Resource adequacy forecasts 2030
Under different scenarios

Jean Verseille
ENTSO-E Board member

EPRI-IEA
28 September 2015,
About ENTSO-E, an EU institution with legal mandates

- **41** TSOs from 34 countries
- **525** million citizens served
- **1000** GW generation capacity
- **310** thousands km of transmission lines

Ten-Year Network Development Plans
Adequacy forecasts
R&D plans
Tools for Market Integration
Network Codes
ENTSO-E Adequacy Reports and Scenarios

=> ENTSO-E adopts and publishes:

“a Scenario Outlook & Adequacy Forecast” report (SO&AF)“

mid-term horizon (5 – 10 years – SO&AF) on an annual basis

=> ENTSO -E should draw up, publish and regularly update a non-binding [Union]-wide ten-year network development plan”

Long term (=> 2030) every second year
Different objectives addressed through different time horizons

Short term
6 months

Operational decisions

Mid term; “predictive”

5 years
10 years

Generation Investment decisions

Long term; “exploratory”

15 years

Grid Investment Policy/political decisions

entsoe
How do we construct the SO&AF scenarios?

SO&AF scenarios are:
- **predictive**: forecast → mid-term maximum (5 to 10 years)
- **bottom-up**: build on national generation adequacy outlooks prepared by TSOs
- **based a common assumption**: 2 different scenarios for generation against one common conservative forecast for demand

**Scenario A = ‘Conservative’**
- Additional investment in generation => Only if **confirmed**
- Notifications of decommissioning => all + technical life time of units
- Demand forecast => highest national estimate available to TSOs

**Scenario B = ‘Best Estimate’**
- Additional investments in generation => all considered as **reasonably credible** by TSOs
- Notifications of decommissioning => Only official communication
- Demand forecast => highest national estimate available to TSOs
Scenario Outlook 2015 – general overview*

Load and energy consumption forecast

- January peak load
- August peak load
- Average increase among all monthly peak loads
- Yearly energy consumption

Net Generating Capacity forecast

Scenario A
Scenario B
SO&AF 2014, sc.A
SO&AF 2014, sc.B

* = provisional SO&AF 2015 data
Scenario Outlook – general overview*

Decommissioning *smoothed* out by RES growth

RES up to 46% of NGC in 2020 in scenario B / 44% scenario A

* = provisional SO&AF 2015 data

---

**January 7 p.m.**

<table>
<thead>
<tr>
<th>Scenario</th>
<th>2016-2025</th>
<th>Fossil fuels [GW, total]</th>
<th>RES</th>
<th>Non-RES hydro</th>
<th>Nuclear [%, yearly]</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>-55</td>
<td>105</td>
<td>10</td>
<td>-18</td>
<td>-1.64%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.55%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.25%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-1.81%</td>
</tr>
<tr>
<td>B</td>
<td>-33</td>
<td>185</td>
<td>15</td>
<td>-17</td>
<td>-0.97%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4.15%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3.12%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-1.67%</td>
</tr>
</tbody>
</table>
The TYNDP 2014 package delivers...

...a vision for the development of the European extra high voltage grid

- Non-binding
- Updated every 2 years
- Based on common market and network studies
- Generation adequacy outlook

...a comprehensive document suite that includes

- Ten-Year Network Development Plan
- Scenario Outlook and Adequacy Report
- 6 Regional Investment Plans
4 contrasting “Visions”

**Vision 1: Slow progress**
- Total X-border Exch.: 605 TWh
- Demand incl. Pumping: 4167 TWh
- RES Penetration: 49%
- CO2 Reduction (1990): 62%

**Vision 2: Money rules**
- Total X-border Exch.: 734 TWh
- Demand incl. Pumping: 4327 TWh
- RES Penetration: 60%
- CO2 Reduction (1990): 78%

**Vision 3: Green transition**
- Total X-border Exch.: 660 TWh
- Demand incl. Pumping: 3610 TWh
- RES Penetration: 41%
- CO2 Reduction (1990): 42%

**Vision 4: Green revolution**
- Total X-border Exch.: 757 TWh
- Demand incl. Pumping: 3712 TWh
- RES Penetration: 40%
- CO2 Reduction (1990): 36%
2030: a milestone for the energy transition on the road to 2050

RES Targets EU = total scope energy
% RES = part of electricity generation mix

CO2 reduction (% - compared to 1990)

-7%
-20%
-39%
-42%
-62%
-78%

2005

EU sets targets of 40% carbon cut and 27% share of renewables by 2030 – live
Rolling coverage and reaction on Europe announcing a new 2030 greenhouse gas emissions target
The Ten-year Network development plan 2014: main findings

- €150 billions for projects of pan-European significance by 2030
- -2 to -5 €/MWh for bulk power prices by 2030
- 50,000 km of new or refurbished grid investments by 2030: +1%/year
- An optimised land use: the crossed urbanised (resp. protected) areas account for less than 4% (resp. 8%) of the total TYNDP projects’ routes
- Contribution with 20% of the CO2 emissions mitigation for the European power sector by 2030
- Integration of RES up to 40-60% of total consumption in 2030
Interconnection capacity must on average double by 2030

Target interconnection capacities
By 2030 – Vision 1

Target interconnection capacities
By 2030 – Vision 4
Taylor made solutions, adapted to every specific situation

50000 km of new or refurbished investments

21000 km of new HVDC lines

15% of all investments are upgrade of existing assets
THANK YOU