



Institute
and Faculty
of Actuaries

Call for Proposals

Modelling Pension Funds under Climate Change

Deadline for submissions: 12:00 noon (BST), Friday 12 May
2017

Request for Tender open:
5 April 2017

1 SUMMARY

1.1 Background

The Institute and Faculty of Actuaries (IFoA) is a professional body representing and regulating over 29,000 members around the world. Actuaries provide commercial, financial and prudential advice on the management of assets and liabilities – particularly where long-term management and planning are critical factors. Under its Royal Charter, the IFoA has a public interest duty. Part of this is fulfilled through the development of research outputs that are relevant to actuarial practitioners, policymakers and other stakeholders around the world.

Resource and environment issues, particularly climate change, are increasingly recognised as being relevant to the work of actuaries, and the IFoA undertakes a range of research, thought leadership and public affairs activities in this field. The impact of resource and environment issues on pension schemes is less understood. Uncertainty over the size of the potential impact, and therefore whether it is material, is one of the barriers to adequately reflecting these emerging issues.

In response, the IFoA has formed a Working Party of volunteer members to focus on this issue. The “Resource and Environment Implications for Pensions Actuaries” Working Party has created a Practical Guide for actuaries who advise UK defined benefit pension schemes which will be published shortly. (We would be pleased to supply a draft version to Tenderers on request.) The guide explains where resource and environment issues are relevant to pension schemes and the work of pensions actuaries, as a first attempt at helping them navigate the associated uncertainties, in collaboration with covenant and investment advisers. Supplementary reports are now being prepared which provide more technical detail on how resource and environment issues might impact on sponsor covenant assessments, funding advice and mortality.

1.2 Research

The Working Party has received feedback that pensions actuaries seek some quantification of resource and environment impacts before incorporating them into their work. It has concluded that the Practical Guide is likely to gain much more interest from and traction with, actuaries if it is supported by some quantification. The Working Party therefore wants to commission a piece of quantitative research which will be used to develop the supplementary report on funding advice, as well as being made available through standalone research outputs.

Although the Working Party is considering a range of resource and environment issues, it feels that quantification is likely to be most feasible in relation to the impacts of climate change. Therefore, this Request for Tender focuses on climate change. We would welcome proposals that consider other resource and environment issues as well as climate change, but this is not a requirement of the Tender.

The research is intended to address the need for pensions actuaries to understand the potential magnitude of climate change impacts, and hence if and when climate change might be relevant to the funding advice they give. For example, whether it could be considered a sufficiently material risk that it should be explicitly considered and disclosed when carrying out actuarial valuations. The key difference from previous published work on pensions and climate change is that the working party would like this research to consider the impact on pension scheme liabilities as well as assets.

1.3 Timescale and Funding

The estimated start date of the project is early June 2017, with interim results available mid July 2017 and the final research outputs available by the end of July 2017. We are open to considering other timescales, depending on the circumstances of the research team (for example, to accommodate potential university-based applicants). Funding of up to £25,000 has been made available for this research at this stage.

1.4 Tender

The IFoA invites tenders from experienced research teams or organisations for the delivery of the research in accordance with this tender pack.

2 RESEARCH PROJECT

2.1 Background

The Working Party would like to develop some quantitative illustrations of climate change impact on the funding position of UK defined benefit pension schemes, by considering the impact on both the key financial assumptions and the value of its investments. These would illustrate the potential impact of a small number of scenarios, incorporating political, economic and physical responses to climate change, versus a baseline.

When advising on pension scheme funding, actuaries typically compare the market value of the scheme's assets with a present value of its liabilities. To do this, they use several financial variables which are set by reference to investment markets, the most important being fixed interest and index-linked UK government bond yields (and hence the implied level of expected future inflation). Actuaries look to understand the term structure of these financial variables, comparing them with the term structure of the future benefit payments that the pension scheme expects to make.

UK defined benefit pension schemes typically have a planning horizon of 5 to 20 years. Their funding models tend to include the following components:

- Market value of the scheme's portfolio of assets at time T.
- UK price inflation from time T onwards, set consistently with market prices at time T¹. This is used to project forward the scheme's benefit cashflows (i.e. the pension and lump sum benefits paid in each future year)².
- An interest rate used to discount the scheme's benefit cashflows back to time T, to obtain a present value that can be compared with the market value of the scheme's assets. This interest rate typically has two components:
 - A "risk-free" rate derived from the yields on UK fixed interest government bonds at time T³.
 - An allowance for investment returns in excess of the risk-free rate, reflecting:
 - The scheme's current and expected future asset mix;
 - Expected future returns on relevant asset classes; and

¹ This could be an average annual rate (eg 3.5% pa) or (preferably) an inflation curve like the last chart on this page: <http://www.bankofengland.co.uk/statistics/pages/yieldcurve/default.aspx>. If an average rate is used, it should be appropriate for the long term nature of pension liabilities (which typically have a duration of 15 – 20 years).

² Demographic assumptions, eg mortality rates, are required. Schemes with members still building up salary-linked benefits also require a salary growth assumption.

³ This could be an average annual rate (eg 2.5% pa) or (preferably) a yield curve like the second chart on this page: <http://www.bankofengland.co.uk/statistics/pages/yieldcurve/default.aspx>. If an average rate is used, it should be appropriate for the long term nature of pension liabilities (which typically have a duration of 15 – 20 years).

- The desired degree of prudence, given an assessment of the sponsoring employer's ability to pay additional money into the scheme in future if needed (all else being equal, less allowance will be made for investment outperformance if the employer is financially weak).

The illustrations will therefore need to consider, as a minimum, the effect of climate change on the returns from asset classes commonly used by pension schemes⁴, realised inflation, yields on UK index linked government bonds (or, equivalently, breakeven RPI) and yields on UK fixed interest government bonds⁵⁶.

2.2 Goals and Objectives

We envisage that the commissioned research will provide various model outputs (for example, asset class and UK yield curve impacts under selected scenarios) which the Working Party could then use to prepare example illustrations of funding impact, for inclusion in their supplementary report about funding advice. The successful Tenderer would also produce a technical report from the commissioned research that documents the underlying methodologies and assumptions.

We would want to make the model outputs available to actuaries so they can use them to develop their own illustrations, which could be for defined contribution as well as defined benefit schemes.

Through the commissioning process, we would explore the feasibility of including variables in addition to those outlined at the end of section 2.1 in order to increase the range of pension schemes for which the modelling is relevant, for example salary growth and non-UK yield curves.

We recognise that any modelling in this area will have significant limitations due to the inherent uncertainty and complexity of climate change. Our focus is on indicating the potential order of magnitude and range of uncertainty, to help inform actuaries' professional judgement about the treatment of climate risk when advising pension schemes. Nonetheless, we expect the research report to include an account of the uncertainties associated both with the modelling (including the scenarios) and with the outputs from the modelling. Tenderers should indicate in their response the principal uncertainties attaching to their proposed modelling and how they propose to address these uncertainties in their research.

2.3 Choice of Methodology

To date, much of the work in this area has been qualitative. However, the Working Party has received feedback that actuaries would like more quantitative information about how pension schemes might be affected by climate change. We would therefore like to develop some quantitative illustrations, supported by narrative descriptions of the associated climate change scenarios, of the potential impact on pension scheme funding. We envisage that this will be achieved by extending existing models, such as those that illustrate how investment markets may be affected by climate change. However, we are open-minded regarding the choice of model and look forward to seeing Tenderers' suggestions on this point.

⁴ Asset allocation information is available here: http://www.pensionprotectionfund.org.uk/Documents/Purple_Book_2016_chapter7.pdf

⁵ Various options could be considered, eg a single yield at an appropriate duration, yields at several durations (eg 5 year intervals), or full yield curves.

⁶ The illustrations would ideally also consider the impact of climate change on pension scheme members' mortality rates. The Working Party is carrying out its own research in this area and is not expecting Tenderers to address mortality impacts in their response.

We also wish to see Tenderers' thoughts regarding the model outputs that could be produced within the budget available, the definition of the baseline, the selection of climate change scenarios, and the choice of time horizon(s) T for the modelling. We would discuss and agree these points with the successful Tenderer at the start of the project.

2.4 Target Audience for Research Outputs

The primary audience for the research outputs will be IFoA members who advise UK defined benefit pension schemes. However, we also expect the research outputs to be relevant to other actuaries, financial institutions, policymakers and government / regulators.

3 SERVICE SPECIFICATION

3.1 Purpose and Expected Outcome

The IFoA is seeking to appoint a research team or organisation to conduct the research set out under sections 1 and 2 in this document. The successful organisation will provide input into, conduct, analyse and present the results of the research.

3.2 Scope of work and deliverables

The successful research team or organisation will:

1. Liaise with the IFoA and the Working Party in the development of a research plan
2. Liaise with the IFoA and the Working Party to agree the climate change scenarios to be considered and design the required models
3. Carry out the modelling of the agreed scenarios
4. Provide interim results to the IFoA and the Working Party, in the form of a presentation or similar
5. Liaise with the Working Party to provide the results and supporting information needed by the Working Party to produce its supplementary report on funding advice
6. At the end of the research period, provide a full report on the research and results
7. Provide regular updates to a project oversight group (formed from members of the Working Party and IFoA executive) throughout the project to ensure the research remains on track and in line with expectations.

3.3 Indicative timetable and structure

The following is very much an indicative timetable and the IFoA would welcome Tenderers' own thoughts on the timeline for the project.

Deliverable	Date
Meeting to agree research plan	31 May 2017
Project start	5 June 2017
Round table meeting to discuss interim findings	17 July 2017
Presentation of final research report	31 July 2017

3.4 Supervision of the project

The project will be supervised by the IFoA's Research and Knowledge Team, working with the 'Resource and Environment Implications for Pensions Actuaries' Working Party.

The IFoA will assign a Project Manager to oversee the project. The Project Manager will work closely with the research team and the Working Party to ensure the project deliverables are being achieved and to address any issues arising.

The research team will provide the IFoA Project Manager and the Working Party with regular updates on the project. Reporting methods will be agreed by both parties, and a high degree of interaction with the IFoA

| project manager and the Working Party is expected. As a minimum, a project kick off and closure meeting are mandatory.

4 TENDER INFORMATION

4.1 Notice to Tenderers

This Request is being made available to Tenderers for their sole use and for purpose of assisting a Tenderer to prepare and submit a Tender to the IFoA in accordance with the requirements of this Request. It has been made available on the condition that it is used only in connection with the Project and for no other purpose.

Whilst prepared in good faith, this Request is intended only as preliminary background explanation of the Project. This Request does not purport to contain all of the information that a Tenderer may require. Any Tenderer considering tendering to the IFoA should make their own evaluation of the potential opportunity.

None of the IFoA nor its advisers or staff:

- Makes any representation or warranty (express or implied) as to the accuracy, reasonableness or completeness of this Request.
- Accept any responsibility for the information contained in this Request or for its fairness, accuracy or completeness.
- Shall be liable for any loss or damage (other than in respect of fraudulent misrepresentation) arising as a result of reliance on such information or any subsequent communication.

Only the express terms of the final agreement (available on request) and other related contractual documents as and when they are executed shall have any contractual effect in connection with the Project. It should, however, be noted that this paragraph does not apply to paragraphs 4.2.3, 4.2.5 and 4.2.7 of this Request which shall have contractual effect.

4.2 Conditions of tendering

4.2.1 Right to cancel or vary the Process

The IFoA reserves the right to:

- cancel, abandon and/or withdraw from the contract opportunity and procurement process at any time and, therefore, not proceed with this Project or award the Agreement or any other contract connected to the Project; and/or
- require you to clarify your Tender in writing and/or provide additional information as the IFoA may reasonably require; and/or
- amend the terms and conditions of the tender process.

The IFoA reserves the right to issue supplementary documentation at any time during the tender process. All such further documentation issued by the IFoA shall supersede any part of the Request to the extent indicated.

The IFoA is in no way committed to accepting any Tender.

4.2.2 Right to reject and/or disqualify

The IFoA reserves the right not to consider your Tender for acceptance where:

- The Tender is submitted late, is completed incorrectly, is incomplete or fails to meet the IFoA's Submission Requirements; and/or
- There is a change in identity, control, financial standing or other factor affecting you; and/or
- The IFoA becomes aware that you have fixed or adjusted your prices or rates in agreement with any other person, communicated to any person the amount or approximate amount of your price (except where disclosure is made in confidence to obtain quotations for the preparation of your Tender) or that the information provided by you in your Tender is intentionally or unintentionally false, misleading or incorrect.

4.2.3 Costs and Expenses

You are solely responsible for your costs and expenses incurred in connection with the tender process, preparation and submission of your Tender, conduct of any subsequent clarification or any other aspect of this tender process.

4.2.4 Conflicts of Interest

The IFoA wishes to avoid or reconcile any conflicts of interest which may compromise its obligations to conduct an open and transparent competitive process. You must, therefore, ensure that participation in the tender process does not in any way compromise the IFoA's objectives in this regard.

If in doubt, the IFoA will ask that you declare potential conflicts of interest as soon as possible and inform the IFoA of the measures you intend to put in place to avoid or reconcile a conflict occurring.

The IFoA will seek to agree any measures that are necessary to avoid or reconcile any conflict of interest or potential conflict of interest. In the event that an agreement cannot be reached, you may have to withdraw from the tender process.

4.2.5 Confidentiality

The content of Tenders, or any other information provided by Tenderers in the course of tendering for this Project, or in the course of their subsequent appointment, may be disclosed by the IFoA to its employees, volunteers, working groups, committees, professional advisers or other regulatory bodies.

4.2.6 Canvassing and Collusion

Except as provided in the Request, you shall not approach staff or volunteers of the IFoA with a view to providing information or clarification in respect of any part of your tender or proposals or attempting to support or enhance your prospects of being appointed as successful Tenderer.

Please sign and return with your Tender the Non-canvassing Certificate and the Anti-collusion Certificate.

4.2.7 Publicity

There must be no publicity by you regarding the Project or the future award of any agreement unless the IFoA has given express written consent to the relevant publicity.

4.2.8 Conditions of Contract

The main contractual terms include the following:

Standard of care

The IFoA requires that all works and activities to be undertaken with due care and attention notwithstanding that research may be exploratory or uncertain. In that respect, depending on the proposed use of the research, we do not usually look for guarantees or warranties as to what certain outcomes will be able to do but we do need care to be taken whilst the work is being undertaken.

Outputs

The outputs will be known at the time of applying for grants and will need to be included in the agreement. The payment of grants will be linked to the satisfactory completion of outputs.

Intellectual property

The starting point is for the IFoA to hold all intellectual property for research developed or arising through the course of the project, unless agreed in writing between the IFoA and the researchers.

VAT

The IFoA is an exempt body in terms of VAT where we are providing grants for research that meets the relevant criteria.

Publicity

All media releases, public announcements and public disclosures by the researchers relating to the Project, including promotional or marketing material, is subject to approval by the IFoA prior to release.

4.2.9 Sub-contracting

Please set out in your Tender if you intend to use sub-contractors to deliver the Project. You shall be fully responsible for all sub-contractors and must ensure all relevant terms and conditions are applied within any relevant sub-contract. For the avoidance of doubt, this includes the obligation of confidentiality.

4.2.10 Jurisdiction and Governing Law

The laws of England and Wales shall be applicable to the Request. The courts of England and Wales shall have exclusive jurisdiction in relation to any disputes arising from the Request.

5 TENDER EVALUATION CRITERIA

5.1 Evaluation procedure

Submissions will be assessed on a range of criteria, including evidence that the research team will produce work that:

- is aligned to the objectives outlined in this tender;
- is theoretically sound;
- can be applied easily and consistently by practitioners;
- is clearly explained and well documented.

Proposals will also be assessed against:

- Existing relevant skills and experience in the individuals working on the project;
- Evidence of a track record of research projects in cognate areas;
- Confidence that the aims of the project can be met within the timescales specified;
- Willingness to promote and support the work post project completion;
- Ability to communicate results;
- Value for money.

Other considerations of the selection will be evidence of innovative thinking in relevant areas, quality of vision and enthusiasm for the project. The contract shall be awarded on the basis of quality and value for money.

As a guide only, the IFoA intends to evaluate Tenders on the basis of the criteria set out above, but reserves the right to evaluate and award the contract as it sees fit. Appendix 1 details the type of information required in Tenderers' proposals.

5.2 Short Listing

Tenders may be short listed and invited to meet with the IFoA (at their own expense) to discuss their proposals. We envisage that discussions will be necessary, both at the selection stage and before the successful Tenderer commences work, to agree the precise scope of work, including the model outputs to be produced and the scenarios to be explored (as outlined in section 2.3 above).

5.3 Result

If a successful Tenderer is selected, the IFoA will notify the successful Tenderer of the outcome and shall start any relevant contract negotiations.

6 COMPLETION AND SUBMISSION REQUIREMENTS

6.1 Clarifications

Any questions about the project or the terms of this Request should be submitted to:
research@actuaries.org.uk

You may be required by the IFoA to provide additional information supplementing or clarifying your Tender in order for the IFoA to evaluate Tenders. If so required, Tenderers are asked to respond within 5 working days of a request. Failure to respond to any request may result in you not being appointed as the successful Tenderer.

6.2 Content of Tender

Each Tender must consist of the following:

- A cost structure (See Appendix 1)
- A proposal for the delivery of the project (See Appendix 1)
- The Form of Tender (Appendix 2)
- Non-canvassing certificate (Appendix 3)
- Anti-collusion certificate (Appendix 4)

6.3 Submission of Tenders

Tenders should be returned electronically to research@actuaries.org.uk

Tenders must be returned by e-mail no later than **12.00 noon UK time, BST on 12 May 2017** and be clear, concise and formatted as follows:

- Language: English
- Financial: all financial information or data forming part of any Tender must be submitted in or converted to pounds sterling, inclusive of VAT.
- Signed by an authorised signatory for your organisation. In submitting a Tender it is assumed by the IFoA that the signatory is so authorised.

Any Tender received after the Tender Return Date may not be considered by the IFoA.

Date	Activity
5 April 2017	Call for tenders opens
12 May 2017	Deadline for submissions 12 noon BST
19 May 2017	Shortlisting
End May 2017	Award announced and research plan agreed
Early June 2017	Research commences

7 APPENDICES: REQUIRED CONTENT FOR TENDER SUBMISSION

Appendix 1

Cost Structure and Proposal for delivery of the Project

A. Cost structure

Please provide a breakdown of the expected costs incurred for the project, including VAT.

B. Outline of proposal and delivery

The following information must be included when submitting your proposal for the delivery of the project. We have included some guidance on the expected length of the submission.

Organisation (300 words)	<ul style="list-style-type: none"> • Provide a profile of your organisation and credentials in modelling capital markets. • Include the location of the offices from which the allocated researchers will be working.
Researchers (300 words plus appendix with structure chart and biographies)	<ul style="list-style-type: none"> • Provide evidence of the experience of the researchers conducting the research, including any similar research projects. • Include a structure chart of the staff planned for deployment on this project, indicating their grade and line of reporting. • Provide examples of similar projects worked on in the past, including details of clients and publications.
Research structure (1500 words plus further details in technical appendix, if required)	<ul style="list-style-type: none"> • Provide details on the methodology you would employ and why. • Provide details of your core model and how you would approach climate change impacts. • Outline the baseline and scenarios you propose to use and the outputs that would be available from your modelling. • Provide details of the deliverables your organisation would expect to provide as outlined in Section 3. • Provide details of how the work will be quality assured.
Ability to work to project timescales	<ul style="list-style-type: none"> • Provide draft project plan • Provide estimate of the time required and/or any issues foreseen with the timelines outlined in Section 3.3
Why you? (300 words)	<ul style="list-style-type: none"> • Why you believe you would be most suited to this project.
Technical and supplementary appendices (no limits)	<ul style="list-style-type: none"> • As you see appropriate to provide technical detail on your models, expertise and experience in modelling the impact of climate change

Tenderers are asked to treat the word count as a rough guide. No strict cut-off will be applied, if more content is required for clarity, although succinctness is always appreciated. Shorter word counts in the main response, with additional detail included as appendices, will help the selection committee in their review.

Appendix 2

Form of Tender

Institute and Faculty of Actuaries
Level 2 Exchange Crescent
7 Conference Square
EDINBURGH
EH3 8RA

Dear IFoA,

Tender for Modelling pension funds under climate change

We have satisfied ourselves as to the nature of the IFoA's requirements for the Project and offer to provide the services in accordance with your Request for the price(s) set out in our Tender.

We acknowledge the terms of paragraph 4.2.8 of the Request and agree to work with the IFoA to execute a final agreement, if successful.

Our Tender shall be open to acceptance for a period of 30 days after the Tender Return Date.

We confirm that our Tender is signed by a duly authorised signatory of the Tenderer who has full legal authority to sign on behalf of the Tenderer.

Tenderer's Name (Print)	
Tenderer's Signature	
Organisation Name and Address	
Witness Name (Print)	
Witness Signature	
Date	

Appendix 3

Non-Canvassing Certificate

This certificate is required to be signed by the Tenderer (or each member of the consortium team, if applicable) and returned to the IFoA with the Tender.

Name of Tenderer

.....

I/we* hereby undertake that I/we* have not canvassed or solicited, nor will in the future, canvas or solicit the IFoA or any officer or employee thereof in connection with the award of this Tender and that the persons employed by me/us* acting on my/our* behalf have not nor will not do any such act.

In this certificate, the word “person” includes any persons and any body or association, corporate or unincorporated and “agreement” or “arrangement” include any such transaction, whether formal or informal, legally binding or not.

Signature of authorised officer of the Tenderer:

.....

Name

.....

Date

.....

* Delete as appropriate

Appendix 4

Anti-Collusion Certificate

1. We certify that this Tender is made in good faith, and that we have not fixed or adjusted the amount of Tender by, under or in accordance with any agreement or arrangement with any other person. We also certify that we have not and we undertake that we will not, before the award of any Agreement for the Project:
 - (a). communicate to any person other than the IFoA or a person duly authorised by them on their behalf the amount or appropriate amount of the Tender or proposed Tender, except where disclosure, in confidence, of the approximate amount of the Tender was necessary to obtain insurance premium quotations required for the preparation of the Tender;
 - (b). enter into any agreement or arrangement with any person that they shall refrain from participating in tendering for the Project, that they shall withdraw any Tender once offered or vary the amount of any Tender to be submitted to the IFoA;
 - (c). pay, give or offer to pay or give any sum of money or other valuable consideration directly or indirectly to any person or doing or having done or causing or having cause to be done in relation to any other Tender or proposed submission for the Project, any act of thing of the sort described above.
2. We further certify that the principles described above have been, or will be, brought to the attention of all suppliers and associated companies providing services on materials connected with the Tender (if so applicable) and any contract entered into with such suppliers or associated companies shall be made on the basis of compliance with the above principles by all parties.
3. In this certificate, the word "person" includes any persons or any body or association, corporate or unincorporated; "any" means any agreement or arrangement; "arrangement" includes any transaction, formal or informal and whether binding or not; and "the Project" means the Project in relation to which this Tender is made.

Signature of authorised officer of the Tenderer:

.....

Name

.....

Date

.....