

Public Consultation on Adequacy Methodology (14 July - 19 September 2014)  
**Scenario Outlook and Adequacy Forecast Evolutions document**

Respondent Full Name	Comment	ENTSO-E Answer
Jasmina PIERRE	This proposal for improvement to the future SOAF reports adopts a pragmatic step by step approach that we are fully supportive of. Some methodological questions are therefore left open and will gradually be tackled. We propose to foresee future stakeholder consultations for these incremental improvements, ideally before the preparation of SOAF 2016 and SOAF 2017.	The contribution of market participants is very important to develop and apply appropriate models for adequacy assessment, especially in cases of Demand Side Management (DSM), hydro inflows, pump storage power plants and modeling of reserves. An in-depth discussion with stakeholders on modelling principles, constraints resulting from technology, regulatory and market framework is planned in the form of continuous consultations and dedicated expert workshops. Focus is on the development of a sound methodology which will allow to perform a diagnosis of the power system with respect to adequacy risks. One of the main objectives is to be able to inform about the 'need for flexibility' in the system both from the generation and the demand sector.
Jasmina PIERRE	-	The text has been updated accordingly.
Jasmina PIERRE	A more precise description of the target market model and the sharing of data and tools with the TYNDP would be welcome. Indeed, considering that the TYNDP analysis already uses a market model we would like to better understand why it is not possible to use it for SOAF 2016 and which points need improvement.	The Target Model is the 'state-of-the-art' definition for the European Internal Energy Market (IEM). The Target Model provides a blueprint and roadmap for closer market integration by setting out clear proposals for the coordination and harmonisation of Europe's electricity markets. This requires in particular that in cooperation with ACER, national regulators and transmission systems operators' step up their work on market coupling and guidelines on network codes applicable across European networks. The development of a model able to capture all the key features of the Pan-EU power system is a main objective for ENTSO-E. In order to cope with this ambitious goal, ENTSO-E believes that a market-based stochastic model, with a proper representation of the zonal configuration of the geographical area under investigation, is necessary. In this context, ENTSO-E is aware of the differences between sequential and non-sequential simulation approaches. ENTSO-E is also aware that the choice of the approach will affect in a significant manner the indicators which can be assessed through the simulation as well as the structure and the complexity of the input data. Hence, the selection between the modeling approach (Monte Carlo method, stochastic dynamic programming, global mixed integer method, etc..) and the available tools for market simulations will be further investigated in the next steps of the methodology improvement process and the final methodology details will be properly consulted. ENTSO-E will definitely optimize the synergies between market modeling in TYNDP and Adequacy Assessment, when possible, also keeping in mind that the focus of infrastructure development and adequacy assessments are slightly different.
Zdenek Danielovsky	It is necessary to explain the term "Pan European measurement and temperature"	A gradual evolution of the Pan-European Climate Database (PECD) is foreseen both in terms of years covered and scope of data. At present, PECD time series include solar PV load factors, wind load factors and temperature data for the period 2000-2011/2012-2013. In addition to the country level data, also regional time series are available for a few countries. An increased geographical granularity is essential to enable modelling at different levels including local market simulations. The ongoing technology evolutions like changes in wind turbine height, storm control facilities, blade pitching, the development of deep offshore floating turbines, PV tilt angles, CSP technology, have a fundamental impact on the characteristics of future generation equipment. These changes are to be reflected by the assumptions made on the composition of generation equipment when deriving the load factor time series from climate model data. Beyond the extension of PECD, also a more accurate analysis of uncertainties caused by different hydro conditions is important. By consultation with expert stakeholders, the use of retrospective hydro inflow data can contribute to an improved adequacy assessment.

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Zdenek Danielovsky	Specifications of scenarios A (Conservative) and B (Best Estimate), that have the same names as the scenarios in the documents public consultation on the "Ten-Year Network Development Plan 2014", should be the same. It is appropriate to improve the relationship in documents.	These scenario names will be used in a consistent way across ENTSO-E documents.
Zdenek Danielovsky	Some parts of the text and wording are the same as in "ENTSO-E target methodology for adequacy assessment". Comments made to such formulations are therefore also valid for SO&AF.	The text is updated accordingly.
Titzl	<p>It may be relevant to identify the various stakeholders (or at least make a reference to them) of the SO&amp;AF methodology, as they have been explicitly mentioned in this document. I guess (correct me if I am wrong), the stakeholder of the SO&amp;AF methodology are respectively the national TSOs, of course, but they in turn have others stakeholders and national regulation to comply with.</p> <p>Remark: the PMI, Project Management Institute gives the following definition of a stakeholder „a person or a group of person who is actively part of the project and/or whose interest may be positively or negatively affected by the outcomes“. The value of the SO&amp;AF is largely determined by the stakeholders.</p>	The contribution of market participants is very important to develop and apply appropriate models for adequacy assessment, especially in cases of <u>Demand Side Management (DSM)</u> , hydro inflows, pump storage power plants and modeling of reserves. An in-depth discussion with stakeholders on modelling principles, constraints resulting from technology, regulatory and market framework is planned in the form of continuous consultations and dedicated expert workshops. Focus is on the development of a sound methodology which will allow to perform a diagnosis of the power system with respect to adequacy risks. One of the main objectives is to be able to inform about the 'need for flexibility' in the system both from the generation and the <u>demand sector</u> .
Titzl	Definitely, the respective market structure have to be considered as the condition setting environmental context for the SO&AF methodology. Even more, I think, a reference to the market conditions should be part of the SO&AF report, in the form of an „observer“, namely a process would observe the evolutions of the market structure and analyse how these changes may impact the SO&AF methodology.	Scenario A & Scenario B used for adequacy forecasts build on national generation adequacy outlooks prepared by each individual transmission system operator. Economical and technological assumptions regarding evolutions in the market structure, e.g. merit order fuel switching effects, will be considered in the market modeling assessment of adequacy proposed.
Titzl	As it can be inferred from this paragraph, the success and the outreach of the methodology will highly depend on how the national SO&AF will be integrated into an paneuropean SO&AF methodology. As mentioned in paragraph 4, the main idea is to provide the paneuropean SO&AF methodology with a common data platform. Beside setting up a methodology for the SO&AF and defining a set of process and process group, it should be thought of providing a complete framework, to cover different possible issues and give guidance about the complete process.	<p>The goal of the ongoing process is to improve the ENTSO-E Pan-EU and regional adequacy assessment methodology toward a target methodology which will cope with the new requirements set by the recent evolution of the European electrical system, while this process does not aim to set rules for the national assessments.</p> <p>It should be also pointed out that a Pan-EU and regional assessment needs to adopt some kinds of simplification in the modelisation approach in order to create a model able to catch all the key aspects of each and all the different areas under investigation, while a national methodology can take into account in a much more detailed way the national legal and regulatory framework, obviously losing in its applicability to other countries. Hence, in line with the recommendation of the ECG subgroup on adequacy, ENTSOE believes that national methodologies should be maintained and eventually improved by the relative owners/stakeholders.</p>

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Titzl	I reckon, this project of setting up a SO&AF methodology is quite challenging. It covers different fields of knowledge and skills, takes technical, economical and legal knowledge (to perform an accurate capacity assessment analysis with some legal framework), skills and methods in process management (to lead the data collection process, releasing a report of the SO&AF methodology) and as well an approach based on quality and improvement management (in order to enhance the SO&AF methodology and keep all the stakeholders up-to-date). From what I read in this document, I guess, the principles upon which the SO&AF methodology is based, provides a consistent framework for defining the methodology (and now the next big challenges will be to implement all these principles and guidelines into qualitative and efficient process).	We thank the stakeholder for his constructive comments which are in line with the target methodology and roadmap documents consulted.
Paulo Lopes	EURELECTRIC welcomes the opportunity to respond to the consultation on the methodology for the ENTSO-E Scenario Outlook & Adequacy Forecast Report as stakeholder involvement is key to achieve an improved methodology.	We thank the stakeholder for his constructive comments.
Sarah KEAY-BRIGHT	The guidance to use "Reasonable regional economic considerations of generation projects" when identifying projects to include in Scenario B seems very vague. It would be useful to include more explicit guidance on how to identify projects to include such as planning consent status (applied, granted etc), financial closure obtained or some other criteria that would ensure conformity of approach amongst Member States.	Scenario A & Scenario B used for adequacy forecast are defined and used to assess the risk of the system due to lack of adequacy and to provide an diagnosis of the status of the system in the medium term future. These scenario build on national generation adequacy outlooks prepared by each individual transmission system operator. Economical and technological assumptions regarding evolutions in the market structure, e.g. merit order fuel switching effects, will be considered in the proposed market modeling assessment of adequacy. The contribution of market participants is very important to develop and apply appropriate models for adequacy assessment, especially in cases of Demand Side Management (DSM), hydro inflows, pump storage power plants and modeling of reserves. An in-depth discussion with stakeholders on modelling principles, constraints resulting from technology, regulatory and market framework is planned in the form of continuous consultations and dedicated expert workshops. It should be also pointed out that a Pan-EU and regional assessment needs to adopt some kinds of simplification in the modelisation approach in order to create a model able to catch all the key aspects of each and all the different areas under investigation, while a national methodology can take into account in a much more detailed way the national legal and regulatory framework, obviously losing in its applicability to other countries. Hence, in line with the recommendation of the ECG subgroup on adequacy, ENTSOE believes that national methodologies should be maintained and eventually improved by the relative owners/stakeholders.
Paulo Lopes	The document under consultation lacks depth to truly understand the methodology that will be followed for the Scenario Outlook & Adequacy Forecast. There is little clarity on how the assumptions for the assessment will be created. The methodology thus lacks transparency and further details should be published by ENTSO-E.	The development of a model able to capture all the key features of the Pan-EU power system is a main objective for ENTSO-E. In order to cope with this ambitious goal, ENTSO-E believes that a market-based stochastic model, with a proper representation of the zonal configuration of the geographical area under investigation, is necessary. In this context, ENTSO-E is aware of the differences between sequential and non-sequential simulation approaches. ENTSO-E is also aware that the choice of the approach will affect in a significative manner the indicators which can be assessed trough the simulation as well as the structure and the complexity of the input data. Hence, the selection between the modeling approach (montecarlo method, stochastic dynamic programming, global mixed integer method, etc..) and the available tools for market simulations will be further investigated in the next steps of the methodology improvement process and the final methodology details will be properly consulted. ENTSO-E will definitely optimized the synergies between market modeling in TYNDP and Adequacy Assessment, when possible, also keeping in mind that the focus of infrastructure development and adequacy assessments are slightly different.

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Sarah KEAY-BRIGHT	There is a need for a more transparent and harmonized approach to what constitutes “adequacy” including a more harmonized approach to calculation of LOLE.	The development of a model able to capture all the key features of the Pan-EU and regional power system is a main objective for ENTSO-E. In order to cope with this ambitious goal, ENTSO-E believes that a market-based stochastic model, with a proper representation of the zonal configuration of the geographical area under investigation, is necessary. Main indicators will be assessed in order to quantify the system adequacy and the need for flexibility, e.g. expectancy LOLE, the loss of load probability LOLP, and the effective load carrying capability ELCC, etc... Other indicators as CO2 might be also assessed but not as the main ones for the adequacy assessment.
Paulo Lopes	In the Scenario Outlook & Adequacy Forecast, ENTSO-E should not merely publish the outputs of its modelling. It should take those outputs and execute economic viability checks to verify whether the generation capacity it assumes will be available actually has the economic conditions to do so. More specifically, it should not only be assumed that capacity of certain providers will be available for the system just considering –for instance – its residual life, but it should also be verified whether current market / regulatory arrangements lead to a viable economic situation for those providers.	The purpose of the ENTSO-E target adequacy methodology under construction is the development of a sound methodology which will allow to perform regular pan European and regional diagnosis of the evolving European power system with respect to adequacy risks. Considering any modelling implies simplifications, ENTSO-E adequacy target modelling is to focus on the hourly power balance modelling. Although these studies will not encompass every potential issues of the future power system, ENTSO-E strongly believes that: i) This methodology will allow the development of a model able to capture all the key features and risks regarding adequacy for the Pan-EU power system. This is a main objective for ENTSO-E: ii) Together with other studies/activities performed by ENTSO-E, these analyses will help improving market design and network codes ultimately. In that sense, it is worth mentioning that ENTSO-E is aware of the impact of designing an optimal and economically feasible set of investments plans in generation portfolio. However this is outside of the scope of the methodology consulted. Finally whenever there is no official communication of decommissioning, it is considered that the units will be available for security of supply reasons.
Melle Kruisdijk	We strongly encourage ENTSOE to continue the open and constructive dialogue with all stakeholders while developing the methodology, and would welcome a clear proposal from ENTSOE describing how and when information with stakeholders is shared and feedback is gathered.	The fundamental changes of power systems integrating high share of renewables require a multilateral cooperation <u>with increased transparency from all parties</u> . The contribution of market participants is very important to develop and apply appropriate models for adequacy assessment, especially in cases of <u>Demand Side Management (DSM)</u> , hydro inflows, pump storage power plants and <u>modeling of reserves</u> . An in-depth discussion with stakeholders on modelling principles, constraints resulting from technology, regulatory and market framework is planned in the form of continuous consultations and dedicated expert workshops. Focus is on the development of a sound methodology which will allow to perform a diagnosis of the power system with respect to adequacy risks. One of the main objectives is to be able to inform about the 'need for flexibility' in the system both from the generation and the demand sector.
Sarah KEAY-BRIGHT	Governance: ACER/CEER, or alternative, should have a formal oversight role.	We have a close and constructive cooperation with ACER and we will continue this process. ACER already provides official opinions on the main deliverables published according to Regulation (EC) 714/2009.
Melle Kruisdijk	Wärtsilä welcomes the proposed use of one-hour resolution in ENTSO-E's assessment as a big improvement compared to the 'static' adequacy view used earlier. Wärtsilä has performed several studies for different power systems to analyse and understand the impact of intermittent RES, need for flexibility, and the power system cost savings that can be achieved with different levels of flexible capacity added to future power systems. In these studies, we've found that sub-hourly effects can have considerable impact, depending on the share of intermittent RES in the power system. This impact is not revealed with an hourly approach, as currently proposed by ENTSOE. We therefore recommend ENTSO-E to consider sub-hourly analysis. As a first step, this can be considered specifically for regions with high expected fluctuations in production, e.g. regions with high shares of installed renewable energy sources.	The ENTSO-E adequacy methodology considers that the large-scale exploitation of renewable energy sources of variable generation poses challenges for electricity system operation. In addition to sufficient levels of back-up capacity, additional resources of system flexibility will be needed in the future. Focus is on the development of a sound methodology which will allow to perform a diagnosis of the power system with respect to adequacy risks. One of the main objectives is to be able to inform about the 'need for flexibility' in the system. Flexibility in the adequacy assessments is based on weather-dependent effects related to load variation, generation patterns of wind and solar power plants with a one-hour resolution and the consideration of the resources of flexibility. The existing Pan-European Climate Database (PECD) will be used for this adequacy assessments. Power plants of all fuel types can be subjected to must run conditions as well as provide flexibility to the system, both due to technical or economic reasons. Furthermore the must run level of a plant can differ throughout the year due to heat supply for instance. The TSOs are assessing the level of must run generation based on technical and economic characteristics of the power system. For this evaluation TSOs are consulting power plant operators on their own constraints. The goal is to extend the level of detail, so the information of must run constraints will be defined for the different types of units within a given technology to increase the knowledge about flexibility of the system. The information about must – run constraints will be detailed in order to increase the awareness about the flexibility of the system. One of the main objectives is to be able to inform about the 'need for <u>physical</u> flexibility' in the system at the hour of operation. The purpose of the ENTSO-E target adequacy methodology under construction is the development of a sound methodology which will allow to perform <u>regular pan European and regional diagnosis</u> of the evolving European power system with respect to adequacy risks. Considering any modelling implies simplifications, ENTSO-E adequacy target modelling is to focus on the hourly power balance modelling. It should be also pointed out that a Pan-EU and regional assessment needs to adopt some kinds of simplification in the modelisation approach in order to create a model able to catch all the key aspects of each and all the different areas under investigation, while a national methodology can take into account in a much more detailed way the national legal and regulatory framework, obviously losing in its applicability to other countries. Sub-hourly adequacy assessment belongs to national adequacy assessments.

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Melle Kruisdijk	<p>Different generation technologies have different ways of providing flexibility. Some generation technologies are able to start up from zero output and then increase their output ('ramp up') within a matter of seconds. Other technologies may take a number of hours to start up, but once they are generating above a stable level they can quickly flex their output up to meet the system needs (typical of large units such as combined cycle gas turbines (CCGTs), and large coal plants). These slower technologies typically provide the required system flexibility today. As a result, such plants need to run 'part-loaded' at their minimum stable export level (typically 50%-70% of capacity) in readiness for dispatch, which in turn add costs to the system in terms of fuel and carbon costs, wear and tear, and maintenance costs. It could also lead to lost renewables output, to the extent that part-loading the CCGTs leads to wind curtailment. Finally, part-loading these plant at their minimum stable export level means that there is less capacity available from these plants for flexibility purposes (i.e. only the upper half of the total name-plate capacity can be used). In the assessment of resources of flexibility, we believe all the parameters that determine the flexible capabilities should be taken into consideration.</p>	See answer to Mr. Kruisdijk in the Target Methodology answers part.
Roland Tual	<p>SEDC would insist on the importance to avoid biased language which favours generation over other types of resources. Demand side flexibility and storage should be assessed on their technical capabilities to fulfil the system needs, on a comparable footing with generation. We would ask for this expression to be systematically replaced.</p>	See answer to Mr. Tual in the Target Methodology answers part.
Roland Tual	<p>The current SOAF Report 2014-2030 states "For the Scenarios A and B (2014-2025), only 15 countries reported values for load management higher than zero." And only up to a maximum of 2.65 % of load at EU level, assuming there is 50% of non-hydro renewable generation in the system. (p.18 and .24).</p> <p>France has already surpassed this percentage today, as has Belgium, both with low renewable ratings. The assumptions therefore side-line DSM as unlikely to take place when in fact current market data contradicts this assumption. It suggests a lack of serious effort to review the potential of DSM in European electricity Markets.</p> <p>On top of this, both the Energy Efficiency Directive (EED) and the Network Codes state that DSM should be able to compete in all electricity markets on an equal footing with generation. As such, the figures quoted above seem to suggest that the EED's and Network Codes - which specifically name the establishment of Demand Response - will not be applied in 10 Member States in the 10 years to come.</p> <p>We would ask that these assumptions concerning DSM be reviewed, updated, brought into line with current legislative requirements and contain actual research and market data. The SEDC would suggest that anything less, represents a lack of engagement in current market developments.</p> <p>For example national estimates can appear absurd when it comes to load management. E.g., the SOAF '2014-2030' states for Belgium "No estimation of the system services needed in 2030 is available, meaning that the level is assumed to remain the same in 2030 as in 2020." The report explains later that "Strategic reserve mechanism has not yet been taken into account." (p.86). We would insist that these gaps are filled and that TSOs are able to provide realistic estimation of such a resource in the future.</p>	See answer to Mr. Tual in the Target Methodology answers part.
Roland Tual	<p>In the most optimistic scenarios, Load management is evaluated to a maximum share of 2,92% (Vision 4) to 3,14% (Vision 3) of the total load by 2030 in the current SOAF 2014-2030 (F. 3.1.11, p.19) – with around 60% RES in both visions. These figures seem very low given the level we already see in some countries. The same report states "It can be seen that the share of available load management is not expected to increase significantly in the assessed period" [2014 - 2030].</p> <p>With a very low share of RES, MS like France or GB already reach similar percentages.</p> <p>In its most recent analysis, the European Commission stresses that Demand Response could cut European peak demand for electricity by 10%, or 60 GW. (European Commission (2013) Staff Working Document: Incorporating demand side flexibility, in particular demand response, in electricity markets.) If extreme values are to be used, they should also include higher figures in the next report.</p> <p>On top of this, both the Energy Efficiency Directive and the Network Codes state that DSM should be able to compete in all electricity markets on a similar footing with generation. As such, the figures quoted above seem to suggest that the EED's and Network Codes - which specifically name the establishment of Demand Response - will not be applied in the 10-15 years to come.</p> <p>We would ask that these assumptions concerning DSM be reviewed, updated, brought into line with current legislative requirements and contain actual research and market data.</p>	See answer to Mr. Tual in the Target Methodology answers part.
Jasmina PIERRE	<p>ENTSO-E Consultation on target methodology for system adequacy assessment, seasonal outlook and SOAAF reports evolutions</p> <p>EDF response – General comments - 20 September 2014</p> <p>See attached file</p>	See answer to Mrs. Pierre in the Target Methodology answers.

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Jasmina PIERRE	This introduction departs from the otherwise objective tone of the document. Defining and then "measuring potential lack of flexible generation" is indeed a target for future SOAF reports that we fully support. However, the claim that TSOs are not provided with sufficient conditions to meet flexibility requirements seems to lack evidence to support it and should be one of the potential conclusions from the reports.	See answer to Mrs. Pierre in the Seasonal Outlook part answers part.
Jasmina PIERRE	It is important for each player to understand the underlying methods and assumptions to each figure.	The structure of the report will be improved gradually to enhance the transparency of the data used & published.
Jasmina PIERRE	Same comment as previously made in the "target methodology" section. This paragraph should be more explicit about the target "methodologies" . We believe that cross-border contributions are best assessed through a regional simulation of plants using a zonal model (we understand that this is what is also called "market-model" in this consultation document). In that sense, the wording "harmonized methodology" is not fully relevant and should only apply to the methods regarding the selection/creation of input data. The analysis in itself should be a single simulation performed centrally.	See answer to Mrs. Pierre in the Target Methodology part answers part.
Jasmina PIERRE	EDF believeq that individual national generation adequacy outlooks should be used differently for the next five-year period analysis and for the analysis of the period between 5 and 15 years. For the next five-year period, considering the relatively limited evolution of the electric system, a regional "best-estimate" scenario can be built from the gathering of national best-estimates scenarios with minimal adjustment (as long as the principles for building these individual "best estimate" scenarios are sufficiently harmonised). On the other hand, considering the important level of evolutions for the next 15-year period, EDF believes that the scenario used will require much more centrally defined adaptations.	SO&AF adequacy should be understood as medium term. According to the recommendations of the ECG - subgroup on adequacy, adequacy should aim to a 5years - 10 years horizon, since beyond 10 years the uncertainties might be higher than the level of accuracy possible for Pan-EU adequacy assessments.
Jasmina PIERRE	Regarding the "scenario building", ENTSO-E should do a "reality check". To give an example, ENTSO-E SOAF of 2013 forecasted that the Fossil Fuel Generation Capacity would be stable until 2015 at a level of 468 GW. Nevertheless the starting point for 2014 SOAF is at 437GW.	Scenario A & Scenario B used for adequacy forecast are used to assess the risk of the system due to lack of adequacy and to provide an diagnosis of the status of the system in the medium term future. These scenarios build on national generation adequacy outlooks prepared by each individual transmission system operator. Economical and technological assumptions regarding evolutions in the market structure, e.g. merit order fuel switching effects, will be considered in the market modeling assessment of adequacy proposed.