

# ACER

 Agency for the Cooperation  
of Energy Regulators

*The Director*

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*By e-mail only*

***Subject: The Agency's views on a consistent and interlinked electricity and gas market and network model - An opportunity to improve the Ten Year Network Development Plans beyond 2017***

Dear Sirs,

I am addressing you as other parties formally involved in the process of Article 11(8) of Regulation (EU) No 347/2013 of the European Parliament and of the Council of 17 April 2013 on guidelines for trans-European energy infrastructure and repealing Decision No

1364/2006/EC and amending Regulations (EC) No 713/2009, (EC) No 714/2009 and (EC) No 715/2009<sup>1</sup> (hereinafter “Regulation (EU) No 347/2013”), in order to share the Agency’s views regarding a transparent, consistent and interlinked electricity and gas model and its role for the further development of scenarios and of the Ten Year Network Development Plans (TYNDPs). Such views reflect, where relevant, the previous Agency’s documents regarding the European Network of Transmission System Operators for Electricity and for Gas (ENTSOs’) cost benefit analysis (CBA) methodologies<sup>2</sup>.

Regulation (EU) No 347/2013 modified the existing provisions regarding the development of TYNDPs prepared by the ENTSOs, to ensure that the TYNDPs are subject to a CBA. In such a context, Article 11(8) of Regulation (EU) No 347/2013 requires that the ENTSOs develop a consistent and interlinked electricity and gas market and network model (hereinafter “the model”) to be included in the CBA methodologies. The submission of the model by the ENTSOs to the Agency is foreseen by 31 December 2016.

The Agency is aware of the fact that the ENTSOs are closely cooperating towards the delivery of the model<sup>3</sup>, and welcomes the constructive approach they have adopted.

### **Application and frequency of update of the model**

As the CBA methodologies shall be applied for the preparation of each TYNDP developed by ENTSO-E or ENTSG pursuant to Article 11(1) of Regulation (EU) No 347/2013, the Agency understands that also the model, as part of the CBA methodologies, shall be used, once available, for the preparation of each electricity and gas TYNDPs.

Pursuant to Article 11(6) of Regulation (EU) No 347/2013, the CBA methodologies shall be updated and improved regularly. As the model will be a part of the CBA methodologies, the Agency understands that the model shall also be updated and improved regularly.

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<sup>1</sup> OJ L 115. 25.4.2013, p. 39.

<sup>2</sup> Agency’s position on the ENTSO-E “Guideline to Cost Benefit Analysis of Grid Development Projects”. [http://www.acer.europa.eu/Official\\_documents/Position\\_Papers/Position%20papers/ACER%20Position%20ENTSO-E%20CBA.pdf](http://www.acer.europa.eu/Official_documents/Position_Papers/Position%20papers/ACER%20Position%20ENTSO-E%20CBA.pdf)

Agency’s Opinion No 01/2014 on the ENTSO-E guideline for cost benefit analysis of grid development projects. [http://www.acer.europa.eu/Official\\_documents/Acts\\_of\\_the\\_Agency/Opinions/Opinions/ACER%20Opinion%2001-2014.pdf](http://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Opinions/Opinions/ACER%20Opinion%2001-2014.pdf)

Agency’s Opinion No 04/2014 on the ENTSG cost-benefit analysis methodology. [http://www.acer.europa.eu/Official\\_documents/Acts\\_of\\_the\\_Agency/Opinions/Opinions/ACER%20Opinion%2004-2014.pdf](http://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Opinions/Opinions/ACER%20Opinion%2004-2014.pdf)

<sup>3</sup> As also explicitly indicated in the ENTSO-E “Annual Report 2015 – Electricity without borders”, p. 11. [https://www.entsoe.eu/Documents/Publications/ENTSO-E%20general%20publications/ENTSO-E\\_AR15\\_FINAL.pdf](https://www.entsoe.eu/Documents/Publications/ENTSO-E%20general%20publications/ENTSO-E_AR15_FINAL.pdf)

and in ENTSG “Annual Work Program 2016”, p 22 <http://www.entsoe.eu/public/uploads/files/publications/AWP%20&%20Annual%20Report/2015/Annual%20Work%20Programme%202016%20-%20AWP0017.pdf>

As TYNDPs shall be adopted every two years, the Agency understands that the inputs and the modelling for the TYNDPs will be updated and improved by the ENTSOs as part of this process.

### **Interdependence of network and market modelling**

In the electricity sector, market and network studies are usually performed using separate market and network modelling. This practice, consolidated over the years, has been formally defined by the ENTSO-E CBA methodology, according to which “*network studies contain the full detail of the physical grid and are used to calculate the actual load flows that take place in the network under given generation/load conditions*”<sup>4</sup>. Further to this existing provision, the Agency does not see benefit in a single network representation, joining electrical and gas grids, since they operate on different physical laws and thus have low interdependence. Therefore, the networks could be modelled separately by relevant grid-specific modules within the model.

The modelling of electricity and gas markets, on the other side, is characterised by a higher interdependence, particularly due to the interaction of prices of electricity, gas and other fuels and CO<sub>2</sub>, as well as that of electricity and gas infrastructure development. The possible ways in which a market representation will be developed, joining electricity and gas markets, should be discussed and elaborated firstly by the ENTSOs and later assessed by the relevant stakeholders.

A necessary first step towards the model is to focus on the transparency of the model and of the assumptions which need to be shared between the ENTSOs and used in the model. In what follows, we focus on specific aspects which require the ENTSOs’ attention already in this first step.

### **Study horizons and treatment of uncertainties through broader cooperation**

Regulation (EU) No 347/2013<sup>5</sup> requires the ENTSOs to develop a common input data set representing the Union’s electricity and gas systems in the years n+5, n+10, n+15, and n+20, where n is the year in which the analysis is performed, and, for the model, an extension of the input data set to the year n+30.

The Agency considers that the need for a longer-term analysis of infrastructure projects to be operational for example 10-50 years ahead should be appropriately balanced with the increasing uncertainties over longer future horizons and with the complexities and burden of running market and network analysis. Further, the Agency considers that adding a reference to fixed years (2020, 2025, 2030, etc.) may facilitate the scenario development processes and

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<sup>4</sup> ENTSO-E Guideline for Cost Benefit Analysis of Grid Development Projects, Final – Approved by the European Commission, 5 February 2015, Section 2.4.

<https://www.entsoe.eu/Documents/SDC%20documents/TYNDP/ENTSO-E%20cost%20benefit%20analysis%20approved%20by%20the%20European%20Commission%20on%204%20February%202015.pdf>

<sup>5</sup> Annex V(1) and Annex V(13) of Regulation 347/2013.



the comparison of assumptions used in successive TYNDPs, while preserving the study horizon granularity and accuracy foreseen by Regulation (EU) No 347/2013.

The Agency thus reaffirms its recommendation<sup>6</sup> to consider a time-differentiated planning approach that includes:

- evaluating near-term uncertainties mainly through a best-estimate scenario, complemented by sensitivity or probabilistic analyses;
- evaluating long-term uncertainties mainly through contrasting scenarios and scenario-based analyses.

Furthermore, the ENTSOs should carry out a broader discussion on the inclusion of a so-called ‘best estimate’ scenario in the various study horizons<sup>7</sup>.

In light of the upcoming extension to a longer term study horizon (around the year 2050), the Agency deems it necessary that the development of scenarios for electricity and gas TYNDPs, especially for the longer time periods, is subject to a broader collaboration, involving the European Commission, Member States, NRAs and the Agency, and takes account of other studies regarding scenario development, including those promoted by the European Commission<sup>8</sup>.

Based on the outcomes of such a collaboration, the ENTSOs should jointly describe in a common document the storylines and the rationale for the development of the various scenarios, especially in the longer term.

In this respect, the Agency welcomes that the ENTSOs are aligning the consultation process on scenarios for electricity and gas TYNDPs 2018, regarding its timing and content, to maximise stakeholder involvement and to optimise synergies across the two sectors.

### **Transparency on the basic elements of the model**

Annex V of Regulation (EU) No 347/2013 lays down the principles for the model and identifies some specific features. More generally, the Agency sees that a scientific model is not only a mathematical description of the system in order to analyse its behaviour, including exogenous and endogenous variables, constants, equality and inequality constraints and, for optimisation problems, an objective function, but also requires a full formal description of the model in a proper document.

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<sup>6</sup> Agency's Recommendation No. 05/2015 on good practices for the treatment of the investment requests including cross border cost allocation requests for electricity and gas projects of common interest. [http://www.acer.europa.eu/Official\\_documents/Acts\\_of\\_the\\_Agency/Recommendations/ACER%20Recommendation%2005-2015.pdf](http://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Recommendations/ACER%20Recommendation%2005-2015.pdf)

<sup>7</sup> Agency's Opinion No 21/2014 on the draft ENTSO-E Scenario Outlook and Adequacy Forecast 2014-2030. [http://www.acer.europa.eu/official\\_documents/acts\\_of\\_the\\_agency/opinions/opinions/acer%20opinion%2021-2014.pdf](http://www.acer.europa.eu/official_documents/acts_of_the_agency/opinions/opinions/acer%20opinion%2021-2014.pdf)

<sup>8</sup> Studies on scenarios are regularly updated by the European Commission. See e.g. „Trends to 2050“ [https://ec.europa.eu/energy/sites/ener/files/documents/trends\\_to\\_2050\\_update\\_2013.pdf](https://ec.europa.eu/energy/sites/ener/files/documents/trends_to_2050_update_2013.pdf).

Therefore, the Agency sees as basic elements of the model the input/output data sets and their formal description, duly accompanied by the algorithms and their formal description.

Regarding the data sets and algorithms, the Agency expects that:

- the model shall allow for a full assessment of the economic, social and environmental impacts, as required by Annex V(13) of Regulation 347/2013;
- common input data set and assumptions about their evolution over time (usually known as “scenarios”) for the electricity and gas markets are used, including at least common fuel prices (coal, gas and oil) and carbon dioxide prices, as required by Annex V(1) of Regulation 347/2013;
- the data sets used for the electricity and gas markets “shall be compatible, notably with regard to assumptions on prices and volumes in each market”, as required by Annex V(2) of Regulation (EU) No 347/2013. The cross-sectoral influence of gas and electricity projects needs to be considered adequately, as well as mutual effects, e.g. end-user consumption trade-off between gas and electricity and price elasticities;
- a consistent set of inputs/outputs is defined where applicable (e.g. volumes of gas consumption due to electricity generation per country, power-to-gas installations if applicable), together with a proper communication by each ENTSO to the other ENTSO of all relevant information (thus ensuring consistency and interlinks between their modelling activities);
- the timing of the modelling processes is aligned.

Regarding the transparency and description of the basic elements of the model, the Agency expects:

- the full publication and transparency of ENTSOs’ data sets for the model, namely all input and output variables, further expanding existing practices<sup>9</sup> where applicable. The delivered data sets shall be comprehensive, so that interested parties are enabled to build up and run similar studies for themselves;
- as already indicated in its previous Opinion<sup>10</sup>, a comprehensive description of the assumptions, documentation of data sources, data acquisition and processing algorithms (the formally documented model). The description should include detailed information about the chosen parameters; and
- a particular description of the choices made as regards modelling and the reasons for such choices. As an example, ENTSO-E should consider and discuss the possible relevance of including a flow-based approach in the electricity market modelling.

### **Next steps**

This letter expresses the Agency’s understanding and views in advance of the submission of the model by the ENTSOs, foreseen by 31 December 2016.

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<sup>9</sup> ENTSO-E TYNDP data: <https://www.entsoe.eu/major-projects/ten-year-network-development-plan/maps-and-data/Pages/default.aspx#tyndp2016>

ENTSO-G TYNDP Annexes on data: <http://www.entsog.eu/publications/tyndp#ENTSOG-TEN-YEAR-NETWORK-DEVELOPMENT-PLAN-2015>

<sup>10</sup> Agency’s Opinion No 21/2014 and Agency’s Opinion No 11/2015 on the draft Ten Year Network Development Plan 2015 submitted by ENTSOG.

[http://www.acer.europa.eu/Official\\_documents/Acts\\_of\\_the\\_Agency/Opinions/Opinions/ACER%20Opinion%2011-2015.pdf](http://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Opinions/Opinions/ACER%20Opinion%2011-2015.pdf)

In parallel to the preparation of this submission, various processes are relevant for improving the modelling approach for the TYNDPs beyond 2017, including in particular:

- the update of cost-benefit analysis methodologies<sup>11</sup>,
- the ongoing preparation of the electricity and gas TYNDPs 2018, including a common approach on scenario development<sup>12</sup>, and
- the publication of TYNDP data sets and related information<sup>13</sup>.

The Agency is ready to provide its opinion(s) on the model, as well as on scenarios for the electricity and gas TYNDPs, after relevant submissions from the ENTSOs and accounting for ongoing ENTSOs' activities and for the contributions of all stakeholders.

The views presented in this letter represent a constructive contribution to improve TYNDPs beyond 2017 in line with the upcoming improvements required by Article 11(8) of Regulation (EU) No 347/2013. The Agency remains available to provide any necessary clarification.

Yours sincerely,

  
Alberto Pototschnig

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<sup>11</sup> See for example the “ENTSO-E Guideline for Cost Benefit Analysis of Grid Development Projects – Draft for public consultation 25 April - 31 May”, 2016.

<sup>12</sup> ENTSOs launched a common public consultation on 12 May 2016 (cf. <http://www.entsog.eu/events/joint-entsos-consultation-build-the-europes-future-tyndps-2018-scenarios#welcome> ) and a workshop on 2 June 2016 (cf. <http://www.entsog.eu/past-events> ), similarly available on ENTSO-E's web site.

<sup>13</sup> See Footnote 9, as well as for example the ENTSO-E On-Line Application Portal for TYNDP 2014 input datasets <https://www.entsoe.eu/publications/statistics/network-dataset/TYNDP-2014-input-datasets/Pages/default.aspx> and ENTSG TYNDP Annex D, such as available at this link for TYNDP 2015 <http://www.entsog.eu/publications/tyndp#ENTSG-TEN-YEAR-NETWORK-DEVELOPMENT-PLAN-2015>