INVITATION TO TENDER

## Workforce skills: understanding physics-related skills in the UK and Ireland

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## Context

## The Institute of Physics

The Institute of Physics (IOP) is the professional body and learned society for physics in the UK and Ireland, inspiring people to develop their knowledge, understanding and enjoyment of physics. We are a registered charity.

We work with a range of partners to support and develop the teaching of physics in schools; we encourage innovation, growth and productivity in business including addressing significant skills shortages; and we provide evidence-based advice and support to governments across the UK and Ireland.

Our members come from across the physics community whether in industry, academia, the classroom, technician roles or in training programmes as an apprentice or a student. However, our reach goes well beyond our membership to all who have an interest in physics and the contribution it makes to our culture, our society and the economy.

We are a world-leading science publisher and we are proud to be a trusted and valued voice for the physics community.

## Our strategy

‘[Unlocking the Future’](https://www.iop.org/about/strategy) is our ambitious strategy to transform the physics landscape for the UK and Ireland, and to ensure a thriving physics ecosystem that will contribute to innovation, discovery, research, growth and debate in the UK, Ireland and beyond.

The strategy identifies three key challenges that present the greatest barriers to unlocking the potential of physics and its impact in society, and details six aspirations to meet these challenges.

## Understanding physics-related skills in the UK and Ireland

Both the UK and Irish governments are investing in R&D to drive economic growth, productivity and prosperity through technological advancement. However, it is widely reported that the UK and Irish economies face critical skills shortages, as well as imbalances in the supply and demand for high-value skills and qualifications[[1]](#footnote-2). In addition, while being a positive and necessary feature of a knowledge-rich economy, innovation is a significant cause of skills gaps, with more than a third of skills gaps reported in the 2017 employer skills survey attributed to the introduction of new technologies, new products and services, or new working practices.

Our strategy seeks to ensure that the UK and Ireland are able to realise the full societal and economic benefits of the new industrial era. To do this, we need to understand the extent to which shortages currently exist for physics-related skills and how they vary across the nations and regions of the UK and Ireland, as well as the anticipated future demand for physics-related skills driven by the development of new technologies. In particular, we are seeking to answer the following questions:

* Which physics-related skills are currently valued by employers?
* To what extent are employers’ needs for physics-related skills currently met?
* How might technology and other changes impact demand for physics-related skills in the future?
* How might the community adapt to fulfil these changing needs?

The IOP is looking to commission two pieces of research to develop its understanding of physics-related skills in the workforce: the first will be a broad assessment of the presence of and demand for physics-related skills across the whole economy; the second will be a series of deep dives into selected focus areas with significant demand for physics-related skills.

Report 1

The first report will explore the extent to which reported skills shortages currently exist for physics-related skills and how they vary across the nations and regions of the UK and Ireland. This will involve developing a definition of physics-related skills and using it to assess the occupations and sectors which make use of these skills and to what extent employers’ demand for these skills is met.

Report 2

The second report will present an analysis of future technology-driven skills needs in a small number (5 to 10) of focus areas that make significant use of physics-related technologies likely to have future economic or societal impact. This will include, in each focus area, anticipated changes in technology which are likely to drive new or greater demand for skills, associated skills requirements, and existing and potential mechanisms for acquiring these skills.

Further details of the approach that the IOP is broadly interested in taking are detailed in [section 6](#_Context) of this document; however, we ask suppliers to outline a proposed approach and methodology, in line with the above objectives, and to work with the IOP to refine this further if successfully appointed.

The findings of these reports will enable the IOP to:

* recommend actions to policymakers, employers and education and training providers to strengthen the supply of physics-related skills
* make evidence-based contributions to wider discussions about national skills shortages
* increase understanding of the use of physics-related skills outside of academia.

## Services required

We invite tenders for research into:

1. the presence of and demand for physics-related skills across the UK and Irish economies (report 1 as referenced above).
2. future skills needs driven by the development of physics-related technologies and mechanisms for fulfilling these needs (report 2 as referenced above).

The priority for this tender is to appoint a supplier for report 1, but responses from suppliers who are able to supply services for both reports are welcome. We welcome responses which focus on both the UK and Ireland, but will also consider responses which focus on either Ireland or the UK.

We anticipate that the following services and deliverables would be provided:

Report 1:

* Development of an appropriate methodology, including a robust definition of physics-related skills and methodology for mapping onto occupations and sectors, by which to understand the presence of and demand for physics-related skills across the UK and Irish economies
* Sourcing, review and analysis of data, including employment and skills shortage datasets and/or job postings data, at national and regional levels (at a minimum at the level of NUTS 1)
* Interviews with select employers/employees in the occupations and sectors identified to illustrate key findings arising from the quantitative research in more detail and to drive a compelling narrative
* A report drawing together the findings of the research alongside key messages and implications, at national and regional levels, for policymakers, employers, and education and training providers. These should be accessible to a non-specialist audience
* A copy of any data used to support claims in the report, including copies of data taken from other sources, at a sufficient level of detail for the IOP to be able to reproduce any figures referenced in the report or validate claims made in the report
* Attendance at one or more meetings during the research to present a summary of progress and initial findings, and at a launch event to present the final findings on completion.

The approach should demonstrate:

* An understanding of the complex area of workforce skills.
* Expertise in data research and the presentation of results through reports and other formats that are suitable for non-expert audiences, including policymakers.
* A sensitivity to the current economic climate businesses are operating in as a result of COVID-19.

Report 2:

* Development of an appropriate methodology by which to understand the future skills needs driven by the development of physics-related technologies and mechanisms for fulfilling these needs
* Initial scoping exercise to assess and select, with input from a steering group appointed by the IOP, the focus areas
* Design and execution of data collection in each focus area, achieving a reasonable sample size that allows for robust conclusions. We anticipate that this may include data collection through surveys, interviews and workshops but we welcome proposals as to the approach
* Review and analysis of data, with national and regional breakdowns where possible
* A report drawing together the findings of the research alongside key messages and implications, at national and regional levels, for policymakers, employers, and education and training providers. These should be accessible to non-specialist audiences
* A copy of any data (including qualitative data) used to support claims in the report at a sufficient level of detail for the IOP to be able to reproduce any figures referenced in the report or validate claims made in the report
* Attendance at one or more meetings during the research to present a summary of progress and initial findings, and at a launch event to present the final findings on completion.

The approach should demonstrate:

* An understanding of the complex area of workforce skills.
* Expertise in qualitative research and/or foresighting and the presentation of results through reports and other formats that are suitable for non-expert audiences, including policymakers.
* A sensitivity to the current economic climate businesses are operating in as a result of COVID-19.

Please contact us for information on the budget available.

## Timelines

### Project Plan

We ask potential suppliers to outline a proposed methodology and to identify key data to be collected. However, once selected, the successful supplier will work with the IOP’s project team to refine the methodology – for example, the definition(s) of ‘physics-related skills’ using the chosen taxonomies and the mapping onto occupations and sectors[[2]](#footnote-3) – and develop a final plan for the research project. The successful supplier will be expected to engage with the IOP’s project team on a regular basis.

Report 1: we would expect the appointed supplier to provide preliminary findings by 30 May 2021 and a final report by 28 June 2021.

Report 2: we would expect the appointed supplier to provide preliminary findings by 9 August 2021 and a final report by 6 September 2021.

### Tender Timeline

The anticipated timeline for the tender process is as follows:

|  |  |
| --- | --- |
| **Event** | **Date** |
| Invitation to tender released | 5 February 2021 |
| Deadline to request a meeting\* to discuss the ITT\*We will endeavour to find a mutually convenient time to meet but cannot guarantee that this will be possible. | 12 February 2021 |
| Potential suppliers to confirm by email their intention to submit a response  | 17 February 2021 |
| Deadline for clarifications  | 17 February 2021 |
| Completed responses returned to the IOP | 12:00, 5 March 2021 |
| All responses assessed by the IOP |  From 5 March 2021  |
| Interviews of shortlisted suppliers | w/c 15 March 2021 |
| Outcome(s) communicated to potential suppliers | Following completion of final interviews |

## Tender Returns and Assessment

We would be grateful to receive:

* Completed Request for Information (see Section 5)
* Proposed terms and conditions

The IOP will make a selection taking into account the following factors:

* Approach to the project
* Relevant previous experience and qualifications
* Suitability of terms and conditions
* Price
* Financial stability
* Geographic coverage
* Availability

Please return your response by email by 12:00, 5 March 2021. Hard copies of responses are not required.

Thank you in advance for your submission.

### Contact Details

Danielle Rawlings
Project Manager
Institute of Physics

+44 (0) 75 1650 3116

danielle.rawlings@iop.org

Submissions and enquiries or requests for clarification should be made by email to Danielle Rawlings. In order to avoid misinformation, you should not contact any other representative of the IOP to discuss this document.

If the IOP considers any question or request for clarification to be of material significance, both the query and the response will be communicated, in anonymous form, to all potential suppliers.

##  Request for Information

|  |
| --- |
| Please indicate if the tender relates to:  |
| [ ]  The UK and Ireland[ ]  Ireland only☐ The UK only  | [ ] Report 1 only[ ] Reports 1 and 2 |

### Supplier Information

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **1** | **Name of organisation** |  | **Contact name and job title***(for person handling this ITT for the supplier)* |  |
| **Registered address** |  | **Correspondence address relevant to this opportunity** *(If different to registered address)* |  |
| **Website address** |  | **Telephone number/mobile number** (incl national code) |  |
| **Companies House registration number** |  | **Email address** |  |
| **2** | **Year of registration** |  |
| **3** | **Please provide full details of ownership** (100 words max) |  |

### Competencies and Past Experience

|  |  |  |
| --- | --- | --- |
| **1** | **Please describe the suitability, competencies and qualifications of the individual(s) proposed to undertake the work**(300 words max) |  |
| **2** | **Please provide case study examples of relevant previous experience in providing services similar to those covered by this ITT and working with organisations of the size and nature of the IOP**(350 words max) |  |
| **3** | **Types of organisations/sectors for whom you provide services**  | **Sector**CommercialCharityOther  | **% of clients**%%% |
| **4** | **What are your core business competencies?**(Brief statement of what your organisation does – 200 words max) |  |
| **5** | **Please provide the names and contact details for two clients who can act as referees. Please give details of the types of services being provided, number of users, length of time such services have been provided by your company and location of the services being provided** (100 words max) |  |

### Financial Information, Insurance, Policies and Trade Bodies

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **1** | **TURNOVER AND PROFIT** | **Year ending****2017** | **Year ending** **2018** | **Year ending****2019** | **Year ending 2020 (if available)** |
| **Turnover** | £ | £ | £ | £ |
| **Operating Profit** | £ | £ | £ | £ |
| **2** | **Additional notes or explanation of accounts** (100 words max) |  |
| **3** | **Please provide your latest set of audited accounts and annual report** |  Supplied / Not Supplied  |
| **4** | **If you cannot supply the above financial information, please provide us with other indications of financial health and scale** (200 words max) |  |
| **5** | **Please confirm the financial cap per claim of your Professional Indemnity, Public Liability and Employer’s Liability Insurances?** |  |
| **6** | **Please provide details of your company’s contingency provision for continuation of service in the event of a disaster during the term of the contract across a range of scenarios including: Industrial action, computer hardware/software failure, loss of key site/facility, epidemic/pandemic, force majeure, etc.** (150 words max) |  |
| **7** | **Please set out your approach to mitigating risk and managing any shortfall in service and how you would guarantee continuity of service** (150 words max) |  |
| **8** | **Please provide details of your quality assurance processes and management systems and if applicable, any quality related accreditations or certifications you hold. Please list any other industry standards which you have gained which are relevant to provision of the services. In each case, please explain to which services or elements of your business they apply, when they were obtained and what they cover** (200 words max) |  |
| **9** | **Please confirm what steps you have taken/are taking to ensure that your firm complies with the Bribery Act 2010, the Modern Slavery Act 2015, the Criminal Finances Act 2017 and other similar legislation or regulatory requirements.** (150 words max) |  |
| **10** | **Are you a member of any relevant trade bodies?**(Please state which ones) |  |
| **11** | **Please provide details of your policies, procedures and practices in relation to:****(a) the environment and climate change;****(b) health and safety; and****(c) corporate social responsibility** |  |

### Approach and Methodology

|  |  |  |
| --- | --- | --- |
| **1** | **Summary of proposed approach to the project,** including:* A proposed methodology, key data to be collected and a sample of types of questions.
* A timeline and key milestones
* Project management
* Project governance and reporting
* Risk mitigation
* Quality assurance / control
* Budget management

(1000 words max or 2000 words if also including report two) |  |
| **2** | **Proposed pricing methodology and estimated price**(200 words max) |  |
| **3** | **Availability and expected ways of working with the IOP**(200 words max) |  |

**Please note, we also request:**

* Proposed terms and conditions

## Appendices and Information

### Context

The first report will develop a definition of physics-related skills (see below) and use this to produce a broad analysis of:

* occupations which make use of physics-related skills
* industrial sectors which make use of physics-related skills (based on occupational make up)
* shortages associated with physics-related skills and their variation across the nations and regions of the UK and Ireland.

A definition of ‘physics-related skills’ will be developed as part of the project, using O\*NET or a suitable equivalent skills framework, which can be mapped to occupations and industrial sectors (such as those defined by the SIC, SOC and NACE classification systems, selected as appropriate to the region of application), to enable quantifiable analysis of physics in the workforce.

Shortages should be explored by linking these physics-related skills, occupations and/or sectors to existing datasets on employer skills shortages (such as the UK [employer skills survey](https://www.gov.uk/government/publications/employer-skills-survey-2017-uk-report), the Irish [National Employer Survey](https://hea.ie/assets/uploads/2019/01/21-01-19-J8961-Irish-National-Employer-Survey-Final-Report.pdf) and the [European Labour Force Survey](https://ec.europa.eu/eurostat/web/microdata/european-union-labour-force-survey)) and/or job postings data. The data could be used to explore some or all of the following, in relation to physics-related skills:

* extent of skill-shortage vacancies
* impact of and actions employers are taking to overcome these shortages, as well as skills gaps (i.e. relating to those currently employed) in physics-related sectors
* strength of demand for different skills
* which skills employers find hardest to fill
* impact of Covid-19 on the above
* how the above vary by industry and by location.

Some complementary qualitative research should be conducted to illustrate key observations or questions arising from the quantitative research in more detail and to drive a compelling narrative. One approach could be to select stakeholders from industries identified as having a significant need for physics-related skills and ask them how the quantitative findings align with their own real-world experiences or predictions. Qualitative research could also be used to explore the impacts of Covid-19 if this should prove difficult with the data-based approaches.

While report 1 will predominantly present a snapshot of the current situation, a brief analysis should be presented of recent trends – for example, growth in physics-related occupations and shortages – and factors which might impact these trends in the future, to provide additional context and continuity with the second report.

**Report 2: Deep dives**

The second report(s)[[3]](#footnote-4) will present an analysis of future technology-driven skills needs in a small number (5 to 10) of focus areas that make significant use of physics-related technologies likely to have future economic or societal impact. This should include:

* anticipated changes in technology, which are likely to drive new or greater demand for physics-related skills, in each focus area over the next x years (see below description of focus areas for more details)
* associated skills requirements
* existing and potential mechanisms for acquiring these skills.

This information will be obtained using a qualitative approach based on (for each focus area) surveys of companies, interviews with key individuals, and workshops to explore and further develop the findings of the survey and interviews.

The selected focus areas could be industries, emerging technologies, Grand Challenge topics, research themes, or sectors highlighted by the analysis in report 1, for example; however, focus areas must have a clear connection to physics. An initial scoping exercise should be conducted in a range of potential focus areas, selected with input from a steering group appointed by the IOP, to review any existing technology and/or skills roadmaps and test likely responses with select key stakeholders. The final focus areas should then be chosen based on the strength of these initial findings and the complementarity of the focus areas when taken together (for example, if two potential focus areas look likely to have identical requirements, it may not be necessary to conduct two separate analyses).

Focus areas should be chosen based on a demonstrable use of physics-related technologies; however, the skills and/or occupations identified as likely to be in new or greater demand in the future should not be limited to those currently provided through physics-based training or education. This will enable the project to make recommendations aimed at strengthening the supply of all skills needed by physics-related employers in the future.

We recommend that the time period considered should not be universal to all focus areas, but should instead be set for each focus area individually according to anticipated technological development timescales – this will enable development of more reliable and useful conclusions for each focus area, and presentation of an overarching timeline of skills requirements in the final report.

Technology-driven skills needs are the focus of report 2; however, other factors likely to significantly impact future skills requirements (e.g. demographic and/or policy changes, Covid-19) should be identified and briefly discussed.

### Further Information

The IOP will deliver an ongoing programme of engagement to stimulate discussion of the key findings identified in the reports among policymakers, employers, education and training providers, our members and the wider physics community. To support this, the IOP would expect to be able to participate in any stakeholder engagement (for example, in interviews and workshops with employers) undertaken by the successful supplier as part of the commissioned research.

### Terms and Conditions of Tender

This document, the evaluation process and any information supplied by the IOP must be treated as private and confidential. Potential suppliers should not disclose the fact that they have been invited to tender or release details of this document, the evaluation process or any information supplied by the IOP other than on an “In Confidence” basis to those who have a legitimate reason to know, or with whom they have to consult, for the purpose of preparing responses. Potential suppliers are responsible for any breach of confidentiality which occurs as a result of any person to whom they make a disclosure. The IOP must grant its prior written permission for the distribution or sharing of this document or any other confidential information with any other parties.

The IOP is not bound to accept the lowest cost or any response to this document. The IOP also reserves the right to accept any response to this document in whole or part thereof.

The IOP makes no commitment to award a contract as a result of this process. The IOP reserves the right to accept or reject any and all responses to this document for whatever reason it deems appropriate. The IOP may also withdraw this document at any time.

The costs of preparing and delivering responses to this document, and any subsequent presentations and negotiations, are entirely the responsibility of the potential supplier.

Responses to this document, in whole or in part, may be incorporated and form part of any subsequent contract with the successful supplier. By submitting a response, you are confirming that all information included in your response is true and accurate in all material respects and you will be required to warrant this in your contract with IOP if you are selected as a successful supplier.

After the evaluation is completed, the IOP will retain copies of all responses to satisfy audit obligations.

The IOP may enter negotiations with more than one potential supplier simultaneously and may award all or any part of any proposal to one or more suppliers in negotiations without prior notice.

Potential suppliers shall not make any press release, public announcement or other public mention of any name or trademark of the IOP in connection with this process without the IOP’s prior written consent.

The IOP reserves the right to issue revisions to this document, including the timetable, at any time prior to the due date and to change any aspect of this process at any time.

Receipt by the potential supplier of this document does not imply the existence of a contract or commitment by or with the IOP for any purpose. Nothing contained in this ITT or any other communication made between IOP or its representatives and any party shall constitute an agreement, contract or representation between IOP and any other party (except for a formal award of contract made in writing by IOP).

The information contained in this document is necessarily selective. It does not purport to contain all of the information which a potential supplier may require. While the IOP has taken reasonable steps to ensure, as at the date of this document, that the facts which are contained in this document are true and accurate in all material respects, the IOP does not make any representation or warranty as to the accuracy or completeness or otherwise of this document, or the reasonableness of any assumptions on which this document may be based. All information supplied by the IOP to the potential suppliers, including that contained in this document, is subject to the potential supplier’s own due diligence. The IOP accepts no liability to potential suppliers whatsoever and however arising and whether resulting from using this document, or any omissions from or deficiencies in this document.

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It is the responsibility of potential suppliers to obtain for themselves at their own expense all additional information necessary for the preparation of their response to this document. No claims of insufficient knowledge will be entertained.

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Any potential supplier who directly or indirectly canvasses any employee or other representative of the IOP, other than the person named above, concerning the award of the contract will be disqualified.

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Potential suppliers should note that, if they are successfully selected as a supplier, IOP reserves the right throughout the contract to purchase services offered under the contract from any other person, firm or company.

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1. For example, EC research shows that the UK had the fifth highest skills shortage and that Ireland had the sixth highest macro-economic skills mismatch of all Member States in 2017: <https://ec.europa.eu/info/sites/info/files/economy-finance/dp100_en.pdf> [↑](#footnote-ref-2)
2. The IOP will be able to contribute some domain expertise to this process such as, for example, existing requirements for chartership, Fellowship and degree accreditation. [↑](#footnote-ref-3)
3. The deep dives could be published in a single report, or in a series of shorter reports used as the basis of more targeted engagement. The ultimate format should be decided once the focus areas have been agreed. [↑](#footnote-ref-4)