

Continental Central South Regional Stakeholders Workshop on ENTSO-E TYNDP 2014

Date: 20 March 2014

Location: Terna Campus premises, via della Marcigliana 911 – 00139, Rome
Time: 10.00 – 14.50

Workshop MINUTES

Agenda

| No | Subject | Time | Lead |
|-----|--|--------------|---|
| 1. | Arrival and Registration | 09.30 | |
| 2. | Welcome | 10.00 | Ettore Elia Regional Group Continental Central South Member Terna Head of National Grid Planning Dept. Harald Koehler ENTSO-E Regional Group Continental Central South Convener |
| 3. | ENTSO-E TYNDP 2014 - Improvements and forward steps - New role of TYNDP under the Reg. (EU) 347/2013 | 10.10 | Claire Fourment ENTSO-E Regional Group Continental Central South Member |
| 4. | Third party projects in the TYNDP 2014: - Regional focus | 10.35 | Robert Tempels ENTSO-E Regional Group Continental Central South Member |
| 5. | TYNDP assessment: - Focus on CBA Methodology | 10.50 | Silvia Ibba ENTSO-E Drafting Team Planning Standards Member |
| 6. | Scenario Development Status - 2030 Visions Approach | 11.10 | Modesto Gabrieli ENTSO-E Working Group System Adequacy & Market Modelling Convener |
| 7. | TYNDP 2014 - Regional Focus: - Challenges for Grid Development in CCS Region | 11.35 | Harald Koehler ENTSO-E Regional Group Continental Central South Convener |
| 8. | Discussion | 11.55 | ALL |
| 9. | Lunch | 12.15 | |
| 10. | CCS RgIP 2014 Criteria and Methodologies - Market Studies: Regional Focus | 13.15 | Fabrizio Vedovelli ENTSO-E Regional Group Continental Central South Sub-Group Market Studies Leader |

- Network Studies: regional focus

Gabriel Dudicourt
ENTSO-E Regional Group Continental Central South
Sub-Group Network Studies Leader

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| 11. | CCS RgIP 2014 Regional projects assessment | 14.00 | Ettore Elia ENTSO-E Regional Group Continental Central South Member |
| | - V1 scenario provisional results | | |
| | - V4 scenario provisional results | | |
| 12. | m Discussion | 14.30 | ALL |
| 13. | Conclusions | 14.50 | Harald Koehler ENTSO-E Regional Group Continental Central South Convener |
| | | | Ettore Elia ENTSO-E Regional Group Continental Central South Member, Terna Head of National Grid Planning Dept. |

1. Welcome and Introduction: ENTSO-E TYNDP process

Ettore Elia, as ENTSO-E Regional Group Continental Central South Member and Terna Head of National Grid Planning Department, welcomes all participants on behalf of TERNA and ENTSO-e, highlighting the relevance of the event and thanking everybody for attending the workshop.

Harald Köhler from Austrian TSO (APG) as a convener of Regional Group Continental Central South (CCS) opened the meeting and introduced all Stakeholders with all topics of today's meeting, main impact of the TYNDP report and expected outcomes of this meeting. He pointed out the increasing importance of the TYNDP as a guide for decision makers when considering investment in electricity infrastructure over the next decade and beyond, it is critical that stakeholders at regional and national levels are well informed and consulted on the TYNDP process and outcomes.

2. ENTSO-E TYNDP

- **improvements and forward steps**
- **new role of TYNDP under the Reg. (EU) 347/2013 and PCIs process**

ENTSO-E has presented the TYNDP role under the of two EU regulation on infrastructure: 714/2009 (part of the 3rd Internal Energy Package) and the 347/2013 which entered into force in May last year. Under these legislations the role of the TYNDP is the following:

- ensure greater transparency regarding the entire electricity transmission network;
- form the sole basis for the Projects of Common Interest.

Related to the TYNDP development over time the graph below is summarising the main improvements:

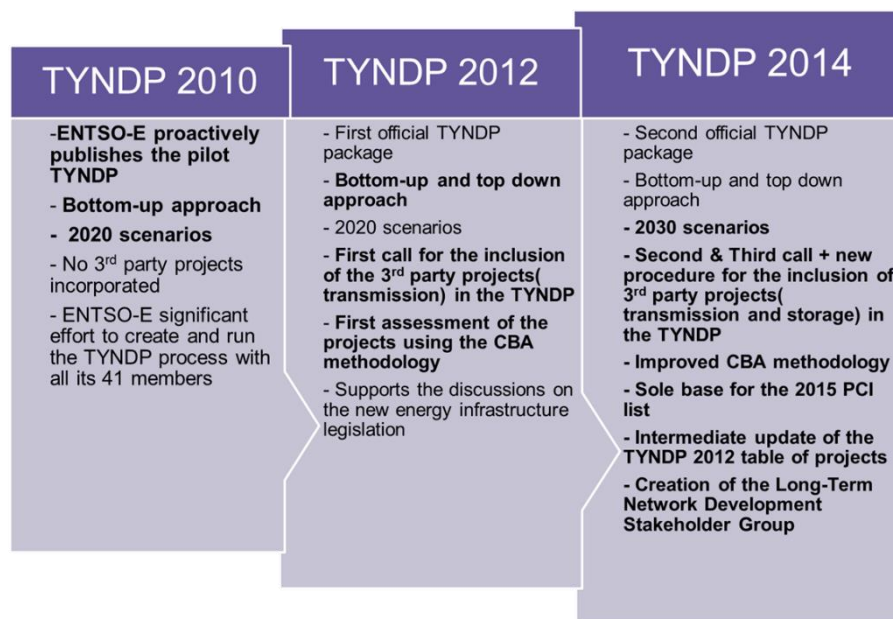


Fig 1. TYNDP improvements

For more detail information please see the associated presentation.

3. Third party projects in the TYNDP 2014 (regional focus)

The inclusion of the third party projects in the 2014 version of the TYNDP is based on the third party procedure which ENTSO-E published in January 2013 and further updated (in the light of the new (EU) 347/2013 regulation) in September the same year. The update in the procedure has been followed by 2 open calls for projects. As an outcome, ENTSO-E has accepted for further assessment 24 third party projects (transmission and storage) out of which 19 are PCIs. The CCS region incorporates six 3rd party transmission projects involving Austria, Germany, Italy and Switzerland.

For more detail information please see the associated presentation.

4. TYNDP assessment: focus on CBA Methodology

The Regulation (EU) 347/2013 mandates ENTSO-E to draft and publish a Cost Benefit Analysis (CBA) methodology by November 2013 followed by ACER, EC and member states opinion. The target is having the official CBA methodology publication by September 2014.

ENTSO-E's approach is to adopt a combined cost-benefit and multi-criteria framework, allowing for the best available information both for the public (TYNDP) and PCI decision-makers, on the full range of indicators required by the Regulation 347/2013, while monetising as far as possible.

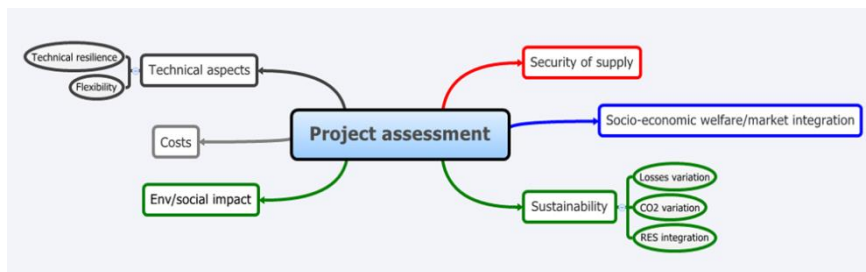


Fig 2. Main categories of the project assessment methodology (Cost Benefit Analysis indicators)

The main goals of this methodology, as stated in Regulation 347/2013, are the following:

- System wide cost benefit analysis (CBA), allowing an assessment of all TYNDP projects in a homogenous way;
- Supporting Selection Projects of common interest (PCIs);
- CBA results as one of possible input for Cross Border Cost Allocation (CBCA).

For more detail information please see the associated presentation.

5. TYNDP 2014 process & scenarios (2030 Visions Approach)- Scenario development status

The TYNDP is a two year process with activities at the European and regional level. The plan will be put forward for public consultation in July 2014 until September 2014 with the final version expected by December 2014.

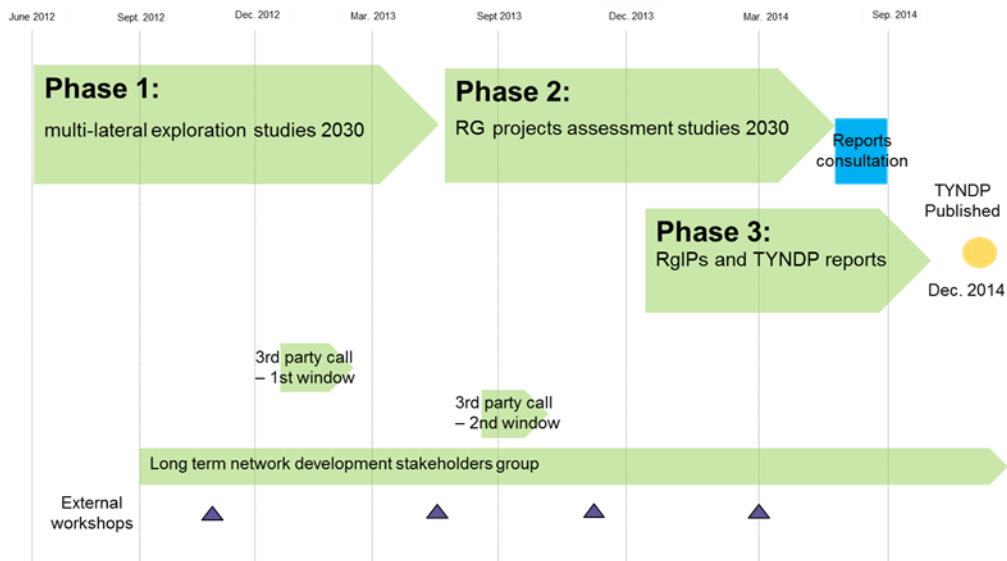


Fig 3. TYNDP process

The TYNDP 2014 tackles the 2030 by using four contrasting scenarios, as presented below:

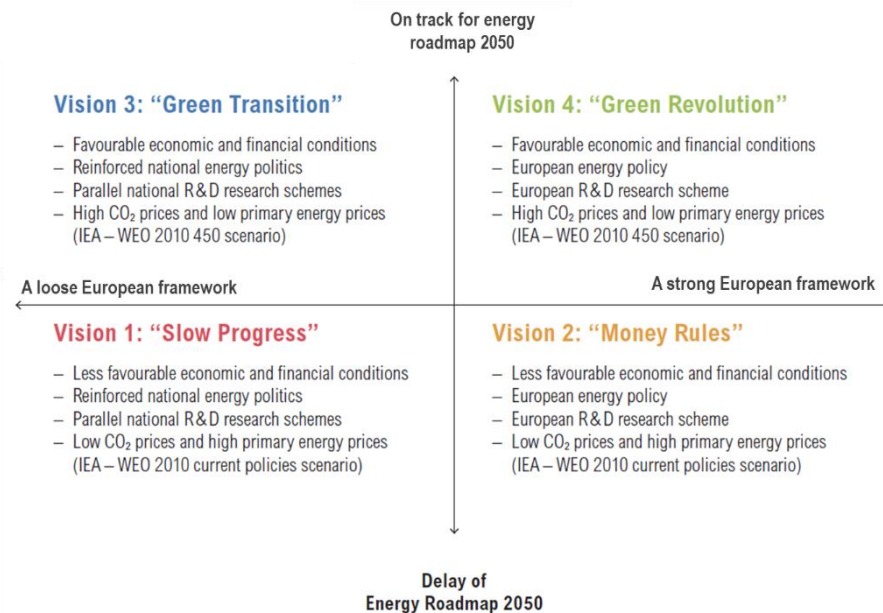


Fig 4. 2030 Visions

The role of the scenarios is to address uncertainties and to create the frameworks based on which the pan-European and regional market and network studies are performed. By having contrasting scenarios (going from 40 to 60% RES

integration) ENTSO-E can assess in its TYNDP the proposed portfolio of projects and detect the possible gaps in the future grid infrastructure.

For more information on scenarios please see the associated presentation.

6. TYNDP 2014 process: regional focus

ENTSO-E has presented the role of the RGs within the TYNDP process and the main tasks associated to it as follows:

- Perform regional market and network studies;
- Identify the needs and necessary network reinforcements considering the four visions in analysis;
- Evaluate all the TYNDP projects (CBA assessment through a multi-criteria analysis of benefits and costs), including TSOs and Third party projects
- Adapt the Pan-EU studies according the regional specificities (e.g.: temperature sensitivity, hydro conditions, wind and solar profiles, pumping modelling, etc.)

For more insight please related to the associated presentation.

7. Market and Network Studies: regional focus

In order to assess the TYNDP projects (including the PCIs), ENTSO-E's regional groups perform market and network studies based on a common set of data on which are added the regional specificities. Within this presentation ENTSO-E underlined the input data sets and the preliminary output of the regional CCS market and network studies of the vision 1 (slow progress) and vision 4 (green revolution).

For concrete details see the associate presentation.

8. Regional project assessment - provisional results for V1 and V4

ENTSO-E has presented the regional framework for the assessment of all the projects considered by CCS, by providing also examples of preliminary CBA assessment concerning a few projects of pan-EU relevance. . Considering the proposed infrastructure on the 2030 horizon, the main problems are generally mitigated and the results displayed showed significant benefits provided by the projects in terms of SEW, RES integration and CO2 reduction.

For concrete details see the associate presentation.

9. Summary of the discussion within the workshop

The question from audience

At which stage is the technology entering the process? Is there any clear analysis of the use of HVDC or HVAC, cable or overhead line, hydro storage or battery including the consideration of the costs?

ENTSO-E answer

In the next TYNDP 2014 there will be a chapter related to the technology for the future development of the network. Currently at ENTSO-E level there is a specific working group (Asset Implementation and Management working group – WG AIM) that is tackling and working with all existing asset technologies and the future implementation of this kind of devices in the transmission networks. In addition to that there is the “Research and Development Committee”, which works more oriented on the research than on the practical topics.

The TYNDP is also taking into account this subject including the technologies which are going to be developed in the network transmission system. Due to the inclusion of projects based on HVDCs in the TYNDP2014, a lot of facets of this kind of new technologies were already concerned. This is another challenge for all TSOs in the development of the future network.

The question from audience

It is necessary to understand the issue of the limited number of market nodes in your model better. It is surprising that apart from very special situations e.g. in Luxemburg, only Italy considered more than one market area while Germany was only one. So do you assume that there are no network problems at all?

Could you give some additional information about the exchanges between areas according to some few important factors (import/export, balance) in the different scenarios? What are the impacts? How large is the confidence interval of Vision 4 compared to Vision 1?

During the consultation there was some criticism with respect to the ratio of increase of demand. In Vision 4 most of it has to do with the usage of the electric energy in a way which is not common today.

Are active demand and the effect of the decrease of demand in relation to prices respected? Is the demand participation in the market considered somehow?

ENTSO-E answer

A European market study including a high number of nodes is not possible from the technical point of view. Therefore in the pan European market study the number of nodes was reduced in order to achieve a good balance between the use of the simulators and the quality of the results.

The main purpose of the pan European market modelling is the scenario building and the provision of boundary conditions for regional groups who are not able to do the market simulations on the whole ENTSO-E perimeter on their own. Besides that each regional group has focused on each particular region (e.g. on the regional level the market model includes six areas in Italy instead of two as in the pan European market studies).

More details regarding the load flows and possible constraints in the network are assessed within the network studies, where certain problems of the network are identified. The market study has to be understood as a part of the whole assessment.

The demand growth in vision 1 and vision 4 is based on different assumptions. Vision 4 represents the green revolution with a high evolution of the economic system which leads to more investments. It is important to point out the growth of installed renewable capacity, but as well the growth of the demand taking into account the investments in the economic sector. In vision 1 the hypothesis is a slow progress - there is no economic breakthrough of the electrical vehicles and less economic investments.

The influence factors of energy exchanges are mainly the price levels, the CO₂ emissions, the different categories of generation and the load. A variation of these factors is caused by the different assumptions within the visions, which are affecting the merit order list and therefore leading to a different use of the generation.

The question from audience

When will the CBCA be done and will this evaluation also be done for merchant lines?

ENTSO-E answer

The cross border cost allocation (CBCA) has been introduced by the regulation 347. For this specific task there is more detailed information in article 12. In the framework of this regulation the CBCA is requested together with the CBA in case some project promoter would like to apply for grants for works. This means that not all PCI projects will have a CBCA evaluation and only those PCIs that could apply for grants for works can request for a CBCA.

The regulation 347 does not allow projects which already received exemptions from the commission to apply for grants for works but only for grants for studies. As a consequence in this framework and in this context merchant lines are out of the scope for CBCA.

The CBCA is not a process executed by ENTSO-E. In the procedure it is foreseen that the project promoter can submit a proposal of CBCA to the national regulation authority. In case of cross border transmission projects the submission could also include a previous agreement between TSOs and between national regulators. Then the national regulation authorities should agree on this proposal. If no agreement can be achieved, ACER will decide.

The question from audience

Is it still possible for the project promoters to submit projects in this period? When will it be possible for the next process?

ENTSO-E answer

ENTSO-E had opened two windows for the submission of third party projects in the framework of the TYNDP 2014 which are already closed. As our report is part of a bigger European process, in case of any further submission we do not close our doors.

Of course the project promoter has to be aware that most of the project assessment is going to be finalized soon. Only little time will be available from regional groups' side to provide all assessments. This can lead to the situation that the final results will not be conducted in the right way as done for all projects which were included in the project assessment from the beginning. This is the main reason why it is difficult to integrate further applications. ENTSO-E will decide upon case by case about the possibility to accept further projects.

In the TYNDP2016 an improvement of the process is foreseen. ENTSO-E is awaiting some guidelines from the commission in this respect (regulation 347 suggests guidance on how the third party projects should be part of the TYNDP by the European commission). In the frame of the TYNDP2016 there will be a different schedule of the timeframes. In due time, all information can be found on www.entsoe.eu and all information about how to include projects into the TYNDP2016 will be provided to the stakeholders.

The question from audience

All the given examples of projects are market related or based on technical requirements. Is this a general picture in the TYNDP or are any projects which are dedicated to the reduction of CO2 emissions or the connection of renewable energy? How should it be understood, that in a presented project, the CO2 emission increases in both visions (1 and 4) although one would expect an increase just in vision 1?

In the last proposal of the ENTSO-E CBA some indicators of environmental and social aspects were introduced. Will these indicators be assessed also for the 3rd party projects?

Is it possible for internal projects to become a PCI?

ENTSO-E answer

There are different project benefits, depending on the projects and the border. In general cross border projects interconnect different markets and unlock the use of more efficient sources for the energy generation. This leads to an increase of the social and economic welfare.

As a consequence by using different sources of production, an impact in CO2 emissions is evident. This can lead to a CO2 reduction e.g. if the generation of coal is replaced by renewables or by gas.

If in some special conditions of a project is able to connect cheaper generation it can cause a higher emission of CO₂. This can be caused by the fact that the generators are not free to turn off and turn on (must run units, start-up costs, etc.). With a reinforcement cheaper but less flexible generation can get activated that leads to a higher CO₂ emission.

Within the TYNDP there are projects, which are dedicated to the integration of RES (in most cases internal reinforcements of the grid).

Internal projects can have benefits which are connected to cross border lines and affect their transmission capacity. It is not a rigid separation.

The social and environmental impact is a new indicator in our CBA (compared with the public consultation this summer). Currently this indicator does not get monetised but evaluated in terms of kilometres. Taking into account the maturity of several projects, the indicator can be quite under- or overestimated. Stakeholders and decision makers have to interpret it in the context of every specific project.

The question from audience

I understand that the calculation of the GTC increase is based on certain points in time - how can you be sure to find the worst hours?

Are certain points in time or complete year round calculations used for the assessment of the other indicators like the variation of losses and CO₂ emissions?

ENTSO-E answer

For the GTC assessment, certain points in time were used, which do not just represent extreme hours but also rather moderate situations. With this approach, a range of the GTC value can be assessed which is a basis for the estimation of the project's benefit. A similar approach is used for the assessment of the variation of losses indicator.

For the assessment of CO₂ emissions, the market simulation is used and therefore a simulation of the whole year is respected.

The question from audience

In which way are the third party projects included into the TYNDP – are they treated as a project (cluster of investments) or as an investment?

In the opinion on the TYNDP 2012 some improvements on the resilience indicator were requested. Which analysis is done for the assessment of resilience and are there already any concrete bottlenecks which are appearing in the Visions?

ENTSO-E answer

In general the nature of the submitted project is not modified. The submissions of the 3rd party projects were received as independent projects. Therefore 3rd party projects are not combined and taken into account together with TSO projects. So they represent projects in terms of clusters and they are clusters with one single investment. That is the way they will be presented in the TYNDP2014 results table. In the future they could be together with internal reinforcements – but a lot of open questions have to be clarified before doing so.

The resilience indicator was improved and also more details on how to assess this indicator will be provided in the future. For the TYNDP2014 we are doing our best to base the project assessment on the experiences but we want to go much more into detail for these indicators.

The question from audience

In case of a merchant line and a TSO project which are very similar, ENTSO-E has to find methodologies to ensure equal treatment – as already committed to do.

The regional investment plan of 2011 had included 41 projects with a cost of EUR 50 billion. In the certain slide with the illustration of bubbles there were less than 41 bubbles shown. Consistent clustering was a strong recommendation by all stakeholders in the past. Which effect has the clustering of investments on the projects in regional group continental central south?

ENTSO-E answer

The bubbles in the slide are not representing projects – the investments within a project are sometimes distant from each other although they belong to the same project. This is not represented by the bubbles.

The final clustering of the projects is still in progress in order to ensure the best representation of each project (however, all investments are already respected). At the moment the total number is about 41 projects.

ENTSO-E has already committed itself by ACER, European Commission and member states assuring that no discrimination in the project assessment has been done and will be done in the future. All development projects are considered on the same level.

The question from audience

Is there a strategy to respect different clusters in different visions?

ENTSO-E answer

The assessment was started from former clusters of the TYNDP12. The clustering rule and the clustering of the projects are not changed between the different visions.

The clusters are created by starting from the main investment and assessing, which investments are contributing at least 20% to the benefit of the main item. Based on this clustering, the analysis of all four visions is done. Maybe for the TYNDP 2016 a different strategy can be used.

The question from audience

Wouldn't it be useful for transparency – maybe not now, but for TYNDP16 – to show not only the result of the single cluster but also the result of the main item e.g. the interconnector as standalone system. It could increase the confidence.

ENTSO-E answer

This suggestion was also received from ACER and the European Commission. The GTC is the main driver for PCI selection and other decision making processes. A guidance of which is the GTC increase of each investment item will be given.

The question from audience

Where will the smart grid related project between Italy and France (the so called “Green-Me” project included in the PCI list issued by the EC on last October 2013) be addressed? In the national development plan, in the regional investment plan or in the TYNDP?

ENTSO-E answer

The Green-Me project is about the improvement of the foreseen and control of the distributed generation of France and Italy and is included and confirmed in the national development plan of Terna since 2013. This kind of project involves also the distribution system operators of France and Italy and has its main investments and benefit in the area of the respective distribution systems. Therefore the evaluation of the projects, as it will be mentioned in the Regional Investment Plan, should be performed by assessing its effects on both the transmission and the distribution systems. In the future, a quantitative assessment of the smart grid projects involving the transmission system could be provided also in the TYNDP. This would require to consider the relevant investments planned by the DSOs and TSOs.

The question from audience

The speed up of the permitting procedure is limited to a duration of 3.5 years plus 9 months. How is that to be understood? How is the limit assured?

ENTSO-E answer

This duration refers to the official permitting process that every project has to go through in order to be built.

The regulation 347/2013 introduces a maximum duration of three years and a half (the time between the decision of the investment and the time the beginning of the construction is allowed). Two years are reserved for the pre-application process – the time until you can start the legal statutory permitting process. The legal statutory process has to be ended

within one and a half year. The possibility of an extension of a maximum of nine months is given if the national authority sees that it is not possible to permit the project within the 3.5 years. The Commission and its Regional Groups will monitor the progress of the projects of common interest. These projects are followed with close attention.

The question from audience

Please provide more details about the concept of adaptation of the projects, the TOOT concept and the clustering.

ENTSO-E answer

Basically the current TYNDP assessment is based on the TOOT (take out one at a time) concept in order to avoid any underestimations of projects. Of course there are cases – especially projects which cannot be considered as mature – where the assessment needs to be considered in a different environment. For example the PINT (put in one at a time) method does not respect the full developed network and single investment items are only added to evaluate the project in that context.

The question from audience

Who is able to submit storage projects into the TYNDP and PCI process? How are storage projects assessed? Are they assessed together with transmission projects and is a competition between the two types of projects thinkable?

ENTSO-E answer

Projects are not only accepted from TSOs but also from private project promoters. This is especially the case at storage projects because no TSO is building storage power plants. The requirements for inclusion of 3rd party promoters for transmission and storage promoters into the TYNDP are defined in the ENTSO-E procedure. Based on the fact that Regulation 347/2013 is open for all promoters, ENTSO-E is not giving any restrictions.

The great part of requests of 3rd party promoters was received during the last two application windows for the 3rd party project inclusions within the TYNDP process.

For the assessment of the storage projects in the TYNDP14, the same reference network is considered for transmission and storage projects. So there is no distinction between the assumptions taken into account for transmission projects from TSOs and 3rd parties in comparison with those for storage projects. The current CBA methodology is not respecting the specific storage projects the auxiliary service and the reserve mechanism.

At the beginning of March, ENTSO-E started cooperation with EASE (European Association for Storage of Energy) and formed a specific taskforce in order to identify which is the best way to improve the storage CBA methodology for the future. Due to the tight timeframe, this storage CBA part will not be finished in time for the submission to the Commission. Within the regulation it is foreseen to add more improvements to the CBA methodology in the future. Therefore we will define the next steps for the improvement of our CBA methodology together with ACER. For the TYNDP 2016 a more improved CBA methodology with a higher developed assessment for storage projects will be available and used as a basis for the calculations.

The comment from audience

Compared to the TYNDP 2012 at the current state already 14 improvements can be identified in the new TYNDP 2014 process. Especially the application of the CBA methodology can be observed in a very positive way although no full application is done (which will be considered in the TYNDP 2016). In general two years ago, the TYNDP was less developed than today – what is a result of the efforts of ENTSO-E.

ENTSO-E comment: *It is appreciated, that the efforts of ENTSO-E are recognized and valued. The current state of the TYNDP was achieved by hard work and good contact with and a lot of input from ACER, national regulation authorities, the European Commission and the stakeholders. Based on this state we are looking forward to improving the TYNDP and the CBA methodology together with all stakeholders for the future in order to provide a firm basis also for the PCI lists of the European Commission.*

Notes:

All the material presented in the ENTSO-E stakeholders' workshops on the TYNDP can be consulted on the ENTSO-E website at: <https://www.entsoe.eu/major-projects/ten-year-network-development-plan/tyndp-2014/stakeholder-interaction/>

The TYNDP FAQ can be accessed here: <https://www.entsoe.eu/major-projects/ten-year-network-development-plan/tyndp-faqs/>

The ENTSO-E CBA methodology can be accessed at: <https://www.entsoe.eu/major-projects/ten-year-network-development-plan/cba-methodology/>

The ENTSO-E Visions 2030 can be accessed at: <https://www.entsoe.eu/about-entso-e/system-development/system-adequacy-and-market-modeling/soaf-2013-2030/>