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Projecting potential future profitability of TEŠ from 2021 to 2030

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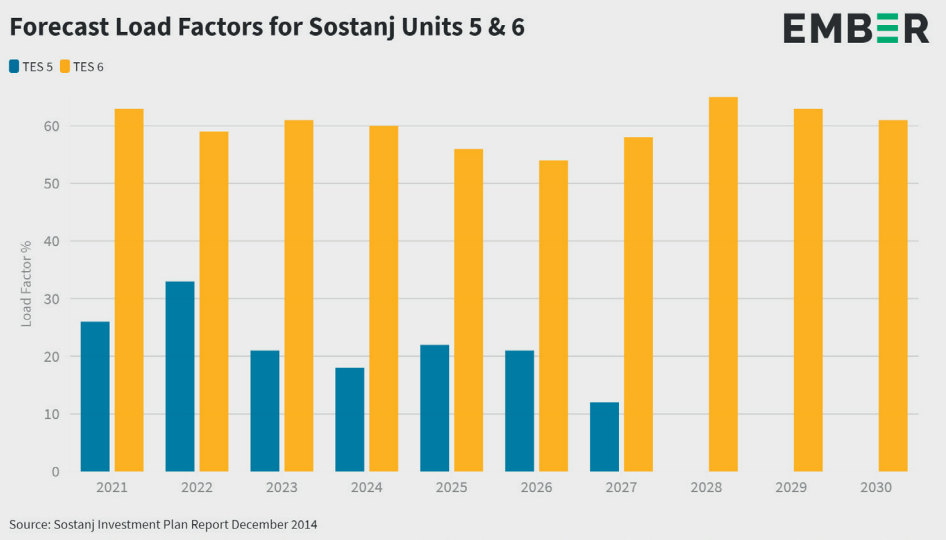
Introduction

This analysis looks at the potential future profitability/non-profitability for TEŠ 5 & TEŠ 6 power station units over the period from 2021 to 2030. Several scenarios have been examined with inputs from various sources, including the 2014 Investment Plan Report for the Sostanj power plant. The analysis does not include any costs or calculations associated with the mine. It is only focused on the power plant units.

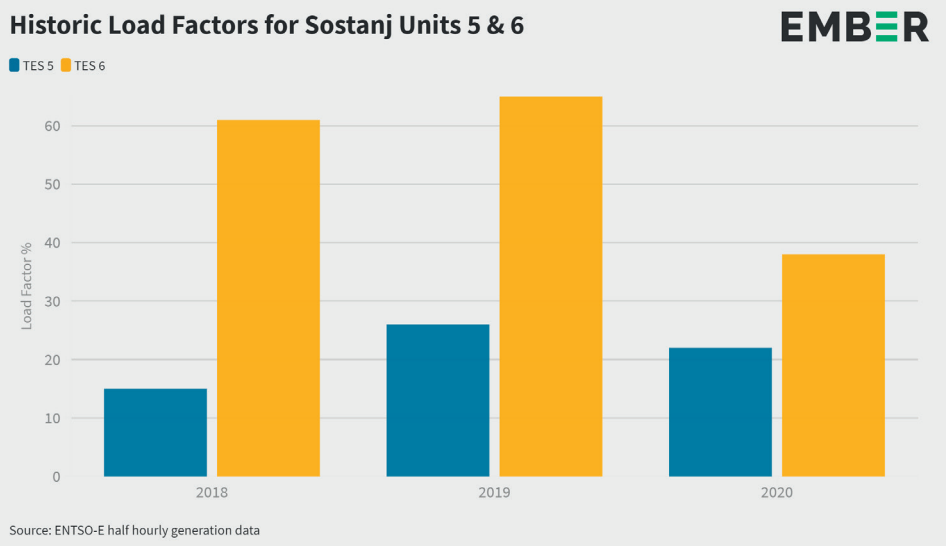
Overview of the analysis

The report examines the outlook for the economic viability of the Sostanj power station units and incorporates current and forecast data including electricity production, fuel costs, CO2 costs, power prices and operating costs.

The **forecast generation** for **all scenarios** has been taken from the Sostanj Investment Plan Report December 2014.



Historic load factors from 2018 to 2020 for both units for comparison:



Below is an overview of some of the values and calculations used in this analysis. For more detailed information, please refer to Annex II.

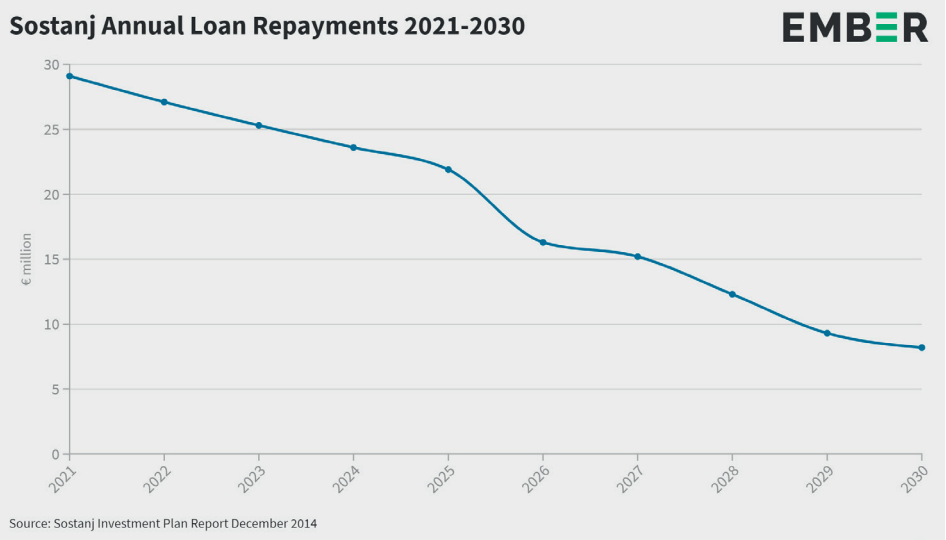
Gross profit calculation = Generation x (Clean Dark Spread - Variable Operating & Maintenance Costs)
Net profit calculation = Gross profit - (Fixed Operating & Maintenance costs + loan repayment costs)
Clean Dark Spread (€ / MWh) = Power price - ((Coal price + (CO2 price * Carbon Intensity))/Efficiency rate

Coal prices have been taken from the Investment Plan Report 2014 (€2.75 / GJ).
Generation values have been taken from the Investment Plan Report 2014.
TEŠ 5 Efficiency rate = 35%.
TEŠ 6 Efficiency rate = 43%.
Carbon intensity = 0.36 tCO2e/MWh.

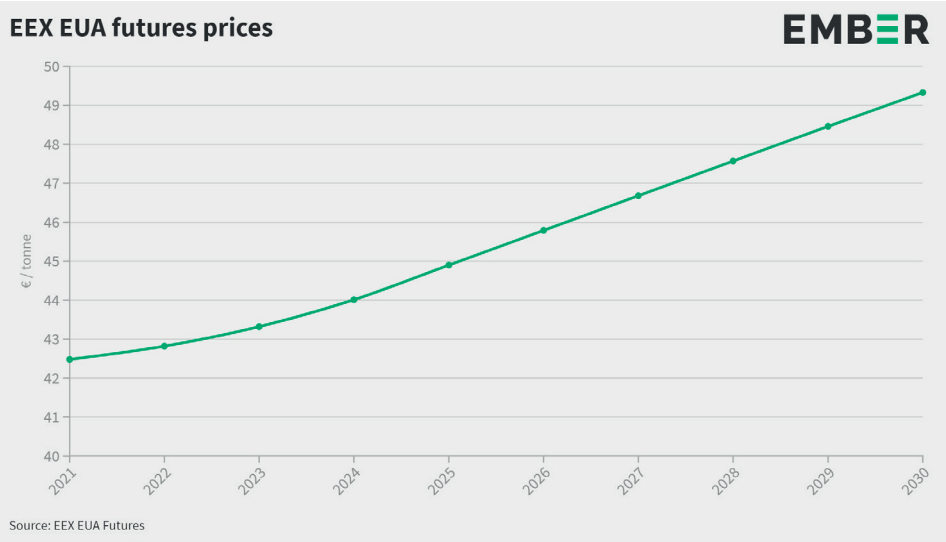
Variable Operating and Maintenance (VOM) costs have been estimated at €2.1 / MWh.
Fixed Operating and Maintenance (FOM) costs for TEŠ 5 have been estimated at €60 / kW / year.
Fixed Operating and Maintenance (FOM) costs for TEŠ 6 have been estimated at €40 / kW / year.

The FOM costs for each unit have been estimated based on the FOM costs for lignite plants in Germany, due to the lack of available FOM costs for the Sostanj units, and are allocated according to the age of the unit.

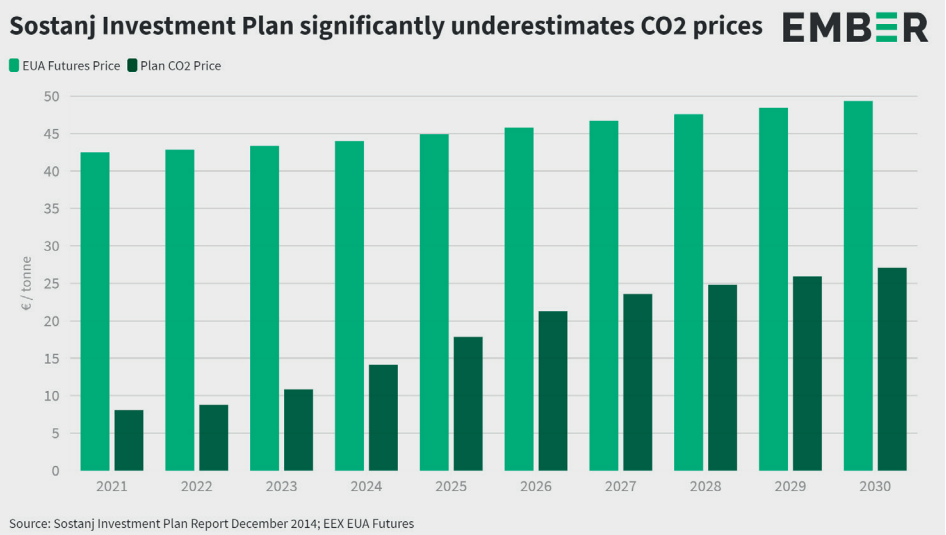
The power plant also has fixed annual costs associated with loan repayments. This amount, plus any FOM costs, has been deducted from the gross profits to calculate the final net profit/loss. The loan repayments due from 2021 to 2030 total €188 million.



The current forward EU-ETS EUA forward curve from EEX has been used for most of the scenarios unless stated otherwise.



The reason that the EEX EUA carbon prices have been used in the majority of the scenarios is that the carbon prices from the 2014 Investment Plan are substantially lower than the actual current CO2 prices. These prices have a significant impact on the economic viability of the power plant. Below is a comparison of the forecast carbon prices from the Investment Plan and the current EEX futures curve for CO2 credits.



Future profit/loss scenarios

Of the five scenarios that have been analysed, the one detailed below appears to be the most feasible and, therefore, it has been highlighted here. For all other scenarios, refer to Annex I.

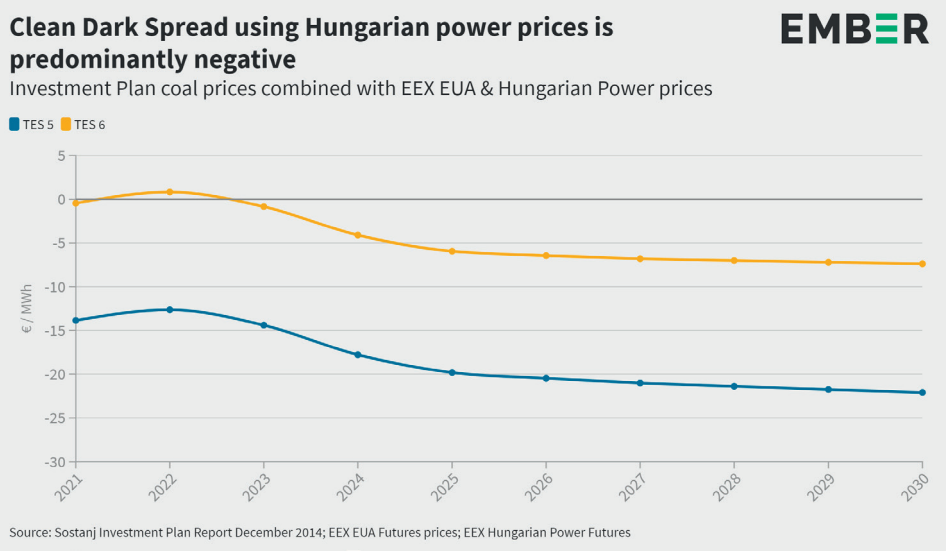
Key scenario

The forecast electricity prices for this scenario are from the EEX Hungarian power futures curve due to the interconnectivity between Hungary and Slovenia and the fact that historic prices for the two countries have closely tracked each other. Hungarian power prices actually tend to be slightly higher than those in Slovenia so this scenario may, in fact, slightly overestimate any profit.

Scenario inputs:

Coal prices = TEŠ Investment Plan Report 2014 (€2.75 / GJ)
Power prices = EEX Hungarian Power futures *
Carbon prices = EEX EUA Futures curve

** The Cal 2021 electricity price has been calculated using the actual Q121 day ahead prices for Slovenia from ENTSO-e data and the Hungarian EEX prices for Q221 to Q421. Beyond 2024, where Hungarian forward prices are not available from EEX, EEX Austrian power futures prices have been used + €1. This +€1 is the average calendar year spread for Hungarian futures prices over Austrian futures prices.*



Scenario outcomes:

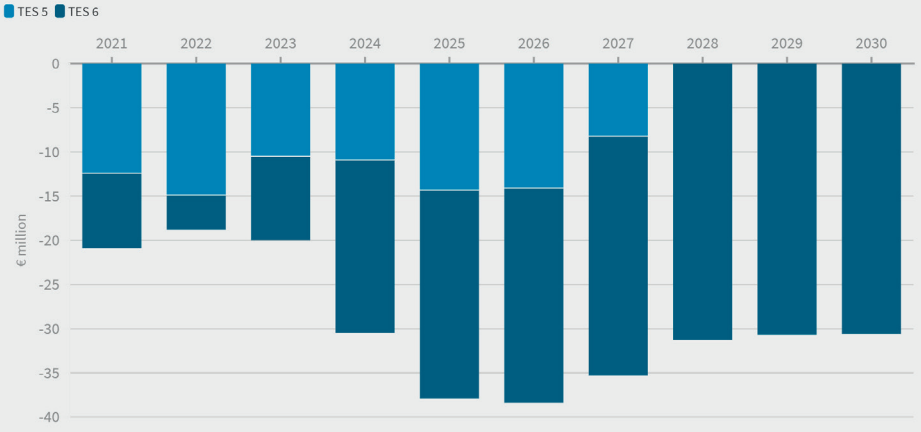
Total Gross losses (including VOM) = -€294 million (2021 to 2030)
TEŠ 5 = - €85 mil
TEŠ 6 = - €209 mil

By 2025: Net losses (including FOM and loan repayment) = -€479 million

By 2030: Total Net losses (including FOM and loan repayment) = -€870 million

Sostanj could have gross losses of almost €300 million by 2030

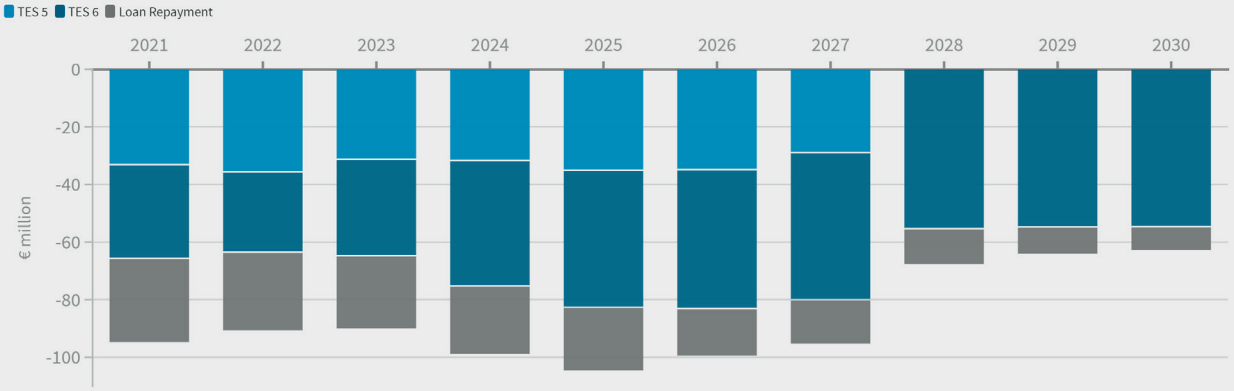
Gross losses based on Investment Plan coal prices and EEX EUA and Hungarian power prices



Source: Sostanj Investment Plan Report December 2014; EEX EUA Futures; EEX Hungarian Power Futures

Sostanj could have net losses of €870 million by 2030

Net losses based on Investment Plan coal prices and EEX EUA and Hungarian power prices



Source: Sostanj Investment Plan Report December 2014; EEX EUA Futures; EEX Hungarian Power Futures

Annex I

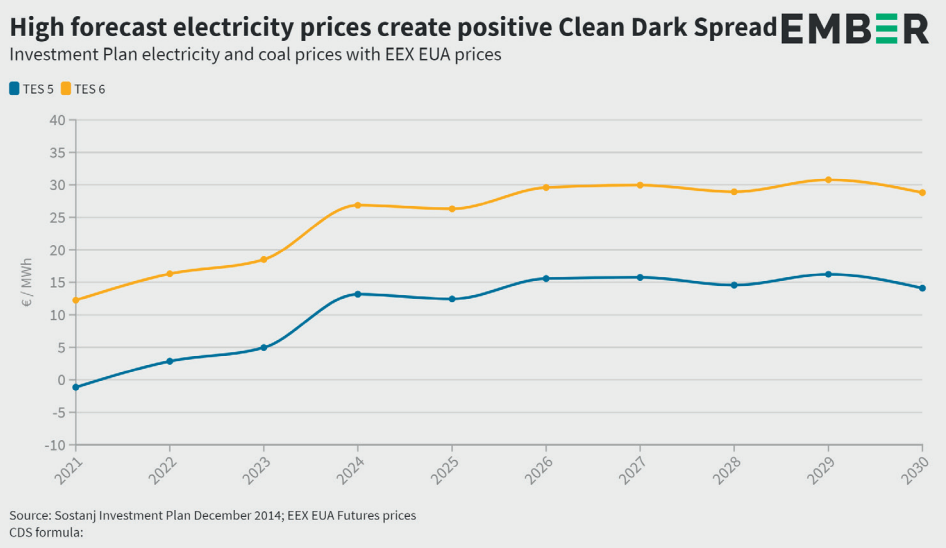
Alternative scenarios that have been analysed:

(a)

This scenario takes the forecast coal and electricity prices from the Investment Plan combined with the EEX futures curve for carbon credits.

Scenario inputs:

Coal prices = TEŠ Investment Plan Report 2014 (€2.75 / GJ)
Power prices = TEŠ Investment Plan Report 2014
Carbon prices = EEX EUA Futures curve



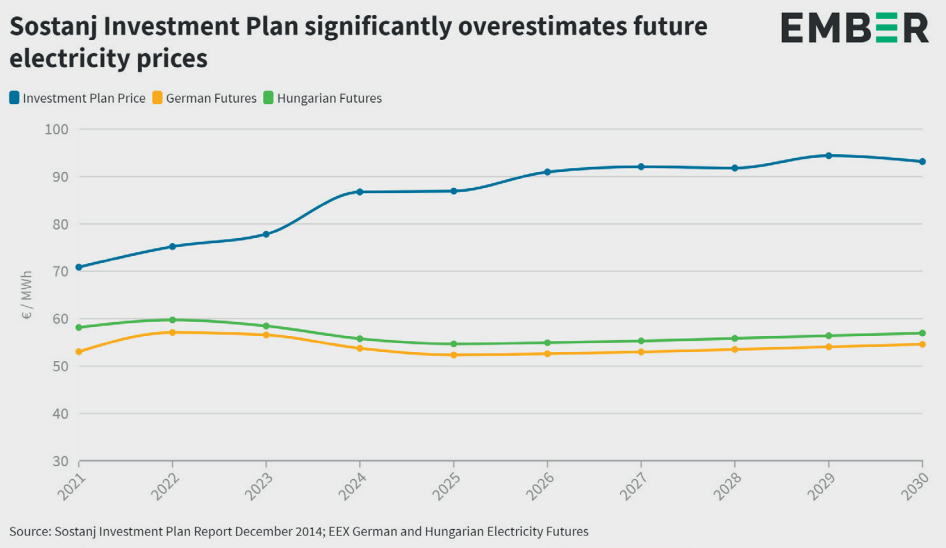
The Clean Dark Spread (CDS) is large in this scenario because the Investment Plan contained very high forecast electricity prices.

If we look at some historic actual prices versus those predicted in the Plan for the same periods, we can see a significant difference.

€ / MWh	2018	2019	2020
Investment Plan	55.51	61.00	63.94
Actual price (ENTSO-e)	51.12	48.73	37.54

The actual Q121 price for Slovenia was €54.76. The predicted price from the Plan for the whole of 2021 in the Plan is €70.84.

Below is a comparison of the Investment Plan forecast power prices and the current EEX German and Hungarian baseload futures curve. The average premium of the Plan price above the German curve price for the period 2021 to 2030 is €32 / MWh.

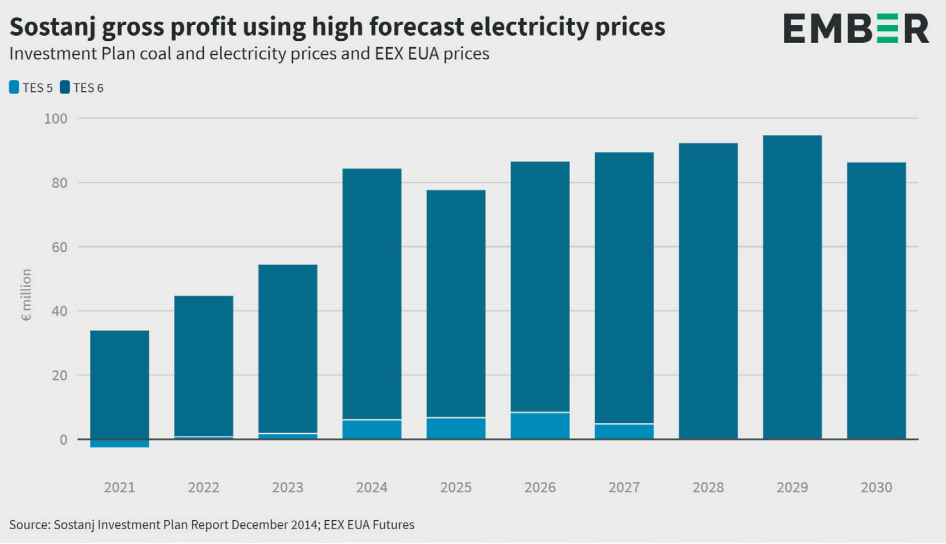


Scenario outcomes:

Total Gross profit (including VOM) = €741 million (Q3 2021 to 2030)
TEŠ 5 = €26 mil
TEŠ 6 = €715 mil

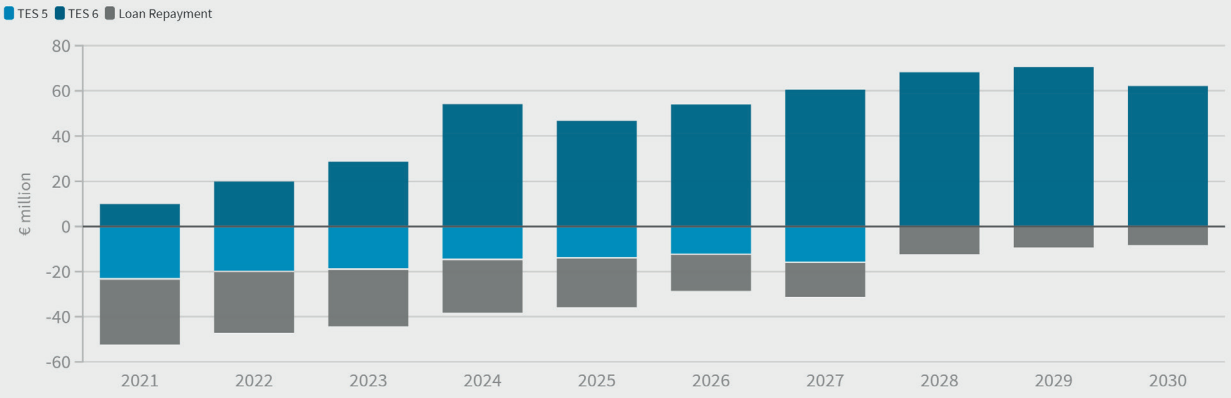
By 2025: Net losses (including FOM and loan repayment) = -€58 million

By 2030: Total Net profit (including FOM and loan repayment) = €167 million



Sotanj net profit using high forecast electricity prices

Investment Plan coal and electricity prices and EEX EUA prices



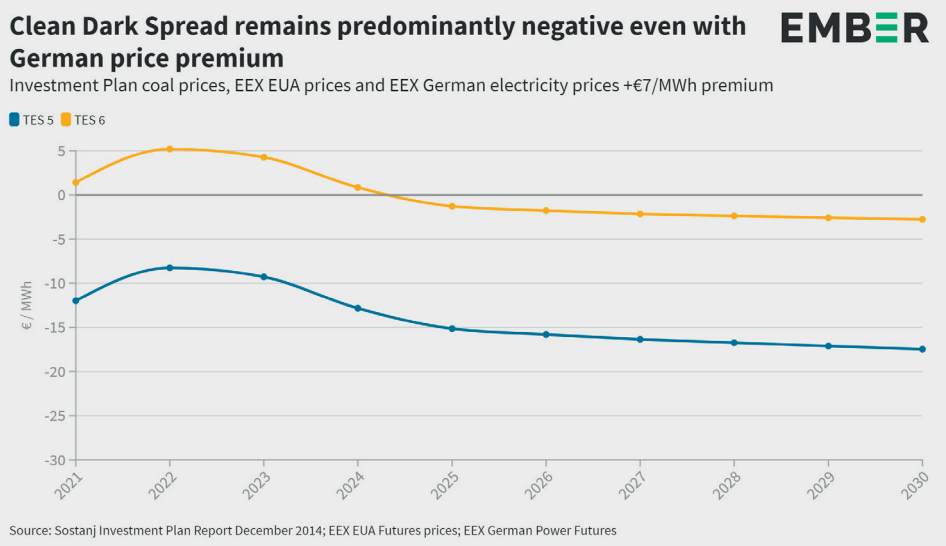
Source: Sostanj Investment Plan Report December 2014; EEX EUA Futures

(b)

This scenario takes the forecast coal prices from the Investment Plan combined with the EEX futures curve for carbon credits and German electricity.

Scenario inputs:

Coal prices = TEŠ Investment Plan Report 2014 (€2.75 / GJ)
Power prices = EEX German Power Futures
Carbon prices = EEX EUA Futures curve



Scenario outcomes:

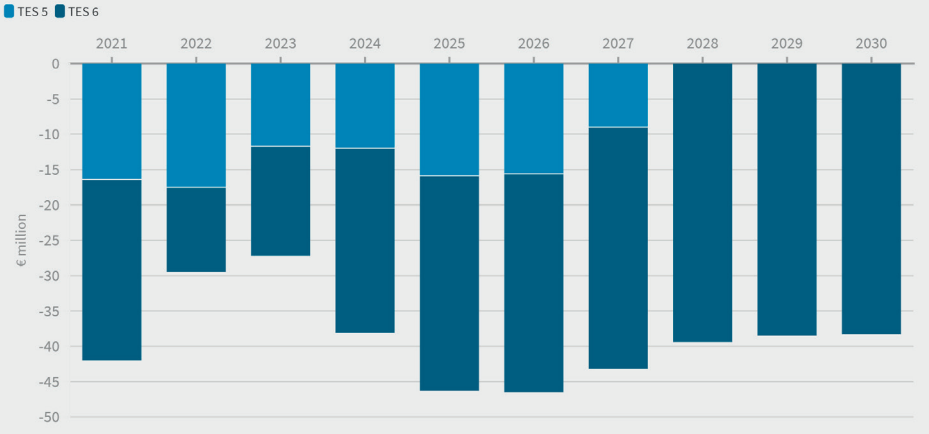
Total Gross losses (including VOM) = -€389 million (2021 to 2030)
TEŠ 5 = - €98 mil
TEŠ 6 = - €291 mil

By 2025: Net losses (including FOM and loan repayment) = -€534 million

By 2030: Total Net losses (including FOM and loan repayment) = -€962 million

Sostanj is unprofitable based on German electricity prices

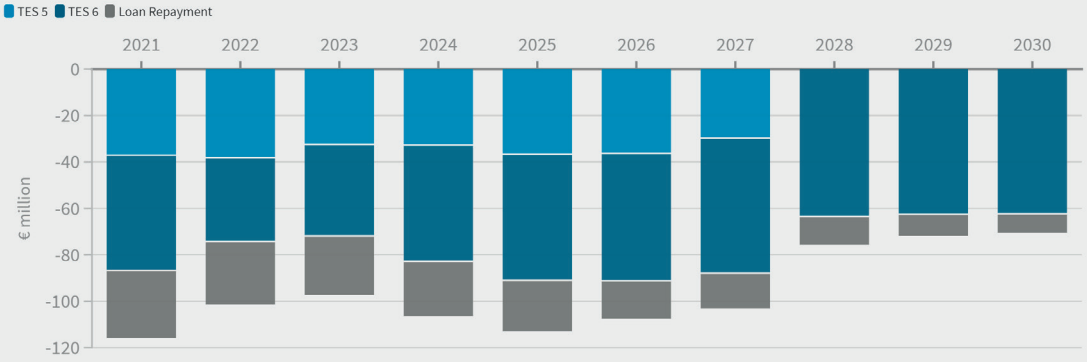
Gross losses using Investment Plan coal prices and EEX EUA and German power prices



Source: Sostanj Investment Plan Report December 2014; EEX EUA Futures; EEX Hungarian Power Futures

Sostanj net losses almost €1 billion based on German electricity prices

Investment Plan coal prices and EEX EUA and German power prices



Source: Sostanj Investment Plan Report December 2014; EEX EUA Futures; EEX German Power Futures

(c)

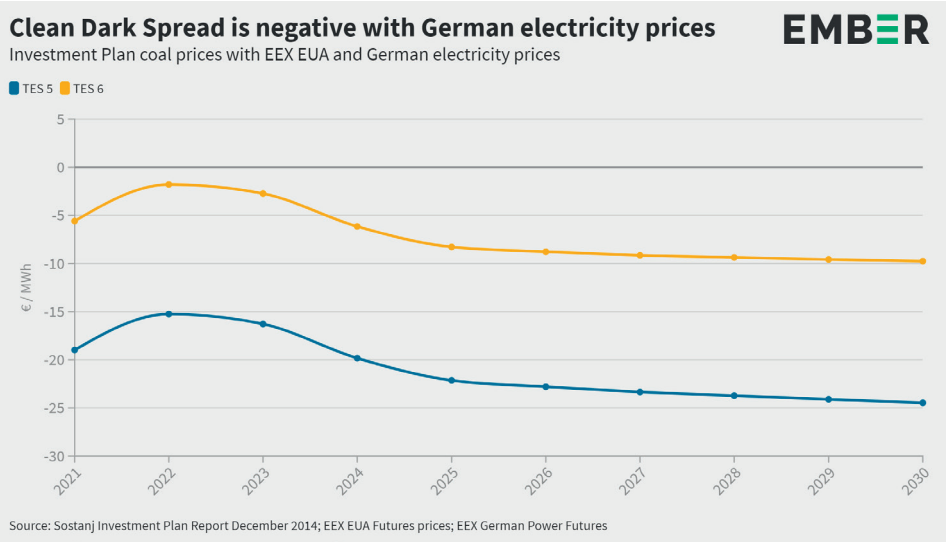
This scenario takes the forecast coal prices from the Investment Plan combined with the EEX futures curves for carbon credits and for EEX German electricity plus a premium of €7.

Scenario inputs:

Coal prices = TEŠ Investment Plan Report 2014 (€2.75 / GJ)
Power prices = EEX German Power Futures + €7 *
Carbon prices = EEX EUA Futures curve

** In the absence of a Slovenian power forward curve, a premium to the German power forward curve has been calculated. This is based on historical day-ahead price differentials*

Even in this scenario, where a quite significant premium has been added to the German electricity prices, the forecast electricity prices in the Plan are still much higher.



Scenario outcomes:

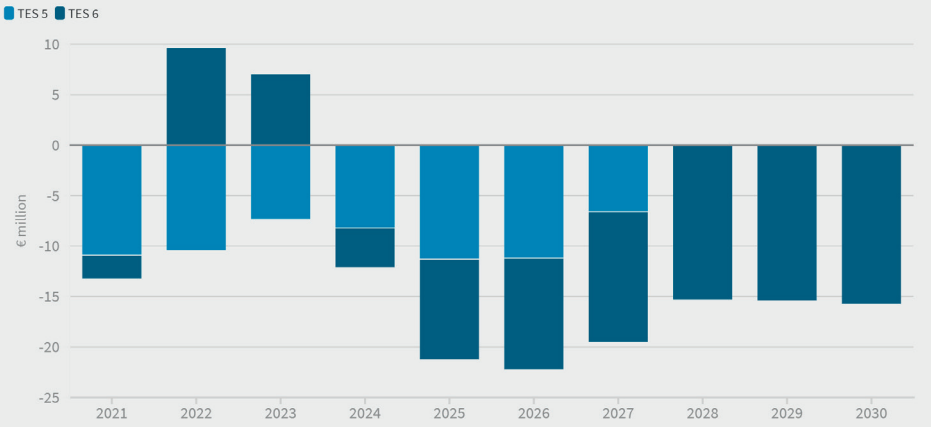
Total Gross losses (including VOM) = -€135 million (2021 to 2030)
TEŠ 5 = - €66 mil
TEŠ 6 = - €70 mil

By 2025: Net losses (including FOM and loan repayment) = -€398 million

By 2030: Total Net losses (including FOM and loan repayment) = -€709 million

Sostanj gross losses with German power price premium

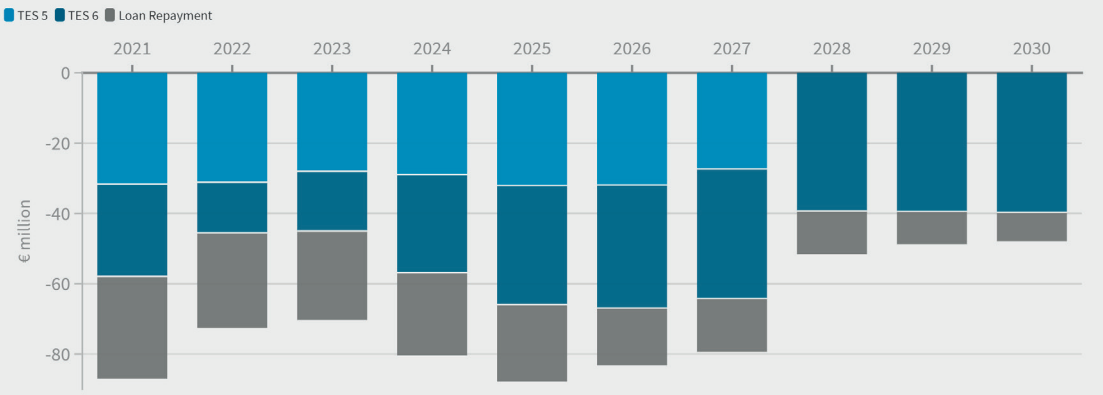
Investment Plan coal prices, EEX EUA prices and German power prices + €7/MWh



Source: Sostanj Investment Plan Report December 2014; EEX EUA Futures; EEX German Power Futures

Sostanj net losses with German power price premium

Investment Plan coal prices, EEX EUA prices and German power prices + €7/MWh



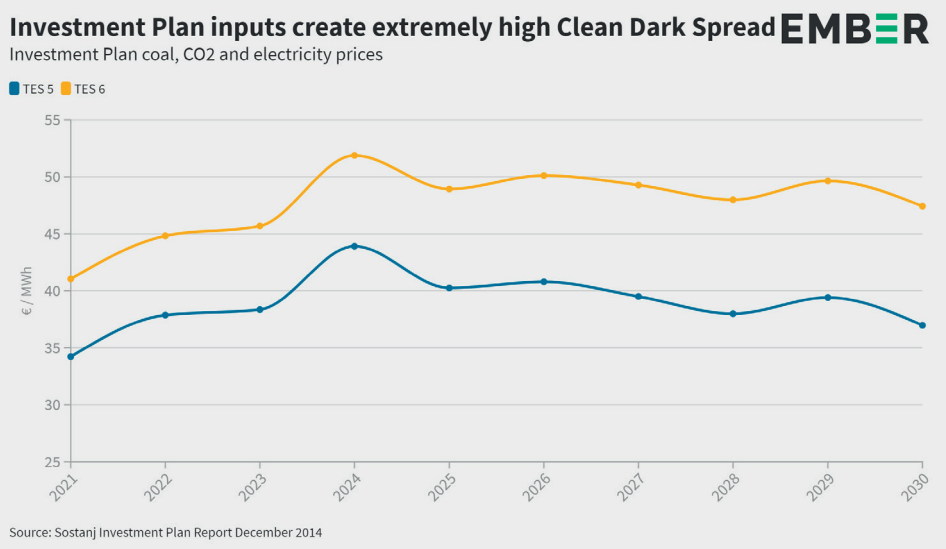
Source: Sostanj Investment Plan Report December 2014; EEX EUA Futures; EEX German Power Futures

(d)

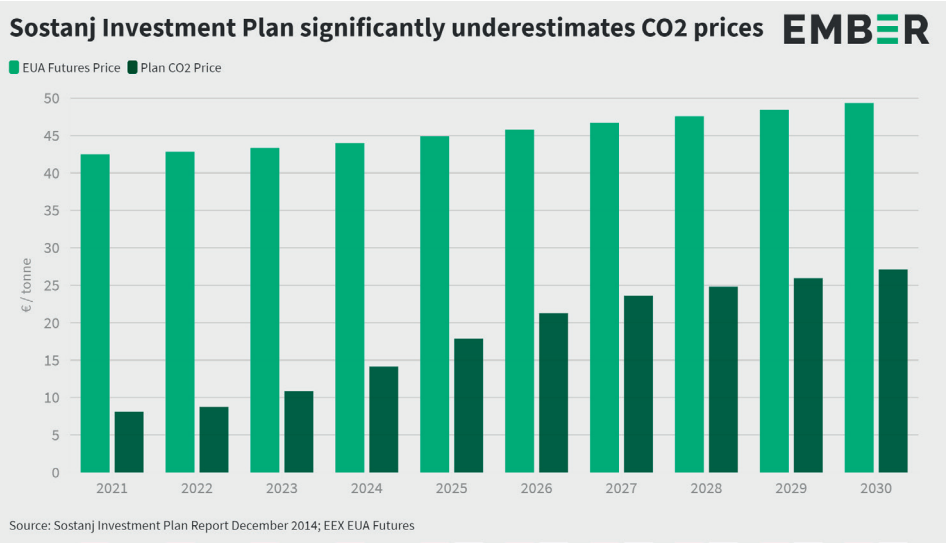
All data for this scenario is taken directly from the Investment Plan. Scenario inputs:

Coal prices = TEŠ Investment Plan Report 2014 (€2.75 / GJ)
Power prices = TEŠ Investment Plan Report 2014
Carbon prices = TEŠ Investment Plan Report 2014

The investment plan had extremely high power price forecasts combined with extremely low CO2 price forecasts. This created a substantial Clean Dark Spread.



Below is, once again, the comparison of the CO2 prices used in the Plant versus the current EEX price curve. You can see that the difference is extremely large. It is not feasible that the CO2 will return to the levels forecast in the plan due to EU emissions reduction targets.

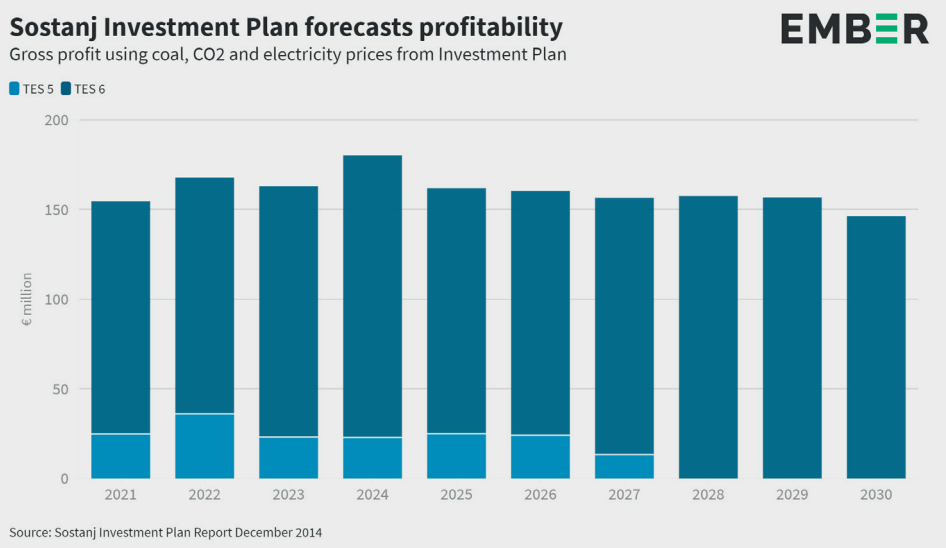


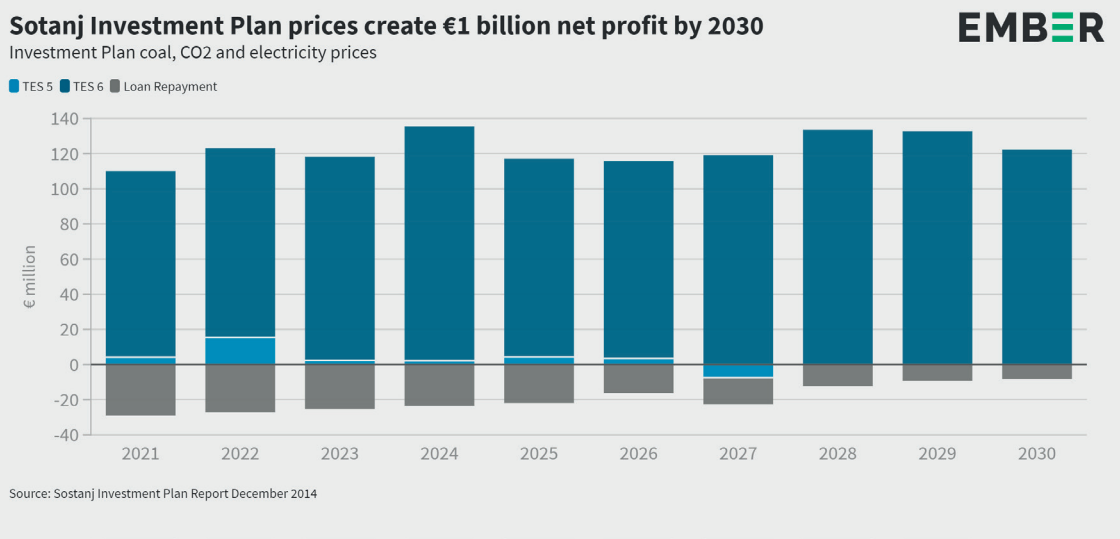
Scenario outcomes:

Total Gross profit (including VOM) = €1.6 billion (2021 to 2030)
TEŠ 5 = - €170 mil
TEŠ 6 = - €1.4 billion

By 2025: Net profit (including FOM and loan repayment) = €477 million

By 2030: Total Net profit (including FOM and loan repayment) = €1 billion





Annex II

Additional information/caveats:

- Generation data = Electricity generation data forecast in the Investment Plan
- Coal price = €2.75 / GJ (coal price listed in the Investment Plan)
- CO2 price = EEX EUA price or the CO2 coupon purchase price in the Investment Plan
- Profitability calculations exclude any profit or loss due to forward fuel, electricity or carbon hedges.
- German power prices from EEX to Cal-27 then formula used for extrapolation
- Hungarian power prices from EEX to Cal-24. From Cal-25 = Austrian power prices + €1 / MWh
- Austrian power prices from EEX to Cal-27 then formula used for extrapolation
- CO2 prices to Dec-30 from EEX
- Heat production and revenue has not been included in this report as it only makes up a small proportion of total income (eg 2.95% in 2019)

Calculations and assumptions:

- Load factor = generation (MWh) / installed capacity (MW)
- Clean Dark Spread = Power price - ((Coal price + (CO2 price * Carbon Intensity))/Efficiency rate
- Gross profit (€) = Generation x [(Clean Dark Spread (€ / MWh) - Variable Operating
- & Maintenance Costs (€ / MWh)[
- Net profitability (€) = Gross profitability - (Fixed Operating & Maintenance costs (€) + loan repayments (€))
- Fixed operating costs (FOM)= €40,000 / MW / year for TEŠ 6. €60,000 / MW / year for TEŠ 5
- The FOM costs for each unit have been estimated based on the FOMcostsforlignite plantsinGermany and are adjusted based on the age of the unit.
- Variable operating costs (VOM) = €2.1 / MWh for both units
- CO2 cost = CO2 price (€/MWh) / unit efficiency rate
- Coal cost = Coal price (€ / MWh) / unit efficiency rate
- Coal conversion rate = 3.6 GJ / MWh
- Unit efficiency raTEŠ: 43% for TEŠ 6. 35% for TEŠ 5
- Carbon intensity = 0.36 tCO2e/MWh
- Capital costs are excluded from all calculations
- Associated mine costs are excluded from all calculations