

Technology and Innovation Centres: Summary of responses to the Technology Strategy Board's prospectus published in January 2011

Introduction

This document summarises the responses to the document "Technology and Innovation Centres: a prospectus" published by the Technology Strategy Board in January 2011.

The prospectus outlined the Technology Strategy Board's proposed approach to establishing a new network of elite technology and innovation centres which will be drivers of future economic growth for the UK. The responses provided a valuable input to the Board's choice of the first centres to be established and the development of the [Strategy and Implementation Plan](#) for the new network which was published on 26 May 2011.

The prospectus invited comments on a wide range of proposals including suggestions for specific areas for investment in centres and more generic issues concerning the remit and management of centres.

Over 500 responses were received by February 2011 from individuals, businesses, development agencies, academic institutions and academic and company representative bodies. The Technology Strategy Board is grateful for the large amount of work done by all those responding which has made a significant contribution to the development of the programme and to defining the way forward.

This document summarises the responses under the following headings:

- What is a technology and innovation centre?
- What will it do?
- How will it be managed?
- How should the candidate areas listed in the prospectus (high value manufacturing, energy and resource efficiency, transport systems, healthcare, ICT, electronics, photonics and electrical systems and other areas) be refined to provide greater technical focus and definition?

The responses were overwhelmingly positive about the establishment of a network of technology and innovation centres and for the added value that a network would bring to UK companies and the performance of the economy. However a few respondents felt the project risked stifling entrepreneurship and innovation in some of the UK's most important sectors and that the £200m investment would provide better results if pointed directly at individual companies.

What is a technology and innovation centre?

Respondents strongly endorsed the need for a technology and innovation centre to be a physical centre which is recognised as the centre of excellence in the UK for pre-development commercialisation and which has the capacity to provide global impact and reach.

The feedback highlighted a number of positive factors which should be considered in the design and roll-out of the programme:

- the importance of strong company demand and continued business leadership
- the need for a centre to be well integrated into its company and sector;
- ecosystem and into the broader UK innovation infrastructure;
- the clear differentiation in the scope and remit of centres from existing academic, RTO and company institutions;
- the importance of co-operation and collaboration between the members of the network.

In addition potential danger areas were mentioned which could hinder the future success of the TIC network, including:

- too dispersed a model could dilute the idea of excellence if it avoided difficult decisions;
- locating a centre within a university department could hinder autonomy and reduce its ability to deliver to new audiences and in new ways.

A significant number of comments were made on the proposed funding model for centres. In the main, respondents were in favour of the model proposed for three equal sources of funding - competitively won business-funded contract research, competitively won collaborative applied R&D co-funded by business and public bodies and core funding from the Technology Strategy Board - although a number of potential danger areas were identified, as follows.

- centres needed to strike the right balance between investing in capital and appointing suitable staff;
- centres needed to avoid devoting too much energy to accessing Research Council money in direct competition with academic institutions;
- centres need to ensure that they can look to industry for finance rather than public sources in times of financial stringency.

What will a technology and innovation centre do?

Respondents were very supportive of the proposed activities which a centre should carry out and provide. However, responses identified important lessons to be learned from the underperformance of previous initiatives that could have a bearing on centre performance and integration.

The principal risks identified were:

- broadening the focus and scope and straying into commercial company activities or academic research territory and funding sources;
- generating innovation in isolation – success requires strong relationship and complementary activities to build the company capacity to exploit innovations;
- establishing a large IP portfolio as an end in itself which, could divert the management from its main objectives;
- creating a membership model that discourages company diversity and encourages large or single company dominance.

A large number of respondents highlighted the important role that the centres should play as a ‘teaching factory’ for young technologists and as a skills development academy for existing engineers.

How will a technology and innovation centre be managed?

Strong and transparent governance was highlighted as critical by most respondents. Many cited past experiences from projects and centres where the absence of good governance had resulted in negative experiences and little if any real impacts.

The responses identified a number of actions which should be considered in order to make the new network effective:

- The engagement of the right management team for each centre is crucial; it is seen as essential for them to have a business and commercial mindset and to be well networked in the UK and globally;
- The establishment of an independent oversight committee with a clear remit and robust membership would be very helpful;
- A strong leadership team should be established within the Technology Strategy Board at both the executive management and Governing Board levels;
- Strong physical and virtual networking and collaboration should be established across the centres and with the Technology Strategy Board;
- Metrics and performance measures should be established that are trusted by companies and contributors and that recognise that time to impact is different for different technologies.

Comments on Candidate areas

A large number of comments were received on the proposed candidate areas. The following sections summarise the comments in each area.

High Value Manufacturing

Organisations were invited to register by 31st January their interest in leading or forming part of the first technology and innovation centre to be set up, in the area of high value manufacturing. 142 organisations responded to this request in the prescribed format designed to assess their ability to lead or form part of the centre. In addition 36 further inputs made points relevant to manufacturing as part of their response to the wider set of questions.

All the responses received were positive about the concept of the new network of centres and about the choice of high value manufacturing as a key area for the programme. Some sounded a cautionary note about the need for selectivity in terms of the areas of focus for the eventual work programme of the centre. Otherwise, the nature of response largely reflected the nature of the organisation responding and the particular questions posed.

A small number of responses, all from consortia, aimed to demonstrate their organisations' capability and experience to run a centre in the manufacturing area. Their responses supported the concept of the centre and emphasised their ability to take on the lead role. There were in addition a number of separate responses from individual organisations making up consortia which described their individual capabilities and confirmed the support of their parent organisation (which included for example large universities) for the consortium approach.

A number of large companies wrote to confirm their support for the concept of the manufacturing centre and, in some instances, to support a particular consortium. They also stressed that a centre could align with their own plans for manufacturing technology development by providing capabilities (facilities and people) which would help them develop the technologies which they need to remain competitive. They also made reference to the need to develop a broad range of capabilities, not just in the technologies but in supply chain development, skill development and community building.

A number of small companies responded, generally to say that they would welcome involvement in the centre when it became established. They described their own particular capabilities but made the general point that many larger companies had changed their business model and were becoming more reliant on small companies as a major source of innovation. They also asked that the structure and set-up of the centre should encourage involvement of SMEs and avoid being dominated by large players. Many of the responses in this category were from technology companies which were developing a particular technological capability, rather than a product.

In a similar vein, a significant number of universities responded who saw themselves as having capabilities which could be used by the centre, even though they did not see themselves as being able to take a role in the centre's leadership and management. These organisations could be brought into the operation of the centre either on specific projects or to provide a specialised capability where it would not make sense for it to be duplicated by the centre.

Trade associations, and other representative organisations, wrote to offer their services to bring interested companies in contact with the centre and disseminate its work. There were also a small number of responses seeking funding from whatever source no matter how unlikely.

Overall, the response to the request for inputs provided confidence that a technology and innovation centre in high value manufacturing would be well supported and identified a small number of consortia capable of being invited to make proposals to run the centre. In addition the responses identified a large number of other organisations who could subsequently be involved in the centre as clients or technology providers.

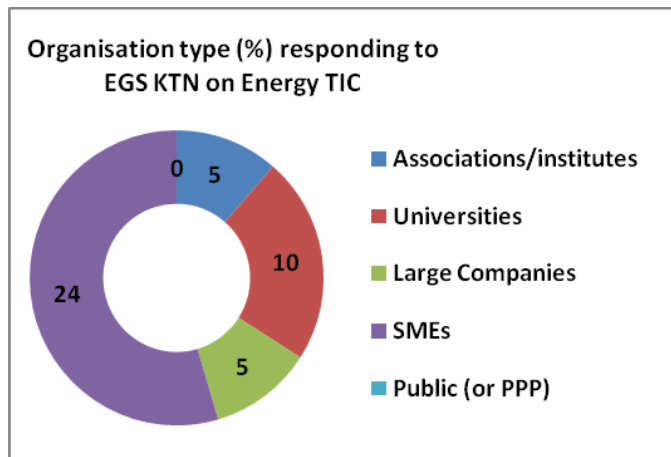
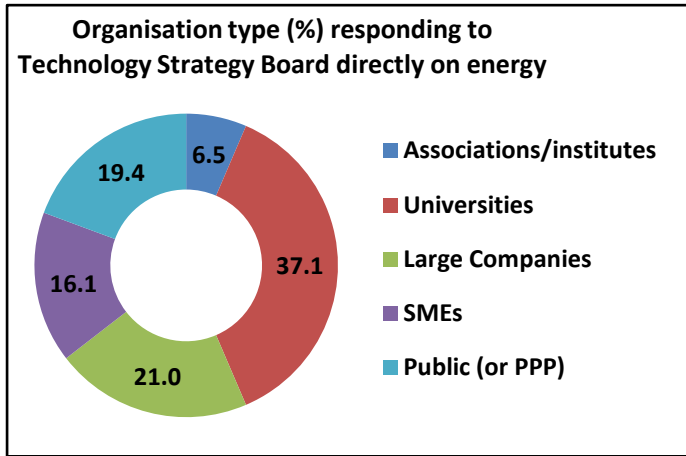
Energy and Resource Efficiency

Responses were invited on the potential for new centres in the areas of energy and resource efficiency. The responses in each area have been analysed separately.

Energy

A total of 62 organisations responded direct to the Technology Strategy Board. In addition 58 further inputs, relevant to an energy centre, were made through the Energy Generation and Supply Knowledge Transfer Network (EGS KTN) through a more general, free format request for input.

All the responses received were positive about the concept of centres and about the choice of energy as a key area for the programme. The following analysis breaks down the responses received by type and size of organisation for the Technology Strategy Board and EGS KTN:



In each case, approximately 20-30% of responses supported a centre focused on offshore renewable energy technologies. These responses made a strong case for such a centre. They stressed the UK's world leading expertise in offshore engineering in terms of the supply chain and offshore operations and the long history of oil and gas engineering around our coast which means that the UK knows more about our seabed and marine environment than any other country in the world. They argued that this has given the UK a worldwide reputation in offshore excellence and makes the UK an excellent base for offshore research.

Responses also highlighted that the UK has a timely lead in some new offshore technologies (tidal and wave) and is well positioned to take advantage of inward investment opportunities and establish a UK supply chain for offshore wind. In summary the responses for offshore renewable energy gave strong support for the creation of a centre as a potentially timely and strategic intervention by the Technology Strategy Board.

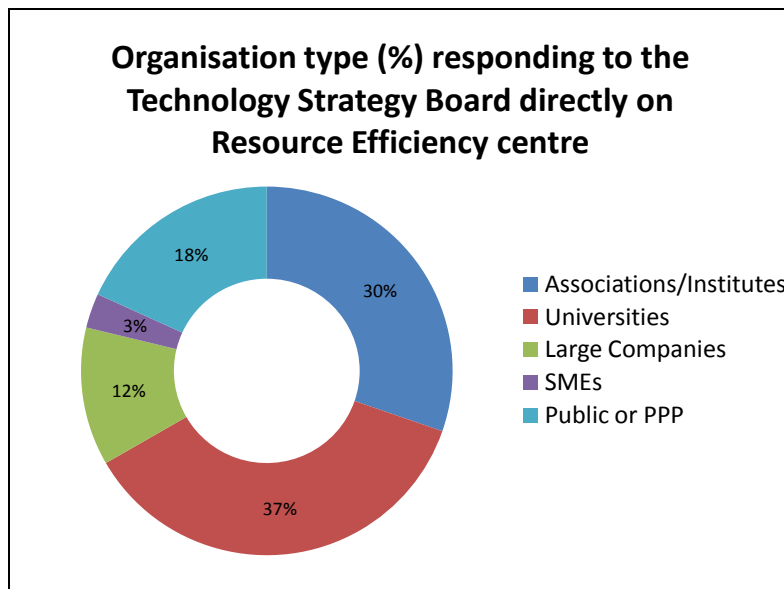
There was also significant support for emerging energy technologies including the smart grid, energy storage and demand side management. Most of the responses supported a centre in the technology area where their respective organisations

already had an interest and explained how they could integrate and be involved in the proposed centre. The Technology Strategy Board concluded that the area of smart grids and distribution would be suitable for further examination.

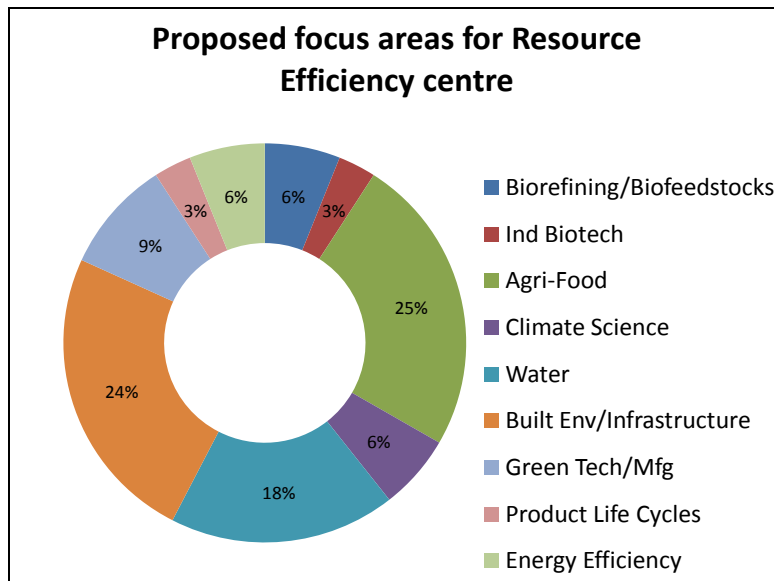
Resource Efficiency

The topic of resource efficiency is a very broad one. 14 responses were received which directly addressed the theme of resource efficiency within the energy and resource efficiency area identified in the prospectus. In addition, another 19 responses not addressed to the energy and resource efficiency area specifically mentioned resource efficiency as a key target for centres. A number of other responses addressed wider environmental or sustainability issues and are covered in the relevant sections below.

Of the 33 responses targeting resource efficiency, the lead organisation and main focus areas broke down as follows:



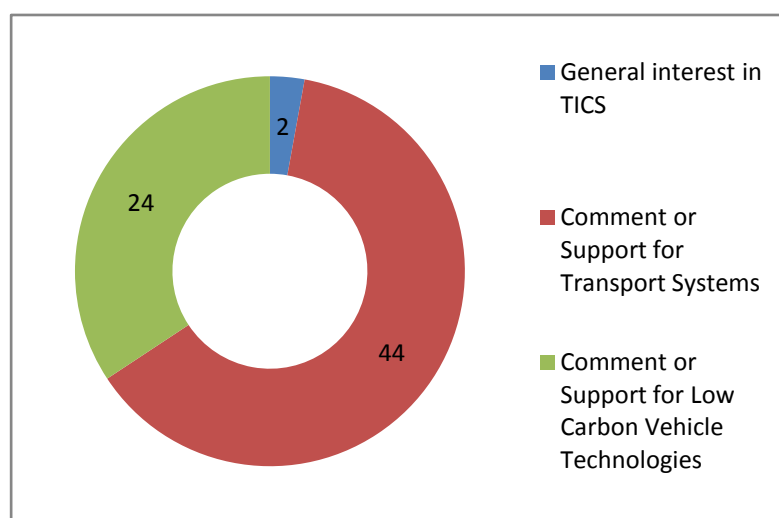
A wide range of focus areas were proposed for a Resource Efficiency centre, from Industrial Biotechnology and Energy Efficiency in buildings and elsewhere, to Water and Agri-Food. A number of the suggested areas for focus were specific end-use markets – see below.



While a number of these could be considered for separate potential centres, the Board concluded that further engagement with industry and the knowledge base was required to assess the potential scope and suitability for a centre within the broad theme of Resource Efficiency.

Transport Systems

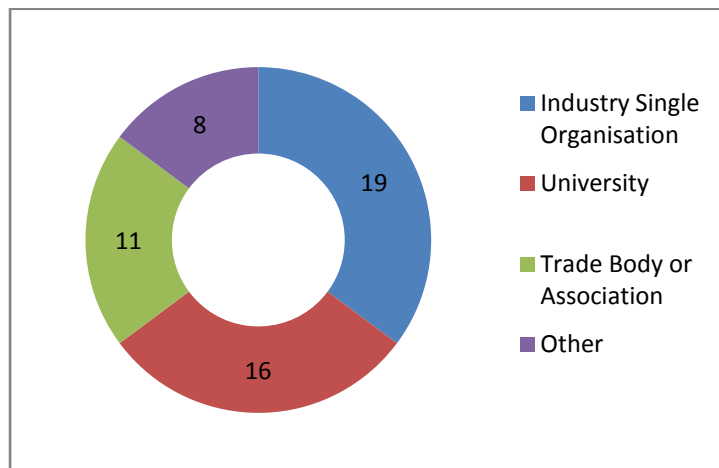
A total of 55 separate responses were received relating to the area of transport systems. The responses included those from single organisations, universities, trade associations and consolidated responses from multiple parties. All the responses were positive about the concept of centres and also about the choice of Transport Systems as a key area for the programme. The chart below shows the split of responses by area of focus (the figures in the charts below give equal weight to each response regardless of numbers of organisations behind the particular response).



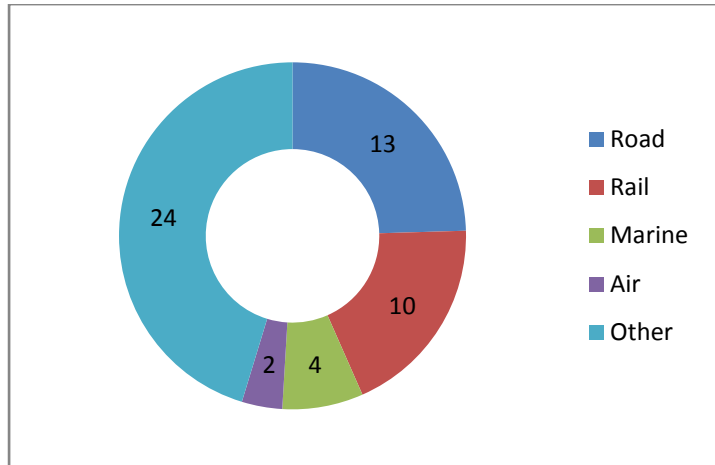
Nearly two thirds of responses felt that the focus of a potential centre should be around transport systems and integration. Some differences of opinion were expressed about the precise focus of the proposed centre – ie whether it should be on integration of the transport system as a whole or whether it should focus should be on integration of certain modes with other sectors (eg rail to grid). The remainder of responses suggested the focus should be on cross-sectoral Low Carbon Vehicle Technologies.

10 of the responses either proposed specific centres or commented that they would like to be a partner in a particular centre. About half of those responding in the two main areas of focus identified above were either party to or endorsed specific proposals. This suggests a lot of community building has already taken place.

Organisations which responded ranged from individual organisations through to trade associations and academia. Just over a third of the lead respondents were single industrial organisations, with a further 20% being trade associations. 30% of respondents were from individual universities, with approx 15% being classified as other (eg Institutions, RTOs, RDAs). Approximately a third were either consolidated responses or linked to other responses. Among those responses which prioritised Transport Systems and Integration more than half were from industry organisations, trade bodies or individual companies – which suggests that there is strong business support for a centre in this area. The following chart breaks down the responses received by type of organisation.



The following chart shows the sectors - Road, Rail, Marine and Air - from which the responses were received.



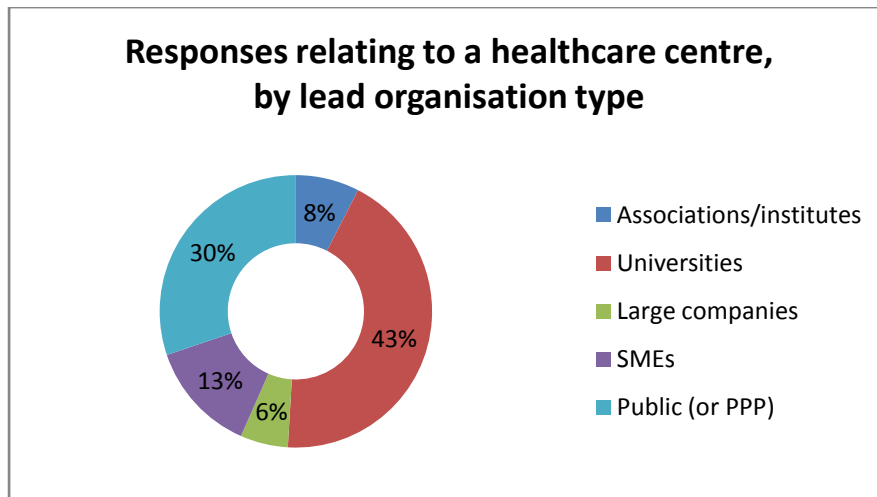
The Rail and Automotive/Road sector accounted for over 40% of responses with only very limited responses from the Air and Marine sectors. Nearly half of the responses did not have a specific affiliation to any individual sector. These were mainly from the academic sector.

The responses provided supporting background information for both areas proposed. Those that prioritised Transport Systems and Integration set out the potential benefits that could be achieved by consolidating the broad range of activities needed to deliver technologies and services to provide cost effective efficient transport systems. They also described the global opportunities that such activities could open up. The Technology Strategy Board has concluded that further work should be done on a possible centre in this area.

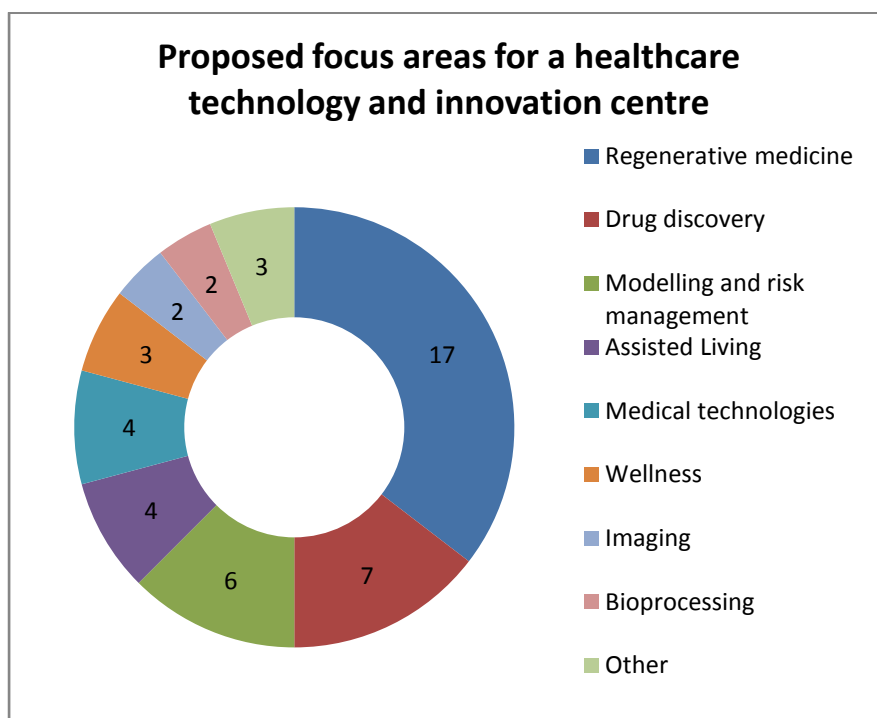
Healthcare

A strong and positive response was received from the Healthcare sector with 53 separate submissions and a further four responses providing general comments. 41 of the 53 responses addressed a specific healthcare area and 12 were more generally supportive of a centre in the broad area of healthcare.

Responses were received from associations and institutes, universities, industry, including large companies and SMEs, and public sector organisations or PPPs. 73% of submissions had a lead author from a university or the public sector. Many submissions were consolidated responses from multiple parties - for example, one response was submitted by over 40 individuals and another association submitted a proposal on behalf of 13 universities. Also, some individuals sent in separate submissions in support of a particular proposal. The chart below shows the proportion of submissions from different kinds of organisation weighted equally regardless of the number of individuals/organisations behind each specific response.



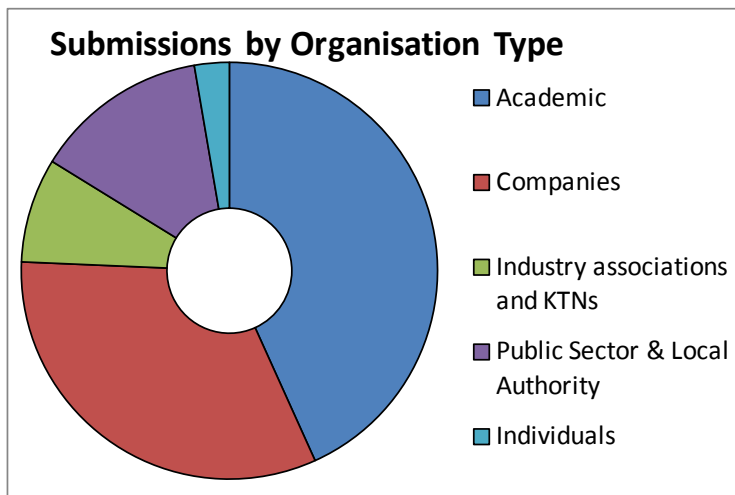
A wide range of focus areas were proposed for a Healthcare centre. These could be broadly categorised into 11 areas - see chart below.



Of the specific responses received, there was very strong support (36% of responses) in favour of a centre in the broad area of regenerative medicine/cell therapy. Also, a high number of separate submissions were received for drug discovery and modelling and risk management - with 15% and 13% of responses respectively. The Technology Strategy Board concluded that a strong case had been made for a centre in the area of cell therapy – which was announced in March.

ICT

74 separate submissions addressed the possibility of an ICT centre, and these were almost universally supportive of the idea. Submissions from companies and industry associations were balanced evenly with those from academic institutions, with evidence of interest from a number of public sector bodies as well. A proportion of the responses expressed general support without recommending specific topics, but the majority of responses were directed towards particular technology or market applications.



Whilst the number of inputs is not a direct measure of the weight that should be attached to an idea, it does provide some evidence of the strength of support in the business and academic community. Although the categories of interest overlap and interpenetrate, three major groupings were apparent:

- A large group of submissions, and a study by the Creative Industries KTN, looked at the Creative Industries and the impact of digital technologies on their production and business models, and argued persuasively for the importance of these sectors in the UK innovation economy. Since the industry spreads across a number of sectors, embraces multiple technologies, and includes clusters of companies throughout the country, several submissions also counselled care in naively applying a simple model for the structure and operations of a centre in this space.
- A group of submissions explored a centre focusing on computer modelling and simulation, and/or the use of high-power computing to handle the increasingly frequent problems that involve large data sets or are of high complexity. In particular, the application of such techniques to understand complexity in the Financial Services was a rallying point for a consortium of potential collaborators. It was also proposed that the complexity of ICT systems themselves, and the issues of reliable performance in their design and operation, might benefit from a concentration of expertise and of analytical capabilities.

- The future evolution of the internet was considered by many submissions, in different forms and at different layers of complexity. The “Internet of Things” and the proliferation of connected devices was proposed as a topic, including the business models surrounding the services it will support, and ICTKTN assembled further viewpoints on this subject. The application of such a spanning technology to the challenge of city management also attracted the attention of several system integrators and academics, and this added to other inputs about cities that did not include an explicit ICT focus. Underpinning the discussion were suggestions around important technologies for the future of the internet and our connected lives: communications infrastructure and wireless technology; informatics and data management, and cyber security were each proposed for TIC investment by numbers of independent submissions.

The responses confirmed that there is a critical mass of interest in the business and academic communities around each of these three important topic areas. For that reason the Technology Strategy Board concluded that the topics of digital media/creative industries, complex systems and future internet systems should be included amongst the 10 candidate areas from which the next phase of technology and innovation centres selections will be made. The Technology Strategy Board will be taking forward discussion with the relevant communities to explore in more detail the interest in such centres and what they might achieve. It also identified an overlap between ICT and sustainability/environmental issues in relation to a potential centre in Future Cities and will also be exploring this (see below).

Electronics, Photonics and Electrical Systems

75 responses were collected relevant to one or more aspects of the electronics, photonics and electrical systems area (EPES). 12 responses were letters of support for various proposals, and 63 responses addressed one or more of the focus areas in the EPES area. A total of 9 submissions specified EPES in its entirety.

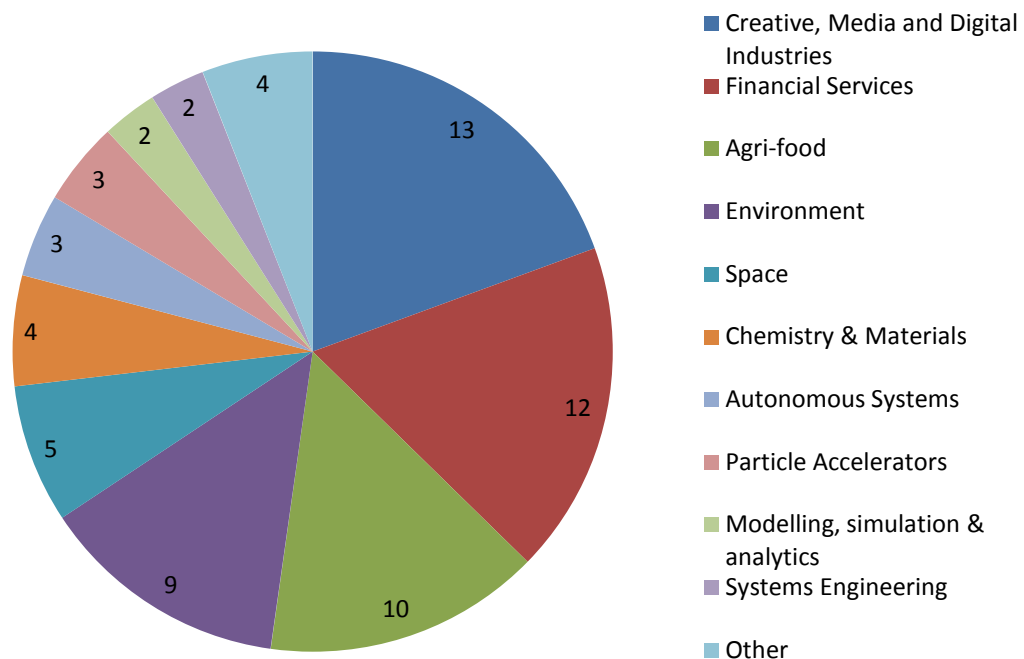
A total of 18 responses were submitted proposing photonics as an area for a centre. Most respondents stressed the importance of photonics to UK industry and addressed photonics in general terms. Inputs were received from large companies, small companies, trade associations, universities, and private individuals. A number of the responses identified specific sites and capabilities which could contribute to a photonics centre.

A total of 10 responses were submitted proposing sensors or sensor systems as an area for a centre. Some of the submissions were on behalf of a large region or community of companies and universities. Most stressed the importance of sensor technologies to UK industry and addressed sensor systems in general terms. Inputs were received from large companies, small companies, trade associations, universities and private individuals. Some of the responders named specific sites and capabilities.

The Technology Strategy Board concluded that both areas deserved further exploration as potential areas for centres and it will be taking forward further discussions with the relevant communities in both areas.

Other areas

A total of 67 other responses were received which focused on particular opportunities for new centres outside the areas listed above. Although some contributions were very specific, they can be grouped into 11 broad areas:



The proposals relating to opportunities in Creative, Media & Digital industries and Financial Services were predominantly rooted in the development and exploitation of digital/ICT technologies and could be considered as a single digital group. They were considered alongside the other proposals in the ICT area and the three potential technology and innovation centre propositions described above emerged from this analysis.

The proposals relating to environment and agri-food were considered with other resource efficiency responses and the further work on a possible centre in this area will address the proposals made.

In addition there was significant overlap between a number of sustainability issues raised in the energy, transport and resource efficiency responses with the system integration/ICT issues raised in the context of the management of cities (see above). The Technology Strategy Board therefore concluded it would take forward

discussions with the relevant communities in the context of exploring a potential centre in the area of Future Cities.

The areas of intelligent sensing systems, lasers, nano-fabrication and consulting engineers will be considered within the scope of future work on centres in the manufacturing, sensors and photonics areas. Other responses fell into a number of areas including chemistry and materials, autonomous systems, modelling, simulation and analytics, particle accelerators and systems engineering.

Five responses came from the Space sector. They represented a coordinated response from the UK Space sector - industry, academia and government agencies. They suggested that a centre in the area of Space and Space Applications could give the UK a competitive advantage, enabling industry to access and commercialise rapidly world class research from our knowledge base. The responses argued that a centre could help deliver the growth targets defined in The Space Innovation and Growth Strategy. The potential to build on the development of the International Space Innovation Centre (ISIC) was highlighted as an opportunity. It was suggested that a Space centre could cover a broad range of R&D intensive activities, from the development of satellites through to the delivery of everyday services derived from Space technologies. Further discussions will be held with the relevant community on the potential for a centre in this area.