

# ANNUAL REPORT 2015

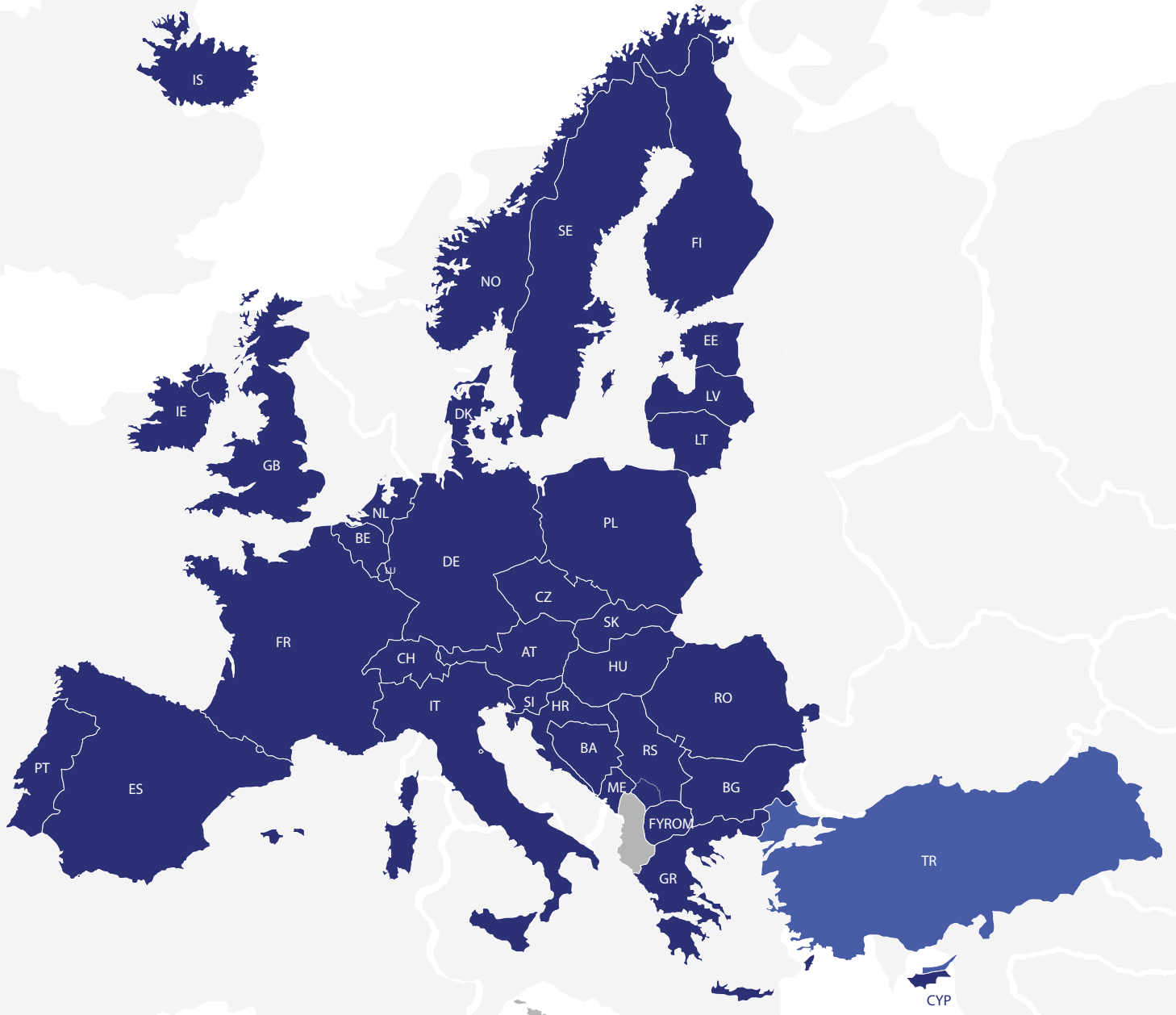
Electricity without borders



European Network of  
Transmission System Operators  
for Electricity



- Countries with ENTSO-E Member TSOs
- Country with ENTSO-E Observer Member TSO



# ABOUT ENTSO-E

ENTSO-E, the European Network of Transmission System Operators, represents 41 electricity transmission system operators (TSOs) from 34 countries across Europe. It also has one observer member. ENTSO-E was established and given legal mandates by the EU's Third Legislative Package for the internal energy market in 2009, which aims at further liberalising the gas and electricity markets in the EU.

The role of transmission system operators has considerably evolved with the Third Energy Package. Due to unbundling and the liberalisation of the energy market, the transmission system has become the meeting place where the various players interact. The importance of the work of TSOs and of ENTSO-E's work products for a well-functioning market, a reliable system and the success of energy policy will continue to evolve.

## ENTSO-E OBJECTIVES

ENTSO-E members share the objective of completing the internal energy market and ensuring its optimal functioning, whilst supporting the ambitious European energy and climate agenda. Some of the most important issues on today's agenda are the integration of a high degree of renewables in Europe's energy system, the development of corresponding system flexibility, and an increased customer-centric approach compared to the past. ENTSO-E is committed to developing the most suitable responses to the challenge of a changing power system, whilst maintaining security of supply. Innovation, a market-based approach, customer and stakeholder focus, security of supply, flexibility, regional cooperation and sustainability are the key points on ENTSO-E's agenda.

ENTSO-E contributes to the achievement of these objectives through:

⌚ the drafting of network codes – the rules of the game of the internal energy market -

and leading on their implementation with all stakeholders;

⌚ the development of pan-European Ten-Year Network Development Plans (TYNDPs), on which the list of Projects of common interest is based;

⌚ policy proposals based on the European system viewpoint;

⌚ strengthened and focused regional cooperation in markets, planning and operation, most recently through the regional security coordination initiatives (RSCIs);

⌚ technical cooperation between TSOs;

⌚ the publication of Summer and Winter Outlook reports for short term system adequacy, along with annual Scenario Outlook & Adequacy Forecast reports providing a pan-EU overview on longer term system adequacy;

⌚ the coordination of research and development plans, innovation activities and the participation in research programmes such as Horizon 2020.

Through these deliverables, ENTSO-E is helping to get the world's largest integrated electricity market from promise to practice. This market is decisive for Europe's economy, sustainability and security of supply.

ENTSO-E is aware that such important tasks go hand in hand with a strong interaction with European institutions, as well as market participants and stakeholders. Transparency is therefore a key principle for ENTSO-E and requires constant listening, learning and improvement, in the interest of society as a whole.

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# HIGHLIGHTS OF 2015



- ⌚ 2015, Year of the Energy Union: ENTSO-E responded with its Vision package, which addressed the dimensions of market design and innovation, regional cooperation, regulation and security of supply.
- ⌚ 2015 saw the approval of the first five network codes and guidelines. Their implementation is already ongoing, and will require work by all participants in forthcoming years. European Stakeholder Committees have been created for this purpose.
- ⌚ The European grid successfully passed the stress test of the 20 March solar eclipse.
- ⌚ In January, the ENTSO-E Transparency Platform went live: all interested parties can consult the principle data of the European power market on their screen.
- ⌚ The e-Highway2050 project was finalised, presenting the evolution of the grid to reach close to zero emissions in the EU by 2050.
- ⌚ TSOs speeded up regional cooperation in markets, planning and operations.
- ⌚ Finally, 2015 is the year of the global climate agreement COP 21, which ENTSO-E both welcomes and supports.



# EXECUTIVE SUMMARY



**Peder Andreasen**  
President



**Bente Hagem**  
Chair of the Board



**Konstantin Staschus**  
Secretary-General

2015 has been a year rich in events, not least from an energy policy point of view. The Commission has committed itself to ambitious targets, including a newly formed Energy Union. Presented in February, the intent of the Energy Union is to unite Europe's efforts with respect to security of supply, regional cooperation, market integration, and innovation. ENTSO-E's overarching response to the Energy Union is the Vision package. By putting customers at the centre, it started with the Vision issued in June 2015, followed by four policy papers addressing markets and innovation, regions, security of supply and regulations. The final package was handed over to the European Commission, European Parliament and the Luxembourg Presidency of the EU on 20 November, during ENTSO-E's Annual Conference.

Since 2009, the Renewable Energy Directive has driven an energy transition that has changed Europe; renewable energy production keeps growing, and this requires greater cooperation and flexibility, innovation, and ground rules. Distribution system operators are evolving, as they connect large amounts of small scale renewable energy sources to the grids. The cooperation between TSOs and DSOs is, therefore, increasingly important and includes data management, innovation and smart grids. The December 2015 COP 21 global climate protection agreement has confirmed Europe's path towards carbon-neutrality and has thus strengthened the foundations of Europe's Energy Union and of ENTSO-E's contributions to it.

A solar eclipse on 20 March attracted a lot of attention worldwide, being the first time

that such a high proportion of photovoltaics were connected to the grid. Would Europe be able to manage a scenario where important levels of generation would disappear and reappear within three hours? The answer was yes, thanks to the meticulous preparation by TSOs in ENTSO-E during the previous year.

2015 was also the year when the first five network codes and guidelines were approved: the efforts of TSOs, regulators, Commission and stakeholders since late 2009 bore fruit, and connection conditions for generation, demand and HVDC equipment as well as market rules for intraday, day-ahead and forward markets are now clear and future-proof. They not only support but also drive progress on market integration and system security for the energy transition. Their implementation has begun and will require continual, substantial efforts and cooperation during forthcoming years. New network codes may be needed, for example a code on distributed flexibility, uniting TSOs, DSOs and others in a co-creation project.

The market has to be adjusted so as to underpin the energy transition with cost efficiency. ENTSO-E responded to the Commission's summer 2015 consultation on market design with concrete proposals for:

- Ⓔ an augmented market design where customer empowerment contributes to security of supply;
- Ⓕ stronger regional cooperation, as a basis for market efficiency, cost reduction and improved security of supply from a national to a pan-European level;
- Ⓖ a fit-for-purpose regulation.



ENTSO-E, like ENTSOG and ACER, is a young organisation. We are learning and evolving. Our constant exchange with our members ensures our solid anchor in Europe's complex system and national realities. Experts and executives from all corners of Europe cooperate on a daily basis and jointly make concrete improvements to the energy systems and markets. Exchanges held between our three organisations and with the EU institutions are permanent, constructive, and fruitful. Together, we make the internal energy market a reality, not as an objective in itself, but in the interest of over 500 million people who see their security of supply increasing, whilst innovation is ensured and sustainability continues to develop.

ENTSO-E has developed further its interactions with stakeholders, having implemented new tools and having decided upon new commitments. The Transparency Platform went live in January 2015, allowing experts, traders and the public to consult an increasingly complete database on physical power data in Europe. The minutes of our Assembly meetings are now made public, so that interested parties can observe decision making in ENTSO-E.

Grid planning for Europe translates into the intensive preparation of the next Ten-Year Network Development Plan, the TYNDP 2016. Getting projects implemented remains a key priority. New infrastructure has an impact on society, and TSOs work with and listen to citizens to improve projects and increase public acceptance. The cooperation with NGOs, including the Renewables Grid Initiative, is one example of ENTSO-E's and TSOs' desire to bring people on board.

Finally, ENTSO-E has seen new committed Board and Assembly members elected, whilst others have left. Our thanks in particular go to prior President Nick Winser and Chairman of the Board Pierre Bornard for their enthusiastic commitment and leadership.

Climate protection, a power system more and more based on renewable energy, strong and smart grids are not always easy to reconcile with the desires and interests of each of over 500 million citizens in Europe's multi-level democracy, but in electricity, the benefits from European cooperation and market integration are real, and we make them bigger all the time!

# ENTSO-E IN CONTEXT

12 

public consultations  
in 2015

19 

external workshops,  
events & webinars,  
and 3 major  
conferences

  
1700

Added number  
of participants  
in all events combined

13 

policy papers published,  
of which 2 joint papers

## DEBATE. ENGAGE. SHARE. ACT.

This is how ENTSO-E shapes its main products. Be it network codes, Ten-Year Network Development Plans, Scenario Outlooks and Adequacy Forecasts, annual work programmes or research and development, they all build on the input of stakeholders and NGOs such as the Renewables Grid Initiative, DSOs including CEDEC, Geode or EDSO for Smart Grids, along with generators such as those represented by EURELECTRIC, traders such as EFET, or the Smart Energy Demand Coalition, to name but a few.

19 external workshops and events have taken place in 2015, as well as 12 public consultations, along with many bilateral meetings with stakeholders and policy makers. Stakeholder engagement is fundamental to ensure a transparent, effective and collaborative process for fostering electricity market integration in Europe and delivering products for the benefit of society as a whole. ENTSO-E is a young and dynamic organisation; we constantly seek to improve how we do things and how we co-create with other parties for whom our work is relevant. We see consultation with stakeholders as far more than just a mandatory requirement – stakeholder expertise is indispensable to delivering well-critiqued and acceptable proposals. ENTSO-E is committed to taking into account the broadest range of views from stakeholders at an early stage of development of its products and to listening to the concerns of market participants, stakeholders and other relevant parties. We strive to understand their needs and to use

stakeholders' feedback as a contribution for improving the quality of our work products.

High-quality stakeholder engagement requires adequate tools and forums, enabling all stakeholders to voice their opinion. In 2015, ENTSO-E launched its new consultation hub, centralising all public consultations organised by ENTSO-E. Chosen primarily for its user-friendliness, it allows stakeholders to contribute easily to ENTSO-E's work.

## SPREADING THE DEBATE

ENTSO-E also shares information regarding electricity challenges with the wider public via large events. Three conferences in 2015 gathered more than one thousand people. The InnoGrid2020+ conference in March, jointly organised with EDSO for Smart Grids, highlighted the importance of R&D to achieve the EU's climate and energy policy goals. The e-Highway2050 conference in November was a culmination of 3 ½ years' effort by 28 projects partners, cooperating to design a methodology and a modular long-term plan for the development of the high voltage electricity grid through 2050.

ENTSO-E's Annual Conference 2015, 'The Energy Union Ahead: reliable, sustainable, competitive', brought together representatives of the European Commission, European Parliament, ACER and national regulators, Member State government representatives and many European and international energy stakeholders, as well as NGOs and academia, all of whom took part in passionate debates. The conference was organised under the



patronage of the Luxembourg Presidency of the Council of the EU, in partnership with the Florence School of Regulation (FSR), the Renewables Grid Initiative (RGI) and the Energy Community, with FTI-CL Energy acting as the sponsor.

In addition to their partnership for the Annual Conference 2015, ENTSO-E and the Florence School of Regulation have committed to a long term partnership. Joint work will include 'Chatham House' style debates on major power issues, as well as partnerships in conferences or training sessions.

## COOPERATION WITH EU INSTITUTIONS, ACER AND EU MEMBER STATES

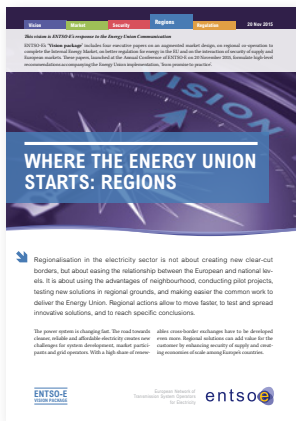
ENTSO-E, by its mandate and role in the achievement of the internal energy market, collaborates closely with the European Commission and the Agency for the Cooperation of Energy Regulators (ACER). This includes the development and implementation of network codes, the preparation of the Ten-Year Network Development Plan, research, development and innovation activities, to name a few: ACER contributes to all these activities. EU Member States, the European Parliament and the European Commission oversee ENTSO-E's legal mandates, judge the quality of the deliverables, and shape them further. 2015 saw the first five network codes/guidelines approved in comitology, which highlights the important collaborative achievement by all concerned and involved, namely ACER, ENTSO-E, European institutions, not forgetting the stakeholders themselves.



All parties will collaborate further to ensure the consistent implementation of the codes throughout the EU and beyond. It is also important that ACER, the European Commission, EU Member States and national regulatory authorities see it as their common task to explain these codes to Europe's citizens. ACER and ENTSO-E are also cooperating to enhance stakeholder engagement, with the joint creation of the European Stakeholder Committees for Network Code Implementation. The committees were launched in 2015, with the first two meetings discussing market codes.

ENTSO-E presented its work to the Committee on Industry, Research and Energy (ITRE) of the European Parliament in May 2015, together with ENTSOG. It provided MEPs with an overview of the key roles and tasks of the transmission system operators for the integration of the internal energy market and how they collectively cooperate to meet power system challenges. We also hosted a dinner-debate in the European Parliament in Strasbourg with the European Energy Forum, the theme being 'How to integrate up to 60% renewables to the EU power system'. This presented the fundamental role of both hardware (infrastructure) and software (network codes) needed to successfully meet this challenge. A breakfast debate co-organised with MEP Peter Eriksson allowed for a lively debate on power challenges in 2016, e.g., the integration of renewables. These discussions will help ENTSO-E to further develop its thinking.

ENTSO-E and partners teamed up to support the COP21 at ENTSO-E's Annual Conference



## COOPERATION WITH ENTSGO

Although gas and electricity differ greatly, and the energy transition affects the two systems in different ways, European networks play a crucial role in both cases. This is why ENTSGO and ENTSO-E have been established with similar functions. The similar mandates, relationships with stakeholders and European policy makers highlight the multitude of win-wins by exchanging experiences, best practices as well as mutual learning. This is why the secretariats and boards of the two associations regularly exchange information and also engage in common presentations or actions.

In 2015, in addition to a joint presentation in the European Parliament, the ENTSGOs organised a joint webinar to present the Winter Outlook reports. In addition to cooperation in the framework of the 2013 Infrastructure Regulation, the ENTSGOs have started common work on the consistent and interlinked electricity and gas market and network model.

## ENGAGING WITH THE ENERGY COMMUNITY

The Energy Community is an important partner for ENTSO-E in promoting further market integration and implementing the principles of the internal energy market throughout the wider European area.

In 2015, ENTSO-E launched the development of the first joint programme with the Energy Community to enhance collaboration and enable TSOs from various parts of Europe to exchange best practices. This programme will foster cross-border cooperation, regional pilot projects/initiatives, with a view to integrating markets, fostering interconnections and the timely implementation of the Third Energy Package and of the network codes.

In 2016, ENTSO-E will be working further with the Energy Community on the development of a joint program to facilitate effort-sharing in the process of overcoming obstacles to interconnectivity, harmonising legal frameworks, eliminating legal and regulatory barriers, and promoting regional security coordination as key challenges to be jointly tackled.

## TRANSMISSION + DISTRIBUTION = COOPERATION

Distribution system operators (DSOs) and TSOs have to cooperate in the transition to clean energy. The role of DSOs is changing, with a shift towards decentralised generation. The energy transition and smart grids are fundamentally changing the relationship between TSOs and DSOs. Both grid operators face a number of common challenges when it comes to managing the increasing share of renewable generation and supporting a system where customers are active and participate in all markets. Smart meters in households and for distributed generation bring myriads of new data and control variables into the power system, and data management is a key area for joint efficiencies and innovation between TSOs and DSOs.

Throughout 2015, ENTSO-E and European DSOs associations undertook a number of joint thematic workshops to develop solutions to new challenges in the areas of data management, regulatory policies, R&D

and standardisation. This culminated in the publication of joint general guidelines to reinforce the cooperation between TSOs and DSOs.

Network code implementation processes and key challenges, such as uncoordinated access to resources, regulatory uncertainty, lack of grid visibility and grid data and data management, are priority areas for the TSO-DSO cooperation platform in 2016.

## THE TRANSPARENCY PUSH

In 2015, as a first step towards greater transparency, ENTSO-E decided to publish the minutes of its Assembly meetings on its website.

Furthermore, ENTSO-E decided to set up an Independent Advisory Council to provide advice on the deliverables of ENTSO-E. ENTSO-E also wishes to set up a more formal channel of communication with the European Parliament's ITRE committee through regular meetings and reporting.



# 01

## NETWORK CODES : THE RULES OF THE GAME

1.1. What happened in 2015?

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1.2. Lessons learnt and the way forward

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1.3. The rules on the ground: implementing  
network codes



# 1. NETWORK CODES: THE RULES OF THE GAME

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Network codes provide the building blocks for the entire future electricity system. Without network codes, renewable energy sources will not be connected to the grids in a future-proof way, European citizens are likely to remain passive energy consumers and European regions likely to remain energy islands. ENTSO-E wants a different future for Europe - a future with a reliable, sustainable and competitive internal energy market.

## 1.1. WHAT HAPPENED IN 2015?

After several years of intense cooperation between the European Commission, ACER, ENTSO-E, TSOs and hundreds of experts from all electricity market participants and stakeholders, 2015 was a pivotal year for network codes. The Guideline on capacity allocation and congestion management was the first code to enter into force in August 2015, and to become binding throughout Europe. Four other codes received a positive vote from Member States in comitology in 2015 and are now ready to enter into force in 2016. Meanwhile, the work to implement the network codes and finally deliver their benefits to European consumers accelerated.

### Deliver the Markets of the Future

The coming into force of the CACM Guideline on 14 August 2015 is a significant milestone on the road towards fully integrated, competitive, liquid electricity markets in Europe. It will boost efforts to create well-functioning pan-European day-ahead and intraday markets. But this is only the beginning - its implementation will not be straightforward and will require once again substantial work by ENTSO-E, TSOs and other participants in the power system. 2015 also saw the validation by EU Member States of the second of the three market

codes, on forward capacity allocation. This code sets out rules and methodologies for forward markets, which provide market participants with the ability to manage the risk associated with cross-border electricity trading. It promotes the development of liquid and competitive forward markets in a coordinated way across Europe. It is expected to enter into force in 2016, after its scrutiny by the European Parliament and Council.

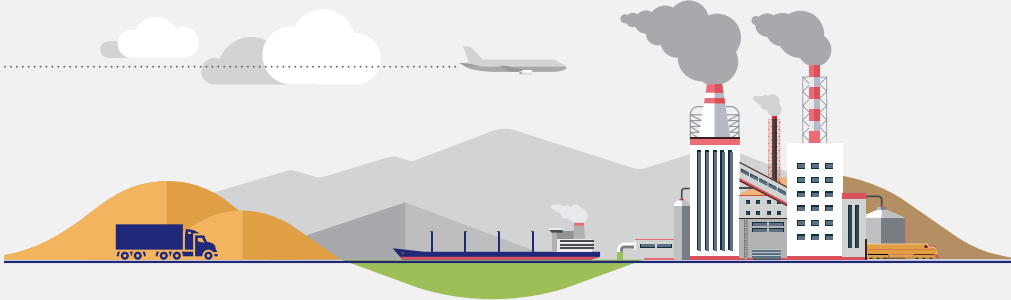
### Future-proof Connections to All Grids

Three connection network codes set out rules and requirements for all users of the transmission grid: generation facilities, demand facilities, and high voltage direct current (HVDC) technologies. The three connection codes will ensure that all parties connecting to the transmission grid contribute to system security. As such, they will allow more renewable energy sources to be connected to the system while ensuring that electricity transmission grids remain stable.

The connection codes also pave the way for the development of competitive pan-European markets in generator technologies, smart grids and HVDC technologies by providing greater certainty to investors and freeing the industry from overly heterogeneous national specifications.

# WHY NETWORK CODES

OBJECTIVE : Create a secure, sustainable and competitive European electricity market.

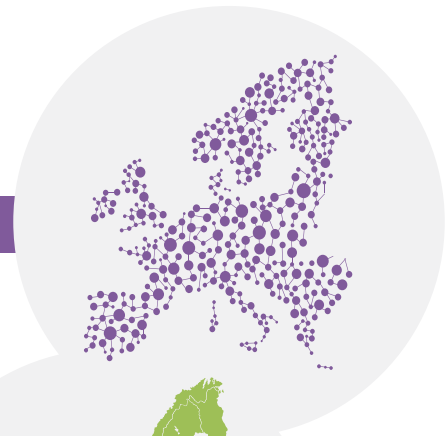


Network Codes tackle this objective on three fronts :

1

System operations

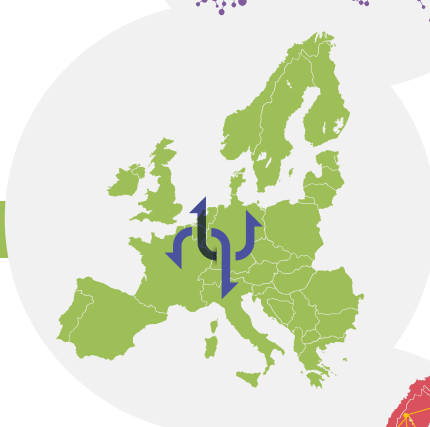
**SECURE OPERATIONS ACCROSS EUROPE**



2

Market

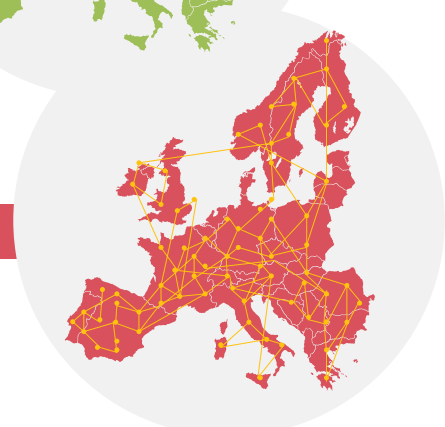
**MAKING THE ELECTRICITY MARKETS  
WORK ACROSS BORDERS**

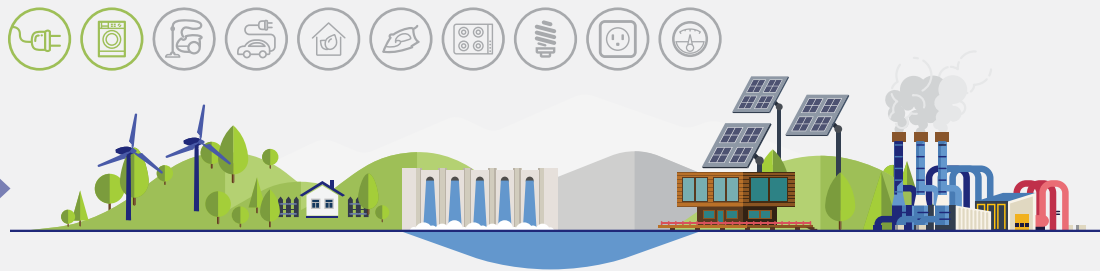


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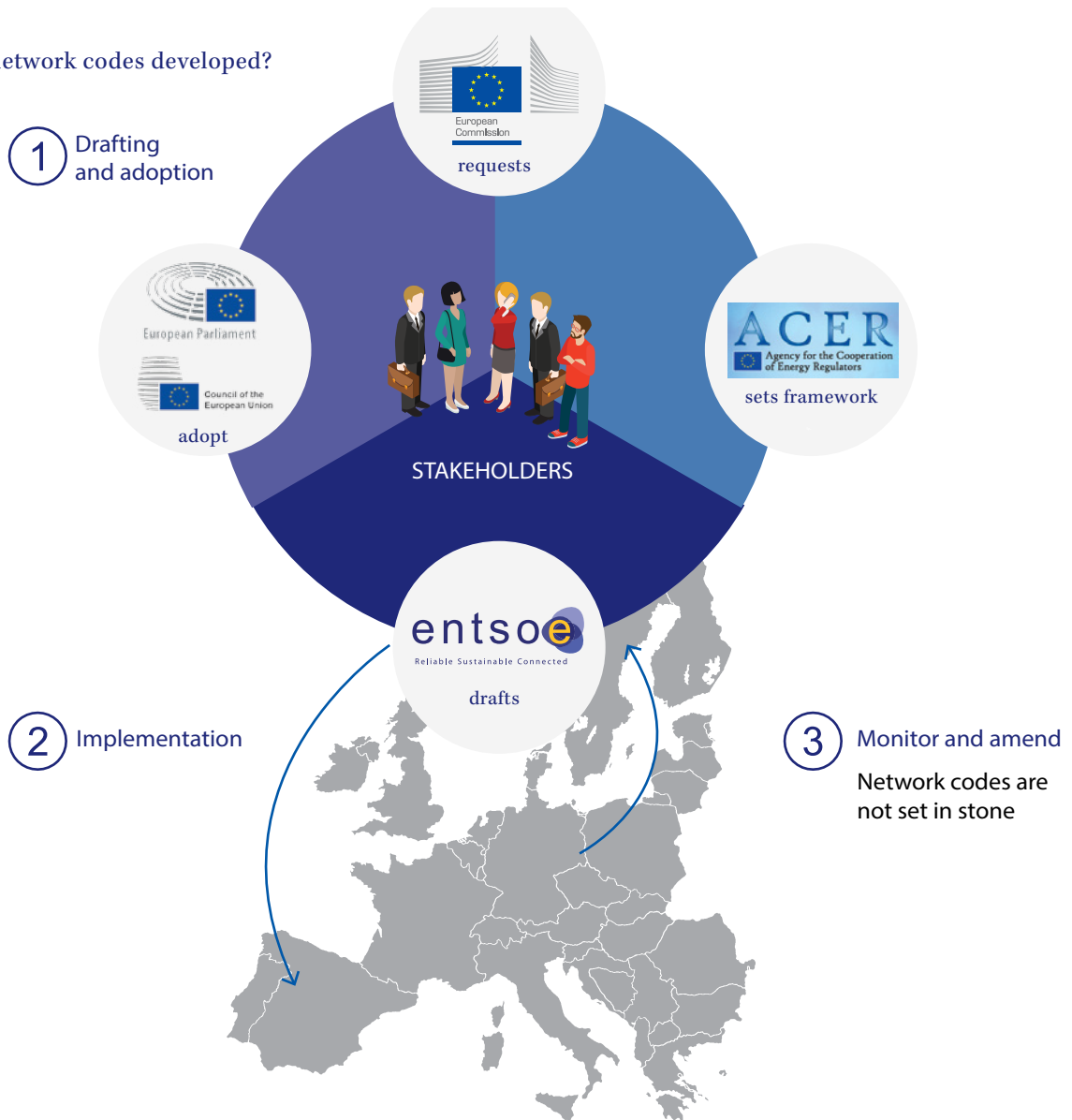
Infrastructure

**CONNECTION RULES FIT FOR THE FUTURE**





## How are network codes developed?



## 1. THE RULES OF THE GAME

EU Member States voted positively on these three codes between June and October 2015. Their entry into force will represent the result of over six years of work and debate.

The three connection codes will now go through scrutiny of the European Parliament and Council and are expected to enter into force before mid-2016.

### Operating the Grid, together

In 2015, ENTSO-E together with the Commission and ACER decided to make significant structural changes to the set of draft codes that will govern how power systems are operated. Three operational network codes were merged into a single operational guideline. This will bring more clarity, consistency, and accelerate the adoption process. The System Operations Guideline entered comitology at the end of 2015. ENTSO-E hopes it will be adopted and enter into force in 2016.

### Other Codes

In 2015, ENTSO-E and its partners also progressed on the completion of the two remaining codes: Electricity Balancing (market) and Emergency and Restoration (system operations). Both codes received a positive opinion from ACER in 2015. ENTSO-E hopes they will be submitted for vote by Member States in comitology in 2016.

## 1.2. LESSONS LEARNT AND THE WAY FORWARD

The first phase of the ambitious program to provide the European power sector with common sets of rules is expected to come to an end in 2016, with the expected adoption of

the emergency and restoration and balancing codes. In order to prepare for implementing the existing codes, monitoring their impact, amending them and possibly adopting new codes, the time is right to reflect on the way we have been working together with stakeholders so as to draw conclusions and concrete proposals for future improvements. Although ENTSO-E has identified some internal areas for improvement, notably to guarantee full cross-code consistency, the focus will be put mainly on enhancing the way in which we engage with all stakeholders.

A sound stakeholder engagement process is one that allows stakeholders to voice early-on their main concerns and expectations. It is one that gives time to analyse and fully consider the contributions of each stakeholder and also to debate changes. It must provide the right balance between the limited resources of ENTSO-E, TSOs and stakeholders, the time allocated by regulatory authorities with the need to debate in a transparent and open manner. To be effective, it must appeal to stakeholders representing all the geographic diversity of Europe and all interested parties, including consumers, environmental organisations, and participants in markets across Europe.

ENTSO-E is committed to proposing enhanced stakeholder engagement processes. This is why ENTSO-E and ACER suggested to set up European Stakeholder Committees for Network Code Implementation and organised a joint public consultation to detail their structure. The Market Stakeholder Committee gathered for the first time in 2015. ENTSO-E will provide secretariat services to support the discussions. We believe that in the future, they should have a role to play



in network codes amendment.

If ENTSO-E is tasked with developing new network codes, for example distributed flexibility, a co-creation process with stakeholders will be used. The operational details of this process still need to be properly defined and discussed with stakeholders.

### 1.3. THE RULES ON THE GROUND: IMPLEMENTING NETWORK CODES

The drafting and approval of network codes was the first step. The second, starting now, is their implementation across Europe. Each code requires a series of steps to be taken, which may include national decisions, regional agreements, and new European common methodologies and IT tools. Involved in the implementation process are ENTSO-E, TSOs, DSOs, ACER, national regulatory authorities, EU Member States, power exchanges, and all representatives of the power sector including generators, manufacturers, consumers, service providers and civil society groups.

#### Implementing the Guideline on Capacity Allocation and Congestion Management

The goal of the Guideline on capacity allocation and congestion management (CACM Guideline) is to create the largest, most efficient electricity market in the world. It will create a long lasting competitive business environment for European companies and is a prerequisite to achieve Europe's sustainability objectives. We have to fully implement it together in order to harvest this potential.

#### Capacity Calculation Regions

Capacity calculation regions are areas where

a coordinated capacity calculation method will be applied. Within the new supra-national regions, TSOs will be using state of the art technology to determine and update, for forward day-ahead and intraday timeframes, how much electricity market participants can exchange across each border. Defining regions is therefore the first step.

Taking into consideration the input provided by stakeholders in a consultation, all TSOs were able to agree on a proposal and submit it to all national regulatory authorities by the legal deadline of November 2015. This proposal defines 11 regions in Europe and sets out clear objectives of cooperation between regions, which should eventually lead to some of them being merged in the future. In particular, TSOs in the Central West Europe and Central East Europe regions committed to cooperate in the implementation of a common flow-based capacity calculation methodology, so as to ensure a smoother and faster integration of both regions.

The next step is for national regulatory authorities to decide on this proposal.

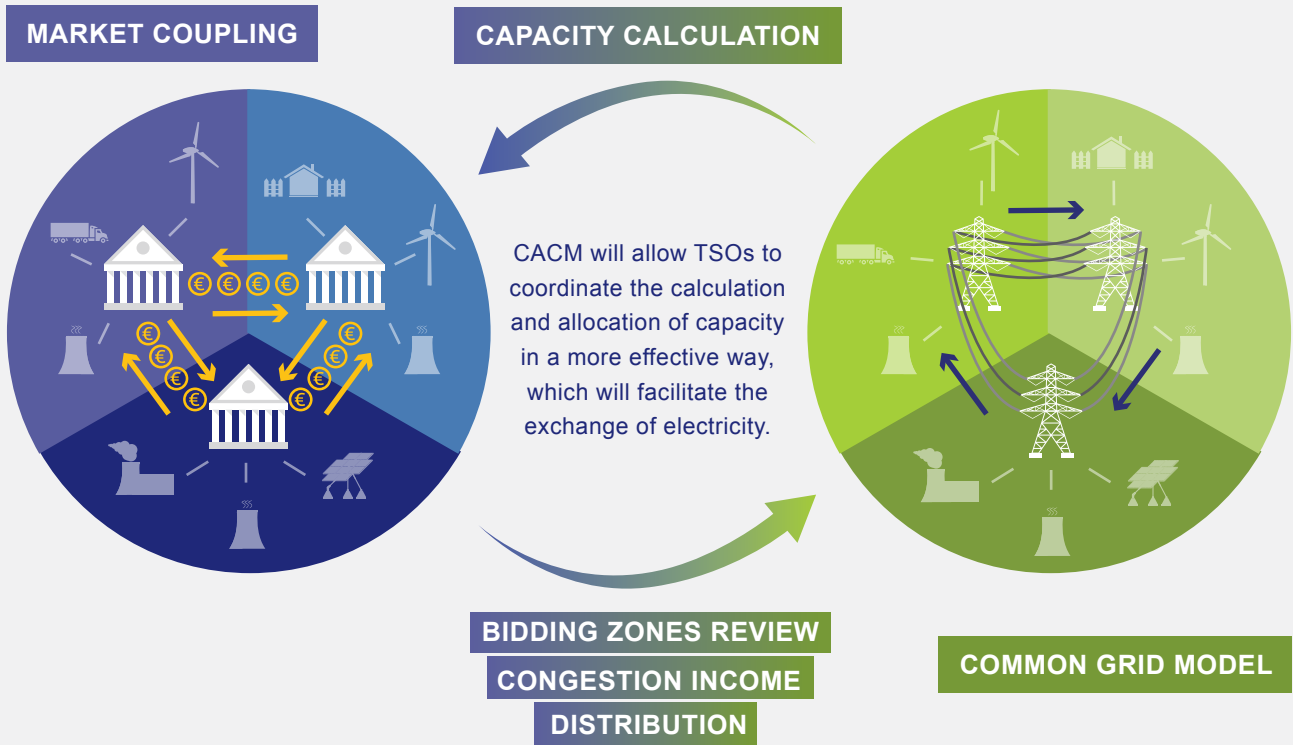
#### Bidding Zones Study

A bidding zone is the largest geographical area within which market participants are able to exchange energy without capacity allocation. Within a bidding zone, electricity market wholesale prices are therefore uniform. Market participants who wish to buy or sell electricity in another zone need to take into account grid constraints, which sometimes implies price spreads between bidding zones. As part of the implementation of the CACM Guideline, a reporting on the efficiency of existing bidding zones, and possibly a review, are foreseen. With the support of ACER, national regulatory

## CACM: BRINGING MARKETS AND THE PHYSICAL WORLD CLOSER

MARKETS : €

GRID : e<sup>-</sup>



authorities, the European Commission and various stakeholders, ENTSO-E has already taken a number of steps in this direction, and will continue to do so in 2016.

Following the publication of the Bidding Zone Review Technical Report in 2014, ENTSO-E with help from consultants developed during 2015 the methodology and assumptions that will be used in the review process. ENTSO-E has developed alternative bidding zones configurations to be assessed, going from the status quo to a ‘start from scratch’ configuration. In particular, the configurations explore the possibility to split existing big bidding zones covering the whole territories of France, Germany and Poland, to split the German-Austrian bidding zone,

and to merge the Belgian and Dutch and the Czech and Slovak bidding zones. These proposals have been communicated to the participating regulatory authorities. The work carried on by ENTSO-E in the bidding zone review process investigates the best delineation of bidding zones that fits the multicriterion of efficiency, price signals, liquidity and security of supply.

The first results of the review are expected to be known by end 2016, but work will continue in 2017.

### Congestion Income Distribution

The revenues received as a result of capacity allocation – ‘congestion income’ - need to be distributed to the involved TSOs or third

party asset owners. The sharing of the congestion income between the TSOs is typically based on joint agreements among them. In cooperation with ACER and national regulatory authorities, ENTSO-E has been tasked to prepare a pan-European methodology for the distribution of congestion income. ENTSO-E has prepared a first draft methodology, containing general principles and a general implementation process for these principles, but leaving the specific mechanisms for sharing congestion income to regional or local arrangements.

ENTSO-E is already discussing this proposal with ACER and regulators, with the goal to deliver a methodology that satisfies all parties involved by 14 August 2016.

### **Major Milestones in Market Coupling**

The maps on the next page illustrate the growth towards the coupling of European day-ahead electricity markets. The journey started as voluntary projects in some Member States.

The CACM Guideline sets the rules for a coordinated European day-ahead and intraday market that allows market participants to trade up to at least one hour before real-time. In February 2015 the Italian-Austrian, Italian-French and Italian-Slovenian borders were coupled to the already coupled large Northwestern/Southwestern European day-ahead market with the Multi-Regional Coupling, thus linking the majority of EU power markets - from Finland to Portugal and Slovenia. In May 2015 the Central West European area (France, Germany and Benelux) switched to a flow-based model, allowing for increased price convergence. The flow-based methodology takes into account interdependencies and strives

for increasing the security of the system and the capacity provided to the market, thus supporting the accommodation of variable resources as much as possible.

### **The Common Grid Model**

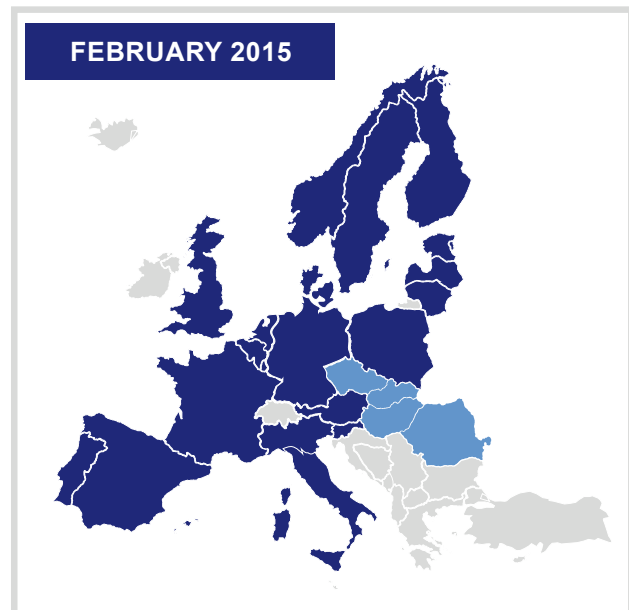
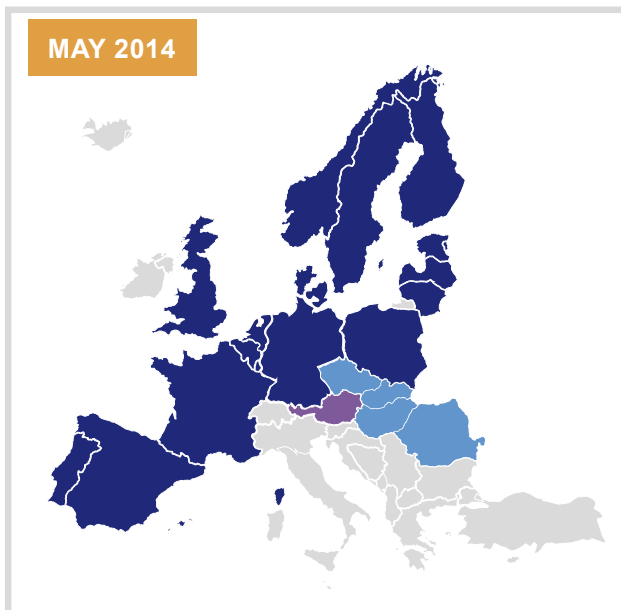
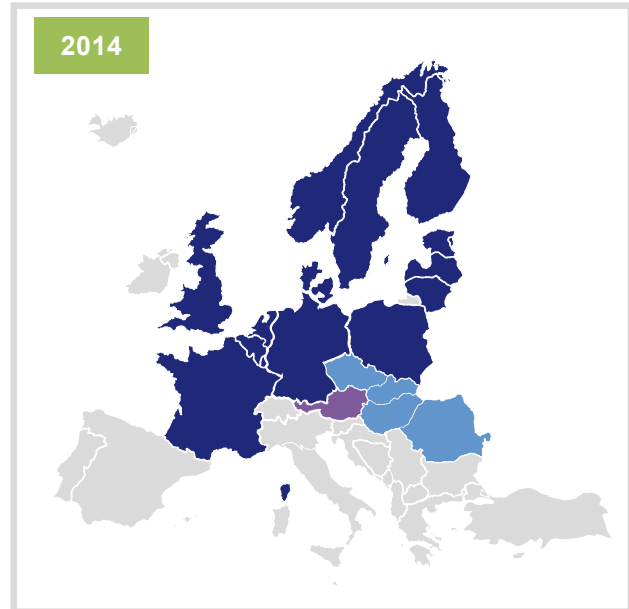
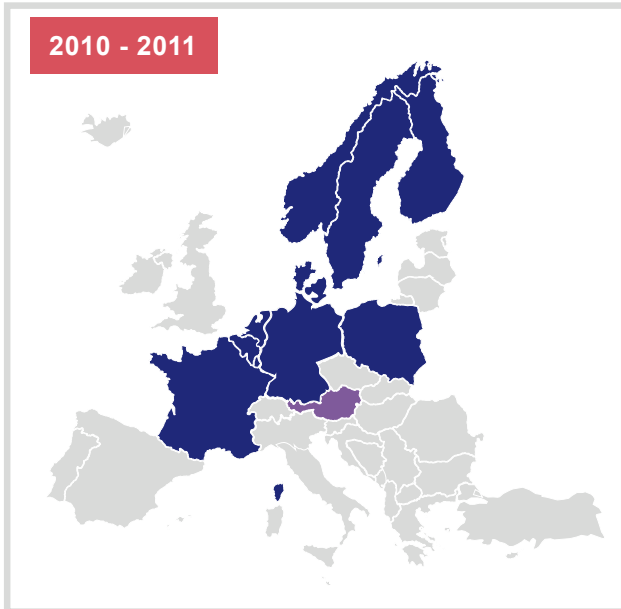
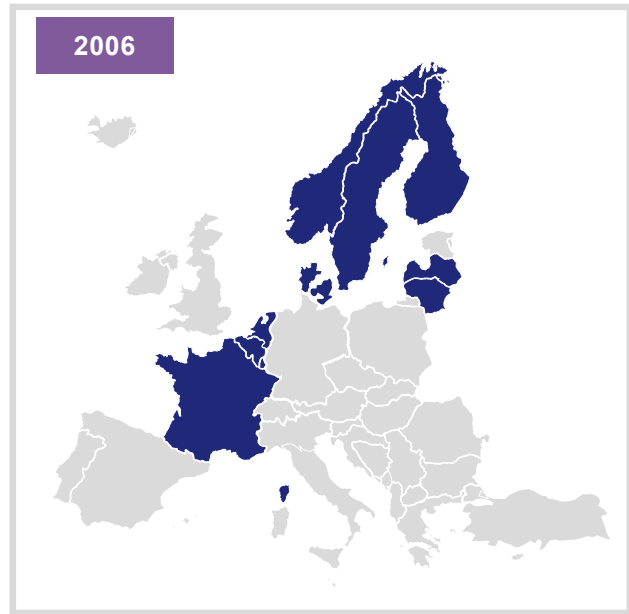
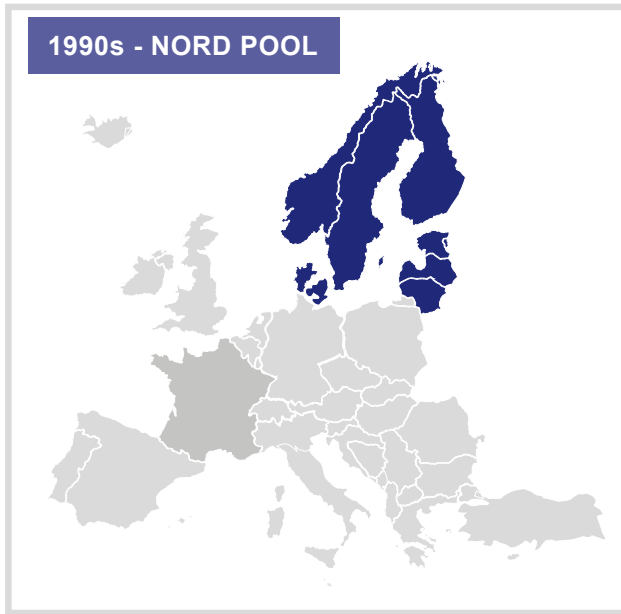
TSOs all over Europe constantly exchange information - daily market and system operations would not be possible without a common language. This language is the common grid model, which enables the execution of operational and capacity calculation processes, as defined in the network codes and guidelines for system operation and market.

ENTSO-E's common grid model program has set up five interdependent work packages, in order to design common methodologies, procedures and algorithms to be used by all. ENTSO-E drafted in 2015 the common grid model methodology and the generator and load data provision methodology, as required by the CACM guideline. The first workshop in October 2015 allowed stakeholders to provide input, whilst a public consultation and second workshop took place in early 2016.

### **Early Implementation Projects to Accelerate the Delivery of European Forward and Balancing Markets**

ENTSO-E has proactively decided to launch early implementation projects of two codes - forward capacity allocation and electricity balancing - in coordination with regulators and interested stakeholders. These pilots are adding value in that they allow to test the grounds and get all stakeholders used to the forthcoming methodologies.

# 1. THE RULES OF THE GAME



## Forward Capacity Allocation

Forward markets allow parties to secure transmission capacity before the day-ahead time frame, while hedging the risks. The Network Code on Forward Capacity Allocation will make sure that forward markets are developed in a coordinated way across Europe. ENTSO-E began the early implementation of the harmonised allocation rules project in 2014, before the forward capacity allocation regulation was adopted by EU Member States in October 2015. Harmonised allocation rules deal with the procedures for auctioning transmission rights, the terms on which market participants may participate in explicit auctions and the terms for use of cross-zonal capacity.

In 2015 ENTSO-E submitted the final version of the harmonised allocation rules to national authorities, who approved it in the third quarter of 2015. This successful outcome was supported by the input and expertise provided by stakeholders who participated in a public consultation and workshop during the drafting process. The first yearly allocation based on the harmonised allocation rules was organised by the Joint Allocation Office - joint service company of 20 TSOs – at the end of 2015.

TSOs are now updating the harmonised allocation rules based on the final version of the forward capacity allocation regulation, as adopted by EU Member States.

## Electricity Balancing

Electricity balancing is the process by which TSOs ensure, in real time, sufficient energy to balance inevitable differences between supply and demand. The Electricity Bal-

ancing Network Code aims to move Europe from the current situation, in which most balancing is carried out at a national level, to a situation in which larger markets allow the resources available in Europe to be used in a more effective way (for example, hydro power from Switzerland allowing greater levels of solar power to be connected in Italy or Germany).

ENTSO-E's work on balancing is conducted with stakeholders involved in the Balancing Stakeholder Group, including DSOs, energy traders and energy exchanges, renewable generation, utilities, regulators and the European Commission, to name a few. Implementing the Electricity Balancing Code is a very ambitious project, which will require significant changes in all European countries. This is one reason why ENTSO-E began some implementation activities early on.

ENTSO-E has proposed several pilot projects to identify and overcome potential barriers, get bottom-up experience for the implementation and report on the experience gained. In 2015 the eight pilot projects have continued their geographical expansion. A first step towards a regional integration model has been made, with a proposal for imbalance netting coordinated balancing areas (CoBAs). Coordinated balancing areas are areas where TSOs cooperate with respect to the exchange of balancing services, the sharing of reserves or the operation of the imbalance netting process avoiding the activation of automatic frequency restoration reserves bids by first netting with neighbouring TSOs.

The focus for 2016 lies in starting an implementation project that will evolve from

## 1. THE RULES OF THE GAME

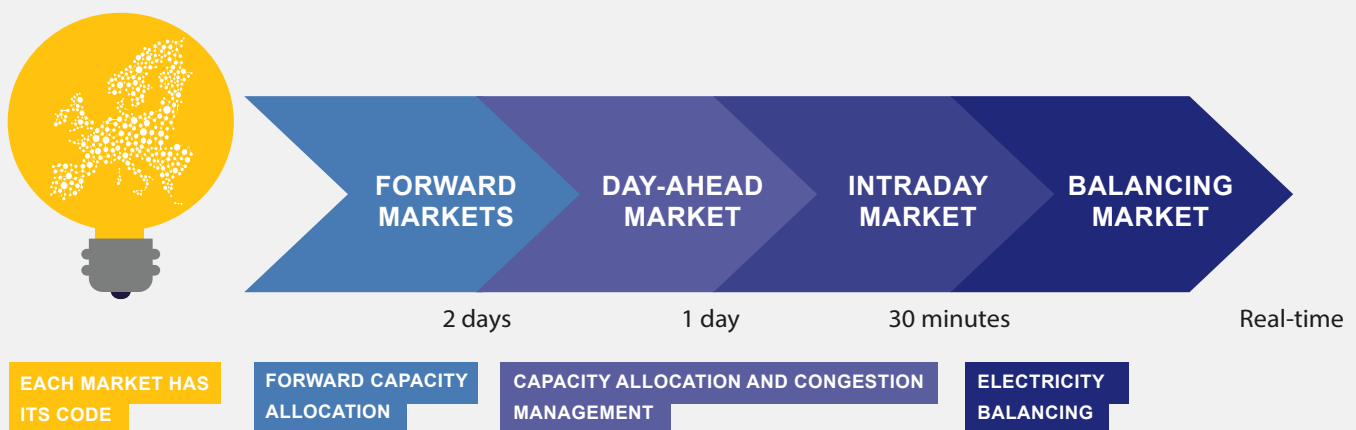
the existing imbalance netting projects to a single coordinated balancing area for imbalance netting in continental Europe and to create a governance structure for implementing regional and European integration models to be used for all processes.

In addition, in 2015 ENTSO-E has finalised the general methodology for cost-benefit analysis and the specific methodology for the cost-benefit analysis on the imbalance settlement period. ENTSO-E has also started the cost-benefit analysis on the imbalance settlement period in order to have results ready in time for the European Commission's impact assessment in March 2016. ENTSO-E has decreased the proposed number of standard products for manual frequency restoration reserves and replacement reserves to six, whilst conducting a study on the automatic frequency restoration reserves process.

### Implementing Connection Codes

In 2015 all three connection codes – requirements for generators, demand connection and high voltage direct current – were approved by the European Commission in comitology. Their entry into force is expected by mid-2016. From that moment onwards, the leading role in the implementation of the three codes will be at the national level. Implementation must take place within three years, two years being allocated to implementation at the national level and one to allow manufacturers, producers and consumers to comply with the requirements. ENTSO-E's role in the implementation process is the publication of the implementation guidelines, within six months of the entry into force of each code. ENTSO-E interacted with all the interested stakeholders as early as December 2015, in order to define the relevant topics for the implementation guidelines.

### ELECTRICITY MARKETS



Aside from this official mandate, ENTSO-E has already taken significant steps in supporting the implementation of the connection codes. On 23 September 2015, ENTSO-E organised a public workshop, where four implementation approaches (from the UK, Norway, France and Germany) were presented and discussed. Nearly 100 representatives from 22 countries participated, from a wide range of organisations including ministries and national regulatory authorities. This allowed for a positive exchange of experiences between the participants and provided food for thought to EU Members States that had not yet started the implementation process. As there were very few representatives from South-East Europe, ENTSO-E decided to organise a similar workshop in that region in the beginning of 2016.

Finally, ENTSO-E is collaborating with CENELEC, one of the European standardisation organisations, to assist with the development of standards that will bridge the gap between the connection codes and their implementation.

### Transparency of Implementation Projects

ENTSO-E is developing an active library to make sure all documents on code implementation are made available to stakeholders in an easy and practical way. The active library, which will be made accessible in spring 2016, will contain the latest publicly available information on the implementation of network codes in all European countries and regions, including overviews of national processes and links to available material on national websites (in the national language).

In addition to a number of specific stakeholder groups, public workshops and public

consultations organised for the different implementation projects, the Market Stakeholder Committee was created in 2015. It will be followed in 2016 by the other two committees on connection and operational codes. The committees, chaired by ACER and supported by ENTSO-E, will gather experts from pan-European organisations representing all sides of the power sector and consumers. They will check the progress of implementation projects against their original planning and will constitute a platform for all stakeholders to raise their concerns or objectives whilst sharing good practices. In 2016, all documents, including meeting presentations and reports will be publicly available, and meetings of the stakeholder committees may be made available on live streams. The stakeholder committee page hosted on ENTSO-E's website will allow any user to submit a remark or question to stakeholder committee members.



# 02

## ACTIVE CUSTOMERS

2.1. The ENTSO-E Transparency Platform:  
knowledge is power

2.2. Towards smarter grids: The TSO-DSO  
interface for the benefits of customers

2.3. TSO-DSO cooperation on 20 March 2015:  
the solar eclipse





## 2. ACTIVE CUSTOMERS

### 2.1. THE ENTSO-E TRANSPARENCY PLATFORM: KNOWLEDGE IS POWER

Transparency is essential for a well-functioning internal energy market, increasing competition and contributing to appropriate prices. It ensures trust and market stability and is a strong safeguard against manipulation. A level playing field needs to be created with equal information for all market participants, allowing better risk analysis and decision-making as well as the reliable monitoring and regulation of power markets.

The ENTSO-E Transparency Platform is the place where all market participants in Europe – big and small, incumbents and new entrants, businesses and citizens – have free and equal access to fundamental data and information on energy generation, transmission and consumption. The information is collected from data providers including TSOs, power exchanges and other third parties.

Launched in January 2015 as required by EU regulation, the platform allows reporting to ACER under the REMIT Regulation, the EU legislation against market manipulation in the energy sector, since the end of 2015.

#### Focus on the User

The quality, collection of and access to the data needs to be constantly improved. The ENTSO-E Transparency User Group set up mid-2015 is collecting, analysing and prioritising user feedback. It is composed of representatives of European regulators, of the European

Commission, distribution system operators, suppliers and traders amongst others. The agreed action plan for 2016 includes further developments in the download facility and further steps towards enhancing both the data provision and data quality.

### 2.2. TOWARDS SMARTER GRIDS: THE TSO-DSO INTERFACE FOR THE BENEFITS OF CUSTOMERS

Integrating the electricity market means integrating all its participants and, above all, consumers who have become active players in the market. Either by taking on the role of producer-consumer ('prosumer') or by engaging in demand response, the role of consumers in the electricity system is growing and should be central. This, along with developments such as increasing amounts of renewable energy sources and expanding shares of power production taking place at the distribution level, require a revision of the way transmission and distribution system operators interact.

For this reason, in 2015 ENTSO-E intensified its collaboration with the associations representing DSOs at EU level, through a series of joint workshops covering the topics of roles and responsibilities, data handling, network planning and active power management. In spring 2015 a memorandum of understanding was signed specifying certain interactions of the five associations. In November, all associations issued joint general guidelines for reinforcing the cooperation between TSOs and DSOs.

THE TRANSPARENCY PLATFORM IN NUMBERS:

90 

million values added in 2015



10 MILLION

visitors in 2015

The guidelines set the basis for further cooperation in the future on data management, active and reactive power management and coordinated planning of network development. In a nutshell, it provides a framework for moving to the smart grids' future. Smart grids, along with the appropriate market arrangements, will unlock the potential of consumers to play an active role in the electricity market. This will safeguard the efficiency, competitiveness and security of the European power system for decades to come.

The TSO-DSO interface is expected to feature in the Commission's forthcoming market design legislation to be released in 2016. This is why ENTSO-E and DSO associations are taking a new step in their cooperation, with the publication early 2016 of a joint paper outlining the responsibilities of TSOs and DSOs in data handling.

### 2.3. TSO-DSO COOPERATION ON 20 MARCH 2015: THE SOLAR ECLIPSE

Solar eclipses represent a real challenge for a power system that incorporates increasing solar generation. Active consumers and enhanced TSO-DSO cooperation are part of the solution to keep the EU grid safe during upcoming eclipses, along with the speedy adoption and implementation of all network codes, upgraded market and system rules

and new system services provided notably by photovoltaics.

During times when fossil fuels dominated, solar eclipses were not a big deal for power system operators. This changed with the increasing share of solar generation. For power systems, the high variations in solar generation that take place during an eclipse are a significant challenge. The solar eclipse that took place on 20 March 2015 required a thorough and coordinated preparation by TSOs.

When the next solar eclipses occur in Europe, in 2021 and 2026, the share of photovoltaics will by then be even higher. The impact on the power grid will thus be greater. This calls for more adaptations. Smart grids with active energy customers placed at the centre would help provide more flexibility. The network codes, in particular the Requirements for Generators (RES integration) and Demand Connection (smart grids) codes, aim to reflect this new reality of more decentralised and more variable power systems. Their swift implementation is necessary. Finally, enhanced TSO-DSO cooperation would allow TSOs to have a better overview of solar generation capacities, nearly all of which are connected at distribution level.

# WHAT TSOs DO FOR YOU

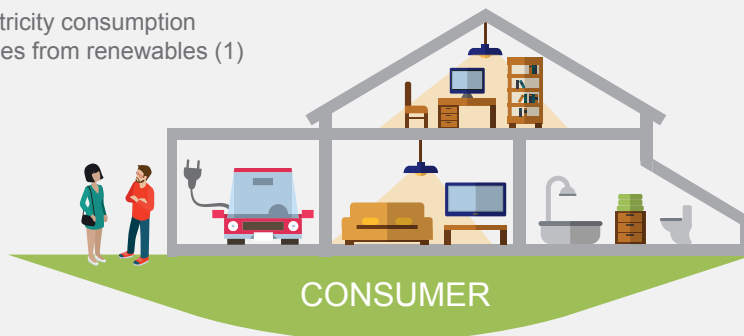
## TSOs BUILD INFRASTRUCTURE TO INTEGRATE RENEWABLES



**20%** decrease in CO2 emissions by 2030 (2)

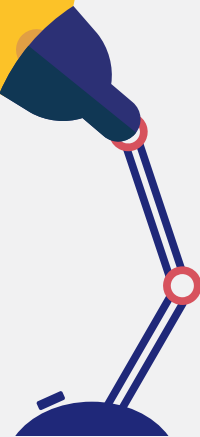


**24%** electricity consumption comes from renewables (1)



## TSOs KEEP THE LIGHTS ON

**24/24 7/7**



## TSOs SUPPORT THE SWITCH TO SMART GRIDS



**3%** energy saved on average (3)



**13%** reduction of household energy costs (4)

## TSOs CONTRIBUTE TO THE INTEGRATION OF EUROPEAN ENERGY MARKETS

**13 billion €**

saved per year for consumers (5)

**2 to 5 €/MWh**

reduction in wholesale power prices (2)

(1) In 2012 in the EU-28, European Environment Agency, website

(2) Due to enhanced market integration, brought by the €150 billion grid expansion proposed in the TYNDP 2014

(3) European Commission DG Energy, website

(4) and (5) European Commission Communication COM(2012)663 Making the internal energy market work

# 03

## EUROPE'S POWER FUTURE

3.1. Designing the future grid: the TYNDP 2016

3.2. Further into the future: e-Highway2050

3.3. Innovation: what does the future hold?

3.4. Re-thinking the energy market

3.5. Where the Energy Union starts: regions

3.6. What Governance for the Energy Union?

3.7. Teaming up with our neighbours



# 3. EUROPE'S POWER FUTURE

## 3.1. DESIGNING THE FUTURE GRID: THE TYNDP 2016

Infrastructure is vital to achieve the EU targets of decarbonising the energy system. Low carbon trends for the European economy have a direct impact on the design and upgrade of the entire European energy infrastructure, particularly with regards to the pan-European electricity transmission network. ENTSO-E is tasked with publishing Ten-Year Network Development Plans (TYNDP) to design the grid of the future.

Work on the 2016 edition of the TYNDP started as early as 2014 and continued at an increasing pace throughout 2015.

ENTSO-E's call for submission of storage and transmission projects of European relevance resulted in 48 non-ENTSO-E applications, including 25 transmission and 23 storage projects - this is nearly twice the number of the 2014 edition - in addition to over 150 transmission and storage projects submitted by ENTSO-E member TSOs. The list of projects was opened for public consultation. All but two of these projects (one was withdrawn and the other did not fulfil the pan-European relevance criteria) are assessed in the TYNDP 2016.

For network development through 2030, the large uncertainties about the future development of generation, demand and wholesale prices need to be captured by using a wide spread of scenarios. For these the input from the Network Development

Stakeholder Group is especially important. ENTSO-E developed and published the report on one scenario for 2020 and on four 2030 scenarios, including the data used for the establishment of the scenarios. The scenarios to be used in the TYNDP 2016 incorporate stakeholders' feedback also received during the TYNDP 2014 exercise, as well as the feedback collected during public workshops, webinars and a one-month on-line consultation.

The main change compared to the 2014 edition is the publication one year before the TYNDP of the six Regional Investment Plans. They contain detailed information on regional infrastructure needs and projects resulting from the common planning exercise of the TSOs. Draft regional reports were presented during a public workshop at the end of June and submitted to public consultation over the summer. The final reports, as well as all comments received, were published in early November. A public webinar was organised, providing a high-level overview of the final regional reports and of the next steps in the TYNDP 2016 process.

### Ensuring System Adequacy

ENTSO-E published in July the Scenario Outlook and Adequacy Forecast 2015. This report looks at short and medium term adequacy - the capacity of a system to cover demand - and its likely evolution in Europe up to 2025. For the first time, the Scenario Outlook and Adequacy Forecast uses the pan-European climate database and is

## SUMMARY OF THE CHARACTERISTIC ELEMENTS OF THE 4 SCENARIOS OF THE TYNDP 2016

	 1 SLOWEST PROGRESS	 2 CONSTRAINED PROGRESS	 3 NATIONAL GREEN TRANSITION	 4 EUROPEAN GREEN REVOLUTION
 Economic and financial conditions	Least favourable	Less favourable	More favourable	More favourable
 Focus of energy policies	National	European	National	European
 Focus of R&D	National	European	National	European
 CO <sub>2</sub> and primary fuel prices	low CO <sub>2</sub> price, high fuel price	low CO <sub>2</sub> price, high fuel price	high CO <sub>2</sub> price, low fuel price	high CO <sub>2</sub> price, low fuel price
 RES	Low national RES (>= 2020 target)	Between scenario 1 and 3	High national RES	On track to 2050
 Electricity demand	Increase (stagnation to small growth)	Decrease compared to 2020 (small growth but higher energy efficiency)	Stagnation compared to 2020	Increase (growth demand)
 Demand response (and smart grids)	As today	Partially used	Partially used	Fully used
	0%	5%	5%	20%
 Electric vehicles	No commercial break through of electric plug-in vehicles	Electric plug-in vehicles (flexible charging)	Electric plug-in vehicles (flexible charging)	Electric plug-in vehicles (flexible charging and generating)
	0%	5%	5%	10%
 Heat pumps	Minimum level	Intermediate level	Intermediate level	Maximum level
 Adequacy	National - not autonomous limited back-up capacity	European - less back-up capacity than scenario 1	National - autonomous high back-up capacity	European - less back-up capacity than scenario 3
 Merit order	Coal before gas	Coal before gas	Gas before coal	Gas before coal
 Storage	As planned today	As planned today	Decentralised	Centralised

able to present with more precision and on a hourly basis the times when the power system may be under stress.

These improvements respond to suggestions received from stakeholders in relation to previous editions. The Scenario Outlook and Adequacy Forecast will provide even more information and insight as of 2016, when a probabilistic market-based system adequacy assessment will be implemented.

### 3.2. FURTHER INTO THE FUTURE: E-HIGHWAY2050

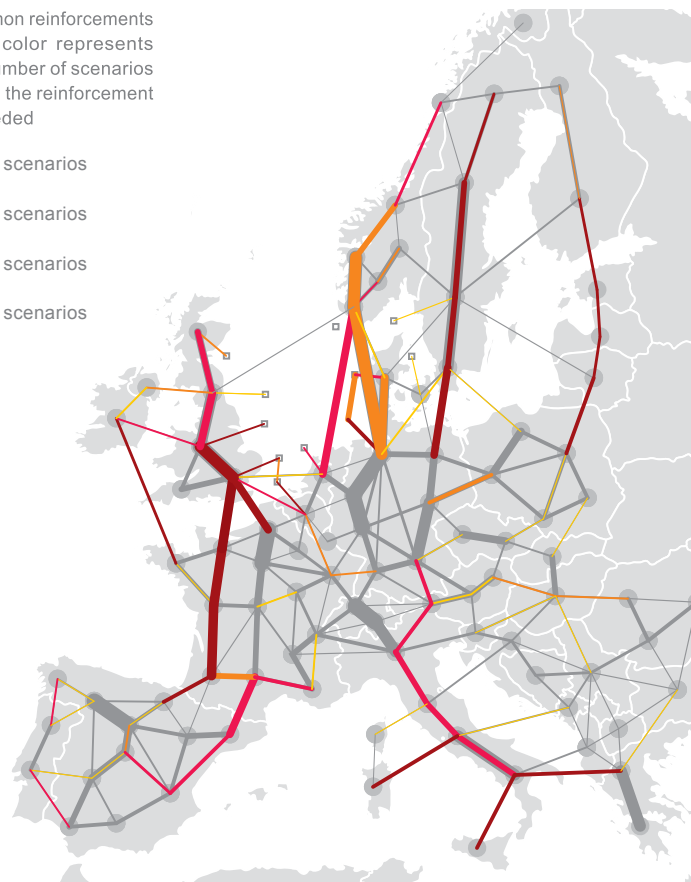
The energy transition will not end in 2030 - the time horizon of the TYNDP. ENTSO-E is already looking beyond. The e-Highway2050 research and innovation project assessed at how the transmission network has to evolve in order to reach close to zero emissions in the European Union by 2050.

Started in 2012, the e-Highway2050 research project delivered its final results in 2015. Novel network planning methodologies have been developed to address such a long-term horizon and cover the whole continent. The five very different scenarios considered provide an overview of the possible future evolutions of the European power system, whilst aiming to meet the objective of a near to fully decarbonised economy by 2050. The results of the e-Highway2050 project show that the planned 2030 network is not sufficient to face the 2050 energy scenarios. A few fundamental trends appear:

- ⊕ a set of needed reinforcements to the grid appear in all scenarios considered: major 'North - South' corridors with several reinforcements that connect the north of the pan-European electricity system (North Sea, Scandinavia, UK, Ireland), and southern

Common reinforcements - the color represents the number of scenarios where the reinforcement is needed

- 2 scenarios
- 3 scenarios
- 4 scenarios
- 5 scenarios



- countries (Spain and Italy), to the Central Continental area (northern Germany, Poland, Netherlands, Belgium and France);
- ⊕ that grid reinforcements are even necessary in a "small & local" scenario, which is dominated by decentralised generation;
- ⊕ the expansion of the network is driven by the increase of generation capacities, especially renewable energy sources;
- ⊕ the proposed architecture is not an overlay grid, but an evolution of the existing European grid, to be developed step by step.

The costs of investment in grid expansion lie between €100 and €400 billion. The benefit for the European economy, resulting from an optimal use of energy sources, would largely exceed these costs in all cases: 200 megatons of CO2 emissions and up to 500 TWh of renewable energy curtailment would be avoided annually.

### 3.3. INNOVATION: WHAT DOES THE FUTURE HOLD?

As stated by Maroš Šefčovič, Vice President of the European Commission, the Energy Union “intimately links research and innovation, information and communication, transport and energy systems.” ENTSO-E coordinates TSOs’ innovation activities to ensure the future grid is up to the challenge.

#### Implementing the Energy Union Framework

In line with the Energy Union framework, ENTSO-E adopted in 2015 a research, development and innovation strategy. The strategy looks at the opportunities and challenges associated with the transformation of the European energy system with developments in ICT, power electronics, big data analysis, energy storage, etc. to secure highest value and efficiency. ENTSO-E’s research, development & innovation strategy highlights the growing need to coordinate TSOs’ efforts around three objectives:

1. taking into account a system view;
2. ensuring a funding framework, which makes use of both European Commission and national funding for innovation activities;
3. enabling inter-TSO cooperation on a diverse range of topics e.g. public acceptance.





#### Setting the scene – the R&D Roadmap

Last published in 2012, ENTSO-E’s R&D Roadmap will be updated to reflect the Energy Union Framework and the research, development & innovation strategy, as well as structural changes within the 2015 update of the Strategic Energy Technology (SET) Plan. It will put a strong focus on active par-

ticipation of EU Member States, as well as the involvement of national players in identifying needs for further research and innovation activities in addition to energy storage integration in the future electricity networks. The Grid+Storage project, of which ENTSO-E is a partner, provides a forum for interaction between TSOs, DSOs and energy storage stakeholders. Discussions being held within the project will feed into the scope and content of research, development & innovation activities for the next 10 years.

#### Planning – the R&D Implementation Plan

The annual ENTSO-E R&D Implementation Plan lists the concrete R&D activities needed in the next three years to achieve the objectives set in the R&D Roadmap. It helps identify the right R&D at the right time, whilst taking into account the European political context. Highlights of the 2016-2018 plan, released in March 2015, include:

-  Integration of storage
-  Innovative control systems
-  Power market operations
-  TSO / DSO cooperation

#### Keeping track – the R&D Monitoring Report:

The R&D Monitoring Report assesses research and development work performed by TSOs and partners within the context of the R&D Roadmap. The R&D Monitoring Report 2015 published early 2016 reveals significant results in executing R&D activities. Strong support from the European Commission in the area of power transmission system innovation resulted in the granting of four new R&D projects under the Horizon2020 framework.



## All about using it in the Real World – the R&D Application Report



The R&D Application Report demonstrates how results of TSO R&D projects are being deployed on the ground and how they improve transmission system operation. The 2014 edition was released in March 2015.

### Spreading Innovation - Innogrid2020+

InnoGrid2020+ is an annual conference co-organised by ENTSO-E and EDSO for Smart Grids. The 4<sup>th</sup> edition in March-April 2015 saw over 350 participants - grid operators, industry, EU officials, academics and media - discussing innovation in the power system. The 5<sup>th</sup> edition in March 2016 will address 'Digital energy', in particular the transmission-distribution interface (TSO-DSO).

### 3.4. RE-THINKING THE ENERGY MARKET

Having the right market rules in place is one of the fundamentals of Europe's power system. Markets must be able to integrate variable generation, support the development of smart grids and ensure security of supply. Throughout 2015, the debate on

#### A few examples of innovative projects:

- ⊕ ANEMOS Plus developed and demonstrated advanced tools for managing electricity grids containing large-scale wind generation.
- ⊕ MERGE evaluated the impact of electric vehicles on the EU electric power systems with respect to planning, operations and market functioning.
- ⊕ OPTIMATE developed a numerical test platform for analysing and validating new market designs that allow massive integration of flexible generation dispersed throughout several regional power markets.

the design of electricity markets has been at the centre of European policymaking. TSOs play a pivotal role with their networks and operations. As they connect all users and

The main conclusion of the R&D publications is that the current TSOs' R&D resources are insufficient to meet the European R&D objectives. TSO and regulatory commitment must be arranged to provide timely cost-effective and innovative solutions for future grids. Transmission tariffs in the EU should cover more R&D investments. Regulatory initiative in this field through ACER notably is necessary. Continued strong political will and financial support through initiatives such as Horizon2020 are essential in order to implement TSOs' ambitious research, development and innovation activities for the benefit of society as a whole.

service providers to one system, they are ideally placed to contribute to the design and implementation of market rules.

In that context, ENTSO-E has continued its work on market design building on its 2014 policy paper and further deepening its analysis. In 2015 the focus was on end-consumers, retail markets, innovation and the role of new actors.

With its Vision paper *Markets and Innovation deliver the Energy Union* ENTSO-E proposes concrete actions for today's challenges while anticipating solutions for 2030 and beyond. Prices reflecting scarcity, linking retail and wholesale markets, a coordinated regional and European framework for renewable energy sources, an overall change in the offers to and interaction with the active customer alongside better research and development management were at the centre of ENTSO-E's proposals. These elements should form a part of the forthcoming review of European electricity legislation.

In 2015, ENTSO-E contributed to the discussion on demand response by actively participating in the work of the Smart Grid Task Force EG3 led by the Commission and by publishing our recommendations in the policy paper *Market Design for Demand Side Response*. To enable active demand participation, consumers must have access to price information and be exposed to variable prices revealing the value of flexibility. Moreover, they should be able to sell their flexibility on the market. In this context, regulatory barriers, when present, need to be removed to unlock the full potential of demand response. Lastly, demand response should develop based on viable business cases: subsidies should remain limited and clearly identified.

#### 3.5. WHERE THE ENERGY UNION STARTS: REGIONS

Power markets and system operations and development require an additional level between the European and national levels. In addition to easing the sometimes difficult relationship between the national and the European level, regions bring tremendous benefits. Using the advantages of the neighbourhood, they allow, for instance, the testing of innovative solutions, the finding of conclusions that answer to regional specificities and the creation of economies of scale.

Regional security coordination initiatives (RSCIs) are service providers which support TSOs to better coordinate at a regional level, as increasingly required by the energy transition and market integration. Developed by TSOs on their own initiative, the RSCIs currently in operation already play a key role in the coordinated planning of TSOs' operations across a large part of Europe, covering 80% of Europe's citizens. The pioneers, Coreso and TSC, have almost a decade of experience behind them and are recognised as important contributors to the overall security of the network, both individually and in cooperation with each other. Several new RSCIs are currently in the process of being established by TSOs, so that all of Europe will be covered soon.

To ensure further coordination and harmonisation of operational activities amongst TSOs, the framework and provisions on RSCIs in the System Operation Guideline (one of the network code/guideline) will make it mandatory for TSOs to coordinate certain operational activities through RSCIs. ENTSO-E has decided that this will be best achieved by TSOs being party to a multilateral agreement.

The agreement was signed among ENTSO-E members on 10 December 2015. It foresees that signatory TSOs participate in RSCIs or contract five essential services from them.

The rollout and implementation of the five core services provided by RSCIs will be completed throughout Europe by the end of 2017. The multilateral agreement and the RSCIs have been structured in a way that will allow organic growth through future enhancements and the introduction of new services. Consumers will benefit from this enhanced TSO coordination through improved security of supply, increased network operation and market efficiency.

### 3.6. WHAT GOVERNANCE FOR THE ENERGY UNION?

Overall, the Third Package is delivering. The initial regulatory gap observed in 2007 is shrinking. Broadly, the mandates of the ENTSOs and of ACER are appropriate, but there is a need to increase efficiency further through the full use of the existing provisions. ENTSO-E's Vision paper *Regulatory governance for the Energy Union: Implement or update* of November 2015 proposes solutions to improve the governance of the power system.

The Energy Union will be built on the full implementation of the Third Package. Implementation, particularly of the network codes, has to remain a priority for all parties involved.

With regard to infrastructure there is, likewise, a vital need to focus on getting the infrastructure built. Only one-third of the planned lines are on schedule – despite the Projects of Common Interest process.

ENTSO-E therefore welcomed the establishment of the Copenhagen Infrastructure Forum in November 2015. We recommend a specific role for the Forum in developing solutions for getting the trans-European energy infrastructure from promise to practice.

Beyond this implementation imperative, ENTSO-E sees a few but vital new areas for regulation: they relate to retail-wholesale integration, as well as to the regional and European system adequacy assessment.

In view of the objectives of the Energy Union Strategy and to give stakeholders the possibility to assess ENTSO-E's commitment to the internal energy market and to society as a whole, we propose several adjustments to ENTSO-E's mandate and governance through a set of proactive voluntary measures:

- ⊕ improve further stakeholder involvement;
- ⊕ set up an Independent Advisory Council;
- ⊕ establish ENTSO-E's system adequacy methodology as the basis for enhancements to market design, security of supply and market integration at a regional and European level.

In many cases, voluntary approaches prepare the ground for sound new legislation or regulation. Voluntary cooperation has brought significant progress in areas such as market coupling (capacity allocation offices) or system operations (example of the regional security coordination initiatives in the previous article). Regulators cooperate through the Council of European Energy Regulators, and some EU Member States have set up cooperation structures such as the North Seas Countries' Offshore Grid Initiative, the Baltic Energy Market Interconnection Plan and the Pentilateral Energy Forum. The po-

tential benefits of greater regulation should always be analysed against the costs of non-intervention and the benefits and risks of possible voluntary or market approaches.

### 3.7. TEAMING UP WITH OUR NEIGHBOURS

Electricity does not stop at borders. ENTSO-E has 41 members and one observer member (since January 2016), accountable for transmission system operations in 35 different countries - this is more than the EU. Beyond Europe, links exist and continue to develop with many others. For example, the Continental European system is synchronously connected to North Africa, with all Balkan countries, with Turkey and with the extreme western part of the Ukraine (Burshtyn). Additionally, the Baltic EU Member States have synchronous connections with Russia and Belarus. Direct current connections, easier to manage between systems with different market and operational rules, exist not only within the EU and the ENTSO-E area, but also with Russia, and on the eastern borders of Turkey.


New countries committing to apply the rules of the internal energy market send out a clear message; it's a testament to the attractiveness and quality of EU rules governing electricity markets, including network codes. The Energy Community based in Vienna has proved its efficiency in spreading out the EU *acquis communautaire* to nearby countries which are not EU members. ENTSO-E and the Energy Community work together to promote the principles of the internal energy market.

Following the permanent connection of Turkey with Continental Europe in 2014, ENTSO-E finalised the process in April 2015 with the signature of a long-term agreement. In January 2016, ENTSO-E welcomed the Turkish TSO, TEIAS, as an observer member. Also in 2015, Continental Europe TSOs signed a connection agreement with Kosovo's\* TSO, KOSTT. This agreement transfers the responsibility of operating the Kosovar transmission system from the Serbian TSO, EMS, to KOSTT.

KOSTT and TEIAS are committed to promote the implementation of the Third Energy Package. They must comply with the operational rules like all other Continental European counterparts. They also agreed to comply with the operational and balancing network codes, when they enter into force.

Expanding the rules of the internal energy market is a win-win situation. These agreements increase system security on both sides, as more TSOs can offer help to a power system operator in difficulty. They also drive electricity costs down, as TSOs can share power reserves used to maintain a balance between generation and demand at all times.

*\*This designation is without prejudice to positions on status, and is in line with UNSCR 1244 and the ICJ Opinion on the Kosovo declaration of independence.*



# 04

## APPENDICES

ENTSO-E work program status

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ENTSO-E governance

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ENTSO-E structure, organisation & governance

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Financial statement

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ENTSO-E board and office holders

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ENTSO-E member TSOs

# ENTSO-E'S WORK PROGRAM STATUS - 2014-2015

Deliverable	Goal	Status - end 2014
<b>NETWORK CODES DEVELOPMENT AND IMPLEMENTATION</b>		
<b>Network Code on Requirements for Generators (NC RfG)</b>	Draft and implement binding EU legislation for generation connection to underpin system development fit for the future	Network code in Comitology
<b>Network Code on DSO and Industrial Load Connection (NC DCC)</b>	Draft and implement binding EU legislation for demand connection to underpin system development fit for the future	Network code in Comitology
<b>Network Code on HVDC Connections (NC HVDC)</b>	Draft and implement binding EU legislation for HVDC connections to underpin system development fit for the future	Code submitted to ACER for opinion and ACER recommendations published in Q2/2014 Network code prepared by EC for formal Comitology
<b>Network Code on Capacity Allocation and Congestion Management (NC CACM)</b>	Prepare the implementation of CACM guideline, allocating capacity in the day-ahead and intra-day timeframe, calculating the levels of available cross border capacity, and allocating and recovering costs	Approved in comitology in Q4 2014
<b>Network Code on Forward Markets (NC FCA)</b>	Deliver to ACER draft binding EU legislation for forward market integration	ACER recommendations published in May 2014
<b>Network Code on Balancing (NC EB)</b>	Deliver to ACER draft binding EU legislation for market integration and system security, especially the cross border exchange of reserves and balancing energy	Submitted to ACER for Opinion Q1/2014, re-submitted in Q3/2014
<b>Network Code on Operational Security (NC OS)</b>	Deliver to ACER draft binding EU legislation for operational security based on TSO coordination	Awaiting Comitology
<b>Network Code on Operational Planning and Scheduling (NC OPS)</b>	Draft and implement binding EU legislation for operational planning and scheduling based on TSO coordination	Awaiting Comitology
<b>Network Code on Load-Frequency Control and Reserves (NC LFCR)</b>	Draft and implement binding EU legislation for the definition and dimensioning of reserves and for load-frequency control, based on TSO coordination and the requirements for generators	Awaiting Comitology

Deliverable & AWP 2015 completion (quarter/year)*	Internal & external consultation in 2015	Status - end 2015: Comments/explanations
Adoption in comitology foreseen for Q2 2015, implementation in Q3, Q4 2015	Workshop on the implementation of connection codes Q3 2015	Approved in comitology in June 2015
Adoption in comitology foreseen for Q2 2015, implementation to begin Q3, Q4 2015	Workshop on the implementation of connection codes Q3 2015	Approved in comitology in October 2015
Adoption in comitology foreseen for Q2 2015, implementation to begin Q3, Q4 2015	Workshop on the implementation of connection codes Q3 2015	Approved in comitology in September 2015
Implementation activities to begin in Q1 2015 and to continue throughout the year. Estimated date of submission of proposal on capacity calculation regions in October 2015. On-going work as of Q1 2015 on generation and load data provision methodology, Common Grid Model methodology, and congestion income distribution arrangements, with submission foreseen in 2016. Bidding zone study Q2 2015 and continued activity on cross-border remedial action throughout 2015	Public consultation and workshop on the determination of capacity calculation regions in Q3 2015. Market stakeholder committee meetings Q3/Q4 2015	Entry into force in August 2015 Implementation: Proposal on capacity calculation regions published in October 2015. Ongoing work on the bidding zone study, alternative BZ configurations proposed Ongoing work on draft methodology for congestion income distribution CGM methodology and Generator and Load Data provision methodology drafted in 2015, publication of drafts for consultation foreseen Q1 2016
Adoption in comitology foreseen in Q4 2015. Implementation: Work on Harmonisation of Allocation Rules ongoing from 2014 with completion foreseen end 2015.	A Stakeholder Advisory Group set up in 2014, met in Q4 2014, Q1 and Q2 2015. Public consultation on harmonised allocation rules and workshop in March 2015. Market Stakeholder Committee meetings Q3/Q4 2015	Approved in comitology in October 2015 Implementation: Final version of the HAR submitted and approved by national authorities (Q3) Ongoing update of the HAR based on final version of FCA Regulation
ACER Opinion Q1 2015, pre-comitology from Q2 to Q4 2015. Early implementation: Work on Balancing CBA started in Q4 2014 scheduled for completion June 2015. Work on standard balancing products definition started in 2013 to continue in 2015. Ongoing coordination of cross border pilot projects.	Public consultation on the methodology for CBA in Feb-Mar 2015. Public consultation on the CBA for ISP and webinar with stakeholders in Nov/Dec 2015. Market stakeholder committee meetings Q3/Q4 2015	ACER recommendation published Q3 2015, comitology expected to begin in 2016 Early implementation: General CBA methodology and specific CBA methodology on the imbalance settlement period finalised Proposal for Imbalance Netting Coordinated Balancing Area Study on the automatic Frequency Restoration Reserves process conducted Proposal for a list of activation purposes developed Ongoing coordination of cross border pilot projects Ongoing preparation of document defining the rules and procedures for the future financial settlement of inadvertent interchange
Pre-comitology phase foreseen to end in Q2 2015, comitology in Q3, Q4 2015. Implementation: Updates to the ENTSO-E Awareness System to align thresholds with the NC OS requirements, awaiting final NC OS text	Internal consultation on data from generators	Operational codes merged into a single operational guideline in Q3 2015 Implementation: Work on Implementation guidelines started in Q4 2015 Ongoing work on proposal on how to aggregate data from generators (see below SO-System frequency)
Pre-comitology phase foreseen to end in Q2 2015, comitology in Q3, Q4 2015. Implementation: Ongoing work on Common Grid Model incl. completion by Q4 2015 of OPDE business requirements, European merging function, base cases.		Operational codes merged into a single operational guideline in Q3 2015 Implementation: Work on Implementation guidelines started in Q4 2015 Draft Operational Planning Data Environment specifications are expected to be finalised early 2016 (see SO-Common Grid Model)
Pre-comitology phase foreseen to end in Q2 2015, comitology in Q3, Q4 2015		Operational codes merged into a single operational guideline in Q3 2015 Implementation: Work on Implementation guidelines started in Q4 2015

\* For network codes: includes only the implementation measures for which work has already begun in 2015

Deliverable	Goal	Status - end 2014
<b>Network Code on Emergency &amp; Restoration (NC ER)</b>	Draft binding EU legislation on procedures and remedial actions to be applied in the Emergency, Blackout and Restoration states.	Mandate delivered by the EC on 1 April 2014 Preliminary working draft completed in June 2014, followed by consultation phase. New draft of the Code to be prepared on the basis of the input received during the consultation process, for submission to ACER Q2/2015
<b>RESEARCH AND DEVELOPMENT ACTIVITIES</b>		
<b>R&amp;D Implementation</b>	Foster TSO coordination on R&D, with strong links to the SET Plan and EEGI, by publishing and disseminating the R&D Implementation Plan	Publication of R&D Implementation Plan 2016-2018 foreseen for 2015
<b>R&amp;D Monitoring</b>	Monitoring and managing the implementation of the R&D Roadmap 2013-2022. Contributing in the Grid+ project activities	Publication of R&D Application Report 2014 foreseen Q1 2015
<b>R&amp;D Dissemination activities</b>	Communicating R&D activities, via the Innogrid 2020+ conference organised jointly with DSOs	Innogrid2020+ conference organised in March 2014
<b>Standardisation</b>	Improve interoperability and cooperation with standardisation bodies	CGMES published and tests in Q2, Q3 2014
<b>SYSTEM DEVELOPMENT ACTIVITIES</b>		
<b>Towards the next TYNDP 2016 &amp; Regional Investment Plans 2016</b>	Prepare the 2016 TYNDP with common market and network models to derive the trends, needs and future development of the transmission network at pan-European level	Scenario and identification of investment needs/ common planning studies has started and will continue in 2015
<b>System Adequacy Reports</b>	Deliver the Scenario Outlook & System Adequacy Forecast Summer Outlook, Winter Review Winter Outlook, Summer Review	SO&AF 2014-2030 published on 3 June 2014. Summer Outlook Report 2014 and Winter Review 2013/14 published on 21 May 2014. Winter Outlook 2014/15 and Summer Review 2014 published on 1 December 2014
<b>e-Highway2050 Project</b>	Contribute to the e-Highway2050 R&D consortium, e.g. through the dissemination work package, so that the study becomes the definitive study on the methodologies and architecture (e.g. voltage levels) of the long-term future grid fit for 2050 goals	Several deliverables to be published throughout 2015
<b>SYSTEM OPERATIONS ACTIVITIES</b>		
<b>Incident Classification Scale</b>	Implementation with ICS software and software upgrades	Updated ICS methodology submitted to ACER in Q2 2014. ICS annual report 2014 sent to ACER in Q4 2014.
<b>Common Grid Model</b>	Allow for the implementation of network codes with TSO coordination	5th CIM interoperability test conducted Q3 2014
<b>TSO cooperation</b>	Implementation of the roadmap described in the policy paper for TSO coordination	Policy paper on TSO coordination published in Q4 2014
<b>Interoperability of synchronous areas</b>	Study on Enhancing inter Synchronous Area cooperation by using existing and emerging technology of HVDC properties for reserve sharing and exchange providing social welfare. Study on Increase hourly ramping on HVDC links between Nordic and CE	Ongoing in 2014
<b>Continental Europe dynamic model</b>	Definition of a common dynamic model for CE to permit evaluation on network developments, particular studies and information to external subjects involved in extended system studies.	Ongoing in 2014
<b>Critical systems protection</b>	Assessing and enhancing the protection of critical infrastructure	Ongoing
<b>Electronic Highway</b>	Implement bandwidth upgrades to meet the increased challenges and coordination needs of the future, including the EAS and RSCIs	Ongoing
<b>ENTSO-E Academy</b>	Supports the improvement of knowledge sharing and consolidation of best practices in the TSO community	Ongoing



Deliverable & AWP 2015 completion (quarter/year)*	Internal & external consultation in 2015	Status - end 2015: Comments/explanations
End of drafting phase Q1 2015, submission to ACER Q2 2015, pre-comitology in Q3 and Q4 2015	Third and fourth public stakeholder workshops in Q1 2015	ACER recommendation published in June 2015, comitology expected to begin in 2016
Publication of 2016-2018 Implementation plan foreseen for March 2015. Scoping and drafting of Plan 2017-2019 from Q2 2015.	Public consultation in January 2015	R&D Implementation Plan 2016-2018 published in March 2015. R&D Implementation Plan 2017-2019 scheduled for publication in Q1 2016
Publication of report 2014 foreseen for March 2015. Scoping and drafting of report 2015 in Q2 to Q4 2015.		R&D Application 2014 report published March 2015. R&D Monitoring Report 2015 scheduled for publication in Q1 2016
Planned conference March 2015		Innogrid2020+ conference took place on 31 March - 1 April 2015
Interoperability tests. Standardisation cooperation workshops throughout 2015.	Two standardisation cooperation workshops organised in 2015	Cooperation with CENELEC on connection network codes
Work on scenario, projects, investment needs and planning studies to continue in 2015. Work on CBA studies to start Q3 2015.	3 public consultations in 2015, 4 stakeholder workshops or webinars, 5 meetings of the long-term development stakeholder group.	Released Q4 2015: the six regional investment plans, the list of projects to be assessed in the TYNDP 2016 main report, the TYNDP 2016 scenario development report and associated market data
Summer Outlook 2015 foreseen in Q2 2015. Winter Outlook 2015/16 Q4 2015. SO&AF 2015-2030 Q3 2015	Continuous internal consultation on improvement of methodologies	Summer Outlook 2015 and Winter Review 2014/15 published in May 2015. SO&AF 2015-2030 released in July 2015. Winter Outlook 2015/16 released in December 2015. Test phase for adequacy methodology improvements near completion, for application in next report Q2/2016
All remaining deliverables scheduled for publication throughout 2015 and by Q4 2015	Internal consultation Q3/4 2015, Conference November 2015	Project results published and disseminated in Q4 2015 at final project conference
Updated ICS and ICS Annual Report 2014 Q2 2015		ICS Annual report 2014 published in December 2015
Throughout 2015: enhancing TSO cooperation	Workshop on Operational Planning Data Environment in November 2015	CGM methodology and the Generator and Load Data provision methodology drafted in 2015, publication of drafts for consultation foreseen Q1 2016 Final drafting of Operational Planning Data Environment specifications expected Q1 2016. Timeline delayed due to intense discussion and investigation regarding the network layer (OPDE/internet/ATOM concept)
2015		Multi-lateral agreement signed by TSOs in December 2015, setting the framework for TSO cooperation via the RSCIs
Ongoing throughout 2015		Two projects started in 2015: "Frequency coupling" (expected completion end 2016) and "Mutual frequency assistance between synchronous areas" (expected completion mid-2016). Study completed in 2015. A pilot test on one HVDC link planned for early 2016.
Q1-Q3 2015		
Initial model foreseen Q1 2015		The ENTSO-E Initial Dynamic Model of Continental Europe was made available on entsoe.eu in Q1 2015
Ongoing		Continuous activity throughout 2015
Several upgrades planned for 2015		Activity completed to 95%, will be finalised in 2016
Activities foreseen throughout 2015		Launch of dedicated internal webpage for training material Q2 2015, 7 workshops in 2015 SO Committee decided to stop the activities of Academy in Q4 2015 for prioritisation and resource reasons.

Deliverable	Goal	Status - end 2014
<b>Synchronous area extensions</b>	Connection of Turkey to Continental Europe Synchronous Area (CESA)	Preparatory work in 2014
<b>System frequency</b>	To support the implementation of the NC OS, TSOs of synchronous areas should aggregate generation and, within six months from NC OS entering in force, all TSOs should make a proposal as to how to collect data from generators. The task is to develop and follow the process which will lead to the full TSO observability of the generators. Preparation of a document defining the rules and procedures for the future financial settlement of inadvertent interchange envisaged by the NC EB.	Started in 2014  Ongoing in 2014
<b>Compliance monitoring</b>	Assess whether the RGCE member TSOs are compliant with the standards of the RGCE Operations Handbook. Evaluation of compliance for TSO KOSTT.	Compliance Monitoring Report 2014 published  Started in 2014
<b>MARKET ACTIVITIES</b>		
<b>Regional market development</b>	Ensure that regional developments continue to develop in a manner consistent with the overall EU Target Model. Establish a coherent vision for market integration.	Go-live in Q2 2014 of the North-Western Europe and South-Western Europe day-ahead electricity markets. 4M MC go-live in Q4 2014. Integration to continue in 2015.
<b>Unplanned Flows - Bidding Zones Study and Cross-Border Remedial Actions Task Force (Context: Implementation of CACM guideline)</b>	Assess where and how the geographical boundaries of bidding zones should be determined. The Bidding Zone Review process continues in 2015, developing the necessary studies and analyses. Define a regulatory framework for coordinated cross-border re-dispatching and countertrading including cost-sharing arrangements.	Ongoing in 2014
<b>Electricity balancing pilot projects</b>	Develop and expand (where possible) pilot projects to promote harmonisation and to test the feasibility of the different milestones in the Network Code on Electricity Balancing and impact of the long term target.	Ongoing in 2014
<b>Market design 2030 framework and RES integration</b>	Proactively considering issues around market design and the creation and promotion of an effectively competitive market. Propose solutions on RES support and design & implementation and capacity mechanisms. Investigate how the market can promote tools and technologies facilitating large scale integration of RES such as storage and demand side participation, including TSO-DSO interaction, ancillary services.	Market design policy paper published in Q3 2014. Follow-up activities to be taken forward in 2015.
<b>TSO-DSO cooperation</b>	Follow up on the EC recommendation to enhance cooperation between DSOs and TSOs	
<b>The challenges of financing infrastructure – investment incentives</b>	To work with the EC and ACER to encourage National Regulatory Authorities and Member States to improve the regulatory certainty for investors in transmission projects to encourage vital investment	Seminar with stakeholders and publication of a position paper in Q4 2014
<b>Inter TSO Compensation (ITC)</b>	Coordination of the ITC settlement process, annual ITC audit process and preparation and delivery of the ITC data for annual monitoring report developed by ACER.	
<b>Delivery of the Annual Tariffs Report and Congestion Revenue Management Report</b>	Publication of ENTSO-E Overview of Transmission Tariffs in Europe, providing a comparative overview of transmission tariffs for 32 European countries Delivery of annual Congestion Revenue Management report to regulators	2014 edition published in Q2 2014  Congestion Revenues Report 2013 delivered in July 2014
<b>Tariffs structure harmonisation</b>	Harmonised transmission tariff structures is one area defined for framework guidelines and network codes in Regulation (EC) No. 714/2009, Article 8(6).	Preparatory work in 2014
<b>The Central Information Transparency Platform</b>	Implementing the EC Guidelines on Fundamental Data Transparency in an integrated IT system for all of Europe	The Transparency Platform went live on 5 January 2015.
<b>Electronic Data Interchange (EDI)</b>	Harmonisation and implementation of standardised electronic data interchange	Ongoing

Deliverable & AWP 2015 completion (quarter/year)*	Internal & external consultation in 2015	Status - end 2015: Comments/explanations
Signature of long-term agreement foreseen in 2015		Long-term agreement signed in Q2 2015. Monitoring of operational compliance continued.
Q4 2015	Internal consultation in 2015	Project ongoing (in 2015 a questionnaire on the observability of generators sent to TSOs and answers evaluated; in 2016 a process for implementation will be prepared)
Q4 2015		Ongoing, adoption by ENTSO-E Market Committee foreseen by end 2016
Q2-Q4 2015		To be published early 2016
Q1 2015		Completed Q1 2015
Ongoing activities throughout 2015		Q1 2015 IBWT borders (Italian borders) go-live Q2 2015 CWE Flow-based Market Coupling go live Inclusion of Swiss Northern Borders in MRC project temporarily suspended due to EU-CH political negotiations.
Foreseen Q2 2015		Contract with the consultants signed, discussions with ACER and NRAs on scenarios in Q3/Q4 2015, current completion estimate of Q2 2017.
Continued activity throughout 2015		
Q4 2015	High level European stakeholder group Project 4 organised 2 workshops in 2015	Pilot projects reports published in Q3 2015
Throughout 2015		Policy Paper "Markets and Innovation deliver the Energy Union" Q4 2015 Contribution to ongoing discussion on demand-side response by participation in Smart Grid Task Force EG3, and policy paper 'Market design for Demand-Side Response' Q4 2015
Throughout 2015	3 workshops in 2015	Signature of a MOU with European DSO associations, publication of joint guidelines November 2015. Second joint paper on data management foreseen for 2016
Throughout 2015		Study commissioned by the EC analysed the financial situation of 14 Member States, ENTSO-E part of steering committee. Date of publication tbc.
Q3 2015		ITC data delivered. Launch of process for inclusion of KOSTT as separate ITC party to the ITC agreement
Q3 2015		Published in June 2015
Q2 2015		2014 report delivered in July 2015
Throughout 2015		Based on pre-scoping study, ACER concluded on preparatory work to start in 2016
Ongoing work throughout 2015	The Transparency User Group set up in April 2015. The TP has been presented in the AESAG meetings in 2015.	Data population grew substantially in the course of the year. Data reporting to ACER (under REMIT) started in October 2015.
		Preparation of Weather Data Exchange Process began, publication expected in 2016

# ENTSO-E GOVERNANCE

ENTSO-E is an international non-profit association (AISBL) established according to Belgian law. The highest body within ENTSO-E is its Assembly, which comprises representatives at CEO level of all the current 41 members. ENTSO-E also has one observer member, which is not represented in the Assembly but is invited to appoint representatives in certain working groups. The Assembly meets four times a year.

The ENTSO-E Board is elected from the overall ENTSO-E membership via the Assembly every two years. The Board comprises 12 representatives. The ENTSO-E President, Vice President, and Committee Chairs are also invited to Board meetings. The Board coordinates the work of ENTSO-E's committees and its Legal & Regulatory Group (LRG) and implements Assembly decisions. It adopts position papers within the framework of the general ENTSO-E strategy adopted by the Assembly. The Board meets approximately six times a year.

ENTSO-E's four specialised committees comprise representatives from member TSOs. They lead a number of regional groups and working groups. The committees deal, from different angles, with TSO cooperation on a European basis, as well as with overall energy system and energy policy issues.

The ENTSO-E committee structure reflects its contributions to the four main EU energy policy goals:

## 1. Contributing to the development of a strong and adequate grid

The System Development Committee coordinates network development at European and regional level and prepares the Ten-Year Network Development Plans, the Regional Investment Plans and adequacy forecasts. It also drafts connection network codes.

## 2. Guaranteeing secure and reliable power system operations

The System Operations Committee is in charge of technical and operational standards, including operational network codes, as well as of power system quality. It ensures compliance monitoring and develops tools for data exchange, network models and forecasts.

## 3. Promoting a fully developed internal electricity market

The Market Committee works towards an integrated and

seamless European electricity market and is in charge of methods for cross-border congestion management, integration of balancing markets, ancillary services, and the inter-TSO compensation mechanism, including market network codes.

## 4. Ensuring the ambitious use of innovation

The Research, Development and Innovation Committee ensures the effective implementation of ENTSO-E's mandate in the area of innovation and R&D, largely focusing on strong and smart grids and the empowerment of customers and consumers.

At the same level as the four Committees, the Legal & Regulatory Group (LRG) advises all bodies across ENTSO-E on legal and regulatory issues. In addition, Expert Groups on Data, Network Codes Implementation and EU Affairs provide specific expertise and work products.

## ENTSO-E SECRETARIAT

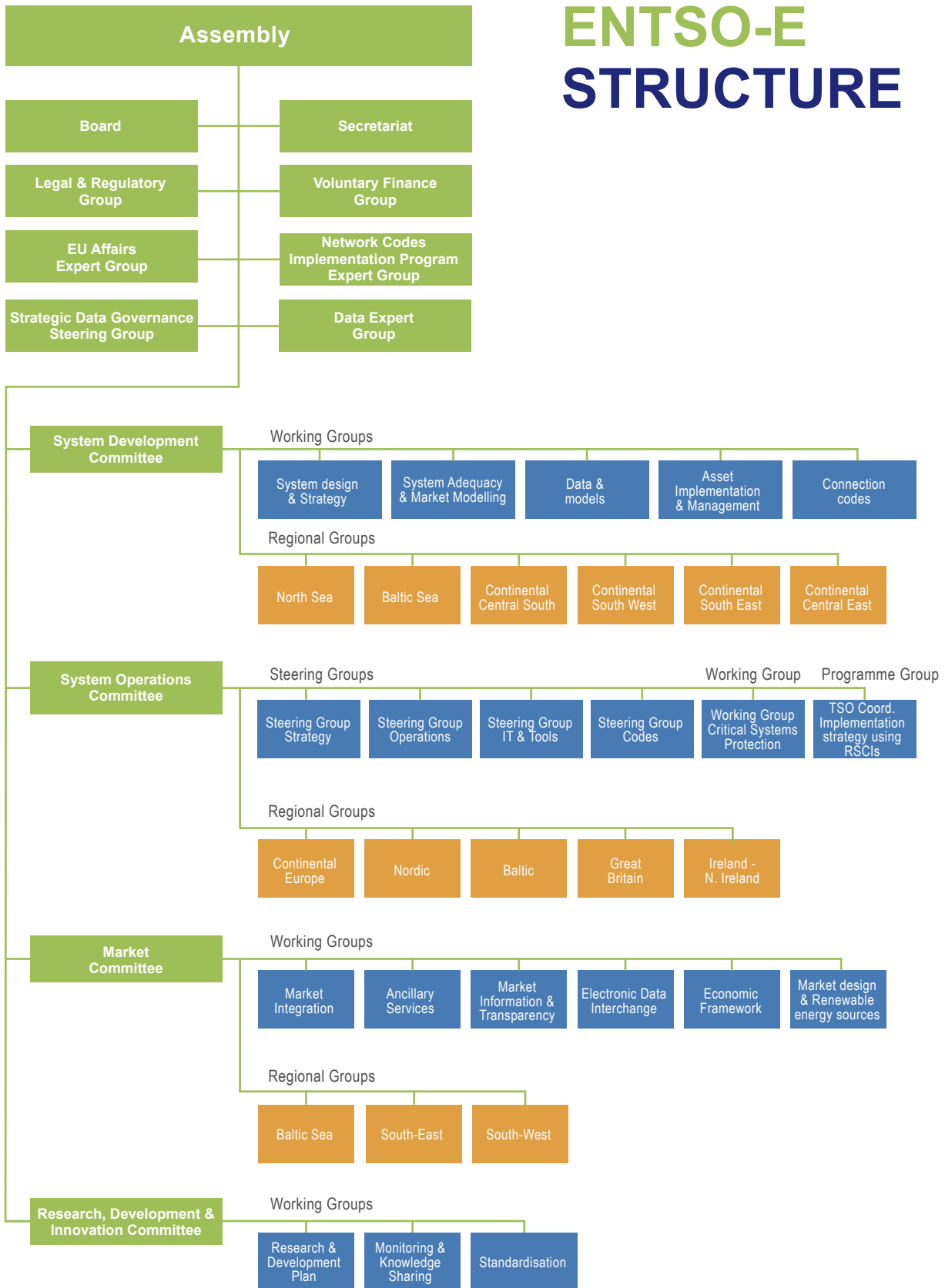
The ENTSO-E Secretariat is based in Brussels and employs 69 permanent staff. It is headed by the Secretary-General and represents ENTSO-E with the European institutions, regulators and stakeholders.

Together with the Board, Assembly, Committees and the LRG, the Secretariat develops ENTSO-E deliverables. Through its support for the various bodies and groups, it ensures the smooth and effective management of the association's work. An important task is to ensure that ENTSO-E work products reflect European policy directions and stakeholder concerns, which the Secretariat is well placed to understand well based on its Brussels location and communications expertise.

As the organisation chart on page 48 shows, the Secretariat's structure mirrors the ENTSO-E committee structure, with thematic and horizontal sections. Each section is headed by a manager, supported by advisors and coordinators.

The overall ENTSO-E annual budget is detailed on page 46. ENTSO-E member TSOs contribute to the budget according to the number of countries and population served.

# ENTSO-E STRUCTURE



# FINANCIAL STATEMENT

## PRO FORMAT PROFIT & LOSS OVERVIEW (NON AUDITED SUBJECT TO CHANGES)

December, 2015

All amounts expressed in kEUR	YTD Actual 2015 A	YTD Budget 2015 B	A - B
<b>REVENUES</b>			
Member fees	17.700	17.700	0
Exceptional member fees	0	0	0
Other incomes	72	80	-9
<b>TOTAL REVENUES</b>	<b>17.772</b>	<b>17.780</b>	<b>-9</b>
<b>EXPENSES</b>			
Communication structure	-228	-433	205
Project & research	-4.145	-5.489	1.345
<i>Sub-total communications &amp; project</i>	<i>-4.373</i>	<i>-5.923</i>	<i>1.550</i>
Remunerations	-6.687	-6.979	292
Other staff costs	-794	-803	9
Administration & legal fees	-169	-181	13
Travel & accommodation	-111	-97	-14
Renting & building charges	-862	-939	77
IT	-2.131	-2.072	-58
Depreciations	-281	-353	73
<i>Sub-total staff &amp; infrastructure</i>	<i>-11.034</i>	<i>-11.425</i>	<i>391</i>
Assembly & Board	-29	-27	-3
Committee	-96	-78	-18
Group	-370	-367	-3
Regional Group	-21	0	-21
<i>Sub-total meetings</i>	<i>-517</i>	<i>-472</i>	<i>-45</i>
<b>TOTAL EXPENSES</b>	<b>-15.924</b>	<b>-17.820</b>	<b>1.896</b>
Financial & other results	5	40	-35
<b>NET RESULT</b>	<b>1.853</b>	<b>0</b>	<b>1.853</b>

# ENTSO-E BOARD\*



Chair

Bente Hagem  
Statnett SF, Norway



Vice-Chair

Ben Voorhorst, TenneT  
TSO B.V., The Netherlands



Member

Zbynek Boldis  
CEPS, Czech Republic



Member

Kamilla Csomai  
MAVIR, Hungary



Member

Matt Golding  
National Grid, UK



Member

Thomas Karall  
APG, Austria



Member

Klaus Kleinekorte  
Amprion, Germany



Member

Piotr Rak,  
PSE, Poland



Member

Jukka Ruusunen  
Fingrid, Finland



Member

Andrés Seco,  
REE, Spain



Member

Thomas Tillwicks  
Swissgrid, Switzerland



Member

Jean Verseille  
RTE, France

# ENTSO-E OFFICE HOLDERS



President

Peder Andreasen  
Energinet.dk, Denmark



Vice-President

Matteo del Fante  
Terna, Italy



Chair System  
Development Committee

Sébastien Lepy  
RTE, France



Chair System  
Operations Committee

Joachim Vanzetta  
Amprion, Germany



Chair Market Committee

Pascale Fonck, Elia System  
Operator, Belgium



Chair Research &  
Development Committee

Carlo Sabelli  
Terna, Italy



Chair Legal &  
Regulatory Group

Milan Roman  
SEPS, Slovakia

\*31/12/2015

# ENTSO-E SECRETARIAT







# ENTSO-E MEMBER TSOs

Country	Company	Abbreviation
<b>AT</b> Austria	Austrian Power Grid AG Vorarlberger Übertragungsnetz GmbH	APG VUEN
<b>BA</b> Bosnia and Herzegovina	Nezavisni operator sustava u Bosni i Hercegovini	NOS BiH
<b>BE</b> Belgium	Elia System Operator NV/SA	ELIA
<b>BG</b> Bulgaria	Electroenergien Sistemen Operator EAD	ESO
<b>CH</b> Switzerland	Swissgrid AG	Swissgrid
<b>CY</b> Cyprus	Cyprus Transmission System Operator	Cyprus TSO
<b>CZ</b> Czech Republic	ČEPS, a.s.	ČEPS
<b>DE</b> Germany	TransnetBW GmbH TenneT TSO GmbH Amprion GmbH 50Hertz Transmission GmbH	TransnetBW TenneT DE Amprion 50Hertz
<b>DK</b> Denmark	Energinet.dk	Energinet.dk
<b>EE</b> Estonia	Elering AS	Elering
<b>ES</b> Spain	Red Eléctrica de España S.A.U.	REE
<b>FI</b> Finland	Fingrid Oyj	Fingrid
<b>FR</b> France	Réseau de Transport d'Electricité	RTE
<b>GB</b> United Kingdom	National Grid Electricity Transmission plc System Operator for Northern Ireland Ltd Scottish Hydro Electric Transmission plc Scottish Power Transmission plc	National Grid SONI SHE Transmission SPTtransmission
<b>GR</b> Greece	Independent Power Transmission Operator S.A.	IPTO
<b>HR</b> Croatia	Croatian Transmission System Operator Ltd	HOPS

Country	Company	Abbreviation
<b>HU</b> Hungary	MAVIR Hungarian Independent Transmission Operator Company Ltd	MAVIR
<b>IE</b> Ireland	EirGrid plc	EirGrid
<b>IS</b> Iceland	Landsnet hf	Landsnet
<b>IT</b> Italy	TERNA - Rete Elettrica Nazionale S.p.A.	TERNA
<b>LT</b> Lithuania	Litgrid AB	Litgrid
<b>LU</b> Luxembourg	Creos Luxembourg S.A.	Creos Luxembourg
<b>LV</b> Latvia	AS Augstsprieguma tīkls	Augstsprieguma tīkls
<b>ME</b> Montenegro	CGES AD	CGES
<b>MK</b> FYR of Macedonia	MEPSO - Operator na elektroprenosniot sistem na Makedonija, AD	MEPSO
<b>NL</b> Netherlands	TenneT TSO B.V.	TenneT NL
<b>NO</b> Norway	Statnett SF	Statnett
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