

DPS SCHEDULE 4: LETTER OF APPOINTMENT AND CONTRACT TERMS

Part 1: Letter of Appointment

Dear Sirs

Letter of Appointment

This letter of Appointment is issued in accordance with the provisions of the DPS Agreement (RM6018) between CCS and the Supplier dated 15th October 2018

Capitalised terms and expressions used in this letter have the same meanings as in the Contract Terms unless the context otherwise requires.

Order Number:	To follow
From:	Department for Business, Energy and Industrial Strategy 1 Victoria Street London SW1H 0ET ("Customer")
To:	VIVID ECONOMICS LTD 163 Eversholt Street, London, England, NW1 1BU ("Supplier")

Effective Date:	Monday 15 th October 2018
Expiry Date:	End date of Initial Period 30 th April 2019

Services required:	Set out in Section 2, Part B (Specification) of the DPS Agreement and refined by: <ul style="list-style-type: none">the Customer's Project Specification attached at Annex A andthe Supplier's Proposal attached at Annex B; and
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Key Individuals:	BEIS - SICE
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- [REDACTED]

BEIS – Clean Growth

- [REDACTED]
- [REDACTED]
- [REDACTED]

Consortium member	Role
Vivid Economics	
[REDACTED] [REDACTED] [REDACTED]	Overall responsibilities for ensuring EINA's meet BEIS needs, and quality assurance. Attendance at project meetings.
[REDACTED] [REDACTED] [REDACTED]	First point of client contact, consortium management, and ensuring consistency across the project. Attendance at (almost) all fortnightly meetings, progress meetings, and (most) workshops.
[REDACTED] [REDACTED] [REDACTED] [REDACTED]	[REDACTED] will support the day-to-day running of the project. She will maintain and update a task register and risk register, and have attendance at fortnightly meetings.
[REDACTED] [REDACTED] [REDACTED]	Key contributor to methodology design and implementation, with particular responsibility for the business opportunity and policy opportunity assessments. Attendance at all progress meetings and some fortnightly meetings.
Carbon Trust	
[REDACTED] [REDACTED] [REDACTED] [REDACTED]	Lead CT's contribution to the project overall, including facilitating workshops in CT's technology areas and ensuring QA of its outputs. Attendance at progress meetings.
[REDACTED] [REDACTED]	First point of contact for CT, ensuring delivery and day to day management. Attendance at

	Project Manager	CT's workshops and relevant fortnightly and progress meetings.
	E4tech	
	██████████ ██████ ██████████	Lead E4tech's contribution to the project overall, including facilitating workshops in E4tech's technology areas and ensuring QA of its outputs. Attendance at progress meetings.
	██████████ ██████████ ██████ ██████████	First point of contact for E4tech, ensuring delivery and day to day management. Attendance at E4tech's workshops and relevant fortnightly and progress meetings.
	██████████	Potentially supported by ██████████, who is expected to return from maternity leave between January and March 2019

Contract Charges (including any applicable discount(s), but excluding VAT):	The total value of this contract shall not exceed £490,949.50 excluding VAT and as per the breakdown in Annex C
Insurance Requirements	<p>Additional public liability insurance to cover all risks in the performance of the Contract, with a minimum limit of £5 million for each individual claim</p> <p>Additional employers' liability insurance with a minimum limit of £5 million indemnity</p> <p>Additional professional indemnity insurance adequate to cover all risks in the performance of the Contract with a minimum limit of indemnity of £2 million for each individual claim.</p> <p>Product liability insurance cover all risks in the provision of Deliverables under the Contract, with a minimum limit of £5 million for each individual claim</p>
Customer billing address for invoicing:	All invoices should be sent to should be sent to finance@services.ukpbs.co.uk or Billingham (UKPBS, Queensway House, West Precinct, Billingham, TS23 2NF) A copy of the invoice should be sent to-

FORMATION OF CONTRACT

BY SIGNING AND RETURNING THIS LETTER OF APPOINTMENT (which may be done by electronic means) the Supplier agrees to enter a Contract with the Customer to provide the Services in accordance with the terms of this letter and the Contract Terms.

The Parties hereby acknowledge and agree that they have read this letter and the Contract Terms.

The Parties hereby acknowledge and agree that this Contract shall be formed when the Customer acknowledges (which may be done by electronic means) the receipt of the signed copy of this letter from the Supplier within two (2) Working Days from such receipt

[Redacted]

[Redacted]

Date: [Redacted]

[Redacted] Title: [Redacted]

ANNEX A

Customer Project Specification

1. Background

The aim of this project is to support evidence and analysis on the role of different technologies in the UK's future energy system – and therefore where innovation support and investment for those technologies could deliver the greatest benefits.

We expect the outputs of the project will inform thinking and decisions by a variety of organisations including BEIS and other public sector funders.

The outputs will be a suite of reports, data packs and models for the range of technology areas assessed, plus cross-technology sector analysis.

The project has two main phases, the purpose of EINAs Phase 1, now complete, was to develop a project methodology, building on the work previously done since 2010 on the Technology Innovation Needs Assessments (TINAs).

EINAs Phase 2 is the full delivery of the project including analysis across a range of technology sectors.

The project is expected to take 5-6 months to complete. We aim to start by early October 2018 and finish by March/April 2019.

Strategic Context

The Industrial Strategy and the Clean Growth Strategy both emphasise the need for focused investment on innovation in low carbon energy. Research, development and demonstration (RD&D) in low carbon technologies is key to the future affordability, security and sustainability of energy supply and use, and will help UK businesses of all sizes maximise the opportunities from the growing low carbon economy. The outputs of this research will be used as evidence for the upcoming Spending Review, this was announced by Government in January and is due to take place in 2019.

Who we are Organisation Details

The Department of Business, Energy and Industrial Strategy (BEIS) is at the heart of the Government's agenda, with a vision of an economy that works for everyone. We are responsible for developing and delivering a comprehensive industrial strategy and leading the Government's relationship with business; we work to tackle climate change and ensure that the country has secure energy supplies that are reliable, affordable and clean.

The BEIS team responsible for the Energy Innovation Programme scopes, designs, and manages projects across the technology spectrum. In the current spending review period we expect to directly invest over £500m in new energy technologies, and steer wider Government investment of a further £2bn.

Useful links

Information on the BEIS Energy Innovation Programme:

<https://www.gov.uk/guidance/energy-innovation#beis-energy-innovation-programme>

Previous TINA reports

- TINA domestic buildings energy efficiency summary report which can be found: <https://www.carbontrust.com/media/218010/tina-domestic-buildings-energy-efficiency-summary-report.pdf>
- TINA heat summary report which can be found: <https://www.carbontrust.com/media/190042/tina-heat-summary-report.pdf>

The Energy Systems Catapult (ESC), details can be found: <https://es.catapult.org.uk/> will be running Stage 1, the whole systems modelling

- Their whole systems model is Energy Systems Modelling Environment (ESME) details can be found: <https://es.catapult.org.uk/projects/whole-energy-systems-analysis/>

EINAs Phase 1

The EINAs methodology was developed during Phase 1, 'the pilot' of the research. To develop the methodology, the supplier worked closely with an advisory group made up of policy, technical, analytical and delivery experts from BEIS and InnovateUK. The EINAs methodology was initially designed to be run over a 20 month period. In the course of EINAs Phase 1, it was announced that the next Government Spending Review would be brought forward to take place in 2019. Therefore, the supplier was asked to design a 'compressed' EINAs methodology that could be completed in 5-6 months.

Two of the main outputs from the pilot are a pilot report and a methodology report. These are currently in draft form and are available to bidders within the e-sourcing suite but they must not be shared more widely. The methodology report includes more detail of the 'compressed' and 'full' EINA methodology. Bidders should feel free to propose a methodology for a compressed EINA. It does not need to conform completely with the methodology proposed by the EINAs Phase 1 supplier. However, it must meet aims of EINAs described below.

2. Aims and Objectives of the Project

The aim of this project is to support evidence and analysis on the role of different technologies in the UK's future energy system – and therefore where innovation support and investment could deliver the greatest benefits.

We expect the outputs of the project will inform thinking and decisions by a variety of organisations including BEIS and other public sector funders.

The outputs will be a suite of reports, data packs and models for the range of technology areas assessed, plus cross-technology sector analysis.

The project has two main phases, the purpose of EINAs Phase 1, now complete, was to develop a project methodology, building on the work previously done since 2010 on the Technology Innovation Needs Assessments (TINAs).

EINAs Phase 2 is the full delivery of the project including analysis across a range of technology sectors.

The project is expected to take 5-6 months to complete. We aim to start by early October 2018 and finish by March/April 2019.

The EINAs methodology, developed in Phase 1, seeks to deliver the following objectives:

- ☐ Create a robust knowledge base to guide UK government RD&D investment decisions;
- ☐ Provide insights on the potential of technologies in future energy systems which could be improved through innovation.
- ☐ Provide an assessment of potential opportunities for maximising private sector leverage to meet innovation needs.
- ☐ Create a common understanding of innovation needs and the case for support to facilitate coordinated planning across UK government and other funders and investors.
- ☐ Allow cross-comparison and prioritisation of RD&D needs between and within technology areas.
- ☐ Provide UK government with the evidence needed to recommend priority areas to developers about UK priorities and approaches.

Additional objectives (optional);

- ☐ Increase our understanding of the links between innovation spend and future benefits of technologies;
- ☐ Provide a methodology and account for disruptive technologies such as blockchain which do not currently feature in ESME.

We expect the EINAs research to use the following aspects of the TINAs approach;

- ☐ Use existing modelling and evidence (in this case the Energy Catapult’s ESME model) to identify a range of representative scenarios for the potential role of the technology in the UK’s energy system;
- ☐ Assess and prioritise the scope for RD&D to positively affect identified technologies or applications;
- ☐ Estimate the value to the UK economy from cutting the costs of the technology through RD&D;
- ☐ Estimate the value to the UK economy of the economic growth opportunity (to date this has been based on exports only);
- ☐ Estimate the effect of RD&D on domestic Gross Value Added (GVA), an annual gross jobs estimate and a systems perspective on the value of innovation;
- ☐ Assess the case for UK public sector intervention in RD&D for technologies in future energy systems;
- ☐ Identify the potential RD&D priorities to deliver the greatest benefit to the UK.

Modelling approach:

☐ The EINA approach builds on the TINAs approach. The main difference is it does not start with a preferred list of technologies. Instead the energy system is considered first, to select technologies with the greatest potential, these are then reviewed at a technology or technology family level in detail.

☐ In the initial stage, we believe there is value in using a whole systems model to reflect the interactions between technologies and the whole energy system. This means using a whole energy systems model such as ESME or UKTM (in this case we are using ESME) rather than modelling using sector specific models. Following the first pass it may be that further modelling using sector specific models could add value to the research. We welcome bidders to consider this in their tender. More detail on the potential sector specific models can be found in the EINAs Phase 1 Methodology document (Table 7 – sector specific modelling required).

3. Suggested Methodology

The contract will ask bidders to run, in consultation with BEIS, Stages 2 and 3 of the EINA methodology which was developed in Phase 1. We welcome adjustments to our suggested approach where necessary but require that the outputs are as much as possible in line with the below. Stage 1 of the methodology, whole system modelling, is being run by the ESC. We expect that this will be ongoing when the appointed contractor for Stages 2 and 3 commences work.

The three stages of the EINAs methodology are as follows:

- Stage 1 - For information (outside the scope of this Project Specification) – to be run by the Energy Systems Catapult modelling team:

a) Scoping.

The process starts with a scoping stage to establish the degree to which costs can be reduced, based on existing evidence. The core of this stage is a rapid evidence review, which will determine the technologies and technology families to be modelled in the EINAs, and feed into Stage Two.

b) Energy System Modelling.

This stage will generate an estimate of the value to the energy system that is the reduction in whole system cost, of innovation in different technology families. This will be used to prioritise areas for focus in the more detailed assessments of innovation.

This stage involves the use of both scenarios and sensitivities: Scenarios represent substantially different outcomes for the energy system (e.g. high electric versus high hydrogen), whereas sensitivities represent different levels of innovation within a scenario.

- Stage 2: Sub-theme EINAs.

Sub-theme EINAs will be led by the contractors and informed by experts with relevant technological expertise, and conduct more focussed evidence gathering on innovation potential for the technology families that are most important in terms of system value.

The contractor will act as a hub for collecting information from a broader range of experts as well as providing their own relevant skills to synthesise the information. Where relevant and necessary they may also support energy system modelling undertaken by an additional organisation. Additional modelling may be required in many of the sub-theme EINAs to take account of detailed characteristics if they are not well specified in the overall model - for example, spatial detail or detailed temporal disaggregation. If models are not available, more detailed modelling using the energy systems model, with an innovation specific set of modifications may be required.

Quantitative results on system values are combined with the results of energy systems model using a standard methodology and reported at the technology family level. In some rare cases, such as unexpected breakthroughs, the benefits of innovations may be outside the scope of scenarios provided and here additional analysis should be considered on a case-by-case basis. An indicative short form EINA process is described in the EINAs Phase 1 Methodology document in Box 4.

- Stage 3:

a) Business opportunities.

Stage 3a will translate modelled deployment outputs from Stage 2, together with estimated export opportunities, into potential UK business opportunities, including GVA and jobs supported by innovation. The analysis is based on a stepwise process to translate deployment into turnover and subsequently into GVA. Results are at the technology family level. This stage is again led by the contractor, to ensure that all the evidence available is consistently assessed, although experts will feed in detailed evidence. For this stage we are interested in better understanding the UK's position and following on from this the potential for international trade.

b) Public support opportunities. (supplementary and if necessary may be carried over beyond April 2019 to be complete by the end of June 2019 and included in advertised budget)

Stage 3b will assesses market barriers, and prioritises needs for government support to unlock benefits to the system. This stage is led by the appointed contractor to ensure consistency of the assessment, but again informed by the specialist knowledge of the innovation experts.

Research Technique & Approach

The successful contractor will use a combination of research techniques including but not necessarily exclusively:

☐ Literature review of relevant material;

☐ Stakeholder engagement as a means of data collection, validation and to gain buy-in from the sector. This engagement should comprise of a number of workshops, and may also include interviews or surveys or any other reasonable means as agreed with BEIS. Stakeholders should include, but not be restricted to, representatives from government, industry, SME, corporates, academia and finance. The outputs of these

workshops will be key to producing the required deliverables detailed in the next section.

☐ Bidders must include costings for the following in their bids;

o Running 15 half day workshops with 20 participants in each, and the cost per each additional workshop above that in the event that more than 15 are required.

o We realise that more workshops may be required. The indicative figure of 15 is intended to help us compare bids and should not be seen as an upper limit on the number of workshops to be run.

☐ We recognise that disruptive innovations, including new business models, may not be captured with this EINAs approach due to the necessary limitations of the technologies included in ESME. Given the potential impact of these innovations, we welcome suggestions on how best to

incorporate them in the research. They could for example be included in a workshop dedicated to these sorts of disruptive innovations that do not fit elsewhere.

☐ The successful contractor will be expected to work closely with the ESC who are delivering the energy system modelling aspects of the project.

Contractors must supply quality assurance evidence for any analysis they wish to submit to BEIS. This must be to a standard that is at least the equivalent of BEIS's internal standard, available at <https://www.gov.uk/government/collections/quality-assurance-tools-and-guidance-in-decc>

Consortium Bids

In the case of a consortium tender, only one submission covering all of the partners is required but consortia are advised to make clear the proposed role that each partner will play in performing the contract as per the requirements of the technical specification. We expect the bidder to indicate who in the consortium will be the lead contact for this project, and the organisation and governance associated with the consortia.

Contractors must provide details as to how they will manage any sub-contractors and what percentage of the tendered activity (in terms of monetary value) will be sub-contracted.

The Department recognises that arrangements in relation to consortia may (within limits) be subject to future change. Potential Providers should therefore respond in the light of the arrangements as currently envisaged. Potential Providers are reminded that any future proposed change in relation to consortia must be notified to the Department so that it can make a further assessment by applying the selection criteria to the new information provided.

4. Deliverables

We expect the contractor to:

- Produce a suite of reports, data packs and models for the range of technology areas assessed, plus cross-technology sector analysis.
- Provide technical annexes explaining methods, results, data sources and any assumptions used.

Final deliverables:

The contractor will provide:

- a) Summary reports, in BEIS templates, for sector, theme and whole system reporting levels, plus cross-sector and cross-theme reports. Tables 1-43 in the EINAs Phase 1 Pilot Report provide indicative details of the expected contents of the reports. See additional detail on the outputs required below.
- b) PowerPoint presentation and speaking notes, in BEIS templates, summarising the project, which could be used by a third party.
- c) Quality assurance processes for validating the evidence and modelling, including senior sign off
- d) Each written report should be submitted as a word document. It should, where necessary (to be agreed with BEIS) include; an executive summary of up to two pages and a table of contents. All reports should be written in line with the BEIS style guide (available at <https://www.gov.uk/guidance/style-guide/a-to-z-of-gov-uk-style>) so that they are suitable to be published. See additional detail below.

Additional Detail on Outputs Required

The following outputs will be required from the project at agreed milestones, in a format suitable for publication and future use.

Management Outputs

1. Agreed plan for the project.
2. Quality assurance plan, including details of who will sign off outputs, and their role within the contractor's organisation.
3. Weekly email updates. Methodology Outputs

In preparation for the research, the contractor will develop:

1. Methodological approach report: A report setting out the methodology, this should include:
 - a. Annexes, including data collection instruments, referencing any sources used in its development (e.g. peer review publications, interviews etc. Please Note - this is not an exhaustive list but indicative of the type of sources which might be considered).
2. Technical model guidance/user manuals (for each model type and in BEIS templates): This should include:
 - a. Clean dataset in Excel format, with a description of how the data has been edited and coded, and derived variables produced, plus any instructions necessary to use that dataset.

- b. Where matching between datasets will be required, contractors will be expected to provide a system of unique identification between these.
 - c. Any model inputs should be clearly referenced. Data should only be hard coded if it is an input.
 - d. All assumptions should be clearly referenced.
3. Summary report templates: (for each model type and in BEIS templates): report and supporting documentation template for sector, theme and whole system reporting levels. Summary Reports should be targeted at an informed reader, not at either a technical or an analytical expert reader. Supporting analytical documentation should be targeted at technical and analytical experts. This should also include:
- a. Data collection instruments; response rates (if appropriate); assessment of bias in sample, (for quantitative data) assessment of uncertainty in results.
 - b. All sources should be clearly referenced. Where assumptions have been used, they should be clearly described.
4. Sector Breakdown, A list of sectors to be assessed by the methodology under each theme. This will be agreed by BEIS and include:
- a. A description of scope;
 - b. An explanation of why they were selected;
 - c. A list of sectors considered but excluded and an explanation as to why.
5. PowerPoint presentation. (In BEIS templates) presentation pack about the methodology, to be used by the cross-Government Energy Innovation Board sub- committee, in their capacity as an advisory body for this work.

Finalised Outputs

- 1. Finalised methodological report: A report (in BEIS template) setting out the methodology used, this should include:
 - a. Annexes, including data collection instruments, referencing any sources used in its development (e.g. peer review publications, interviews etc. Please Note - this is not an exhaustive list but indicative of what might be considered).
- 2. Finalised model reports (where relevant): Finalised sector, theme and whole system, model reports in Excel,1 and cross-sector and cross-theme comparison model reports in Excel.2
- 3. Finalised summary reports (in BEIS templates): Final summary reports per sector, theme and whole system reporting levels. This should include:
 - a. Data collection instruments; response rates (if appropriate); assessment of bias in sample, (for quantitative data) assessment of uncertainty in results.

b. Supporting documentation template setting out the underlying analysis used in the summary report should be targeted at technical or analytical experts. This should also include:

i. Data collection instruments; response rates (if appropriate); assessment of bias in sample, (for quantitative data) assessment of uncertainty in results

1 The models should be compliant with BEIS standards

<https://www.gov.uk/government/collections/quality-assurance-tools-and-guidance-in-decc>.

ii. All sources should be clearly referenced. Where assumptions have been used, they should be clearly described.

4. PowerPoint Presentation summarising overall findings for each sector and theme, in BEIS template, to be used by the cross-Government Energy Innovation Board sub-committee, in their capacity as an advisory body for this work.

5. PowerPoint presentation and speaking notes in BEIS templates, summarising the project, which could be used by a third party.

Please note:

1. Referencing of the data sources and assumptions must abide by the following points:

The chosen method of referencing should be consistent, and agreed in writing with BEIS beforehand.

The referencing must allow all data to be traced back to the original source. Examples may be found in BS ISO 690:2010.

Follow logical best-practice in variable naming, with documented and consistent conventions.

All reports must be written to a sufficiently high standard for publication. Our experience shows that this may require several drafts and this should be taken into account when considering timelines and costs.

Outputs for Models (if applicable)

An Assumptions log completed within BEIS standard template (available at <https://www.gov.uk/government/publications/assumptions-log-template>) or an agreed equivalent, which describes what assumptions have been used within the model. This should include all assumptions, including those which are implicit. All sources that provide the basis for these assumptions should also be clearly referenced.

As well as assumptions, the assumptions log should also give complete information about all inputs, containing details of all data used within the models. Frequently, data used will be a mixture of primary and constructed variables. Please ensure any links or inter-dependencies between these variables are clearly highlighted.

Contractors are expected to note that an assumption can take a number of forms (the following list is not exhaustive):

- Quantitative input data may be assumed;
- Quantitative assumptions may be made during manipulation of the data;
- Qualitative assumptions may have informed the calculation methodology;
- Qualitative assumptions may have informed the structure of the model;
- Complete description of the transformation, including (not exhaustive):
 - o The transformation of each input datum into each model parameter.
 - o An example calculation (explaining how the model transforms input to outputs), provided as text with formulae.
 - o Details of how constructed variables are created, e.g. to enable the analysis to be replicated if necessary
 - o (Where spreadsheets are used): identifying the cells containing the formulae and transformed data that correspond with the equations in the written text.

Full details of methodology, where any model parameters are derived from a collection of raw input data (this derivation may be statistical). These details must include graphical plots of the input data. Any outliers included or excluded from the input data must be documented explicitly, with reasons why they were included or excluded. Where appropriate, a description of any back-casting or linearizing historical data should also be included (excluding that inherent in the UK TIMES model).

Sensitivity tests of model runs; alongside cases where the decision to include or exclude outliers is arguable, where assumptions are more novel or where the quality of fit indicates this.

Arguments and evidence supporting the choice of any statistical fit. All ultimate input data from other sources must be identical, both numerically and in units, to that published in the original reference.

A 'map' of the workings of the model, in particular identifying discrete sections of the model. This should include:

- Presenting a high-level model map (e.g. summarising the process flow of data, from input through to methodological stages, then output);
- Identifying sections of the code as they relate to sections of the map;
- Identifying which variables are used across multiple sections of the model;
- Indicating what variables and procedures would be affected if any section of the model were replaced or updated, and how they would be affected (e.g. highlighting the resulting significant effects on the model and analysis).

Any interdependencies with other models should also be considered in the model supporting documentation where appropriate. This includes outputs from other models which feed in as inputs, or where outputs from this model feed into others as inputs.

Referencing of the data sources and assumptions must abide by the following points:

- The chosen method of referencing should be consistent, and agreed in writing with BEIS beforehand.
- The referencing must allow all data to be traced back to the original source. Examples may be found in BS ISO 690:2010.
- Follow logical best-practice in variable naming, with documented and consistent convention.

ANNEX B

Supplier Proposal



PROJ1.2 Staff to
Deliver.pdf



PROJ1.1
Approach.pdf



PROJ1.6
Consortium of bids



PROJ1.4 Project
Management.pdf



PROJ1.3 Project
Plan.pdf

Annex C

Price breakdown

SOURCING REFERENCE:	CR18136
SOURCING DOCUMENT TITLE:	Energy Innovation Needs Assessments
BIDDER NAME	Vivid Economics Ltd

Cell D23 shall be used for evaluation purposes. Section 2 shall directly feed into section 1 using formulas to ensure that the amount of days and values correlate. To note that T&S shall be included within the day rates provided. All pricing must be reflective of the quality

Please complete the shaded yellow sections only

Section 1

Objective	Number of Days	Total Fixed Costs (ex VAT)	Comments
Research			
Data Collection/Compilation			
Half day Workshops x 15			
Drafting			
Analysis			
Project Management			
Meetings			
TOTAL FIXED PRICE			

Section 2

Job Title	(Please)
Senior Economist/Economist/Analyst	
Principal/Project Manager	
Director	
Director	
Director	
Director	
Experts (Imperial College)	
TOTAL FIXED PRICE	

All prices are firm and fixed and include person fees, as well as travel and subsistence costs
 All prices are exclusive of VAT