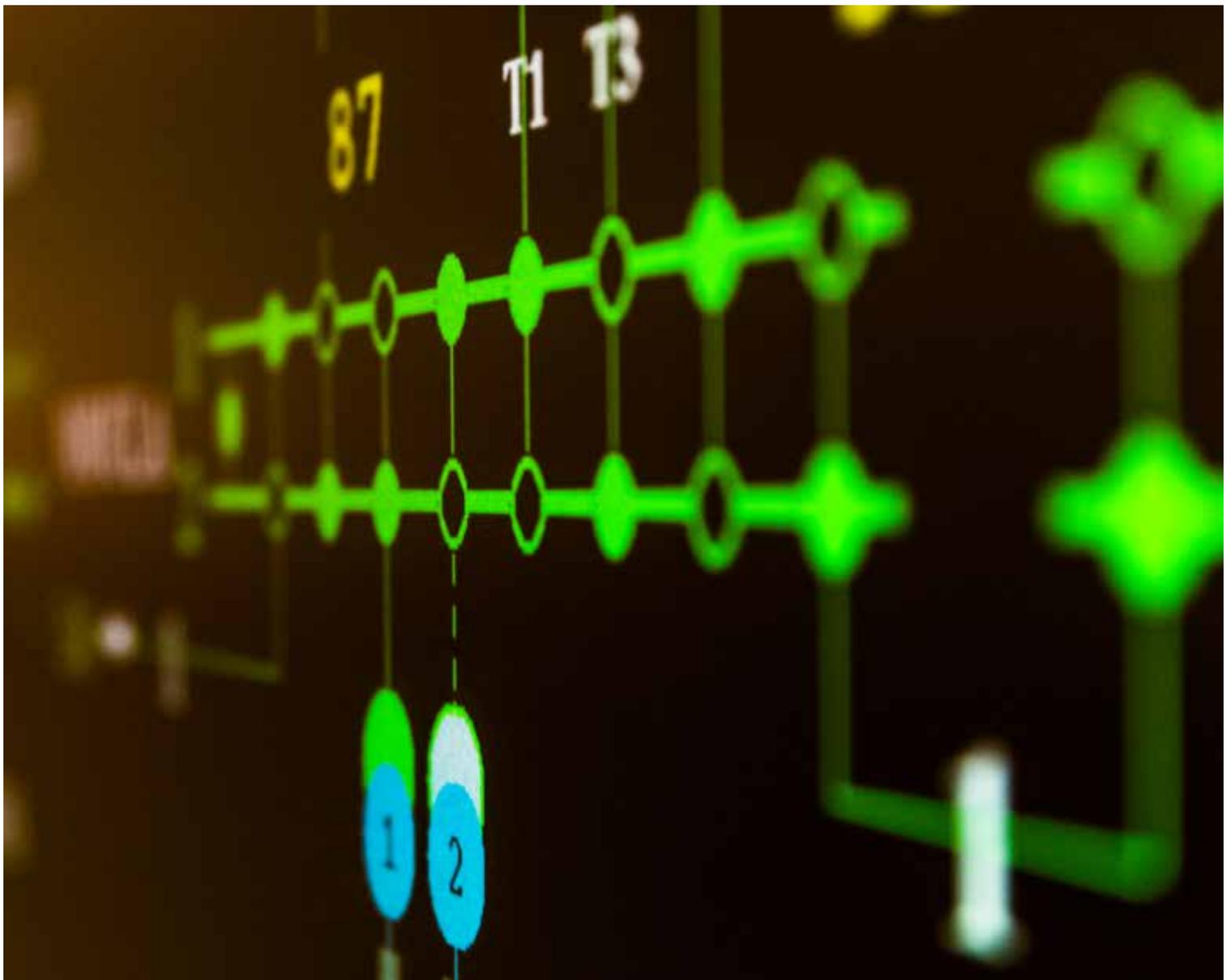


# Elia Grid International System Operations



# Your expert in power system operation



Backed by two major transmission system operators

**Elia Grid International embodies the international ambitions of the Elia Group.**

By offering consultancy and engineering services to the international energy market, Elia Grid International develops power system projects for third parties and considers investment opportunities in foreign electricity systems.

## Internationally renowned experts

Elia Grid International can rely on a team of internationally renowned experts with the know-how and expertise to meet the highest standards in the power system business.

The unique international cooperation between its parent companies, Elia and 50Hertz, gives Elia Grid International a direct and privileged view on the best practices in the TSO business, particularly as these are constantly being challenged by day-to-day operational challenges.

In addition to establishing best practices, Elia Grid International's experts also develop innovative tools and protocols to help clients create a modern power system and give them the support they need in forecasting the impact of such a design. The objective is to achieve a more cost-effective and reliable exploitation of the client's existing and future assets.

Elia Grid International develops its projects independently or in association with other renowned international partners.

## An Elia Group company

As a wholly owned subsidiary (50/50) of Elia Transmission in Belgium and 50Hertz Transmission in Germany, Elia Grid International combines the quality and expertise of two large European electricity transmission system operators, each with a solid track-record and many decades of experience.

[www.eliagroup.eu](http://www.eliagroup.eu)



## Key Figures Elia Group



**30,000,000**  
inhabitants served



**143,000**  
km² covered



**18,000**  
km of high-voltage lines owned and operated in Belgium and Germany



**2,000**  
employees



**800**  
experienced engineers and technicians



**30,000**  
MW of installed capacity of renewable energy sources



**6**  
European Interconnections



**22**  
nationalities inside the Group

## Powering a world in progress

As part of the Elia Group, Elia Grid International offers a wide-ranging knowledge-base and international expertise. The many successful projects currently being developed and implemented by the Elia Group around the world illustrate that Elia Grid International can deliver services at the very highest level.



US	Europe	West Africa	Middle East	Turkey	Japan
Advice on offshore wind power integration and HVDC	Leading the development of a governance model for the pan-European Electricity Highway System (EHS)	Services to support the development of the West African Power Pool (WAPP), training for sub-station operators	Advice on asset management, grid operations, RES integration, unbundling and promotion of electricity markets	Advice on the Transmission Grid Code review and review of the electrotechnical safety organisation and installations	Advice on deregulation processes

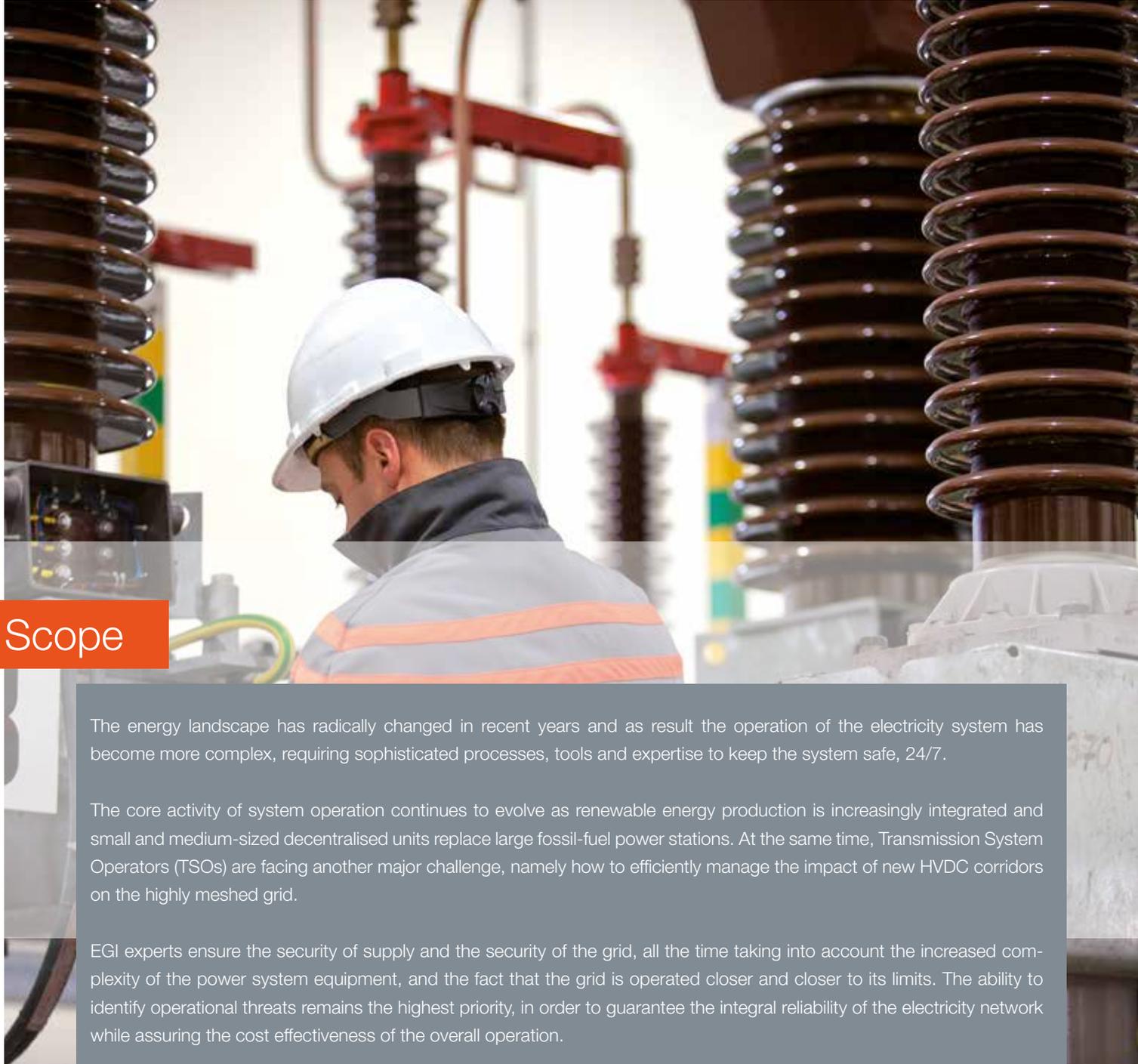
## Domains of expertise

- Asset management
- System operations
- Grid development & network studies
- Owner's engineering
- Electricity markets and deregulation process development
- Renewable energy integration



# System Operations

For a reliable, secure and performant electrical grid



## Scope

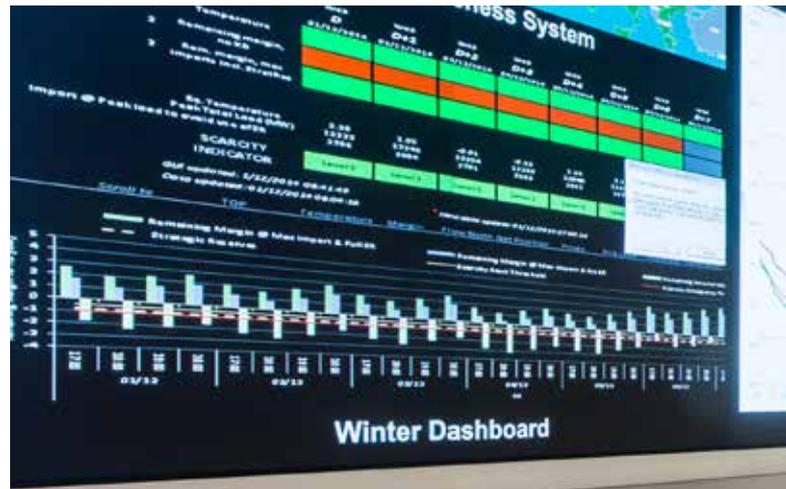
The energy landscape has radically changed in recent years and as result the operation of the electricity system has become more complex, requiring sophisticated processes, tools and expertise to keep the system safe, 24/7.

The core activity of system operation continues to evolve as renewable energy production is increasingly integrated and small and medium-sized decentralised units replace large fossil-fuel power stations. At the same time, Transmission System Operators (TSOs) are facing another major challenge, namely how to efficiently manage the impact of new HVDC corridors on the highly meshed grid.

EGI experts ensure the security of supply and the security of the grid, all the time taking into account the increased complexity of the power system equipment, and the fact that the grid is operated closer and closer to its limits. The ability to identify operational threats remains the highest priority, in order to guarantee the integral reliability of the electricity network while assuring the cost effectiveness of the overall operation.

Decades of experience have given our experts the highest levels of operational excellence in all fields of transmission system operation. This expertise is shared with our clients to help them improve the reliability, security and performance of their electrical networks, and includes the training of their system engineers.

# Elia Grid International's expertise in System Operations



## System Operations is about

- ... day-to-day security of supply
- ... reaching the system reliability objectives
- ... a comprehensive set of dynamic security assessment procedures
- ... evaluation of security actions
- ... network planning and management
- ... coordinating and planning of intermittent and load demand

## Grid ancillary services and balancing

### GOAL

Acquire or procure and operate the generation and load reserves in an efficient way and at the lowest cost for the control of the grid frequency.

### EXPERIENCE

- Tendering and executing the financial management of power reserves and managing primary, secondary and tertiary reserves
- Reviewing and defining well proven and cost-effective strategy for network balancing and ancillary services taking into account energy market design and network specificities (market liberalization, optimal generation dispatch, renewable energy penetration...)
- Organising and improving coordinated balancing mechanisms between TSOs through better coordinated international grid control

## Load frequency control

### GOAL

Ensure that the system frequency remains stable taking into account any possible disturbances that can occur in the system.

### EXPERIENCE

- EGI experts have developed the load-frequency control system for Belgium. This is operated inside the energy management system (EMS) and delivers high quality control of the area balance and frequency.
- Experts from EGI are involved in keeping the quality of control up to the same standard taking into account the growing intermittent production from wind and solar energy.

## Grid code development

### GOAL

Codes and standards for grid connection and operation have to include minimum requirements to ensure the stability and security of the power system.

### EXPERIENCE

- EGI experts have played a leading role at European level in drafting the ENTSO-E Operation Handbook and developing its network codes.
- Accordingly our experts are well placed to assess the impact of grid evolution (e.g. the integration of wind power) and formulate recommendations on how to improve the existing frameworks in compliance with regional, technical and market requirements. Such assessments can cover issues as diverse as grid security, national and international connectivity, grid access, ancillary services and exchanges of information. This expertise has already been used in Western Africa, Saudi Arabia and Turkey.



## Emergency and business continuity plans

### GOAL

Ensure the security of supply to all consumers connected to the electricity system and avoid black-outs.

### EXPERIENCE

- EGI has developed and tested emergency systems and procedures in several countries. These include a defence plan for frequency restoration, avoiding voltage collapses and energy scarcity, and the contractual arrangements and procedures for emergency exchanges between TSOs.
- The business continuity plans have been developed to guarantee the continued functioning of the IT infrastructure and any critical activities and/or operations.

## RES integration

### GOAL

With its experience in Germany and Belgium, EGI can provide methodologies and processes which allow for massive integration of renewable energy to the electricity system without any deterioration of the security of supply.

### EXPERIENCE

- EGI has delivered a complete grid integration study for connecting 50 GW of renewables to the Saudi-Arabian grid to K.A.CARE in Riyadh.
- We have worked for DEWA in Dubai to establish a multi-year roadmap for the company to connect renewable energy sources to the grid.

## System training and simulation

### GOAL

Make sure the operators at the different control centres are able to manage normal grid operation as well as extreme situations like emergency conditions and eventually 'black start' and restoration of supply.

### EXPERIENCE

- EGI experts have more than 20 years of operational experience and have access to simulation equipment and training programmes which are amongst the most sophisticated in the market.
- Gridlab, unique in Europe and part of Elia Group, serves as a European training and research centre for power system security, also offers off-the-shelf training modules in domains including grid and system management, interconnection, the development of renewable energy installations and grid restoration. The GridLab Grid Simulator is a unique technological tool to test critical grid situations under real conditions. The system works with the actual data from the grid operators. [www.gridlab.de](http://www.gridlab.de).
- Trainings have already been provided to customers in Japan, Turkey, Ghana, etc.

## International coordination centre operation

### GOAL

Improve the coordination between different transmission system operators in order to ensure the secure operation of interconnected electricity grids.

### EXPERIENCE

- EGI, as part of Elia Group, has very strong connections to several coordination centres. Coreso, a Central Western European (CWE) coordination centre for forecasting and operating electricity flows, enhances the level of security of supply by providing an international vision of electricity flows to supplement its national equivalents.
- TSO Security Cooperation (TSC), a cooperative initiative between 11 European transmission system operators, improves the security of interconnected extra-high-voltage grids in Central Europe.
- EGI experts have also been active on the GCCIA project and the coordination requirements between the countries around the Arabian Gulf.

[www.eliagrid-int.com](http://www.eliagrid-int.com)

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