Electricity supply & demand balance in France

Thomas Veyrenc, RTE, Director for strategy and planning
Adequacy forecasts provide insights and scenarios for the debate on the French electricity mix

- In France, the Energy Transition law of 2015 set objectives (40% of RES, 50% of nuclear) but with no detailed scenarios or paths to reach these targets.

- In 2017, RTE developed, in consultation with all stakeholders, five contrasted energy transition scenarios. These scenarios are detailed in RTE’s adequacy forecast. They all include a diversification of the mix but differ on the evolution of RES and nuclear capacities.

- These scenarios have been used for the debate on the new French energy plan (PPE).

- At the end of 2018, the French government presented a reviewed energy plan for the next 10-15 years. The proposed plan is close to Ampère and Volt scenarios and marked by:
  - Closure of coal plants by 2022
  - Increased development of RES
  - Some closure of nuclear power plants between 2025 and 2035
Adequacy forecasts provide insights and scenarios for the debate on the French electricity mix

- In France, ~90% of generation is carbon-free, and the oldest oil and coal plants have already been decommissioned in recent years.

- With the closure of the last coal plants (~7 MtCO2/y), the French power sector would emit around 15 MtCO2/y.

- Issues for short/medium term (2022-2025) and longer term (2025-2030) are different
  
  - 2020-2025: substitution between fossil-fuel power stations and carbon-free electricity
    
    Currently, security of supply matches exactly the reliability standard (loss of load expectation of 3 hours per year) – no more, no less → raises questions about the possibility to close down the 5 last coal-fired units in 3 years.

  - 2022-2035: addition of renewables are supposed to be bigger than removal of nuclear units

    If energy efficiency plans are implemented as planned, concerns for security of supply should fade away (increased capacity margins).
2020-2025 : a period of substitution in order to reinforce decarbonisation of the French electricity mix

- The latest adequacy forecast (BP 2018) published by RTE contains an in-depth analysis on security of supply after closure of the last coal power plants.

- Analyses are based on detailed simulations of the European supply and demand balance:
  - Data provided by other TSOs for the definition and the modelling of the European electricity mix,
  - Data and information provided by stakeholders during public consultation process

- Analyses show that closure of power plants are compatible with the French reliability standard under some conditions (e.g. transition Fessenheim/Flamanville, interconnections, commissioning of new offshore wind)

- Sensibility checks performed to include different evolutions on power systems (e.g. closure of coal units in Germany).
2025-2035 : diversification of the French electricity mix with additional renewable energy capacities

- Between 2020 and 2030, baseload capacity (nuclear + RES) is planned to increase.

- France – already a large exporter (net balance of 60 TWh in 2018) – would continue to be a net exporter (except during peakload) in every scenario and with a great degree of certitude in a highly interconnected system.

- New uses of electricity (electric vehicles, hydrogen production…) should develop to cut CO2 emissions. They could also provide flexibility to the power sector with a positive impact on security of supply and the general cost-efficiency of energy policy.

- Recent (and upcoming) reports of RTE present detailed analyses on these different subjects.