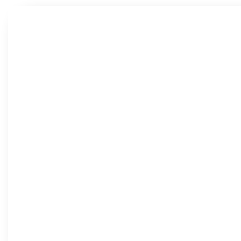
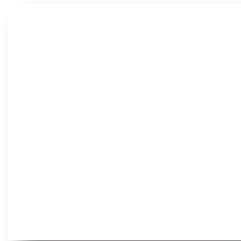


Getting better value from public sector research establishments

Quentin Maxwell-Jackson



CENTREFORUM

About the author

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■ Contents

Key findings	4
Executive summary	6
Introduction	20
1 The organisations	23
2 Performance	30
3 Which factors affect performance?	44
4 Conclusions and policy implications	51
Appendix 1	55

Appendix 2, containing a number of case studies on public sector research establishments is available from

www.centreforum.org/psre

■ Key findings

CentreForum has undertaken a research project, based on case studies, looking at the performance of the UK's Public Sector Research establishments (PSREs) of which:

- 10 remain in public ownership (£2.3 billion annual government expenditure and 20,000 staff)
- 7 laboratories are Government Owned Government Operated (£1.3 billion p.a. and 14,000 staff)
- 3 laboratories are Government Owned Contractor Operated (£1 billion p.a. and 6,000 staff)
- 7 organisations were privatised (£2 billion per annum turnover and 14,000 staff)
- 3 are non profit distributing (£0.1 billion p.a. and 1,000 staff)
- 4 are profit distributing (£1.9 billion p.a. and 13,000)

We conclude that:

- the main difference in performance between the organisations was financial and organisational. One of the Government Owned Government Operated labs (Forensic Science Service) has made significant losses in a very competitive market, and will close in 2012. Some of the privatised organisations, such as LGC and QinetiQ, have grown strongly and profitably since privatisation
- the success of some of the privatised organisations, and to some extent that of the contractorised laboratories,

directly resulted from the removal of public sector operating constraints, including slow decision making, adverse culture, high overheads and lack of access to capital

- removing these constraints would yield value for money benefits and savings, although some activities need to remain in the public sector for reasons of security and the need for impartiality
- privatised labs were particularly effective in employing technology transfer at the heart of their business models to drive profitable growth and increase employment
- there was evidence that some former public sector scientists were positive and enthusiastic about furthering their careers in the private sector
- clarity about the scientific/technical advice and services government needs from PSREs is key to getting the best performance from them, but has not always been present

There is clearly the potential to free more PSREs from public sector operating constraints to get better value and save money.

Given the squeeze on public spending - and the desire to promote technology transfer and innovation to help economic growth - now is the moment to reopen the question of the appropriate status of publicly owned PSREs.

: Executive summary

Context

The government has put sustainable economic growth at the centre of its economic strategy, alongside a desire to rebalance the economy so that financial services do not play such a dominant role in the future profile of the economy:

“The Government’s economic policy objective is to achieve strong, sustainable and balanced growth that is more evenly shared across the country and between industries”.

Promoting research and innovation is rightly seen as a key component of this, with the government committed to “investing in the apprenticeships and innovation centres that industry needs”.

But is Government spending on research and development as effective as it might be? And are the opportunities for commercial exploitation and technology transfer from this expenditure being maximised?

Many studies have shown that whilst the UK has a good record on invention and innovation it has a relatively poor record when it comes to commercial exploitation.

Government currently spends about £2.3 billion on government owned research establishments employing 20,000 staff, of which £1.3 billion is spent on research establishments which the government both owns and operates (14,000 employees). The other government owned establishments, accounting for about £1 billion of spend, are contractor operated. In addition, approximately £1 billion is

spent on a large number of research council funded institutes, centres and facilities.

In the course of the 1990s and the early 2000s there was a move to involve the private sector more in the ownership and management of public sector research establishments (PSREs). This paper examines, through a series of case studies, the experience of those public sector research establishments where private sector involvement was introduced into their ownership and/or management. It then compares this with the experience of research establishments which remained in the public sector, to consider whether there is evidence that effectiveness and efficiency are improved by greater private sector involvement.

The focus here is on PSREs, but the findings are relevant to the management of those research establishments under the aegis of the research councils as well as potentially to other parts of the public sector.

Scope

All the 17 PSREs looked at here started life as Government Owned Government Operated (GOGO) organisations, and 7 still have this status. In the 1990s the management of several PSREs was outsourced and they became Government Owned Contractor Operated (GOCO) organisations. Other PSREs were completely divested through privatisation.

The PSREs and former PSREs covered in this study are:

Current PSREs – Government Owned Government Operated (GOGO)

- ⋮ Animal Health and Veterinary Laboratories Agency (AHVLA)
- ⋮ Centre for Environment, Fisheries and Aquaculture (Cefas)
- ⋮ Defence Science and Technology Laboratory (Dstl)
- ⋮ Food and Environment Research Agency (Fera)
- ⋮ Forensic Science Service (FSS)

- ⌚ Health Protection Agency (HPA)
- ⌚ Health and Safety Laboratory (HSL)

Current PSREs – Government Owned Contractor Operated (GOCO)

- ⌚ Atomic Weapons Establishment (AWE)
- ⌚ National Nuclear Laboratory (NNL)
- ⌚ National Physical Laboratory (NPL)

Former PSREs – Non Profit Distributing (NPD)

- ⌚ Building Research Establishment (BRE)
- ⌚ Natural Resources Institute (NRI)
- ⌚ Transport Research Laboratory (TRL)

Former PSREs – Profit Distributing (PD)

- ⌚ AEA Technology
- ⌚ LGC (formerly the Laboratory of the Government Chemist)
- ⌚ QinetiQ
- ⌚ TUV NEL (formerly the National Engineering Laboratory)

The table below summarises organisational status, turnover, staff numbers and percentage of government funding for each of the PSREs and former PSREs studied.

What is the role of the PSREs?

The PSREs are positioned between academic and research council fundamental science/research on the one hand and industrial/commercial R&D on the other. Many of them provide the research infrastructure which is necessary to support the application of fundamental research findings for wider public benefit.

The current and former PSREs span a wide range of scientific disciplines and provide key scientific and technical inputs to public policy and government decision making. Most focus their effort on providing a range of evaluation,

Table 1–

Organisation	Organisational Status	Turnover £m	Staff numbers	Core Govt Funding
PSREs GOGO				
AHVLA	Executive Agency of Defra	217	2,700	87%
Cefas	Executive Agency of Defra	57	550	68%
Dstl	Trading Fund in MOD	435	3,640	89%
Fera	Executive Agency of Defra	68	839	67%
FSS	Wholly owned Government Company	113	1,840	0%*
HPA	Non-Departmental Public Body	341	4,100	50%+
HSL	Executive Agency of HSE	38	405	80%
TOTALS		1,269	14,074	
PSREs GOCO				
AWE	GOCO (Jacobs, Lockheed Martin, Serco)	900	5,000	97%
NNL	GOCO (Battelle, Serco, U of Manchester)	78	648	0%
NPL	GOCO (Serco)	71	611	60%+
TOTALS		1,049	6,259	
Former PSREs Non Profit Distributing				
BRE	Company Ltd by Guarantee, charity	45	575	0%
NRI	Part of University of Greenwich	9	65	0%
TRL	Company Ltd by Guarantee	42	400	0%
TOTALS		96	1,040	
Former PSREs Profit Distributing				
AEA Technology	Plc quoted on the London Stock Exchange	114		0%
LGC	Private Company, Bridgepoint control	124	1,332	0%*
QinetiQ	Plc quoted on London Stock Exchange	1,625	11,200	0%*
TUV NEL	Wholly owned by TÜV SÜD Group	13	155	0%*
TOTALS		1,876	12,687	

*receives some non-competitive contract income from government

testing, emergency response and consultancy services to government, industry and the general public. These span a diverse range of areas, such as DNA testing, health threat assessment, standards setting, certification and advising on and implementing various forms of emergency response.

Research in these establishments is generally highly applied (rather than fundamental) research, as befits their role of sustaining and developing a wide range of services, and supporting the development and implementation of specific policy areas.

Assessing the performance of these organisations requires an understanding of the roles they perform for government and the wider public benefit. There are broadly two key requirements:

- Specialist scientific/technical services – such as evaluation, testing, standards setting and maintenance, technical consultancy, emergency response, etc.
- Scientific/technical advice and input to policy making and decision making which is up-to-date, impartial, timely, comprehensive and forward looking

Assessing performance

Two broad criteria were used to assess performance:

- To what extent government got (and is it getting) what it has stated it wants at the required quality level, and are there wider benefits to the economy?
- How has the organisation performed financially?

On the first of these all the organisations appear to be performing well whatever their organisational status. There are no indications of consistently poor quality, and indeed many examples of highly regarded technical input to government policy, and high quality services.

The main difference in performance between the organisations turns out to be how they perform financially and organisationally. Here there are significant differences in efficiency and growth rates.

The Forensic Science Service (FSS) – a GOGO – has performed weakly from a financial/organisational perspective. Large annual losses – over £50m in 2010 – have become unsustainable, and the FSS will be shut down in 2012.

There are indications that some of the other GOGOs are beginning to experience substantial reductions in government funding, and turnover is falling. There is evidence that some of the labs could have operated significantly more efficiently in the past. Comparison with the privatised and GOCO labs suggests that GOGO operations may have been adversely affected by a number of public sector constraints, as discussed below.

All the GOCOs have met their financial targets, returning consistent surpluses. AWE revenues have grown very strongly since 2000, while NPL has managed to increase third party revenues by 16% per annum since 2004.

Two of the Non Profit Distributing privatised establishments – BRE and NRI – have experienced significant turnover dips since privatisation. NRI's existence was clearly threatened in 2001 when its parent university had to bail it out, while BRE had to take steps to sharpen up its commercial operations. TRL has managed to sustain level turnover in real terms, but it is expecting a dip this year.

The two private equity backed organisations – LGC and QinetiQ - have grown profitably since privatisation, LGC achieving 800% growth. They have sustained and created employment in the UK. Their success in diversifying away from a dominant UK customer has made them less vulnerable to declines in UK government spending. TUV NEL has grown its revenues 1½ times since 2001.

AEA Technology today represents only a small part of the activities privatised. Its share price and financial performance have suffered as it has tried to transform its scientific and market focus.

Many former government scientists and other staff continue to be employed by the privatised PSREs. Those we interviewed

were very positive about the benefits to them and their careers of the move from the public to the private sector. As one senior scientist commented: “[We now have] a more focused approach to getting the output which customers want. I’m very positive about what has been achieved. I’m very positive or I would not still be here.” Similar comments have been made by staff who have moved from the civil service to a GOCO management company, such as at NPL.

Factors affecting performance

In reviewing the detailed case studies of those organisations which had increased private sector involvement, we identified some factors which when removed or alleviated had a significant positive impact on their performance. This suggests that publicly owned and operated organisations are likely to be adversely affected by these factors.

They are:

- **Extent of technology transfer** - the most effective technology transfer arises if it is at the centre of an organisation’s business model, rather than stuck on as an adjunct. The government PSREs - GOGOs and GOCOs - register patents each year and some have set up spin-off companies. But the privatised organisations such as QinetiQ and LGC are fundamentally in the business of technology transfer, in a way the government owned bodies are not. This has been a key factor in their significant growth and employment creation. For example, LGC has grown very strongly and profitably by a process of spotting technology areas with potentially broad commercial value, investing in targeted R&D in these areas, and then leveraged the capital of its shareholders to make small, strategic acquisitions to bolster capability. Technology transfer is intrinsic to the way it operates and has grown. This type of freedom to exploit key technical/scientific knowledge as part of the core business model, with access to capital for strategic investments, is not generally available to publicly owned and operated laboratories.

- ⚡ **Over-dependence on government** - Privatised PSREs have been able to diversify their customer base away from government much more quickly and extensively than non-privatised entities. They will find it less of a challenge to weather the steep decline in government funding now taking place, following a long period of relatively benign conditions. The survival of some government owned PSREs, with their high dependence on a single government customer, will very likely be at stake before too long.
- ⚡ **Public sector operating constraints** - Structural, procedural and cultural factors often constrain the operation of organisations within the public sector. We discuss these in more detail below because of their significance.

Public Sector Operating Constraints

Those organisations which had been contractorised or privatised identified a common set of constraints which, to a greater or lesser extent, had hampered their performance when they were publicly owned and operated bodies. Removing some or all of these constraints was seen by these organisations as key to improving their performance.

These are:

- ⚡ **Slow decision making** – Government decision making takes much longer than in the private sector. This is because of the need to satisfy multiple stakeholder groups, complex procedures and a risk averse culture which spawns “paralysis by analysis”.
- ⚡ **Operational constraints** – Government imposes restrictions on certain activities and areas of spend (e.g. marketing, advertising) which restrict an organisation’s freedom.
- ⚡ **Culture** – The culture of government (and the wider public sector) is not best suited to successful commercial operations. Symptoms include a lack of customer focus, undue risk aversion and secrecy.

- ⚡ **High overheads** – Too many layers of administration, generous pension contributions, and high redundancy costs all drive up overheads.
- ⚡ **Policy constraints** – Government policy often restricts public sector operations, for instance by requiring independence from the supply chain.
- ⚡ **Accounting rules** – Government accounting rules can reduce incentives for third party revenues, impose annuality and restrict flexibility between operating and capital budgets.
- ⚡ **Lack of access to capital** – It can be difficult for public sector organisations to gain the capital funding they need quickly given Treasury rules and cumbersome decision making processes.
- ⚡ **Access to industry best practices** – Government owned and operated bodies do not have the same easy access to the latest industry best practices and expertise which the best contractors or private sector organisations have. This can make or break projects such as delivering a capital asset on time and to budget.

The constraints listed above apply to the different types of organisation to a greater or lesser extent as summarised in Table 2.

Strategic clarity

Clarity about what the government needs from PSREs is key to getting the best performance from them, but has not always been present.

Where the government's strategy or its implementation is confused or too narrowly drawn performance has been impaired – for instance at FSS where government did not follow through and implement the agreed strategy to move swiftly to full privatisation.

In other cases, the importance of high quality, impartial scientific/technical advice may not have been sufficiently recognised. For example, the National Nuclear Laboratory (NNL) is now required to compete for most of its work in the

Table 2

Constraints	Government Owned		Privatised	
	GOGO	GOCO	Not Profit Distributing	Profit Distributing
Speed of decision making	X	partial	√	√
Operational constraints	X	partial	√	√
Culture	X	√	√	√
High overheads	X	√	√	√
Policy constraints	X	X	√	√
Accounting rules	X	partial	√	√
Access to capital	X	X	X	√
Access to industry best practices	X	√	√	√

X = constraint √ = not a constraint

civil nuclear supply chain. But is it actually fully performing the role of a national laboratory? There are major areas of nuclear policy (e.g. disposal of plutonium stockpiles, assessment of next generation reactor designs) where the government may not have access to sufficiently well-informed and impartial scientific advice.

In some cases government policy or strategy on an issue appears to be spread across a number of departments, with the consequence that it is unclear who in government owns - rather than simply advises - on the need for key scientific and technical input, or access to key facilities.

It is important to emphasise the central importance of high quality, impartial scientific advice and associated services

across a very wide range of government policy areas. All major government departments have chief scientific advisers, who often sit on the main departmental board, and their role is clearly to articulate this need. But is their input sufficiently prominent? Who in government owns (rather than simply advises on) key scientific capabilities that are needed to inform policy making in areas which span a number of departments? And are lessons learned in one department shared with others so that best practice models are easily adopted?

Policy implications

What is the most effective way to deliver the services and scientific/technical input needed for policy making and government decision making?

In some cases, appropriate scientific/technical advice and other services are readily available in the market, and can be purchased there – for instance, forensic testing services.

But where there are assets and capabilities which do not exist in the market, or where there would be unacceptable risks in relying on the market to provide them, government has to step in and develop the capability it needs. This requires a good understanding of the various supply markets and their capabilities in order to inform the “make or buy” decision. Markets do not remain static, so this needs to be kept under regular review, not least because government investment in the key capabilities it needs can stimulate the development of new markets, with important benefits for technology transfer and economic growth.

Everything else being equal, fully privatised organisations operate with fewer constraints than public sector ones. They are more likely to succeed in an environment where there is competition and the need to react quickly to changing markets and customer requirements.

Of course, it is possible to reduce and possibly to remove some of these constraints within the public sector. Mechanisms such as trading fund structures, executive agency status and

so on have been developed to do just that. But the evidence from the case studies, particularly of those organisations which have been successfully privatised, is that even where such public sector mechanisms have been used they have not fully removed significant operating constraints. QinetiQ and LGC, for example, spent significant resources removing vestigial public sector constraints through major transformation programmes. Some of the constraints, such as lack of access to capital, are not easily addressed in the public sector.

There are, of course, reasons why some organisations need to remain in government ownership. These include access to impartial advice (e.g. Dstl) or to ensure that strategic/security sensitive assets remain in government hands (AWE). However, examples such as LGC's very successful operation of the statutory Government Chemist function demonstrate that with the appropriate contractual mechanisms even statutory/regulatory functions may be discharged effectively and efficiently by privatised bodies.

Changing the presumption

Government Owned and Government Operated PSREs today account for about £1.3 billion of public expenditure, and over 14,000 staff posts

We think the presumption that research establishments need to be publicly owned and operated needs to be changed, given the adverse impact of public sector constraints on performance. The question should not be "Why should this organisation be privatised/contractorised?" but "Why does it have to remain in government?"

Even where government decides a PSRE needs to remain in the public sector it should try to secure a GOCO arrangement because this will give better value for money and other benefits than managing it in the public sector.

The UK Coalition Government is facing unprecedented pressures on government spending. Now is an ideal time to reopen the question about the future status of publicly

owned PSREs. Fewer constraints mean better value for money for government. There are opportunities which merit investigation now.

For example:

- ⚡ It is difficult to see why the three Defra establishments – AHVLA, Cefas and Fera need to remain as GOGOs rather than becoming GOCOs or being fully or partly privatised.
- ⚡ In reviewing the PSREs there is scope to look more widely than current organisational boundaries. There are overlaps in the scientific focus and roles of several of the PSREs. For example, AHVLA, Cefas, Fera and HPA all have emergency response roles, and there may be scope for them to achieve better value for money by sharing common services or capabilities.
- ⚡ The boundary between Dstl and QinetiQ needs further scrutiny with a view to moving more of Dstl’s activities into the private sector (as is already being done with some of its assets). It is unclear why the activities which have to remain in government ownership in Dstl would not deliver greater value and benefits to government under a GOCO arrangement.
- ⚡ We have not looked at the research council funded research establishments in this study, but a review of their operations and organisational status would be worthwhile given that up to £1 billion is spent on them.

Conclusion

PSREs – government owned and privatised – contribute a significant amount of high quality applied scientific research, technical advice and emergency response capability in a wide range of critically important areas. The experience of those PSREs whose ownership or management was passed to the private sector has shown that there is considerable potential for them to generate employment and promote commercial exploitation of R&D and ensure technology transfer to the wider economy. At a time of significant

pressure on government finances and a strong desire to utilise government R&D spending to the utmost to promote growth it is incumbent on Government to ensure that it gets maximum value from its spend.

We believe that because of public sector operating constraints this is unlikely currently to be happening with the existing PSREs or with the research council research establishments.

Now is the moment to seize the opportunity for Government to free them from these constraints. This will ensure that Government gets not only better value for money, but through promoting more effective technology transfer and employment it will boost economic growth.

: Introduction

The role of R&D in the economy

Research and Development (R&D) is an essential part of innovation in a knowledge-based economy, increasing productivity whilst stimulating growth.¹ It is, however, often underfunded because it carries short term risk, despite its longer term potential profits and positive externalities. The Plan for Growth has pledged to provide “practical support to help UK IP-intensive businesses exploit their IP in key overseas markets by strengthening relations with IP authorities and increase R&D cooperation.” However, the challenges for innovation and invention are twofold.

First, Britain underfunds research. It spends around 1.8 per cent of its GDP on R&D, which is below the EU’s Lisbon Target of 3 per cent. In order to meet the BIS target of 2.5 per cent of GDP by 2014, the Government can invest directly in research. It can also seek to attract private capital, both from domestic and foreign investors, by increasing incentives to conduct research. Tax credits, for example, have been used to stimulate private investment particularly from SMEs, which have been shown to be improving.²

Second, Britain has been poor at exploiting innovation, and converting this into commercial profit. In terms of raw scientific research, Britain is second only to the US in production of cited scientific papers, but when converting research into patents it lies behind America, Japan and Germany. Britain also lags well behind European levels of

1 www.ifs.org.uk/fs/articles/0045a.pdf

2 www.cbi.org.uk/pdf/20090204-cbi-r&d-tax-credit-survey-report.pdf

sales of new to market and new to firm innovation.³ There is a perception that foreign firms, particularly in the United States, are far more effective at backing new technology and making it profitable. The Government's proposals within the 'patent box' to reduce tax from profits on patented innovation to 10% can improve incentives and lower risk in the exploitation of innovation.

Thus it is clear that more funding, and an economic environment offering greater incentives, is needed at both R&D stage and then at the exploiting stage. Moreover, it is important to ensure that funding is spent as effectively and efficiently as possible. This will be the focus of this paper.

Context and objectives

During the late 1980s and 1990s the Thatcher government embarked on a radical rethink about the way in which public services should be delivered. The aim was to reduce the size and scope of the State, to bring private sector expertise and experience to bear through outsourcing/contractorisation, and to free public sector operations from the constraints imposed by public ownership through privatisation.

Changes in management arrangements through outsourcing and privatisation were considered important as a means of giving maximum freedom to compete with the private sector in the face of declining revenues from government and increased market testing of government research contracts.

In local government many services were subject to Compulsory Competitive Tendering; in central government a programme of market testing was launched; and a systematic programme of privatisation saw many high profile businesses transferred to the private sector – British Airways, British Gas, British Telecom, BAA, TSB, to name a few.

As part of this programme the management of several Public Sector Research Establishments (PSREs) was outsourced using a Government Owned Contractor Operated (GOCO)

3 ec.europa.eu/enterprise/policies/innovation/files/ius/ius-2010_en.pdf

mechanism, or completely divested through privatisation.

10 to 15 years later we now have the opportunity to ask how successful this policy was. What effect have contractorisation and privatisation had on the performance – financial and qualitative – of the PSREs? And what lessons can we draw for future policy? Although the focus here is on the PSREs, it is also worth considering whether there are broader implications for other parts of the public sector.

The observations and conclusions in this report are based on a series of case studies which summarise the recent history of the PSREs and former PSREs. For some we have had the benefit of interviews with senior managers in the organisations concerned, and we have been able to check the information collected in the interviews and through publicly available sources back with the organisations. In other cases, particularly with current PSREs, we were not able to secure interviews, so we have presented summary case studies based on what information can be gleaned from public sources. These organisations were also given the opportunity to comment on the factual accuracy of the summary case studies produced, which some of them did.

Structure of the Report

In the remainder of this report we set out summary details about the organisations studied in **Section 1**. We then look at how each of the different types of PSRE/former PSRE has performed over the last 15-20 years in **Section 2**. We then consider the factors which may be behind performance differences in **Section 3**. Finally, in **Section 4**, we draw our conclusions, and consider their implications for future policy, both in respect of these organisations, and more generally.

Appendix 1 contains a short method statement.

Appendix 2 gives case studies for each of the organisations covered.

: 1 The organisations

Types of organisation

The organisations studied fall into two categories, with two sub-categories in each:

Current PSREs – these are research and/or research based organisations which continue to be owned by government. PSREs break down further into:

- : **Government Owned Government Operated (GOGO)**
– these PSREs are typically constituted as Executive Agencies, Trading Funds or Non-Departmental Public Bodies.
- : **Government Owned Contractor Operated (GOCO)** –
where the key assets (land, major equipment, intellectual property) of the PSRE remain in government ownership, with management and operation contracted out to private sector operators.

Former PSREs – which no longer have significant or any government ownership or interest, but provide some services to government under contract. We can distinguish:

- : **Non Profit Distributing** which include charities and non profit distributing companies. This category, in the case of former PSREs, comprises companies limited by guarantee, including charities and universities.
- : **Profit Distributing** which in the case of former PSREs are companies limited by shares, either publicly quoted, part of larger quoted organisations, or privately owned (including private equity).

The PSREs and former PSREs covered in this report are as follows:

Current PSREs – Government Owned Government Operated (GOGO)

- ⌚ **Animal Health and Veterinary Laboratories Agency (AHVLA)** – an Executive Agency of Defra, AHVLA is the national regulator in UK for the prevention, control and eradication of notifiable disease, upholding public health on farms and maintaining welfare of farmed livestock.
- ⌚ **Centre for Environment, Fisheries and Aquaculture (Cefas)** – an Executive Agency of Defra, Cefas is a multidisciplinary scientific research and consultancy organisation that provides advice on marine, coastal, estuarine and freshwater organisms and environments.
- ⌚ **Defence Science and Technology Laboratory (Dstl)** – Dstl is a Trading Fund within the Ministry of Defence, and its role is to maximise the impact of Science and Technology for UK defence and security, drawing on the capabilities within Dstl and the wider supply base in industry and academia.
- ⌚ **Food and Environment Research Agency (Fera)** – is an Executive Agency of Defra which aims to support and develop a sustainable food chain, a healthy natural environment and to protect the global community from biological and chemical risks.
- ⌚ **Forensic Science Service (FSS)** – is a wholly owned Government company which provides a full range of forensic science services to customers across all types of crime.
- ⌚ **Health Protection Agency (HPA)** – is a Non-Departmental Public Body sponsored by the Department of Health which provides an integrated approach to protecting UK public health through the provision of support and advice.
- ⌚ **Health and Safety Laboratory (HSL)** – is an Executive Agency of the Health and Safety Executive (HSE), a Non-Departmental Public Body sponsored by the Department of Work and Pensions. HSL's research and development work underpins the activities of HSE which are to protect the health, safety and welfare of employees and others who may be exposed to risks from work activities.

Current PSREs – Government Owned Contractor Operated (GOCO)

- : **Atomic Weapons Establishment (AWE)** – MOD owns AWE’s sites and facilities, while management is undertaken by a GOCO arrangement operated by a company limited by shares with three equal shareholders – Jacobs Engineering Group, Lockheed Martin and Serco. AWE provides and maintains the warheads for the UK’s nuclear deterrent, covering the full nuclear warhead life cycle.
- : **National Nuclear Laboratory (NNL)** – is a company limited by shares wholly owned by the Department for Energy and Climate Change (DECC). In what might be termed a “GOCO Lite” arrangement, the contractor consortium – Battelle, Serco and the University of Manchester – seconds key senior managers into NNL. NNL is a nuclear technology service provider serving the nuclear industry, and covering the complete nuclear fuel cycle.
- : **National Physical Laboratory (NPL)** – is operated by Serco in a GOCO arrangement managed by BIS. NPL develops and maintains the UK’s primary measurement standards, supporting an infrastructure of traceable measurement throughout the UK and the world to ensure accuracy and consistency.

Former PSREs – Non Profit Distributing

- : **Building Research Establishment (BRE)** – BRE Trust is a company limited by guarantee and a registered charity, operating through three wholly owned trading subsidiaries. BRE provides a broad range of consultancy, testing, certification, commissioned research and training services covering all aspects of the built environment and associated industries.
- : **Natural Resources Institute (NRI)** – NRI is part of the University of Greenwich which is a company limited by guarantee and a charity. NRI undertakes research, consultancy and teaching in support of sustainable development, economic growth and poverty reduction.

- Transport Research Laboratory (TRL)** – The Transport Research Foundation (TRF) is a non-profit distributing company limited by guarantee which operates through a wholly owned subsidiary – TRL Ltd. TRL works on all aspects of transportation, including safety, vehicles, environment, sustainability, infrastructure, software and certification.

Former PSREs – Profit Distributing

- AEA Technology** – AEA Group Plc is quoted on the London Stock Exchange, and operates in Europe and the USA. Previously a small part of the research arm of the UK Atomic Energy Authority (UKAEA) (about 90% of the former AEA Technology was sold in a number of disposals), AEA Technology is focused on providing climate change and energy consultancy.
- LGC (formerly the Laboratory of the Government Chemist)** – LGC is a privately owned company limited by shares. Bridgepoint, the private equity group, has a controlling shareholding. LGC provides laboratory services, measurement standards, reference materials and proficiency testing services in the UK and internationally, is the UK's designated National Measurement Institute for chemical and bioanalytical measurement, and the host organisation for the UK's Government Chemist function.
- QinetiQ** – QinetiQ Group Plc is quoted on the London Stock Exchange. QinetiQ addresses a global market and provides a wide range of technical services, technical assurance and safety related services, as well as doing a small amount of highly applied R&D for the UK Ministry of Defence (MOD).
- TUV NEL** – is a company limited by shares wholly owned by TÜV SÜD Group, an international service organisation headquartered in Germany. TUV NEL provides technical consultancy, research, testing, flow measurement and programme management services. It is the National Measurement Institute for flow measurement.

Table 3 summarises organisational status, turnover, staff numbers and percentage of government funding for each of the PSREs and former PSREs studied.

Table 3

Organisation	Organisational Status	Turnover £m	Staff numbers (FTE)	Core Govt Funding
<i>PSREs GOGO</i>				
AHVLA	Executive Agency of Defra	217	2,700	77%
Cefas	Executive Agency of Defra	54	550	63%
Dstl	Trading Fund in MOD	435	3,640	89%
Fera	Executive Agency of Defra	67	855	61%
FSS	Wholly owned Government Company	113	1,840	0%*
HPA	Non-Departmental Public Body	341	4,100	50%+
HSL	Executive Agency of HSE	38	405	80%
TOTAL		1,265	14,090	
<i>PSREs GOCO</i>				
AWE	GOCO (Jacobs, Lockheed Martin, Serco)	900	5,000	97%
NNL	GOCO (Battelle, Serco, U of Manchester)	78	648	0%
NPL	GOCO (Serco)	71	611	60%+
TOTAL		1,049	6,259	
<i>Former PSREs Non Profit Distributing</i>				
BRE	Company Ltd by Guarantee, charity	45	575	0%
NRI	Part of University of Greenwich	9	65	0%
TRL	Company Ltd by Guarantee	42	400	0%
TOTAL		96	1,040	
<i>Former PSREs Profit Distributing</i>				
AEA Technology	Plc quoted on the London Stock Exchange	114		0%
LGC	Private Company, Bridgepoint control	124	1,332	0%*
QinetiQ	Plc quoted on London Stock Exchange	1,625	11,200	0%*
TUV NEL	Wholly owned by TÜV SÜD Group	13	155	0%*
TOTAL		1,876	12,687	

*receives some non-competitive contract income from government

It can be seen that these organisations vary significantly in size, from NRI and TUV NEL with about £10m per annum turnover to the large defence sector establishments which range from £400m (Dstl), through £900m (AWE) to over £1.6bn (QinetiQ). The largest civil establishment is HPA, with nearly £350m in annual turnover.

Another significant difference is the proportion of core government funding – i.e. funding which is in some way guaranteed and differs from revenue won through competition for R&D and service contracts.

FSS - alone of the GOGO organisations - has no guaranteed government funding, while the other GOGOs have at least 50% of their income guaranteed, up to as much as nearly 90% in the case of Dstl.

Amongst GOCOs, NNL has no guaranteed funding, although it receives about 50% of its income from one government customer - Sellafield.

Unsurprisingly, none of the privatised former PSREs receives core government funding, although several of them (e.g. LGC, QinetiQ, TUV NEL) receive income under contract for provision of nationally important capability.

None of these organisations has a pure R&D focus, and none of them conducts a significant amount of curiosity led or “blue skies” research. That is the preserve of the research council funded laboratories, universities and other government funded organisations such as CERN.

The research done by the organisations studied is generally highly applied research, or technical consultancy. Each has a different mix of R&D and services, which can include testing, certification, regulatory activities, provision of emergency response, advice and consultancy. Moreover, each operates in a different sector or market, some of which are mature (e.g. construction) and others developing and growing rapidly (e.g. biotechnology).

This means that comparing these organisations directly against each other - given their very different missions, the

different markets in which they operate, and their different scale – would be misleading. That said, there is merit in assessing how effective they have been in achieving what they have set out to achieve, how good a service they provide to government, and whether this represents good value for money. This will be our focus.

What does ‘performance’ mean?

This report sets out to explore how well these diverse organisations have performed under a variety of organisational and ownership structures. But what does “performance” mean?

Drawing on the case studies on each organisation (see Appendix 2) we will examine two aspects of performance:

Has the Government got (and is it getting) what it wants at the required quality level, and are there wider benefits to the economy?

This is relevant not only to the government owned organisations which deliver most of their services to government, but also to former PSREs. The objective of privatisation was not simply to give government a sale proceed, but also to ensure that its future requirements were met at the required quality level as measured by the outcome of internal and external performance reviews, customer assessments, number of research publications, etc. Wider economic benefits include technology transfer and employment creation.

Financial performance and value for money

This looks at the viability of the organisations in terms of turnover, surplus/profit and loss, employment and growth, and value for money.

■ 2 Performance

In this section we consider the performance of each type of organisation in relation to the two criteria set out in the previous section:

- To what extent has the Government got (and is it getting) what it wants at the required quality level, and are there wider benefits to the economy?
- How has the organisation performed financially?

We then draw conclusions about the performance of the PSREs and former PSREs, and consider the impact of organisational status on performance.

The summary conclusions contained in the remainder of this section draw on the case studies for each PSRE and former PSRE which are set out in Appendix 2.

Government Owned Government Operated (GOGO)

Seven of the organisations studied fall into this category. Most have performed satisfactorily under the two headings, but as expected are heavily reliant on government funding. The exception is FSS which was expected to compete in the market for all its revenues. It has recently suffered severe market and operational difficulties and will be closed down in 2012.

Government requirement and quality

All the organisations in this category appear to have met their parent department's requirement. Most have been judged as good or better in peer reviews and customer assessments, and there is evidence of some wider public and economic benefit.

All the GOGOs are set annual targets and objectives by their parent departments virtually all of which they have consistently achieved:

- AHVLA's predecessor VLA was independently reviewed in 2007 and its research rated "good" and occasionally "exceptional", and it was acknowledged as a centre of excellence.
- Cefas has consistently met its ministerial targets, which include customer satisfaction and science quality.
- Dstl achieved all its quality targets in 2009/10, with 94% of customer ratings at 7/10 or greater, and Dstl's technology transfer vehicle achieved modest revenue of just over £1m.
- Fera met all its seven ministerial targets in 2009/10, and the Lawton study concluded that most parts of its work were "excellent", with some "good".
- FSS has pioneered forensic DNA analysis, and is a world leader in this area applying innovations and novel techniques to DNA analysis and re-investigation of cold cases. However, it is only one supplier in a competitive market with shrinking demand, and it has been unable to win enough business to survive. FSS will close down in 2012.
- HPA has a comprehensive set of objectives, grouped into three categories – infection reduction, incidents and emergencies, and organisational aims - and has achieved green or amber status for the majority of objectives.
- HSL was subject to a major performance review in 2009 which highlighted areas for improvement, and took action so that HSE satisfaction levels were reported to have risen in 2009/10.

Financial Performance

Financial performance in the GOGO grouping has been patchy, with a significant performance issue in the case of FSS. Not surprisingly, most PSREs are beginning to feel the impact of government cuts, and the turnover of virtually all of them has fallen or is set to fall:

- ⚡ AHVLA was recently created through a merger, and was tasked with reducing overheads by 33%. Its constituent organisations have met their financial objectives over time, but have suffered declining turnover and some significant operating deficits.
- ⚡ Cefas has met its financial targets, but £2.5m costs were incurred when the new Waveney site plan was cancelled. Cefas funding has risen recently (some of it attributable to significant funds “flow through” to subcontractors), and it has increased non-Defra income to 32% in 09/10 from 18% in 03/04.
- ⚡ Dstl turnover has fluctuated since privatisation, falling significantly between 2002 and 2005, but has recently risen to a level somewhat below 2002 turnover and has made operating surpluses.
- ⚡ Fera made a small operating loss in 2009/10, and has been streamlining unprofitable parts of its business.
- ⚡ FSS has struggled to complete a radical restructuring plan whilst competing in a competitive market with shrinking demand. In 2010 it made a loss of £53m.
- ⚡ HPA has seen a significant recent fall in revenue as funding cuts bite, although external income has increased 114% since the Agency’s establishment in 2003.
- ⚡ HSL’s revenue has also declined as government spending is reduced.

Government Owned Contractor Operated (GOCO)

This group consists of two establishments with significant core funding (AWE and NPL), and one with none (NNL).

NNL’s GOCO arrangement is different from AWE and NPL in that contractor staff are seconded into the government owned entity, rather than all management/operations being undertaken by a contractor owned operating vehicle.

Performance by all three organisations has been good against both financial and quality/requirement criteria. However, government has not fully defined a remit for NNL that includes providing technical support and advice to

government on a range of nuclear matters. Accordingly, NNL is not fully performing the function of a national laboratory with the necessary allocated funding; instead, it must therefore focus on nuclear supply chain R&D contracts which have a much shorter term perspective than that required for underpinning a nationally strategic capability. NNL does not currently appear to be a “national laboratory” since it is not addressing the full range of longer term issues facing the UK’s nuclear industry.⁴

Government requirement and quality

All the GOCOs are managed through a contract. They all appear to be meeting their contractual requirements:

- MOD conducts regular reviews of the AWE contract, and major projects are benchmarked against other major capital/operation programmes. AWE stressed the importance of reach back into the parent organisation to bring commercial expertise to the nuclear weapons business. AWE has independent advisory committees, including its MOD customer, which advise on quality and other aspects. An indication that MOD is content with the service delivered by the contractor consortium is that the original 10 year contract was extended to 25 years, with 3-5 yearly price points. AWE has developed close links with five universities, and supervises a number of PhDs. AWE told us that they had delivered on virtually all their milestones.
- NNL has been through a number of reorganisations, as detailed in the case study. The challenge has been to transform NNL from in-house R&D support work for BNFL to one that is more commercial and project focused. The ultimate proof of whether, under the current arrangements, it is performing the services its customers want to sufficient quality is its ability to attract follow-on business, and on this basis it is succeeding. NNL conducts regular customer surveys, and these indicate that

4 The House of Lords Science and Technology Committee is currently investigating UK nuclear R&D capabilities.

customer responsiveness is perceived to have improved. The key issue with NNL is whether, given government constraints on its remit and funding, it is currently set up to fulfil a full role as a national laboratory.

- When the NPL GOCO was established there had been concerns that science quality might diminish. Consequently a separate body, the Science Advisory Group for the NPL, comprising members of the Royal Society and Royal Academy of Engineering, was established to monitor research quality. In addition, BIS reviews the GOCO contract annually. We were not able to see this review for confidentiality reasons, but clearly the fact that the contract continues would indicate that the service NPL is delivering is considered satisfactory by government. NPL has commissioned independent economists to assess NPL's wider economic impact, and the results are given in the case study. Since 2004 NPL has more than doubled its peer review papers and seen a 116% increase in citations.

Financial performance

All three organisations appear to be performing well financially:

- AWE revenues have grown steeply in the past ten plus years - from £216m in 2000 to £900m in 2010. Incentives are built into the contract for MOD to receive benefits through "share line" derived via a Target Cost Incentive Fee (TCIF) arrangement. The contractor receives a fee based on delivery of specific strategic and sub-strategic milestones, as well as for compliance with standards on issues such as safety, site operation, etc. The AWE contractor consortium has a good track record of delivering major capital projects on time and to budget.
- The model for a national nuclear laboratory in the UK is different from those in other countries in that NNL is expected to operate commercially and compete for all its work. With seconded management from the contractor consortium, NNL has succeeded in remaining viable, and

has met or exceeded the profits projected in its business plan. The key financial performance measure used by DECC for NNL are trading profit and underlying cash flow, and the Serco/Battelle/Manchester consortium receives an incentive fee for exceeding the business plan agreed at the time NNL was set up. NNL has operated profitably since GOCO status.

- ⚡ NPL has consistently made small surpluses on its turnover. Third party revenues have grown strongly, and at 16% per annum since 2004. Serco, the contractor, points to a 50% reduction in NPL overheads since the arrangement was put in place, together with efficiency savings of £22.5m since 2004.

Privatised – Non Profit Distributing

There are three establishments in this group, all of them companies limited by guarantee. None of them receives any guaranteed core funding from government, and all must compete in the market for their government work.

Thus a key measure of their successful performance is the extent to which they have been able to survive in this environment. This has clearly been challenging:

- ⚡ BRE's revenues declined slightly following privatisation, and have recently reached roughly similar levels.
- ⚡ NRI's revenues have declined dramatically, as reflected in staff numbers reducing from 350 at privatisation (they were 540 when the decision to privatise was taken) to 65 today.
- ⚡ TRL's revenues have remained roughly flat for the past 10 years.

All three organisations have had to adapt to life in the market place, and have had to take some significant actions in order to survive. In the case of NRI, without the support of its parent university it would undoubtedly have been wound up in 2001.

Government requirement and quality

All three organisations have survived (NRI after a major crisis), have diversified their business away from government, and appear to be successful in winning government contracts in their area:

- Only about a quarter of BRE revenues now come from central government, all of them on the basis of contracts won in competition in the market. The BRE Trustees, who are respected figures in the industry, provide challenge on BRE's performance, and strategy, and monitor its service quality. The number of BRE publications has doubled in the past five years. BRE channels surpluses into its own research programme, which enables it to retain some of its capability as a national asset.
- NRI receives about 30% of its revenues from DFID, under contracts won in competition with other providers, although as mentioned above its income has decreased significantly since privatisation (as an indication, the workforce reduced from 350 at privatisation down to about 65 today). NRI reports that customer perceptions of them are that they can be relied on to deliver, and that they are regarded as excellent technically. The 80 postgraduates NRI has trained since 2001, drawn mainly from developing countries, have since gone back to their home countries and applied their knowledge and skills within their local communities.
- TRL, in line with the others in this group, has pursued a strategy of diversification away from its UK government clients. TRL reports that the nature of UK government commissioned work in transport has changed significantly since privatisation. There are now few multi year projects, and overall contract size has reduced considerably. TRL's work for government is now more applied/implementation focused. Contracts are shorter and smaller than they used to be, and always competed. One of TRL's key challenges has been to adapt to sudden fluctuations in government funding, including the way it uses key assets.

Financial Performance

All organisations in this group appear financially viable, although some have had to weather challenging times as they adjusted as core funding was removed and they diversified their customer base:

- Although BRE's profit and revenue has suffered significant dips since privatisation, recent figures show growth. Turnover in 2010 was £45m, £4m higher than in 1995. The group has moved from making a loss of £700k in 1995 to a profit of £5.6m 2010. A breakdown of BRE's revenue shows a slow but successful diversification away from central government. In its place there has been an increase in private sector contracts, which, in the last five years alone, have increased by 50%. Culturally, BRE staff have had to sharpen up their commercial understanding and quality control, becoming much more client focused, which has been a hard lesson for some scientists and researchers to learn. The Chief Executive has recently mounted a strategic exercise to determine BRE's strategy as a research-based organisation.
- NRI is part of the University of Greenwich, and without the support of its parent would have closed down in 2001. That was a crisis year for NRI. It made an operating loss which had not been foreseen. A new Director and senior team were appointed, and an urgent restructuring exercise followed to bring NRI's costs in line with its projected income. Numerous staff were shed at that stage, to leave headcount at 100 (down from about 350 in 1996). Further drastic action had to be taken, and headcount halved again to reach less than 50. NRI has since grown slightly, so that there are now about 65 scientists/academics.
- TRL reports that its turnover has roughly remained constant in real terms over the past 10 years, while the number of staff has fallen. It has made a profit in each year. In 01/02 turnover was £33m with 530 staff, in 09/10 it was £42m with 400 staff. 2011 accounts are still in preparation, but it is estimated that turnover will be lower than in 09/10, and staff numbers approximately

390. Recent turnover has been adversely impacted by reductions in public sector spending. TRL has a pension scheme deficit reported as £20m in 2010.

Privatised – Profit Distributing

Three out of the four organisations in this group (LGC, QinetiQ, TUV NEL) appear to have done well since privatisation. Significant effort was required to transform them from their government culture and operating methods to embrace private sector disciplines. This process took a number of years.

LGC has grown from its public sector roots by acquisition and organically, increasing turnover 800% since privatisation. The much larger QinetiQ has pursued a similar strategy of expansion, and now has a significantly larger presence outside the UK than in it. TUV NEL is a very small part of a large German company which acquired it soon after privatisation. None of them receives core government funding any more, although a high proportion of TUV NEL revenues come from government under a single National Measurement Office contract, QinetiQ has a Long Term Partnering Agreement with MOD, and LGC receives about £6m a year to provide the UK Government Chemist and designated National Measurement Institute functions.

AEA Technology now represents only about 10% of the business at the time of privatisation, following large scale divestments of the core nuclear research capabilities. It recently made a significant operating loss (which the accounts restate as profit after taking account of certain restructuring and acquisition costs), and its share price has collapsed.

Government requirement and quality

LGC, QinetiQ and TUV NEL appear to be successful in competing for government contracts, and in some cases have negotiated long term contracts (e.g. QinetiQ's Long Term Partnering Agreement with MOD). AEA Technology's UK customer base has been shrinking:

- AEA Technology has been hit hard by the UK Government's spending cuts. This resulted in 2011 UK revenues declining to £55m from £74m in the previous year. The company's strategy of increasing its US presence by acquisition enabled this decline to be balanced by an increase in US revenues to £60m from £40m the previous year.
- LGC remains the UK's designated National Measurement Institute for chemical and biochemical analysis, and provides the UK Government Chemist, a statutory role, under contract with BIS. This accounts for £5-6m of annual revenues on a turnover of over £120m. LGC uses transparent accounting, and a partnership arrangement, with appropriate governance structures in place. The main change in the last twenty years has been the breadth of services LGC provides. While twenty years ago LGC were focusing on consumer safety (products, food) and law enforcement (tobacco, drugs) they now offer a wider breadth of forensic services, laboratory solutions for accurate measurement (reference material, proficiency testing schemes, training and consultancy), health services and measurement services for industry. LGC points to some examples of tangible effects they have had on the wider economy and society:
 - Reduced the cost on the public purse of BSE testing by 60%
 - Reduced the cost of providing forensic services by up to 50%
 - Reduced turnaround of DNA Database samples from 7 months to 5 days
 - Enabled the police to solve complex cases that have been open for a number of years (Rachel Nickell, Damilola Taylor)
- MOD funding under contract accounted for 72% of QinetiQ's UK business in 2009/10, which is just over half of the total QinetiQ Group's revenues. Globally non-government income has increased to 17% of the Group's total revenues. QinetiQ's biggest contribution to spinning out knowledge from research is from using the skills and

capabilities developed to provide services to government and industry, whether in the form of technical advice or 'intelligent customer' interpretation of trials data, for example. Spin-offs in 2007 had a valuation at the time of £40m. In 2010/11 QinetiQ collected royalties of £7m. QinetiQ claims to have saved MOD £180m in the first 7 years since it was set up, on top of the £700m savings which are built into the LTPA over 25 years.

- ⚡ We have limited information on TUV NEL, but clearly the continuation of the BIS contract for TUV NEL's participation in the National Measurement System seems to indicate that BIS is satisfied with the quality and value for money it is receiving.

Financial Performance

- ⚡ AEA Technology revenues in 2011 were £114m (over half from the USA), showing no growth on 2010 (although with a significant reduction in European revenues balanced by increase in USA), with an operating loss of £6m. When the loss is adjusted for the one off costs of restructuring (including redundancies in Europe), acquisitions and other adjustments the accounts show an adjusted profit of £9m. Share performance since privatisation, initially strong, has been very poor over the past 10 years. The shares floated in 1996 at 280p and rose steadily to reach 860p in 1999. Since then there has been a steady and steep decline, and in August 2011 the share price hit a new low of 2p.
- ⚡ LGC's turnover rose significantly following privatisation, growing by nearly 800% to £124m in 2010, an increase of 80% in the revenue per employee since privatisation. Profitability grew slowly at first, with low margins in the early years, and £1m profit on £23m turnover in 2000, £6m on £60m in 2005 and £14m on £124m turnover in 2010. Profitable growth has been achieved through a strategy of expansion through acquisition and organic growth. LGC has invested in areas with potentially broad commercial value, and leveraged the capital of its shareholders to make small, strategic acquisitions to bolster capability.

LGC's growth has been helped by increased levels of government and private sector outsourcing, an increasing regulatory regime and concerns for safety and security.

- ⌚ In 2006 QinetiQ was successfully floated on the London Stock Exchange, raising £360m for the taxpayer beyond the £150m share proceeds/debt repayment returned to government when 1/3 of QinetiQ's equity was sold to Carlyle Group. In 2008 MOD sold its remaining 19% shareholding, raising £254m.
- ⌚ In 2009 and 2010 QinetiQ issued profit warnings. The underlying causes were a significant (up to 20%) cut in MOD funding as a result of the budget crisis, and timing delays on US Government contracts resulting from the change in Presidential administration. A new Chief Executive was appointed at this time, and initiated renegotiation of the terms and conditions of ex civil service staff, which was inhibiting restructuring of the business because of the very generous redundancy and pension terms written into employment contracts which QinetiQ had inherited. Following negotiations with the Trades Unions, 75% of staff voted in favour of a package of measures which reduced redundancy and pension terms in return for pay increases and more leave.
- ⌚ QinetiQ floated on the London Stock Exchange in 2006 at 200p per share, and after reaching peaks of nearly 230p it was trading in August 2011 at a little over 100p.
- ⌚ TUV NEL revenues have increase 150% since 2001, and growth has been profitable.

Conclusions

We have used two broad criteria to assess performance.

On the first of these – the government requirement/public benefit and quality – there are no indications of consistently poor quality in any of the organisations in this study. In fact most of them have established reputations for good or excellent research and services which they have in the most part continued to sustain. There is also considerable evidence of wider benefit to the economy, although it is a

different judgement about whether this has been maximised in all cases.

NNL is successfully achieving what it has been asked to do, but this may leave a vacuum for high quality scientific and technical advice and input on major civil nuclear issues for which NNL, despite being a “national laboratory”, does not receive funding.

On wider benefit, within the For Profit group both LGC and QinetiQ have grown very significantly since privatisation, and thus both sustained and created employment in the UK. Their success in diversifying away from a dominant UK customer has made them less vulnerable to reductions in UK Government spending, although by no means immune to it.

On financial performance there is clearly one significant poor performer – FSS. It was announced in December 2010 that the large annual losses being made by FSS – over £50m in 2010 – were unsustainable, and the service will be shut down by 2012. Interestingly, FSS was the only GOGO without significant core funding.

Of the other GOGOs, some are beginning to experience significant reductions in government funding, and turnover is falling. There is evidence that some of the PSREs could have operated significantly more efficiently in the past. For instance, AHVLA is being tasked to reduce overheads by 33%, which indicates the opportunity for efficiencies, even taking account of merger synergies.

All the GOCOs appear to be meeting their financial targets, returning consistent surpluses. AWE revenues have grown very strongly since 2000, while NPL has managed to increase third party revenues by 16% per annum since 2004. NNL appears to be exceeding its trading profit target.

Two of the Non Profit Distributing privatised establishments – BRE and NRI – have experienced significant turnover dips since privatisation. In the case of NRI its existence was clearly threatened in 2001 when its parent university bailed it out, while BRE had to take steps to sharpen up its commercial

operations. TRL has managed to sustain a reasonably constant level of turnover, but it is expecting a dip this year.

The story for the For Profit privatised establishments is of profitable growth since privatisation in the two private equity backed organisations – LGC and QinetiQ. TUV NEL has also grown its revenues by 1½ times since 2001. AEA Technology's share price and financial performance have suffered as it has transformed its scientific and market focus, and shifted its operational base to the USA.

3 Which factors affect performance?

What are the reasons for these differences in performance?

From the case studies, we have identified the following issues which appear to have affected performance:

- Extent of technology transfer
- Over-dependence on government
- Public sector operating constraints

We discuss each in turn in this section.

Extent of technology transfer

Transferring technological innovations into commercially viable products and services is a key way in which PSREs and former PSREs can benefit the wider economy, creating employment and contributing to GDP. Most, if not all the establishments studied here are actively involved in promoting technology transfer, and many have one or more exploitation arms to enable this to happen. Most of the organisations also regularly register patents.

However, the most effective technology transfer arises if it is at the centre of an organisation's business model, rather than stuck on as an adjunct.

For example, spotting commercial opportunities and applying relevant technologies to them is at the very heart of the way in which LGC has grown its revenues profitably by more than 800% since privatisation. It invests from its own funds in R&D in "promising areas of science", providing the seed capability to grow rapidly in areas of market promise. This strategy has been backed up by access to capital for strategic acquisitions

to cement this capability. In this way, technology transfer to commercial activities is central to LGC's growth strategy, not an add on or ancillary activity.

Similarly, QinetiQ has positioned itself between academia and industry, providing "the conduit between basic research and real-world application." As well as spinning out technology into a large number of start up companies, QinetiQ also "spins-in" technology from other fast paced markets into the UK defence sector, ensuring that these are adapted to a defence environment. Technology transfer is integral to QinetiQ's business model.

BRE and TRL are also well placed to make the connection between new technologies and application in industry given that in both cases their parent trust or charity is controlled by senior industry players. However, without access to the capital available to the For Profit companies, BRE and TRL have not been able to use technology transfer as a driver for significant growth.

This is not to say that technology transfer does not play a part in the activities of the government PSREs - GOGOs and GOCOs - most of which register patents each year and have set up spin-off companies. But QinetiQ and LGC are both fundamentally in the business of technology transfer, in a way the government owned bodies are not, and this has been a key factor in their significant growth.

Over-dependence on Government

A stark difference between the privatised and non-privatised organisations is that the former have been able to diversify their customer base away from government much more quickly and extensively than non-privatised entities.

We have seen that a very high proportion of the revenues of all GOGOs other than FSS come from government in the form of core funding – at least 50%, and as much as 90% - and this does not include revenue from contracts for which they must compete. By contrast all the privatised bodies have, to a greater or lesser extent, reduced their exposure

to government, either through broadening their client bases, as seen with BRE and TRL on flat or declining revenues, or through significant expansion as in the case of LGC and QinetiQ.

Clearly the privatised bodies are likely to find it less of a challenge to weather the current decline in government funding. We would expect that continuing funding pressures, combined with their high reliance on one customer, will pose significant challenges in the next year or so for government owned and operated PSREs as well as for GOCOs.

Public Sector Operational Constraints

There has long been recognition that structural, procedural and cultural constraints have a significant impact on performance and value for money within the public sector.

Various mechanisms have been used over the years to make it easier for the parts of government with executive functions to have greater freedom to operate. These include the frameworks and structures used for Executive Agencies and Trading Funds. In addition, the operation of many parts of government has been outsourced in GOCO arrangements, and we have seen that this applies to three of the PSREs studied here.

However, none of the above arrangements fully succeeds in removing all the constraints that are part and parcel of government ownership and scrutiny. These factors appear to have constrained the performance of all the government owned PSREs in this study. Some of the constraints are removed or alleviated in the case of GOCOs, which are able to draw in wider private sector expertise to help address some of the performance and cultural issues.

These are some of the constraints of government ownership which come out in the case studies:

- **Speed of Decision Making** – It seems to take much longer for key decisions to get made in government than in the private sector. For example, it took two years for

the business case for restructuring the FSS and putting it on to a sounder footing to be considered by government. Review followed review, and as someone close to the situation commented: "Civil servants have no ability to make a commercial risk assessment, so they want coverage of everything." That takes time and causes delay. In another example a senior manager at LGC discussed the difference between LGC before and after privatisation. "We have a capability to invest that we never had before. Purchasing equipment was an onerous task [before privatisation]. Now, provided you've got a good case, you can just get the equipment you need quickly."

- **Operational Constraints** – From time to time government places blanket restrictions on certain activities, or mandates particular ways of doing things. For example, in the past year there has been a moratorium on spend on advertising, marketing and external advice in UK central government. One GOGO PSRE told us that this had significantly impacted that organisation's ability to compete in the market. Another example is the need to get approval for recruitment, promotions, pay levels and the like. QinetiQ's view was that civil service based terms and conditions of employment restricted its ability to compete more effectively with other providers and to restructure its business in the light of changing market conditions. QinetiQ therefore took the step of renegotiating the terms and conditions of former civil servants.
- **Culture** – The civil service culture has developed in a context where operating commercially in a competitive market is not the main focus:
 - — BRE commented that their ex civil service staff needed to sharpen up their commercial understanding, their attention to quality as the customer sees it, and the need to become more customer focused generally.
 - — QinetiQ, in common with LGC, put in

place a cultural transformation programme: “The transition from a public sector research institution to the private sector has been challenging for our staff. As a public sector organisation our staff had the freedom to pursue academic interest without regard for its future application; pursuing pet projects with little regard for their pull through into frontline uses or programmes. Many would argue that fundamental research of this type is more appropriately carried out in academic institutes and in effect parts of DERA [QinetiQ’s public sector antecedent] had been acting as if they were a secretive university, closed to wider interest groups”.

- **High Overheads** – FSS commented that their overhead structure was too high to allow them to compete effectively in the market, because:
 - They had too many people
 - Benefits were too generous – e.g. 25% employer pension contribution (since reduced to 12%, but still high by private sector standards)
 - Legacy terms and conditions meant high restructuring costs - £40-50,000 on average per post, with some costs in six figures.
- QinetiQ had to negotiate with staff to change terms and conditions to remove the high legacy redundancy and pension terms it inherited in order to remain competitive and viable. TRL has been left with a £20m pension scheme deficit which it is having to fund out of operating revenue.
- **Policy Constraints** – Government policy can restrict an establishment’s ability to exploit market opportunities fully, and make alliances with other players. As QinetiQ commented: “our previous position in Government constrained alignment with industry due to the need to preserve total independence of the supply chain. Now we are able to ‘back the winners’ and work closely with

industry from the inception of an idea through to delivery, thereby reducing the risk that investment is wasted due to a lack of knowledge of what is realisable." In addition, government owned establishments may be constrained in their ability to compete by EU State Aid regulations.

- **Accounting Rules** – These can constrain flexibility to operate in several ways. For instance, the government operates a “net running costs” regime for central government departments and their Executive Agencies, which means that there may be little financial incentive to generate third party revenue. Rules about carrying balances between years can inhibit longer term projects, and there are restrictions on moving money between operating and capital budgets. Trading Funds are less subject to these rules, but do not avoid them entirely.
- **Lack of access to capital funding** – securing capital funding is challenging in government at any time, and particularly in the current climate. Treasury rules and requirements must be followed and decision making can be convoluted and slow. By contrast, LGC and QinetiQ have been able to access capital relatively quickly to fund growth by acquisition in areas of strategic interest and market opportunity, and to fund restructuring programmes.
- **Lack of access to industry best practices** – Government operated organisations often struggle to acquire and apply industry best practices to optimise their operations. GOCO contractors are able to “reach back” into their parent organisations for support and expertise. For example, at AWE one of the GOCO operator’s parents brought its experience of major capital projects to bear on a large new facility, which was delivered on time and to budget.

Everything else being equal, fully privatised organisations operate with fewer constraints than public sector ones. They are more likely to succeed in an environment where there is competition and the need to react quickly to changing markets and customer requirements.

Of course, it is possible to reduce and possibly to remove some of these constraints within the public sector. Mechanisms such as trading fund structures, executive agency status and so on have been developed to do just that. But the evidence from the case studies, particularly of those organisations which have been successfully privatised, is that even where such public sector mechanisms have been used, they have not fully removed significant operating constraints. QinetiQ and LGC, for example, spent significant resources removing vestigial public sector constraints through major transformation programmes. Some of the constraints, such as lack of access to capital, are not easily addressed in the public sector.

There are, of course, reasons why some organisations need to remain in government ownership. These include access to impartial advice (e.g. Dstl) or to ensure that strategic/security sensitive assets remain in government hands (AWE). However, examples such as LGC's very successful operation of the statutory Government Chemist function demonstrate that with the appropriate contractual mechanisms even statutory/regulatory functions may be discharged effectively and efficiently by privatised bodies.

A final point is that the ex-public sector employees we interviewed, who now work in privatised establishments, were very positive about the impact on transition from the public to the private sectors on their careers.

As one senior scientist who had made the transition commented: "[We now have] a more focused approach to getting the output which customers want. I'm very positive about what has been achieved. I'm very positive or I would not still be here." Similar comments have been made by staff who have moved from the civil service to a GOCO management company, such as at NPL.

: 4 Conclusions and policy implications

This section sets out conclusions from an analysis of the case studies (see Appendix 2) together with policy implications.

How clear is the role of the PSREs?

The PSREs are positioned between academic and research council fundamental science/research on the one hand and industrial/commercial R&D on the other. Many of them provide the research infrastructure which is necessary to support the application of fundamental research findings to issues of wider public benefit.

The current and former PSREs span a wide range of scientific disciplines and provide key scientific and technical inputs to public policy and government decision making. Most of them focus most of their effort on providing a range of evaluation, testing, emergency response and consultancy services to government, industry and the general public. These span a diverse range of areas, such as DNA testing, health threat assessment, standards setting and advising on and implementing various forms of emergency response.

Research in these establishments is generally highly applied (rather than fundamental) research, as befits their role of sustaining and developing a wide range of services, and supporting the development and implementation of specific policy areas.

Assessing the performance of these organisations requires an understanding of the roles they perform for government and the wider public benefit. There are broadly two key requirements:

- Specialist scientific/technical services – such as evaluation, testing, standards setting and maintenance, technical consultancy, emergency response, etc.
- Scientific/technical advice and input to policy making and decision making which is up to date, impartial, timely, comprehensive and forward looking

Clarity about what the government needs from PSREs is key to getting the best performance from them, but has not always been present. Where the government's strategy or its implementation is confused or too narrowly drawn performance has been impaired – for instance at FSS where government did not follow through and implement the agreed strategy to move swiftly to full privatisation.

FSS has proved unable to generate enough revenue through competing in the market to sustain its operations, and it has run up large losses. This was because the strategy adopted by government seems to have been muddled. The process of privatisation was begun, and then stopped. FSS was left in a position where it had moved a step or two towards privatisation, but was not able to operate free of public sector constraints.

FSS lacked the access to capital enjoyed by the privatised PSREs which would have allowed restructuring and diversification. It was also hampered by public sector operating constraints which made it challenging to compete against private sector players in a competitive market. FSS will close in 2012.

In other cases, the value and importance of high quality, impartial scientific/technical advice may not have been recognised sufficiently. For example, the National Nuclear Laboratory (NNL) has to compete for all of its work in the civil nuclear supply chain and it is thus questionable whether it is fully performing the role of a national laboratory as government does not fund or task it to support major areas of nuclear policy (e.g. disposal of plutonium stockpiles, assessment of next generation reactor designs).

In some cases government policy or strategy on an issue appears to be spread across a number of departments, with the consequence that it is unclear who in government owns - rather than simply advises - on the need for key scientific and technical input, or access to key facilities.

We feel it is important to emphasise the importance of high quality, impartial scientific advice and associated services across a very wide range of government policy areas. All major government departments have chief scientific advisers, who often sit on the main departmental board, and their role is to articulate this need. But is their input sufficiently prominent? And are lessons learned in one department shared with others so that best practice models are easily adopted?

A lack of strategic clarity can significantly affect performance because performance has to be judged by the extent to which an establishment has met the role and objectives set out in the strategy. If the strategy is confused or too narrowly drawn performance in this wider sense will be impaired.

Constraints affecting performance

Those organisations which had been contracturised or privatised identified a common set of constraints which, to a greater or lesser extent, had hampered their performance when they were publicly owned and operated bodies. Removing some or all of these constraints was seen by these organisations as key to improving their performance.

- : **Speed of decision making** – Government decision making takes much longer than in the private sector. This is because of the need to satisfy several stakeholder groups, complex procedures and a risk averse culture which spawns “paralysis by analysis”.
- : **Operational constraints** – Government imposes restrictions on certain activities and areas of spend (e.g. marketing, advertising) which restrict an organisation’s freedom.
- : **Culture** – The culture of government (and the wider public sector) is not best suited to successful commercial

operations. Symptoms include a lack of customer focus, undue risk aversion and secrecy.

- ⚡ **High overheads** – Too many layers of administration, benefits and pension contributions significantly more generous than the private sector and high redundancy costs all drive up overheads.
- ⚡ **Policy constraints** – Government policy often restricts public sector operations, for instance by requiring independence from the supply chain.
- ⚡ **Accounting rules** – Government accounting rules can reduce incentives for third party revenues, impose annuality and restrict flexibility between operating and capital budgets.
- ⚡ **Lack of access to capital** – It can be difficult for public sector organisations to gain the capital funding they need quickly given Treasury rules/procedures and cumbersome decision making.
- ⚡ **Access to industry best practice** – Although government owned and operated bodies can read the textbooks, they do not have easy access to the latest industry best practices and expertise. This can make or break projects such as delivering a capital asset on time and to budget.

The constraints listed above apply to the different types of organisation to a greater or lesser extent. This is summarised in Table 4.

Government Owned Government Operated PSREs are subject to all the constraints.

Government Owned Contractor Operated PSREs are able to overcome some of them. While government's slow decision making, operational constraints, difficulty in accessing capital and some of the accounting rules affect them (although the first two only partially), private sector management is able to transform organisational culture and reduce overheads. Contractors can also "reach back" into their parent companies to access the latest industry best practices and expertise.

Table 4

Constraints	Government Owned		Privatised	
	GOGO	GOCO	Not Profit Distributing	Profit Distributing
Speed of decision making	X	partial	√	√
Operational constraints	X	partial	√	√
Culture	X	√	√	√
High overheads	X	√	√	√
Policy constraints	X	X	√	√
Accounting rules	X	partial	√	√
Access to capital	X	X	X	√
Access to industry best practices	X	√	√	√

X = constraint = not a constraint

Non Profit Distributing privatised establishments are free of all the constraints of government operations, but do not have the access to capital available to For Profit companies.

And finally, For Profit privatised establishments operate without any of the above constraints.

So there is a spectrum of organisational types from those which are most constrained to those which are completely free of these constraints (they may be subject to other constraints, of course).



None of the constraints identified arises simply because of the research and scientific context in which these organisations operate. In fact, the constraints which are part and parcel of public sector operations are likely to arise in any sector or market in which the government operates.

So this analysis and conclusions can be applied more widely across public services.

Avoiding public sector operating constraints

Of course, it is possible to reduce and possibly to remove some of these constraints within the public sector. Mechanisms such as trading fund structures, executive agency status and so on have been developed to do just that. But the evidence from the case studies, particularly of those organisations which have been successfully privatised, is that even where such public sector mechanisms have been used, they have not fully removed significant operating constraints. QinetiQ and LGC, for example, spent significant resources removing vestigial public sector constraints through major transformation programmes. Some of the constraints, such as lack of access to capital, are not easily addressed in the public sector.

There are, of course, reasons why some organisations need to remain in government ownership. These include access to impartial advice (e.g. Dstl) or to ensure that strategic/security sensitive assets remain in government hands (AWE). However, examples such as LGC’s very successful operation of the statutory Government Chemist function demonstrate that with the appropriate contractual mechanisms even statutory/regulatory functions may be discharged effectively and efficiently by privatised bodies.

But how should government decide the appropriate status for a PSRE (or any other executive part of government, for that matter)?

Changing the presumption

The key to successful performance is clarity on the government's part about what it is seeking to achieve, and so what it needs. If it can buy goods and services in the market, then clearly it should do so. That even applies if the goods and services are critical to the UK.

But where there are specialist scientific assets or capabilities which the market is not going to provide, and which are required to meet national requirements, then the government has to step in and provide them. This requires great strategic clarity about why the asset, service or capability has to be provided by (rather than just funded by) government.

There are some obvious examples where government ownership and funding is clearly necessary. AWE will always remain in government ownership because of the nature of its capability – managing the full life cycle of the UK's nuclear deterrent. But the management and operation of the programme can be and is done by the market, and AWE works successfully as a GOCO.

Government Owned and Government Operated PSREs today account for about £1.3 billion of public expenditure, and over 14,000 staff posts. This means it is a sufficiently large sector to merit regular review.

We think the presumption that research establishments need to be publicly owned and operated needs to be changed, given the adverse impact of public sector constraints on performance. The question should not be "Why should this organisation be privatised/contractorised?" but "Why does it have to remain in government?"

Even where government decides a PSRE needs to remain in the public sector it should try to secure a GOCO arrangement because this will give better value for money and other benefits than managing it in the public sector.

The UK Coalition Government is facing unprecedented pressures on government spending. Now is an ideal time to reopen the question about the future status of publicly owned PSREs. Fewer constraints mean better value for money for government, and we have seen that there are opportunities which merit investigation now.

For example:

- It is difficult to see why the three Defra establishments – AHVLA, Cefas and Fera need to remain as GOGOs rather than becoming GOCOs or being fully or partly privatised.
- In reviewing the PSREs there is scope to look more widely than current organisational boundaries. There are overlaps in the scientific focus and roles of several of the PSREs. For example, AHVLA, Cefas, Fera and HPA all have emergency response roles, and there may be scope for them to achieve better value for money by sharing common services or capabilities.
- The boundary between Dstl and QinetiQ needs further scrutiny with a view to moving more of Dstl's activities into the private sector (as is already being done with some of its assets). It is unclear why the activities which have to remain in government ownership in Dstl would not deliver greater value and benefits to government under a GOCO arrangement.
- We have not looked at the research council funded research establishments in this study, but a review of their operations and organisational status would be worthwhile.

Conclusion

PSREs – government owned and privatised – contribute a significant amount of high quality applied scientific research, technical advice and emergency response capability in a wide range of critically important areas.

The experience of those PSREs whose ownership or management was passed to the private sector has shown

that there is considerable potential for them to generate employment and promote commercial exploitation of R&D and ensure technology transfer to the wider economy.

At a time of significant pressure on government finances and a strong desire to utilise government R&D spending to the utmost to promote growth it is incumbent on Government to ensure that it gets maximum value from its spend.

We believe that because of current public sector operating constraints this is unlikely currently to be happening with the existing PSREs or with the research council research establishments.

Now is the moment to seize the opportunity for Government to seek to free them from these constraints. This will ensure that government gets not only better value for money from its spend, but through promoting more effective technology transfer and employment it will boost economic growth.

■ Appendix 1

Approach

This study was based on desk research, and a short interview programme. All current and past PSREs were invited to take part. The following agreed to give interviews with senior members of staff, and so we have consequently written up full case studies, which have been checked back with the establishments for factual accuracy:

- Forensic Science Service
- Atomic Weapons Establishment
- National Nuclear Laboratory
- National Physical Laboratory
- Building Research Establishment
- Natural Resources Institute
- Transport Research Laboratory
- LGC
- QinetiQ

In addition we held interviews with BIS, and with Battelle.

Where we were unable to undertake an interview we have produced a summary case study based on desk research of publicly available information. This was also checked back with the relevant PSREs, and where responses were received these were taken into consideration.

Full details of the case studies can be found at www.centreforum.org/psre