Advantages for our Members and Business Partners

- High-quality services, extraordinary expertise, and in-depth responses to all technical questions on electrical power systems with more than 100 years of tradition
- Fast, focussed processing of your questions through direct, close communication with our highly qualified engineers with many years of experience
- Provision of calibrated test equipment and recognized/certified software tools
- Legal certainty due to compliance to legal or regulatory constraints and requirements
- Quality assurance through metrological validation
- Our active participation in international standardization bodies, councils of experts and associations
- Extensive training programs

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Services Tailored to our Customers

Based on our many years of experience and recognized expertise in the power system technology sector and grid integration of power generating facilities, we offer a wide range of services to our customers

- Manufacturers of power generating technologies, storage systems and grid technologies
- Planners and operators of power generating facilities, storage systems, charging stations and demand facilities
- Distribution and transmission system operators

Alongside these three target groups, we also serve public institutions, authorities, scientists and policy-makers as a valuable contact point.

Get in touch with us!

Kontakt

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Our Field of Research

The research field of “power systems technologies” is characterized by pre-competitive research on the existing and innovative equipment and components of electrical power systems. It focuses on integrating these technologies into grid operation with a special focus on digitalization. At FGH, industrial collective research in collaboration with companies is in the spotlight. A strong application orientation, high-precision fit and transferability of results all ensure the fast transfer of research findings to general practice. Our members can initiate, shape content of and actively collaborate in our projects themselves through participation in the FGH Research Council. Thus, the results of the research projects are particularly valuable to them. The research activities are financed by funds from the European Commission, German federal and state ministries, the German Research Foundation, the Federal Network Agency, partners in industry and the capital resources of FGH.

Our research and development work primarily focuses on

- **Design and fault diagnostic of** grid technologies and components for medium- and high-voltage technology
- Requirements for **future technologies** in electrical power systems
- Innovative methods and prototypes for **quality assurance in cable production processes**
- **Information and communication technology** in electrical power systems
- **Asset management** for electrical power systems

With their participation in the FGH Research Council, our members can

- initiate
- shape the content of and
- actively participate in the research projects

SUPPORTING THE SHIFT TO A SUSTAINABLE ENERGY SYSTEM

Power Systems Technologies

About Us

FGH is a **recognized pioneer in future energy systems** – working in close collaboration with its member companies, customers and partners. Since 1921, **our declared aim has been to conduct professional and scientific research on topics related to the future electrical power system**.

Driven by this clear vision **we transfer scientific findings to the practice of engineering, creating a central knowledge base for the industry, operators and associations**. Our knowledge transfer activities are complemented by our practice-oriented training programs. Four fields of expertise form the comprehensive foundation of our work: **electrical grids, power systems technologies, testing and certification and the FGH Academy**.

The focus of "**power systems technologies**" includes the grid code compliant design, installation, and testing of power generating facilities and primary or secondary power system technologies as well as their standardization. We introduce the findings from our research projects directly into multifaceted services for our group of members and customers as well as into the drafting of national and international rules and standards. **Grid digitalization and integrating generating and storage systems** into the grid characterize our work for the ongoing energy transition.

Services for Manufacturers of Power Generating Facilities and Grid Technologies

FGH has a long history of supervising the development of **grid code compliant power generating and grid technologies** and their rapid qualification for the electricity markets. We also support manufacturers with **quality assurance in their production processes** and with fault diagnoses for equipment in operation by a variety of attractive services.

Our portfolio includes among others

- International grid code analyses and product-related gap analyses for your target markets
- Consulting on product qualification for international proof of conformity
- Developing and validating root mean square (RMS) and electromagnetic transient simulation (EMT) models
- Studies on control interactions, harmonics, subsynchronous oscillations and grid-forming control
- Damage analyses and expert opinions
- Production monitoring and quality assurance in production processes in cable manufacturing
- Calculating of electromagnetic interference
- Design and testing of earthing systems
- Test reports on arc flash tests (IEC 62271-200/-202)
- Trainings and workshops

We are your qualified partner for your needs from development, production to the operation of your power generating and grid technologies in electrical power systems.

Services for Developers and Operators of Power Generating Facilities

For more than 35 years, we have tackled the growing challenges involved in the **grid integration of power generating facilities** regardless of their technology – from wind power to photovoltaics and from hydropower to combined heat-power modules. We provide experience with systems both with and without battery storage, and also take charging stations for e-mobility into our services.

We ensure that the energy transition will achieve sustained success, for example with

- EU-wide conformity studies (ENC RfG and national grid code implementations)
- Electrical design plans, incl. short-circuit current calculation (VDE 0102; IEC 60909), control and protection concepts, (transient, thermal) cable dimensioning IEC 60287/IEC 60853 and calculating losses of output
- Technical due diligence
- Process supervision and technical consulting
- Stationary and dynamic grid calculation
- Studies on grid forming capabilities
- Commissioning statements
- Testing of protection devices and recurring testing
- Acceptance and diagnostic tests for cable systems
- Damage analyses and expert reports
- Electromagnetic interference of third-party systems
- Calculating and checking grounding systems
- Customer-specific in-house training

Our expertise and reliability are appreciated by the industry, and we are happy to make them available to you during the entire planning and operating phase of your projects.

Services for Grid Operators

Distribution and transmission system operators benefit indirectly from our multifaceted services for the **qualification of power system technologies** and **power generating facilities**. Furthermore, we offer additional, harmonized services to system operators on all voltage levels in the context of **asset management for power system technologies and grid integration of power generating facilities**.

We are happy to support you with our expertise in the following areas, for example

- Support in grid connection issues and the determination of suitable grid connection points
- Updating existing (n-1) concepts in the view of a changing generation structure
- Optimizing process management for proof of conformity of power generating facilities
- Detailed design and documentation of technical connection requirements for low- and medium-voltage networks
- Modeling of low-, medium- and high-voltage networks
- Transient thermal calculations for maximum cable utilization
- Power system technology diagnostics in medium voltage systems and adapted asset management strategies
- Calculating the electromagnetic interference of adjacent operating equipment
- Concepts for network and supply restoration and crisis preparedness
- Expert reports on field emissions
- Implementation of periodic testing of protection devices at network operators' own electrical installations
- Damage assessment reports including fault cause analyse

This allows us to perfectly complement the portfolio or distribution and transmission system operators of our team "Electrical Grids"