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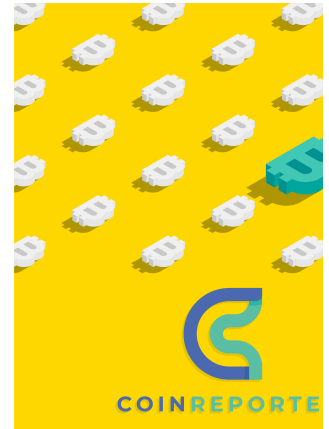
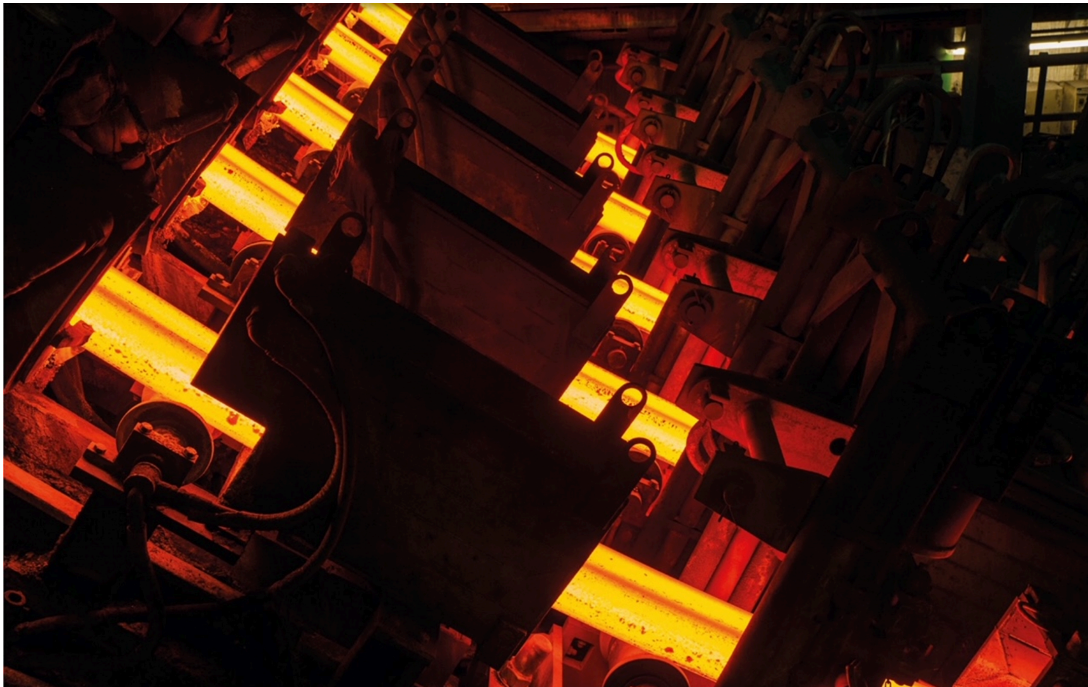
GREEN DEAL

Heat pumps crucial to green transition for steel and other industries

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By Nick Powell



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Steel production is a traditional heavy industry but it is also a pioneer of the solutions needed for a greener, less environmentally damaged world. Steel is 100% recyclable and much of the industry turns scrap into new products. But the energy required is huge, even if it can be supplied as green electricity, so there's an increasing focus on capturing the heat generated by the steel-making process and recycling or redistributing it. The large heat pump technology involved also offers other industries greener energy solutions, writes Nick Powell.

The COP15 Martin steel plant at Brescia in northern Italy is committed to being a good neighbour. Located close to housing, it's very much part of the community and provides much more than employment to the

surrounding area. Heat that once escaped through a cooling tower is now sent to a district heating system, keeping 2,000 homes warm in winter. When demand falls away in the summer, the heat is converted into electricity, enough for 700 homes.

At the heart of this 'heat-leap' project, launched in 2020, is a large heat pump, supplied by another Brescia firm, Turboden. It's a pioneering firm that emerged in 1980 from the Politecnico di Milano's research into closed loop energy systems. Now backed by a majority shareholder, Mitsubishi Heavy Industries, the company is at the cutting edge of large heat pump technology.

Combined with a compressor, it both provides heat at the required temperature to the district heating system and sends colder water back to the steelworks to cool its products once again, completing the circle and saving on water as well as electricity. It's helping ORI Martin's 12-year plan to reduce its emissions by nearly a third by 2030.

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Where steel has led, other industries can follow, as they look to cut energy waste for both environmental and economic reasons. Turboden's latest project involves an even larger heat pump, which will enable a Finnish paper mill to stop using gas and so improve its energy security as well as reducing its carbon footprint. Low temperature waste heat from exhaust air and waste water will be superheated to 170 degrees, to produce steam for the paper-making process.

Andrea Magalini, General Manager of Turboden's Heat Generation Business Unit, expects the market for systems using large heat pumps to rapidly expand, with the company working on 10 projects a year in five years' time. Each will call for a specific design to address the individual customer's needs and requirements.

It's marketed as the most competitive technology to produce green heat and promises 99% reliability. One application will be providing the steam required for carbon capture and another exciting prospect is using it in the extraction of lithium, a mineral vital for the batteries needed in electric vehicles.

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But Luca Rigoni, Chief Executive of A2A Heat and Services, which runs Brescia's district heating system, heating is the 'elephant in the room' in the decarbonisation debate. How we heat our homes is a major cause of emissions entering the atmosphere and heat pump technology offers the solution. In Brescia alone, the use of heat from the steelworks is preventing the discharge of 917 kilo-tonnes a year of CO2.

Turboden's marketing director, Marco Baresi, says he's glad to see industrial policy becoming more important in the European Union's approach to climate change and implementing its Green Deal. He sees his company's work in developing large heat pump technology as a positive and practical response to the RepowerEU initiative. It's a key strategic technology identified in the Net Zero Industry Act as requiring development in Europe.

It is also an extraordinary opportunity for export to emerging and development countries. Marco Baresi identifies Turboden is a perfect example of a successful European clean technology company, helping to reduce greenhouse gas emissions and promote sustainable development.

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