

## A Patent Trend Analysis for Hydrogen Based Ironmaking: Identifying the Technology's Development Phase

**Authors :** Ebru Kaymaz, Ash İl bay Hamamcı, Yakup Enes Garip, Samet Ay

**Abstract :** The use of hydrogen as a fuel is important for decreasing carbon emissions. For the steel industry, reducing carbon emissions is one of the most important agendas of recent times globally. Because of the Paris Agreement requirements, European steel industry studies on green steel production. Although many literature reviews have analyzed this topic from technological and hydrogen based ironmaking, there are very few studies focused on patents of decarbonize parts of the steel industry. Hence, this study focus on technological progress of hydrogen based ironmaking and on understanding the main trends through patent data. All available patent data were collected from Questel Orbit. The trend analysis of more than 900 patent documents has been carried out by using Questel Orbit Intellixir to analyze a large number of data for scientific intelligence.

**Keywords :** hydrogen based ironmaking, DRI, direct reduction, carbon emission, steelmaking, patent analysis

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