A solar farm was established at the outskirts of Berlin on an area of 730,000 m² with 225,936 solar modules, 15,000 customized solar cables, 2.9 million screws, nuts and washers and a total output of 26,402 kWp. But let’s start at the beginning.

One of the ten largest solar farms in Europe was built in a record time of only 4 months on the location of a former sewage sludge drying facility of the Berlin water works. The solar farm “Eiche” provides 25,000 MWh/yr after its connection to the electrical grid. The solar power system, for which HELUKABEL® was the exclusive partner for cables and wires, is a project of SYBAC Solar Berlin GmbH and Ingenieurbüro Dr. Kapitola.

The construction started on 15th Aug. 2010 and the completion of the system was already announced only few months later in December. This was especially significant if one takes into consideration that two project developers/ investors failed in the past with this project due to unavailability of modules. Before the construction on the 73 ha area could start, 28 sewage sludge basins with a total of 18,000 prefabricated concrete parts were removed and disposed. Afterwards, the construction of the solar system progressed efficiently. During the extremely short construction phase, approximately 105,000 thick film and 121,000 thin film solar modules where installed and wired on 8,196 module tables. HELUKABEL® was pleased that their SOLARFLEX-X® PV1-F solar cable, certified by TÜV and VDE, was used to install the project. The cables for the installation were customized with the appropriate connector assemblies, to guarantee a fast installation at site. A total of 460,000 m of SOLARFLEX-X® with cross-sections of 4 and 6 mm², 80,000 m copper and aluminum underground cable and 3,000 m telecommunication cable as well as several other cable types were installed in the solar farm “Eiche”. A large part of these products was delivered to the site just in time by the Berlin subsidiary of HELUKABEL®, and special accessory products were placed in inventory for on-demand delivery. So in case of any changes in technical planning an immediate reaction could be guaranteed.

After the system is connected to the electrical grid, the solar system will both sustainably supply approximately 5,400 4-person households as well as provide CO₂ savings of 17,000 tons annually.

### Solar farm Eiche in numbers

<table>
<thead>
<tr>
<th>Area</th>
<th>730,000 m²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of modules</td>
<td>225,936 pcs.</td>
</tr>
<tr>
<td>- thereof thick film</td>
<td>104,976 pcs.</td>
</tr>
<tr>
<td>- thereof thin film</td>
<td>120,960 pcs.</td>
</tr>
<tr>
<td>Module tables</td>
<td>8,196 pcs.</td>
</tr>
<tr>
<td>Total output</td>
<td>26,402 kWp</td>
</tr>
<tr>
<td>Annual electricity production</td>
<td>25,000 MWh</td>
</tr>
<tr>
<td>4-person households supplied</td>
<td>5,400</td>
</tr>
<tr>
<td>CO₂ savings</td>
<td>17,000 t/a</td>
</tr>
<tr>
<td>Module series with a length of</td>
<td>60,952 m</td>
</tr>
<tr>
<td>SOLARFLEX-X® PV1-F</td>
<td>460,000 m</td>
</tr>
<tr>
<td>Aluminum and copper underground cables</td>
<td>80,000 m</td>
</tr>
<tr>
<td>Telecommunication cables</td>
<td>3,000 m</td>
</tr>
<tr>
<td>Several other cables</td>
<td>7,000 m</td>
</tr>
<tr>
<td>Steel</td>
<td>2,550,000 kg</td>
</tr>
<tr>
<td>Screws, nuts, washers</td>
<td>2.9 million pcs.</td>
</tr>
</tbody>
</table>

Additional Information: sybac-solar.de

Advantages of SOLARFLEX®-X PV1-F

- extensive product portfolio
  1×2.5 mm² to 1×300 mm²
- Certifications: VDE (E PV 01:2008-02), TÜV (2 Pfg 1169/08.2007), UL (4703 PV wire, 854 USE-2)
- UV, ozone, weather and hydrolysis resistant
- halogen-free
- very good oil and chemical resistance
- flame resistant in accordance with VDE 0482-332-1-2, DIN EN 60332-1-2, IEC 60332-1
- very robust abrasion resistant liner, short-circuit proof up to 200°C through dual insulation, short-circuit temperature up to 200°C/5s
- Service life: 25 years in acc. with standard: ammonia resistant available in-stock
Play it safe

Popular cross sections are available from stock

The fire risk has increased significantly during the last few years, as more people live in close spaces and more assets are concentrated in individual buildings. The functional integrity of electrical systems in case of a fire, along with the importance of installations of the correct cables, are subjects that are discussed for almost all larger construction projects.

The use of halogen-free safety cables is already mandatory for many application areas. Specific application areas include, for example, hospitals, airports, hotels, movie theaters, schools, fire alarm systems, alarm systems, escalators, lifts and safety lightings. All applications have the requirement that states that the fire behavior of the cables is of special importance due to the concentration of people and assets in public buildings. Both the behavior during flame exposure, i.e. flammability and fire transmission, is important and secondly, the consequential damages due to the generation of corrosive and toxic gases and smoke developments (darkening of emergency routes, obstructing the fire extinction) must be minimized.

To address these issues, we have extended the range of halogen-free cables and wires in our inventory providing a variety of cable types in the most widely used AWG mm² sizes in stock.

Our delivery program include:

**Halogen-free cables with functional integrity E0**
- NIXXH - Building wire
- N2XH - High current cable
- J-HISTH - Fire alarm inside cable

**Halogen-free cables with functional integrity E30 / E90**
- NIXXH - FE 180 - E30 / E90
- NIXXCH - FE 180 - E30 / E90
- N2XH - FE 180 - E30 / E90
- N2XCH - FE 180 - E30 / E90

E0 = without functional integrity; E30 = functional integrity 30 minutes; E90 = functional integrity after 90 minutes

**Cables & Wires | Continuous flexing**

MULTIFLEX 600 / 600-C

NFPA 79 Edition 2007

The highly flexible, oil resistant control cable HELUKABEL® MULTIFLEX 600/ 600-C was successfully tested in the test laboratory with 1 million bending cycles for the use in conveyor cable tracks. The cable is available in stock. The special combination of TC-ER, PTLC-ER and ITC-ER permits the use of MULTIFLEX 600/600-C as continuously moving cables for industrial machines and systems in acc. with NFPA 79 Edition 2007; it is approved for the open, unprotected installation from the cable tray to the machine. The outstanding oil resistance (OIL RES I & II) guarantees a long durability for industrial applications in dry, moist or wet environments.

**Media Technology**

**Two newcomers for the perfect show**

It is not possible to make a breathtaking lightshow without cabling of light technology providing control signals and electricity to, for example, moving heads. The HELUSOUND® DMX+POWER hybrid cable combines a shielded light control wire and the power supply wire. The DMX cable, which is shielded by a tin-coated copper braiding is perfectly suited for the control of light systems and mixing boards (110 Ohm characteristic wave impedance). It highlights a soft PVC insulation and it is qualified for the use at indoor and outdoor installations. The DMX cable can also be used for the transmission of audio signals such as a microphone wire or as a power supply wire for active loudspeaker systems.

Quality is also very important for the event systems. As of now, we are offering two load cables to guarantee that the lights perform perfectly during the entire show. The extremely flexible load cables U/U 300/500 V and load cables U/U 600/1000 V are used for common mechanical demands for professional stage light systems and other electrical load circuits from 500 V to 1000 V.

The flexibility is achieved by very fine wire stranded design with 0.15 mm flexible strands. The core and sheath insulation are made of cold-flexible PVC; this is also available as a customized product.

**Now also present in Malaysia**

As of now, HELUKABEL® is represented by its own subsidiary in Malaysia. The Southeast-Asian country, with its almost 28 million citizens, is economically and politically viewed as one of the most stable countries in Southeast-Asia.

Contact: Ph. +603 7885 8724, sales@helukabel.com.my

**S.A.G. Solarstrom AG counts on HELUKABEL®**

One of the ten solar fields in Puglia, Italy, total output 9.7 MWp. S.A.G. Solarstrom AG (Freiburg) erected a total of 10 photovoltaics open air systems with a total output of 9.7 Megawatt (MWp) in the South-Italian province Apulia. For the cabling of the infrastructure, the S.A.G. company group relies on cables and wires from HELUKABEL®. The photovoltaics project includes nine open air systems with 999 kWp each and one system with 710.4 kWp and it therefore has a total output of 9.7 MWp. In total 52,440 modules were installed on an area equivalent to 42 football fields. The system was commissioned in 2010 and saves approximately 7,300 tons CO₂ annually.

The company PowerWind GmbH has successfully entered the American Community Scale market. It consists of smaller and medium sized project with a local owner structure. PowerWind uses the UL-certified cable HELUWIND® WK-135, SUPER-PAAR-TRONIC-C-PUR, CAN-Bus 4 x 1/0,34 mm² UU/CSA, high temperature CAN-BUS as well as HELUWIND® WK-MOBIL fiber optic cable for the internal tower communication of the control systems when cabling the nacelle. HELUWIND® WK-103w was used for the power cables. The 900 kW wind power system, type PowerWind 56, was installed at the US ski resort Berkshire East, Massachusetts in time for the start of the season. In future, the system will generate more than 100 percent of the annual energy demand required for the operation of chairlifts and snow cannons. The surplus energy will be used for the electrical supply of the nearby small town of Charlemont.

**Malaysia | New subsidiary**

**Italy | Photovoltaics system in Apulia**
7 axis for the perfect freedom of movement

The Max-Planck institute for biological cybernetics and Buck Engineering & Consulting GmbH jointly developed a new motion simulator for which HELUKABEL® designed a new robot dress package.

For the simulation of maneuvers with helicopters in a realistic 1:1 simulation, both partners modified a 6-axis KUKA robot to a 7-axis simulator, which permits linear and rotary accelerations and motions on a large scale. This system could, for example, be used for the training of helicopter pilots. However, driving simulations also profit from the large motion range of the simulator. The objective of the joint development is to build a simulator, which makes it possible to emulate sophisticated maneuvers or driving situations effectively and safely and therefore to analyze the basics for the multi-sensor integration for control tasks. The critical maneuvers can be repeated as often as possible with a reproducible quality that can be simulated up to a crash. In a real environment, the driving and flight instructors are forced to interact already at the start of an error. The convincingly realistic experiences are invaluable for the driving and flight students.

One of the largest challenges for the technical implementation is to emulate movements of real systems within a limited space in such a way that the occupant believes that he/she is in a real environment. The synchronization with a 3D monitor completes this illusion.

Two beamers project the real situation into the cockpit. This permits, for example, accelerations and motions of the simulator with experience of high speeds and large decelerations. The 7-axis simulator uses a new approach for the motion simulation, based on the simulator developed by the Max-Planck institute for biological cybernetics. A simulator cockpit provided by Buck Engineering & Consulting GmbH is installed at the 6-axis robot. The simulator cockpit is the only one with a seventh axis worldwide, to sustainably expand the translative motion range of the restricted 6 axis mechanics.

In addition, the additional seventh axis and the worldwide first rotating axis 1 at this robot make the operation of the simulator as a centrifuge possible. This simulator design offers a significantly larger work and motion range than conventional platforms and other robot based systems. The advantages of a robot arm for the psycho-physical basic research are found in the large linear motion range, which is important for the simulations of accelerations. HELUROBOTICS® developed a customized robot dress package for this complex and demanding application. With a continuous length of approximately 11 m, it supplies the simulator cockpit with video, network, power supply and sensor wires.

A conventional routing of the dress packages was not possible due to the large work range of the gondola and its mounting. Therefore, HELUROBOTICS® has implemented a new routing approach for the hose package. The package is equipped with a novel pull-back process for the dress pack. A combination of a gas pressure spring and a pull-spring permits a tracking of the function package, which is almost noiseless from the simulator cockpit. At the same time, an adequate hose reserve is available to permit a large motion stroke. A reliable simulation operation of the KUKA robots requires also the perfectly fitting cables. The HELUKABEL® cables used are robot ready designs and guarantee high durability and long-term security during the tests.

Mobile fiber optic cables at crane systems

Data cables that are designed for distances of approx. 200–300 m must be used for the communication with transmitters, control elements and motors. In addition, this application type requires wires that are suited for high data rates and immunity from electromagnetic malfunctions. This is why HELUKABEL® has developed a cable, that meets the highest requirements for stability, functionality and flexibility and which meets the future data transfer rates requirements of 10,000 Mbit/s. The fiber optic cable can be ordered with single or multi mode fibers OM3 with up to 12 fibers. The HELUKABEL® fiber optic cable must be mobile all around because in a typical environment it is wound on a drum or be also usable for festoon applications, for so-called programmable logic controllers or measuring sensors at crane systems. Torsion forces are generated for this type of application due to the repeated alternating loads, which must be compensated by the sheath, the structure as well as by the support and load relief elements of the cable. In addition, a low weight and high flexibility must minimize the impact on the measured sections or sensor supported applications, by guaranteeing that they do not hinder moving parts in their function or impact them negatively in a different manner. This is why HELUKABEL® mobile cables do not only absorb the generated torsion forces but they are also used for highly flexible applications, which require a dynamic reaction. A typical example are drag chain applications for crane arms with a variable work space. At the same time it must be considered that modern crane systems are difficult to access. This is due to their size as well as a design, which is not always maintenance-friendly but which is primarily designed to carry high loads at a low weight. Therefore, the HELUKABEL® mobile cable is ranked high, because it does its duty without revision in port facilities under adverse conditions such as salt water, lube oils as well as downpours and under mechanical strains. Sun radiation represents another influencing factor, which bleaches the cables and which attacks the surface based on the composition of the air with UV radiation so that they outgas until they become porous and cracked. The HELUKABEL® mobile cable counters this effect by using a thermoplastic elastomer, which has a high embrittlement point of 60°C and which offers a 400 % elongation at break. This is why the cable can also be used without mobility loss even under the blasting sun of Africa’s deserts. The fiber optic cable has a high resistance against environmental impacts and a high chemical resistance against many materials. This unique combination of outstanding resistance against environmental impacts and good resistance against fluids provides an ideal thermoplastic fiber optic cable for a wide range of applications. The cable has therefore been accepted by crane producers and operators in the market and we are looking for additional application opportunities.
Sunshine in Eastern Europe

The Eastern European countries are mostly associated with snow and Siberian cold—however, the sun also shines in Eastern Europe. HELUKABEL®’s perfect solar cable SOLARFLEX®-X allows a sustainable production of electricity based on sun energy also possible in the Ukraine as well. For example, approx. 100 t SOLARFLEX®-X cable were installed for a solar project in the south of the country.

HELUKABEL® presents a new cable screw connection at Hannover Fair. The sizes M16, M20 and M25 cover cable diameters from 4 mm up to 20 mm.

- Simple installation.
- Optimal strain relief, class B in acc. with EN50262, across the entire clamp area.
- Protection type IP68 at high pressure of up to 40 bar – across the entire clamp area
  + Strain relief
  + Leak tightness
  + Clamp area
  + Temperature + Design

- Suitable for high pressure cleaning: IP 69 across the entire clamp area
- Application temperature: -40°C to +120°C
- Also available as a black chromated design.

23 years of know-how in the cable industry

23 years of know-how in the cable industry, thereof more than 15 years in design and development, make Mr. Thomas Mann one of the leading experts in the cable and wire segment for industrial automation.

As the manager for the process engineering department, Thomas Mann is in the future responsible for the development of new product series, the introduction of new materials as well as the optimization of production processes at the Windsbach plant.

With the assignment of Thomas Mann, the customers of HELUKABEL® will have a knowledgeable contact person in the technology area, who permits a direct and prompt implementation especially for extensive projects.

Contact: Mr. Gibus, gibus@helukabel.de; SIVAX, info@sivax.kiev.ua

Cable accessories | Cable fittings

HELUKABEL® in the Ukraine

All started in 1996 with an order for telecommunication cables for the amount of $ 10,000. Neither partner, HELUKABEL® or SIVAX, thought at the time that this would lead to such a successful, exclusive trade relationship and that both companies could reach such rapid growth rates until today. After this start, SIVAX continuously expanded the width and depth of its product portfolio for cables, wires and cable accessories. Today, customers receive products from HELUKABEL®, certified in accordance with Ukrainian standards, exclusively through SIVAX.

The economic upswing, the democratisation and the cooperation of the Ukraine with Western European countries was also realized in sports related areas. The Ukraine and Poland are the joint hosts of UEFA EURO 2012 (European soccer championships). This will bring additional attention and sport fans to the country. HELUKABEL® now (European soccer championships). This will bring additional attention and sport fans to the country.