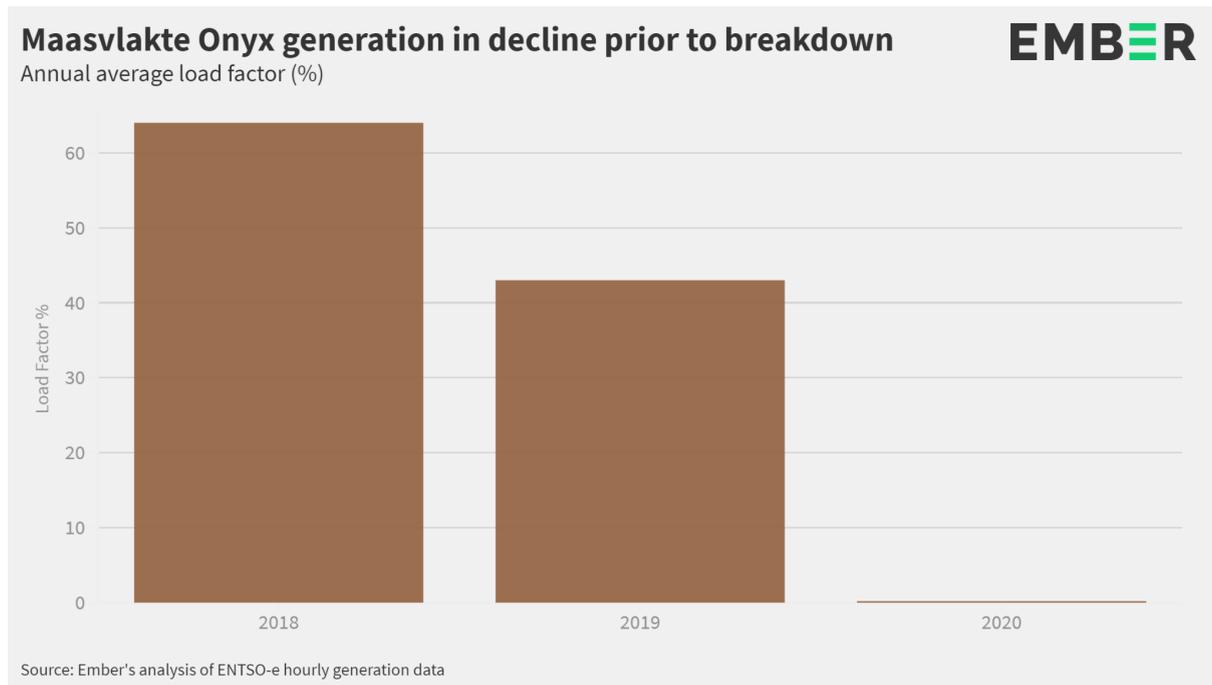


Onyx Power Maasvlakte Analysis

Historic performance and profitability

Onyx Power's Maasvlakte power plant suffered a technical failure in January 2020 and has not generated electricity since then. Prior to this, the plant was running at an average annual load factor of 64% in 2018 and 43% in 2019.



Revenue has been calculated using ENTSO-e historical hourly power generation for Maasvlakte Onyx Power and Dutch power prices

Gross profit = Revenue - [coal costs + CO2 costs + VOM]

VOM = variable operating and maintenance costs = €2 / MWh

Plant efficiency rate = 45%

Carbon intensity = 0.33333

Net profit/losses = Gross profit - FOM

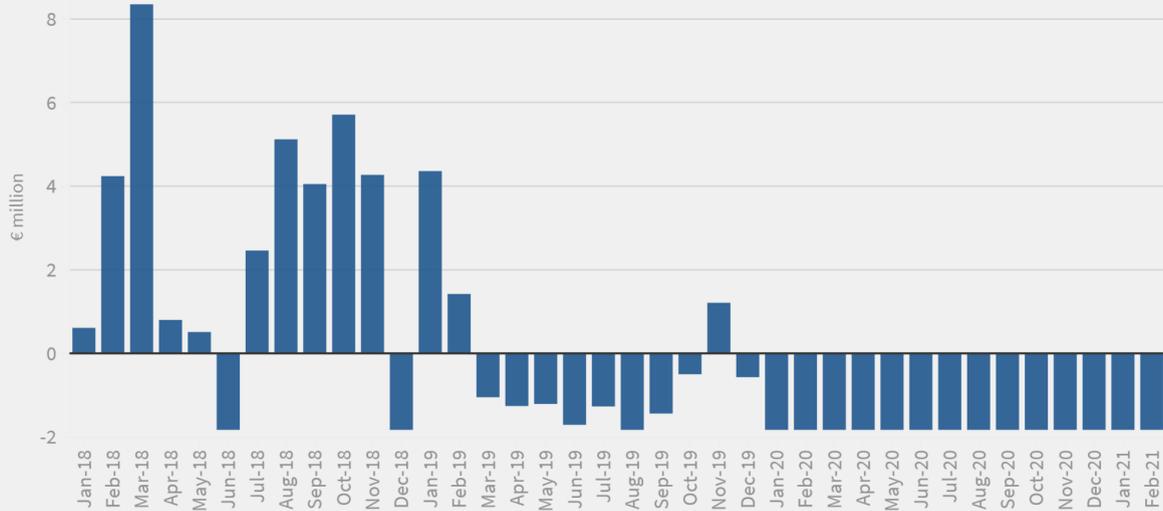
FOM = Fixed Operating and Maintenance costs = €30 / kW / year

For more detailed information on the calculation methodology, please refer to the [Annex I](#)

Onyx Power's Maasvlakte unit has not run since January 2020. Net profits in 2018 were €32 million but these fell to net losses of €4 million in 2019. During the period when the plant has not been generating, it will have incurred losses based on its fixed operating and maintenance costs. These are estimated at €30 / kW / year, which is €21,930,000 per annum based on a plant capacity of 731MW.

Maastvlakte Onyx historic net profit/loss

Monthly net profit/loss (€ million)



Net profit calculation = Gross profit - Fixed Operating & Maintenance costs

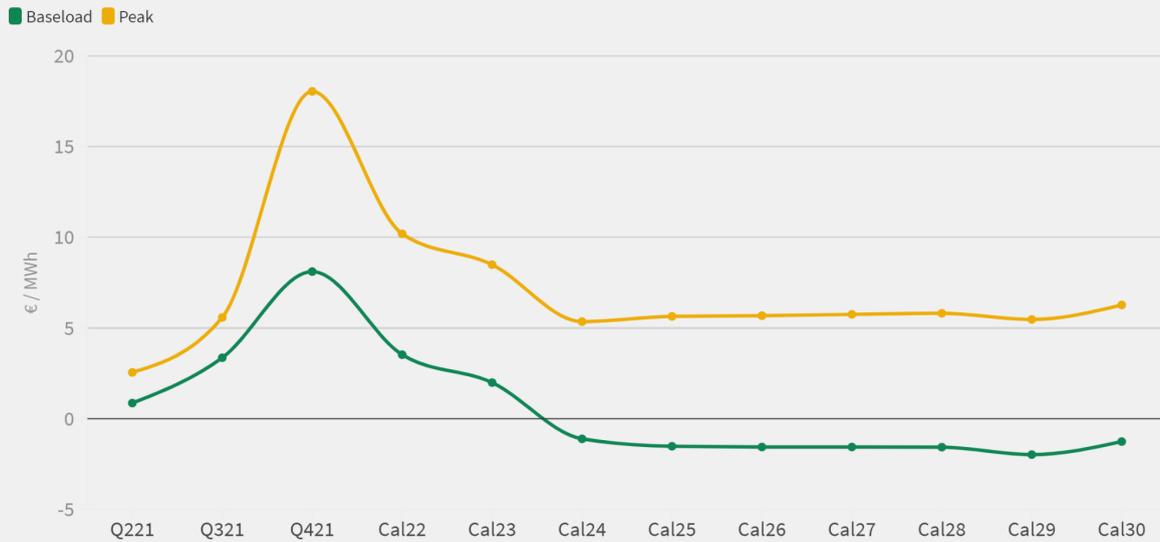
Future profitability

Future profitability calculations have been based on a scenario where Maastvlakte Onyx Power comes back online in Q421.

The current Q321 dispatch cost of a hard coal unit with an efficiency rate of 45% is around €50.17. This is calculated using a Dec21 carbon price of €41.85 and a Q321 coal price of €60.20 / tonne. This is before any fuel transport costs or non-fuel operating costs are taken into consideration. With Dutch power prices at €53.53/MWh baseload, this equates to a clean dark spread of €3.36/MWh.

Clean Dark Spread for Maasvlakte Onyx

Clean Dark Spread based on unit efficiency rate of 45%



Source: EEX EUA and Dutch power futures prices; CME API2 coal prices

Variable Operating and Maintenance and coal transport costs have been estimated at €2.5/MWh

Clean Dark Spread less VOM costs for Maasvlakte Onyx

Clean Dark Spread with VOM costs deducted based on unit efficiency rate of 45%



Source: EEX EUA and Dutch power futures prices; CME API2 coal prices

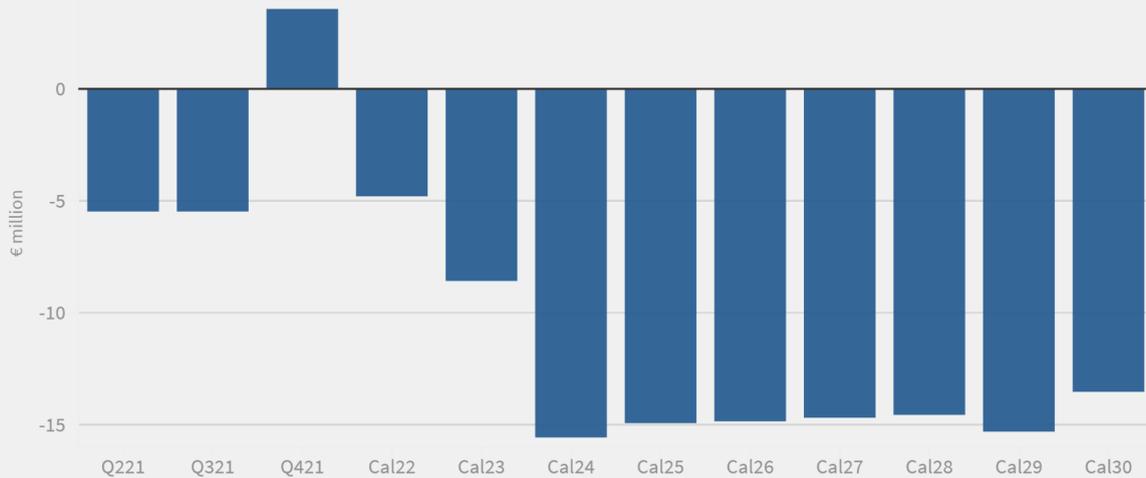
Gross profit calculations have been carried out with assumptions that the units only generate when the CDS less non-fuel variable costs and coal transportation costs (€2.50/MWh) is positive. With the current coal, carbon and power curves, this results in Maasvlakte Onyx only running during peak hours except in Q321, Q421 and calendar year 2022.

For the net profit/loss calculations, Fixed Operating & Maintenance costs of €30/kW/year have been deducted from the gross profits. These are fixed regardless of the number of hours run or volume of power generated. Based on these assumptions, the Maasvlakte Onyx plant will be accruing consistent net losses from 2022. Total net losses from now until the end of 2030 equate to over €120 million.

Maasvlakte Onyx forecast net losses of over €120 million by 2030 **EMBER**

Net losses in € million assuming plant comes back online in Q421

■ Maasvlakte Onyx



Net profit calculation = Gross profit - Fixed Operating & Maintenance costs

Biomass subsidies

Biomass subsidy calculations have not been incorporated into the above analysis.

Onyx Power receives subsidies for co-firing Maasvlakte with biomass. The subsidies compensate utilities for a proportion of their generation and associated costs (fuel, CO₂, operating and maintenance, and capital costs) if these costs are above the EEX Dutch baseload electricity price (APX).

Onyx currently receives subsidies for producing up to 10% of the power station's annual electricity generation from biomass.

The Netherlands government intends to end all biomass subsidies in 2027. Consequently, even if the current subsidies were to enable Maasvlakte Onyx power station to survive economically when it initially comes back online, this will not be the case from 2027 onwards and it will be exposed to the full market conditions.

Further information on biomass subsidies can be found in this [report](#).

Annex I

Additional information/caveats:

- *Generation data = ENTSO-e hourly generation in MWh by unit*
- *Historic power prices = EEX Dutch power day ahead prices*
- *Future power prices = EEX Dutch power futures*
- *Coal price = CME API2 monthly prices*
- *Historic CO2 prices = ECX EUA front month*
- *Forward CO2 prices = EEX EUA futures price (December contract)*
- *Profitability calculations exclude any profit or loss due to forward hedges. Utilities sell electricity and buy carbon permits in advance, so our methodology using day-ahead prices does not include the profit or loss of these forward hedge transactions.*

Pricing information

Dutch power prices from EEX to Cal-25 then formula used for extrapolation

CO2 prices out to Dec-30 from EEX

API2 prices out to Cal-25 then formula used for extrapolation

Calculations and assumptions:

- *Load factor = generation (MWh) / installed capacity (MW)*
- *Hourly revenue (€/MWh) = Hourly generation from ENTSO-e (MWh) x EPEX hourly prices (€)*
- *Gross profitability (€/MWh) = Hourly revenue - ((CO2 cost + Coal cost + Coal transportation cost + VOM) * hourly generation)*
- *Gross profitability (€/MW) = Gross profitability (€/MWh) / Installed capacity (MW)*
- *Net profitability (€/MW) = Gross profitability - Fixed Operating & Maintenance (FOM) costs (€/MW)*
- *Fixed operating costs (FOM) = €30,000 / MW / year*
- *Annual FOM per unit (€) = FOM (€/MW) x installed capacity (MW)*
- *Variable operating costs (VOM) are averaged at €2/MWh for all units*
- *Coal transportation is averaged at €0.5 / MWh for all units*
- *CO2 cost = CO2 price (€/MWh) / unit efficiency rate*
- *Coal cost = Coal price (€ / MWh / unit efficiency rate)*
- *Unit efficiency rates: 46% for Eemshaven and Maasvlakte 3. 45% for Onyx Power Maasvlakte*
- *Conversion of coal price in tonnes to MWh = Coal price (€/tonne) / 6.97633*
- *Conversion of CO2 price in tonnes to MWh = CO2 price (€/tonne) * 0.33333*
- *Capital costs are excluded from all calculations*