Net Zero Steel

Brazil Country Profile - Netzero Steel Project

www.netzerosteel.org/countries-results/

The Netzero Steel Project considers the geo-spatial evolution of production of 13 existing facilities in Brazil described in the GEM database that account for 97% of Brazil's 2019 production, as well as 1 smaller additional archetype plant that was added to account for missing production. All scenarios achieve >90% reduction in emissions by 2050, see the full report for the methodology and background to the study.

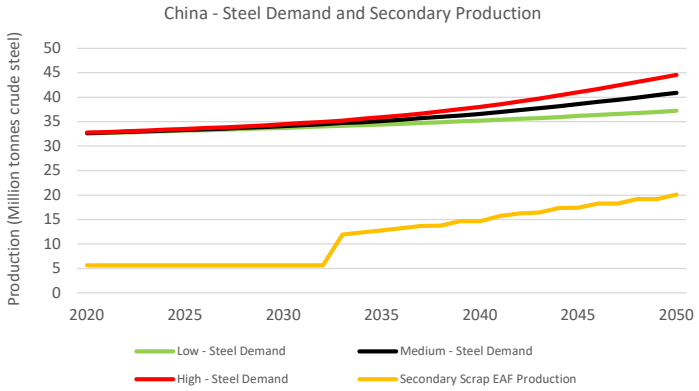
All the nine modelled scenarios (3 demand scenarios) and (3 CCS pipeline length scenarios) reduce overall emission intensities from an estimated existing emission intensity of 1.66 tCO2e/tonne of steel in 2019 to 0.14 tCO2e/tonne of steel in 2050. This compares to a global average of 1.58 in 2019 and 0.14 tCO2e/tonne of steel in 2050. Note that the study boundary includes all direct energy and process emissions that occur at integrated iron and steel mills, but does not include GHG Protocol Scope 2 or Scope 3 class emissions that occur off-site, or allow for the crediting of exported energy products (See report for more details).

Demand Transition

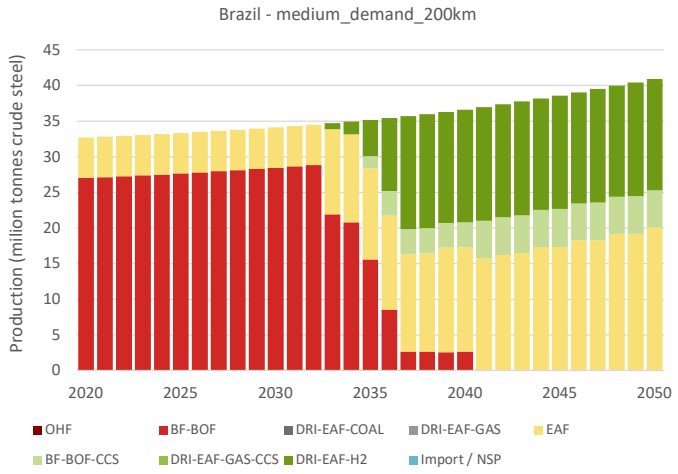
• In the medium demand scenarios Brazil's steel demand increases 25% between 2020 and 2050.

• low/medium/high scenarios in 2050 correspond to 172/189/206 tonnes crude steel per capita. This compares to a global average of 206/236/267 tonnes crude steel per capita.

• Secondary production from scrap in EAF rises from 15% in 2020 to 49% in 2050 in our central scenario. This compares to the projected global average of 46%.



Technology Transition



• By 2036 more than half of Brazil's production is projected to be low carbon in the central scenario.

• DRI-EAF-H2 rises in market share from zero in 2032 to 38% in 2050 in our central scenario (range of scenarios is 18% to 52%).

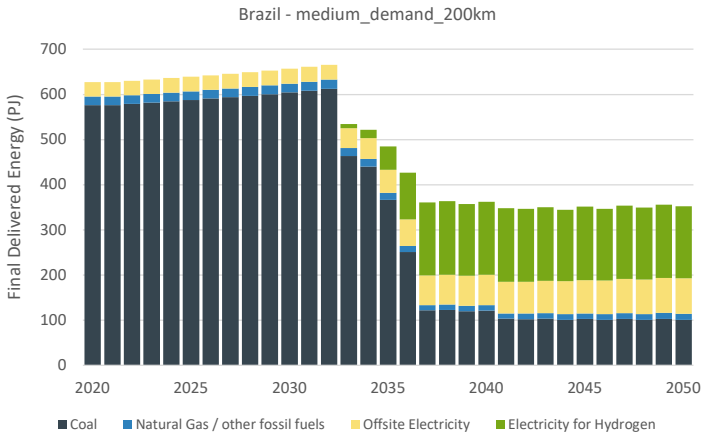
• Steel production with CCS retrofit accounts for 13% of production in the 2050 central scenario (range of scenarios is 0% to 35%).

Energy Transition

• Facility energy demand for fossil fuels falls by 81% by 2050 in the central scenario (range of scenarios is 45% to 99%).

• Electricity demand rises to 66 TWh in 2050, a rise from current levels of 7.4x by 2050 in the central scenario (range of scenarios is 3.8x to 10.3x). For comparison, electricity demand in 2050 represents 11% of current total electricity demand in Brazil.

• Electricity demand for hydrogen rises to 44 TWh by 2050 in the central scenario (range of scenarios is 17 to 66 TWh).



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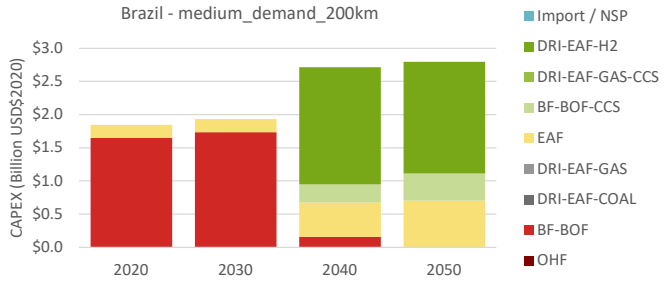
Investment Transition

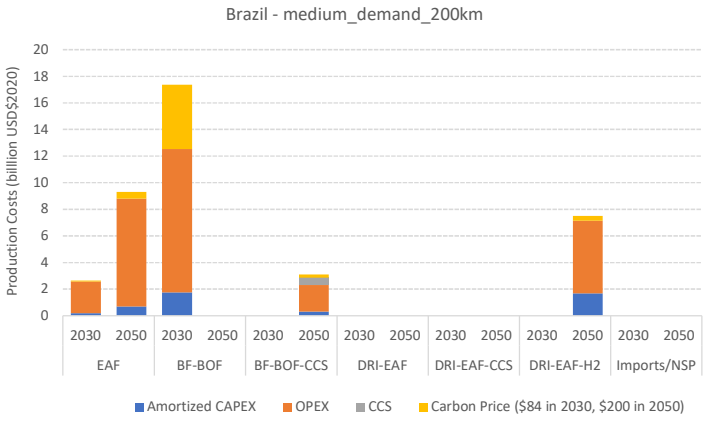


• CAPEX investment increases by 151% from 2020 to 2050 in the central scenario.

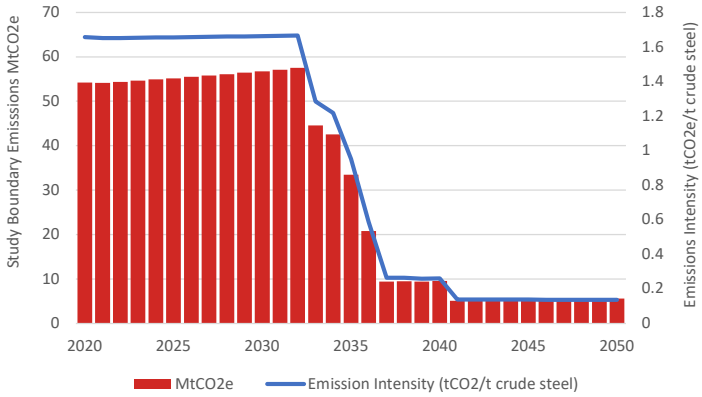
• DRI-EAF-H2 contributes to the largest share of CAPEX investment, 60% in 2050 in the central scenario.

• Total production costs in 2020 $USD are estimated to be $20 billion in both 2030 and 2050 for the central scenario.

• CAPEX costs are projected to be 14% of overall production costs in 2050 for the central scenario.



Emissions Transition



• Cumulative emissions between 2030 and 2050 are 955 MtCO2e (Range for scenarios is 939 to 985 MtCO2e.)

• Emission intensity of production falls from 1.66 tCO2e/tonne of crude steel in 2020 to 0.14 tCO2e/tonne of crude steel in 2050.