

Third ENTSO-E 2030 Vision Workshop on Visions for the Ten-Year Network Development Plan 2014

Date: 2 July 2013

Time: 10.30h – 16.00h

Place: ENTSO-E premises, Avenue Cortenbergh, 100, 1000 Brussels

WORKSHOP MINUTES

1. Meeting's agenda

No	Subject	Time	Lead
1.	Welcome	10:30 – 10:45	Dimitrios Chaniotis ENTSO-E Manager System Development
2.	General overview on the 2030 scenarios and use of the scenarios in the TYNDP process	10:45 – 11:15	Jesús Mendiola Wippermann ENTSO-E Modelling Advisor
3.	Bottom up scenarios – slow progress(scenario 1) and green transition (scenario 3) - Input data - Market studies results Discussion	11:15 - 12:30	Eppie Pelgrum Convener of ENTSO-E Sub-Group Market Modelling ALL
	Lunch	12:30 – 13:30	
4.	Top down scenarios – money rule(scenario 2) and green revolution(scenario 4) - Input data - Market studies results - Suggestions for improvement Discussion	13:30 – 15:30	Cherry Yuen Yee Shan Project Manager ENTSO-E Pan-European Market Studies Expert Team ALL
5.	Next steps	15:30– 15:45	Modesto Gabrieli Francescato Convener of ENTSO-E Working Group System Adequacy & Market Modelling
6.	Conclusions	15:45 – 16:00	Dimitrios Chaniotis ENTSO-E Manager System Development
7.	End of the workshop	16:00	

2. General overview on the 2030 scenarios and use of the scenarios in the TYNDP process

ENTSO-E has given a general overview of building the scenario process as well as presenting the main changes performed in our scenarios based on the stakeholders' feedback.

The main points of the presentation:

- ENTSO-E scenarios are built along 2 axes: 2050 roadmap (delayed/reached) and the European framework integration (loose/strong)
- the 4 visions overview can be consulted here: [2030 visions overview](#)
- The main input data can be classified in four parts: economy and market, demand, generation and grid.
- Visions 1 and 3 are bottom-up build while the visions 2 and 4 are the top-down.
- Till now ENTSO-E has hold 2 stakeholders' workshops¹. The first workshop was concentrated on vision 1 and 3 and the second one on scenarios 2 and 4. In addition ENTSO-E has run an open call for input for adjusting the top down visions during 4 December 2012 and 7 January 2013. For further insight on the input received and the ENTSO-E implementation please visit the TYNDP 2014- stakeholders' interaction page².

Questions: no questions were asked.

3. Bottom up scenarios – slow progress(scenario 1) and green transition (scenario 3)

ENTSO-E has presented the building of the bottom-up Visions 1 and 3 their process, key inputs and some preliminary results of the market simulations (fuel mix, CO2 emissions, country balances).

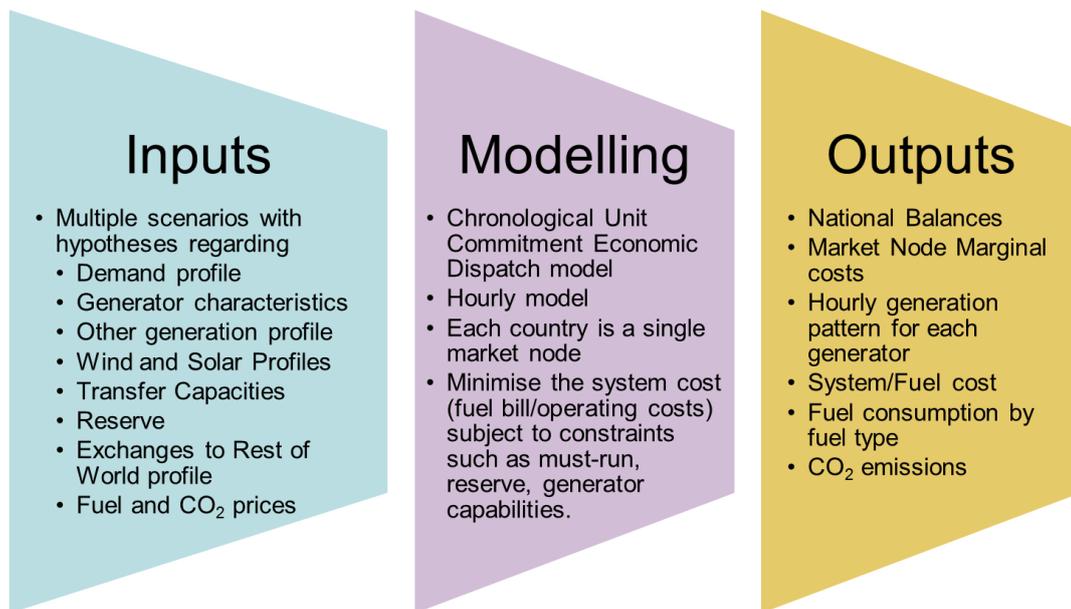
All the stakeholders are encouraged to look at the checks in annex of the presentation and come back with suggestions.

Main elements:

- 4 market simulation tools were used at the pan-EU expert team. Different tools with different answers-> this gives us a view on the uncertainty (each tool has its own strength).
- We have modelled the entire Europe but also with the neighbouring countries.
- The input-output pan-EU study:

¹ <https://www.entsoe.eu/major-projects/ten-year-network-development-plan/tyndp-2014/stakeholder-interaction/>

² <https://www.entsoe.eu/major-projects/ten-year-network-development-plan/tyndp-2014/stakeholder-interaction/>



- The pan-EU market studies use mainly a node per country but in the RGs studies the modelling is more detailed.

- For each node the data collected was:

- Demand and Demand-Side Management Data Set (year around hour-by-hour time series)
- Supply data
 - Thermal dispatchable Generation Data Set
 - Hydro Generation Data Set
 - Wind Generation Data Set
 - Solar generation
 - Other Renewables Generation Data Set
 - Other Non-Renewables Generation Data Set
- System data
 - Operational reserves Data Set
 - Exchange capacities between market nodes
 - Power Exchange Data with non ENTSO-E countries

- For the TYNDP 2014 study ENTSO-E acquired 2 climate data sets(temperature, wind and solar)

- The demand has an increase of 16% between vision 1 and 3

- The difference in the installed capacity between vision 1 and 3 is around 200 GW (mainly RES) → see slide 20

- Vision 1 and 3 are starting point for the vision 4 and 2.

Discussion:

- How does the absolute value of prices influence the CBA?

A: The CO₂ price and the fuel price influence the CBA outcome but it is tricky to consider the impact of a high CO₂ price.

- What is the percentage of RES from the total generation for the vision 1 and 3?

A: vision 1: 40%, vision 3: 50%.

- What assumptions does ENTSO-E consider with respect to the generation load factors?

A: The load factor is not an assumption but an outcome of the simulation. This depends of the optimisation and the prices assumptions (e.g. since nuclear is cheap is running more hours).

- What about considering the CAPEX of the investments? Without considering it, we may put forward the infeasible generation.

A: The expert team considers the CAPEX when creating the top down visions. The data from vision 1 and 3 are given by Long Term Adequacy Correspondents (LACs) and reflects the scenarios considered feasible by TSOs in 2030. ENTSO-E does not change it.

- How does ENTSO-E translate the temperature into load profile? What is the impact of the heat pump on the peak load?

A: The temperature data sets are used only in the regional groups' studies and not in the pan-EU ones. At pan-EU level, the expert team compares the historical load with the historical temperature and transpose it for the future references. The information on the heat pumps is delivered by the LACs and is used accordingly.

- Does ENTSO-E model the 10 historical years and is further using just the average?

A: This is done differently in the RGs. In the NS RG for example all the 10 years data is considered and finally averaged out.

- For the DE it was a problem with the 2011 load and temperature assumptions. How did you consider this?

A: ENTSO-E does not use the temperature to define the load curve. This information is considered by the LACs before delivering the data to ENTSO-E.

- Centralised/decentralized generation should be better represented in the modelling. Did ENTSO-E considered the power and heating market? Is the biomass included (it seems to be a very modest increase)?

A: ENTSO-E explicitly models the centralised biomass while the decentralised biomass is included in the "other RES" category. ENTSO-E does not model the CHP market. When is a CHP unit the LACs are requested to mark it as a must run unit.

- ACER: Consistency checks seem to be more under the form of constrains and not as a check. Are there any further consistency checks in the modelling?

A: For the vision1 and 3 it is true, the consistency checks represent the checks against an expected range.

- ACER: Do you have scenarios that gather high energy prices and demand?

A: This scenario is not within the assumptions that ENTSO-E made when deciding on which scenario shall use for TYNDP 2014. We tried to define the extremes according to our technical expertise and to the main inputs received from the stakeholders.

- ACER: How do you incorporate the results at R&D? Did ENTSO-E considered some assumption on the breakthrough costs for e.g. PV panels?

A: No this information was not considered in our modelling.

- 90 Euro CO2/t may be feasible. Important though is to add the assumption on the regulatory framework (what kind of capacity market, curtailment of the wind generation on the negative process).

A: Since the TSOs are working directly with the national regulators the values from visions 1 and 3 consider the regulatory framework.

- Are the result presented stemming only from one tool? For the stakeholders would be interesting to see the variants.

A: The results which are shown in the current presentation stem from only one model. For the construction of the top down scenarios (2 and 4) we have used the average values resulted from four tools. ENTSO-E will consider the possibility of releasing these variant or not (in case are significant differences).

- What about the BTCs?

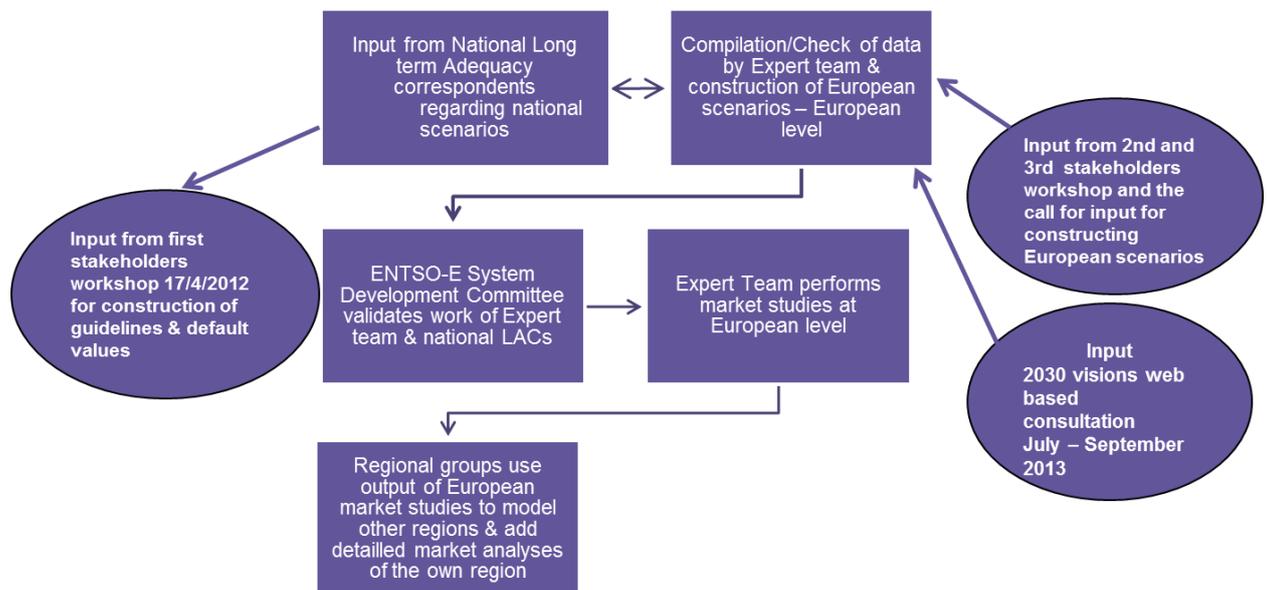
A: For the bottom-up visions the BTC are based on the TSOs best estimates while for the top downs visions the expert team make assumptions on the BTCs values. In the regional studies all the projects that are coming ready within 2030 are in the model.

3. Top down scenarios – money rule (scenario 2) and green revolution (scenario 4)

ENTSO-E has presented the basic assumptions of the top-down visions, the methodology behind it(including the pros and cons) the concerns related to the shortcoming of the vision 4 and possible solutions.

Main underlined elements:

- For the two top down scenarios we have a common approach of European policies.
- Vision 2 – 35Euro CO2/t, vision 4- 93Euro CO2/t.
- The process of constructing the visions 2 and 4 is the following:



- More load in vision 4 than vision 3
- Thermal reduction:
 - o Vision 2: total reduction (mainly gas) = 14 GW, mostly in GB, DE, ES and IT (out of the 485 GW installed thermal capacity in Vision 1)
 - o Vision 4: total reduction (both gas and hard coal) = 14.5 GW, mostly in DE, IT, NL and GR (out of 522 GW installed thermal capacity in Vision 3)
- EC target range for 2030 to be on track for energy roadmap 2050:
 - o Visions 3 and 4 are in the range for CO2 reductions (-62%) / slightly inferior for RES integration (vs. Decarbonisation Scenarios)

- Visions 1 and 2 are not on track for both indicators (but ok against Current Trend Scenarios)
- Pros and cons of the current methodology of deriving the visions 2 and 4 are presented in the slides 25 and 26.
- The identified shortcoming of the vision 4 and the suggested solutions -> see slides: 27-32.
-

All the stakeholders are requested to give additional feedback on:

- **ENTSO-E proposals for improvement**
- **Specific request on RES increase:**
 - **Initial increase based on capacity factors alone resulted in some small countries having too much RES, additional parameters required, e.g. surface area; for offshore it is more tricky which parameters we can consider in addition to capacity factors**
 - **Studies with reliable maximum technical potential for all countries within the ENTSO-E parameter**

Discussion:

CAN Europe: The visions 3 and 4 are not very different and rely on CCS to reach the CO2 target. What will happen if not? Electricity demand is high. Does ENTSO-E show the energy demand for all the system? Does ENTSO-E consider the market coupling?

A: ENTSO-E does not have a figure about the overall energy demand, but it is sure that electrical vehicles and heat pumps will be there and participate in the load development.

Additionally we assume a perfect market which means that the EU market is coupled. We only consider the marginal costs.

- ENTSO-E considers too much RES for vision 1.

A: This value includes hydro and in line with the existent RES installed in Europe.-

Suggestions to improve the vision 4:

- **Locate the RES where the consumption nodes are.**

A: ENTSO-E also thought of it but this will not lead to an optimisation of the capacity factor.

- **Consider additionally the regulatory frameworks. Use a cost effective approach.**

A: ENTSO-E does not have for the moment a proper model.

- **It is very important to take the overall energy view into scenario. Greenpeace 60%r RES minimum. Also the solar figure is very low (EPIA) and the consumption is very high.**
- **Install the RES: look at the load centres - home solar systems highly probable**

ACER: Since 1 country 1 node, the distribution of RES is per country and not within the country.

A: ENTSO-E is looking at the climate data base and considers distribution based on capacity factor and surface area.

- **ENTSO-E should consider the CO2 variation and see the resulting impact on the entire system.**

A: it is interesting, but electricity is not the only targeted sector for the CO2 reduction. This element is harder to consider.

- **Suggestion EWEA:**

- **For the location of PVs ENTSO-E can use the EPIA scenario: preference for the consumption base deployment. In EPIA scenarios the solar capacity is double.**
- **Note that the new wind technologies may allow the installation of these units closer to the consumers> Wind could be installed where there is lower EFPH.**
- **CCS deployment depends on the CO2 price assumptions, and the analysts consider that CO2 will not reach the assumed price.**

ACER: The solution is not talking RES from A to B. If you think having solar close to the consumers is easier compared to wind technology, but the space is limiting.

- Load factor of the different competing technologies? Capital cost of thermal power plants that have low number of running hours would be huge, are high capacity payments included?

A: The increase in RES penetration could lead to a possible revision of the thermal installed capacities in V4

Do the new coal units' data consider the plants in construction? CHP must run- part of that can be removed from must run.

- A: ENTSO-E looks at the additional units between 2020 and 2030, but is really low (about 8 GW) so the effect is not so high.

- To what extent did ENTSO-E consider the NUC flexibility?

A: For ramping modelling they show rather flexible. But some of the NUCs are not flexible.

- ACER: What happens if you do not reach adequacy after the thermal reduction?

A: ENTSO-E reinstates the thermal capacity. Adequacy must be ensured.

- What is the definition of decentralised storage?

A: A decentralised storage = amount of storage which is less than 4 % of the local demand.

- What is the percentage used for the demand response and how is it considered?

A: it is based on the stakeholders input and is done by shaving the load curve.

- Some biomass/biogas units can go from a power mode to heat mode operation which will allow flexibility in use.

A: This can be applied at the local level but will not have significant impact at the country level.

- Why does ENTSO-E take out the must run obligation for coal units?

A: The generation will still be there, only their must run obligation is deleted. This does not mean that they will not work but that they will work only according to the grid strengths and the need of the market.

4. Next steps

ENTSO-E presented the next steps in terms of scenario building. For further insight please see the associated presentation.

Note:

- ENTSO-E will launch an eight weeks web-consultation on the data for all four scenarios mid-July 2013: https://www.entsoe.eu/news-events/announcements/newssingleview/article/consultation-on-the-tyndp-2014-2030-visions-is-open/?tx_ttnews%25255BbackPid%25255D=28&cHash=ebe469c5c2bd7d6aabb7b6fc1a7b18c9 All the interested stakeholders are kindly requested to submit their comments within the consultation timeframe.
- All the presented material can be accessed at: <https://www.entsoe.eu/news-events/events/3rd-entso-e-2030-visions-workshop-2-july-2013-brussels/>