

Dutch PPA Market Developments

**Realized and Expected Revenues
+ the Impact of the Revenue Cap**

28 February 2022, by Tobias Frankema

Agenda

1. Market Developments
2. PPA capture prices
3. Dutch revenue cap explained

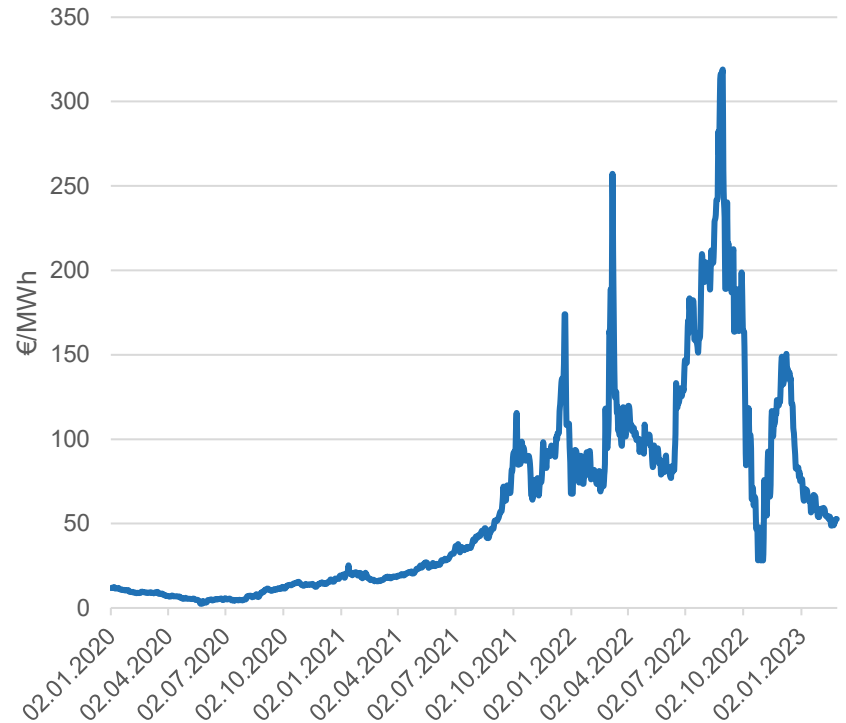


Market Developments

TTF Gas prices (Day ahead)

Prices are coming down due to mild winter

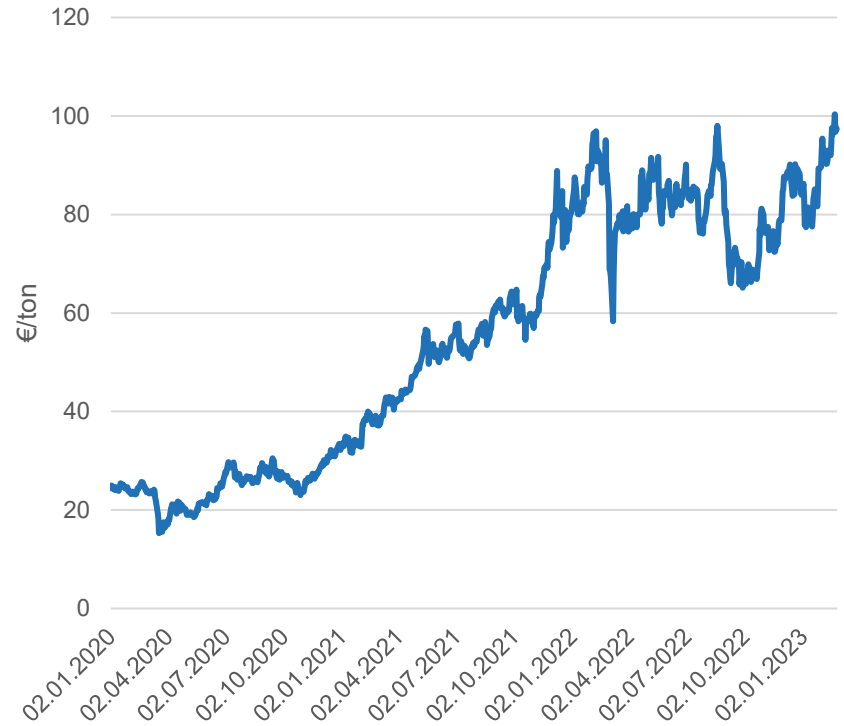
- Gas prices have been rising since Q2-2021 as **Russia started to withhold gas supplies** to Europe.
- **Ukraine war and sanctions** further added to fears of an undersupplied market.
- **Policies to fill gas storages** further increased demand last summer
- **Mild winter** is making gas less scarce again. Prices back to levels seen around Sep-2021



Carbon Emission Allowances (EUAs)

High carbon prices elevate power prices

- The price for EUAs is what **power plants based on fossil fuels must pay** for each ton of CO₂ emissions.
- **More ambitious EU climate targets** has led to reforms of the EU Emission Trading System (ETS). Less EUAs will be made available to the market, increasing prices.
- **Speculative trading** adds to the market dynamic.
- EUA prices are expected to remain high, which means their **impact on power prices are expected to be sustained**. Higher power prices lead to higher capture prices for renewables.



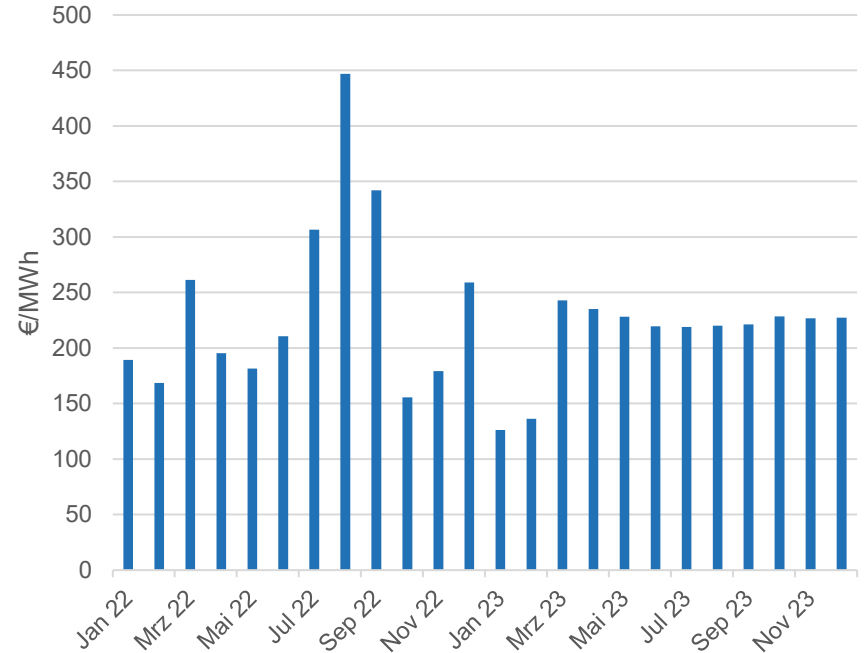
Market Developments

Power prices 2022-2023

Extreme market volatility

- Graph shows realized market prices (EPEX) Jan-22 - Feb-23 + current forward prices for Mar-23 - Dec-23.
- Gas + carbon prices expected to keep the power market supported.

Power Market Price (Baseload)



PPA Revenues

PPA structures

Dutch PPAs usually have one of the below 3 price structures:

1. Linked to SDE prices
2. Spot prices - imbalance factor
3. Fixed price

SDE price structure explained

The Dutch government publishes SDE reference prices (correction amounts) end of March for the previous years.

Correction amount = EPEX Baseload *

Profile/Imbalance factor

Profile/Imbalance factor is determined based on data from market participants.

Profile = value of nominated volumes on the day ahead (EPEX) market

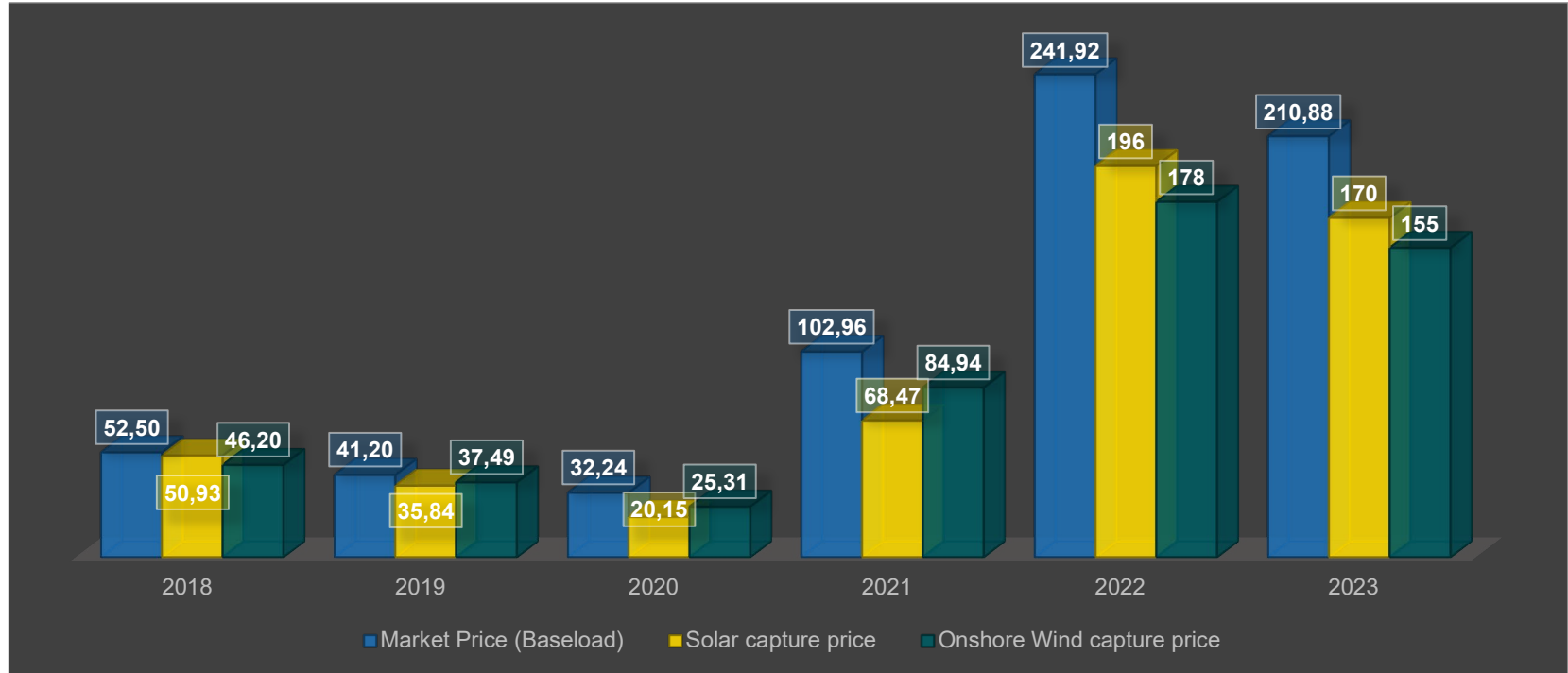
Imbalance = difference between nominated production volumes and actual production volumes * imbalance prices

A profile/imbalance factor of 0,85 indicates that the capture price of that technology has been estimated to be 85% of the average (baseload) EPEX price of that calendar year.

The SDE correction amounts represent the average capture price. Some parks perform better, others worse.

Historical and estimated future PPA power revenues

Based on the SDE profile/imbalance factors published by the Dutch government (2018-2021) and estimated profile/imbalance factors (2022-2023)



What will the (near) future bring?

- Unlikely that gas prices will go back to pre-war levels. EUA (carbon) prices will remain supported. → **Power prices will remain supported.**
- **Increase of solar and wind installed capacity** will lead to lower capture prices (profile/imbalance factor decreases).
- **Revenue cap** will impact PPA revenues at least in the period Dec-22 - Jun-23



Dutch implementation of the revenue cap

Revenue Cap

- Directive for revenue cap was adopted by the EU to tax excessive revenues by generation technologies with low marginal costs (renewables, nuclear, lignite).
- Each member state is free to implement in line with minimum requirements.
- For wind and solar: 90% of profits starting at €130/MWH or equal to the SDE base amount.
- Initially only for the period December 2022 - June 2023. In April 2023 it will be decided whether to extend.
- Revenues related to Guarantees of Origin will be excluded.
- Additional income for producers related to curtailment/redispatch, are excluded (will not be taxed).

Dutch implementation of the revenue cap

Status

- Dutch Ministry of Economic Affairs and Climate published a letter to parliament with their intentions on 30 November 2022
- A first draft of the law has been published and a consultation has been ongoing until February 16th
- Law to be submitted to parliament around March
- To be implemented by July 1st 2023 (retroactively from 1 December 2022 - 30 June 2023)



Implementation: Foreseen process

- The calculation is done per month, and for the period that the Regulation applies. That means once after 30 June for each month that the Regulation is in force (1 December 2022 - 30 June 2023)
- Parties must proactively file their income, similar to the process for turnover tax
- It is expected that for the period December 2022 – June 2023, the taxes must be filed latest June 2024.
- The Dutch Emissions Authority (substantive) and the tax authority (collection and administration) (supported by ACM) are in charge of further implementation.

Example calculations

Example 1: Price structure based monthly differing prices (Spot prices)

	PPA gross Income (€/MWh)	Revenue cap (€/MWh)	Production Volume (MWh)	Tax (€/MWh)	PPA net income (€/MWh)
jan-23	200	130	100	63	137
feb-23	180	130	200	45	135
mrt-23	140	130	400	9	131
apr-23	130	130	800	0	130
mei-23	150	130	1000	18	132
jun-23	100	130	1100	0	100
jul-23	150		1000		150
aug-23	180		800		180
sep-23	190		600		190
okt-23	100		400		100
nov-23	120		200		120
dec-23	150		100		150

Weighted PPA Gross Income 143,73

Weighted PPA Net Income 138,22

Example 2: Price structure based on 1 flat price per year (SDE or fixed price)

	PPA gross Income (€/MWh)	Revenue cap (€/MWh)	Production Volume (MWh)	Tax (€/MWh)	Net income (€/MWh)
jan-23	143,73	130	100	12,36	131,37
feb-23	143,73	130	200	12,36	131,37
mrt-23	143,73	130	400	12,36	131,37
apr-23	143,73	130	800	12,36	131,37
mei-23	143,73	130	1000	12,36	131,37
jun-23	143,73	130	1100	12,36	131,37
jul-23	143,73		1000		143,73
aug-23	143,73		800		143,73
sep-23	143,73		600		143,73
okt-23	143,73		400		143,73
nov-23	143,73		200		143,73
dec-23	143,73		100		143,73

Weighted PPA Gross Income 143,73

Weighted PPA Net Income 137,09