ALUMINIUM NEWS

THE VOICE OF THE UK ALUMINIUM INDUSTRY

ISSUE 16 MARCH 2023

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FOR MORE INFORMATION PLEASE VISIT:
http://bit.ly/3fod5jb

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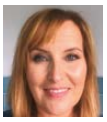

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ALFED
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THE VOICE OF THE UK ALUMINIUM INDUSTRY – DRIVING A SUSTAINABLE FUTURE

WHY JOIN THE ALUMINIUM FEDERATION

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OUR SURVEY SAYS...

By Nadine Bloxsome, Membership & Sustainability Manager, ALFED

As I write this, we are hurtling towards mid-February and the year already feels like it is flying!

The first few months in any new role allow for a certain settling-in period and with that, of course, comes elements of change and reorganisation to meet with new ways of working and delivery. Here at ALFED, there have been several new changes recently and as the newest members of the team, Sharon and I are still finding our feet with day-to-day duties and the wealth and knowledge that comes with working at such a longstanding organisation.

I thought it would be easier to begin with asking the members what it is that is currently working and what could either be done a bit better or needs to be scrapped altogether! The last few years have brought us new ways of working that see us jumping between a virtual world and so I am keen to try and get a balance for networking opportunities, social events, technical support, and training that can work across both online and in person platforms.

Thank you to everyone who has so far filled out the Member Surveys – we tried not to bombard you, but the main areas to focus on were the development of the Sector Groups and the ALFED HSE Support Group.

This HSE Support Group was especially of interest, as it seems not all members are aware of this excellent resource and regular meeting opportunities to present case studies, share examples of best and worst practice and in general, work towards ensuring we are all involved in safe and secure operations.

Please keep an eye out for more promotion around when this group starts up again this year and we'd always like to hear of and share any specific safety or wellbeing initiatives that your company is implementing.

Hopefully you will see us starting to put some of your feedback into action over the coming months. There will be an increase in networking and member events, technical support offerings, seminars, webinars and training opportunities, as well as dedicated campaigns to promote the UK aluminium sector.

The first major member networking event of this year that I would encourage all members to sign up to is the Sector Groups Forum, which will take place at the British Motor Museum on Tuesday 28th March, 2023.

The Aluminium Federation Sector Groups bring together members from across the supply chain, fostering customer and supplier relationships, while encouraging learning from your peers. Each meets regularly for networking and to discuss issues ranging from trade and standards to supply and HSE.

In an effort to form a collaborative approach across the supply chain, we would like to invite all ALFED Members to attend a this Sector Group Forum to hear from a line-up of guest speakers.

After a networking lunch, each of the Sector Groups will host their regular meeting, with the opportunity for other ALFED Members to participate for a wider discussion.

A final networking reception will be held within the Museum, with the chance to take a guided tour, or speak with any of the staff on hand about the exhibits in more detail.

- Nadine Bloxsome, Membership & Sustainability Manager, ALFED

Registrations are now open on the website and you can also select which Sector Group would be of the most interest for you and your company to join.

ALFED ANNUAL BUSINESS BRIEFING AND DINNER

THURSDAY 30TH NOVEMBER 2023

Tortworth Court Four Pillars Hotel in South Gloucestershire

This annual event is a great opportunity to catch up with industry colleagues and friends at a prestigious venue.

Last year's dinner was sold out and attended by over 250 aluminium industry professionals, offering an excellent networking opportunity.

The black-tie evening dinner will follow on from a full day's programme of industry speakers at the now established ALFED Business Briefing.

A host of speakers will present on topics offering new insights on transformation, innovation, strategy, and sustainability in the current climate.

A full agenda will be published in due course and tickets will be available from 29th March 2023.

To find out more about how your company can promote its presence across the event and the sponsorship opportunities on offer, please download the brochure from our website or contact: sponsorship@alfed.org.uk / 07920 259 262.

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RAA – RICHARD AUSTIN ALLOYS

FIND OUT MORE: HTTPS://BIT.LY/3MWR918

With spring and hopefully summer just around the corner, ALFED invites you to join the aluminium industry at a special networking dinner event at the beautiful Carden Park in Cheshire.

While the Annual ALFED Dinner is famously-known as a black tie affair, this dinner is specifically aimed at re-connecting members and the sector, in an informal setting, to discuss business or just enjoy a social engagement with friends and colleagues.

There is also the opportunity to start the day with a round of golf on the prestigious Nicklaus course or by teaming up in a clay pigeon shooting competition.

Famously designed by the great Jack Nicklaus and son Steve, the Nicklaus golf course at Carden Park is a must for all golfing enthusiasts.

A picturesque start at the first hole awaits. Located next to the onsite vineyard and offering beautiful views of the Welsh hills, your game leads you around the front of the Cheshire country estate.

Book your places now and also enjoy an overnight stay and breakfast the next day, with the option to also stick around and enjoy the luxurious spa facilities before we head into a nice long-weekend!

Find out more: bit.ly/413fQ0s

ALFED SPRING NETWORKING DINNER SPONSORSHIP PACKAGES 2023

Sponsorship is the perfect way to add impact to your attendance to the ALFED Activity Day, increasing your company's visibility both before, during and after the event to maximise exposure of your brand(s)/business, and to generate higher ROI from member companies in the year ahead.

Discover our sponsorship packages: https://bit.ly/3L700g3

Sponsored by: TANDOM Metallurgical Group Ltd

ALFED SECTOR GROUPS FORUM – 28 MARCH 2023

The Aluminium Federation Sector Groups bring together members from across the supply chain, fostering customer and supplier relationships, while encouraging learning from your peers. Each meets regularly for networking and to discuss issues ranging from trade and standards to supply and HSE.

In an effort to form a collaborative approach across the supply chain, we would like to invite all ALFED Members to attend a dedicated Sector Group Forum on **Tuesday 28th March at the British Motor Museum in Gaydon.**

The day will begin with a networking breakfast and presentations from a line-up of guest speakers, who will encourage discussions around relevant industry topics, market updates and challenges.

After a networking lunch, each of the Sector Groups will host their regular meeting, with the opportunity for other ALFED Members to participate for a wider discussion.

A final networking reception will be held within the Museum, with the chance to take a guided tour, or speak with any of the staff on hand about the exhibits in more detail.

Spaces are limited for this event and all ALFED Members are welcome at no charge. If you would like to invite a guest or a non-ALFED Member to join, please contact the team directly to register.

AGENDA*

9am – 10am: Registration and Breakfast Networking

10am – 12.30pm: Business Briefing: Sector Focus

Speakers include:

- Tom Jones, CEO, ALFED
- Speaker TBC, ALVANCE Aluminium Group
- Paul Williams, CRU
- Chris Bayliss, Aluminium Stewardship Initiative
- Steve Andrews, Commercial Manager, ISSB Ltd
- Gregory Uring, Thales Integration Manager, HITACHI
- Tony Graham, OCEA Shipbuilding (UK) Ltd
- Anders Jersby, Materials Processing Institute
- Paul Cornick, Birmingham University
- Elle Bennett-Runton, KTN

12.30pm – 2pm: Lunch

2pm – 3.30pm: Individual Sector Group Meetings

3.30pm – 4.30pm: Networking Coffee Break and optional museum tours

**(subject to change)*

Queries: Nadine Bloxsome, Membership & Sustainability Manager: nbloxsome@alfed.org.uk
Find out more: https://bit.ly/3ZZvnxN

BIY ENERGY

BIY Energy Ltd is a business energy consultancy and brokerage with its head office based in Yorkshire but operating nationwide. Their mission is to help businesses and organisations save money, cut carbon emissions and to relieve the headache associated with energy.

Working with large multinational companies down to very small businesses. If any business is struggling to cope with energy costs or the complexity of the market they will offer assistance in any way they can to help.

www.biyenergy.com

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The Commonfield story began in 1995 with the design, manufacture and marketing of a range of products created using decorative glass in collaboration with Glaverbel/AGC Glass in Belgium. One of the partnership's early successes was a unique coloured glass, sliding-door wardrobe system – a pioneering product that has grown into a global market product worth many millions per annum.

www.commonfield.com

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They operate in all major market sectors across the UK and are known for their unrivalled ability to meet clients' requirements. Their extensive in-house processing portfolio in combination with their processing expertise enables them to deliver cost efficient metal solutions and high-quality steel products.

www.kloecknermetalsuk.com/en.html

LUFFY AI

Luffy AI develops adaptive neural networks that allow learning and adaption at the edge. Their AI control systems learn the nuances of the process being controlled and adapt to changes over time to maintain optimal process efficiency. Recent deployments on a thermal process have achieved 10% reductions in energy consumption with 40% improvements in process variable accuracy. The AI allows better control of the temperature profile, reducing the tuning time of the process and increasing overall throughput and efficiency. This technology is suitable for manufacturing processes that are sensitive to environmental parameters, feedstock changes, or generally difficult to control optimally.

www.luffy.ai

OPEN ENERGY MARKET

Open Energy Market provides smart energy services to navigate challenging markets. Their smart energy services span across procurement, compliance and legislation, net zero opportunities, and demand-side services, allowing them to create a tailored and futureproofed strategy for your business.

Their approach combines the technology of their award-winning Open Platform with their team's extensive sector knowledge and experience allowing them to identify, evaluate, and implement opportunities resulting in market-leading cost savings and carbon reduction.

www.openenergymarket.com/

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Efficient furnace practices with low cost production standards, start with automated charging and skimming. Using the best available technology allows for a significant reduction of energy consumption, minimum cycle times and lower furnace maintenance cost as well as a safer environment for the operators. RIA Cast House Engineering has been focusing on the development and manufacturing of charging and skimming equipment since 1997 and is focused on the development of innovative automation and process optimization solutions, continuing their development of the safest and most efficient systems possible. The latest generation RIA charging and skimming machines utilize full artificial intelligence (AI) to make charging and skimming cutting edge technology. RIA solutions achieve the lowest possible operational cost and the safest operating environment for this important part of the process.

www.ria-che.com

SCANMETALS UK

As a specialist metals recycling company, Scanmetals is a leader in the recovery of non-ferrous metal from incinerator bottom ash (IBA). The recovered non-ferrous metals are cleaned, separated into different fractions and sold to primary and secondary smelters, refineries, ingot makers and foundries globally.

www.scanmetals.com

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www.tyrolit.co.uk

VOSS STAINLESS UK

Voss Stainless UK hold over 9,000 articles and over 12,000 tonnes of steel and aluminium in stock at all times. What sounds difficult finds its way to you with ease – for this purpose they have digitalised all procurement processes. Thanks to their innovative VossOnline Toolbox, you simply order today what you need tomorrow. Check their stock in real-time and work with your own article numbers and matchcodes. Transparent. Efficient. Fast.

www.voss-stainless.co.uk

In March 2019, the aluminium industry witnessed one of the biggest cyber-attacks it has ever seen.

It was a reminder to all those involved in not only aluminium manufacturing, but larger, heavy industries, that the hazards and risks these facilities are susceptible to, can cause significant impact on production lines.

With an increase in remote monitoring and more digital manufacturing technologies being implemented across the aluminium supply chain, this one-day Cyber Security Forum will address the challenges faced by the sector, present what effective cyber resilience could look like, covering areas such as cyber risk assessment, cyber awareness in the workforce, supply chain security, cyber security legislation and compliance, and policies & procedures.

Hosted in association with BlueFort Security, the UK's leading cyber security solutions provider and Coventry University, participants will have the opportunity to meet with cyber security specialists providing valuable technical expertise and hands on support to your business.

There will also be the opportunity to take part in a cyber simulation exercise, which will see participants work together to "manage a cyber incident".

Date: 25th May 2023

Time: 9.30am – 4.00pm

Price: £49+vat per person

Venue: The Technocentre, Coventry University Technologypark, Puma Way, Coventry, CV1 2TT

The aluminium industry is a vital part of the UK manufacturing sector and an essential component of the modern UK economy, which will play a key role in the UK's transition to a more sustainable future.

But what is the reality behind Net Zero? What are you doing within your business to develop a sustainable strategy and is it in-line with the bigger milestones?

In a four-part training programme, Jerome Lucaes, CEO of Fast Forward Zero, ALFED members will be guided through the fundamental learnings of climate science, key principles of a Net Zero standard and establishing governance.

Leveraging over 25 years of experience, Jerome is working to develop relevant and applicable solutions that inspire sustainable transformations to leverage unique competitive advantages.

Jerome is one of the few business leaders with real experience and premium sustainability achievements that have been transformative for the metals markets and their supply chains.

Attendees to the Sustainability Forum taking place on 1st June at BMA House, London, will then also be able to hear from Jerome in person and find out more about this planned series of dedicated sessions.

Stay ahead and go to Net ZERO carbon

Session ONE: Wednesday 3 May: 10-11am

The basic of carbon footprint accounting – What Net ZERO carbon really means

- Definitions – greenhouse gases, scopes, LCA- Estimated vs actual emissions
- Corporate accounting – product accounting – the 3 Scopes of Carbon Accounting
- What Net Zero Carbon means for a business
- The key principles of the Net Zero standard of the SBTi
- Low carbon aluminium in the aluminium sector – current offerings and limitations

Session TWO: Wednesday 21 June: 10-11am

How to set up and implement a net Zero carbon strategy

- The fundamental learnings from climate science (IPCC reports)
- Why net Zero carbon strategy matters – for whom
- Establish the right governance
- Implementing the pillars: measure, strategize, implement, engage, report
- The use of compensations – Limitations and risks

Session THREE: Wednesday 12 July:10-11am

Understanding the complexity of new market standards, regulations and frameworks, in relation to climate and sustainability. What they really mean for the aluminium industry.

- ETS, CBAM, national regulations
- Science Based Targets initiatives (SBTi)
- Task Force on Climate-Related Financial Disclosures (TCFD), Carbon Disclosure Project (CDP), WBCSD GHG Protocol, MPP, ASI, FMC, and others

Session FOUR: Wednesday 27 September: 10-11am

The Net 0 carbon pathway for the aluminium industry

- A global perspectives of the challenges to tackle
- The solutions: electrification
- The state of the art for new technologies: Inert anodes, MVP, CCS
- Low carbon aluminium in the aluminium sector – what to expect?

* Dates may be subject to change

Registration is required to access the sessions.

Please register to attend either individual sessions, or all four to receive a group booking discount.

- £99 + VAT per each individual session
- £299 + VAT to join all four sessions

Register: http://bit.ly/3IWmvBp

A GREEN INDUSTRIAL POLICY FOR A STRONGER UK ALUMINIUM INDUSTRY

In an announcement recently released by European Aluminium, it was highlighted that the EU's initiative to propose a new industrial policy to halt Europe's deindustrialisation could not come at a more critical time for Europe's suffering aluminium industry.

The announcement states: "Since the start of the energy crisis, Europe has already lost 50% (1.1 million tonnes) of its primary aluminium production capacity. The economic viability of semi-fabrication and recycling sectors, which depend on gas, has also been severely compromised."

And while the EU's new industrial agenda is under some scrutiny as to its long-term vision, Europe already has something that the UK doesn't…a plan.

Other leading global economies have already taken assertive actions to attract investments in green technologies and provide competitive advantages for the value chains manufacturing them, such as the aluminium industry.

The most recent re-shuffle in government, at first glance, looks like a good move and in a recent statement by Tom Jones, CEO, ALFED, this focus on energy security, innovation, business, and trade is welcomed, however the challenges and opportunities facing our sector require an integrated approach.

First and foremost, the UK needs an industrial strategy, which can work alongside a long-term green growth plan, encompassing all departments.

Tom Jones said: "This plan must be structured to deliver the next 20 years of growth and investment alongside the transition to Net Zero – because that's what will ensure the UK's future competitiveness."

Aluminium is used in almost all green technologies, particularly those that will deliver the energy transition, such as wind and solar power, alternative fuel cells, hydrogen production, high-voltage cables, and batteries.

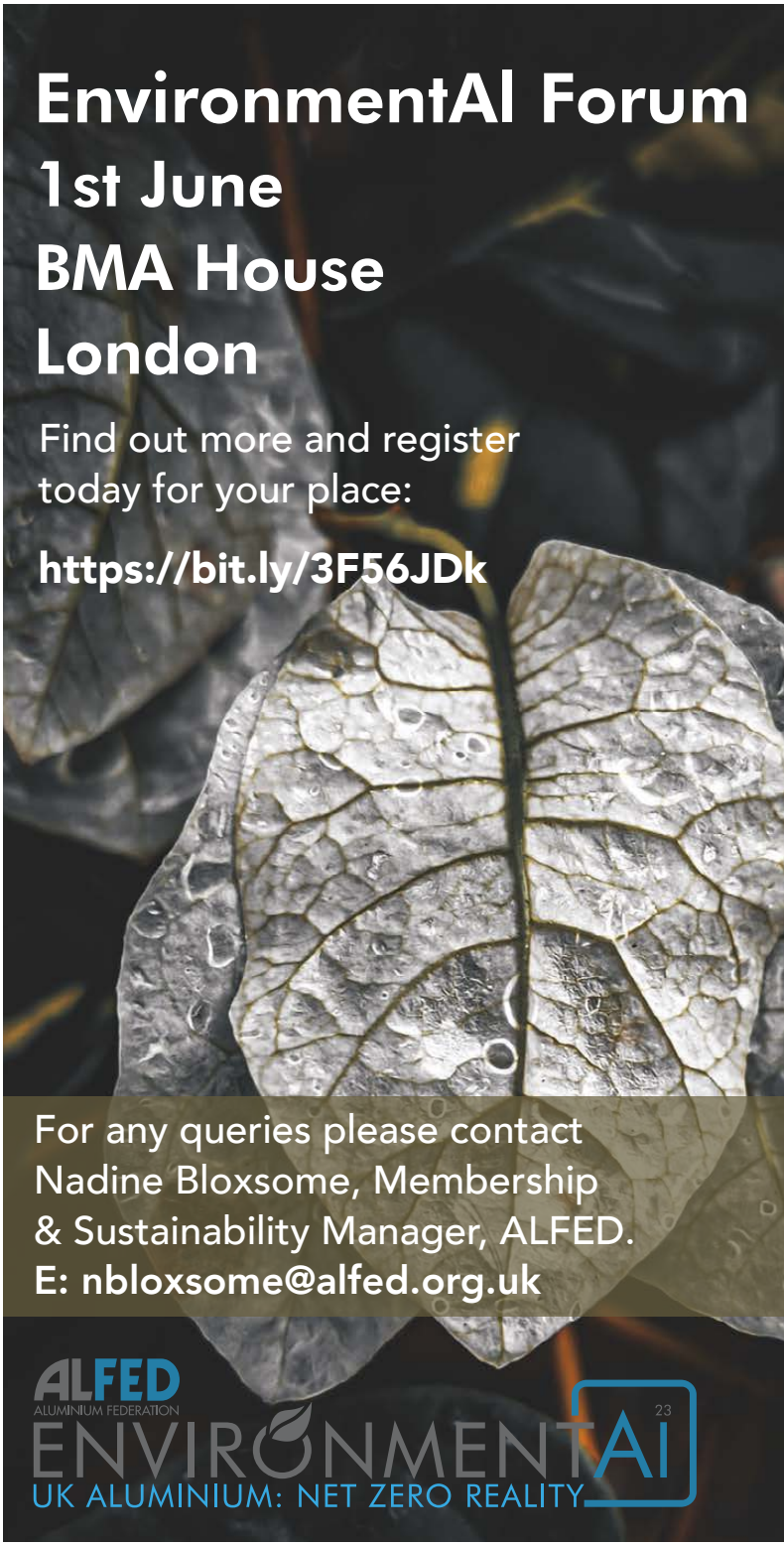
If the UK is serious about accelerating the green transition and reducing its dependency on other partners, industries like aluminium, that are key to this transition, must be provided with the support needed to keep businesses running and position the UK as an attractive investment opportunity for the future.

In an attempt to drive a sustainability strategy across the UK aluminium supply chain and support members in their efforts to navigate what this looks like, ALFED will be launching the first 'EnvironmentAI' Forum, which is planned to take place on the 1st June at BMA House, London.

This Forum will be open to all ALFED members and guests to examine the reality behind Net Zero. As a sector, are we making sacrifices in a bid to boost sustainable efforts? Or are efforts being hampered by misinformation, energy instability and a lack of governance?

Registration is now open to take part in this one-day event and I would encourage all members to submit topics for discussion or areas of interest that you would specifically like to see presented.

There are also a number of sponsorship opportunities available to promote sustainable solutions and any R&D projects or developments that could assist in developing a greener supply chain.



A PIVOTAL MOMENT - TAKE ADVANTAGE OF THE ENERGY CRISIS

Today's energy crisis has challenged traditional approaches to business and left organisations scrambling for solutions. Winners will use the energy crisis as a catalyst to accelerate their transition towards greener business models and leverage the associated competitive advantages in the long term.

By Jerome Lucaes, CEO, Fast Forward Zero *(right)*

> Today's energy crisis is a symptom of a bigger disease: our over-reliance on fossil fuels.

Calm in times of crisis

During times of crisis, we are quick to leap to conclusions and act in the short term. In recent months, we have seen examples of climate policies being unfairly criticised and long-term decarbonisation goals becoming less of a priority as countries and businesses each scramble for rapid solutions amid the current energy crisis. Now more than ever, it is important to step back, understand how we got here and recognise the underlying issues at play.

Looking back to 2021, the tightening of energy markets was already apparent. The standout driver was the rapid increase in demand for gas and coal as economies rebounded from the lows of the pandemic, but this was not the only variable impacting prices. Weather events had affected wind and hydropower generation, maintenance work was catching up from lockdown-induced delays, and more generally, the world was emerging from a period of weak oil/gas investments and inadequate ramp-up in renewables.

Fast forward to the invasion of Ukraine in 2022, and the crisis spiralled to new extremes. The US & EU announced a range of sanctions on Russia, many countries rolled out plans to phase out Russian oil & gas, and Germany decided not to approve the new Nord Stream II pipeline. As Russia began limiting export pipelines and Europe rushed to alternatives, previous global energy flows were reshuffled. Consequently, LNG and oil prices rose dramatically.

The impacts of this have been far-reaching. On a humanitarian level, the cost of living has soared, with inflation disproportionately impacting the most vulnerable and pushing families into poverty. On an economic level, we have seen countries edging slowly towards recession. At a time when countries are still reeling from the effects of the Covid-19 pandemic, the options that governments have to cushion the blow have been squeezed.

When we consider the impacts on industries and businesses, it is clear that the effects have also been uneven. Regionally, European and Asian sectors have been especially exposed.

More specifically, those energy-intensive businesses, dependent on fossil fuels and exposed to spot prices, have been hardest hit (hydrogen, fertilisers, electro-metallurgy etc).

Examples: In September 2022, Eurometaux reported that 50% of the EU's aluminium and zinc capacity had already been curtailed due to the energy crisis. Alcoa has been among those forced to curtail capacity in the Aluminium space, citing exposure to spot prices above **$600 per megawatt hour.** Meanwhile, Europe's fertiliser industry has been hit by ammonia and nitrogen production curtailments. This has included Yara, who announced it will have "curtailed an annual capacity equivalent to 3.1 million tonnes ammonia and 4.0 million tonnes finished products" in August.

Recognising the underlying problem

That brings us to today, with many businesses facing sharp energy challenges and difficult decisions to make. Asking government for subsidies will help calm the cost fever, but not treat the deeper disease. While the crisis is complex, with many factors at play, it is clear that a bigger issue is a historic addiction to fossil fuels that is accelerating climate change and catastrophic weather events. Greener business models and locally sourced renewables could be sheltering organisations from market volatility and supply insecurity if they had been developed quicker.

For many years, energy buyers have been lulled into a false sense of security that imported fossil fuels were a stable and secure source to drive economic growth. That reality is no more. And energy management is significant to all companies, not just those operating in energy-intensive sectors. To have any chance of finding successful sustainability solutions, we must recognise these new realities.

Companies that accelerate their decarbonisation strategy will be the winners

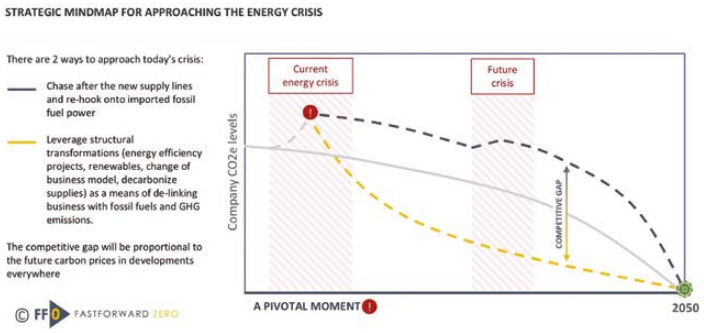
For many companies facing imminent threats to tomorrow's energy security, long-term planning will be difficult to prioritise. Instead, the focus will be on ensuring survival. In industries strongly dependent on gas for thermal energy (food, beverage, chemistry, metal transformation etc.), this may mean temporarily switching from gas to coal and diesel, thus driving emissions higher. For others, the focus will be rerouted to new sources of the same fossil fuels or even curtailing production.

A reactive approach may bring short-term relief, but it will not address the underlying problems. Businesses chasing new fossil fuel sources will only prolong their exposure to market volatility and supply security over the long term and find themselves further behind in the race to deliver low carbon solutions: a variable that looks set to dictate the requirements for many markets and customers over the decades to come.

Winners & losers emerge from crises

What past crises have shown us is that there will be winners and losers that emerge from this situation. One can hypothesise that the winners of today's crisis will be those that balance the short and long-term, leveraging solutions that help address the underlying problems. The winners will shift OPEX energy costs through CAPEX onto renewable power, energy efficiency projects and greener business models.

The rewards for those that achieve this pivot will be vast. From a sales perspective, lower emission companies will be positioned to serve the growing number of carbon-sensitive customers whilst earning higher profits in return for lower carbon goods. Businesses will additionally be better equipped to cope with new future energy crises. Meanwhile, organisations will find huge cost savings as carbon pricing increasingly applies to global markets.



The business case to decarbonise has never been stronger. Decarbonisation levers are available to businesses

The business case for accelerating decarbonisation projects has never been stronger. By improving energy efficiencies, reducing the reliance on fossil fuels and implementing "green" business models, organisations can not only navigate a way out of today's crisis but also locate a path towards a competitive future built on low carbon values.

By decarbonising, businesses will limit both their energy burden and carbon footprint. A company can improve its energy efficiency in numerous ways, ranging from building maintenance (lighting/ heating/ insulation) to technological upgrades. Examples of technological improvements can be found in the Aluminium space; breakthrough technologies (inert anodes), smelter pot upgrades and more advanced feed systems can improve energy consumption and emission levels.

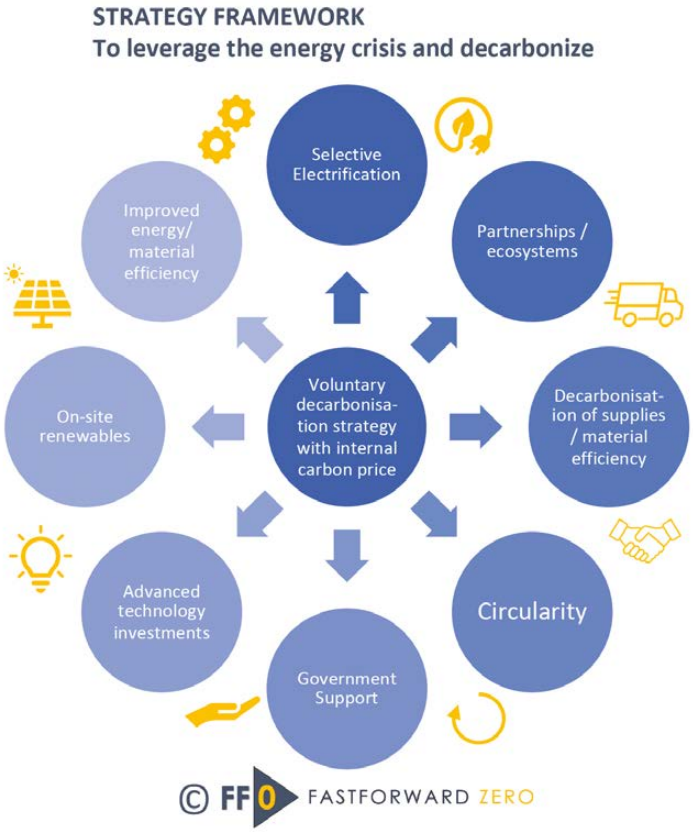
By increasing the share of energy from on-site renewables, companies can reduce their exposure to volatile energy markets and traditional power sources, which are more vulnerable to political escalations. EU policymakers have been streamlining permits and regulations to fast-track renewable installations. The opportunities for renewables can also be extended through selective electrification. By switching thermal energy processes to electric power supply and updating fleets to electric alternatives, the share of renewables can be broadened.

For some organisations, more transformative technologies and business models can be adopted to mitigate energy exposure and develop low carbon competitive advantages. Producers may seek to include increased levels of recycled content in the metals space, which require less energy to produce. Secondary aluminium, for example, is widely quoted as requiring 95% less energy in its production than primary Aluminium. Downstream producers may further seek to transform product design, enabling closed-loop recycling. This can include the standardisation of alloys or partnering with businesses across the supply chain. Organisations may also shift focus to more sustainable markets such as EVs or green construction. To drive transformation, internal carbon pricing can further ensure investments are made with carbon considerations in place.

By working with suppliers actively investing in their own decarbonisation, businesses can ensure their supply chain remains resilient to energy challenges. Partnering on investments can also drive down supply chain emissions, accelerate low carbon technological innovations and widen a company's green product offering.

The options are vast but must be tailored

Organisations have a wide array of decarbonisation levers they can reach for during today's energy crisis. The most appropriate solutions will vary significantly depending on the organisation's industry, capabilities and goals. Timing is critical, and for many, this means preparing now. This is especially true for those organisations sheltered by government support, who will likely see such measures finished before the crisis ends.



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NET-ZERO AUTOMOTIVE SUPPLY CHAIN

By Dr Alan Banks, Ford Motor Company on behalf of UK Auto Council. E: abanks2@ford.com

The effects on the global supply chain in recent years have been profound; COVID, the crisis in Ukraine but also the issue with the 'Evergiven' being stuck in the Suez Canal have highlighted the fragility of our 'just in time' lifestyle.

Sourcing globally for the lowest landed cost has served us well for many years – it has lowered operating costs, enabled us to take advantage of low-cost country production that consumers have benefitted from since its inception. Supply chains in Eastern Europe and the Far East were able to be exploited for easy to ship, high labour content commodities to keep costs down for the collective good. We could argue that job losses in local economies that made way for globalisation have been the price we've paid but by and large, this was driven by consumer demand for less expensive goods. Consumer pressure generally wins against any argument to the contrary – and for many of these products, price sensitivity is high.

Recently however, global sourcing for the lowest cost has been called into question. Primarily driven by the sensitivity of the supply chain itself, recently highlighted by the global pandemic, issues with ocean freight, and the need to cut greenhouse gas emissions and CO2 in particular. The raw material markets have been particularly under scrutiny, as sourcing globally for the lowest cost typically means sourcing in less developed economies, who often use fossil fuels in their manufacture, and coupled with the distance of shipping, has led to higher embedded CO2 in raw material production, rather than driving GHG reduction. Consumers today are more environmentally conscious, demanding improvements, and in some instances, they are willing to pay more for greener goods.

Demand for recycled materials and sustainable products is only likely to increase going forward – regardless of legislation that is put in place. We could be in a position whereby public expectations out-perform legislation with the aim to reduce CO2. As OEM's become more environmentally astute, the transition to lower embedded CO2 materials and products will become a requirement.

It is unlikely that high-polluting (and low cost) countries today will be able to transition to zero-emission countries tomorrow, which will leave the supply chain vulnerable to unexpected and rapid legislation changes and potential shifts in consumer demand. In the auto industry this is likely to be very important as the push for zero-emission vehicles has a time limit. By 2035, all vehicles sold in the UK must be 100% zero-emission. But if the embedded carbon in the manufacture of these vehicles isn't addressed – including how that vehicle is recycled at end of life – then it could be argued that the industry has only done half the job in reducing GHG.

Socio-political issues are also having a significant impact on the supply chain. The war in Ukraine has given the world shortages in ways nobody anticipated. The impacts of the Russian gas supply to Western Europe, to the grain supply from Ukraine itself, have all contributed to huge price rises across all markets. But before this, the global Covid Pandemic also caused supply issues – such that the global pricing was adversely affected. Similarly, demand for materials used for Battery Electric Vehicles (BEV's) such as Cobalt, Nickel and Lithium have increased exponentially and were already on short supply prior to the war, and Russia has one of the world's largest nickel mines is in Siberia. As this is now sanctioned, the situation will be exacerbated as demand for BEVs continues to grow. We must therefore look at better solutions to recycle and reuse these materials both to improve the CO2 footprint but also to secure supply.

The CO2 required to produce aluminium from recyclate is minimal compared to virgin. For instance, the CO2 output per tonne of material is approximately 20 tonnes for coal-based production. The European average is 6.7 tonnes of CO2 per tonne of aluminium. But this compares to less than 0.5 tonnes of CO2 to make aluminium from recyclate Figure 1. For the UK auto industry alone, this would equate to 8.25 million tons of CO2 reduction if the UK produced its own aluminium with 50% scrap (Figure 1). For reference, the UK scraps 100k tonnes of aluminium a year.

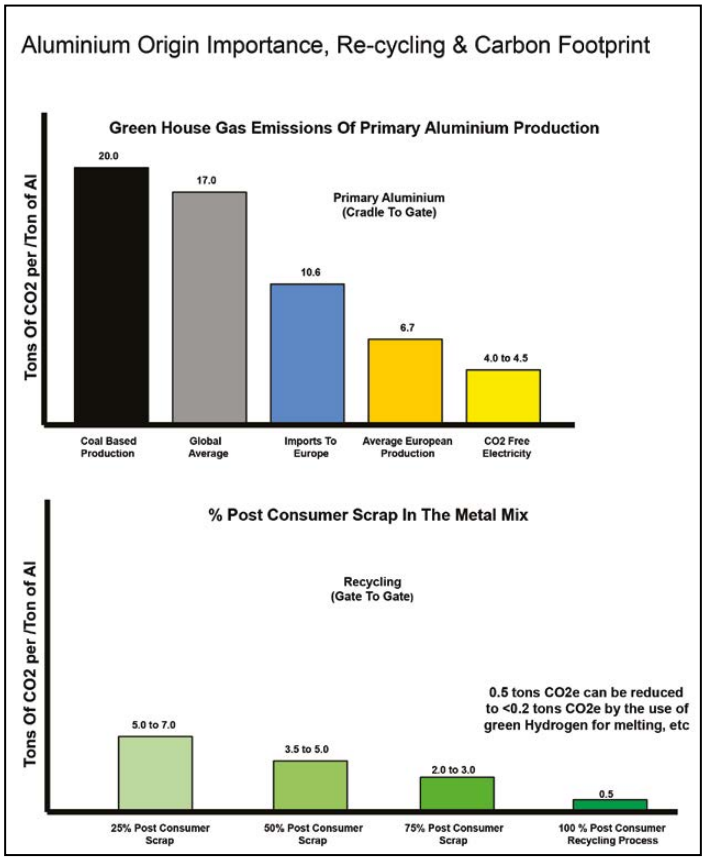


Figure 1 - Embedded CO2 Comparison for Aluminium Production (ALFED)
Image source: Constellium 2021

As the UK doesn't have a remelt facility, the UK exports low value scrap low value scrap to be repurposed into high value (and high cost) material. This creates huge opportunities for industry that can make a business case for material on-shoring. The UK steel industry has a similar CO2 equation as the Aluminium industry and would also benefit (Figure 2).

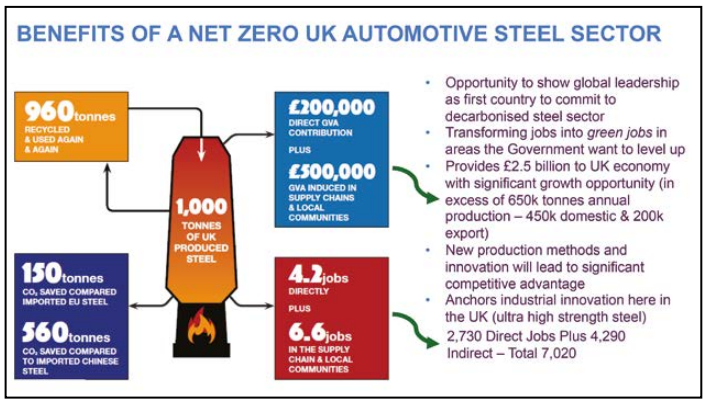


Figure 2 – CO2, GVA and Job Creation Opportunities for the UK Auto Steel Industry (UK Steel). *Image source: UK Steel 2022*

The UK auto sector is healthy and is likely to grow as the demand for zero-emission vehicles intensifies. To protect UK supply chain, the raw material opportunities for manufacture within the UK can help by being resilient to outside influences and global insecurities.

As well as the CO2 reduction, the business case behind on-shoring of raw material is compelling. To be self-sufficient for the UK auto industry for Aluminium, Steel, Carbon Fibre and Glass fibre would:-

- Reduce global CO2 by 137 tonnes of CO2 per tonne of material produced
    - Over 13 million tonnes annually
- Create over 13,500 jobs
- Generate over £5bn for the UK economy

The UK is already seen as an investible economy with at least 2 industry led propositions of automotive sheet and extrusion capability to more than cater for the sector. This will however leave a gap in the UK supply line for casting ingot which is as yet, unfilled. This means that there is an opportunity for in excess of 100,000 tonnes of aluminium ingot for casting purposes – and with electric motor casings a growing commodity, home produced material should be incentivised to fill this market, Figure 3.

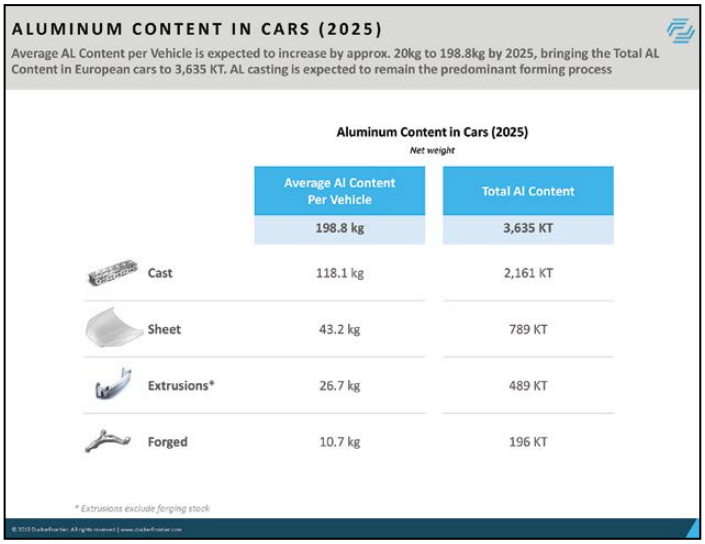


Figure 3 – Aluminium Content Requirements by 2025
Image source: DuckerFrontier 2019

Whilst this potential should be industry led, the foundations of the opportunities could be underpinned by Government strategy starting with the Department of the Environment, Farming and Rural Affairs (DEFRA) wo would own the recycling strategy for materials. Encouragement to prevent off-shoring (and thus generating a huge amount of CO2 in the process) to recycle scrap material would set the agenda for materials to be made in the UK. DEFRA would need to work with the environmental lobby to demonstrate that although CO2 output from the UK will increase in the short term, the global reductions would be a compelling argument.

UK CO2 output would be mitigated in the longer term by investment in green energy. Scotland, for instance, is already powered by 98% renewable energy and as the other UK countries decarbonise, so to will the CO2 output diminish.

The Department of Business, Energy and Industrial Strategy (BEIS) could use on-shoring of recyclate to incentivise businesses to invest in UK materials using repurposed scrap as the base-line for a materials strategy. Incentives for business (not just direct funding) are the key for businesses to invest if they see long-term potential for their investment.

Establishing security of the supply chain is a priority in the current and future markets. With uncertainty around long-term supply due to the war in Ukraine and the uncertainty around Taiwan, it is in the interests of the UK business sectors to understand and take advantage of any opportunities that exist. As the world evolves, so must the way we do business. In the post-Cold War era, the economics of local supply in a global market mitigated against the local economies.

In the current market, especially with CO2 reduction as a requirement, the market opportunities may well be favourable for a re-think on the way we do business. Earth overshoot day (the day in which humanity has used up all of the biological resources that the planet can naturally regenerate) gets earlier every year, Figure 4. In 2022, that date was July 28th. In the UK alone, the date was May 19th. Whilst the issue 'could' be resolved by decarbonising high polluting material sources, this will not resolve the fragile supply chain and the UK will lose the job creation and wealth improvement opportunities that on-shoring would provide.

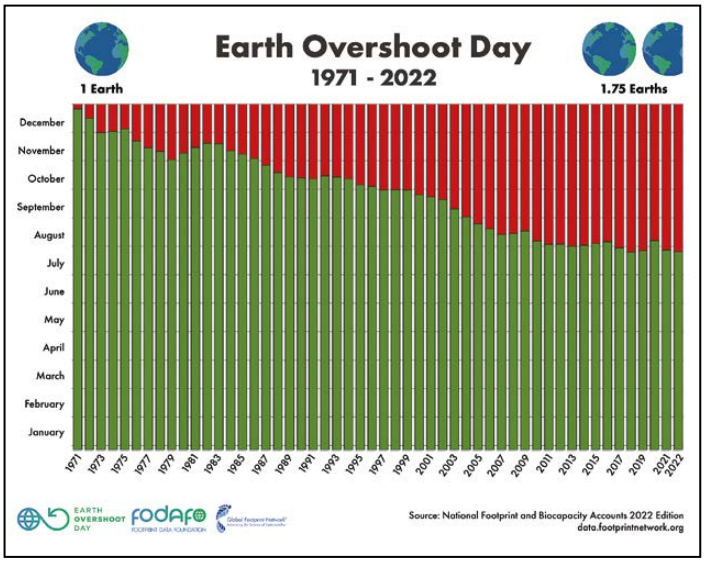


Figure 4 – Earth Overshoot Day

THE DEVELOPMENT OF ALUMINIUM ADDITIVE MANUFACTURING

Dr Julan Wu, University of Birmingham

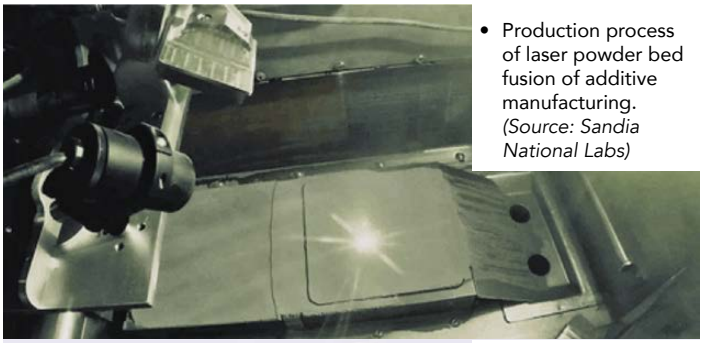
The use of aluminium has been increasing in recent years due to its many benefits, including the benefits of its strength, durability, lightweight properties, corrosion resistance, and heat resistance. Additionally, aluminium is a good conductor of electricity and heat, making it a popular choice for many industrial and commercial applications. Additive manufacturing methods, also known as aluminium 3D printing, are attracting interest from both research and industry for the capabilities to produce complex geometric structure which are unattainable using other techniques. Using AM, a part is produced layer-by-layer guided by the three-dimensional models. There are many benefits to produce aluminium using AM, including: reduced waste, increased geometry design freedom, efficiency, flexibility etc. It is potential to minimise the waste by shape optimisation and post machining and shorten the design-to-manufacture time by reducing the manufacturing steps by a single step.

Many stakeholders in the industry have focused on Additive manufacturing (AM) aluminium, including suppliers of aluminium goods and powders, Additive manufacturing (AM) technology developers, and AM service providers. In the last few years, aluminium AM has grown exponentially, becoming one of the most widely demanded materials in the industry after being one of the more difficult metals to process.

Aluminium AM involves using a 3D printer to create objects out of aluminium powder or aluminium-filled thermoplastics. With the technology advancing in recent years, the usage of aluminium AM is increasing and expected to become more popular in the coming years. AM aluminium parts have now been used in aerospace and automotive products where parts with complex geometries, lightweight and high strength are expected. AM has the potential to revolutionize the way aluminium products are designed and manufactured. However, there are several challenges that need to be addressed before it can become a mainstream production method for aluminium.

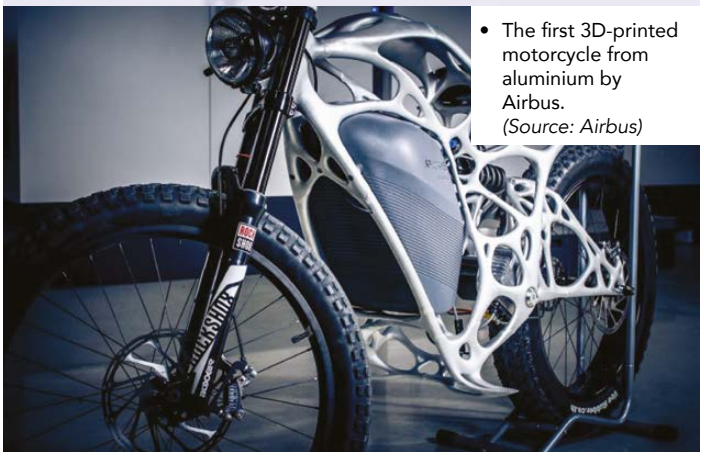
One of the main challenges is achieving the same level of mechanical properties in AM aluminium parts as in conventionally manufactured parts. This is because the microstructure of AM parts is typically different than that of conventionally manufactured parts and the formation of defects, which can affect their strength and toughness. Another challenge is the high cost of AM equipment and materials, which can make the process less cost-effective than traditional manufacturing methods for some applications. In recent years, with the development of technology and the reduction of cost, more and more industries are starting to adopt AM aluminium, especially in aerospace, automotive and medical industries.

A trend in additive manufacturing aluminium is the use of Laser Powder bed fusion (PBF-LB) process, which is one of the most common AM processes for metals, it uses a laser to melt metal powder and build up the parts layer by layer. In general, PBF-LB of aluminium provides the strengths of higher geometric design freedom and enhanced microstructure. During the PBF-LB process, metal powder is melted by the high energy density laser beam and solidify rapidly to room temperature. The rapid cooling rate form the ultrafine microstructure within the melt pool. Chemical modifiers are required in traditional cast alloys to enhance the microstructure and improve the mechanical properties. Another advantage for PBF-LB to produce aluminium is the microstructural enhancement by refining the microstructure from rapid solidification during the production without altering the chemical composition. The refined microstructure improves the properties of tensile and compressive strength, hardness, fatigue, creep, and wear resistance and electrical properties. Although ductility of AM aluminium is lower, proper heat-treatment provides enhancement on the ductility while not impact the strength significantly. PBF-LB also offers the advantage of producing Al-alloys which are challenging to machine or form.



- Production process of laser powder bed fusion of additive manufacturing. *(Source: Sandia National Labs)*

- Example of a part of an aircraft: An AM part with optimum design structure offering lightweight (bottom) compared to a conventional part (top). *(Source: Airbus)*



- The first 3D-printed motorcycle from aluminium by Airbus. *(Source: Airbus)*

PBF-LB of high strength aluminium alloys presents a challenge due to the formation of cracks during the final stages of solidification. These cracks occur as a result of material shrinkage. To overcome this issue, researchers are exploring the use of in-situ alloying to develop new alloy, which involves adding elements to the alloy composition to promote heterogeneous nucleation during solidification. This changes the microstructure from a columnar structure, which is common in SLM materials, to an equiaxed microstructure, effectively eliminating the formation of cracks.

For further information please contact Jas Bahra, Business Engagement Manager, University of Birmingham. Email: j.bahra@bham.ac.uk - Phone: 074545 21030.

INCREASING CORROSION CAUSED BY CLIMATE CHANGE:

HOW SALT SPRAY TESTING CAN HELP DETERMINE CORROSION RESISTANCE

Climate change has heavily influenced the frequency and intensity of floods and other naturally occurring weather-related disasters around the world.

In the UK, analysis by the Met Office in 2020 shows that, on average between 2010 and 2019, summers were 13% wetter and winters were 12% wetter. Another study showed that heavy rainfall events in the UK have been made 40% more likely by climate change (Friederike E L Otto et al, 2018).

The UK Climate Change Committee has warned that 1.4 million people in the UK currently face a risk of extreme flooding, and that number could increase to at least 1.7 million if global warming levels continue to rise.

The impact of global warming on corrosive environments

As global warming continues to heat the planet, a warmer atmosphere means that there is more water and precipitation within our air, leading to growing levels of humidity. As these weather conditions become wetter, infrastructures (buildings, railway lines, and utility supplies, for example) become more susceptible to corrosive damage and weakened material due to increased exposure to rainwater and its acidic properties.

Climate change has influenced the frequency and severity of flash flooding, increasing rain, and coastal and river flooding. When flooding occurs, salt and high contents of acids from the water can lead to rusting and corrosion of metallic fittings including fasteners, pipes, and fixtures; foundations can become compromised and cause structural damage and even collapsing or failure of vital framework; long-term effects from saturation damage can lead to metal corrosion; utility systems such as oil and gas storage tanks may leak, resulting in pollution to the environment, and additional risks to health and safety caused by contaminants and debris. The consequences can be devastating.

Buildings need to be able to withstand the increased frequency and levels of rainwater, so the materials that are used to create these buildings must be more resistant to corrosion.

Our duty of care

As an independent test laboratory, we have a duty of care to support our customers in a range of industries, by providing valuable advice and reliable testing for their material's suitability and resistance to corrosion. We want to support our customers as they research and develop new products and materials that can withstand our ever-changing environment. We pride ourselves in giving reliable and accurate testing to make sure our customers' products are compliant with relevant standards, and comprehensive analysis on corrosion of metals.

One of our most popular tests to evaluate corrosion is through carrying out salt spray testing. This is an effective way to replicate environments with high salt content and corrosive properties.

How does salt spray testing help?

Salt Spray Testing is an accelerated corrosion test that helps to evaluate the resistance or susceptibility of materials. We analyse the quality of surface treatments to ensure that they are able to protect the material as intended. Coatings, platings, and powders applied to a material act as protective barriers, and our salt spray testing ensures that they are able to provide that service.

A salt spray test subjects a sample or material to a salt-concentrated atmosphere for prolonged periods of time. Humidity and temperature changes can also be accommodated to provide a comprehensive environmental setting. This type of test replicates a highly corrosive atmosphere that the sample or material may experience in real service conditions.

The samples are then checked regularly to monitor corrosion and degradation levels.

It is important to understand that salt spray testing cannot predict the service life of a material. Instead, salt spray testing helps our customers to:

- identify if the material they have chosen for their product is suitably resistant to corrosion levels expected in its intended environment.
- Provide a vital understanding of how the material will behave in a corrosive environment
- Highlights areas susceptible to weakening or high-risk areas of corrosion
- Identify design flaws, which can help to improve production processes and quality control

Understanding the limitations of a particular material helps our customers to make informed decisions about their products and materials.

Our Corrosion Science Department at Rotech Laboratories says, "Since salt is naturally found in many environments, it's important to know how materials react when they're exposed to it.

"Salt spray testing helps us see the weaknesses of a material, so it's a great way to find flaws or defects in raw materials before production starts. It gives our customers upfront information about their product and material, so they have confidence in the suitability and durability of their products in a corrosive setting."

For further information:

Website: www.rotechlabs.co.uk

Email: info@rotechlabs.co.uk

Call: 0121 505 4050

ALUMINIUM RESEARCH AT WMG

WMG is an internationally renowned research and education group, transforming organisations and driving innovation through a unique combination of collaborative research and development alongside pioneering education programmes.
An academic department of the University of Warwick, and a centre for the HVM Catapult, WMG was founded by the late Professor Lord Kumar Bhattacharyya in 1980 to help reinvigorate UK manufacturing and improve competitiveness through innovation and skills development.

Since then, WMG has grown significantly and now hosts over 800 staff and nearly 5000 students across five directorates with multiple research themes. Within the Materials and Manufacturing directorate the light alloys research group looks to focus on all areas of aluminium research from alloy development and formability to joining and recycling. At WMG we recognise the important role aluminium will play in the transition towards Net Zero vehicles and are engaged in both fundamental and high technology readiness level studies.

Facilities

WMG has world leading facilities for physical and microstructural characterization with a suite of static load frames from 5-250kN, and dynamic load frames up to 250kN, including a 25kN frame with integrated furnace. This allows for testing ranging from standard tensile tests to fatigue and high-temperature creep. A compact drop tower and VHS test rig provides testing at high strain rates to mimic crash conditions. All systems can be operated with GOM digital image correlation equipment.

The electron microscopy suite features multiple SEMS, Zeiss Sigma FEGSEM including advanced in-situ stages, JEOL 7800F, Scios Dualbeam, Versa 3D Dualbeam, and a Talos F200x TEM with scanning facilities, all combined with the latest analytical sensors and Oxford Aztec software. WMG hosts Buehler in our materials engineering centre with the latest metallographic equipment enabling the preparation of even the trickiest specimens.

WMG is home to a unique forming capability based around an Interlaken Servopress 225 hydraulic press. The modular design allows for a wide range of tests to be conducted; hole expansion, cross-die, and forming limit curves (FLCs) at room temperature, with gas bulge and FLCs possible up to 600°C. A unique SPF hybrid SPF/QPF tool and a quenched forming tool allow for characterization and benchmarking of materials under advanced forming conditions.

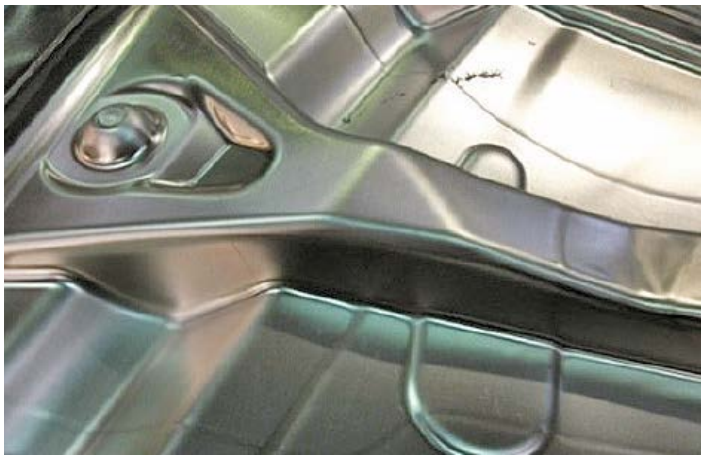
Along with this are cutting-edge facilities for remote laser welding and a range of physical joining techniques, including self-piercing rivets which were pioneered at WMG. The department hosts several 5-axis CNC machines, as well as EDM machining, and has some of the latest Additive Layer Manufacturing equipment available.

Success Stories

WMG engages with industrial stakeholders and academic partners at all scales, from short-term studies with SMEs to long-term multimillion pound collaborations with international companies. Current partnerships include a three-year Catapult collaboration with Speira Aluminium and a long-term partnership with Jaguar Land Rover. Examples of other collaborations are detailed below.

Superform Aluminum – Superform are world leaders in superplastic forming. To maintain this position they identified the need to form higher strength alloys while reducing cycle times. To achieve this they engaged with WMG and sponsored a four-year EngD programme. Advanced electron microscopy stages were used to understand microstructural evolution at high temperatures, the results of which were fed into forming trials utilizing a custom-designed SPF forming tool on the Interlaken press.

The results were then used to directly modify the forming process in the Superform factory. The result of the project was the delivery of a new high-strength aluminium alloy and complementary

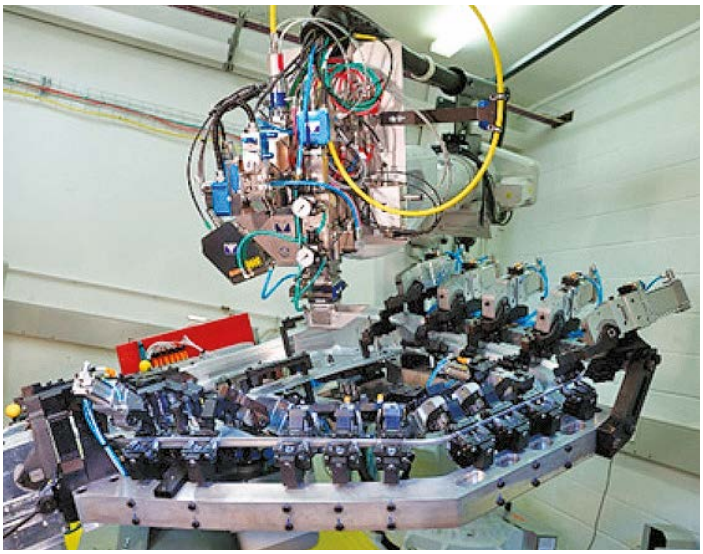


forming process which has been commercially used since the successful project completion. The forming process optimization at WMG achieved a significant reduction in production cycle times, opening up the potential of using the technology in higher volume applications. The project also demonstrated the ability of low TRL studies utilizing in-situ stages to rapidly inform and improve high TRL processes.

Sarginsons industries Ltd. – WMG's SME team supports over 300 businesses including Sarginsons, a metal castings foundry that specialise in high-integrity castings as well as CNC machining, with extensive metallurgic and heat treatment expertise. Having identified several key objectives for the next few years Sarginsons approached WMG to help prioritise them and link them up with the right expertise and support.

With an ongoing mission to improve and create USPs in the business, for the first project they wanted to discover if creating a cooling channel insert in one of their die-casting processes could improve the integrity, quality, and performance of parts. Using CAD and CFD modelling, WMG were able to simulate a variety of cooling scenarios to identify what process would be feasible and if the insert could be developed using Additive Manufacturing. Following that a series of tests are underway to find out which materials are best suited to 3D print tooling. This initial work has led to other strategic opportunities including a £50k collaborative-funding bid. The expected impact is a significant reduction in energy consumption and material waste, with associated reduction in carbon emissions.

Jaguar Land Rover – With the support of a multimillion investment from the Advanced Propulsion Centre and HVM Catapult, Jaguar Land Rover teamed up with WMG to develop a novel laser welding

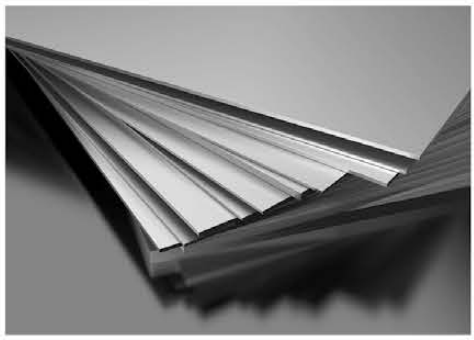


process that would deliver a lightweight door panel with wider vision angle and improved driver comfort. The project developed a new fully autogenous remote laser welding process able to produce crack-free welds on both 5XXX and 6XXX aluminium alloys. The synergy between near-field scanning optics and fast modulation of the laser power enabled control of the heat input and hence tailor the weld microstructure. The remote laser welding process has been commercially exploited since the successful project completion.

The process developed by the WMG laser welding team and Digital Lifecycle Management research group achieved 50% less thermal distortion and a 25% reduction in production cycle time compared to tactile laser welding process. The project also demonstrated that by working across the entire research and innovation cycle, from fundamental research, through applied research, to technology development and prototyping, the WMG team can support the adoption of new technology and rapidly de-risk their implementation.

Lightweighting the Future

WMG endeavours to be at the forefront of innovation and to do this we rely on collaboration with industrial partners. Our current research is focused on recycling, advanced characterization, formability, and circular networks around aluminium. However, we are actively looking to engage with industrial partners involved with any aluminium technologies, from small focussed short-term research projects to larger multi-year collaborations. If you would like to discuss any potential projects please contact Dr Scott Taylor, scott.taylor.1@warwick.ac.uk for general enquires or WMGSME@warwick.ac.uk for SME enquiries.



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IS THERE LIGHT AT THE END OF THE TUNNEL FOR ENERGY BUDGETS?

The beginning of the year has seen substantial losses in the markets, with wholesale gas and power prices falling by a quarter in January. Prices have continued to trend downwards, providing hope that we may be seeing the energy crisis begin to ease.

The Freeport LNG terminal, closed since an explosion in June, partially returned to operation in February, with the first LNG vessel partly laden, and set sail to the Suez Canal, further supporting confidence in the market. All safety and hazard checks have been successfully passed, suggesting an operational restart by the end of the quarter.

Meanwhile, government support continues, albeit at a lower rate. The new 12-month Energy Bill Discount Scheme (EBDS) replaces the Energy Bill Relief Scheme (EBRS). The new scheme strikes a balance between supporting businesses over the next 12 months and limiting taxpayers' exposure to volatile energy markets, with a cap set at £5.5 billion based on estimated volumes. EBDS will apply from 1 April 2023. The existing EBRS threshold value of 21.1 pence per kwh will be replaced with 18.5 pence per kwh. The maximum value of relief from April will be 8.91 pence per kwh, added to the threshold value this takes you to 27.41 as a cap.

A higher level of support will be provided to EII businesses. In order for the relief to be applied post 1 April 23, energy suppliers will need to receive a completed energy industries form stating your industry SIC code.

To date the relief has been applied in different ways by suppliers, with some averaging day/night unit rates which can be difficult to understand. If you have any questions about the level of support you should receive, Zenergi is happy to help.

A downward trending market poses many different questions to a rising one. A rising market, which we saw last year, brings risk of budgets exceeding and pressure to cut and cap losses. Now in a downward trending market, the temptation can be to act too soon, or commit too long to rates that could continue to get better. This is where flexible procurement can seem attractive, allowing the risk to be spread through multiple trades.

You can keep up to date with the latest news and energy prices by visiting Zenergi's Market Watch site where you can access a daily market report. You can also subscribe to receive the report directly in your inbox: https://zenergi.co.uk/market-watch/

zenergi

ALFED provides its members with a free technical, support, advice, and information service available to all our member subsidiaries and all their employees.

ALFED Member Technical Support

ALFED provides its members with a complimentary technical, support, advice, and information service available to all our member subsidiaries and all their employees.

The technical support extends across the entire aluminium industry and all technologies. The support includes alloy specification, alloy selection, recycling, production, heat treatment, manufacturing, fabrication, welding/joining, corrosion and coating.

Help is offered in resolving the more technical and complicated aluminium challenges in design, manufacture, process and in service.

The support service is confidential and members enquiries can be theoretical, anonymous, that is purely problem specific without reference to their customers, or with interaction with members customers end-user.

Support covers all sectors, such as architecture, transport, packaging, consumer goods and electrical engineering.

Support is available by email, telephone or on-site visits.

ALFED Non-Member and Public Technical Support

Non-ALFED member organisations and the public are offered a free 15 minute consultation, please contact our technical specialists using the online form below, giving your contact details and a description of the problem, we will then contact you and arrange to discuss your request. https://alfed.org.uk/technical-support/

Please note that after your free consultation period there will be a charge as follows: first hour £100+vat or daily charge of £750+vat plus expenses. We will advise you about this during your free session.

Support covers, such as failure prevention and failure analysis. Support includes advice on failure prevention during design, process and in-service and failure analysis.

Technical Training

ALFED offers specific technical tailored courses including in-house, from apprentice level, through production, quality and sales to engineering graduate, covering production of aluminium, hot and cold processing, product design, fabrication, and little-known topics such as "Creep and Fatigue".

ALFED Information Database and Legislation

ALFED has access to extensive technical libraries and publications, it also holds copies of many aluminium related British Standards, extracts can be provided to members subject to copyright.

ALFED chairs the British Standards "Light Metals" Committee and is a member of the European Aluminium Standards working group ensuring that members are advised of proposed change and updates on ISO, European and British Standards.

The information support base is global in that ALFED has extensive Knowledge Parentships with sister organisations such as European Aluminium, The Welding Institute, ESTAL, and many Universities.

New Entrants into Aluminium Industry

ALFED works closely with new members entering into the aluminium industry, advising on alloys, supporting process and product development and with specific training.

Health, Safety and Environmental Support

ALFED works closely with the Health & Safety Executive, UK REACH, The Environment Agency and the Metals Industry Liaison Support Group. Members are warned of legislation changes, activity areas and forthcoming work packages.

Members in the first instance should use the technical support service to raise specific questions on Health, Safety and Environmental issues. Most enquiries can be dealt with directly or will raised anomalously or redirected to the relative bodies.

ALFED also members have free access to the Croner, Employment Law, HR and H&S Business Support helpline. Please contact the ALFED team for more details: alfed@alfed.org.uk.

Contact The ALFED Team for more information: Email: alfed@alfed.org.uk or call: 0330 236 2800.

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- Wrought Aluminium and Applications
- Heat Treatment of Aluminium
- Elastic and Plastic Behaviour of Metals
- Production of Wrought Aluminium
- Extrusion
- Drawing, Shaping and Forming of Aluminium
- Corrosion and Protection of Aluminium
- Casting Technologies

Date: 18th April 2023 **Time:** 9.30am – 4.30pm **Price:** £249+VAT per person

Venue:
Aluminium Federation, Suite 9, Alcora Building, Mucklow Hill, Halesowen, West Midlands, B62 8DG
Register: https://bit.ly/3Zhts6U

The World of Aluminium is an intermediate level technical course specifically designed for production engineers, process and quality technicians, stockholders, customer facing sales/ marketing persons and material/ product purchasing individuals. This course is aimed at individuals who require a solid basic understanding to confidently engage with the aluminium industry and its products.

The course creates a solid basic understanding of aluminium, aluminium metallurgy, heat treatment and metal forming processes. It assumes no prior knowledge of metallurgy and is specifically tailored to the industry sector.

Technical elements are balanced with insights into the history of aluminium, its growth as the strategic metal of society, its sustainability properties and illustration of products, to create a holistic broad rounded knowledge.

Date: 23rd May 2023 **Time:** 9.30am – 4.30pm **Price:** £249+VAT per person

Venue:
Aluminium Federation, Suite 9, Alcora Building, Mucklow Hill, Halesowen, West Midlands, B62 8DG
Register: https://bit.ly/3ZnTIfF

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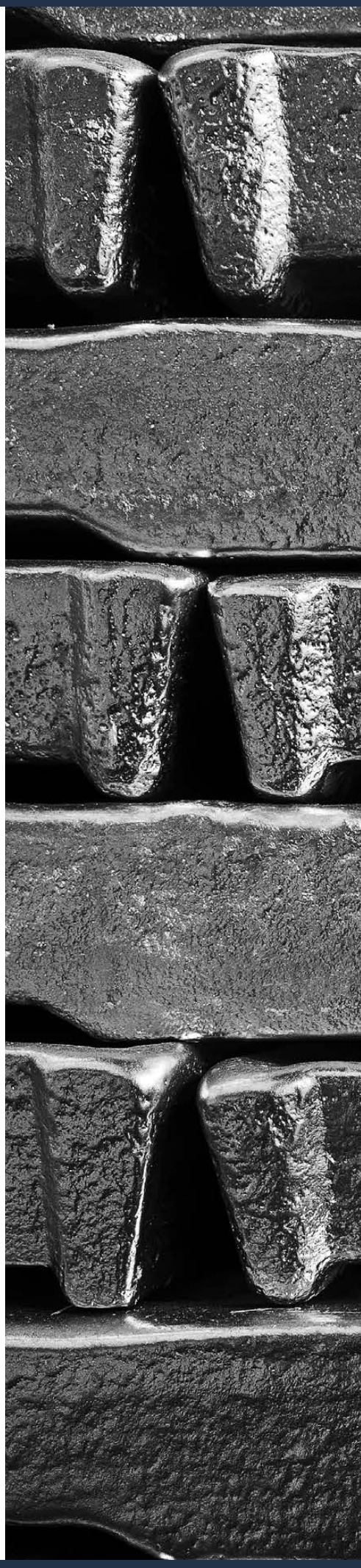

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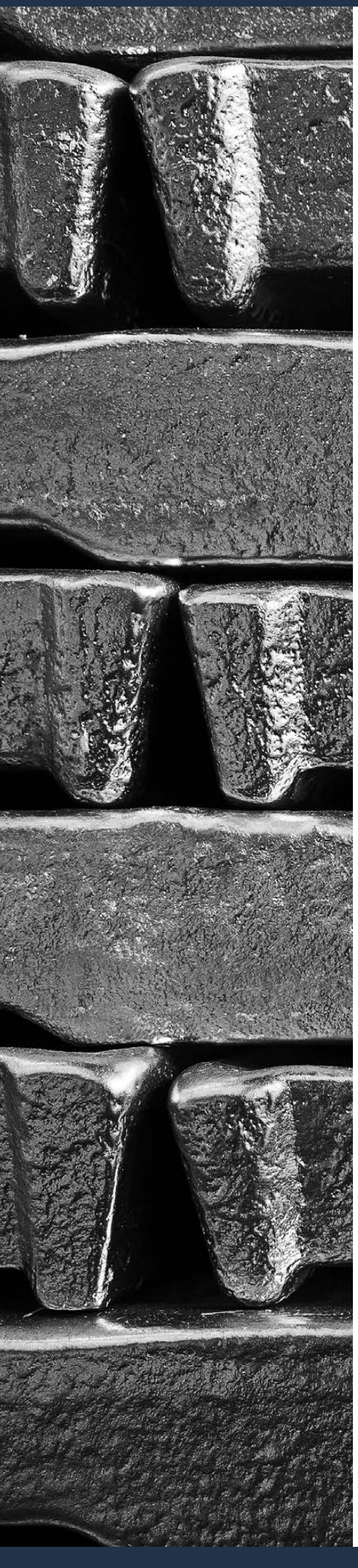
West Midlands B70 9DR 0121 500 4100
http://www.williamking.co.uk/

WILSONS PLC
Cambridgeshire PE28 5XN 01487 833 600
https://www.wilsonsmetals.com/



OUR KNOWLEDGE PARTNERS

A

ADVANCED FORMING RESEARCH CENTRE (AFRC)

Renfrewshire PA4 9LJ 0141 534 5200
https://www.strath.ac.uk/research/advancedformingresearchcentre/

B

BARTLETT SCHOOL OF ARCHITECTURE

Greater London E15 2GW 0207 679 2000
https://www.ucl.ac.uk/bartlett/architecture/

BCAST, BRUNEL UNIVERSITY LONDON

Middlesex UB8 3PH 01895 274 000
https://www.brunel.ac.uk/research/Centres/BCAST

BRITISH SAFETY INDUSTRY FEDERATION

Hertfordshire HP2 4SQ 01442 248 744
https://www.bsif.co.uk/

BURCHILL GC

London EC4R 3TT 07766 461 018
https://burchillgc.com/

C

COVENTRY UNIVERSITY

West Midlands CV1 2JH 02477 657 688
https://www.coventry.ac.uk/

CRANFIELD UNIVERSITY

Buckinghamshire MK43 0AL 01234 750 111
https://www.cranfield.ac.uk/

CRU INTERNATIONAL LTD

Greater London WC1V 6EA 0207 903 2000
https://www.crugroup.com/

H

HANATECH LTD

West Midlands DY1 1JJ 01384 913 010
https://www.hana-tech.co.uk/

I

INSTITUTE OF MATERIALS FINISHING

Warwickshire B46 1HQ 0121 622 7387
https://materials-finishing.org/

M

MAKE UK - THE MANUFACTURERS' ORGANISATION

Greater London SW1H 9NQ 0207 222 7777
https://www.makeuk.org/

S

SWANSEA UNIVERSITY

Wales SA2 8PP 01792 606 770
https://www.project-metal.co.uk/

T

THE SOCIETY OF MOTOR MANUFACTURERS & TRADERS (SMMT)

Greater London SW1P 2BN 0207 235 7000
https://www.smmt.co.uk/

THE UNIVERSITY OF SHEFFIELD

South Yorkshire S1 3TD 0114 222 2000
https://www.sheffield.ac.uk/materials

TWI - THE WELDING INSTITUTE

Cambridge CB21 6AL 01223 899 000
https://www.twi-global.com/

U

UKRI/STFC RUTHERFORD APPLETON LABORATORY

Oxfordshire OX11 0QX 01235 445 962
https://stfc.ukri.org/

UNIVERSITY OF WARWICK

West Midlands CV4 7AL 02476 523 523
https://warwick.ac.uk/

UNIVERSITY OF WOLVERHAMPTON

Shropshire TF2 9NT 01902 323 900
https://www.wlv.ac.uk/

Z

ZENERGI GROUP (ENERGY MANAGEMENT)

Wiltshire BA15 1UD 01225 867 722
https://zenergi.co.uk/

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ENVIRONMENTAL 23

UK ALUMINIUM: NET ZERO REALITY

1st June, 2023

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CEO
Fast Forward Zero

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Membership & Sustainability Manager, ALFED

MILES PROSSER
Secretary General
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