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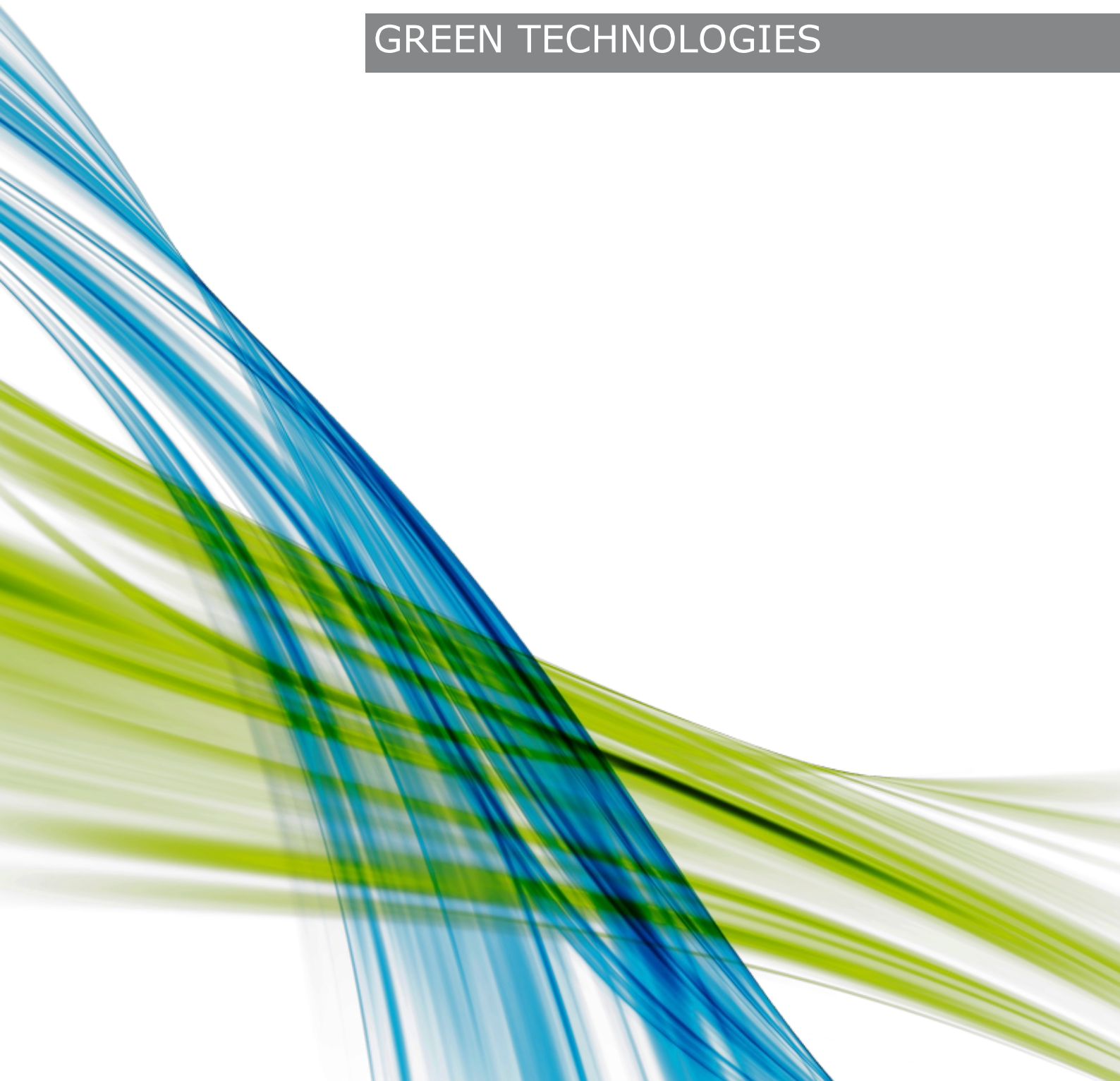
ELECTRIC LLC

consulting • design ► distribution of electrical systems

GREEN TECHNOLOGIES



Contents

Foreword by the Managing Director

We create ideal solutions according to your special guidelines.

Martin Endres
Managing Director

The world needs more and more energy each day. Besides the environmentally and sustainable generation of energy, an effective and efficient energy supply gains increasing importance. Not only hospitals, airports or universities need a safe and reliable power distribution.

Energy is everywhere and energy is everywhere indispensable.

In order to offer you a maximum in reliability and security of supply, MECO ELECTRIC LLC exclusively cooperates with selected and considerable manufacturers. It is self-evident for us, offering you turnkey projects from one source.

Clients will benefit from our excellent network of partnerships, as well as from the hereof resulting vendor independence. This will place us in the position to meet your individual demands at best, both in technical and in economical respects.

We offer manufacturers and merchants of electrical industry products the possibility to participate in national and international projects of MECO ELECTRIC LLC. The focus of these activities lies on Europe, the Near and Middle East, the United Arab Emirates, as well as the States of Africa.

The Company

Company MECO ELECTRIC LLC was founded in 2009 in Abu Dhabi. Our activities range from consulting, design and conception to delivery, mounting and maintenance of solar thermal, photovoltaic and wind power stations, cooling systems, as well as technologies for water treatment. Besides the mentioned green technologies we offer our customers a wide range of electrotechnical systems and products like low- and medium-voltage switchgears, transformers and UPS-plants, as well as all kinds of electrical installation materials.

We can revert to a wide experience of more than 35 years in the field of energy distribution and energy supply, especially low- and medium-voltage engineering. Due to our comprehensive product and market knowledge, long-lasting business relations and our extensive national and international business contacts, we are always the right partner for your projects.

Due to our vendor independence, we are able to find the right supplier for each phase of your project, professional and at optimal costs. A cooperation with MECO ELECTRIC offers you the possibility, to reduce numerous and tedious activities for initiation and agreements, especially in comprehensive projects.

Mission and Vision

MISSION

Energy moves us – MECO moves energy

Due to the increasing internationalization and globalization of business relationships, specific transaction costs like information-, bargaining- and control costs, constitute essentially influencing factors to the total profitability of investments and projects. As a capable partner, we identify economical and technical potential for optimization along the whole value chain. It is our aim to offer our customers a maximum of flexibility and productivity by innovative products and concepts at any time.

VISION

We will also react to the increasing demands of the markets at any time in the future, to come up to our standard of the highest possible flexibility and customer satisfaction. Our aim is the ability to offer you customized projects from one source. This means for us, that you can totally focus on your own core competences, without claiming further financial or personal resources. Especially in an international context, we want to contribute to minimize our customers market risks and uncertainties.

Partners

Our licensed performance partners form the extended workbench of MECO ELECTRIC LLC. Here your plants, designed by us, will be manufactured customized and tailor-made. Upon completion of your energy plant, we will be extensively at your side for all service- and maintenance affairs.

We exclusively draw all components necessary for your MECO energy plant from well-known manufacturers of the electrical industry, such as ABB, Eaton, Logstrup, Rittal and Siemens. Due to the variety of our component partners we can always assure you the highest product quality available on the market.

Creating Value

CONSULTING

Our aim is to generate turnkey projects from one source. As a competent full-service provider we accompany you in every technical and economical question. Our consultancy services range from planning, development and testing of your independent energy system, the development of foreign markets, up to detail consultation for major orders. Naturally we will also provide you advice concerning assembly, modification, as well as deconstruction of energy systems of any kind.

DESIGN

Our project solutions are customized and individually fitted to the demands of our customers. Besides a comprehensive calculation of costs, our project design also includes the consideration of all relevant demands. For example country and market specifics, test specifications or approval procedures. Due to our vendor independence we are always able to offer you individual project solutions on the highest technical and economical level.

REALIZATION

The implementation of your project occurs in a close collaboration with our licensed partner companies. These are experts in their relative area and stand for highest possible quality and reliability. The project organization and inspection will be assured by us. Thus you will receive detailed reports to the actual status of your project at any time. Besides the assembly of energy plants, our business activities also include the delivery and mounting, as well as the integration into an already existing environment.

SERVICE AND MAINTENANCE

After the realization of your project we will be at your side as well. Our competent partners, responsible for service and maintenance affairs, take care of a perfect operation of your MECO energy plant. Anyway, we support you in all questions concerning your already existing plants. The backfitting and disassembly are also parts of our business activities, as well as the removal and a professional and environmentally friendly disposal.

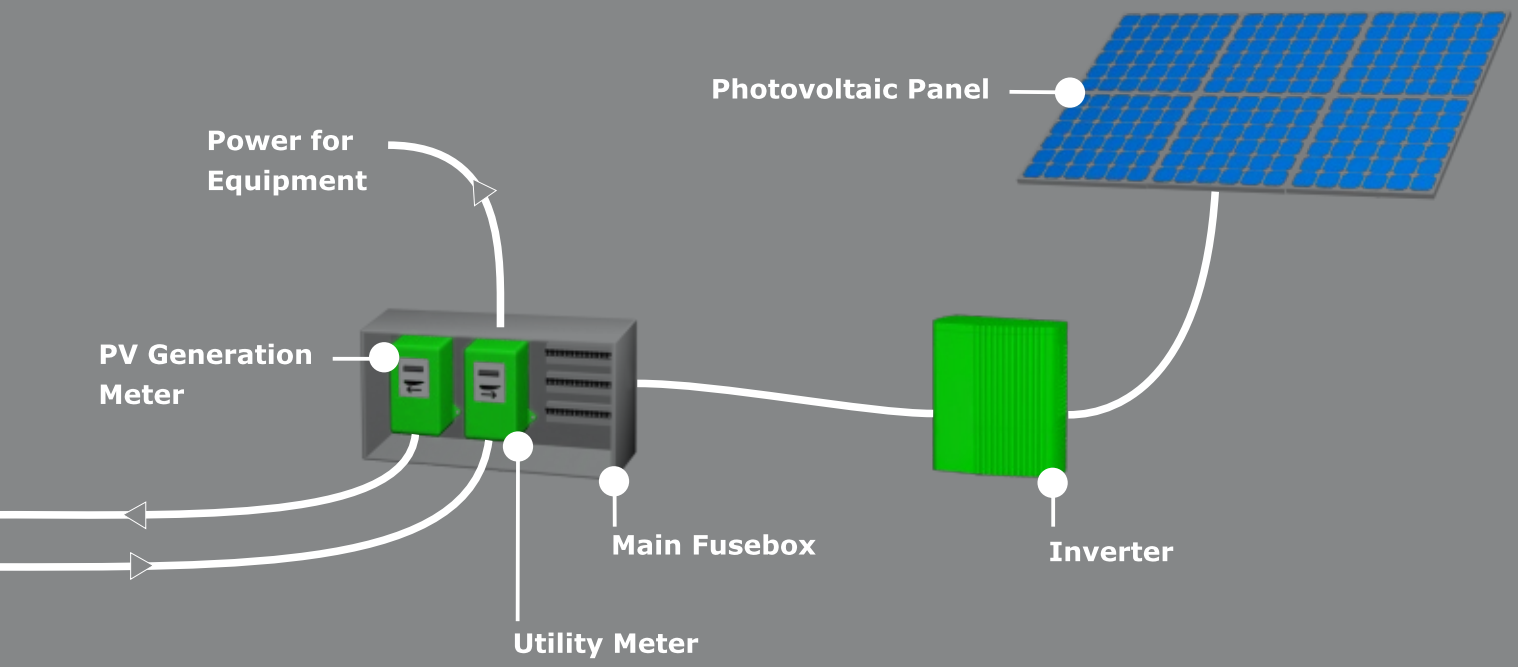
Our Services

PHOTOVOLTAICS

As our largest source of energy, the sun delivers around $1.1 \cdot 10^{18}$ kWh of solar energy, to the surface of the earth. Approximately 10.000 times more than the world´s primary energy demand. This radiant energy can be collected and converted into direct current electricity. This occurs without creating noxious fumes like CO_2.

As of 2013, photovoltaics generates electricity in more than 100 countries and, while yet comprising a tiny fraction of the 4.800 GW total global power-generating capacity from all sources, is the world´s fastest growing energy-generation technology. Solar cells produce direct current electricity from sun light, which can be used to power equipment, recharge a battery, or for grid connected power generation.

Due to your vendor independence and our wide-ranging business relationships, we are able to offer you the best products and systems for your projects, both from a technical and financial point of view.



GRID CONNECTED SYSTEMS

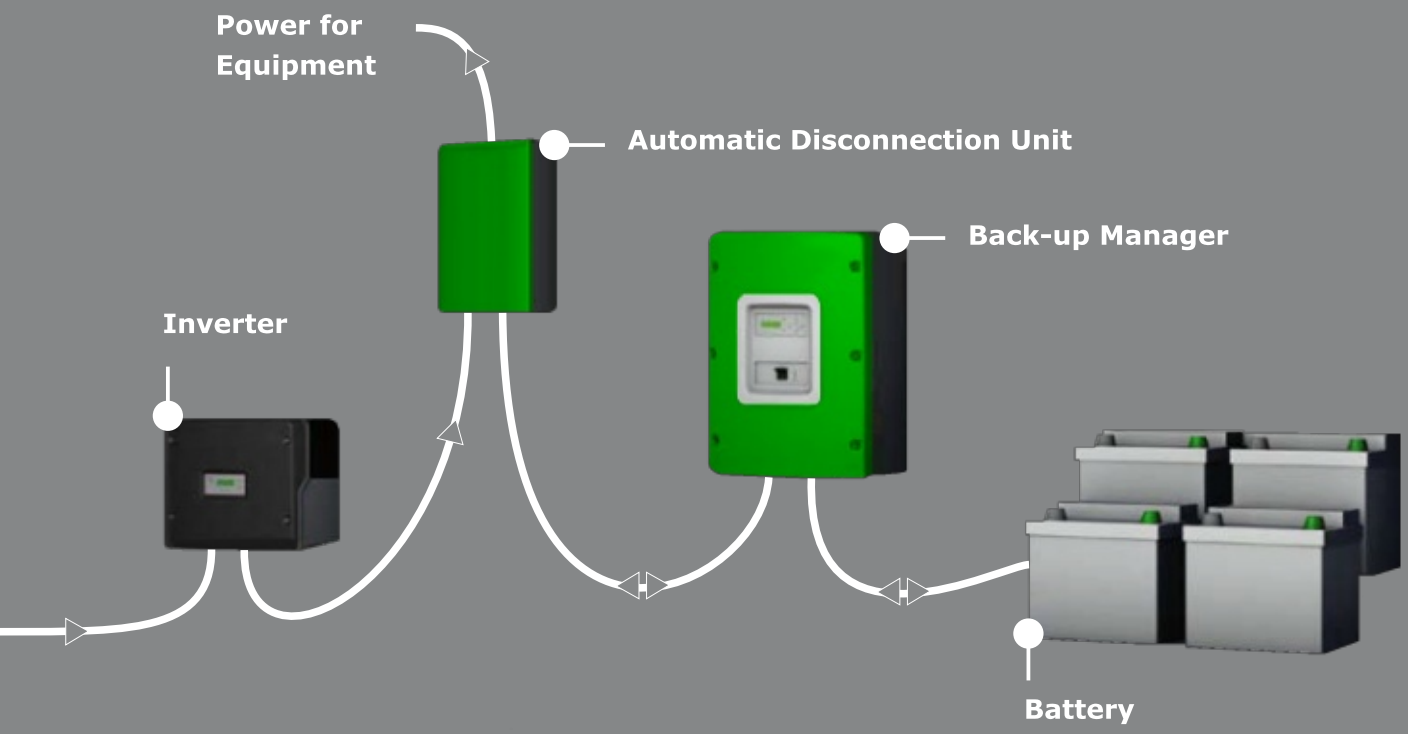
In terms of grid connected systems the output of the photovoltaic arrays can either be used directly, or fed into the grid. Therefore inverters are needed to convert the generated DC electricity into AC. Electricity meters measure the produced energy, as well as the consumed.

Grid connected systems contribute to a reliable energy supply and support the growing demand for energy easily. It is an ideal power source for public utility companies, independent power producers and individuals.

Our grid packages are complete systems for grid connection. They include highest quality system technology and the most durable products available on the market.

Key advantages:

- Quick and easy installation due to modular system design
- Fast approval process for new locations due to environmental and social compliance
- Flexible installation (roof, facade, track- rack, open land, ...)
- Capacities from kWp up to MWp plants



PHOTOVOLTAIC OFF-GRID AND BACK-UP SYSTEMS

Photovoltaic off-grid systems are a cheap and efficient option for energy supply when no public grid is available. The principle is simple: Solar modules generate electricity from the sun and store it via a charge regulator in batteries. By connecting several batteries to each other, almost any capacity and voltage can be realized.

Photovoltaic back-up system keep your pc´s, lightings, refrigerators, machines etc. running without interruption in case there is a blackout of the public grid. During a blackout the disconnection unit disconnects your system from the public grid and switches to the battery set within 20 msec. Throughout daytime you use your own power from the photovoltaic modules and during nighttime from the batteries. The back-up manager is controlling the whole system and ensures a smooth operation of all parts.

The system gives you a maximum of convenience and reliability:

- Independent power source
- No public grid connection necessary
- Cheap and reliable in comparison to diesel generators
- Quiet and odourless
- Low costs of maintenance

DESIGN AND ARCHITECTURE

Photovoltaics is no longer just a technology to produce electricity by converting solar energy. It easily bends the bow between practical use and design. Aesthetics, lightness and transparency in the architectural genius of the period.

Photovoltaic modules can be multiply used as transparent front elements, made as conventional insulated glass or as panel glass. They fit to all conventional construction systems.

These functions can be realized:

- Solar power generation
- Lighting management
- Shadowing effects
- Glare shield
- Heat insulation
- Innovative design
- Cost savings

SOLAR LIGHTS

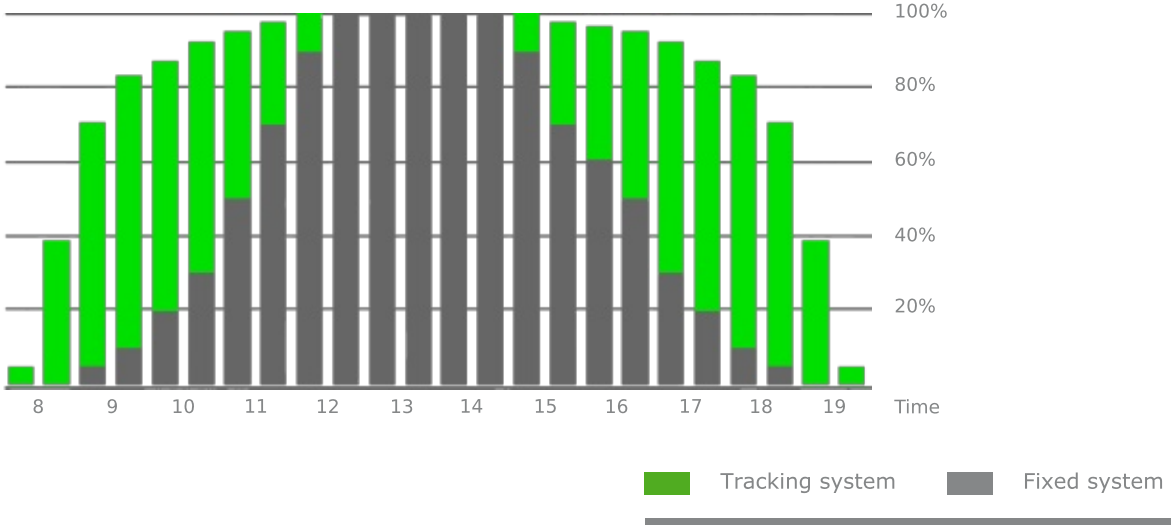
Throughout the day the lights are placed in the sun, so that the battery is charged. A solar module, charging unit and battery is integrated into the lamp. No extra module or wire is needed. A high efficiency solar generator makes sure, that there is light throughout the whole night.

Solar lights are feasible for:

- Gardens, parks, or golf courses
- Reception and parking areas
- Promenades, exhibitions, and many more

TRACK RACKS

Track-racks follow the sun like sun flowers. Consequently the solar system always yields the maximum of energy from the sun. Single-axis solar tracking increases the energy return of solar modules by 25 - 35% per year in average. Depending on the location, up to 55% more during summer months can be realized, due to prompt alignment to the brightest spot in the sky. Track-racks have a constant capacity and are an ideal source for solar pumps.

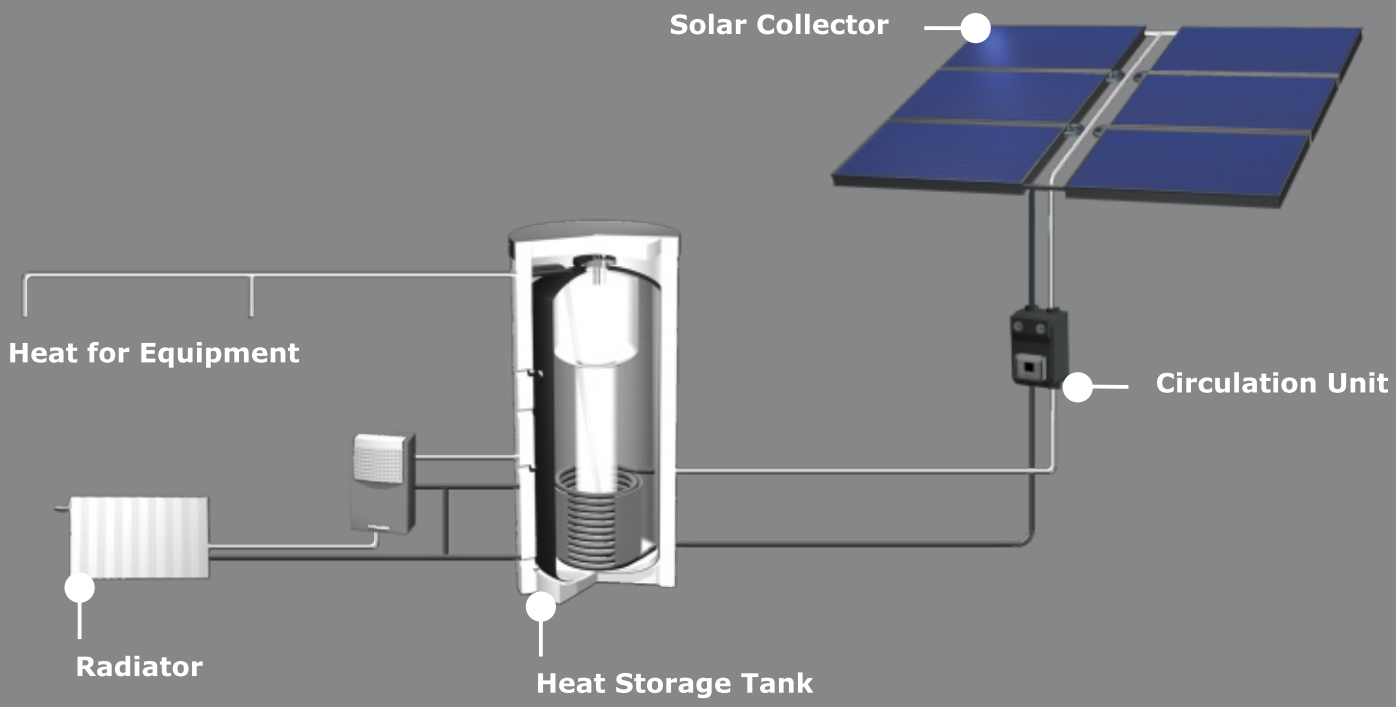


SOLAR SUBMERSIBLE PUMPS

With solar operated pumps everyone has the possibility to get ground water, cheap and without grid connection, or expensive diesel generators.

The advantages are:

- Lift up to 240 m, flow rate up to 4.0m³/h
- Simple installation, maintenance-free
- High reliability and life expectancy
- Cost-efficient and low energy demand



SOLAR THERMAL

The sun supplies us with an enormous daily energy potential. It can contribute up to 100% of the energy needed for hot water and heating, assuming your house is properly insulated and equipped with a sufficient sized solar collector and storage tank.

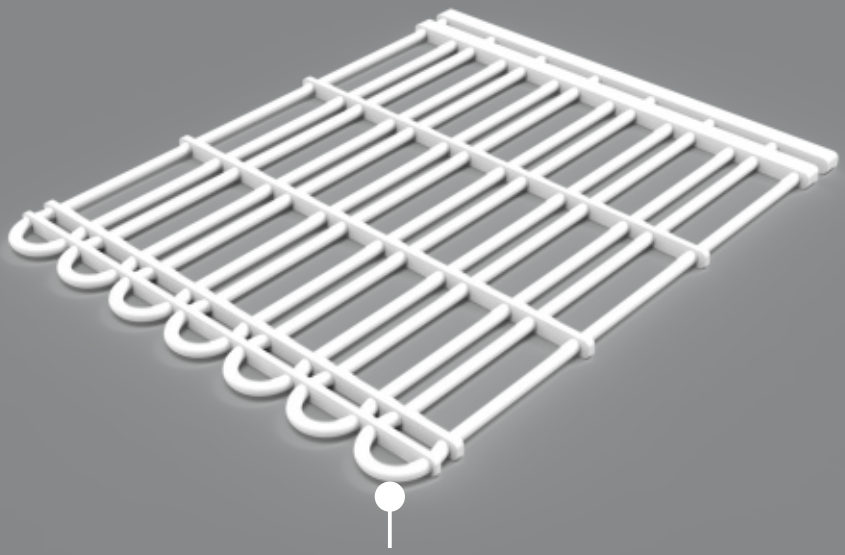
SOLAR HEATING SYSTEMS

Solar panels collect sunlight to heat a circulating solar fluid. This fluid is transported to the solar storage tank. In this section the heat is transmitted to the process water, as well as to the heating water circuit. Solar thermal heating systems can easily be integrated in an already existing system with central hot water supply at any time.

The key features are:

- Up to 100% energy-savings potential for hot water and heating
- Unlimited capacity due to modular design
- Temperatures of up to 90°C
- Feasible for homes, offices, hotels, restaurants, wellness or industrial processes

Heat Pump



Capillary Cooling Mats

RADIANT COOLING SYSTEM

An air-to-water or water-to-water heat pump cools down water which is the coolant for our system. Chilled water circulates through cooling mats which are plastered directly onto the raw ceiling or on the walls. The result is a very large cooling surface which guarantees a constant and even temperature profile of the room. On the way through the capillary cooling mats the cold water emits its cooling energy and absorbs the heat of the room. Floor distributors split the central cold water inlet. Every single room has its own thermostat.

Besides the capillary cooling mats, our system includes an air-handling-unit. This system component automatically controls the relative humidity and the CO_2 content of the room air to prevent condensation. As we use water as a coolant and due to the large cooling surface, energy savings of 40% up to 70% can be realized in comparison to conventional split units.

System advantages:

- Even temperature distribution
- Highest energy efficiency
- Not emitting bacterias or germs
- Absolutely silent and invisible
- Suitable for all room sizes and floor plans
- From residential up to industrial projects

WIND POWER STATIONS

Our patented wind power station gives you the perfect technology to generate power autonomously, efficiently and sustainably. Space-saving, efficient and reliable. Remarkably quiet, robust and with low costs for maintenance.

No matter where you need the energy: the wind power station allows you to generate renewable energy in the simplest way possible. Whether for an industrial application, for an office or for residential buildings. You can generate clean energy to cover your own needs or to feed it into the public power grid.

The key features are:

- Generate renewable energy yourself and use it immediately
- Security of supply, independence from power failures
- Three different versions with 2.5kW, 5.0kW and 7.5kW
- Very low start-up speed of 1.5m/s
- No switching-off due to strong wind
- Independent from wind direction
- Extremely silent due to low rotation speed
- Individual designs and colours

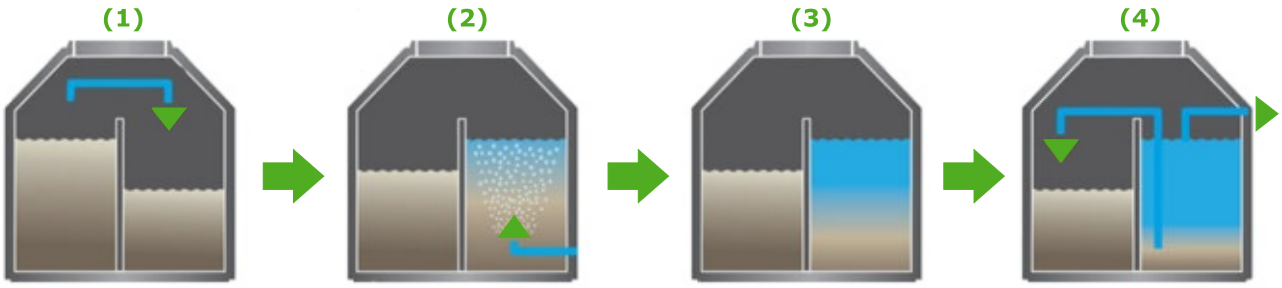
WATER TREATMENT

We offer flexible and modular water treatment solutions, which can be extended and adapted according to your specific requirements. From small-sized residential units up to large-scale industrial facilities.

SEAWATER DESALINATION

Our desalination systems make use of the Reverse Osmosis technology. All suspended solids are removed in the first step, so salt precipitation or microbial growth does not occur on the membranes. High pressure pumps supply the pressure needed to enable the water to pass through the membrane and have the salt rejected. The received water is collected in a storage tank and post-treated in a last step. A disinfection plant produces a disinfectant from brine by electrolysis. The disinfectant is able to destroy germs, bacteria, viruses and fungi and this without using any chemicals. Our individual systems have capacities from 1m^3/h up to 105m^3/h and can easily be connected to large-scale facilities.

WASTEWATER PURIFICATION



(1) The wastewater is initially fed into a sludge tank where solid constituents are removed. From here, the wastewater is gradually led into the SBR tank.
(2) The actual biological treatment process takes place in the SBR tank. Short aeration and rest phases alternate and the activated sludge with its millions of micro-organisms can treat the water thoroughly.
(3) During a 90-minute rest phase, the activated sludge settles on the bottom of the tank and a clear water zone forms in the upper part of the SBR tank.
(4) The separated clear water is led from the SBR tank to the receiving water (sea, river or lake) or into a percolation system. The remaining sludge is returned to the first chamber of the tank and the process can start again.

System advantages:

- Single or multi container versions from 4 up to 200 persons
- All certifications according to EN 12566-3, CE-approved
- Easy and quick installation, due to pre-mounted technical equipment
- Very energy-efficient (only 300kW/h per year)

THE greenACTIVEhome

The MECO ELECTRIC greenACTIVEhome is an off-grid self-sufficient house, which can be designed and built according to your individual requirements. Off-grid means that no public grid is required. Self-sufficiency signifies that the house produces the entire required energy on its own. The house consists of a high-performance photovoltaic system, a wind power station, a small-scale sewage treatment plant, as well as our unique cooling system.

Your private oasis

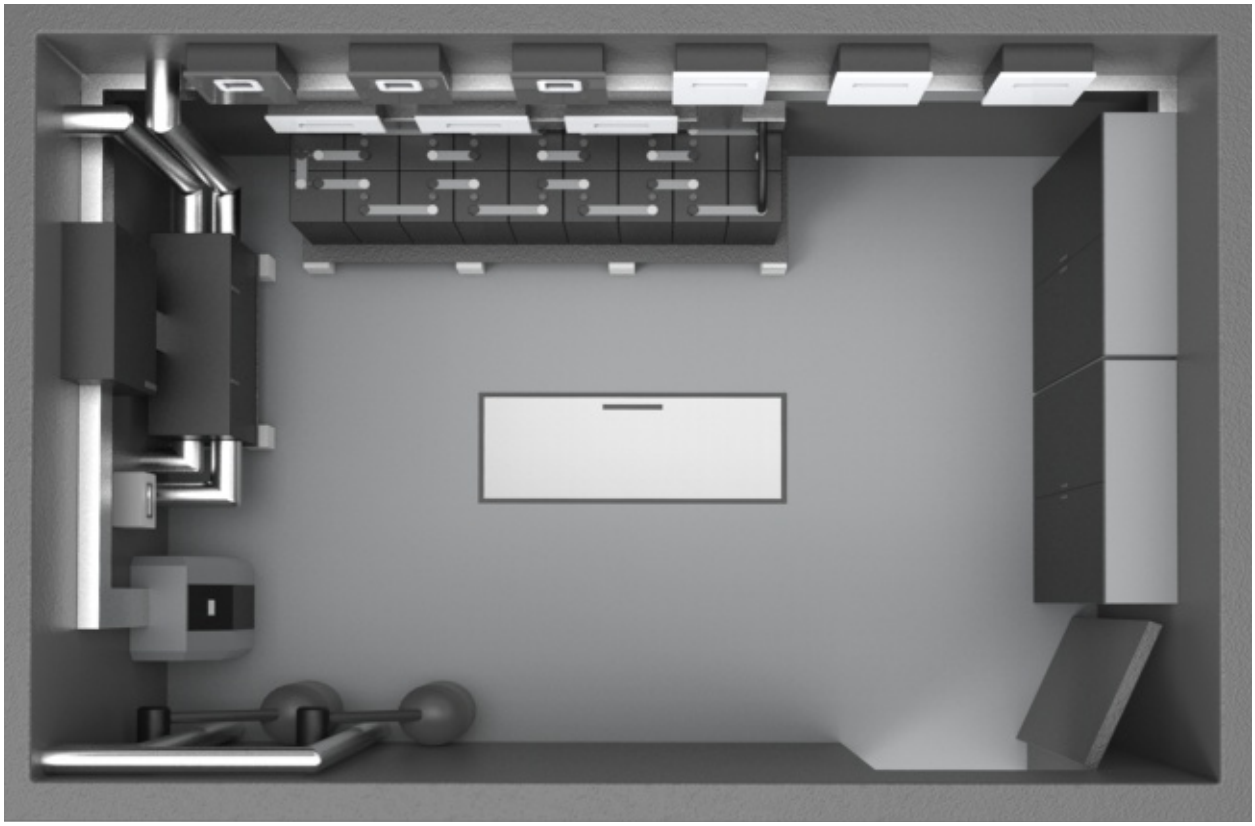
Individually designed according to specific climatical conditions, the house can be located where ever you prefer to live. A luxury Villa on an island in the see, a weekend house in the back country, or a holiday resort in the desert - the greenACTIVEhome is your private oasis.

The greenACTIVEhome is powered by a high-performance photovoltaic system, installed on the roof or besides the building and our unique wind power station. This combination of photovoltaics and wind energy is powerful enough to ensure the functionality of all components under any circumstances. Besides the security of supply, controlling the system complexity is a very important aspect. All components are optimally attuned to each other and work accurately and reliably. Only the most energy-efficient and powerful components available on the market are applied.

Natural challenges are closely linked to the specific weather and climatic conditions. The states of the Near and Middle East for example show temperatures of 50°C during daytime in summer month. This fact places great demands on the cooling system. Misty weather conditions, dust and sandstorms influence the output of the photovoltaic system. Therefore sufficient sized storages are required to guarantee the supply of electricity and cooling.

We assure this by using a high-performance battery system and a long-term water storage tank. The water storage is an important component of our radiant cooling system. It consists of different compartments for chilled water and for hot water. Chilled and hot water are produced during daytime by a water-to-water heat pump, which is powered by the photovoltaic system. The storage tank is designed to provide hot and cold water for at least two days. During nighttime only a small circulation pump is required to ensure cooling for the entire building.

All conponents like batteries, circulation pumps, air-handling unit, heat pump and inverters are located in the technical room. The storage tank is placed beneath it. Therefore the technical room can be seen as the heart of the greenACTIVEhome.



System advantages:

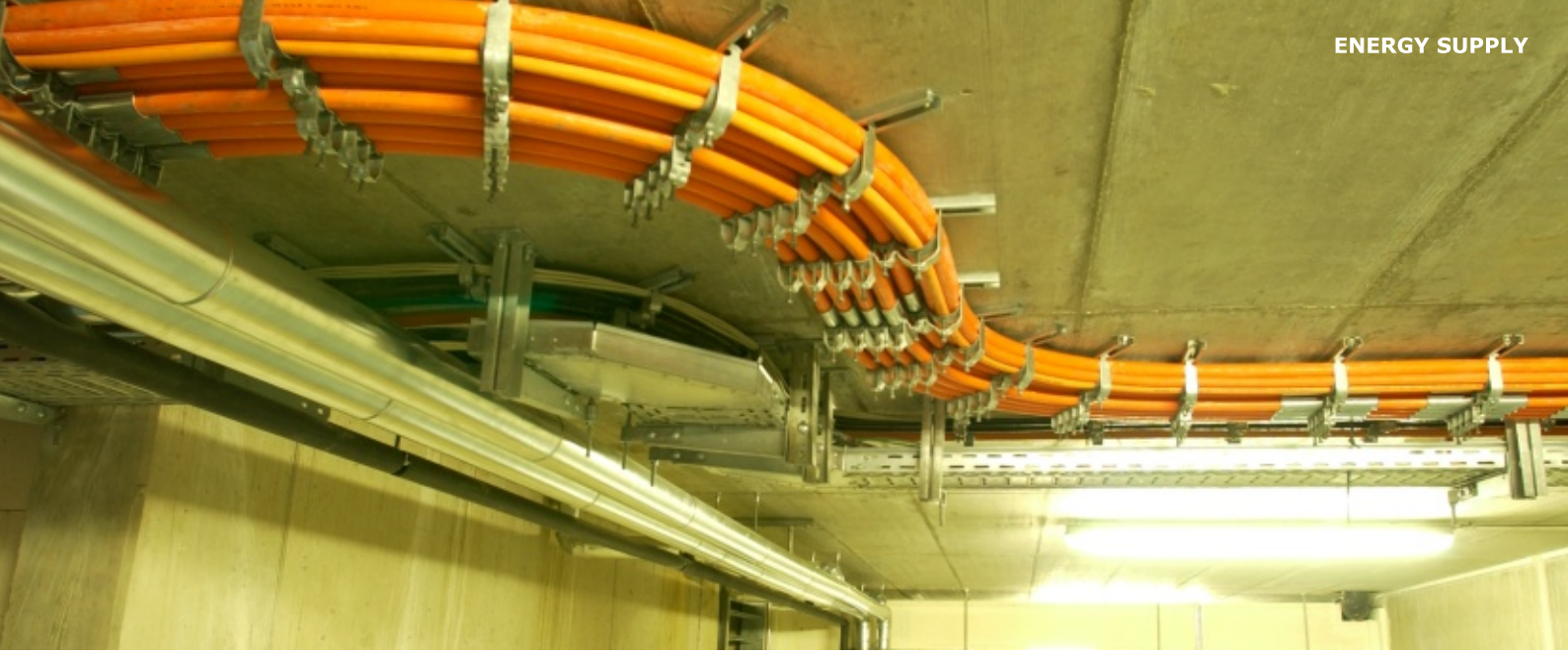
- State of the art technologies
- No public grid neccessary
- Sustainable and environmental friendly living
- Design and implementation according to your individual requirements

COMPLETE SOLUTIONS FOR POWER SUPPLY

- From medium-voltage-switchgears, over ready-for-use transformer stations, up to individually designed low-voltage main-distributions.
- Project design, planning, delivery assembly and startup of all components in the power supply area, including gateways to process control.
- Remodelling, deconstruction, modernization and maintenance of electro-technical systems.
- Delivery and assembly of emergency power systems, generator sets and UPS-units including network-analysis and network-calculation.

DIVERSITY IN THE LOW-VOLTAGE RANGE

- We offer a wide range of low-voltage cabinets with switchgears and devices of several manufacturers, so we keep our independence and assure you the best technology for your project.
- Typetested or partially typetested low-voltage-switchgears according to VDE 0660 / Teil 500 (IEC 439-1).
- Rated currents up to 8000A.
- MCC plug-in technology for hightest availability.
- Inner subdivision of the cabinets, from 2, 3a, 3b, 4 and 4b. Special solutions also with busbar crossover (typetested system).



FLEXIBILITY IN THE MEDIUM-VOLTAGE RANGE

- We deliver medium-voltage components made by several manufacturers. In this way we can find the optimal solution for your project.
- MV-cabinets up to 72kV.
- Cabinets including switch-disconnector or circuit-breaker as fixed or plug-in module.
- Air- and SF6-insulated cabinets as side-by-side mounting or compact unit.
- Gateways to process control (GLZ,ZLT).

SAFE ENERGY DISTRIBUTION WITH EMERGENCY- AND UPS-SYSTEMS

- We offer emergency power systems for back-up and peak load.
- Complete solutions according to VDE 0107, 0108, DIN 6280 respectively ISO 8528.
- Application of motor-generator combi-nations by several manufacturers.
- Static and dynamic UPS-units.
- Current transformers.
- Emergency power systems in combination with photovoltaic and wind power systems.

THE RIGHT VOLTAGE WITH TRANSFORMERS

- We deliver medium-voltage transformers in several designs, including equipment and connection to the low- and medium-voltage environment.
- Three-phase current transformers up 24kV.
- Oel-Transformers with expansion box or in hermetic version.
- Cast-resin transformers, also with blower for uprating.

INSTALLATION MATERIALS FOR THE PERFECT CONNECTION

- Low-voltage cables including connectors.
- Medium-voltage cabels up to 20kV.
- Cable fittings and conduit systems.
- Fire protection technology.
- Switches and sockets.
- All kinds of lighting materials.
- Tools and measuring devices.

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