Time to accelerate

Activity Report 2018
For a successful energy transition ... ... in the interest of society

We connect generation and distribution

Public Authorities
Suppliers and partners
Regulatory authorities
Employees
Shareholders and investors
Energy suppliers

European system operators
Consumers
Industrial clients

Local Communities
Press & general public

DISTRIBUTION

Consumers
Industrial clients

TRANSMISSION

GRI 102-40
GRI 102-9

Academics & energy professionals
NCGOs and federations

Regulatory authorities
Suppliers and partners
Public Authorities

3 ACTIVITIES

RENWABLE ENERGIES
CLASSIC ENERGIES

MANAGING THE MARKETPLACE
BALANCING THE DISTRIBUTED SYSTEM
FACILITATING THE MARKET

GENERATION
EUROPEAN PRODUCTION
DISTRIBUTION
It’s time to accelerate …

... to develop the grid of the future that integrates increasing amounts of renewable energy generation.

... to prepare the system of the future while keeping the lights on and ensure our infrastructure is fully available to the market.

... to create a culture of innovation and entrepreneurship, and redesign the market by embedding all kinds of technologies and market players and integrating new types of consumption in a secure way.

... to contribute to the single European internal energy market by operating and developing interconnectors.

... to implement a corporate Group culture that leverages the full potential of our talents to establish a high performance organisation.

... to live up to the needs of society and the expectations of our stakeholders.

... to make sure we are ready to take on new tasks.
Why is Elia Group in such a rush to change?

Chris Peeters: It is what society expects of us. The UN climate change conference in Poland once again highlighted the urgent need for action. The way things are going now, we are heading for a temperature increase of 3.2 degrees Celsius. That is completely unacceptable. Progressive countries are trying to speed up the energy transition: for instance, Germany has decided to increase its share of renewable energy to 65 percent by 2030.

Bernard Gustin: Our activities are central to the issues that most concern young people today: the climate and the rise in digitalisation. Our grid has equipped us with the resources we need to respond to this. We are making the energy transition possible and ensuring that it is progressing at the right pace. We want to move forward with digitalisation too.

The technology is available. As a leading energy company, we have to live up to our responsibility, along with the distribution system operators and the rest of the sector. This is a key shift in our role. Ten years ago, we, as a system operator, were just another boring, regulated transmission monopoly.

Chris Peeters: We are also seeing a trend towards convergence. Technologies and market parties are moving ever closer to one another: heating and mobility are going electric, and a third horizon is opening up through Power-To-X. The pieces are all in place for major changes to be made very quickly. Of course, this means that Elia Group will have to adapt too – both locally and at European level, since the integrated, low-carbon economy will be a European economy.

Bernard Gustin: That is why it is still extremely relevant for the Group to operate in two countries through Elia and 50Hertz. Our shareholding structure may be Belgian, but if you look at our figures and our activities, you will see that we are just as German as Belgian. And although we are not the biggest player in the market, our unique position has made us a European leader in our industry. We intend to fully live up to our responsibility and will seek further opportunities to become an even stronger European player.

Was that also the Group’s reason for increasing its stake in 50Hertz?

Chris Peeters: Definitely. It is time for us, too, to accelerate. We want to bolster our profile as a European Group that actively assists local and European policymaking in devising the energy system of the future. Our vision paper on digitalisation and the consumer-centric energy system is a good example of what we can do. We have put forward concrete proposals to advance the goals set by the European Commission’s Clean Energy Package. Operating in two countries that currently have different approaches to the energy transition gives us real added value, which is directly relevant to present developments in Europe.

2018 saw Elia Group shift up a gear in a number of areas. Now that Elia has acquired an additional 20 percent stake in 50Hertz and a new local investment partner has come on board, the partnership between Elia in Belgium and 50Hertz in Germany is stronger than ever. Together, the two companies aim to become one of Europe’s leading groups of transmission system operators. The context in which they operate is changing rapidly and becoming increasingly supranational due to the energy transition, the emergence of new market players, innovative technologies and the rise in digitalisation. The only option is to move forward – and quickly, rather than slowly.
up a dedicated team and devise a range of activities to make internationalisation a more prominent part of our experience with international expansion. This acquisition has given us a far more solid position has made us a European leader in our market and have your finger on the local pulse. Our new German partner has an excellent insight into the local context. To be successful, it is vital to understand the local market can take maximum advantage of available interconnection capacity will increase and decrease depending on the wind. How can Elia and 50Hertz strengthen one another?

Bernard Gustin – Elia Group Chairman

How can Elia and 50Hertz strengthen one another?

Chris Peeters: We are moving towards the future together. And the future appears, in part, to lie in offshore energy. Offshore energy is set to grow exponentially in the seas in which we operate. As we integrate new technologies and innovations, we will need new skill sets, so stepping up our offshore activities is a major concern for us. Not only will it change how we manage our technical infrastructure, it will also create a new dynamic in system management. I am thinking of 50Hertz’s Combined Grid Solution project, the world’s first interconnector connecting two wind farms between two countries. The amount of available interconnection capacity will increase and decrease depending on the wind. How can you bring that capacity to market while also ensuring that the market can take maximum advantage of something that will, by its very nature, be highly variable? It is an extremely complex issue, but we are very excited to be working on it.

Bernard Gustin: I was very impressed by the positive response of the international press to the launch of the Nemo Link project to build a subsea interconnector between Belgium and Great Britain. These specific skills of the Group’s two companies complement one another perfectly here offshore (50Hertz) and interconnectors of the world’s Link is an entirely new activity that will be added to our profile in 2019 and is sure to have an impact on our figures. At the end of the day, that really matters for a privately held company.

Finally, who would you like to thank in 2018?

Chris Peeters: I would like to thank our employees and our grid users in Belgium and Germany. A special mention also goes to the Board of Directors, which helped the Group to move towards a more growth-oriented approach with the deals it concluded over the past year aided by highly professional, constructive collaboration on the part of the German authorities and our new partner. We look forward to a year of fruitful cooperation with KfW; our regulators and the various local, federal and European authorities in 2019.

Bernard Gustin: As well as my fellow directors, I want to thank Elia Group’s management and staff 2018 was a very busy year, with many events and developments to be handled on top of all our usual work. There is always some degree of apprehension about any change. While our people were sometimes tested by the events of the past year, their dedication and hard work gave us the confidence to continue with our transformation into an international group. This is a vital step for our Group.
Elia Group

Who?

One of Europe’s top 5 TSOs

Elia Group is active in electricity transmission. With its two TSOs - Elia in Belgium and 50Hertz in Germany - we operate 18,990 km of high-voltage connections that secure the power supply of 30 million end users. With a reliability level of 99.999 percent, we provide society with a robust electricity grid.

Elia operates an electricity transmission system with voltage levels between 30 and 400 kilovolt (kV), and 50Hertz transports electricity over high-voltage levels of 150, 220 and 380 kilovolts (kV).

We lead the way in a successful energy transition ensuring a reliable, sustainable and affordable energy system for the future.

How?

Through cooperation and innovation

We operate and develop our grid infrastructure in close collaboration with all stakeholders. We are highly focused on safety and our goal is zero accidents. We are committed to innovation and continuously improve our operational systems. In Germany, we are already integrating over 56.5 percent renewable energy into the grid. This is how we make the energy transition happen.

What?

Our core tasks

Grid ownership - We prepare to deliver the infrastructure of the future
We develop, build and maintain our transmission grid according to long-term needs. We heavily invest in the integration of renewable energy, the development of an offshore high-voltage grid and the construction of interconnectors to facilitate the integration of the European energy market. By doing so, Elia Group drives the transition to tomorrow’s energy system.

System control - we maintain the balance
Operating the electricity system is an increasingly complex task due to the sharp rise in renewable generation sources, the continuous arrival of new players and technologies and the development of supranational coordination. To ensure a reliable supply and efficient operational management of our grids, Elia Group monitors the electricity system in real time. This requires specialist knowledge as well as sophisticated tools and processes.

Market facilitation - We are part of the European integrated market
Elia Group makes its infrastructure available to all market players in a transparent, non-discriminatory way. Digitalisation and the latest technologies offer market players new opportunities to optimise their electricity management by selling their surplus energy or temporarily reducing consumption. We develop services and mechanisms allowing the market to trade on different platforms, which promotes economic competitiveness and the well-being of society.

Trusteeship* - We transparently integrate renewable energies into the market
The German legislator has transferred the responsibility for coordinating and processing legal levy systems to promote environmentally friendly technologies to the transmission system operators. 50Hertz collects these levies as a trustee, administrates these and coordinates their distribution to the recipients. If the electricity from renewables is not marketed directly, we sell this electricity on the power exchange.

Why?

In the interest of society

The electricity grid is a key pillar of the energy policy that supports our socio-economic prosperity. Elia Group aspires to be a catalyst for a successful energy transition and consequently, a reliable, sustainable and affordable energy system. By building interconnectors and integrating renewable energy generation, Elia Group promotes both the integration of the European energy market and the decarbonisation of our society.
Elia Group is commonly known as the umbrella brand of the Belgian and German transmission system operators Elia System Operator sa/nv (‘Elia’) and 50Hertz Transmission GmbH (‘50Hertz’). Elia Group operates under the legal entity and listed company Elia. Its main shareholder is the municipal holding Publi-T. Elia holds the 80 percent majority in Eurogrid International SCRL/CVBA (‘Eurogrid’), which holds, through its 100 percent subsidiary Eurogrid GmbH, 100 percent of the shares in 50Hertz. The remaining 20 percent in Eurogrid is held by Kreditanstalt für Wiederaufbau (‘KfW’).

In addition to its activities as transmission system operator in Belgium and in north and east Germany, Elia also participates in the Nemo Link joint venture that operates the first subsea interconnector between Belgium and the United Kingdom (collaboration with the British system operator National Grid). Elia and 50Hertz also provides various consulting services to international customers through their joint subsidiary Elia Grid International sa/nv (‘EGI’).

**Shareholder structure**

<table>
<thead>
<tr>
<th>Shareholder Structure</th>
<th>Ownership</th>
</tr>
</thead>
<tbody>
<tr>
<td>Publi-T</td>
<td>44.88%</td>
</tr>
<tr>
<td>Publipart</td>
<td>2.50%</td>
</tr>
<tr>
<td>Interfin</td>
<td>4.26%</td>
</tr>
<tr>
<td>Katzen Natie</td>
<td>6.93%</td>
</tr>
<tr>
<td>Bellflux Insurance</td>
<td>1.86%</td>
</tr>
<tr>
<td>Free Float</td>
<td>39.57%</td>
</tr>
<tr>
<td>Nemo Link</td>
<td>50%</td>
</tr>
<tr>
<td>Eurogrid International SCRL</td>
<td>50%</td>
</tr>
<tr>
<td>KfW</td>
<td>50%</td>
</tr>
<tr>
<td>50Hertz</td>
<td>100%</td>
</tr>
<tr>
<td>Elia Grid International</td>
<td>50% - 50%</td>
</tr>
</tbody>
</table>

The additional change in share ownership followed a second notification received in May 2018 from IFM of an agreement with a third party for the acquisition of IFM’s remaining 20 percent stake in Eurogrid. After obtaining an 80 percent stake in Eurogrid, Elia achieved its objective and decided to exercise its pre-emption right and to partner with KfW by selling the remaining 20 percent stake at the same price.

**Successful refinancing of bridge loan**

In August 2018, Elia successfully launched a EUR 300 million 10-year senior bond and EUR 700 million perpetual hybrid to refinance a bridge loan for the acquisition of an additional 20 percent stake in Eurogrid. Investors showed great interest, with book building completed in just a few hours due to high demand and the bonds were significantly oversubscribed.

More information on the Elia share in 2018 – see page 110
Corporate bodies

More information on our corporate governance and specific obligations in terms of transparency, neutrality and non-discrimination towards all stakeholders involved in our activities, can be found in part 2 of the Annual Report 2018: Corporate Governance & Consolidated Financial Statements.

ELIA

Executive Committee

Chris Peeters  
Chief Executive Officer and Chairman

Catherine Vandenborre  
Chief Financial Officer

Markus Berger  
Chief Infrastructure Officer

Patrick De Leener  
Chief Customers, Market & System Officer

Frédéric Dunon  
Chief Assets Officer

Pascale Fonck  
Chief External Relations Officer

Peter Michiels  
Chief Human Resources and Internal Communication Officer

Ilse Tant  
Chief Community Relations’ Officer

Board of Directors

Bernard Custin  
Claude Grégoire  
Geert Versnick  
Gerard Verstraete  
Michel Alle  
Luc De Temmerman

Frank Derck  
Cécile Flandre  
Philip Heylen  
Luc Hujoel  
Roberte Kunsteman

Jane Murphy  
Dominique Offergeld  
Boudy Prezelet  
Saskia Van Uffelen

Dr. Katharina Herrmann  
Dr. Lutz-Pscherer*  
Andrea Ludwig*  
Boris Schucht*  
Dr. Lutz-Christian Funk

50Hertz

Executive Committee

Boris Schucht  
Chief Executive Officer*

Dr. Frank Golletz  
Chief Technical Officer**

Marco Nix  
Chief Financial Officer

Dr. Dirk Biermann  
Chief Markets and System Operation Officer

Dr. Katharina Hermann  
Chief Human Resources Officer until October 2018***

Board of Directors

Chris Peeters  
Peter Hausmann**  
Markus Berger

Dr. Lutz-Christian Funk

Andrea Ludwig*  
Dr. Lutz Picheler*  
Electrical engineer

Supervisory Board

50Hertz is controlled and monitored by Eurogrid and a co-determined Supervisory Board. The Supervisory Board of 50Hertz Transmission GmbH consists of six members.

Chris Peeters  
Chief Executive Officer, Elia System Operator SA-NV, Chairman

Peter Hausmann**  
Member of the Executive Main Board, Union for the Mining, Chemical and Energy Industries, Deputy Chairman

Markus Berger  
Chief Infrastructure Officer, Elia System Operator SA NV

Dr. Lutz Christian Funk  
Executive Director KWR

Dr. Lutz Picheler*  
Electrical engineer

* Boris Schucht left the company on 28 February 2019
** Dr. Frank Golletz is acting CEO from 1 March 2019 onwards
*** Sylvia Borcherding succeeded Katharina Hermann from January 2019 onwards

* Workers’ representatives
Group priorities

For a successful energy transition in a sustainable world

AN EVOLVING ELECTRICITY SYSTEM

As transmission system operators, Elia and 50Hertz lead the way in the energy transition. Our grids have a crucial role to play in the decarbonisation of the energy sector and society in general.

Besides the rise of renewable generation, the energy transition is also bringing other changes: increasing decentralised generation, more supranational coordination and the emergence of innovations like Internet of Things (IOT), Artificial Intelligence (AI) and Blockchain that are contributing to the fast-paced digitalisation of our society. As a result, new market players and new technologies appear such as electric cars, battery storage, Power-To-X technologies and so on.

In a future, decarbonised and progressively digital world, managing the power system becomes increasingly complex. Not only will electricity generation become ever more weather-dependent, it will also be produced by millions of assets connected everywhere in the European grid. Both transmission and distribution system operators will need more flexibility to keep the system in balance and to manage congestions and voltage issues.

What is the Energy Triangle (Trias Energetica)?

The idea of the ‘Energy Triangle’ is used to describe the triple challenge of balancing energy security, socio-economical impact and environmental sensitivity. The way towards a carbon free society requires long-term and significant investments at a time when meeting the challenges of energy poverty and competitive energy costs are more relevant than ever.

SAFETY

We go for Zero accidents

The safety of everyone, everywhere, is always our number one priority. We continuously invest in safety and work in a responsible and safe manner. Our goal is zero accidents. Every employee and contractor knows the principles of our safety programme. We ensure that Elia Group’s safety instructions are properly applied in order to prevent incidents.

INNOVATION

To accelerate the energy transition

We integrate innovative technologies and keep up with the latest developments in the energy sector. Through a range of initiatives, we encourage our employees to be at the forefront of the energy transition, not only with ideas, but also with practical applications for system operation, asset management and market development. In doing so, we draw on our own expertise but are also keen to learn about and develop ideas from outside the Group through collaboration and open innovation.

IN THE INTEREST OF SOCIETY

For a reliable, sustainable and affordable energy system

Security of supply is a condition for a prosperous society. We are aiming for a reliable, sustainable and affordable energy system. Developing our grid infrastructure is critically important to this goal. We realise the grid of the future through proactive dialogue with a variety of stakeholders, based on mutual respect and empathy to come to the best societal and environmental solutions.

We also believe that our technical knowledge and analyses support policymaking and contribute to the public debate on the future of the energy system. A system operator that always puts society first is key to successfully implementing the energy transition.

A reliable system:

An energy mix that allows demand to be met at all times, promoting economic activity and safeguarding our prosperity.

A sustainable system:

Through renewable integration that fully exploits domestic potential and supplements this with renewable energy generation from abroad via additional interconnectors.

An affordable system:

Thanks to our well-developed grid, we have access to the most efficient sources of energy, both at home and abroad. This ensures price convergence with neighbouring countries and makes us more competitive.

AN EVOLVING ELECTRICITY SYSTEM

Emergence of new market players and technologies driven by fast-paced digitalisation

Increasing importance of sector coupling

Increasing renewable and decentralised generation

European integration of the electricity system and more supranational coordination

IN THE INTEREST OF SOCIETY

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Our strategy

Elia Group is a frontrunner in the transition of the energy sector. To achieve this goal we have a strategy that accommodates the profound and rapid changes in the energy sector. At the same time, our strategy is robust and reflects our essence, so that we continue to create value for society in the future.

Given the capital-intensive nature of our business and the necessary management attention in a transforming business, we focus on six building blocks:

1. We ensure a secure, reliable and efficient grid
   - We are preparing the system of the future, integrating high levels of renewable energy and new types of consumption in a secure way, while keeping the lights on and giving the market maximum use of our infrastructure.

2. We deliver the transmission infrastructure of the future
   - We develop the grid of the future that integrates increasing amounts of onshore and offshore renewable energy generation into the integrated European grid.

3. We develop the electricity system and the market
   - We are redesigning the market to encompass all kinds of technologies and market players, independently from the grid they are connected to, so they can fully exploit the economic benefits. We are committed to fostering a single European internal energy market.

4. We have our eyes wide open for innovation
   - We create a culture of innovation and entrepreneurship to accelerate the energy transition. We build an ecosystem to develop the tools and methods that will enable a more digital, decentralised and sustainable energy system.

5. We align culture with strategy
   - We want to implement a corporate group culture that puts safety and sustainability at the centre of our activities and leverages the full potential of our talents to establish a high performance organisation.

6. We cooperate to create value for society
   - We continue to conduct a proactive and open dialogue to stimulate participation from our various stakeholders. We are a transparent and trusted advisor for decision makers to create value for society.
Sustainable actions in the interest of society

Responsible and sustainable operations are part of the core business of a transmission system operator. Elia Group considers itself as a responsible service provider to society. In addition to social and ecological demands, a sustainable economic basis is needed for the successful energy transition. For this reason, Elia Group has firmly integrated sustainability into its corporate strategy.

In the past, Elia and 50Hz reported on their strategy, management approaches and measures in separate sustainability reports. For the first time, this report brings the various joint indicators together. The Global Reporting Initiative (GRI) provides the framework and both companies report in accordance with the GRI Core standard. Efforts to deliver a joint sustainability report in the future will continue. This goes hand in hand with a continuous improvement in sustainability performance.

In a comprehensive approach, the respective stakeholder groups, their concerns and important topics were identified in a so-called materiality matrix. The complete analysis of the economic, ecological and social impact of Elia Group’s activities is detailed in the Sustainability Report 2018. Below we identified the most material topics.

Sustainable Development Goals
Elia Group has also extended its perspective to sustainability. In order to facilitate global sustainable development that works at economic, ecological and social levels, the United Nations has defined 17 concrete goals that apply to all countries worldwide. In order to successfully implement these Sustainable Development Goals (SDGs), everyone is called upon. Elia Group wants to contribute to the achievement of the SDGs. In a first internal step, the most appropriate SDGs were identified and clustered in 3 priority levels:

- TOP PRIORITY
- HIGH PRIORITY
- MEDIUM PRIORITY

Report on the SDGs will successively be expanded and the activities of Elia Group will be linked to these global sustainability goals. During 2019, Elia Group will discuss the goals and their targets with its stakeholders.

Overview of Elia Group’s engagement with stakeholders
GRI 102-42
Elia Group has many stakeholder initiatives. The method and frequency of engagement per stakeholder group and the link to the material topics have been summarised in the table on the right. *Belgium only*

* As a strong TSO group, Elia and 50Hz play a leading role in the energy transition. This first joint report emphasises the importance of sustainability in all core business processes, operations and corporate strategies.*

Chris Peeters
Elia Group CEO
GRI 102-14

ELIA GROUP’S MOST MATERIAL TOPICS

<table>
<thead>
<tr>
<th>Stakeholder group</th>
<th>Mode of engagement</th>
<th>Frequency</th>
<th>Main topics / expectations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employees</td>
<td>Performance management</td>
<td>Regular</td>
<td>Employees - Human development</td>
</tr>
<tr>
<td></td>
<td>– Internet</td>
<td></td>
<td>– Employees - Wellbeing</td>
</tr>
<tr>
<td></td>
<td>– Donations</td>
<td></td>
<td>– Community involvement</td>
</tr>
<tr>
<td>Customers</td>
<td>– Customer satisfaction survey</td>
<td>Annual</td>
<td>– Transmission services</td>
</tr>
<tr>
<td></td>
<td>– Users’ Group / Working Groups</td>
<td></td>
<td>– Environment</td>
</tr>
<tr>
<td></td>
<td>– Elia extranet</td>
<td></td>
<td>– Fair operating practices</td>
</tr>
<tr>
<td>Society</td>
<td>– Social events</td>
<td>Regular</td>
<td>– Community involvement</td>
</tr>
<tr>
<td></td>
<td>– Engagement via own employees</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shareholders</td>
<td>– Shareholder meeting</td>
<td>Regular</td>
<td>– General corporate performance incl. the contribution to society</td>
</tr>
<tr>
<td>Regulators</td>
<td>– Reports / Communication</td>
<td>Regular</td>
<td>– Fair operating practices</td>
</tr>
</tbody>
</table>

Availability, reliability and future of the power system
This topic concerns providing information on Elia Group’s plans and processes to ensure reliability, delivering sufficient capacity to the market and to facilitate the future power system to transport electricity to customers.

Accident & incident management
This topic concerns managing accident and incident risks for Elia Group’s own employees, as well as its subcontractors. This is translated into robust safety programmes aiming for zero accidents.

Systematic risk management
This topic concerns the management of risks such as damage to the grid due to bad weather, catastrophes, etc. to ensure power transmission can be guaranteed. This requires contingency planning measures, disaster/emergency management plans, training programmes and recovery plans.

Employee health, safety and well-being at work
This topic relates to the physical, mental and social wellbeing of workers and the prevention of working conditions causing an impact on health. It also relates to the adaptation of the occupational environment to the physiological and psychological needs of our employees.

* The strategy, management approach and sustainability measures of Elia Group are explained in more detail in the Sustainability Report 2018. Seeing each country has its own regulatory particularities, not all indicators can be applied to both entities.

* Belgium only
Key figures 2018

Operational

- 30 mio END USERS (ELIA GROUP)
- 18,990 km OF HIGH VOLTAGES LINES & CABLES (ELIA GROUP)
- 140,147 km² COVERED (ELIA GROUP)

Environmental

- 4,810.1 kg OF IT MATERIAL RECEIVED A SECOND LIFE (ELIA GROUP)
- 26.24 km OF BIRD MARKERS INSTALLED UNTIL 31/12/2018 (ELIA)
- 56.5% PERCENTAGE OF RENEWABLE ENERGY INTEGRATION (50Hz/12s)

Financial

- € 9.2 billion REGULATORY ASSET BASE (ELIA GROUP)
- € 280.8 mio NORMALISED NET PROFIT (ELIA GROUP)
- € 1.66 GROSS DIVIDEND (ELIA GROUP)

Social

- 2,441 TOTAL NUMBER OF EMPLOYEES (ELIA GROUP)
- 24 NATIONALITIES (ELIA GROUP)
- 172 NEW HIRES (ELIA GROUP)

GRI 102-44

GRI 201-1
Elia Group in 2018

Elia completes an additional 20 percent stake in 50Hertz

In 2018, Elia completed the acquisition of an additional 20 percent stake in Eurogrid, the holding company of 50Hertz. Following this transaction, Elia owns 80 percent of Eurogrid and controls 50Hertz. Elia decided to exercise its pre-emption right and to partner with KfW by selling the remaining 20 percent stake at the same price.

KfW as new partner in 50Hertz

In August 2018, Elia announced the closure of the transactions with IFM and the German state-owned bank Kreditanstalt für Wiederaufbau (KfW). As a result, KfW, on behalf of the German Federal Government, replaces IFM as shareholder in Eurogrid. The additional change in share ownership followed a second notification received from IFM in May 2018. Elia decided to exercise its pre-emption right and to partner with KfW by selling the remaining 20 percent stake at the same price.

Elia Group publishes Vision Paper on consumer-centric system

In November 2018, Elia Group published a Vision Paper outlining better services and optimised energy bills for consumers. Towards a ‘Consumer-Centric System’ encourages households and industries to directly benefit from advanced energy services via a real-time communication platform, an appropriate market design and digital innovations. Elia encouraged market parties to sign up for an open sandbox environment where innovative concepts will be tested in 2019. More information on page 68.

Federal Development Plan 2020-2030 (Belgium)

In line with the legal obligation to draw up a Federal Development Plan every four years, in late May 2018 Elia submitted a draft plan to CREG on the medium-term future of the Belgian high-voltage grid (Federal Development Plan 2020-2030). Elia advocates an accelerated approach to infrastructure development in order to fully exploit the advantages of the energy transition. The Federal Development Plan 2020-2030 was available for viewing in late 2018 during a public consultation. More information on page 53.

Nemo Link officially inaugurated


MOG foundation installed at sea

Belgium’s first ever ‘power plug at sea’ is one step closer to becoming a reality when the jacket was successfully installed on the seabed in November 2018. More information on page 44.

Awards & recognition

Elia was awarded the Top Employer of 2018 title, identifying it as one of Belgium’s 64 top employers and one of the three best in the energy sector. Elia Group’s corporate movie was awarded the first prize at the Belgian Corporate Movie Festival and Elia Group’s Annual Report 2017 won the Best 1st Sustainability Report, an initiative of the Belgian Institute of Auditors. Peter Michiels was elected Belgian ‘HR Manager of the Year’ and there were nominations for Catherine Vanderlinden and Chris Pooters respectively for CFO of the Year and Manager of the Year.

ALLEGRO progress at halfway stage

Work on the first electricity interconnector between Belgium and Germany is running to schedule. Elia completed 50 percent of the construction on Belgian soil, while Amprion started working on the 41 km connection that will traverse Germany. Commissioning is scheduled for end-2020. More information on page 49.

Launch of XBID facilitates trading across European borders

The go-live of the European Cross-Border Intra-Day (XBID) solution in June marked an important step on the path to an integrated European intraday market. The XBID platform will deliver continuous trading of electricity across 14 European countries: Austria, Belgium, Denmark, Estonia, Finland, France, Germany, Latvia, Lithuania, Norway, The Netherlands, Portugal, Spain and Sweden. Most other European countries are due to take part in a second wave and will go live with XBID in the summer of 2019. More information on page 64.

XBID in the summer of 2019. More information on page 64.

More information on page 68.

4th Belgium’s 64 top employers and one of the three best in the energy sector. Elia Group’s corporate movie was awarded the first prize at the Belgian Corporate Movie Festival and Elia Group’s Annual Report 2017 won the Best 1st Sustainability Report, an initiative of the Belgian Institute of Auditors. Peter Michiels was elected Belgian ‘HR Manager of the Year’ and there were nominations for Catherine Vanderlinden and Chris Pooters respectively for CFO of the Year and Manager of the Year.

Awards & recognition

Elia was awarded the Top Employer of 2018 title, identifying it as one of Belgium’s 64 top employers and one of the three best in the energy sector. Elia Group’s corporate movie was awarded the first prize at the Belgian Corporate Movie Festival and Elia Group’s Annual Report 2017 won the Best 1st Sustainability Report, an initiative of the Belgian Institute of Auditors. Peter Michiels was elected Belgian ‘HR Manager of the Year’ and there were nominations for Catherine Vanderlinden and Chris Pooters respectively for CFO of the Year and Manager of the Year.

Launch of XBID facilitates trading across European borders

The go-live of the European Cross-Border Intra-Day (XBID) solution in June marked an important step on the path to an integrated European intraday market. The XBID platform will deliver continuous trading of electricity across 14 European countries: Austria, Belgium, Denmark, Estonia, Finland, France, Germany, Latvia, Lithuania, Norway, The Netherlands, Portugal, Spain and Sweden. Most other European countries are due to take part in a second wave and will go live with XBID in the summer of 2019. More information on page 64.

More information on page 68.

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WindNODE Flexibility Platform in test operation

In November, 50Hertz launched the Flexibility Platform as part of the WindNODE project with four distribution system operators and other partners from its own grid area. Regional producers, consumers and storage operators offer the transmission system operators the flexible use of their facilities on the platform so that renewable energy can be reduced in the case of grid congestion. More information on page 63.

Improved electricity flows to the Czech Republic and Poland

In July, the modernisation and expansion of the Vierraden substation was completed and the assets were integrated into the grid. An important component of the new 380 kV line is the phase shifting transformers, which are used to control the power flows. This will enable the power flows on the interconnector to Poland to be controlled more efficiently in future. Already in January, two further phase shifting transformers were put into operation at the Röhrsdorf substation. This will allow the cross-border power flows between the 50Hertz grid and the grid of the Czech partner ČEPS to be better controlled. More information on page 65.

Safe handle everyday work

The ‘gib8’ Work Safety Campaign was launched in the first quarter of 2018. The messages reach everyone in the company and on the construction sites. For this season, special materials, activities and training courses are provided to address different groups of employees with suitable topics. The occupational safety campaign is also aimed at external contractors. More information on page 91.

CompactLine commissioned

After 11 months of construction, the compactline was commissioned in August. The innovative pilot line is a completely new technological design and much more compact than a conventional 380 kV overhead line. The new design fits in an existing 220 kV corridor. Under the responsibility of 50Hertz, the compactline was developed by a research consortium from 2013 and has been installed in Jessen since September 2017. More information on page 105.

€ 465 mio redispatch costs saved

Since the commissioning of the southwest interconnector from Bad Lauchstädt in Saxony-Anhalt to Rodewitz in Bavaria, redispatch costs of € 465 million have been saved up to 31/12/2018. The line offers 5000 megawatts additional capacity from northern and eastern Germany to the south. With this interconnector, power plants and wind farms in the 50Hertz grid area replace more expensive power plants in Bavaria or Austria.

Further milestones in offshore expansion

In November, after three years of construction, all of the Ostwind 1 submarine cables were put into test operation. The 220 kV submarine cables connect the Viking and Arkona wind farms with the connection point in Lubmin. This marks another important milestone for a successful energy transition. In the same month, the 150 kV submarine cables between the two substation platforms of the German offshore wind farm Baltic 2 and the Danish wind farm Kriegers Flak were successfully tested. The future German-Danish interconnector Combined Grid Solution is a further milestone for the Danish-German grid expansion project.

For the Ostwind 2 offshore project, 50Hertz placed an order in November for the manufacture and laying of 220 kV submarine cables (with a total cable length of 270 kilometres) for the connection of two more Baltic Sea wind farms to the grid. They will transmit power from the two wind farms Arcadis Ost 1 and Baltic Eagle to the 50Hertz substation in Lubmin. More information on page 46.

New wind power in-feed record

After 50Hertz had integrated more than 15,000 megawatts of wind energy into the grid for the first time in October, the record was again broken in December. Very strong wind caused a wind energy in-feed in the 50Hertz grid area of 15,672 megawatts.

Excellent Training

50Hertz is a member and supporter of the Campaign Fair Company. In 2018, 50Hertz was again awarded various certificates highlighting its excellent training opportunities. These certificates assess the company by questioning trainees, students and employees. Since 2014, the 50Hertz trainee programme has been awarded the annual Absolventa certificate for career supporting and fair trainee programmes.
Elia Grid International in 2018

Elia Grid International (EGI) is a subsidiary of Elia Group. Its core activities are to export the unique knowledge and experience about the energy transition, and to support the move towards climate saving technologies. Owned by Elia and 50Hertz (50/50), Elia Grid International provides consultancy services in asset management, power system operations and security, system and market operations, owner’s engineering and investment advisory to international clients, thanks to the expertise and solid track record of these two TSOs.

Elia Grid International is a truly international company with offices in Brussels, Berlin, Riyadh, Doha and Dubai, employing experts from 17 nationalities.

Elia Grid International supports Vietnam with three projects on RES integration

Vietnamese transmission system operator NLDC and local authorities called on Elia Grid International’s expertise to support the transition of the Vietnamese power system. EGI has worked on three projects including system studies, recommendations and capacity building. Following this first successful collaboration, NLDC and EGI are now entering into a long-term contract.

GCCCELAB and Elia Grid International sign MoU

On 11 November, GCC Electrical Equipment Testing Lab (GCCCELAB) and Elia Grid International (EGI) signed a Memorandum of Understanding (MoU) intended to further develop their joint services in the Gulf States. This collaboration will allow future customers to call on both the experience of two leading European system operators and their specific local market expertise.

National Grid Saudi Arabia attends workshop at Elia Grid International

From the 11th until the 19th of April, a Saudi Arabian delegation composed of members of the transmission system operator in Saudi Arabia (National Grid SA) participated at a workshop in Elia Grid International’s offices in Brussels and Berlin. The lecture series presented by Elia and 50Hertz technical experts aims at conveying best practices of the Elia Group with regard to grid planning, especially in the context of increasing penetration of renewable energy resources.

Ukrenergo experts participate in a workshop at Elia Grid International Berlin

On the 22nd and 23rd of May, experts and operational managers of the Ukrainian transmission system operator Ukrenergo participated in a workshop at Elia Grid International’s premises in Berlin. They had the opportunity to gain insights into different processes like operational planning, congestion management, frequency control and balancing. The workshop is part of the project run by Elia Grid International that aims to support Ukrenergo in its preparations for the synchronisation of the Ukrainian power system with the rest of Europe.

Elia Grid International obtains ISO9001:2015 certification

Elia Grid International was successfully re-certified with the new internationally recognised Quality Management System Standard ISO9001:2015 in April 2018. During a 2-day audit by the German TÜV SÜD, all Elia Grid International’s locations (Brussels, Berlin and Dubai) got certified. The new standard requires incorporating the Quality Management System (QMS) into the strategic orientation of the company and puts focus on having a comprehensive risk- and stakeholder management.
We ensure a secure, reliable and efficient grid

One of Elia Group’s core tasks is to transport energy in an affordable and efficient way from where it is generated to where it is consumed. Our investment projects anticipate the further integration of renewable energy, increasing international cooperation and the emergence of innovative technologies. As an enabler of the energy transition, Elia Group is therefore preparing its infrastructure for the system of the future. At the same time, we continue to ensure system stability which provides a safe and reliable power supply throughout both countries, the whole year round.

To cope with the changing context of the energy transition, Elia Group is developing new maintenance policies aimed at maximising grid availability, smoothing out peaks in equipment replacement and minimising costs. The Group is drawing on new technologies and methods to move to a system of decision-making based on the condition of equipment, rather than just a predetermined maintenance or replacement frequency.

Electrical infrastructure is and always will be dangerous. That is why safety is our top priority in all that we undertake. As part of our commitment to safety, Elia Group is working towards a zero accident rate. Continuous development of technical, managerial and behavioural competencies is therefore a core responsibility of our Competence Centre.

By striving towards operational excellence in all that we do, Elia Group is able to ensure a secure, reliable and efficient grid for all our stakeholders, while supporting economic development at a European level.
WE ENSURE A SECURE, RELIABLE AND EFFICIENT GRID

OUR AMBITIONS
Facilitating the energy transition while ensuring a reliable grid 24/7
As more and more generation capacity from renewable energy sources is installed, maintaining the balance and ensuring a highly reliable electricity grid becomes a particularly challenging task. As a system operator, we aim to maximise the availability of our electricity system and keep the lights on at all times to support economic activity and the well-being of the population. To this end, we constantly optimise our critical and strategic processes in order to minimise operational risks. At the same time, we strive for efficiency and cost-effectiveness.

Implementing improved asset management while applying the highest safety standards
A sophisticated asset management strategy has been put in place to closely monitor the functioning of critical infrastructure components. Investment peaks are levelled out thanks to a balanced maintenance and replacement policy. As working methods evolve, staff need training to help them develop the requisite skills and techniques. We provide professional training courses and apply the highest safety standards so our staff and contractors have a safe working environment. More information on our safety programmes can be found on pages 88 - 91.

At Elia Group, we invest in our talents. They are the cornerstone of our asset management and operation & maintenance practices. Yet again in 2018, they played a key role in setting a record year regarding the availability of the system, replacing a phase shifter transformer in less than three months (transport from Germany included), and erecting a temporary pylon in a few days just to name a few.

Frédéric Dunon – Chief Asset Officer at Elia

OBJECTIVES
We are preparing the system of the future, integrating high levels of renewable energy and new types of consumption in a secure way, while keeping the lights on and giving the market maximum use of our infrastructure.

18,990 km
Elia Group manages 18,990 km of high voltages lines & cables

Learn more about how Schoneheime ensures a secure, reliable and efficient grid.
System security
We maintain the balance

As European system operators, it is our role to design and develop the fitting infrastructure to enable the energy transition. On the one hand, we have to develop the necessary infrastructure that transports the energy in an affordable and efficient way from where it is generated to where it is consumed. On the other hand, we have to ensure system stability at all times. Thanks to new technologies and methods to monitor the complex and large volumes of data, we are able to balance the infed and consumption thus ensuring the security of the electrical system the whole year round.

15,672 MW
SYSTEM MANAGEMENT SAFELY INTEGRATES 15,672 MW WIND ENERGY INTO THE GRID.

Just a few weeks after 50Hertz had integrated more than 15,000 megawatts of wind energy into the grid for the first time, the record has been broken again. On 8 December, very strong wind between 1 p.m. and 1.15 p.m. led to a wind energy feed-in of 15,672 MW in the 50Hertz control area.

+18%
In Belgium, renewable energy generation grew by 18 percent in absolute terms in comparison with 2017. At 3 p.m. on 28 July, wind and solar power covered 46 percent of Belgium’s total load, an absolute record. The months of May (517 GWh), June (446 GWh) and July 2018 (555 GWh) saw the highest monthly solar generation levels ever recorded in Belgium. Onshore and offshore wind power also broke generation records in January (435 GWh) and December (452 GWh).

In 2018, we set the record for the low-est Energy Not Supplied (ENS) score in Belgium. The ENS is the amount of energy that we were not able to supply to our customers due to internal outages. This record is a testament to our excellent, cross departmental collaboration, quick decision-making and efficient asset management.

The ENS score equals the sum of the duration of an outage multiplied by the interrupted power. For the calculation, only outages that last more than 3 minutes are considered.
Unexpected unavailability of multiple plants for winter 2018-2019 in Belgium

GA - BUS-DMA DISASTER/EMERGENCY PLANNING AND RESPONSE

After a study analysis of what can be imported if market conditions are favourable, Elia in Belgium increased the import level in the first half of 2018 from a maximum of 4,500 MW to 5,500 MW. The need for an optimised capacity allocation was immediately highlighted during the second half of 2018 when half of the nuclear units had unexpected outages (Doel1, Doel2, Tihange2 and Tihange3), on top of those that were already planned (Doel4, Tihange1).

This has never been seen before in Belgium, causing a 5,000 MW capacity shortfall until mid-December (i.e. 25 per cent of total installed manageable generation capacity in Belgium). In November, only 1 out of 7 nuclear plants was operational and in December, 4 were still out of service.

To deal with the crisis, Elia participated actively in a taskforce that was led by the Ministry of Energy, and ran a weekly operational process reviewing the outlook for the upcoming week. Thanks to international support, reshuffled maintenance interventions and market efforts to find additional capacity, security of supply was never at risk despite the critical situation.

Pascale Fonck – Chief External Relations Officer at Elia

“We are pleased that Elia was able to carry out its responsibilities in a professional manner and that we helped to avoid a load shedding, however, one lesson learnt is that this situation cannot continue in the longer term. Belgium should not have to face these issues every winter. Our country has to prepare itself and take measures to ensure the security of supply, seeing that the nuclear plants are due to phase out in 2025.”

In light of the imminent energy scarcity, the Belgian Minister of Energy, Marie-Christine Marghem, met her German counterpart, Peter Altmaier, to discuss what Germany could do to help during possible power short-ages. During her stay in Berlin, the minister also visited the 50Hertz headquarters.

Consult the Redispatch Calculator to find out the current status about how much we have saved.

CONGESTION MANAGEMENT AND REDISPATCH

On particularly windy and solar-intensive days, more power is traded than can physically be transported by the grid. In order to ensure system security even in such situations, conventional power producers which are spatially near a grid bottleneck, are instructed to reduce their power. At the same time, power generation on the other side of the grid bottleneck is activated. This so-called redispatch is complex and cost-intensive, because while the electricity producers in the North and East of Germany are shut down, reserve power plants in the South of Germany or Europe are powered up at the same time. The costs incurred by the power plants are compensated. If this is not enough to resolve grid congestion, the generation of electricity from renewable energies must also be restricted through infeed management. This also leads to compensation payments made to producers of renewable energy. The total costs of all of these measures are the so-called congestion management costs.

“€ 465 mio

NUMBER OF REDISPATCH COST SAVINGS THANKS TO SOUTH-WEST INTERCONNECTOR

In 2017, the 380 kV South-West Interconnector (5000 MW) between north-eastern Germany and Bavaria was fully operational after 15 years of development and construction. The new line had – together with improved congestion management – an immediate effect and led to significant congestion management savings. Until 31 December 2018, 50Hertz managed to save over EUR 465 million.
INTERVIEW WITH BORIS SCHUCHT, CEO 50Hertz

How Germany can reach its climate targets for 2030

In 2018, 50Hertz saw 56.5 percent of the consumption in its grid area covered by renewable energy. That is another record. What might we expect in the coming years as the German Energiewende (energy transition) is rapidly progressing?

"To reach the Paris Agreement targets, the German government increased its renewables targets for 2030 to 65 percent, which means that instead of 90,000 MW installed renewables (photovoltaic and wind) in Germany today, an amount of about 130,000 MW plus a few thousand additional offshore wind turbines will be required and will have to be connected to the grid. Besides this, a commission of experts has just ended a monthly discussion with a compromise on when and in which manner the coal phase-out will take place in Germany. And this accelerated phase-out means that Germany has to cope with a system with fewer conventional power plants much earlier than expected. This will be a further challenge we have to prepare for.

50Hertz sees its main role as developing a grid which is able to handle the future demand of society and ensures the secure electricity supply of the country as well as that of Europe. It is our mission to effectively and efficiently integrate the constant increase in renewables in the system. While optimising the transport capacity of the existing grid by using innovative technologies, we still have to further extend our grid in the next 10 to 15 years to reach the 65 percent renewables target and to offer the society the infrastructure it needs."

What role will grid expansion play in the future?

"In the past, there was a tremendous increase in redispatch costs. But following the inauguration of the South-West Interconnector in 2017, which runs from Saxony-Anhalt to Bavaria, these costs could be reduced by more than 50 percent. What does this mean? Well, it shows that grid extension is decisive and one of our major tasks to sustainably reduce redispatch costs and by doing so reduce the energy costs for consumers.

To allow this continuous development of the grid, a stable framework on the regulatory side is vital in order to avoid unnecessary interruptions or difficulties for us financing our investments in the grid."

Dr. Frank Golletz is acting CEO from 1 March 2019 onwards.

What will it be like when we have achieved 65 percent renewables in electricity consumption?

"All of 50Hertz’s analysis show that although the ambitious 65 percent target is a big challenge, it is achievable in Germany until 2030. But our analysis also showed us that we cannot use the same philosophy of today “grid follows renewables” by building new wind farms or overhead lines through the country. Society will not accept unlimited new infrastructure or turbines. This philosophy has pretty much reached the public acceptance borders, which is why we expect a paradigm shift towards a target grid from this point in time.

Innovation and optimisation in grid operation will become even more important and have to be put into practice to a greater extent. On the other hand, it is crucial that renewables must be expanded where sufficient grid capacity is available. Renewables to follow the grid will be the new philosophy. Practically, this involves 50Hertz looking at the system and identifying where it can safely integrate more renewables. This is more efficient for society than allowing everybody to build renewables wherever they want.

Additionally, with 65 percent renewables in the system, the consumption market will be saturated, and therefore new technologies such as power to gas, power to heat are required to make use of the excess amounts of renewables and thus to facilitate an even higher share of renewables integration."

What else is needed to reach the German Climate Targets?

"In Germany, the energy sector has been pretty successful in reducing CO₂ emissions and has done its homework. Another central area of focus is the so-called sector coupling. Without it, we will certainly not achieve our climate targets. If we take climate protection seriously, we need to tackle the transformation in the mobility and heating sectors. CO₂ can be saved significantly in these sectors. The climate protection targets are achievable if we manage to take the other sectors along with us.

All our considerations on the 65 percent target show that storage solutions will play a very important role. Therefore, Germany and Europe need to create the framework to develop these technologies and make them marketable. In the past, legislators have strongly promoted these frameworks for innovations in the energy sector. Showcase projects such as our joint WindNODE project have emerged in various areas. This is a good development that should be continued. For 50Hertz, it is important that we fully understand what this means for the electricity system, overall consumption and for the transportation needs so we can prepare the infrastructure for such a world in the right way."

50Hertz sees its main role as developing a grid which is able to handle the future demand of society and ensures the secure electricity supply of the country as well as that of Europe.

Boris Schucht* CEO 50Hertz

* Boris Schucht left the company on 28 February 2019. Dr. Frank Golletz is acting CEO from 1 March 2019 onwards.

ELIA GROUP ACTIVITY REPORT 2018 - 35
Asset Management & Maintenance

We endeavour to achieve operational excellence

We continue to invest in the development and use of new technologies that help us optimise the maintenance and replacement of our assets. We highly value our maintenance activities seeing they contribute significantly to our common goal of continuously delivering an outstanding service to all our customers. Elia Group uses a range of methods to digitalise work in the field, including connected equipment (PCs, smartphones and smart devices), new mobile applications and the overhaul of current processes.

In our line of work, operational excellence is key to safety, which is an absolute priority for Elia Group. Our primary objective is for anyone who works on or near our facilities – both Elia employees and external staff – to return home safely every day. To achieve our goal, good operational dialogue is required between all parties.

“AMEX is reaching its end in 2019. It’s crucial that the processes, models, methods but also the roles, responsibilities and behaviours are anchored into the organisation. The implementation of the improvement levers shall also be monitored even if the programme structure has closed. This transition will be ensured by a sustainability roadmap including competence development, supporting processes and tools.”

Stéphanie Hammer – AMEX Manager at Elia

In 2019, Elia will start implementing the new strategies to realise efficiency gains, and preparing the integration of new technologies in close collaboration with 50Hertz.

We developed a professional approach to consolidate the implementation of the different transformation programmes (AMEX, MWOW, and GO FOR ZERO) to enable us to have consistent end-to-end processes in the field. We choose to work with half-yearly releases, each of them focusing on a specific aspect: safety quality of inspections, efficiency savings on painting and pruning, and deployment of new protection technologies.

In 2018 we realised

THANKS TO AMEX:

• More than € 8 million CAPEX savings thanks to prolonging the lifetime of certain assets such as transformers,

• €750k OPEX savings via optimisation of maintenance activities,

• The maintenance activity workload decreased by the equivalent of 6.5 FTE. These FTEs have been reallocated to new activities such as offshore.

Successful implementation of the first ACC wave in Belgium

The Asset Management team successfully implemented the first wave of the Asset Condition & Control (ACC) project. The ACC project helps us to switch from Time Based to Condition Based Asset Management. Concretely, this means that our employees have remote access to our digital assets to calculate the equivalent age for the transformers, circuit breakers, separators and voltage and current measurement transformers.

One of the most important data sources are the measurements from the tour post, which we are able to capture via the eForms application since this year. Thanks to the information we get from all these data sources, the asset manager can determine whether a particular asset needs maintenance or replacement. This is then based on the assets real wear and tear, and no longer based on the theoretical time intervals that we have used in the past.

“Amex has brought us a real step forward in our Asset Management. I strongly believe that this new way of working will have a positive influence on our organisation, and on our employees.”

Diederik Moers – Manager Asset, Condition & Control at Elia

Amex Manager at Elia

Stéphanie Hammer –

"For Asset Management, this is a new step in the use of data and even Big Data. It was therefore quite a challenge to collect and process the data from different sources, but thanks to solid cooperation with driven people from Asset Management, IT, Maintenance Assessment & Commissioning and Network Operation, we managed it!"
The BOOST project was launched in 2014 with the aim of optimising cost management. It was rolled out in three successive waves: underground engineering, IT activities, and overhead lines and substations. Thanks to this initiative, Elia saved more than €33 million over the first three years of the 2016-2019 tariff period.

ProjectWise
In 2018, all the latest versions of the as-built plans stored on different servers and IT tools throughout Elia were migrated to a single plan management application: ProjectWise.

Plan Management worked with the various sectors (Low Voltage, High Voltage, Telecom and Linear Assets and Structure) to devise special workflows that determined the roles and responsibilities of those involved, the aim being to manage the plan life cycle and make plans securely available. Standardised plan management processes were created and approved to ensure consistency in working methods within and between departments.

ProjectWise enables all users to view the latest versions of the available plans in a centralised digital location and check their status within the plan life cycle. It facilitates the reservation of plans for studies and allows users to follow up red-line requests and get information about the classification of as-built plans at substations.

A number of paper documents are still being digitalised. This large-scale migration project, encompassing over 800,000 master plans and some 1,000,000 files, will keep the Plan Management teams busy for some years to come in view of the volume of work involved. Sorting metadata and eliminating duplicate documents are just two of the tasks to be performed.

Moving towards condition-based maintenance
In addition to these Elia programmes, 50Hertz has been investing in improving the efficacy of its maintenance programmes, whereby it is aiming to reduce the maintenance costs of its assets over their entire lifetime. Previously, maintenance schedules were based on certain timeframes but 50Hertz is introducing a system much closer to condition-based maintenance. For example: the higher the usage of an asset, the shorter the time between maintenance interventions. This programme was largely put in place in 2018.

50Hertz regional centres reorganised
In 2018, 50Hertz prepared a new location concept that came into force at the beginning of 2019. The new concept was needed because of the further integration of offshore wind farms, the use of the new HVDC cable SuedOstLink and further EEG-related grid expansion measures, which are expected to result in a 25 percent asset growth. Furthermore, 50Hertz will add another 20 onshore substations to the existing ones in the next few years. Because of this asset expansion, the company has also restructured its regional branches with the number of locations increasing from seven to 10, and these are now managed in five regional centres. The new locations reduce reaction and travel times and thus ensure efficiency.

150 pylons exchanged in Saxony-Anhalt and Brandenburg
As part of its pylon reinforcement programme, 50Hertz is increasing the reliability and stability of its pylons. 150 pylons, built in the 70s and 80s, were reinforced and a further 300 pylon reinforcements are planned for the entire grid area in the coming years.

“With the presence of our regional centres, we can guarantee a rapid response in the support of our technical assets and at the same time give 50Hertz a face in our grid area. With our additional sites, we already have the right structure today for the expansion of substations, switching and cable systems and overhead lines in the context of the energy transition.”

Jochen Mueller – Head of Grid Operation at 50Hertz
Elia Group embarked on unprecedented levels of investment in the last few years and this continued in 2018 as the Group pressed on with its efforts to realise the energy transition. For the next three years, Elia and 50Hertz will be investing a staggering €1.1 billion per annum in the integration of renewable energy, the development of an offshore high-voltage grid and the construction of interconnectors to facilitate the integration of the European energy market.

These investments are largely a reflection of the need to shore up the security of supply. In Belgium and even more so in Germany, the ability to generate energy is becoming increasingly diversified, as well as throughout the whole of Europe as each country aims to achieve the renewables targets of 2030. Society is ever less reliant on major utilities only and at the same time, renewables are characterised by intermittent generation.

Elia Group is robustly addressing these challenges.
AMBICTIONS

Delivering on time, budget and quality

We aim to deliver the future grid on time to allow society to reap the benefits of the energy transition. We want to provide affordable power for society and take care of designing and constructing the grid with the highest quality standards. As a result, we deliver a reliable energy system that continues to support economic activity.

Integrating renewables

With our infrastructure ranging from 400 kV to 30 kV, Elia Group wants to facilitate the uninterrupted flow of renewable energy from where it is produced to where it is consumed. Our grid is an enabler of the energy transition. We want to become a leader in infrastructure development to contribute to our sustainability targets.

Realising interconnections with neighbouring countries

We develop and build interconnectors to support security of supply and to enable the integration of renewable generation at European level. By doing so, we facilitate the single European energy market and support the competitiveness of our countries at the same time: to find the cheapest energy wherever it is produced, while offering export opportunities to our domestic plants.

MARKUS BERGER – CHIEF INFRASTRUCTURE OFFICER AT ELIA

“Elia is on track with its ambitious investment programme. We delivered what we promised, although we are confronted with major challenges every year. In 2018, we managed the €600 million investment programme successfully, something we can really be proud of!”

MARKUS BERGER – CHIEF INFRASTRUCTURE OFFICER AT ELIA

“2018 was a milestone year in the ambitious investment programme to strengthen and extend the existing grid, both on- and offshore. In light of the target that renewables should realise a 65 percent share of the energy mix in Germany by 2030, 50Hertz is planning a 1,800 km grid expansion. Furthermore, the company will add another 20 onshore substations to the existing ones in the next few years.”

FRANK GOLLETZ – CHIEF TECHNICAL OFFICER AT 50HERTZ

“Discover how Nemo Link helps support security of supply.”

OBJECTIVES

We develop the grid of the future that integrates increasing amounts of onshore and offshore renewable energy generation into the integrated European grid.

GRID INVESTMENTS IN BELGIUM IN 2018

€ 636.7 mio

GRID INVESTMENTS IN GERMANY IN 2018

€ 491.5 mio
Facilitating Offshore Energy

Offshore energy is set to grow exponentially in the seas in which Elia and 50Hertz are operating. In Belgium, the construction of the Modular Offshore Grid (MOG) progressed rapidly in 2018. In Germany, 50Hertz achieved the cable connections (representing 190 km) for two offshore wind farms in the Baltic Sea.

The Modular Offshore Grid (MOG)
The MOG project comprises two offshore platforms located approximately 40 km off the coast of Zeewbrugge. They will act as a ‘power plug’, bundling the subsea cables of four Belgian wind farms (Rentel, Saastar, Mermaid and Northwester 2).

The combined cable infrastructure will enable the wind farms to transmit as much of the electricity generated to the mainland as possible. In total, the switchyard platform will connect 130 km of 220 kV cables with the Sloven high-voltage substation in Zeewbrugge.

Belgium’s first ever ‘power plug at sea’ is one step closer to becoming a reality.

The jacket was successfully installed on the seabed in early November, anchoring the platform to the seabed with four posts at a depth of 60 m. Meanwhile, the first 220 kV cables for the Modular Offshore Grid (MOG) were successfully tested at the production centre. In spring 2019, the topside, which is being built in Zwickledicht, will be fitted onto the jacket. After this stage is completed, the first cables will be connected in 2019 when some of the wind farms will already be able to be connected to the MOG. The full capacity will be available in 2020.

885 GWh
In 2018, Wikinger fed in 885 GWh of renewables into the 50Hertz grid representing the electricity consumption of 220,000 households.

OSTWIND 2 IS UNDERWAY
Following an offshore wind tender in late April 2018, Germany’s national regulatory authority (Bundesnetzagentur) allocated 733 MW of connection capacity to the Baltic Sea, specifically to the Arcadis Ost 1, Baltic Eagle and Wikinger Süd wind farms. After initiating talks with the wind farm operators, 50Hertz awarded the manufacturing and installation contract of three 220 kV AC cables for the Ostwind 2 project to the consortium NKT-Boskalis.

Project Cluster Westlich Adlergrund (Ostwind 2)
The Ostwind 1 project started in 2015 and is part of the grid connection of the cluster Westlich Adlergrund and includes the connection of the Arkona (385 MW) and Wikinger (350 MW) offshore wind farms to the 50Hertz grid in Lubmin. The cluster Westlich Adlergrund represents an area of 109.2 km² and is situated in the Exclusive Economic Zone. It is located at about 42 km from the closest coast of Rügen island, and some 90 km from Lubmin in the bay of Greifswald. In 2018, after three years of construction, all Ostwind 1 submarine cables were put into test operation. The cable connections are a key part of the grid to feed renewable energy into the grid.

For the first time in Germany, the Ostwind 1 project uses 220 kV AC (alternating current) technology, making higher electricity transmission capacity possible. Until now, the connections of offshore wind farms in the German Baltic Sea consisted of 150 kV, three-phase cable systems. At the Lubmin substation, the electricity is transformed to 380 kV and fed into the 50Hertz transmission system. In 2018, Wikinger wind farms fed in 885 GWh of renewables into the 50Hertz grid representing the electricity consumption of 220,000 households. The project is ahead of schedule and around 10 percent below budget.

“Belgium’s first ever ‘power plug at sea’ is one step closer to becoming a reality.”
Henrich Quick
Head of Projects Offshore at 50Hertz

“50Hertz embarked on a programme to purchase more cables and ramp up the project team to be able to serve these new Baltic wind farm projects, which will come onstream in 2022-2023.”

Philippe De Backer
Federal Minister for the North Sea, visited the Zwickledicht site where the switchyard platform is being built.

Minister Philippe De Backer visits construction site MOG
On November 27, Philippe De Backer, Federal Minister for the North Sea, visited the Zwijndrecht site where the switchyard platform is being built.

Philippe De Backer: “The development of the MOG is part of a long-term strategy: in time, we will be able to connect new wind farms to the offshore power plug. I also believe that other European countries will eventually be able to connect their energy to Belgium’s offshore power plug, making the North Sea a real energy hub in Western Europe.”

Discover the progress 50Hertz made on the Ostwind 1 project.
Towards a more interconnected European Grid

Besides preparing their grid for the energy transition, Elia and 50Hertz are also committed to developing an integrated, European-wide electricity market. To ensure that this is as efficient as possible, the company believes that interconnectivity should be further increased between the different markets. That is why 50Hertz is investing in major projects such as Combined Grid Solution and Hansa PowerBridge. Elia is using the benefits of its geographical location at the centre of the European energy system to bolster security of supply and to strengthen the development of interconnections with neighbouring countries such as Nemo Link (UK) and ALEGro (Germany).

Combined Grid Solution - a world first!
Between Denmark and Germany

The Combined Grid Solution is a major offshore project and a joint project with the Danish system operator Energinet. It is a hybrid system that interconnects the grid of the German north-eastern region with the Danish area of Sjaelland by using the grid connection infrastructure of the German offshore wind farms Baltic 1 and 2 and the Danish offshore wind farm Kriegers Flak. Furthermore, the Combined Grid Solution contributes to the objective of the EU Council to provide 15 percent of generating capacities as interconnector capacities and increasing the security of supply by stabilising the electricity system. The operation will start in 2019.

The Hansa PowerBridge - Between Sweden and Germany

Hansa PowerBridge is an onshore/offshore cable connection that will run from the Gustrow substation in Mecklenburg-Western Pomerania through the Baltic Sea to Sweden. The 500 km distance will be bridged by a high voltage direct current (HVDC) interconnector the Hansa PowerBridge.

The project will provide an important contribution to the security of the transmission systems and will allow for the indirect storage of electricity from German renewable energy sources. Both countries will profit from combining Swedish hydropower with German generation system. Hansa PowerBridge will have a capacity of about 700 MW and be operational in 2025/2026. 50Hertz is partnering with Svenska Kraftnät. In May 2018, the first seabed inspection took place of the Baltic Sea on the way to the territorial waters of Sweden. Thirteen defined targets were inspected with a Remotely Operated Vehicle equipped with sensitive technology to enable the submarine cable to be laid safely. All targets were cleared up and fortunately no remnants from the last World War were found.

“European electricity grids will grow and become more and more interconnected in the upcoming years. And the development of a real meshed offshore grid integrating renewable energies and interconnectors is an essential part. I am very happy to have joined this exciting journey while working for the Combined Grid Solution project, which is the first of its kind. Every day our very committed 50Hertz team together with the Danish partner Energinet is gaining new experiences that will help all of us to realise the large scale projects of the future.”

Elke Kwapis – Project Leader Combined Grid Solution at 50Hertz

“According to the Danish energy minister, the Combined Grid Solution will facilitate the development of the largest wind power installations in the world. Hansa PowerBridge means that 50Hertz gets a fifth electric neighbour. Both sides will benefit from the interconnector. Surplus wind power from Germany will help to lower electricity prices in southern Sweden. During calm wind periods, Germany can receive electricity from the huge water reservoirs in northern Sweden.”

Gert Schwarzbach – Head of Interconnectors at 50Hertz

Discover more about how CGS & Hansa PowerBridge increase interconnectivity.
One of the most important achievements of 2018 and a milestone in the company’s history is the inauguration of Nemo Link, Elia’s very first high voltage direct current project (HVDC) and the first subsea electricity interconnector between the United Kingdom and Belgium.

Nemo Link is a collaborative effort organised by Elia (Belgium) and National Grid (UK), which created a joint venture with a mixed Belgian-British team. Connecting the Richborough (UK) and Herdersbrug (Belgium) converter stations via a 140 km cable (130 km submarine) was an extremely complex undertaking that entailed many technical challenges.

Nemo Link is a crucial step in the integration of the electricity grid between continental Europe and the UK and facilitates access to renewable energy all over Europe, as well as allowing excess energy to be exported. Nemo Link is expected to see 1,000 MW in electricity exchanges (equivalent to the capacity of a nuclear reactor), a significant plus in terms of ensuring security of supply. The interconnector will be commissioned in Q1 2019.

ALEGrO
Between Germany and Belgium
ALEGrO (Aachen Liège Electrical Grid Overlay) is besides the Nemo Link project, a second key direct current (HVDC) project linking the Lixhe (Belgium) and Oberzier (Germany) converter stations. The project is a joint venture between Elia and Amprion, one of the four German system operators.

The 90 km interconnector (69 km in Belgium and 41 km in Germany) will have a capacity of 1,000 MW when commissioned in 2020. The cable runs underground for the entire route and mainly follows existing road and rail infrastructure.

During the year, works progressed well on Belgian soil and main works are due to be completed by the end of 2019. Activities in Germany were initially hampered by permitting processes but these were solved in October and work continued apace.

ALEGrO will contribute to the integration of renewable sources of energy, price convergence between the markets and security of supply.

Before work began, the Nemo Link cable route was thoroughly examined for UXO and historical heritage. The project teams came across thousands of objects from the First and Second World Wars. They worked closely with authorities, agencies and military services in France, the UK and Belgium to detect and decommission these items.

“Nemo Link is a fantastic example of how a technically complex project that required huge investment can be delivered by countries and companies working together to bring something that will deliver real value to both the UK and Belgium and to countries further afield.”

Laurence Slade – CEO Energy UK

“ALEGrO project is progressing according to schedule and a lot of work has already been performed, something we are truly proud of. In 2018, more than 50 percent of the cables have been laid on Belgian soil. We are currently building the 20-metre high converter station in Lixhe and the first transformers have arrived. Our German partner Amprion received the permits and launched their works as well.”

Els Celens – Project Manager ALEGrO at Elia
Reinforcing the onshore grid

In addition to the substantial work on the offshore grid and interconnectors, Elia and 50Hertz are also further expanding and optimising the onshore grid. Many projects are currently underway to respond to the needs and accommodate local renewable energy generation.

compactLine pilot project
compactLine is a 380 kV line that, due to its compact design, fits into sections of existing 220 kV lines. The line is characterised by lower pylon heights, narrower routes and smaller, solid pylons. From September 2017 to August 2018, a two-kilometre pilot line was built at the Jessen/Nord substation. Commissioning took place in the third quarter of 2018. The compactLine’s practical suitability will be examined in a subsequent, one-year-monitoring phase.

SuedOstLink (South-East Link)
This high-voltage direct current (HVDC) power link between Saxony-Anhalt and Bavaria will be able to transmit up to 2,000 MW of electricity, with an approximated length of about 580 km, mostly realised underground. 50Hertz is responsible for the Northern part of the project. TenneT is handling the Southern part in Bavaria. In 2018, the in-depth spatial planning for the first of a total of four sections was submitted. 50Hertz presented the planning results in the context of the early public participation. In parallel to the permission process, potential suppliers of a new 525 kV technology for underground cables undergo a rigorous technical test to develop a new sustainable technical solution for SuedOstLink. Construction is scheduled to start in 2022 and commissioning is aimed for 2025.

STATUS OF FURTHER PERMISSIONS:
- Approved: Stendal - West-Wolmirstedt (50 pylons)
- Approval in progress: Berliner Nordring, Uckermarkleitung
- Permits in preparation: SuedOstLink, Güstrow - Parchim, Parchim - Perleberg, Perleberg-Stendal West, Röhrsdorf - Weida, Weida - Remptendorf, Pulgar-Vieselbach and for substations Wessin, Berlin Charlottenburg, Lubmin

Phase-shifting transformers (PST)
A major achievement in 2018 was the commissioning of Phase-shifting transformers (PST) for the interconnectors to both the Czech Republic and Poland in Röhndorf and Viersen, respectively. Both projects highlight the close working relationship between 50Hertz and its neighbouring transmission system operators. PSTs are used to control the electricity flows and to avoid overloading individual lines.

Boucle de l’Est II
Elia started stage 2 of the East Loop project that involves replacing and upgrading the overhead line connecting the Bovericq (Malmedy), Brommelen, Triëst-Port and Bruma stations. The work is scheduled to run until 2022.

Mercator – Avelin
Elia is upgrading the 380 kV Mercator-Avelin overhead line, which is 110 km long and passes through 25 municipalities in Flanders and Wallonia before continuing into France. The massive project is divided into three parts: Mercator-Horta, Horta-Avelgem and Avelgem-Avelin.

Brabo
With the Brabo project, Elia aims to strengthen the high-voltage grid and consolidate security of supply in and around the Port of Antwerp. The project is being rolled out in three phases between 2016 and 2023.

Rabosée – Battice
In 2018, Elia finalised the construction of a new 150 kV, underground electricity connection linking the Battice substation and Rabosée (Wandre-Haut). The underground link is now connected to the 150 kV Bressoux-Cheratte-Lixhe overhead connection and a new transition substation was also constructed at Rabosée.

SuedOstLink (South-East Link)
Shaping the future grid.

Elia Group is trying to ensure that its stakeholders reap the full benefits of an integrated market, while at the same time meeting sustainability objectives. To be able to achieve this ambition, it is vital that the development of the Belgian and German grid infrastructure stays ahead of market developments. That is why both Elia and 50Hertz draw up development plans to make sure the grid is determining the speed at which the energy transition takes place and not the other way around.

"As the new Development Plan includes some very large investment projects such as ‘Boucle du Hainaut’ and ‘Ventilus’ with a major impact on society - nationally, but also locally - much effort has been put into the interaction with stakeholders to create buy-in on the need for these projects at a very early stage. We were only able to realise this thanks to a very good cooperation between colleagues from different departments. Personally, I think major steps were taken on optimising such interaction, however we should also all be aware that we will have to keep up this approach and effort through the whole lifecycle of the projects to ensure their successful and timely realisation."

Kristof Sleurs – Head of Grid Development at Elia

Federal Development Plan Belgium

In line with the legal obligation to draw up a Federal Development Plan every four years, Elia in Belgium submitted a draft plan in late May 2018 on the medium-term future of the Belgian high-voltage grid. The Federal Development Plan 2020-2030, Elia advocates an accelerated approach to infrastructure development in order to fully exploit the advantages of the energy transition. The Federal Development Plan 2020-2030 was available for viewing in late 2018 during a public consultation.

The Federal Development Plan 2020-2030 identifies the investments that must be made over the period in order to meet the future needs of our electricity system. The Plan focuses on developing the high-voltage 380 kV grid by concentrating on three key areas: upgrading Belgium’s electricity power grid integrating additional offshore wind power generation and continuing to develop interconnectors.

It also entails upgrading and extending the 220 kV to 110 kV grid to enable the integration of more renewable energy generation and to cope with increasing energy flows. Some of the investments set out for the period beyond 2025 are still indicative and depend on the findings of further studies.

Electricity Grid Development Plans in Germany (Netzentwicklungsplan)

Since 2012, the need for grid expansion and conversion in Germany has been determined in a three-stage process. This is regulated in the Energy Industry Act (EnWG) of 2011. In 2016, an amendment to the Energy Industry Act came into effect which changed the essential principles for the preparation of the network development plan (NEP). Key points were the conversion of the rhythm for the preparation of the NEP to a two-year cycle, the introduction of an implementation report and more flexibility in the observation horizon of the scenarios among others.

According to this the four German transmission system operators 50Hertz, Amprion, TenneT and TransnetBW draw up a biennial NEP, which determines the requirements they have identified for the conversion of the extra-high voltage grid. This is publicly discussed and confirmed by the Federal Network Agency (BNetzA). Finally, the Bundesverwaltung, the German parliament, transfers the confirmed projects for grid expansion into the so-called Federal Requirements Plan.

The first implementation report was published in 2018. The report transparently lists all projects with their planning and implementation status. In early 2019, the German transmission system operators will jointly present the first draft of the grid development plan for the target year 2030. This will form the basis for the upcoming Federal Requirements Plan, in which the grid development projects will be legally defined. In the NEP 2030, the transmission system operators show how the political goal of integrating 65 percent renewables into the grid and compliance with the climate protection targets of the federal government can be achieved.

When it comes to developing the power grid of the future, Elia Group is committed to three principles:

1. Minimising the construction of new infrastructure by giving priority to optimising and improving existing infrastructure.
2. Open dialogue with all the stakeholders during the entire development process from a very early stage.
3. Respect for people and the environment when building and operating our infrastructure.
We develop the electricity system and the markets.

Given the growth in renewable energies and their variable generation, greater flexibility is needed within the electricity system to maintain a constant balance between supply and demand. Digitalisation and the latest technologies offer market players new opportunities to optimise their electricity management by selling their surplus energy or temporarily reducing consumption (demand flexibility). By opening up our system to new players and technologies, Elia Group wants to create a more competitive energy market while maintaining security of supply at all times. To achieve this, Elia Group ensures that every market player has transparent, non-discriminatory access to the grid.

Elia Group wants to facilitate further market integration, at both national and European level. We give new players and technologies a chance by innovating in our systems and by introducing new market products.

Developing cross-border balancing mechanisms requires greater cooperation and coordination, as well as an appropriate legislative framework.
WE DEVELOP THE ELECTRICITY SYSTEM AND THE MARKETS

“In 2018, Elia Group has taken the first major step in creating an open system that puts consumers at the centre. Experts at Elia partnered up with innovative market players to realise the ambitions outlined in Elia Group’s Vision Paper ‘Towards a consumer-centric system’. There is still a great deal of research and development to be done to get the system off the ground, but technology is developing at the speed of light. Elia Group is currently in the sandboxing stage, in close cooperation with the distribution system operators.”

Patrick De Leener – Chief Customers, Market & System Officer at Elia

OBJECTIVES

We are redesigning the market to encompass all kinds of technologies and market players, independently from the grid they are connected to, so they can fully exploit the economic benefits. We are committed to fostering a single European internal energy market.

AMBITIONS

Towards an open and integrated market

Making transmission capacity available to market players across international borders is a source of added economic value for the community as a whole. It makes energy markets more accessible and thus more competitive. Consumers can access the cheapest energy wherever it is available.

Steer and implement the European regulatory framework

Initiated by the European Commission, the European Network Codes are drawn up on the basis of proposals by the transmission system operators and are designed to provide the energy market with a common legislative framework applicable to all Member States. The European Union (EU) is keen to strengthen the strategies in place to make the pan-European energy market a reliable, competitive and low-carbon sector as the Clean Energy for All Europeans package has intensively shown.

Efficient use of the grid

Elia Group makes its contribution to achieving the climate goals by integrating the continuously increasing amount of renewables into the grid in the most effective and efficient way.

Our expertise at society’s service

Elia Group is an active member of a number of national and European associations and is dedicated to help plan the energy system of the future. We regularly conduct in-depth studies to enable us to give sound advice about the electricity system’s needs. Moreover, Elia Group is highly society-oriented and sets up project groups in order to gain a better insight into market players’ needs and requirements and to identify the best solutions.

50Hertz has to bridge the gap between what is feasible in terms of grid expansion and what is needed given the increase in renewables and the energy transition. We recognise that we cannot expand the grid indefinitely and we also believe that public acceptance is near its limits. To handle future increased transport capacity, innovative solutions are necessary. In addition to high-voltage direct current lines (HVDC), such as the SuedOstLink, grid reinforcement measures with high-temperature low sags (HTLS) or weather-dependent overhead line operation. Furthermore, we test the possibilities of the planned and plannable higher capacity utilisation of individual lines in our grid.”

Dirk Biermann – Chief Markets and System Operation Officer at 50Hertz
Efficient use of the grid and control of the system

To make sure the grid runs smoothly 24 hours a day, the transmission control centres of both Elia and 50Hertz activate the regulation tools needed to ensure a secure grid. This led to a reliability rate of 99.999 percent in 2018. They have access to ancillary reserves which contribute to maintaining the frequency and voltage on the electric system, managing congestion and balancing generation and consumption in real time. Historically, mainly large conventional power plants have been providing these ancillary services. As the leading role is shifting from conventional power plants towards renewables (e.g. defined in the German 65 percent renewables goal), providers like battery storage, power-to-X technology and also the different renewable energy technologies will play an important role in the coming years and decades. Additionally, “demand response” like detachable loads and new flexibilities from small-scale devices will be needed for a secure and efficient system operation.

Grid optimisation

Today, 50Hertz is already successfully integrating around 16.5 percent renewable into the transmission grid in northern and eastern Germany. Despite the high proportion of volatile wind and solar energy, system security is always guaranteed. While in Germany a share of 65 percent is planned as a target share for 2030, at the 50Hertz grid area we expect this will already happen in 2020.

What challenges does 50Hertz face in integrating further renewables into the grid?

Dr. Dirk Biermann: “The ambition of 50Hertz and the other German TSOs in the next few years is to integrate the increasing amount of renewables into the grid in the most effective and efficient way. Additionally, 50Hertz has to further develop the grid to enable the extra transmission of renewables from the north to the south and from the east to the southwest. As permitting procedures for new lines are lengthy, 50Hertz is looking at what it can do including optimised usage of the existing infrastructure and enhanced congestion management.”

Where do you see the greatest development potential?

Dr. Dirk Biermann: “Let us first have a look at where we are coming from: when the wind is blowing we have heavy traffic, in particular from north to south, and we face significant bottlenecks on our lines. Also in these critical cases we respect the security rules saying that overloading and tripping of lines has to be avoided, even in case of an additional outage in the system. This is European standard. To meet this requirement, we keep redundant transmission capacity available just for the outage case (the “n-1 case”). Nevertheless we believe that part of this redundancy could also be used in normal operation if we can ensure that we are flexible and fast enough to react on outages appropriately. This sounds logical and easy, but it means a paradigm shift towards new automation concepts in system operations, new steering mechanisms for power flows in the grid and the optimised coordination of flexibility sources. We believe so strongly in such innovation that we have incorporated it already to some extent in the German grid development plan. On the one hand, this makes sure that we do not go far from any investment that ultimately might not be required. On the other hand, we rely on future innovation that nobody can foresee today. It is good to be optimistic and we will deliver this innovation in the coming years. Society however should be aware of the fact that our promise is not a given, not a short-term solution, but a long and uncertain research and development project that takes effort and time.”

And what about batteries?

Dr. Dirk Biermann: “Battery prices have dropped significantly and they will gain more and more importance as flexibility providers. For the optimisation of system operations they could help us to react fast enough in the case of outages. We are investigating this as the so-called ‘grid booster’ concept.”

65% RENEWABLES TARGET SHARE FOR 2030 IN GERMANY

Dr. Dirk Biermann – Chief Markets and System Operation Officer at 50Hertz
Elia has developed and consulted with stakeholders concerning a proposal for the Automatic Frequency Restoration Reserve (AFRR) design and implementation plan. In this study, several modifications are proposed including the implementation of a merit order activation, a daily AFRR procurement, rules enabling portfolio bidding and other new features which facilitate the opening of the AFRR market to all technologies, independent of the voltage level and the type of AFRR provider. Elia foresees that the new AFRR design, together with a separate procurement of FCR and AFRR products, will go live in July 2020. Based on a technical and economic assessment, Elia recommends the postponement of the choice to implement Transfer of Energy in the AFRR market.

Preparations for the implementation of dynamic dimensioning and daily procurement of reserves

In 2018, Elia developed a software tool to determine its required reserve capacity on a daily basis. This tool allows the implementation of the new method to dynamically size the balancing reserve needs in near-real time based on day-ahead predicted system conditions, including offshore and onshore wind power, solar photovoltaics, electric demand, power plant schedules and transmission. Implementation of the dynamic dimensioning together with a daily procurement of Manual Frequency Restoration Reserve (mFRR) is foreseen in 2020, after concluding a parallel run during 2019.

Integrating battery technology for the first time

One of the key responsibilities of Transmission System Operators is to keep the electricity system in perfect balance. In order to achieve the balancing needed, TSOs have contracts in place with different voltage levels to participate. Belgium, enabling other technologies with different voltage levels to participate.

Stabilising Measures

Elia embarked on a study this year to examine the impact that a decline in conventional power plants has on the system in Germany there are still a large amount of coal-fired plants and the inertia created by the turbines has a stabilising effect on the grid. However, when there are fewer conventional plants in the system, Elia still has to maintain the grid’s stability and make sure there is enough inertia for both regular and emergency operations. Ultimately, Elia believes that it is likely that new devices have to be built in the system to compensate for the decline in conventional power plants.

“The prices for batteries have dropped significantly in the past and this might continue. Although it will remain unrealistic in the short term to economically reduce the transmission task by TSO-scale batteries, it is likely that such components will play an important role to ensure system security in highly loaded grids with little conventional generation in the long term.”

Dr. Klaus v. Sengbusch – Head of Strategic Grid Planning at 50Hertz
We develop the electricity system and the markets now, only large generation units with an installed capacity of at least 25 MW could offer their available energy, whereas smaller generation units and demand flexibility were excluded. The platform has been operational since September 2017 for customers connected to the Elia grid. Since early 2018, the platform is also available for the distribution system. Elia will facilitate data exchange within BidLadder by means of the DataHub platform, developed in collaboration with distribution system operators.

**DataHub project**

On 1 January 2018, Elia and the Belgian distribution system operators (DSOs) launched a joint platform called T-DSO DataHub for exchanging data. This is an important initiative to capture a bigger range of flexibility to reduce the balancing cost and therefore the cost to all grid users.

Generators and users connected to the transmission or distribution system for all voltages greater than or equal to 5 kV which are able, upon request, to generate electricity or temporarily limit consumption, have had the option of offering Elia this flexibility on a daily basis. When Elia uses the capacity on offer – generally the next day – the market players and grid users are remunerated. In so doing, market players and grid users can actively help to maintain balance on the system.

The DataHub development follows the launch of BidLadder, a platform allowing market players to provide Elia with all the flexibility they have in their portfolio. To open BidLadder to the distribution system, Elia and the DSOs needed a tool to facilitate these data exchanges. DataHub is that tool.

**WindNODE flexibility platform**

The WindNODE partner project supported by the Federal Ministry for Economic Affairs and Energy (BMWi) gathers over 70 partner companies and offers an ideal basis to realise such system innovations. The partner network represents all stakeholders of the energy industry so that direct development feedback can be generated. 50Hertz is the consortium leader for this project.

In 2018, an important sub-project of the 50Hertz-led WindNODE project entered the test phase. The flexibility platform which is intended to show how decentralised systems can be better integrated into processes in the energy industry. 50Hertz together with regional DSOs developed the flexibility platform which allows additional market participants to offer switchable or irrefrangible loads and thus their flexibility. On the basis of these offers, distributed flexibilities can be integrated into the grid congestion management processes in a technology-neutral way.

In a second sub-project, 50Hertz will further develop the balancing power procedures to improve deployment options for decentralised flexibilities. To be successful, the smart meter infrastructure will provide an important basis as the automated processing of measured values is utterly important for the efficient handling of processes. Furthermore, the data from the intelligent measuring systems will be used to improve the prognosis for markets and system operation – which at the end of the day helps to make the energy transition happen.

**MARKET PLATFORMS TO MANAGE INCREASING FLEXIBILITY**

The BidLadder project

BidLadder is a market platform set up by Elia that has been operational since September 2017. It allows all market players to offer their flexibility on a daily basis to keep the system balanced regardless of the voltage level they are connected to and the technology they use (generation or demand-side management). This means that smaller units can participate with a high degree of flexibility. Until now, only large generation units with an installed capacity of at least 25 MW could offer their available energy, whereas smaller generation units and demand flexibility were excluded. The platform has been operational since September 2017 for customers connected to the Elia grid. Since early 2018, the platform is also available for the distribution system. Elia will facilitate data exchange within BidLadder by means of the DataHub platform, developed in collaboration with distribution system operators.

“DataHub is an important step in terms of cooperation and moves towards an integrated market. Three regions – Flanders, Wallonia and Brussels – have worked closely together to align their processes. This really is a joint initiative, with a joint project team and with true, joint governance.”

Patrick De Leener – Chief Customers, Market & System Officer at Elia

“In 2017 alone, renewables amounting to 641 GWh were cut back in the 50Hertz grid area in order not to overload the grids. With this amount of energy, the city of Berlin could have been completely supplied with electricity for two weeks. This is where the flexibility platform comes in as a central building block: suppliers use the platform to report previously unused regional flexibilities for electricity consumption or generation. Bids for the following day and for the same day are possible. System operators check these bids and use them when grid congestion becomes visible in their calculations.”

Dr. Georg Meyer-Braune – Project Manager Windnode at 50Hertz
Towards a single European internal energy market

Elia Group aims to develop the electricity grid and markets from a cross-border perspective. As a Group, Elia and 50Hertz are working closely with other European TSOs and DSOs to improve current methodologies to optimise capacity allocation to increase the potential of electricity exchanges.

XBID, the European Cross-Border Intraday solution

In June 2018, the Nominated Electricity Market Operators (NEMOs) and Transmission System Operators (TSOs) launched the European Cross-Border Intraday (XBID) solution, as well as 10 Local Implementation Projects. This marked an important step towards creating a single, integrated European Intraday market.

The go-live with the 10 Local Implementation Projects enables continuous intraday trading of electricity across the following countries: Austria, Belgium, Denmark, Estonia, Finland, France, Germany, Latvia, Lithuania, Norway, The Netherlands, Portugal, Spain and Sweden. Most other European countries are due to take part in a second wave, which is targeted in the summer of 2019.

The XBID solution is based on a common IT system with one Shared Order Book (SOB), a Capacity Management Module (CMM) and a Shipping Module (SM). In June 2018, Elia launched the European Cross-Border Intraday (XBID) solution, as well as 10 Local Implementation Projects. This marked an important step towards creating a single, integrated European Intraday market.

The XBID solution is based on a common IT system with one Shared Order Book (SOB), a Capacity Management Module (CMM) and a Shipping Module (SM). In the intraday timeframe it allows orders entered by market participants for continuous matching in one bidding zone to be matched by orders similarly submitted by market participants in any other bidding zone within the geographic scope of the XBID solution reach, as long as transmission capacity is available. The XBID solution supports implicit continuous trading and if needed explicit allocation (German/French border). It is in line with the EU Target model for an integrated intraday market.

European-wide intraday coupling is a key component for completing the European Internal Energy Market. With the rising share of intermittent generation in the European generation mix, connecting intraday markets through cross-border trading is an increasingly important tool for market parties to keep positions balanced. The purpose of the XBID initiative is to increase the overall efficiency of intraday trading.

Phase Shifting Transformers

Another major achievement in 2018 was constructing the phase shifting transformers for the interconnectors to both the Czech Republic and Poland. Together with the partners ČEPS and PSE respectively, this project is a shining example of European cooperation.

The TSOs are now able to jointly steer the flow of electricity in a more efficient way. The phase shifters have relieved the load on the grids of our Polish and Czech neighbours and enable us to provide more capacity for European electricity trading at the cross-border interconnectors. In the future, this will play a much greater role than before in successfully advancing the energy transition, with ever higher proportions of renewable energies and the usual high system stability.

Federal Grid Code

After two years of intensive talks with all the market players involved, on 15 March 2018 Elia launched a formal public consultation to revise the Federal Grid Code. This forms the legal foundations converting the European Network Codes into Belgian directives. It governs cross-border transactions on the Belgian electricity market, among other things. This is the first time it has been extensively revised since 2002. After a period of consultation, the amended proposal was submitted to the relevant authorities on 17 May 2018.
International Cooperation

Elia Group is an active member of various international organisations that work to promote the security, sustainability and reliability of the world’s electricity grids.

ENTSO-E
The European Network of Transmission System Operators for Electricity (ENTSO-E) represents all European Union operators and other transmission system operators that are connected to the European electricity grid. ENTSO-E acts as a point of contact for bodies such as the European Commission and the Agency for the Cooperation of Energy Regulators (ACER) for matters concerning technical problems and market-related issues.

ENTSO-E

CORESO and TSC Net
The regional technical coordination centres CORESO and TSC Net bring together various European transmission system operators with a view to enhancing the operational security of grids in Central West Europe. The development of intraday markets has triggered a rise in cross-border electricity flows. CORESO and TSC Net also strives to improve the region’s integration of renewable energy generation by exchanging data and expertise.

CORESO and TSC Net

EPEX SPOT SE
Elia has a minority stake (17 percent) in the holding HGRT, which is a shareholder (49 percent) in the European Power Exchange SE. EPEX SPOT manages a number of electricity trading platforms, mainly in the Central West Europe region (i.e. Germany, France, the United Kingdom, the Netherlands, Belgium, Austria, Switzerland and Luxembourg). These markets account for 50 percent of Europe’s electricity consumption.

EPEX SPOT SE

EEX | EPEX
50Hertz is committed to the development of a common European electricity market. To further this goal, 50Hertz holds 10 percent of the shares in the European Power Exchange (EEX) in Leipzig, and as such also indirectly participates in the European Power Exchange (EPEX) in Paris.

EEX | EPEX

Delegation from European Commission visits Elia Group HQs in Brussels and Berlin

On March 15, a delegation from the European Commission visited Elia HQ in Brussels to receive training. It concerned a group of civil servants working on various energy projects in the European Commission’s representation offices throughout the world, from Burundi to Tajikistan. Elia Group gave a presentation on the company’s role of the National Control Centres and the European electricity market. Later on, Elia Grid International elaborated on the consultancy services it offers clients. Such initiatives allow Elia Group to show the European Commission that we are a reliable partner with the necessary expertise.

Delegation from European Commission visits Elia Group HQs in Brussels and Berlin

Elia Group CEO opens Best Paths conference and European Utility Week

Chris Peeters called for ongoing commitment to innovation and international cooperation in his speech at the Best Paths conference. The Best Paths project brings together a multidisciplinary team from 11 countries including Elia in Belgium and 50Hertz in Germany. Best Paths aims to develop novel technologies to increase pan-European transmission grid capacity and electricity system flexibility.

Elia Group CEO opens Best Paths conference and European Utility Week

Additionally, Mr. Peeters was one of the guest speakers at the European Utility Week in Vienna on November 6. He presented Elia Group’s vision regarding a consumer-centric energy system. The event is an annual forum bringing together all the major players in the European energy system. This year’s edition was focused on digitalisation, decarbonisation, energy markets and innovation.

Elia Group CEO opens Best Paths conference and European Utility Week
Our expertise at society’s service

In our role as transmission system operators, Elia Group publishes forward-looking studies to keep an eye on the pulse in the market.

Towards a consumer-centric system

In November 2018, Elia Group published a Vision Paper outlining better services and optimised energy bills for prosumers. Towards a Consumer-Centric System encourages households and industries to directly benefit from advanced energy services via a real-time communication platform, an appropriate market design and digital innovations. This will enable end users to fully exploit their technological investments, optimise their electricity bills and contribute to system balance.

With this Vision Paper Elia Group aims to provide insights and spark the debate on the energy system of the future. Up until now, there is no direct link between consumer’s behaviour in the lower voltage levels and the price signals of the wholesale market. The consumer hardly receives any incentive to respond to the needs of the system that copes with variable renewables and the increasing challenge to keep the balance between energy generation and consumption.

By opening the system to potentially millions of prosumers, we could align the interests of system operators, commercial energy players, and consumers, creating benefits for all parties involved. Consumers get to increase their comfort and optimise their energy bills, commercial players can create value on new services and system operators will benefit from behaviours more aligned with system needs.

In 2019 Elia, in close cooperation with the distribution system operators and 75 market parties from different sectors will participate in an open sandbox environment to test innovative concepts for providing energy services to prosumers. The test phase will run until end-2019.

In 2018, Elia in Belgium already developed I.O. Energy, an initial use case to test the concept of a real-time communication platform. This was done in partnership with Fluinus, Luminus, Evenaards and Scholt.

Chris Peeters – Elia Group CEO

“Digitalisation is one of the key challenges for Elia Group as it is evolving rapidly in other sectors. This creates high expectations within society, wanting to enjoy its benefits in the energy sector as well. Consumers wish to fully use their flexibility and their investments to maximise their comfort and to minimise their energy bills. On the one hand, by deploying their electrical appliances when electricity is at its cheapest, thus contributing to the system by consuming surpluses during off-peak hours. On the other hand, they want to offer their solar generation onto the grid at a time of their choosing.”

“I’m delighted that Elia, as one of the leading TSOs, has come forward with its vision on how to implement what we are currently discussing at a political level. This is exactly what we need; we need to be fast, we need to anticipate, we need to come forward at an early stage with ideas about how to make the electricity market design revolution happen. I’m very grateful that Elia has taken this initiative.”

Klaus-Dieter Borchardt – Director Energy Market European Commission

Elia presented the Vision Paper at its annual Stakeholders’ Day on Friday, 23 November. More than 250 experts from all energy sectors and other industries were present to discuss current and future projects. Scan the code to read the paper.

Elia Group defines 3 key building blocks to make the consumer-centric energy system happen:

01 A real-time communication platform that sends data from millions of digital assets between the end user and the parties (system operators, market parties, clearing houses, etc.) designated by the end user. The data will remain the property of the end user.

02 An upgraded market design in which it is possible to send signals so that end users modify their generation and consumption behaviour in line with market needs. To this end, commercial parties can develop new services that not only enhance end user comfort but also optimise energy bills by boosting the return on prosumers’ technological investments.

03 New digital tools such as Blockchain, the internet of Things (IoT) and artificial intelligence (AI) that help manage complex system operation with more bidirectional electricity flows. Thanks to improved monitoring, analysis and inspection, system operators can better predict expected generation and adjust the supply accordingly. Commercial market parties can better manage their customer portfolio using improved digital tools and offer fully automated energy services that activate the end user’s flexible capacity.
We cooperate to create value for society.

Elia Group’s activities have an impact on the socio-economic development in Belgium and Germany. As a key player in the energy system, Elia Group is committed to continuing an open and transparent dialogue with its various stakeholders. Elia Group takes account of society’s needs and concerns at every stage of its infrastructure projects. We approach our stakeholders with empathy, expertise and integrity.

This means that the company takes its corporate social responsibility very seriously, which includes an active commitment to environmental and climate protection. Elia Group respects flora, fauna and biodiversity, uses natural resources conservatively and keeps the energy consumption and emissions of our activities as low as possible.
“To construct the lines and infrastructure of the future, earlier and more systematic cooperation is necessary. 50Hertz is convinced that stakeholder participation leads to better project outcome. The company aims to involve all stakeholders at a very early stage in the process - far before the project is technically designed. By doing so, we incorporate the input into the various planning stages over the entire lifecycle of the project. 50Hertz grid projects are therefore evolving with the stakeholders. We need to enhance our grid project together! Stakeholder participation - not just acceptance.”

Olivier Feix – Head of Nature Conservation and Permits at 50Hertz

„In 2018, Elia set up a new approach for its large infrastructure projects. A key role is given to the governor of the province in which the project will be realised. The governor gathers representatives of civil society (environmental, economical and agricultural) in order to obtain a preliminary consensus on topics such as ambitions, technology, mitigating measures and corridor. Such a consensus is then used to gather input from mayors and citizens. This approach helps not only to control risks but also offers opportunities for project improvement. Sustainability is also on top of the agenda and a number of projects were introduced to minimise Elia’s ecological footprint and to assist local communities.”

Ilse Tant – Chief Community Relations’ Officer at Elia

**AMBICTIONS**

**Proactive dialogue & stakeholder engagement**

We realise the system of the future through proactive dialogue with a variety of stakeholders during the entire project duration based on mutual respect and empathy to come to the best societal and environmental solutions.

**Our expertise available for the interest of society**

We perform the necessary studies and analyses and act as an advisor to the different governments with regard to the realisation of the energy transition in the interest of society.

**OBJECTIVES**

We continue to conduct a proactive and open dialogue to stimulate participation from our various stakeholders. We are a transparent and trusted advisor for decision makers to create value for society.

"We cooperate to create value for society"
Elia Group is convinced that early involvement with all stakeholders is vital for the success of the energy transition and for the huge projects needed to make it happen. In 2018, the Group continued its efforts to gather valuable input right from the start. Already in the early concept stage, we are working closely with all stakeholders such as local communities, associations, NGOs and various government organisations. We’ve set up several initiatives with input right from the start. Already in the early concept stage, we are working closely with all stakeholders such as local communities, associations, NGOs and various government organisations. We’ve set up several initiatives with input right from the start.

Elia is a leading Belgian grid operator. Its mission is to ensure a reliable power supply for all electricity users. Elia’s day-to-day activities are guided by a strategic framework that aims to maintain and develop an efficient, reliable and innovative transmission and distribution network, that can provide a safe and decent energy supply.

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Tariff Methodology 2020-2023

In the first months of 2018, CREG and Elia consulted each other on the tariff methodology that will apply for the 2020-2023 regulatory period. This consultation led to adjustments in different areas, such as the setting of incentives for the new regulatory period, the way in which the fair margin is determined, the level of adequate gearing, but also different adaptations to reasonableness criteria or the tariff structure. Following consultation, Elia and CREG submitted their proposal for a Tariff Methodology for public consultation. After taking into account the comments made, the CREG definitively approved this Tariff Methodology on 28 June 2018. Elia will have to comply with this Tariff Methodology in order to establish the 2020-2023 Tariff Proposal, on which a public consultation is being held at the end of winter 2019.

In 2018, Elia embarked on a roadshow to seek the opinions of the federal and regional politicians and members of civil society on the large future grid projects which are part of the new federal development plan 2020-2030. The support obtained during the roadshow was the basis to start the permitting preparations for two large projects in the Flanders and Walloon region. In that respect, Elia works closely with the Belgian provincial governors who take a lead role in outlining infrastructure plans to the residents in their region. Governors help build bridges between Elia and the regional interests. They understand the local sensitivities and know the interest of their province.

Elia aims to get to the point of view and explain the drivers in plenty of time, rather than merely consulting each other on the tariff methodology in order to establish a balanced solution based on the input right from the start.

In the political arena, 50Hertz also holds a regular ‘Energy Lunch’ in Berlin whereby it meets with political stakeholders, NGOs and associations. Regarding the Federal State level, 50Hertz is invited regularly to a so-called ‘Ländertreff Netze Nordost’ where representatives of all the Federal States in the 50Hertz grid area discuss the most pressing energy policy challenges with 50Hertz experts. Additionally, the company has about 100 meetings a year with international, national and local politicians, industry representatives or NGOs to provide transparency to specific topics where it is needed and asked for.

“On the one hand there is clearly the overall political and societal drive to achieve the energy transition and the clear legal framework and even pressure to accelerate the required high-voltage grid extension in Germany. On the other hand, however, there are concrete and very personal concerns, that are quite understandable. In this dilemma, 50Hertz believes that dialogue with all stakeholders is the only way forward and the most effective way to finding a balanced solution between these fundamentally opposite viewpoints. This dialogue takes many forms, depending on the stakeholders, but is and always has to be conducted in a respectful and transparent manner.”

Kerstin Maria Rippel – Head of Communications and Public Affairs at 50Hertz

Elia Stakeholder Engagement

Roadshows to help build bridges

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Tailer-made participation using a standardised toolkit

50Hertz has a special toolkit, which incorporates a strategic approach applied to all of its grid projects. The toolkit includes a wide variety of initiatives from town hall meetings, info markets, dialogue tours, workshops, meetings, info campaigns to digital platforms. The participatory tools are enhanced yearly, also thanks to the exchange of experience with other international infrastructure companies and NGOs.

Elia's roadshows to help build bridges between Elia and the regional interests. They understand the local sensitivities and know the interest of their province.

250 guests from all political persuasions attended a parliamentary evening held at 50Hertz headquarters

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Elia’s Stakeholders’ Day 2018

On Friday, 23 November, Elia held the annual Stakeholders’ Day, bringing together more than 250 experts, market players and stakeholders from the energy sector to discuss current and future projects. Two ministers were guest speakers at this event: Alexander De Croo (Belgian Deputy Prime Minister and Federal Minister of Development Cooperation, Digital Agenda, Telecommunications and Postal Services) and Marie Christine Marghem (Belgian Federal Minister of Energy, Environment and Sustainable Development).

Elia’s Users’ Group

The Users’ Group is a consultation body that brings together representatives of various groups such as major consumers, power producers, suppliers and distribution system operators, but also employers’ organizations, power exchanges, public authorities and many more. Elia uses the Users’ Group as a forum for informing and consulting these stakeholders about a range of specific areas connected to the operation of the electricity market.

Moreover, positions on specific issues and recommendations are passed on to the relevant minister(s) and/or regulators.

Elia launched public consultation on the Federal Technical Regulations amendment

On 15 March, after two years of intensive talks with all the market parties involved, Elia launched a formal public consultation for the revision of the Federal Technical Regulations. This is the basis for the legal document that regulates cross-border transactions for the Belgian electricity market. The proposal put forward by Elia is the first thorough review since 2002.

During the consultation period which lasted four weeks, stakeholders have been able to share their views and officially react to previous proposals from different meetings and workshops organized by Elia in the framework of the Users’ Group.

Draft proposal Capacity Remuneration Mechanism

At the end of 2017, Elia published an Adequacy Outlook report concluding that there is a need for investment in new generation capacity in Belgium in light of the planned nuclear phase-out by 2025. Other independent studies came to the same conclusions.

During 2018, upon the Belgian government’s request, Elia, together with the Energy Administration and the CREG, assisted the federal government in working out the high level design principles of a so-called Capacity Remuneration Mechanism (CRM). The aim of a CRM is to outline a framework to provide timely investments in generation capacity (thermal capacity, demand side management etc.) which is necessary to ensure Belgium’s adequacy in 2025 and beyond.

The Belgian government is set to approve the initial CRM design proposal in the first quarter of 2019. Following that the detailed design principles will have to be worked out with all the stakeholders before the design is submitted to the European Commission for validation. The intention, outlined in the draft law, is to have a first auction in 2021. The resulting new capacity has to be delivered by the 2025 deadline.

Enhanced stakeholder dialogue

In 2018, 50Hertz continued to systematically work with local mayors and this has proven to be invaluable. By involving mayors with details of a proposed project first hand and as early as possible, they are enabled to share this knowledge with local residents. This approach greatly supported the process of early participation of citizens and stakeholders and enriched the dialogue.

Elia’s Stakeholders’ Day 2018

“Elia’s Stakeholders’ Day 2018 aftermovie. Watch the 50Hertz stakeholder participation approach in grid development is also very much appreciated by society and politics. 50Hertz treats its stakeholders with respect, shows local presence and that it is handling projects in a sensitive and sustainable way. Ultimately, it is most important to improve our projects by integrating local knowledge. Hence, Public Acceptance is an integrated part of the permitting procedure.”

Danuta Kneipp – Head of Public Participation Combined Grid Solution at 50Hertz
WE COOPERATE TO CREATE VALUE FOR SOCIETY

projects are underway.
municipalities where Elia infrastructure
logical transition initiatives by citizens in
Be Planet to develop and support eco-
working with the public utility foundation
Partnership with Be Planet
work and will be pursued in 2019.
resulted in 46 of the 48 refugees fi nding
climbing. The hugely successful project
power pylons, mast and telecom tower
specialised training courses in painting
In spring 2018, “Rising You” organised
a training scheme for young refugees
For the second year, Elia took part in
employment
Helping refugees fi nd
employment
For the past two years, Elia has been working with the public utility foundation
Partnership with Be Planet
For the past two years, Elia has been working with the public utility foundation

CORPORATE CITIZENSHIP

Helping refugees fi nd employment
For the second year, Elia took part in a training scheme for young refugees called ‘Rising You’ in partnership with the Flemish employment agency VDAB and IRIS Anticorrosion, a company specialising in the condition and maintenance of industrial production sites. In spring 2018, “Rising You” organised specialised training courses in painting power pylons, mast and telecom tower climbing. The hugely successful project resulted in 46 of the 48 refugees finding work and will be pursued in 2019.

Partnership with Be Planet
For the past two years, Elia has been working with the public utility foundation Be Planet to develop and support ecological transition initiatives by citizens in municipalities where Elia infrastructure projects are underway.

On 18 December, Elia, Be Planet and Courcelles municipal council unveiled the winners of the call for projects launched in Courcelles, in the presence of Hainaut’s prefect. The winners were chosen on the merits of their projects promoting the ecological transition and sustainable development. The partners have allocated €30,000 to provide material and/or financial support to four community projects ranging from the safeguarding of bees and biodiversity to promoting local and environmentally-friendly food production.

Fifth-year pupils at the Calmitte community primary school in Frameries were the fi rst to test the new educational kit during a press conference organised at the Pass de Mons scientifi c adventure park, attended by Walloon Minister of Energy Jean-Luc Crucke, Elia CEO Chris Peeters and representatives of Oise and Risa.

SOHertz participatory exhibition is making the energy transition tangible
The participatory exhibition “Turning Energy Together”, developed by SOHertz and the Independent Institute for Environmental Issues (UfU e.V.) at the end of 2012, illustrates various aspects of the energy system transformation in a playful way. The exhibition has been honoured by the German UNESCO Commission as a project of the UN Decade of Education for Sustainable Development. In 2018, more than 1100 school pupils attended the participatory exhibitions.

EDUCATIONAL PROJECTS
Elia gives guest talk on ElectriCITY at primary school in Temse
On October 16, Elia experts gave a guest talk on energy at Holliebeek Free Primary School in Temse. Its pupils saw the progress of the Mercator-Horta project on a daily basis, so this provided an ideal opportunity to give a talk on the subject.

Using the ElectriCITY game that Elia launched last year, the pupils were able to learn about energy in a fun way, including the energy transition and how to cope with the challenges involved in expanding the high-voltage grid.

ElectriCITY is a free educational pack for children aged 10 to 14, which Elia developed in collaboration with the distribution system operators. The pack aims to make young people aware of the importance of electricity and the rational use of energy. In 2018, Elia finalised the German and French versions.

Fifth-year pupils at the Calmitte community primary school in Frameries were the first to test the new educational kit during a press conference organised at the Pass de Mons scientifi c adventure park, attended by Walloon Minister of Energy Jean-Luc Crucke, Elia CEO Chris Peeters and representatives of Oise and Risa.

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Open Site Day: Elia opens doors of Nemo Link conversion station in Bruges
On 6 May 2018, Elia once again participated in Open Site Day, an initiative of the Belgian Construction Confederation. On this day, special building sites are opened to the public. Elia offered one-time access to the Nemo Link conversion station in Bruges, due to be operational in early 2019.

Boarding for offshore wind
With the support of Elia, 800 people enjoyed a free trip to the wind farms in the Belgian North Sea over the weekend of 15 and 16 September 2018. On the way they were given some technical insights that helped them to fully appreciate the experience. The wind turbines now operating are generating enough electricity to meet the annual power needs of 1 million Belgians, and Elia and the Belgian Offshore Platform (BOIP) organised this joint public event to celebrate the milestone. Elia will connect the future wind farms to the Modular Offshore Grid.

At the 4th Renewable Energy Day in Mollkenburg-Vorpommern around 300 interested citizens had the opportunity to get information about the various offshore projects.

" Be Planet’s mission fi ts perfectly with our social role as a grid operator. We are working to ensure a smooth transition to the electricity grid of the future, which will be reliable, sustainable and affordable. This involves cooperating closely with regional and local actors and, where possible, creating win-win situations. Be Planet helps us to connect with local community organisations and work with them to enhance biodiversity and energy efficiency.”

Julian Madani – Project Communication Manager at Elia
Mitigating environmental impact & promoting ecological diversity

Energy infrastructure projects are linked to legal obligations to mitigate and compensate environmental impact. However, Elia Group sees environmental aspects as an opportunity to properly integrate mitigation measures into the planning process and then enter into a collaborative dialogue to work out suitable societal measures with local stakeholders.

IN BELGIUM
Elia signs up for Green Deal Business and Biodiversity
Elia has joined more than 100 companies in signing the Green Deal Business and Biodiversity, an initiative by the Flemish government’s Environment Department encouraging companies to enhance biodiversity on their premises. Elia is committed to implementing additional measures along our high-voltage infrastructure over the next three years.

Creating green corridors under overhead lines 2.0
To ensure our security of supply, safety distances around the electrical conductors of our high-voltage lines must be respected. Unfortunately, this implies regularly cutting down everything that grows below the lines. In 2011, Elia set up the Life+ project in collaboration with RTE, and funded by the European Commission and the Walloon Region, to try and find solutions that ensure safety distances, whilst preserving biodiversity.

This seven-year project was hugely successful and we managed to transform 130 km of forest corridors into fully-flanked ‘ecological corridors’. Instead of cutting down trees and shredding vegetation, Elia now plants small trees, creates ponds or brings in sheep to graze the vegetation naturally. This method presents no risk to the grid or wildlife and encourages local fauna and flora, which are gradually reclaiming the land.

Decisions were always taken in consultation with owners, farmers, hunting clubs, municipalities and administrations, and long-term agreements were concluded.

In view of these positive results, Elia decided to launch a five-year follow-up project, LIFE 2, but this time without any external funding.

Installing bird markers
In 2015, a joint study by Elia, Natuurpunt, Natagora, Vogelbescherming Vlaanderen and the Flemish Institute for Nature and Forest Research (INBO) found that 3.4 percent of Elia’s network of overhead lines was hazardous to birds. This is because some high-voltage lines are almost invisible to flying birds. Based on precise mapping of the areas most at risk, Elia drew up an action plan to reduce the risk of bird mortality by installing bird markers. These spring-like devices are fitted on the lines and reduce the risk of collision considerably. Since 2016, we have installed bird markers on more than 26 km of lines.

Installing nest boxes on our facilities
Elia places nest boxes on some of its facilities to provide secure nesting places to help preserve endangered species. The birds’ natural nesting periods are taken into consideration when installing these boxes. Over the past 17 years, Elia has set up no fewer than 56 nesting boxes for protected bird species, including kestrels, peregrine falcons and tawny owls. Some of these nest boxes are very successful, for example as many as 42 peregrine falcons have been hatched in the nest box in Schelle since 2002.

For an overview of all compensation measures taken by Elia and 50Hertz please consult the Elia Group Sustainability Report 2018.
IN GERMANY

710 Compensation measures

50Hertz pursues the principle of minimising the impact on nature and limiting biological diversity. Whenever interference with the environment cannot be avoided, 50Hertz implements compensation measures. In 2018, 710 compensation measures were implemented.

Southwest interconnector: Important biotope secured

The Kaiserwiese is home to many protected plants and insects. 50Hertz supports the conservation of the site, which is under the protection of the European Flora Fauna Habitat Directive. After the Second World War, it was a military drop zone for air craft bombs. The necessary annual mowing in autumn was only possible under stringent safety precautions and high expenditure. For years, the head of the Lower Nature Conservation Authority had tried in vain to organise the necessary care for the important habitat of native plants and insects.

Now in summer, the gladiola is in full bloom. Swarms of butterflies, including very rare species, indicate that the measures have been successfully implemented. The management plan for future care is still being worked on. The time for mowing in autumn, for example, must be well chosen in order to take rare insects into consideration.

Large biodiversity projects and ecopool partnerships

2018 has been the year where 50Hertz has worked out a long-term ecological approach to foster the development of ecopools in its region through offering multi-annual partnerships. Such ecopools can combine multiple ecological dimensions to enrich ecosystems with fauna and flora. Against the background of the offshore development on the coastal region of Mecklenburg-Western Pomerania, 50Hertz has paid a lot of attention to developing maritime projects such as the removal of a large artificial dam in the Baltic Sea which was blocking the way water was flowing, leading to a build-up of harmful siltation. 50Hertz also initiated the development of a concept to reconstruct reefs in the Baltic Sea region with WWF.

Ecological aisle management

In order to accommodate an overhead power line in forest areas, aisles are usually built. Due to the necessary safety distances, the construction requires sufficient clearance to the sides and to the ground. Trees must therefore be removed regularly in sections along the corridors. However, trees and shrubs provide habitats for numerous animals and plants. Therefore, the goal of 50Hertz is to impair these natural spaces as little as possible in the long term and to increase biodiversity under the overhead lines.

In the course of the project, a biologically diverse and valuable aisle develops. German authorities demand that ecological aisle management has to be realised in new construction projects. 50Hertz adheres to these demands and also uses ecological aisle management on existing terrains on a voluntary basis.

Improving the birds’ protection line

High voltage lines can have an adverse effect on birds. Besides concrete actions to support bird species (such as special nests on pylons, aviaries for birds of prey), in 2018, 50Hertz installed additional bird protection markers along specially chosen sections of the existing grid. In the frame of the Renewables Grid Initiative, the company further improved a project conducted by Naturschutz Deutschland e. V. to set up a national “Vogelfund und Stromleitung” hotline (bird finds and power lines hotline). This pioneering initiative – which is the first bird find hotline ever – provides the opportunity to systematically assemble precise information about the impact lines have on birds.

EXAMPLES OF COMPENSATION MEASURES

- PLANTING
  - Planting tree aisles and rows, hedges, orchards

- FORESTRY
  - Forest restructuring, first afforestation

- DEMOLITION
  - Unsealing, demolition of buildings in community outdoor areas

- OTHERS
  - Cabling medium voltage lines

- HYDRAULIC ENGINEERING
  - Pond renaturation, restoring straightened rivers to their original condition, creating small bodies of water, renaturation of flowing and still bodies of water

- SPECIES PROTECTION
  - Building amphibian protection facilities, nesting aids, bat habitats, reptile habitats, species protection towers
2018 was a particularly important year for Elia Group because of the change in shareholdership. By further joining forces, Elia and 50Hertz will play an important role in positioning Elia Group as a strong brand in the European labour market. We are well aware that the success of Elia Group relies on the achievements and engagement of our people.

We want to attract the brightest talents by being the leading Group of TSOs in Europe guaranteeing equal opportunities for all. We want to help our employees to develop their skills to create a high-performance organisation that empowers people to take more initiatives.

By establishing a corporate group culture with strong safety and sustainability awareness, Elia Group will positively face the challenges of tomorrow.

We align culture with strategy.
“Elia Group is an ambitious company that operates in a fast changing sector. To be able to maintain our key role in this dynamic environment, we are strongly committed to innovation and cooperation across departments. We also strive towards a company culture of permanent feedback. By giving feedback in a constructive way, we support each other in our daily tasks. This is essential for a modern and agile company that wants to respond quickly to trends both within and beyond company boundaries.”

Peter Michiels - Chief Human Resources and Internal Communication Officer at Elia

OBJECTIVES

We want to implement a corporate group culture that puts safety and sustainability at the centre of our activities and leverages the full potential of our talents to establish a high performance organisation.

AMBITIONS

Putting safety first

As a Group, we constantly invest in safety and expect our staff (both in the field and at administrative sites), subcontractors, colleagues, the distribution system operators, and all others to work safely and responsibly at all times.

Growing our talents

Elia Group analyses the available and required talent within its organisation to identify possible talent gaps. We are committed to continuously develop talent by providing individual growth opportunities. Additionally, we stimulate diversity in the composition of our teams and strongly condemn any discriminatory acts in the work environment.

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A culture based on feedback

In order to ensure excellent performance at work, we encourage an open feedback culture, which outlines our expectations regarding competencies and behaviours. From these dialogues, we derive consequences to keep performance at a high level.

Making sustainability part of our DNA

Elia Group wants to play a central role in the sector and create value for all stakeholders. That is why we consider sustainability in all aspects of our business.

OUR ASPIRATIONAL VALUES

In a changing energy sector, four aspirational values are key to achieving Elia Group’s strategy. They are reflected in the behaviour and attitude of our staff.

We are entrepreneurial

Our staff work proactively and take initiatives with a view to improving how they work and exploring new ways of doing things.

We collaborate

Elia Group values collaboration, both within the company and with external partners. Our staff share their expertise and their information and question each other, thus enabling their ideas to mature. They seek fruitful collaborations and win-win partnerships.

We are accountable

All of our staff take full responsibility for their projects and tasks. They achieve their motivating, ambitious targets and work hard on their projects until they are completed.

We are agile

In a world of constant change, our staff embrace new developments, are proactive and persevere.

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We are agile

In a world of constant change, our staff embrace new developments, are proactive and persevere.

“Elia Group is an ambitious company that operates in a fast changing sector. To be able to maintain our key role in this dynamic environment, we are strongly committed to innovation and cooperation across departments. We also strive towards a company culture of permanent feedback. By giving feedback in a constructive way, we support each other in our daily tasks. This is essential for a modern and agile company that wants to respond quickly to trends both within and beyond company boundaries.”

Peter Michiels - Chief Human Resources and Internal Communication Officer at Elia

“Putting safety first”

As a Group, we constantly invest in safety and expect our staff (both in the field and at administrative sites), subcontractors, colleagues, the distribution system operators, and all others to work safely and responsibly at all times.

“Growing our talents”

Elia Group analyses the available and required talent within its organisation to identify possible talent gaps. We are committed to continuously develop talent by providing individual growth opportunities. Additionally, we stimulate diversity in the composition of our teams and strongly condemn any discriminatory acts in the work environment.

“A culture based on feedback”

In order to ensure excellent performance at work, we encourage an open feedback culture, which outlines our expectations regarding competencies and behaviours. From these dialogues, we derive consequences to keep performance at a high level.

“Making sustainability part of our DNA”

Elia Group wants to play a central role in the sector and create value for all stakeholders. That is why we consider sustainability in all aspects of our business.

“In 2018, 50Hertz continued to set the course for future sustainable development by addressing a number of factors such as the regulatory setting, empowerment measures and also the further development of the Environment Social Governance (ESG) framework. This had an influence on the company’s strategy and several measures have been included in its new business plan. We are keen to see sustainability becoming a part of the company’s DNA, and consequently wants to see standards firmly embedded in the culture of the company. Sustainability is a vital consideration in all aspects of the business but particularly when it comes to those at the heart of the company – the employees.”

Marco Nix - Chief Financial Officer at 50Hertz
Safety always comes first

Safety is a critical part of our corporate culture. Elia Group aims to develop a genuine safety culture, pursued by each and every person and department within the company. Right from day one, our employees are given thorough safety training to ensure that they respect their own safety and that of their fellow workers and the environment at all times. In addition, we have a special focus on the safety of the subcontractors and third parties that work alongside us.

IN BELGIUM

GO FOR ZERO safety programme

GO FOR ZERO is a company-wide initiative and includes all projects that aim to optimise the safety culture within Elia. Our primary objective is for anyone who works on or near our facilities to return safe and sound every day. We firmly believe that excelling in this area is a prerequisite for operational excellence.

The People & Technical Skills project aims to catalogue the technical and behavioural skills within Elia, then develop training paths to enhance these Elia skills.

Elia shares many values with DSOs and its colleagues in the distribution sector. In view of this fact, Elia and its colleagues in the distribution sector decided to launch a project to enhance safety.

In response to the energy transition, Elia is undertaking the most ambitious investment programme in its history. In cooperation with its contractors, Elia is striving to ensure that they too, have optimal safety and zero accidents.

Elia Group believes that the safety culture is not about more procedures, but about aligning people’s behaviour. Everyone needs to be a ‘safety leader’. If they see anything unsafe, they must stop the work and give their colleague feedback. Work shouldn’t restart until the work is deemed safe again. This ‘stop work’ authority was presented during the Make a Difference Roadshow throughout the year.

In Germany, an initiative rolled out whereby all leaders are asked to be role models and speak with one voice. An internal HR team assembled and explained this new behaviour and culture in every team meeting.”

Stéphane Otto – Head of Health and Safety at Elia

“50Hertz’s main priority is that its employees have a safe and healthy working environment. A big campaign was conducted during 2018 highlighting best safety practices. At the various touchpoints of the different target groups there was information and instruction that was directly tailored to the respective group. These ranged from a broad programme to spotlight lessons learnt about ‘near misses’ or if they have an idea about how safety can be improved to a HQ sticker and poster campaign to inform staff members about potentially dangerous practices. Although 50Hertz and Elia have their own well-established safety programmes in place, one thing is clear – the two companies have the same vision and are striving to reach the same goals. By exchanging best practices we can learn from each other and support each other in reaching our goals.”

Thorsten Schröder – Head of Health and Safety at 50Hertz
IN GERMANY

Gib8 - Safety Programme

In March 2018, 50Hertz introduced the ‘Gib8’ programme, which concerns safety at both project sites and at its offices. But the high 50Hertz standards also apply to contractors working on the 50Hertz construction sites. Therefore, in addition to employees there was a particular focus on suppliers and subcontractors. And if suppliers fail to decrease the levels of safety incidents, 50Hertz is uncompromising – they will either be excluded from the next tender or banned completely from participating in the future. Additionally, suppliers are obliged to have certain sustainability management procedures and high safety requirements in place.

Overall, 50Hertz is pleased to see that suppliers have been happy to jump on board with the programme and this is having a positive impact. A very good example is offshore, although working in a highly challenging environment – where all the electrical cabling works for Ostwind 1 offshore wind farm were completed ahead of schedule - the number of incidents was drastically reduced by nearly 50 percent.

Ongoing training and awareness raising

The employees working in the substations and in the field are instructed six times a year, those working in the offices once a year. In addition an occupational safety competition is held on a yearly basis to further sensitize and motivate the workforce. On the one hand, the accident figures of the individual sites of the previous year are taken into account, and on the other hand, knowledge of occupational safety is reviewed.

ELIA’S SAFETY WEEKS

Each year, Elia organises Safety Weeks for its staff in May and September in an effort to raise awareness about the importance of safety. The programme included various communications, training sessions and team exercises, designed to ensure that everyone got involved and took the messages on board. In May 2018, the spotlight was on non-negotiables, i.e. behaviours that we no longer wish to see in the company. In September, we focused on “Safety on the road”.

At Elia Group, we are committed to ensure that everyone returns home safely every day. This includes our employees, our contractors and anyone working in the vicinity of our installations. Together we go for Zero Accidents, resulting in a Safe Today and a Safe Tomorrow. We aim to achieve these goals by cultivating the right skills, focusing on good operational dialogue between all teams and continuous improvement.”

Walter Geelen – Head of Maintenance & Commissioning South at Elia

Awareness campaign highlighting the dangers of Elia facilities

In 2018, Elia relaunched its safety campaign for third parties who work on or near our facilities. By raising awareness about the different risks concerned with working near electrical infrastructure, we hope to limit the number of incidents. Despite our continuous efforts, three fatal accidents occurred this year involving third parties and subcontractors. This has caused Elia to stress the importance of safety measures even further and campaigns will continue to run in 2019.

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Cultural change

In 2018, the main focus for HR was establishing a common ground for a closer collaboration. Both companies have strong local footprints and solid business cultures. Today, we are developing a common, integrated way of working that will transform us into one multinational Group with more than 2,400 employees.

Building the Elia Group

We have started a joint project to intensify the collaboration between Elia and 50Hertz. With this initiative, we are investigating how the two companies can work more closely together to create added value, increase our joint expertise and build new standards of excellence. Twelve work streams have been identified where we can exchange knowledge about the most important issues affecting the two companies and where improvements or efficiencies can be gained—ultimately in the interest of society. This will help us achieve our ambitions and strengthen our position as a leading TSO group in Europe.

CO-CREATION

Implementing change
Following on from the Employee Survey ‘Sag es!’ (Say it!) in 2017, 50Hertz is keen to encourage more employee participation and, in turn, more empowerment. In order to tackle the key issues raised in the survey, discussions were held at various departments and the results were translated into solutions.

In another follow-up from the 50Hertz survey, a Management Conference was held where 100 managers outlined the measures they had put in place based on the results of the Survey. One key finding was the need to enhance cooperation between different departments and many managers implemented changes to improve this.

Make A Difference—culture based on feedback
At the start of 2018, Elia gave new impetus to the project around our corporate culture by introducing ‘Make A Difference’ (MAD), an overarching programme of initiatives to help our employees to literally make a difference at work.

One of these initiatives is developing a corporate culture of continuous improvement, in which feedback becomes a regular practice for everyone. We regard sincere, respectful and regular feedback as a tool to help colleagues improve their actions, tasks and attitudes.

“The intensified collaboration between Elia and 50Hertz offers our employees more personal development opportunities in an international context. It allows for intercultural exchange between colleagues and encourages further knowledge sharing. We are currently working on Group-wide excellent safety standards, for example.”

Barbara Verhaegen—Head of Internal Communication at Elia

“Many companies may carry out surveys but they don’t always lead to change. 50Hertz in contrast, aims to implement the changes and improvements suggested by the employees. Improving communication throughout the company is a broad-based initiative.”

Julia Persitzsky—Head of Learning & Development at 50Hertz

ELIA’S FEEDBACK CULTURE IS BASED ON 4 GOLDEN RULES:

01 Be honest and respectful
02 Show appreciation & be constructive
03 Be specific
04 Do it at the appropriate time
Growing our talents

Elia Group has set up several initiatives to combine the best practices of Elia and 50Hertz. The two companies are aiming to build a ‘talent ecosystem’ which will allow them to incorporate new skills such as digital expertise. We want to make sure that we have the right people on board to build the energy system of the future. A common framework is being established to allow talent to flow freely within the organisation.

EXCHANGING EXPERIENCES

Elia Group Management Days

In 2018, Elia and 50Hertz continued to hold the annual Elia Group Management Days where 80 managers came once again together to informally exchange information and to continue working on a common culture.

Elia & 50Hertz colleagues exchange best practices on Data Management

On November 7, several colleagues from 50Hertz and Elia met at the headquarters of 50Hertz in Berlin to discuss topics such as customer management, metering and transparency of data. Both companies use similar technical and IT solutions, and often face the same challenges. By working more closely together, we are able to exchange best practices and help each other overcome hurdles.

Deep dive into Combined Grid Solutions project

Improving risk management, increasing transparency and optimising the timing of our projects are just some of the objectives of the collaboration project. To underline the importance of efficient collaboration, our CEO Chris Peeters and our CFO Catherine Vandenborre visited the Bentwisch high voltage substation to meet with the teams working on the interconnection project Combined Grid Solution (CGS).

The 50Hertz team and representatives of the project partner energinet.dk gave a detailed overview of the challenges, roles and responsibilities concerning risk and supplier management during the construction of the submarine electricity cable between Germany and Denmark. Chris and Catherine also met with ABB, the construction partner for this project.

Growing our talents

Elia Group has revamped the way it exchanges talent between Belgium and Germany.

In the past, there had been a number of one-offs regarding talent exchange for longer term assignments, but now there are many more opportunities for exchanges of three to six months, to enable the best people and best practices to be in place for projects.

“For the first time, HR is advertising job vacancies in both countries and many people have taken up the opportunity. For example, an offshore team member in Belgium has moved to Germany to work in procurement and a German employee, previously working offshore in the Baltic Sea has moved to an interconnector project in Scandinavia. Another 50Hertz employee has switched to the customer relationships’ department in Belgium.”

Dr. Andreas Holleczek - Recruiting Officer at 50Hertz
For Elia Group, environmental protection and conservation of resources is an integral part of our culture and strategy. Elia and 50Hertz are working on a joint sustainability reporting platform - the standards of the Global Reporting Initiative (GRI). This has broadened the Group’s view of sustainability. It is no longer simply thinking about planting some trees to mitigate any environmental disturbance; but it is taking a much wider perspective and a deeper approach.

“Acting sustainably”

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Trainees working with NGOs

Proactive dialogue is part of our sustainable culture and that is why a key part of the traineeship is to work within an NGO to gain a better understanding of their point of view. 50Hertz expects its young- sters to have an understanding of projects from all angles, and all trainees, no matter where they are working in the company are obliged to work at an NGO.

In partnership with suppliers

The close partnership with suppliers is reflected in our supplier agreements, which cover not only occupational health and safety, but also quality management and environmental concerns. The first steps have also been taken to identify and manage human rights duties of care in the supply chain.

Elia Employee initiatives

Elia aims to be a sustainable and responsible company. To achieve that goal we work hard to reduce our ecological footprint both from the top down and bottom up. In 2018, a group of employees launched the ‘ambassadorship initiative’, in collaboration with Elia’s Environment & CSR department. More than 50 colleagues volunteer to tackle sustainable development issues. They share their ideas on Jive, Elia’s community platform, and meet on a monthly basis to share ideas and to plan actions.

The first theme is ‘food’ and the current actions concern battling food waste, introducing more local products and having a social impact.

Elia’s Annual Report wins a sustainability award

The Elia Annual Report 2017 won the ‘Best First Sustainability Report’ Award in the category ‘First Year Reporting’ at the 2018 edition of the Awards for Best Belgian Sustainability Reports. Elia Community Relations Officer Ilse Tant collected the prize on the company’s behalf from Thierry Dupont, President of the Belgian Institute of Registered Auditors. These awards are a Belgian Institute of Registered Auditors’ initiative aimed at encouraging companies to report on sustainable development and they recognise the importance of transparent communication with stakeholders.

“In 2018 we further improved our ESG rating, this might be a tiny event in the grand scheme of things but all of these small steps are reflected in our purchase price, and our share value. There is a lot of acknowledgement of these soft factors. We get good results and have a solid cash flow, which enables us to perform all of our ambitious projects, and without having to approach the external market! This all signifies that we are professional, and can be trusted to do what we promise.”

Marco Nix – Chief Financial Officer at 50Hertz
Identified opportunities are examined in depth and proof tested to prepare Elia Group for the next generation of state-of-the-art technologies. Once testing has proven the efficiency of the technology, the innovative initiative is effectively incorporated into our daily practices.

As well as continuing to integrate innovative technologies, we stay abreast of the latest developments in the energy sector. We see this as an opportunity and want to play a pioneering role. Elia Group has a range of initiatives that foster and reward innovative thinking, to ensure that our employees remain at the forefront of new developments.

In a rapidly changing energy landscape, innovation plays a key role in understanding, anticipating and promptly adopting the changes needed to ensure the transition towards a more reliable, affordable and efficient energy system. We continue to innovate in our industry, so the power sector can evolve and benefit society now and in the future.

We have our eyes wide open for innovation & growth opportunities.
"Currently, we distinguish four major trends that are driving the transformation of the energy landscape: big EU renewable power flows, renewable generation and decentralisation. Digitalisation is the motor behind all these trends and together, they will lead to the emergence of disruptive power markets and business models. It is up to us to anticipate the potential impact on our activities and to innovate with the market."

Menno Janssens – Head of Innovation at Elia

AMBITIONS

Excelling in managing assets
Renewable energy integration and increased interconnection demand more of our infrastructure. The adoption of new technologies allows Elia Group to improve the use of our assets in many ways providing increased capacity, higher efficiency and more reliability.

Developing and managing tomorrow’s electricity grid
Elia Group expands and optimises the grid according to society’s needs. We cope with the increase of renewable energy and progressive decentralised generation.

Continuing to be a pioneer in market facilitation
Elia Group designs an efficient and transparent electricity market to ensure a smooth transition to a sustainable, affordable, and integrated European market. Elia Group continuously collaborates with different stakeholders so the market can be adapted in line with the evolving needs of increasing flexibility on the balancing market.

Open innovation through collaboration
In a world of widely distributed knowledge, Elia Group has decided to go for open innovation. We cannot rely entirely on our own ideas and expertise to advance our technology. Buying or licensing processes or inventions from other companies, like start-ups, also makes a valuable contribution.

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In 2017, the new German coalition government stated that the German energy mix should be made up from 65 percent renewable sources by 2030. This means that additional transmission capacity is needed, which would be the equivalent gigawatts of three, huge, HVDC overhead lines.

We believe this is not going to be practicable because it will never gain public acceptance and there is simply not enough space to accommodate these huge lines. Additionally, the impact they have on the environment would be unwelcome.

It is our responsibility to manage the grid challenges and grid expansion intelligently by way of innovation. Therefore, it is the TSOs challenge to reduce the additional need for overhead lines – hence the need for grid innovation.”

Nadja Ballauf – Head of Corporate Development at 50Hertz

OBJECTIVES

We create a culture of innovation and entrepreneurship to accelerate the energy transition. We build an ecosystem to develop the tools and methods that will enable a more digital, decentralised and sustainable energy system.

Learn more about how digitalisation is driving the transformation of the energy sector.

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Nadja Ballauf – Head of Corporate Development at 50Hertz
Excelling in managing assets

“Moving forward with testing shared air space for new usage is extremely interesting for the industry. As a utility company owning a large and critical infrastructure, being able to use unmanned aircraft for our activities enables us to ensure a reliable and affordable operation of the grid in all circumstances.”

Johan Maricq – Innovation Project Leader at Elia

U-space drone demonstrations in Belgium

The Safe and Flexible Integration of Initial U-space Services in a Real Environment (SAFEIR) consortium consists of 13 public and private organisations that have been selected by Single European Sky ATM Research Joint Undertaking (SESAR JU). As a member of the SAFEIR consortium, Elia wants to contribute to the regulatory process for drones and drive forward the deployment of interoperable, harmonised and standardised drone services across Europe. These demonstrations include high voltage line mapping and pylon inspection.

For Elia, the use of drones will reduce the safety risks faced by its employees during inspections. Flexibility and efficiency would also improve, helping Elia to keep grid management costs under control.

PROOF OF CONCEPT USING DRONE INSPECTIONS AND ARTIFICIAL INTELLIGENCE

Elia is currently testing two aspects on how drone technologies can improve the quality and efficiency of the inspection of overhead lines and the hereby avoid risk for our employees and colleagues.

• Generation of an auto flight plan: At present, a drone pilot needs to carefully operate the drone around the infrastructure while someone else is taking pictures from the camera attached to the drone. With this project, an application will automatically control the drone around the pylon and will take pictures at fixed positions, with fixed angles.

• Post-processing of the collected pictures: As mentioned above, inspections of our lines generate a number of pictures. To facilitate all this data as well as optimising its potential use, new post-processing techniques and data management systems will be needed. One of the most promising techniques available today is the use of Artificial Intelligence to automatically recognise defects.

Testing high-temperature low sag conductors

One longer-term project concerns higher utilisation of the existing grid through high-temperature low sag conductors (HTLS). Conventional overhead lines heat up. The more electricity flowing through the lines, the hotter they get and this can lead to lines sagging. If they sag too much we are not allowed to operate them.

To combat this problem, Elia and 50Hertz are aiming to introduce new conductors, which can cope with a higher flow of electricity. Eight new conductors have been developed by different producers and have been put through a one-year rigorous testing period. Twenty years of operations were simulated in just a year. We will now decide which high temperature conductors are suitable for future projects.

Satellite supported vegetation analysis

50Hertz is currently working with a Berlin-based company on a project exploring satellite-supported vegetation analysis, which will help 50Hertz manage the pylon aisles in a more ecological way. Ultimately rather than sending out a technician analysing the necessity of cutting branches away from pylons the growth of branches can be monitored by satellite. As a result, 50Hertz can proactively manage its pylon aisles.

Virtual reality boosts safety

Always on the lookout for new technologies, Elia studied the benefits of virtual reality in our daily activities. Following the conception workshop in 2017, Elia initiated the Sarqa VR project.

Sarqa VR aims to provide a preparation of on-site interventions. By virtually accessing high voltage substations, our colleagues in the field are able to apply the necessary demarcations of each Work Order and to identify the potential risks in connection with their intervention.

During this preparation, they can observe whether the safety zones are respected and avoid conflicts with other planned or ongoing works. A ‘validator’ mode is also included making it possible for a safety officer to validate their preparatory work. This tool could also be used for training new employees.

Advantages:

• Anticipating problems and visualising them within their context;
• Digitising the documentation regarding the preparation of the interventions;
• Specifying the preparation of the intervention;
• Placing elements such as service vehicles to see whether these do not enter the safety zones etc.

“Experience how we integrate Virtual Reality.”

Discover how Elia is using drones and AI in its daily activities.

Wilhelm Kiewitt – Specialist Corporate Development at 50Hertz
Developing and managing tomorrow’s electricity grid

compactLine
CA - EUS - DMA - STAKEHOLDER PARTICIPATION
The practical test phase of the compactLine pilot project which focuses on the increasing acceptance for 380 kV overhead lines, got underway in August 2018. The new pylon is much shorter compared to the traditional Danube pylon which reaches typical heights of 50-60 m. Additionally, due to decreased sag of conductor bundles, the compactLine technology uses less space than conventional overhead line systems in the overhead line corridor.

For this project, 50Hertz is working with the German Ministry of Economics, universities and industry partners. Issues such as new maintenance procedures and public acceptance are all being considered. New components like insulators and devices also had to be developed. All the various stakeholders, especially the local community and NGOs (for example NABU and WWF), have been closely involved right from the start of the project.

Insulated arms for Stevin
Two new technologies were commissioned in connection with the Stevin project in Belgium. Insulating arms were fitted to compact pylons to replace an existing 150 kV line. Transforming pylons in this way made it possible to increase the voltage level to 380 kV without having to increase the height of the new pylons. High-temperature low sag (HTLS) conductors - which reduce the effects of sag when the temperature on the line is high – now make it possible to increase power on the new 380 kV lines.

Flexibility platform in the WindNODE project
CA - EUS - DMA - DEMAND-SIDE MANAGEMENT PROGRAMMES
The ‘Flexibility Platform’ helps improve the integration of more renewables into the grid, reducing costs and leading to reductions in CO2 emissions. The ‘Flexibility Platform’ is a digital purchasing platform to reduce wind farm cutbacks in the situation when there is grid congestion. In these critical situations some wind farms have to be cut off from the grid and a decision has to be taken concerning which ones need to be temporarily shut down. And this also means that green, renewable energy is being shut off, rather than coal-fired energy etc. Additionally, when the wind farms are closed off, it is still necessary to find another producer – typically these have been producers in Southern Europe, operating conventional energy plants.

The new platform makes it possible to coordinate as many market players as possible - from the distribution grid operator via retail with its cooling systems and large-scale consumers to decentralised producers. This project highlights a very strong cooperation between 50Hertz and the DSOs. Flexibility Platform looks to make maximum utilisation of flexibilities from many different sources.

Four industrial plants in Berlin, with processes ranging from around 50 kilowatts to 4 megawatts, are involved in the platform, as is a nationwide supermarket chain, which is also making its flexibilities available. Fifty logistics locations and 3,800 branches throughout Germany can lower the temperatures much more dramatically when plenty of sun and wind energy is available. So called virtual power plants (bundling of decentralised generation and consumption plants) are also integrated into the project to avoid the congestion.

50Hertz is very proud to be the consortium leader and to bring more than 70 market players together to reach the test phase of the new platform. The first results of the test phase are expected to be available in Q2 2019.

"The construction of the compactLine using a completely new overhead line design poses a wide variety of challenges for everyone involved. Before we can test the safe operation of the new line, many new developments had to be implemented in the field for the first time. For example, the new line tensioning system required not only special fittings due to the high tensile forces, but also adapted installation equipment for the line."

Joachim Löbe - Head of Line Projects at 50Hertz
Continuing to be a pioneer in market facilitation

"Wind always has priority. I.e. if more wind is blowing than forecasted or any equipment of the interconnector trips, the market must be corrected in a way that the schedule for the border meets the capacity which is physically available. i.e. corresponding countertrades must be initiated directly on the energy market. Furthermore, the physical flow has to meet the schedule even under fluctuating wind conditions. The interconnector is virtually a weak, three-phase system, so that we also have major challenges with voltage stability, which are caused among other things by the strongly fluctuating power flows. In addition, the market will have to be notified of free transmission capacities at short notice. We are solving these and other challenges with the first fully automated system operation tool which is part of our control centre, the Master Controller for Interconnector Operation (MIO). A unique tool for a unique project."

Dr. Anne Katrijn Marten – Head of Concepts and Analysis at 50Hertz

Outcomes from the first use case are expected in early 2019. In view of expanding the ecosystem to include more players during the course of the year, market parties willing to take part had to sign up before mid-February. To allow as many market parties as possible, a test environment (sandbox) will be set up before mid-2019 where new and existing concepts can be tested and assessed in preparation for being scaled up at a later stage.

The fully-automated system of Mastercontroller for Interconnector Operation (MIO) includes:

- Calculation of potential power exchange between Germany and Denmark, which are used to determine the power exchange schedule
- Voltage regulation
- Avoidance of equipment overloads
- Enables 100 percent utilisation of operating resources

Real-time control of the interconnector, the feed-in of the wind farms and preservation of the priority in-feed

Elia launched a pilot project to analyse possible applications of Blockchain technology in the energy sector. The increase in renewable energy generation is making it increasingly difficult for transmission system operators to guarantee that generation and consumption are balanced at all times. Power generation from renewables fluctuates constantly, so flexible reserves that can be activated swiftly (like batteries, demand management via heat pumps, etc.) are needed to ensure a steady balance. Elia is exploring the opportunities offered by Blockchain technology as a payment system to address the business side of such complex, rapid transactions. The pilot project, conducted together with SettleMint and Actility, lasted three months.

Blockchain is a distributed, digital transaction technology that enables secure data storage and makes it possible to execute smart contracts in peer-to-peer networks. Its intrinsic characteristics (it is unalterable, transparent and secure) also make it easier to automate contract execution.

Since the technology’s capabilities are steadily expanding across the time, Blockchain and smart contracts could help to manage multiple sources of flexibility automatically. In future, this technology could profoundly change how the energy sector operates by being applied to different levels of the market (short-term requirements, ancillary services, and so on).
Open Innovation through collaboration

Elia Group Innovation Days

On 12 November, 50Hertz hosted the sixth edition of the Innovation Day at its headquarters in Berlin. During this event, both 50Hertz and Elia colleagues presented their innovative projects. On December 7th, Elia hosted its fourth Initiative Fair. More than 200 curious colleagues attended the event to discover the various initiatives within the Elia Group.

Open innovation challenge

For the second time, Elia Group hosted the Open Innovation Challenge in Brussels. With this international start-up competition we want to develop innovative solutions to improve the quality of consumption and generation forecasts. Any start-up linked to Big Data, blockchain and AI, predictive analysis, or renewable energy could take part in this Elia Group Start-up Challenge to try and win a proof-of-concept worth €20,000.

Of the five finalists, PowerMarket convinced the jury with its solution that detects solar panels and improves solar generation prognoses. By using both satellite images and artificial intelligence, PowerMarket can very accurately identify the exact location of solar panels and their installed capacities. These valuable data can then be combined with meteorological data to estimate solar energy for every hour and every day of the year. Accurate forecasting reduces the need to activate reserves and, as a result, prevents activation costs. Elia and PowerMarket will spend three months testing the concept to demonstrate the effectiveness of this innovative solution for forecasting solar generation.

50Hertz also believes it is important to remain agile and open to fresh ideas. Besides drawing on its years of experience, we collaborate with start-ups that approach the traditional energy market from a different viewpoint. Currently, 50Hertz is working on a project to investigate how it can improve weather forecasts and grid forecasting with the help of artificial intelligence.

Hack Belgium

This year, Elia participated in the second edition of Hack Belgium. The event brought together experts from various sectors, entrepreneurs and other enthusiastic and talented individuals to develop innovative ideas that will benefit Belgian society.

By participating, Elia demonstrates its commitment to taking innovative and socially responsible action on behalf of the energy transition and Belgium’s future. This also allows Elia’s employees to cultivate the entrepreneurial and innovative mindset that is so important to the company’s future.

InnoDC consortium

The increasing integration of HVDC and renewable energy has transformed the grid and our understanding of it. These changes are challenging the operation of power systems. It is Elia’s responsibility to guarantee the safe and reliable operation of the system, which makes it fundamental to understand what the impact of these new scenarios is and how to face the new challenges.

That is why we decided to join InnoDC, a consortium of 14 partners from industry, academia and the third sector offering a development path to researchers across Europe in the area of offshore wind and Direct Current (DC) grids. Funded by the European Commission’s Horizon 2020 programme, 15 early stage researchers enrolled at the partner universities will receive training about offshore wind power and DC grids, preparing them for their role in the energy transition.

At Elia, an early stage researcher will be working on determining what modelling approaches and software tools are needed to study power systems with a high penetration of power electronic devices. This allows us to better grasp existing software tools and suggest improvements. The research focuses on how to accurately model the components of the power system and to assess what level of modelling detail is really needed for different types of system studies with this new technology.
The Elia share in 2018

ELIA ON THE STOCK EXCHANGE

Another strong performance of the Elia share, hitting a new record high in 2018. The year ended at a price of €58.30, c. 21.7% higher than the Elia share price, closing the year at a price of €47.90 at the end of 2017. The lowest price in 2018 of €46.90 was reached on 9 February, while the highest price was €62.70 on 10 December.

The Elia Group achieved strong financial performance in 2018 supported by the acquisition of an additional 20% stake in Eurogrid International. Fuelled by strong intermediary results, the full control and consolidation of Eurogrid and the realisation of strategic investments in the interest of society, shareholder confidence further increased in 2018. This was also reflected in the strong performance of the Elia share price, closing the year at a price of €38.50, up 27% from €30.25 at the end of 2017. The lowest price in 2018 of €26.90 was reached on 9 February, while the highest price was €42.70 on 10 December.

Dividend

On 21 February 2019, the Elia Board of Directors decided to propose a nominal dividend of €10.1 million, or €0.26 per share. This gives a net dividend of €1.162 per share. This represents an increase of 2.5% from the previous year and an increase of 3.2% compared to the reference share price.

The approval dividend policy confirms the Company’s existing dividend practice. It supports the Company’s long-term ambition to continue to increase its annual dividend in real terms to the shareholders while at the same time enabling the Company to sustain a strong balance sheet that is needed to fund the Company’s investment program.

The Board of Directors specifies that future dividends will remain dependent upon the results of the Company (which are affected by a number of factors, including the evolution of the long-term interest rates in Belgium and factors outside the Company’s control as well as the Company’s financial situation, financing needs (in particular, capital expenditure), and business perspectives).

The proposed dividend represents a pay-out ratio of 36.80% of the IFRS reported profit attributable to owners of ordinary shares.

INVESTORS

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Investor Relations Manager,
Boulevard de l’Empereur 20
1000 Brussels, Belgium
Tel.: +32 2 546 75 79
Fax: +32 2 546 75 79
E-mail: investor.relations@elia.be

Information about the Group (press releases, annual reports, share prices, disclosures, etc.) can be found on the Elia Group website www.eliaigroup.eu.
Key figures

### Consolidated results (in million EUR)

<table>
<thead>
<tr>
<th>Year</th>
<th>Total revenue and other operating income</th>
<th>EBITDA</th>
<th>EBIT</th>
<th>Normalised net profit</th>
<th>Reported net profit</th>
<th>Non-controlling interest</th>
<th>Hybrid securities</th>
<th>Profit attributable to owners of ordinary shares</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>1,931.8</td>
<td>750.5</td>
<td>502.6</td>
<td>275.2</td>
<td>307.1</td>
<td>25.7</td>
<td>6.2</td>
<td>275.2</td>
</tr>
<tr>
<td>2017</td>
<td>867.1</td>
<td>455.4</td>
<td>324.6</td>
<td>203.4</td>
<td>208.5</td>
<td>0.0</td>
<td>0.0</td>
<td>203.4</td>
</tr>
<tr>
<td>2016</td>
<td>868.1</td>
<td>425.0</td>
<td>295.0</td>
<td>179.9</td>
<td>205.8</td>
<td>0.0</td>
<td>0.0</td>
<td>179.9</td>
</tr>
<tr>
<td>2015</td>
<td>851.4</td>
<td>442.8</td>
<td>336.4</td>
<td>175.8</td>
<td>210.6</td>
<td>0.0</td>
<td>0.0</td>
<td>175.8</td>
</tr>
<tr>
<td>2014</td>
<td>836.3</td>
<td>402.6</td>
<td>289.7</td>
<td>153.4</td>
<td>167.9</td>
<td>0.0</td>
<td>0.0</td>
<td>153.4</td>
</tr>
</tbody>
</table>

### Consolidated balance (in million EUR)

<table>
<thead>
<tr>
<th>Year</th>
<th>Total assets</th>
<th>Equity attributable to owners of the company</th>
<th>Net financial debt</th>
<th>CAPEX</th>
</tr>
</thead>
<tbody>
<tr>
<td>31.12.2018</td>
<td>13,754.3</td>
<td>3,447.5</td>
<td>4,605.6</td>
<td>946.2</td>
</tr>
<tr>
<td>31.12.2017</td>
<td>6,582.3</td>
<td>2,563.3</td>
<td>2,689.1</td>
<td>895.3</td>
</tr>
<tr>
<td>31.12.2016</td>
<td>6,241.5</td>
<td>2,511.4</td>
<td>2,557.3</td>
<td>810.6</td>
</tr>
<tr>
<td>31.12.2015</td>
<td>5,635.6</td>
<td>2,514.4</td>
<td>2,577.3</td>
<td>790.6</td>
</tr>
<tr>
<td>31.12.2014</td>
<td>5,697.0</td>
<td>2,514.4</td>
<td>2,577.3</td>
<td>790.6</td>
</tr>
</tbody>
</table>

### Other key figures

<table>
<thead>
<tr>
<th>Year</th>
<th>Regulatory Asset Base (RAB) (bn EUR)</th>
<th>Dividend per share</th>
<th>Return on Equity (adj.) (%)</th>
<th>Equity attributable to owners of the company per share (EUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>9.2</td>
<td>7.4</td>
<td>8.1</td>
<td>42.1</td>
</tr>
<tr>
<td>2017</td>
<td>7.4</td>
<td>7.1</td>
<td>7.9</td>
<td>41.2</td>
</tr>
</tbody>
</table>

### Management discussion and analysis of the 2018 results

**Strengthening Elia’s position in 50Hertz while progressing well on key investments**

- Grid investments of €636.7 million in Belgium and €491.5 million in Germany to ensure a reliable, sustainable and affordable energy system that meets society’s demand for appropriate actions against global warming and climate change.
- Acquisition of an additional 20% stake in Eurogrid International in April 2018, resulting in full control of Eurogrid and a change in consolidation method.
- The normalised net profit of the Elia Group is up 38.0% to € 280.8 million as a result of the acquisition of additional shares of Eurogrid, solid operational performance and release of a legal claim provision in Germany together with the realisation of strategic investments in Belgium.
- The net profit (Elia Group Share) is up 32.0% to €275.2 million.
- A dividend of €1.16 per share will be proposed at the General Assembly of 21 May 2019.
- Elia and 50Hertz continue to provide very high system reliability (99.999%), benefitting 30 million end-users in Belgium and Germany.

### Other key figures

<table>
<thead>
<tr>
<th>Year</th>
<th>Regulatory Asset Base (RAB) (bn EUR)</th>
<th>Dividend per share</th>
<th>Return on Equity (adj.) (%)</th>
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<tr>
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<td>9.2</td>
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<td>42.1</td>
</tr>
<tr>
<td>2017</td>
<td>7.4</td>
<td>7.1</td>
<td>7.9</td>
<td>41.2</td>
</tr>
</tbody>
</table>

1 EBITDA = EBIT + depreciation/amortisation + changes in provisions
2 EBIT = result from operating activities and share of profit of equity-accounted investees (net of income tax) vermogensmutatiemethode, na winstbelastingen
3 As from 2014, the companies previously consolidated proportionately are now accounted for using the equity method.
4 The figures of 2014 have been restated for the recognition of the reimbursement rights in accordance with IAS19
5 The Group applies IFRS 15 under the full retrospective method under which comparative figures for financial year 2017 have been restated
6 RAB includes 60% of 50Hertz until 2017 and 80% as of 2018
7 EPS (adj.) = net profit attributable to owners of ordinary shares / weighted average number of shares
8 RoE (adj.) = Net profit attributable to owners of ordinary shares / equity attributable to owners of ordinary shares

(1) Net profit attributable to owners of ordinary shares (post non-controlling interest and post hybrid coupons)
(2) The Group applies IFRS15 under the full retrospective method under which comparative figures for financial year 2017 have been restated
(3) The term “normalised” refers to performance measures (EBIT, Net Profit) before non-recurring items. Non-recurring items are either income or expenses which do not occur regularly as part of the normal activities of the company. They are presented separately because they are important for the understanding of the underlying sustainable performance of the company due to their size or nature
(4) CAPEX amount include 100% of the investment realised in Germany.
Results

The 2018 financial statements are strongly affected by IFRS acquisition of the additional 20% stake in Eurogrid, which Elia acquired on 26 April 2018. This transaction increased Elia’s shareholding in Eurogrid from 60% to 80%, giving Elia full control over Eurogrid. The consolidation of Eurogrid and its affiliates consequently switched from the equity method, which applied for the first four months of the 2018 financial year, to a full consolidation as from acquisition (May 2018). The total acquisition price amounts to €275.5 million for the additional 20% stake, plus €12.2 million in interest.

The acquisition was fully financed by the issuance of a €700 million hybrid bond and a €300 million senior bond, the lending costs of which are regarded as non-regulated and therefore not covered by tariffs. The hybrid bond has no profit impact as it is equity accounted under IFRS due to its perpetual nature and the issuer’s ability to optionally delist the coupons.

The Elia Group’s normalised net profit increased by 58.0% to €303.8 million. This increase was the result of the aforementioned acquisition (and its consolidation impact) and a higher normalised result for both Elia Transmission and 50Hertz Transmission, partially offset by the higher non-regulated cost for financing the additional stake in Eurogrid.

- Elia Transmission (Belgium) achieved strong results with a normalised net profit of €14.9 million (up 17.2%) driven by the full realisation of the mark-up investments since the start of the tariff period in 2016 (up €11.4 million), the higher average equity and OLO compared to 2017 (up €2.9 million) and lower regulatory settlements from the previous year (up €1.7 million). These impacts were offset to some extent by a lower contribution from incentives (down €1.8 million). Finally, the normalised net profit benefitted from limited damage to electrical installations (up €2.5 million).

- 50Hertz Transmission (Germany) (on a 100% basis) achieved a strong increase in normalised net profit (up 18.1%), mainly due to the release of a legal claim provision (up €50.8 million). This provision had been established after German unification to cover possible legal claims by landowners in East Germany. Following a reassessment driven by a tax audit, part of the provision was released. A major portion (€48.7 million) was released in April and therefore only 60% was attributable to Elia. The ongoing investment programme at 50Hertz also resulted in higher non-regulated profit in both onshore and offshore. This was further increased by the start of the efficiency programme launched in 2017. Furthermore, the offshore investment cost coverage fell by €40.4 million due to the transition towards a cost-plus mechanism in 2019. Indeed, the regulatory allowance for offshore OPEX changed from a 3.4% OPEX lump sum to be invested on CAPEX, as applied in the past, to a pass-through mechanism for incurred costs. Finally, considering the higher depreciations (down €8.3 million) linked to the ongoing investment programme and lower financial costs (up €3.5 million), the normalised net profit for the German activities amounted to €115.3 million.

The non-regulated segment (incl. NemoLink) recorded a normalised net loss of €7.8 million (down €2.9 million). This loss is due to the non-regulated financing costs for the aforementioned acquisition (not covered by tariffs) and EC1’s lower result. As the NemoLink interconnector was not yet operational by year end 2018, its net contribution to the result was limited to €0.7 million.

The Elia Group net profit saw a more pronounced increase (up €7.7 million to €30.7 million). This increase is mainly related to non-recurring income linked to the acquisition (€4.5 million), as well as revenue linked to the partial commissioning of the Ostwind 1 offshore connection at 50Hertz Transmission (€23.5 million).

The normalised net profit of the Elia Group attributable to owners of ordinary shares (after deducting the €25.7 million in non-controlling interests and €6.3 million attributable to hybrid securities held by Elia) increased from €2.7 million in 2017 to €4.4 million in 2018.

Capital expenditures

By expanding international connections affected by the tax audit, part of the provision was released. A major portion (€48.7 million) was released in April and therefore only 60% was attributable to Elia. The ongoing investment programme at 50Hertz also resulted in higher non-regulated profit in both onshore and offshore. This was further increased by the start of the efficiency programme launched in 2017. Furthermore, the offshore investment cost coverage fell by €40.4 million due to the transition towards a cost-plus mechanism in 2019. Indeed, the regulatory allowance for offshore OPEX changed from a 3.4% OPEX lump sum to be invested on CAPEX, as applied in the past, to a pass-through mechanism for incurred costs. Finally, considering the higher depreciations (down €8.3 million) linked to the ongoing investment programme and lower financial costs (up €3.5 million), the normalised net profit for the German activities amounted to €115.3 million.

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The normalised net profit of the 50Hertz Group increased from €12.2 million in 2017 to €27.5 million in 2018. This increase was driven by the acquisition of the additional 20% stake in Eurogrid and the combined result of an increase in net profit in both Belgium and Germany.

Elia Transmission (ET) and 50Hertz Transmission (50H) are combined under IFRS due to their perpetual nature and the issuer’s ability to delist the coupons. The normalised net profit of the Elia Group attributable to owners of ordinary shares (after deducting the €25.7 million in non-controlling interests and €6.3 million attributable to hybrid securities held by Elia) increased from €2.7 million in 2017 to €4.4 million in 2018.

Following an offshore wind tender in late April 2018, Germany’s Bundesnetzagentur (Federal Network Agency) allocated 733 MW of connection capacity to the Baltic Sea, specifically to the Arkadis Ost-1, Baltic Eagle and Wiking Sø wind farms. By expanding international connections affected by the tax audit, part of the provision was released. A major portion (€48.7 million) was released in April and therefore only 60% was attributable to Elia. The ongoing investment programme at 50Hertz also resulted in higher non-regulated profit in both onshore and offshore. This was further increased by the start of the efficiency programme launched in 2017. Furthermore, the offshore investment cost coverage fell by €40.4 million due to the transition towards a cost-plus mechanism in 2019. Indeed, the regulatory allowance for offshore OPEX changed from a 3.4% OPEX lump sum to be invested on CAPEX, as applied in the past, to a pass-through mechanism for incurred costs. Finally, considering the higher depreciations (down €8.3 million) linked to the ongoing investment programme and lower financial costs (up €3.5 million), the normalised net profit for the German activities amounted to €115.3 million.

The normalised net profit of the Elia Group saw a more pronounced increase (up €7.7 million to €30.7 million). This increase is mainly related to non-recurring income linked to the acquisition (€4.5 million), as well as revenue linked to the partial commissioning of the Ostwind 1 offshore connection at 50Hertz Transmission (€23.5 million).

The normalised net profit of the Elia Group attributable to owners of ordinary shares (after deducting the €25.7 million in non-controlling interests and €6.3 million attributable to hybrid securities held by Elia) increased from €2.7 million in 2017 to €4.4 million in 2018.

50Hertz also resulted in higher non-regulated profit in both onshore and offshore. This was further increased by the start of the efficiency programme launched in 2017. Furthermore, the offshore investment cost coverage fell by €40.4 million due to the transition towards a cost-plus mechanism in 2019. Indeed, the regulatory allowance for offshore OPEX changed from a 3.4% OPEX lump sum to be invested on CAPEX, as applied in the past, to a pass-through mechanism for incurred costs. Finally, considering the higher depreciations (down €8.3 million) linked to the ongoing investment programme and lower financial costs (up €3.5 million), the normalised net profit for the German activities amounted to €115.3 million.
2018 NET DEBT EVOLUTION

External debt was issued in 2018.

- €100 million EIB loan.
- Within Eurogrid, no
  €50 million of commercial paper and
- Cash flow from operating activities, the use of
- Transmission, the sizeable CAPEX pro-
- €210 million bank loan was taken out
  to the full consolidation of Eurogrid. Net
  debt increased further with the issue

Net financial debt increased to €4,605.6 million, €272.9 million of which is linked to the full consolidation of Eurogrid. Net debt increased further with the issue of €300 million senior bond to finance the aforementioned acquisition and a €210 million bank loan was taken out to fund Nemolink.

With regard to Elia Transmission, the sizeable CAFEX programme was mainly financed by cash flow from operating activities, the usage of €50 million of commercial paper and €100 million EIB loan. Within Eurogrid, no external debt was issued in 2018.

### Net debt & credit metrics

<table>
<thead>
<tr>
<th>(in € million)</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net debt</td>
<td>2,689</td>
<td>4,605.6</td>
</tr>
<tr>
<td>Leverage (D/E) (incl. NCI &amp; hybrid)</td>
<td>4.8</td>
<td>6.5</td>
</tr>
<tr>
<td>Average cost of debt</td>
<td>2.92%</td>
<td>2.30%</td>
</tr>
<tr>
<td>% fixed of gross debt</td>
<td>82.51%</td>
<td>92.16%</td>
</tr>
<tr>
<td>Net debt / EBITDA</td>
<td>5.9</td>
<td>6.1</td>
</tr>
<tr>
<td>EBITDA / (Current interest)</td>
<td>1.12x</td>
<td>1.71x</td>
</tr>
<tr>
<td>&amp; hybrid)</td>
<td>1.12x</td>
<td>1.71x</td>
</tr>
</tbody>
</table>

### Elia Transmission in Belgium

Elia Transmission’s revenue rose to €199.4 million, a 12.7% increase on the same period the previous year. The increase in revenue is the result of a higher allowed regulated net profit, higher depreciations and higher taxes that are passed through into reve-

The EBITDA (up 5.5%) and EBIT (up 4.5%) were mainly affected by increased re-
gulated net profit, higher depreciations, lower financing costs and higher current taxes to be passed on in the tariff, partly offset by the lower result of equity-ac-
counted investments.

Net financial costs (down 15.2%) fell by €117 million compared to the previ-
ous year. Over the course of 2018, inter-
rest rate swap contracts which matured at the end of 2017, have been renewed at lower interest rates benefiting from the low interest rate environment. The lower lending costs are entirely to the consum-
er’s benefit, in accordance with the regu-
latory framework.

The result in an increased normalised net profit to €7.9 million (up 72.4%). At no non-recurring items were recognised in 2018, the reported net profit increased to a lesser extent, up 11.5%.

Total assets increased by €460.2 million to €5,909.2 million, mainly as a result of the investment programme. The EBITDA, equity mainly increased as a result of the reser-
vation of the 2018 profit and the capital increase of €5.3 million reserved for per-
sions, minus the contribution of reg-
ulated activities to the 2017 dividend payment.

### 50Hertz Transmission in Germany

50Hertz Transmission’s revenue increased by 2.6% compared to the same period last year. This was the result of growing revenue following the ongo-
ing CAFEX programme, partially offset by lower pass-through energy costs and higher allowed regulated net profit.

EBITDA increased slightly by €2.6 million to €475.0 million (up 0.5%). Total invest-
ment remuneration fell (down €25.9 million), as the higher onshore (€75 million) and offshore (up €30.0 million) remuneration triggered by the ongoing investment programme, was more than offset by the lower regulatory allowance for offshore OPEX (€37 million). The regulatory revenues from the Base Year mechanism decreased (down €3.3 million) from the annual adjustment for inflation and efficiency targets linked to the application of the regulatory frame-
work. OPEX and other costs fall slightly (up €24 million). The efficiency pro-
gramme implemented in 2017, resulted in a further drop in several operational expenses, such as maintenance and insurance, while own work capitalised revenues increased due to a higher allo-
ation of personnel costs to new invest-
ments and were only partially offset to a certain extent by higher personnel costs, driven by both an increase in tariff wages and additional staffing to roll out the growing investment programme.

Normalised EBIT (up 10.1%) was further impacted by the release of a provision for legal claim easements (up €72.1 million). Following a reassessment driven by a tax audit, part of the provision was released. This was partly offset by the increased deprecations resulting from the com-
missioning of the southwest coupling line and the North Ring in the second half of 2017 and the partial commissioning of Ostwind 1 in 2018 (down €11.8 million).

In light of non-recurring revenue linked to the partial commissioning of the Ostwind 1 project (€53.3 million) and a bonus for the efficient management of renewa-
ble energies (€0.1 million), partially off-
s ated by the lower regulatory allowance of prior years (€2.8 million), the reported EBIT totalled €385.8 million.

Total assets increased by €564.0 million to €6,752.1 million (up 9.7%), mainly driven by the investments made and a further increase in the cash position.

Finally, 2018 showed a positive free cash flow of €278.7 million, thereof €34.3 mil-
lion generated by the EEG mechanism. The ongoing investment programme has been financed by operating cash flow and working capital.

No new long term debt was issued by Eurogrid GmbH in 2018. Net financial debt consequently fell to €1,272.9 million compared to the end of 2017. It includes an EIB cash position of €359.4 million.
The non-regulated revenue decreased by 29.9% compared to 2017. This was mainly due to EGI revenue, which fell from €13.2 million to €9.5 million due to the decline in owner engineering services rendered compared to 2017 levels. Furthermore, the 2018 sale of the Training and Research Centre for Power Systems Security (GridLab) to DNV GL resulted in a non-recurring financial loss of €3.2 million.

A normalised operating loss (EBIT) of €5.6 million was generated due to higher non-regulated costs and the lower contribution of Eurogrid (€0.1 million), partially offset by the financial costs of €9.2 million. Eurogrid’s non-regulated profit of €4.3 million, which is mainly related to the financing cost for the acquisition of Eurogrid (down €3.5 million), was fixed to €0.7 million. Taking into account the non-regulated items, the reported net loss decreased to €5.5 million, as the remeasurement to fair value of the Group’s initial participation in Eurogrid (€0.2 million) was partially offset by acquisition-related expenses and non-current financing and hedging costs (€4.9 million).

The net financial income increased to €1.3 million, primarily as a result of the acquisition of an additional stake in Eurogrid, which is considered as non-regulated financing and therefore does not affect the remeasurement to fair value of the Group’s initial 60% shareholding in Eurogrid.

Non-regulated activities of the Group (including NemoLink)

<table>
<thead>
<tr>
<th>(in € million)</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total revenues</td>
<td>19.8</td>
<td>13.9</td>
</tr>
<tr>
<td>EBITDA</td>
<td>(2.6)</td>
<td>(7.9)</td>
</tr>
<tr>
<td>EBIT</td>
<td>(3.0)</td>
<td>(8.9)</td>
</tr>
<tr>
<td>Non-recurring items</td>
<td>0.0</td>
<td>(0.0)</td>
</tr>
<tr>
<td>Normalised EBIT</td>
<td>0.0</td>
<td>(0.0)</td>
</tr>
<tr>
<td>Net financial costs</td>
<td>0.6</td>
<td>1.3</td>
</tr>
<tr>
<td>Normalised net revenue</td>
<td>(4.3)</td>
<td>(7.6)</td>
</tr>
<tr>
<td>Net profit</td>
<td>(0.0)</td>
<td>(3.3)</td>
</tr>
<tr>
<td>Attributable to the Elia Group</td>
<td>(0.1)</td>
<td>(2.1)</td>
</tr>
<tr>
<td>Total assets</td>
<td>594.4</td>
<td>1677.9</td>
</tr>
<tr>
<td>Total equity</td>
<td>594.7</td>
<td>1952.7</td>
</tr>
<tr>
<td>Net financial debt</td>
<td>57.4</td>
<td>507.6</td>
</tr>
</tbody>
</table>

Non-recurring items - reconciliation table

<table>
<thead>
<tr>
<th>PERIOD ENDED 31 DEC. 2018 (in € million)</th>
<th>ELIA TRANSMISSION</th>
<th>SIHOFERZ TRANSMISSION 100%</th>
<th>NON-REGULATED (INCL. NEMOLINK) 100%</th>
<th>CONSOLIDATION ENTRIES</th>
<th>ELIA GROUP</th>
</tr>
</thead>
<tbody>
<tr>
<td>EBIT – Non-recurring items</td>
<td>0.0</td>
<td>(2.8)</td>
<td>0.0</td>
<td>1.4</td>
<td>(0.4)</td>
</tr>
<tr>
<td>Regulatory settlements prior year</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>(0.6)</td>
<td>(0.6)</td>
</tr>
<tr>
<td>Equity consolidation SIHOFerz (60% net profit)</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Offshore commissioning</td>
<td>0.0</td>
<td>33.5</td>
<td>0.0</td>
<td>0.0</td>
<td>33.5</td>
</tr>
<tr>
<td>Energy bonuses</td>
<td>0.0</td>
<td>0.3</td>
<td>0.0</td>
<td>0.0</td>
<td>0.3</td>
</tr>
<tr>
<td>Eurogrid acquisition costs</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>(3.3)</td>
<td>(3.3)</td>
</tr>
<tr>
<td>Total EBIT non-recurring items</td>
<td>0.0</td>
<td>30.6</td>
<td>(3.3)</td>
<td>0.0</td>
<td>28.1</td>
</tr>
<tr>
<td>Non-recurring financial cost</td>
<td>0.0</td>
<td>0.0</td>
<td>(3.8)</td>
<td>0.0</td>
<td>(3.8)</td>
</tr>
<tr>
<td>Revatisation participation Eurogrid</td>
<td>0.0</td>
<td>0.0</td>
<td>9.2</td>
<td>0.0</td>
<td>9.2</td>
</tr>
<tr>
<td>Total Before tax non-recurring items</td>
<td>0.0</td>
<td>30.6</td>
<td>6.5</td>
<td>0.0</td>
<td>37.1</td>
</tr>
<tr>
<td>Impact tax reform on deferred tax</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Tax impact</td>
<td>0.0</td>
<td>(3.0)</td>
<td>2.2</td>
<td>(0.4)</td>
<td>(2.6)</td>
</tr>
<tr>
<td>Net profit non-recurring items</td>
<td>0.0</td>
<td>21.6</td>
<td>4.3</td>
<td>0.4</td>
<td>25.3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PERIOD ENDED 31 DEC. 2017 (in € million)</th>
<th>ELIA TRANSMISSION</th>
<th>SIHOFERZ TRANSMISSION 100%</th>
<th>NON-REGULATED (INCL. NEMOLINK) 100%</th>
<th>CONSOLIDATION ENTRIES</th>
<th>ELIA GROUP</th>
</tr>
</thead>
<tbody>
<tr>
<td>EBIT – Non-recurring items</td>
<td>0.0</td>
<td>(4.6)</td>
<td>0.0</td>
<td>4.6</td>
<td>0.0</td>
</tr>
<tr>
<td>Regulatory settlements prior year</td>
<td>0.0</td>
<td>0.0</td>
<td>0.1</td>
<td>(0.1)</td>
<td>0.1</td>
</tr>
<tr>
<td>Equity consolidation SIHOFerz (60% net profit)</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>(0.1)</td>
<td>0.1</td>
</tr>
<tr>
<td>Energy bonuses</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>(0.0)</td>
<td>0.0</td>
</tr>
<tr>
<td>Total EBIT non-recurring items</td>
<td>0.0</td>
<td>4.6</td>
<td>0.0</td>
<td>(0.1)</td>
<td>4.5</td>
</tr>
<tr>
<td>Non-recurring financial cost</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Revatisation participation Eurogrid</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Total Before tax non-recurring items</td>
<td>0.0</td>
<td>4.6</td>
<td>0.0</td>
<td>0.0</td>
<td>4.6</td>
</tr>
<tr>
<td>Impact tax reform on deferred tax</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Tax impact</td>
<td>0.0</td>
<td>(0.3)</td>
<td>0.0</td>
<td>(0.1)</td>
<td>(0.4)</td>
</tr>
<tr>
<td>Net profit non-recurring items</td>
<td>0.0</td>
<td>4.3</td>
<td>(0.1)</td>
<td>0.3</td>
<td>4.0</td>
</tr>
</tbody>
</table>

Following the acquisition of the additional 20% stake in Eurogrid International, the non-regulated segment (incl. NemoLink) recognised a non-recurring profit of €4.3 million, as the remeasurement to fair value of the Group’s initial participation in Eurogrid (€9.2 million) was partially offset by acquisition-related expenses and non-recurring financing and hedging costs (€4.9 million).

At SIHOFerz Transmission these items are mainly linked to the partial commissioning of the Ostwind 1 project (€33.5 million) and a bonus for the efficient management of renewable energy (€1 million), partially offset by regulatory settlement of prior years (€2.8 million).
Reporting parameters

Registered office
This report is limited to Elia System Operator and Elia Asset, which operate as a single economic entity under the names Elia and 50Hertz Transmission.

The registered office of Elia System Operator and Elia Asset is located at Boulevard de l’Empereur 20 1000 Brussels, Belgium.

The registered office of 50Hertz GmbH is established at Heidestraße 2 D-10557 Berlin, Germany.

The registered office of Eurogrid International is located at Rue Joseph Stevens, 7 1000 Brussels, Belgium.

The registered office of Elia Grid International is located at Rue Joseph Stevens, 7 1000 Brussels, Belgium.

Reporting period
This annual report covers the period from 1 January 2018 to 31 December 2018.

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Ce document est également disponible en français.
Dit document is ook beschikbaar in het Nederlands.

We would like to thank everyone who contributed to this annual report.