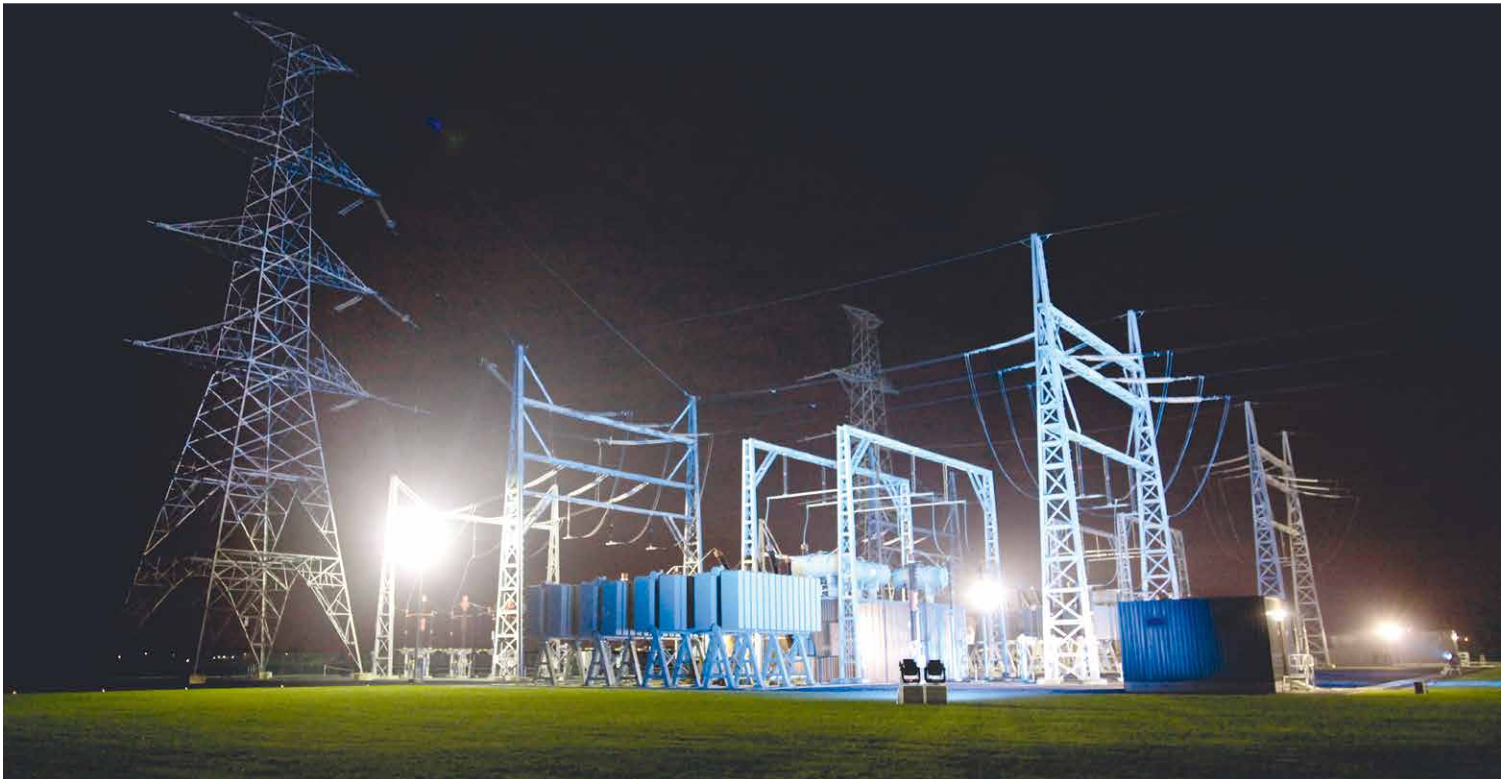




Elia Grid International

Your expert in power system solutions



Your expert in power system solutions

➤ Backed by major grid operators

Elia Grid International combines the best of two transmission system operators: Elia Transmission in Belgium and 50Hertz Transmission in Germany – since 2010 merged into the Elia Group. As a fully owned subsidiary of the Elia Group, Elia Grid International has extensive international experience in all aspects of electricity transmission and distribution.

➤ Activities

The company leverages the Elia Group's expertise to provide state-of-the-art solutions for worldwide clients through the following activities:

- Solutions & Services
- Engineering, procurement & construction (management)

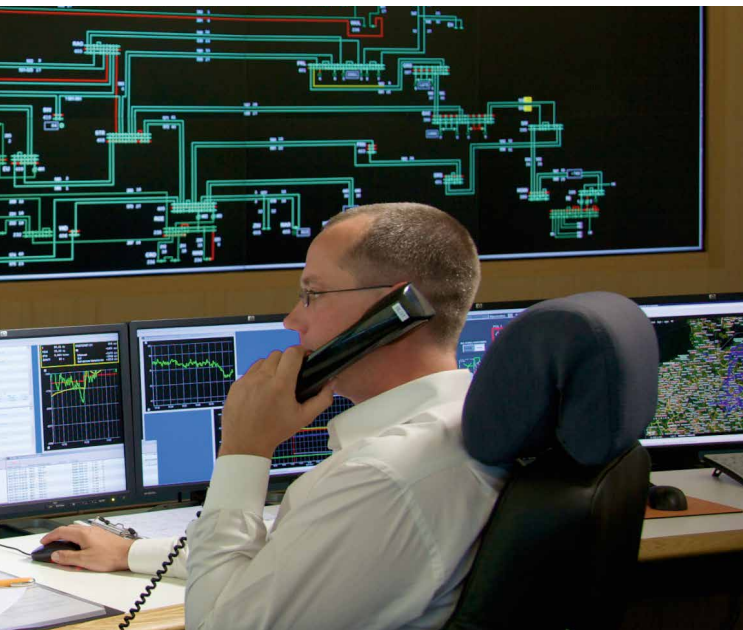
Elia Grid International provides proven solutions in an economical viable and innovative way.



➤ Expert domains

With offices in Brussels and Berlin, Elia Grid International is a strong partner with a proven transmission system operator approach offering services in the following domains:

- Asset management
- System operation
- Grid development & network studies
- Engineering, procurement & construction (management) of high voltage lines & substations
- Electricity markets and deregulations process development
- Renewable energy integration
- Dynamic system simulations



Accelerating the world's energy revolution

The global energy industry is evolving rapidly with the incorporation of renewable energy sources (RES), the developments in high-voltage technology and the ongoing integration and deregulation of competitive electricity markets. This presents huge challenges and great opportunities.

With its R&D and knowledge management centre, Elia Grid International is innovating within a rapidly changing environment, in order to maintain the lead in technological advancements and pioneering the further development of the electricity market.

As an example, the company plays a major role in the development of offshore infrastructure thanks to its strategic position on both the North Sea and Baltic Sea.



Markus Berger,
CEO Elia Grid International

Elia Grid International is a dynamic, forward-thinking company providing innovative, state-of-the-art grid solutions. “

Elia Group



► Powering a world in progress

The Elia Group is organized around its two transmission system operators, Elia in Belgium and 50Hertz in Germany. Thanks to this unique international cooperation, the Elia Group is a driving force in the European energy sector transition and has a proven track record as:

- **developer & asset manager** for large onshore and offshore infrastructure projects in Europe and the US.
- **facilitator & supporter** of European market integration, actively shaping the market in North West and Central Europe and developing allocation mechanisms jointly with other grid operators, regulators and power exchanges.
- **integrator** of the world's highest proportion of wind infeed in its German grid area.





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

Delivering proven grid solutions

Elia Grid International combines the practical expertise of two transmission system operators (TSOs). As part of the Elia Group, our business partners can rely on a long and successful history in delivering transmission and distribution projects in Belgium (Elia) and Germany (50Hertz) covering all project phases, from design to commissioning, through the following activities:

- Engineering, procurement & construction (management)
- Solutions & Services

➤ Engineering, Procurement and Construction (management)

Elia Grid International can offer a full turnkey experience or any part of the value chain, such as:

- detailed engineering
- procurement
- project management
- commissioning



The technical skills of our employees cover the full range of experience needed to successfully deploy transmission and distribution projects such as:

- substations -up to 400 kV- and mobile if needed
- offshore and onshore HVDC projects
- design and protection of phase shifting transformers
- underground cables up to 400 kV
- latest overhead line technology such as HTLS

Since Elia Grid International is not dependent on any manufacturers, the company has built up extensive knowledge and experience with different installations and technologies. As a result, Elia Grid International can help to define the best solution for its partner's needs.



References on Engineering, Procurement and Construction (management)



South-west
interconnection

Germany



ALEGrO
Interconnection

**Belgium &
Germany**



EPC substation
projects

Europe

Project

210 km of 380 kV overhead line between Bad Lauchstädt (Saxony-Anhalt) and Redwitz (Bavaria)

First direct interconnection between Belgium & Germany

Construction of new or extension of existing substations for various clients

Budget

295 MIO €

430 MIO €

Between 5 en 20 MIO €

Expertise

- » Complete permission process (route planning & underground cable study)
- » Engineering
- » Project management of the construction process

- » Underground HVDC line of 100 km
- » Construction of 2 converter stations

- » Delivery of fully wrapped EPC projects

► Solutions and Services

As an independent partner, Elia Grid International delivers and implements long-term solutions and services in 5 expertise domains:

1. Asset management
2. System operation
3. Grid development & network studies
4. Electricity markets and deregulations
process developments
5. RES integration

1. Asset management

Elia Grid International supports the operation and maintenance of its client's facilities ensuring their reliability, availability and quality of service. Elia Grid International supports its partners during the assessment and due diligence phase of asset construction or project acquisition. This includes:

- Asset valuation
- Expected quality of supply
- Impact of the applicable market model on the future revenue stream
- Best practices for operating your facilities



Reference project – National Grid Saudi Arabia

- » Assess the company's asset management methods in comparison with the best performers on that matter and come up with an action plan to overcome the gaps
- » Recommend and propose targets, defined jointly with the client's management
- » Propose a high-level roadmap to support the agreed implementation strategy

2. System operation

Elia Grid International supports its clients across the full range of system operation requirements, including:

- load frequency control
- grid ancillary services and balancing
- settlement and accounting
- emergency and business continuity plans
- grid code development
- system training and simulation
- international coordination centre operation



Reference project – review of West African Power pool (WAPP) operational manual

- » Assessment of programming and trade accounts between control areas
- » Assessment of the management planning directive
- » Assessment of emergency directive
- » Assessment of frequency power and criteria for security directives

3. Grid development and network studies

Elia Grid International has expertise and proven experience in international projects involving the development of new grid codes and transmission network planning.

Elia Grid International can help to design and develop:

- integrated infrastructure development plan, factoring in a large voltage range from 30 kV to 380 kV, HVAC and HVDC
- significant proportion of renewable energy sources
- interconnections and international developments



Reference project – Saudi Arabia

- » Perform studies for the energization of the new long transmission corridor
- » Describing the procedure for the energization of the inter-connection

4. Electricity markets and deregulations process developments

With the knowledge of our two independent and fully certified TSOs in Europe, Elia Grid International can support in key aspects of market deregulation, such as:

- best-in-class independent TSO governance
- unbundling processes
- efficient and sustainable regulatory schemes
- tailored grid codes
- transmission tariffs

Elia Grid International gives support in setting up capacity calculation and allocation mechanisms for ensuring balance between a high level of security of supply and the creation of a smoothly functioning electricity market. Elia Grid International also helps to develop and deploy power exchanges.



Reference project – Flow based market coupling for ENTSO-E (European Network of TSOs)

- » Participating in the ENTSO-e workgroup discussing the flow based implementation Europe
- » Flow-based market coupling method for cross border congestion management

5. RES integration

The integration of renewable and decentralised energy sources have become key factors in electricity systems across the entire energy value chain. Elia Grid International offers a holistic approach embracing:

- offshore and onshore RES integration
- operation of RES in highly interconnected AC and DC networks
- development of market and trading schemes to facilitate RES integration



Reference project – support of TSOs in the Middle East

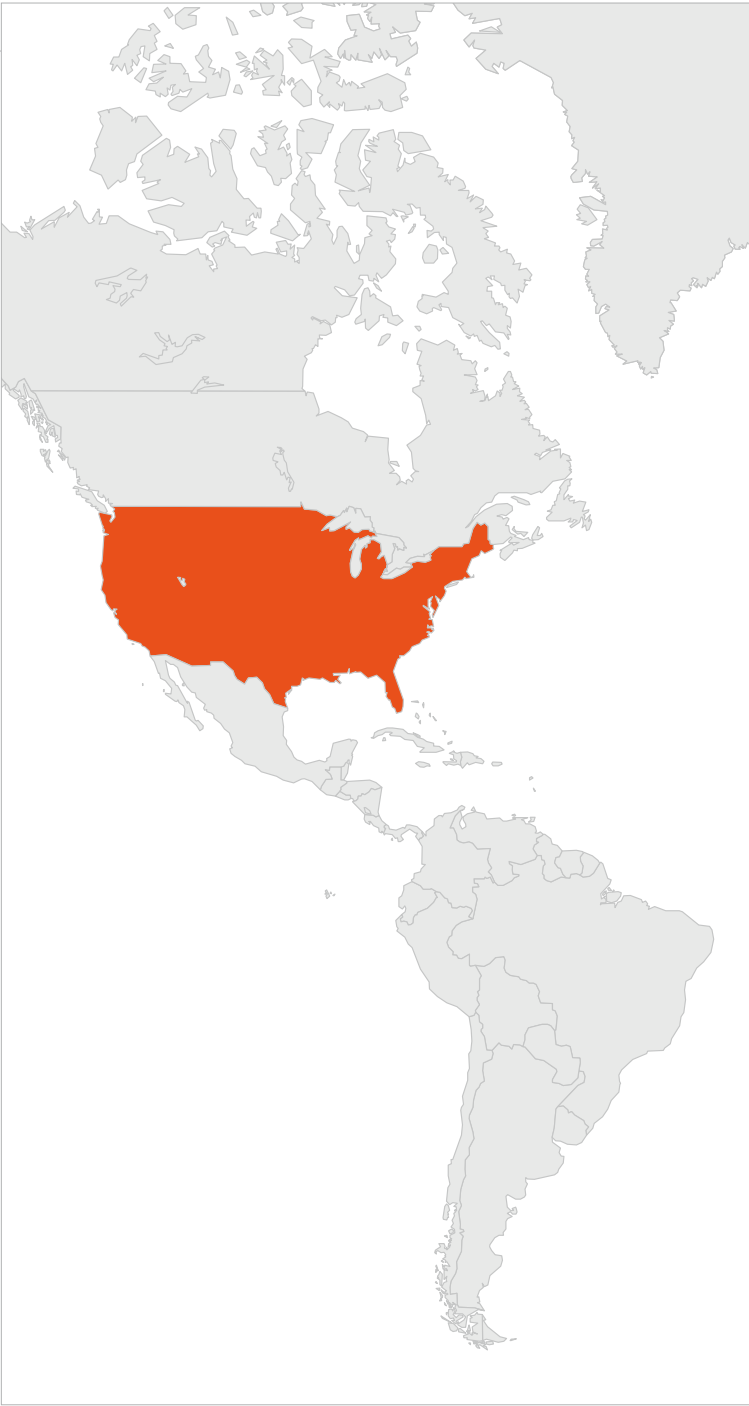
- » Define the required standards to be integrated in the existing regulating codes
- » Recommend a level of RES penetration to our client's network
- » Define a pricing mechanism

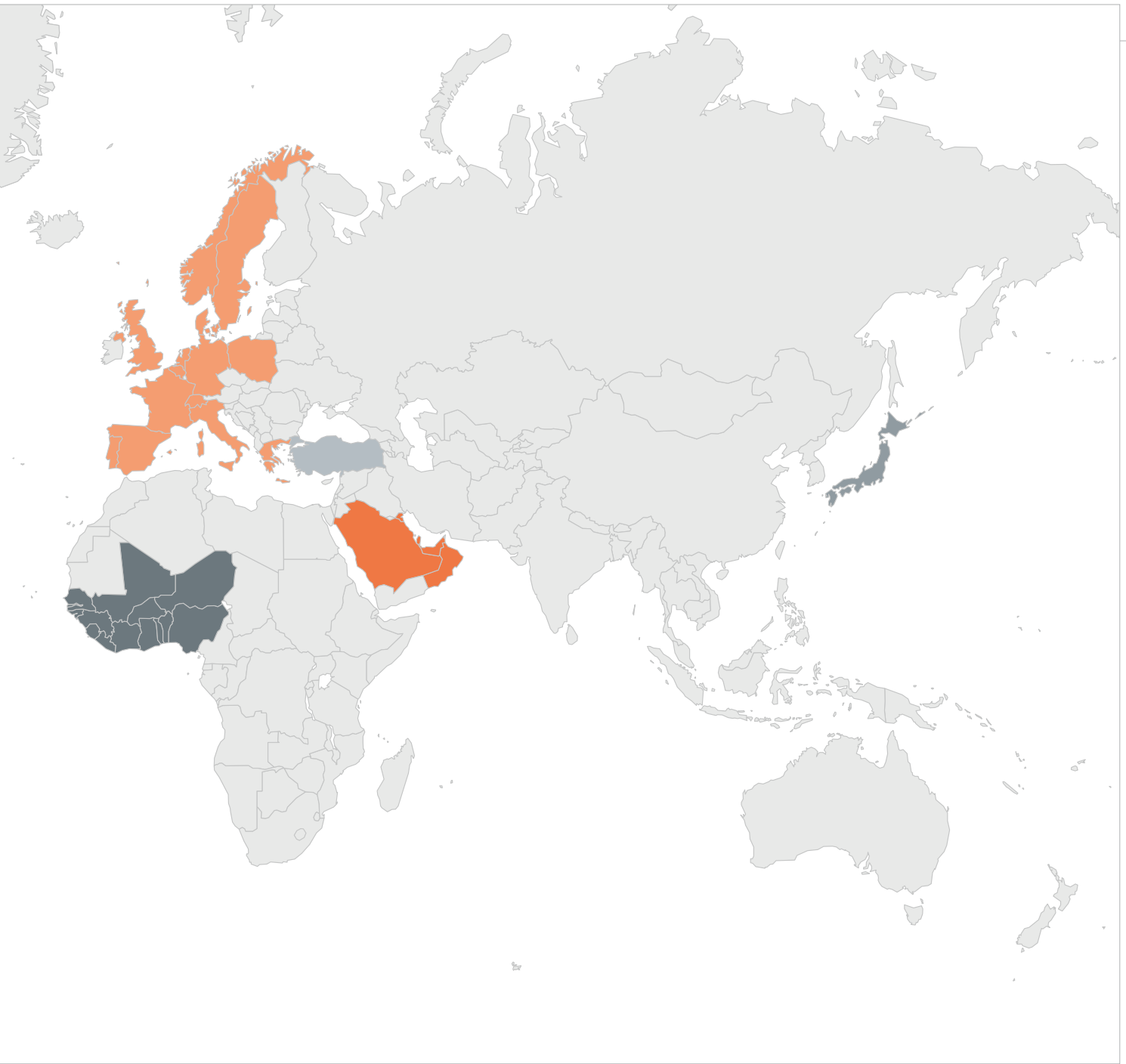
Powering a world in progress

As part of the Elia Group, Elia Grid International benefits from the extensive experience of its mother company and has access to international knowledge and expertise.

The many successful projects currently being developed and implemented by the Elia Group around the world prove that Elia Grid International can deliver services at the very highest level.

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





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An Elia Group company

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