglicht-Mittelstand_Broschuere.pdf

10 Federal Ministry for Economic Affairs and Energy – BMWi (2019). Second Progress Report on the Energy Transition – Energy of the Future – Reporting Year 2017.
Available at: https://www.bmwi.de/Redaktion/EN/Publikationen/Energie/second-progress-report-energy-transition.pdf?__blob=publicationFile&v=3

11 German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety – BMU (2018). GreenTech made in Germany 2018.
Available at: https://www.bmu.de/en/publication/greentech-made-in-germany-2018-environmental-technology-atlas-for-germany/

12 Institute for Transformative Sustainability Research – IASS (2020). Soziales Nachhaltigkeitsbarometer der Energiewende 2019.
Available at: https://www.iass-potsdam.de/sites/default/files/2020-04/Online_IASS_Barometer_200422_FINALFINAL.pdf

13 PV magazine (2019). Noor solar park operational.
Available at: https://www.pv-magazine.com/2019/07/01/noor-limits-as-dubai-makes-extraordinary-carbon-emissions-claim/

14 UAE Government (2020). 7. Affordable and clean energy.
Available at: https://u.ae/en/about-the-uae/leaving-no-one-behind/7affordableandcleanenergy

15 MEES (2020). Saudi Targets 50% Renewable Energy Capacity.
Available at: https://www.mees.com/2020/6/26/power-water/saudi-targets-50-renewable-energy-capacity/08176b40-b7b2-11ea-be25-69fa80b29688

16 Evwind (2019). Oman targets 30% renewable energy share by 2030.
Available at: https://www.evwind.es/2019/03/19/oman-targets-30-renewable-energy-share-by-2030/66472

17 International Renewable Energy Agency – IRENA (2019). Renewable Energy Market Analysis – GCC 2019.
Available at: https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2019/Jan/IRENA_Market_Analysis_GCC_2019.pdf

18 International Renewable Energy Agency – IRENA (2019). Renewable Energy Market Analysis – GCC 2019.
Available at: https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2019/Jan/IRENA_Market_Analysis_GCC_2019.pdf

19 Bahrain eGovernment (2019). Sustainability.
Available at: https://www.bahrain.bh/wps/portal/!ut/p/a0/hcqxCsIwEADQX3HpfGmLoY5FpKVLQRFjlnJqCKfhkpqz6N-LX-D44IEFA5ZxlY9CkTH8bPXUj0qXVV-MNTX2sVTvq7X6zU2Wn1nBwDMO_ZOBM93m2LdhrZHFvAeN8XFJ8CobJcaEC8o3YrxJ6lwuVX1mQGC8USD6QHt3pC8ikFGw!/

20 International Renewable Energy Agency – IRENA (2019). Renewable Energy Market Analysis – GCC 2019.
Available at: https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2019/Jan/IRENA_Market_Analysis_GCC_2019.pdf

21 International Renewable Energy Agency – IRENA (2019). Renewable Energy and Jobs – Annual Review 2019.
Available at: https://www.irena.org/publications/2019/Jun/Renewable-Energy-and-Jobs-Annual-Review-2019

22 International Renewable Energy Agency – IRENA (2019). Renewable Energy: A Gender Perspective.
Available at: https://www.irena.org/publications/2019/Jan/Renewable-Energy-A-Gender-Perspective


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