



GET THE BEST OF ENERGY

# WORLD

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## MADE IN ITALY: DESIGN IN ITALIAN TECHNOLOGY

GBE IS FOUNDED ON THE EXCELLENCE OF ITALIAN TECHNOLOGY AND THE ABILITY TO DEVELOP CUSTOMISED AND SPECIAL PRODUCTS FOR ALL NEEDS

**R**eliability, professionalism and product quality are once more the founding values behind the proven success and results of GBE in 2016. All throughout Europe, the GBE brand is a benchmark for reliability thanks to a consolidated product range in each of the company's key markets. GBE has continued to invest in new products, including high voltage shielded oil-immersed reactors with on-load power regulation, power transformers with OFWF cooling, motor-driven transformers with inverters for load loss optimisation, polyphase transformers with up to 48 pulses in a single bank. Encouraged by its results, last year GBE decided to re-invest in the Italian market. Many Italian companies were in fact able to demonstrate proven technology and quality, thus making them eligible partners for the development of highly diversified plants. Backed by a new network of agencies guaranteeing capillary coverage across the entire territory, GBE has once again secured a strong market presence, driven by its distinctive determination, a key factor in the company's success throughout Europe. Technical expertise, precision and experience, allow GBE agents to offer not only standard

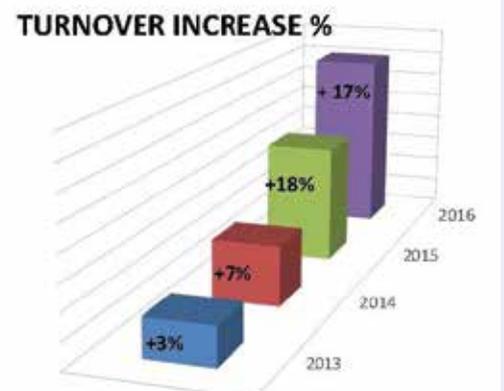
products for distribution to installers or end users, but also direct customer assistance for customised and special products. GBE therefore continues to confirm its ability to guarantee excellent value for money, both worldwide and locally, but also to develop optimised products according to the most complex specifications. All this serves to demonstrate the large number of Italian resources yet to be tapped into, all worthy of investment, including solar plants, wind farms, hydroelectric plants, navigation systems, co-generation and energy distribution systems. The Made in Italy brand has always been in high demand all throughout the world, where Italian design is recognised for its excellence not only in the textiles, food and wine sectors, but also in the field of technology. The latter is in fact assuming increasing importance and even overtaking other European countries. Italian companies are thus progressively becoming market leaders for products traditionally dominated by other countries. GBE's turnover in Italy rose by 30% in 2016. It's not hard to believe that thanks to a set of common values shared with its partners, 2017 will be the bearer of new opportunities.



## TURNOVER CONTINUES TO GROW IN 2016: +17%

The year 2016 was an interesting one characterised by consistent results: GBE successfully consolidated its existing market share, while strengthening its hold in new markets. Products were specifically designed and developed to meet the regulatory standards of specific countries, demonstrating exceptional versatility in the development of power stations complete with MV circuit breakers and LV switches for outdoor installations. While the number of units produced was almost the same, the average power increased to 1366

kVA (+9% compared to 2015), and the overall power to approximately 4100 MVA. The three facilities are currently running at full capacity, while the steelworks department has been equipped with six welding stations and a unique painting system. The company's strength however, continues to lie in its specialised personnel: in 2016, training played an important role and involved all the main company departments, thus laying the foundations for the continued, further growth of GBE.



# OIL-IMMERSED SHORT-CIRCUIT LIMITING REACTORS

THESE OIL-IMMERSED REACTORS OFFER NUMEROUS ADVANTAGES, INCLUDING THE INSTALLATION OUTDOORS OR IN ENVIRONMENTS CHARACTERISED BY HIGH-LEVEL POLLUTION, WITH MINIMAL SAFETY DISTANCES

GBE specialises in the development of class F and H dry type and cast resin reactors, oil-immersed reactors with and without magnetic core, in both medium and high voltage. GBE has recently produced several different air core three-phase short circuit limiting reactors with the active part completely fluid immersed. These reactors are made with three coils assembled on the same surface and secured to a base with non-magnetic profiles. The upper and lower parts are developed using magnetic metal screens to direct the flows produced by the windings. These oil-immersed reactors offer numerous advantages, including the possibility for installation outdoors or in environments characterised by high-level pollution, with minimal safety distances thanks to the grounded tank. These reactors are designed in such a way that the magnetic field is shielded and conveyed inside the tank itself, thus minimising the generation of external magnetic fields. These products are significantly smaller than dry type reactors and can be installed alongside other equipment and/or metal parts, thus optimising the use of space. Oil-immersed short-circuit current limiting reactors, unlike cast resin or VPI reactors, can therefore be adapted to any type of installation and offer excellent performance, with a minimal



Oil-immersed short-circuit limiting reactor with shield, 4800 kVAR, 11kV

impact on the environment, particularly if developed with natural oil or synthetic esters. Oil-immersed short-circuit current limiting reactors with magnetic shielding prove to be less effective when the ratio between the short-circuit and rated current is particularly

high. In these cases, it is best to adopt other types of solutions such as dry type or oil-immersed reactors with shielding obtained through a shorted turn external to the winding itself.

## ASSEMBLY OF AN OIL-IMMERSED SHORT-CIRCUIT LIMITING REACTOR



01 | ACTIVE PART ASSEMBLED



02 | OVEN DRYING



03 | TANKING



04 | READY FOR THE TEST LAB

# GBE CERTIFICATION FOR WIND POWER APPLICATIONS

GBE, SUPPLIER FOR A GAMESA MAXI PROJECT



Vibration testing on cast resin transformer 2350 kVA ANAF, 33/0.69kV at Virlab Laboratory (Spain)

Last year GBE obtained GAMESA certification, making way for the supply of numerous cast resin transformers for wind power applications. The constructive design of the transformer for wind turbine generators varies depending on the type of installation, which may be: inside a transformer station at the base of the wind tower; inside the tower itself; in the nacelle in the presence of high power, as was the case for the GAMESA project. From a technical point of view, unlike solar plants, wind farms are able to guarantee greater power continuity. Wind transformers are also characterised by low core induction in order to adapt to high grid voltage fluctuations. Standard IEC 60076-1 states that a generator-powered machine must have an overvoltage withstand capacity of 14% for 5 seconds in the case of load rejection. This type of transformer must have suitable winding insulation. The machine can be coupled and decoupled multiple times to suit power demands. These events may lead to phenomena, which may compromise the working life of the machine in the long-term. In wind turbines, the transformer is normally positioned in small compartments. Dimensions and dissipation must therefore be optimised, also for operation in

| PLACE OF INSTALLATION   | FEATURES OF THE TRANSFORMERS FOR WIND FARMS |                     |                       |                            |                                               |                                        |                    |
|-------------------------|---------------------------------------------|---------------------|-----------------------|----------------------------|-----------------------------------------------|----------------------------------------|--------------------|
|                         | MAGNETIC CORE LOW INDUCTANCE                | APPROVED INSULATION | ADJUSTABLE TOLERANCES | AMBIENT TEMPERATURE RANGES | PROTECTED ELECTRICAL CONNECTIONS AND SUPPORTS | OPERATION AT HIGH AMBIENT TEMPERATURES | WINDING RESISTANCE |
| A - Transformer station | ✓                                           | ✓                   | ✓                     | NA                         | ✓                                             | ✓                                      | NA                 |
| B - Nacelle             | ✓                                           | ✓                   | ✓                     | ✓                          | ✓                                             | ✓                                      | ✓                  |
| C - Tower               | ✓                                           | ✓                   | ✓                     | ✓                          | ✓                                             | ✓                                      | ✓                  |

TRANSFORMERS FOR WIND POWER APPLICATIONS ARE CHARACTERISED BY LOW CORE INDUCTION TO ADAPT TO HIGH GRID VOLTAGE FLUCTUATIONS, WITH A PARTICULAR FOCUS ON WINDING INSULATION

ambient temperatures up to 50/55/60°C; moreover, if installed near the sea, transformers must have a high level of resistance against aggressive atmospheric agents. In these cases, C5-M painting cycles are recommended (as per standard ISO 12944). For cast resin transformers, the IEC 60076-16 standard requires compliance with environmental class E3, for which GBE has already obtained CESI certification, no. B3021957. For the GAMESA project, routine, short-circuit, impulse and heat run tests were performed at CESI (Certificate No. B6017338) and with DNV approval. The vibration resistance test on the other hand was carried out at the VIRLAB Laboratory in Spain (Certificate No. 162401). For this last test, the platform-mounted transformer was

subjected to vibrations with acceleration greater than 1g, from 0 to 100Hz, in continuous mode for four and a half hours on all three axes, simulating vibrations over 30 years of operation in the nacelle. The aim of the test is to assess the mechanical resistance of all components of the transformer, revealing any resonance phenomena with a critical effect on the machine.

## THREE-SINGLE PHASE CAST RESIN TRANSFORMERS



One significant problem in the case of large single phase loads fed from a three-phase supply, is how to evenly split the current and power across the three phases. In this regard, GBE proposes two different solutions: SCOTT-T transformers (which we spoke about in the previous issue of GBE News, published on [www.gbeonline.com](http://www.gbeonline.com)) and three-single phase transformers. The first solution is developed using two single phase transformers. The second solution, which is simpler and more affordable than the first, involves the development of "three-single phase" transformers, which distribute the load across all three phases, albeit in a non-symmetrical manner. Unlike the SCOTT-T transformer, the three-single phase doesn't require two balanced single phase loads, but rather can function with any type of load. As can be inferred from the photo, the windings are housed in the outer columns of the core; the central column on the other hand is normally insulated with a fibreglass cylinder so as to reduce the overall dimensions to a minimum. In the primary winding, the current in the central phase is doubled with respect to the other two phases, while in the secondary windings, the current is equal and is exactly the same as that fed to the load. GBE has recently supplied a series of three-single phase cast resin transformers for an installation in Germany, and another in Spain.

# TÜV CERTIFICATION FOR GBE AL TYPE HOUSINGS

POSITIVE IP23 AND IP54 TESTING



installation. In order to guarantee the IP23 protection class, the housing is subjected to two tests: the first to test the water seal with a normalised jet, sprayed at an inclination of 60°; the second to test the level of protection against solid foreign bodies with a diameter greater than 12.5 mm. Testing for the IP54 protection class on the other hand, is more complex. In this case, the housing must withstand the water seal test with jets sprayed from all directions, while protection against solid foreign bodies is tested in a test chamber, creating a vacuum inside the housing equal to 0.2 Bar. Both tests are considered passed if there is no water or dust inside the housing. In the case of cast resin transformers installed with IP54 protection, external heat exchange occurs by way of the housing's irradiating surface. For power levels greater than 630 kVA, this surface area must be enlarged, either by increasing the dimensions of the housing itself or modifying the selected panel type, opting for corrugated solutions.



Seal testing at the TÜV Laboratory (Italy)

Protection class testing is essential when developing transformers intended for installation in special environments. Thanks to the test reports obtained, GBE is able to demonstrate its ability to produce housings in compliance with the IEC 60529 standard.

At the TÜV ITALIA laboratory in Milan, GBE has certified the protection class of its "AL" housings for cast resin transformers, confirming that the adopted design is suitable for both internal and external installations.

Over the years, GBE research and development has led to the production of various housing types to provide clients with high-quality solutions in all protection classes, from IP21 to IP54. The "AL" type housing features a load-bearing structure made from anodized aluminium profiles obtained via extrusion, and interlocking corner profiles in zamak. The side panels and roof can be made in either pickled and/or zinc-coated metal, but also in aluminium, are epoxy resin coated and fitted with a gasket to guarantee the highest IP levels. The panels are secured using fibreglass reinforced nylon hooks, specifically shaped for anchoring

to the profiles of the load-bearing structure. Two "AL" housing versions were tested at the TÜV ITALIA laboratory: the first with protection class IP23, made with aluminium ventilation louvres, and the second with protection class IP54, with a hermetic seal for external

**GBE PRODUCES A BROAD RANGE OF HOUSINGS, OFFERING CUSTOMERS HIGH-QUALITY SOLUTIONS IN ALL PROTECTION CLASSES, FROM IP21 TO IP54**

## CASE HISTORY PHILIPPINES



## GBE CAST RESIN TRANSFORMERS FOR

Trump buildings, known for their spectacular views, comfort and luxury, have forever been associated with the most important and prestigious property in the world. These buildings, designed by the best international architects, are erected in all the most important cities such as New York, Chicago, Las Vegas and Miami. In 2016, the new Trump Tower was erected in Manila, Philippines, a futuristic residential and commercial complex at a staggering height of 250 metres with 57 floors, covering an area of 34,000 m2

with interior furnishing and decoration by the renowned French brand, Hermès. The building is erected in the Century City complex in the Makati district (Manila) and is one of the tallest in the Philippines. Century City, a completely

**GBE CAST RESIN TRANSFORMERS ARE DEVELOPED IN COMPLIANCE WITH CLASSES E2, C2 AND F1, OFFERING HIGH-LEVEL SAFETY AND ENVIRONMENTAL ASSURANCES**

# NEW INVESTMENTS IN THE STEELWORKS AND PAINTING DEPARTMENT

THE CONTINUOUS SEARCH FOR THE BEST QUALITY STANDARDS



Investment in the steelworks department continues with the aim of increasing not only internal production, but also product quality. The year 2016 saw the purchase of new machines: a new press brake to supplement the current one with a 320t capacity, a new sheet metal shearing machine, even though almost all cuts are made using a laser cutting system, and a new metal sheet calender for the development of special products.

All this with the aim of guaranteeing a monthly production rate of at least 100 tanks for oil-filled transformers, all accessory steelworks for transformers/reactors and a series of new oil bunds. The number of welding stations has doubled: each one is equipped with a lift table for all welding and joining operations for mechanical parts. High-performance tanks for transformers up to 5000 kVA requiring very heavy reinforcement and bases, can now be produced in-house. In addition to the above, the painting plant has also been expanded. Today, GBE is able to use not only water-based paints, but also single and two-component epoxy resin coatings, characterised by higher ceiling temperatures. The new painting booth is still equipped with a paint recovery system, with collection tank cooling at temperatures lower than 3°C, thus ensuring that even when a catalyst has been added, paints can be reused. As mentioned on previous occasions, GBE has always been particularly attentive to the environment, guaranteeing the quality and efficiency of its entire production. Various samples emerging from the new painting process were proven to be compliant after being subjected to salt spray testing in an external laboratory for 300/400 hours. These new investments were inspired by the desire to ensure full customer satisfaction in terms of delivery times, internalise production for certain types of semi-finished products considered of primary importance, but above all to guarantee product quality. These are the features setting GBE apart from its competitors, thus allowing the company to consolidate its relationship with its customers.

## THE TRUMP TOWER IN MANILA

vertical village characterised by top luxury and an avant-garde architectural design, encompasses the best the world has to offer in a single space: a genuine international city set to become one of the most captivating destinations throughout Asia. In collaboration with its official distributor in the Philippines, GBE was selected as the supplier of transformers to the Century Development Corporation. The order consisted in two cast resin transformers, each 1500kVA - 34500V/400V in IP21 housing. GBE cast resin transformers, developed

entirely in compliance with classes E2, C2 and F1, are certified for internal installation in residential and commercial complexes such as this. The main feature of the cast resin transformer is the fact that it is self-extinguishing, or rather free of fire and flammability hazards: an important guarantee in terms of environmental safety and protection. This, together with other quality standards, led to the selection of GBE as the supplier of transformers for one of the most famous private buildings in the world.

## GBE FULL-SCALE REVAMPING



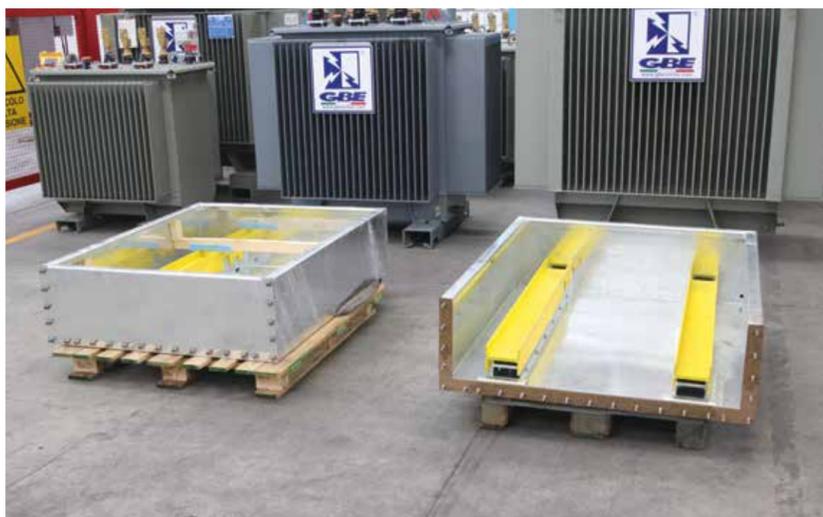
The GBE general headquarters is being revamped with new offices. Works began halfway through 2016 and include plans to extend by approximately 1000 m2. The office building will feature a central foyer with a waiting area, relaxation area, meeting rooms and a conference room. All offices - administrative, technical, commercial, buying, management, and even the Executive offices - will be transferred to the first floor by 2017. The architectural firm responsible for the design has concentrated on creating a modern style, using sober, clean lines, with large glass façades to separate the various departments, maintaining an open-space approach in certain areas where shared space is a driver for synergy and productivity. All the materials and style are distinctly Made in Italy. The office expansion became necessary following an internal restructuring, which resulted in a significant increase in staff numbers. GBE has experienced steady growth in recent years, resulting in the need to increase the number of internal resources in order to continue its guaranteed support and dynamic approach, with an increasing focus on internal demands and above all client expectations. At the same time, the entire building has been adapted to meet regulatory standards, specifically new safety criteria imposed by seismic regulations. The main building, despite being built in the early eighties, has also been adapted to comply with safety regulations, which by law are only applicable to new constructions. The entire facility has been renovated using high-resistance steel supports to anchor each and every element of the structure. Executive management has in fact sought to maximise the protection of its staff, ensuring a work environment that is not only healthy, but also safe.

# WORLD

## BUNDS FOR OIL-FILLED TRANSFORMERS

A FLEXIBLE, EASY-TO-USE SOLUTION DESIGNED BY GBE

**B**unds for oil-filled transformers are a new product developed by the GBE steelworks department. For those installations where this bund has not been included, GBE has developed an extremely flexible solution, designed to protect the environment. The oil bund has been developed in pickled and subsequently galvanized metal sheet, in either stainless steel or aluminium painted with polyester products. The solution offers high resistance to



Test certificate issued by TÜV Laboratory Milan (Italy)

THE ENTIRE RANGE OF POWER IS COVERED, FROM 100 KVA UNTIL 3150 KVA, HOWEVER AD HOC SOLUTIONS CAN ALSO BE DEVELOPED FOR HIGHER POWER LEVELS

atmospheric agents and in all environments. The GBE bund can also be supplied with access on the long or short side, depending on client specifications. It features an internal track on which the transformer slides and a removable external kit, which allows the transformer to be inserted inside the bund without any additional or subsequent lifting. The bund's seal is guaranteed by a cork-rubber gasket. The tank has been designed in line with the same philosophy adopted for all new products, with the aim of offering clients a customised

solution that meets their specifications, but above all a complete package. GBE currently offers seven types of bunds with two variants for the insertion of the transformer. The entire range of power is covered, from 100 kVA until 3150 kVA, however ad hoc solutions can also be developed for higher power levels.

For shipping purposes, the bund is supplied with packaging designed to minimise bulk and thus guarantee suitable protection. The oil bund produced by GBE has been certified at the TÜV laboratory (Certificate No. MEC16170.00\_GBE), offering customers additional peace of mind.

### CASE HISTORY FINLAND

## TOSHIBA STORAGE PROJECT



In 2016, GBE, in collaboration with the Italian company EEI Energy Division, supplied Toshiba TTDE with a cast resin transformer. It was the first energy storage system for frequency regulation in Finland. This transformer is connected to a 2x600kW inverter, model 8YS600 optimised for Toshiba, complete with a high-speed measuring system for backfeeding, container and batteries, cooling and fire protection system, designed to work in temperatures between -40°C and +40°C. The transformer is a 1400 kVA with 10 kV delta connected primary with 7 x 2,5% regulation steps, and two secondary supplies with star winding connection, each 550 V. To develop this transformer, a typical constructive design for converters was used, specifically two

primary windings connected in parallel, to which the secondary foil type windings are linked, for the geometrical respect of both electrical heights. Every detail was carefully evaluated: zinc-coated steelworks, pressure plugs in a non-hygroscopic material, pressure rubber seals in silicone, the formulation of the coil resin in such a way as to guarantee transformer operation at extreme temperatures up to -40°C, as required by this project. The entire range of GBE products are developed in accordance with environmental and fire classes E2 - F1. Moreover, in collaboration with the KEMA laboratory, GBE has also passed the C4 (GOST Standards) environmental test for operation up to -60°C.



## OUR PARTNERS' PERSPECTIVES



The founding partners of GBE:  
Giuliano Sanson,  
Renato Tapparelli and  
Francesco Muzzolon

### Being a reliable supplier



**Staffan Altback,**  
**General Manager**  
**Unitrafo Electric AB**  
**OFFICIAL**  
**DISTRIBUTOR,**  
**SWEDEN**

"GBE, our stable partner, has been active in the Swedish market for 17 years now, boasting numerous deliveries to the majority of Sweden's most renowned companies. These include firms in the hydroelectric, wind power, nuclear, conversion, automotive, steel and paper making sectors, but also a number of installations in public buildings, hospitals, theme parks and shopping centres. The most significant requests in the Swedish market are of course based on current European standards, adapted to meet local technical specifications, which thanks to the work of Unitrafo can be satisfied by a local supplier with maximum reliability. The difference lies not only in the quality of the product, but also the quality of customer service and respect for delivery times. GBE has demonstrated these characteristics time and again, contributing to the recognition of "Unitrafo" as the "most reliable supplier of the year" by one of our most influential clients. In light of these solid foundations, we aim for a future characterised by strong growth across various sectors, for example public transport, renewable energy and conversion systems. There are also great opportunities in Sweden's "basic" industries, such as mining, steelworks, paper making, similarly to the automotive sector with the production pole in Gothenburg, the city hosting Volvo's largest facility. Also worth noting is the growing need to renew existing hydroelectric plants, which are currently responsible for approximately 50% of Sweden's total energy production."

### A partnership that creates value



**Michele Marcante,**  
**Marcante**  
**Rappresentanze Padova**  
**AGENT IN THE**  
**TRIVENETO, ITALY**

"Quality without compromise and attention to detail, combined with the unique ability to design machines that meet the specific demands of a technologically evolved clientele. These are

the necessary conditions for success in an increasingly crowded, strongly competitive market such as ours. The technical and organisational skills of GBE allow us to confidently approach these challenges every day, building client relationships that go beyond simple supply, consolidated to become genuine partnerships that create added value for all. In recent years, we have in fact witnessed a rising trend consisting in the optimisation of transformers to suit special system demands. In these cases, GBE has always been able to provide their expert support, designing and developing transformers which, by way of a customised design, perfectly adapt to the specific needs of the application, while continuing to offer extremely competitive value for money. One new challenge in particular was the SMART GRID, where GBE is progressively acquiring experience in the development of special transformers to service energy storage systems for grid quality, back up and peak shaving. For these reasons, in an Italian market where trust is on the rise and investment opportunities are increasingly more attractive, GBE has proven to be a valuable partner, able to support our clients and cater to new emerging opportunities, guaranteeing the high-level performance that our end users demand."

### Flexibility is fundamental



**Slawomir Lenik,**  
**General Manager**  
**ELEKTRA TYCHY**  
**OFFICIAL**  
**DISTRIBUTOR,**  
**POLAND**

"We respect GBE, above all for their excellent quality. For us, it is extremely important to be able to guarantee product reliability. Our main objective is to build long-term relationships with our clients, so it is critical that we sell and propose transformers with the certainty that they will work perfectly in all conditions. Another reason why we're happy to work with GBE is that we appreciate their open-minded approach to collaboration. GBE never fails to offer solutions adapted to suit our needs, as well as suggestions on technical specifications. This type of technical support is of the utmost importance and highly appreciated, insofar as the Polish market demands very high quality at competitive prices. For this reason, we need to be flexible

not only in terms of technical specifications, but also in terms of price, so as to maintain a competitive edge. In the Polish market, the latest news is that after years of considerable neglect, the Polish Power Grid (PSE) has begun to re-modernise the system. Our company is part of this project through the supply of GBE cast resin transformers for various power stations, which almost always satisfy the most specific requisites. In the meantime, we are continuing to work for Polish industries, where price remains the most important factor. We are certain that our solid collaboration with GBE will help us come out ahead in this challenge."

### A single point of contact



**Peter Biebl,**  
**General Manager**  
**Ingenieurbüro S. Biebl**  
**AGENT IN BAVARIA,**  
**GERMANY**

"GBE is a medium-sized, flexible, technically avant-garde company, which responds to requests from the international market by offering high-quality solutions. In particular, in the field of cast resin transformers, the market demands both affordable standard solutions and special customised ones. GBE is able to produce the broadest range of solutions requested by the market. One challenge in this regard is represented by the offer for competitive, high-value standard cast resin transformers in a market where it is difficult to compete on price. In regards to oil-filled transformers, price is often a deciding factor when comparing offers by local competitors. The commercialisation of turnkey solutions, specifically transformer plus distribution system, often supplied with a housing, has proven to be a winning strategy. In the capacity of local GBE agency, we look after client relations and loyalty building, proposing cast resin transformers for industrial firms and oil-filled transformers for electricity companies. Our strength lies in the fact that we are a single point of reference for clients, from the initial request right through to delivery. In our 15 years of collaboration with GBE, we have contributed to creating awareness about this Italian company in our area, with impressive turnovers."

# UPCOMING TRADE FAIRS

TO DISCOVER GBE TECHNOLOGY AND PRODUCTS, AND OUR KNOW-HOW IN THE DEVELOPMENT OF SPECIAL PROJECTS



**ELEKTROTECHNIK – DORTMUND**  
 15/02/2017-17/02/2017



**HYDROMATTERS 4.0 – PADOVA**  
 19/09/2017



**ELTEFA – STUTTGART**  
 29/03/2017-31/03/2017



**ENERGY NOW EXPO – KILKENNY**  
 25/10/2017-26/10/2017



**HANNOVER MESSE – HANNOVER**  
 24/04/2017-28/04/2017



**ELECTRIX 2017 – CAIRO**  
 03/12/2017 – 05/12/2017



**ALL ENERGY - GLASGOW**  
 10/05/2017-11/05/2017



**CAST RESIN, DRY TYPE, OIL FILLED TRANSFORMERS & REACTORS**  
*Standard and Customised Solutions*



**HEADQUARTERS**



**POWER AND CAST RESIN TRANSFORMERS PLANT**



**OIL FILLED TRANSFORMERS PLANT**



**STEELWORK PLANT**