Net Zero Steel

United States Country Profile - Netzero Steel Project

www.netzerosteel.org/countries-results/

The Netzero Steel Project considers the geo-spatial evolution of production of 39 existing facilities in the USA described in the GEM database that account for 74% of US 2019 production, as well as 18 smaller additional archetype plants that were 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.

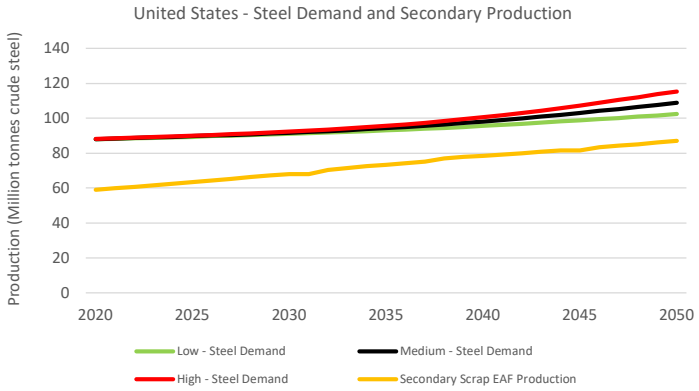
All the nine modelled scenarios (3 demand scenarios) and (3 CCS pipeline length scenarios) reduce overall emission intensities from an estimated existing emission intensity of 0.68 tCO2e/tonne of steel in 2019 to 0.15 tCO2e/tonne of steel in 2050. This compares to a global average of 1.58 in 2019 and 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

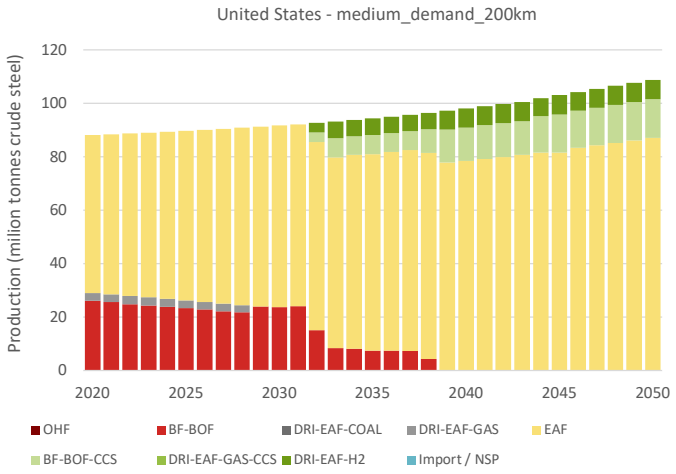
• In the medium demand scenarios United States's steel demand increases 24% between 2020 and 2050.

• low/medium/high scenarios in 2050 correspond to 267/284/301 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 67% in 2020 to 80% in 2050 in our central scenario. This compares to the projected global average of 46%.



Technology Transition



• By 2033 more than half of United States's production is projected to be low carbon in the central scenario.

• DRI-EAF-H2 rises in market share from zero in 2031 to 7% in 2050 in our central scenario (range of scenarios is 0% to 21%).

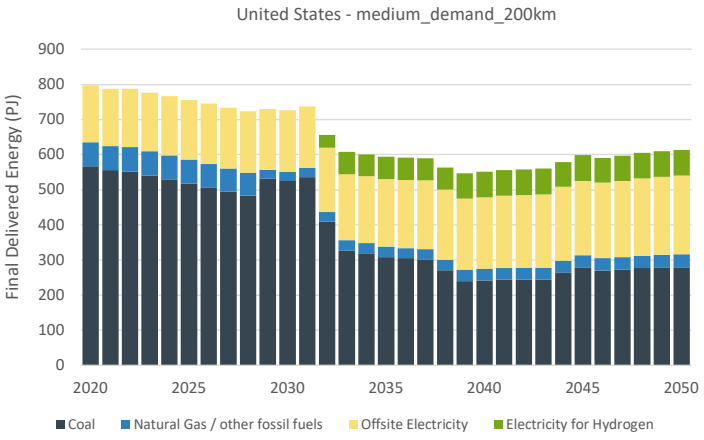
• Steel production with CCS retrofit accounts for 13% of production in the 2050 central scenario (range of scenarios is 0% to 21%).

Energy Transition

• Facility energy demand for fossil fuels falls by 50% by 2050 in the central scenario (range of scenarios is 21% to 96%).

• Electricity demand rises to 83 TWh in 2050, a rise from current levels of 1.8x by 2050 in the central scenario (range of scenarios is 1.3x to 3.1x). For comparison, electricity demand in 2050 represents 2% of current total electricity demand in United States.

• Electricity demand for hydrogen rises to 20 TWh by 2050 in the central scenario (range of scenarios is 0 to 68 TWh).



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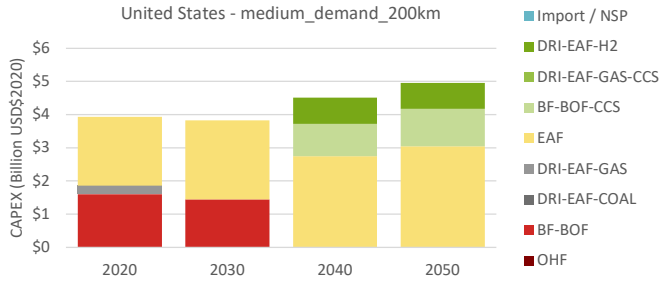
Investment Transition

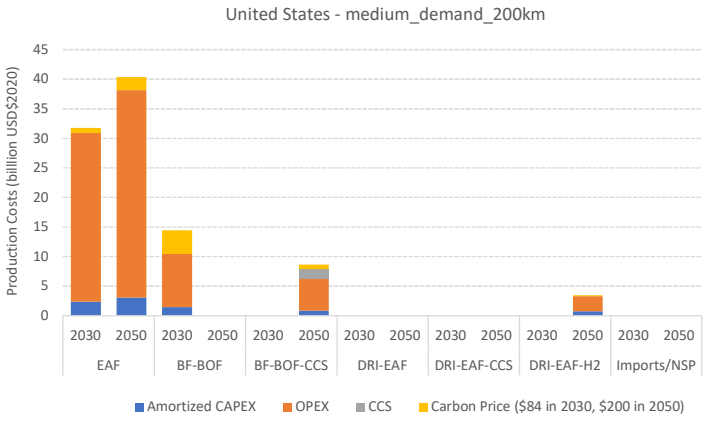


• CAPEX investment increases by 126% from 2020 to 2050 in the central scenario.

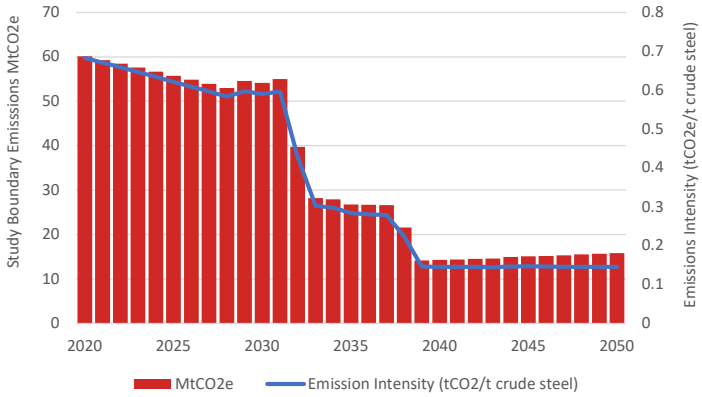
• EAF contributes to the largest share of CAPEX investment, 62% in 2050 in the central scenario.

• Total production costs in 2020 $USD are estimated to be $46 billion in 2030 and $53 billion in 2050 for the central scenario.

• Amortized CAPEX costs are projected to be 9% of overall production costs in 2050 for the central scenario.



Emissions Transition



• Cumulative emissions between 2030 and 2050 are 1,050 MtCO2e (Range for scenarios is 1,008 to 1,082 MtCO2e.)

• Emission intensity of production falls from 0.68 tCO2e/tonne of crude steel in 2020 to 0.14 tCO2e/tonne of crude steel in 2050.