

HM Treasury Taskforce

Implementing Baker: Developing the
Bridge between Public Sector Science
and the Market

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EXECUTIVE SUMMARY

1.1 INTRODUCTION AND BACKGROUND

- 1.1.1 The Baker Report published in August 1999, identified the need and opportunity to commercialise government intellectual property arising from publicly funded research output in the Public Sector Research Establishments (PSREs). The Government's response to Baker will advocate a wide range of measures to support commercialisation.
- 1.1.2 The Baker Report recognised that more could be done to ensure that opportunities for translating research into jobs and prosperity are identified and exploited. These include mechanisms for spreading best practice, assisting in identifying and managing Intellectual Property (IP) and access to commercial skills to deliver value for money for technology-based business ventures.
- 1.1.3 One early commitment made in the 1999 Post Baker Review was to look at the role which a central commercialisation unit could play in improving commercialisation, for example, by developing demonstrator pilot projects.
- 1.1.4 The Treasury Taskforce provided some support for PSREs in commercialisation of their IP as part of its role in assisting public-private partnerships (PPPs) developed under the government's Wider Markets Initiative.
- 1.1.5 Drawing from the Baker findings and recommendations, the Treasury Taskforce in consultation with the Office of Science and Technology has engaged in a market scoping study to assess the levels and type of support required for the commercialisation of research output from PSREs. In particular, the study considers the potential role of Partnerships UK (PUK), the successor to Treasury Taskforce, as a vehicle for the provision of appropriate commercial support into this market.

1.2 THE BAKER REPORT

- 1.2.1 The Baker Report made a number of specific recommendations, including:-

'PSRE chief executives must ensure that they have access to the skills and experience they need for knowledge transfer' (paragraph 7.5),

'Minister's should consider creating a small expert unit within central Government to drive forward the knowledge transfer agenda - and provide advice, help and encouragement to PSREs and their sponsors on knowledge transfer - particularly in relation to larger or more complex deals' (paragraph 7.10) and

'Sponsors of PSREs should encourage the development of networks among PSREs for sharing best practice in knowledge transfer and to promote synergies (paragraph 7.13).

1.3 PARTNERSHIPS UK

- 1.3.1 Partnerships UK has been established by the Government as a joint venture between the Treasury and the private sector to develop the potential of public private partnerships (PPPs) across all sectors. Partnerships UK is the successor to the projects arm of the Treasury Taskforce and supports significant PPPs (including Wider Markets and PSRE sponsored PPPs) by assisting with business cases, identifying and negotiating with suitable partners and generally providing experienced commercial management support to the public sector. PPPs are seen by the Government to have a key role to play in enabling the public sector to make most efficient use of its assets (including IP) and to derive best value for money from its engagement with the private sector.
- 1.3.2 Given the public sector mandate of Partnerships UK in the PPP market, it is clear that PUK could offer an important intermediary role in supporting PSREs in commercial activities – in part a continuation of the support provided by the Treasury Taskforce. For example, the principles underlying the structuring of sound commercial deals for the public sector in PPPs, which take account of the numerous constraints (e.g. financeability, government policy, management control, private sector capacity to bear risks etc.) are common to all sectors. Accordingly having established Partnerships UK as a dedicated centre of excellence in these disciplines, it should be a natural base from which to support PSREs in their engagement with the private sector in commercialising IP. This presents the opportunity to transfer private sector acumen through the core competencies of Partnerships UK personnel in forging commercial deals.
- 1.3.3 Partnerships UK is currently developing its detailed business plan and so it is timely to assess the extent to which its activities in support of science and technology PPPs can be scoped so as to address the relevant recommendations of the Baker Report.
- 1.3.4 The scoping study recognises the broad thrust of Baker's recommendations but has made detailed enquiries to assess the specific needs and gaps in existing arrangements for realising the economic potential from PSREs. Given time constraints, this represents a necessarily limited review and is not an exhaustive attempt to identify all the inherent challenges facing PSREs with respect to commercialisation.

1.4 THE SCOPING STUDY - BROAD FINDINGS

- 1.4.1 An important finding from the study is that there is a clear '**funding and development gap**' facing the commercialisation of PSRE projects. Although Baker recognised that many PSREs are already engaged in a substantial number of commercial projects, the study has shown that the full potential of these economic opportunities are challenged by obstacles to developing commercial projects.

'Funding Gap'

- 1.4.2 The scoping study identified 3 stages of technology transfer activities that required development and funding support:-

Stage I – Creating, identifying and protecting intellectual property. Many PSREs indicated that they lacked both the resources and skills to determine whether research output developed had real commercial value. In many cases, PSREs have funded these activities from their own resources. However, there were cases where PSREs were unable to dedicate adequate resources (financial and non-financial) or lacked the necessary skills to undertake Stage I activities.

Stage II – Preparing a project for market. When PSREs have identified a commercial project, a substantial amount of further development and funding work is required to test ‘proof of concept’ activities and to assess, critically, the robustness

and market feasibility of a project and to develop first stage business plans. Again, an inability to undertake this type of routine activity can act as a major limitation to the PSREs ability to progress significant projects.

Stage III - Bringing a project to market. This Stage involves putting in place the funding and partnership arrangements which will complete the commercialisation process. In private sector terms, this is normally the stage at which venture capitalists or business angels may invest.

- 1.4.3 In the absence of complete market information, it is impossible to say with any degree of certainty how big the funding gap is. Typically, evidence suggests that 1% of R&D spend should be dedicated to technology transfer for Stage I and II activities. Given that the civil annual R&D spend on PSREs is £1.4 billion, the total funding gap can be estimated to be around .£14 million per annum.
- 1.4.4 Meeting the ‘funding gap’ with adequate financial resources can be seen as preparing technology to warrant investment, for example to strengthen the patent claims, validate technology and seek out complementary technology (‘packaging’). The output of such funding will better inform exploitation decisions and thereby add financial worth/value whether the technology is ultimately used to aid creation of a company or to enhance the prospect of licensing.
- 1.4.5 Overall it was found that the requisite structures, skills and financial resources are not readily available in PSREs to take scientific and technology projects from the laboratory and into the commercial environment – or – from bench to market.

‘Development Gap I’: Structural and Governance

- 1.4.6 A number of structural and governance issues will need to be addressed with respect to developing a commercialisation agenda in PSREs. These include:

PSREs are not organised as business units. The movement towards harnessing the skills and intellectual assets arising from the science base to achieve commercial gain will require changes to objectives and performance criteria of PSREs;

uncertain governance with respect to commercialisation. This is most often evident in questions about the right of a PSRE or staff to take equity or issues of Intellectual Property ownership, where research output is generated from a variety of different funding sources;

commercial exploitation is not driven by current priorities. Thus, key drivers for commercialisation were in many cases not explicit. PSRE Boards are interested in fulfilling the remit that they have been set which, at present, lacks a commercial dimension. Unless Ministerial support for changing objectives is procured, it is unlikely that commercialisation will be embraced.

'Development Gap II': Commercial Expertise and Support

- 1.4.7 **PSREs welcomed the opportunity to access training and mentoring from experienced experts in the practicalities of commercial product/service development.** The scoping study found a real need and demand for a dedicated commercialisation unit to provide a responsive service with quick guidance on principles, where to find more advice and access to case histories.
- 1.4.8 **Accessing the right skills and expertise.** PSREs, in many cases, face a skills deficit with respect to commercialisation activities, or are seriously under-resourced to either build capability in-house or buy in relevant consultancy or legal services where appropriate.
- 1.4.9 **Absence of early stage development support.** It was found that many PSREs feel that support for developing commercial ideas and progressing projects to a point where private sector interest can be developed was not available. It was considered that providing support of this nature would be particularly beneficial.

1.5 OVERALL CONCLUSIONS

- 1.5.1 A commercialisation agenda will only be progressed if Ministerial direction is given to the performance criteria for PSRE current strategy. Unless this is effected, both PSRE Boards and Civil Servants are unlikely to encourage commercialisation projects.
- 1.5.2 A self-organised Association of PSREs could greatly strengthen the position and ability of the PSRE community to high-light development issues. This could be Chaired by an independent representative of the PSRE sector with a direct reporting line to Government to reflect outcome of discussions. This is a necessary vehicle for raising the overall profile of PSREs within Government and would operate as a effective medium of communication.
- 1.5.3 An overall 'Champion' for the PSRE group could greatly raise the profile of PSREs for cross-cutting government policy. To date, the PSREs have not been viewed as a distinct group and have fallen out of the 'loop' of many policy initiatives that would have great benefit to the PSRE community. A 'Champion' could ensure that PSREs remain firmly at the fore-front of enterprise led policy developments taking place in other parts of government.
- 1.5.4 In line with a commercialisation agenda, some PSREs will need to be encouraged to consider their own internal business development strategy and make available appropriate resources to buy the relevant expertise to assist this process. In many instances, this will be an important step towards the development of a pipe-line of commercial projects from current public sector scientific and technological activity.
- 1.5.5 Unless an holistic approach across Government to the 'development and funding gap' is adopted the prospects for the commercialisation of intellectual property arising from public spend in the PSREs will continue to be thwarted. The establishment of a commercialisation unit to support this market can only be effective if the other, complementary issues, are also addressed.
- 1.5.6 The 'Funding Gap' is a critical issue; left unaddressed will greatly reduce the potential of projects arising from PSRE intellectual property. This issue should be addressed by Treasury without delay with a view to establishing a dedicated fund to prepare technology so that it can warrant further investment. The output of such funding will better inform exploitation decisions and thereby add financial worth/value whether the technology is ultimately used to aid creation of a company, or to enhance the prospect of licensing. The business case developed suggests that this gap amounts to c.£14million p.a. and will need to reflect the discipline of the private sector in terms of managing the fund, but cognisant of the development requirements and the market intervention need.

- 1.5.7 In PSREs where commercial thinking is more progressed, support in ensuring the best value for money from commercial deals is brokered will be an area where Partnerships UK will, more typically, be able to provide support.
- 1.5.8 Given the work of the Treasury Taskforce with a number of PSREs to date and based on evidence on 'burning projects' within the group during the round of interviews and data collection, it is very clear that with small amounts of investment and re-focusing of policy and development support, a considerable amount of additional value could be generated from public spend in the PSRE sector.

1.6 RECOMMENDATIONS

- 1.6.1 Government should consider the proposed solutions to addressing both the funding and development gap presented in this study.

'Funding Gap'

- 1.6.2 Regarding **Stage I** activities, the cost of commercialisation to PSREs should be addressed by government and relevant sponsor departments. PSREs will need to identify potential opportunities and resource to explore these opportunities with the appropriate specialist advice from the market place.
- 1.6.3 If commercialisation is to be adopted as an overall objective for PSREs and of public sector science spend, government should consider a cross-cutting review of the current mission statements of PSREs to recognise this explicitly.
- 1.6.4 Treasury should consider the proposed business model presented in this study as a basis for developing a dedicated Technology Fund for PSRE projects (**Stage II**). This 'pre-VC' Fund should be managed using the disciplines of the private sector but combining a 'softer' approach than traditional Venture Capital expectations. Such a Fund, once established, will require rapid decision making. The choice of location of such a Fund should be the next step for government in progressing this process.
- 1.6.5 Partnerships UK could naturally be involved in Stage III activities following the experience and expertise of Treasury Taskforce in its PPP activities to date and Partnerships UK prospective role in co-sponsoring activities in other sectors.

Development Gap I': Structure and Governance

- 1.6.6 A series of Seminars organised by Treasury and OST/DTI should be rolled out to inform and educate the PSREs of current changes taking place with respect to the government response to the Baker Report, the Science and Innovation White Paper and in light of this scoping study, the government's response to the main support requirements of this sector.
- 1.6.7 An Association of PSREs independently chaired and organised by the PSREs themselves, with a direct reporting line to government, would be a useful medium for communicating current issues for the PSRE group.
- 1.6.8 A 'Champion' could be selected to represent the PSRE group across wider government policy groups to ensure adequate representation is made and that PSREs are viewed as a critical component of the UK Science, Engineering and Technology infrastructure.

Executive Summary...

- 1.6.9 Treasury could develop common guide-lines for PSREs and individuals taking equity stakes in businesses.
- 1.6.10 OST/DTI could usefully consider the range of enterprise programmes that are currently available to the Higher Education Sector but which preclude PSREs. In addition, address the definition of PSREs for specific schemes (business or institutional). This would be an important step forward in supporting the PSREs in commercial projects.
- 1.6.11 An across Government review could usefully address the competing priorities and objectives of the PSRE public good role and that of commercial exploitation and technology transfer.
- 1.6.12 An across Government review could look at raising the profile and awareness of Wider Markets Initiatives in relevant departments and consider appropriate training for core.
- 1.6.13 An across Government review could address the issue of IP assignment when more than one sponsor is funding a PSRE.
- 1.6.14 OST could address the training deficit facing PSREs – particularly with respect to improving core commercial skills such as preparation of outline business plans.

'Development Gap II': Commercial Expertise and Support

- 1.6.15 A commercialisation unit dedicated to the PSRE sector should be set up in Partnerships UK. This service is a logical and natural extension of the Treasury Taskforce activities. The study has identified a number of services that will be particularly beneficial to the PSREs for commercialisation. The delivery of services provided by this Unit should be formalised by creating specific roles for example, by providing a help desk, undertaking a number of services for the PSRE sector such as developing tools to assist PSREs in their commercial route to market and increasing resources to offer broader coverage of the PSRE sector than is currently provided.
- 1.6.16 Partnerships UK should act as a bridge, insofar as there are gaps between the PSREs and the market which it can fill, but in other respects act only as a catalyst by which PSREs may access the full range of private sector resources available – technical and financial.
- 1.6.17 The initial minimum resource requirement level for the Science, Technology and Equipment team of Partnerships UK needed to make a credible impact on the PSRE sector comprises is: one senior transactor to support business case development, commercial negotiations, private sector partner selection and access to private sector finance; and one assistant whose responsibilities would include building awareness with all PSREs of available routes to market and gap support available from Partnerships UK and other arms of government. These resources would form the foundation of a commercialisation unit for PSREs and will be expanded progressively in response to demand.

Supporting the PSREs Action Plan: Service Delivery and Responsibilities for primary tasks

TASK	RESPONSE
'Funding Gap'	
Stage I – (Creating, identifying and protecting intellectual property) developing IP strategies; identification of ideas etc.	<i>OST to work with PSREs on benchmarking the scope and success of existing Stage 1 activities</i>
Stage II – (preparing a project for market) Technology Fund	<i>Treasury assess the location of a Technology Fund to be made available to PSREs and their advisors for further Proof of Concept activities</i>
Stage III – (bringing a project to market) Commercialisation and Partnering	<i>Offered as part of Partnerships UK services</i>
'Development Gap I': Structure and Governance	
Benchmarking on IP auditing/evaluation best practice in PSREs	<i>Office of Science and Technology commissions feasibility study OST/PUK/Treasury Seminar Programme</i>
Best practice on interpreting and extending on the Baker recommendations	<i>Promulgate Baker response, White Paper and Scoping Study action plan OST/PUK/Treasury Seminar Programme</i>
Best practice with regard to rewards to inventing staff	<i>OST progressing OST/PUK/Treasury Seminar Programme</i>
PSRE PR, marketing and communications and Brand positioning in science and technology industries	<i>OST/PUK/Treasury Seminar Programme</i>
Changes to Civil Service Management code to free up PSRE in commercialisation	<i>Cabinet Office progresses OST/PUK/Treasury Seminar Programme</i>
IPR Roadshow – Guidelines and Ownership	<i>Guidelines are progressing OST/PUK/Treasury Seminar Programme</i>
Training: - preparing business plans - patent law, applications and maintenance - promoting an entrepreneurial culture in staff - costing and pricing structures for professional services	<i>OST/PUK/Treasury Seminar Programme</i>
Commonality and principles concerning Government equity share in commercial ventures	<i>Treasury/PUK to develop</i>
Opening up Enterprise schemes to PSREs. Maintaining awareness of the range of mechanisms available from within government, EU and regional development organisations to support business development	<i>DTI/Other Departments</i>
A cross government view on IP assignment	<i>Draft guidelines to be finalised</i>
Reconciliation of the competing priorities and objectives of the academic approach with that of commercial exploitation and tech transfer and reflected in mission statements, performance criteria and objectives	<i>Departments to review PSREs' mission statements; promulgation of new IP guidelines</i>

Increase understanding in departments of Wider Markets projects and provide key training for core department staff	<i>OST/PUK/Treasury Seminar Programme</i>
A Champion selected to progress PSRE profile and representation on government committees for issues of interest to PSRE development	<i>To be announced in Government's response to Baker</i>
An Association of PSREs is set up to act as a medium to government on issues facing PSRE community with respect to development	<i>OST to consult Departments</i>
Reducing the concerns of core departments of WM projects	<i>OST/PUK/Treasury Seminar Programme</i>
Assistance in mentoring and partnering	<i>PUK Service</i>
<i>Development Gap II: Commercial Expertise and Support</i>	
Quick, responsive service to the PSRE sector to assist in guidance on principles, what is permissible and what is not, where to find more advice, access to relevant documents and case histories and act as a sounding board for ideas and problems.	<i>To be set up in Partnerships UK. This will continue the work of the Treasury Taskforce in developing demonstrator projects to build up capability and knowledge on PPPs in the science and technology markets.</i>
Develop a 'diagnostic tool' – on-line proforma to assist PSREs in shaping commercial proposals in Wider Markets Areas (for example, self-assessment - 'questions to ask of your project' etc. to assist PUK/PSREs and advisers.	<i>'Help desk': (PUK to develop)</i>
Following on from 'proforma' - Early stage advice on best route to exploitation/market	<i>'Help-desk': PUK service</i>
Commercial agreements – help develop templates for shareholders agreements, draft clauses, best practice on confidentiality agreements, JV agreements and licences	<i>'Help desk': (PUK to develop)</i>
Advice on structures of commercial vehicles – in particular joint venture and spin-off companies and licensing	<i>PUK service</i>
Development oversight and provide support to PSREs on complicated and challenging projects due to institutional issues (for example vires) creating problems finding route to market.	<i>PUK service</i>
Source of information/point of contact on commercial funding/equity advice. Information on and contacts with VC organisations and other institutional investors.	<i>PUK to develop service</i>
A sign-off service for deals which are not large and complex – providing sign off/commercial comfort to HMT for newly active PSREs embarking on first deals	<i>PUK service</i>
Advice on due diligence procedures	<i>PUK current service</i>
Investigate a professional services web-based directory including: lawyers and financial advisors specialising in IP commercialisation. Private sector funded and delivered.	<i>OST feasibility study to test desirability</i>
Assistance in mentoring and partnering to people closing deals	<i>PUK current service</i>