

A rustic wooden windmill with a circular fan of weathered metal blades stands in the foreground. In the background, several modern white wind turbines are visible against a clear blue sky. The scene is set in a flat, open landscape.

Development of costs for onshore wind turbines: interest rates, electricity prices and material costs

DFBEW Conference 5th of March 2024 | Ivo Schmidt Sierra

enervis: energy consulting 2001

- Situated in Berlin
- 80 employees
- Managed independently



enervis:

Data + modelling + market experience

Electricity- and capture price scenarios for:

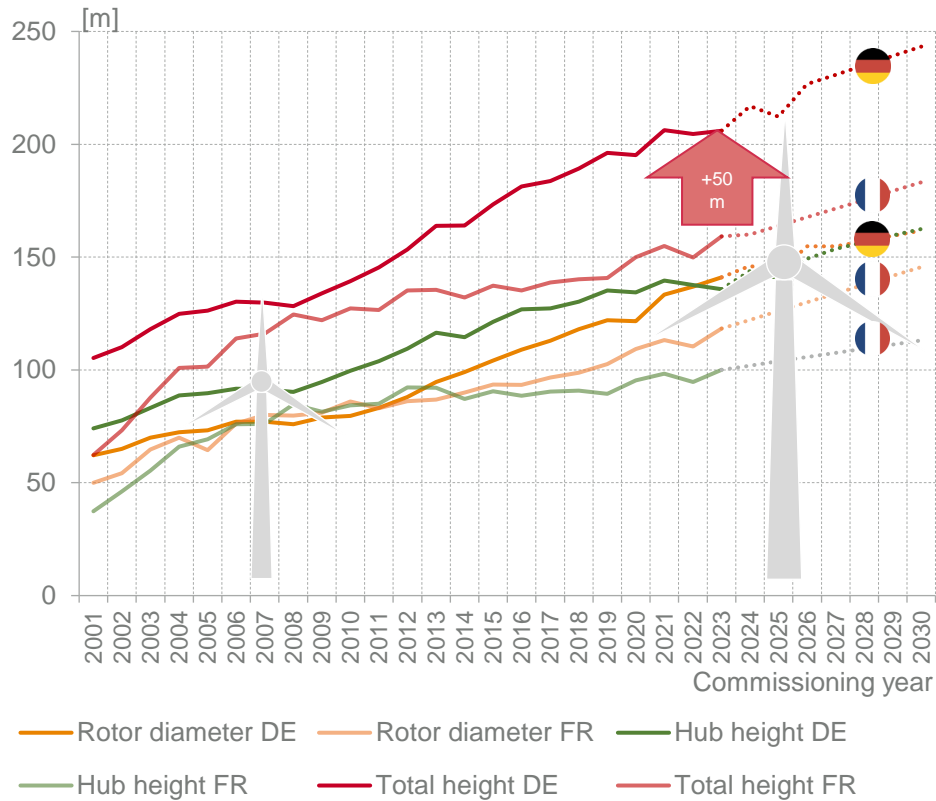
- Wind (onshore / offshore), PV, PPAs
- power plants, CHP
- Batteries, PtX, H₂

enervis consulting services:

- Electricity- and capture price forecasts
- Online-Tools: PPA- & capture price atlas; battery dispatch tool
- Auction studies (DE & FR)
- PPAs
- Revenue and § 51 reports

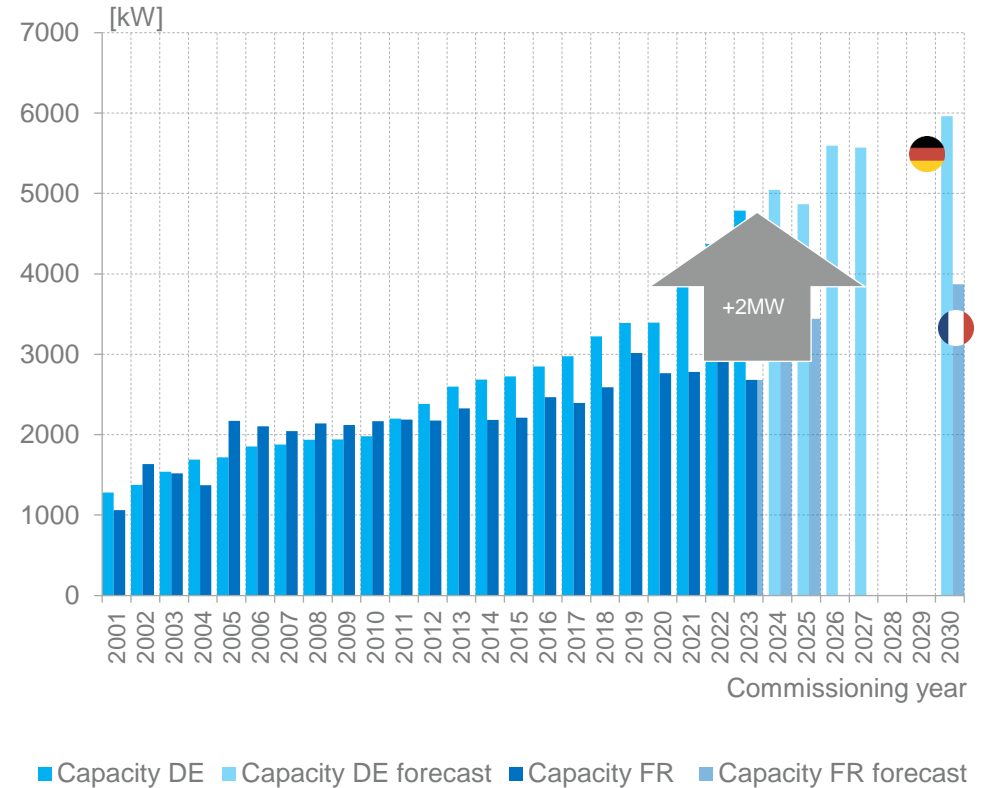
What projects are in the pipeline?

Hub height & rotor diameter Germany vs. France



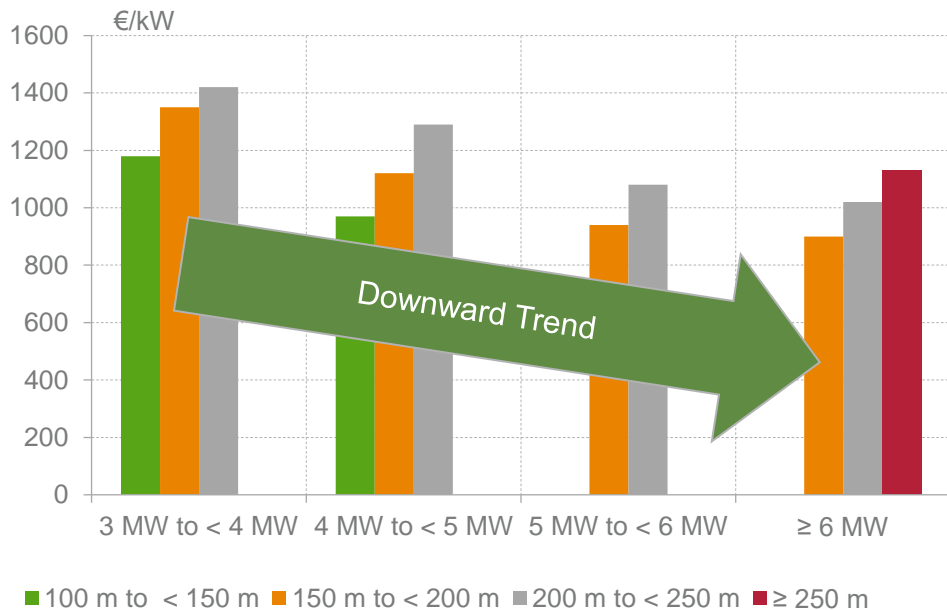
Sources: Marktstammdatenregister; enervis database; WattaBase database

Average WTG capacity Germany vs. France



Development of investment costs

Main investment costs

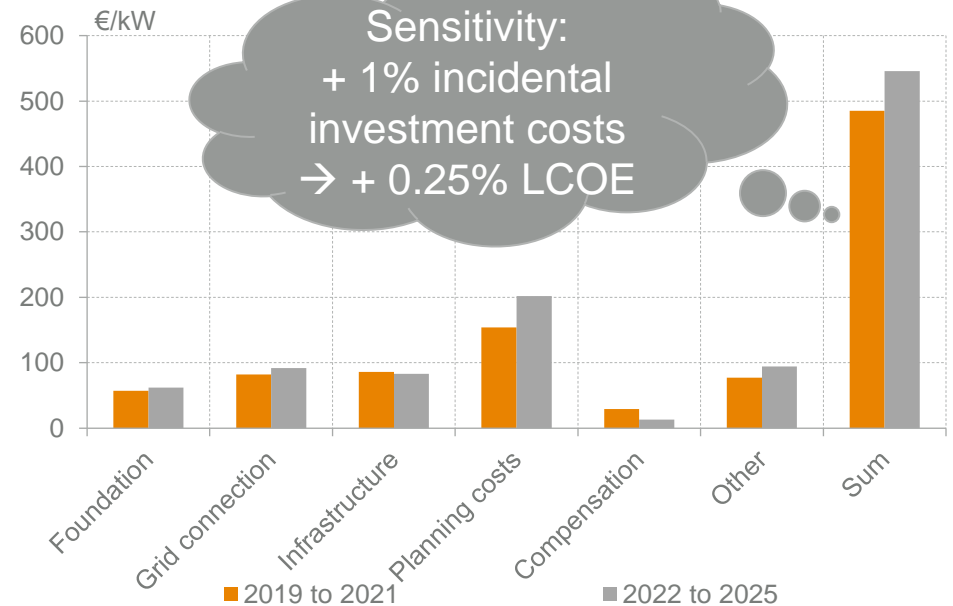


- The larger the generator, the cheaper specific investment costs per kW

➤ Translates into lower LCOEs

Source: Deutsche Windguard

Incidental investment costs

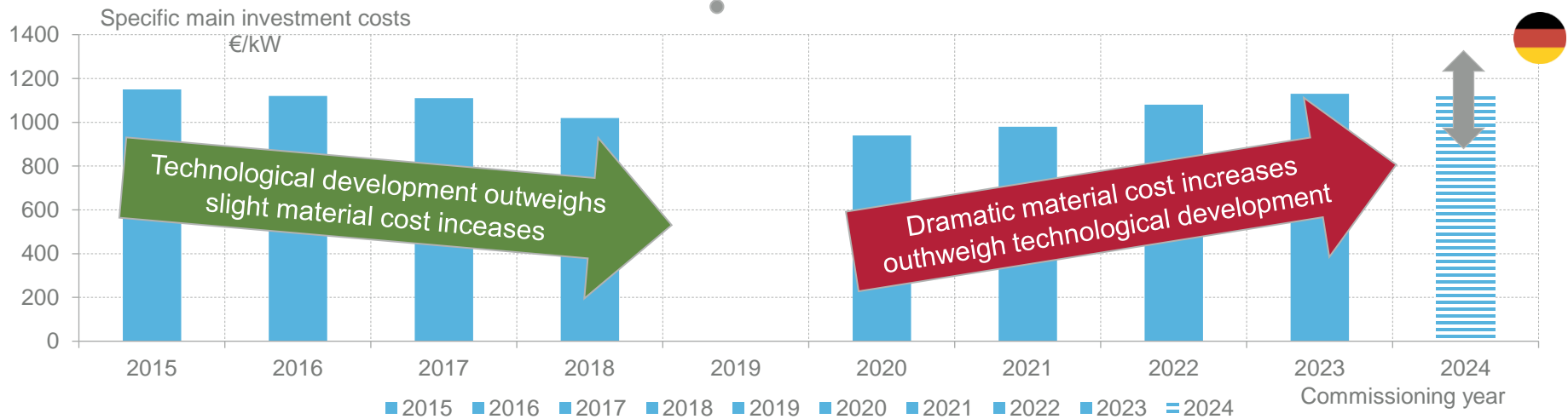
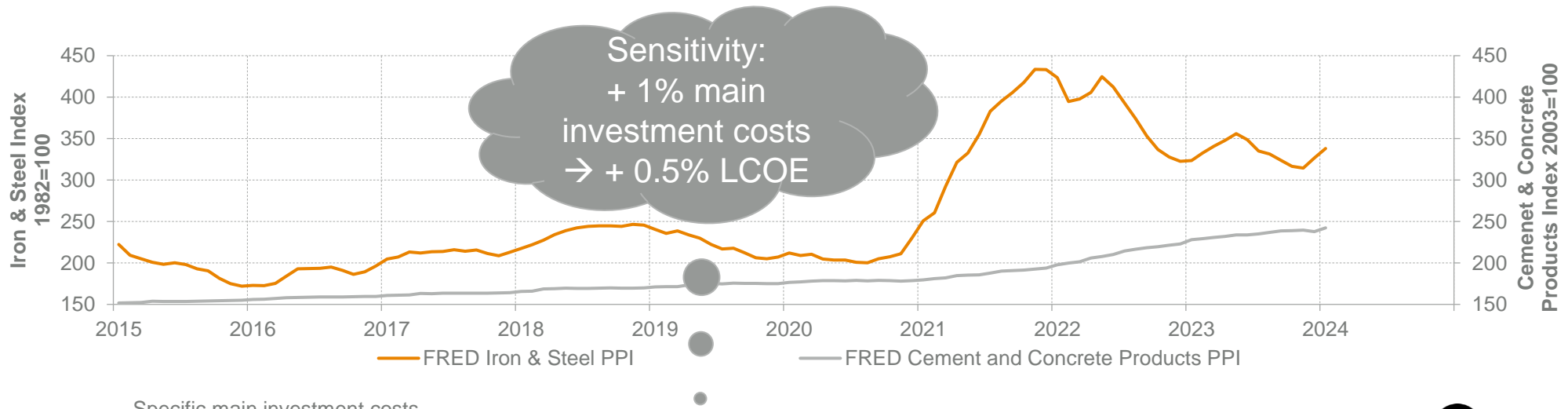


- Slightly increased especially due to increased planning costs

➤ Translates into higher LCOEs

Source: Deutsche Windguard

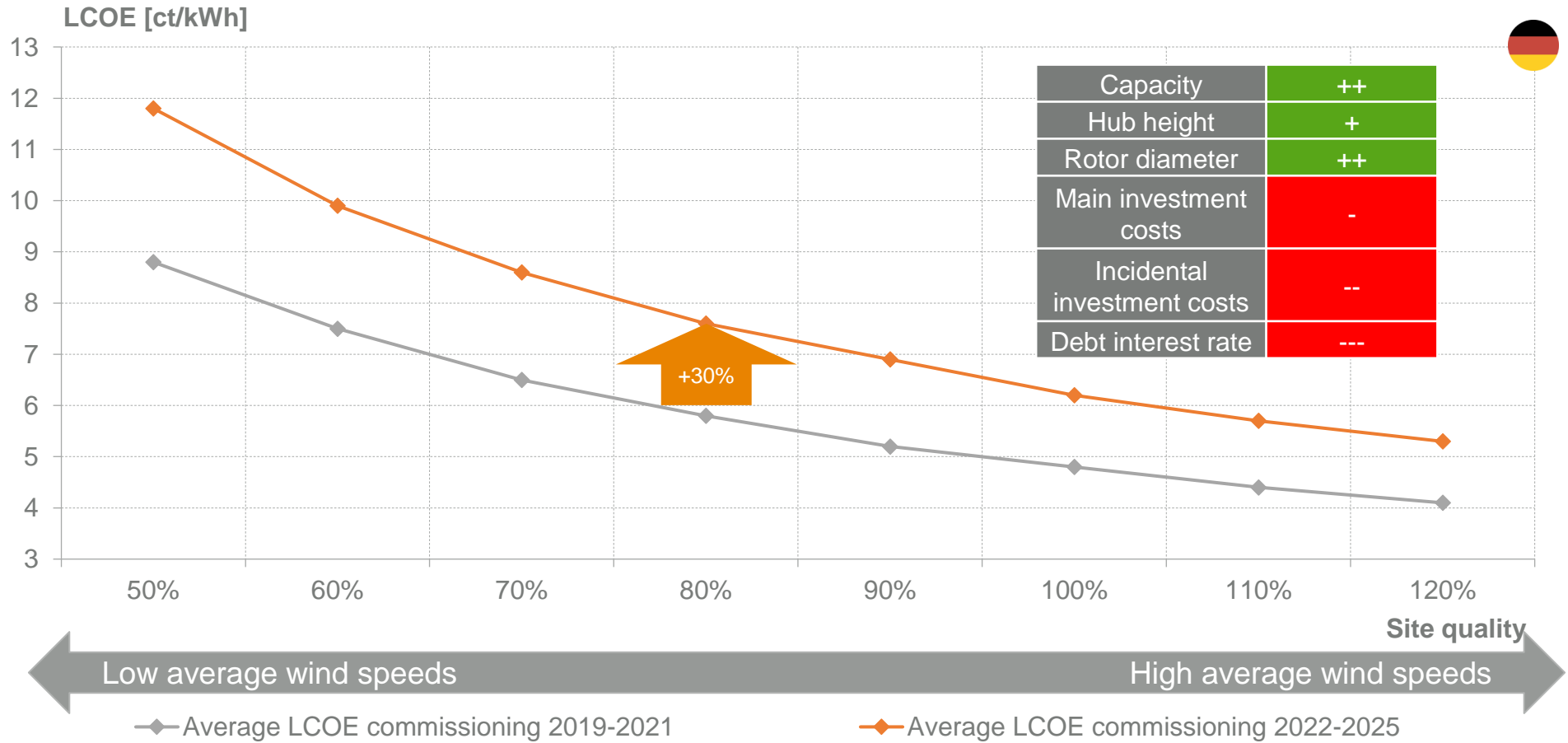
Increased material costs directly translate into higher investment costs



Sources: Federal Reserve Bank; Deutsche Windguard

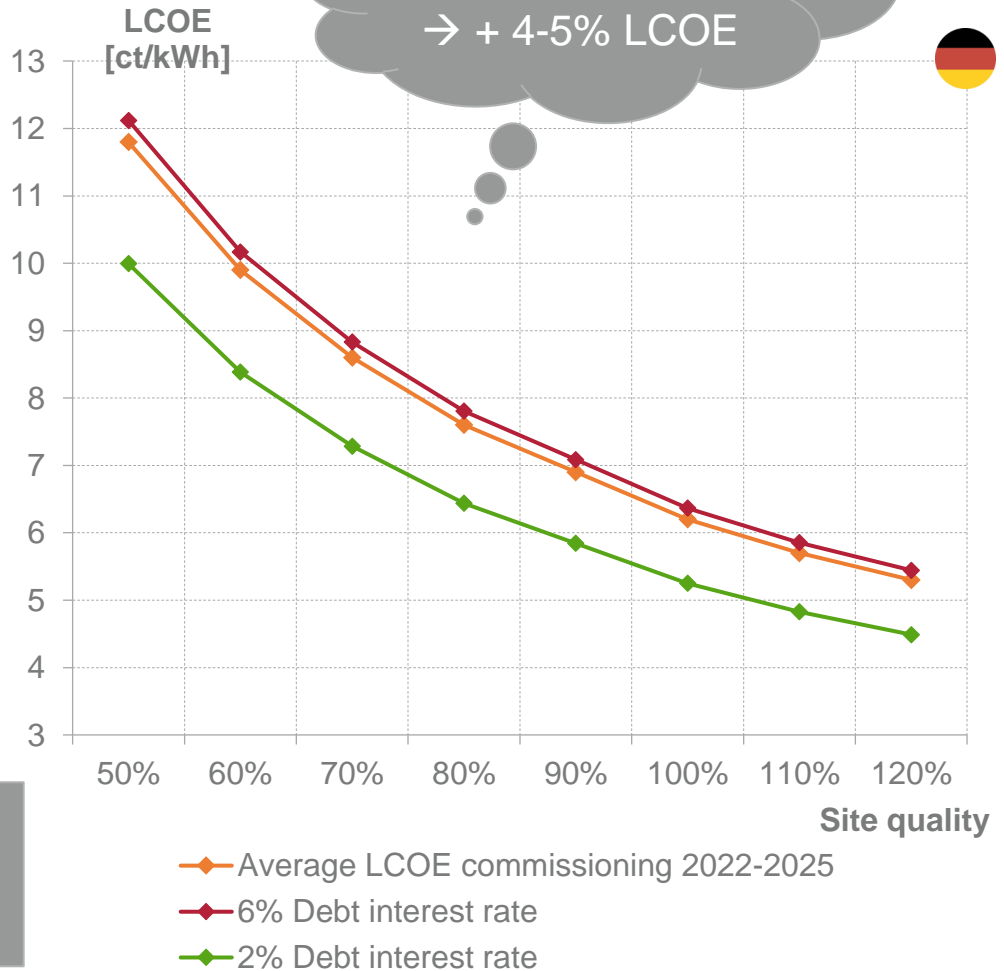
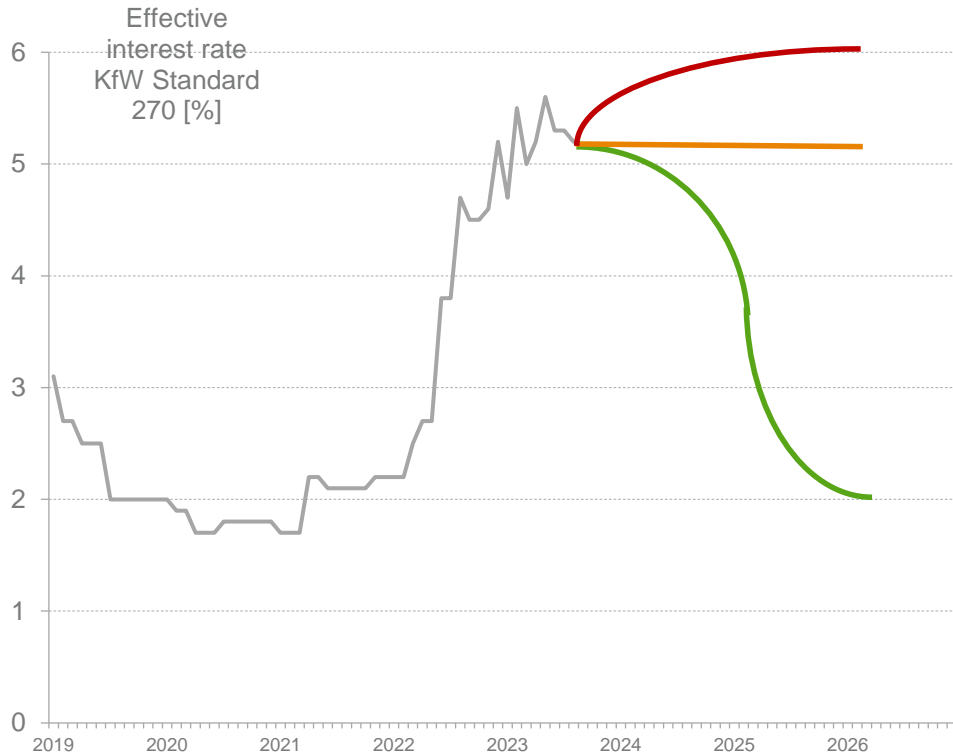
LCOE development

Negative investment cost and interest rate development outweigh positive WTG dimension development!



Sources: Federal Reserve Bank; Deutsche Windguard

Sensitivity of debt interest rate development

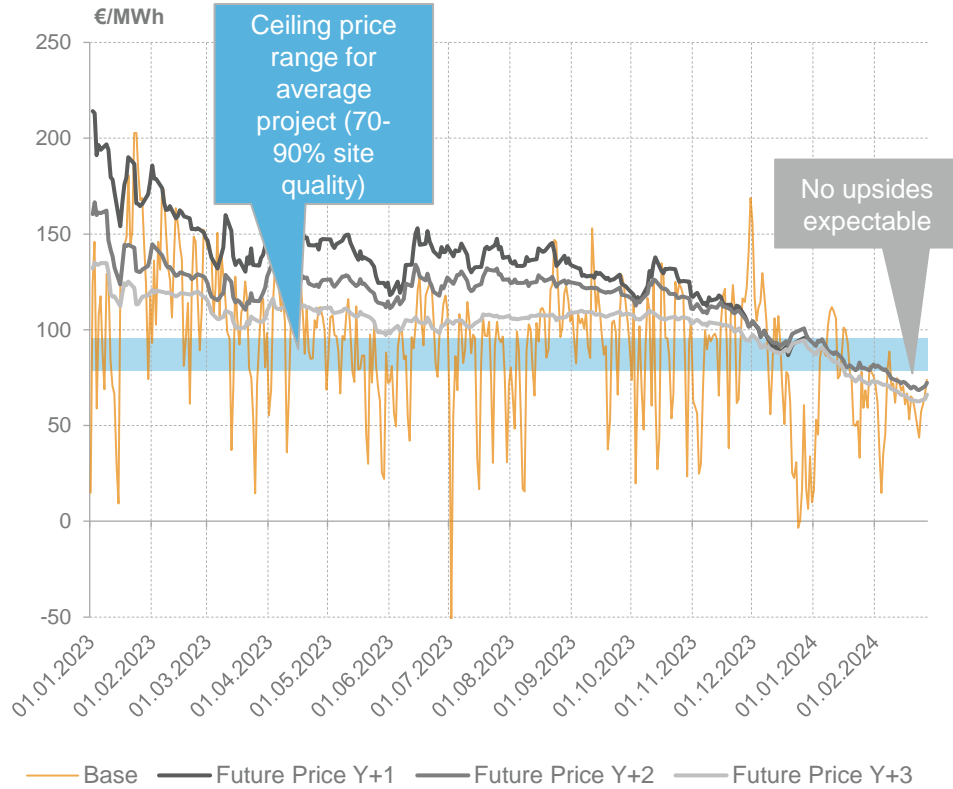


 Interest rates are the main cost parameter driving LCOEs!

Sources: KfW; Deutsche Windguard

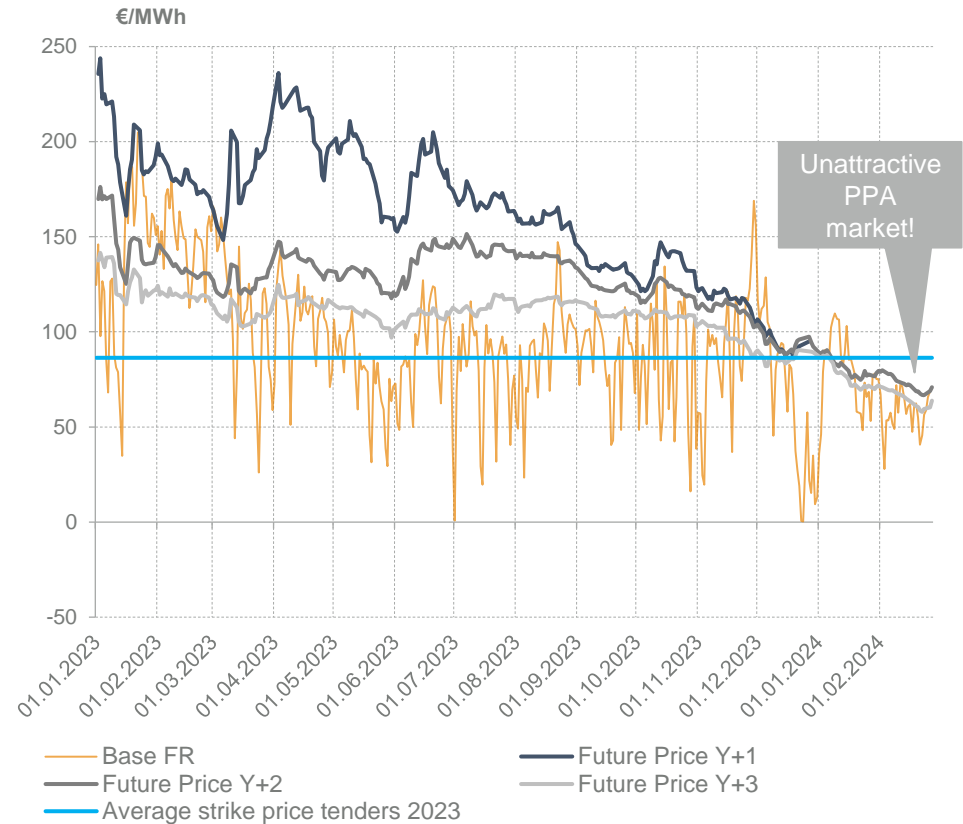
What to expect from the electricity market?

Electricity prices vs. tender ceiling prices

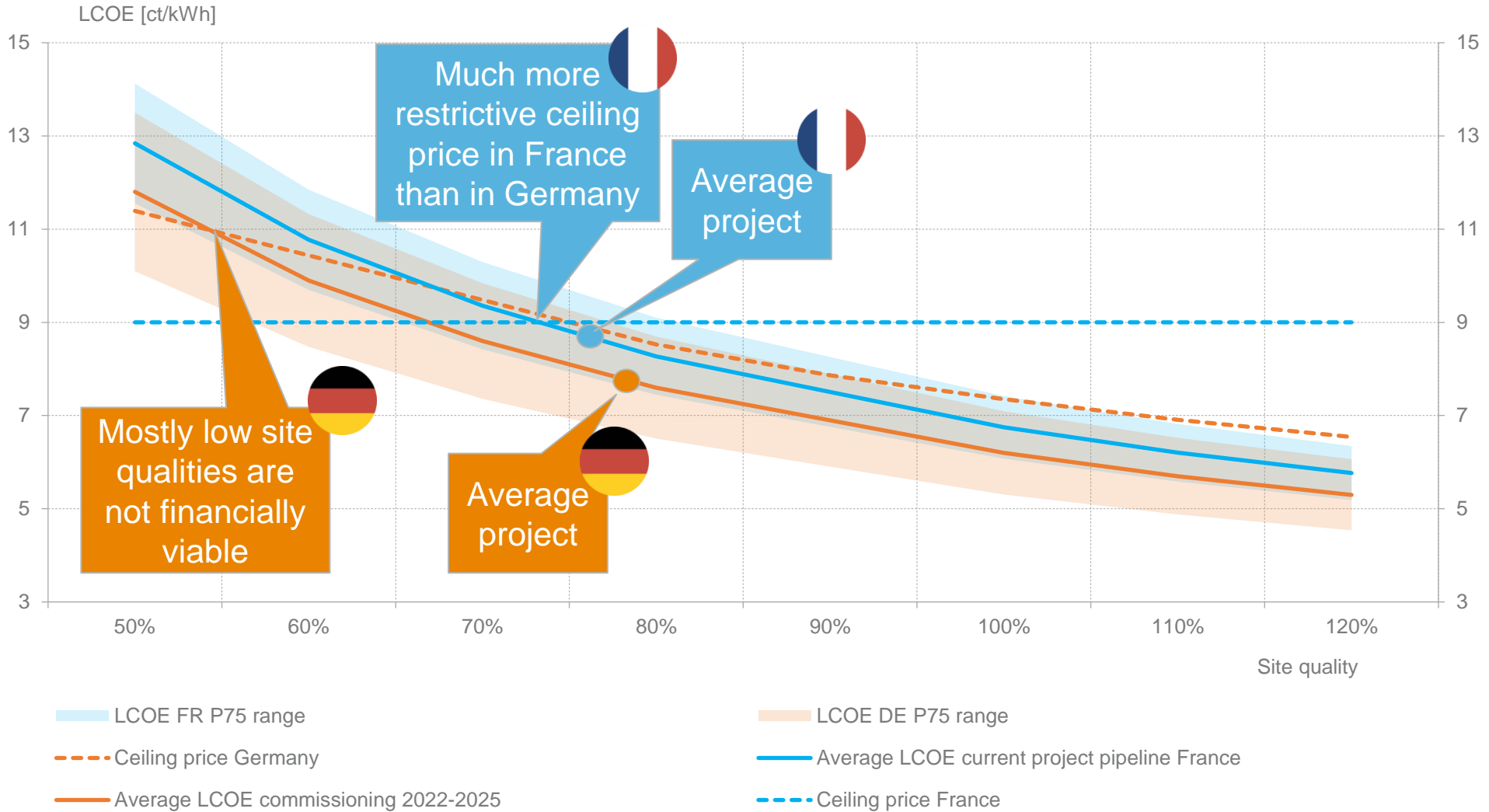


Sources: EEX; ENTSOE Transparency

Electricity prices vs. tender ceiling prices



Auction strike prices vs. LCOE



Conclusion

- **Larger WTG dimensions lead to lower LCOEs.** However, increased construction **material prices** (steel, concrete) and **interest rates** have outweighed the positive effect of larger WTGs → **significant LCOE increase by around 30%** for projects commissioning since 2022 in Germany.
- With decreasing material costs and probably decreasing interest rates, **LCOEs will probably fall back to pre 2022 levels** in the upcoming two years.
- Delayed reaction by authorities increasing the auction **ceiling price to be sufficient for roughly 75% (Germany) and 65% (France)** of all projects in the pipeline.
- Depending on what develops faster, ceiling prices or LCOEs, these shares will change positively or negatively.
- Large **additional upsides** from the electricity market **cannot be expected** in upcoming years.
- **PPAs do not seem like an attractive alternative** to the tenders at the moment due to low future market prices in both countries.

Do you have questions about this topic?

Feel free to contact us!



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