

The EU energy crisis: current status, brief history and outlook

Tim Schittekatte

Schtim@mit.edu

Seoul – June 28, 2022

Session 6: Energy Security and the new Geopolitical Landscape

2022 CEEPR & EPRG International Energy Policy Conference

“Strategies for 2050 Carbon Neutrality in East Asia”

Setup presentation

1/ The current status

2/ Brief history of the energy crisis

3/ Outlook: What can the EU do right now & by the end of this decade?

4/ Some power market lessons and a proposal

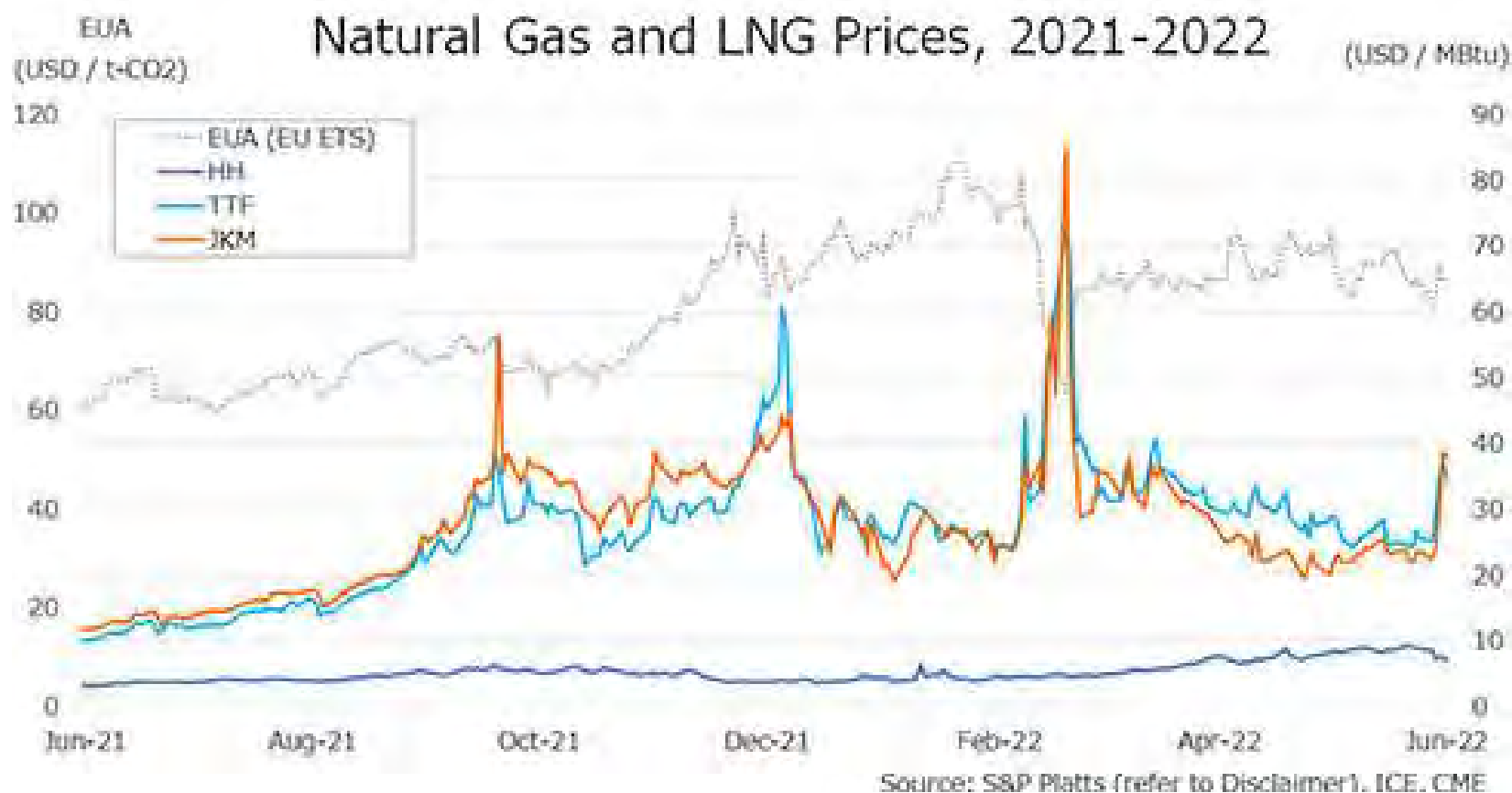
5/ Conclusions

[Disclaimer: focus on gas and electricity, less on coal and oil]

The current status

First and foremost

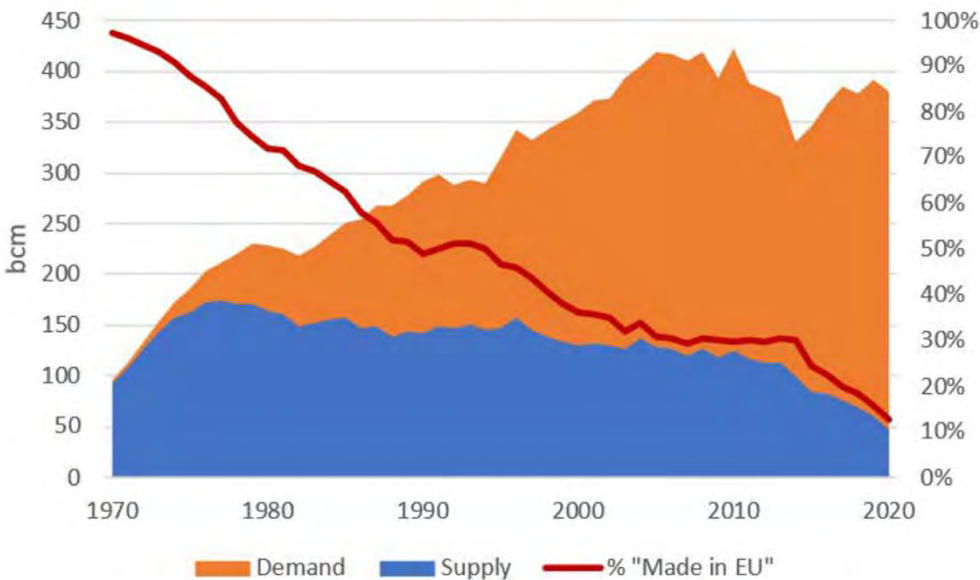
This is (mostly) a gas price crisis ...



<https://globalnghub.com/weekly-review-of-natural-gas-and-lng-prices-2.html>

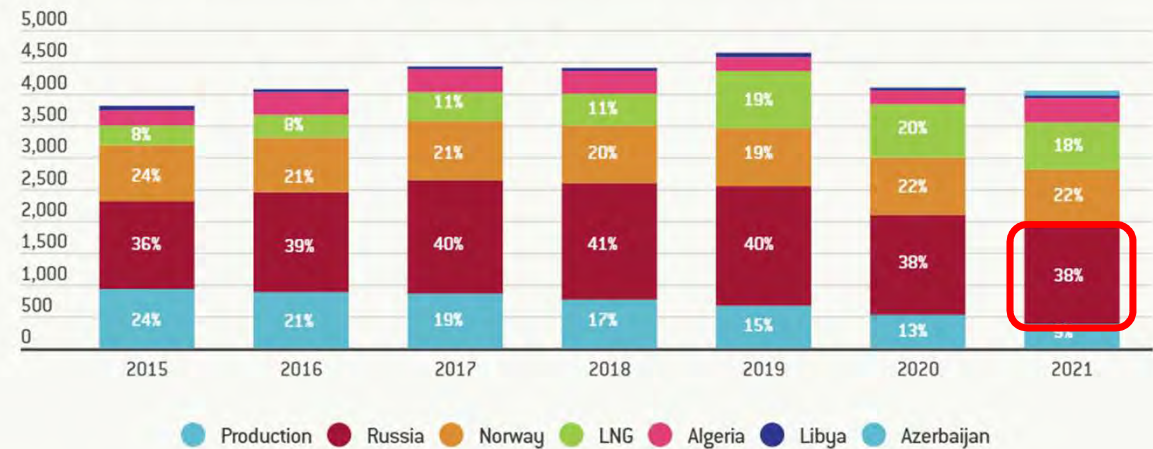
Dependency grew over the years

Historical EU-27 gas supply-demand and EU dependence



Source: BP Statistical Review of World Energy 2021

Figure 1: Annual EU27 natural gas domestic production and imports (TWh)

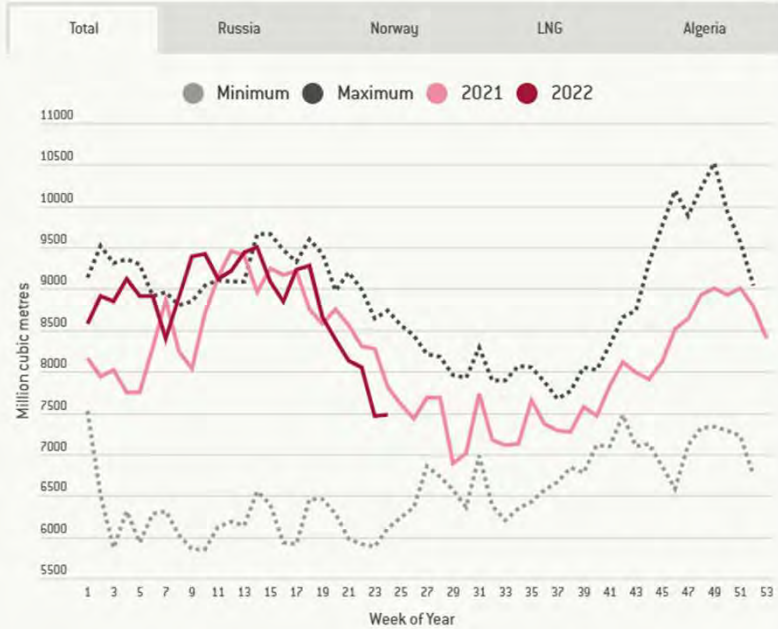


Source: Bruegel based on ENTSOG, GIGGNL, GIE, NPD.

What is the issue?

Figure 1: EU Natural Gas Imports (by source)

Last updated: 21/06/2022 (updated every Tuesday)



Source: ENTSO-G, <https://transparency.entsog.eu/#/map>
Note: Minimum and Maximum values are calculated from the period 2015-2020.

Figure 5: EU Gas Storage

Last updated: 21/06/2022 (updated every Tuesday)

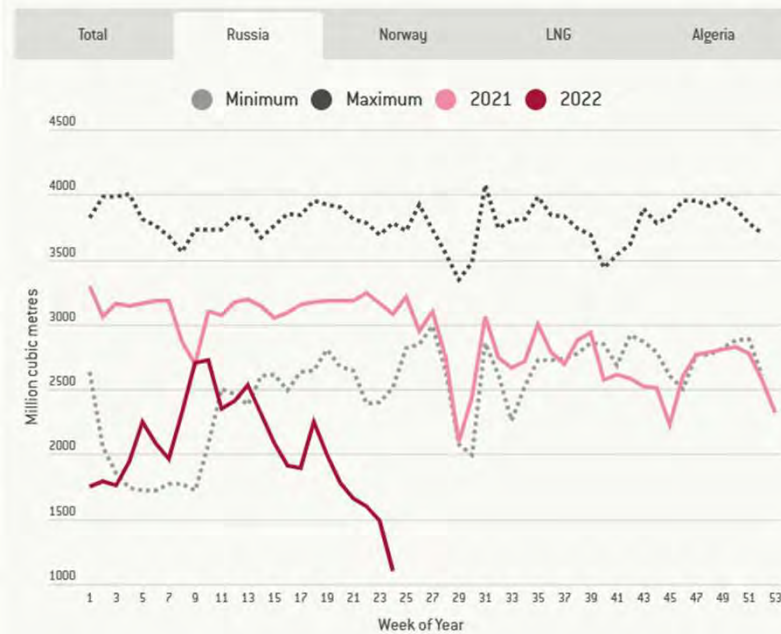


Source: AGSI: <https://agsi.gie.eu/#/>

This is the issue

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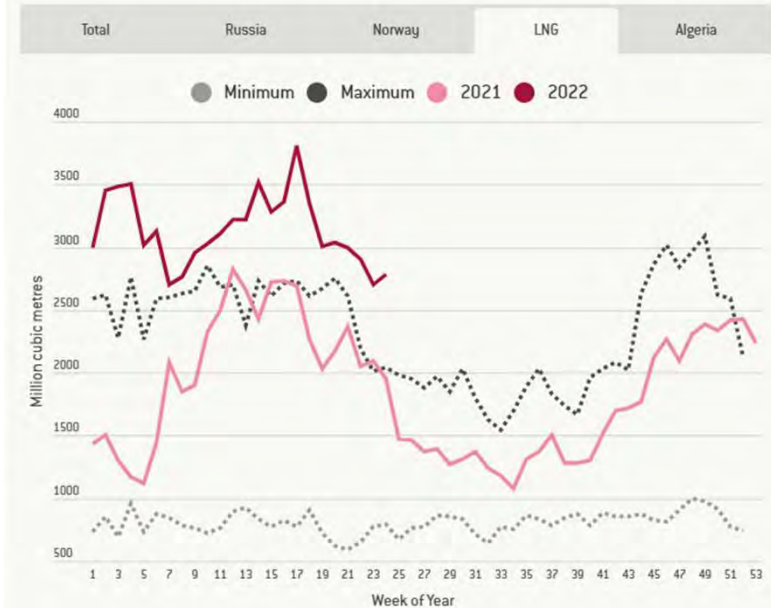


Source: ENTSO-G, <https://transparency.entsog.eu/#/map>

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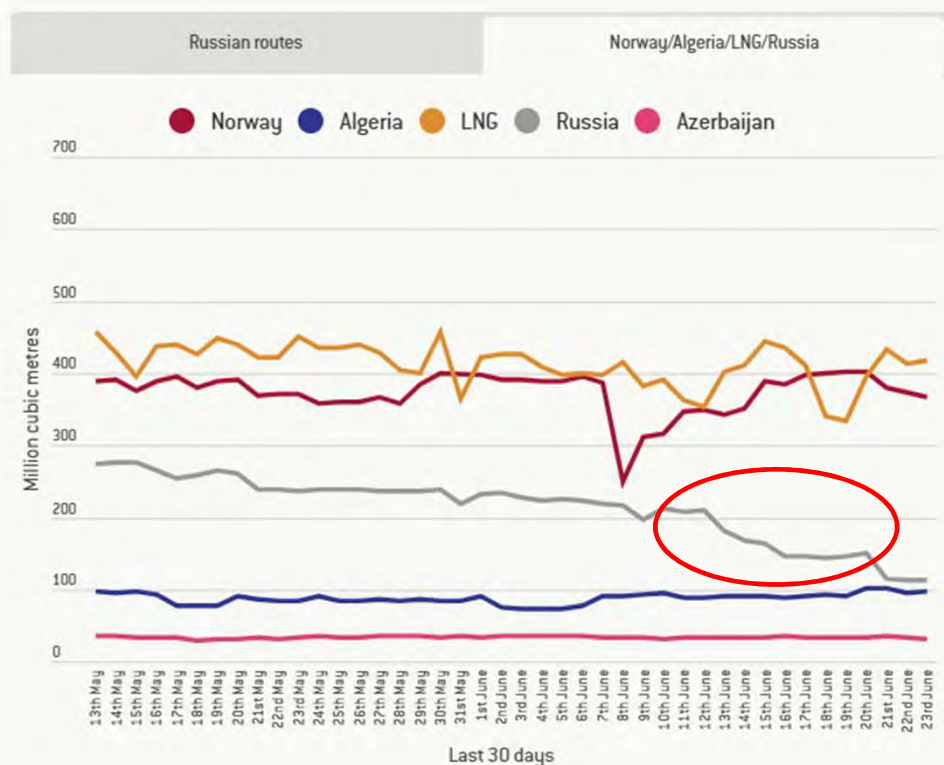
Source: ENTSO-G, <https://transparency.entsog.eu/#/map>

Note: Minimum and Maximum values are calculated from the period 2015-2020.

The latest events

Figure 4: Daily gas imports by Russian routes, Norway, Algeria and LNG

Last Updated: 24/06/2022.



Sources: Entso-g, <https://transparency.entso-g.eu/#/map>

Bloomberg
US Edition

• Live Now Markets Technology Politics Wealth Pursuits Opinion Businessweek Equality Green CityLa

Markets

Russia Squeezes Gas Supply to Europe's Biggest Buyers

- Germany, Italy, France energy giants receive less than ordered
- Russia moves as European leaders push closer ties with Ukraine

By Isis Almeida and Vanessa Dezem
17 June 2022, 08:48 GMT-4 Updated on 17 June 2022, 10:51 GMT-4

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FINANCIAL TIMES

Energy crisis

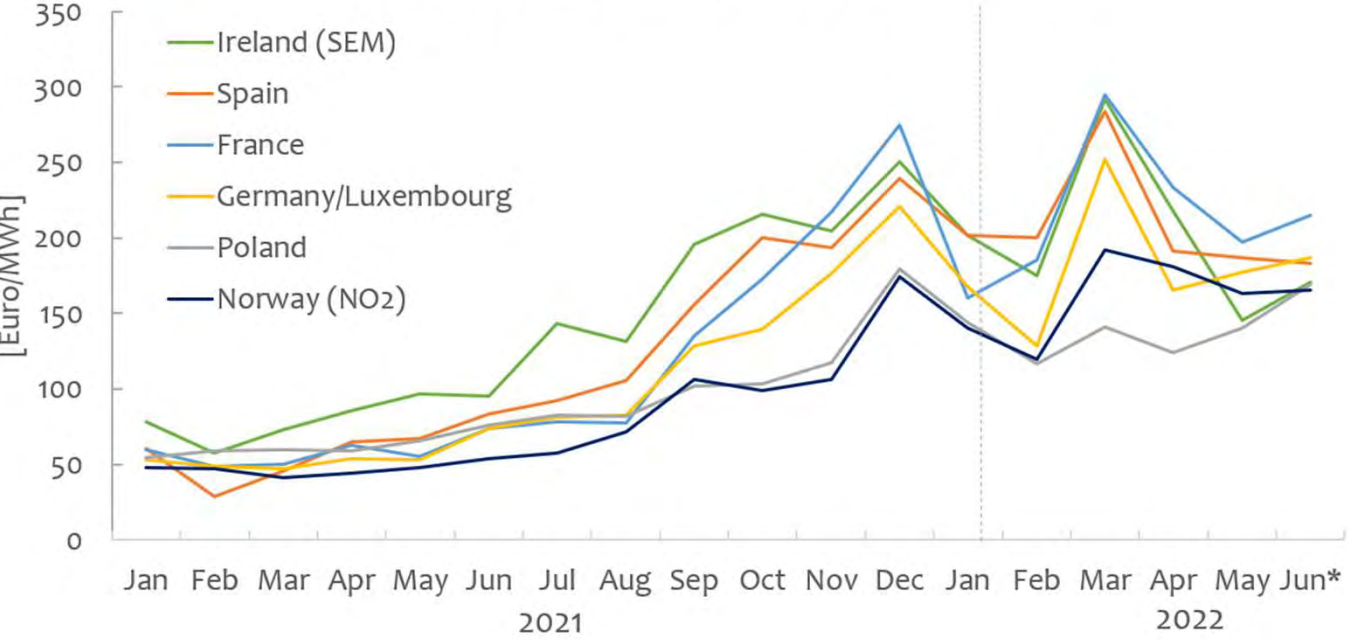
Germans told to conserve energy as Russia cuts gas flows to Europe

Deputy chancellor warns of 'serious' situation as Italy, Austria and Slovakia report more supply reductions

Guy Chazan in Berlin, David Sheppard in London, Nastassia Astrasheuskaya in Riga and Roman Olearchyk in Kyiv JUNE 16 2022

Electricity markets are severely contaminated... a perfect storm?

Monthly averaged day-ahead power prices



*Data until 06/21/'22

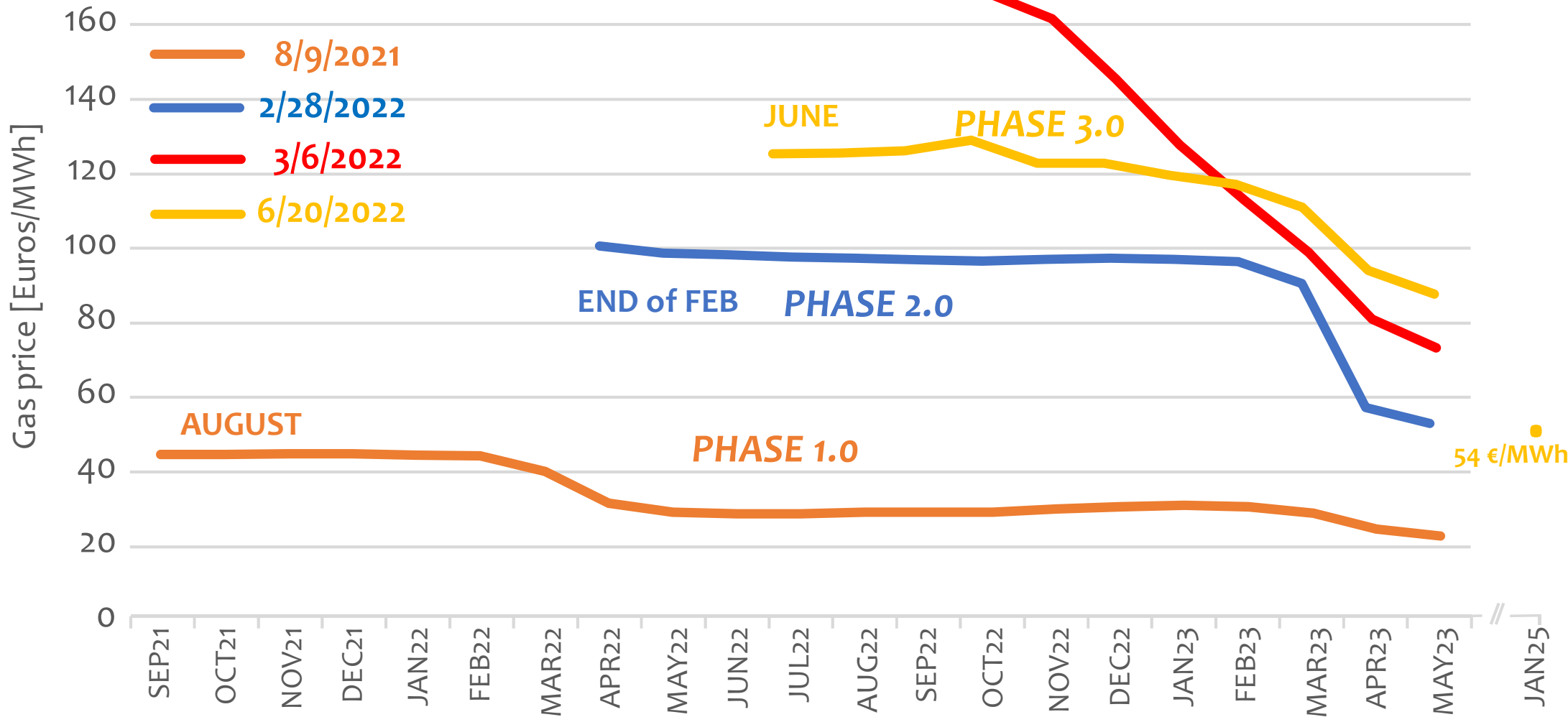
EU chief announces electricity market overhaul amid 'skyrocketing' prices

By Frédéric Simon and Nikolaus J. Kurmayer | EURACTIV.com 10 Jun 2022 (updated: 13 Jun 2022)



Brief history of the energy crisis

A story of 3 phases



Milestones and contributions

Phase 1.0

Phase 2.0

Phase 2.0+

Phase 3.0

Today



3.8.2022- REPowerEU
3.23.2022- Affordable energy communication

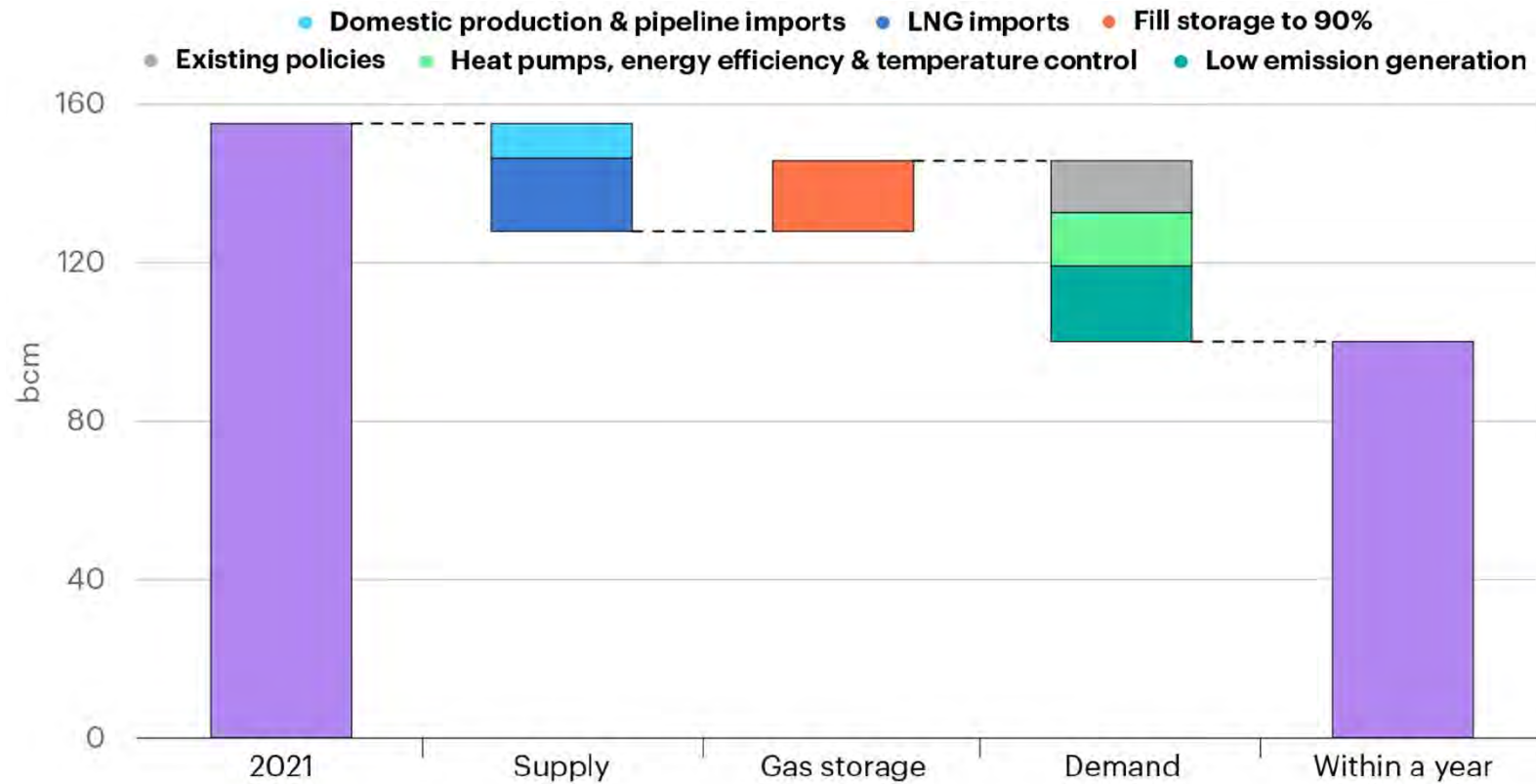


Outlook:

What can the EU do right now?

What can the EU do right now?

Target: Reducing dependence from Russian gas by two third by end 2022...but some disagreement on feasibility

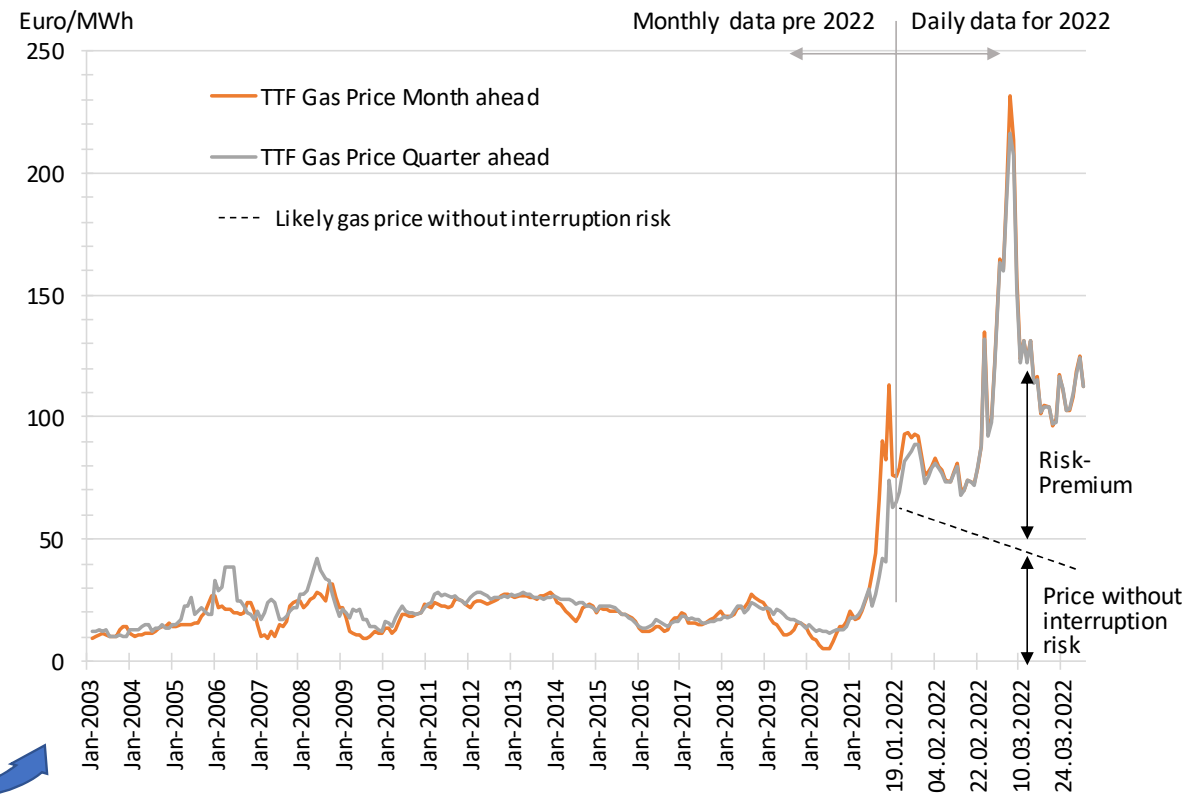


Source: IEA (2022)

What can the EU do right now? Interventions in the gas market

Four potential interventions in the gas market:

1. Escrow account for payments to Russia for gas sales
2. Import tax on Russian gas
3. Price cap on Russian gas
4. Conditional uniform gas price cap in case of disruption



Source: Neuhoff (2022)

What can the EU do right now?

Interventions in the electricity market

- Besides, aid to vulnerable consumers and companies via targeted support, the European Commission suggests the possibility of four types of interventions
 - Wholesale electricity price cap (so far discarded in the EU but not in Australia)
 - Subsidising fossil fuel generators to lower clearing prices (Spain, Portugal)
 - Single buyer selling at regulated prices to end-users (France, Slovakia)
 - Windfall profit tax capturing inframarginal rents (Spain, Italy)
- **Recommendation: in case of no other choice, windfall profit tax**
 - Look beyond electricity
 - Not easy to implement and not without static and dynamic consequences, but:
 - Price signal remains in place
 - Limited distortions between gas and electricity

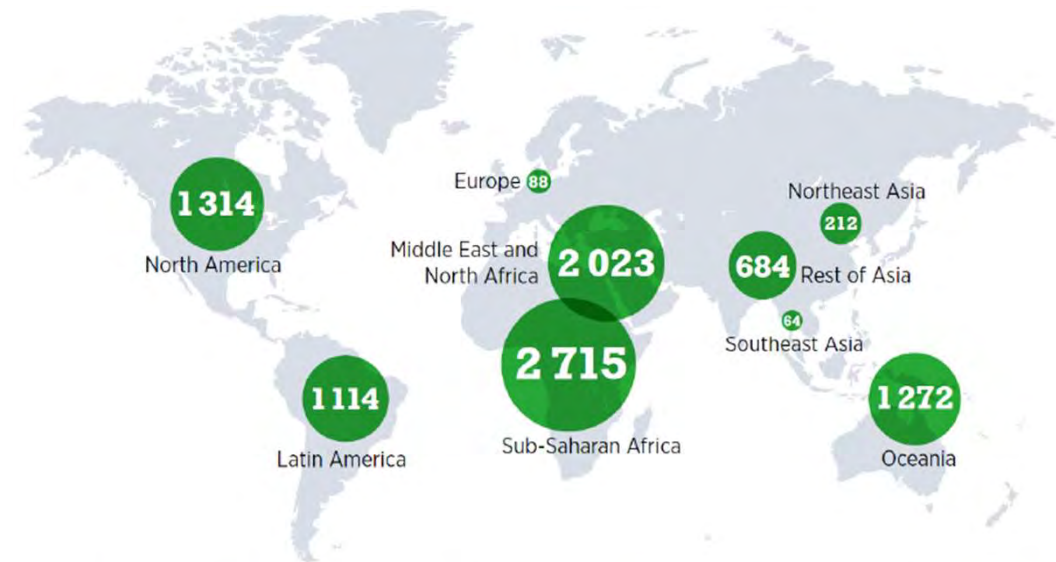
Outlook

What can be done by the end of this decade?

Target: Getting rid off Russian fossil fuels “well before the end of the decade”



- “The ongoing energy crisis does not change the climate ambitions from the EU, only its trajectory””
- Fit-for-55:
 - 55% emission reduction (vs 1990-levels)
 - 45% renewable energy
 - 13% energy efficiency (vs 1990-levels)
- Key pillars:
 - Massive renewables (especially offshore wind)
 - Electrification of transport & heating + rooftop PV
 - Decarbonisation of industry via hydrogen



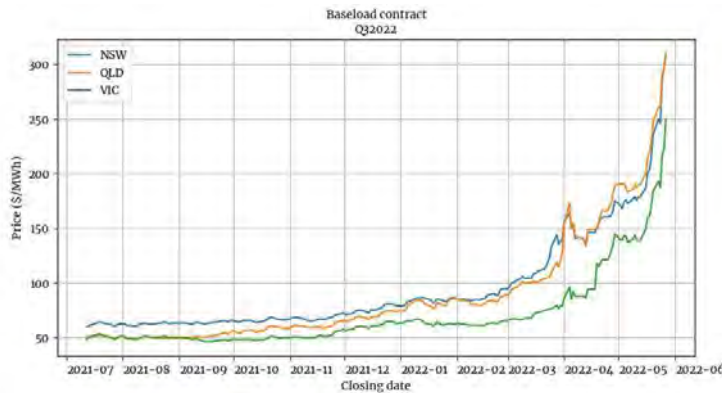
International Renewable Energy Agency (IRENA): Technical potential for producing green hydrogen under USD 1.5/kg by 2050, in EJ

Some power market lessons and a proposal

Not an EU-specific problem....

S&P Global
Commodity Insights
COAL | ELECTRIC POWER | ENERGY TRANSITION | LNG | NATURAL GAS — 15 Jun 2022 09:26 UTC

Australia energy regulator suspends electricity spot market as energy crisis deepens



Credit: Dylan McConnell

Boris Johnson hints at major reforms to 'frankly ludicrous' energy market



James Murray

27 June 2022 • 6 min read

Summer 2022 power futures prices
End of day average prices for July - Aug 2022 peak power

Ticker	Hub	May-22	Apr-22	Mar-22	Feb-22	Jan-22	Dec-21
PVM	WECC Palo Verde	225	232	222	224	218	258
MDC	WECC Mid-C	153	139	123	126	97	103
SPM	CAISO SP-15	147	133	116	110	98	105
NPM	CAISO NP-15	138	125	107	101	91	97
ERH	ERCOT Houston Hub	200	148	108	92	92	88
ERN	ERCOT North Hub	195	143	105	88	88	84
ERW	ERCOT West Hub	191	138	101	84	84	82
PPF	PJM PEPCO Zone	184	115	73	64	56	52
PAV	PJM ATSI Zone	183	111	69	61	53	50
PEB	PJM Eastern Hub	183	114	72	63	55	52
ADB	PJM AEP Dayton Hub	182	111	70	61	53	50
DCP	PJM DAY	181	113	71	62	54	51
PJM	PJM West Hub	181	113	70	62	54	50
PQB	PJM Duquesne Zone	181	111	69	61	53	50
NIB	PJM NI Hub	173	106	65	57	50	47
PCP	PJM PECO Zone	160	101	62	54	46	42
MLB	MISO Illinois Hub	181	113	71	61	54	51
CIN	MISO Indiana Hub	184	115	72	62	55	51
MCC	MISO Indiana Hub	182	114	72	62	55	51
MDP	MISO Minnesota Hub	135	94	65	55	48	45
NJY	NYISO Zone J	137	109	76	69	63	59
ZFB	NYISO Zone F	129	102	69	62	58	55
NGY	NYISO Zone G	129	102	69	61	55	52
NAY	NYISO Zone A	122	96	66	60	54	50
NEP	NEPool Mass Hub	129	103	69	62	59	56
FSP	SPP South Hub	110	81	63	57	53	50
FNP	SPP North Hub	97	74	59	55	51	47
H	Henry Hub Gas [\$/MMBtu]	8.3	6.9	5.2	4.6	4.1	3.7

Units: \$/MWh Legend: 50 normal, 100 wow, 150 oh @#\$%

Credit: Brian Bartholomew

An alternative regulatory solution to complete the market mechanism

Affordability options



13 measures for the consideration of policymakers, future-proofing the EU wholesale electricity market design

1. Speed up electricity market integration, implementing what is already agreed

4. Stimulate 'market making' to increase liquidity in long-term markets

7. Preserve the wholesale price signal and remove barriers to demand resources providing flexibility

10. Tackle non-market barriers, ensuring generation and infrastructure is built at pace

13. Consider a 'temporary relief valve' for the future when wholesale prices rise unusually rapidly to high levels

2. Improve access to renewable Power Purchase Agreements (PPAs)

5. Better integrate forward markets

8. Shield those consumers that need protection the most from price volatility

11. Consider prudently the need for market interventions in situations of extreme duress; if pursued, consider tackling 'the root causes'

3. Improve the efficiency of renewable investment support schemes

6. Review (and potentially reduce, if warranted) collateral requirements

9. Tackle avoidable supplier bankruptcies, getting the balance right

12. Consider public intervention to establish hedging instruments against future price shocks

Want to learn more?

Check out the full report on ACER's Final Assessment of the EU Wholesale Electricity Market Design.

www.acer.europa.eu
[linkedin.com/company/eu-acer/](https://www.linkedin.com/company/eu-acer/)
twitter.com/eu_acer

European Union Agency for the Cooperation of Energy Regulators

EU-ACER
@eu_acer

Massive thanks 🙏 to ❤️ more than 1,100 participants of today's webinar on ACER's Final Assessment of the EU Electricity Market Design 💡 the European Commission's @csikow for her initial reactions to the report

ACER Report:
extranet.acer.europa.eu/Official_docu...

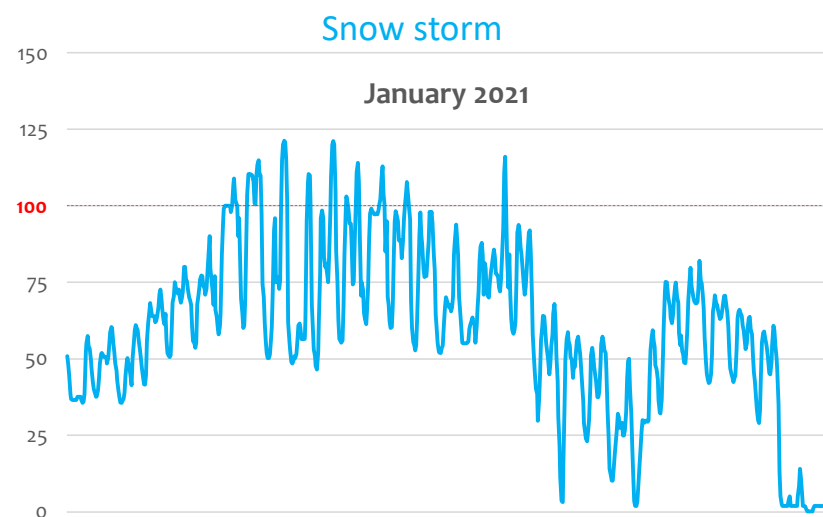
8:25 AM · May 5, 2022 · Twitter Web App

An alternative regulatory solution to complete the market mechanism

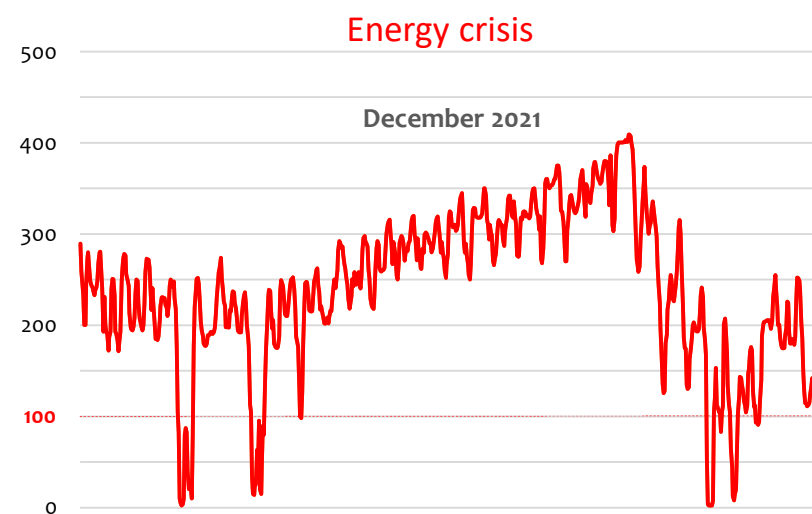
Affordability options

- Illustrative example

- Different impact of the option depending the nature of the price event



51 hours with prices above 100€/MWh,
January average price 60€/MWh,
Stability Option not exercised



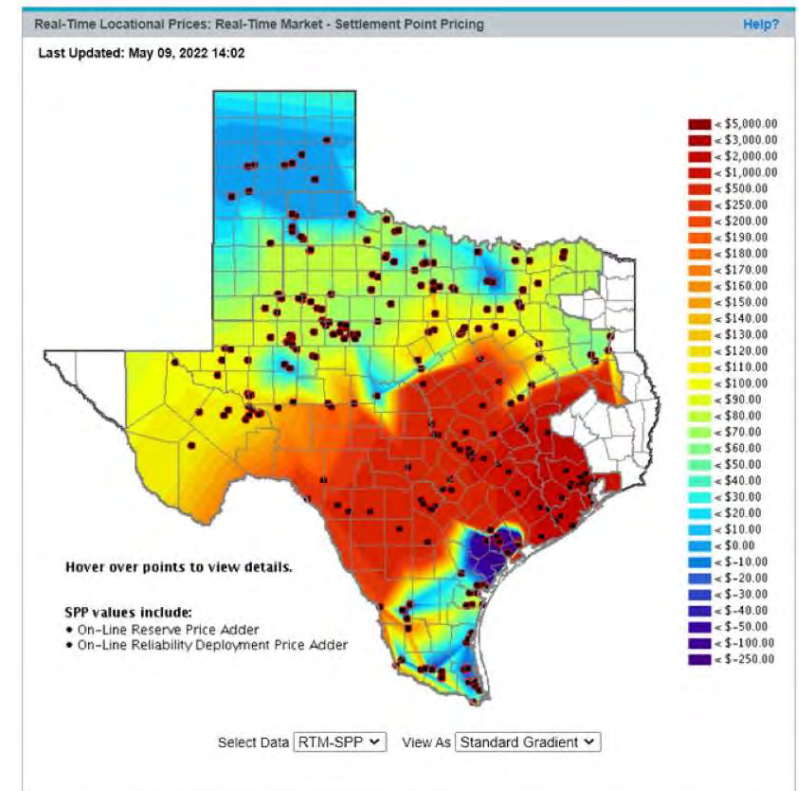
December average price 239€/MWh
Stability Option in the money
Pay out of 139€/MWh for protected consumers

High prices will avoid high costs...if barriers to entry are low

EXISTING U.S. GENERATION CAPACITY VS. INTERCONNECTION QUEUES



* Queue data represents about 85% of U.S. electric load; AK and HI and some non-RTO utilities not included.



Conclusions

Conclusions

- **EU-specific:**

- This is a gas price crisis, as a consequence electricity markets are contaminated and also put into question
- The risk for a supply disruption is real, emergency measures are put in place
- The EU energy crisis is and will be a big challenge for industry and consumers in Europe
- EU aims to be independent from Russian fossil fuel imports well before 2030 and never look back
- The energy crisis will lead to an acceleration of its green transition be it via an “unexpected trajectory”

- **More general:**

- The EU situation is expected to:
 - put further pressure on the LNG market– exact outcome depends on gas market intervention
 - accelerate the development of a global (green) hydrogen market
- Periods of sustained high electricity prices are a feature of transitioning power systems: marginal pricing is vital but improved hedging instruments need to be introduced to avoid political turmoil
- Barriers to entry and access to (renewable) generation need to be addressed to make the power market function

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ERCOT - Houston Hub: 08/10/'20-08/16/'20

Affordability ≠ Volatility

