Month-ahead trading strategy presentation for SEE | September 2024

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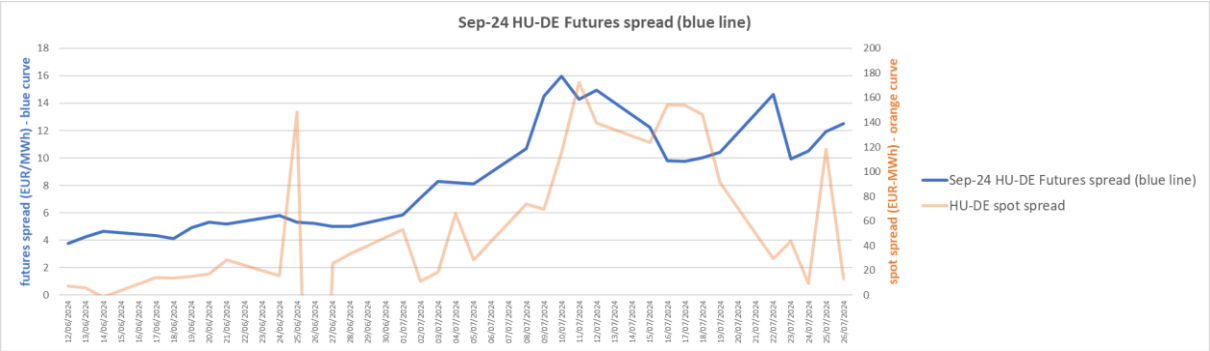
Conclusions for September 2024:

- Short trading position on Hungarian market is advised for September, however 1st two weeks of September can have increased risks of HUPX price spikes caused by maintenances in the transmission grid. Therefore, 1st two weeks should not be left short against settlement if it is possible to close them on the forward market.
- Short HU vs. long DE spread can be risky since long DE position can be risky on settlement in case of windy September. Therefore, part of the trading position should be made as short HU vs. long ITA trade spread.
- There are several main arguments for making short position for September 2024.
- However, since it was shown that high spot settlement of HUPX-EPEX(DE) spread push also September futures up it might not be the best moment to make short position for September immediately.
- The rest of August is expected to have highly above average temperatures while futures for weeks of August are relatively low priced. There is a high probability that August spot HUPX-EPEX(DE) settlement is significantly above forward market expectation. Experience shows that high spot HUPX-EPEX(DE) spread has a strong impact on futures HU-DE spread for the front month. Therefore, it can be expected that futures HU-DE spread for August will be going up in the next 2-3 weeks.

Diagram below shows that fear fueled by rising spot HUPX-EPEX(DE) spread settlement was pushing futures HU-DE spread for September up. There were no additional information published related to September in the last 3-4 weeks but still September futures spread went up from 5 EUR/MWh on 10-14 EUR/MWh, just based on spot market sentiment during July.



The main arguments for making short position for September 2024 are the following:

Argument 1: Consumption will drop so much that there will be no need to activate high-priced part of selling offers of the Greek market (last 2000 MW of the Greek market selling curve) and the most expensive offers in the merit order of other markets. This will reduce the risk of high price settlement on all markets of the HU+SEE region.

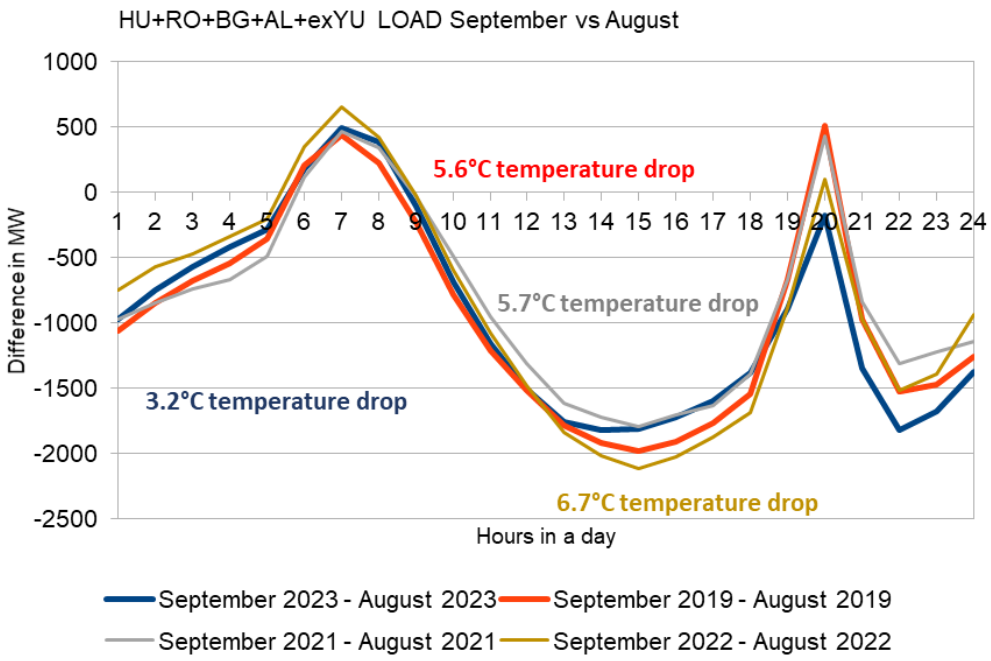
Argument 2: HUPX-EPEX(DE) spot spread in sunny hours will be negative. This will support lower settlement of the average HU-DE spread during September

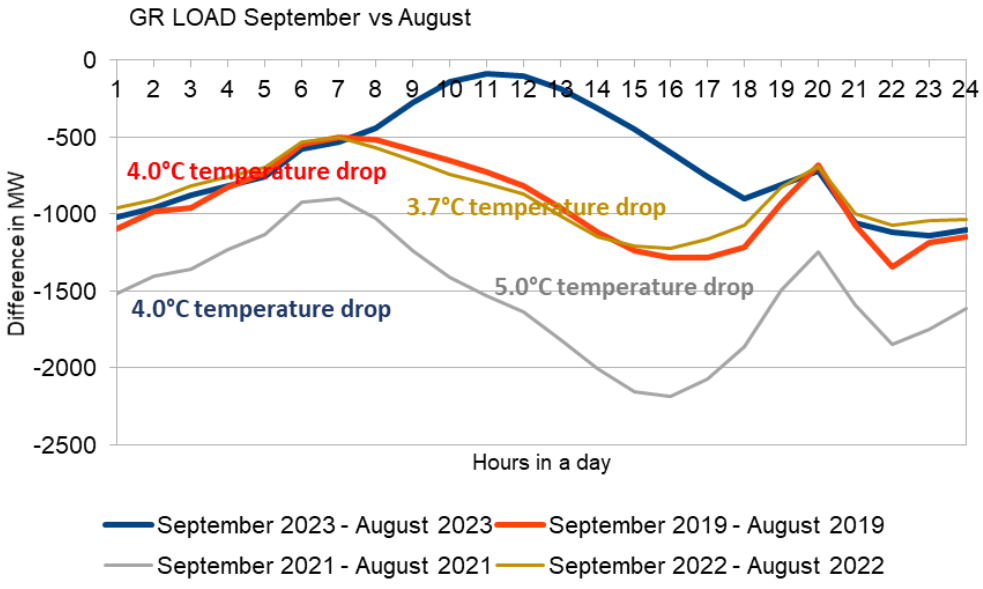
Argument 3: Although import needs of Hungarian market will be as high as in July, transmission grid conditions in September should be better than in July and August so there should be no price spikes of HUPX above other markets of SEE region.

CONSUMPTION IN SEPTEMBER 2024

- Consumption in September in relation to August is on average 1000 MW lower in HU+SEE region outside Greece and around 700-900 MW in Greece (1700-1900 MW in total)

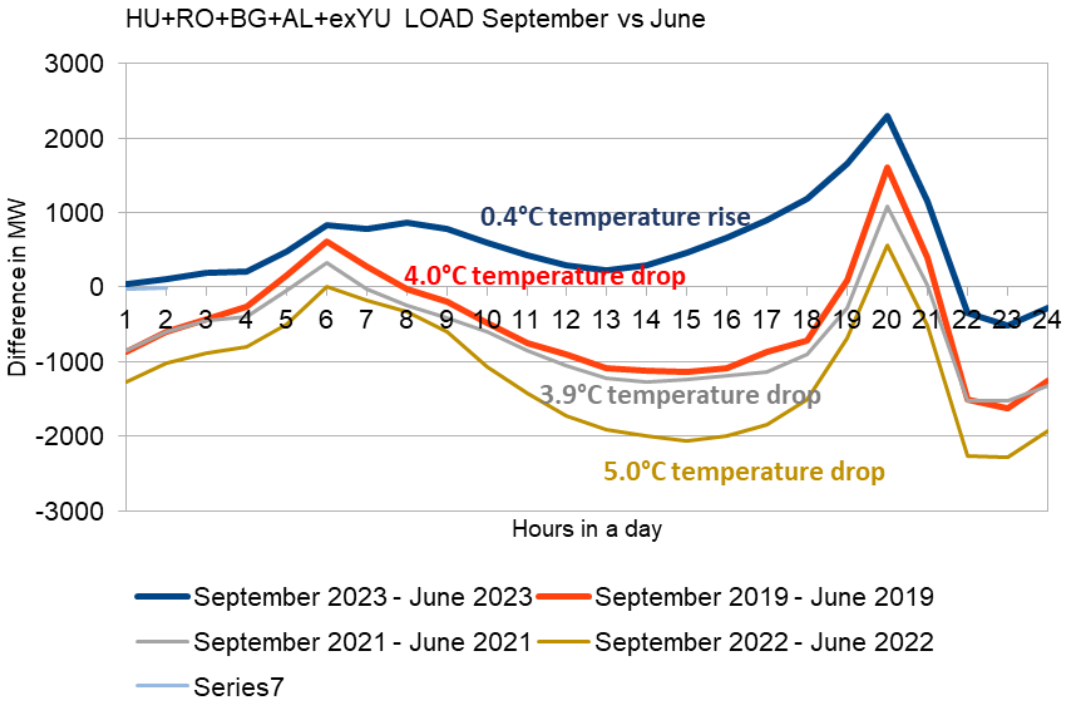
  September is generally a month in which consumption does not react on temperatures, but in 2023 consumption in September was reacting on higher temperatures due to very high temperatures. Still September 2023 was 3°C colder than August 2023 outside Greece and 4°C colder than August in Greece. Such huge drop of temperatures has a huge impact on consumption.

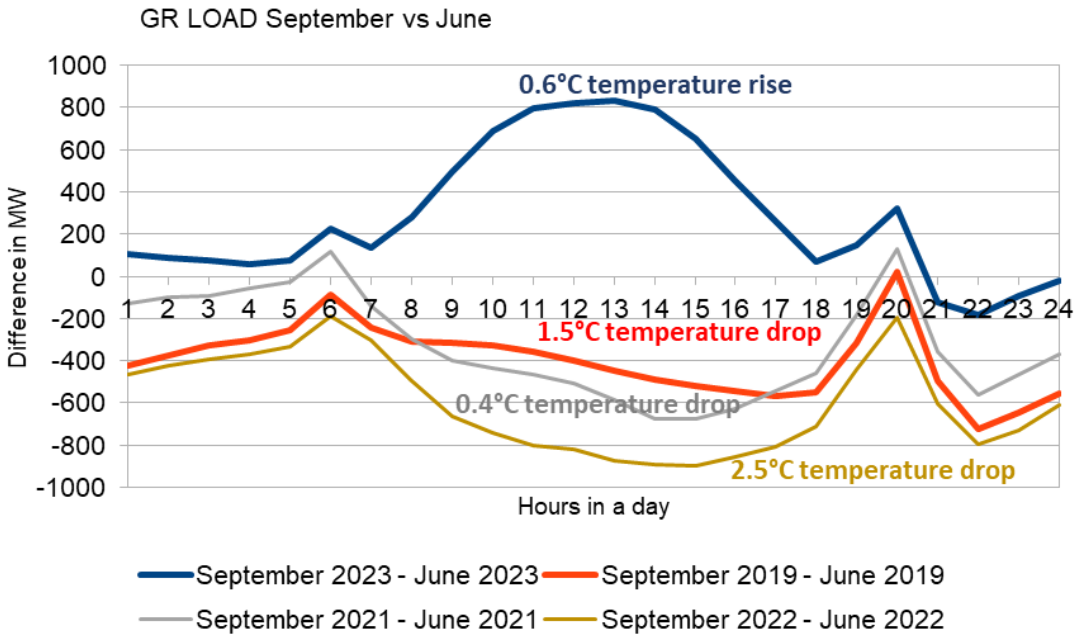




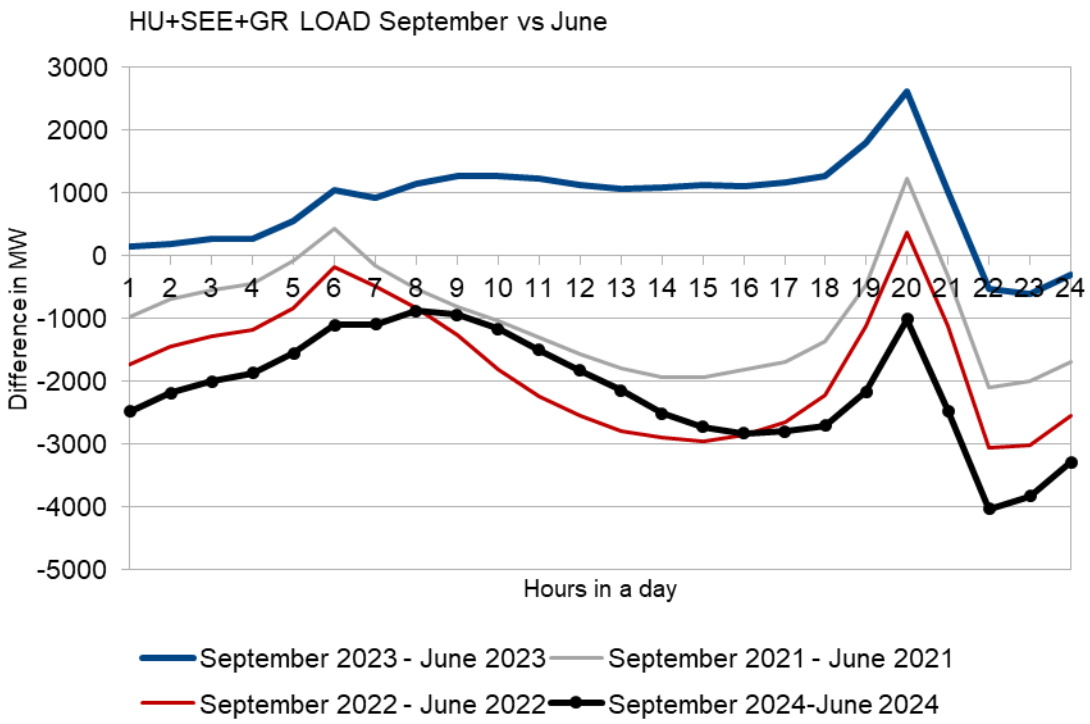
- Consumption in September is usually lower than in June since temperatures are usually lower in September than in June. Since June 2024 was extremely warm, consumption in September 2024 should be 2000 MW lower than it was in June even in the case of as warm September as it was in September 2023.

In 2023, June was not warm and September was extremely warm which resulted in higher consumption in September than it was in June which is not a regular situation. September 2023 was one of the warmest ever recorded and one should not expect warmer September 2024 than it was in 2023.

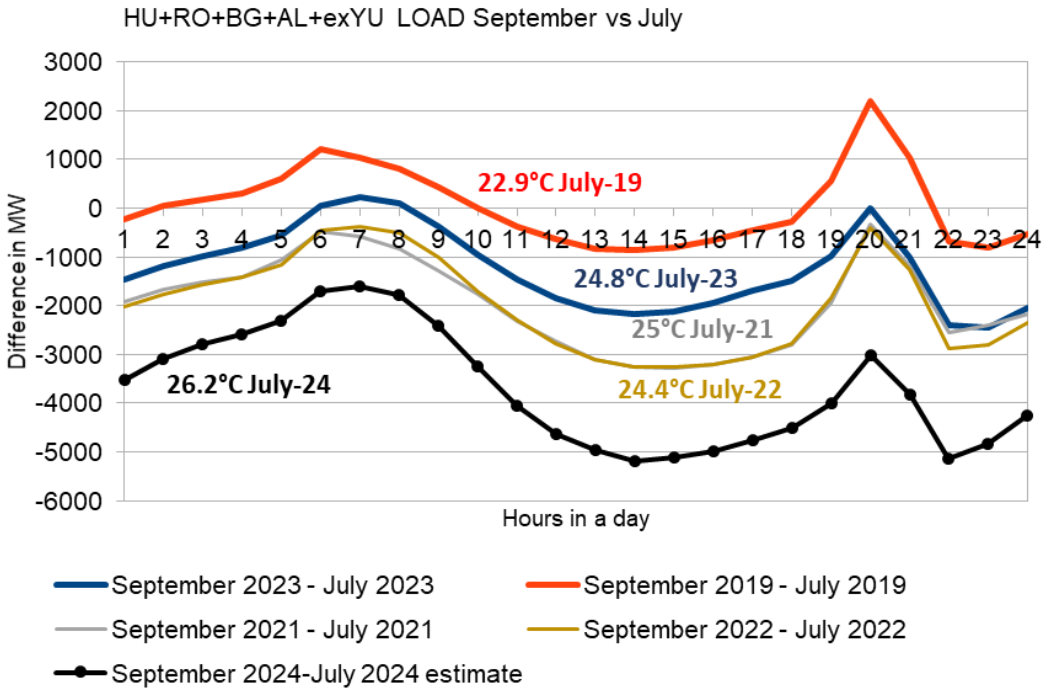


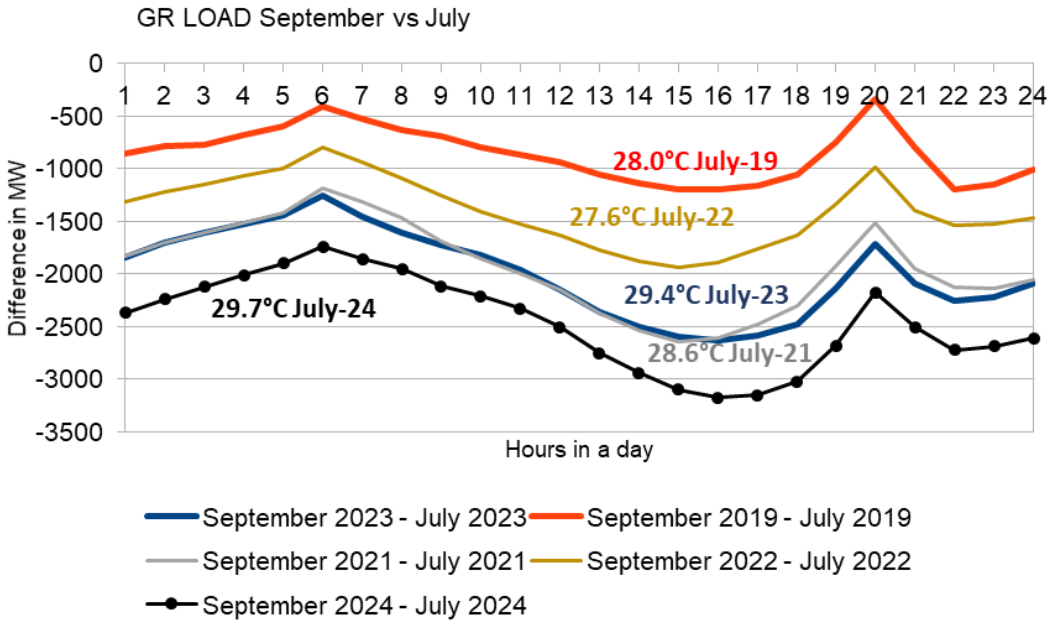


Since June 2024 was extremely warm, consumption in September 2024 should be 2000 MW lower than it was in June even in the case of as warm September as it was in September 2023.



- Consumption in September is incomparably lower than consumption in July. Since July 2024 was extremely hot, consumption decline between September 2024 and July 2024 will be particularly high. July 2023 was also very hot and the average decline of consumption between July 2023 and September 2023 was 3200 MW. Average temperature of July 2024 outside Greece is 1.5°C higher than it was in July 2023 and in Greece 0.5°C higher and the expected decline of consumption between July 2024 and September 2024 is 6100 MW including the effect of reduced generation of solar prosumers in September (3700 MW outside Greece and 2400 MW in Greece). Greek consumption was around 500 MW higher in July 2024 than it was in July 2023 althoug temperature was just 0.5°C higher.



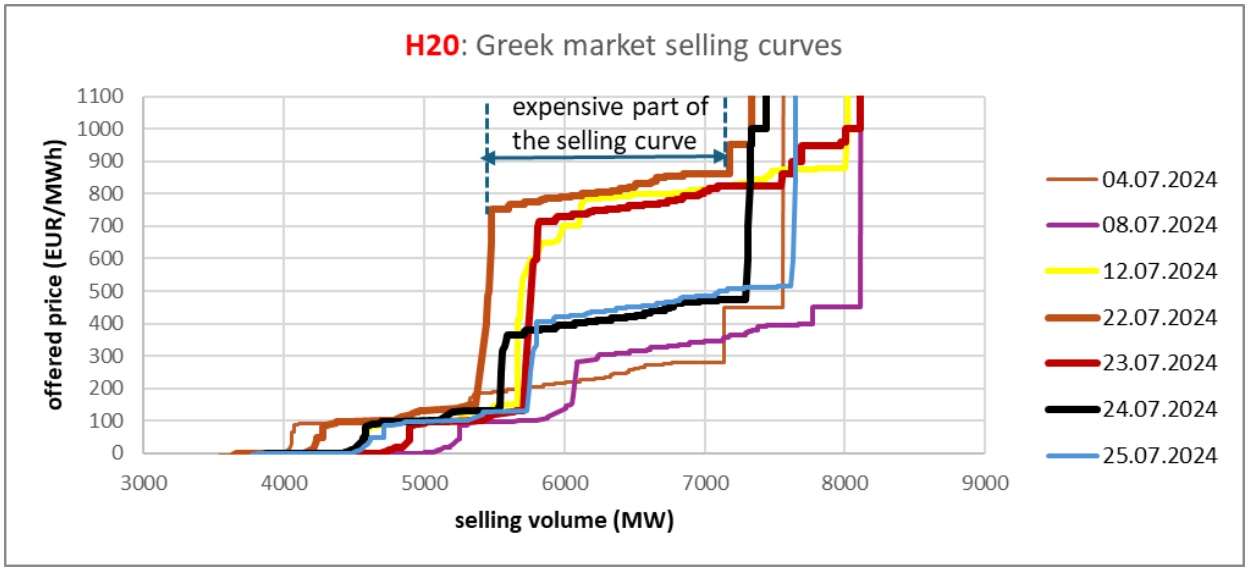


Explanation of the Argument 1: Consumption will drop so much that there will be no need to activate high-priced part of selling offers of the Greek market (last 2000 MW of the Greek market selling curve) and the most expensive offers in the merit order of other markets. This will reduce the risk of high price settlement on all markets of the HU+SEE region.

- Huge expected decline of consumption between July 2024 and September 2024 (6100 MW decline) will make market conditions in September incomparable to market conditions in July, irrespectively to the fact that decline of consumption will be followed by the decline of hydro, lignite, solar and nuclear power generation.

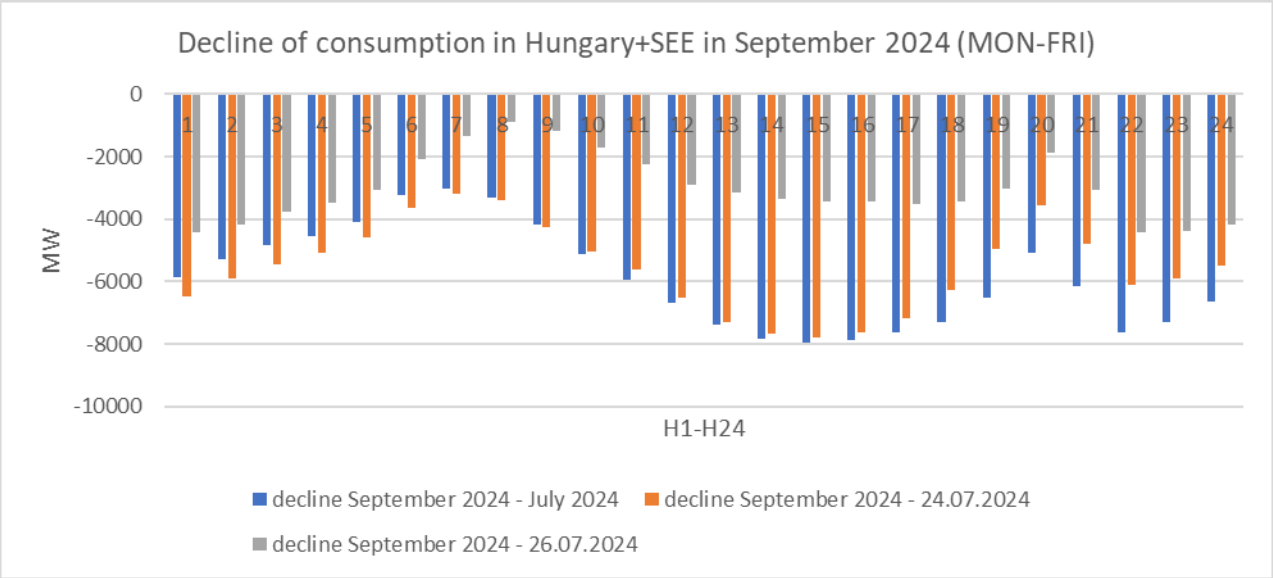
- In July 2024 due to the huge consumption, but also quite constrained transmission grid conditions, in hours H19-H24 markets have to use also the most expensive offers in the merit order. On the Greek market, the last 2000 MW of the merit order of selling offers are much more expensive.

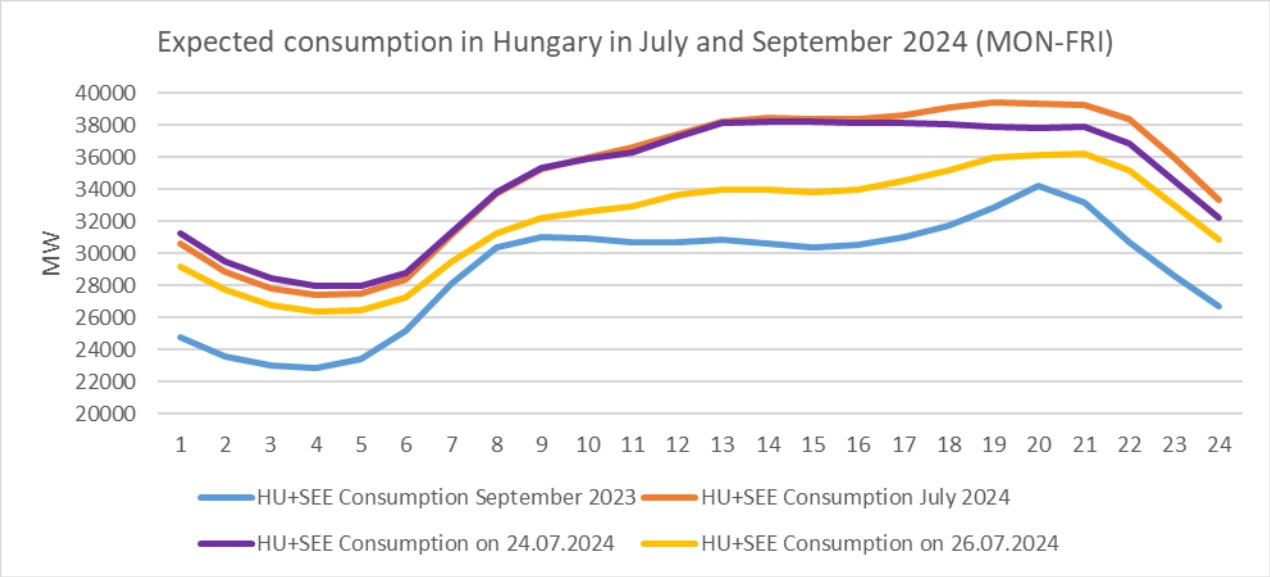
  With the decline of consumption by 6100 MW, irrespectively to the decline of hydro generation which will follow the decline of consumption, there will be no necessity for activation of high priced offers from the merit order list.



HUPX settlement on 24.07.2024 and 26.07.2024 illustrates how a small decline of consumption can have a strong effect on market prices. Days 24.07.2024 and 26.07.2024 had relatively low HUPX settlement of only 75 EUR/MWh and 104 EUR/MWh while July 2024 on average settled at 158 EUR/MWh on working days (25.07.2024 is not relevant for observation since there was partial decoupling and heavily reduced capacities across Europe)

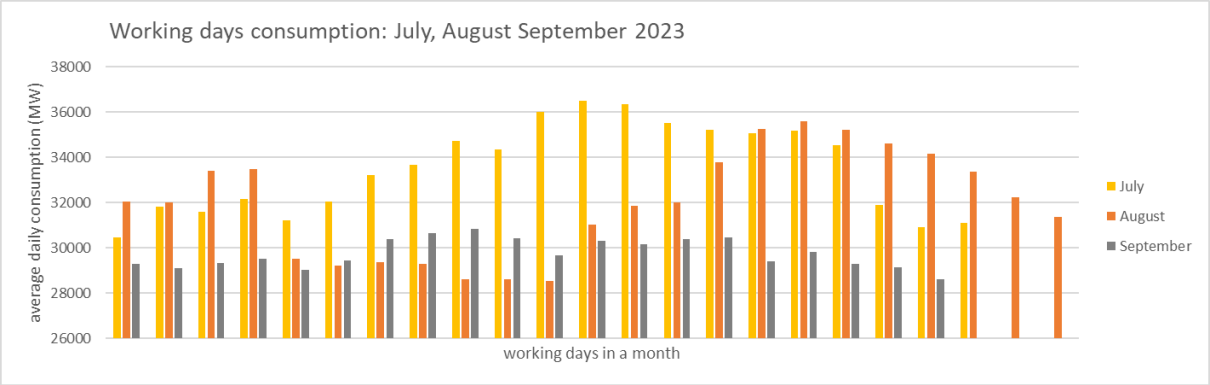
Charts below assume that consumption in September 2024 will be equal to September 2023, which is a safe assumption since September 2023 was very warm.

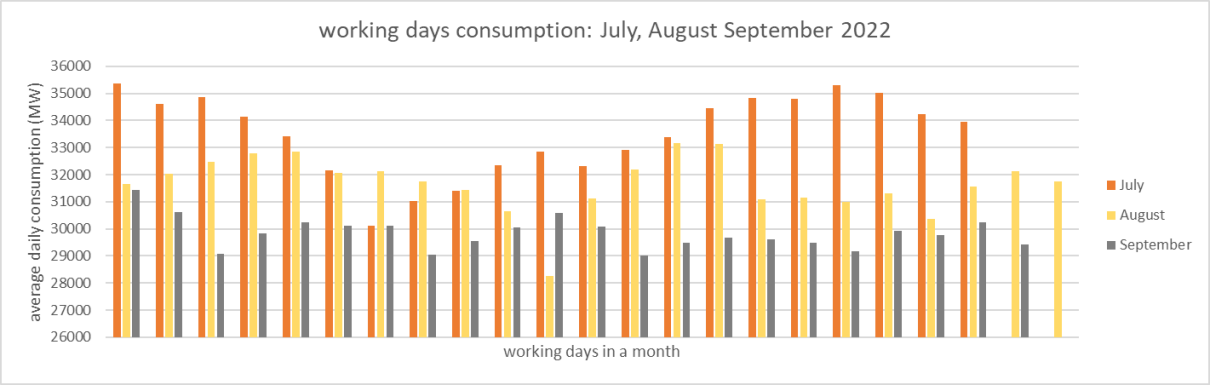


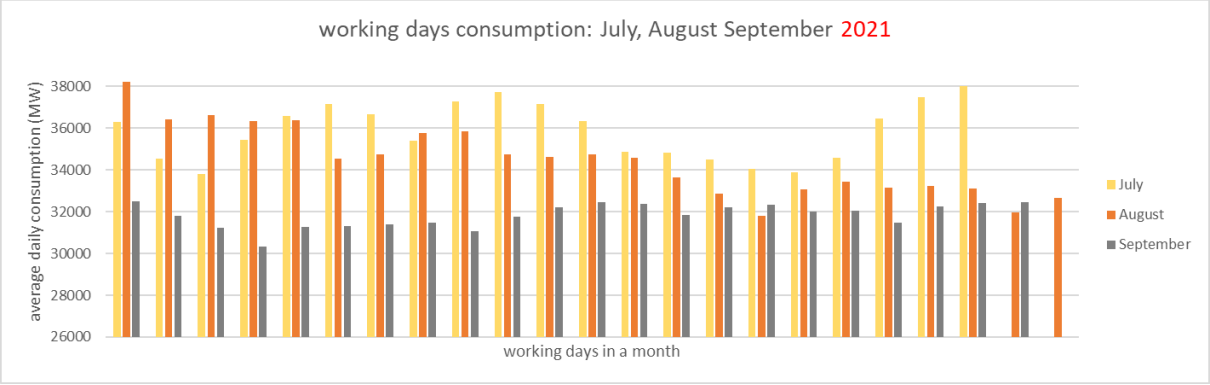


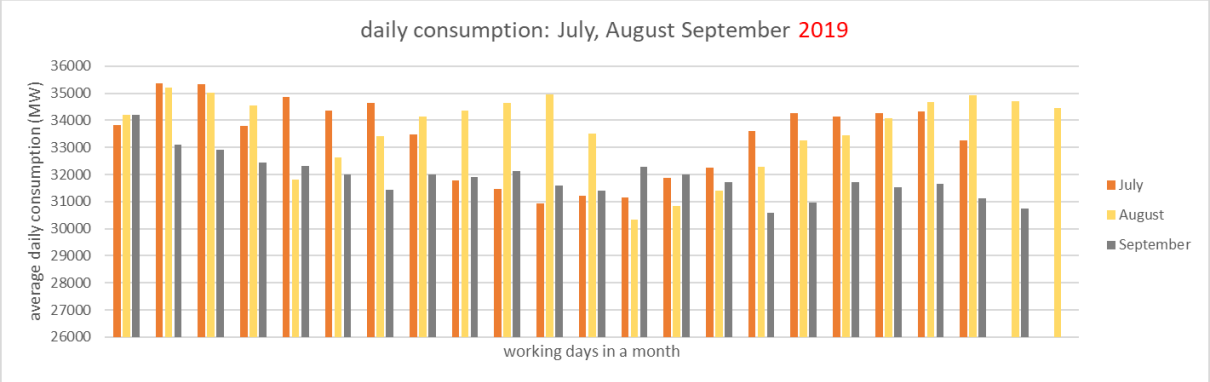
Stable consumption without declines the risk of price spikes

- Another convenience with consumption in September is that consumption does not get extremely high on any day, while during hot July and August consumption gets too high for the regional market.
- 2000-3000 MW increase of daily consumption of the SEE region during heat waves of July and August simply is not there in September.
- Stable consumption, not affected by temperatures, is the key reason why September is generally bearish month.

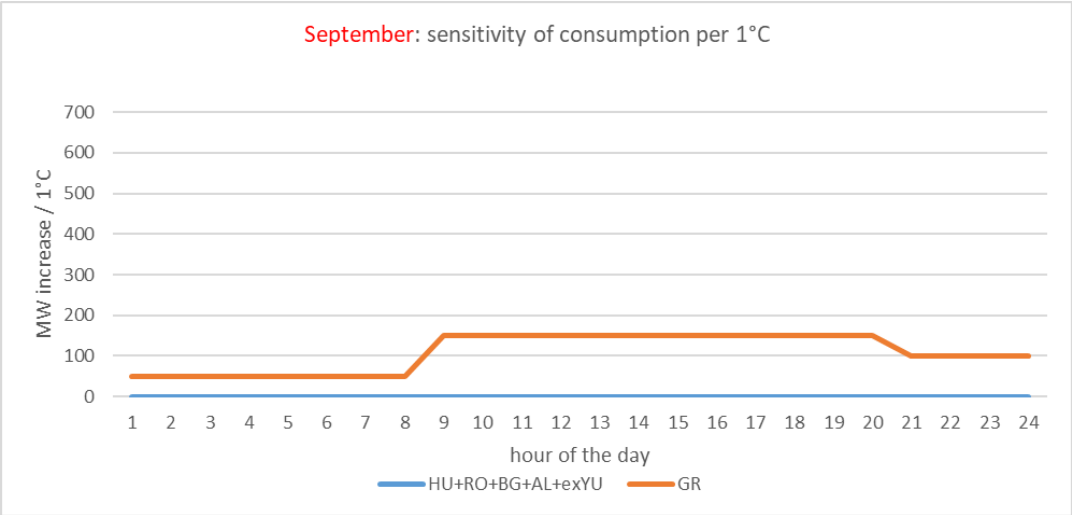


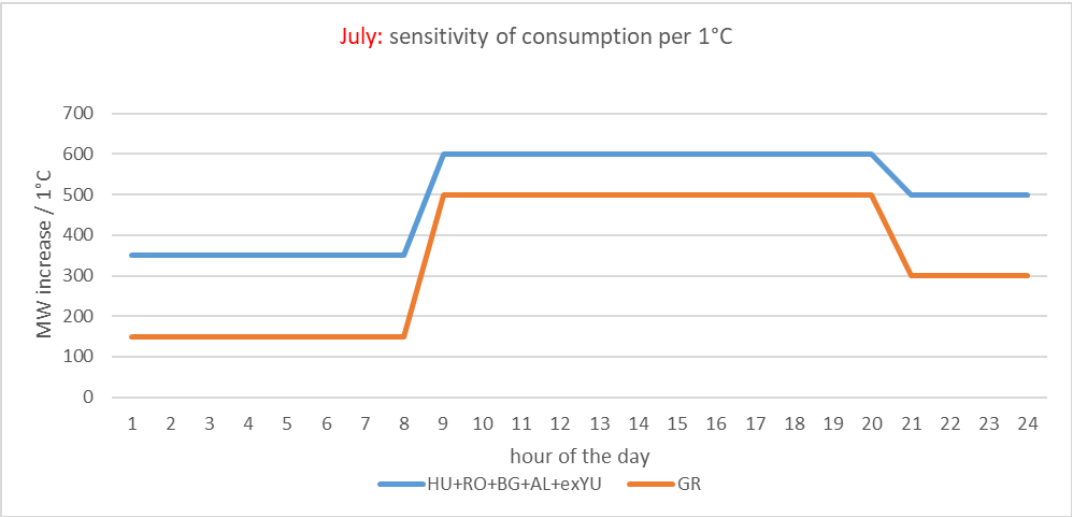






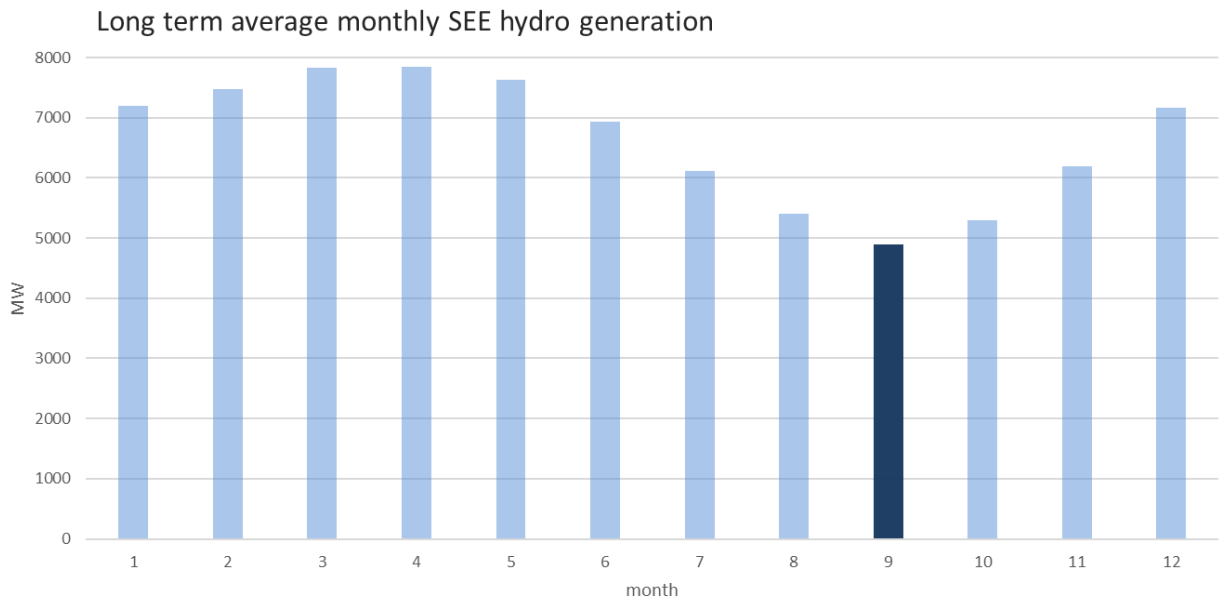
- Average temperatures in September will be 5°C lower than in July, air conditioning is rarely needed and the reaction of consumption on temperatures is very low. The reason is that average daily temperature rarely goes above 22°C which is the temperature level after which regional consumption grows.
- Only in Greece there is a certain small reaction of Greek consumption on changes of temperatures.
- Following chart show how different is reaction of consumption on temperatures in September and in July (the scale of the vertical axis is the same on both charts).



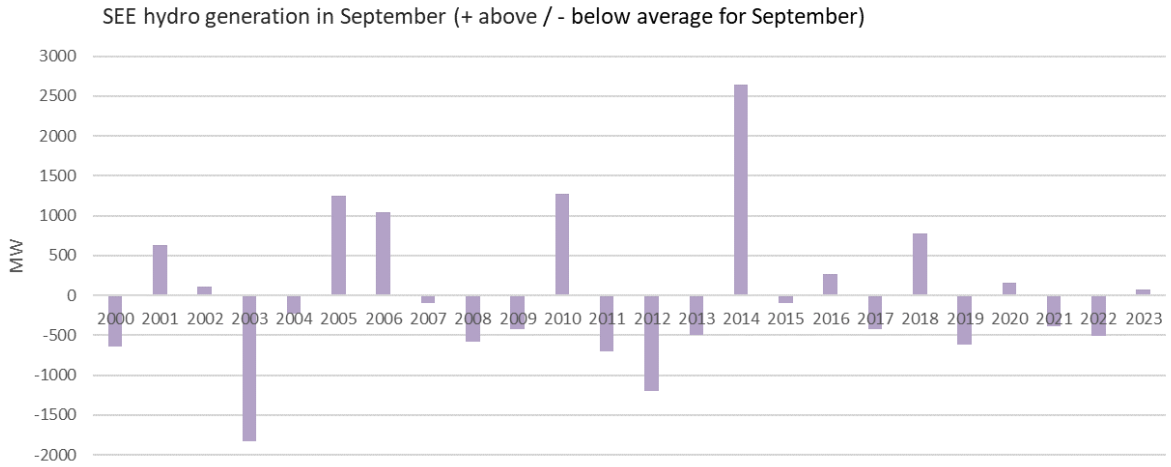


HYDROLOGY IN SEPTEMBER 2023

- September is a month with the lowest hydro generation of all months.
- Danube is at minimum in September.
- On average, hydro generation in September is
  - 2150 MW lower than in June
  - 1250 MW lower than in July
  - 550 MW lower than in August.



It is very rare that hydro generation in September deviates more than 1000 MW above or below the average for September.

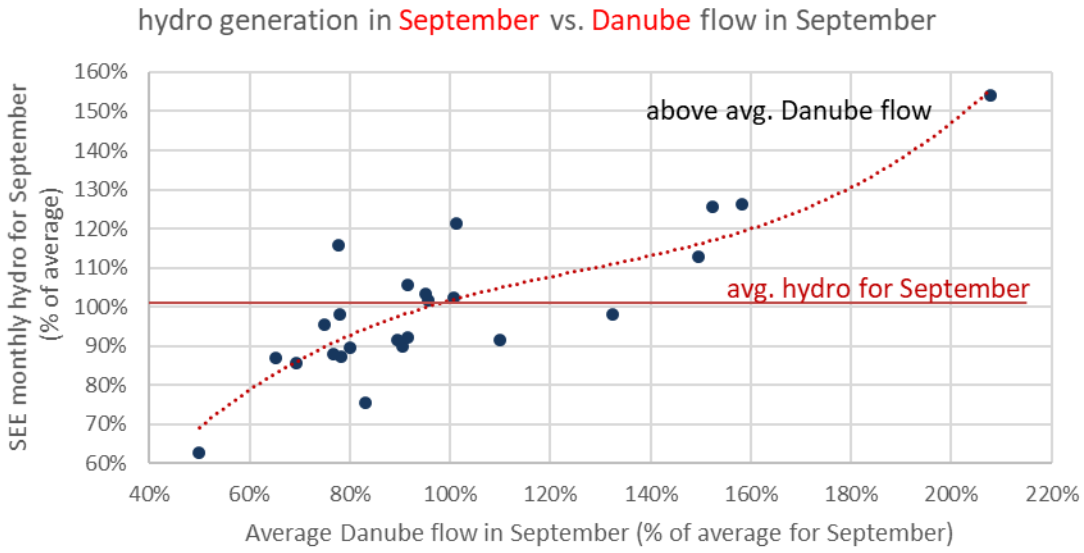


Hydro generation in September nearly always lower than in July, but if July has strong hydro generation then the difference between hydro generation in September and July is higher. Since both June and July 2024 had close to average hydro generation for those months, there are no particularly strong reasons to expect stronger than average decline of hydro generation in September.

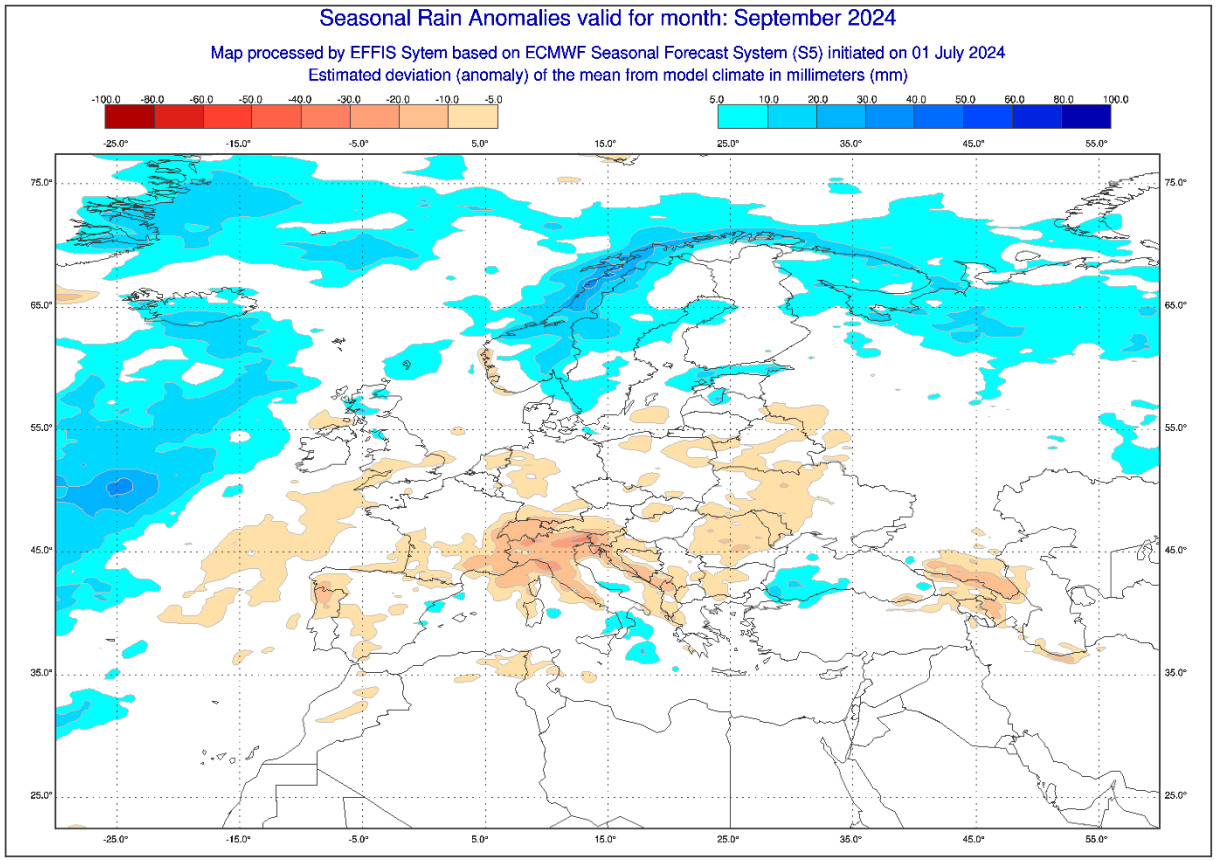
A decline of hydro generation between July and September which is 300-500MW stronger than average while hydro generation in July was not strong happened in years 2000, 2012 and 2019. Those three years were characterized with extremely low precipitation during at least July or August in combination with extremely high temperature in those months. Both July and August 2024 will be extremely warm although extremely low precipitation is not forecasted. However, due to extremely hot weather in July and August, decline of hydro generation between July 2024 can be up to 1850 MW in the worst case.

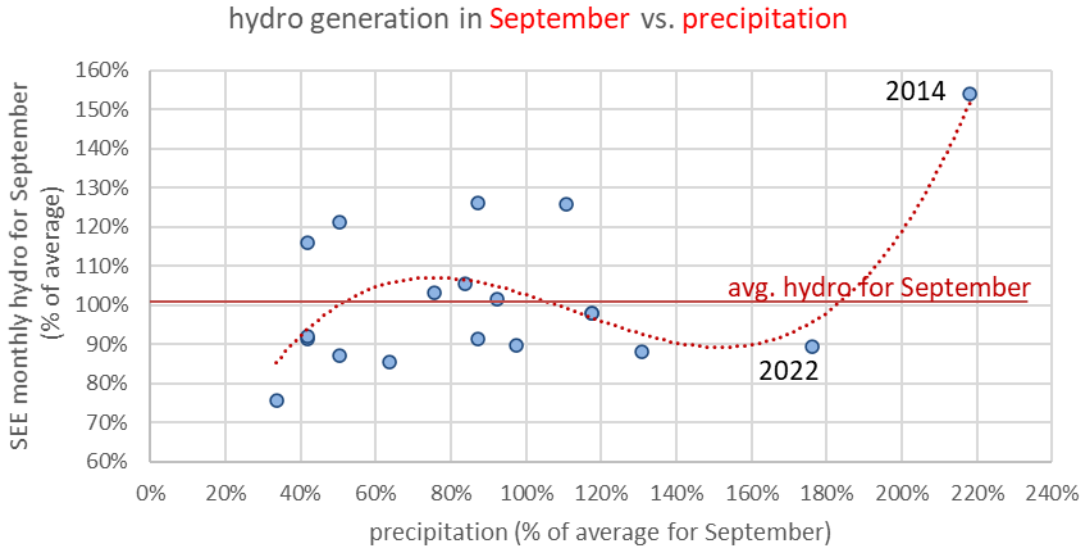
- Current Danube Forecasts for September are 15% below average although they are quite old (forecast since 28.06.2024) and even lower Danube flow forecast for September can be expected due to very hot July and August. Danube flow is not a great indicator of hydro generation in September except for when Danube flow is either extremely low or extremely high. For September 2024, Danube flow forecast does not give any strong indication. Danube flow forecasts of 20-30% below average would guarantee at least 10% below average hydro generation.

The best assumption would be to count with 10% below average hydro generation.



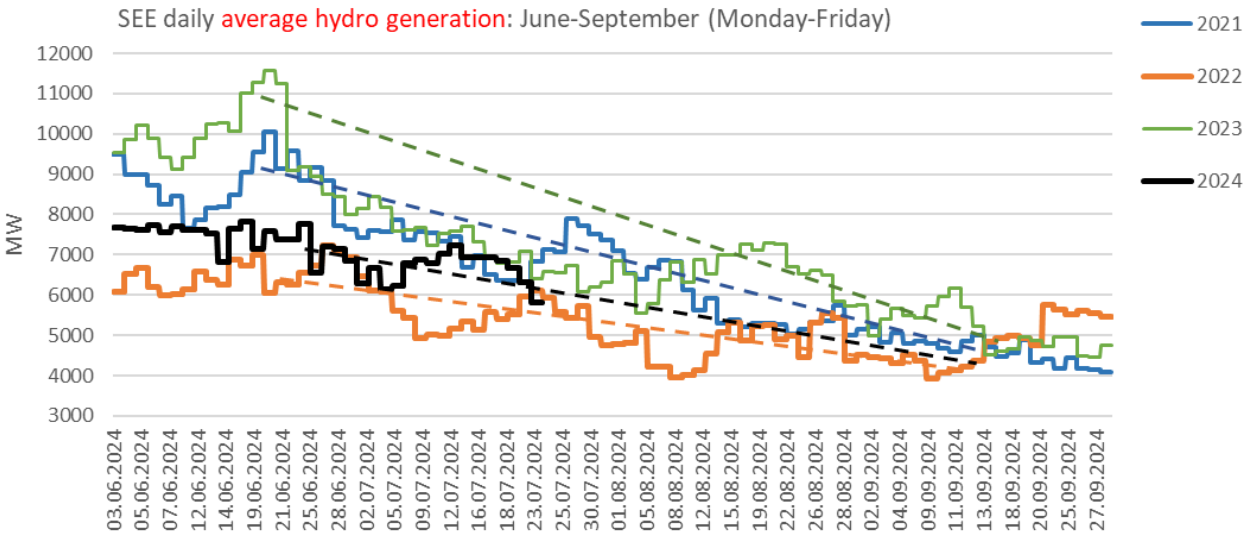
- Precipitation forecast for September 2023 is very low, but precipitation does not play a big role in hydro generation in September. Low precipitation forecasts are not a sufficient reason to estimate extremely low hydro generation in September 2024.





- September 2014 had the highest hydro generation and it was due to the extremely high precipitation. On the other hand, September 2022 had also strong precipitation, but did not have high hydro generation.

Hydro generation in September is usually not a determining market factor. Hydro generation is usually very low in September irrespectively to whether previous months had good or bad hydrology. Only in exceptionally good hydrological conditions hydro generation can be a major market factor.



Conclusion on Hydro generation in September 2024:

The best assumptions about hydro generation for September 2024 are following:

Assuming that hydro generation in September will be 1850 MW lower than in July results in 10% below average hydro generation for September.

Danube flow prospects are not reliable, but based on Danube flow prospects hydro generation in September should be around 10% below average.

The best assumption is to expect 10% below average hydro generation:

- **500 MW lower than in September 2023**
- **1850 MW lower than in July 2024**
- **2750 MW lower than in June 2024**

LIGNITE AND NUCLEAR GENERATION IN SEPTEMBER 2024 WILL BE LOWER THAN IN SEPTEMBER 2023

The main differences in availability in units between September 2024 and September 2023 are the following:

- Availability of lignite units in Serbia is around 300 MW lower than in September 2023 due to stronger maintenance.
- Romanian lignite fired generation could be around 100 MW lower than in September 2023 since it is a bit lower than last year in each month of 2024.
- Bulgarian lignite fired generation should be 300 MW lower than in September 2023 since Bulgarian lignite fired generation has low performance this year. Also, since September futures are much lower than settlement of July, it is justified to plan with lower lignite fired generation in September 2024 than in July 2024.
- Only one unit in TPP Matra (HU) will be available in September 2024, while most of the time two units were operational in September 2023. This will result in effectively 150 MW lower generation in critical hours.
- 500 MW in NPP PAKS will be in the maintenance in the period 23.08.2024-23.09.2024, while all units in NPP PAKS were available in September 2023. This will result in effectively 350 MW lower average nuclear power generation.
- No significant change should be expected in Greece since Greek lignite fired generation was quite low in September 2023 as well.
- In other countries lignite fired generation should be the same as in September 2023.

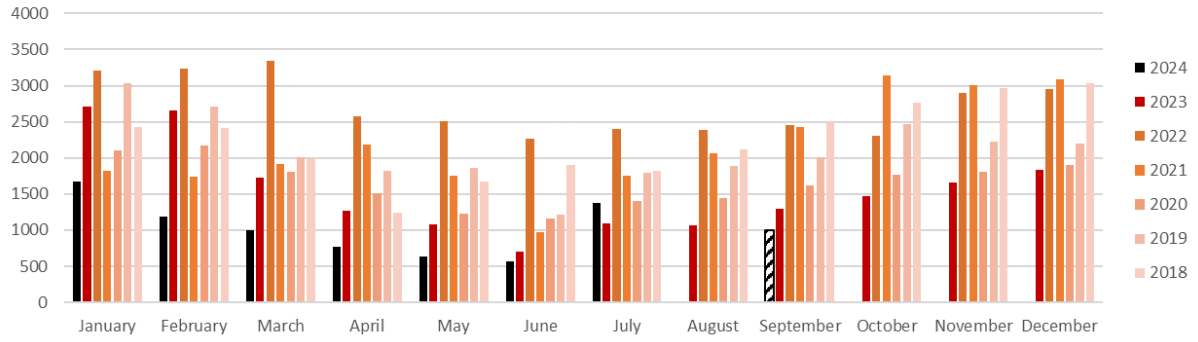
For the whole region lignite and nuclear power generation should be:

- **1200 MW lower than in September 2023!**
- **750 MW lower than in July 2024**
- **2000 MW higher than in June 2024!**

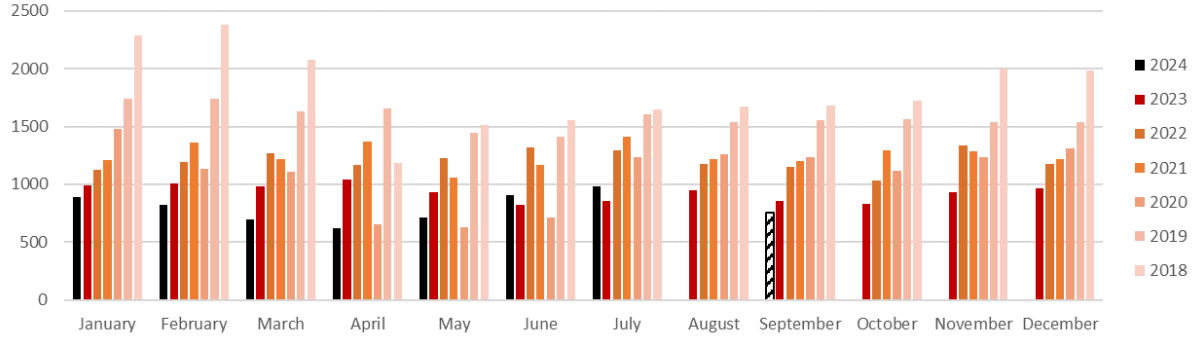
Although lignite and nuclear generation will be on average even 1200 MW lower than in September last year, it will not be much lower than in July 2024 because both 1000 MW NPP Kozloduy and 650 MW NPP Cerna Voda had an unplanned outage during July.

Lignite and nuclear power generation in September 2024 will be even 2000 MW higher than in June 2024 because there were very strong maintenances of lignite units during June while also 1000 MW NPP Kozloduy had unplanned extension of maintenance for the whole June 2024, 650 MW NPP Cerna Voda had regular maintenance for the whole month of June 2024 and 500 MW NPP PAKS had a maintenance in the 1st week of June 2024.

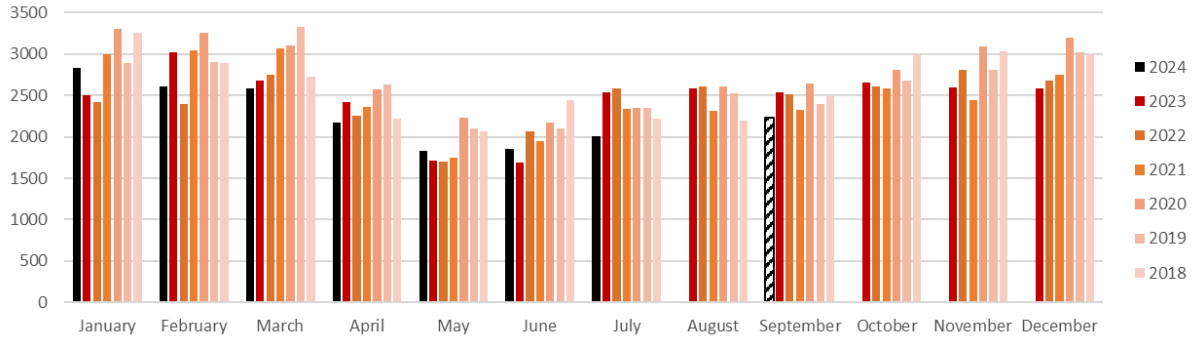
Bulgaria: Average coal-fired generation (MW average)



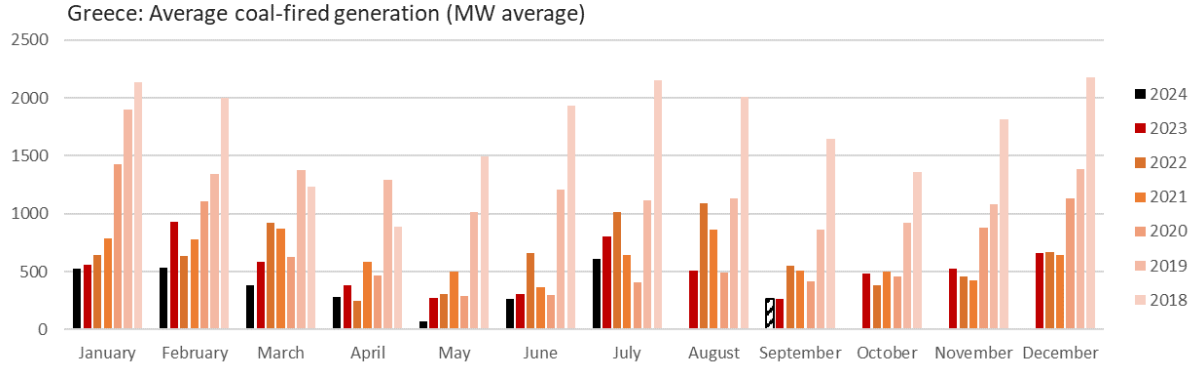
Romania: Average coal-fired generation (MW average)

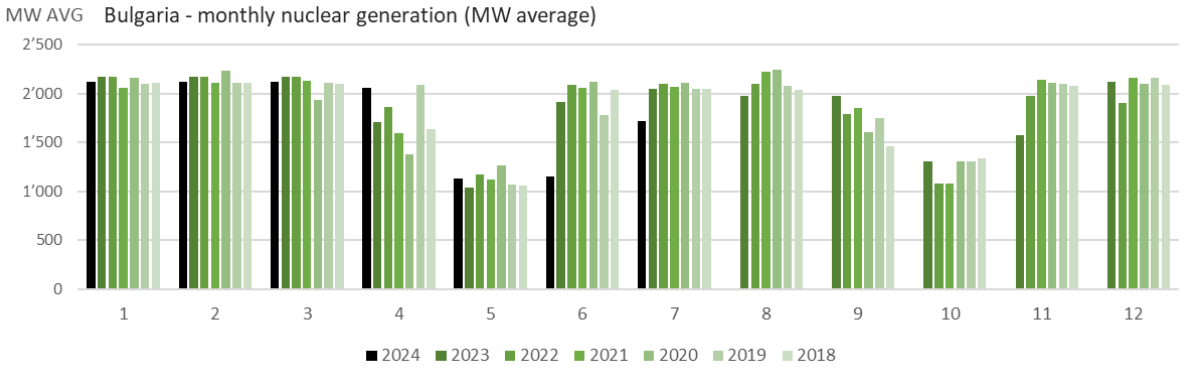


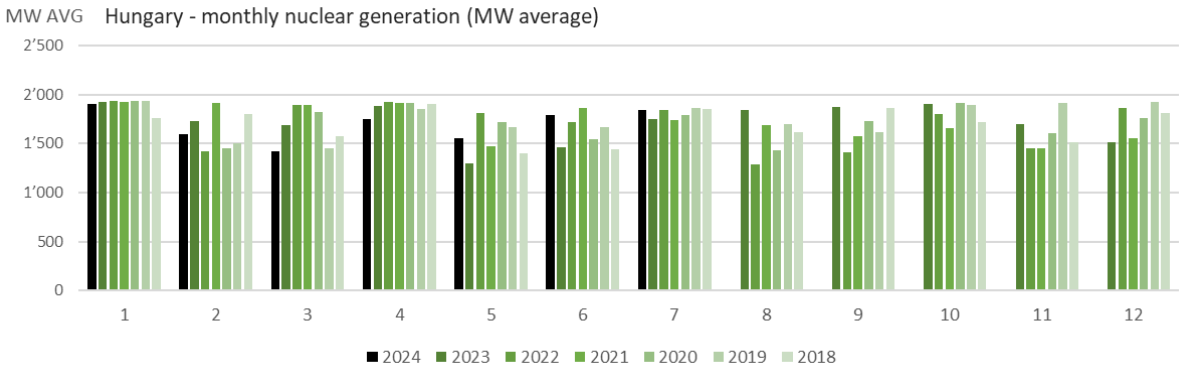
Serbia: Average coal-fired generation (MW average)

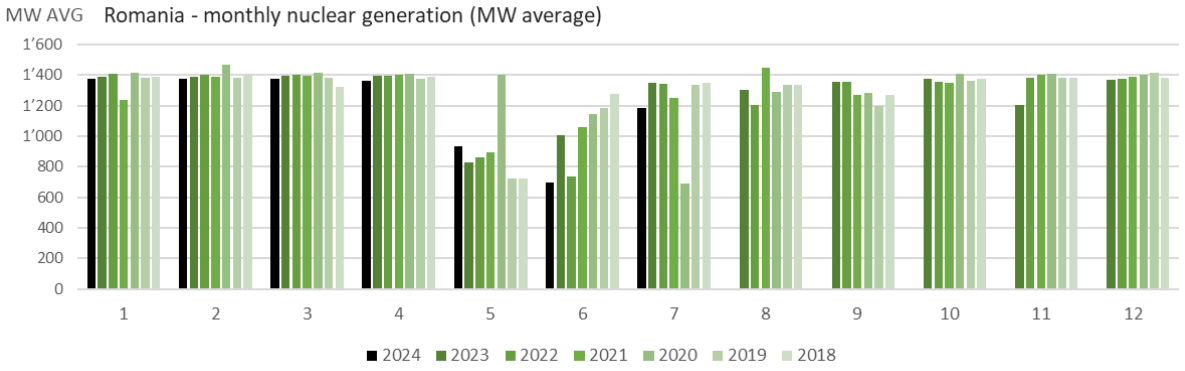


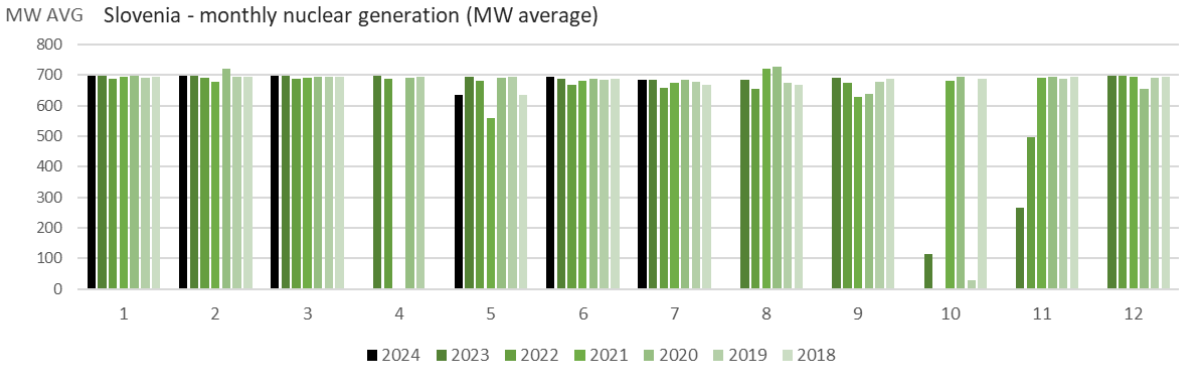
Greece: Average coal-fired generation (MW average)




MW AVG
Bulgaria - monthly nuclear generation (MW average)
2'500
2'000
1'500
1'000
500
0
1 2 3 4 5 6 7 8 9 10 11 12
2024 2023 2022 2021 2020 2019 2018

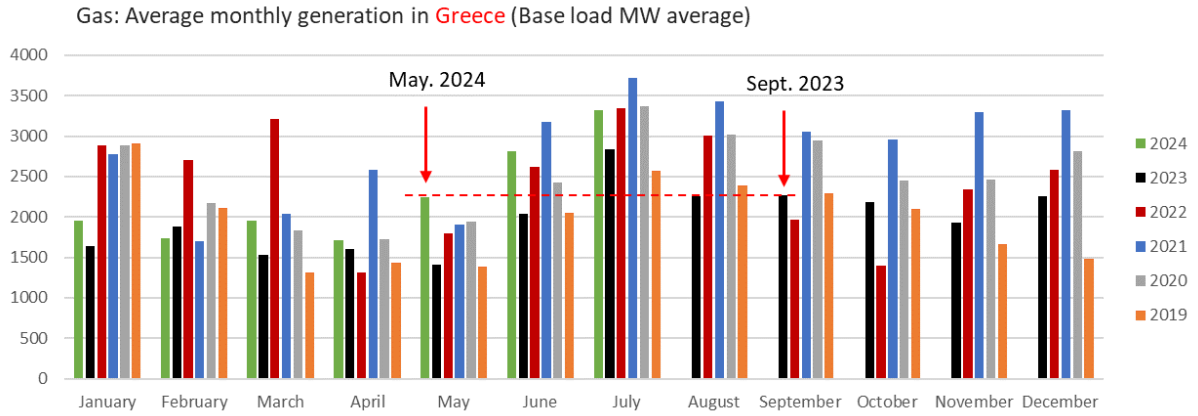

MW AVG
Hungary - monthly nuclear generation (MW average)
2'500
2'000
1'500
1'000
500
0
1 2 3 4 5 6 7 8 9 10 11 12
2024 2023 2022 2021 2020 2019 2018


MW AVG
Romania - monthly nuclear generation (MW average)
1'600
1'400
1'200
1'000
800
600
400
200
0
1 2 3 4 5 6 7 8 9 10 11 12
2024 2023 2022 2021 2020 2019 2018

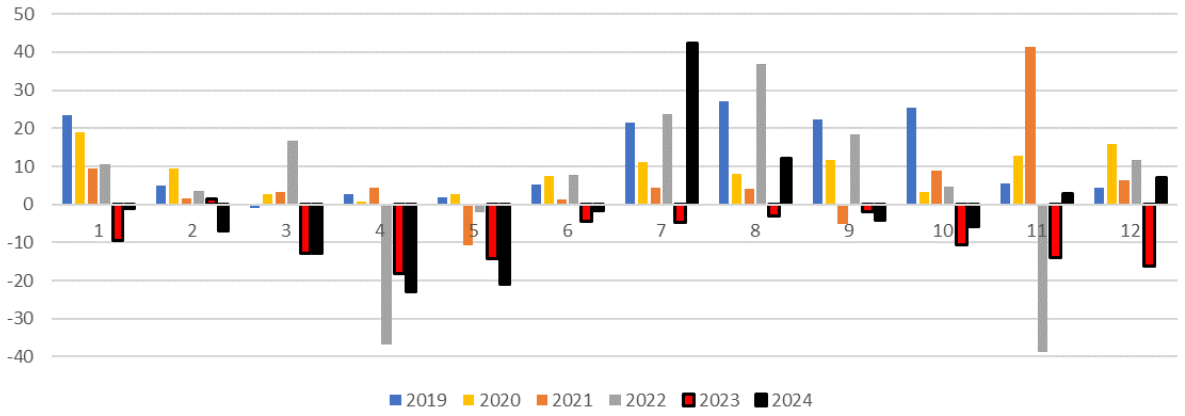

MW AVG
Slovenia - monthly nuclear generation (MW average)
800
700
600
500
400
300
200
100
0
1 2 3 4 5 6 7 8 9 10 11 12
2024 2023 2022 2021 2020 2019 2018

Gas fired power generation in September 2024

- Gas fired power plants outside Greece will have similar expected revenues in September 2024 as they had in September 2023, based on gas and power futures for September 2024. Availability of gas fired units outside Greece will be similar as last year and similar generation of gas fired units can be expected.
- In September 2023, Greek gas units had gas costs which were 4-5 EUR/MWh lower than Austrian gas market and due to lower costs Greek gas fired generation was quite high in September 2023. Weighted average import gas price of Greece was lower than Austrian even if the special tax for Greek gas fired power plants is taken into account which was in place last year. We can not expect lower costs of gas for Greek gas units in September 2024 which indicates that gas fired generation in Greece could be lower than in September 2023.
- However, taking into account that in any case profitability of gas units in Greece will not be lower than it was in May 2024 and that availability of Greek gas units for September 2024 is much better than it was in May 2024, there are no reasons to expect lower gas fired power generation in Greece than it was in September 2023 or May 2024.
- Generation of Greek gas fired power plants in September 2024 should be at least as high as in September 2023 and as in May 2024.
- This implies that gas fired generation in Greece in September 2024 will be 1000 MW on average lower than in July 2024 and 500 MW lower than in June 2024. In June and July 2024 gas fired generation in Greece was exceptionally high due to high temperature and high prices all over the region.

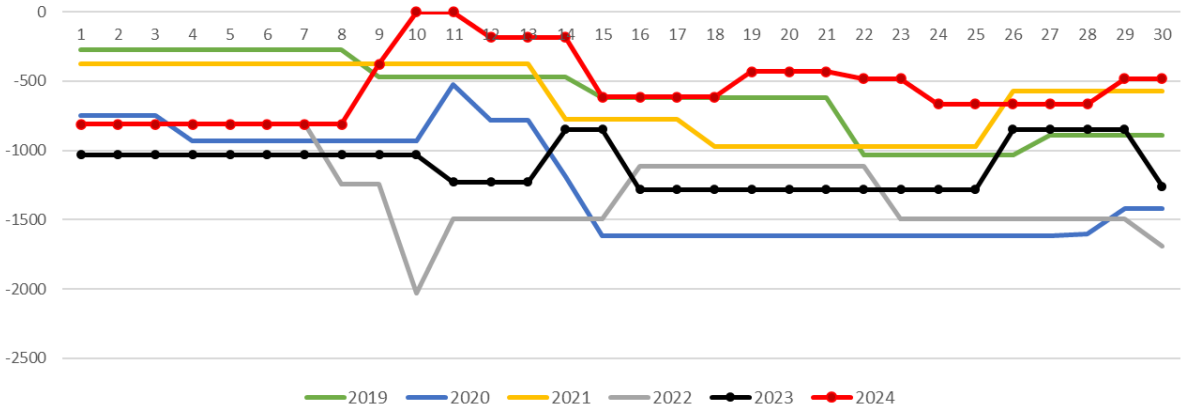


Hungary: **Indicative profitability** of gas units with 57% efficiency,
Hungarian Spot base-load (CEGH day-ahead gas, Daily CO2 futures price)

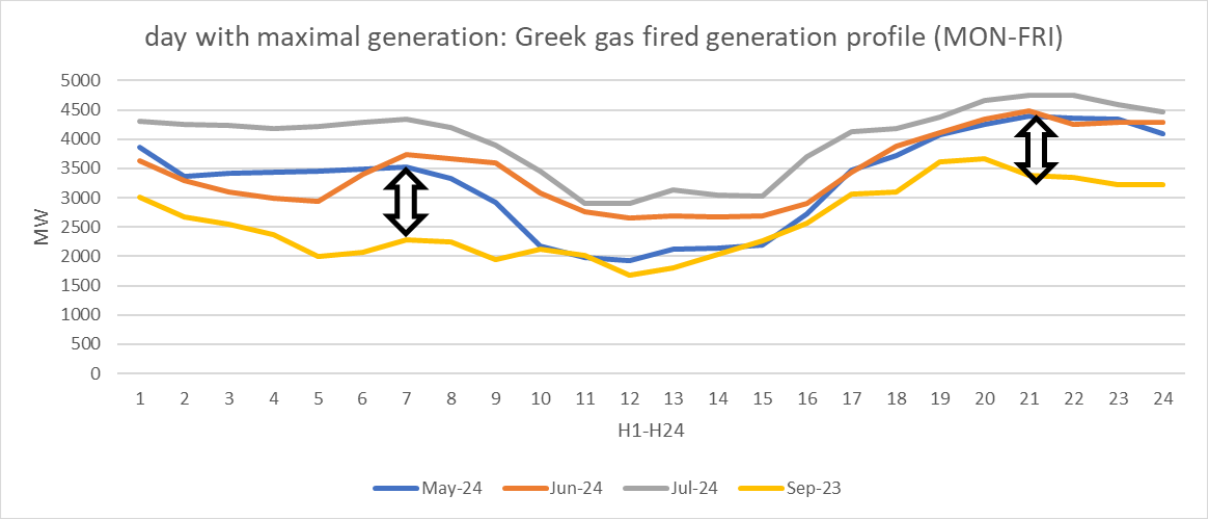


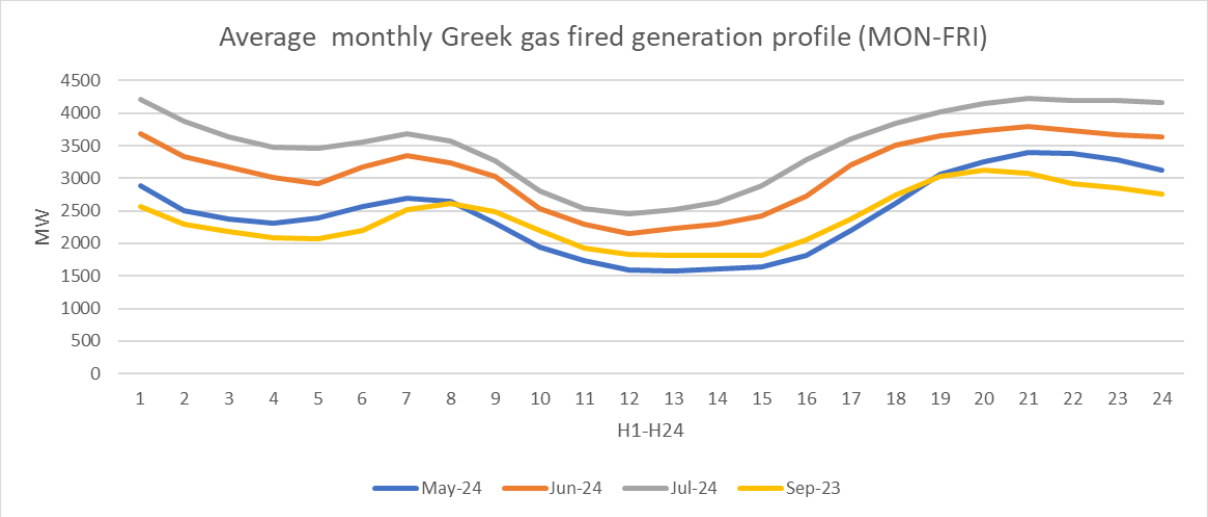
- Availability of units in Greece for September is significantly better than it was in September 2023, 550 MW higher than in September 2023. Increased availability is an important for limiting extreme prices on HUPX and all other markets.

September, Greece: Scheduled maintenances of thermal units (MW out of operation)



Availability of Greek gas fired units for September 2024 is 550 MW better than in September 2023 and 440MW better than in May 2024. Although similar average generation can be expected, much more generation from Greek gas units can be expected in case of high prices on HUPX in expensive hours H7-H8 and H19-H24 than it was the case in September 2023.



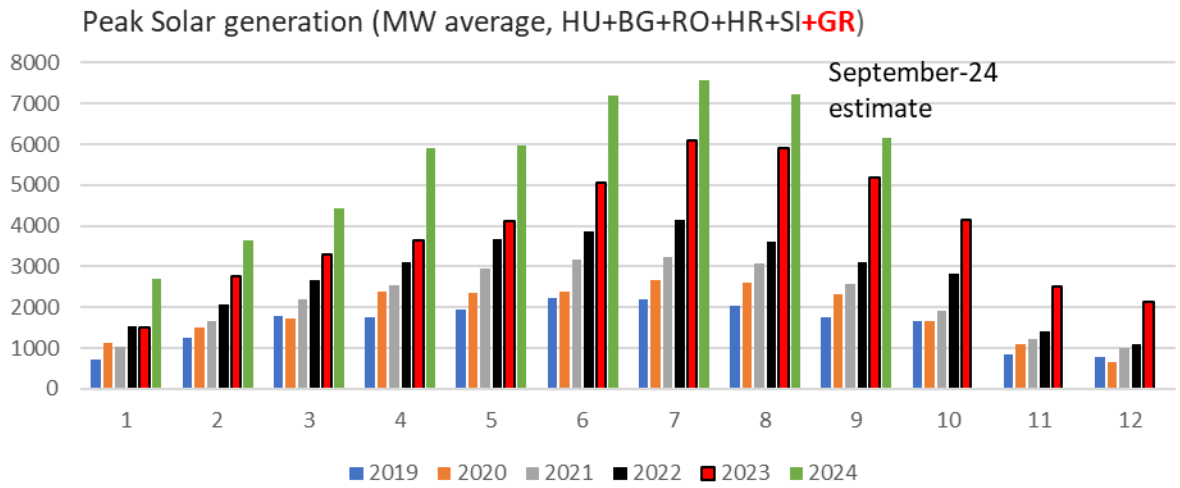


SOLAR GENERATION IN SEPTEMBER 2024

Solar generation in September is the lowest in Q3: By some 18-20% lower than in July in both Greece and the rest of the region. In July solar generation was in line with expectations, and solar generation drop in September vs July will have strong impact on SEE power balance.

For the entire SEE region, peak hours solar generation H9-H20 in August 2024 should be (reported generation):

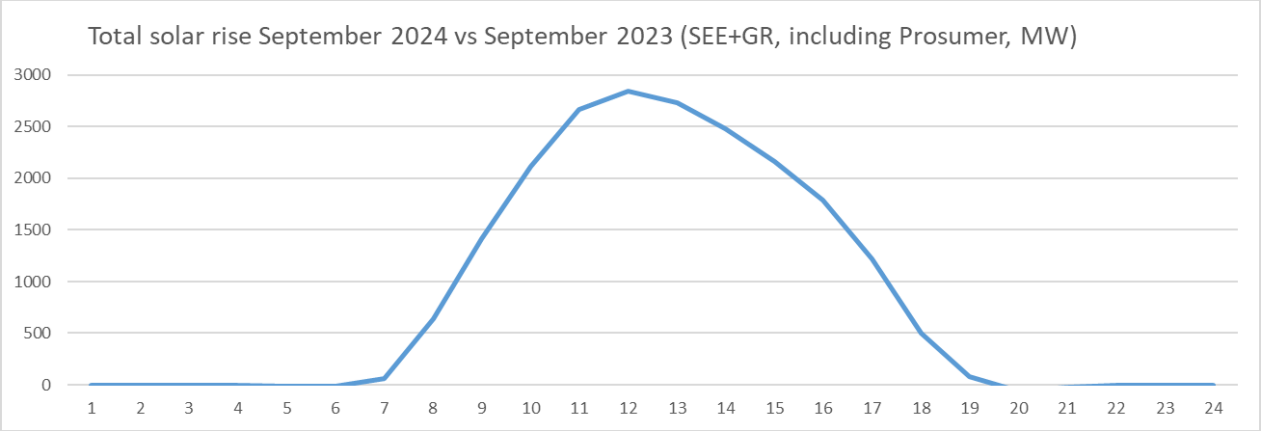
- 950 MW higher than in September 2023
- 1400 MW lower than in July 2024
- 1100 MW lower than in August 2024

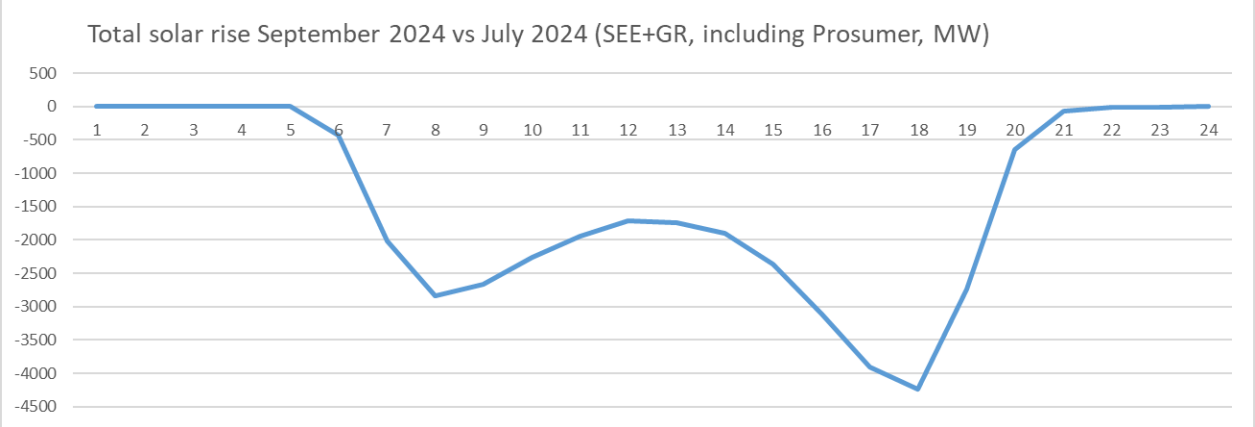


However, decline of reported (Entso-e) generation does not account drop of solar generation on distribution network, which is accounted as negative consumption (Prosumers). For each 1 MW of Entso-e reported solar generation there is additional 0.7 MW on distribution grid, so total impact in peak hours on the market will be:

- 1600 MW higher than in September 2023
- 2400 MW lower than in July 2024
- 1800 MW lower than in August 2024

Peak solar generation does drop throughout September, but for some 10% observing early and late September.





Highest drop of solar generation compared to July is by far the highest in H18, and this year should amount to 4000 MW. This sounds extremely risky, but H18 in July 2024 had extreme consumption due to heatwave. Such heatwaves are not present in September

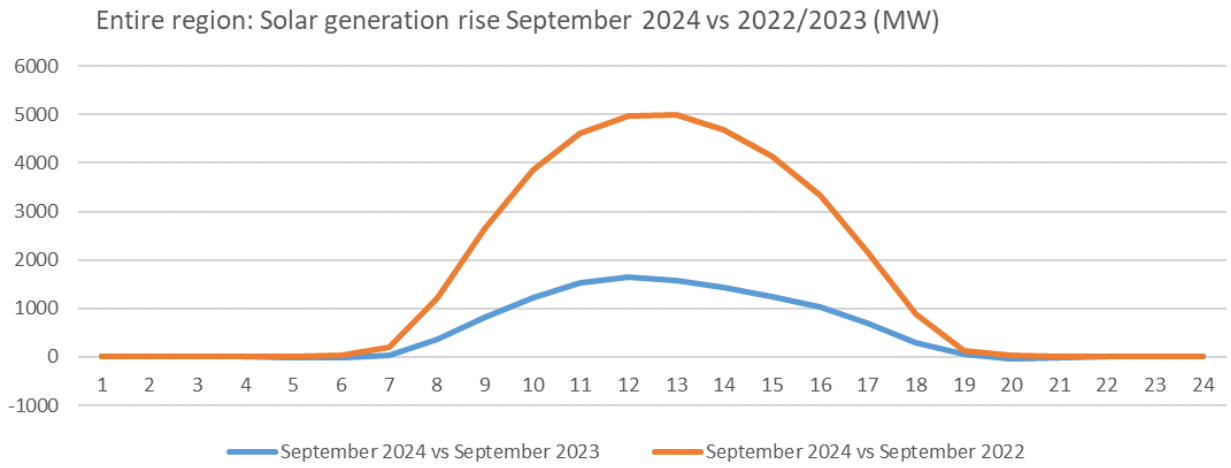
- H18 in July 2023 had **4000 MW** higher consumption than H18 in September 2023
- H18 in July 2024 had **8000 MW** higher consumption than H18 in September 2023
- Even with 4000 MW total solar generation drop (reported+prosumer), power balance in September 2024 in H18 will be incomparably better than in July 2024

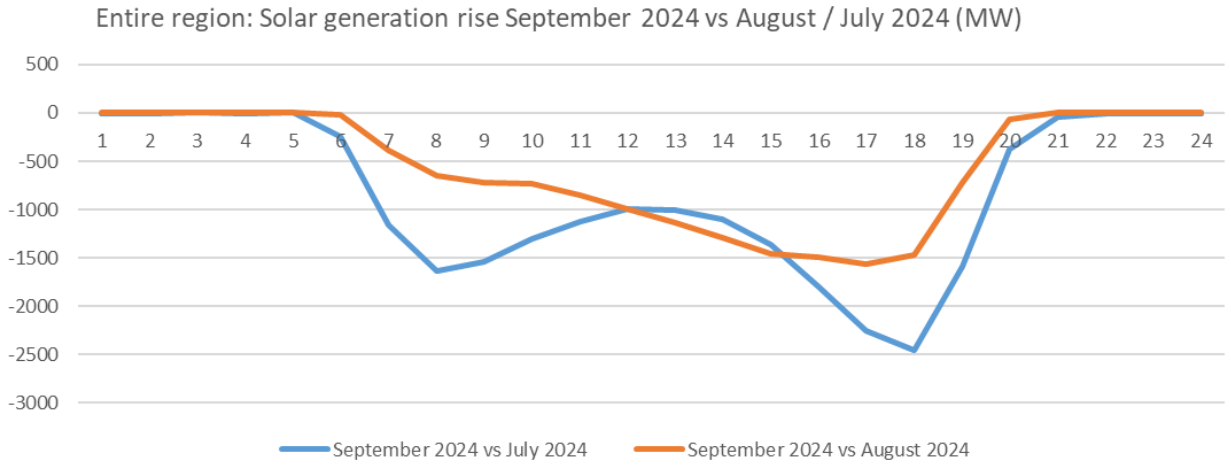
H19, which will have 2700 MW lower total solar generation compared to July 2024, but this will not create risks compared to H19 in July since H19 in July had extremely high consumption.

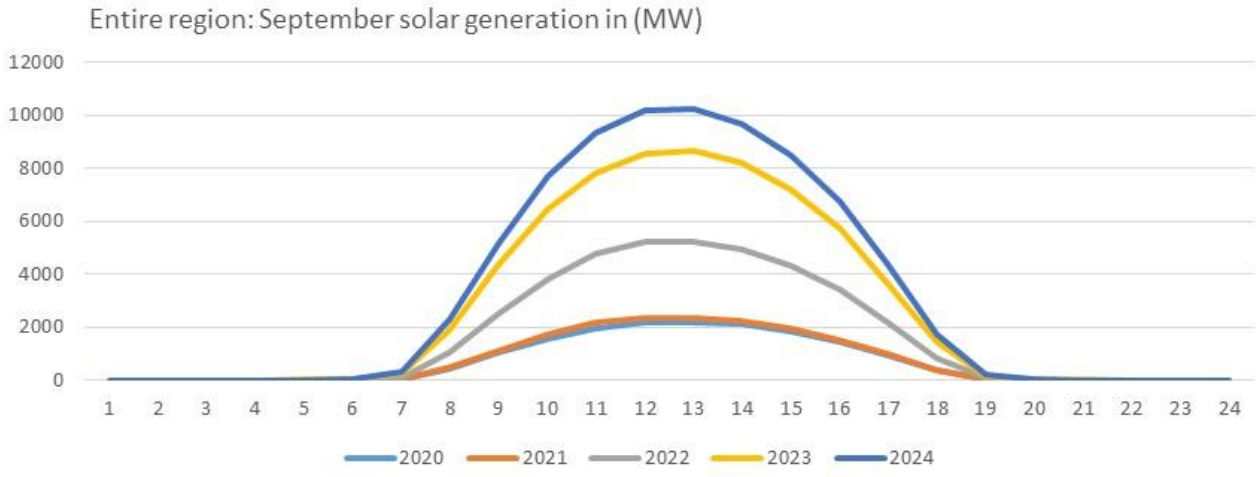
- H19 in July 2023 had **3000 MW** higher consumption than H19 in September 2023
- H19 in July 2024 had **6700 MW** higher consumption than H19 in September 2023
- Even with 2700 MW total solar generation drop (reported+prosumer), power balance in September 2024 in H19 will be incomparably better than in July 2024

Also the riskiest hours in July 2024 (H20-H21) will have the same solar generation in September (close to 0), but over 5000 MW lower consumption

For the entire region, we should expect following changes in reported solar generation based on Entso-e data (excluding prosumers):





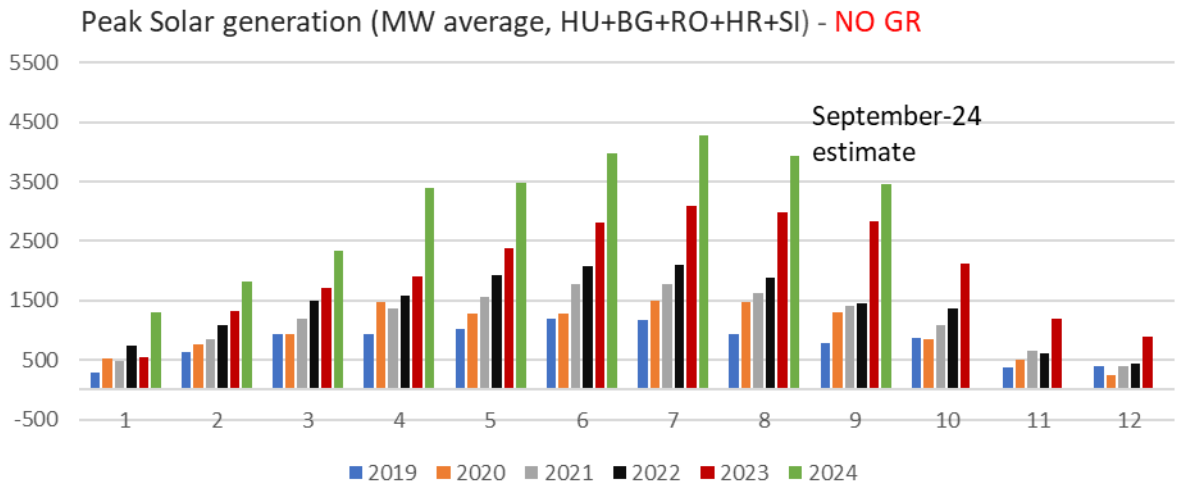


SOLAR GENERATION OUTSIDE GREECE

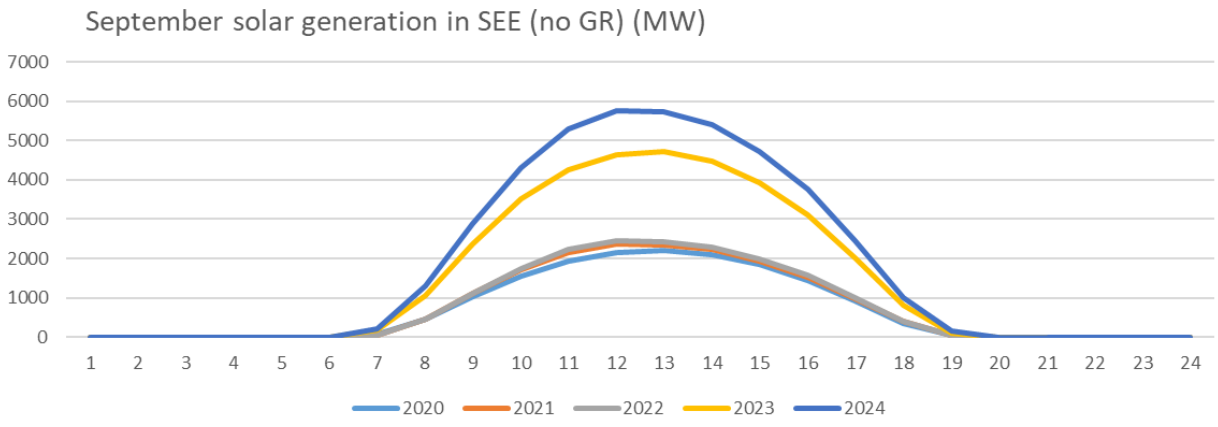
Similar weather conditions can be expected for September 2024 as it was in July and in August 2024 (below average precipitation). Peak solar generation is approximately 20% lower in September than in July of the same year.

Reported (Entso-e) solar generation in Hungary and SEE (excluding Greece) should be

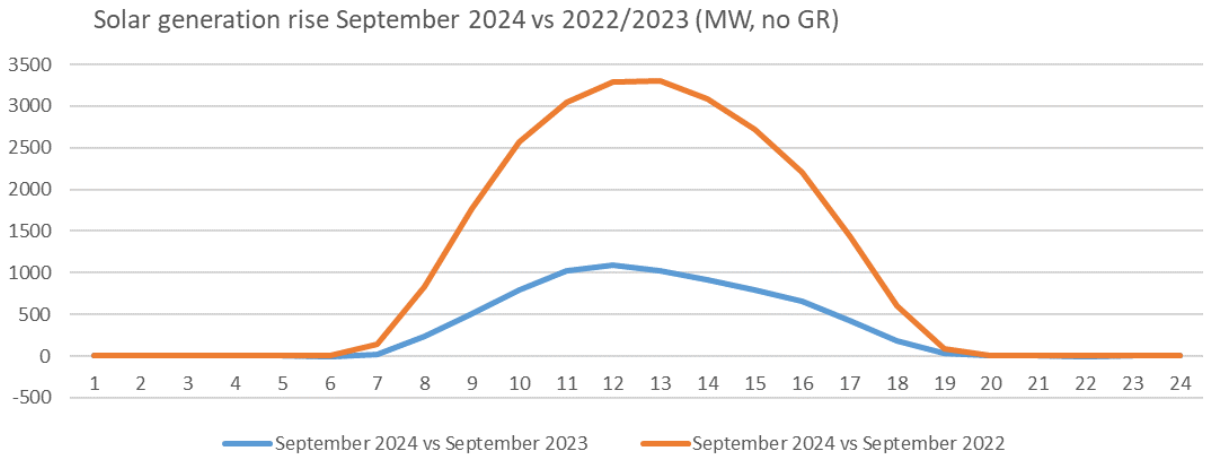
- 600 MW higher than in September 2023
- 820 MW lower than in July 2024
- 500 MW lower than in August 2024



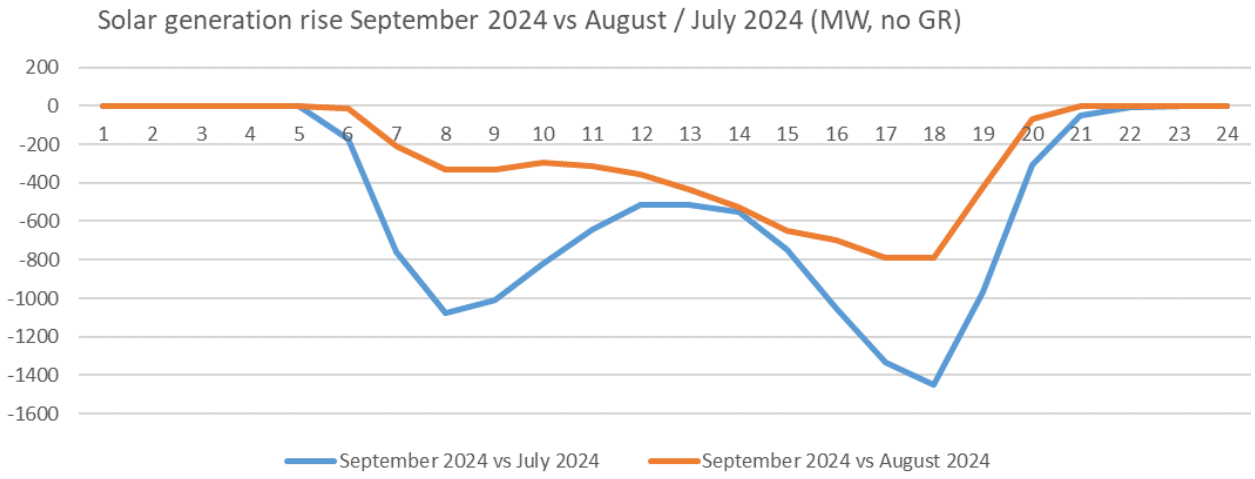
Assuming the same distribution of hourly generation VS max output in September 2024 as it was the case in previous years in September, and average profile change September vs July, we should expect following profile of solar generation in Hungary and SEE (excluding Greece) in September 2024



In hours H11-H14, solar generation will be over 3000 MW higher than in September last year

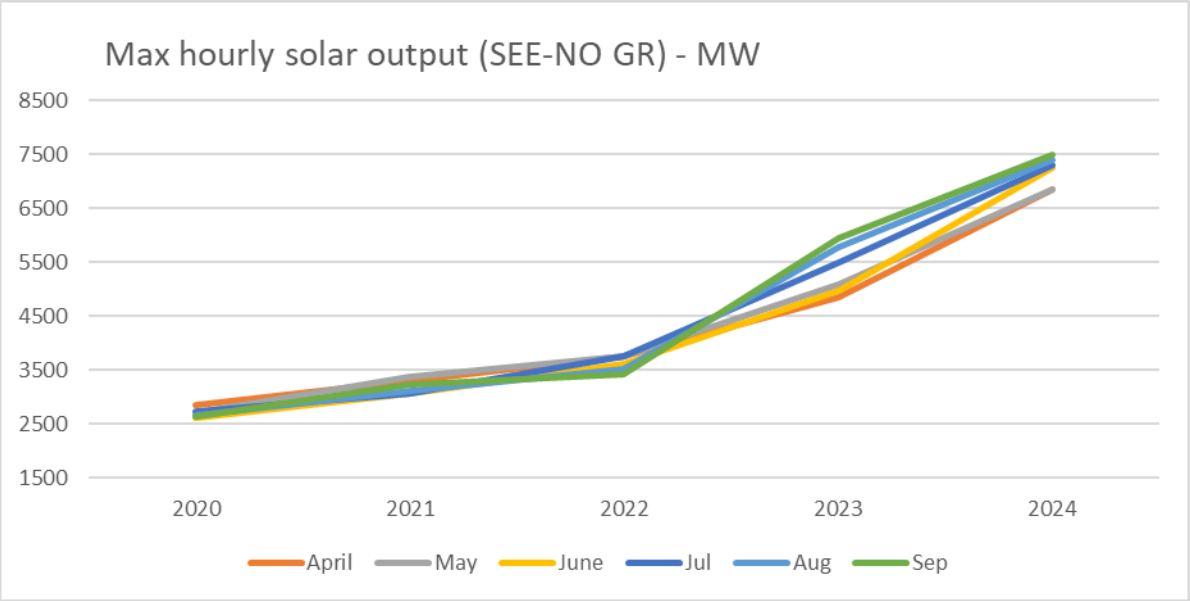


Compared to July 2024 and August 2024, solar generation will not be lower in critical hours (H20-H24), but consumption drop in H18-H19 will be much stronger than solar drop.



In SEE (excluding Greece), Max hourly output in September is actually higher than in July-August of the same year. One of the reason is certain increase of amount of installed solar capacities, which is around 100-200 MW on monthly level. Also, lower temperatures improve efficiency of the photovoltaics. For every degree above 25°C, a solar panel's output can decrease by around 0.3% to 0.5%.

In our simulations, we assumed 1500 MW higher Max solar output than in September 2023, and 200 MW higher than in July 2024.



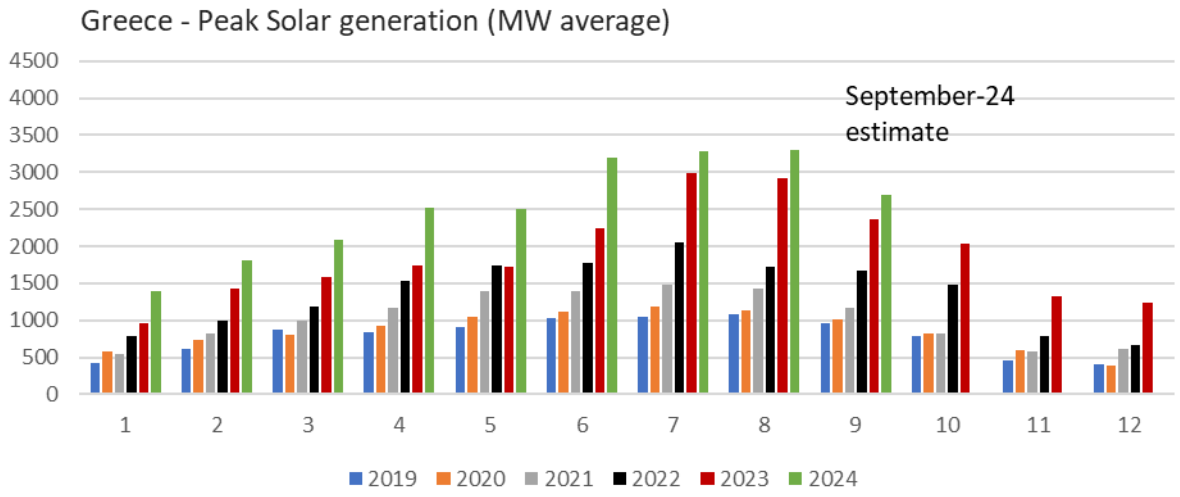
SOLAR GENERATION IN GREECE

Solar generation in September in Greece is lower than in July, by approximately 18-21%, and approximately 15-20% lower than in August.

Peak solar generation in September-2024 in Greece should be around 2700 MW at average weather conditions.

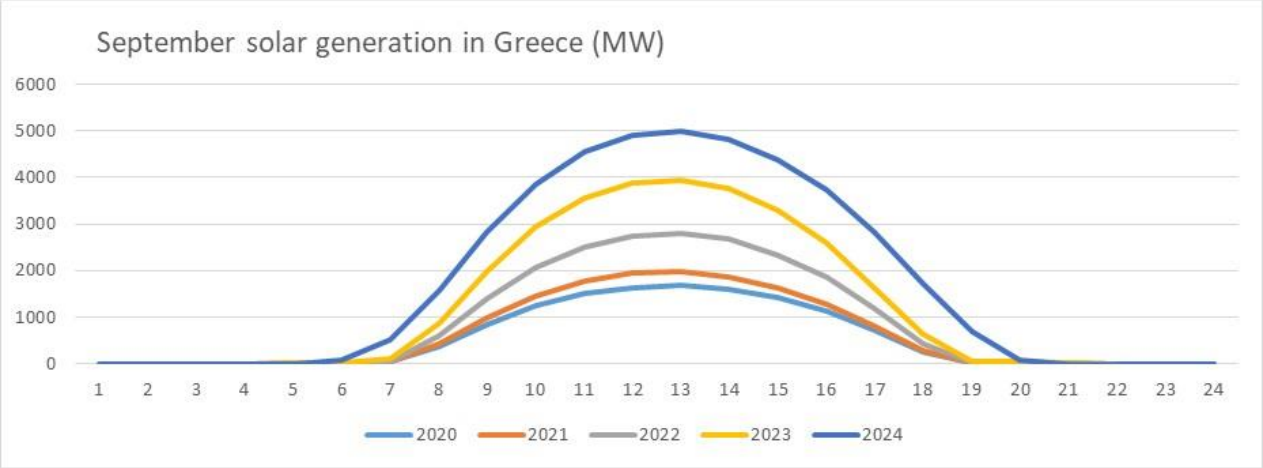
Reported (Entso-e) solar generation in Greece should be

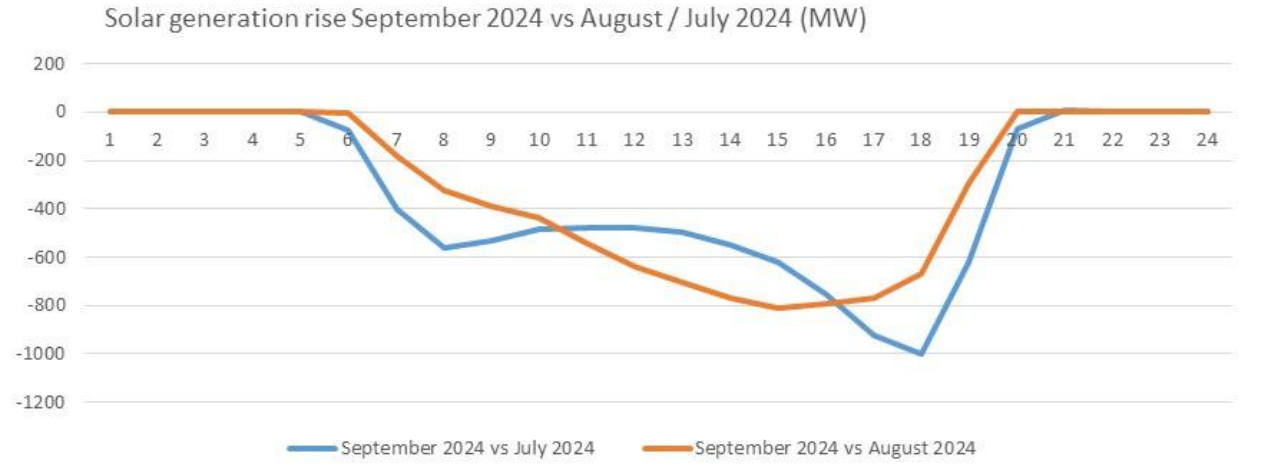
- 350 MW higher than in September 2023
- 580 MW lower than in July 2024
- 600 MW lower than in August 2024

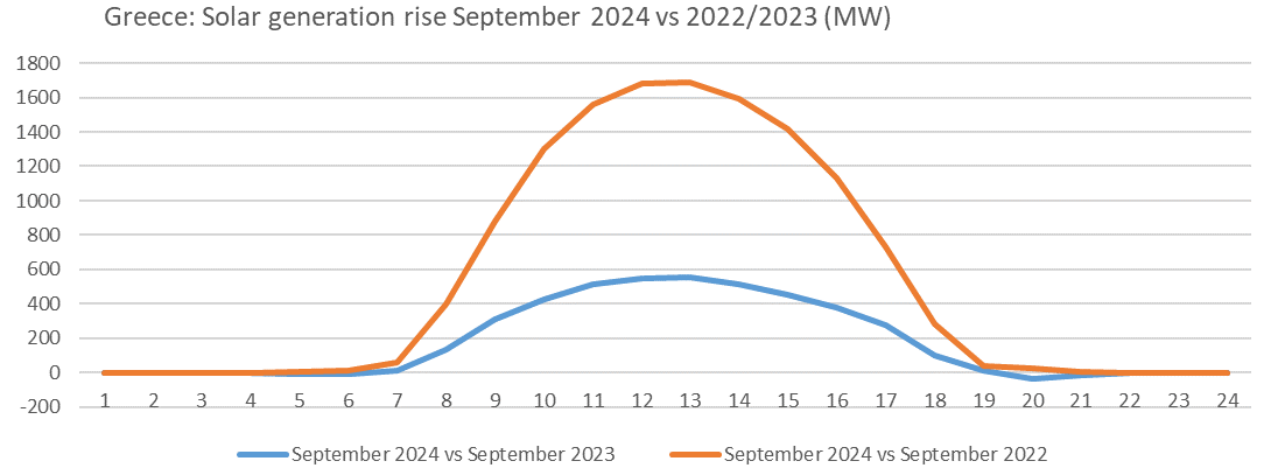


This is a pessimistic assumption *which is made with daily Greek data - which does not seem to be correct on Entsoe. Greek operator will publish actual solar generation data for July 2024 in mid-August 2024, which will be higher, as it was the case in past months. We modelled solar generation for Greece based on Daily data for July, which shows just 10% year-on-year growth, while in past months, revised data showed around 40% year on year growth. Due to such inconsistency of data, actual September Solar generation might be 700 MW higher in peaks than in our assumptions described further in the text. Assumptions were made based on Entso-e data for July 2024 which is most probably incomplete.*

Assuming the same distribution of hourly generation VS max output in September 2024 as it was the case in previous years in September, and average profile change September vs July, we should expect following profile of solar generation in Greece in September 2024







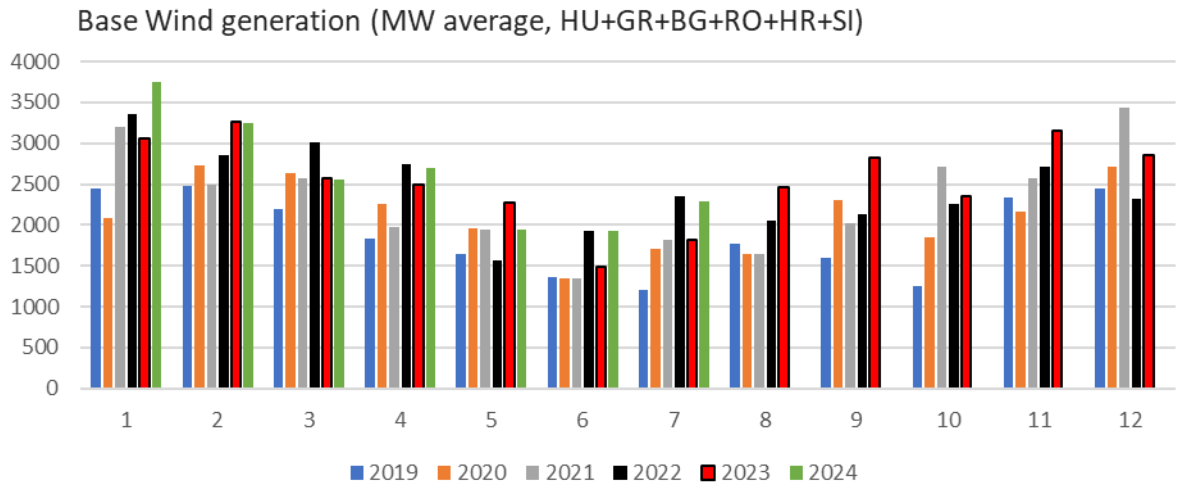
WIND POWER GENERATION IN SEPTEMBER 2024

September is on average the month with the highest wind generation in Q3 (but much lower than Q4). September has significantly higher wind generation than July, unless July has extremely high wind generation. This July did have relatively high wind generation, but not exceptional (wind generation was lower than in July 2022, despite significant amount of newly installed capacities

Wind generation in September can be lower than in July in case that July had exceptional solar generation. It is fair to assume that in worst case wind generation in September 2024 will be the same as in July 2024, and in best case the same as in September 2023

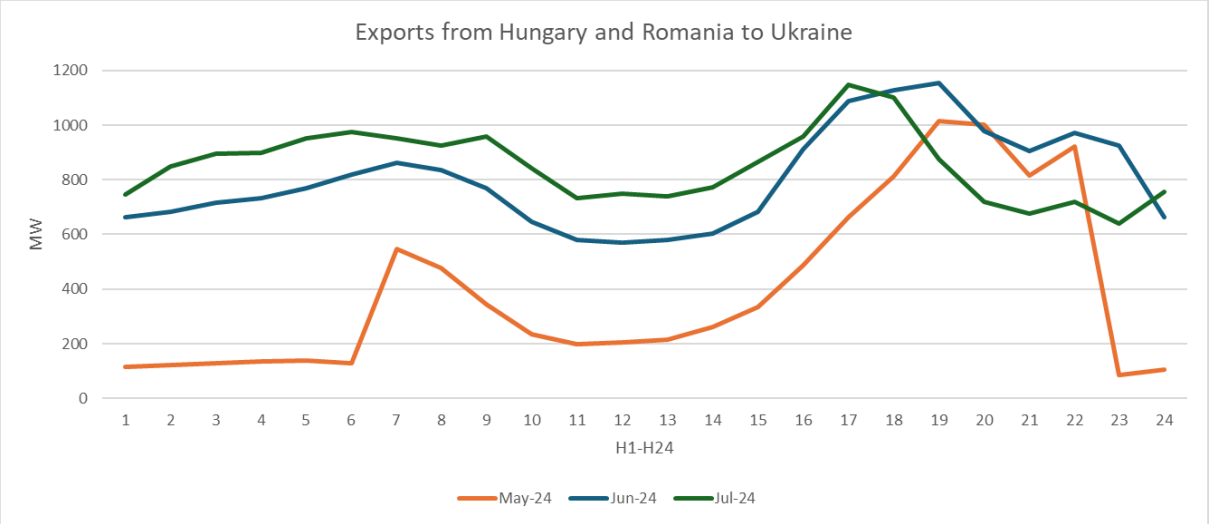
In pessimistic scenario, wind generation in September should amount to 2,300 MW. In optimistic scenario for September 2024 wind generation will be

- 500 MW higher than in July 2024
- The same as in September 2023



EXPORTS TO UKRAINE AND MOLDOVA

- There were no exports to Ukraine and Moldova in September 2023. Therefore, high exports which started in May 2024 have to betaken into account as part of the generation-consumption balance of the Hungary+SEE region.
- Export similar as in July should be assumed, 850MW in average.



ANALYZING THE CHANGE OF THE REGIONAL GENERATION-CONSUMPTION BALANCE IN SEPTEMBER 2024

- The biggest factor for change of the generation-consumption balance in September against June and July 2024 is the decline of consumption with the decline of temperatures.
-

Change of average values of generation and consumption in September 2024

September 2024:	vs. September 2023	vs. June 2024	vs. July 2024
Consumption	0 MW	-2000 MW	-6100 MW
Hydro generation	-500 MW	-2750 MW	-1850 MW
Lignite + nuclear generation	-1200 MW	+2000 MW	-750 MW
Gas fired generation	0 MW	-500 MW	-1000 MW
Wind power generation	0 MW	+800 MW	+500 MW
Export to Ukraine	+850 MW	+50 MW	+0 MW
Change (base load equivalent)	**-2550 MW**	**+1500 MW**	**+3000 MW**

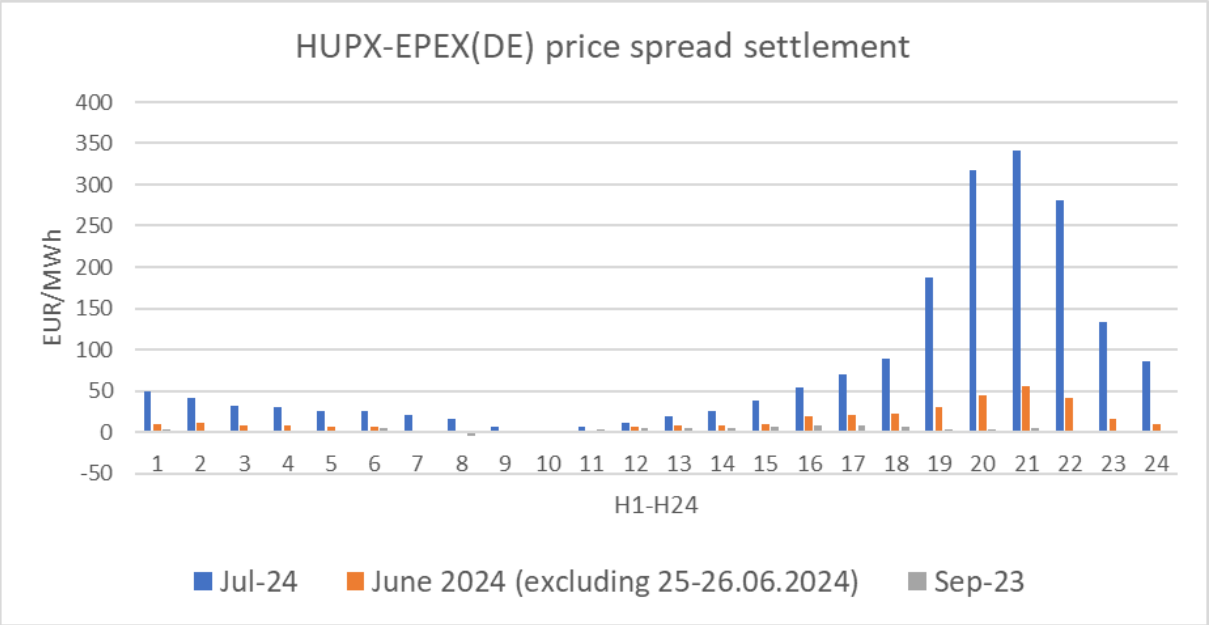
On top of base load equivalent there is a decline of solar generation profile compared to July and June 2024 and increase of solar generation profile against September 2023

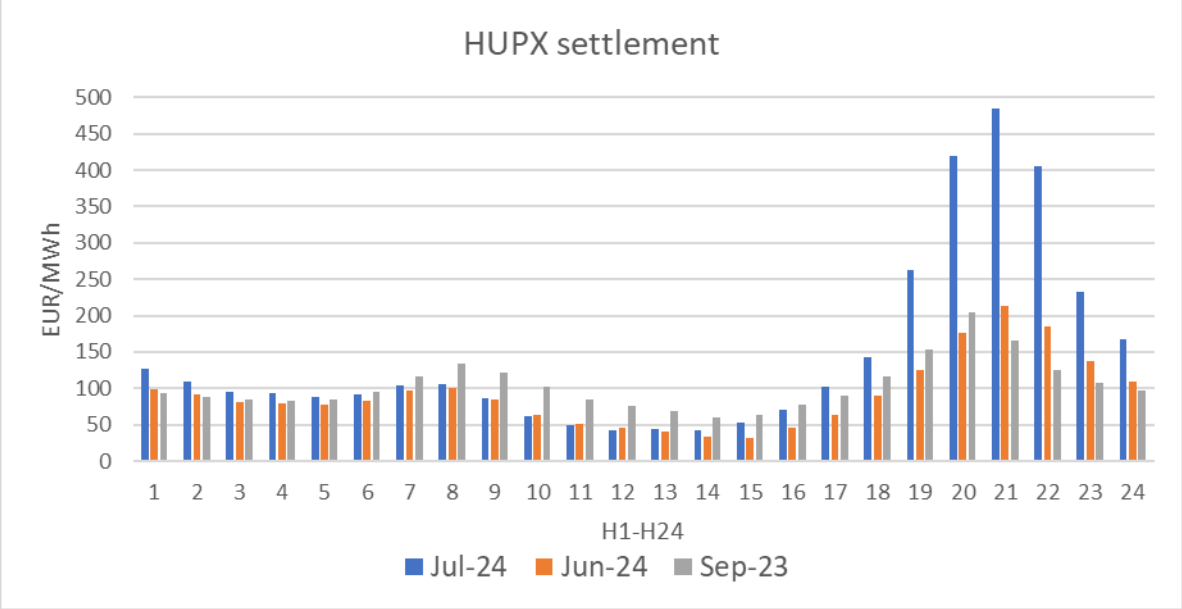
The table above illustrate that availability of energy in September 2024 will be much worse than in September 2023, but also much better than in June 2024 and July 2024.

Since market price level of September 2024 futures is too different to market price level of June and July 2024 it is not reliable and appropriate to compare generation-consumption balance of the HU+SEE region of September 2024 with generation-consumption balance of July 2024 and June 2024. At the price level of September futures, generation consumption balance of June and July 2024 would be significantly lower. Also, generation-consumption balance of July 2024 would be much more negative if the transmission grid in FBMC was not so constrained which limited imports of the region and stimulated high output of hydro reservoirs, lignite fired and gas fired units.

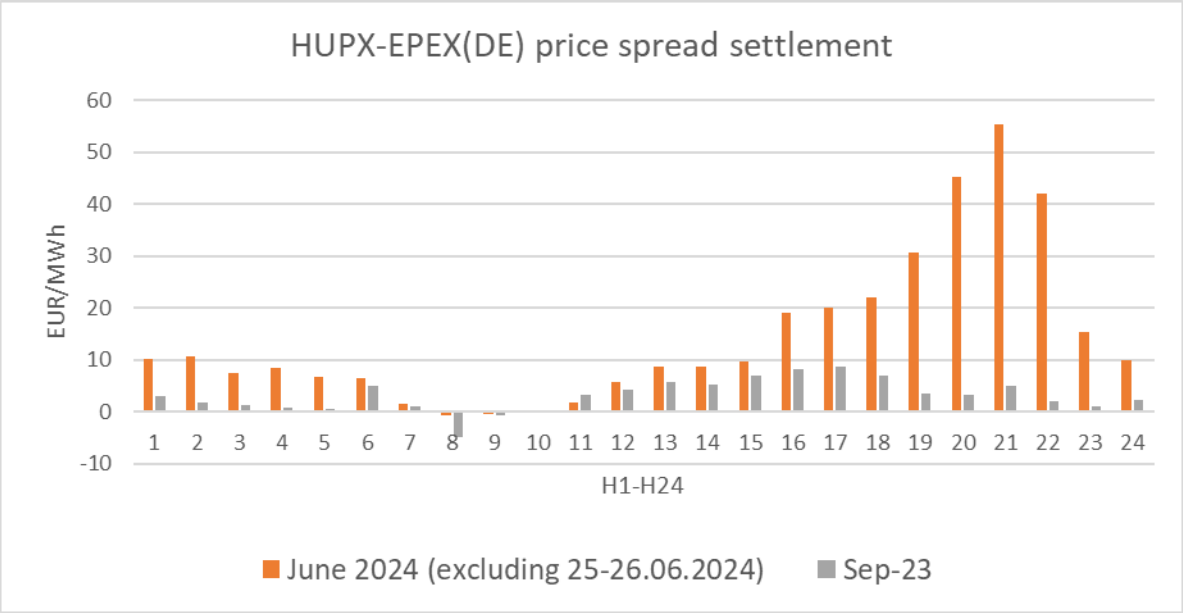
The fact that **generation consumption balance of the region in September 2024 will be 3000 MW better than in July 2024 and 1550 MW better than in June 2024** (excluding solar hours since in solar hours market was not too stressed in July 2024), shows that **market conditions in September 2024 will not be comparable to market conditions in June and July 2024**. Market will not need to activate highest offers in the selling merit order curves.

Additional argument for bearish trading approach to September 2024 is that not only that Generation-Consumption balance of the "average" day in September 2024 will be 3000 MW (base load equivalent) better than the "average" day of July, but the improvement will be even higher compared to days with higher than average consumption in July 2024 and it was exactly days with higher than average consumption which were pushing HUPX to extremely high prices.



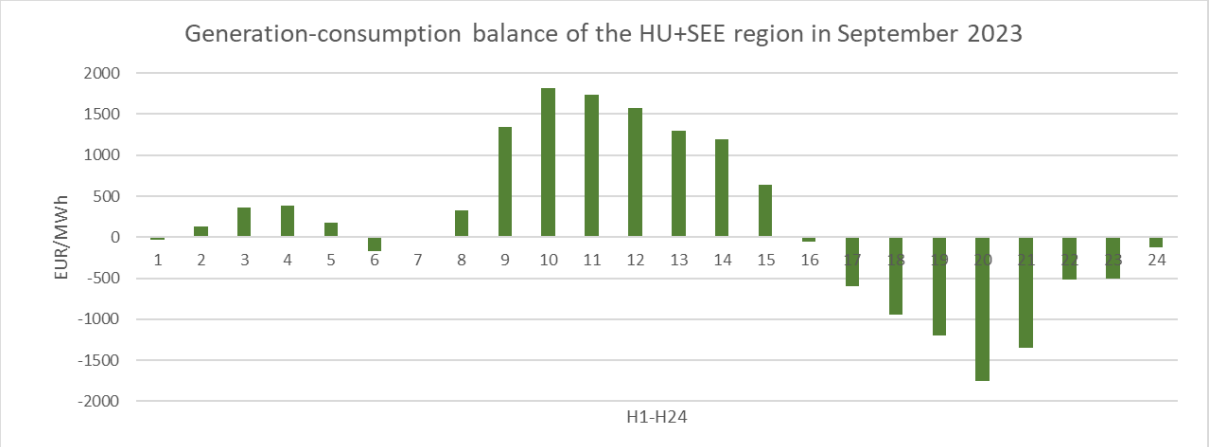


- There are no reasons for HUPX nor HUPX-EPEX(DE) price spread to settle as high as in June 2024 since generation-consumption balance will be 1500 MW better mostly in hours which had high HU-DE spread in June 2024. If 25.06-26.06.2024 are excluded due to issues with market coupling mechanism, HUPX-EPEX(DE) spread in June settled at around 14 EUR/MWh. Current Futures HU-DE spread is no too far from that value, which shows that current futures HU-DE spread is exaggerated.



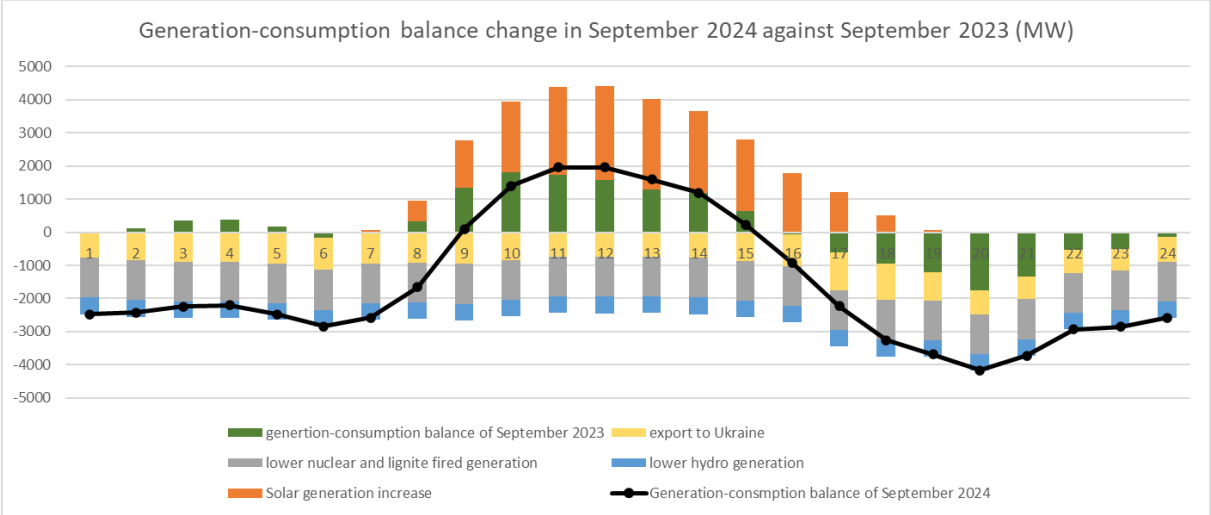
- Generation-consumption balance of the HU+SEE region amounted in average +150 MW in September 2023 (nearly neutral net position of the region). In September 2024 it will be much lower due to exports to Moldova and Ukraine, lower lignite and nuclear power generation and lower hydro generation.

  2550 MW lower generation-consumption balance in September 2024 than in September 2023 should not cause dangerous market conditions since availability of gas fired generation is higher and it can protect HUPX from eventual rising prices in hours H19-H21.



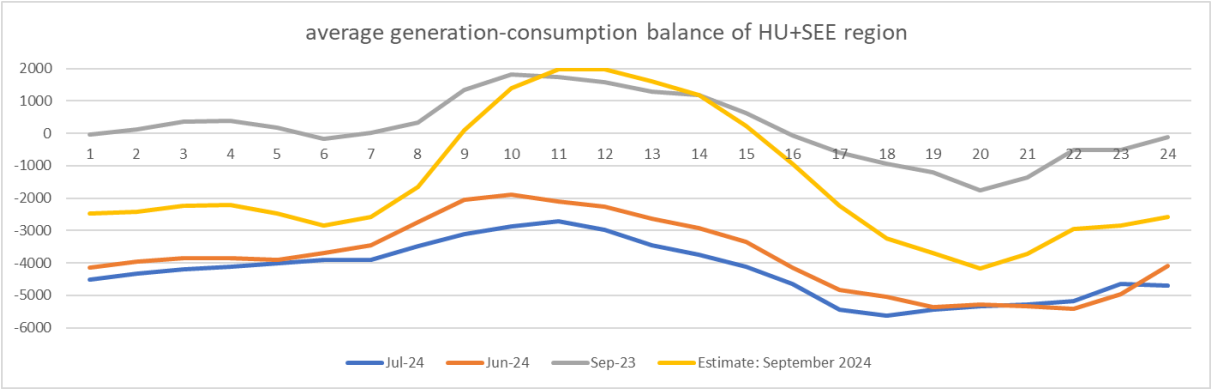
Even with pessimistic assumptions that average solar power generation in the period H9-H20 in September 2024 will be just 1600 MW higher, generation-consumption balance in hours H9-H15 will be very similar to generation-consumption balance of September 2023.

Generation-consumption balance in hours H18-H21 will be significantly worse than in September 2023, but it has to be taken into account that the region was not importing significant amount of energy from Italy in those hours and that there is much more available generation in Greece which can cover the import needs of the Region.



Explanation of the Argument 1: *Consumption will drop so much that there will be no need to activate high-priced part of selling offers of the Greek market (last 2000 MW of the Greek market selling curve) and the most expensive offers in the merit order of other markets. This will reduce the risk of high price settlement on all markets of the HU+SEE region.*

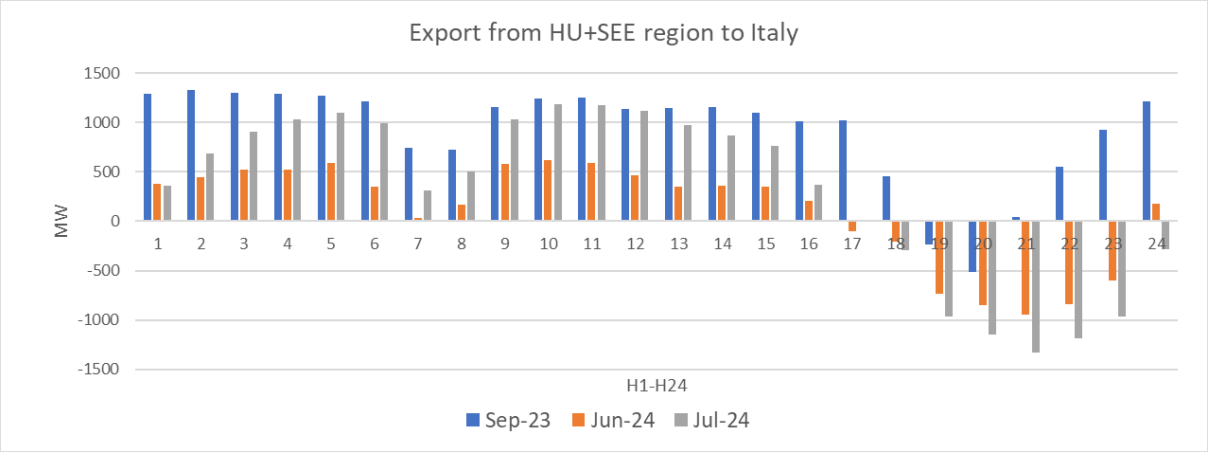
- It is obvious that market will in average need around 1700 MW less energy in hours H19-H24 in September 2024 than it was the case in June and July 2024. Such high reduction of average energy needs will eliminate the need for activation of the expensive part of the selling merit order curve.



July balance would have been much more negative, but it was enforced on just -5500 MW due to grid constrains

Although Generation-Consumption balance in hours H19-H24 will be nearly 2500 MW worse than in September 2023 this should not be dangerous for the following reasons:

1. HU+SEE region on average did not import from Italy in those hours (except for minimal volumes in hours H19 and H20). The difference in generation-consumption balance to September 2023 can be covered by imports from Italy.
2. There is better availability of gas fired power plants in Greece.
3. For the whole year 2024, transmission grid capacities in Flow Based Market Coupling (FBMC) capacities were much higher than last year due to regulatory requirements for TSOs to increase the minimal RAM (Remaining Available Margin) on all grid elements in FBMC. In September 2024 capacities in FBMC should again be much higher than in September 2023.

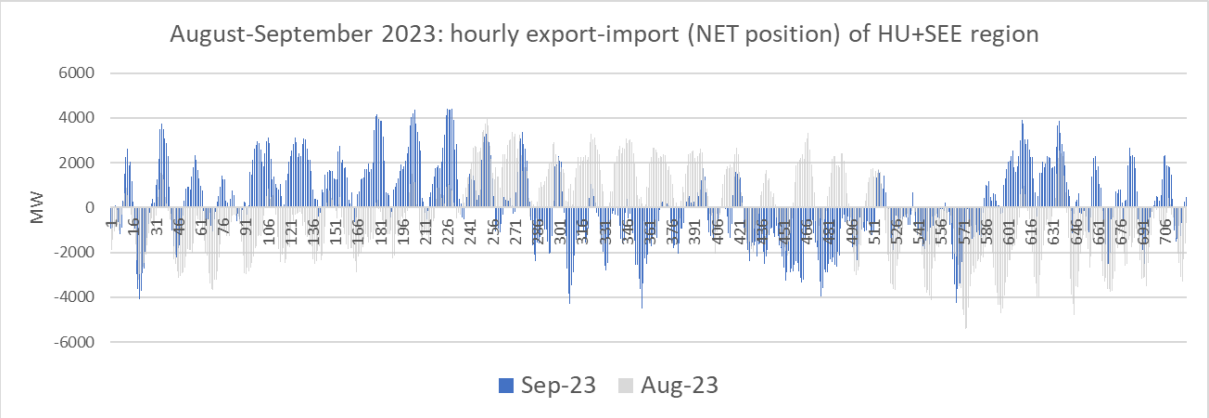


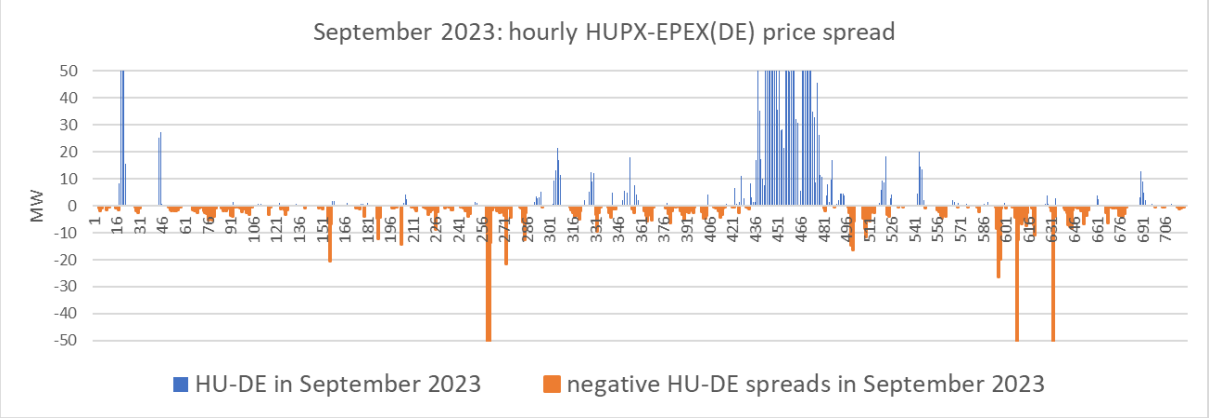
For sunny hours, Generation-consumption balance of the region should be better than in the assumption. We modelled solar generation for Greece based on Daily data for July, which shows just 12% year-on-year growth, while in past months, revised data showed around 40% year on year growth. Due to such inconsistency of data, actual September Solar generation might be 700 MW higher in peaks than in our assumptions described further in the text. Assumptions were made based on entso-e data for July 2024 which is most probably incomplete. Greek operator will publish actual solar generation data for July in mid-August, which will be higher, as it was the case in past months.

Explanation of the Argument 2: HUPX-EPEX(DE) spot spread in sunny hours will be negative. This will support lower settlement of the average HU-DE spread during September

- HU+SEE region was not having long position in Flow Based Market Coupling in sunny hours since early May 2024, after 1000 MW NPP Kozloduy went in maintenance (05.05.2024) and 500 MW PAKS went in maintenance (10.05.2024). Also, since early May 2024 there were no negative HU-DE spreads in sunny hours. For having negative HU-DE spread in sunny hours, HU+SEE region should be a net exporter in sunny hours.

- If the HU+SEE region was able to have long period with very long position in August and September 2023, then it should be able to have long positions also in September 2024 since the average expected generation-consumption balance of the HU+SEE region in hours H9-H15 should be very similar.



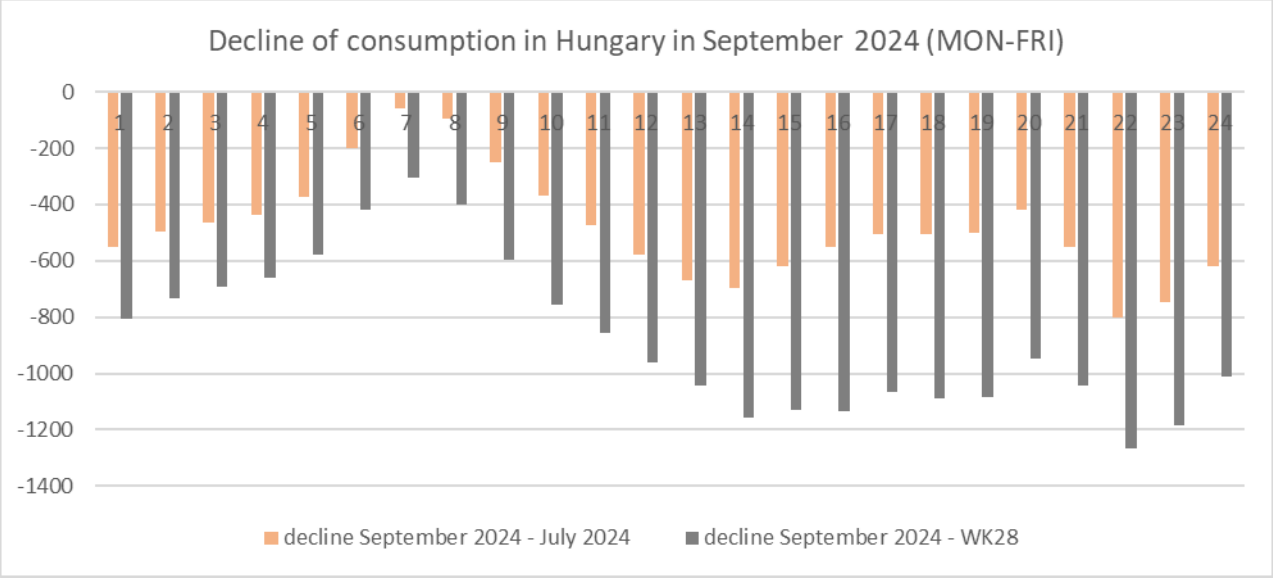


- Last year negative hourly spreads contributed with -1.5 EUR/MWh to the average HU-DE spread in September. This year, it could be higher

Explanation of the Argument 3: Although import needs of Hungarian market will be as high as in July, transmission grid conditions in September should be better than in July and August so there should be no price spikes of HUPX above other markets of SEE region.

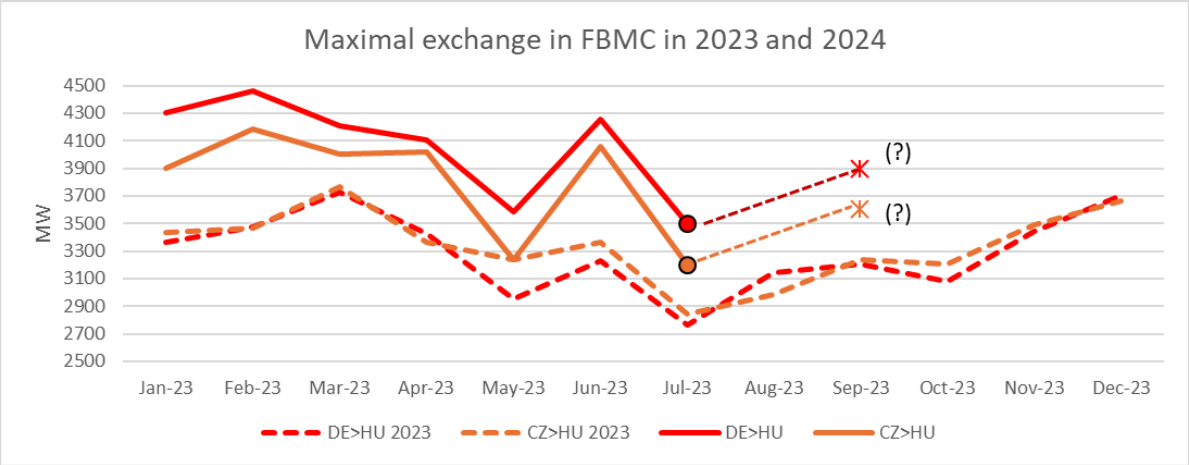
Consumption decline in September 2024 against consumption in July and August will be huge for the whole region, but not so huge in Hungary itself. Consumption decline in Hungary should not be higher than 500-600 MW compared to July in hours H19-H22. If maintenance of 500 MW in PAKS and one unit in TPP Matra in Hungary are taken into account, deficit of energy on Hungarian market will be very similar or even higher than in July. This is the main bullish risk for HUPX in September, but this risk will materialize only if exchanges in FBMC are limited by transmission grid elements for which the PTDF (Power Transfer Distribution Factor) in FBMC is much higher for the Hungarian bidding zone than for the Romanian biding zone or any other of bidding zones of the SEE region. The only such grid elements are cross-border tie-lines between Austria and Hungary which had too high loading in the period 08.07.2024-12.07.2024 and caused limited imports of Hungarian bidding zone and HUPX price spikes in FBMC. This risk can not be neither excluded nor confirmed. If this risk materialize, HUPX can settle very high on such occasions.

A very important conclusion is that even if the average import position of Hungarian market in September 2024 will be similar to the average import position of Hungarian market in July 2024, **import position of Hungary in September 2024 will still be significantly better than it was in the WK28**. WK28 was the only week when Hungarian market had price spikes above Romanian market. Those price spikes on HUPX were caused by highly loaded 220kV grid elements on the Austrian-Hungarian border only in the WK28 due to extremely high consumption in Hungary. This should not be the case in September 2024.

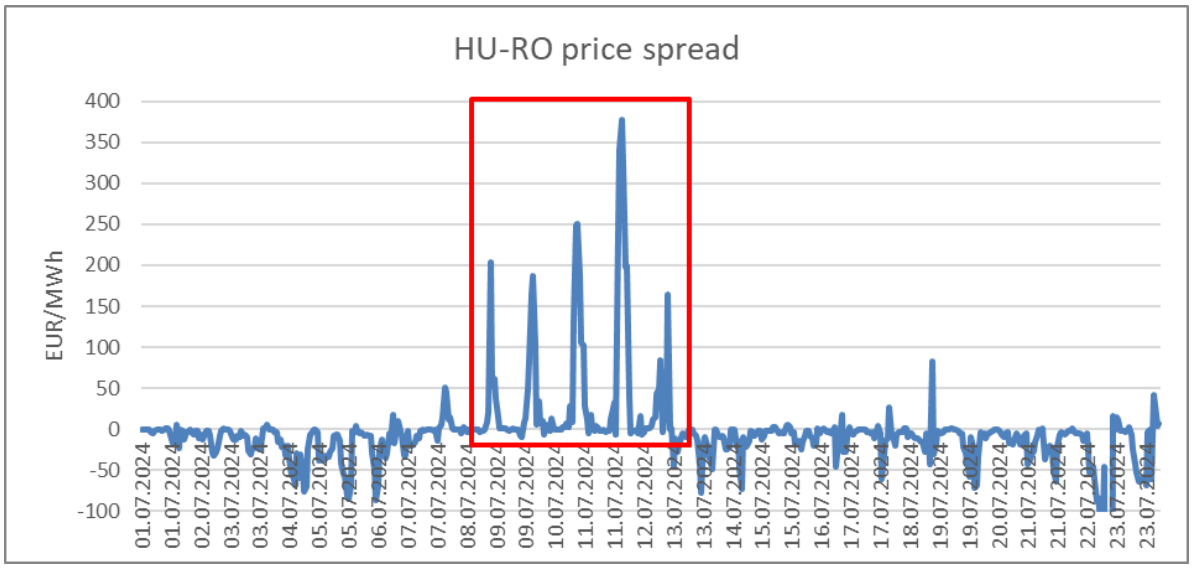


In order to achieve bearish settlement in September, transmission grid conditions need to be more comfortable than in July which should be the case for September 2024. Transmission grid capacities in September 2024 should be significantly better than in July 2024 and the stress on grid should be lower.

- For the whole year 2024, transmission grid capacities in FBMC were much higher than last year due to regulatory requirements for TSOs to increase the minimal RAM (Remaining Available Margin) on all grid elements in FBMC. In September 2024 capacities in FBMC should again be much higher than in September 2023.



- HUPX price was significantly deviating from Romanian market only in the period 08.07-12.07.2024 (WK28), when the grid elements which were limiting Hungarian imports in FBMC were on the AT-HU border. With the increase of grid capacities in FBMC in September this should not be happening anymore.
- Due to the improved FBMC capacities in September and much lower Hungarian consumption than in the WK28, HUPX should be much more correlated to OPCOM and other markets than it was the case in July. **Therefore, improvement of the regional generation-consumption balance should be well reflected on HUPX during September 2024.**



TRANSMISSION GRID CONDITIONS IN SEPTEMBER 2024

Transmission grid conditions for September should be better than in July and FBMC market exchanges should be higher than in July. However, transmission grid conditions are not risk-free.

a) HU-AT cross-border lines, risky 1st week of September

- AT-HU line, Wien-Gyor 2 12.08.2024-08.09.2024
- AT-HU line, Zurndorf - Szombathely, 12.08.2024-08.09.2024

1st week of September can be risky for HUPX due to maintenance of AT-HU transmission lines simultaneously with maintenance of 500MW in NPP Paks. This problem should escalate rather in August when NPP Paks goes in maintenance.

There are no historical data which show how FBMC will behave for HUPX when both of those lines are in maintenance. The impact has to be seen after 12.08.2024. However, to counter this potentially highly negative effect, there should be fully available Serbian>Hungarian border with 1000 MW NTC where energy from the rest of the region should be delivered to HUPX.

It is highly recommended that the 1st week of September is not left short on settlement in Hungary or to buy Serbia>Hungary NTC for the first 9 days of September (Serbian-Hungarian border will be available only for the first 9 days of September).

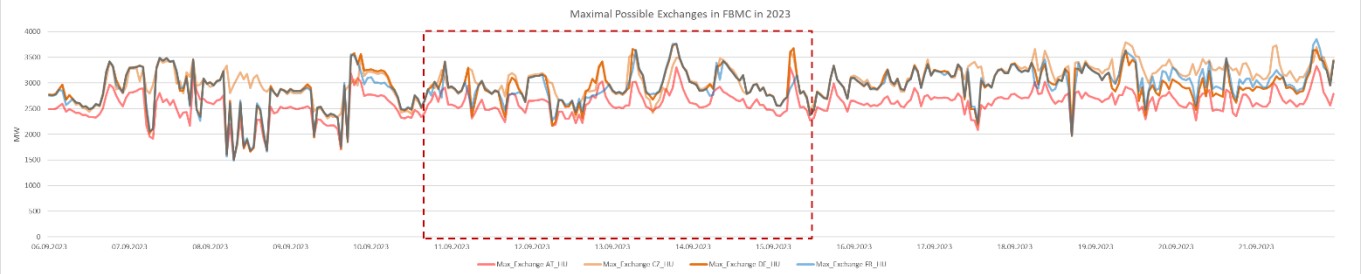
b) Maintenance of the internal Slovakian line V.Dur-Levice(2) 09.09-13.09.2024.

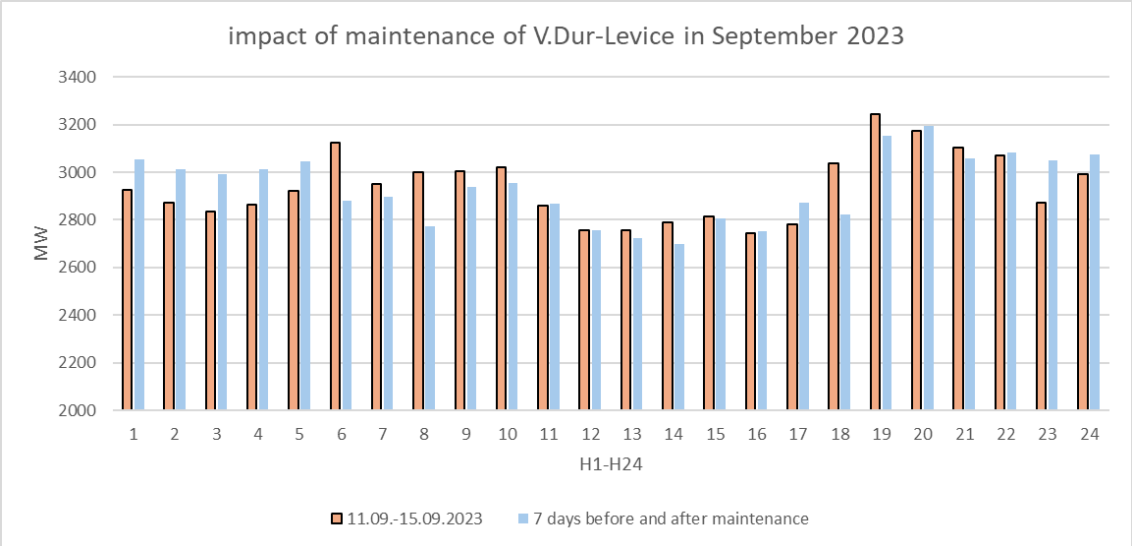
This is a very important maintenance since Levice station is connected to the highly loaded HU-SK cross-border line Levice-God. When one out of two V.Dur-Levice lines is in the maintenance, flow on the 2nd line is much higher which limits imports of Hungary and the whole SEE region.

This year, loading of the 2nd V.Dur-Levice line can be particularly high due to high exports to Ukraine.

V.Dur-Levice line was in maintenance also in September 2023 in the period 11.09.2023-15.09.2023, no visible change in maximal import of Hungarian markets could be noticed in that period.

Still, it is advised not to leave the period of 09.09-13.09.2024 short on settlement since Serbian-Hungarian border will be out of operation and SR>HU NTC will be 0 MW.





c) Maintenances in Slovenia:

Maribor-Cirkovce,	03.09-04.09.2024 (only in the period 07:00-15:00)
Cirkovce – Krško	09.09-13.09.2024 (only in the period 07:00-15:00)
Maribo-Kainachtal (AT-SLO)	11.09-12.09.2024 (only in the period 07:00-15:00)
Tumbri-Krsko (CRO-SLO)	23.09-27.09.2024 and 30.09-04.10.2024

Those maintenances are mostly during sunny hours, so the impact can be even bearish on HU-DE spread since the HU+SEE region will be exporter in sunny hours. Also, those maintenances do not have strong impact on HUPX but rather on CROPEX and BSP(SLO).

d) Maintenance of the Serbian-Hungarian border 09.09.2024-13.10.2024, NTC=0MW

In case of unplanned outages in Hungary, the period 09.09-13.09.2024 can be risky for HUPX since energy can not be delivered to Hungary outside of FBMC mechanism which can be dangerous while V.Dur-Levice is in maintenance.

It is advised not to leave the period of 09.09-13.09.2024 short on settlement since HUPX can be risky in case of unplanned outage of generation in Hungary.

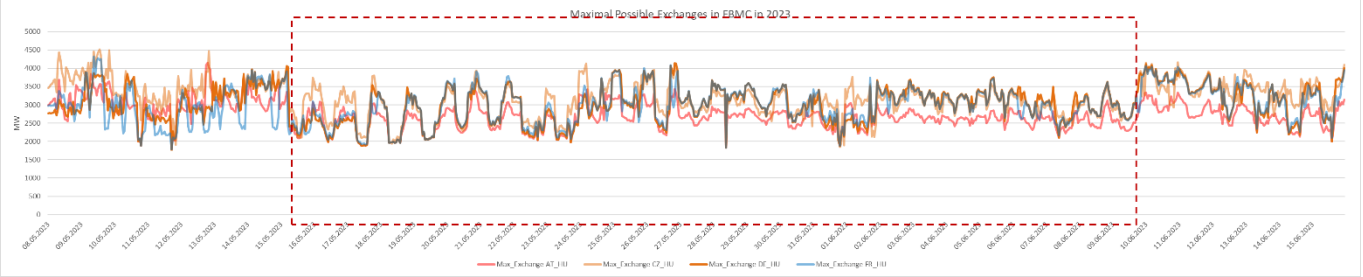
e) HU-SK cross-border lines

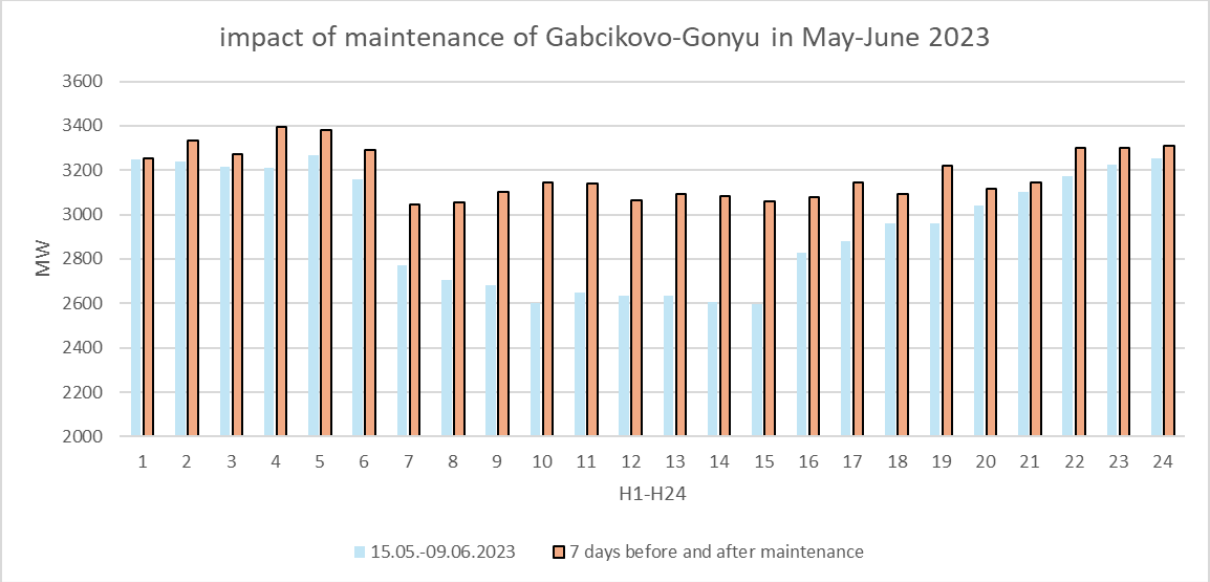
- SK-HU (Gabcikovo – Gonyu) 23.09.2024 – 27.09.2024
  Last time this line was in maintenance in the period 15.05.2023-09.06.2023

- SK internal (Gorna Zdana-Sucany 23.09.2024 – 27.09.2024

When Gabcikovo-Gonyu was in maintenance in May-June 2024, there was a clear decline of grid capacities in FBMC. However, the decline of capacities was mostly in sunny hours which can have a bearish effect on HU-DE spread this year since Hungarian market will be very long in sunny hours and this maintenance could reduce export capacity from Hungary. Also, 500 MW in NPP Paks should be back in operation on 23.09.2024.

There should be no bullish impact of this maintenance on HUPX-EPEX(DE) price spread.





Important maintenances:

Matrai G5 (HU), 224 MW, 26.07.2024-01.11.2024	OUT
Paks G5G6 (HU), 500 MW, 23.08.2024-23.09.2024	OUT
Kostolac B G1 (RS), 349 MW, 07.05.2024-25.09.2024	OUT
TENT A G2 (RS), 210 MW, 28.05.2024-24.09.2024	OUT
TENT A G3 (RS), 329 MW, 25.08.2024-23.10.2024	OUT
Paroseni (RO), 130 MW, 31.08.2024-29.09.2024	OUT
Bucuresti S G3 (RO), 84 MW, 02.09.2024-16.10.2024	OUT
Galabovo G1 (BG), 343 MW, 04.08.2024-03.09.2024	OUT
Bobov Dol G2 (BG), 190 MW, 08.07.2024-08.09.2024	OUT
Galabovo G2 (BG), 343 MW, 07.09.2024-29.09.2024	OUT
Korintos Power (GR), 433 MW, 23.08.2024-07.09.2024	OUT
Lavrio G5 (GR), 377 MW, 26.08.2024-10.09.2024	OUT
Lavrio G4 GT01 (GR), 183 MW, 11.09.2024-17.09.2024	OUT
Lavrio G4 GT02 (GR), 183 MW, 18.09.2024-22.09.2024	OUT
Lavrio G4 GT03 (GR), 183 MW, 23.09.2024-27.09.2024	OUT
Alouminio ST (GR), 334 Mw, 05.09.2024-12.09.2024	OUT
NPP Mochovce TG21, 22 (SK), 470 MW, 07.09.2024-26.09.2024	OUT

<u>Lines maintenances:</u>

GR-AL (Kardia – Zemblak) 15.09.2024 – 05.10.2024

RS-HU (Subotica – Sandorfalva) 09.09.2024 – 13.10.2024 – NTC 0 MW

RS-HR (S. Mitrovica – Ernestinovo) 02.09.2024 – 06.09.2024 – NTC 0 MW

BA-ME (Trebinje – Perucica) 09.09.2024 – 13.09.2024 – 220 kV line

BA-ME (Sarajevo – Piva) 17.09.2024 – 19.09.2024 – 220 kV line

BA-HR (Prijedor 2 – TE Sisak) 25.09.2024 – 26.09.2024 – 220 kV line

BA-HR (Prijedor 2 – Medjuric) 27.09.2024 – 23.10.2024 – 220 kV line

RO-BG (Rahman – Dobrudja) 16.09.2024 – 27.09.2024

RO-BG (Stupina – Issacea) 19.08.2024 – 06.09.2024

RO-HU (Arad – Sandorfalva) 26.08.2024 – 06.09.2024

NMK – KS (Skoplje 2 – Urosevac) 01.09.2024-30.09.2024 – NTC 0 MW

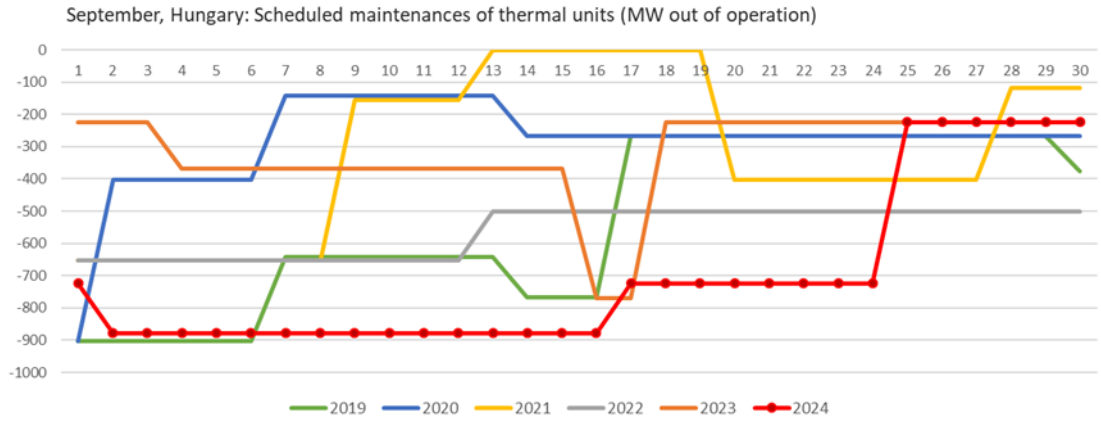
SK-CZ (Varin – Nosovice) 16.09.2024 – 20.09.2024

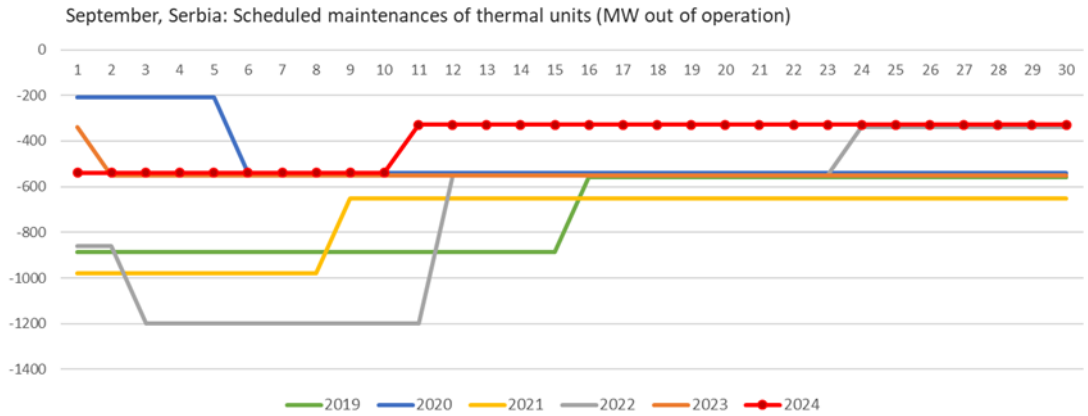
SK-CZ (Varin – Nosovice) 29.09.2024

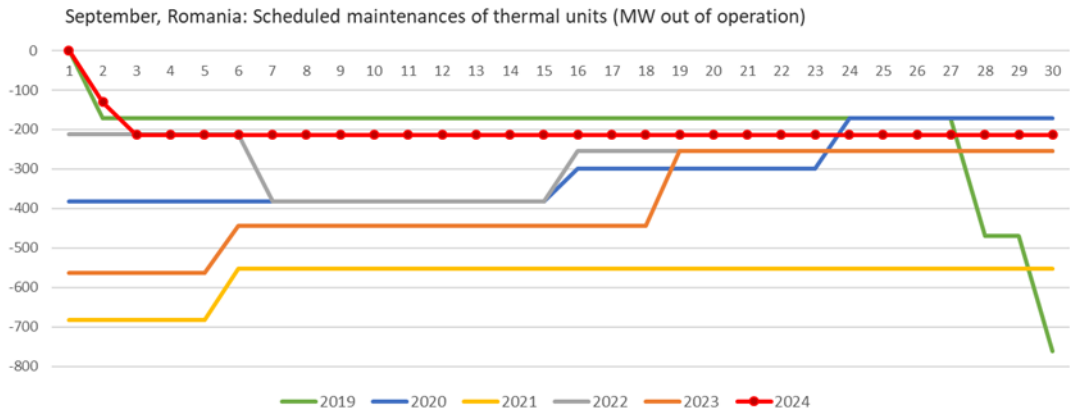
SK-HU (Gabcikovo – Gonyu) 23.09.2024 – 27.09.2024

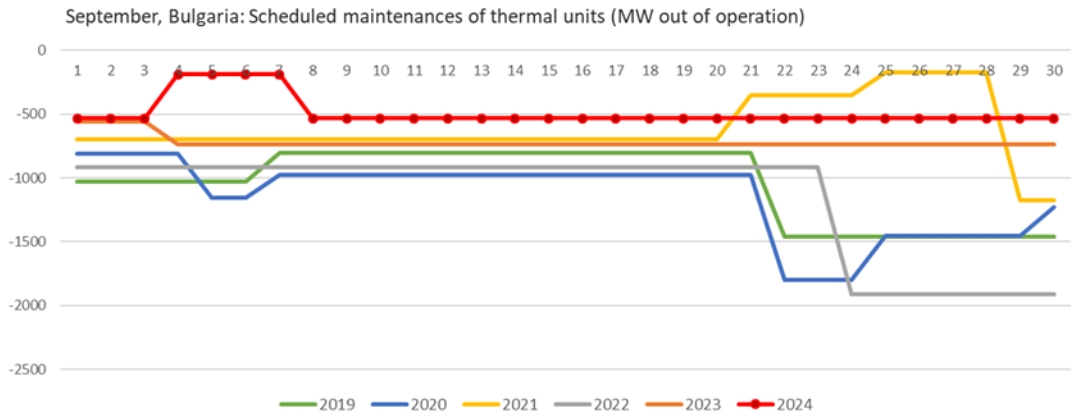
BG-TR (Maritsa Iztok 3 – Hamitabat) 09.09.2024 – 13.09.2024 (NTC reduced)

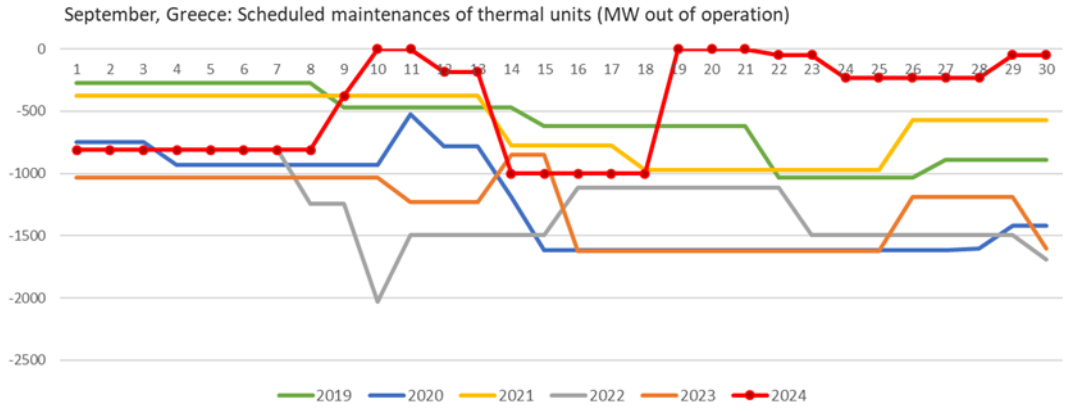
BG-TR (Maritsa Iztok 3 – Hamitabat) 16.09.2024 – 21.09.2024 (NTC reduced)






September, Romania: Scheduled maintenances of thermal units (MW out of operation)
0
-100
-200
-300
-400
-500
-600
-700
-800
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
2019 2020 2021 2022 2023 2024

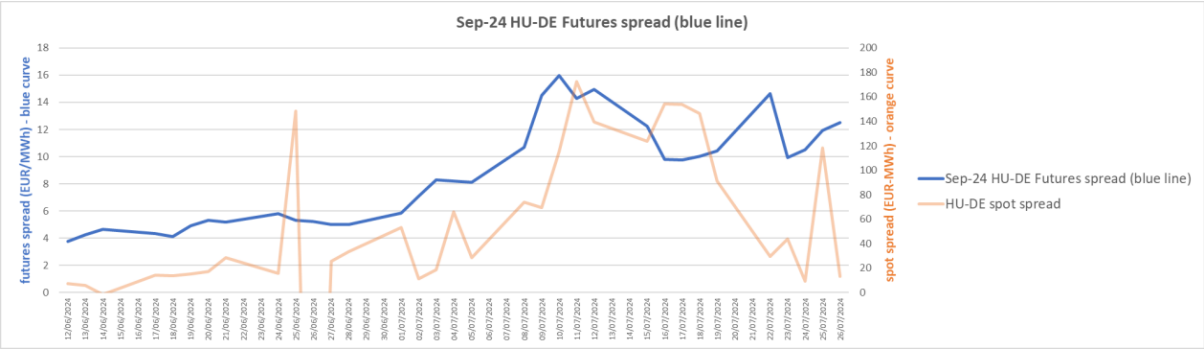

September, Bulgaria: Scheduled maintenances of thermal units (MW out of operation)
0
-500
-1000
-1500
-2000
-2500
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
2019 2020 2021 2022 2023 2024


September, Greece: Scheduled maintenances of thermal units (MW out of operation)
0
-500
-1000
-1500
-2000
-2500
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
2019 2020 2021 2022 2023 2024

CONCLUSIONS FOR SEPTEMBER 2024

- Short trading position on Hungarian market is advised for September, however 1st two weeks of September can have increased risks of HUPX price spikes caused by maintenances in the transmission grid. Therefore, 1st two weeks should not be left short against settlement if it is possible to close them on the forward market.
- Short HU vs. long DE spread can be risky since long DE position can be risky on settlement in case of windy September. Therefore, part of the trading position should be made as short HU vs. long ITA trade spread.
- There are several main arguments for making short position for September 2024.
- However, since it was shown that high spot settlement of HUPX-EPEX(DE) spread push also September futures up it might not be the best moment to make short position for September immediately.
- The rest of August is expected to have highly above average temperatures while futures for weeks of August are relatively low priced. There is a high probability that August spot HUPX-EPEX(DE) settlement is significantly above forward market expectation. Experience shows that high spot HUPX-EPEX(DE) spread has a strong impact on futures HU-DE spread for the front month. Therefore, it can be expected that futures HU-DE spread for August will be going up in the next 2-3 weeks.

Diagram below shows that fear fueled by rising spot HUPX-EPEX(DE) spread settlement was pushing futures HU-DE spread for September up. There were no additional information published related to September in the last 3-4 weeks but still September futures spread went up from 5 EUR/MWh on 10-14 EUR/MWh, just based on spot market sentiment during July.



The main arguments for making short position for September 2024 are the following:

Argument 1: Consumption will drop so much that there will be no need to activate high-priced part of selling offers of the Greek market (last 2000 MW of the Greek market selling curve) and the most expensive offers in the merit order of other markets. This will reduce the risk of high price settlement on all markets of the HU+SEE region.

Argument 2: HUPX-EPEX(DE) spot spread in sunny hours will be negative. This will support lower settlement of the average HU-DE spread during September

Argument 3: Although import needs of Hungarian market will be as high as in July, transmission grid conditions in September should be better than in July and August so there should be no price spikes of HUPX above other markets of SEE region.