COUNCIL FOR SCIENCE AND TECHNOLOGY

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Prime Minister
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Sent by email only

07 October 2022

Dear Prime Minister

DELIVERING NATIONAL PRIORITIES THROUGH PUBLIC PROCUREMENT

Government procurement is not yet reaching its potential to stimulate innovation in Britain's economy and drive growth, productivity, prosperity, and security. Government's annual procurement spend of more than £300Bn[1] shapes future markets and supply chains, particularly in sectors where public purchasing dominates the market, such as in construction, energy, health, defence and security.

Public procurement must deliver best value for taxpayers, but a narrow focus upon lowest cost at the point of purchase can detract from opportunities for long-term benefits: to incentivise innovation and build market capability in strategically important areas for our nation's future, and to deliver better, more efficient products and services for the public sector, whilst growing productive British businesses. As was seen through development of the COVID-19 vaccine, collaborative partnerships between government and business are vital for successful innovation, creating a culture that offers opportunities for co-creation of innovative solutions, risk sharing, and a greater focus on outcomes. Increased public sector investment in R&D is welcome but further action is needed to reform the ecosystem of support for business research and innovation and translate this into productive UK businesses, and jobs with benefits for the economy and society.

Given the scale of government spending, even small changes to prioritise innovative solutions, where appropriate, could produce significant incentives in the supply chain. To begin with, if just 5% of the £300bn that government already spends on procurement was targeted towards innovative products and services, £16bn of revenue (the equivalent of twenty ARIA institutions) would be available to companies that prioritise research and innovation. This would help incentivise business investment in R&D and skills, while driving growth and delivering new products and services that could improve the operation of government. These benefits can already be seen at a limited scale in programmes such as Innovate UK's SBRI programme,

[1] Government Commercial Function: The Procurement Bill - Summary Guide to the Provisions (June 2022)

where on average, participating companies experience annual revenue growth rates over 30%.[2]

We welcome and acknowledge the focus and commitment that government has already placed on transforming public procurement, as demonstrated through the 2021 Innovation Strategy, Cabinet Office's 2020 Green Paper, and the national procurement policy statement published in 2021.The forthcoming procurement bill, which aims to allow for more flexible approaches, is tailored to suit need and make it easier to procure innovative solutions. We hope to see these policies and approaches applied, and our advice seeks to reinforce and add to these efforts.

We offer the following seven recommendations covering three themes of "signalling", "governance" and "delivery".

Signalling

> **Recommendation 1: Signal needs for public sector operations**: All government departments should develop and publish forward-looking annual 'statements of innovation needs and challenges' to provide a framework for business engagement and planning.
>
> **Recommendation 2: Signal national needs**: For major national priorities such as achieving net zero, government should create and publish long-term technology roadmaps highlighting areas for development and deployment of technology applications and capability, to signal where government is seeking to incentivise development of UK market capability.

Through successful demand signalling, NASA in the United States has accelerated the growth of private companies like SpaceX to deliver new human launch capabilities and technologies, reducing costs and reliance on other nations.[3] Sweden has been able to support its climate goals, for example delivering a 95% reduction in CO_2 emissions from participating organisations by increasing procurement of electric vehicles.[4]

Governance and accountability

To achieve the 'double dividend' of more efficient public services and economic growth, government should commit to investing in innovation through procurement and hold itself to account**.**

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[2] Mazzucato, M. (2020). Mission-oriented public procurement: lessons from international examples. UCL Institute for Innovation and Public Purpose, Policy Report, (IIPP 2020-20). Available at: https://www.ucl.ac.uk/bartlett/public-purpose/pr2020-20.

[3] Zapata, E. (2017, September). An Assessment of Cost Improvements in the NASA COTS-CRS Program and Implications for Future NASA Missions. In AIAA Space 2017 Conference (No. KSC-E-DAA-TN44427).

[4] Mazzucato, M. (2020). Mission-oriented public procurement: lessons from international examples. UCL Institute for Innovation and Public Purpose, Policy Report, (IIPP 2020-20). Available at: https://www.ucl.ac.uk/bartlett/public-purpose/pr2020-20.

Recommendation 3: Set targets for research and innovation within procurement: At least 5% of departmental and wider public procurement budgets, on average, should demonstrably and measurably contribute to novel UK-based research and innovation. There are a wide range of tools available to departments to achieve this, from innovation requirements written into contracts for large programmes, to government co-funding or investment in the businesses that are developing tomorrow's technologies relevant to public sector needs.

Recommendation 4: Establish leadership and accountability: You should appoint a specific Cabinet Office Minister to work with the Government Chief Commercial Officer to lead and champion radical procurement reform to drive national R&D and innovation. A separate procurement unit may be required to lead on innovation.

Recommendation 5: Develop professional capability to integrate innovation across the procurement cycle: Skilled civil servants involved in public procurement are critical to delivering innovation – seeking out opportunities, defining requirements and brokering solutions with industry. Support for innovation should be fully integrated into procurement processes, with strong connections between commercial, innovation and operational teams, alongside effective engagement with the supply chain. To deliver innovation, teams need specialist knowledge, flexibility to take risks, and capabilities to support this. We recommend that the head of the government commercial function and the science and engineering profession should work with Innovate UK to establish a cadre of government professionals who are technically, commercially, and operationally literate.

Delivery

Recommendation 6: Pathfinders: The government departments with the largest procurement spend should launch a series of sector-specific procurement pathfinders to test innovation-enhancing approaches aligned with key national goals. These pathfinders could build on existing best practice seen in the vaccine taskforce, ventilator challenge and existing innovation stimulation mechanisms including NSSIF, ACE and the NHS innovation accelerator.

Recommendation 7: New Procurement 'Playbook': The Government Commercial Function should codify lessons from pathfinders and other examples of innovation-enhancing procurement into a new procurement 'innovation playbook' which provides the structure and framework with which these changes are implemented and monitored.

Success means that UK businesses receive an 'innovation dividend' for investing in the development of innovative products and services relevant to public sector needs. If done effectively, benefits can be realised for all involved:

- **For businesses**: clearer demand signals to inform private investments, a valuable, trusted and increasingly accessible government customer bringing benefits such as aligning exports with HMG requirements, and appropriate financial reward to justify innovation and risk-taking.
- **At a departmental level**: improved market collaboration and access providing capabilities and innovations that improve departmental operation and services and reduce costs.
- **At a national level**: economic growth, businesses encouraged to invest in R&D to meet the UK's national goals, creating high-skilled jobs, boosting UK S&T capabilities, and strengthening UK supply chain resilience.

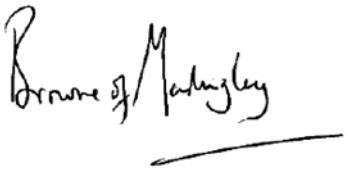
At the moment, every penny of taxpayer's money must work harder. Innovation-enabling procurement is an opportunity to turn additional government spending on areas like defence or healthcare into a stimulus for UK innovation and economic growth. We would welcome you and your minister's support of ongoing improvements to public procurement and leadership in signalling and driving forward these opportunities.

Thanks to the Royal Academy of Engineering for hosting a systems workshop with experts and government officials to inform our work.[5]

This letter is copied to the Chancellor of the Exchequer; the Secretary of State for Business, Energy and Industrial Strategy; the Secretary of State for Education; the Chief Secretary to the Treasury; the Chancellor of the Duchy of Lancaster, the Minister for Science and Investment Security; the Cabinet Secretary and the Permanent Secretaries of HM Treasury, and the Department for Business, Energy and Industrial Strategy, and the Department for Education.

Yours sincerely,

Sir Patrick Vallance
Co-Chair



Lord Browne of Madingley
Co-Chair

[5] RAEng & CST Workshop Report: how can public procurement drive innovation in pursuit of national goals?, October 2022

PRIME MINISTER'S COUNCIL FOR SCIENCE AND TECHNOLOGY

Delivering national priorities through public procurement

Issues to address

1. Many ways in which government procurement could increase national levels of R&D have been proposed and this is a well-studied topic. However, many barriers (perceived and real) have prevented such proposals from being effective. During this CST study, the following obstacles were observed:

Signalling

a. A lack of 'medium and long-range demand signals' to encourage businesses to invest. Industry and its financial backers are willing to invest if government demand is clear, especially if government demand can be aligned with export potential.
b. A lack of a national level 'systems view' which recognises the role that procurement has in the research and development system. Businesses often feel that national benefit is rarely considered beyond narrow value for money tests.

Governance and Accountability

c. Poor connections between innovation-focused public bodies (e.g., UKRI), and operational delivery and government procurers that limits the ability of successful innovation to be taken up by government.
d. Limited consideration of UK supply chain development and benefits in delivering domestic investment, resilience, skills, capabilities and exportable outputs.
e. An unwillingness on the part of business to offer innovative solutions to public procurement when it feels a procurement will be won by the lowest price, lowest risk bidder.
f. Excessive delays in competitive procurement can lead to cash flow challenges for businesses, especially SMEs.
g. Operational and commercial teams lack 'top cover' for choosing innovative approaches (the associated lead in time for early market engagement and perceived additional costs) over safe procurement (such as buying the same product/service as last time, or a catalogue product from overseas).
h. A national lack of guidance, skills and expertise amongst procurement staff to judge engineering and technology risk of innovative approaches, products and services. Default use of unlimited liability provisions was one example highlighted.
i. A risk averse culture is interlocked with the procurement process, making change difficult. In some cases, specifiers and procurers don't even know each other, severely restricting dialogue with innovative suppliers.
j. A lack of capacity within businesses to engage and administer public procurement processes, especially for small innovative businesses with limited workforces.

Delivery

a. Difficulty in translating high-level national goal and government ambitions into practical, meaningful and measurable metrics to inform departmental procurement appraisal and evaluation. This can cause innovation to be overlooked in place of outcomes that can more easily be measured.
b. A general view that UK R&D isn't a priority for government procurement and simply introduces unnecessary risk.
c. Articulation of risks to an untested solution is often easier than articulation of benefits.
d. Overriding incentives to deliver value-for-money that fail to recognise additional social, economic and environmental outcomes of innovative solutions.
e. Low expectation from businesses that investment in innovation will lead to government procurement contracts. This is a particular challenge to small innovative businesses who may require additional support to scale up.
f. Often there are scale-up challenges and 'unfair intellectual property clauses' where a R&D intensive business may win an R&D contract but must re-compete, and may lose, large scale procurement.
g. Requirements are often over-specified limiting options for innovation and potential selection of more effective solutions.[6]
h. Public-sector business support for the earliest stages of technology development do not achieve its full potential due to a lack of effective 'hand-off' to public sector customers.

Recommendations

2. To address these challenges, CST proposes the following recommendations:

Signalling

Recommendation 1: All government departments should develop and publish a forward-looking annual 'statement of innovation needs and challenges' for operational delivery (what operational challenges they need solutions to). This should complement departmental Areas of Research Interest (ARIs) and could be incorporated into departmental Outcome Delivery Plans (ODPs). This would provide clarity on priority areas of need to facilitate collaboration across the public sector, with international partners and give businesses a clearer indication of expected future demand to promote investment in relevant R&D.

1. Businesses should have full visibility of these need lines and, if appropriate, have the means to recommend modifications or additional ideas if other national benefits can be demonstrated.

2. To provide clear signalling to innovators, statements of needs should include indicative scale and timescale of procurement.

Recommendation 2: Innovation policy, commercial leads and horizon scanning teams should develop long-term roadmaps to uncover expected timelines, dependencies and future challenges, for key priority technologies

[6] RAEng & CST Workshop Report: how can public procurement drive innovation in pursuit of national goals?, October 2022

within their areas of interest and in line with national objectives. This work could be led by departmental CSAs to ensure alignment with ARI development, and to facilitate knowledge sharing through government science and technology networks.

3. In our brief consultation with businesses, we found strong appetite for further engagement with government to better understand long-term operational challenges for which they are likely to have procurement needs, outside of the restrictions of discussions on individual contracts.

4. Coordination with technology horizon scanning by OSTS, GO Science and BEIS will help to ensure that 'statements of needs and challenges' are based upon sound understanding of the future technology landscape and the position of UK business within that landscape.

5. Further workshops should be conducted by sector, bringing together public sector officials, with large and small businesses to discuss the particular challenges they face and opportunities for growth through innovating new products and services. These workshops should engage companies across the entire UK, with a particular focus on those who have not previously supplied government.

<u>Governance and accountability</u>

Recommendation 3: During Spending Reviews, the Treasury should set targets for departmental and wider public procurement spend that should demonstrably and measurably contribute to novel UK-based research and innovation. CST recommend at least an average of 5% of governments procurement budget should be allocated in this way.

6. The Cabinet Office, Treasury and National Audit Office should work with departments to define the proportion of procurement expenditure that should be directed towards R&D and innovative products and services. They should develop metrics for how the proportion of R&D in any procured product or service is defined, and to evaluate the impact of procurement spend (e.g., rates of R&D in sectors). These should be monitored in line with departmental and NSTC commitments to innovation, R&D, and addressing national challenges.

7. Part of this commitment should include the use of targeted procurement at the scale-up phase, with measures to evaluate and track innovative scale-ups supported by public procurement. This should be at a significant proportion of government's procurement budget to be a genuine incentive to business R&D. As a sophisticated corporate and sovereign buyer, it is appropriate that government takes some risk to stimulate innovation from UK scale-up companies as has been done in other successful countries. We offer more detailed recommendations in our letter 'Increasing the availability of scale-up investment for domestic innovative science and technology companies'.

Recommendation 4: The Prime Minister should appoint a specific Cabinet Office Minister to work with the Government Chief Commercial Officer to lead radical procurement reform to drive national R&D and innovation.

8. The Government Chief Commercial Officer (or infrastructure equivalent) must be suitably empowered to act as a catalyst for cultural, process and systemic change across government. This must include having oversight and authority to challenge the level of innovation being sought in procurement processes, particularly during early stages. This procurement change requires leadership from the highest level of government including a close partnership between leaders and HMT.

9. Discussion with experts in business and different public services suggests that a separate procurement organisation may be required to lead on innovation. To support the delivery of radical procurement reform within government, a new specialist innovation team could be established, comprising industry experts and government procurement professionals with specialist S&T knowledge and skills.

Recommendation 5: To establish a seamless system of support for businesses with innovative solutions relevant to public sector needs, the heads of the government commercial function and the science and engineering profession should work with Innovate UK to develop a cadre of government technically, commercially, and operationally literate professionals. They should receive intensive training in procurement processes, pre-procurement market engagement and early-stage innovation support mechanisms and should form a network of champions for innovation through procurement across government departments.

10. Government should recognise that the skills required to manage innovative procurement are not the same as commodity procurement. This will require specific training packages, job-swaps with industry, and effective use of existing support for developing and assuring professional skills such as the Major Projects Leadership Academy and the Government Commercial Function's accreditation process developed with the Chartered Institute of Procurement and Supply.

11. Different departments will need relevant specialist expertise in-house to procure effectively, with sufficient knowledge of the S&T capabilities relevant to their needs to make sure what is produced is fit for purpose. They also need the skills and training to engage in technology and market development, including through co-development and integration of technology for service transformation.

12. To tackle existing cultural barriers that limit effective procurement the cadre of professionals should engage with finance, policy and legal professions to improve awareness of all factors involved throughout the process.

13. In addition to upskilling public procurement professionals, innovative businesses with potential to be government suppliers could also benefit from training on how to engage with public procurement processes. Government should consider development of a periodic training course offered to those wishing to bring innovative products and services to the public sector. This could be designed and delivered by Innovate UK building on their experience of supporting innovative businesses.

Delivery

Recommendation 6: Government should launch a series of sector-specific procurement pathfinders to test end-to-end approaches aligned with key national goals. These should deliberately maximise the national innovation dividend through pre-procurement market engagement rather than 'catalogue product' solutions. Government Commercial Function could seek proposals from the government departments with largest procurement spend (DHSC, HO, MoD, BEIS) for specific areas where principles and approaches can be tested and learning shared.

14. To inform procurement demonstrations, we suggest bringing together learning from the vaccine taskforce, ventilator challenge and existing innovation stimulation mechanisms (including NSSIF, ACE and the NHS innovation accelerator) to clarify and build a playbook of tools and mechanisms. Evaluation processes should be built into new pathfinders at the outset to ensure their benefits can be measured and lessons learnt and promoted.

15. We recommend that these demonstrators are focussed on:
    a. specific national priorities where social value has already been identified and codified by government, such as Net Zero, Levelling-up, Healthy Life Expectancy; and
    b. industry sectors where public sector procurement shapes the market such as defence, construction, decarbonisation, education or health.

16. The demonstrators could offer the opportunity to test radically different approaches such as:

Exploration of use of Social Value measures to encourage UK Innovation

17. Procurement pilots could test mechanisms to encourage UK beneficial outcomes which result in delivery of national goals. This could include exploring freedoms enabled by post EU-exit (while staying within the legal framework of the WTO rules).

Investment in technology development

18. Extend or build on the NSSIF approach for government 'corporate venturing' in advanced technology firms and provide equity in priority areas. NSSIF investment could be used across a spectrum of areas but it is felt such investment applies most closely to national security areas.

Pre-market development of UK S&T capability relevant to national goals

19. Support demonstrator infrastructure for ‘proof of concept’ linked to national goals and OSTS priorities. These should build on recommendations from organisations such the Royal Academy of Engineering to fund demonstrators intended to act as national foci for innovation will reduce the cost of getting innovations to a stage appropriate for procurement.

20. Allow for innovation challenges, innovation ‘sprints’ and demonstrations of technology development in areas strategically important areas, including capacity for surge on rapidly emerging areas of public sector need (e.g. Ventilator Challenge).

Recommendation 7: The above recommendations should be codified into a new procurement ‘innovation playbook’, incorporating lessons learnt from the pathfinders, providing a structure and framework with which these changes are implemented and monitored.

21. Using lessons from the pathfinders a procurement ‘innovation playbook’ should ensure policy, operational, commercial, and S&T professionals in government understand their opportunities and responsibilities and have access to guidance tools and approaches across all stages of innovation, market development and procurement.

22. The innovation playbook should capitalise on changes to UK procurement regulations following EU-exit and should include appropriate ‘weighting’ in procurement evaluation formulas towards those employing UK-based R&D (including manufacturing technology) where the IP is resident in the UK enabling exports and other national benefits. The framework of the WTO rulebook is noted, and some legal advice will be needed on how far the ‘social value’ element (or national exemptions) can be adjusted.

23. The playbook’s approach should also recognise the economic value-add of secondary, spill-over benefits including support for scale up of innovative SMEs or competitive R&D in large businesses. This would require systematic analysis of the uncertainties in estimates of economic value, considering potential up-sides as well as down-sides.

24. The Government Commercial Function and Treasury should also review international best practices in public procurement for innovation which could be included in the playbook. This may include lessons from the US Inflation Reduction Act 2022, which included over $9 billion for Federal procurement of American-made clean technologies to support the green agenda.

25. In specific areas, government should introduce changes to procurement policy that drive outcomes-based approaches (such as solving a specific challenge related to delivering a net zero economy). The principle of outcomes-based procurement is recognised in the government’s public sector procurement policy[3].This could focus on:

    a. Using challenge statements rather than output specifications to allow maximum scope for innovative solutions

b. Developing measures to assess the value of contribution of bids to specific national priorities.
c. Establishing a departmental league table to assess how departments are performing against their innovation targets and use of outcome-based approaches.
d. Use best practices in prize and challenge development including offering prize competitions to expand reach of challenges
e. Engaging specifically with start-up ventures with potential solutions to critical national challenges

26. Lastly, to raise awareness of best practice and increase acceptance of risk, case studies detailing successful examples of public procurement driving innovation and R&D outcomes (including appropriate failures), such as NSSIF and the NHS innovation accelerator, should be catalogued and publicised.

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