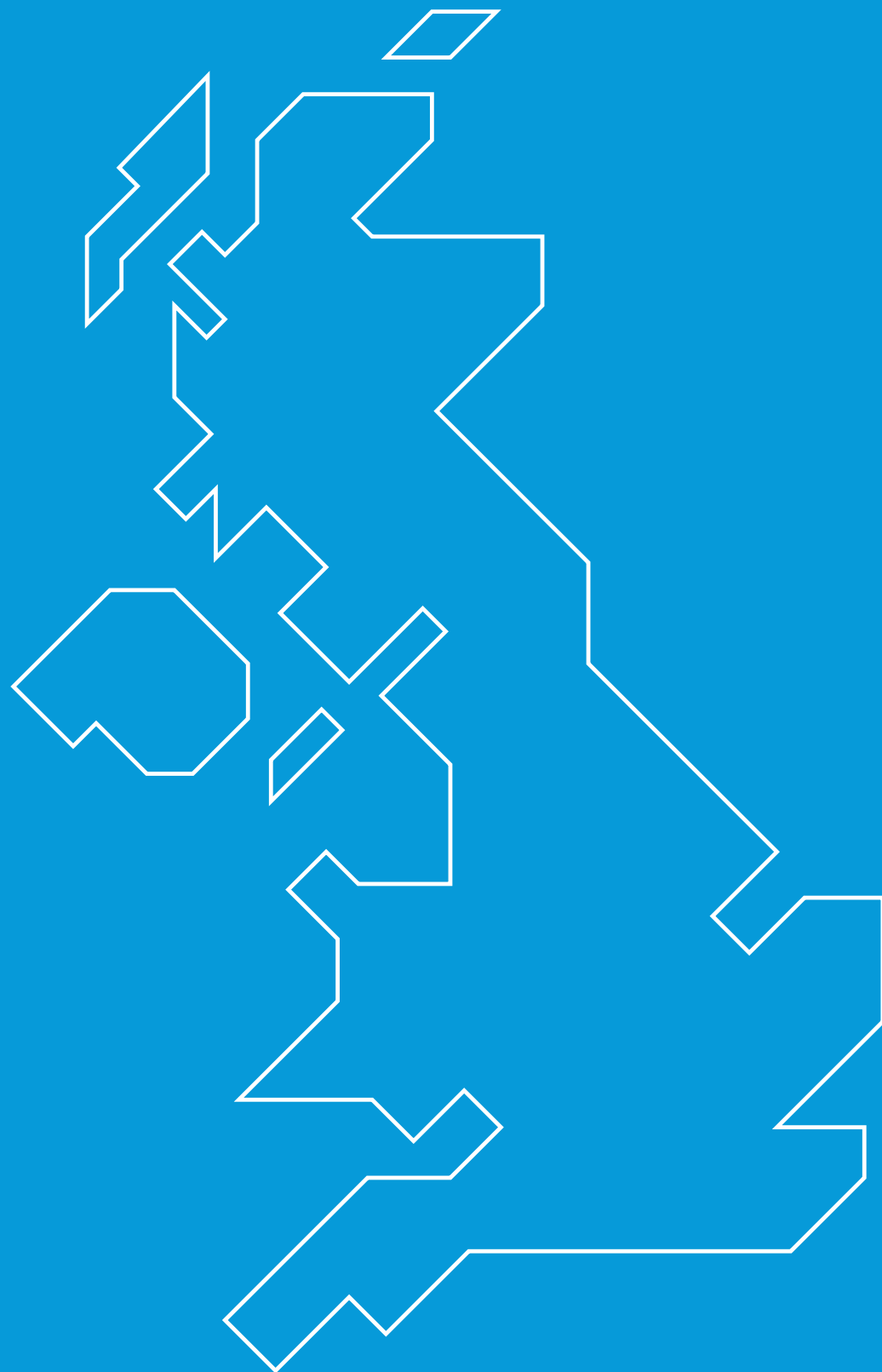


Developing a Strategy for Industrial Biotechnology and Bioenergy in the UK

Landscape Review Summary Report
October 2017

Prepared for 4 BBSRC Networks in Industrial Biotechnology and Bioenergy (BIOCATNET, C1Net, CBMNet, and P2P), and led by the Crossing Biological Membranes Network (CBMNet), University of Sheffield.





Developing a Strategy for Industrial Biotechnology and Bioenergy in the UK

In March 2017 RSM was commissioned by a consortium of 4 BBSRC Networks in Industrial Biotechnology and Bioenergy (BIOCATNET, C1Net, CBMNet, and P2P), led by the Crossing Biological Membranes Network (CBMNet), University of Sheffield.

The findings and recommendations provided in the Landscape Review are based on an extensive desk-based review of relevant strategy and policy documentation; in-depth interviews with 50 strategic industrial biotechnology stakeholders; analysis of secondary datasets including company and investment data; an online survey yielding 160 responses; in-depth case study research; and group consultation with leading academics.

THE POTENTIAL FOR INDUSTRIAL BIOTECHNOLOGY

Industrial Biotechnology is the use of biological resources for producing and processing materials, chemicals and energy. The breadth of potential products and markets to which Industrial Biotechnology can be applied is one of its greatest strengths, but also arguably one of the key reasons why Industrial Biotechnology is not adequately referenced in current UK government policy, and / or investment.

During the production of the Landscape Review, a government strategy on the UK Bioeconomy was being prepared and this report and its recommendations are intended to be complementary and supportive of that new strategy.

Industrial Biotechnology will shape the UK's future role and standing in major international industrial markets (currently comprising c. £34bn revenue). More significantly, Industrial Biotechnology is recognised internationally as the key enabling technology that can help address major societal challenges through new methods of manufacturing consumer products, new materials (such as industrial composites and biodegradable plastics) and sustainable energy in the form of liquid and gaseous biofuels. Simultaneously, Industrial Biotechnology can help to reduce greenhouse gas emissions, and make more effective use of agriculture, food and municipal wastes.

Figure 1.1 shows some of the markets for which Industrial Biotechnology is the likely source of disruption.

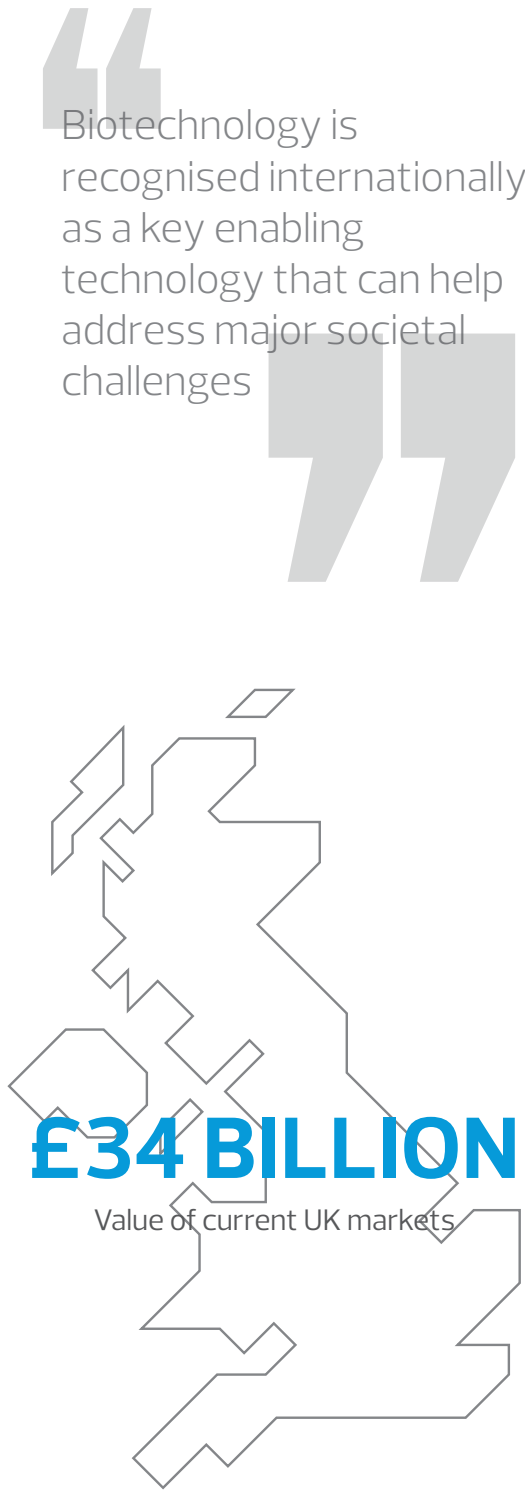
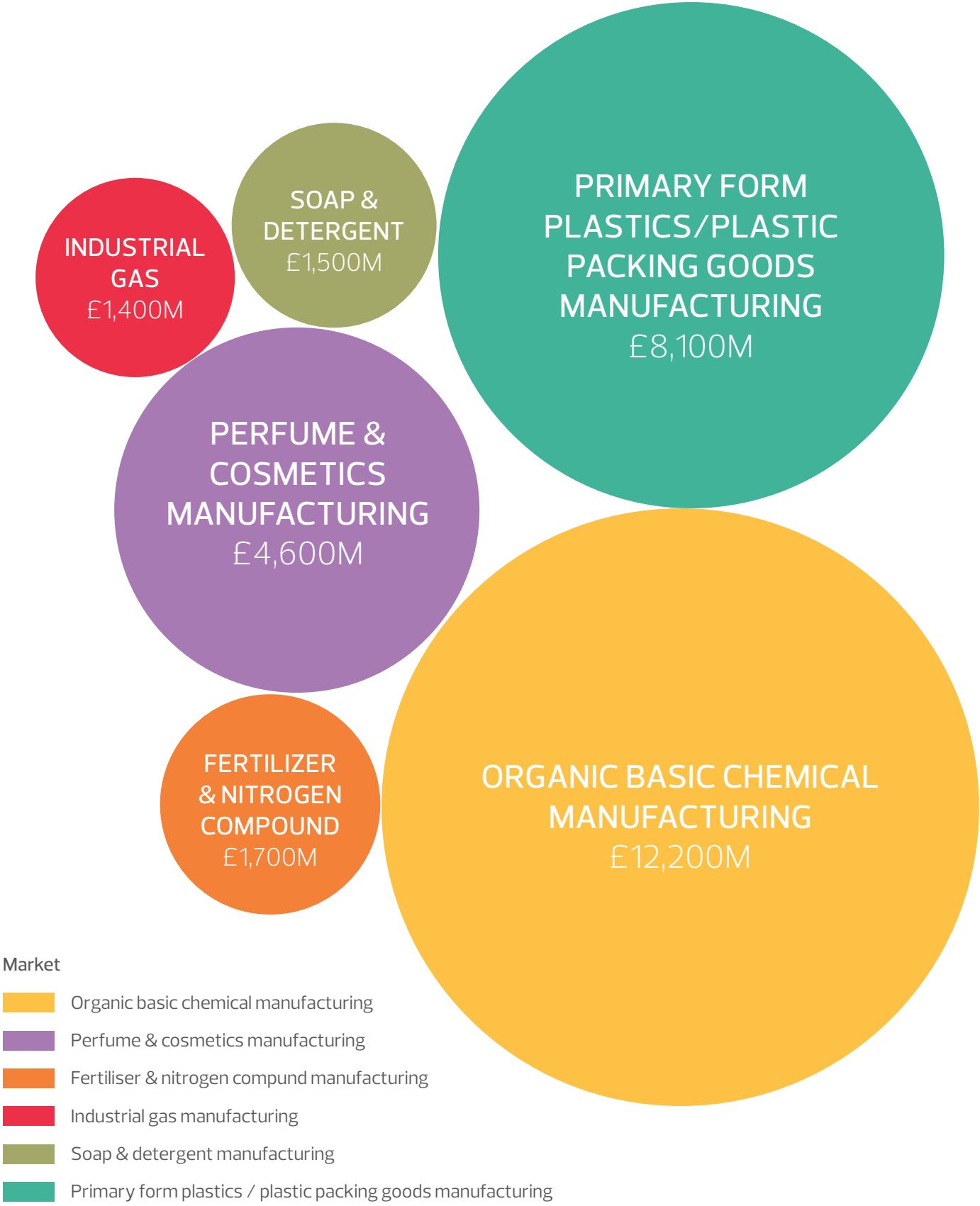


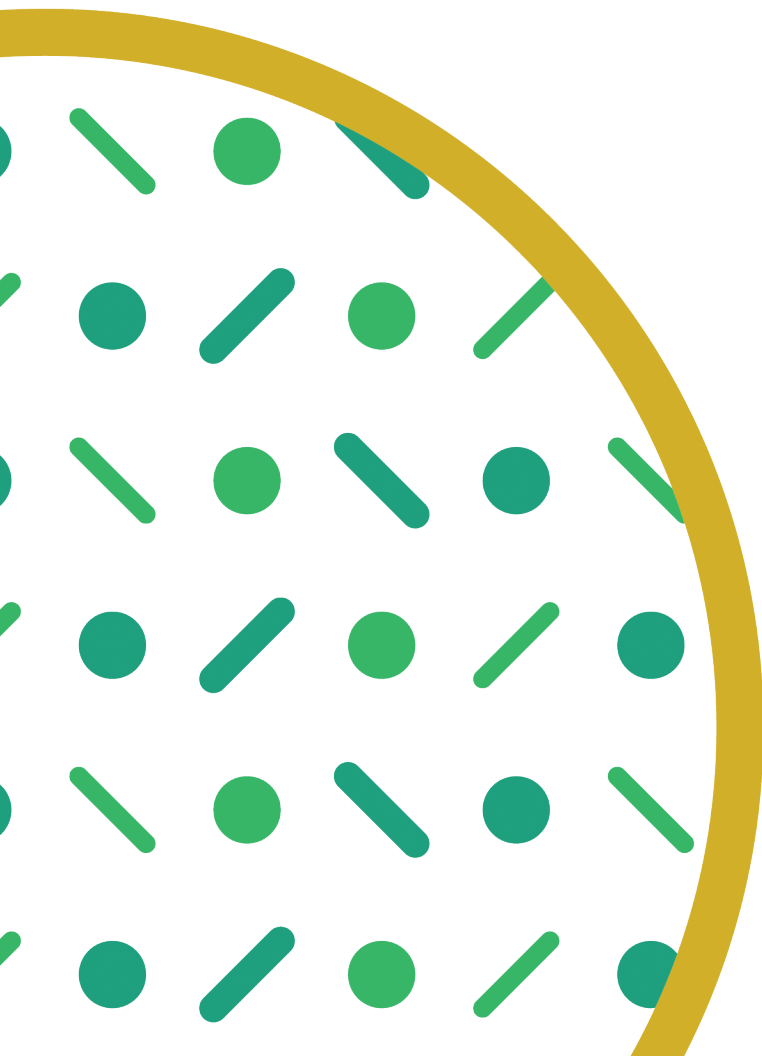
FIGURE 1.1
Value of current markets for which Industrial Biotechnology presents future supply chain opportunities



Source: Industrial Business Intelligence Service (IBISWorld), RSM

The breadth of Industrial Biotechnology's application, coupled with the UK's excellent scientific research base means that there are fewer enabling technologies better placed to deliver against the central thrust of the Industrial Strategy.

In addition to significant food waste and relatively high CO2 emissions, since 2004 the UK has become increasingly reliant on foreign energy imports. Industrial Biotechnology and Bioenergy, together with other renewable sources such as wind and hydro power, will become increasingly important as the UK moves towards targeted reductions in greenhouse gas emissions under the Paris Climate Agreement, and looks to reduce dependency on energy imports.



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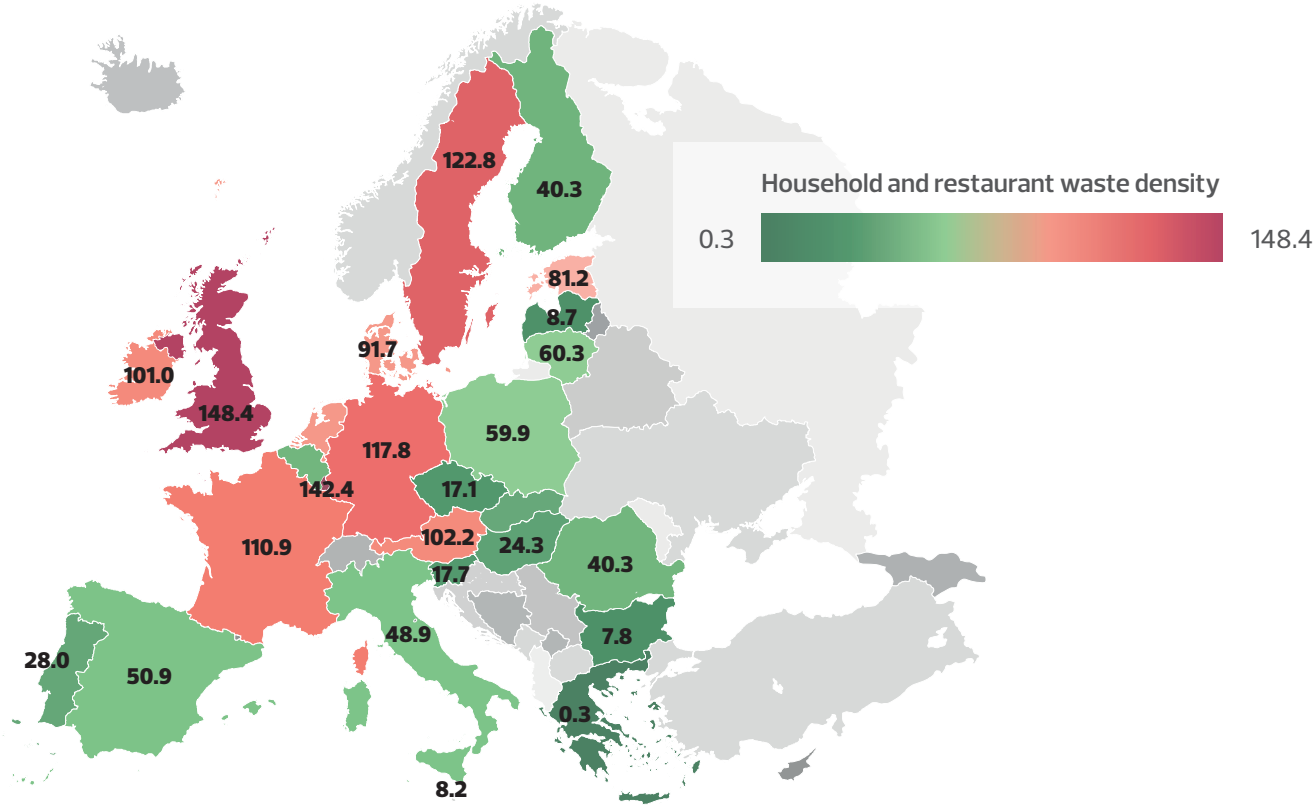
Unlike in the past, industrial strategy must be about creating the right conditions for new and growing enterprise to thrive, not protecting the position of incumbents. A modern British industrial strategy must make this country a fertile ground for new businesses and new industries which will challenge and in some cases, displace the companies and industries of today.

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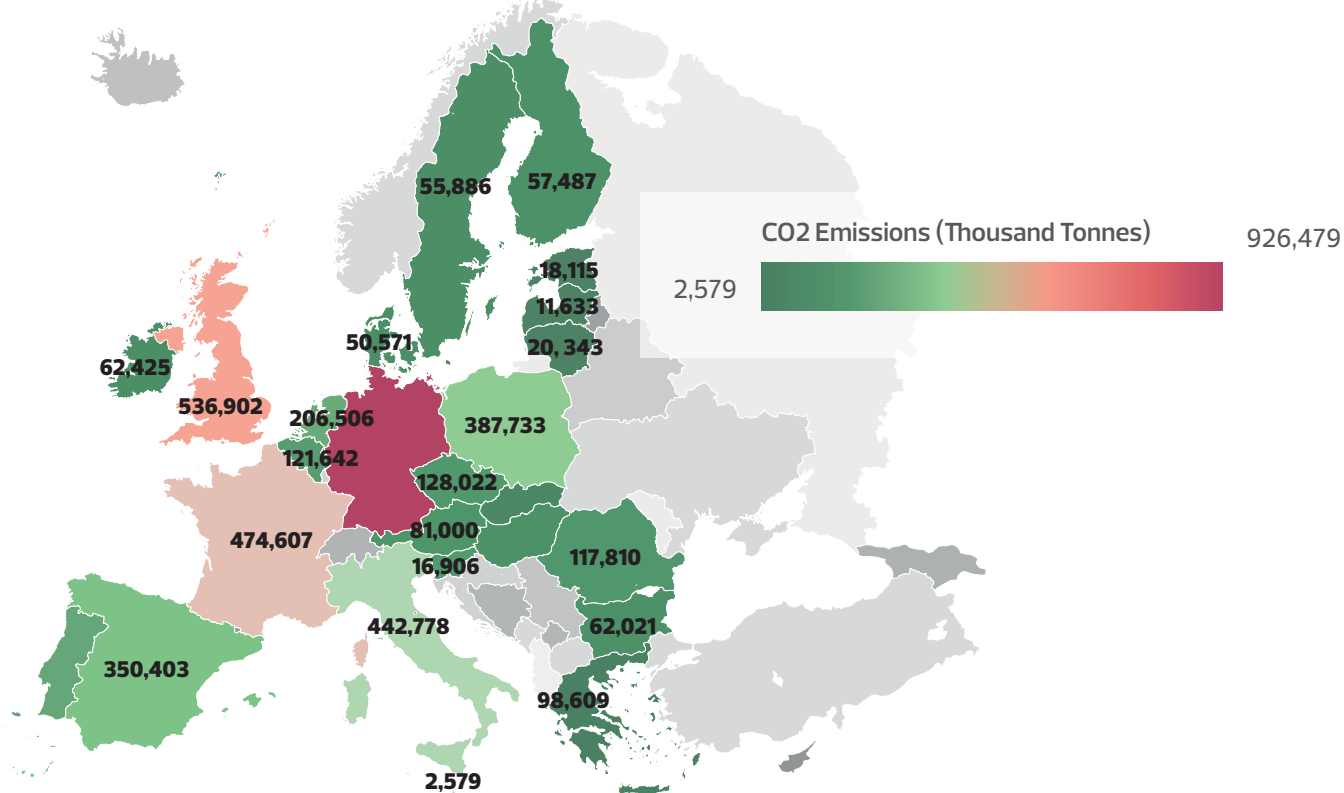
Rt Hon Greg Clark MP, Secretary of State for Business, Energy and Industrial Strategy

FIGURE 1.2
UK societal challenges for which Industrial Biotechnology can provide a solution

Generating opportunity from food waste



Supporting a low carbon economy



Source: Eurostat, RSM

INDUSTRIAL BIOTECHNOLOGY'S CURRENT AND FUTURE ECONOMIC CONTRIBUTION

This report updates previous reports on the contribution of Industrial Biotechnology to the UK economy and shows that there are already more than 1,800 UK businesses undertaking Industrial Biotechnology related activity, employing over 14,000 people, generating £3.7bn in revenue, and contributing £1.2bn in Gross Value Added.

Employment growth in Industrial Biotechnology has significantly outpaced national averages, increasing by over 10% per annum between 2014 and 2016. Median earnings in Industrial Biotechnology markets are £20,000 above the national average, at c.£48,000. The UK has particular strength in high growth and emerging Industrial Biotechnology markets, including in the manufacture of high value chemicals, and the manufacture of recombinant biologics using new technologies from the UK's academic leadership in genomic, systems and synthetic biology, partnered with leading multinational companies and UK-based SMEs. Therefore, the UK can be most successful where it aligns activities in IB to feedstock availability, and targets high value products.



3.7BN
REVENUE

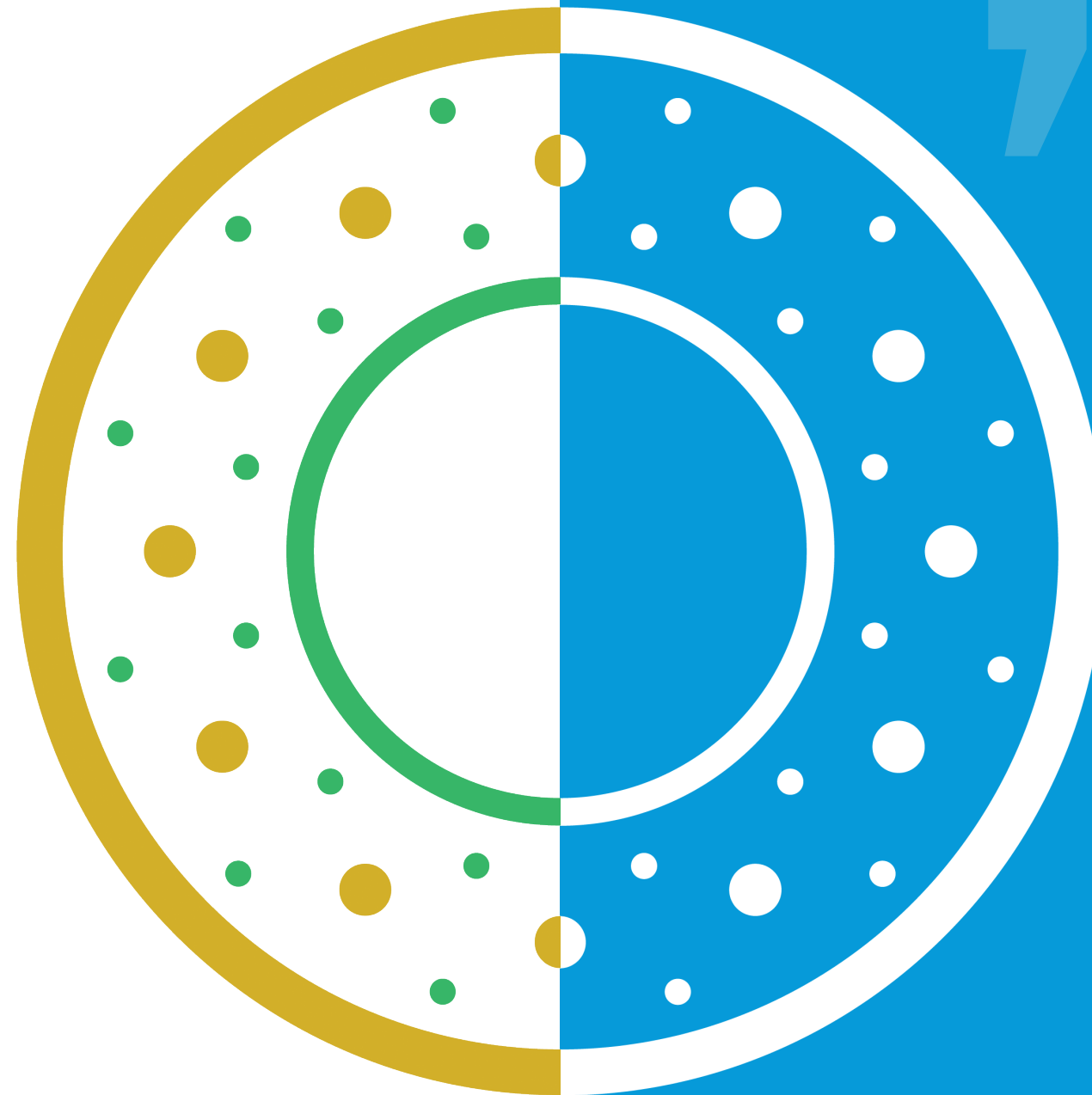


£1.2BN
GVA



14,000
FTES

“Earnings in Industrial Biotechnology outstrip the UK median by c.£20,000”



ADDRESSING BARRIERS TO REALISING INDUSTRIAL BIOTECHNOLOGY'S POTENTIAL

However, Industrial Biotechnology suffers from volatile prices in traditional markets and this has been particularly hard felt in recent years due to a collapse in oil prices and new gas reserves available due to fracking.

Perhaps now more than ever, in order to keep pace with international competitors, Industrial Biotechnology requires the UK government to have foresight, to trust in the UK's industrial and academic expertise and to demonstrate its commitment to industrial biotechnology on the global stage.

Recommendations

The Industrial Biotechnology community cannot make these contributions unless it is adequately supported by the UK government in terms of both specific policy and investment. To that end, this report recommends that:



01

BEIS identifies a long-term plan for Industrial Biotechnology that provides clarity regarding future policy direction and government investment, particularly in light of the decision to leave the EU.

02

The core membership of the Industrial Biotechnology Leadership Forum be expanded to include at least one strong advocate from the academic community.

03

The IB Catalyst be re-instated as a priority, providing at least £20m spend on new research projects, with a call for applications initiated in Q2 2018.

04

Provision is also made for funding a small number of larger scale demonstration projects (c.£10 – £50m) through joint government / industry initiatives.

05

BEIS and UKRI explore the potential of modular manufacturing as a method of 'scaling out' industrial biotechnology processes and products on a regional basis.

06

UK Research and Innovation find ways that allow SMEs to be better financially supported to access existing UK scale-up facilities (e.g. at the Centre for Process Innovation).

07

The existing policy and regulatory frameworks are reviewed and simplified where appropriate, without compromising safety and security, and the UK communicates internationally that its approach to regulation and standards is focused on informed risk management.

08

Financial and advisory support be put in place to help businesses, especially start-ups and SMEs, to navigate efficiently the regulatory requirements to facilitate innovation.





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