

Written Evidence Submitted by the Oil & Gas Technology Centre (OGTC) (RFA0022)

About the Oil & Gas Technology Centre

- **The Oil & Gas Technology Centre (OGTC)** welcomes the opportunity to respond to the Science and Technology Committee's Inquiry: A New UK Research Funding Agency.
- **Strong support:** The OGTC strongly supports the creation of an effective ARPA focused on a transformative programme with involvement from both industry and the research community.
- **Uniquely positioned:** As a 'sectoral ARPA' we believe the OGTC is uniquely positioned to both inform the creation of such an agency and become a trusted delivery partner.
- **£16BN GVA:** Established in early 2017, the OGTC has become the go-to technology centre for the oil and gas sector, generating >£16BN potential GVA and commercialising >20 technologies.
- **Partnership:** Like the proposed UK ARPA, the OGTC partners with industry, academia and government to accelerate technology deployment to address major challenges.
- **Programme management:** The OGTC works in partnership with stakeholders in a programme management capacity.
- **Major challenges:** We identify fundamental challenges that need to be addressed and create research and development programmes to deliver solutions.

Summary response

- **Improve effectiveness:** We believe the effectiveness of UK's current £49BN investment in R&D needs to be vastly improved to tackle major national and global challenges.
- **Create ambitious strategic goals:** UK ARPA should be driven by the UK's big strategic goals and allowing it to quickly pivot to a more responsive well-funded delivery system.
- **Not competition based:** The current competition based Innovate UK model is not universally appropriate to address major challenges like, for example, net zero.
- **Create pace, clarity and focus:** UK ARPA can bring clarity, pace and razor-sharp focus to a small number of highly strategic missions, creating alignment with and support from industry.
- **Global positioning:** UK ARPA can maintain and improve the UK's position as a global leader in R&D, bringing huge benefits to the UK economy, particularly post Covid-19.
- **Provide significant funding:** To compete and succeed, UK ARPA needs to be properly funded and operate separately from the existing UK R&D system.
- **Use existing capability to move quickly:** In organisations like Catapult Centres and the OGTC, the UK has the capability and knowhow to rapidly create and deliver a UK ARPA.



- **Big picture and industry led:** UK ARPA should be an independent agency with clear strategic imperative and be industry led, not science led, seeing the big picture and having ambitious goals.
- **Consortium-based:** It is vital that UK ARPA enables and unlocks cross-sector partnerships, creating and funding the right consortia to tackle the right challenge.

What gaps in the current UK research and development system might be addressed by an ARPA style approach?

- Programmes and projects that drive delivery of a strategic UK imperative, eg, net zero.
- The current competition based Innovate UK model is not universally appropriate to tackle major challenges; UK ARPA must see the bigger picture and drive industry-support.
- The new agency should support ‘intervention style’ projects that require a critical industry or place appropriate consortium (hence not suitable for a competition) to deliver a step change in a region or industry’s performance. Examples can include direct air capture in Grangemouth, the Shetland Hub, where the members of the consortium are critical to the success of the project.
- Programmes and projects that have a real ‘market’ pull that will lead more easily to successful exploitation of the results and economic, societal or environmental benefits.
- Investment in later stage development to balance the investment in early stage research, thus ensuring technologies become market ready.
- The scope to rapidly fund radical and transformational ideas that do not attract support from the conventional research community.

What are the implications of the new funding agency for existing funding bodies and their approach?

- In organisations like Catapult Centres and the OGTC, the UK has the capability and knowhow to rapidly create and deliver a UK ARPA. A whole new model is not required. We must use this existing framework to move quickly, rather than start from scratch.
- UK ARPA should have a clear strategic imperative and be industry led, not science led, seeing the big picture and having ambitious goals.
- The new agency should become a distinctive and successful vehicle to improve the effectiveness of UK’s current £49BN investment in R&D to tackle major national and global challenges. Once established we believe a significant proportion of this funding should be invested via UK ARPA.
- It is vital that UK ARPA enables and unlocks cross-sector partnerships, creating and funding the right consortia to tackle the right challenge. There are strong examples to build on, such as the OGTC’s partnership with the Offshore Renewable Energy Catapult to establish the Energy Transition Alliance.
- UK ARPA should have a clear strategic imperative and be industry led, not science led, seeing the big picture and having ambitious goals.



- There should be co-ordination and cooperation between the UK ARPA and existing funding agencies (including UKRI) to ensure distinctions are maintained, benefits from collaboration are achieved, and overlaps avoided.

What should be the focus of the new funding agency and how should it be structured?

- Funding should be phased, with lower levels in years one and two, to enable the new agency to establish and focus on the right challenges, before larger sums are available to accelerate opportunities.
- Funding should not be capex oriented and asset creating. Instead investment should be focus directly on projects and the regional capability. We should not build more centres.
- The portfolio of the agency should comprise of individual but large projects, each being proactively supervised/monitored by a member of the agency's staff.
- UK ARPA can bring clarity, pace and razor-sharp focus to a small number of highly strategic missions, creating alignment with and support from industry.
- Its team must be technically knowledgeable in the projects they are funding and be able to develop and manage strong relationships with industry, with real autonomy and empowerment.
- UK ARPA must work across technology readiness levels to accelerate transformative ideas from prototype through to commercial deployment, with clear demand and commitment from industry.
- The OGTC is a sectoral ARPA model and the catapult system which integrates the challenges of industry with core R&D are good models to build from.
- A whole new structure is not required. Instead rapidly adapting models where critical government investment has already been made would allow the UK to quickly pivot to a more responsive well-funded ARPA delivery system.
- But UK ARPA must be developed on a genuinely different platform, with different boundaries and greater flexibility than the existing UK innovation system, and it must not be hindered or incumbered by bureaucracy.
- Project managers are an essential part of the US model and this approach should be adopted for UK ARPA. Competitive remuneration will be essential to attract the right calibre of people.

What funding should ARPA receive, and how should it distribute this funding to maximise effectiveness?

- In comparison to other countries, the initial £800M appears to be limited and the initial five-year timeframe appears too short. It is difficult to forecast exactly how much funding is required until the mandate and scope of the UK ARPA is clearer.
- However, to compete and succeed globally, UK ARPA needs to be properly funded and operate separately from the existing UK R&D system.



- The level of funding is only one determinant of success; the key determinants are the clarity of mission and purpose, and the quality of capability and expertise.
- To deliver transformative solutions, UK ARPA must have the right appetite for risk and must have the agility to pivot or quickly stop projects that are not meeting the agreed success criteria.

What can be learned from ARPA equivalents in other countries?

- The proposal to base the UK agency on the US models of DARPA and ARPA-E is sensible in view of their success, provided it is modified to address the differences in the research, development and innovation infrastructures between the US and UK.
- In the US DARPA focuses on advanced technologies for national defence, ARPA-E on advanced technologies for energy, HSARPA focused on Homeland Security and IARPA focused on National Intelligence, and dealing also with investment in quantum computing, machine learning, and forecasting tournaments like the Good Judgement Project. UK ARPA needs to have equally clear areas of focus to succeed.
- The differences mainly exist where US universities often incorporate research institutes and national laboratories, whereas in the UK there is a separate Innovation, Research and Technology (IRT) sector that includes Research and Technology Organisations (RTOs) including the subset of Catapult Centres, sectoral ARPAs (the OGTC), Public Sector Research Establishments (PSREs) some industry-focused university centres, and private sector research, development and innovation organisations.
- To be successful the UK ARPA must:
 - Have a very clear mission, mandate and scope
 - Be flexible, adaptive, responsive and agile
 - Avoid bureaucracy and red tape
 - Build mutually beneficial relationships with industry
 - Focus on commercialisation as much as research and innovation

What benefits might be gained from basing UK ARPA outside of the 'Golden Triangle' (London, Oxford and Cambridge)?

- Basing UK ARPA outside the 'Golden Triangle' would demonstrate national inclusivity and enable the new agency to access the wide excellent capability that exists in other areas of the UK.
- It would also enable UK ARPA to develop close links to key industrial sectors across the UK, aligned the mission and challenges of the new agency.
- In creating UK ARPA, the Government could take a 'place-based' approach, establishing the new agency – both head office and regional offices – to create economic opportunity and wealth across multiple regions. DARPA has six such offices in the US.
- It is essential that ARPA projects are awarded to those organisations with the best expertise, capability and proven track-record to undertake the work, irrespective of geographical location. Particularly where the activity relates to a particular, geographically specific sector (eg, the offshore energy sector).

Further evidence



- The OGTC would welcome the opportunity to provide further evidence and insights to the Science and Technology Committee during the course of this investigation.

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