# Technology Strategy Board
## Driving Innovation

## Governing Board Meeting

## Minutes of the 45th Meeting

The meeting was held on 2nd & 3rd April 2014 at the Manufacturing Technology Centre (MTC), Ansty

### Attendance

**Board:**
Phil Smith
Mike Carr
Stewart Davies
David Grant
Iain Gray
Andrew Milligan
Hazel Moore
Sara Murray
Colin Paynter
Christopher Snowden
Bob Sorrell
Ian Shott (3rd April only)

**Executive:**
Simon Bennett
Mike Biddle
Simon Edmonds
Mark Glover
Graham Hutchins
Guy Rickett
Aileen Thompson
Nigel Townley

**Apologies**:
Amanda Brooks
Doug Richard

**BIS**:
Paul Crawford

**For Future Cities Catapult:**
Keith Clarke
Peter Madden
Richard Miller

**For Precision Medicine Catapult:**
Chris Ball
Patrick Johnson
Zahid Latif
Penny Wilson

**For Energy Systems Catapult:**
Rob Saunders
Nick Smailes

### Welcomes

1.  The Chair welcomed the Board to its 44th meeting.  He reminded the Board of the main items of business for this meeting and conveyed apologies for absence from Doug Richard and Amanda Brooks and the Board noted that Ian Shott, Graham Hutchins and Andrew Milligan would each be absent for part of the meeting.

2.  The Board joined the Chair in congratulating Iain Gray on the award of his CBE.

### Minutes of the 44th meeting (paper: TSB2014-01-06)

3.  Paragraph 31 dementia wording needs clarifying

4.      The Board **approved** the minutes of the 44<sup>th</sup> meeting.

**Chief Executive's report** (paper: TSB2014-02-02)

5.      Iain Gray presented his report.

6.      **Budget resolution**: The Board agreed that, in the context of the financial challenges facing BIS, the ministerial agreement not to cut the Technology Strategy Board budget for 2014/15 had been a good outcome. It noted that the confirmed budget letter from BIS had still not been agreed, as it was the subject of ongoing negotiations about the detailed level of imposed control in the allocation.

7.      **Budget 2014**: The Board noted that the programme uplifts awarded in the Budget did not reflect its own priorities.  It noted that the Cell Therapy Manufacturing Centre also included core programme funds and that for the Graphene Programme, extra funds had also been provided for Manchester University.  The Board also discussed the creation at the Alan Turing Institute and noted that the Technology Strategy Board had been approached on how to establish it and to define the economic proposition.  The Board agreed that, given the reputational risk arising from complexity and lack of visible applications, the Graphene and Turing Institutes must be made to deliver on the applications-oriented side.

8.      The Board agreed that "fiscal event"  funds awarded in the innovation area were often poorly linked with strategy and generally political in nature and that more work was necessary in advance of these events to demonstrate to Government the value of supporting projects where there was a strategic priority and industry consensus.

9.      **KTN Ltd:** The Board noted progress in the establishment of KTN Ltd and that further discussions would be held with a small number of key stakeholders who remained sceptical about this move. It also noted that David Lockwood and Chris Warkup planned to come to a later meeting to discuss progress and direction.

10.    **Scotland:** The Board discussed the possible considerations should Scotland vote for independence.  It agreed that it must continue to act as a national body but felt that it would be remiss of the executive not to give some thought to the impact of a possible yes vote in the referendum.

**Catapult Committee** (paper TSB2014-02-08)

11.    Simon Edmonds presented the paper.  David Grant, former Chair of the Oversight Committee for Catapults gave his full support to the proposed change.  In discussion, the Board commented that care was needed not to replicate unnecessarily the Catapults' own internal discussions and generally to keep the Committee focus on the high level issues.

12.    The Board **approved** the proposed membership and terms of reference.

**Future Cities Catapult** (Paper TSB2014-02-04)

13.    Peter Madden, Keith Clarke and, Richard Miller joined the meeting.

14.    Peter Madden presented the paper and the revised income and impact estimates.

15.    Keith Clarke described some of the international opportunities for the Future Cities Catapult areas of business and explained why he was interested in this area.

16.    In discussion the following issues were raised:

        a.      A number of Catapult programmes had been established to engage SMEs

b. The Catapult was also necessary for bigger firms seeking to engage in this cross-sector space.

c. There were insufficient non-executive directors from potential buying cities. Sir David King was looking at the moment for such a person and one of the executives was from Birmingham CC.

d. The access to finance programme lacked specific process and goals although workshops had been scheduled to address this

e. The Chair had recently met Cities Minister Greg Clark, to whom he highlighted finance the challenges in this area.

f. There was a need to define the finance and infrastructure challenge closely and recognise the limits of scope and capability of the Catapult.

g. Whilst Governments were not opposed to developments in this area, the complex, multi-agency nature makes this a massively complex problem that is inconvenient to deal with in politics.

h. This stage in the Catapult's evolution meant that it was necessary to wait for the opportunities to narrow onto specific cities challenges.

17. The Chair reported Ian Shott's written comments on this revised proposal, which were supportive.

18. The Board **approved** the revised plan.


## Precision Medicine Catapult (Paper TSB2014-02-06)

19. Zahid Latif, Penny Wilson and Chris Ball joined the meeting, and were also joined by Patrick Johnson. Zahid Latif introduced the topic and described the high level proposition, explaining the change in name. Chris Ball presented the details of the business case for the proposed Catapult.

20. Patrick Johnson explained that this was less about diagnostics *per se* and more about underpinning drug development and approval.

21. In discussion, the following comments were made:

a. There was logic to precision medicine improving healthcare delivery as more specific treatments inevitably become more available, but due to the disruptive nature of the technology, this was unlikely to happen without additional support.

b. The delivery of precision medicine requires significant cultural change in healthcare where patients become much better informed about which treatments are likely to help them; where disease is redefined into subsets, leading to a drug approval process revolution, dependent on companion diagnostics. This had not been explicitly picked up in the case, and requires NHS buy-in. Though the NHS has unique clinical databases and can play a key role in the delivery of precision medicine, it is risk-averse when adopting new technologies, and has no roadmap for supporting young companies. It was not clearly explained how it would be possible to get the NHS on board. The NHS is a safe adopter of new technologies. The NHS must become a vehicle for risk and entrepreneurialism. Tackling this issue is a 20 year process and does not clearly fit with the proposed staffing levels and expenditure.

c.  The main opportunity was in linking the "companion" diagnostics to treatment approvals. Companion diagnostics to drug approval make the drugs and the tests integrated

d.  With the commoditisation of diagnostics it was difficult to see how this could deliver economic benefits and get the uptake from diagnostic companies who struggle at the moment to make profits. However, Almac Diagnostics has recently licensed a precision medicine diagnostic to a US company with potential revenues of £175 million per year, so the future profitability of the diagnostic industry may well be different. This comes from linking the "companion" diagnostics to treatment approvals. This linking was a big opportunity.  The Board also noted that a Surrey University company had also licensed a precision medicine product in the USA where the approval process for companion diagnostics is less risk-averse.

e.  If the team had selected some specific diseases this could have helped articulate the UK economic benefit more clearly. Companies could help advise on target areas, based on their anticipated revenue streams from precision medicine.

f.  The proposed staffing did not seem geared towards delivering a cultural change which will take a lot of effort.  The cultural change had already started in the NHS but will take 20 years to manifest.

g.  A consumer market for home tests was a possibility in this space.

h.  There was a need to show in the case that a Catapult would target the biggest issues in healthcare such as obesity.  However, the team commented that precision medicine could relate to obesity.  For example there are many treatments for metabolic syndrome, commonly linked to obesity, and most don't work because they are poorly targeted at unresponsive patients.

i.  There was a failure in the case to differentiate the focus clearly from current diagnostics. The opportunity appeared to be more about diagnosing human differences and less about simple diagnostics. This needed to be articulated better.

j.  The target areas for initial focus had not been well defined in the proposal. There are a huge range of technologies and diseases the catapult could target, but there needs to be more information on which low-hanging fruit could help gain some early wins, and how 140 people could manage the sheer scale of proposed activity. One could imagine using all the staff just to run the proposed biobank.

k.  The team had been waiting for the appointment of the CEO to identify the initial projects but it was difficult to support the case without some numbers on the specific areas in which the Catapult would initially operate. However initial work has suggested that the low hanging fruit were in metabolic syndrome, cardiology, cancer and infectious diseases.

22. Mike Carr, Co-Chair of the IAG commented that it was inevitable that there would be a step change in this market.  Volume was no longer the trend – targeting was.  If business can get on the path earlier they will get a big advantage.

23. The Chair reminded the Board that the task was to agree that the Catapult now move onto the next stage, including appoint the Chair and CEO, and developing the more detailed Business Plan.  He proposed that the Board agree to this with the caveat that the team take on board and address the concerns raised by the Board and keep the Board apprised of the approaches used to address these.  Simon Edmonds

proposed that team continue to work with the IAG to prepare a response setting out a tighter scope, better defined scale, a clearer picture of focus topics and how value would accrue to UK businesses.  The details of the response should be communicated to the Board before a CEO is appointed.  The Board **agreed.**

**Energy Systems Catapult** (paper: TSB2014-02-07)

24.  Rob Saunders and Nick Smailes joined the meeting.

25.  Bob Sorrell, Chair of the IAG commented that the energy system in the UK was going through big changes retiring lots of power generation capacity, developing new renewable supplies.  Demand was changing too, moving to more efficient use.  The systems area (wires and pipes) sat in the middle and needed to be radically changed and this made Energy Systems a significant opportunity in a complex area.  The team had consulted users, generators and the supply chains in between. He reported significant support for the value that could come from a Catapult.  The timing was good and so was UK expertise.  This was a global challenge and so was a global market opportunity.

26.  Rob Saunders presented the context and reason for a Catapult.  Nick Smailes presented the detailed case.

27.  In discussion, the Board sought reassurances about the relationships with ETI and DECC and discussed the need for social scientists in the mix of staff.

28.  The Board agreed that a strong case had been made and **agreed** that the Energy Systems Catapult should move on to the next stage of development.

**Branding**

29.  Aileen Thompson presented the paper.  She made the case that the name of the organisation and its stated offer were holding back communications and proposed a name change to "Innovate UK" with a general new approach to branding the organisation and the more detailed offer.

30.  The Board noted that a charter change was not necessary to begin operating with a new name and that when it became appropriate, a charter change could be enacted through an Order in Council which would be straightforward with ministerial support.

31.  The Board agreed that the proposed new name was right for the organisation and **approved** the new branding approach.  The Board noted that the next stages would include seeking Ministerial support and to look more closely at details of logs, style and other deliver details.

32.  The Board noted that some imminent publications would have the old branding because of publication lead times but expected the progress to be quite rapid once ministerial support was secured.

33.  The Board noted that BIS would like to move faster and complete before the change before the general election communications restrictions.

34.  Graham Hutchins introduced the paper, reminding the Board that the numbers were for end of month 11.  He reported that most issues for the year had been resolved and that nothing new was expected in month 12, although the exact extent would be established once the March 14 month end was completed.  He confirmed that the forecast overspends on programme & administration would materialise.  BIS had expressed disappointment with this outcome. BIS had also confirmed its expectation that Technology Strategy Board would deliver the previously flagged capital under

spend, maintain a tight rein on administration and keep BIS informed of the extent of the potential resource overspend, but had not required any action to prevent it, hoping that this may mitigate some of the pressures in 2014-15.

35. Iain Gray remarked that repeated under-spending in past years had been damaging to the Board's reputation.

36. The Board noted that capital spend given to catapults to avoid capital under spends constituted new commitments and agreed that these should be discussed by the Board and agreed in advance where possible or at least adjustments should be notified (**action**).

37. The Board noted the changes to the top risks set out in the paper.

## Delivery Plan (paper: TSB2014-02-05)

38. Mark Glover presented the paper. He reminded the Board of the planned schedule for publication of the delivery plan and explained the financial uncertainties and risks involved in the plan, especially in the absence of a confirmed budget.

39. He proposed to move forward with the plan on the basis that the capital/resource issue could be managed in discussion with BIS and, should that not work out, he described some contingency actions with the SME support programme that could be taken if necessary. The Board **agreed**.

40. Iain Gray proposed that the Audit and Risk committee take a brief to keep a close watch on progress, looking at the monthly reports.

41. The Board noted a 5% cut to base administration and noted that this would mean making further efficiencies alongside BIS and its other partner organisation. It agreed that this was reasonable in the context of cuts across government and also noted an additional £1.6M for growth in administration for new programmes. The Board commented that it would be impossible to maintain growth in programmes and taking on extra programmes from BIS without appropriate administration support.

## Tour of MTC facilities and projects followed by dinner

42. In informal session, the Board were shown some of the facilities and projects at the MTC. This was followed by a dinner with senior MTC colleagues and a selection of MTC clients.

## Thursday 3rd April

43. The Board discussed the conversations from the previous evening's dinner. It noted the following:

   a. It agreed that it had illustrated well the value of a Catapult as a neutral centre where relationships can be built.

   b. There was a continuing cultural gap between those HVM Catapult centres that had emerged from academic and business facing origins.

   c. The membership model only gives access to one site of the HVM Catapult and this felt wrong. While the legacy of the component institutions' operating models would take some time to resolve, the Board **agreed** that a review of SME access should be a priority (**action**).

## Priorities for Autumn Statement

44. Mark Glover introduced the paper. He explained that the set of ideas for the Autumn Statement was a "long list" that would be narrowed down by removing impractical or ineffective proposals and then focussed on strategic priority. Some projects were ready to go immediately; others would probably be timelier for the 2015 spending review. In discussion the following points were made:

   a. Those that looked at the eight great technologies, including robotics and autonomous systems, were most likely to attract the minister's interest.

   b. The British Business Bank was less likely to go into high risk areas so the Technology Strategy Board must seek to aim is support at the risk gap.

   c. It was good for the Board to have a chance to look at these emerging areas. For the larger programmes, the Board should have some decision making input on how to prioritise the bids. The Board should develop an approved priority "shopping list", on which the Executive can work to match that to political priorities.

   d. While the Autumn Statement process timetable had not yet been published and a new process in BIS was still being worked on, the Board should continue to work on its own priorities and developing support for the highest priorities.

   e. The priorities need to be established with a good understanding of the overall portfolio taking account of a range of factors including risk spread and company size balance.

   f. It was harder to win modest £2-5M bids than more impactful proposal in the order of £250M. Also, the smaller allocations seem to come with more detailed conditions. It would probably be better to make larger more general bids for "innovation".

   g. It would be useful to have an understanding of competing organisations and bids. For example, RPIF and Doctoral Training had been popular, year after year.

   h. For a priority selection process to be useful, it would need to be informed by projected metrics information for the proposed bids. For example, metrics on impact, SME support, university support, sectors, technologies.

   i. There was a need to keep this under review and see how it's moving.

   j. The Bids did not appear to be integrated into the wider investment portfolio. They need to be closely linked with strategy. They should be grounded in emerging technologies from the global research base and then bids should be made more proactively.

   k. The Emerging Technologies and Industries Group looks at a bigger shopping list but there is a tiny budget which can be applied to only 2 or 3 areas but up to 10 would be worthy of investment. The priorities in this area can and have been distorted by lobbying.

   l. More clarity was needed about the respective roles of the Technology Strategy Board and the research councils on the earlier stage ideas. The Technology Strategy Board could be clearer about the triggers that would cause it to be involved

   m. A Darpa-like approach, with the concomitant risk appetite would only be realistic with a Darpa-like budget.

   n. DSTL sees emerging technology work as threat driven rather than opportunity.

o.  Foresight was an important activity that was already making a significant input to the Technology Strategy Board strategic debate.

45. Iain Gray thanked the Board for its input undertook to arrange for Paul Mason to present an overview of the emerging technologies and industries and global challenges work (**action**).

46. The Board agreed that it would like to be kept informed on developments in this area and that it would like to see further contextualising, and to make input to the development of criteria for prioritisation (**action**).

## Strategy Workshop

47. Aileen Thompson introduced the topic of the strategy Workshop by showing short film illustrating the impact the Technology Strategy Board had made in recent years through its past programmes and strategies.

48. The Board split into two groups to discuss the questions raised in the paper over three short sessions, feeding back findings at the end of each session.

49. **First session**: the following comments were reported:

a.  Strategy must be developed in the context an understanding of external factors, particularly and what happens in government and the coming election period

b.  Catapults will inevitably have an influence on strategy.  A key question will be the extent to which they contribute directly to setting the agenda.

c.  Fast change should be the plan rather than revolution or evolution.  A new strategy should continue to be grounded in the current mandate.  We are not doing the wrong things now so we should not be revolutionary but could be more radical with scale.

d.  Significant change in direction will carry risk given current management bandwidth challenges.

e.  The Technology Strategy Board should seek to have a greater influence over the design of the innovation system with a visible thought leadership role.  We cannot expect to be the only voice but can aspire to have greater say.  We have economic evidence and a track record of delivery and can use them to demand a seat at the table.  Influence doesn't come as a right but through delivery performance.

f.  The new strategy needs to be grounded in the technology innovation role.  We should be involved in influencing the skills agenda but only as a sophisticated customer of skills.

g.  An ambition to double the Technology Strategy Board's level of activity over the period of the next strategy was realistic.  The objective must remain UK wealth creation and economic growth.

h.  We need to look at a portfolio approach but a narrowing of focus into only those investments giving the highest projected returns may be politically unacceptable.

i.  There was a strong case for supporting companies and people rather than simply technology projects.

j.  We need to better define the territory we want to occupy and look at those influencer to work with and possibly acquire.

k.    We could be more effective if we had more influence over the early thinking about system design.

50.   **Second session**: the following comments were reported:

a.    Everyone appears to want a catapult as these are politically popular for announcements and likely to attract discretionary funding.  Creating other announcement opportunities may attract funding in other areas.

b.    Catapults are now strong with good boards and CEOs and lots of resources.

c.    Catapult criteria were well defined.  These should be strongly communicated and fully observed.

d.    Catapult metrics were important and it will soon be necessary to start measuring returns and hold them to account.  And to be willing to close them down if necessary.

e.    There was a danger that Catapults become too broad.  Their narrow focus was an asset which kept them on track to deliver economic value.

f.    Catapults should be expected to look to the Technology Strategy Board for increased national resource rather than direct to ministers and departments.

g.    Catapults were an important front door to other Technology Strategy Board programmes.

h.    The Technology Strategy Board already provides extensive SME support.  But a company support approach puts us in danger of being accused of picking winners.  Better, more public criteria were needed for SME support.

i.    Supported companies need to be revalidated over time through further participation in competitions.

j.    Other organisations offer help to SMEs.  How should we link SMEs to them? We should do more to support innovative SMEs but use explicit criteria for who we support and draw lines in the sand to limit the kind of support we can offer, perhaps to the technology innovation space?

k.    Some Catapults are failing to engage SMEs for a range of reasons.  The membership model works against that.

l.    We need to activate the whole toolkit to support SMEs, perhaps through KTNs, maintaining the focus on Technology innovation at all times.

51.   **Third session**: the following comments were reported:

a.    International strategy needed greater precision in its definition. Europe was a special case in the context of the H2020 opportunity and how to secure access.

b.    International strategy has in the past been a lower priority.  It is difficult to build significant impactful bilateral activity with a low level of effort placed in foreign hot spots.

c.    There was a need to be smart about a few specific companies and countries before seeking intelligence and engagement.

d.    International efforts should use overseas resources and assets that already exist though embassies and use them in carefully orchestrated events and processes to get engagement and inward investment.

e.    There was still need to do more in Brussels.  Universities were good at this and have built capability over time with excellent results.  UK business has

engaged embarrassingly poorly when compared with those from other countries. Effective Brussels engagement needs a huge amount of effort. Maybe this could draw on academic networks we already have.

f. Feedback on the limited full time presence in Brussels has already been very strong. If this is to be grown it should be benchmarked to understand the impact.

g. Past efforts to impact Brussels policy through AAL and photonics to the benefit of UK business have been very successful.

h. Once opportunities in Brussels exist the Technology Strategy Board work is limited to signposting but we don't do coaching or mentoring.

i. The broader international context, in particular EU, USA & India, also takes a lot of effort, sending people out to learn and bring back new ideas.

j. It would always be easier for the Technology Strategy Board to target its sub-national efforts regionally rather than at the local LEP level where there would be too many players to manage and through which we would be constantly swamped with requests for funding.

k. The regional approach could use existing assets to link with major areas and university networks and LEPs.

l. A better understanding was needed for primary motivation on local engagement.

m. Use of interesting assets to improve outreach to inspire the next generation of innovators was a possible new activity.

n. A more structured approach to strategic portfolio management would help. Iain Gray agreed to organise exposure to the whole portfolio over forthcoming Board meetings (**action**).

52. In conclusion, the Chair thanks the Board for its engagement in this strategy workshop process and encouraged members to continue to feed emerging thoughts in through Mark Glover. He encouraged Board members to volunteer for closer consultation and act as a sounding board in specific areas. The following were agreed:

a. Communications: Phil Smith

b. Architecture of innovation system: Mike Carr, Iain Shott

c. Catapults and SME access: The Catapult Committee

d. SMEs: Sara Murray (and the Board expected Doug Richard to take an interest here also)

e. International: Bob Sorrell

f. Local and Regional: Stewart Davies

g. Outreach: David Grant

h. Portfolio management: Hazel Moore

53. The Board suggested that a useful next step might be to develop some polarising scenarios, looking at how opposite extreme approaches might work.

**Closed session**

54. **CEO Recruitment**: The Board noted the current situation regarding the CEO recruitment process and asked to receive the brief as soon as it can be provided by BIS (**action**).

55. **Board membership changes**: the Board noted the situation regarding extension of some current members and recruitment to replace others.

56. **Recruitment of executive directors**: the Board noted the situation regarding recruitment to three executive director positions and agreed that good progress was being made.

57. **Talent Review**: The Board asked when it could expect to see another talent review. It was suggested that a more forensic audit process on calibre and competence should be considered, tied in to the strategy review (**action**). Iain Gray reported on the past exercise and provided an update on the current activities in this area.

**Summary of decisions and actions:**

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| 1 | **approved** the proposed membership and terms of reference of the Catapult Committee [*paragraph 12*] | | |
| 2 | **approved** the revised plan of the Future Cities catapult [*paragraph 18*] | | |
| 3 | **Agreed** that the Precision Medicine Catapult should continue to the next stage of development on condition that some scope and scale issues are addressed [*paragraph 23*] | | |
| 4 | **Agreed** that the Energy Systems Catapult should move on to the next stage of development [*paragraph 28*] | | |
| 5 | **Agreed** the proposed new name for the organisation and **approved** the new branding approach subject to ministerial approval [*paragraph 31*] | | |
| 6 | Capital spend given to catapults to avoid capital under discussed by the Board and agreed in advance [*paragraph 36*] | Graham Hutchins | ? |
| 7 | **Agreed** the financial risk basis for continuing with the proposed Delivery Plan [*paragraph 39*] | | |
| 8 | Review SME access to HVM Catapult in the context of the legacy membership structure [*paragraph 43c*] | Simon Edmonds | ? |
| 9 | Arrange for Paul Mason to present an overview of the emerging technologies and industries and global challenges work [*paragraph 45*] | Guy Rickett | October 2014 |
| 10 | Keep the Board informed on developments in Autumn Statement opportunities, provide further contextualising, and invite the Board to make input to the development of criteria for prioritisation [*paragraph 36*] | Mark Glover | July 2014 |
| 11 | Circulate the CEO recruitment brief [*paragraph 54*] | Guy Rickett | April 2014 |
| 12 | Undertake an audit of calibre and competence of the team, tied in to the strategy review [*paragraph 57*] | Iain Gray | December 2014 |