ENTSO-E Ten-year Network Development Plan 2016

Workshop on 2030 scenario building methodology

16 September 2016

Stakeholder input during the interactive sessions

A. Introduction

The process for developing the 2016 version of the TYNDP has begun. One of the key steps in the process is the identification of scenarios and the methodology designed to build them. In order to gather the stakeholders' feedback on development of scenario methodology ENTSO-E hold an interactive workshop on 16 September. Below one can find the outcomes of the interactive sessions.

The agenda and the material presented in the workshop can be accessed on the ENTSO-E website[1].

The workshop started with the introduction of the topic and the main framework of the TYNDP 2016 and the scenario building expectations. It was followed by two interactive sessions and closed by the presentation of the outcomes.

B. Outcomes of the interactive sessions:

Session 1:

1. General questions:

1.1. Which parameters shall be considered when building contrasting visions for 2030?

Group 1	Group 2	Group 3
Overall economic conditions	**renewable in distributed system**	**Geographical distribution of RES**
Res-policies	storage	**EU policies**
RES-technological evolution	load	Security of Supply in gas sector
Distributed storage and generation in the grid	economic development	Nuclear phase out
Political stability	generation mix	Development of Smart grids
10-15% transmission capacity enforced	fuel prices (nuclear and gas)	Assumption of electricity storage (how matter this technical?)
Industrial development	technologies level	Consistent set of parameters in Vision 4 (sensitivities studies- more efficiency) -> more visions
Fuel prices	regulatory evolution	**Flexible demand**
Relevant legal constraints for RES	**capacity market**	Public acceptance
Res from Central East and Mediterranean	smart grid	**High CO2 prices**

[1] https://www.entsoe.eu/news-events/events/Pages/Events/Public-Workshop-on-Scenario-Methodology-for-TYNDP-2016.aspx

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1.2. Level of adequacy for 2030: definition of national and European adequacy (% back-up capacity) and National or European adequacy for each 2030 visions.

The opinions were divergent on this topic stretching from all the visions should be European adequate to only one vision out of four(e.g. Vision 1 – stagnation) shall be nationally adequate. Also the national adequacy is highly dependent on the political moves. In addition considering the RES integration the adequacy can be also looked from the regional perspective.

1.3. What merit order (gas vs coal) is to be expected for each of the 2030 visions?

Visions	Group 1	Group 2	Group 3
vision 1	In all scenarios: gas should come before coal. (Can we reach the EU targets when lignite & coal comes before gas in the merit order?) Use IEA for fuel price sources.	no clear preference but ranges should be considered looking at the political situation security of supply economic development, CO_2 value and interconnection capacities	Coal vs gas, biofuel not first
vision 2			
vision 3			Biofuel first and gas before coal
vision 4			Biofuel first and gas before coal

2. Demand:

2.1. Trend of demand for each 2030 vision compared to today (lower, stagnate, higher) for each vision.

Visions	Group 1	Group 2	Group 3
Vision 1	higher	higher	higher
Vision 2	stagnate	higher	higher
Vision3	higher	lower	lower
Vision 4	higher	lower	lower

2.2. What is the trend for the following 5 parameters (economic growth, energy intensity, electric vehicles, heat pumps, demand response, energy efficiency) for each vision?

Group 1	vision 1	vision2	vision 3	vision 4
Economic growth	lower	growth	not specified	stagnate
Energy intensity industry	stagnate or growth	growth	growth	stagnate

Electrical vehicles	growth	not specified	lower	lower
Heat pumps	lower	lower	lower	stagnate or growth
Demand response	stagnate or growth	not specified	stagnate	stagnate
Energy efficiency industry	lower	not specified	stagnate	stagnate
Group 2	**vision 1**	**vision2**	**vision 3**	**vision 4**
Economic growth	stagnate	lower	not specified	increase
Energy intensity industry	uncertain	lower	lower	increase
Electrical vehicles	lower	not specified	stagnate	stagnate
Heat pumps	stagante	stagnate	stagnate	uncertain
Demand response	Stagnate or higher	not specified	increase	increase
energy efficiency	stagnate	not specified	increase	increase
storage				
Group 3	**vision 1**	**vision2**	**vision 3**	**vision 4**
Economic growth	do not consider	do not consider	do not consider	do not consider
Energy intensity industry	stagnate	lower	stagnate	stagnate
Electrical vehicles	0%	higher	higher	higher (10%)
Heat pumps	higher	higher	higher	higher
Demand response	higher (5%)	higher	higher	higher (20%)
energy efficiency	higher	higher	higher	higher

2.3. What other demand components shall be considered?

Group 1	Group 2	Group 3
Heat from climate units	storages	Industrial growth
Higher use of air condition units (less focus on HP&EV)	smart grid	Energy use in mobility section
Gas heating converted to electricity (because of security of supply and better insulated houses)	Heat pumps	Demographic change. Health sector.
Driver for energy efficiencies (	demography	Housing sector
Smart grid and smart meters. Integration of different energy systems	fuel cells	Forced demand response
It development => higher demand	Power to gas	
IT systems for smart energy. Will that consume more energy than they save??	distributed vs transmission share	

	solar impact on profile
	climate--> air conditioning
	fuel prices
	autonomous grids
	grid tariffs
	transition policy (trends EC)

Session 2:

1. **Thermal reduction:**

1.1. What generation technologies shall be considered for the thermal reduction in the top down visions?

Group 1	Group 2	Group 3
The thermal reduction is highly sensitive of the political decisions. The old unit's gas conventional units are expected to be closed by 2030. The generation capacity portfolio is expected to be reduced in the two top down visions.	The reduction in thermal is highly dependable on the CO2 price and RES capacity. Hard coal, lignite is expected to reach new level of flexibility. Gas: reduction of OCGG, more CCGT Profitability of power plant.	Optimal solution for thermal reductions in V2 & V4 needs to be developed. IED & Bref will reduce a large share of the thermal production units. Grid Reasons or security of supply needs to be considered If ETS functions properly then is expected to eliminate the hard coal and lignite. CCS is unlikely to be commercially deployed by 2030. If renewables encounter large development then will be no room for the nuclear units.

1.2. What additional technology below (CCS, shale gas, power to gas) shall be considered for each 2030 vision?

Group 1	Group 2	Group 3
If the economic climate is not good no new technologies are expected to emerge.	For vision 1 no power to heat and no investment in storage	not strong opinion when and how much
CHP very flexible. Including power to gas. Not must-run	For vision 3 gas probably may be used for transportation	
Increased usage of hydrogen (surplus from industries)	For vision 4 biomass may substitute conventional generation.	
Decentralised generation		
Hybrid generation		

1.3. Which countries have a favourable environment for the following technologies (NUC, lignite, hard coal, natural gas, pumped storage)?

Type of technology	Group 1	Group 2	Group 3
Nuclear	Fi, RU, PL,UK, CZ, FR	FI, SE, FR, SK,IT, UK	FI, FR, UK,
Lignite	DE, PL	DE, PL	PL,GE
Hard coal	PL	DE, PL	PL,GE
Natural gas	BE, UK	NL, DE, BE, ES,IT	ES
Pumped storage	NO, DE, AT, CH, IT	NO, LU, FR, ES, CH,AT,	NO, CH,AT,

2. Optimization of renewables:

If you are given the task to optimize renewables in Europe how would you do that? Consider parameters, process, method, sources, and outcomes.

Group 1 thoughts:

- Optimisation of renewables.
- Harmonisation of renewables (ETS & subsidies & level playing field & market solutions):
- No subsidies at all.
- Relate RES to adequacy (not national)
- Mapping of RES potential: split between variable and dispatchable RES. An important step (relate transmission vs. RES) and system cost. Backup and ancillary service can also come from renewables. (Solar people working with this mapping will send us when they are ready)
- Market perspective: Socioeconomic, system cost or the business case for the individual unit. Lifetime cost, upfront cost, cost of electricity.
- Think of system adequacy and consider the grid. (Chicken and egg problem).
- The exercise of ENTSO-E should be an optimal approach to the whole system: RES, transmission and production.
- Take into consideration the advantage of decentralised generation: lower grid cost. ? (Example from Germany: right now it does not make sense to have wind generation in north and solar in the south due to the grid cost associated with it compared to distributing the production and even using not optimal locations)

- Literature on optimisation of RES: "Impact of restricted grid expansion in Germany in a 2030 perspective" Ecofys 2013"

- Data sources to be considered: National plans for 2020 as the lower limit for RES.

    - Highest limit for RES : EWEA, EDIA, ESTELLA,

- National markets: Sensible figures for the capacity factors. Meaning the capacity factors will have to be higher than current TYNDP.

Group 2 thoughts:

- potentials (EWEA for wind)(space left, so density of power)
- costs (transmission investment)
- local neo initiatives
- demand response
- potential limitations by infrastructure
- taking into account grid for placing installations
- cleaner objective formulation (costs, CO_2)
- alignment with security of supply
- objectives should be linked to storyline
- single criterion optimization not sufficient

Group 3 thoughts:

Boundaries - present grids and wind resources. Development of technologies leads to equal conditions for installations (equal distribution).
- RES resources
- Optimization PV and wind together
- Investments costs
- Wind technology development- equal distribution
- System services
- Grid extension cost
- Production hours
- Incentives
- Market design-price-> intermittency and flexibility
- Autonomy of regions

Data sources to be considered:

- EWEA
- EC-study by ECOFYS
- EC-study integration for renewable
- ISE Fraunhofer (100% renewables) 2012
- IWES 2013
- TYNDP Data in Benchmark to studies
- different conditions for building interconnections (15% target)

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