



Innovate  
UK

# Foundation Industries

Kolkata and Ahmedabad, India  
25th February – 4th March 2023  
Global Business Innovation Programme



Innovate  
UK  
EDGE

# Welcome

As part of our Global Business Innovation Programme, Innovate UK and Innovate UK EDGE are delighted to bring a delegation of some of the UK's most promising entrepreneurs delivering sustainable solutions for the foundation industries ecosystem, including the materials production to achieve net zero.

This programme contributes to Innovate UK's ongoing commitment to drive productivity and economic growth within this sector, together with the collaboration with key strategic global partners to solve shared challenges.

Our delegation of 10 ambitious UK companies will use this visit to India as an opportunity to engage with key stakeholders, hear cutting-edge ideas, discover new interests, and network with other professionals who share a similar appetite for forward-focused collaboration. The combination of commercial expertise, creative excellence, and technological innovation across the two countries has

the potential to generate a significant value add for companies who operate in both markets.

We hope you enjoy sharing insights, thought-provoking ideas and connections that can help shape the growth of these exciting companies and start to open new opportunities for co-operation and exchange.

On behalf of the programme organisers, we would like to thank our gracious hosts, attendees, delegates and all our partner organisations for their invaluable contributions to this programme.

Thank you for your support.



**Sarah Connolly**  
Innovation Lead  
Innovate UK



**Abrar Jawaid**  
Innovation & Growth Specialist Team Manager  
Innovate UK EDGE

# Global Business Innovation Programmes

The Global Business Innovation Programmes, organised by Innovate UK and delivered by Innovate UK EDGE, bring together cohorts of up to 15 innovative UK businesses looking to grow and scale globally. Each programme focuses on a specific country, a technology or sector area, and enables the businesses to build global collaborations and partnerships to explore innovation opportunities.

Innovative UK businesses will tap into complementary knowledge, skills and facilities in the chosen country and develop understanding, cultural insight, and networks.

It will support businesses with a structured three-phase programme: getting ready for the market, visiting the market and exploiting the opportunity, together with harnessing the expertise of an Innovate UK EDGE Innovation & Growth Specialist to maximise the opportunities and impact for the business.

This brochure details the businesses that are taking part in the Foundation Industries Global Business Innovation Programme with India and gives an overview of their business and objectives for this visit.

# Foundation Industries, India

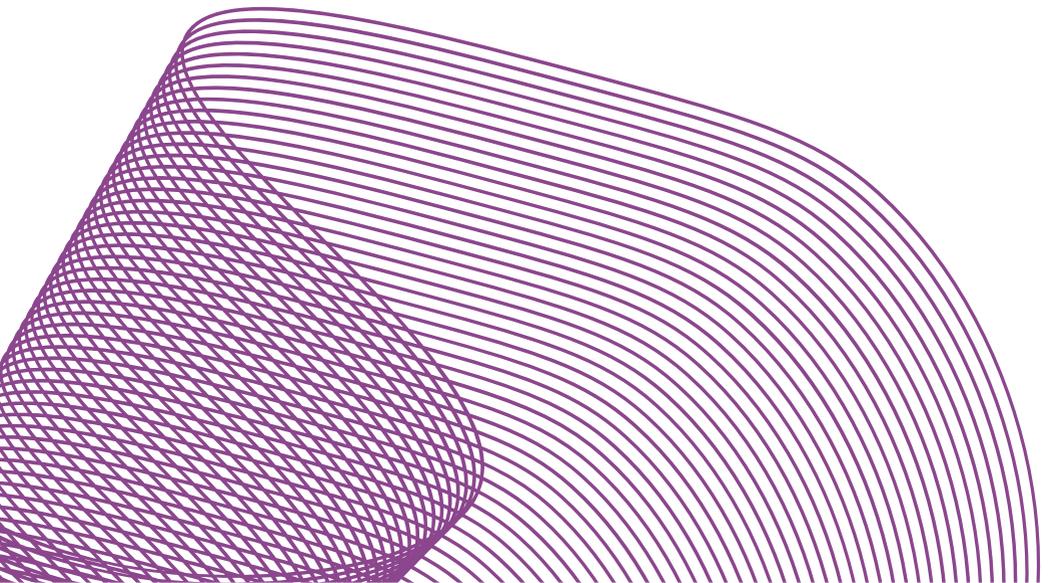
As part of the Industrial Strategy Challenge Fund, the Transforming Foundation Industries Challenge was established in 2020 to support the UK's Foundation Industries sector in metals, paper, glass, cements, ceramics and chemicals. The challenge aims to transform the UK's Foundation Industries by making them internationally competitive, securing more jobs throughout the UK and growing the sector by 2024 in an environmentally sustainable way.

The challenge is addressing barriers affecting the sector in several ways, including scaling innovation, enabling industry-led innovation, technology transfer between Universities and industry supporting access to innovation and providing late-stage finance.

Foundation Industries in India are seeing growing demand for products due to India's increasing population, expanding market and associated large-scale public-sector investments.

Through previous discussions with Indian Foundation Industries we know similar sustainability challenges are being faced to their UK counterparts. To enable collaborative innovation on this topic, UKRI is working with the Department for Science and Technology in India on a bilateral funding opportunity in the near future.

Following the agreement of a 2030 Roadmap for Bilateral Relationship and the ongoing discussions of a Free Trade Agreement, Innovate UK has run a series of very successful engagement activities with India including a lab-to-lab collaboration programme and Global Expert Mission. The Global Business Innovation Programme is the next step in building bilateral relationships, ahead of a bilateral funding opportunity in 2023.



# Ai Build

**Ai Build offers software to enable the commercial use of large format additive manufacturing for patterns, moulds and jigs.**

The novel manufacturing process powered by Ai Build s software is already enabling dramatically more cost-effective and sustainable manufacture of metal foundry moulds and patterns in the UK.

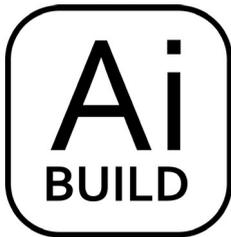
Their additive manufacturing platform AiSync aims to fully automate the digital and shop-floor process of going from pattern/mould design to printed part.

The three focus points of automation are:

Automated design for additive manufacture of pattern/mould

Automated generation of machine instructions in terms of part build-up parameters (toolpath and process settings)

Real-time process monitoring with live defect detection capabilities



## Contact

**Stefan Harban** Strategic Account Executive

**ai-build.com**

Industry: Additive Manufacturing

## ↙ Visit objective

*Expand its customer base in the Foundation Industries sector, having proven an excellent use-case for metal foundries with a UK customer.*



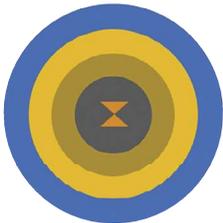
# AiM MACROMED

**AiM Macromed aims to enable the next generation of bioengineering technologies by combining Artificial Intelligence (AI) with synthetic biology.**

Synthetic biology is ushering in an era where therapeutics and green hydrogen can be iteratively engineered rather than discovered. AiM Macromed is developing a bioengineering platform and software to aid this process for focussed applications. The technology development is being conducted by leading researchers affiliated with universities in the UK, USA, India, and Ukraine.

They are also active in healthcare apps in collaborating with ClickMedix LLC for predictive modelling and intervention in the context of diabetes, mental stress, and COVID-19. Over the last seven years, the ClickMedix platform has been used by over two million users in 23 nations worldwide.

AiM Macromed are based in London, UK and are looking to set up an office in India and seeking business partners and investment.



## Contact

**Vishwesh Kulkarni** CEO  
**aimacromed.com**  
Industry: **Biotech**

## ↘ Visit objective

*AiM Macromed's objective is to secure focussed meetings with potential customers, business partners, angel investors and institutional investors.*



# Carbon Re

**Carbon Re is an industrial AI company that uses advanced machine learning and AI to decarbonise cement and steel.**

Their cloud-based platform, Delta Zero, uses powerful AI tools that unlock previously out of reach process efficiencies. Delta Zero can achieve immediate reductions in energy consumption, costs and carbon emissions, reducing fuel costs by up to 10% and saving a single cement plant millions of dollars every year.

Carbon Re combines world-class AI and industrial engineering expertise from UCL and Cambridge University.

## ↘ Visit objective

*Seeking industrial partners who are interested in deploying the Delta Zero platform in their industrial plants. These include partners in cement, steel and glass.*

# Carbon<sup>Re</sup>

## Contact

**Daniel Summerbell** Co-Founder | CSO

**carbonre.com**

Industry: **Climate Tech**



# CO2CO

**CO2CO is a UK business focused on addressing climate change through atmospheric Carbon Dioxide Removal (CDR) and take an innovative approach in large-scale greenhouse gas emissions.**

The business delivers both a service in the form of carbon off-sets and a product in the form of biochar. The carbon off-set service helps large industries meet their net zero targets by performing CDR. CO2CO use microalgae to capture carbon dioxide and generate biomass. They do so at scale and without competition for land and freshwater, processing waste streams and using naturally occurring solar energy.

The biochar product helps Foundational Industries, including fertiliser, pesticides, cement, asphalt, and energy storage become sustainable. Key benefits include large volume and stable quality at low cost, delivering quality carbon sequestration with multiple co-benefits which fits with new, rapidly growing, supply chain models.

The innovation brings together technologies in a sustainable way to address market demand in both cost and quality. Additionally, the innovation delivers climate relevant impact and CO2CO is targeting gigatonne levels of carbon dioxide removal per annum over the next decade.

# CO<sub>2</sub>CO

## Contact

**Philip David Slaughter** CEO

**co2co.earth**

Industry: Carbon Dioxide Removal (CDR)

## ↘ Visit objective

*Seeking innovative partner looking to develop sustainable products using algal based biochar. These include partners in cement and construction.*



# Global Nano Network

**Global Nano Network (GNN) is an innovation company addressing some of the greatest challenges of the energy storage industry.**

Using their expertise in nanotechnology, microbiology, electrochemical and electronics engineering, they have developed solutions in specific areas; high-power current collectors, solvent-free electrode manufacturing and low-cost Lithium-ion battery (LiB) recycling. Their vision is to always innovate and strive to create the optimal circular economy within the battery industry, ensuring that the power needs of tomorrow are at the forefront of what they are focused on today.

GNN's current collector is designed to significantly increase the power density of LiBs by reducing the interfacial resistance between the electrode foil and battery materials without affecting energy density. The solution also reduces the degradation of LiBs, extending their useable life.

Their innovations promote a more greener battery industry. As an example, their high-power current collector promotes the use of more sustainable battery chemistries such as, Lithium Ferro-Phosphate (LFP), LMFP and Lithium Nickel Manganese Oxide (LNMO) with a high performance premium differentiation.



## Contact

**Ravi Daswani** CEO  
**globalnano.network**  
Industry: Energy Storage

## Visit objective

*Meet manufacturers and potential suppliers of aluminium and copper, as well as producers of battery materials. They are open to exploring collaborations with academic institutions that share a similar industrial approach to innovation in the energy storage industry.*



# Hexigone Inhibitors

Hexigone manufactures smart, sustainable and highly effective corrosion inhibitors. The patented and award-winning technology fights corrosion when used in primers with full system barrier topcoats and device type manager's (DTMs) with applications in general industrial protective, marine, coil and powder coatings and more.

Corrosion impacts public safety, the economy and the environment. The most widely used and effective corrosion inhibitor hexavalent chromium [Cr(VI)] has been found to cause cancer in humans and animals and therefore been banned in the European Union being phased out globally.

Driven by his interest in sustainability, Hexigone's Founder and CEO embarked on a mission to develop a safe corrosion inhibitor of comparable performance to hexavalent chromate. During his EngD at Swansea University, Dr Patrick Dodds managed to develop a highly effective, safe alternative.

The protection mechanism is fast, smart and unique. It utilises reservoir systems that can hold onto corrosion-inhibiting chemicals previously incompatible with coatings. The inhibitors can be used to completely replace existing inhibitors or co-blend with phosphate-based systems to deliver cost and environmental benefits. The company now works with 11 distributors globally and are moving quickly to fulfil their vision to help create a safe and sustainable world.



## Contact

**Patrick Dodds** Managing Director  
**hexigone.com**  
Industry: **Chemicals**

## Visit objective

*Create market opportunities in the regions with key coatings customers, meet distributors, potential manufacturers and Tier 1 Original Equipment Manufacturer (OEM) companies.*



# Material Evolution

**Material Evolution are changing and transforming material science through aggressive strategies to bring low/no-waste materials to market at scale, and price points that enable adoption by cost conscious industries.**

Their initial product is a low carbon cement manufactured through leveraging chemical fusion technologies, reducing the need for a traditional, carbon intensive, kilning process. They believe that existing industrial processes frequently results in waste products that can be repositioned as manufacturing feedstocks.

New methods for material processing and catalysis have been discovered and need to be implemented, and the new generations of chemical, sonic and potentially biologic reactors that leverage molecular fusion to achieve durable, cost-efficient and sustainable materials.

They believe the data that is generated today should not be seen as a by-product, but centralised in material discovery, and bring machine learning and AI out of the lab and into the manufacturing lifecycle. The core to this approach is:

- Implementing a fusion first approach to materials manufacturing

- Examining, implementing & scaling chemical approaches to phase change control and material assembly

- Qualifying waste materials & remediation processes to mine the factories of yesterday for materials of tomorrow

- Design, develop, and implementation of data-centric strategies to enable the engine of their corporation



**MATERIAL  
EVOLUTION**

## Contact

**Liz Gilligan CEO**  
**materialevolution.co.uk**  
Industry: **Cement**

## Visit objective

*Make connections for the material supply in chemical and steel manufacturing and look at partners in India for scaling.*



# Nanomox

**Nanomox has developed an innovative patent-pending process (OIS process) using green catalytic solvents at low temperatures to oxidise metals to produce high-performance, inorganic materials for industry.**

The first material Nanomox is offering is zinc oxide, a material used in many applications in high-growth markets like tyre manufacturing, paints, cosmetics, chemicals and electronics.

The OIS process offers enormous energy efficiency improvements over existing technologies, resulting in inorganic materials with a low carbon footprint. Additionally, it can treat metal-containing wastes (e.g. slags/ashes from the steel industry, galvanizing-industry wastes, and battery recycling), preventing landfill and reducing reliance on energy-intensive pyrometallurgical processes.

Excitingly, the OIS process produces hydrogen that can be used as a green fuel. Future goals for Nanomox are:

Expanding their offering to other metal-based inorganic materials beyond zinc, including aluminium oxides, iron oxides, titanium dioxide and others

Creating industrial synergies for resource recovery. For example, integrating the OIS process with steel manufacturing to recover zinc from waste streams, enabling the recycling of zinc-free slags into blast furnaces

Identify new uses for unreacted materials, e.g. cement/concrete manufacturing



## NANOMOX

### Contact

**Francisco Malaret** CEO

**nanomox.net**

Industry: **Chemicals**

### ↘ Visit objective

*Explore business opportunities with upstream industries generating metal-containing wastes (steel industry) and downstream companies formulating products using zinc oxide (e.g., tyre manufacturers).*



# The Glass Company

**The Glass Company Limited is a consultant, procurement and technical audit practise that was founded to support architects, contractors, and corporations with integration of innovative glass products for their projects.**

Their key focus is to bring glass technologies to scalability on projects such as media glass facade and encouraging reduction in carbon emissions from built environment by appropriate glass selection, up-cycling of glass and use of early stage pioneering technologies such as unique printed Building-integrated Photovoltaics (BIPVs) and transparent windows generating electricity from sunlight.

Making buildings smart and generate electricity from vision and spandrel areas to reduce carbon emissions from built environment following the net zero goals set by United Nations (UN).



THE  
**GLASS**  
COMPANY

## Contact

**Sanmukh Bawa** Founder | Director

[theglass.company](http://theglass.company)

Industry: **Construction | Real Estate | Glass Industry**

## ↘ Visit objective

*Establishing partnership with BIPV manufacturers for scaled production and initiate R&D think tank to enhance current commercial technology. Working with large glass production companies to implement strategies for reducing carbon emissions and setting up circular economy glass recycling in more pragmatic manner.*





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Any enquiries regarding this publication should be sent to [contact@innovateukedge.ukri.org](mailto:contact@innovateukedge.ukri.org).

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