The European Electricity Market: time to reboot?

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An *efficient* European electricity market

Multiple objectives =

continuous availability of electricity at affordable prices

while respecting environmental concerns: green energy!

⇒ **How *much* could/should the European electricity market be changed?**

Energy crisis = Soaring energy bills

The European Power Benchmark was 339 €/MWh on average in Q3 2022, 222% higher on a yearly basis

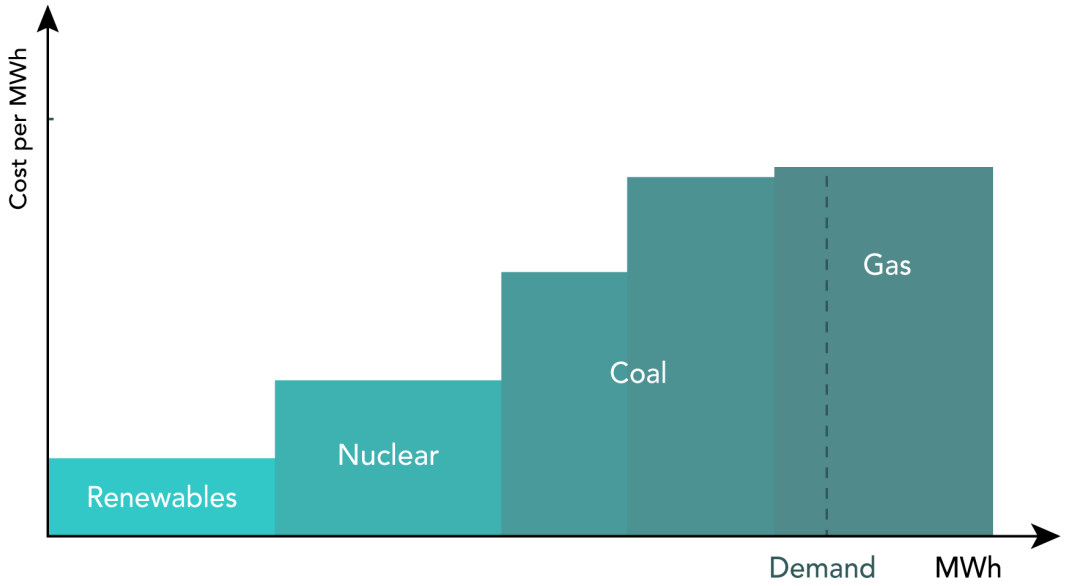
=> Why?

(Source)

Price formation in the power market

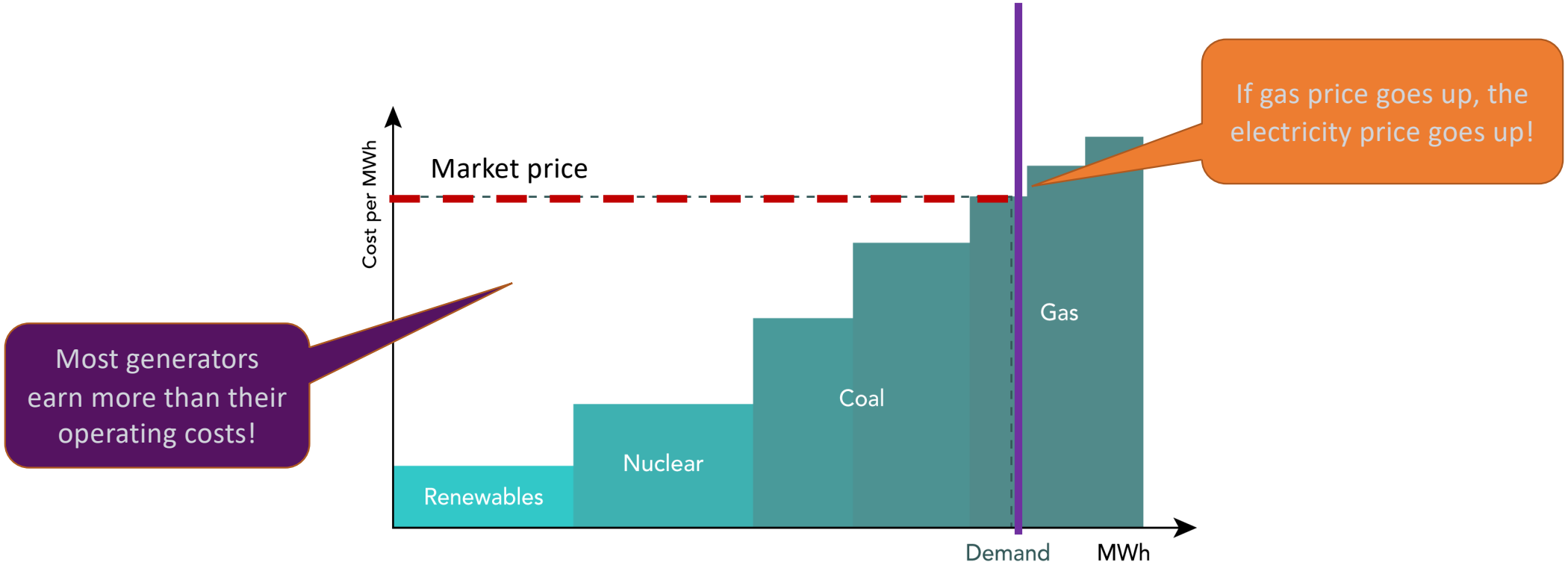
Step 1: Each generator bids the price it will accept to generate power

Step 2: The bids are ordered from the cheapest to the most expensive



Price formation in the power market

Step 3: Market price = the most *expensive* plant needed to supply the demand



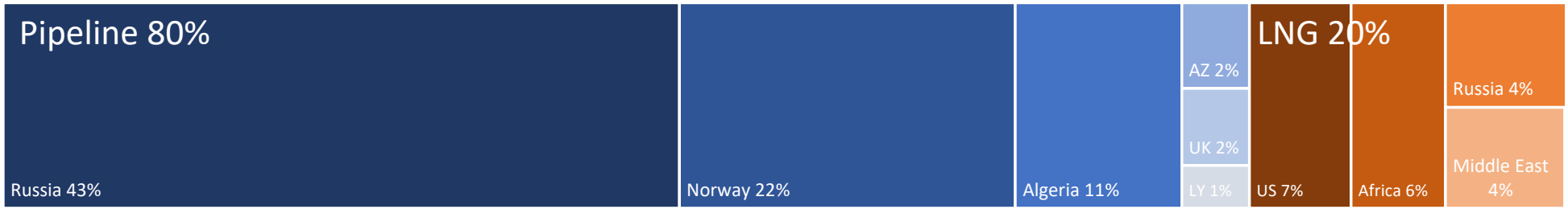
How did EU deal with the energy crisis?

No blackout because…

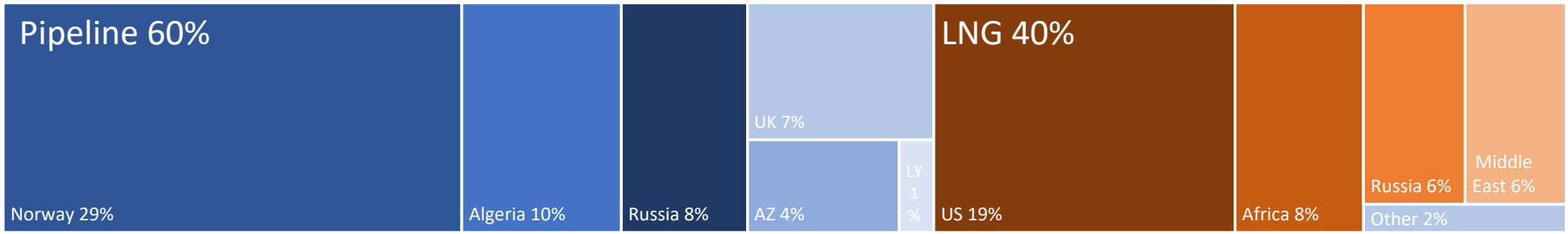
- **EU's gas storage was more than half full after last winter.** The level was around 20 percentage points above the average for the previous five years in Avril 2023
- **Russian pipeline gas share in EU imports dropped** from 41% in 2021 to 8% in October 2023.
- **Liquefied natural gas (LNG) is now a key supply source**, accounting for 40% of the EU's total net gas imports.
- The EU generated a **record 12% of its electricity from solar** from May to August 2022 and 13% from **wind.**

EU natural gas imports

EU Natural gas imports, Jan-Jun of 2021

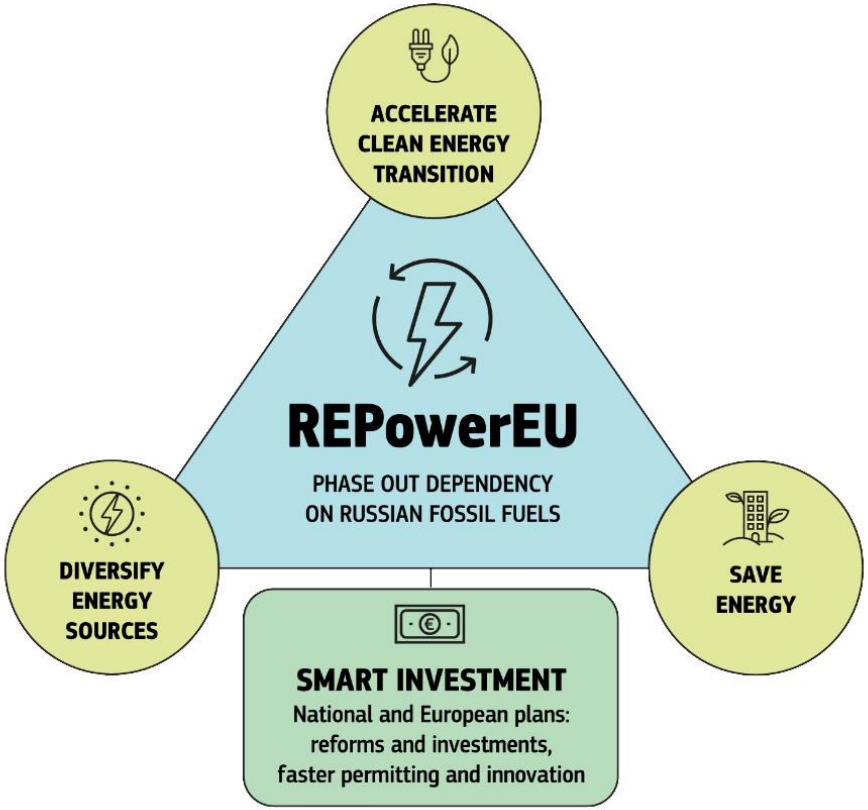


EU Natural gas imports, Jan-Jun of 2023



Source: Le Coq and Paltseva, 2023

Measures taken so far…REPower EU plan (May 2022)



Source: EU

Measures taken so far…

1. Mandatory gas storage (June 2022) Gas storage sites filled to at least 80% of their capacity by Nov. 1, 2022, and to 90% by Nov. 1, 2023

2. Reducing electricity use (Aug. 2022) Obligation for EU countries to reduce consumption by at least 5% during peak hours + Voluntary measure to cut overall electricity use by 10% in the EU by the end of 2023

3. Capping the market revenues at 180 euros/MWh (Sept. 2022) For companies producing power with low operating costs using renewables, nuclear, lignite

4. EU's platform for joint natural gas purchases (launched on April 25, 2023) *=> Lack of credibility and difficult assessment (Le Coq and Paltseva, 2023*

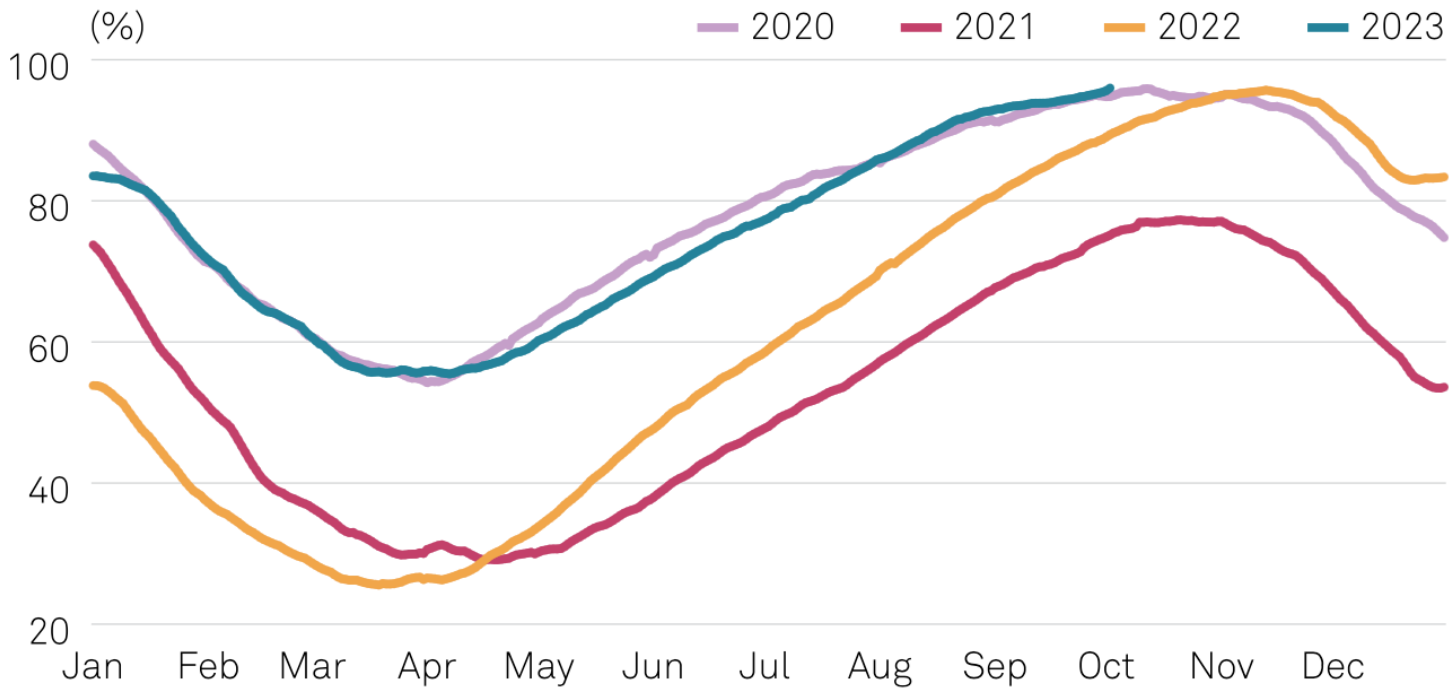
How did these measures work?

Pretty well, if you look at the gas price or current gas storage

The European gas price has fallen.

Source: https://tradingeconomics.com/commodity/eu-natural-gas

Current EU gas stock is higher than last year



Source: GIE

What should (can) be changed in the European electricity market?

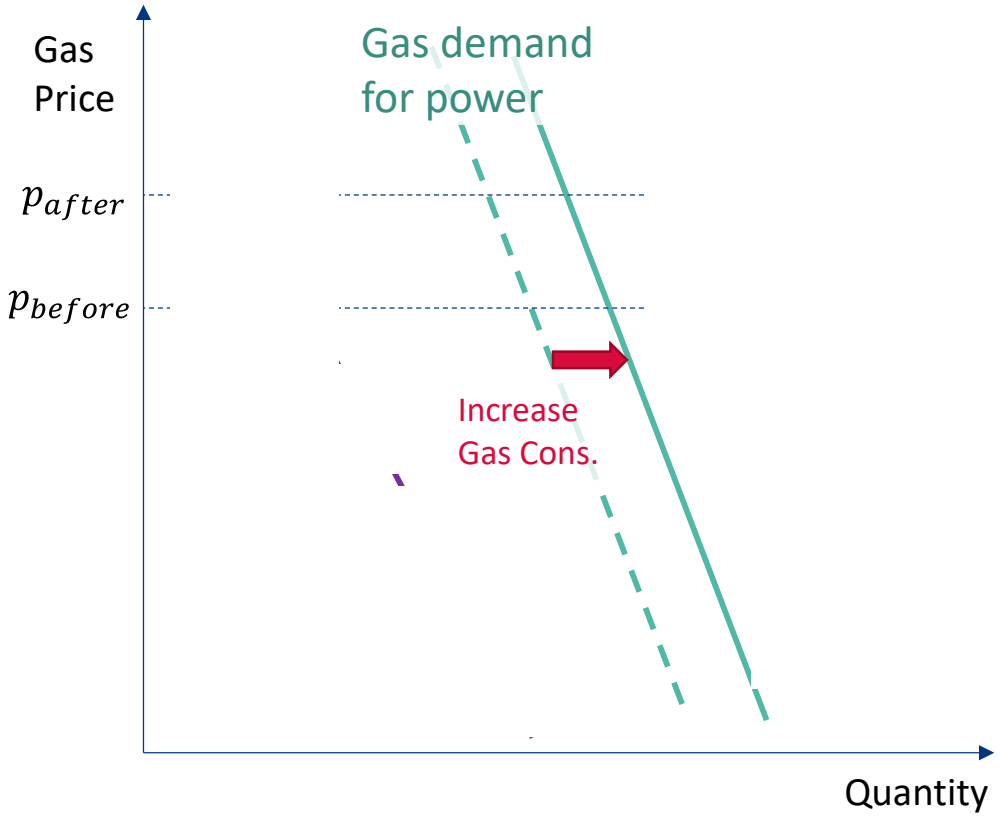
(Too) *efficient* European electricity market?

The electricity market delivered **security of supply by raising prices** in times of scarcity,

=> creating **windfall profits** for some market players,

=> but leaving some market parties exposed to **unhedged high prices** with certain customers unable to pay and energy suppliers going bust.

Measure 1: subsidize gas to reduce electricity ‘s marginal price



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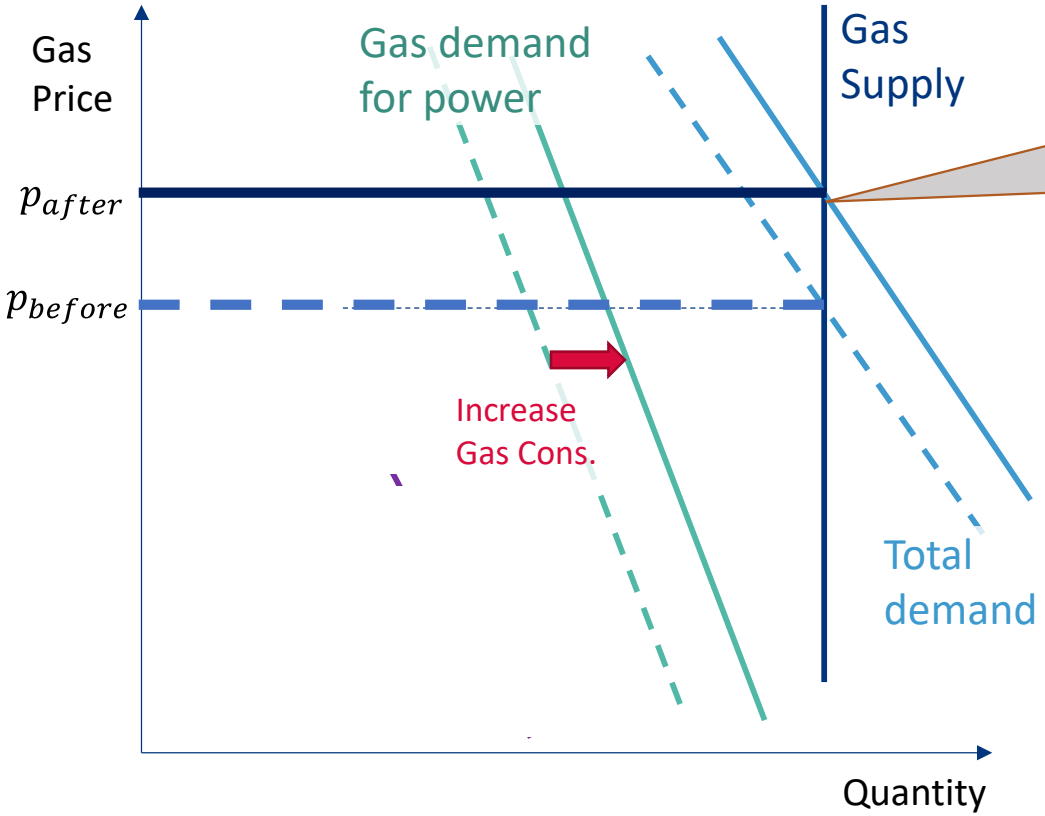
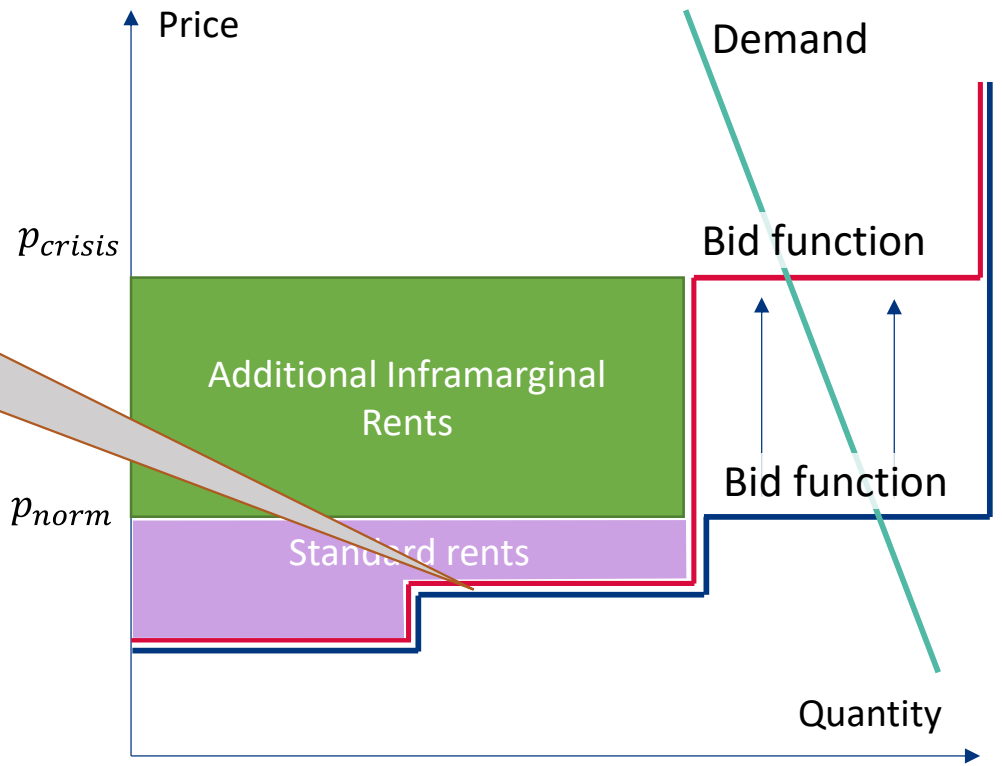


Since gas supply is limited,

Subsidies => Higher demand
=> Higher price

Measure 2: From a Pay-as-bid market to a Pay-as-Clear market

There is no guarantee that RES or nuclear will bid low



Measure 3: Newly adapted measure (October 2023)

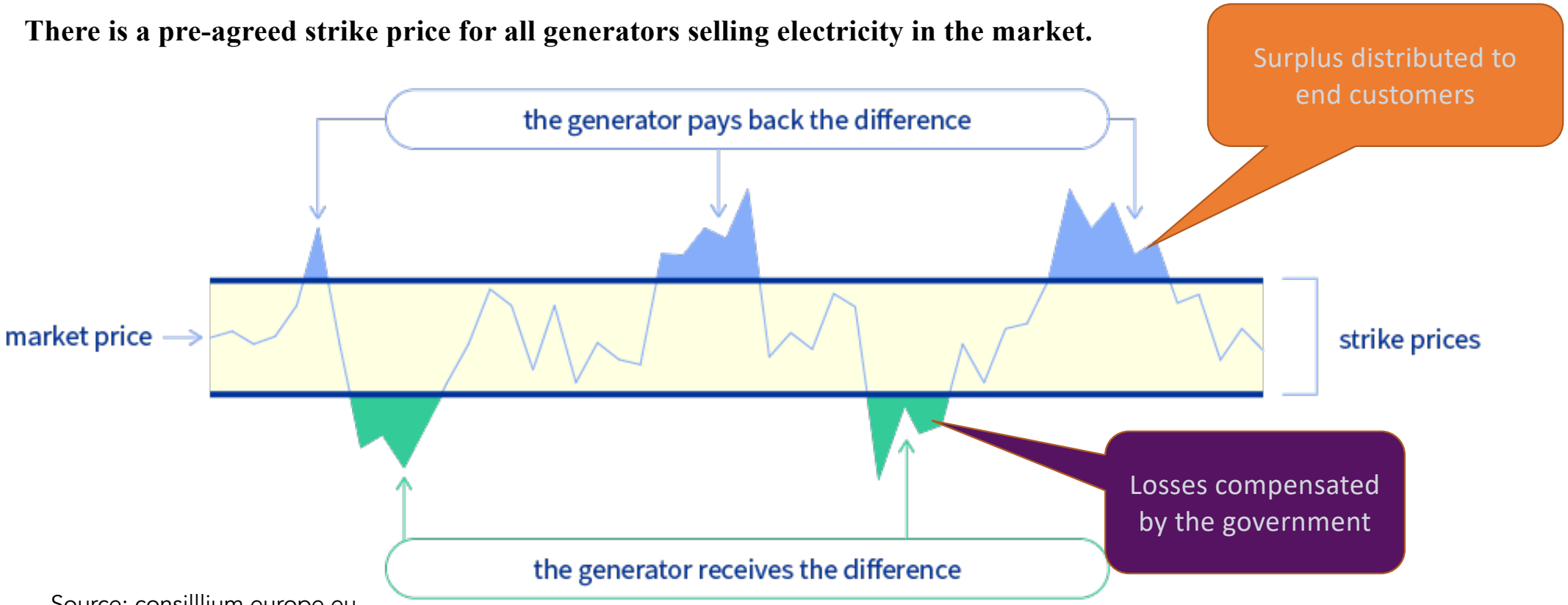
Objective: Improve the investment climate for new renewable energy projects and, in turn, improve the bloc's energy security and limit price variability

=> a two-way contract for difference

=> contracts are also valid for existing power plants when significant investments are made in the plant to expand its capacity or extend its life

Measure 3: a two-way contract for difference

There is a pre-agreed strike price for all generators selling electricity in the market.



Source: consilllium.europe.eu

What’s next?

The challenges ahead

Gas price and the current costs of energy security

- Carbon lock-in with LNG terminals –EU gas storage almost full but eight time more expensive!
- High gas price variability
- Strong competition with Asia

The future

- Rising electricity demand: e.g., in the Nordics, the demand is expected to grow by more than 60 percent into 2050 (Nordenergi, 2021)
- Hydrogen: **green hydrogen** will not become competitive until 2050 unless very high gas prices (Lazarczyk et al. 2022)

Thank you

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http://chloelecoq.org

References

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