

# INVITATION TO TENDER

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Physics and the Economy: Measuring the value of physics-businesses in the UK and Ireland

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## 1. Context

### **About 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; 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’<sup>1</sup>](#) 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. Our Productivity programme focuses on the economic value and potential of the sector and will develop and promote a research and development (R&D) roadmap for physics. Our Ecosystem programme focuses on the environment of the physical sciences, from nurturing skills for the future and retaining our physicists, to supporting a vibrant physics industry, and our ‘Limit Less’ campaign seeks to remedy the underrepresentation of certain groups studying physics, or beginning a physics-based apprenticeship, from age 16.

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<sup>1</sup> IOP Strategy: [Unlocking the Future](#).

## 2. Measuring the economic value of physics businesses in the UK and Ireland

### 2.1. Project summary

Physics and the Economy is a project run every four years by the IOP to assess and quantify the contribution of physics businesses to the economy in the UK and Ireland. The project produces core economic insights on the physics sector in the UK and Ireland. It is a key project within the IOP's productivity programme.

The project was last run in 2016-17<sup>2</sup>, incorporating data from 2011-2015<sup>3</sup>, to at the time create an up-to-date snapshot of the sector. In light of the turbulent policy landscape and national challenges across the last few years, the project will look back beyond the usual four preceding years, to instead capture a fuller picture by reviewing the sector across the 2010s. Completing this project at the end of a decade which saw significant social, economic and political change, this new approach allows us to create new longitudinal insights on sector performance.

The IOP is seeking a supplier to analyse the most up-to-date businesses and economic data to provide a snapshot of the physics business sector, and then contextualise this by analysing business and economic data across 2010's, to review the sector in the context of Brexit and other policy developments. The IOP is asking for the supplier to deliver six evidence reports, detailing these insights for England, Scotland, Wales, Northern Ireland, the Republic of Ireland, and the UK as a whole.

These will be created by gathering economic and business data from across the 2010's on the size and performance of physics businesses.

The four core economic insights that must be provided through this work are:

- The number of physics-based businesses operating, to identify areas with high and low density of physics industry.
- Employment within the sector (employment figures).
- The economic contribution of physics-based businesses (turnover and GVA).
- Productivity of the sector (value added per person).

The IOP asks for a comparison of these four core metrics with those in top-level sectors such as construction or transportation and storage.

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<sup>2</sup> Previous outputs from the project can be found on the IOP website here: [Physics and the Economy](#).

<sup>3</sup> Due to data availability at the time, little data was used from 2015, meaning the reports focused mainly on the years 2011-2014.

Secondly, where possible, to increase granularity of the insights, data should be gathered on the following in each nation and region<sup>4</sup>:

- The age of organisations,
- The size of organisations by employment (SME vs Large),
- The proportions of the business population in a given region which are the businesses' HQs (as opposed to additional bases),
- The proportions of businesses which undertake R&D<sup>5</sup>, and
- The sector or sub-sector it operates in, where possible (such as manufacturing).

The IOP requires these data to be tracked and analysed across the 2010's to provide information on how the size and health of physics has changed over time. This will contextualise and give greater depth to the snapshot figures generated, to paint a fuller picture.

## **2.2. Core insights the 2021 project must produce**

As the learned society and professional body for physics in the UK and Ireland, the IOP must have up-to-date insights on the size and performance of the UK and Irish physics sectors, in order to have a comprehensive knowledge grounding which enables the IOP to support the sector, and be able to influence the policy agendas at a national and regional level.

The data should be analysed to create the following insights<sup>6</sup>:

### *A) A snapshot of the sector*

The IOP requires the analysis of the most recent data collected (probably 2018/19), to create up-to-date insights on the economic value of physics in the UK and Ireland, assessing the number of physics-based businesses, employment figures, turnover and GVA, and productivity. These core metrics should be compared to those from other major economic sectors.

Where possible, the IOP requires up-to-date information on the proportions of physics businesses operating by business age, size by employment figures, sub-sectors operating in, if they are R&D active, and if they are a HQ or additional base.

### *B) Map trends from the past*

The IOP secondly requires these data to be tracked and analysed across the 2010's to provide information on how the size and health of physics has changed over time. This will contextualise and give greater depth to the snapshot figures generated, to paint a fuller picture.

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<sup>4</sup> Some of these metrics overlap with those in the Innovation Survey, for example, the innovation survey looks at detailed innovation information to understand what sorts of innovation take place in the parts of the economy with a known physics focus. Physics & The Economy has a slightly different set of SICs to incorporate parts of the economy with physics-based technology but less evidence of ongoing physics focus in their innovation. This has been done to avoid overlap between the projects, and ensure both achieve their individual aims.

<sup>5</sup> This measure is will most likely be derived from BERD or R&D Tax Credits data, which are collected separately from the Innovation Survey.

<sup>6</sup> Details for the methodology and a definition of physics-businesses/the relevant SIC and NACE codes required to generate these insights are detailed in the methodology.

This will provide a picture of performance of UK and Irish physics sectors in the run up to, and after the Brexit vote. The project must measure the durability and flexibility of the sector through these developments and analyse their impacts. It can compare the data from this iteration with previous years' data,<sup>7</sup> to assess whether the UK and Ireland maintained its trajectory in terms of the size of the sector. Where information is available at sub-sector level, reviewing trends over the ten year period should be used to track the development of individual industries.

*C) Illustrate the role of physics businesses in the regions and devolved nations*

The IOP requires these analyses and insights for each of the regions and nations in the UK and Ireland, including:

- Northern Ireland
- The Republic of Ireland
- Scotland
- Wales
- England (where each region represents a chapter)
- The UK as a whole, where each nation's findings are summarised in a chapter, and these are compared.

Due to the importance of place and levelling up in the policy agenda, there must also be insights for the following individual regions of England:

- North East
- North West
- Yorkshire and the Humber
- East Midlands
- West Midlands
- East of England
- London
- South East
- South West

This will provide the IOP with information on industry in specific areas, to identify clusters which make an area industry-dense, or areas with little relevant industry.

These insights will be formed using the metrics detailed in 2.1. They will be core knowledge assets which will be used to facilitate and support IOP advocacy activities and the delivery of our strategy. Specifically, the outputs from this project will be used for promoting the sector in public or ministerial engagement activities, highlighting the strategic importance of physics in other IOP programmes of work, such as campaigns, consultations responses or reports, and contributing to the productivity programme of our strategy, in collaboration with insights from two other ongoing IOP projects; the Innovation Survey and Workforce Skills project.

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<sup>7</sup> Whilst it would be best practice to continue a consistent methodology to previous Physics and the Economy projects, different contractors have run the project each time, meaning methodological changes have occurred. Moreover, the definition of physics industries has evolved, meaning there will be natural changes to the methodology in this iteration, which should be accepted and acknowledged. Therefore, it is suggested that the project completes an analysis of the size of physics over time using the data in the datasets, rather than previous reports.

### 2.3. Contextualising the insights

Where possible, the contractors should contextualise the produced insights, qualitatively through discussing and presenting key policy, national and sectoral occurrences and issues, to present the insights within the wider landscape they sit in.

#### *Physics within the political and policy landscape*

The historic data and mapping of the size of the sector across the 2010's should, where possible, be contextualised by acknowledgement of the changes and occurrences in the political landscape of the 2010s (including where possible 2020, to enshrine the impact of the COVID-19 pandemic). This should be done qualitatively, referencing key events in the regions and nations which stand out and could impact the insights.

For example, between 2016-2020, Brexit impacted the UK and Ireland's regions and nations in unique and varying ways, and the UK continued to feel the impact of historic unequal regional investment. In Northern Ireland, the Assembly did not sit between January 2017 and January 2020, creating an impact which is not yet known and has not yet been quantified. Across the UK and Ireland, education outcomes and skills differ between regions, and technology and industry clusters exist, meaning there are areas which have access to more, and areas with access to fewer, physics roles and companies. A narrative on these issues is requested to help to contextualise these insights.

#### *Looking beyond physics businesses*

The IOP asks for a comparison of the core metrics created by the analysis with those in top-level sectors such as construction or transportation and storage. This will provide insight into, and contextualise, the overall performance of the sector compared to other significant sectors and the economy as a whole.

Physics is a science which is highly collaborative and often inter-disciplinary. Other learned societies undertake similar sectoral reviews, such as the Royal Society of Chemistry's report [Chemistry's Contribution: Workforce trends and economic impact](#).<sup>8</sup> Similarly, many other nations complete similar analyses of the economic value of their STEM sectors, and there is an opportunity to contextualise the core metrics generated with headline figures from analyses of physics in comparable countries, such as the USA, China, Germany, India and Japan. Examples include the USA's [review of photonics](#).<sup>9</sup>

The IOP asks the contractor to contextualise the headline figures generated in the project using comparable figures from other STEM subjects, using these existing analyses, to paint a picture of the discipline in the wider STEM sector and on the international stage. This would be a timely and insightful contextualisation, representing a time when the UK was negotiating a new trade deal with the EU and the rest of the world, after the UK's historic EU referendum. These political developments have had a disproportionate impact on the Republic and Northern Ireland, and there should be contextualisation of the findings with regards to these challenges. As the UK is seeking to become a leader in emerging technologies within the coming fourth industrial revolution, as well as

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<sup>8</sup> [Chemistry's Contribution: Workforce trends and economic impact](#). Royal Society of Chemistry (2020).

<sup>9</sup> [Review of Photonics](#): USA National Academies of Sciences, Engineering and Medicine (2013).

in climate action and technologies, these insights would assess the performance of the physics sector and R&D comparatively to international competitors and collaborators.

This focus of the project will be on physics businesses and industry. Where Public Sector Research Establishments (PSREs) and universities deliver physics-based services, they will be included in the SIC code list for this analysis, however, the project does not explicitly focus on these third sector organisations, and characterisation of their non-commercial activities would be completed using different methods which fall outside of the scope of this project. Given the complexity of including these knowledge-based organisations, and their comparatively small representation of GVA (c. 4%), they are not a core focus of the project.

#### **2.4. Core outputs the 2021 project must produce**

The IOP requires the discussed insights to be developed into a suite of six reports, which act as evidence documents. This includes one for each nation of the UK (England, Wales, Scotland and Northern Ireland), one for the UK as a whole, and one for The Republic of Ireland.

The individual reports must have distinct content that is tailored to the nation(s) they represent, so that they can be used as effective reference documents and are received well by their respective audiences. They should be sensitive to the policy landscape in each nation and region. For example, a nation's insights should not just be a sub-section of a larger UK report. To ensure coherence and the structure of the project as a series, the suite of reports should use a uniform methodology and be uniform in style, layout and terminology, with only the core figures, insights, and imagery changing to reflect the different landscapes in each nation. The reports must be produced to a publishable standard, to ensure they are referenceable, such as in consultation responses and future reports which require economic figures for context.

These reports will provide the IOP with facts and benchmarked metrics. However, these should not generate policy positions or recommendations. They must consist of factual evidence of the size and shape of physics from across the 2010s (including where possible 2020, to enshrine the impact of the COVID-19 pandemic) in the UK and Ireland.

The reports must include an executive summary and be presented succinctly to make them easily sharable with parliamentarians and other stakeholders. They must therefore be cohesive with other IOP published reports, broadly following the style of the previous Physics and the Economy reports and other outputs, and support future advocacy work on the role of physics. The tender must provide the IOP with the data sets behind the insights, as well as the complete reports, to enable IOP work on creating a digital output for the insights. The published reports will later be used by the IOP to create secondary outputs, which distill the information in the core reports into key findings and build on these, using policy expertise of the regions/nations, to create recommendations.

### 3. Services required

We invite tenders to undertake the next iteration of the IOP Physics and the Economy project.

We are seeking a supplier who can produce an up-to-date snapshot of the sector, review its economic performance over the 2010's and contextualise these insights with knowledge of the political and economic landscape.

#### 3.1. Requirements for the analysis

We require suppliers to produce a snap-shot of the sector to create up-to-date insights on<sup>10</sup>:

- The number of businesses operating, to identify areas with high and low density of physics industry.
- Employment of the sector (employment figures).
- The economic contribution of physics-based businesses (turnover and GVA).
- Productivity of the sector (value added per person).

The IOP asks for a comparison of these core four metrics with those in top-level sectors such as construction or transportation and storage.

We welcome responses which focus on Ireland or the UK as well as responses which focus on both countries together.

We require suppliers to provide figures for the individual devolved nations and regions, and where possible, add granularity to the findings by generating the following business metrics for each area:

- The age of businesses.
- The size of businesses by employment figures (SME vs Large).
- The sector or sub-sector it operates in, where possible (such as manufacturing)
- The proportions of the business population in a given region which are the businesses' HQs (as opposed to additional bases).
- The proportions of businesses which undertake R&D.

The business and economic data used should be the most up-to-date possible.

This project focuses on direct impact and value quantification, due to concerns over the subjectivity of indirect impact assessments and the double-counting of impact and contributions this can lead to between sectors. However, we are open to the supplier estimating indirect economic impact and value added if they can demonstrate an effective and reliable methodology to do so.

Secondly, we require suppliers to use data from across the last 10 years to identify how the performance and size of the sector has changed. This should be done by tracking the size (using the number of relevant businesses across the period and employment figures), and performance of the sector and sub-sectors (using GVA and turnover metrics). Most sources provided in the methodology are available for multiple years.

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<sup>10</sup> Full details on these requirements are in [part 2 – About the project](#).

### 3.2. Requirements for the outputs

We require suppliers to use these insights to produce six reports which detail the economic value of the physics industry in each of the regions and nations in the UK and Ireland, including:

- Northern Ireland
- The Republic of Ireland
- Scotland
- Wales
- England (where each region represents a chapter)
- The UK as a whole, where each nation's findings are summarised in a chapter

Insights should be produced for the following regions in England:

- North East
- North West
- Yorkshire and the Humber
- East Midlands
- West Midlands
- East of England
- London
- South East
- South West

The outputs should outline the context in which these insights exist; including the economic, political and policy landscapes. This includes, but is not limited to, the COVID-19 pandemic (if data from 2020 is available), the Brexit negotiations and the resulting business environment and climate, the fast-moving policy challenges including climate commitments, UK government's legislation to reach Net Zero by 2050, levelling up and the R&D commitments, as well as the rise of emerging tech. The supplier should use this context and the data to reflect on how the sector has evolved over time and responded to these challenges.

Where stark differences exist in the insights, there could be a comparison of the differences between devolved nations and regions, and findings should be contextualised in regards to the current policy and political landscape.

These outputs are required to support the IOP's advocacy work. Full details on these requirements are in [part 2 – About the outputs](#).

Lastly, the supplier must provide the IOP with the data sets behind the insights, to support IOP work on creating a digital output for the insights.

The IOP will be available to comment on and finalise a methodology and a project plan, but the IOP requires suppliers to lead on all the data analysis, insight generation and report writing.

#### 4. Methodology

The project will be completed by mining and analysing business and economic data from across the 2010s (including 2020, where possible). The project will be completed by collating and analysing available data-sources. Different sources may have information for different years.

We are looking to appoint a supplier who has suitable expertise and knowledge to design and deliver an appropriate methodology that will provide the IOP with the project outputs. As part of this the supplier will be responsible for specifying which information sources will be used, however, information sources that could be used might include, without being limited to:

Source	Link	Coverage	Main Metric
Regional Gross Value Added by Industry	<a href="https://www.ons.gov.uk/economy/grossvalueaddedgva/datasets/nominalandrealregionalgrossvalueaddedbalancedbyindustry">https://www.ons.gov.uk/economy/grossvalueaddedgva/datasets/nominalandrealregionalgrossvalueaddedbalancedbyindustry</a>	UK Regions & Nations	GVA
GVA (Income approach)	<a href="https://www.ons.gov.uk/economy/grossvalueaddedgva/datasets/regionalgrossvalueaddedincomeapproach">https://www.ons.gov.uk/economy/grossvalueaddedgva/datasets/regionalgrossvalueaddedincomeapproach</a>	UK Regions & Nations	GVA
UK Business: Activity, Size, & Location	<a href="https://www.ons.gov.uk/businessindustryandtrade/business/activitysizeandlocation/datasets/ukbusinessactivitysizeandlocation">https://www.ons.gov.uk/businessindustryandtrade/business/activitysizeandlocation/datasets/ukbusinessactivitysizeandlocation</a>	UK Regions & Nations (Detailed SIC – 4 digits-at UK level)	# Enterprises Size of Enterprise Employment
Nomis- Business Registers	<a href="https://www.nomisweb.co.uk/sources/bres">https://www.nomisweb.co.uk/sources/bres</a>	UK Regions & Nations	Detailed interrogation of Labour-force data
Industry (Business Register and Employment Survey (BRES) Table 2)	<a href="https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/datasets/industry235digitsicbusinessregisterandemploymentsurveybrestable2">https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/datasets/industry235digitsicbusinessregisterandemploymentsurveybrestable2</a>	UK for 3-digit SIC codes. GB for 5-digit SIC codes.	Number of employees
Compendium of data related to labour productivity by low-level industry	<a href="https://www.ons.gov.uk/economy/economicoutputandproductivity/productivitymeasures/datasets/compendiumofdatarelatedtolabourproductivitybylowlevelindustry">https://www.ons.gov.uk/economy/economicoutputandproductivity/productivitymeasures/datasets/compendiumofdatarelatedtolabourproductivitybylowlevelindustry</a>	UK	GVA, Employment
Workforce jobs by region & Industry	<a href="https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/datasets/workforcejobsbyregionandindustryjobs05">https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/datasets/workforcejobsbyregionandindustryjobs05</a>	UK Regions & Nations (Section-level SIC codes only)	Employment

Eurostat Data Browser	<a href="https://ec.europa.eu/eurostat/databrowser/product/view/SBS_NA_IND_R2?lang=en">https://ec.europa.eu/eurostat/databrowser/product/view/SBS_NA_IND_R2?lang=en</a>	Republic of Ireland & UK. NACE to 5-digit level for some parts of the economy.	Turnover, GVA
Business Demographics	<a href="https://www.ons.gov.uk/businessindustryandtrade/business/activitysizeandlocation/datasets/businessdemographyreferencetable">https://www.ons.gov.uk/businessindustryandtrade/business/activitysizeandlocation/datasets/businessdemographyreferencetable</a>	UK Regions & Nations- (SIC to class level)	Business longevity
Business Population Estimates	<a href="https://www.gov.uk/government/statistics/business-population-estimates-2020">https://www.gov.uk/government/statistics/business-population-estimates-2020</a>	UK-wide at 3-digit SIC level; Regions & Nations at broader SIC level.	Turnover, Employees, Business Count
BERD	<a href="https://www.ons.gov.uk/economy/governmentpublicsectorandtaxes/researchanddevelopmentexpenditure/datasets/ukbusinessenterpriseanddevelopment">https://www.ons.gov.uk/economy/governmentpublicsectorandtaxes/researchanddevelopmentexpenditure/datasets/ukbusinessenterpriseanddevelopment</a>	UK	Business R&D levels
R&D Tax Credits	<a href="https://www.gov.uk/government/collections/corporate-tax-research-and-development-tax-credits#patent-box-reliefs-statistics">https://www.gov.uk/government/collections/corporate-tax-research-and-development-tax-credits#patent-box-reliefs-statistics</a>	UK	R&D Tax Credits (some at 2-digit SIC)
PXStat	<a href="https://data.cso.ie/">https://data.cso.ie/</a>	Republic of Ireland	Business Demography, & others

Most sources mentioned are available for multiple years. Where sources do not provide information at a sufficiently detailed SIC or NACE level to produce level for part of the “physics sector”, methods to provide reasonable estimates on the contribution of physics industries within a larger grouping of industries will need to be developed. Likewise, where metrics are not directly available for a required year or breakdown by region or sub-sector of physics, reasonable estimates can be produced.

There is some divergence between SIC and NACE at 5-digit level, and the IOP will agree the right approach with the supplier. The IOP will provide more detailed SIC and NACE mapping when expressions of interest are received. For all the reports (UK, England, Scotland, Wales, Northern Ireland, and Republic of Ireland), the smallest regional level required for information to be gathered at is NUTS, and the most detailed regional level will be NUTS1. When comparing results between different parts of the physics sector, the groups can be based on the SIC/NACE taxonomy, and those used in previous Physics and the Economy reports.

Whilst it would be simpler to continue a consistent methodology to previous Physics and the Economy projects, different contractors have run the project each time, meaning methodological changes have occurred. Moreover, the definition of physics industries has evolved, meaning it may be necessary and appropriate to employ a different methodology in this iteration. Therefore, it is suggested that the project completes an analysis over time using the data in the datasets, rather than previous reports.

The approach proposed by the contractor should demonstrate expertise in data analysis and interpreting the available data. The contractor should also have expertise in the presentation of results through reports and other formats that are suitable for non-expert audiences, including policymakers.

## 5. Timelines

### Project Plan

We ask for potential suppliers to outline a proposed methodology and project plan. 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-based industries – 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.

We ask for the project to be conducted across June and July and to be delivered in August. We would expect the appointed supplier to provide preliminary findings in July 2021 and a final report in August 2021.

### Tender Timeline

The anticipated timeline for the tender process is as follows:

Event	Date
Invitation to tender released	13 April 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.	21 April 2021
Deadline for clarifications	26 April 2021
Potential suppliers to confirm by email their intention to submit a response	26 April 2021
Completed responses returned to the IOP	12:00, 7 May 2021
All responses assessed by the IOP	From 7 May 2021
Interviews of shortlisted suppliers	w/c 31 May 2021
Outcome(s) communicated to potential suppliers	Following completion of final interviews

## 6. Tender Returns and Assessment

Please contact us for information on the budget.

We would be grateful to receive:

- Completed Request for Information (see Section 7)
- 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
- Availability

Please return your response by email by 12:00, 7 May 2021. Hard copies of responses are not required.

Thank you in advance for your submission.

### Contact Details

Danielle Croucher, Senior Policy Advisor

Institute of Physics

[danni.croucher@iop.org](mailto:danni.croucher@iop.org)

Submissions and enquiries or requests for clarification should be made by email to Danni Croucher. 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.

## 7. Request for Information

Please indicate if the tender relates to:

- The UK and Ireland
- Ireland only
- The UK only

### Supplier Information

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

## Competencies and Past Experience

<b>1</b>	<p><b>Please describe the suitability, competencies and qualifications of the individual(s) proposed to undertake the work</b></p> <p>(300 words max)</p>		
<b>2</b>	<p><b>Please provide case study examples of <u>relevant</u> previous experience in providing services similar to those covered by this ITT and working with organisations of the size and nature of the IOP</b></p> <p>(350 words max)</p>		
<b>3</b>	<p><b>Types of organisations/sectors for whom you provide services</b></p>	<p><b>Sector</b></p> <p>Commercial</p> <p>Charity</p> <p>Other</p>	<p><b>% of clients</b></p> <p>%</p> <p>%</p> <p>%</p>
<b>4</b>	<p><b>What are your core business competencies?</b> (Brief statement of what your organisation does – 200 words max)</p>		
<b>5</b>	<p><b>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</b></p> <p>(100 words max)</p>		

**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)				

<b>9</b>	<b>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)</b>	
<b>10</b>	<b>Are you a member of any relevant trade bodies?</b>  (Please state which ones)	
<b>11</b>	<b>Please provide details of your policies, procedures and practices in relation to:</b>  <b>(a) the environment and climate change;</b>  <b>(b) health and safety; and</b>  <b>(c) corporate social responsibility</b>	

### Approach and Methodology

<b>1</b>	<b>Summary of proposed approach to the project, including:</b>  <ul style="list-style-type: none"> <li>• A proposed methodology, key data to be collected and a sample of types of questions.</li> <li>• A timeline and key milestones</li> <li>• Project management including methodologies</li> <li>• Project governance and reporting</li> <li>• Risk mitigation</li> <li>• Quality assurance / control</li> <li>• Budget management</li> </ul> (1000 words max)	
<b>2</b>	<b>Proposed pricing methodology and estimated price</b>  (200 words max)	
<b>3</b>	<b>Availability and expected ways of working with the IOP</b>  (200 words max)	

**Please note, we also request proposed terms and conditions.**

## **8. Appendices and Information**

### **a. Further Information**

The IOP will deliver an ongoing programme of engagement to stimulate discussion of the key insights identified in the reports among policymakers and other stakeholders, including our members and the wider physics community, as part of our productivity strand in the strategy. The outputs from this project will be used to create secondary outputs, with a higher narrative. To support this, the IOP would expect to be able to participate in any stakeholder engagement which forms or follows the publication of the reports.

**b. 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.

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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.

The IOP may exclude suppliers from the process who are in breach of confidentiality or intellectual property rights and may pursue any remedy or take any other action as it considers appropriate.

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.

The copyright in this document and in all materials provided by the IOP in connection with this process belongs to the IOP. This document and the materials provided in connection with it may not be reproduced, copied or stored in any medium without the prior written consent of the IOP other than for use strictly for the purpose of preparing a response to this document.

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.

### c. Definition of Physics-Based Industries

Physics-based industries are those where either-

- Ongoing R&D in the industry consistently makes use of physics knowledge in a way that can be expected to affect the fortunes of businesses within the industry
- The underlying technology supporting the industry requires significant physics knowledge for continued operation

The proposed list of SIC codes to be used is below. The list is at 5-Digit SIC level. The equivalent definition using the NACE taxonomy would apply.

#### The Physics Sector

Sector Shorthand	5-Digit Name
Oil & Gas	Extraction of crude petroleum
Oil & Gas	Extraction of natural gas
Physics Manufacturing	Manufacture of non-wovens and articles made from non-wovens, except apparel
Physics Manufacturing	Manufacture of other technical and industrial textiles
Physics Manufacturing	Manufacture of other textiles nec
Physics Manufacturing	Printing (other than printing of newspapers and printing on labels and tags) nec
Physics Manufacturing	Manufacture of dyes and pigments
Physics Manufacturing	Manufacture of other inorganic basic chemicals
Physics Manufacturing	Manufacture of synthetic rubber in primary forms
Physics Manufacturing	Manufacture of paints, varnishes and similar coatings, printing ink and mastics
Physics Manufacturing	Manufacture of paints, varnishes and similar coatings, mastics and sealants
Physics Manufacturing	Manufacture of printing ink
Physics Manufacturing	Manufacture of explosives
Physics Manufacturing	Manufacture of other chemical products nec
Physics Manufacturing	Manufacture of flat glass
Physics Manufacturing	Shaping and processing of flat glass
Physics Manufacturing	Manufacture of hollow glass
Physics Manufacturing	Manufacture of glass fibres
Physics Manufacturing	Manufacture and processing of other glass, including technical glassware
Physics Manufacturing	Manufacture of refractory products
Physics Manufacturing	Manufacture of ceramic tiles and flags
Physics Manufacturing	Manufacture of ceramic insulators and insulating fittings
Physics Manufacturing	Manufacture of other technical ceramic products
Physics Manufacturing	Manufacture of other ceramic products
Physics Manufacturing	Manufacture of basic iron and steel and of ferro-alloys
Physics Manufacturing	Manufacture of tubes, pipes, hollow profiles and related fittings, of steel
Physics Manufacturing	Cold drawing of bars
Physics Manufacturing	Cold rolling of narrow strip

<b>Physics Manufacturing</b>	Cold forming or folding
<b>Physics Manufacturing</b>	Cold drawing of wire
<b>Physics Manufacturing</b>	Precious metals production
<b>Physics Manufacturing</b>	Processing of nuclear fuel
<b>Physics Manufacturing</b>	Manufacture of metal structures and parts of structures
<b>Physics Manufacturing</b>	Manufacture of doors and windows of metal
<b>Physics Manufacturing</b>	Manufacture of central heating radiators and boilers
<b>Physics Manufacturing</b>	Manufacture of other tanks, reservoirs and containers of metal
<b>Physics Manufacturing</b>	Manufacture of steam generators, except central heating hot water boilers
<b>Physics Manufacturing</b>	Manufacture of weapons and ammunition
<b>Physics Manufacturing</b>	Forging, pressing, stamping and roll-forming of metal; powder metallurgy
<b>Physics Manufacturing</b>	Treatment and coating of metals
<b>Physics Manufacturing</b>	Machining
<b>Physics Manufacturing</b>	Manufacture of electronic components
<b>Physics Manufacturing</b>	Manufacture of loaded electronic boards
<b>Physics Manufacturing</b>	Manufacture of computers and peripheral equipment
<b>Physics Manufacturing</b>	Manufacture of communication equipment
<b>Physics Manufacturing</b>	Manufacture of telegraph and telephone apparatus and equipment
<b>Physics Manufacturing</b>	Manufacture of communication equipment (other than telegraph and telephone apparatus and equipment)
<b>Physics Manufacturing</b>	Manufacture of consumer electronics
<b>Physics Manufacturing</b>	Manufacture of instruments and appliances for measuring, testing and navigation
<b>Physics Manufacturing</b>	Manufacture of electronic instruments and appliances for measuring, testing, and navigation, except industrial process control equipment
<b>Physics Manufacturing</b>	Manufacture of electronic industrial process control equipment
<b>Physics Manufacturing</b>	Manufacture of non-electronic instruments and appliances for measuring, testing and navigation, except industrial process control equipment
<b>Physics Manufacturing</b>	Manufacture of non-electronic industrial process control equipment
<b>Physics Manufacturing</b>	Manufacture of watches and clocks
<b>Physics Manufacturing</b>	Manufacture of irradiation, electromedical and electrotherapeutic equipment
<b>Physics Manufacturing</b>	Manufacture of optical instruments and photographic equipment
<b>Physics Manufacturing</b>	Manufacture of optical precision instruments
<b>Physics Manufacturing</b>	Manufacture of photographic and cinematographic equipment
<b>Physics Manufacturing</b>	Manufacture of magnetic and optical media
<b>Physics Manufacturing</b>	Manufacture of electric motors, generators and transformers
<b>Physics Manufacturing</b>	Manufacture of electricity distribution and control apparatus
<b>Physics Manufacturing</b>	Manufacture of batteries and accumulators
<b>Physics Manufacturing</b>	Manufacture of fibre optic cables
<b>Physics Manufacturing</b>	Manufacture of other electronic and electric wires and cables
<b>Physics Manufacturing</b>	Manufacture of wiring devices
<b>Physics Manufacturing</b>	Manufacture of electric lighting equipment
<b>Physics Manufacturing</b>	Manufacture of electric domestic appliances
<b>Physics Manufacturing</b>	Manufacture of other electrical equipment

<b>Physics Manufacturing</b>	Manufacture of engines and turbines, except aircraft, vehicle and cycle engines
<b>Physics Manufacturing</b>	Manufacture of ovens, furnaces and furnace burners
<b>Physics Manufacturing</b>	Manufacture of office machinery and equipment (except computers and peripheral equipment)
<b>Physics Manufacturing</b>	Manufacture of non-domestic cooling and ventilation equipment
<b>Physics Manufacturing</b>	Manufacture of metal forming machinery
<b>Physics Manufacturing</b>	Manufacture of other machine tools
<b>Physics Manufacturing</b>	Manufacture of machinery for metallurgy
<b>Physics Manufacturing</b>	Manufacture of earthmoving equipment
<b>Physics Manufacturing</b>	Manufacture of machinery for textile, apparel and leather production
<b>Physics Manufacturing</b>	Manufacture of machinery for paper and paperboard production
<b>Physics Manufacturing</b>	Manufacture of plastics and rubber machinery
<b>Physics Manufacturing</b>	Manufacture of other special-purpose machinery nec
<b>Physics Manufacturing</b>	Manufacture of motor vehicles
<b>Physics Manufacturing</b>	Manufacture of electrical and electronic equipment for motor vehicles
<b>Physics Manufacturing</b>	Manufacture of other parts and accessories for motor vehicles
<b>Physics Manufacturing</b>	Building of ships and floating structures
<b>Physics Manufacturing</b>	Building of pleasure and sporting boats
<b>Physics Manufacturing</b>	Manufacture of railway locomotives and rolling stock
<b>Physics Manufacturing</b>	Manufacture of air and spacecraft and related machinery
<b>Physics Manufacturing</b>	Manufacture of military fighting vehicles
<b>Physics Manufacturing</b>	Manufacture of motorcycles
<b>Physics Manufacturing</b>	Manufacture of bicycles and invalid carriages
<b>Physics Manufacturing</b>	Manufacture of other transport equipment nec
<b>Physics Manufacturing</b>	Manufacture of medical and dental instruments and supplies
<b>Physics Manufacturing</b>	Other manufacturing nec
<b>Machine Services</b>	Repair of fabricated metal products
<b>Machine Services</b>	Repair of machinery
<b>Machine Services</b>	Repair of electronic and optical equipment
<b>Machine Services</b>	Repair of electrical equipment
<b>Machine Services</b>	Repair and maintenance of ships and boats
<b>Machine Services</b>	Repair and maintenance of aircraft and spacecraft
<b>Machine Services</b>	Repair and maintenance of other transport equipment
<b>Machine Services</b>	Repair of other equipment
<b>Machine Services</b>	Installation of industrial machinery and equipment
<b>Energy</b>	Production of electricity
<b>Energy</b>	Transmission of electricity
<b>Energy</b>	Distribution of electricity
<b>Energy</b>	Distribution of gaseous fuels through mains
<b>Waste and Recovery</b>	Collection of hazardous waste
<b>Waste and Recovery</b>	Treatment and disposal of hazardous waste
<b>Waste and Recovery</b>	Dismantling of wrecks
<b>Waste and Recovery</b>	Recovery of sorted materials
<b>Waste and Recovery</b>	Remediation activities and other waste management services
<b>Machine Sales</b>	Agents involved in the sale of machinery, industrial equipment, ships and aircraft

<b>Medical Equipment</b>	Retail sale of medical and orthopaedic goods in specialised stores
<b>Medical Equipment</b>	Retail sale of hearing aids in specialised stores
<b>Medical Equipment</b>	Retail sale of medical and orthopaedic goods (other than hearing aids) nec, in specialised stores
<b>Transport</b>	Space transport
<b>Transport</b>	Service activities incidental to air transportation
<b>Telecoms</b>	Wired telecommunications activities
<b>Telecoms</b>	Wireless telecommunications activities
<b>Telecoms</b>	Satellite telecommunications activities
<b>Telecoms</b>	Other telecommunications activities
<b>Science &amp; Technology</b>	Engineering activities and related technical consultancy
<b>Science &amp; Technology</b>	Engineering design activities for industrial process and production
<b>Science &amp; Technology</b>	Engineering related scientific and technical consulting activities
<b>Science &amp; Technology</b>	Other engineering activities (not including engineering design for industrial process and production or engineering related scientific and technical consulting activities)
<b>Science &amp; Technology</b>	Technical testing and analysis
<b>Science &amp; Technology</b>	Research and experimental development on biotechnology
<b>Science &amp; Technology</b>	Other research and experimental development on natural sciences and engineering
<b>Science &amp; Technology</b>	Specialised design activities
<b>Science &amp; Technology</b>	Other professional, scientific and technical activities nec
<b>Science &amp; Technology</b>	Other business support service activities nec
<b>Defence</b>	Defence activities

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