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ANDRÁS MEZŐSI- ADRIENN SELEI

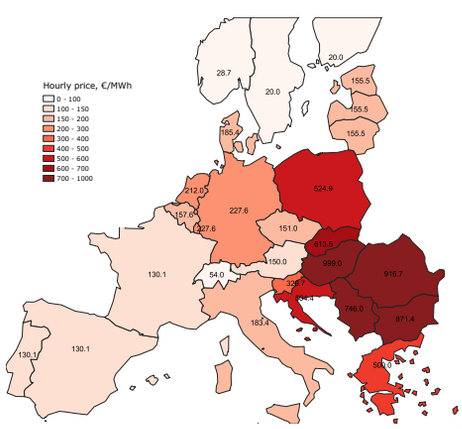
ELECTRICITY PRICES OF €1000 IN THE SUMMER EVENINGS

This summer we have seen particularly high electricity prices in the evening hours not only in Hungary but also in a relatively wider region. Possible causes include both domestic and regional factors, as well as supply and demand side factors. In the following, we briefly review what might have triggered these extreme price spikes, what price movements we should be prepared for in the coming summers, and what measures can be taken to mitigate these extreme price spikes.

THE REGION MOST AFFECTED BY HIGH PRICES

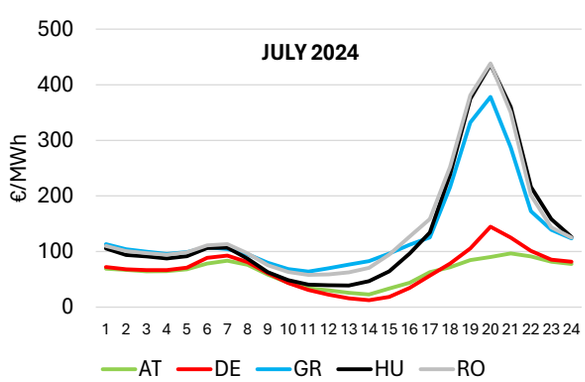
These extremely high prices were most frequent in July in the early evening (17-18-19h), but persistent prices of over €500/MWh were also observed in August and September. The most affected region is the countries to the east of the Czech Republic, Austria and Slovenia, namely Slovakia, Croatia, Hungary, Romania, Bulgaria and Greece (Figure 1). These countries form the region of interest in the analyses presented below. Similar trends were probably observed in the other Balkan countries, but lack of data did not allow a detailed analysis.

FIGURE 1. REGION MOST AFFECTED BY HIGH PRICES, 18 JULY 2024 H19.



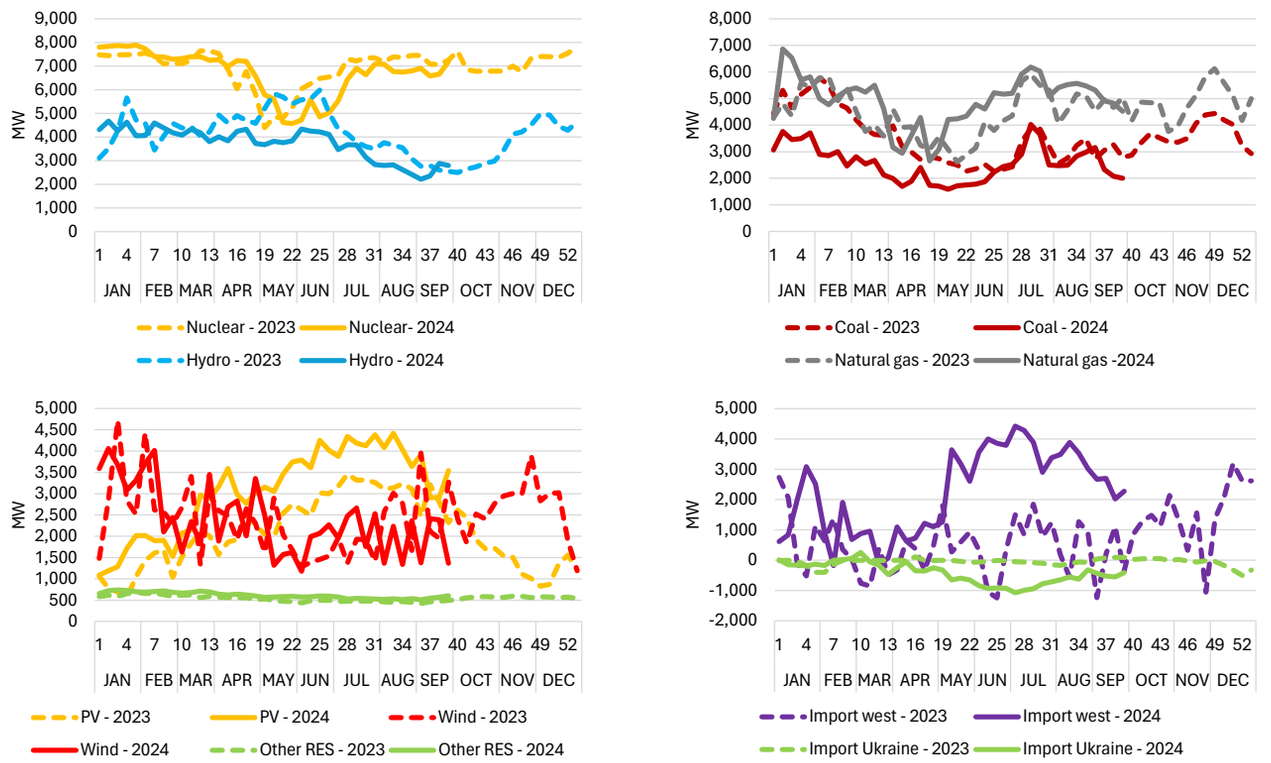
Source: EMBER Energy

FIGURE 2. AVERAGE HOURLY PRICES IN JULY 2024



Source: EMBER Energy

FIGURE 3. EVOLUTION OF THE FUEL MIX IN THE ANALYSED REGION (SK, HU, HR, BG, RO, GR)



Source: ENTSO-E Transparency Platform

Figure 1 also shows that not only the price level is extremely high, but also the spread compared to the German and Austrian markets. Figure 2 shows that in July, not only in the early evening hours, but in the afternoon and at night, a significant price difference of up to € 50-70/MWh can be observed between the German-Austrian and the regional markets. This is particularly interesting in the light of the fact that in April-May the German market was even more expensive than the Hungarian market during most hours. By summer, however, this trend had reversed and by the early evening hours the average price premium on the Hungarian market was close to €300/MWh.

As can be seen from the above, the region's electricity market was under extreme strain during the summer months. The possible reasons for this are briefly reviewed below.

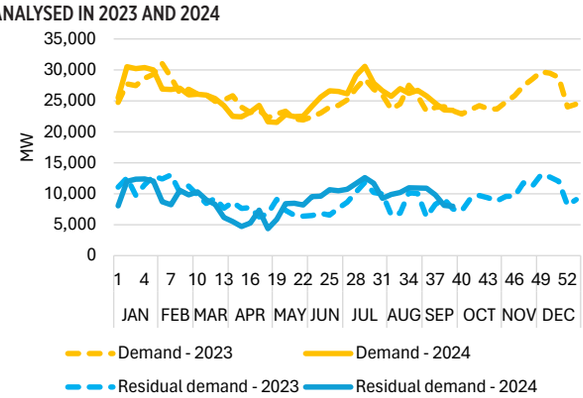
EVOLUTION OF THE REGIONAL FUNDAMENTALS

As a first step, we look at the aggregated weekly average hourly fuel mix of the six countries analysed and its change compared to the previous year (Figure 3).

There is no significant change in nuclear power plant production, which, after a decline in May and June, is back to normal levels by July, only slightly (250-500 MW) below last year. Regional hydro generation in May-June was well below the level of a year earlier, but the difference is also not significant (a few 100 MW) at the critical period. Solar generation has increased significantly due to capacity build-up, but this has no impact on the most problematic early evening hourly rates. The production pattern for fossil capacity is similar to last year, with gas-fired generation even slightly higher. Also, Western imports into the region[1] this summer are significantly higher than last year, with a parallel increase in Ukrainian exports.

Looking at the demand side, both total demand and residual demand in the region[2] were slightly higher (by 1000-2000 MW) than a year earlier (Figure 4), which is only a few percent of the regional demand.

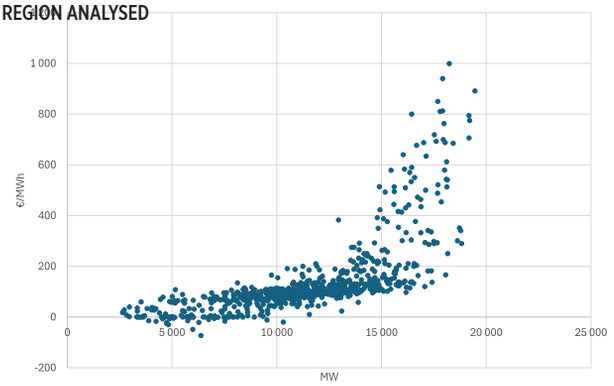
FIGURE 4. EVOLUTION OF DEMAND AND RESIDUAL DEMAND IN THE REGION ANALYSED IN 2023 AND 2024



Source: ENTSO-E Transparency Platform

1 Sum of the following cross-border flows: AT-HU; CZ-SK; SI-HR; SI-HU; PL-SK
2 Consumption-nuclear production-RES production

FIGURE 5. RELATIONSHIP BETWEEN RESIDUAL DEMAND AND PRICE IN THE REGION ANALYSED



Source: ENTSO-E Transparency Platform

The relationship between residual demand and prices is shown in Figure 5. The higher the residual demand, i.e. the more fossil power plants have to produce, the higher the electricity price in the region. However, it is interesting to note that at the regional level, prices show only a moderate increase up to 15000 MW of residual demand, above which extreme high prices start to appear. According to Figure 2 only 2-3000 MW of residual demand causes the problem.

It is worth noting that although there were price peaks in this period in 2023, they were significantly lower than the prices observed this year, typically between 200-300 €/MWh. Overall, it can be concluded that the extremely high prices observed this summer developed even though both supply and demand in that period were only slightly different from the levels observed in the previous year.

ANALYSIS OF A CRITICAL WEEK

Let us zoom in on the supply and demand conditions in a critical week (14-20 July)! We can see (Figure 6 on the next page), that the extremely high prices are likely to be the consequence of a combination of several effects, that are not significant in themselves.

As expected, the highest price peaks are observed when PV production falls to zero. The resilience of hydropower is relatively high, with total generation in the region varying up to 3-4,000 MW in a few hours, which is nicely aligned with price spikes. Nuclear power plants produce in series, coal plants typically produce a little more during hours of high prices, but gas plants are the most responsive. It is noteworthy that during hours of price spikes, Western imports fall sharply, while German and Austrian prices remain moderate.

WHAT CAN WE EXPECT NEXT YEAR, AND HOW CAN WE MITIGATE HIGH SUMMER PRICES?

Overall, it can be concluded that the extreme high prices observed in the summer hours are the result of a combination of demand and supply-side factors: a few percent higher demand at the regional level compared to the previous year, combined with slightly lower nuclear and hydroelectric production, and a limitation of import opportunities from the West during critical periods.

The development of demand is highly dependent on the weather, so a decrease there is unlikely. This situation is exacerbated by the fact that the extremely hot weather is also harming the supply side, with the increasing frequency of certain machinery units being rendered inoperable by the heat. An important question for the coming period is whether the region will do anything to curb this high summer demand. One reason to be pessimistic is that, although many market players have spot contracts since the energy crisis, and could be expected to react to the extremely high prices with their consumption, they are not doing so. However, the increase in consumption during the summer hours is mainly caused by households, so encouraging consumer flexibility is a priority for the region. A very important regulatory task would be to develop a dynamic tariff system that encourages consumers to shift part of their demand to periods when renewable production is taking place.

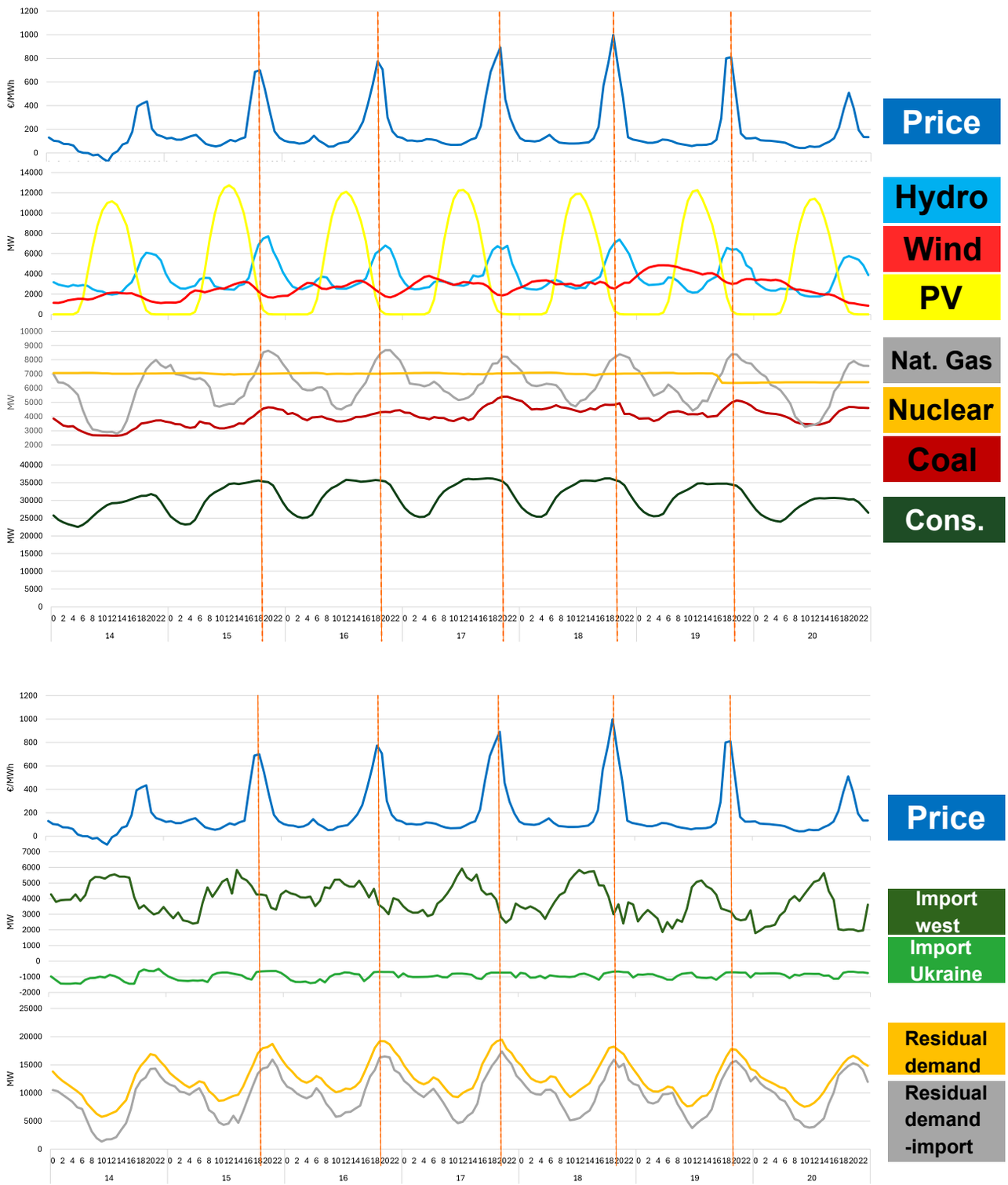
However, analyses show that this is not just a demand-side problem, but also a supply-side shortage. The situation is exacerbated by the fact that power plants are typically due for maintenance in the summer. Thus, in addition to encouraging consumer flexibility, it would also be important to increase supply-side flexibility. Increasing storage capacity and spreading independent aggregation could be a good solution. In addition, an increase in wind power capacity could alleviate the situation, as these plants typically generate well during the problematic evening hours. The renewal and maintenance of existing gas-fired power plants is also important. In the period analysed, the capture price[3] realised by these power plants is very high, which could even encourage new investments. However, in the current regulatory environment, with the special taxes in place, no investor would be willing to make such an investment.

Network constrictions may also have played a significant role in the extreme price levels observed in the region. It cannot be ruled out that some countries are protecting their internal market and limiting available capacity for this purpose. A more in-depth analysis would be needed to identify the impact of this and the possible lack of infrastructure. However, it is likely that network development in the region (especially on the Slovak and Austrian internal networks) would have a positive impact.

Based on the above, we should not be too optimistic about the coming summer, as mitigating the causes will take time and resources. Expectations are also made more gloomy by the fact that early evening high prices have not disappeared after the end of the summer, but are also occurring on autumn days when demand is moderate and import opportunities are good.

[3] hourly price multiplied by actual production

FIGURE 6. HOURLY REGIONAL ELECTRICITY MIX IN A CRITICAL WEEK (14-20 JULY)



Source: ENTSO-E Transparency Platform