

Final Report, February 2011

Sixth Annual Survey of Knowledge Transfer Activities in Public Sector Research Establishments (PSREs)

Report to the Department for Business Innovation and Skills

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1. Introduction

This report presents the results of the sixth (2008/09) annual survey of knowledge transfer activities in Public Sector Research Establishments (PSREs). It is based on the results of a questionnaire circulated to all PSREs and provides both numerical data and more qualitative indicators of knowledge transfer activities for the 2008/09 financial year.

The survey was designed and managed by the Department for Business Innovation & Skills (BIS). Technopolis, a private consultancy specialised in research and innovation policy and evaluation, was contracted to administer the survey, prepare and analyse the data and report on the results.

In conformance with previous years, this report is structured in three further sections as follows:

- **Section 2** sets out background information on the questionnaire design and administration, the target population and the response rates obtained
- **Section 3** presents findings on a number of key performance indicators for knowledge transfer, developed to permit comparison with data gathered through the annual higher education-business and community interaction survey (HE-BCI). Comparisons are also made with values obtained for the performance indicators in PSRE surveys carried out in previous years
- **Section 4** presents findings for all the other main sections of the questionnaire

The questionnaire can be found in **Appendix A** and a list of the responding organisations is given in **Appendix B**.

Technopolis would like to express its gratitude to all organisations and individuals that have provided data and information for this year's survey.

2. Background to the Sixth Annual Survey

2.1 PSREs and knowledge transfer

2.1.1 PSREs

PSREs are a diverse collection of public bodies carrying out research. This research supports a wide range of Government objectives, including informing Government policy making, statutory and regulatory functions and providing a national strategic resource in key areas of scientific research.

The PSREs covered by this exercise fall broadly into two groups: those that are part of, or directly sponsored by, Government departments; and those that are part of, or directly sponsored by the UK Research Councils. For the purposes of analysis, the first group has been sub-divided into three groupings, giving the following (4) categories of PSRE:

1. **Cultural Institutions** are those funded by the Department of Culture, Media and Sport (DCMS), although they may also receive funding from other sources (such as the National Lottery). They comprise art galleries, museums, and arts and heritage organisations, and have been put into their own category due to their relatively low levels of research and innovation activity
2. **NHS Regions** are not institutions as such but relate to the research activities of all NHS Trusts within a given region of the UK. In the last few years the Department of Health has established 'innovation hubs' to provide an innovation management service for most if not all of the NHS Trusts within a given region. It is these Innovation Hubs – with support from the Department of Health - that have responded to the survey on behalf of the trusts within their region
3. **Departmental Research Bodies** represent all other Government Department PSREs not covered by the first two categories
4. **Research Council Headquarters & Institutes.** The headquarters' operations are responsible for administration and management of research funding and as a general rule do not themselves carry out research. The institutes (also known as centres / units) are the main research bodies performing intramural research on behalf of the parent Councils. They may either be 'owned' by the parent Research Council, receiving the great majority of their income from that source, or they may have a more distant relationship, being treated as 'centres of excellence' and receiving a block grant representing only a minority of their overall research funding

2.1.2 Knowledge transfer

There are a variety of PSRE 'knowledge transfer' activities. Free dissemination of research outputs tends to be the primary means of knowledge transfer, with benefits accruing to industry and wider society more generally, rather than to specific businesses. Other routes include research collaborations and contract research on behalf of industry, the licensing of technology to business users, the sale of services, data and software, and the formation of joint ventures and spin-off companies.

Some years ago, the Government established a basket of indicators to measure the responsiveness of the research base to the needs of the economy and public sector. These are being used to track performance over time and will allow cross-comparison with data emerging from the HEI sector as a result of the annual higher education-business and community interaction survey (HE-BCI).

The eight core indicators that are relevant to PSREs are:

1. Business representatives on governing bodies
2. Full time equivalent staff employed in commercialisation / industrial liaison offices
3. Number of patent applications
4. Number of patents granted
5. Number of licensing agreements
6. Income from IP licensing
7. Number of spin-offs
8. Income from business consultancy

Individual indicators may vary in importance from one PSRE to another.

Although the survey focuses on these indicators, it is important to recognise that the PSREs also have a wider impact through, for example, contributing to the development of government policy and in providing advice to businesses and other organisations. Therefore, in addition to these indicators, this survey has included a number of other questions, which taken together are intended to provide a more comprehensive picture of PSRE KT activities.

2.1.3 Survey design

The original questionnaire design used in the 1st annual survey was developed by the (then) Department for Trade and Industry (DTI) in 2004 with input from a wide range of PSREs, and was further extended and improved for the 2nd annual survey through a workshop-based consultative process. The questionnaire used for the 3rd annual survey was largely based on those used in previous years, but with the introduction of a small number of additional questions and other adjustments aimed at improving the data collection process. This version of the questionnaire has since remained largely unchanged throughout the 4th, 5th and 6th annual surveys. The final form of the questionnaire used in the 6th annual survey is reproduced in Appendix A

2.1.4 Survey administration

Technopolis Ltd was awarded the contract to provide BIS with the following services:

- Issuing the survey to PSREs, dealing with enquiries and encouraging returns
- Verification of the data received in order to ensure its integrity
- Analysis of the submitted responses
- Provision of a report setting out the survey results, including performance against the eight Science and Innovation Framework indicators

2.2 Survey response rates

A total of 143 PSREs were identified as being in scope for the sixth annual survey. As was the case in previous years, some respondents arranged to prepare a ‘joint’ submission with data covering more than one PSRE. This most commonly happened with Research Councils and their institutes, specifically:

- The Medical Research Council (MRC) arranged for MRC Technology to provide a consolidated response covering all 53 MRC centres / units plus the headquarters operation (54 PSREs)
- The Science and Technology Facilities Council (STFC) was created in 2007 through a merger of the Council for the Central Laboratory of the Research Councils (CCLRC) and the Particle Physics and Astronomy Research Council (PPARC). STFC provided a consolidated response covering the STFC Headquarters, 3 CCLRC laboratories and the UK Astronomy Technology Centre (5 PSREs)
- The Institute of Food Research and the John Innes Centre each submitted a response that together included information for Plant Bioscience Ltd (1.5 PSREs each)
- The Scottish Crops Research Institute and Biomathematics and Statistics Scotland submitted a joint response (2 PSREs)

In addition, the National Centre for Earth Observation – a recently established centre formed from the merger of four PSREs (Data Assimilation Research Centre; Environmental Systems Science Centre; Climate and Land Surface Systems Interaction Centre; Centre for Terrestrial Carbon Dynamics) - submitted a single response (1 PSRE).

A total of 84 questionnaires were mailed (covering the 143 identified PSREs), and 73 completed questionnaires were returned – an 87% response rate. The completed questionnaires provided data on the knowledge transfer activities of 132 PSREs, representing 92% of those included in the scope of the survey.

As indicated above, the PSREs have been divided into four groups for the purpose of analysis. Figure 1 provides a breakdown of the response rates by type. The response rate was highest for Research Council HQs and Institutes, with 99% of the PSREs providing a completed response. High response rates were also obtained from the Departmental Research Bodies (89%), NHS Regions (85%) and Cultural Institutions (77%).

Figure 1 Survey response rates

Type of PSRE	Number of PSREs in scope	Number of PSREs responding	Response Rate
Cultural Institutions	22	17	77%
Departmental Research Bodies	28	25	89%
NHS Regions	13	11	85%
Research Council HQs and Institutes	80	79	99%
Total	143	132	92%

We consider the overall response rate of 92% to be extremely high, given that this is a voluntary exercise and it is a non-trivial task for PSREs to provide the data requested. The overall response rates in the previous annual surveys were 78% (1st annual survey), 81% (2nd), 94% (3rd), 90% (4th) and 86% (5th).

The 11 non-responding organisations were emailed and telephoned on several occasions with a request for them to participate. In roughly half of these cases, the contact person signalled an intention to provide data, but they were unable to for reasons of data availability and/or competing demands on their time. In the remaining cases the targeted individuals provided no response of any sort.

2.3 Data analysis

On receipt of completed questionnaires, checks were made to validate the data. An initial scan was conducted, followed by a comparison of responses received to identify any significant ‘outliers’ that might require further verification. Where potential anomalies were identified these were clarified and where necessary corrected in discussion with the PSRE itself.

Following the process of validation, the individual returns were combined into a full dataset, in Microsoft Excel format, analyses were conducted and the report was prepared.

3. Science and Innovation Framework Indicators

As part of the *Science and Innovation Investment Framework 2004-2014*, the Government established a basket of eight indicators to measure the responsiveness of the research base to the needs of the economy and public sector.

Figure 2 below lists the eight indicators and presents two figures from the current (sixth) survey for each: (i) a ‘raw’ figure showing the sum of values supplied to us by the responding PSREs, and (ii) a ‘grossed-up’ figure for the indicator to take account of missing values and compensate for the PSREs who did not respond. This figure is calculated on the assumption that, on average, organisations that have provided a particular data item are representative of all organisations in their particular group¹. The raw figures may be taken as a lower bound for the indicator in question, while the grossed-up figure represents an improved estimate, providing a better basis for cross-sectional and longitudinal comparisons. Given the excellent response rates obtained we would expect the grossed-up figures to be a good approximation of the actual true figures that would have been obtained had all of the PSREs responded to the survey and answered all of the questions. The final column shows data from the recent (2008-9) Higher Education-Business and Community Interaction (HE-BCI) survey, allowing some PSRE/HEI comparisons.

Figure 2 Performance Indicators

	PSRE ‘raw’ data 2008-9	PSRE ‘grossed-up’ values 2008-9	HEIs 2008-9
Business representatives on governing bodies (%)	31	34	36
FTE staff employed in commercialisation offices	448	534	4,093
Number of patent applications	392	505	2,097
Number of patents granted	230	303	653
Number of licensing agreements	2,579	2,920	4,463
Income from IP licensing	£198m	£291m	£56m
Number of spin-outs	83	99	191
Income from business consultancy	£100m	£165m	£141m

Figure 3 shows the latest PSRE and HEI data on a *per-institution* basis, derived by dividing the corresponding figures in the above table by the respective numbers of institutions covered (158 HEIs and 143 PSREs, to which the ‘grossed up’ figures apply). This shows that on this basis, HEIs have higher values than PSREs for each indicator except income from IP licensing and income from business consultancy. It is worth noting, however, that the HEI data relates to significantly greater volumes of R&D activity than is the case for PSREs.

¹ An item of data may be missing either because a PSRE has not returned a questionnaire, or because the particular data item has not been supplied. In view of the latter, ‘grossing up’ factors vary between particular data items.

estimated number of licences and options executed in the year is 2,920, and the cumulative portfolio stands at 8,044. Research Council Institutes account for over half of the cumulative executed licences and options. A small number of organisations within each category account for the vast majority of the figures. Income from licensing activity is presented in Section 4.3.5.

Figure 20 Licence options and licences executed⁴

	Number of licence options and licences executed in this year		Cumulative portfolio of executed licence options and licences	
	Raw survey data	Grossed-up values	Raw survey data	Grossed-up values
Cultural Institutions	49	67	106	167
Departmental Research Bodies	310	434	2,165	3,031
NHS Regions	87	113	263	342
Research Council HQs & Institutes	2,133	2,306	4,223	4,505
Total	2,579	2,920	6,757	8,044

4.3.5 Creation of spin-offs and start-ups

The survey explored PSRE activity with respect to the creation of spin-off and start-up firms. A number of different types of spin-off and start-up were identified, as follows:

- Those with some PSRE ownership, using intellectual property from the PSRE
- Those with no PSRE ownership, where the PSRE has assigned or licensed IP
- Staff start-ups, where current or former PSRE staff are company founders, and where the PSRE has neither ownership nor an IP agreement with the company

Figure 21 and Figure 22 present data for the number of firms established in each category and the number still active after three years, as well as data on the employment, turnover and investment secured in association with the active firms.

Across the three categories of firm, a total of 83 new spin-offs were notified by responding organisations, the total (grossed-up) estimate being 98. Spin-offs where there is some PSRE ownership are the most numerous of the three types, accounting for more than half of new firms established. Research Council Institutes are the dominant category of PSRE with respect to the creation of spin-offs, though Departmental Research Bodies and NHS regions are also active. No single PSRE stands out as being particularly successful in producing spin-offs, with only a handful of PSREs having established three or more spin-offs.

Using grossed-up figures, employment across all active spin-offs is estimated at over 4,850, and current annual turnover at over £63m. Based on the figures supplied we estimate that nearly £28m in external investment has been secured for the spin-off companies generated by PSREs.

⁴ A new definition of licensing agreements covered excludes the large number of agreements by cultural institutions for licensing copyright images to third parties. Figures have been amended to incorporate this change.

Figure 21 Spin-offs and start-ups – Raw survey data

	Spin-offs with some PSRE ownership		Spin-offs not owned by PSRE		Staff start-ups		Current employment of all active spin-offs	Current turnover of active spin-offs (£k)	External investment secured for spin-offs (£k)
	Number established in 2008/9	Total number established that are still economically active after 3 years	Number established in 2008/9	Total number established that are still economically active after 3 years	Number established in 2008/9	Total number established that are still economically active after 3 years			
Cultural Institutions	-	-	-	-	2	2	-	10,200	-
Departmental Research Bodies	10	10	1	2	5	2	192	1,660	6,386
NHS Regions	5	13	3	3	-	-	17	1,800	2,640
Research Council HQs & Institutes	30	33	16	15	11	10	4,170	6,509	985
Total	45	56	20	20	18	14	4,379	20,169	10,011

Figure 22 Spin-offs and start-ups – Grossed-up values

	Spin-offs with some PSRE ownership		Spin-offs not owned by PSRE		Staff start-ups		Current employment of all active spin-offs	Current turnover of active spin-offs (£k)	External investment secured for spin-offs (£k)
	Number established in 2008/9	Total number established that are still economically active after 3 years	Number established in 2008/9	Total number established that are still economically active after 3 years	Number established in 2008/9	Total number established that are still economically active after 3 years			
Cultural Institutions	-	-	-	-	3	3	-	22,440	-
Departmental Research Bodies	13	14	1	3	7	3	299	3,576	14,901
NHS Regions	7	17	5	5	-	-	44	4,680	6,864
Research Council HQs & Institutes	32	36	18	17	12	11	4,508	32,545	6,062
Total	52	67	24	24	22	17	4,851	63,241	27,826

4.3.6 Revenue generating agreements

PSREs were asked to provide data on the numbers of revenue generating agreements they have with commercial and non-commercial organisations. The results are shown in Figure 23 (raw data) and Figure 24 (grossed-up values).

Based on the grossed-up data, we estimate that PSREs signed nearly 1,200 new revenue-generating agreements with commercial organisations in the year, and now hold a cumulative portfolio of over 3,000 such agreements. It is estimated that nearly 1,600 revenue-generating agreements have been signed with non-commercial organisations in the year, contributing to a cumulative portfolio of nearly 4,500.

In 2008-09, the DRBs had the largest numbers of revenue-generating agreements with commercial organisations. Given that the Research Council Institutes represent over half of all PSREs by number, they hold relatively few revenue-generating agreements.

Figure 23 Revenue generating agreements – Raw survey data

	New agreements with commercial organisations	Cumulative portfolio of agreements	New agreements with non-commercial organisations,	Cumulative portfolio of agreements
Cultural Institutions	11	59	5	51
Departmental Research Bodies	289	915	446	1,338
NHS Regions	383	833	317	872
Research Council HQs & Institutes	174	255	299	740
Total	857	2,062	1,067	3,001

Figure 24 Revenue generating agreements – Grossed-up values

	New agreements with commercial organisations	Cumulative portfolio of agreements	New agreements with non-commercial organisations,	Cumulative portfolio of agreements
Cultural Institutions	16	100	8	94
Departmental Research Bodies	426	1,423	694	2,081
NHS Regions	553	1,203	515	1,417
Research Council HQs & Institutes	199	300	347	871
Total	1,194	3,026	1,564	4,462

4.3.7 Revenue generation

Figure 25 shows PSRE's total income from commercialisation activities. Income from commercialisation comprises receipts from licensing and other IP, consultancy work, leasing of facilities & equipment, training services and any other income generated from links with commercial organisations. The total revenue generation from commercialisation in the year, grossed-up to account for all PSREs, is estimated to be nearly £472m. Excluding the NHS regions, this equates to around 6.1% of total PSRE income.

The Departmental Research Bodies and (to a lesser extent) Research Council Institutes dominate in terms of income from commercialisation activities. The bulk of the remaining commercialisation income is accounted for by Cultural Institutions. NHS regions commercialisation income was very low in the year, especially when one considers the large number of revenue generating agreements they have with commercial organisations.

Figure 25 Income from commercialisation

	Total income from commercialisation (£k)	
	Raw survey data	'Grossed-up' values
Cultural Institutions	3,708	7,918
Departmental Research Bodies	246,436	403,826
NHS Regions	611	1,052
Research Council HQs & Institutes	66,361	73,858
Total	317,117	486,654

Figure 26 and Figure 27 provide a breakdown of income from commercialisation by source (commercial, governmental and other non-commercial) and by type (income from licensing, income from consultancy, income from leasing of facilities and equipment, income from training, and 'other'). The Table reveals significant variation by type of PSRE with respect to the main sources and types of commercialisation income.

Source - Overall, 76% of commercialisation income is generated from commercial clients, 22% from Government and 2% from other non-commercial sources. For all types of organisation, the main source of commercialisation income is commercial organisations, although, not surprisingly, one of the main sources of commercialisation income for Departmental Research Bodies is also Government Departments.

Type of activity – Income from licensing and other IP is the dominant form of activity (60%). Income from consultancy accounts for a further 36%, while income from use of facilities and equipment, and income from training, account for 3% and 2% respectively. DRBs collectively account for the great majority of the income from consultancy work, licensing and other IP and training, while Research Council institutes account for most of the earnings from the use of facilities and equipment.

Figure 26 Income from commercialisation, by source – Raw survey data

	Licensing and other IP			Consultancy			Facilities and Equipment			Training			Other income from commercial links (£k)
	Business (£k)	Govt. Depts (£k)	Other (£k)	Business (£k)	Govt. Depts (£k)	Other (£k)	Business (£k)	Govt. Depts (£k)	Other (£k)	Business (£k)	Govt. Depts (£k)	Other (£k)	
Cultural Institutions	1,627	2	91	862	65	40	728	86	147	1	-	9	50
Departmental Research Bodies	87,296	50,343	547	97,848	2,545	359	787	1,289	19	3,931	286	365	823
NHS Regions	266	-	-	101	101	130	-	-	-	-	11	2	-
Research Council HQs & Institutes	57,080	234	424	1,072	289	1,475	1,697	-	3,452	170	10	20	439
Total	146,268	50,579	1,062	99,883	2,999	2,004	3,212	1,375	3,618	4,102	307	396	1,311

Figure 27 Income from commercialisation, by source – Grossed-up values

	Licensing and other IP			Consultancy			Facilities and Equipment			Training			Other income from commercial links (£k)
	Business (£k)	Govt. Depts (£k)	Other (£k)	Business (£k)	Govt. Depts (£k)	Other (£k)	Business (£k)	Govt. Depts (£k)	Other (£k)	Business (£k)	Govt. Depts (£k)	Other (£k)	
Cultural Institutions	2,753	6	222	2,107	179	110	1,780	270	461	3	-	28	138
Departmental Research Bodies	128,646	93,974	1,094	161,162	5,481	773	1,573	2,776	44	6,878	572	852	1,772
NHS Regions	432	-	-	187	188	211	-	-	-	-	29	5	-
Research Council HQs & Institutes	62,554	306	556	1,361	372	1,934	2,057	-	4,454	223	13	26	571
Total	194,385	94,286	1,872	164,818	6,220	3,029	5,410	3,046	4,960	7,104	614	911	2,480

4.4 Other Knowledge Transfer Indicators

4.4.1 Business and community representation on governing bodies

Data on external business and community representation on PSRE governing bodies are shown in Figure 28. The number of members on a PSRE governing body varies between 3 and 14, and, across all of the organisations, 31% of membership is drawn from commercial organisations. The proportion of governing body members from business is broadly uniform across the different groups, though Research Council Institutes have slightly lower levels of business representation than others, at 23%. 12% of business representatives were directors of companies managing commercialisation activities on behalf of the PSRE.

Figure 28 Business and community representation on governing bodies (raw survey data)

	Average size of governing body	% from commercial organisations ⁵	% from social, community and cultural groups	% from public sector organisations
Cultural Institutions	13.8	31 (15)	18	32
Departmental Research Bodies	9.3	40 (12)	11	30
NHS Regions	9.5	29 (0)	5	64
Research Council HQs & Institutes	2.6	23 (13)	4	52
All PSREs	5.9	31 (12)	10	41

Representation from social, community and cultural groups is relatively low for all types of PSRE except Cultural institutions, constituting just 10% of total membership. The majority of governing body members – 41% overall – are from public sector organisations, with the proportion being highest for the NHS Regions (64%) and Research Council HQs and Institutes (52%).

4.4.2 Incentives for knowledge transfer and commercialisation

PSREs were asked if a reward scheme for inventors was in operation, and, if so, whether rewards were granted for patented technologies only. The results are shown in Figure 29 and reveal that 73% of the responding PSREs do run some kind of scheme that rewards inventors. NHS regions and Research Council Institutes have the highest propensity to reward inventors – the great majority of the responding PSREs in these groups do. In contrast, relatively few Departmental Research Bodies or Cultural Institutions operate reward schemes for inventors. In all but five cases, the reward scheme is *not* restricted to patented technologies only.

Figure 29 Operation of reward schemes for inventors (raw survey data)

	Percentage of PSREs offering rewards to inventors	Percentage of cases where rewards are restricted to patented technologies only
Cultural Institutions	7	0
Departmental Research Bodies	42	20
NHS Regions	91	10
Research Council HQs & Institutes	94	2
Overall	73	5

⁵ Numbers in brackets show the percentage of governing body members from commercial organisations who are directors of subsidiary companies that manage commercialisation activities on behalf of the PSRE.

4.4.3 Performance monitoring

The survey sought to determine (a) whether PSRE CEOs are being monitored on their organisation’s commercialisation performance, and (b) whether satisfaction surveys are carried out to assess inventors’ levels of satisfaction with the commercialisation service provided. The results are shown in Figure 30, and reveal that commercialisation performance monitoring is carried out by around three-quarters of PSREs, with over half conducting inventor satisfaction reviews. However, there are very significant differences between different types of PSRE on these indicators. Research Council HQs & Institutes and NHS Regions are most likely to have activity in both areas, while the great majority of Cultural Institutions responding to the survey do not actively monitor performance of, or satisfaction with, knowledge transfer and commercialisation services.

Figure 30 Performance monitoring (raw survey data)

	Percentage of CEOs monitored on the PSRE’s commercialisation performance	Percentage of PSREs carrying out inventors' satisfaction reviews
Cultural Institutions	29	0
Departmental Research Bodies	48	29
NHS Regions	100	80
Research Council HQs & Institutes	86	75
Overall	73	59

4.4.4 Citations and publicity

Information was requested from PSREs on numbers of academic citations and numbers of newspaper and other media articles in the year.

Only one-fifth of the PSREs were able to provide data on *academic citations*, and hence it is not possible to provide ‘grossed-up’ numbers with any confidence. Cultural Institutions and NHS Regions had particular difficulty in providing data, with only seven responses between them. Responses from Departmental Research Bodies and Research Council Institutes averaged around 1,200 and 4,400 academic citations per institute, respectively.

Of the PSREs that were able to provide data on the number of *newspaper and other media articles* regarding their activities, Cultural Institutions received the highest volume of media coverage, with an average of nearly 1,700 articles per institute. Departmental Research Bodies and Research Council Institutes also attract significant volumes of media coverage, averaging over 1,200 and 600-700 articles per institute, respectively. Average levels of media coverage among the NHS Regions were significantly lower, averaging just 10 per institute (although this average is based on responses from only two PSREs).

4.4.5 Knowledge transfer mechanisms and routes

PSREs were asked to provide information on any other knowledge transfer activities not covered by the questions reported on above. Particular types of activity not covered above are as follows (number of relevant comments in parenthesis):

- Organising or attending conferences, lectures, symposia and seminars (7)
- Providing education resources (e.g. an education officer, school visits, learning resources, workbooks, courses) (5)
- Providing advice / consultancy to policy makers, regulators, etc. and participation in consultations (5)
- Providing training / good practice events and workshops (4)
- Hosting liaison days, open days and other events for existing/potential contractors, partners, businesses and universities (4)
- Publishing newsletters, leaflets and updates, etc. (3)
- Offering pre-commercialisation, seed or proof of concept funding (3)
- Creating new or enhanced public facilities (e.g. galleries, shops, tourist attractions, visitor facilities, exhibitions) (3)

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- Broadcasting information (e.g. television, radio, webcasting, CDs and DVDs) (3)
- Attending / running trade shows, road shows and exhibitions (3)
- Running innovation competitions (2)
- Providing online information resources (2)
- Holding public events and premises tours (2)
- Establishing a Knowledge Transfer / IP post, or recruiting additional staff in these areas (2)
- Offering use of facilities for research etc. (1)

4.4.6 Long-term impact of knowledge transfer

Finally, PSREs were asked to summarise any assessments carried out of the long-term impact of their knowledge transfer activities. Most institutions did not provide a reply, but of those that did several indicated that they included KT as a specific component of strategic reviews of their institutions and its activities. Specific knowledge transfer assessments cited by PSREs included:

- Social/economic impact studies (7)
- Customer satisfaction surveys (3)
- User monitoring (2)
- Evaluation of media coverage (1)
- Networking initiatives (1)
- IP audits (1)

Appendix A Questionnaire Used in the Sixth Annual Survey

Questionnaire to be used in the survey of Public Sector Research Establishments

General

guidance

For any questions where exact figures are not available, please provide estimates.

- Please provide figures for the last complete financial year (**e.g. April 2008 to April 2009**)
- For any questions where you are unable to provide information, please answer as "not known" or "not applicable".
- For Research Councils, except MRC, please do not include activities undertaken by individual Institutes (separate questionnaires are being sent to them) or staff covered by the HE-BCI survey.
- For RCs where all research is carried out by institutes or in HEIs, we would be grateful if the RC central office could still complete questions 1 - 16 as it helps to provide a fuller picture of activity to promote knowledge transfer from PSREs.
- Throughout the survey the term "non commercial" is used to cover Government Departments, other public bodies, universities and EU funding and "commercial" to cover businesses.

Please return survey **by email only** to james.stroyan@technopolis-group.com before FRIDAY 28th MAY 2010

For clarification or further information, please contact James Stroyan on 01273 204320 james.stroyan@technopolis-group.com

GENERAL INFORMATION

1. Name of PSRE [1]

2. Number of employees in PSRE [2]

3 PSRE's R & D and technological development expenditure (£) [3]

4. PSRE's total income (£) [4]

of which:

4.a income from parent Department (including grant)

4.b income from other Government Department

4.c income from commercial organisations

4.d income from non commercial organisations

5. Number of news items and citations for the PSRE:

5.a Number of academic citations [5.a]

5.b By Institute

5.c By researcher

5.d Number of newspaper and other media articles about the institute [5.d]

INFRASTRUCTURE / INTERNAL CAPACITY

6. How many of your PSRE's staff are engaged in Technology Transfer Offices, Industrial Liaison Offices, Innovation Hubs and Contract Offices and their equivalents [6]

7. Percentage of staff in Technology Transfer Office or equivalent with professional IP management/commercial qualifications and/or undergoing continuing professional development [7]

 %

8. Number of staff in the Technology Transfer Office, Industrial Liaison Office, Innovation Hubs, Contract Office or their equivalent engaged in providing training on knowledge transfer to staff in the PSRE [8]

9. How are the Technology Transfer Offices, Industrial Liaison Offices, Innovation Hubs and Contract Offices or their equivalent funded?

Funding source:

9.a From PSRE's general budget

 £ '000

9.b From earmarked PSRE budget

 £ '000

9.c Funding from parent department [9.c]

 £ '000

9.d Funding from other government departments [9.d]

 £ '000

9.e Funding from business [9.e]

 £ '000

9.f Funding from Public Sector Research Exploitation Fund

 £ '000

9.g Funding from Regional Development Agencies or devolved administration

 £ '000

9.h Income from commercialisation/ knowledge transfer activities

 £ '000

10. External business and community representation on your PSRE's governing body [10]

10.a Total number of members of Governing body

10.b Number that are from commercial organisations [10.b]

10.c Number of these that are Directors of subsidiary companies which manage commercialisation activities on behalf of the PSRE

10.d Number that are from social, community and cultural groups

10.e Number that are from Public Sector organisations

11. Percentage of all PSRE's staff receiving knowledge transfer training [11]

 %

12. Development of graduates - percentage of current projects involving students (include MSc.s and PhDs) [12]

 %

13. Does the PSRE operate a rewards scheme for inventors?

 Y/N

If so, does the scheme provide rewards for patented technologies only?

 Y/N

14. If the PSRE runs an awards for inventors scheme, proof of concept fund, seed fund or equivalent, how are these funded?

Funding source:

14.a From PSRE's general budget

 £ '000

14.b From earmarked PSRE budget

 £ '000

14.c Funding from parent department [14.c]

 £ '000

14.d Funding from other government departments [14.d]

 £ '000

14.e Funding from business [14.e]

 £ '000

14.f Funding from Public Sector Research Exploitation Fund

 £ '000

14.g Funding from Regional Development Agencies or devolved administration

 £ '000

14.h Income from commercialisation/ knowledge transfer activities

 £ '000

15. Is the PSRE CEO or equivalent monitored on the PSRE's commercialisation performance? [15]

16. Does the Technology Transfer Office, Industrial Liaison Office, Innovation Hub, and Contract Office or their equivalents carry out any reviews of inventor's levels of satisfaction with the commercialisation service provided?

INCOME GENERATING ACTIVITIES

17. Patents and licensing [17]

17.a Number of new patent applications filed in year:

UK

Overseas

17.b Number of patents granted in year:

UK

Overseas

17.c Cumulative portfolio of patents applications (e.g. all "live" patent applications held by PSRE):

UK

Overseas

17.d Cumulative portfolio of granted patents (e.g. all "live" granted patents held by PSRE):

UK

Overseas

18. Licences [18]

Number of licence options and licences executed in this year.

Cumulative portfolio of executed licence options and licences

19. Spin-offs and start-ups [19]

19.a Spin-offs with some ownership by your PSRE:

Number established

Number still active after at least 3 years

19.b Formal spin-offs, not owned by your PSRE:

Number established

Number still active after at least 3 years

19.c Staff start ups:

Number established

Number still active after at least 3 years

19.d Estimated current employment of all active firms [19.d]

19.e Estimated current turnover of all active firms (£)

19.f Estimated external investment secured for spin-offs and start-ups (£)
[19.f]

20. Expenditure on management of Intellectual Property (£) [20]

21. Income from commercialisation (£) [21]

21.a Income from licensing and other IP: [21.a]

From commercial organisations

From Government Departments

From other non commercial organisations

21.b Income from consultancy:

From commercial organisations

£ '000

From Government Departments

£ '000

From other non commercial organisations

£ '000

21.c Income from use of facilities and equipment: [21.c]

From commercial organisations

£ '000

From Government Departments

£ '000

From other non commercial organisations

£ '000

21.d Income from training:

From commercial organisations

£ '000

From Government Departments

£ '000

From other non commercial organisations

£ '000

Any additional research income generated from links with commercial organisations

£ '000

NON FINANCIAL IMPACT

22. Number of knowledge transfer opportunities and invention disclosures communicated to Technology Transfer Office, Industrial Liaison Office, Innovation Hubs and Contract Offices or their equivalent [22]

23. Number of collaborative research projects [23]

23.a Do you carry out any research through informal agreements? [23.a]

Y/N

23.b Do you carry out any research through formal agreements? [23.b]

Y/N

23.c Number of collaborative projects (only complete if the answer to at least one of the previous questions is "Yes")

23.d New projects that commenced during this year

23.e Projects running from previous years which are still active (with average number of years for which the projects have been running to date, if information available)

24. Business/community engagement - number of revenue generating agreements with commercial and non commercial organisations to exploit the research carried out by the Public Sector Research Organisation [24]

24.a Number of agreements with commercial organisations, new in year

24.b Cumulative portfolio of agreements with commercial organisations [24.b]

24.c Number of agreements with non commercial organisations, new in year

24.d Cumulative portfolio of agreements with non commercial organisations [24.d]

25. Number of publications [25]

25.a Academic [25.a]

25.b For commercialisation [25.b]

25.c Other [25.c]

OTHER ACTIVITY

26. Given the complicated and diverse range of knowledge transfer activities undertaken by PSREs is it not possible to cover all their activities in the information requested above. Therefore you may wish to use the text box to outline any other knowledge transfer activities not covered above (max 200 words)

27. The above questions are mainly aimed at providing a "snap shot" of knowledge transfer activities in PSREs. To help us develop a better understanding of the long-term impact of PSREs we are interested in any assessments you have carried out of the long-term impact of your knowledge transfer activities. We would therefore be grateful for a short summary (max 300 words) of any such assessments that you have carried out.

END OF SURVEY

Footnotes/definitions

1. For NHS the name of organisation should be that of the Innovation Hub. For all other organisations the name of organisation should be that of the Public Sector Research Establishment. Please use the name of the Laboratory/Museum/Institute/Agency not that of the department carrying out research or the delivery arm managing the technology transfer or IP exploitation.

[\[Back to Question 1\]](#)

2. For NHS, please include an estimate of the total staff employed in the hospitals and trusts covered by the Innovation Hub. For all other organisations please include the total staff employed in the Public Sector Research Establishment – i.e. the Laboratory/ Museum/ Institute/ Agency as a whole not just the department carrying out research or the delivery arm managing the technology transfer or IP exploitation. Please provide the answer as full time equivalents. Please include any staff employed by subsidiary companies which manage commercialisation activities on behalf of the PSRE, but not staff employed by start up or spin off companies covered by question 19

[\[Back to Question 2\]](#)

3. For NHS, please include an estimate of the total R&D expenditure for the hospitals and trusts covered by the Innovation Hub. For all other organisations please include the total R&D expenditure in the Public Sector Research Establishment – i.e. the Laboratory/Museum/Institute/Agency as a whole not just the Department carrying out research or the delivery arm managing the technology transfer or IP exploitation. Include all R&D expenditure including any work funded from external sources, such as income from collaboration and contract work, but do not include R&D in other organisations which is funded by the PSRE.

[\[Back to Question 3\]](#)

4. For NHS, please include an estimate of the total income for the hospitals and trusts covered by the Innovation Hub. For all other organisations please include the total income for the Public Sector Research Establishment – i.e. the Laboratory/ Museum/ Institute/ Agency as a whole not just the team carrying out research or the delivery arm managing the technology transfer or IP exploitation.

[\[Back to Question 4\]](#)

5.a For NHS please include an estimate covering all the hospitals and trusts covered by the Innovation Hub. For all other organisations please include the total for the Public Sector Research Establishment – i.e. the Laboratory/ Museum/ Institute/ Agency as a whole not just the Department carrying out research or the delivery arm managing the technology transfer or IP exploitation. The term academic citations is used to cover formal references in an academic journal, paper or other publication (including both peer reviewed and non peer reviewed publications) to earlier research work carried out by the PSRE and/or its staff. For "institutes" please include all citations for researchers working at the PSRE. The figures for "researcher" should be based on the total number of citations per institute divided by the number of researchers at the institute.

[\[Back to Question 5.a\]](#)

5.d. For NHS please include an estimate covering all the hospitals and trusts covered by the Innovation Hub. For all other organisations please include the total for the Public Sector Research Establishment – i.e. the Laboratory/ Museum/ Institute/ Agency as a whole not just the Department carrying out research or the delivery arm managing the technology transfer or IP exploitation. Please include all newspaper (national and regional) TV and radio references to your PSRE's activities of which you are aware.

[\[Back to Question 5.d\]](#)

6. For NHS, please include all staff working in the Innovation Hub. For other Public Sector Research Establishments please include all staff in Technology Transfer Offices, Industrial Liaison Offices and Contract Offices and their equivalents plus any communications staff or consultants spending a significant proportion of their time on commercialisation of research. Please include any staff employed by subsidiary companies which manage commercialisation activities on behalf of the PSRE or independent companies which manage knowledge commercialisation within the PSRE, but not staff employed by start up or spin off companies covered by question 14.e. Please provide the answer as full time equivalents.

[\[Back to Question 6\]](#)

7. Please include all staff in the Technology Transfer Office or equivalent with professional qualifications used to support commercialisation e.g. MBAs, Legal and/or IP law qualifications or undergoing ongoing continuing professional development e.g. PRAXIS or AUTM training courses.

[\[Back to Question 7\]](#)

8. Please include informal training such as IP awareness seminars as well as formal training

[\[Back to Question 8\]](#)

9.c. Do not include funding from the Public Sector Exploitation Fund under this heading.

[\[Back to Question 9.c\]](#)

9.d. Do not include funding from the Public Sector Exploitation Fund under this heading

[\[Back to Question 9.d\]](#)

9.e Only include any grants, donations or other funding which businesses have provided specifically to support the development of the PSRE's commercialisation/knowledge transfer activities. Do not include income received from consultancy, training, licensing or hire of facilities under this heading – which should be included under “Income from commercialisation/ knowledge transfer activities”

[\[Back to Question 9.e\]](#)

10. For NHS, please provide information on the governing body of the Innovation Hub. For all other organisations please provide information on the governing body for the Public Sector Research Establishment – i.e. the Laboratory/ Museum/ Institute/ Agency.

[\[Back to Question 10\]](#)

10.b. Under “commercial organisations” please include only those governing board members who are currently working for a for-profit business.

[\[Back to Question 10.b\]](#)

11. For NHS, please include an estimate based on the total staff employed in the hospitals and trusts covered by the Innovation Hub. For all other organisations please include the total staff employed in the Public Sector Research Establishment – i.e. the Laboratory/Museum/Institute/Agency as a whole not just the Department carrying out research or the delivery arm managing the technology transfer or IP exploitation. Include any training including continuing personnel development and training courses, and informal activities such as awareness raising seminars for staff.

[\[Back to Question 11\]](#)

12. This question has been included to help develop a better understanding of PSREs' role in developing the skills and professional expertise of graduates in the research base. Please include information on the percentage of projects hosted by your PSRE or hosted jointly by your PSRE and other organisations which involve staff who are working towards MSc.s or PhDs. Do not include the knowledge transfer training covered in the response to question 9.4.

[\[Back to Question 12\]](#)

14.c. Do not include funding from the Public Sector Exploitation Fund under this heading.

[\[Back to Question 14.c\]](#)

14.d. Do not include funding from the Public Sector Exploitation Fund under this heading.

[\[Back to Question 14.d\]](#)

14.e Only include any grants, donations or other funding which businesses have provided specifically to support the development of the PSRE's commercialisation/knowledge transfer activities. Do not include income received from consultancy, training, licensing or hire of facilities under this heading – which should be included under “Income from commercialisation/ knowledge transfer activities”.

[\[Back to Question 14.e\]](#)

15. For Innovation Hubs the response should refer to the CEO of the Innovation Hub. For all other PSREs the reply should refer to the CEO of the Laboratory/Museum/Institute/Agency not that of the department carrying out research or the delivery arm managing the technology transfer or IP exploitation.

[\[Back to Question 15\]](#)

17. For the NHS please include an estimate to cover hospitals and trusts covered by the Innovation Hub. For all other organisations please cover the Public Sector Research Establishment – i.e. the Laboratory/Museum/Institute/Agency as a whole not just the department carrying out research or the delivery arm managing the technology transfer or IP exploitation. Where data is requested for number of patents include PCT and EPO applications. Count each PCT and each EPO application as a single overseas patent application. Count each regional or national patent granted on the basis of a PCT as a single overseas patent granted and, if the countries covered include UK, a single UK patent granted. Count each EPO patent granted as a single overseas patent granted even if it covers more than one country and, if the countries covered include UK, also record a single UK patent granted.

[\[Back to Question 17\]](#)

18. Include licence options and licences (including licences for plant variety rights) granted in previous years which are still in operation during the current financial year plus any new licence options and licences which are executed (e.g. a commercial deal has been put in place) during the year.

[\[Back to Question 18\]](#)

19. For the NHS please include an estimate to cover hospitals and trusts covered by the Innovation Hub. For all other organisations please answer for the Public Sector Research Establishment – i.e. the Laboratory/ Museum/ Institute/ Agency as a whole not just the department carrying out research or the delivery arm managing the technology transfer or IP exploitation. The different types of spin off and start up are defined as: Spin-off (with PSRE ownership) - Spin-off companies established using the PSRE's intellectual property (IP) and in which there is some element of PSRE ownership. Spin-off (with no PSRE ownership) - Spin-off companies to which the PSRE has assigned or licensed IP, but in which there is no PSRE ownership. Staff start-ups - Start-up companies involving current or former PSRE staff as founders where the PSRE has neither ownership nor an IP agreement (In this case the PSRE staff must be connected to the PSRE immediately prior to formation of the company). Please only include those spin-offs and start-ups that have been established to commercialise research from the PSRE, not businesses that have been established to contract out non-research based activities (e.g. maintenance or cleaning services). Please do not include spin-offs or start-ups that are not currently economically active.

[\[Back to Question 19\]](#)

19.d. Provide answer as full time equivalents (FTEs) numbers of staff. Jobs that are created through PSREs hosting manufacturing facilities and laboratories within their sites should not be included here, but you may wish to include any jobs created in this way as part of your answer to question 21.

[\[Back to Question 19.d\]](#)

19.f. Please provide an estimate of all investments which have been secured by spin-off and start up companies from sources other than the Public Sector Research Establishment's seed funding e.g. from venture capitalists, business angels or market floatation.

[\[Back to Question 19.f\]](#)

20. Please include all expenditure on IP including patents, copyright and trade marks. This should include expenditure on e.g. prior art searches, filing patents and legal advice on potential IP infringement.

[\[Back to Question 20\]](#)

21. For the NHS please include an estimate to cover hospitals and trusts covered by the Innovation Hub. For all other organisations please include the total staff employed in the Public Sector Research Establishment – i.e. the Laboratory/ Museum/ Institute/ Agency as a whole not just the department carrying out research or the delivery arm managing the technology transfer or IP exploitation.

[\[Back to Question 21\]](#)

21.a. Please include income from all types of IP including patents, copyright and trade marks.

[\[Back to Question 21.a\]](#)

21.c. Include any income generated from hiring out of the PSREs' facilities and equipment to external bodies, but not work the PSRE carries out on behalf of external bodies and therefore exclude e.g. contract analytical services.

[\[Back to Question 21.c\]](#)

22. Include all disclosures where the Technology Transfer Office or equivalent has taken some action to assess the commercial potential of research e.g. carried out a prior art search.

[\[Back to Question 22\]](#)

23. For the NHS please include an estimate to cover hospitals and trusts covered by the Innovation Hub. For all other organisations please answer for the Public Sector Research Establishment – i.e. the Laboratory/ Museum/ Institute/ Agency as a whole not just the department carrying out research or the delivery arm managing the technology transfer or IP exploitation.

[\[Back to Question 23\]](#)

23.a. Please answer "yes" if the PSRE has contacts, collaboration and/or collaborates with external researchers on an informal basis, but does not always have any formal agreements with them.

[\[Back to Question 23.a\]](#)

23.b. Please answer "yes" if there are projects where there is a formal agreement between your organisation and an external organisation. This should include MoUs, strategic alliances and research contracts. It should exclude Material Transfer Agreements and contracts of employment with individual researchers or contracts for work which forms part of the core activity/management of the organisation but has been contracted out.

[\[Back to Question 23.b\]](#)

24. Include all agreements with business/non commercial organisations that generate revenue, including academic to academic MoUs, other MoUs, strategic alliances, research contracts, Material Transfer Agreements and Clinical Document Architecture. Please do not include agreements where another PSRE is the leading partner or contracts for work which forms part of the core activity/management of your PSRE but has been contracted out.

[\[Back to Question 24\]](#)

24.b. Include agreements which started in previous years which are still in operation during the current financial year plus any agreements which started during the current year.

[\[Back to Question 24.b\]](#)

24.d. Include agreements which started in previous years which are still in operation during the current financial year plus any agreements which started during the current year.

[\[Back to Question 24.d\]](#)

25. For the NHS please include an estimate to cover hospitals and trusts covered by the Innovation Hub. For all other organisations please answer for the Public Sector Research Establishment – i.e. the Laboratory/ Museum/ Institute/ Agency as a whole not just the department carrying out research or the delivery arm managing the technology transfer or IP exploitation.

[\[Back to Question 25\]](#)

25.a. Please include all articles published in an academic journal, paper or other publication (including both peer reviewed and non peer reviewed publications) by researchers working at the PSRE.

[\[Back to Question 25.a\]](#)

25.b. Please include all publications for an external audience that are used to market or raise awareness of the PSRE's commercial services.

[\[Back to Question 25.b\]](#)

25.c. Please include publications such as annual reports and publications for patients, researchers and customers.

[\[Back to Question 25.c\]](#)

END OF FOOTNOTES / DEFINITIONS

Appendix B Responding Organisations

<p>Cultural Institutions</p> <ul style="list-style-type: none"> • Arts Council England • British Library • The British Museum • Historic Scotland, Technical Conservation Group • Imperial War Museum • Museum of London • National Museum of Science and Industry • Amgueddfa Cymru – National Museum Wales • Conservation Technologies (National Museums Liverpool) • National Galleries of Scotland • National Museums of Scotland • Natural England • Natural History Museum • Royal Botanic Garden Edinburgh • Royal Botanic Gardens Kew • Scottish Natural Heritage • Tate 	<p>NHS Regions</p> <ul style="list-style-type: none"> • Health Enterprise East • NHS Innovations East Midlands • NHS INNOVATIONS LONDON • NHS Innovations North • TrusTECH the NW NHS Innovation Hub • NHS Innovations South East Ltd • MidTECH Innovations Ltd – NHS Innovations West Midlands • Medipex NHS Innovations Yorkshire & Humber • NHS Northern Ireland • Greater Glasgow Health Board • Chelsea & Westminster Hospital (THOTH)
<p>Departmental Research Bodies</p> <ul style="list-style-type: none"> • Agri-Food and Biosciences Institute of Northern Ireland • AHDB Potato Council Sutton Bridge Experimental Unit • Central Science Laboratory (renamed the Food and Environment Research Agency-April 2009) • Cefas • CABE (Commission for Architecture and the Built Environment) • Defence Science & Technology Laboratory • The Environment Agency • Fire and Resilience Research and Statistics Division • Forensic Science Service Ltd. • Forest Research • Health and Safety Laboratory • Health Protection Agency (HPA) • Macaulay Institute • Met Office • DairyCo • Moredun Research Institute • NESTA • National Physical Laboratory • National Measurement Office – NMO (formerly NWML) • Ordnance Survey • Scottish Crop Research Institute • Research & Radioavigation (Trinity House) • Culham Centre for Fusion Energy (CCFE) – part of the United Kingdom Atomic Energy Authority • Veterinary Laboratories Agency 	<p>Research Council HQ and Institutes</p> <ul style="list-style-type: none"> • BBSRC • Engineering and Physical Sciences Research Council • Natural Environment Research Council • STFC • British Antarctic Survey • British Geological Survey • Centre for Ecology & Hydrology • Institute for Animal Health • Institute of Food Research • John Innes Centre • MRC Intramural Programme (includes all MRC Institutes & Units) • National Centre for Earth Observation • The National Oceanography Centre, Southampton • NERC Centre for Population Biology • National Centre for Atmospheric Science • Plymouth Marine Laboratory • Proudman Oceanographic Laboratory • Roslin Foundation • Rothamsted Research Ltd. • Scottish Association for Marine Science • Sea Mammal Research Unit

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