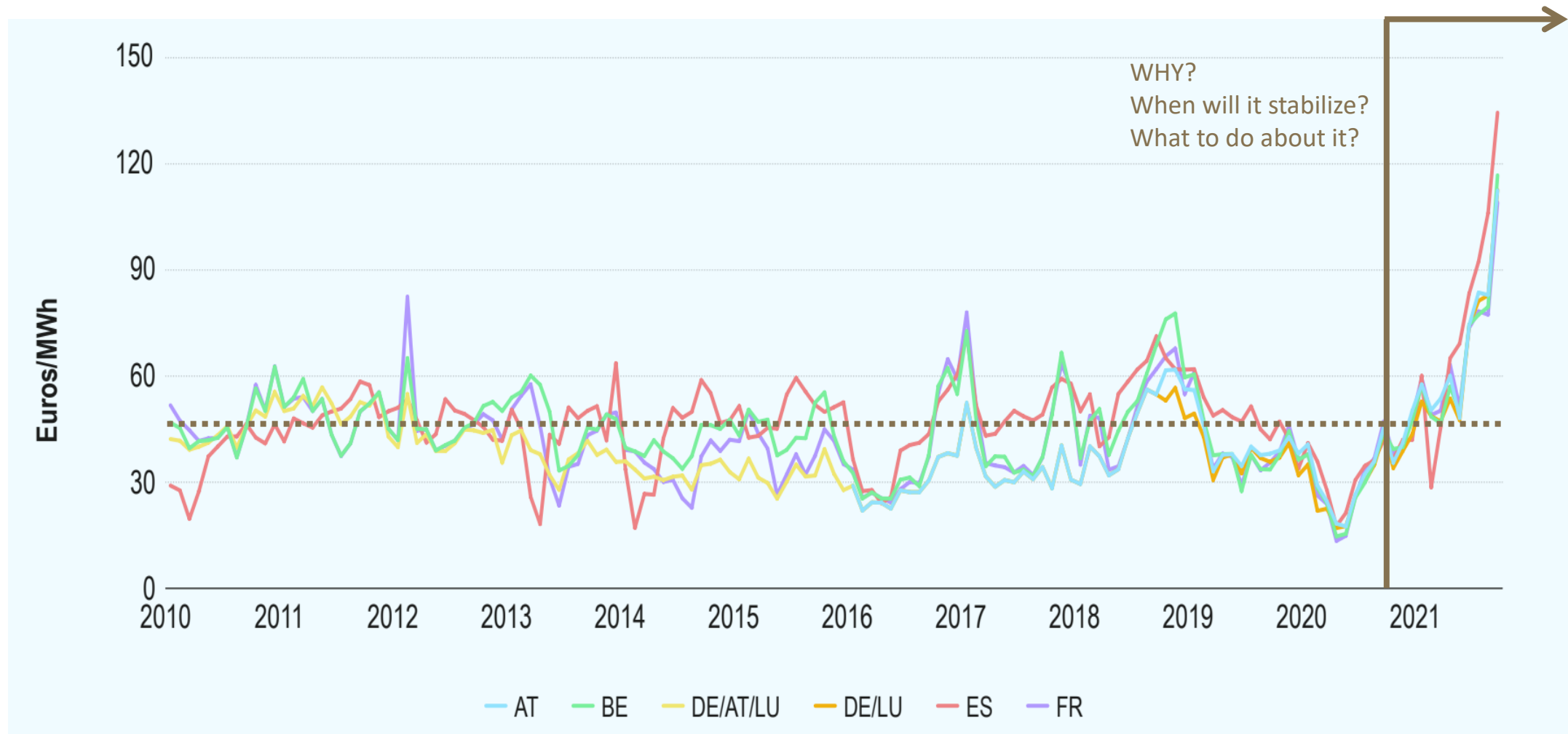




EU'S HIGH ENERGY PRICES OF 2021 – CAUSES AND POLICY IMPLICATIONS FOR ELECTRICITY SECTOR

Dubravko Sabolić, 10 Dec. 2021

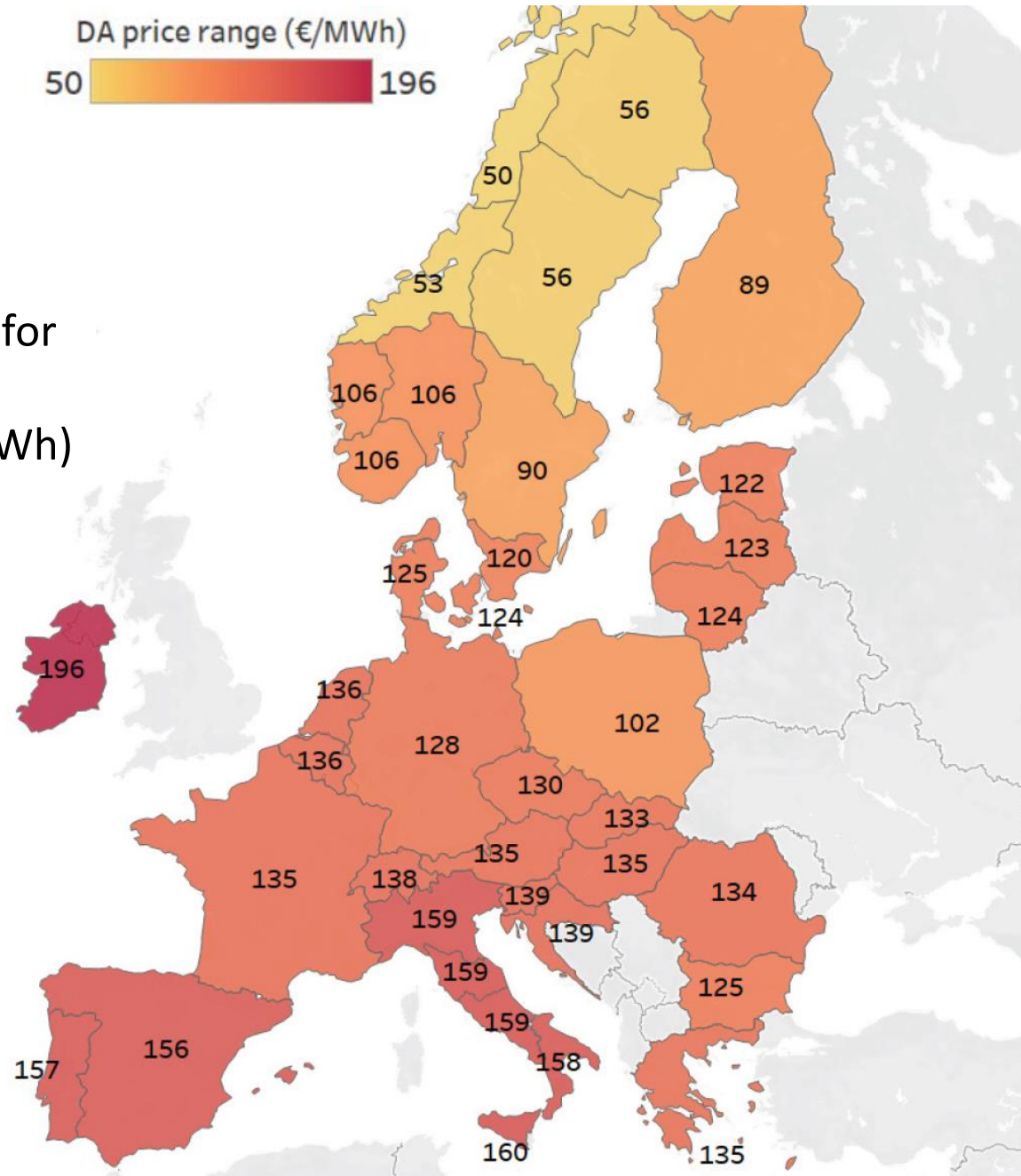
Intro...



Source: ACER/CEER Market Monitoring Report 2020

Sept. 2021




Average electricity prices for bidding zones in the EU:
September 2021 (EUR/MWh)

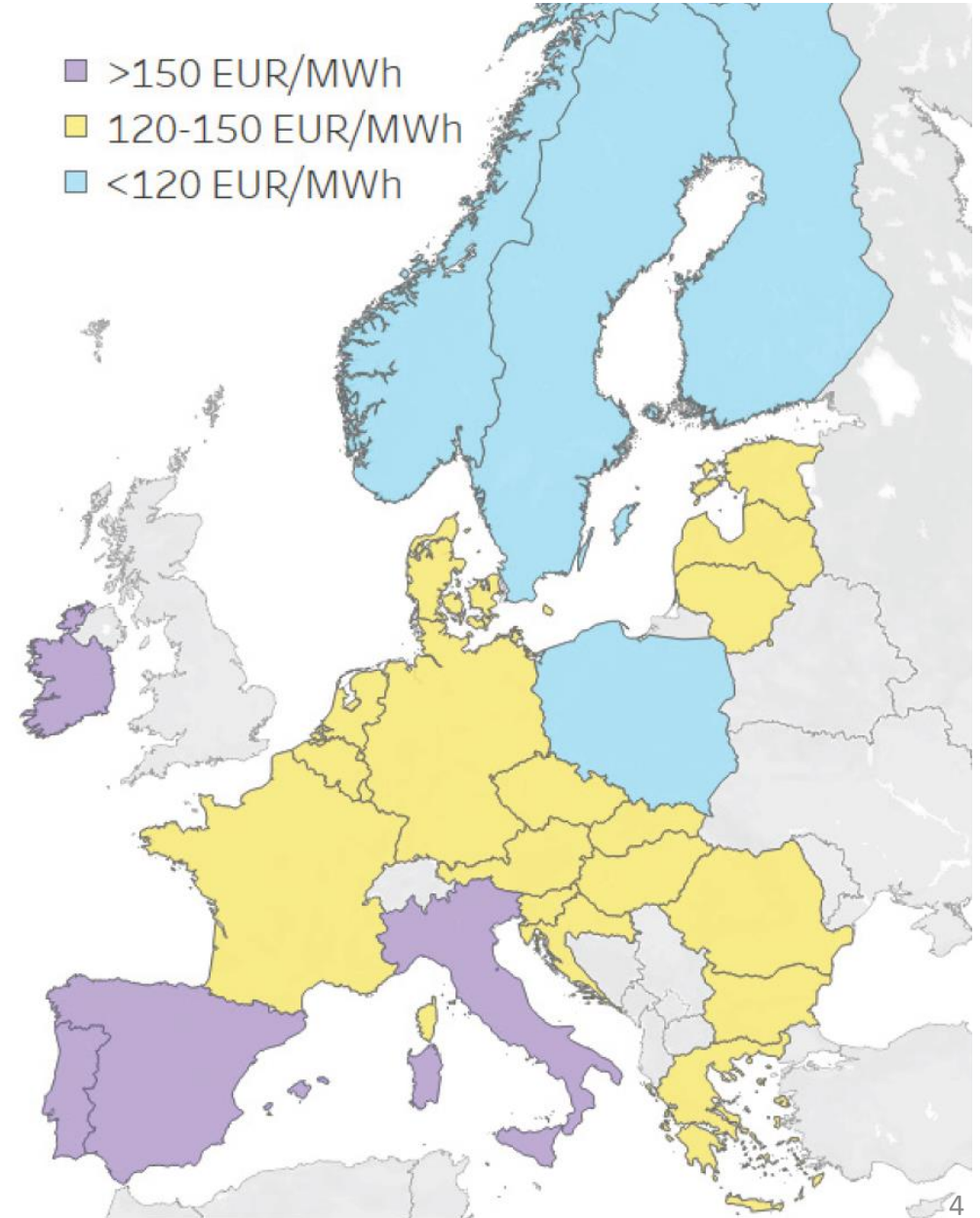


Source: ACER, based on ENTSO-E data

Three group of countries



		Main characteristics of the Member States pertaining to the group	Average day-ahead prices (EUR/MWh)	Electricity demand covered with gas (%)
Group 1		Highly gas-dependent and/or limited interconnected countries	167	34
Group 2		Moderately gas-dependent and/or well interconnected countries	132	14
Group 3		Limited gas-dependent countries	89	3



Source: ACER, based on ENTSO-E data

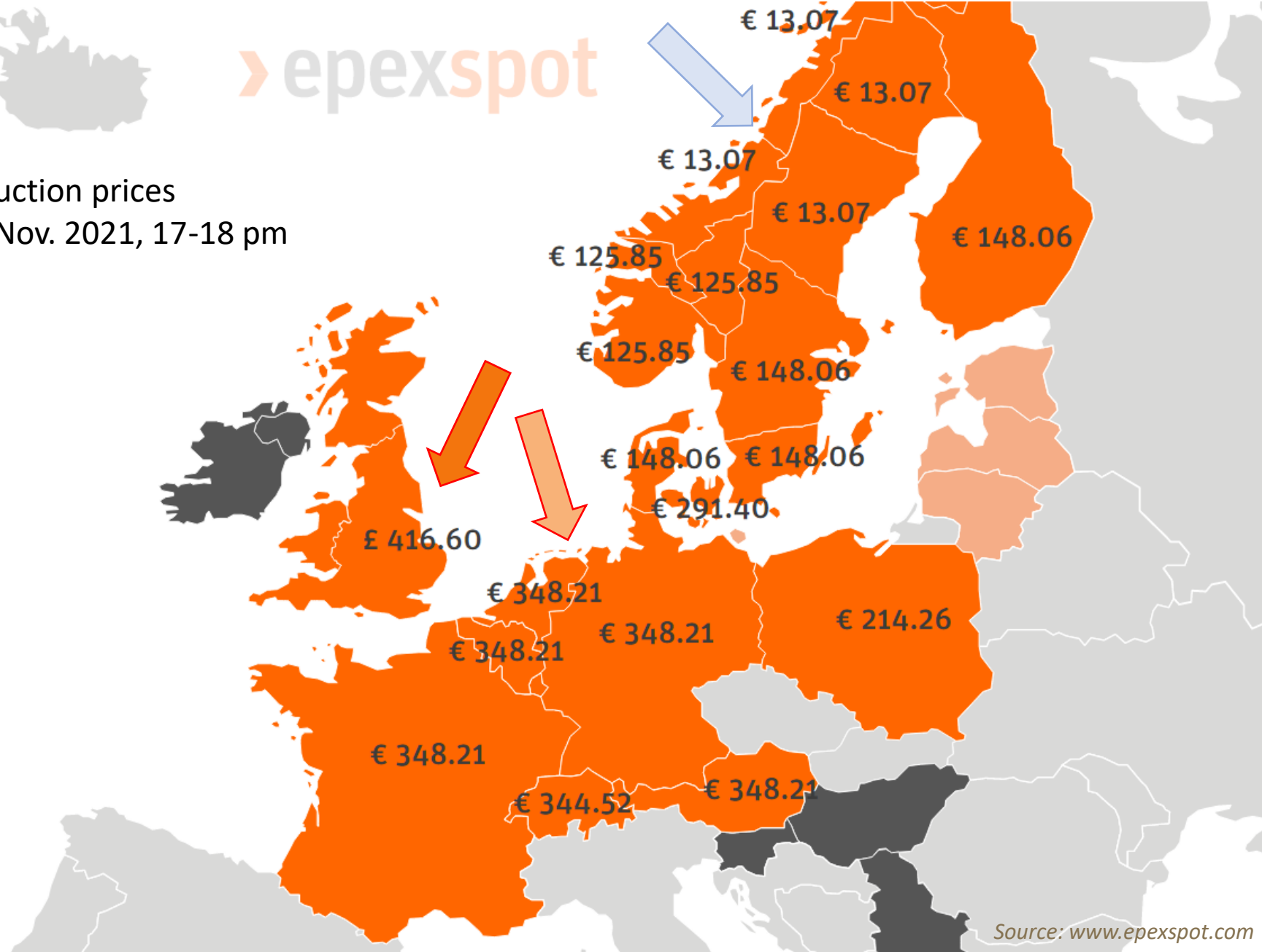
Current state (a week before the conference)



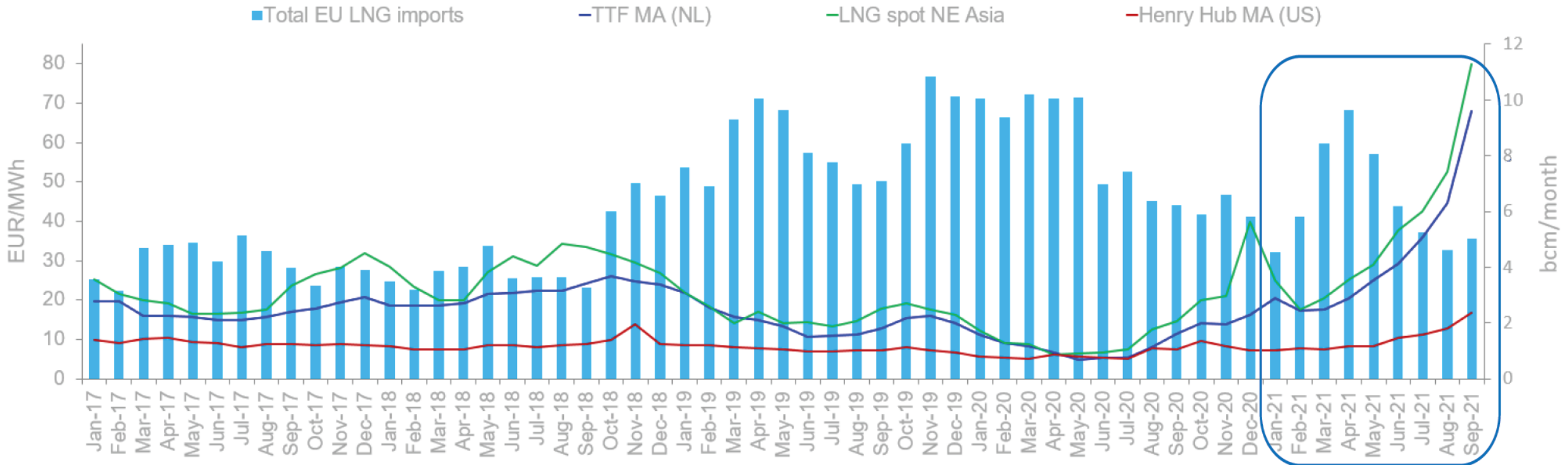
> epexspot

Day-ahead auction prices

Delivery: 23 Nov. 2021, 17-18 pm



LNG prices and imports in the EU, 2017-21



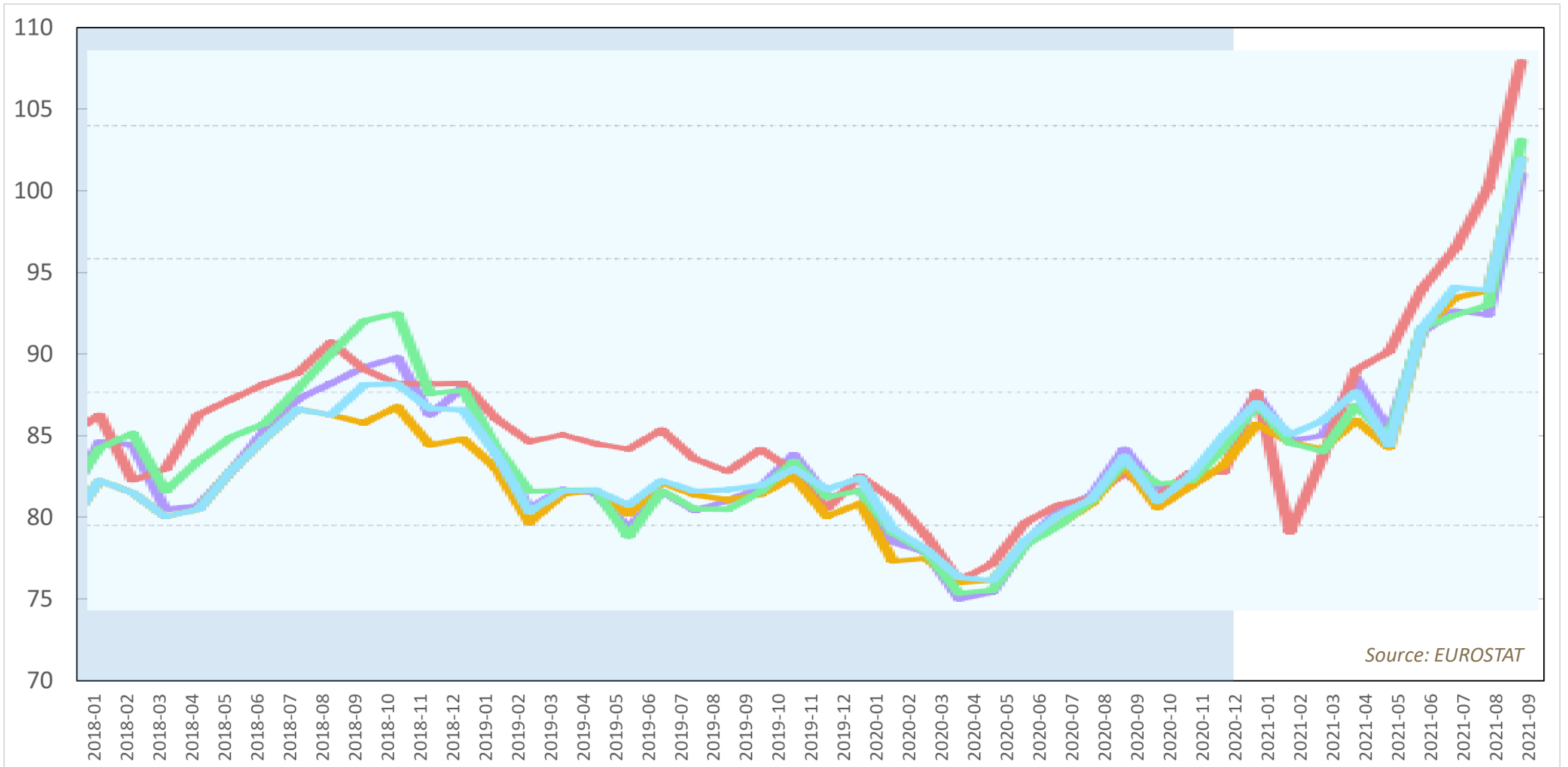
Source: ACER based on ICIS Heren and GIE

Note almost perfect coupling between the Dutch trading platform LNG prices and electricity prices.

Contributing factors

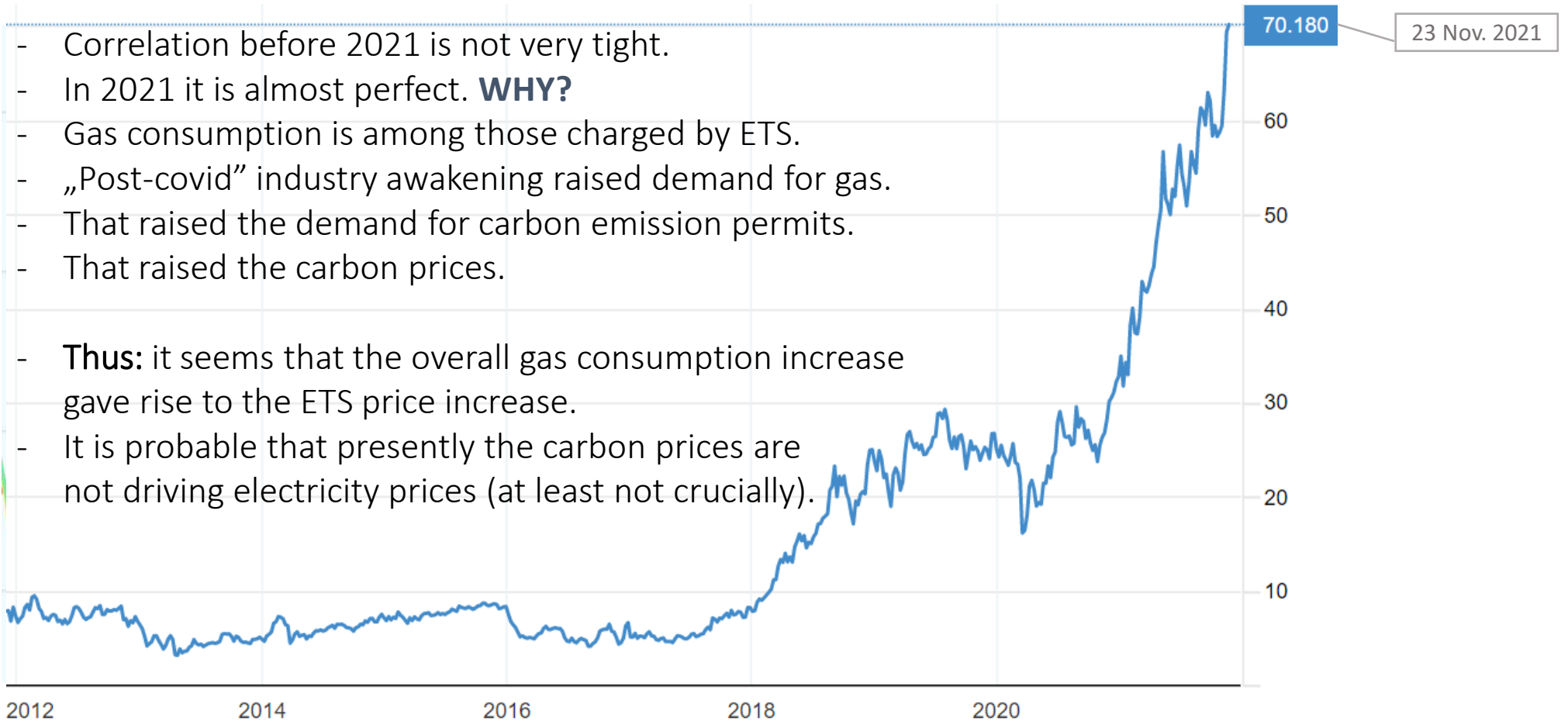
- „Post-covid” economy acceleration => growth of demand for gas.
- What about the ETS prices of CO₂ emissions?
- Was the year 2021 significantly less rainy / windy / sunny than the previous ones?
- Was the summer 2021 significantly warmer than the previous ones?
- Was (is) the winter 2021 significantly colder than the previous ones?

Post-covid economy acceleration



Source: EUROSTAT

EU Carbon permits – prices in € per ton



- Correlation before 2021 is not very tight.
- In 2021 it is almost perfect. **WHY?**
- Gas consumption is among those charged by ETS.
- „Post-covid” industry awakening raised demand for gas.
- That raised the demand for carbon emission permits.
- That raised the carbon prices.

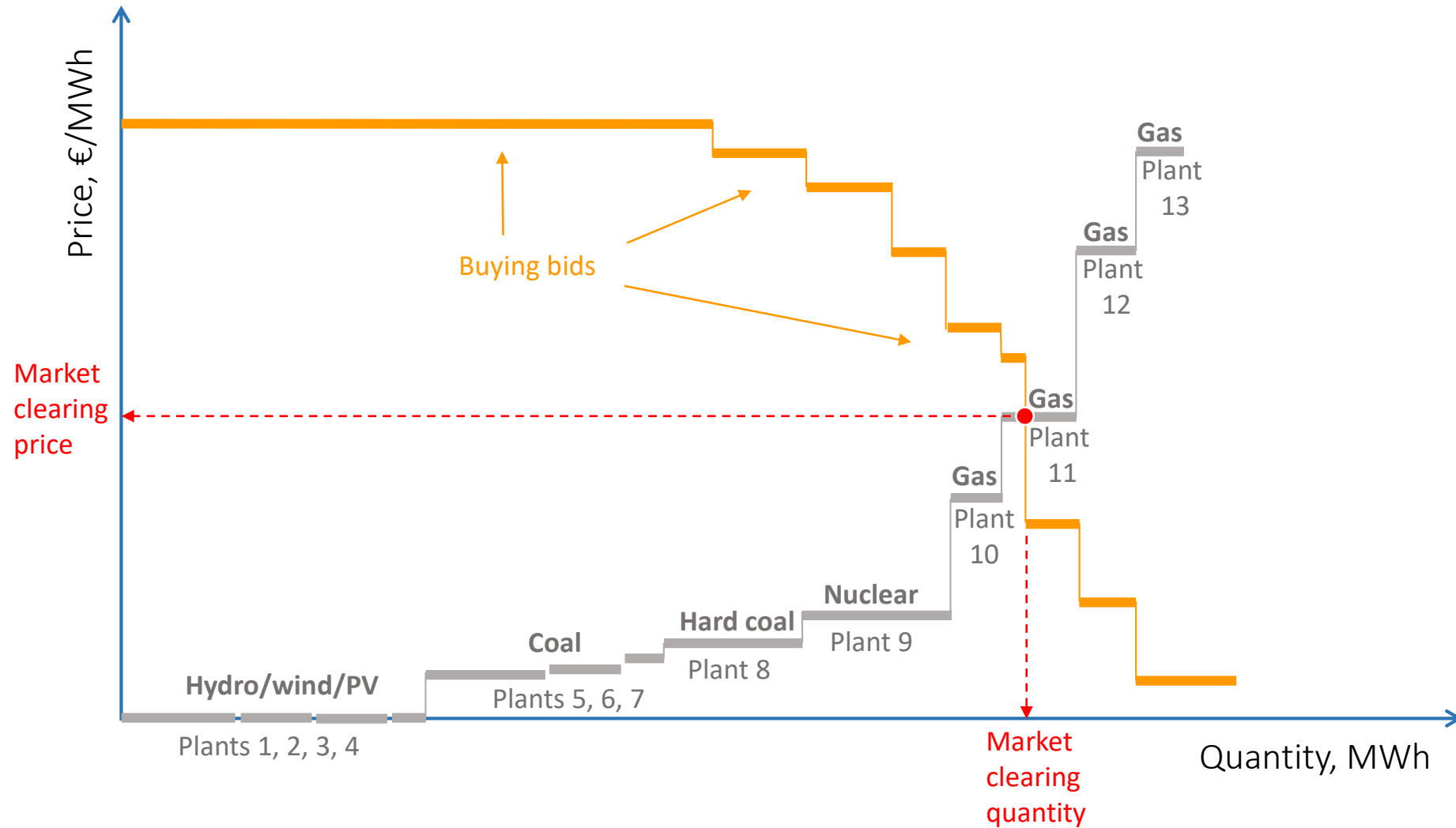
- **Thus:** it seems that the overall gas consumption increase gave rise to the ETS price increase.
- It is probable that presently the carbon prices are not driving electricity prices (at least not crucially).

Source: www.tradingeconomics.com

Why is gas still the key electricity price driver?

- Electricity is traded as a homogeneous commodity at „energy-only” markets, where bids are based on short-term marginal cost of production.
 - Other products of power plants are traded at separate (although economically coupled) markets.
 - Reserved capacities for ancillary services or market balancing.
- Markets for „energy-only”:
 - Forward markets (futures; non-standardized forward contracts)
 - 24 hourly „markets” a day, often day-ahead
 - Intra-day („real-time” markets, „balancing markets”, last before delivery)

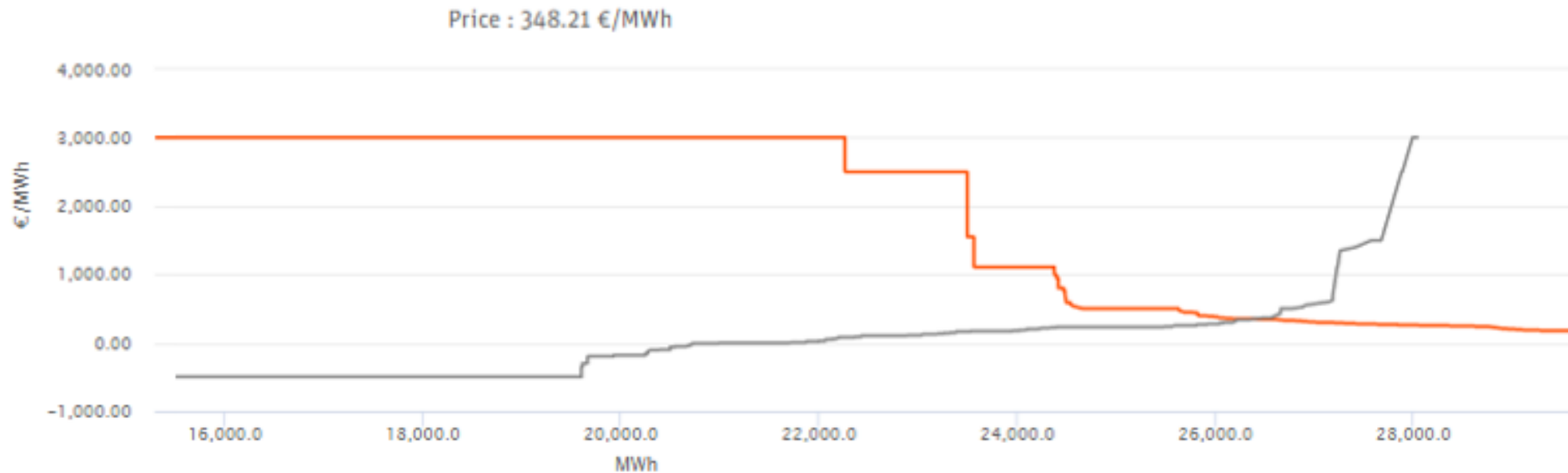
Economic dispatching v. production technology



Example: a real power exchange

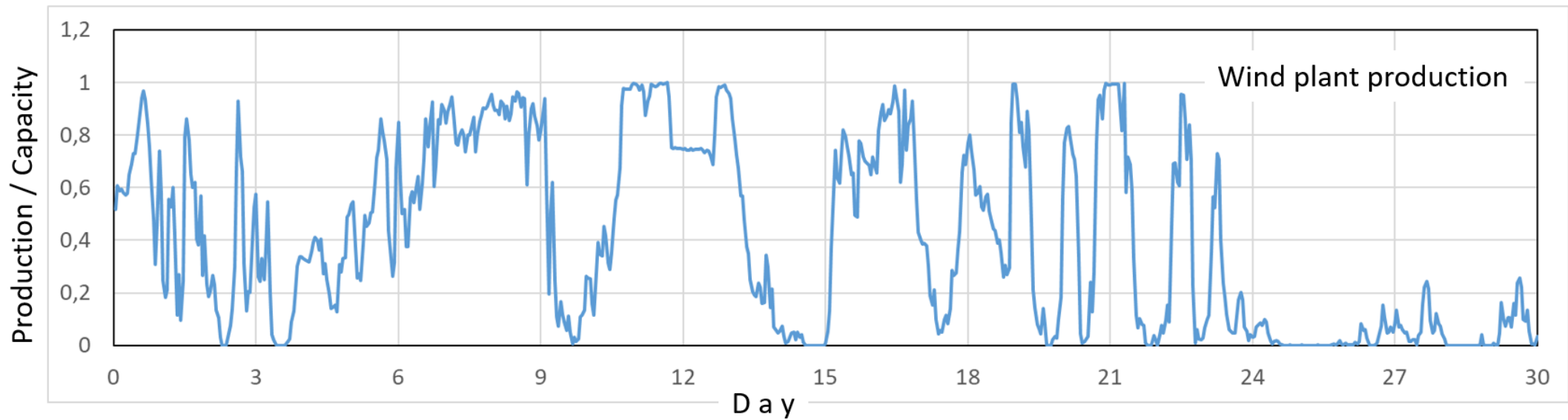
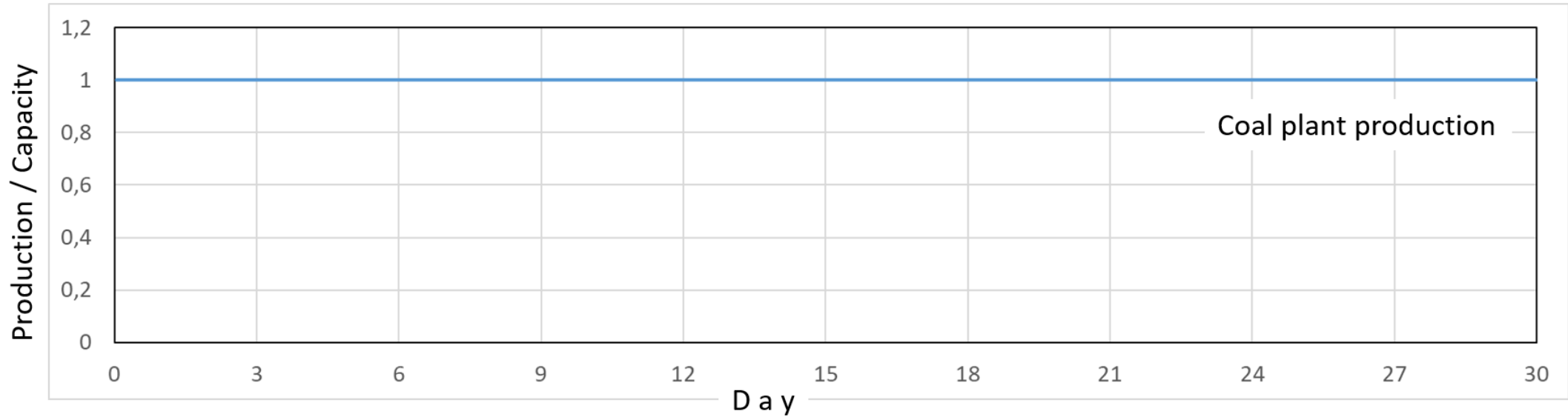
Auction > Day-Ahead > 60min > DE-LU > 23 November 2021

Last update: 22 November 2021 (13:02:58 CET/CEST)

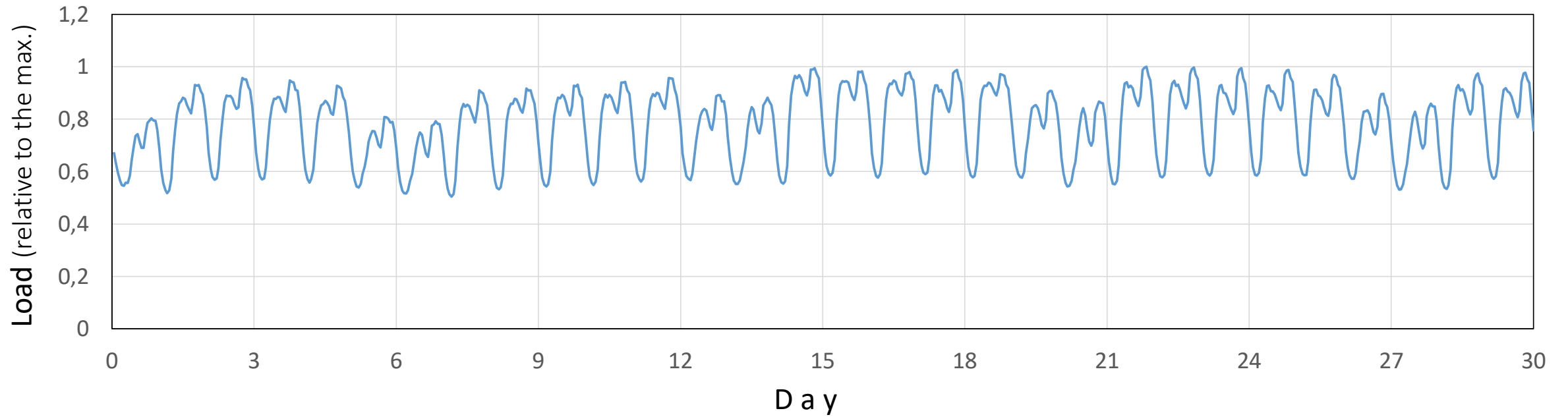


Source: www.epexspot.com

Intermittency



Demand side variations



Main properties of the electricity as a commodity

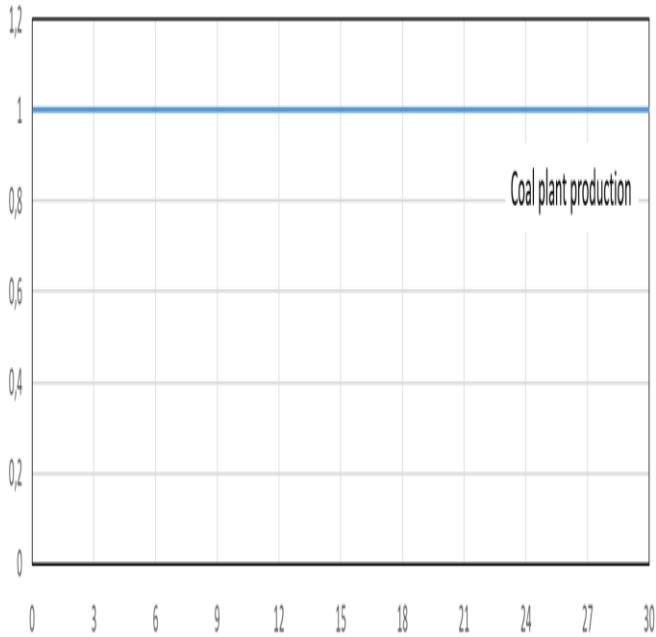
Total production + Total net imports = Total consumption

at all times

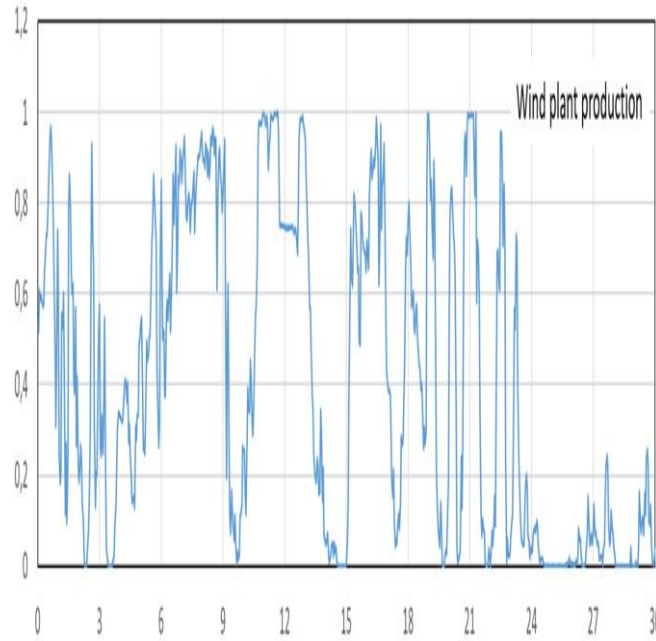
while keeping the frequency and voltage inside tight margins

- Technical network constraints must be kept
- Electricity cannot be stored (must be converted into another form)
- At the time of delivery - consumers draw as much energy as they want;
- new RES produce as much energy as God wants

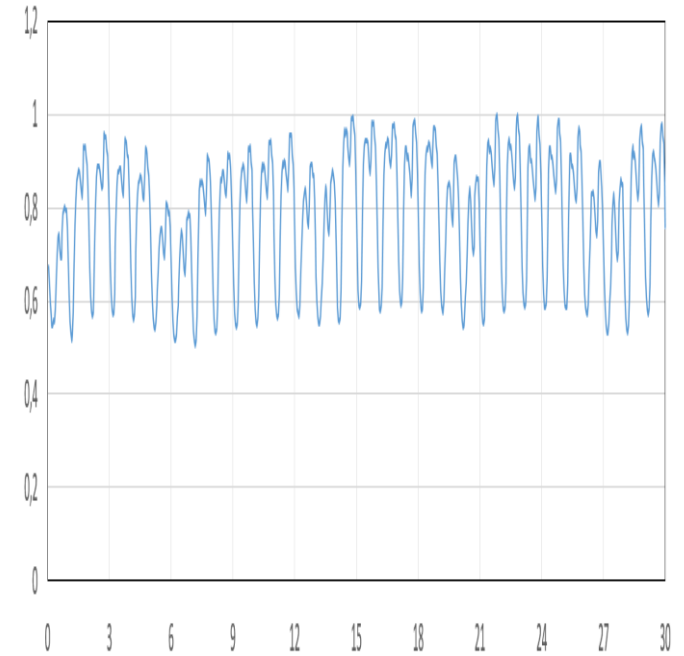
T h u s , . . .



+



=



?

How can this be?
What is missing in the equation?

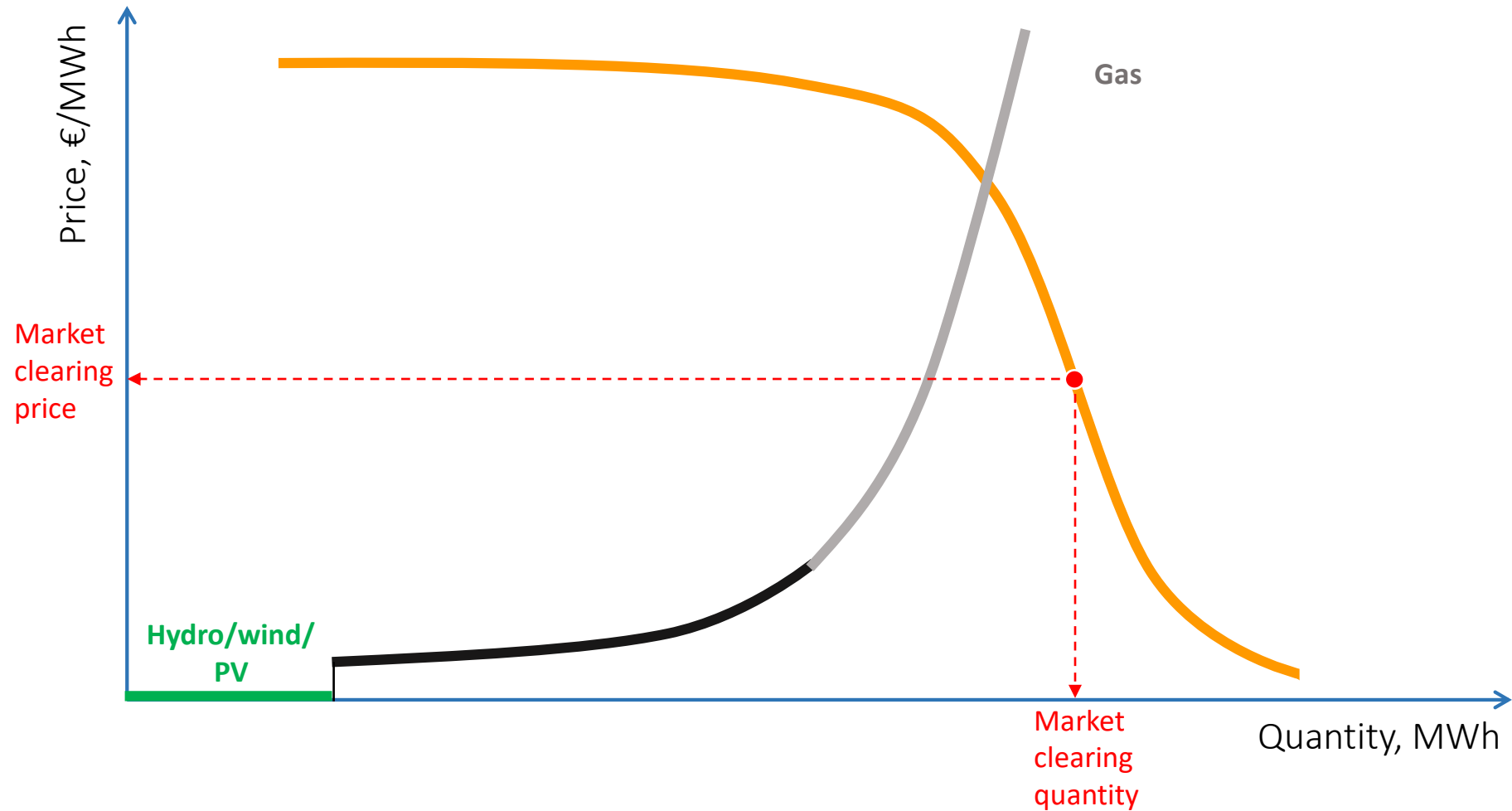
?

- Market balancing (to the best available predictions)
- Ancillary services (the rest)

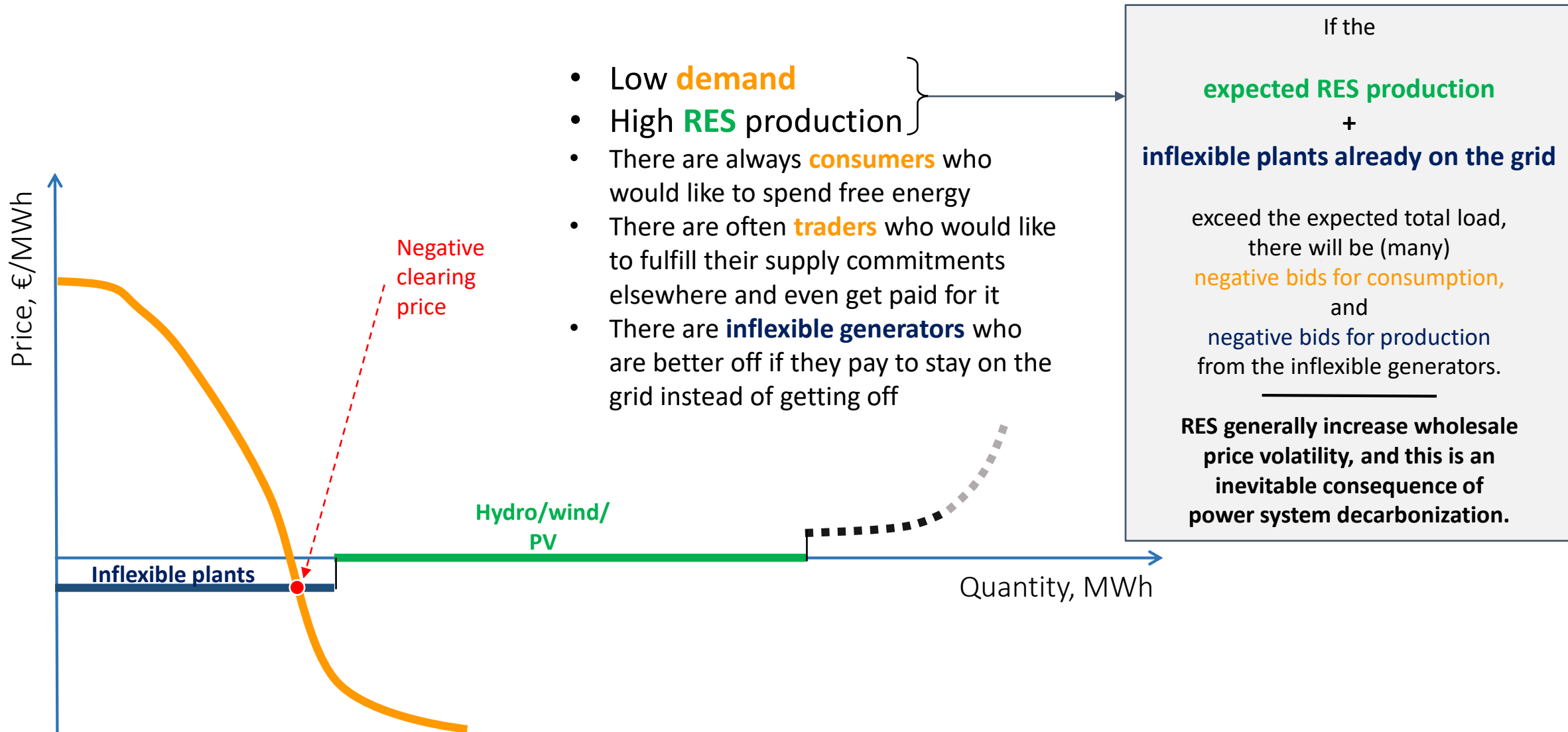
}

Often provided by gas-fired plants

Price setters and the effects of generation/load variability



A „new” phenomenon – negative prices

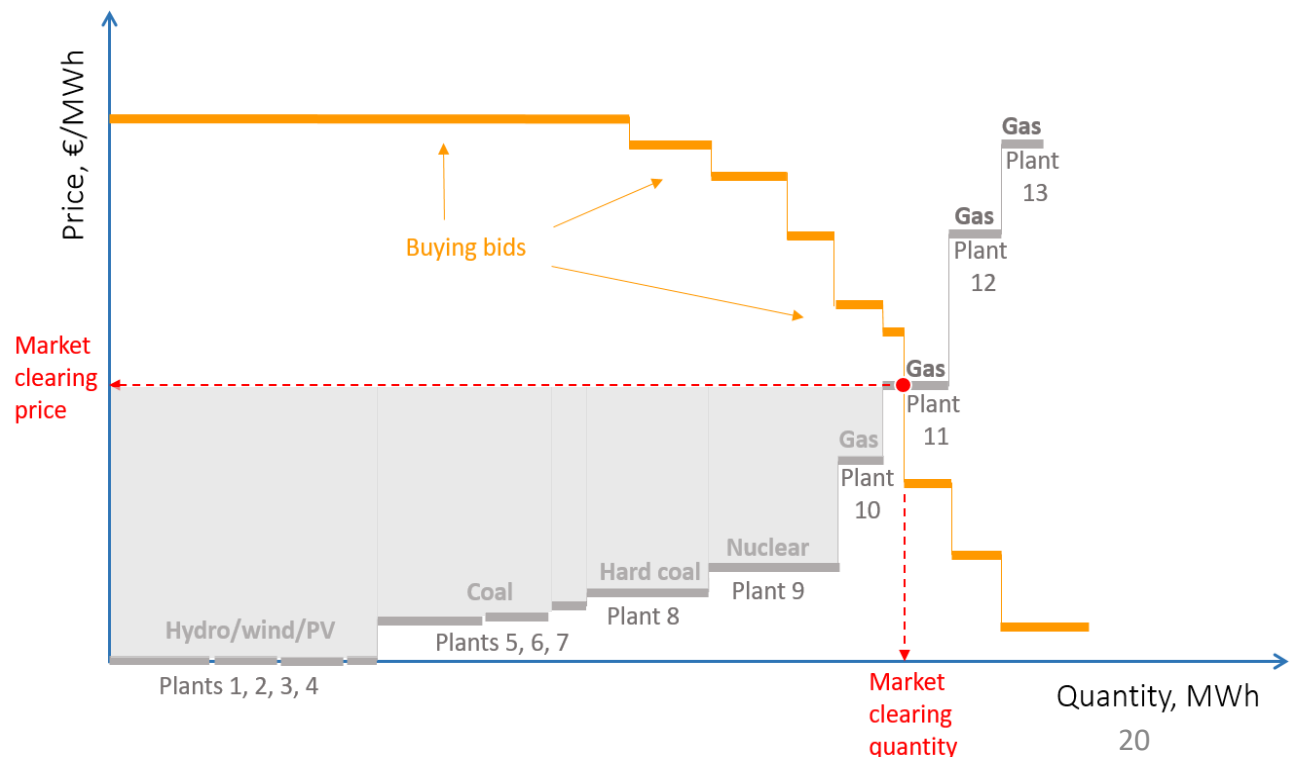


Example: French market, 16 Jun. 2013



Who sets the electricity price?

- Market price equals the marginal cost of producing one additional MWh in a given hour.
- So, it is the marginal cost of production of the currently most expensive dispatched generator.
- The grey-shaded operating profits accumulate over time to cover fixed costs (see pic.)
- Observe:
 - The marginal plant has no oper. profit.
 - Near-zero plants (RES) crowd out the other technologies.
 - However, the peakers are a must-have for the power system stability.
 - Gas plants do not necessarily produce much energy, but often set the prices.



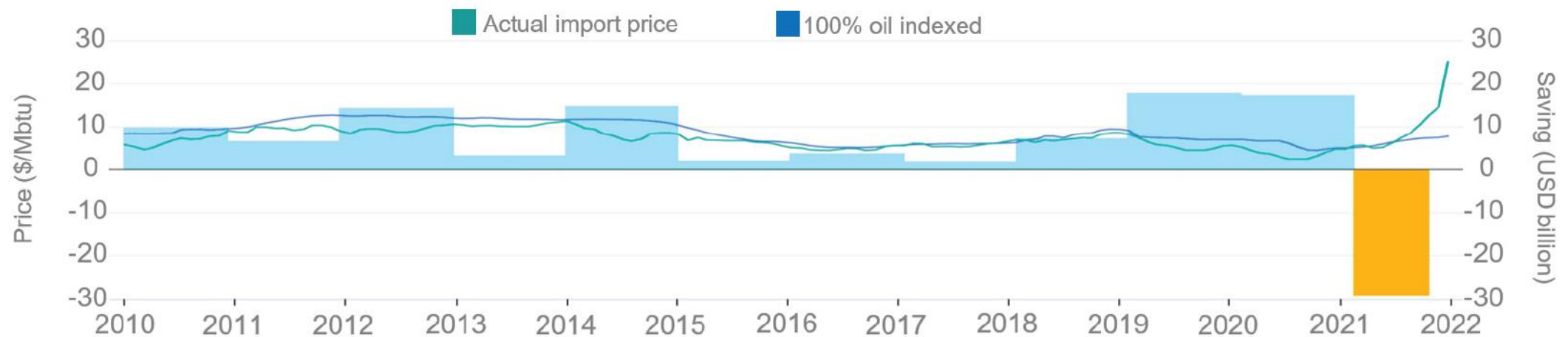
The problem of long-term incentives

- Crowding-out due to RES will keep reducing the working hours of gas plants.
- As they are most usually peakers, they have small short-run operating profits, either way.
 - IEA assessed that until 2030 the gas consumption for electricity production will decrease by 10%, relative to 2020.
 - However, the demand for their operational flexibility is to grow by some 15% because of increasing intermittency.
- In the following decades the intermittency problem **will inflate**.
- So, is it possible, at all, to oust the natural gas from the power sector?
- The solution can come in the form of renewable gases, such as hydrogen.
- However, it will take a lot of time and investments.
- Will the fixed costs be as low as in the case of today's gas-firing plants?

But, why the gas crisis now?

- EU policy of deliberate orientation to LNG hub-based trading instead of long-term oil-indexed purchasing agreements is now being questioned
- Now: 80% of EU gas consumption via hub-trading
- The IEA asserts that since 2010 the EU saved about €70bn due to lower prices compared to the oil-indexed regime; however, in 2021 only the losses were €30bn
- An obvious question: is the EU altogether too dependent on gas?
What is the strategic position towards Russia?

Or is it just a rationalization leading to a denial?



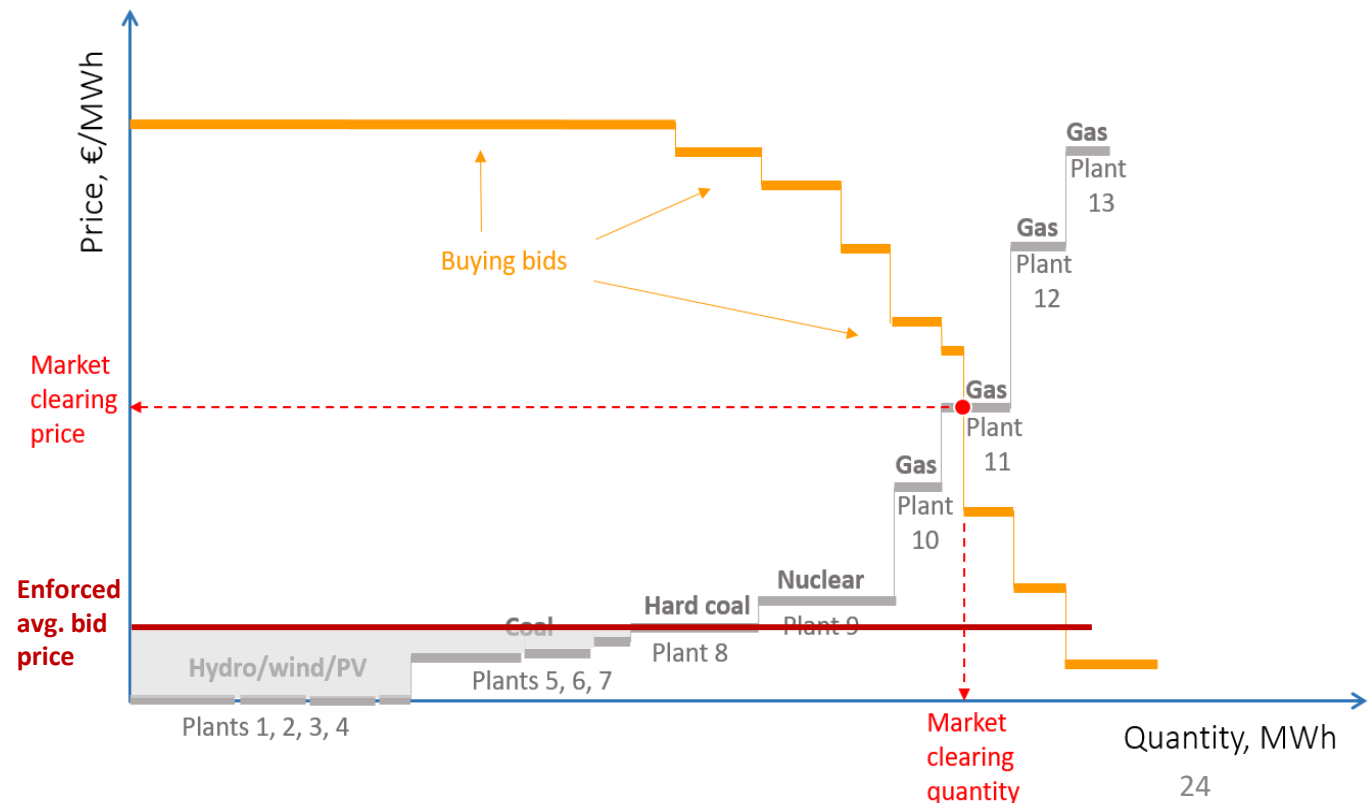
Source: ACER, based on IEA calculations

Russian wrongdoing?

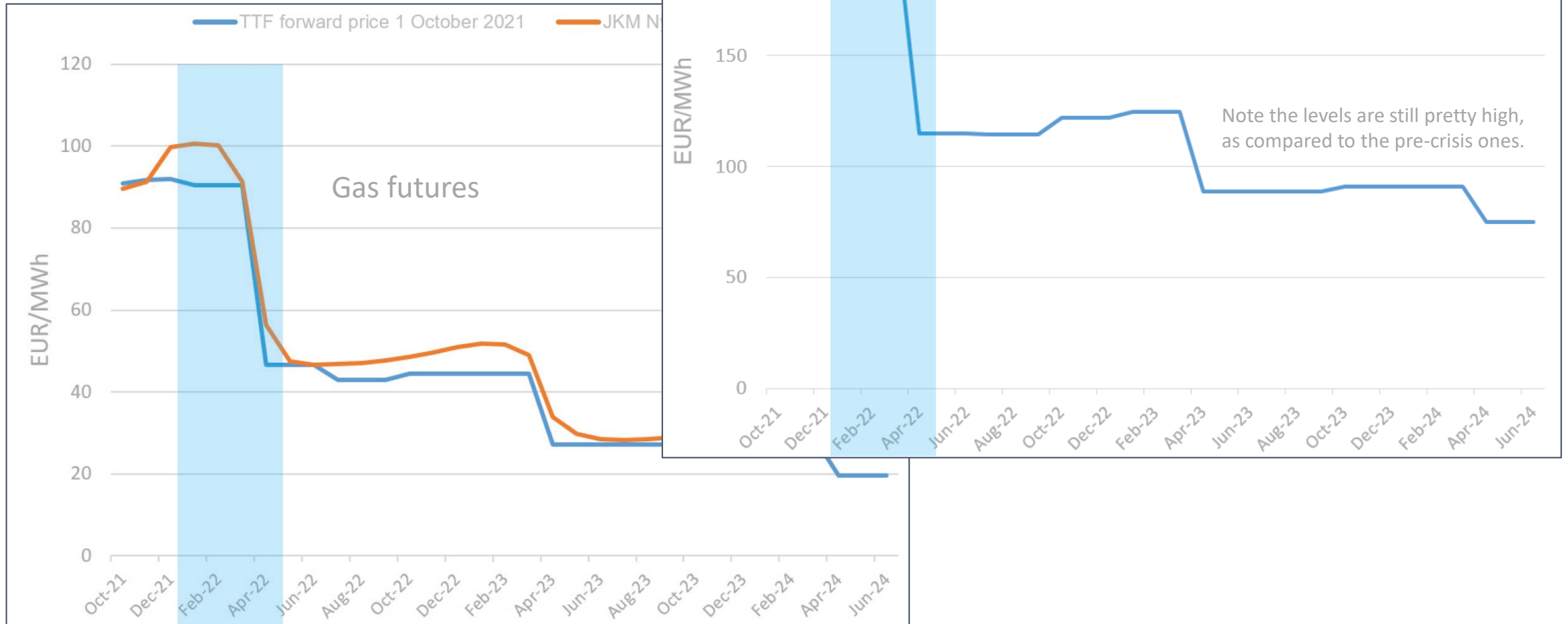
- No obvious market manipulation from the Russian side...
 - Some people point fingers at the missing Gazprom reaction to high prices from Asian LNG markets.
 - However, in the same period Russian domestic consumption saw a 12% increase, and exports to China and Turkey significantly increased (pipelines, LNG ships).
 - Gazprom, that holds about 35% share in total gas imports into the EU, did increase supply to the EU by about 5% YoY.
 - Gazprom's reluctance to purchase more short-term transmission capacities to maintain/increase flows through Ukraine and Poland raised questions about linkages to the politics around the entry into operation of the Nord Stream 2.
- Whatever happens next with gas supply in the EU, it will always lead to discussions about the EU dependence on Russian gas, and the overall EU policy in that sector.

Debate on electricity market design

- There is an ongoing debate in Brussels whether the current electricity market design contributed to the increase of electricity prices.
 - Proposals to switch to *average bid* pricing method:
 - Some EU bureaucrats *think* it would be better to introduce as a regulatory rule that the electricity is to be priced below the market clearing price. → Populism?
- However insane the proposal was, it has been mentioned in official papers.
 - It would drive out of business most of the non-RES, and destroy market value for RES.
- Luckily, the ACER and (hopefully) the EC stand in defense of the current system.
- Current market design in the EU is not perfect, at all, but THAT part (marginal pricing of energy-only, plus [still developing] markets for capacities) is actually OK.



The way out, short-term



The way out, long-term: The conclusions

- The EU green transition:
→ driving **out fossil fuels** from the electricity production **until 2050**.
- That includes natural gas, as well.
- It can ease Europe's heavy strategic problems with:
 - gas import dependency
 - energy import dependency in general
- However, the gas plants are and will continue to be **absolutely essential** for the power system stability with high share of renewable sources.
- The economy of long-term investments must not be destroyed for populist reasons.
- The technological change to other sources of **flexibility** still isn't quite on the way, but it is promising.
- Meanwhile, the investments in the power system will have to be **carefully coordinated**.
- Will the free-market mechanisms suffice – reminds to be seen.
- Personally, I don't believe they will.

THANK YOU ALL! I AM HAPPY TO HEAR YOUR QUESTIONS/DISCUSSIONS.