EGI General Presentation

July 2025


Solving the
Energy Transition
Challenge
egi
Elia Grid
International

About Elia Grid International

We are delivering power consultancy services through offices strategically positioned in key regions

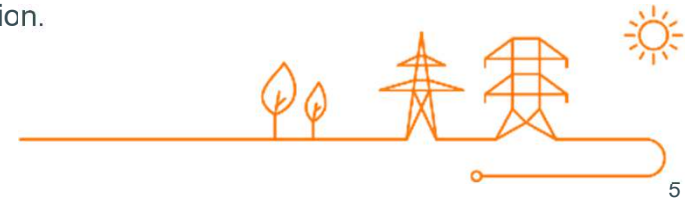
Elia Grid International (EGI) is a leading consultancy company specializing in solving complex power system challenges. Pulling expertise, state-of-the-art solutions, and innovative know-how from two of Europe's top transmission system operators. We provide strategic, technical, and regulatory guidance across all aspects of power transmission.

Our multidisciplinary team delivers cutting-edge solutions tailored to evolving energy needs, ensuring efficiency, reliability, and sustainability. With offices in Belgium, Germany, the United States of the Arab Emirates, Saudi Arabia, Canada, Malaysia and United States of America. We operate in over 20 countries, bringing expertise to clients worldwide.

Driving Energy Transition with Expertise and Innovation

At the forefront of the energy transition, EGI delivers cutting-edge solutions that enable more sustainable, reliable and efficient power systems. Extensive expertise supports grid operators, corporate utilities, and governments worldwide in overcoming challenges related to renewable integration and energy infrastructure modernization.

Strategic Consulting	Renewable Energy Transition	Smart Grid & Digitalisation	HVDC & Offshore grids	Asset Management & Grid Operations
EGI provides tailored advisory services to help stakeholders navigate evolving energy landscapes, optimize investments, and design regulatory frameworks that support a low-carbon future.	EGI's experts ensure the seamless integration of renewable energy sources (RES) into power grids, from grid planning to operational excellence, ensuring stability and flexibility.	EGI harnesses advanced technologies and data-driven solutions to enhance grid intelligence, enabling real-time monitoring, automation, and improved system resilience.	As pioneers in high-voltage direct current (HVDC) transmission and offshore grid development, EGI enables long-distance renewable energy transport, cross-border interconnections, and large-scale offshore wind integration.	EGI optimizes asset performance and lifecycle management, leveraging predictive maintenance, digital twins, and innovative operational strategies to enhance grid reliability and efficiency.

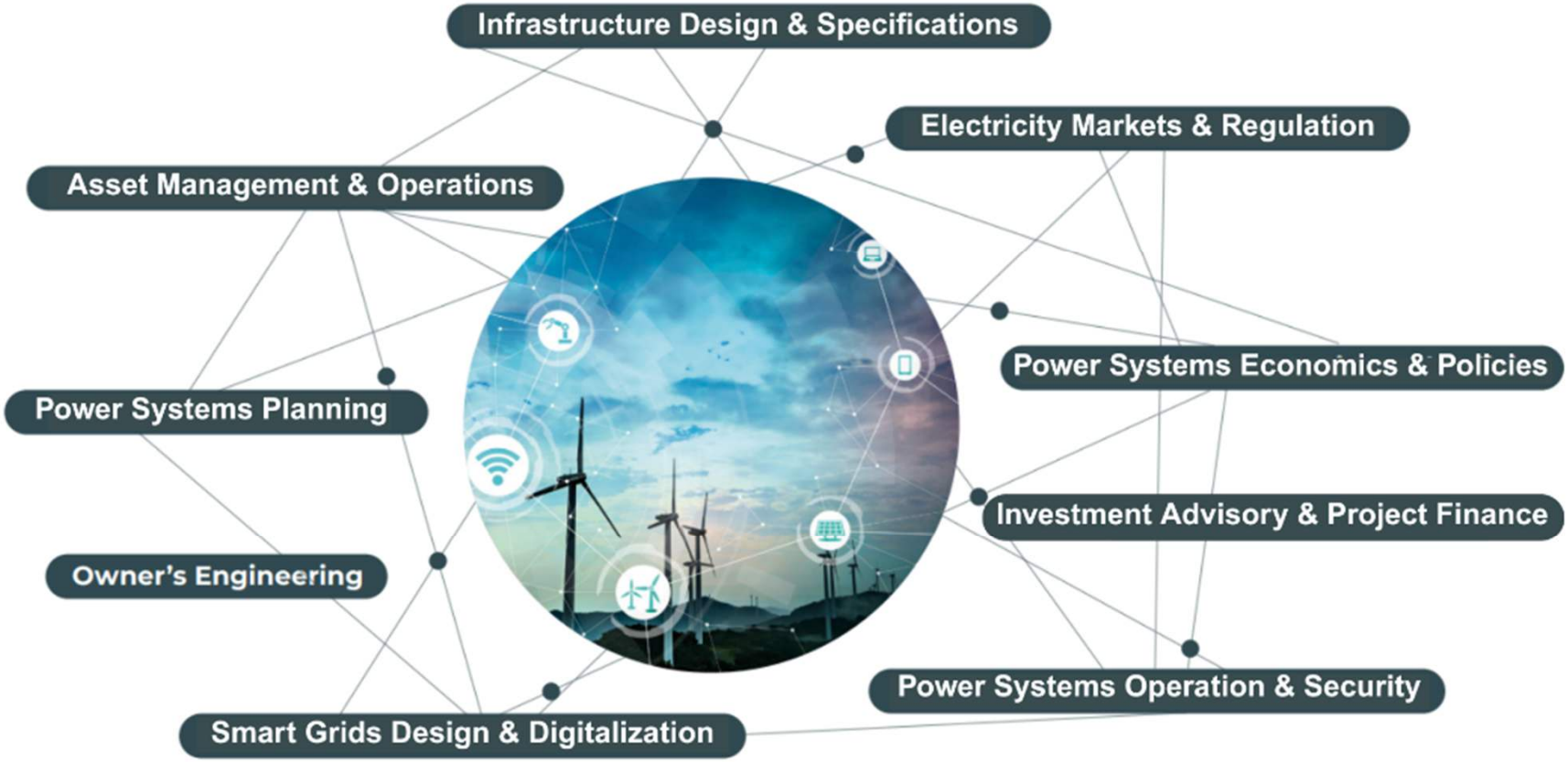


Guiding energy systems into a sustainable future

Shaping tomorrow's grids, today

Our Services

Your agile partner in leading edge power consultancy services



Delivering advanced expertise and solving the toughest power system challenges worldwide to accelerate the energy transition

System Modelling & Optimization

Safe Operation of Large & Complex Systems

Integration of Renewable Energy Sources

Investment Advisory & Technical Due Diligence

Green Hydrogen infrastructure design, operation & derisking studies

Interconnectors, HVDC & FACTS

Regulatory & Policy Support

Digitalization & Artificial Intelligence

Grid Planning & Grid Development

Driving Energy Transition with Expertise and Innovation

At the forefront of the energy transition, EGI delivers cutting-edge solutions that enable more sustainable, efficient, and affordable power systems. Extensive expertise supports grid operators, corporate utilities, and governments worldwide in overcoming challenges related to renewable integration and energy infrastructure modernization.

1

SYSTEM MODELLING & OPTIMIZATION

EGI enables system modelling and optimization by building advanced grid models and applying smart optimization techniques to integrate renewables, enhance stability, and ensure reliable, cost-efficient grid operation.

2

RENEWABLE ENERGY INTEGRATION

EGI's experts ensure the seamless integration of renewable energy sources (RES) into power grids, from grid planning to operational excellence, ensuring stability and flexibility.

Powering Energy Transition

3

DIGITALIZATION & ARTIFICIAL INTELLIGENCE

EGI harnesses advanced technologies and data-driven solutions to enhance grid intelligence, enabling real-time monitoring, automation, and improved system resilience.

4

HVDC & INTERCONNECTORS

As pioneers in high-voltage direct current (HVDC) transmission and offshore grid development, EGI enables long-distance renewable energy transport, cross-border interconnection, and large-scale offshore wind integration.

Holistic Approach, Global Impact

5

ASSET MANAGEMENT & GRID OPERATION

EGI optimizes asset performance and lifecycle management, leveraging predictive maintenance, digital twins, and innovative operational strategies to enhance grid reliability and efficiency.

6

SAFE OPERATION OF LARGE & COMPLEX SYSTEMS

EGI helps secure the operation of complex power systems by boosting resilience, integrating renewables, and supporting real-time decision-making. We de-risk projects through advanced studies and technical expertise, while future-proofing infrastructure with efficient long-term planning that balances stability, reliability, and cost-efficiency.

Derisking your project, every step of the way

7

REGULAROTY & POLICY SUPPORT

EGI supports the development of market design, energy policy and regulatory frameworks to facilitate the energy transition. Expertise covers unbundling, tariff structures, market coupling, renewable integration, and compliance with diverse regulatory environments.

8

INVESTMENT ADVISORY & TECHNICAL DUE DILIGENCE

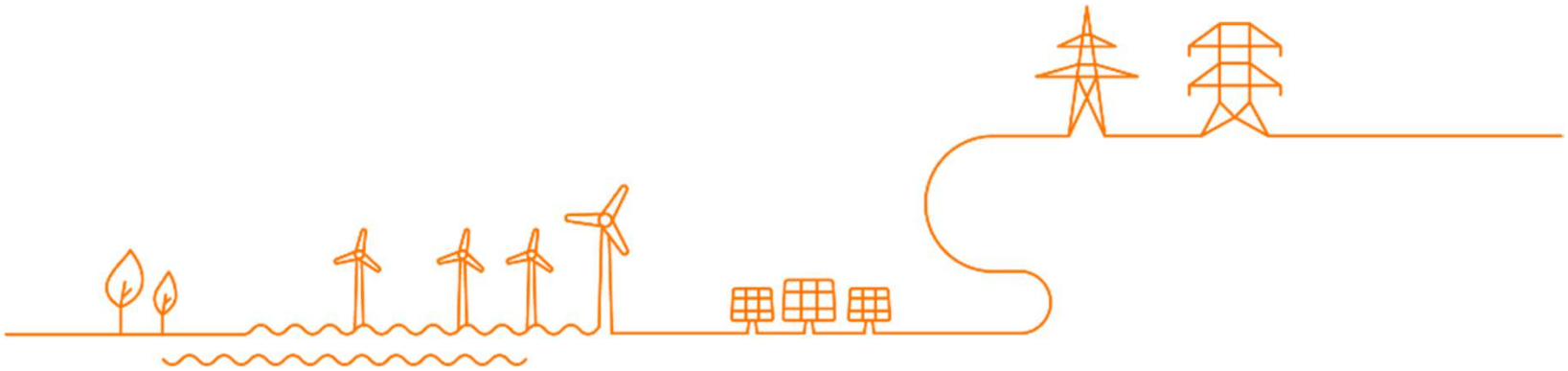
EGI's Investment Advisory uses technical due diligence to assess risks and uncover opportunities in power system investments, providing tailored strategies backed by global expertise.

Creating value through innovation

9

GREEN HYDROGEN INFRASTRUCTURE DESIGN, OPERATION & DERISKING STUDIES

EGI supports large-scale renewable hydrogen projects by contributing to the early screening and concept definition phases. Our expertise includes defining system architectures, setting operational principles, and conducting advanced studies to ensure grid stability and validate system design. By providing key insights and facilitating collaborative framing sessions, we lay the foundation and derisk your investments.



Our Unique Value Proposition

Wide Range Expertise in Power Transmission

EGI has proven operational expertise and consulting experience in all topics related to core processes of a TSO. EGI experts can talk peer-to-peer with TSO experts and power sector stakeholders.

Assisting Project Developers

EGI can assist developers as strategic advisor and help **de-risk and fast-track** their projects by leveraging past experiences. We are able to design state-of-the-art technical solutions that ensure **high reliability & redundancy** on the long-term.

Innovation for faster Energy Transition

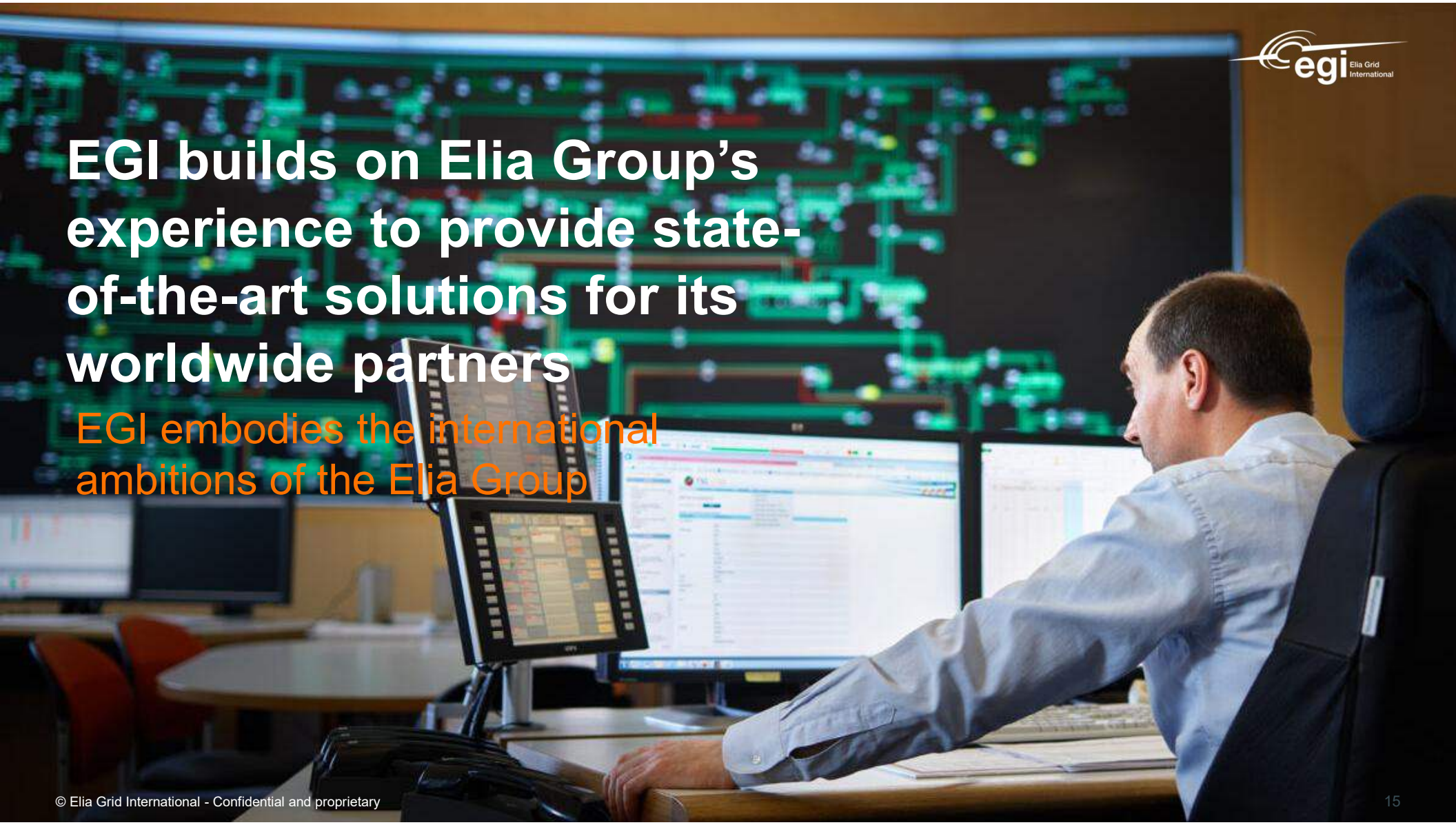
EGI is constantly striving and innovating to develop solutions that can efficiently support the energy transition.

Providing advisory services to the whole energy ecosystem

We have experience with different (evolving) regulatory systems, and we know how to be creative in dealing with them. We can leverage Elia Group's status to support regulatory and governmental engagement.

Global Footprint

With offices in Brussels, Berlin, Dubai, Abu-Dhabi, Riyadh, Calgary, and Kuala Lumpur, EGI brings proven expertise and innovative character in all aspects of electricity transmission while being close to our clients.

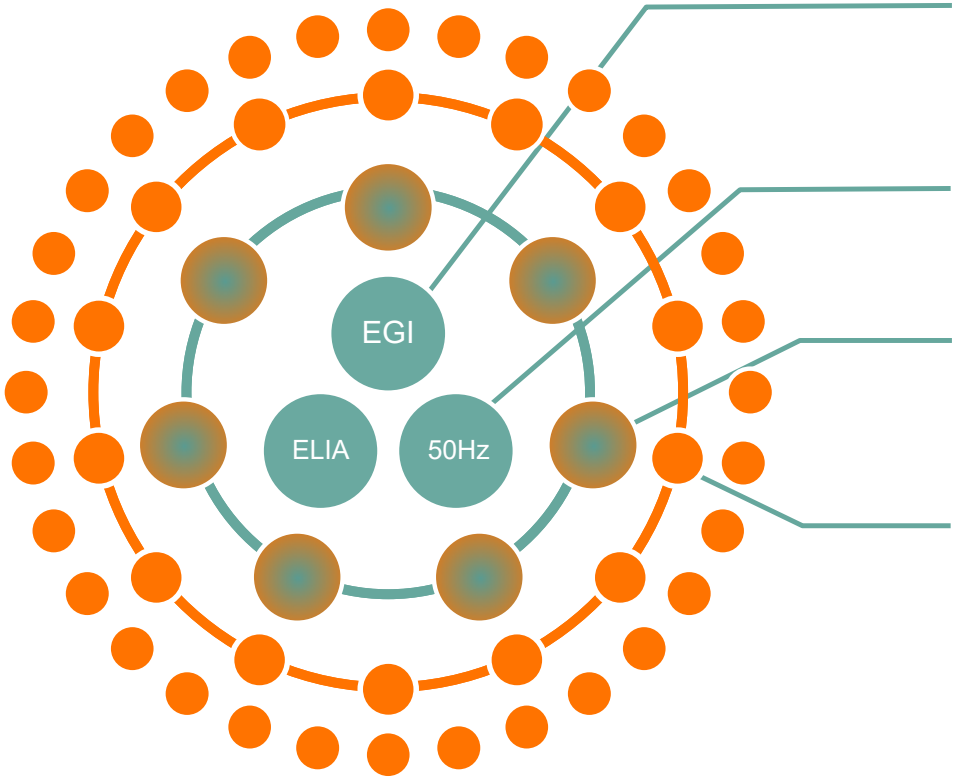


EGI builds on Elia Group's experience to provide state-of-the-art solutions for its worldwide partners

EGI embodies the international ambitions of the Elia Group

Backed by Europe's Top TSOs

EGI is leveraging a large network of grid expertise that provides a unique "Knowledge Ecosystem" to project developers



Own EGI staff:

- Flexible resources, 20+ nationalities, geographically spread and mobile
- Mix of specialized and multidisciplinary expertise in core TSO domains
- International mindset, operating in a competitive market
- Close contacts with client and developing local intelligence

Core TSO expertise:

- Hands-on expertise on all TSO-related activities
- Focused on home market
- Specialist & professional mindset

O&M and EPC contractors:

- EGI leverages the expertise available on the market and uses it to develop the best possible solutions & services to assist project developers.
- Elia group has long-term and privileged relationships with key actors

Other international partners:

- International partners are contracted on a case by base basis and depending on the project scope and required expertise & skills
- EGI has entered into strategic partnership with companies offering complementary and advanced services

Elia Group combines two Transmission System Operators and a consulting company

EGI embodies the international ambitions of the Elia Group

Grid management

System operations

Market facilitation

Trusteeship

REGULATED ACTIVITIES

50hertz

- Northern/Eastern Germany TSO operator
- On- and offshore transmission systems
- 80% owned by Elia Group (20% KfW)
- Monopolistic position in Northeast Germany

elia

- National TSO
- On- and offshore transmission systems
- 99.99% owned by Elia Group
- Monopolistic position in Belgium

nemolink

- 50/50 JV between Elia and National Grid (UK)
- Grid interconnection between BE and UK
- 50% owned by Elia Group

NON-REGULATED ACTIVITIES

egi Elia Grid International | Elia Group

- International energy market consultancy and engineering services

realto

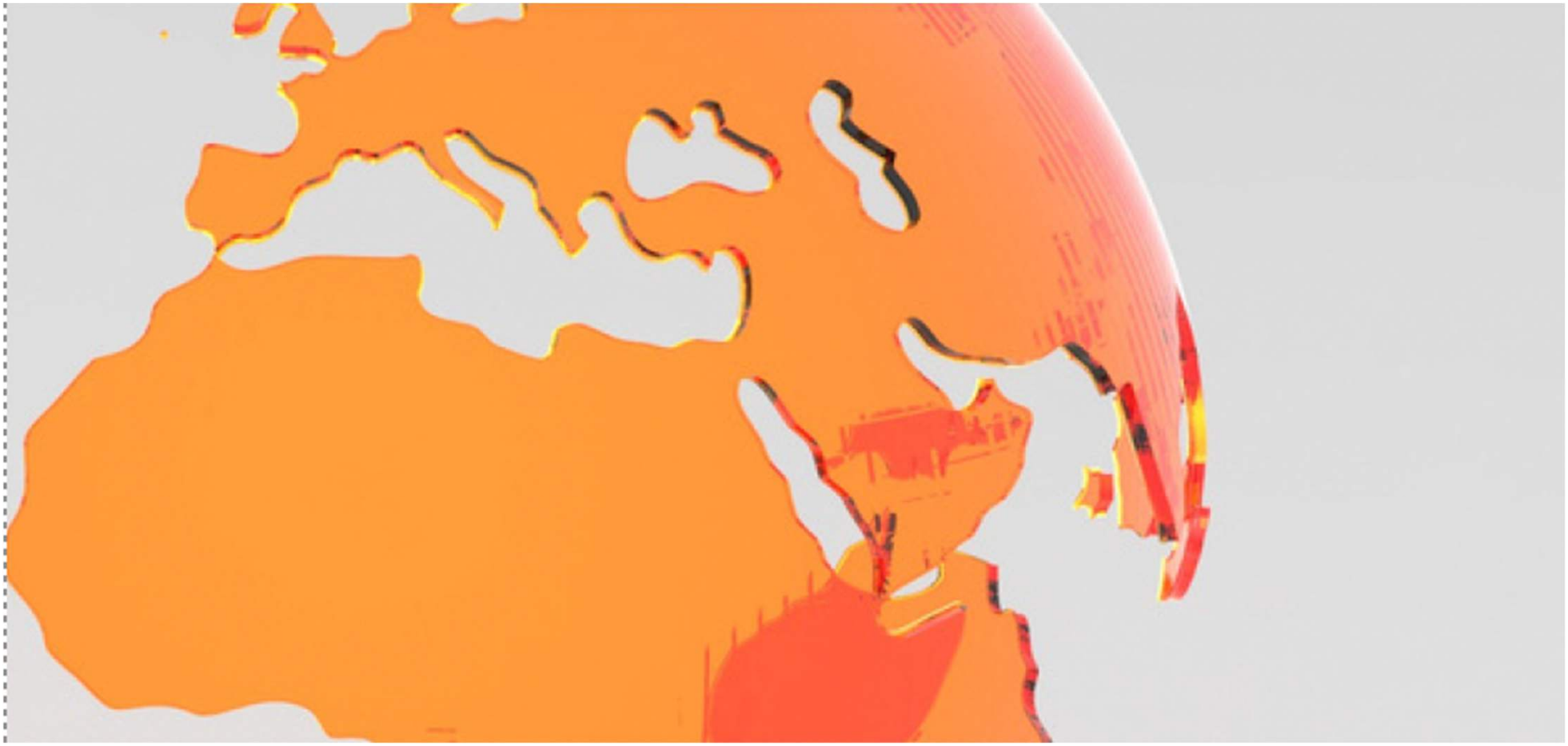
- European market platform
- Exchange and valorisation of data and digital services
- 100% owned by Elia Group

WindGrid | Elia Group

- 100% subsidiary of Elia Group
- Focusing on international offshore developments

They Trust us

Our Projects Portfolio



Our Projects Portfolio

We believe that the success of any energy infrastructure project begins at the very first step. That's why we position ourselves as your trusted advisor right from the project's conception, because getting it right from the start is far more effective than solving problems later on.

With deep expertise built on decades of hands-on experience, we guide you through the early stages of planning, helping you make informed decisions that shape the entire life cycle of your project. From defining the right technical approach to identifying potential risks and opportunities, we provide the insights and structure needed to deliver long-term value, reliability, and performance.

Bringing in EGI early means building on a solid foundation, with smoother execution, and greater confidence in your investment.

Our Projects Portfolio

Green Hydrogen Infrastructure Design, Operation & Derisking studies

South America

Regional ATC Market Coupling Gap Analysis

Europe

60GW Renewable Energy Source Integration Studies

Middle East

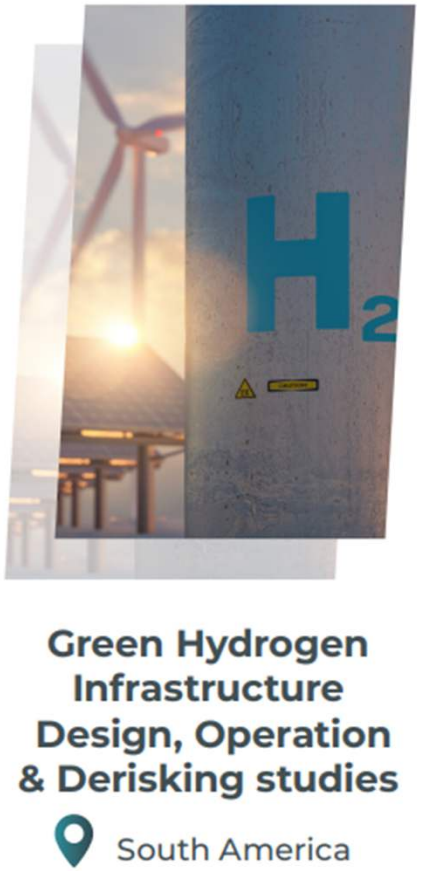
Feasibility Studies on HVDC, Cross-border Interconnection

Southeast Asia

Blackout Restoration Strategy

North Africa

Green Hydrogen Infrastructure Design, Operation & Derisking Studies

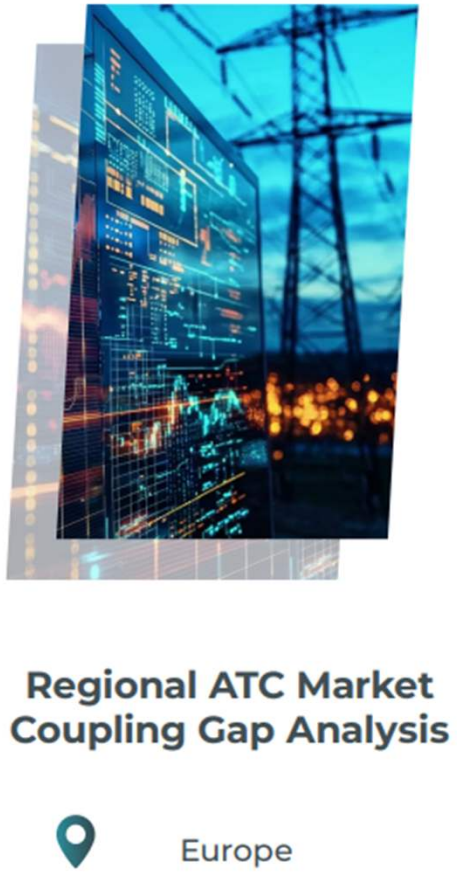


EGI contributed to the early screening and concept definition of a large-scale renewable hydrogen project. The assignment focused on defining the electrical system architecture, setting operational principles, and carrying out advanced studies to ensure grid stability and validate system design. Key insights and collaborative framing sessions supported the establishment of a solid foundation while reducing investment risks.

The scope of work included assessing renewable energy variability (e.g., wind and solar), evaluating and selecting optimal electrical architectures, defining battery storage and electrolysis requirements, modeling overall system performance, refining CAPEX and OPEX estimates, and supporting frequency regulation and dynamic compensation strategies.

This comprehensive approach enabled the development of a stable, resilient, and future-proof power system.

Regional ATC Market Coupling Gap Analysis



This project supported the development of regional electricity markets by strengthening market design and preparing the ground for cross-border integration. A key objective was the establishment of a regional day-ahead market coupling based on available transfer capacity (ATC), aligned with the SDAC model.

The engagement began with a comprehensive inception phase, including data collection, structured interviews, and a review of ongoing initiatives. An exhaustive roadmap of activities required for market coupling was developed, providing clarity on the steps and potential challenges ahead. A gap assessment followed, identifying critical areas for improvement and opportunities to enhance cooperation among system operators.

The final phase delivered a high-level implementation roadmap, outlining practical next steps such as training programs, IT system enhancements, agreement drafting, and targeted implementation measures. Through this structured approach, the project laid the foundation for stable, efficient, and future-ready regional electricity market integration.

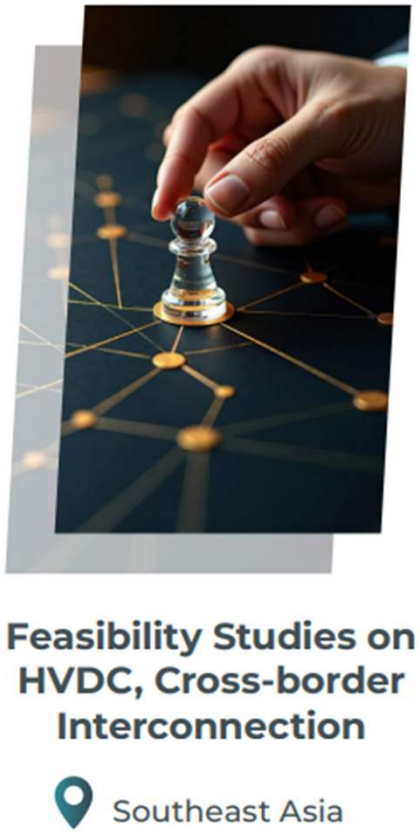
60GW Renewable Energy Source Integration Studies

A comprehensive study was conducted to support the integration of up to 60 GW of renewable energy into the national power system by 2030, including solar, wind, CSP, rooftop PV, and energy storage.

The project assessed optimal renewable capacity and locations, generation adequacy, operational impacts, and grid reinforcement needs. Detailed analyses included steady-state and dynamic grid studies, fault-ride through, transfer limits, statistical evaluation of renewable generation, ramping and reserve requirements, and economic assessment through levelized cost of energy.

Battery energy storage systems (BESS) were evaluated for their role in enhancing grid stability, mitigating intermittency, and providing ancillary services such as frequency regulation, load balancing, and reserve power. The study delivered actionable insights, including preliminary renewable siting and sizing, integration strategies, and models in Python, PSSE, and ANTARES, ensuring technically robust and economically viable solutions for large-scale renewable deployment.

Feasibility Studies on HVDC, Cross-border Interconnection



A feasibility study was conducted to assess potential interconnection options, with the objective of identifying the most promising cross-border links, evaluating their technical and economic viability, and providing a roadmap for implementation.

The work began with a high-level screening of potential candidates, assessing existing and forecasted generation capacities, grid developments, and possible connection points with neighboring power systems. This was followed by a benefits and feasibility assessment, ranking candidates based on expected market impact, technical requirements, and cost-benefit considerations.

From this process, the top three development options were selected for detailed investigation, including cost-benefit analysis and welfare assessment using methodologies adapted from ENTSO-E practices in Europe. The study concluded with a final ranking, key recommendations, and a practical action plan outlining next steps such as training needs, IT system requirements, and agreement drafting.

Deliverables included a PESTEL and ranking matrix, a CBA report on the three most promising candidates, and a blueprint for implementation. This structured approach provided a clear pathway to advance interconnection opportunities, supporting long-term energy transition and regional integration goals.

Blackout Restoration Strategy

A comprehensive blackout restoration strategy was developed to enhance the resilience of an extra-high-voltage electricity transmission network in light of evolving generation portfolios and network expansions.

The project included a review of network topologies, operational regimes, black start capabilities, critical load locations, and interconnections with other networks.

Power system models were updated and validated in PSS/E, ensuring consistent and accurate data structures across static, dynamic, and transient models. System constraints, including thermal, voltage, frequency, and dynamic performance limits, were assessed through load flow, contingency, and stability analyses.

Based on these insights, a robust defence and emergency restoration plan was formulated, incorporating Under-Frequency and Under-Voltage Load Shedding schemes, operational procedures, and a new Emergency Management and Restoration Plan (EMRP). Deliverables included detailed system study reports, operational guidelines, and the full blackout restoration framework.

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