



This candle holder is the first object made from the fossil-free steel. According to its designer, the softly pleated rays beaming out from the candle symbolise the light at the end of the tunnel. | Photo source [SSAB](#)

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THE WORLD'S FIRST-FOSSIL-FUEL-FREE STEEL

 MANUFACTURING

A partnership between a steel producer and a mining company has resulted in a new method for manufacturing steel without the use of CO₂-producing coal

Spotted: Steel is everywhere, but it is also a huge polluter. Steel production accounts for around 8 per cent of global CO₂ emissions. This means that all the electric vehicles and green buildings which use steel are still contributing huge amounts of CO₂ to the atmosphere. Now, a solution may be in sight. Swedish steel company SSAB has partnered with mining company LKAB and the Swedish government to create a process that eliminates the use of fossil fuels in steel production.

Traditionally, steel is made using coal to fire the blast furnaces where the iron ore is melted. At the same time, the carbon in the coal binds with oxygen in the molten ore to purify the iron and then mixes with the pure iron to form steel. The problem is that when oxygen and carbon meet, they create a considerable amount of CO₂. SSAB's new process uses an electric oven instead of a coal blast furnace, and hydrogen takes the place of carbon to capture the oxygen in the iron ore. The by-product of this process is water, instead of CO₂.

The new process has been dubbed HYBRIT (Hydrogen Breakthrough Ironmaking Technology). However, it still uses a lot of energy. So, although it is greener, it only reduces the overall emissions from steel production by around 20 per cent. To reduce this further, the energy used in the HYBRIT process will also need to come from green sources.

Martin Lindqvist, President and CEO of SSAB, [points out that](#) this is just the first step in creating a fossil-fuel-free steel industry. "The first fossil-free steel in the world is not only a breakthrough for SSAB, it represents proof that it's possible to make the transition and significantly reduce the global

carbon footprint of the steel industry. We hope that this will inspire others to also want to speed up the green transition.”

Due to global warming, it has become imperative to find a way of eliminating the pollution generated by the mining of iron ore and the burning of coal to produce steel. At Springwise, we have seen this urgency reflected in a number of innovations. Some are focusing on eliminating or reduce the use of steel by substituting **other materials**, while others refocus on reducing the **use of steel** and of construction waste.

Written By: Lisa Magloff

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Takeaway:

In July, SSAB Oxelösund rolled the first steel produced using HYBRIT technology and delivered it to the first customer, the Volvo Group. The company has declared this a major milestone in the eventual creation of a completely fossil-free value chain. By industrialising this technology in the future and making the transition to the production of sponge iron on an industrial scale, we will enable the steel industry to make the transition. This is the greatest thing we can do together for the climate,” says Jan Moström, President and CEO of LKAB. In the future, partnerships like this could be used as a model for driving the elimination of fossil fuels in other industries.