

What might be the *next* crisis in electricity markets?

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What causes crises and price crunches in the energy sector?



- Supply and demand driven fundamentals market, with significant regulatory and policy impacts;
- The energy system responds to both internal dynamics and external shocks;
- The amount of time the system needs to reach an equilibrium steady state after a shock depends on:
 - **Openness of markets.** The fewer price supports, subsidies, etc, there are, the faster market forces can bring back the system into an equilibrium;
 - **Investment and construction lag for new capacity.** System currently responding to high gas prices through some gas-to-coal switching and passing through prices to end users. In the longer term, if prices stay high, renewables should be able to come online.
 - **How good regulators are at anticipating shocks** and making sure that the market design is fit for purpose and can withstand shocks. (Example – early carbon market – learning on the go).
 - **The nature, severity and duration of the shock;**
- There will always be unpredictable black swan events like Covid-19.
- As the current energy crisis has been discussed at great depth, let's turn our gaze into the future - have the seeds of potential future crises already been sown?

Agenda



- 01** What if EU renewables targets are not met?
- 02** Are we heading towards a duo of (firm) capacity crunch and flexibility crunch?

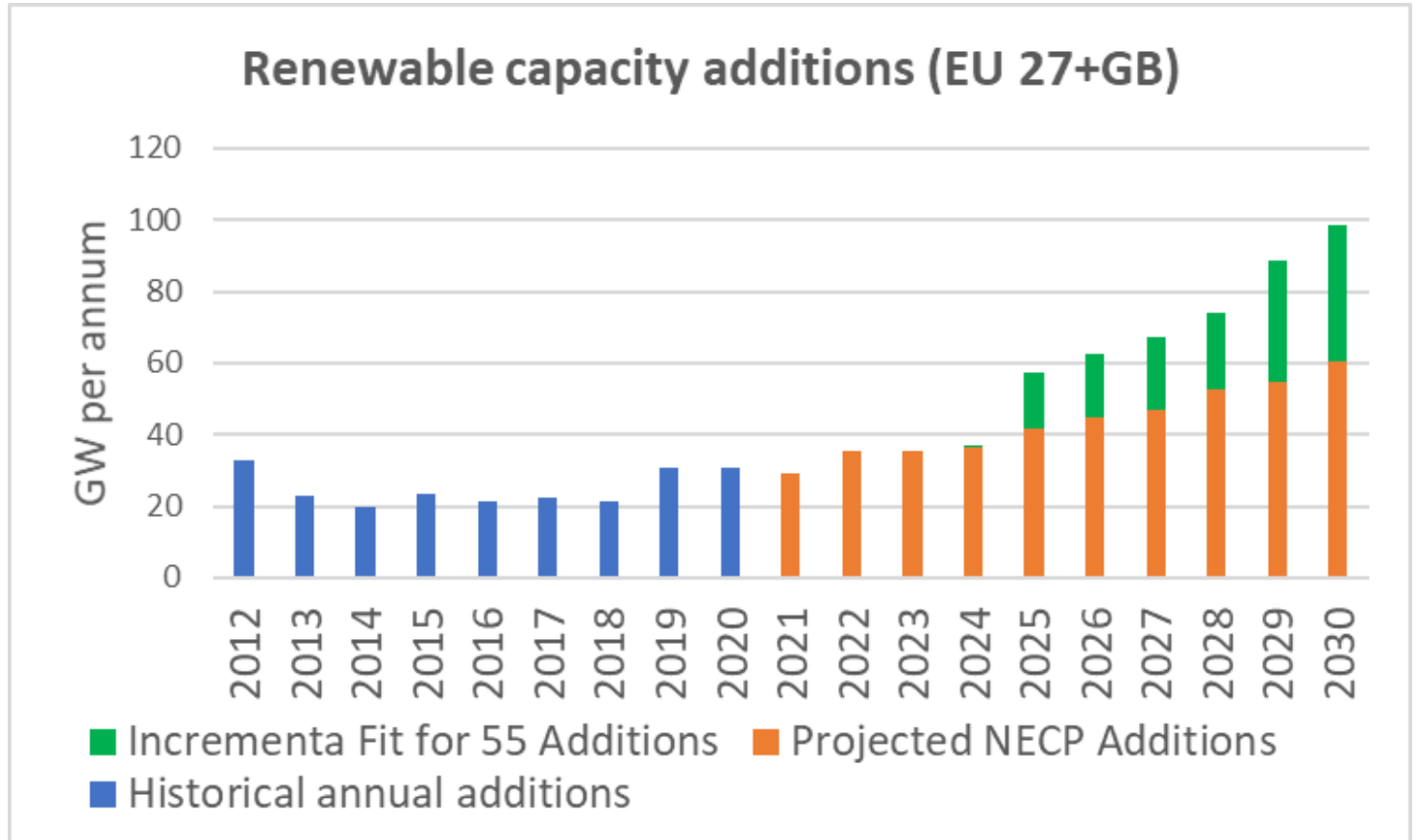
Can the EU pull off its highly ambitious RES buildout agenda?



What if the EU does not manage to install up to 100GW/pa by 2030?

Potential reasons for target underachievement:

- Structural inability to secure the deployment of such significant amounts of capacity, especially in competition with other regions in the world looking to do the same.
- Issues and delays with grid connections;
- Regulatory/permitting hurdles at the national level;
- Power system stability with high levels of renewables might be a preventing factor.





Current auction additions disappointing

Onshore wind interest tumbles in German renewables auction as subscription rate slumps to 2019 levels
published: 07 May 2021 16:11 CET | last updated: 07 May 2021 16:28 CET

Between oversupply and calls for reform: the future of Italian renewable auctions hangs in the balance

London | published: 15 March 2021 15:20 CET | last updated: 16 March 2021 13:37 CET

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UK 'falling behind' on onshore wind targets
Planning authorities approving less than half of the capacity needed, new report says

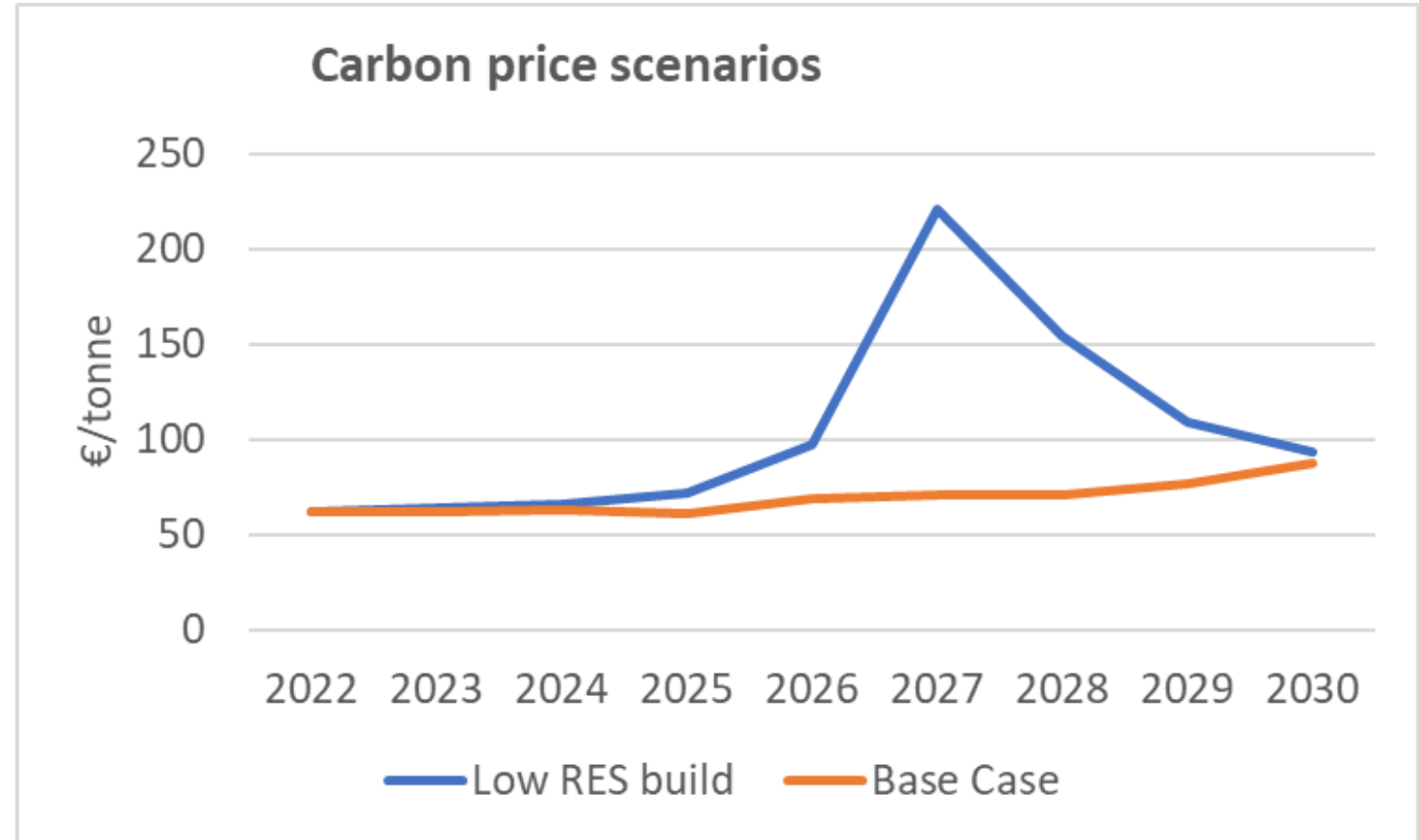
France in danger of missing onshore and offshore wind targets

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Significant carbon price spike if RES targets not met

- ICIS scenario model run with just NECP additions to 2030.
- **Very steep carbon price spike which will filter through to power prices – energy crisis waiting to happen.**
- Consequences: risks of EC being pressured to step in and change the carbon market rules, delaying the timelines, or going back on the Net Zero ambition.
- Implications for the market – extreme volatility/carbon prices driving power prices to high levels; policy instability and uncertainty affecting investment.



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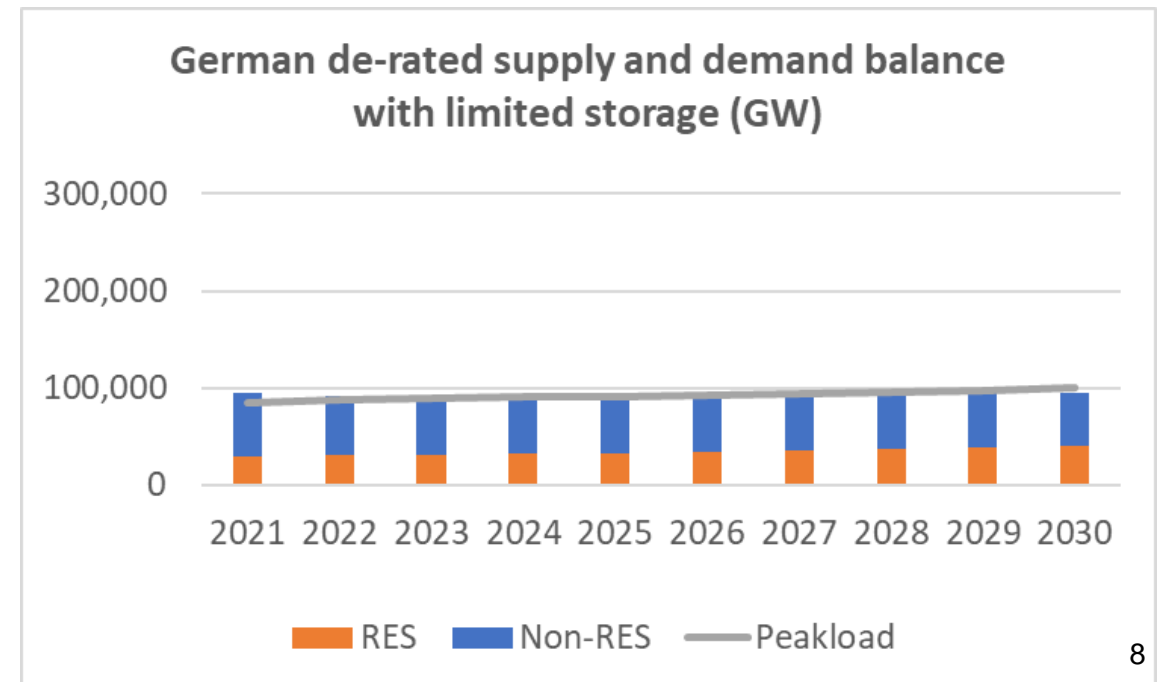
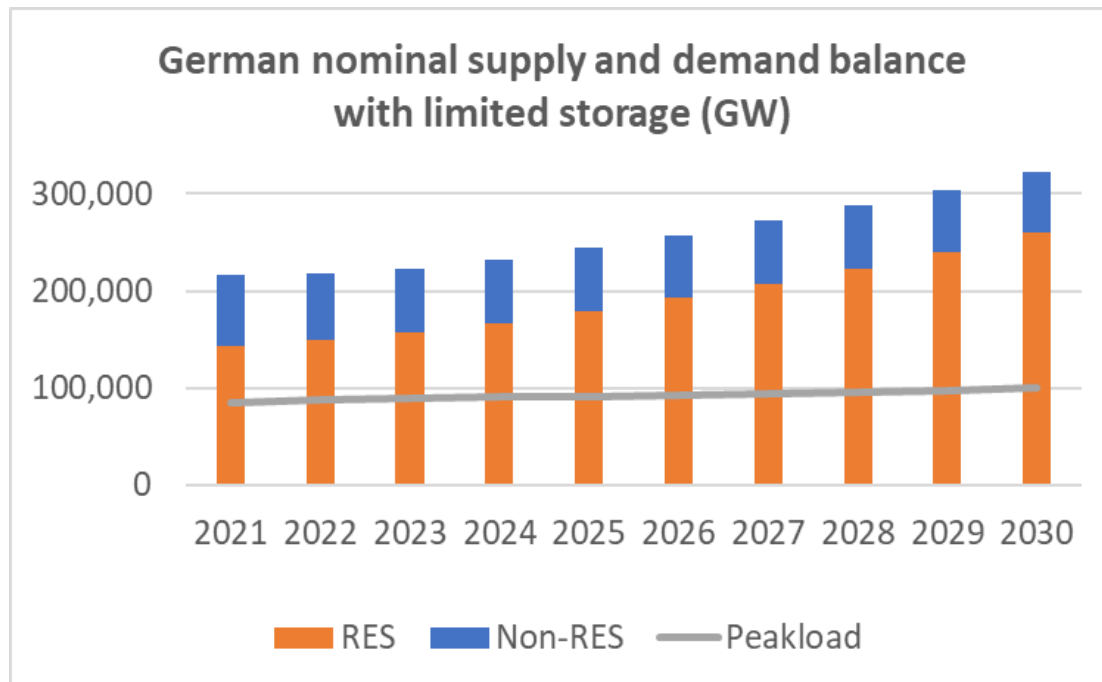


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Are we heading towards a (firm) capacity crunch?

- Capacity de-rating factors of solar, on- and offshore wind assumed to be 5%, 10% and 15% accordingly. If they turn out to be lower, this would affect power systems reserve margins.
- This is in contrast with the 80-90% range of capacity reliability factors for coal, gas, lignite and nuclear.
- Therefore, despite installing thousands of GW of renewables across Europe, system stability and security margins might be under stress, **if** the market overestimates the contribution of intermittent renewables to reserve margins.





The mechanics of a RES-driven capacity crunch

- RES will continue to suffer from low capacity reliability (i.e. we cannot consistently rely on solar or wind to meet peak demand). **Hence, the expected high shares of RES on the system in the future may present a security of supply risk and could be the basis of a future energy crunch.**
- The market and policy makers were taken by surprise by the low-wind situation in September 2021 (*Global Stilling?*) – not just capacity reliability factors, but also **RES load factors present a risk as they may be overestimated.**
- Risk of system stability issues and the need to implement demand response measures, and - ultimately - demand curtailment. This may lead to **Day-Ahead price spikes in the €10,000/MWh range**, based on the Value of Lost Load.
- Market tightness and corresponding price spikes should incentivise the buildout of new firm capacity. Or alternatively, policymakers will implement capacity markets.
- But European energy markets are not as free as we would like to believe – significant policy and regulatory hurdles to building new conventional capacity, and these hurdles will get tougher in the future.
- Capacity markets might work temporarily by preserving the availability of existing thermal capacity on the grid, but we are yet to see how efficient they are in bringing new thermal capacity onto the system, and how timely this can be.



Are we in for a flexibility crunch, too?

- In addition to the potential capacity crunch, there is a related, but separate issue of the lack of flexibility on the system. This is the capability to quickly ramp up or down in response to sudden changes in supply or demand, especially in the presence of intermittent RES without sufficient storage.
- Cost of storage is too high yet, so batteries are not a silver bullet, at least to 2030.
- Flexibility provision might be severely impacted with the retirement of flexible despatchable thermal capacity CCGT and to a certain degree – coal.
- **A flexibility crisis will manifest itself with volatile prices and spikes in the intraday market, and will endanger system stability if not addressed by market and policymakers.**
- Flexibility crisis might be averted if new CCGTs come through capacity markets (but no evidence yet in real life that this would work).
- **Free market investment uncertainty** – market players would be wary about investing into a CCGT as a response to intraday market spikes alone, as they would fear that policymakers would distort the pure market signals.
- **Difficulty task of policymakers to predict market developments and respond in a timely manner** – crises might occur in the meantime if policymakers have not been proactive and only respond after the fact.

THANK YOU!

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