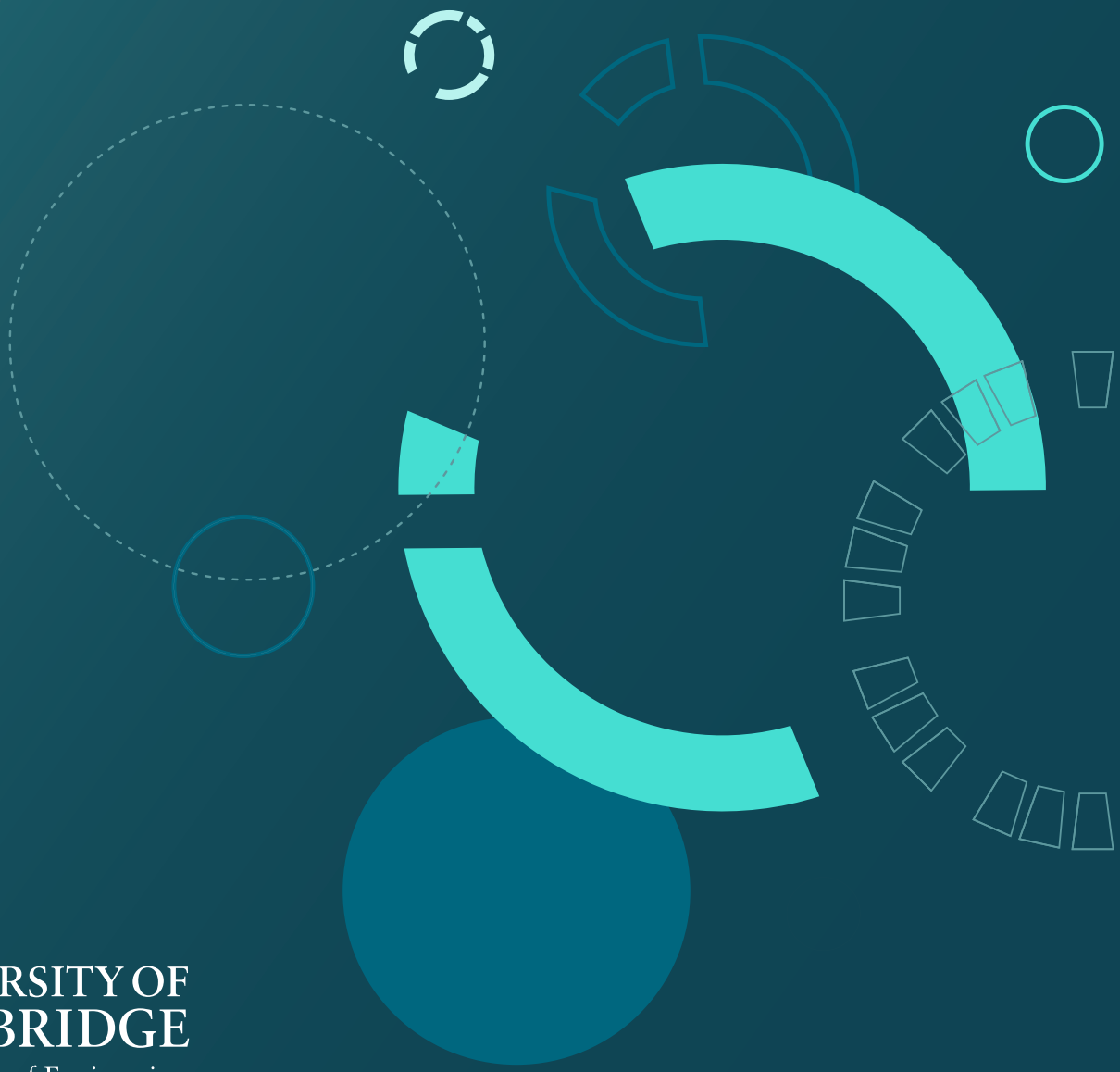
IfM Engage

FUTURES FRAMEWORK
PROSPECTUS



UNIVERSITY OF CAMBRIDGE
Department of Engineering

ABOUT US

The Institute for Manufacturing (IfM) is a division of the University of Cambridge's Department of Engineering. The IfM conducts research spanning management, technology and policy issues related to manufacturing.

Embedded at the IfM, IfM Engage provides consultancy and executive and professional development – based on the new ideas and approaches developed at the IfM – to help policymakers and manufacturing and technology companies around the world create and capture value more effectively.

We have a core team of policy, industry and technology experts who work with our government partners. Based on the requirements of a project, we look to utilise our network, including experts from across the IfM, University of Cambridge and further afield to bring insights, knowledge and clarity to complex and multifaceted policy issues and challenges.

IfM Engage profits are gifted to the University of Cambridge to fund future research.

"I welcome this report for shining a light on UK biotech beyond healthcare. It provides an important evidence base for government as it seeks to understand growth opportunities in this exciting and wide-ranging sector."

Sir Patrick Vallance, Former Government Chief Scientific Adviser commenting on a study commissioned by the Government Office for Science (GOS) and delivered by Cambridge Industrial Innovation Policy (CIIP), based at the Institute for Manufacturing.

The report, '**Life sciences beyond human health: modern industrial biotechnology in the UK**' mapped and characterised the UK non-human health life science sector, informing strategic thinking on the opportunities for the modern industrial biotechnology sector in the UK over the coming years.

HELPING POLICYMAKERS TO MAKE CLEAR AND CONFIDENT DECISIONS ABOUT THE FUTURE

IfM Engage has extensive experience in identifying different potential future outcomes given a particular initial condition or government policy area. Our expertise combines established 'futures' techniques such as scenario development or options development with systems thinking approaches including impact grids and roadmapping.

We are also specialists in conducting international policy reviews, offering our clients insights into the latest policy practices and evidence from around the world. These structured reviews provide a necessary context to consider potential future policy outcomes.

IfM Engage continues to be a registered supplier in the Futures Framework. During the previous Futures Framework agreement (2020-2023) we worked with government partners and agencies to support projects including:

- **Department for Business, Energy and Industrial Strategy (BEIS)** - Review of the logic model and evaluation approach of the ***Made Smarter Adoption Programme***, to inform future evaluation design
- **BEIS** - Development of a new definition of modern ***industrial biotechnology*** and evidence of UK opportunities, to inform the work of the Government Chief Scientific Advisor
- **Department for Business and Trade** – An ***analysis of international supply chains*** to link different supply chain elements to government objectives, market failures and potential policy interventions
- **Innovate UK / UKRI** – An ***International benchmarking study*** of research and innovation priorities to inform Innovate UK's international collaboration strategy
- **Innovate UK / UKRI** - Assistance in the Development of a Manufacturing Made Smarter ***Sustainability Strategy***
- **Innovate UK / UKRI** – A review of International IDT testbed and living lab facilities and functions, informing the scope and governance model of ***Made Smarter Innovation Hubs***
- **Department for Environment, Food and Rural Affairs (DEFRA)** – A ***foresight study*** to compare the relative gains, costs, feasibility and scalability of current and future 'industrial horticulture' models
- **International Energy Unit (IEU) / BEIS** – A ***strategic foresight project*** for the UK's international energy strategy 2040

KEY AREAS OF EXPERTISE

IfM Engage work is based on research developed at the IfM with a strong emphasis on practical application.

We have over 70 research-underpinned tools and frameworks which are used through our work with government and industry, helping organisations to explore and make decisions about the long-term future.

Expertise and capabilities we apply to projects include:

- Business model innovation
- Case study analysis
- Competence mapping
- Data visualisation
- Horizon scanning
- International policy perspectives
- Literature reviews
- Organisational strategy
- Roadmapping
- Scanning emerging trends and research
- Scenario development and scenario planning
- SWOT analysis
- Visioning
- Wind tunnelling and stress testing

WHO WE WORK WITH

IfM Engage works with many public organisations in the UK and abroad. In the United Kingdom, we have facilitated multiple engagements with central government, as well as collaborating with regional government. Through this work we have developed a good understanding of the business cycle and structure of government departments at all levels including regional, central and supranational.

PUBLIC SECTOR:

In the UK: British Standards Institution (BSI); Department for Business, Energy and Industrial Strategy (BEIS); Department for Transport; DSTL; Foreign, Commonwealth & Development Office (FCDO); Government Office for Science; High Value Manufacturing Catapult; Innovate UK; Knowledge Transfer Network; Liverpool City Region LEP; Ministry of Defence; Swindon & Wiltshire LEP; UK Research and Innovation (UKRI)

Internationally: Asian Development Bank (ADB); ASEAN Secretariat; European Bank for Reconstruction and Development (EBRD); Inter-American Development Bank (IDB); Ireland's Department of Business, Enterprise and Innovation; Organization for Economic Co-operation and Development (OECD); The Commonwealth; United Nations Development Programme (UNIDO); United Nations Industrial Development Programme (UNDP)

PRIVATE SECTOR:

3M; Atos; Audi; BP; BD; Biffa; Caterpillar; Cargill; Diageo; Emerson; Grundfos; GSK; Henkel; IHI Corporation; IKEA; Johnson Matthey; Mars; Müller; National Physical Laboratory; PepsiCo; RNLI; Syngenta; Schneider Electric; Unilever

ROADMAPPING FOR FUTURES

The **Government Office for Science's Futures Toolkit** identifies roadmapping as one of the 'most flexible and emergent tools' for 'developing and testing policy and strategy'. The IfM is recognised as a world centre of excellence for roadmapping, training hundreds of professionals in the tool each year and supporting partners across government and industry through projects that are at the forefront of knowledge and practice in this area. Roadmaps can be used to help the teams within any organisation to start actioning specific initiatives, or options.

Find out more about roadmapping.

BRINGING TOGETHER MULTIPLE PERSPECTIVES

We are experts in designing, developing and delivering successful engagements and workshops to solicit multi-stakeholder group input, synthesising outputs to usefully inform future policy actions. These projects can range from individual half-day engagements with a few participants to larger scale engagements with multiple inputs and workshops with over 100 domain experts.

TO INFORM POLICY THINKING

We are an experienced and effective disseminator of policy advice and outcomes. We employ a range of dissemination methods including policy workshops, briefs, publications, webinars and logic models. We ensure pertinent information is communicated at a useful level of detail, using accessible language, and meets the needs of the intended audience.

LEVERAGING EXPERTISE FROM CAMBRIDGE AND BEYOND

When working with our government and industry partners, we complement their knowledge and skills with our unique network of experts from within the Institute for Manufacturing, across the University of Cambridge and beyond to bring additional skills, experience and insights where required.

THE UK INNOVATION REPORT

BY CAMBRIDGE INDUSTRIAL INNOVATION POLICY (CIIP) BASED AT THE INSTITUTE FOR MANUFACTURING

The UK Innovation Report, an annual publication produced by CIIP, aims to contribute to the policy debate around innovation by bringing together, in a single place, innovation and value-added indicators in a concise and accessible format.

Benchmarking the UK's Industrial and Innovation Performance in a Global Context in only one example of how data and analytical tools have been used by our team members to analyse technologies for policy purposes, economic appraisal and analysis of Science and Technology ecosystem.

Read the report here.

engage.ifm.eng.cam.ac.uk/futures-framework/

FUTURES CASE STUDIES

THE FUTURE OF INDUSTRIAL STRATEGIES: FIVE GRAND CHALLENGES FOR RESILIENT MANUFACTURING

A PROJECT FOR UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION (UNIDO)

As part of an initiative involving the World Economic Forum (WEF) and the United Nations Industrial Development Organization (UNIDO), IfM Engage identified five grand challenges for companies and governments to work on to address current global disruptions and inform the next generation of industrial strategies. The work has been summarised in a policy paper presented at the WEF Annual Meeting 2023 in Davos. **View the policy paper**.

MANUFACTURING MADE SMARTER INNOVATION HUB STUDY

A PROJECT FOR INNOVATE UK

Innovate UK is designing a new support mechanism within the Manufacturing Made Smarter (MMS) ISCF challenge initiative: Innovation Hubs. To inform the study and the development of Innovation Hubs, IfM Engage reviewed Innovation Hubs around the world, conducting an in-depth analysis of 13 different organisations, their mission, focus areas, governance and institutional structures, functions and services. As a part of the analysis, more than 600 Digital Innovation Hubs (DIHs) were analysed using several types of quantitative methods.

STUDY ON THE PRACTICAL IMPACT OF DIGITAL MANUFACTURING

A PROJECT FOR INNOVATE UK

This study gathered international evidence on the observed and future impacts of digital technologies in manufacturing. The aim was to inform Innovate UK's business case for supporting digital technology deployment. The project involved an international review of impact evaluations and frameworks for characterising the application areas of emerging digital manufacturing technologies. This included the review of foresight reports from specialist policy units, research institutes, think-tanks, national academies, industry associations and government departments from key manufacturing countries such as China, France, Germany, Korea, Japan, Singapore, the US and Canada.

This study provided Innovate UK with key evidence for the business case for an additional £120 million investment in the 'Made Smarter' Industrial Strategy Challenge Fund.

CASE STUDY

MATERIALS FOR THE ENERGY TRANSITION ROADMAPPING PROCESS

A PROJECT FOR HENRY ROYCE INSTITUTE

Through workshops and community-led activities, this far-reaching activity brought together over 220 materials science experts to create five technology roadmaps, setting out where materials research can make a significant impact on greenhouse gas emissions. The roadmaps:

- provide an understanding of the currently-deployed technologies for each topic
- define significant technical challenges and barriers to impact on net-zero targets
- define future challenges in contributing to net-zero targets
- identify solutions to these challenges
- identify the desired performance targets of those solutions.

Find out more on the **Henry Royce Institute website.**

CASE STUDY

DELIVERING A TECHNOLOGY STRATEGY TO SUPPORT MANUFACTURING IN NORTHERN IRELAND

A PROJECT FOR THE ADVANCED MANUFACTURING INNOVATION CENTRE

IfM Engage supported the development of a strategic roadmap for the Advanced Manufacturing Innovation Centre. With £98m of investment, AMIC operates at the interface between academia and industry, creating new opportunities for innovative manufacturing. The project identified six key themes, offering very substantial and persistent medium- to long-term improvement in Northern Ireland's global advanced manufacturing competitiveness.
Read the case study.

CORE DELIVERY TEAM FOR THE FUTURES FRAMEWORK

We have a core team of policy, industry and technology experts who work with our government partners. Based on the requirements of a project, we look to utilise our network, including experts from across the IfM, University of Cambridge and further afield to bring insights, knowledge and clarity to complex and multifaceted policy issues and challenges.

Dr Rob Phaal, Director of Research, Strategic Technology and Innovation Management, IfM. Rob conducts academic research in the area of Strategic Technology and Innovation Management (STIM). Particular interests include the emergence dynamics of technology-based industry and the development of practical management tools and toolkits. Strategic roadmapping is a key area of ongoing interest, in terms of both research and practice.

Dr Eoin O'Sullivan, Director, Centre for Science, Technology & Innovation Policy, IfM. Eoin conducts academic research on the ways science and engineering R&D is translated in new technologies, industries and economic wealth. Eoin's policy-related activities have included studies for the UK BEIS; the Engineering & Physical Sciences Research Council; the UK Government Office of Science; Innovate UK; and the Higher Education Funding Council of England.

Dr Nicky Athanassopoulou, Head of Solution Development, IfM Engage. Nicky is responsible for developing custom-designed services to support the strategy and innovation activities of organisations of all sizes. She has worked with organisations across many sectors, including engineering, oil and gas, food, defence, software and telecoms. She has helped numerous companies to develop their strategy, innovation, technology and product-development processes.

Dr Carlos Lopez-Gomez, Head of Policy Links, IfM Engage. Carlos is an expert in Innovation Ecosystems with extensive research and advisory experience in the fields of industrial and innovation policy. Carlos joined the IfM after starting his career as an engineer in the automotive industry. Since then, he has advised several national and regional governments as well as international organisations including UNIDO, OECD, ADB, UNCTAD and the World Economic Forum.

Dr Imoh Ilevbare, Principal Solution Development Specialist, IfM Engage. Imoh's key expertise is in Strategic Technology and Innovation Management, and has developed tools/solutions in and around strategic roadmapping, technology strategy, risk management, portfolio selection, product/service design, strategic marketing, creativity, and the assessment of innovation and technology management capabilities.

Dr David Leal Ayala, Deputy Head, Policy Links, IfM Engage. David has expertise in manufacturing engineering and innovation and several years of experience in consultancy and industrial and academic roles, both in the UK and abroad. Before joining the IfM, he was the Co-founder and Chief Scientist of Reduse Ltd., a Cambridge spin-out company based on his PhD research, and he also held a postdoctoral position mainly focused on Industrial Ecology research.

Dr Diana Khripko, Senior Solution Development Specialist, IfM Engage. Diana is part of the team which consults industry and public sector. Through these consultancy projects she supports the customisation of IfM tools and approaches to create bespoke solutions for partners. She is a qualified PRINCE2 project manager and has professional consultancy experience from the energy sector and energy market regulation.

Dr Michele Palladino, Senior Policy Analyst, Policy Links, IfM Engage. Michele is an Economist and Project Manager with more than ten years of experience in academia and the consulting sector, both in the UK and abroad. His expertise includes development and industrial economics, with a focus on science, technology and innovation policy, including Industry 4.0, national systems of innovation, industry structural analysis, and industrial strategies.

Dr Jennifer Castaneda-Navarrete, Senior Policy Analyst, Policy Links, IfM Engage. Jennifer provides expertise in development economics and innovation policy for the work conducted by Policy Links. She has over 10 years' experience in policy analysis in developing and developed contexts. Before joining the Policy Links unit, Jennifer worked in academia and in a regional ministry for industrial development in Mexico.

Mateus Labrunie, Policy Analyst, Policy Links, IfM Engage. Mateus is responsible for conducting economic and policy analysis to inform industrial innovation policies and related matters. Mateus is finishing his PhD at the Centre of Development Studies, University of Cambridge, where he works under the supervision of Dr Ha-Joon Chang on the challenges of industrial policy and technological catching-up in the context of the fourth Industrial Revolution.

Institute for Manufacturing (IfM)

IfM is part of the University of Cambridge's Department of Engineering. With a focus on manufacturing industries, the IfM creates, develops and deploys new insights into management, technology and policy. It strives to be the partner of choice for businesses and policymakers, as they enhance manufacturing processes, systems and supply chains to deliver sustainable economic growth through productivity and innovation.
ifm.eng.cam.ac.uk

IfM Engage

IfM Engage partners with organisations across industry, government and academia to support them in solving complex challenges, using approaches and knowledge developed at the IfM. IfM Engage offerings are grounded in exceptional research, combined with a breadth of industrial expertise.
engage.ifm.eng.cam.ac.uk

Cambridge Industrial Innovation Policy

Cambridge Industrial Innovation Policy (CIIP) is a global, not-for-profit policy group based at the IfM, University of Cambridge. CIIP works with governments and global organisations to promote industrial competitiveness and technological innovation, and offers new evidence, insights and tools based on the latest academic thinking and international best practices.
ciip.group.cam.ac.uk

University of Cambridge

The University of Cambridge is one of the world's leading research universities addressing some of the greatest challenges facing us, from climate change and the genomics of human viruses to food security and anti-microbial resistance. The mission of the University of Cambridge is to contribute to society through the pursuit of education, learning and research at the highest international levels of excellence.
cam.ac.uk

Contact us

To explore how we can support your futures projects, please contact us:

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