



Potential Zero C Steelmaking Technologies

- Scrap based EAF
- Hydrogen DRI & EAF
- Chloride reduction
- Electrolysis

Boston Metal raises \$20M from billionaires' ener

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The team behind Boston Metal, which promises a more sustainable way to manufacture metal.

By Kelly J. O'Brien – Technology Reporter, Boston Business Journal Jan 10, 2019, 2:09pm EST

IN THIS ARTICLE Carmichael Roberts Person Jeff Bezos Person Michael Bloomberg

Person

Boston Metal, a startup whose new metal-manufacturing process promises to reduce carbon emissions, has raised \$20 million in order to bring its lab-born technology to an industrial scale.

The Series A round was led by Breakthrough Energy Ventures – a firm backed by the fortunes of Bill Gates, Jeff Bezos, Michael Bloomberg, Richard

Hybrit – Fossil-free steelmaking









Decarbonisation Technology Solutions

Quality Issues with Electric Arc Furnaces

- Product Nitrogen levels cannot be guaranteed to be <= 40ppm let alone 20ppm. To control product Nitrogen to these levels will require radical new technology changes.
- Level of residual elements cannot be guaranteed to achieve Cu < 0.1% (eg exposed autobody). To consistently control residual contents to these low levels will require a new approach to scrap pre-treatment: scrap collection, sorting, separation and storage.
- To ensure that thin slab caster **cleanness** is comparable with conventional slab caster cleanness will require new processing technology.





Latest Developments

Median equivalised household net income: selected European countries



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UK Failing Competitiveness

A Manufacturing Shaped Hole in Our Economy



Stagnation nation: 10 key facts

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- Low growth: real wages grew by 33 per cent a decade from 1970 to 2007 on average, but this fell to below zero in the 2010s.
- High inequality: income inequality in the UK was higher than any other large European country in 2018.
- The toxic combination: lowincome households in the UK are 22 per cent poorer than their counterparts in France, and typical household incomes are 9 per cent lower.
 - Stalled progress: 8 million young workers have never worked in an economy with sustained average wage rises, and those born in the early 1980s were almost half as likely to own a home as those born in the early 1950s at age 30.
- Levelling up: income per person in the richest local authority – Kensington and Chelsea (£52,500) – was over 4 times that of the poorest – Nottingham (£11,700) – in 2019.

- Brexit Britain: fishing output could shrink by 30 per cent by 2030 as a result of Brexit, but food and beverages manufacturing output could increase by more than 5 per cent.
 - The nature of our economy: Britain is the second largest exporter of services in the world, behind only the US.
 - Good work: half of shift workers in Britain receive less than a week's notice of their working hours or schedules.
- Staying put: young people from the most-deprived areas are twoand-a-half times less likely to leave their home area upon reaching adulthood than their peers in the least-deprived places.
- Burden sharing: wealth has risen from three to almost eight times national income since the 1980s, but wealth taxes have flatlined as a share of GDP.

Increased Inequality

Average wealth has fallen in the North East

Change in median total household wealth by GB region, July 2006 to March 2020



Source: ONS

Child poverty across the UK's nations and regions 2014/15 to 2020/21



А JUST ТЯАИЅ ITION?

Managing the challenges of technology, trade, climate change and COVID-19

David Coats

Visiting Professor, Centre for Sustainable Work and Employment Futures, University of Leicester Research Fellow, the Smith Institute

Community prospect

DECARBONISATION OF THE STEEL INDUSTRY IN THE UK Toward a mutualised green solution

March 2021





Social and Ethical Mission

Chris McDonald @MrChrisMcDonald - Aug 23, 2021 VIDEO: I am relaunching the Ashok Kumar Fellowship to promote understanding between engineers and politicians. The Fellows will work in @POST_UK and write a research paper for UK parliamentarians. The fellowship is supported by @IChemE and @MPI_UK Youtu.be/T1PKaFz9Jr4









NEW POWER STATIONS





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