Elements of concern regarding a total nuclear phase-out in 2025 in Belgium

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1. Renewable energy generated in Belgium can meet just a small amount of our energy needs

Projected yearly total energy consumption in Belgium (2021): around 420 TWh

Renewable energy generated: 20 TWh (wind offshore: 2.3 GW, wind onshore: 2.5 GW, PV: 6 GW onshore)

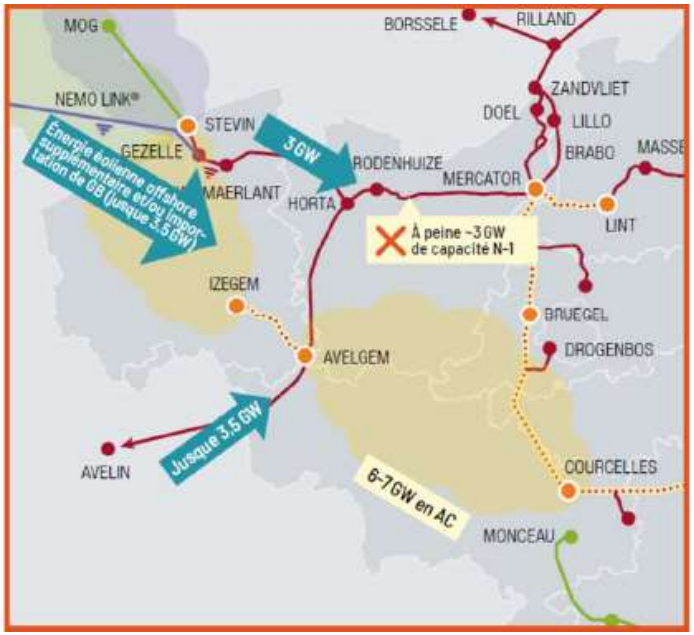
Nuclear energy : 40 TWh

Potential for renewable energy in Belgium : 90 TWh

As a consequence, there is a need for importing a considerable amount of decarbonized energy, in the range of (465TWh – 90TWh – *energy savings*).

Without nuclear energy production and if *energy savings* equalled 100 TWh, 275 TWh of decarbonized energy would still have to be imported (in the form of electricity or energy-rich molecules) at **a competitive price for protecting our industry**.

2. The « Boucle du Hainaut » may not come into operation before 2035



"Boucle du Hainaut" project: construction of a 6 GW electrical interconnection between Avelgem and Courcelles.
Required to integrate additional offshore wind energy into our power systems and develop electrical connections with, for example, Denmark and the UK.
In the very best-case scenario, the connection could be built by 2028.

However, significant NIMBY issues have arisen. Construction could be delayed for 7 years. This could jeopardize and almost stop the development of offshore wind and sea-based interconnectors, unless very other expensive solutions are put in place and/or you decide to operate your power system with little stability margins (e.g. violation of the N-1 security doctrine).

3. Very few on-shore wind farms scheduled to to be built in the years to come in Belgium

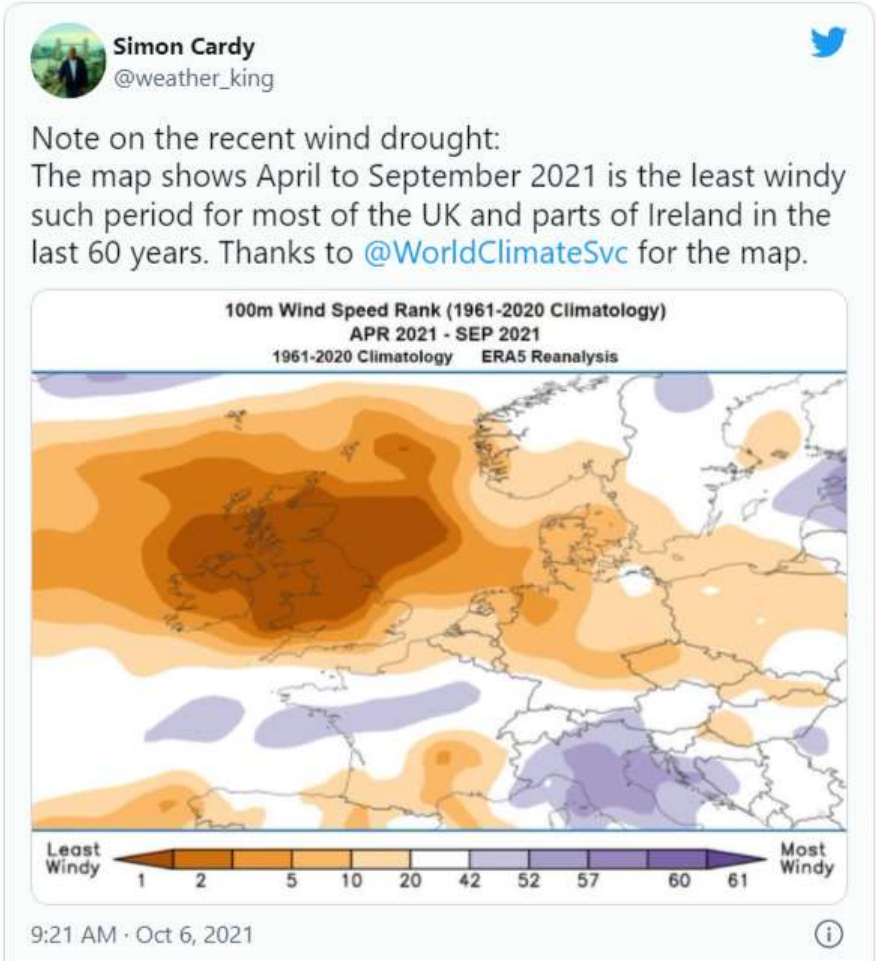
Wind farm developers are facing major problems in obtaining new permits in Flanders and Wallonia.

If nothing changes, we can expect a significant drop in the rate of installation of new on-shore wind farms in the years to come.

This, combined with our problem in developing new electrical connections, may may make it impossible before 2035 for Belgium to partially offset (say 50%) of the country's CO2 emissions linked to its exit from nuclear power.

Doubling our renewable energy production capacity (going from 20 TWh/year to 40 TWh/year) would only halve the increase in CO2 emissions linked to the nuclear phase-out.

4. Change of European wind regimes due to climate change



In recent years, increasingly anticyclonic conditions have been observed over Europe. These are associated with very little wind.

The latest IPCC report suggests that the average wind speed over Europe will reduce by 8-10% due to climate change. This results in a loss of over 25% of wind power production.

There are concerns that this number may be significantly underestimated.

5. Security of supply in terms of gas

From an economic point of view, the nuclear phase-out was much easier to achieve when gas was cheap and its security of supply guaranteed.

But today, gas has become a very expensive commodity and many energy specialists consider the **era of cheap gas** to be over due to, among other things: strong growth in demand in Asia, limited supply from Russia, declining gas fields in Europe. In addition, gas is used by Russia as a geopolitical weapon to weaken Eastern European countries, such as Ukraine.

6. Too few new gas-fired power stations are planned for to compensate for the total exit from nuclear power

A capacity market has been set up in Belgium to have sufficient electricity at all times to be able to meet electricity consumption.

This capacity market is called a CRM (Capacity Remuneration Mechanism).

'ELIA has calculated' that the capacity market needs to secure 9.8 GW of derated capacity.

Derating factors have been introduced for each technology as a way to be able to get rid of all the complexities related to the operation under uncertainty of a power system when calibrating the capacity needs.

4.5 GW of this capacity has been ‘secured’ in the so-called Y-4 auction. As a result of this auction, subsidies will be allocated for the construction of two new gas-fired power plants (CCGT). But one of them, Vilvoorde (796 derated capacity; 875 non-derated capacity) may never get its building permit. **First BIG problem**

Rest of the capacity to be secured in the Y-1 auction (2025). Among the volume to be secured in Y-1, 1.5 GW of derated capacity remains highly problematic because it does not currently exist, physically, in our electrical system. **Second BIG problem**

For having 1.5 GW of derated capacity, you would need either 3 GW of market response (derating factor 50%), 6 GW of battery (derating factor 25%) or 1650 MW of CCGT (derating factor of 91%) . It's hard to imagine how this could be achieved in a year.