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Policy Factsheet

Fossil fuel free steel: No longer a pipe dream in Sweden

MANUFACTURING STEEL WITH GREEN HYDROGEN

Steel production is one of the most energy-intensive industries in the world. The typical steel production process uses thermal heat from metallurgical and thermal coal to melt iron ore and pig iron to produce steel.[1] Steel production causes approximately 10% of global emissions.[2]

Using renewable hydrogen to produce steel is a fossil-free alternative to the current emissions-intensive process.

Hydrogen produces no CO2 during combustion, and can be produced through low or zero carbon processes. Hydrogen generated by electrolysis (rather than heating coal or gas) is known as green hydrogen.[3]

In early 2020, Swedish steel manufacturer, Svenskt Stål AB (SSAB) announced it would produce fossil-fuel free steel using green Hydrogen by 2026, 10 years earlier than originally thought possible. Transitioning to green steel production could reduce Sweden's greenhouse gas emissions by up to 10%, helping the nation reach its goal of carbon neutrality by 2045.[4]

SWEDISH POLICIES TO DEVELOP GREEN TECHNOLOGY

The Swedish Government invests substantially in clean energy technology development. Fossil fuel free steel is no exception. The Swedish Energy Agency has granted $93 million AUD since 2016 to SSAB's steel research company HYBRIT (in conjunction with power company Vattenfall and iron-ore mining company LKAB).[5]

Sweden is a world leader in climate policy due to its ambitious carbon reduction targets, policies and incentives. Sweden was one of the first countries to implement a carbon tax, introduced in 1991. With the highest carbon tax rate in the world, Sweden provides strong evidence that economic growth can be decoupled from emissions. In 2017, Sweden's CO2 emissions were 26% lower than they were in 1990, but GDP had grown 78% over the same time period.

Sweden produces 78% of Europe's iron ore, making iron ore an important part of Sweden's export reliant economy.[6] This has not stopped Sweden implementing ambitious climate targets and growing its economy at the same time.

HYBRIT plant under construction in Sweden[7]

LESSONS FOR AUSTRALIA

The Swedish example offers Australia a blueprint of how to decarbonise an emission intensive industry.

Currently, both major Australian political parties insist that metallurgic coal will remain a necessary part of steel making for the foreseeable future.[8] The Department of Industry's 2019 Resource and Energy Report refers to metallurgical coal as the "non-substitutional" raw material in the production of steel.[9] Yet Sweden has proved otherwise.

Australia only manufactures 0.3% of global steel, despite being one of the largest exporters of raw materials for steel production.[10]

Australia's vast access to both mineral resources and renewable energy sources put it in prime position for investing in green steel-production.

By becoming a world leader in low-carbon metal production, Australia could create 65,000 jobs, insuring itself against the declining demand for coal and gas as the world moves away from fossil fuels.[11]

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