

Economic Development Sub Committee

Item No.

Report title:	Emerging Sectors – The Bioeconomy
Date of meeting:	19 January 2017
Responsible Chief Officer:	Tom McCabe - Executive Director, Community and Environmental Services
Strategic impact By focusing on areas of comparative advantage, authorities responsible for economic development can reduce risk and maximise return from their financial and non-financial investment. Using this smart specialisation approach, we have identified key emerging sectors which Norfolk agencies could support in order to raise the county's profile for those sectors and ultimately create sustained and sustainable growth in the future. These sectors include cleantech, infotech and biotech.	

Executive summary

Biotech, defined as a biological process that can be used in industrial applications, is the focus of this report. Biotech has been recognised as a key area of growth by successive governments within the support strategies for life sciences, agri-tech and industrial biotech, including the new Industrial Strategy. However, we believe it is essential to consider biotech in conjunction with its areas of application, which together make up the bioeconomy.

Norfolk's bioeconomy ranges from focussed biotech R&D companies to large organisations in established industries such as agriculture, food and drink, waste management and healthcare, which together employ over a third of the Norfolk workforce. Working with delivery partners at Norwich Research Park we have identified five core sectors of the Norfolk bioeconomy, as well as linked sub-sectors of industry.

From the SWOT of the development of Norfolk's bioeconomy, we conclude that while the elements for a biocluster are in place in Norfolk, the lack of coordination and unified voice may be reducing the effectiveness of efforts to develop the bioeconomy value chain.

We illustrate our ideal bioeconomy through an imagined future researcher's route to revenue, incorporating many of the elements of a successful bioeconomy support infrastructure. We also list a number of specific recommendations which we believe would lead to positive change.

Finally, we describe the purpose and structure of a new sector development network, Biotech East, which we believe can catalyse many of the necessary changes to Norfolk's support infrastructure needed to develop a thriving, productive bioeconomy.

Hethel Innovation is seeking to support the growth of the bioeconomy in Norfolk through the creation of a biotech and bioeconomy research and business network, Biotech East. The purpose of this network is to connect the various agencies, institutions and industry sectors along the bioeconomy value chain, to secure sustainable economic growth for Norfolk and the wider East of England (see Appendix 1).

Recommendations:

- 1. Members are asked to note the developments of the ‘Bioeconomy’ and the economic opportunities that it provides.**
- 2. Members are asked to endorse the work of Hethel Innovation in the delivery of the ‘Innovation New Anglia’ programme and the establishment of ‘Biotech East’ to support and grow the sector.**

1. Proposal

- 1.1. Hethel Innovation is seeking to support the growth of the bioeconomy in Norfolk through the creation of a biotech and bioeconomy research and business network, Biotech East.
- 1.2. The purpose of this network is to connect the various agencies, institutions and industry sectors along the bioeconomy value chain, to secure sustainable economic growth for Norfolk and the wider East of England.
- 1.3. The initial phase of Biotech East’s development has taken place as part of the ERDF-funded Innovation New Anglia project, led by Hethel Innovation and supported by delivery partners including Norwich Research Park and Norfolk County Council.
- 1.4. To achieve our purpose, however, we will have to seek additional sources of funding to carry out key bioeconomy development activities.

2. Evidence

- 2.1. Biotech is defined by one national association as ‘the application of biological processes in products and technologies which help us heal, fuel and feed the world.’
- 2.2. On a national level, biotech is recognised as a key growth area in the Government’s Smart Specialisation strategy for England through the agri-tech and life sciences industrial sectors.
- 2.3. Medical biotech tools are used frequently by pharmaceutical and medical technology companies as well as small R&D-focussed biotech companies, so the health life sciences sector employed almost 250,000 people and generated approximately £60.7bn turnover in 2015. The biotech sector is also growing rapidly and attracting record levels of investment, with £489m in venture capital raised last year.
- 2.4. Agri-tech is an integral part of the wider agri-food supply chain which contributes annually £96bn or 7% of the UK’s GVA. Key biotech and biotech-related tools such as crop genetics and informatics technologies are a key part of maximising UK agricultural productivity, which has declined in the last 30 years relative to other similar countries.
- 2.5. Finally, industrial biotech, referring specifically to the use of biotech to produce industrial products such as chemical compounds or catalysts, spans biotech for cultivation of plants and animals (agro-industry), biofuels, and applied chemicals industries such as personal care and cosmetics. In the last year national statistics were collected, the industrial biotech sector comprised more than a hundred companies employing 2,600 people.

2.6. This interplay between multiple areas of application suggests that it may be more appropriate to consider biotech as an enabling set of tools rather than an industry in itself. In turn, we believe it is essential to consider biotech in conjunction with its areas of application, which together make up the bioeconomy.

2.7. A comprehensive analysis of the sector is provided in Appendix 1.

3. Issues, risks and innovation

3.1. It is crucial to develop a strategy for identifying and supporting strengths to reach opportunities, whilst addressing weaknesses and threats.

3.2. Our first step in helping to form this strategy was to conduct a SWOT analysis of developing the Norfolk bioeconomy, which are summarised below:

<p>3.3.</p> <p>STRENGTHS</p> <ul style="list-style-type: none"> • Internationally significant research assets • High-skilled human resources • Latent financial assets and mentors • Large organisations in key bioeconomy sectors • Thriving digital and tech community • Combination of agri/food/health research and industry • Innovative business spaces • Land for industrial expansion • Proximity to Lincolnshire, Suffolk and Cambridge 	<p>WEAKNESSES</p> <ul style="list-style-type: none"> • No rallying point for regional biotech and bioeconomy • Gulf between Norfolk’s research and industry • Gap between research IP and economic development strategy • Few enterprises bridging research-industry gap • Low levels of business innovation • Sub-critical incentives for SME innovation adoption • Insufficient seed capital and entrepreneur incentives • Weak infrastructure for cluster development
--	---

3.4. The strengths of Norfolk’s bioeconomy are numerous, including world-class research assets across Norwich Research Park and specific projects such as Leaf Systems, the Biorefinery Centre and the OpenPlant synthetic biology project.

3.5. Other economic factors also play to Norfolk’s advantage, including suitability for any Cambridge biotech company relocation or overspill, and large organisations in the key sectors related to the bioeconomy which can generate market pull for any translational products or processes.

3.6. By contrast, the weaknesses of our bioeconomy focus around a comparatively unfavourable starting point in terms of existing business innovation and demographics, relatively poor transport and broadband infrastructure and a lack of alignment between the various agencies towards a common, locally-oriented goal.

3.7. Other weaknesses relate to the **scale** and **coherence** of existing solutions; efforts to incentivise translation have often been piecemeal and sub-critical.

<p>3.8.</p> <p>OPPORTUNITIES</p> <ul style="list-style-type: none"> • Regular churn of high-skilled researchers, many interested in entrepreneurialism 	<p>THREATS</p> <ul style="list-style-type: none"> • Lack of agency co-operation • Business uncertainty and reluctance to invest in innovation
--	--

<ul style="list-style-type: none"> • Increasing focus on generating economic impact from research • The “Cambridge phenomenon” running out of space • Political will to support specific growth sectors • Weak pound making inward investment more attractive • Platform technologies such as CRISPR for synthetic biology • Brexit impact on GM and drug regulations and public opinion • Labour market restrictions could speed technology adoption 	<ul style="list-style-type: none"> • Technical challenges in scaling biotech • Renewed public opposition to biotech • Other technologies outperform biotech • Reduced research funding • Linking more to Cambridge creates a brain drain • Difficulties in exporting to new countries
--	---

4. Background

- 4.1. In the context of this varied and uncertain picture, the UK government is defining a new industrial strategy that seems likely to involve direct support for specific industry sectors; in turn, it appears likely that biotech and the bioeconomy are going to appear high on the priority list.

Chairman of the Prime Minister’s Policy Board and former Life Sciences Minister George Freeman recently described Britain as a ‘trailblazer’ for biotech, and called for a ‘national mission’ to bring science and industry closer together.

Along with this endorsement, the bioeconomy has also been prioritised by the Department for Business, Energy and Industrial Strategy, with the first industrial strategy call for evidence issued by BEIS relating to the bioeconomy.

Officer Contact

If you have any questions about matters contained in this paper or want to see copies of any assessments, e.g. equality impact assessment, please get in touch with:

Officer name : Simon Coward / Aaron Hunter **Tel No. :** 01953 859104

Email address : info@hethelinnovation.com



If you need this report in large print, audio, braille, alternative format or in a different language please contact 0344 800 8020 or 0344 800 8011 (textphone) and we will do our best to help.