



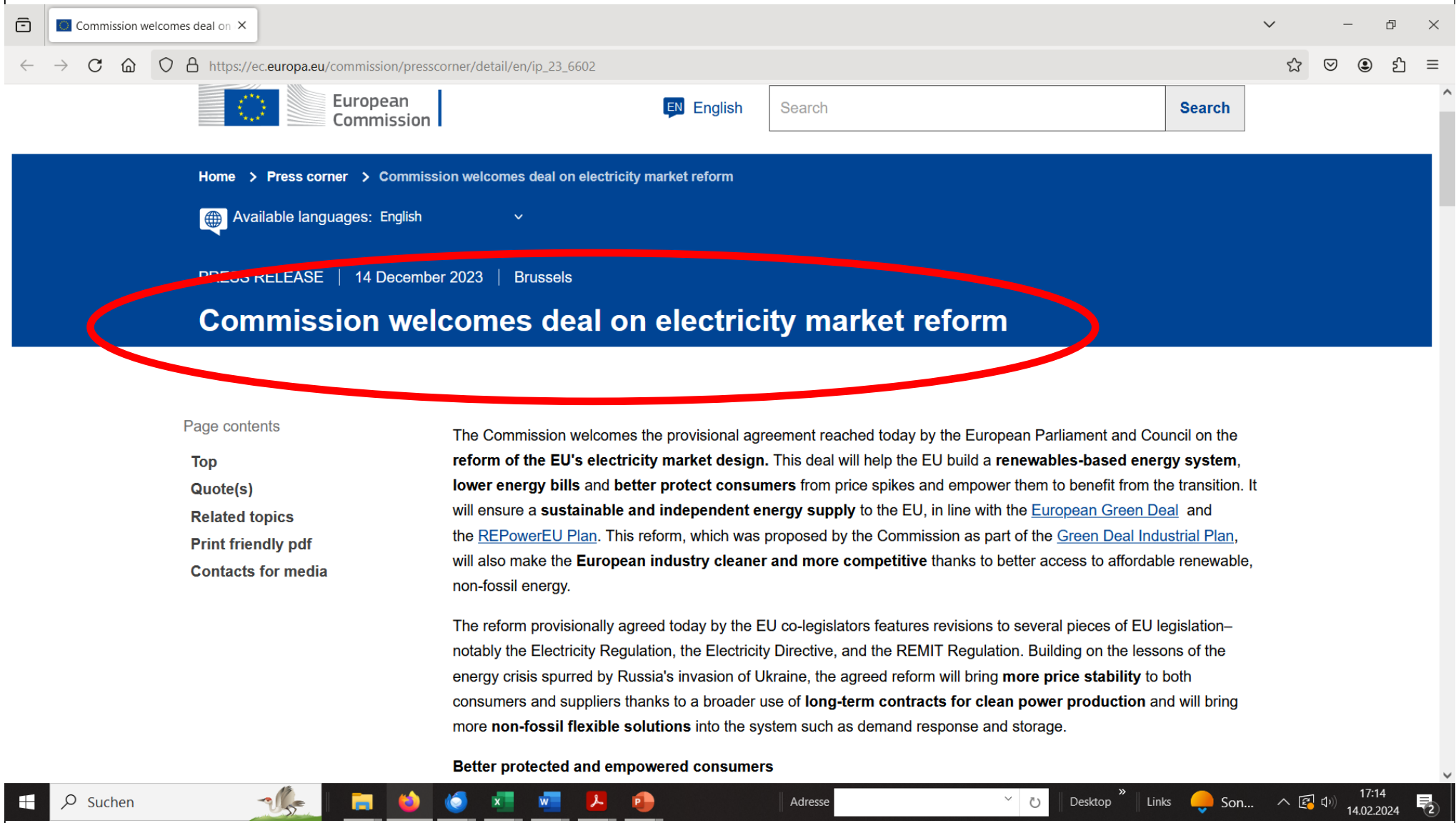
HEADING TOWARDS DEMOCRATIC, SUSTAINABLE AND COMPETITIVE ELECTRICITY SYSTEMS

Reinhard HAAS,
TU Wien

Graz, 12. 2. 2026

1. INTRODUCTION

14 December 2023



The screenshot shows a web browser displaying a press release from the European Commission. The browser's address bar shows the URL: https://ec.europa.eu/commission/presscorner/detail/en/ip_23_6602. The page header includes the European Commission logo, a language selector set to 'English', and a search bar. The main content area has a blue background with the breadcrumb 'Home > Press corner > Commission welcomes deal on electricity market reform' and 'Available languages: English'. The title 'Commission welcomes deal on electricity market reform' is highlighted with a red oval. Below the title, the text reads: 'PRESS RELEASE | 14 December 2023 | Brussels'. The main body of the text states: 'The Commission welcomes the provisional agreement reached today by the European Parliament and Council on the **reform of the EU's electricity market design**. This deal will help the EU build a **renewables-based energy system**, **lower energy bills** and **better protect consumers** from price spikes and empower them to benefit from the transition. It will ensure a **sustainable and independent energy supply** to the EU, in line with the [European Green Deal](#) and the [REPowerEU Plan](#). This reform, which was proposed by the Commission as part of the [Green Deal Industrial Plan](#), will also make the **European industry cleaner and more competitive** thanks to better access to affordable renewable, non-fossil energy.' A second paragraph follows: 'The reform provisionally agreed today by the EU co-legislators features revisions to several pieces of EU legislation— notably the Electricity Regulation, the Electricity Directive, and the REMIT Regulation. Building on the lessons of the energy crisis spurred by Russia's invasion of Ukraine, the agreed reform will bring **more price stability** to both consumers and suppliers thanks to a broader use of **long-term contracts for clean power production** and will bring more **non-fossil flexible solutions** into the system such as demand response and storage.' The page footer includes a sidebar with 'Page contents' (Top, Quote(s), Related topics, Print friendly pdf, Contacts for media) and a section titled 'Better protected and empowered consumers'. The Windows taskbar at the bottom shows the time as 17:14 on 14.02.2024.

MAJOR ISSUES:

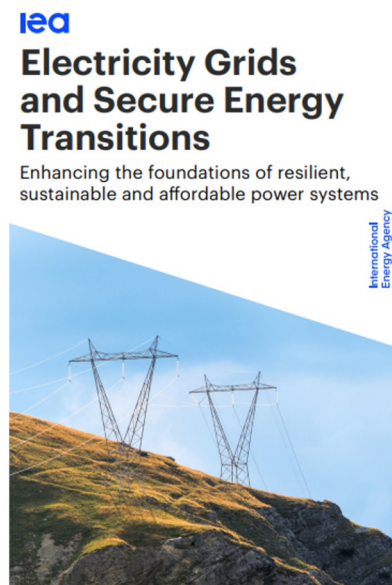
- * Better protected and empowered consumers;
- * energy market integrity and transparency (ACER) ;
- * A competitive European industry with predictable energy costs
- * Long-term contracts: PPAs and CfD
- * integration of renewables (RED III: 42.5%)

2. Late acknowledgement in 2023: No Grids – No Green Deal



“The EU is bringing grids to the centre of its agenda.”

European Commission, Grid Action Plan

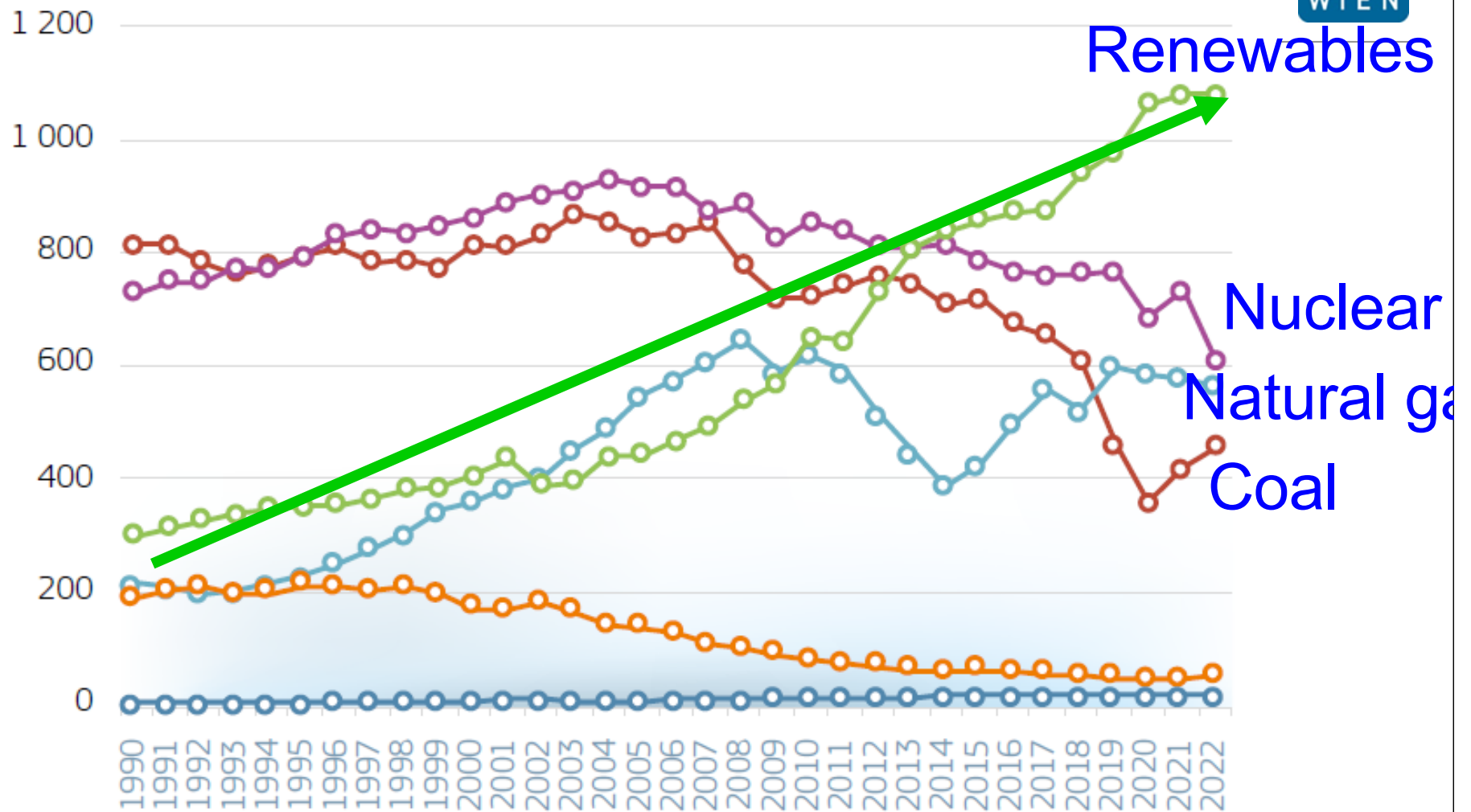


“With this special report, we aim to put an urgently needed spotlight on power grids.”

IEA October 2023



Electricity generation EU-27



Solid fossil fuels, peat, oil shale and sands

Renewables and biofuels

Nuclear

Natural and manufactured gases

Oil and petroleum products

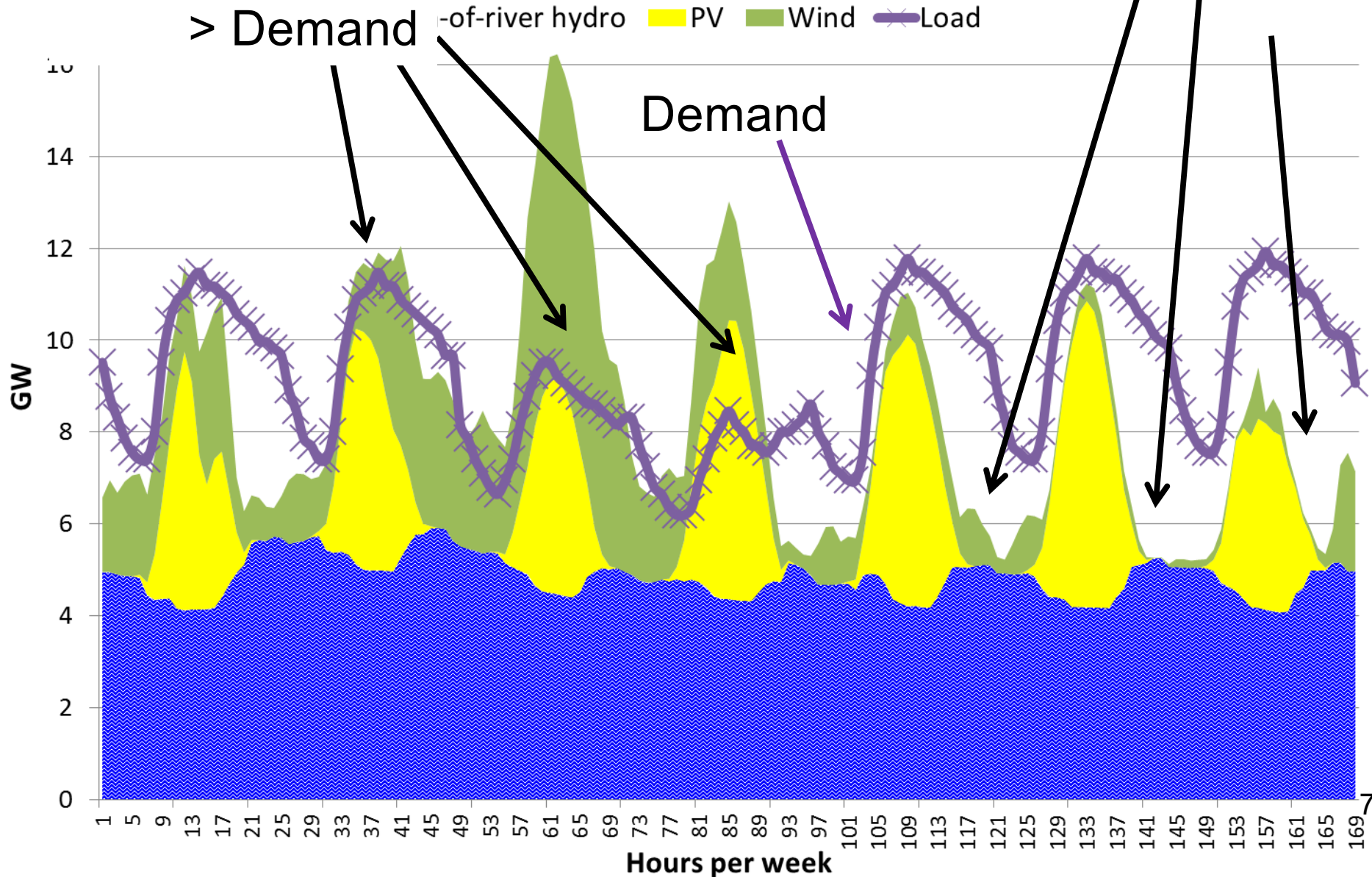
Waste non-RES

2. HOW VARIABLE RENEWABLES IMPACT THE ELECTRICITY SYSTEM

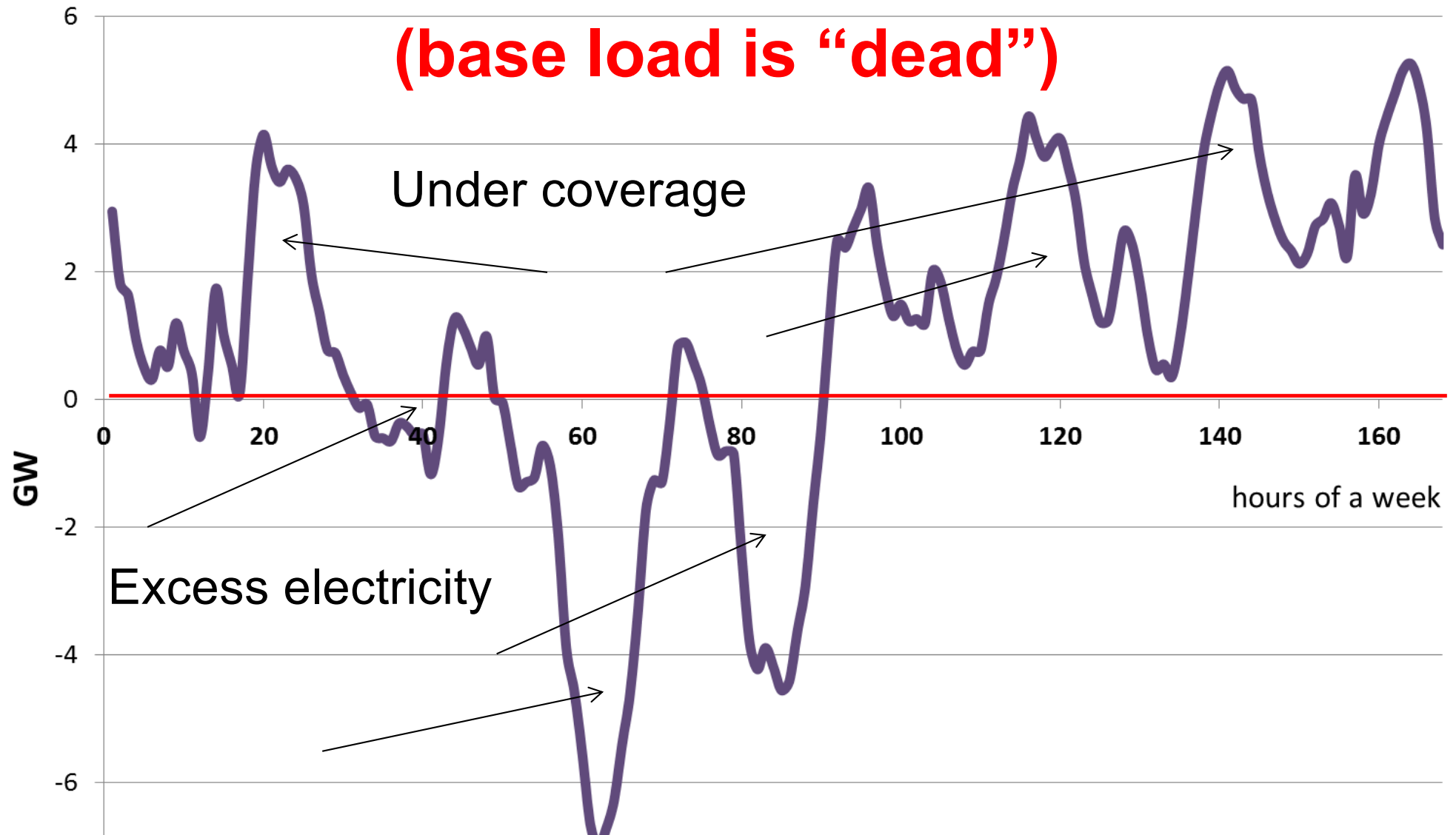
Supply and Demand summer 2030

RES Production < Demand

RES Production > Demand

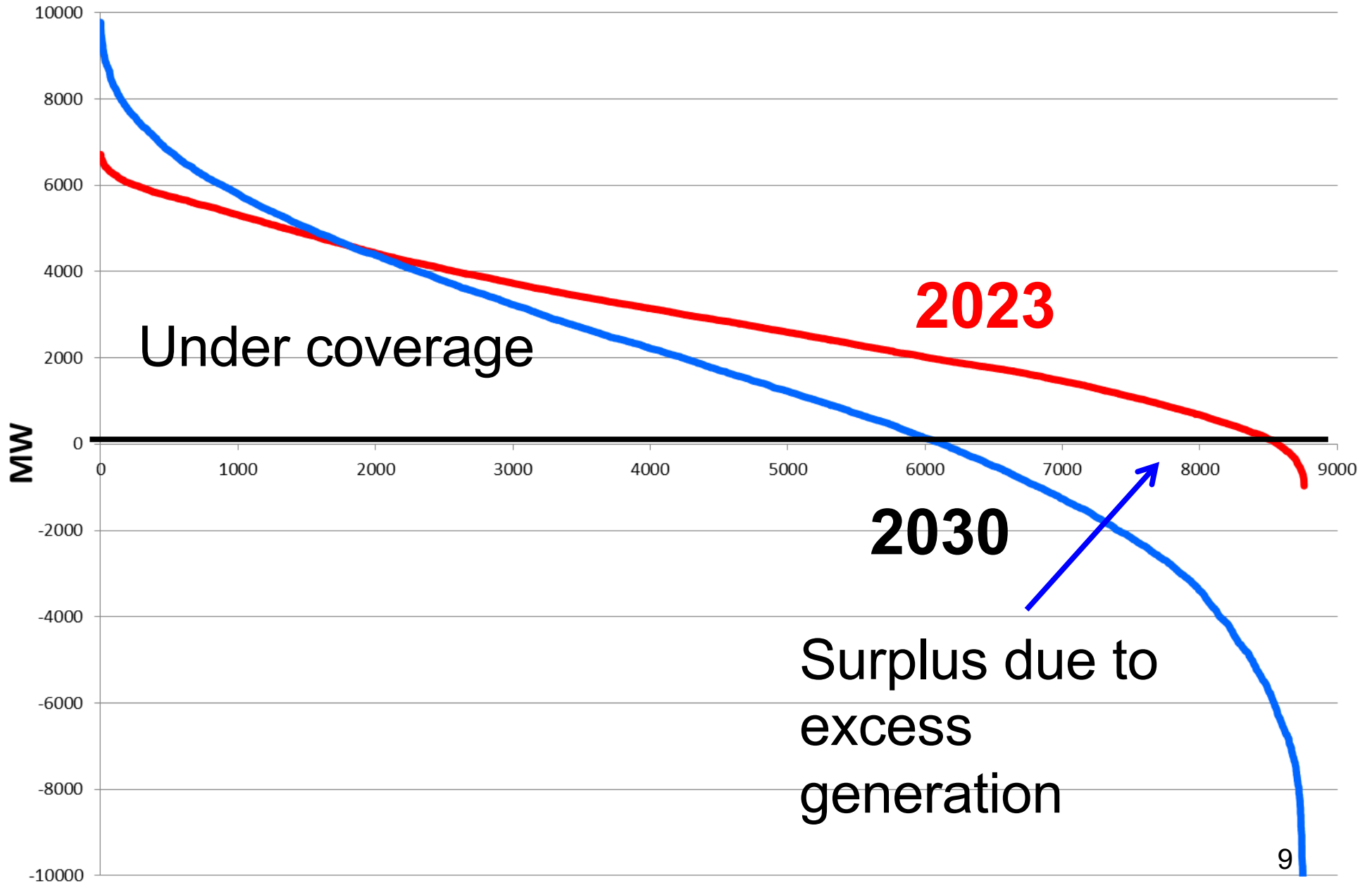


Key term of the future: Residual load

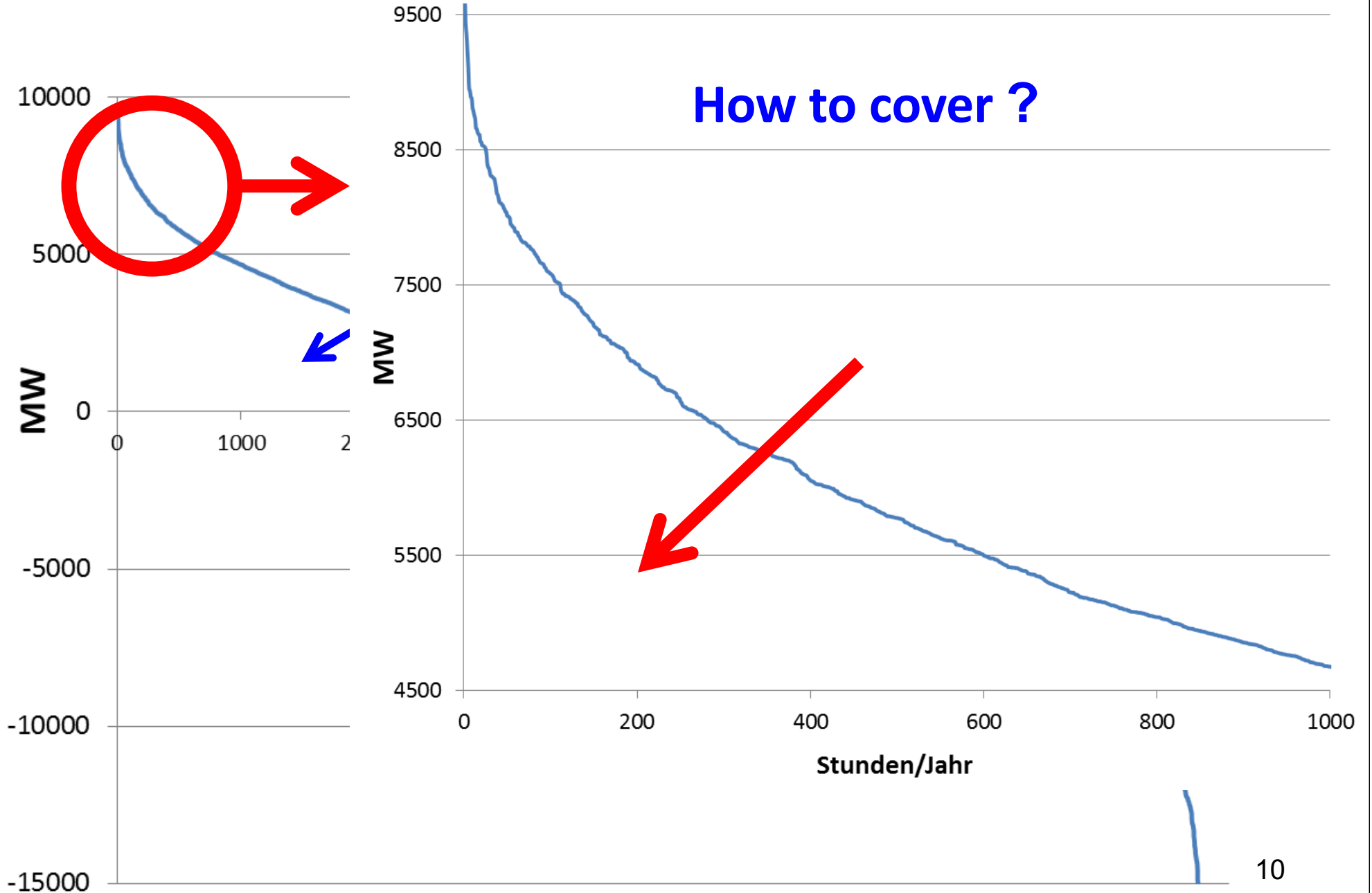


Residual load = Load – non-flexible generation

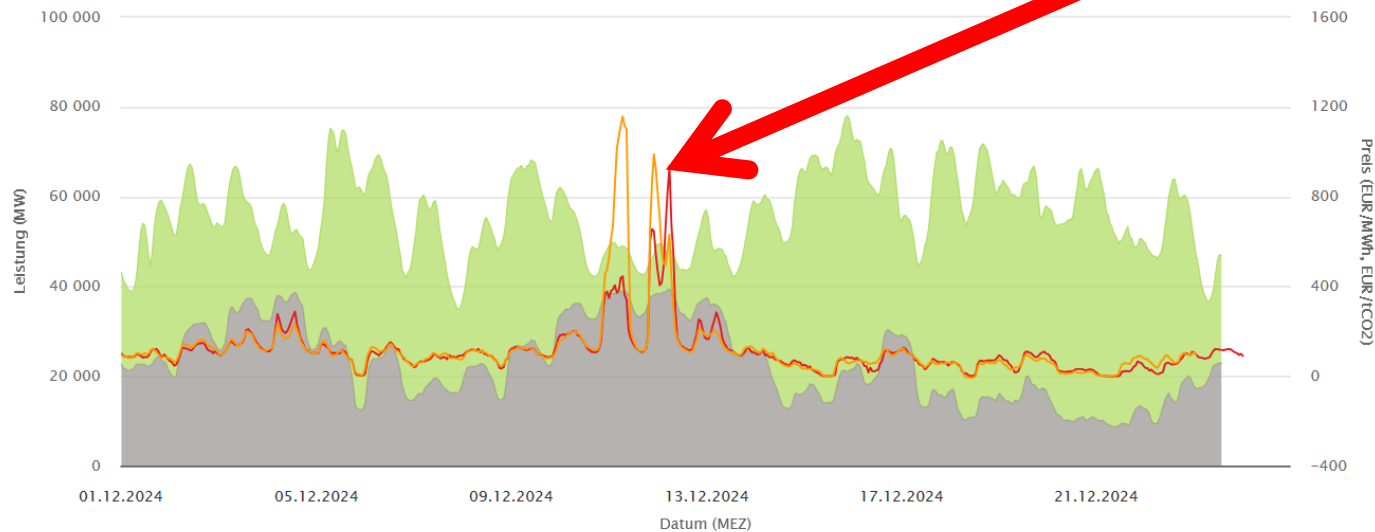
Classified residual load over a year



Classified residual load



Stromproduktion und Börsenstrompreise in Deutschland im Dezember 2024



- Pumpspeicher-Verbrauch
- Erneuerbar
- Intraday kontinuierlich, Durchschnittspreis (DE-LU)
- Intraday kontinuierlich, ID3-Preis (DE-LU)
- CO2-Emissionszertifikate, Auktion-EU
- Grenzüberschreitender-Stromhandel
- Last
- Intraday kontinuierlich, Niedrigstpreis (DE-LU)
- Intraday kontinuierlich, ID1-Preis (DE-LU)
- Nicht Erneuerbar
- Day Ahead Auktion (DE-LU)
- Intraday kontinuierlich, Höchstpreis (DE-LU)
- CO2-Emissionszertifikate, Auktion-DE

Energy-Charts.info - letztes Update: 24.12.2024, 13:50 MEZ

Datumsauswahl

Intervall: Monat

Jahr: 2024

Monat in 2024: Dezember

Handel

Anordnung

Konfiguration

Zeitangaben

Beschreibung

Export

Hinweise

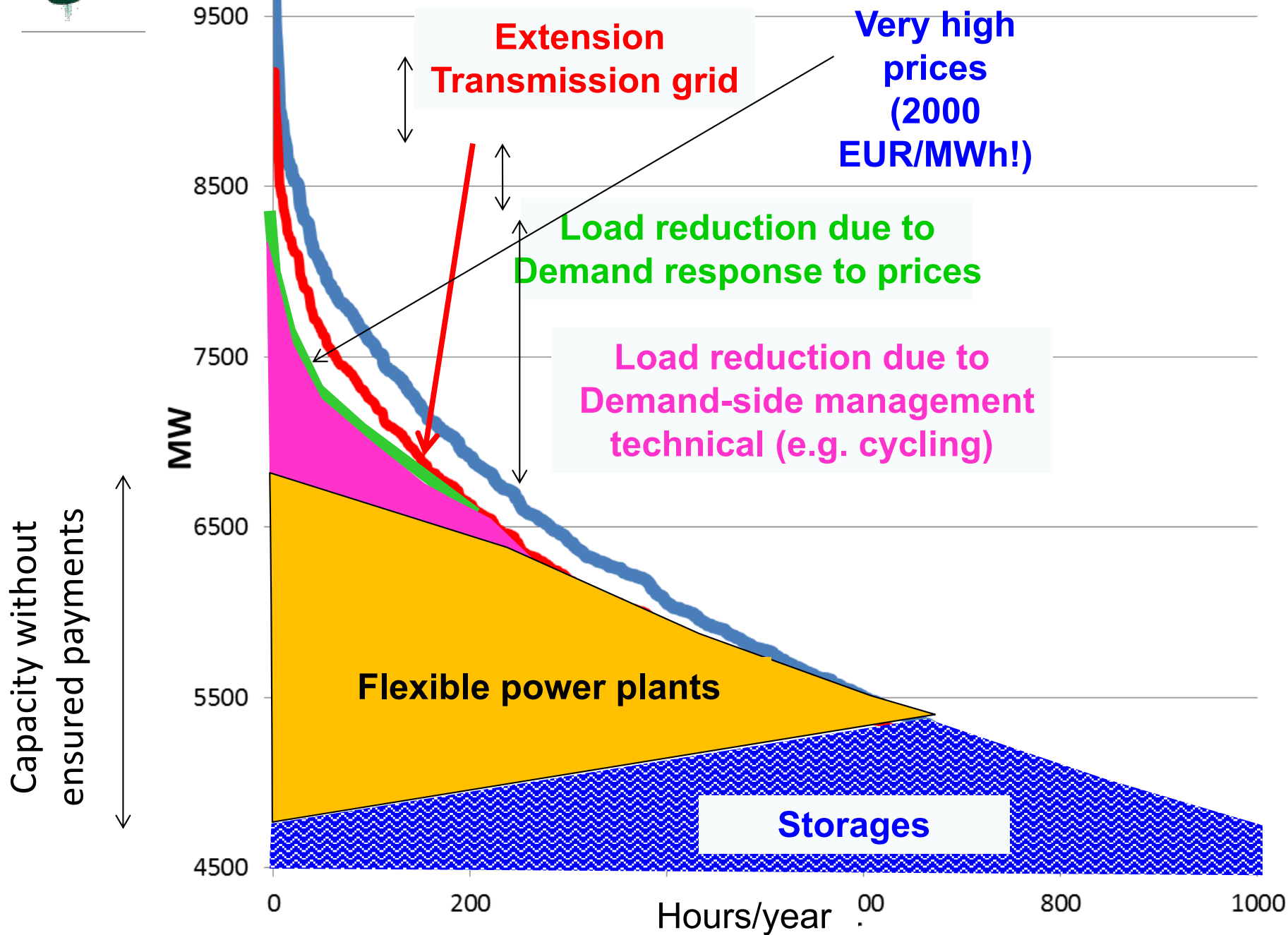
There are two extreme positions:

By a regulated capacity payment with STMC pricing?

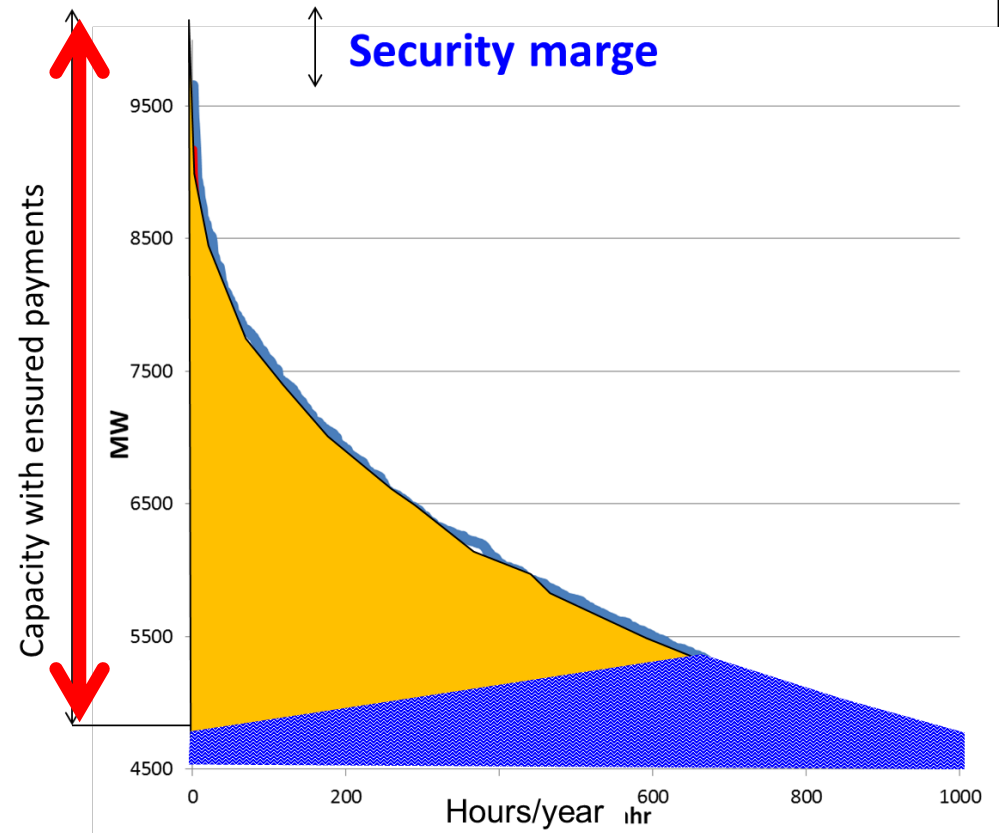
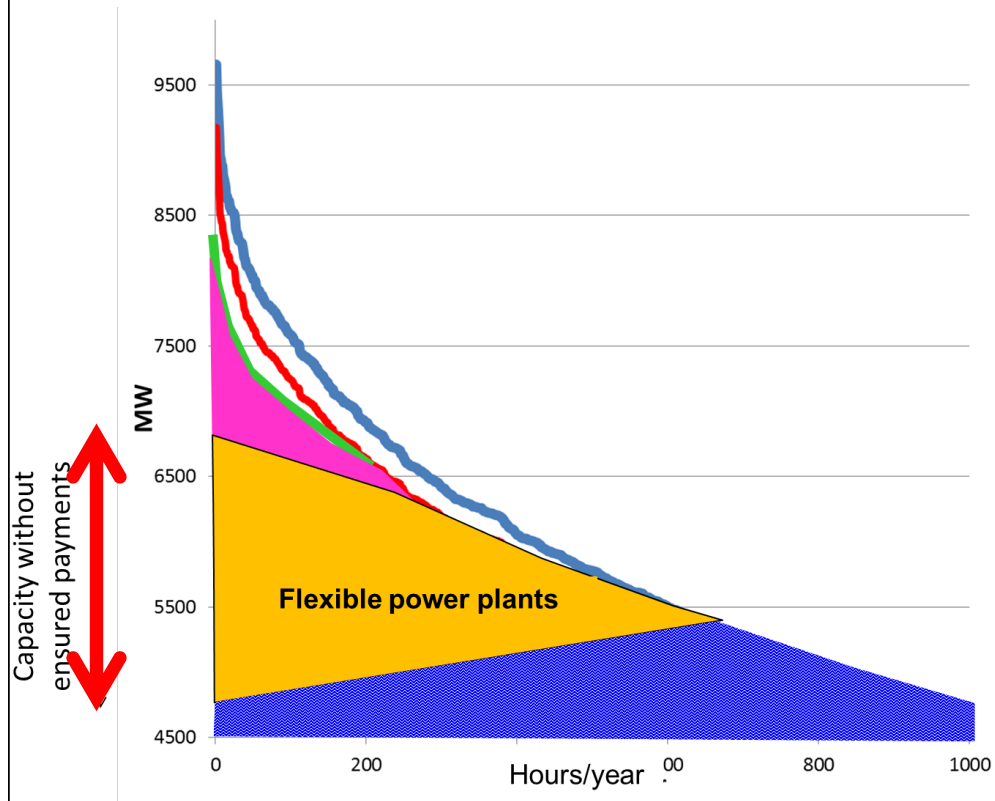
or

By competition between supply-side and demand-side technologies and behaviour (incl. Storages, grid and other flexibility options) with correct scarcity pricing signals?

Flexible coverage of residual load



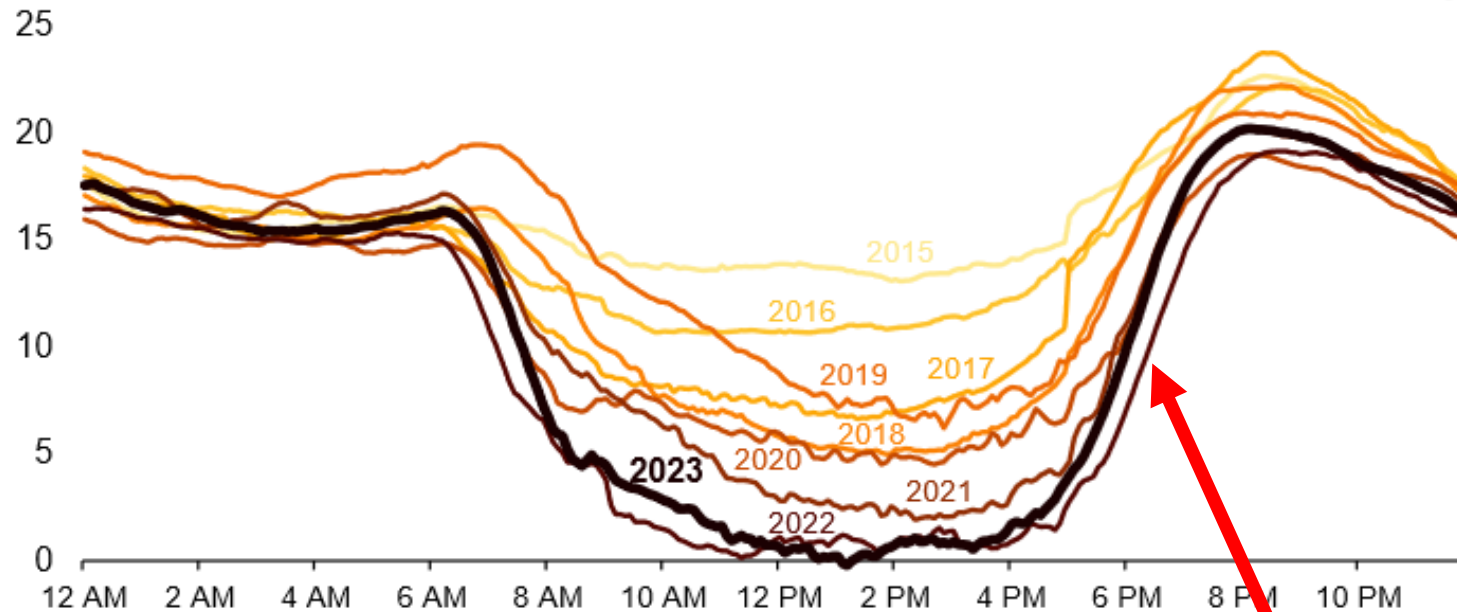
Comparison



The „Duck curve“

California's duck curve is getting deeper

CAISO lowest net load day each spring (March–May, 2015–2023), gigawatts



Ramping!

✓ On time

Day Ahead Auktionen Strom

EXAA Austria

Liefertag:

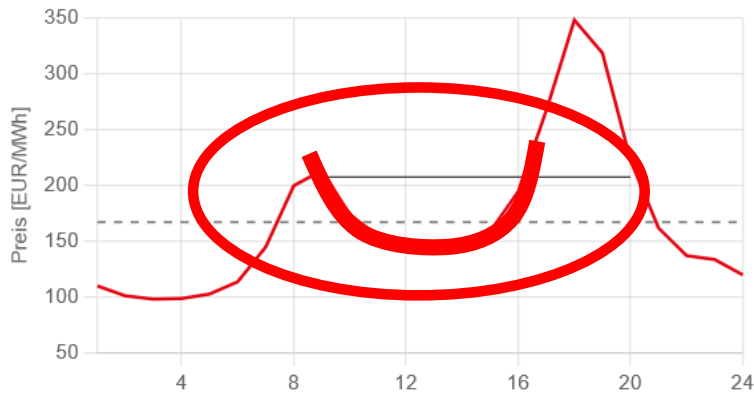
12.11.2024

Auktion:

10:15

Markt:

AT



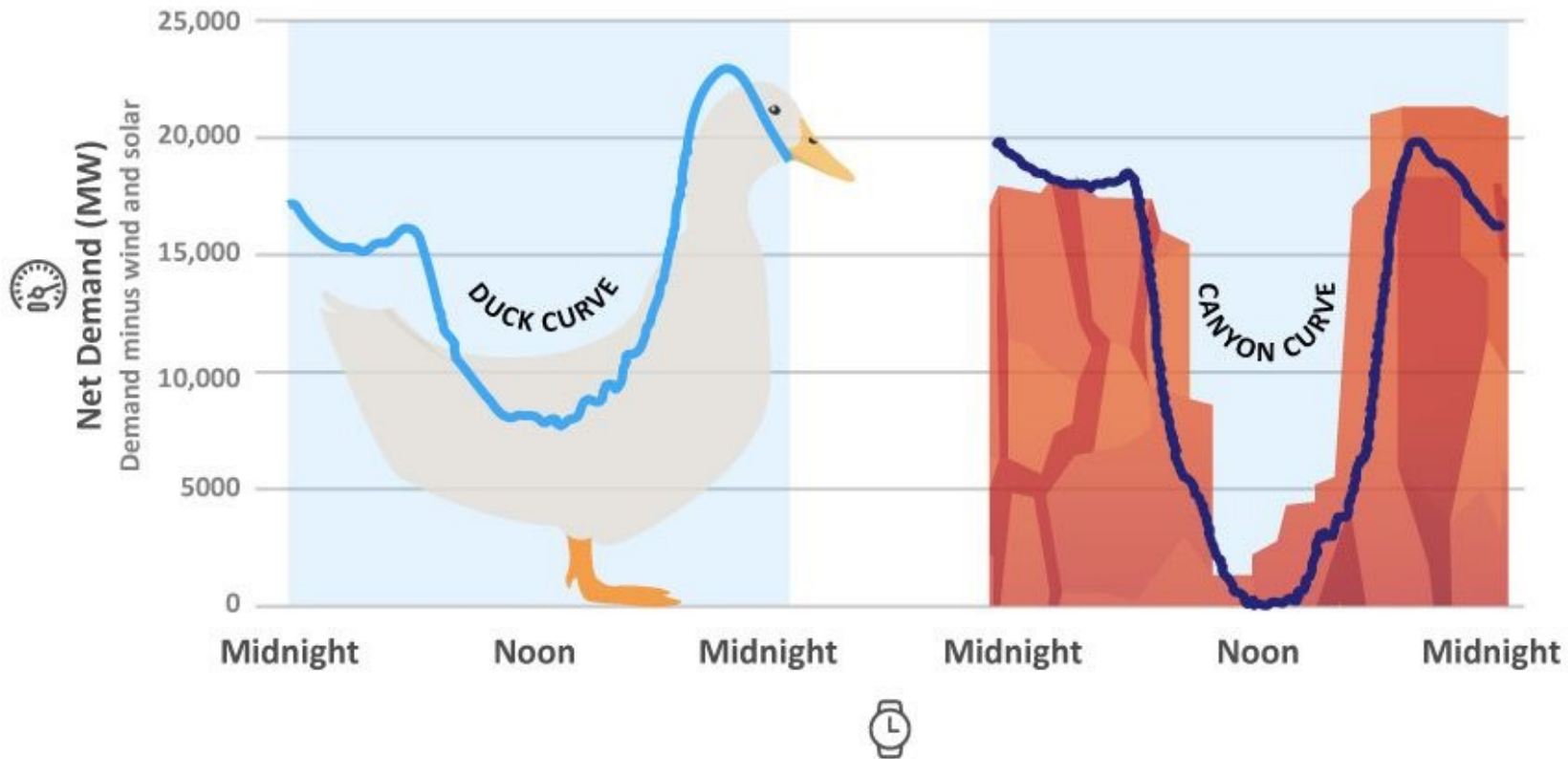
MCP | Base 167,11 €/MWh | Peak 207,51 €/MWh

Aktuelle Handelsergebnisse

From „Duck curve“ to „Canyon curve“

May 27
2018

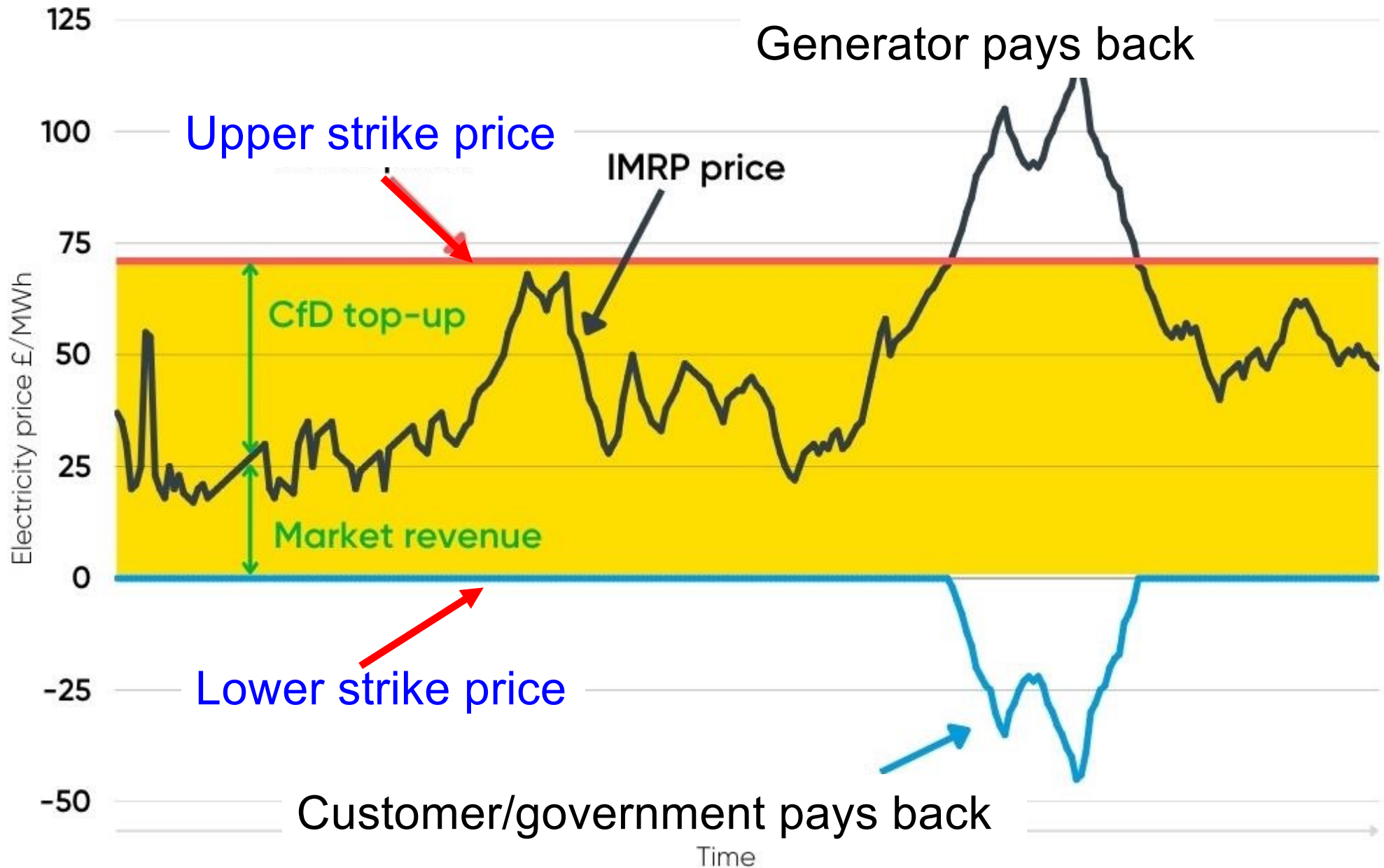
April 16
2023



4. LONG-TERM CONTRACTS

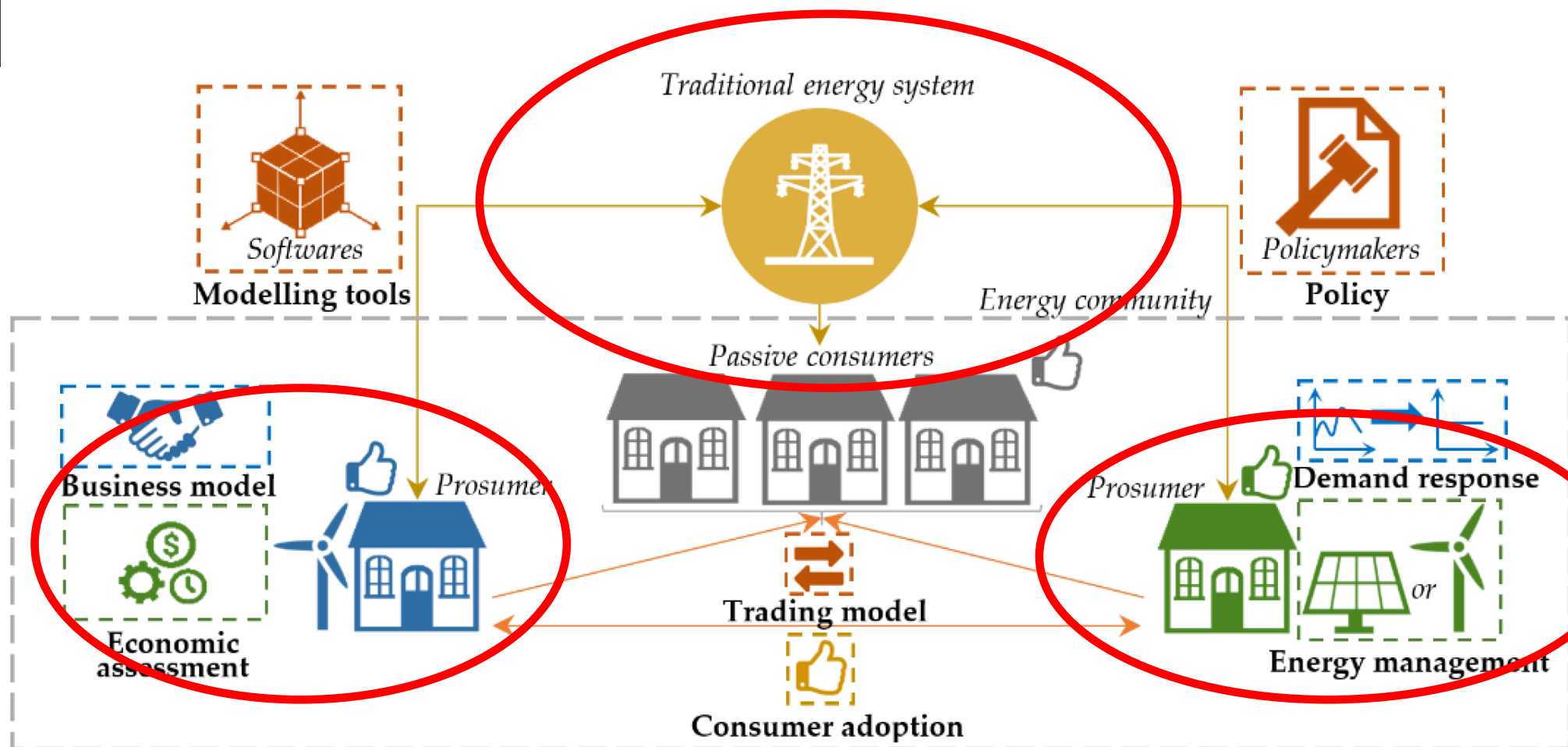
- * **How to recover the investment costs of variable renewables if $P=0$?**
- * **Future and forward markets: How strongly to interfere by a regulatory authority or by the EU ?**
- * **PPA – for Renewables?**
- * **C f D as ultimate solutions?**

An overview of the CfD mechanism (example)



Figures used are for illustrative purposes only.

5. RETAIL MARKETS: TOWARDS PROSUMAGERS AND ENERGY COMMUNITIES



6. CONCLUSIONS

- Sustainable electric. system → integration of a broad **technology** portfolio & **demand-side** options
- Capacity payments: → most urgent exhaust **full** creativity for **flexibility** of all market participants
- **Dynamic** pricing and new **tariff system** systems important especially for **prosumers**
- **New** market design? **New** models of long-term contracts?
- What happens **after 2030**?