This is a published notice on the Find a Tender service: https://www.find-tender.service.gov.uk/Notice/036239-2024

Tender

Quantum Technology Missions Roadmaps

DESNZ & DSIT Group Commercial

F02: Contract notice
Notice identifier: 2024/S 000-036239
Procurement identifier (OCID): ocds-h6vhtk-04b50a
Published 8 November 2024, 12:13pm

Section I: Contracting authority

I.1) Name and addresses

DESNZ & DSIT Group Commercial

London

Email

matthew.findlow@dsit.gov.uk

Country

United Kingdom

Region code

UK - United Kingdom

Internet address(es)

Main address

https://www.gov.uk/government/organisations/department-for-science-innovation-and-technology

I.2) Information about joint procurement

The contract is awarded by a central purchasing body

I.3) Communication

The procurement documents are available for unrestricted and full direct access, free of charge, at

https://beisgroup.ukp.app.jaggaer.com/

Additional information can be obtained from the above-mentioned address

Tenders or requests to participate must be submitted electronically via

https://beisgroup.ukp.app.jaggaer.com/

Tenders or requests to participate must be submitted to the above-mentioned address

I.4) Type of the contracting authority

National or federal Agency/Office

I.5) Main activity

General public services

Section II: Object

II.1) Scope of the procurement

II.1.1) Title

Quantum Technology Missions Roadmaps

II.1.2) Main CPV code

- 73000000 - Research and development services and related consultancy services

II.1.3) Type of contract

Services

II.1.4) Short description

The Department for Science Innovation and Technology (DSIT) would like individuals or organisations with commercial and technical knowledge of the quantum technology sector to develop detailed road maps to support the design and delivery of the each of the National Quantum Strategy Mission.

The ITT can be found on DSIT's e-procurement portal, Jaggaer, under live opportunities.

https://beisgroup.ukp.app.jaggaer.com/

II.1.6) Information about lots

This contract is divided into lots: Yes

Tenders may be submitted for all lots

II.2) Description

II.2.1) Title

Mission 2: Networking

Lot No

Lot A

II.2.2) Additional CPV code(s)

- 73000000 - Research and development services and related consultancy services

II.2.3) Place of performance

NUTS codes

- UK - United Kingdom

II.2.4) Description of the procurement

To deliver on the broad opportunities that are presented by quantum technologies, they will need to become firmly integrated within our digital infrastructure, including priority Future Telecoms platforms such as satellite communications. This will transform the way we transmit, compute and secure our data. This Mission will focus on numerous outcomes including scaling quantum computing, nationwide quantum connectivity, early commercialisation of quantum communications technologies and the delivery of the quantum internet.

As well as the common requirements set out above, the road map for the networking mission must therefore include the following for the timeline of the Mission:

-Key technological and research milestones that need to be achieved in order to materialise quantum networks including a future quantum internet (entanglement distribution from the local to global scale).

-Analysis of the key competing technological components (repeaters, memories, qubits, etc.) and the impact they may have on network design choices and supply chain considerations

-Underpinning fibre and wider classical infrastructure requirements (dark fibre, optical fibre, ground stations, etc.) as quantum networks scale, mapping existing capabilities and identifying gaps where appropriate

-Information on international comparators would also be very helpful to inform what international partnerships may be beneficial and identify supply chain dependencies.

II.2.5) Award criteria

Price is not the only award criterion and all criteria are stated only in the procurement documents

II.2.7) Duration of the contract, framework agreement or dynamic purchasing system

Start date

20 January 2025

End date

31 July 2025

This contract is subject to renewal

No

II.2.10) Information about variants

Variants will be accepted: No

II.2.11) Information about options

Options: No

II.2.13) Information about European Union Funds

The procurement is related to a project and/or programme financed by European Union funds: No

II.2) Description

II.2.1) Title

Mission 3: Quantum sensing for healthcare

Lot No

Lot B

II.2.2) Additional CPV code(s)

- 73000000 - Research and development services and related consultancy services

II.2.3) Place of performance

NUTS codes

- UK - United Kingdom

II.2.4) Description of the procurement

To deliver on the broad opportunities presented by quantum technologies to reduce costs and save lives, quantum-enabled products and services will need to become integrated within our NHS. This mission will build on early UK successes in the development of

products to revolutionise healthcare capabilities and pull these through to adoption, providing a firm foundation to grow the UK quantum medical device industry sector.

The mission will also generate a pipeline of next-generation technologies which harness quantum physics to deliver early-stage diagnoses and improved surgical outcomes, across areas such as dementia, epilepsy, cancer, cardiovascular disease, infectious diseases, as well as quantum for life sciences and social care.

As well as the common requirements set out above, the road map for the quantum sensing for healthcare mission must include the following for the timeline of the Mission:

-Specific technological milestones for quantum sensing, framed with respect to both relevant chronological stages of the NHS health technology pathway in one dimension and clinical areas of need / use cases / scenarios for quantum sensing in another.

-Priority use cases to be explored:

-Brain imaging for neurological disorders, but especially dementia

-Cancer imaging

-Quantum enhanced MRI imaging

-Quantum enhanced In vitro diagnostic tests

The roadmap should be carried out in a way that engages clinical end-users, engaging both quantum capability with clinical areas of need and creates a consensus of milestones and activities agreeable to both health adoption and relevant quantum technology experts alike.

II.2.5) Award criteria

Price is not the only award criterion and all criteria are stated only in the procurement documents

II.2.7) Duration of the contract, framework agreement or dynamic purchasing system

Start date

20 January 2025

End date

31 July 2025

This contract is subject to renewal

No

II.2.10) Information about variants

Variants will be accepted: No

II.2.11) Information about options

Options: No

II.2.13) Information about European Union Funds

The procurement is related to a project and/or programme financed by European Union funds: No

II.2) Description

II.2.1) Title

Mission 4: Position, navigation and timing

Lot No

Lot C

II.2.2) Additional CPV code(s)

- 73000000 - Research and development services and related consultancy services

II.2.3) Place of performance

NUTS codes

- UK - United Kingdom

II.2.4) Description of the procurement

This mission will develop and commercially exploit quantum navigation systems that are small and robust enough to be deployed on aircraft (amongst other moving platforms/ systems), combining technologies such as quantum clocks, inertial measurement units (IMU) including subcomponents such as accelerometers and rotation sensors/gyroscopes, as well as embedding technologies for ultra-precise mapping. Mobile platforms beyond aircraft (ground, air, sea, etc.) should be considered within scope in terms of the technology roadmap.

It forms part of a longer-term aim to reach chip-scale – unlocking the ability to integrate these systems into mobile phone-sized systems – and will therefore include facilitation of the fabrication and manufacturing capabilities needed to achieve this. The approach will deliver on a core element of the government's Position, Navigation & Timing (PNT) Policy Framework published on 18th October 2023 (point 10) to accelerate R&D into quantum navigation and the next generation of optical clocks.

The PNT/quantum PNT market is not expected to approach the size of larger markets where quantum technologies will play an important role, e.g., autonomous vehicles, chip-scale, healthcare, or CNI. Overlaps with these market opportunities will therefore be crucial for making the case for a good return on investment within the business case for Mission 4.

As well as the common requirements set out above, the road map for the PNT mission must include the following for the timeline of the Mission*:

- Estimates of market size and opportunity for core sub-component technologies that can be integrated into multiple sensors which address viable markets as well meeting Defence, Security, and CNI requirements. The UK is positioned to excel at:

- Compound semiconductor technologies enabling targeted laser development,

- Micro-electro-mechanical systems (MEMS)

- Vacuum cells

- Integrated photonics

- Advanced packaging

-Wider linked underpinning technologies such as OPMs and SPLIDAR that have much larger market opportunities through healthcare and autonomous vehicles, for example, should be pulled out as well where there is a clear link to the PNT market that can be pulled through by development for the much larger markets.

*A technology road map for this Mission is already being developed within government. The specific requirement for this Mission will therefore be more heavily focused on the commercial and deployment aspects of the road map; this will be done in close collaboration with DSIT leads.

II.2.5) Award criteria

Price is not the only award criterion and all criteria are stated only in the procurement documents

II.2.7) Duration of the contract, framework agreement or dynamic purchasing system

Start date

20 January 2025

End date

31 July 2025

This contract is subject to renewal

No

II.2.10) Information about variants

Variants will be accepted: No

II.2.11) Information about options

Options: No

II.2.13) Information about European Union Funds

The procurement is related to a project and/or programme financed by European Union funds: No

II.2) Description

II.2.1) Title

Mission 5: Sensing for critical national infrastructure

Lot No

Lot D

II.2.2) Additional CPV code(s)

- 73000000 - Research and development services and related consultancy services

II.2.3) Place of performance

NUTS codes

- UK - United Kingdom

II.2.4) Description of the procurement

This mission focuses on enhancing the capacity and resilience of critical national infrastructure, with significant benefits in cost reduction and supporting Net Zero ambitions. It addresses a core challenge across quantum sensing capabilities, where individual sectors and businesses see the bridge to exploitation and adoption into existing systems as too high risk to fund alone. This mission will therefore focus on accelerating the development of common technological capabilities to catalyse the private investment needed to pull through to adoption. By the end of the mission, key sectors will have deployed these new capabilities in industrial settings, with further exploitation opportunities around the world being realised.

While the definition of critical national infrastructure is broad, the sectors of focus for this mission are telecoms and utilities, transport, energy, and defence.

As well as the common requirements set out above, the road map for the sensing for CNI mission must include the following for the timeline of the Mission:

Performance and benefits of different types of quantum sensors (eg gravity gradiometers, magnetometers, photonic imaging, clocks) against classical solutions for the priority application areas for the Mission:

-Sensing of the underground/sub-surface (features and hazards, buried assets, surveying).

-Quantum distributed sensing (synchronisation of multiple assets in a network, such as drones, or arrays of stationary/fixed sensors).

-Remote gas imaging (such as methane, carbon dioxide, sulfur hexafluoride, hydrogen, hazardous chemicals).

Against relevant performance metrics such as:

-Sensitivity/average position/time error/penetrating depth.

-Noise.

-Operating conditions (min max).

-Dynamic range.

-Bandwidth.

-Personnel expertise required for operation.

-Platform deployment/mobility.

Capture genuine and specific SWaP-c requirements across different use cases – crucial to know where size/weight/power/cost are critical driving factors.

Expected demand for underlying components for each technology – is the market for low or high number of units (i.e. to be sold as a product or a service).

II.2.5) Award criteria

Price is not the only award criterion and all criteria are stated only in the procurement documents

II.2.7) Duration of the contract, framework agreement or dynamic purchasing system

Start date

20 January 2025

End date

31 July 2025

This contract is subject to renewal

No

II.2.10) Information about variants

Variants will be accepted: No

II.2.11) Information about options

Options: No

II.2.13) Information about European Union Funds

The procurement is related to a project and/or programme financed by European Union funds: No

Section III. Legal, economic, financial and technical information

III.1) Conditions for participation

III.1.1) Suitability to pursue the professional activity, including requirements relating to enrolment on professional or trade registers

List and brief description of conditions

This project will require expert technical and commercial knowledge of the quantum technology sector. This will vary by lot:

Lot A (knowledge of quantum networking, and the classical telecommunications sector)

Lot B (knowledge of quantum sensing technology as well as medical technology regulation and adoption pathways)

Lot C (knowledge of classical and quantum PNT, the defence sector and preferably wider sectors where quantum PNT might be adopted)

Lot D (knowledge of quantum sensing technology, and the CNI sectors listed in the Lot description)

III.1.2) Economic and financial standing

Selection criteria as stated in the procurement documents

III.1.3) Technical and professional ability

Selection criteria as stated in the procurement documents

Section IV. Procedure

IV.1) Description

IV.1.1) Type of procedure

Open procedure

IV.1.8) Information about the Government Procurement Agreement (GPA)

The procurement is covered by the Government Procurement Agreement: Yes

IV.2) Administrative information

IV.2.2) Time limit for receipt of tenders or requests to participate

Date

9 December 2024

Local time

12:00pm

IV.2.4) Languages in which tenders or requests to participate may be submitted

English

IV.2.7) Conditions for opening of tenders

Date

9 December 2024

Local time

12:00pm

Section VI. Complementary information

VI.1) Information about recurrence

This is a recurrent procurement: No

VI.4) Procedures for review

VI.4.1) Review body

Department for Science, Innovation and Technology

London

Country

United Kingdom