Met Office

Tools and Systems:

Pre-Procurement Early Market Engagement

CONTENTS

SECTION ONE

INTRODUCTION AND INSTRUCTIONS

1.01 Who We Are

The Met Office is a trading fund within the Department for Business, Energy & Industrial Strategy (BEIS), operating under set targets. Recognised as a world leader in providing weather and climate services, the Met Office employs more than 1,900 people at 60 locations throughout the world. As the UK's National Weather Service, it provides a range of weather and climate services to many public and private sector organisations. It also represents the UK within the World Metrological Organisation (WMO) and plays a prominent role in international meteorology.

1.02 Purpose of the Early Market Engagement

Following the significant investment in the new Supercomputer, the Met Office has an unprecedented opportunity to increase its capability and improve the lives of millions of people around the world with step changes in the way we forecast the weather, the climate and how we communicate that knowledge to our customers in the 21st century. We are looking for partners to work with us to innovate our tools and visualisation systems to a new level of capability, using the very latest technologies for viewing, interpreting and creating the next generation of meteorological services.

In April 2020, the Met Office ran an early market engagement for its future Visualisation tool. Since that exercise was completed, the Met Office has made the decision to expand the scope of the project to include some of the additional tools used by Operational Meteorologist to deliver services to its customers. By broadening this scope, the business seeks to introduce a modern, agile and future-proof toolset which provides the flexibility and resilience to deliver ongoing services to customers in an evolving market

The Met Office wishes to understand the maturity of the marketplace and its potential to deliver the requirements set out in this document. Using the responses to this engagement, the Met Office is looking to build confidence that suitable suppliers exist to deliver the various capabilities and to validate/refine the initial rough order of magnitude costs that the project is currently using to build the project's Business Case.

1.03 Purpose of this Pre-Procurement Document

This document has been produced to provide information to inform responses to the early market engagement. It provides an overview of the key topics for discussion so that suppliers can consider what contributions they can make to inform the Met Office's thinking on sourcing of the required capabilities. The Met Office welcomes responses to any one or more of the capabilities listed in section 1.04, below.

1.04 Definition of Relevant Capabilities

The below sets out the four high level capabilities being explored as part of this early market engagement. This section only serves to provide a high-level overview of the tools. Further details of the requirements and areas of interest are provided in Section 3.

'Visualisation & Graphical Production'

The required outcome is the provision of a solution which will expose increasingly large quantities of meteorological data both in the form of imagery and raw data to enable meteorologists to forecast and report the weather to a range of customers, both internal and external and across global markets. The solution will also facilitate the production of outputs that will represent the weather to our customers in various formats aligned to their bespoke requirements including imagery, text and data, either as end products or components of other products to be produced downstream.

'Templated Production'

The required outcome is a capability which enables the creation of large numbers of products in predefined formats, to include the automatic and manual population of those products using meteorological data, imagery and text. The products are used by internal and external customers for situational awareness and operational decision making.

'Product Distribution'

Product distribution will be responsible for the delivery of the meteorological products to their intended recipients – both internal and external. This solution will include automated monitoring and alerting of delivery status, and will replace the legacy system built, developed and supported internally by the Met Office.

'Workflow Automation'

Workflow automation will manage allocation of work to Operational Meteorologists - balancing workload across available resource. Improves user experience and efficiency by choreographing processes and launching the necessary tools for the task to be performed. This system will automate prioritisation and allocation and provide management dashboards and monitoring. Automated monitoring and alerting will be provided as a part of workflow automation.

1.05 Supplier Response

Interested suppliers are asked to complete the 'EME Supplier Response Spreadsheet' provided for each or any of the four capabilities in Section 3 below.

The response spreadsheet will allow us to gather the essential information required but we would welcome the submission of any further information from suppliers which might support or demonstrate capability against the requirements detailed throughout Section 3.
Any such information may be useful in helping guide the evolution of more detailed requirements as we progress along the path to procurement.

Specific instructions outlining what is required from suppliers to complete the 'EME Supplier Responses Spreadsheet' are detailed in Section 3.

1.06 Next Steps Following the Supplier Response

The Met Office may invite suppliers who respond to further one-to-one conversations – giving the opportunity to discuss specific topics in a greater level of detail – especially where suppliers provide additional information or examples of capability. The Met Office reserves the right to target the subject areas it wishes to discuss. The planned structure of these meetings will be made available once the Met Office has received and reviewed the supplier responses. Any responses and discussions during the one-to-ones will be confidential between Met Office and the responding company, subject to any Freedom of Information requests.

Any information gathered during the early market engagement may then inform the procurement strategy to recommend the most viable ways of sourcing the required capabilities. The Met Office looks forward to receiving the supply market's inputs which will help contribute towards shaping the procurement of the required capabilities and developing a costed business case to support that strategy.

It is currently the expectation that the Met Office will begin its procurement process (subject to parent department approval of the procurement strategy from BEIS) in Summer 2021. This will likely consist of a single procurement activity composed of four 'lots' aligned to the capabilities listed in section 1.04, above. The Met Office will request suppliers compete for one or more of those lots dependant on their experience and capabilities. Part of the rationale for this early market engagement is to test the structure of these lots against what is available in the market to de-risk the future procurement.

1.07 Contact and Response Information

Please submit responses via the Met Office procurement portal by the deadline specified in the schedule below. Please reference *Met Office Tools & Systems RFI 2021*

Point of Contact:

Aled Evans- Category Manager- Technology
Fitzroy Road, Exeter
Devon, EX1 3PB
United Kingdom

Email:
aled.evans@metoffice.gov.uk

1.08 Questions and Requests for Clarification

Please submit any questions or requests for clarification about this early market engagement in writing via the portal by the deadline for submission of questions and requests for clarification identified in the schedule below. To ensure all interested suppliers have access to the same information, responses to any questions received will be made available via the Met Office Proactis e-procurement portal.

1.09 Early Market Engagement Schedule

Event	Date
Early Market Engagement Issued	**11 January 2021**
Deadline for submissions of questions and requests for clarification	**29 January 2021, 1030am (GMT)**
Deadline for Submission of Responses	**5 February 2021, 1030am (GMT)**
Follow up Meetings	**Commencing 15 February 2021**

1.10 Terms of use of this Pre-Procurement Briefing Document

This Pre-procurement briefing document is provided solely for the purposes of obtaining feedback from interested suppliers on the potential commercial opportunities, and the market feasibility to provide the required capabilities. It summarises certain aspects of the potential procurement but does not purport to contain complete descriptions of all such potential arrangements nor does it describe all arrangements that have been or may be entered into in relation to any possible procurement. Any structures and capabilities described in this document are proposals only and should not be taken as final. Any illustrations and examples of capabilities described in this document are shown to support understanding and context of the requirements and should not be taken as bias towards any existing or potential supplier. The recipient of this document (the 'recipient') should note that the information contained in this document is preliminary in nature and is subject to amendment.

No decision has been made as to the form of any procurement and as with all public procurements it is subject to approval. Accordingly, no reliance should be placed on any information contained in this document and no representation or warranty, expressed or implied, is or will be made, and no responsibility or liability is or will be accepted by the Met Office or any of its advisors as to the accuracy, adequacy or completeness of such information within this document.

This document is not intended to form the basis of any investment decision or other evaluation by the recipient and does not constitute and should not be considered as a recommendation by any person in connection with the project.

Each party to whom this document is made available should, at its own cost and expense, make its own independent assessment of the procurement opportunity as it may deem necessary.

This document is written and provided in good faith; Met Office reserves the right to alter any aspect of this document, or to not proceed with the procurement in any way.

SECTION TWO

GOAL AND BACKGROUND INFORMATION

2.01 Goal and Background Information

The Met Office (est. 1854), is the United Kingdom's National Meteorological Service. An executive agency and trading fund of the Department for Business, Energy and Industrial Strategy.

Our purpose is helping you make better decisions to stay safe and thrive. We fulfil our purpose by:

- providing weather and climate-based products and services, such as weather forecasts, weather warnings and climate evidence and advice, when our customers need them and in a way that meets their expectations
- making best use of public finances, scientific knowledge, data, information and technology across all our processes to bring greater benefits to our customers, stakeholders and society as a whole
- maintaining technical rigour in our science, forecasts and collection and handling of data to assure the provenance and quality of our outputs

The Met Office makes meteorological predictions across all timescales, from weather forecasts to climate change. Our solutions and services meet the needs of many communities of interest, including; the general public, government, defence, broadcasters and online media, civil aviation, marine, transport and almost every other industry sector.

The Met Office employs around 1900 staff, in 60 locations worldwide, with most of our teams located at our head office, based in Exeter UK. Under the current Covid-19 environment, many of our staff are working remotely from home and it should be considered that such working practices may remain in some degree in the future. It is important to note that the Met Office complies to BS EN ISO 9001:2015, UK government Cyber Essentials and the EU Inspire directive.

The Met Office are currently running a high priority programme to drive innovation into the heart of the organisation entitled 'Future of Operational Meteorology'. Within this programme, the 'Tools and Systems' project aims to deliver new processes, technology and tools for our operational meteorologists so that we are fit to thrive in the future and are able to respond quickly to our customers changing needs.

This Tools & Systems early market engagement aims to explore options to address future needs, to visualise large quantities of data to inform decision making and delivering customer value within operational meteorology, as well as addressing current pain points often caused by multiple existing solutions. Current identified problems include the following:

- Growing data volumes (set to expand further with Supercomputer developments), impacting the ability of operational meteorologists to distil data into advice, products or services

- Large estate consisting of multiple complex operational tools which presents significant issues around effort and timeliness of updating and improving systems.
- Multiple tools impact the operational meteorologist user journey and therefore the speed to deliver customer outcomes
- Varying level of support and costs associated with maintaining estate
- The current workflow automation system has limited capabilities, restricting further automation opportunities.
- Limited mobility of toolsets – limiting potential operational usability for remote working and business continuity
- Agility of the solutions is limited – preventing flexibility and adaptability to changing customer needs and advances in technology
- Difficulties in accessing internal and 3rd party data
- Challenges in product distribution
- Production automation is limited with many manual steps involved
- Usability of the varied toolset introduces inefficiencies

To provide context, the following 'as-is' high level view of the product creation process shows the relationship between the Expert Meteorologists in the Guidance Unit and customer facing Operational Meteorologists, and the cascade of information and the tools used to deliver meteorological products to end customer users.
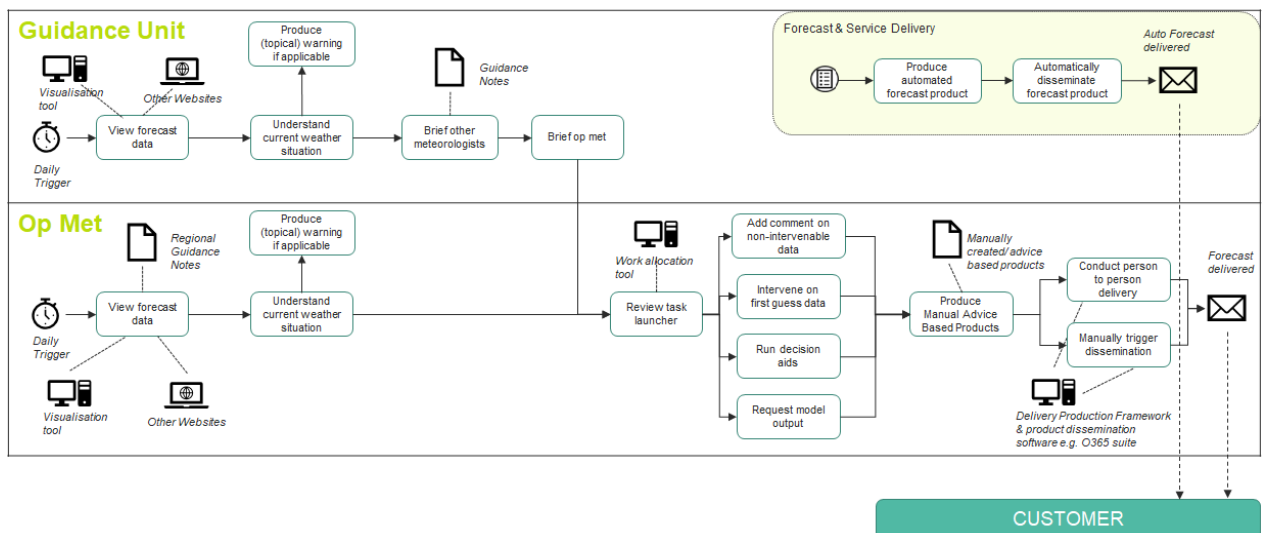
Examples of the types of data that are currently consumed by and presented through the Visualisation toolset include;
- Radar
- Satellite Imagery
- Observational weather data (e.g. rainfall, humidity, temperature, air pressure)
- NWP (Numerical Weather Prediction) model outputs (data and imagery)
- Geographical locations and areas
- Topographical data such as elevation and coastlines

This list is not exclusive and the solution must be flexible enough to be able to include additional geospatial data, as well as other environmental data from partners and customers that may be displayed alongside, or combined with, meteorological data.

Note that weather model data (NWP) is provisioned via multiple disparate sources, both internal and external (e.g. Met Office, ECMWF, NOAA).

SECTION THREE

RESPONSE FORMAT AND CONTENT

3.01 Response Preparation Instructions

Responses should be submitted in the 'EME Supplier Response' spreadsheet provided.

Clear instructions on how to complete the spreadsheet including which sections are required to be completed can be found on the first tab, 'Response Instructions'.

Respondents are invited to respond to any one or more of the four following capabilities:

A – Visualisation and Manual Production
B – Templated Production
C – Product Distribution
D – Workflow Automation

Any additional information provided to support the self-assessment of capability is welcome in the most convenient format to the supplier. Additional information can be provided as separate documents and submitted alongside the main spreadsheet via the Met Office procurement portal.

The pages below provide background detail and information to support you in completing the response form. If you require any additional information please contact us via the Met Office procurement portal.

A: Visualisation and Manual Production

Met Office expects that any supplier will be capable of developing and life-cycling any solution to the highest standard. At a minimum this will mean that we expect the solution to be secure, supportable and resilient. We expect that to ensure this, any supplier will need to be capable of demonstrating the following and should consider them within their response

- A clear release/deployment process that minimises or eliminates user or service impact
- Enabling frequent/regular releases that ensure rapid introduction of new or modified capability
- A testing strategy that minimises human input (and any associated delay to deployment)
- A modular approach to architecture that allows for independent component lifecycles and focused resilience for key capabilities
- A comprehensive approach to user experience design that ensures that workflows are optimised, consistent across solutions and automated where appropriate in order to minimise human effort in both analysis of data and the construction of outputs.[1]
- A robust approach to security, maintained both in the solution and back through the supply chain to ensure that vulnerabilities are avoided where possible, and quickly identified and addressed where necessary. [2]
- A comprehensive support capability that can meet the needs of a 24/7/365 global user community

Section 1: SUPPLIER DETAILS

Business Name and Address
Contact Name and Details

Section 2: BUSINESS OVERVIEW

2a - An overview of your Business, its scale, products, services and customers.

2b - Use-cases to describe how your products are typically used.

2c - An indication if you have worked with UK Government and/or MOD/NATO before.

2d – An indication if you have worked with other national meteorological services.

2e –The Met Office is seeking to procure supercomputing capability and associated services via the delivery of a fully integrated service from 2022 through to 2032. This early market engagement will not discuss any aspect of that procurement. If you are involved in any activity related to that procurement, please will you disclose this here as part of your return.

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[1] Requirements around WCAG AA alignment will be part of any formal procurement
[2] Requirements for security compliance at an organisational and delivery level will form part of any formal procurement

Section 3: CAPABILITIES

The objective is to deliver a solution which can receive, process, and graphically represent increasingly large quantities of meteorological data, at increasing delivery frequency (including streaming) to enable Operational Meteorologists to visualise multiple and varied data sets to support them in forecasting activities. In addition, the solution will provide the capability to produce graphical products (annotations, drawing, overlays etc) based on visualisations.

3a – Map interaction

Interactive maps, including the ability to zoom and pan, are a basic expectation for modern weather visualisation. User experience considerations are important in order to provide users with the most effective user interface for their work.

Users will need to view different parts of the world at different zoom levels; they will need to frequently return to map views previously displayed; and they will need to view 30 or more different visualisations in rapid succession and if appropriate, at the same time, across multiple screens.

Users are interested in viewing horizontal and vertical cross sections of weather data.
Weather data has many dimensions. For example, a typical need could be to display temperature at a number of different altitudes, for specific forecast times. Additionally, the operational meteorologist will need to explore further by viewing different model runs, or ensemble members, and different probabilities.

3b –User Created Visualisations

Users will need to be able to create novel visualisations based on the available data. Novel visualisations are shared with other users that may want to reuse them. The ability to discover new visualisation, created by others and the ability to manage those visualisations will likely be needed.

3c – Time-varying weather imagery

There will be a need for Operational Meteorologists to visualise weather data on a map as it changes over time. The changing display will need to be fluid and as much as possible free from lags and delays.

Users will need to display data that has varying time intervals between steps, for example forecast data with 15-minute intervals for T+0 to T+2 and hourly intervals for T+3 to T+48. Frequently the user will need to overlay more than one data type, for example radar and satellite. This may cause issues if the source data is scaled or projected differently and any such disparities will need to be catered for.
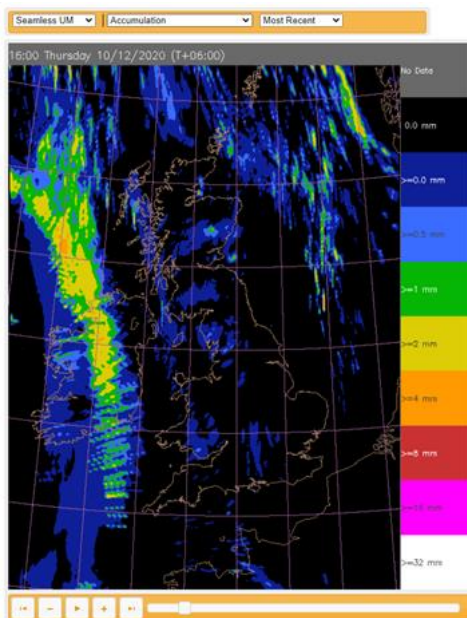
Fig 2. Example of an image with a time series

Data will need to be exposed in such a way for the system to be able to be aware of specific values across geospatial areas in order to alert or highlight against on data contained in one layer, or at a point on a map, or conditional or aggregated data across multiple layers and data types, e.g. an area of forecast precipitation coinciding with an area of saturated ground, displayed across two layers.

The system will also need to be capable of providing a customisable monitoring and alerting capability for data that is not displayed.

3d – Location-specific Data

In addition to gridded data, some weather data will be specific to a given location. For example, simple data could include METARs, weather iconography, or location temperature.

More complex requirements for visualisation of location specific data involve the display of tephigrams and meteograms. The tooling will be expected to be able to display these both as point data and across a map. The tool will also be expected to enable examination of the data within these diagrams, both visually and via interaction with graphical constructions such as Normand's Point (http://cedadocs.ceda.ac.uk/266/1/factsheet13.pdf fig 23)
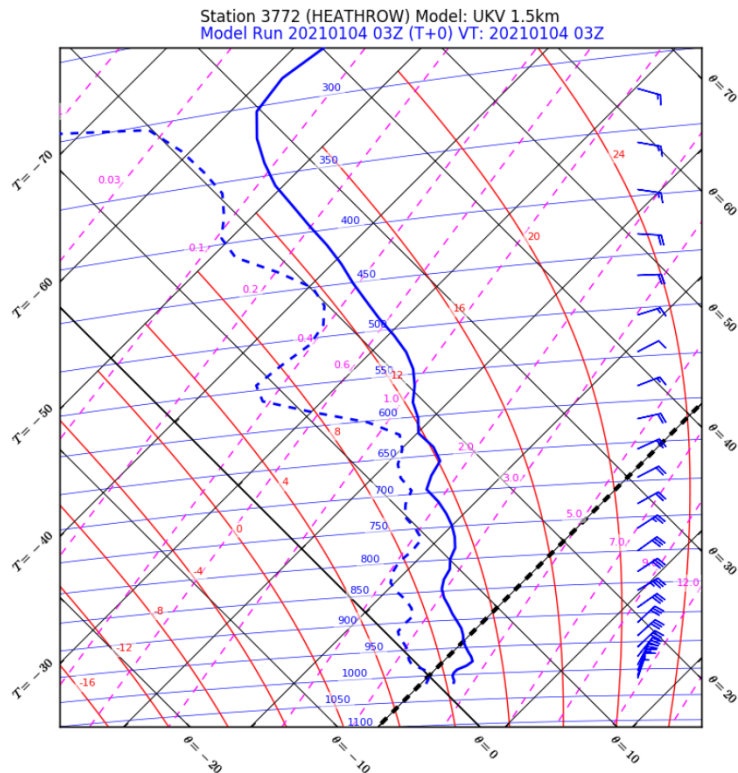
Fig 3. Example of a tephigram

3e – Graphs and Data Diagrams

Operational meteorologists frequently rely on graph plots of data. These may range from meteograms and tephigrams, to spaghetti plots of ensemble members.

The user will need to view complex multi-variate/multi-scalar diagrams. For example, the frequently used tephigram includes multiple data parameters, displayed as multiple lines, icons and areas, in addition to multiple axis and associated labelling. Users will need to rapidly review tephigrams for numerous locations.

3f – Data Overlays

Meteorologists require the ability to overlay non-meteorological data, shapes and features as overlays or underlays of meteorological visualisations, in order to provide context.

Examples of non-meteorological data include polygons for shipping areas, flight information regions and national boundaries; and points for cities and airports.

3g – Novel Visualisation

Met Office welcomes other ideas on how to display data in order to express complex meteorology to experts and customers.

An area of great interest is the 3 or 4-dimensional display of data. Although not a primary visualisation method at this time, this may become more important in the future. We would welcome any insight

from suppliers (as an additional attachment to the response) on how this or other types of novel visualisation can be achieved and any evidence of its use in similar environments.
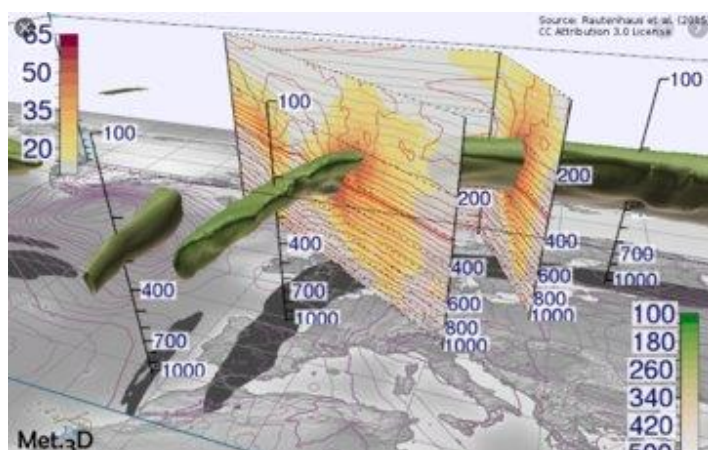

Fig 4. Example of 3D Image

3h – Collaboration

The Met Office is interested in possibilities presented by collaboration tools, specifically where meteorologists could collaborate in analysis and production of meteorological products. This includes collaboration between internal Met Office meteorologists and collaboration between Met Office meteorologists and external meteorologists.

Meteorologists should be able to transparently work with other meteorologists to create graphical and text products.

3i – Visual comparison

A critical capability of weather-data visualisation is the ability to compare models and parameters. Operational Meteorologists frequently need to compare data displayed on a map, either side by side, or as overlays. Of interest is the ability to highlight differences or similarities in data presented both by identifying those differences automatically, by human review, or against predefined parameters or alerts.
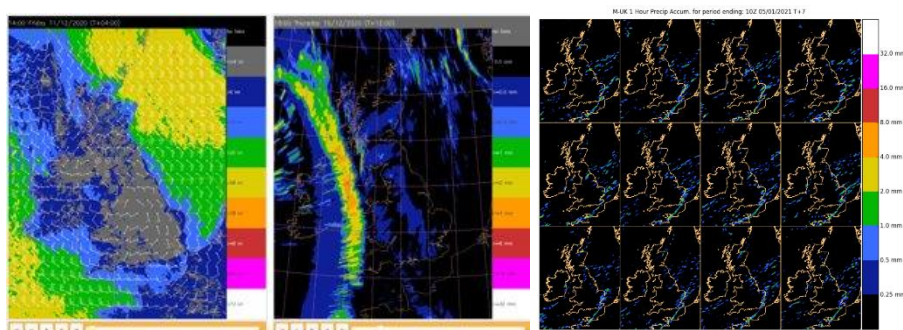

Fig 5. Example of side by side imagery

3j – Manual production

Products can include manually generated content based on visualisations.

Users need to be able to create graphical content based on map visualisations, including drawing and annotating features.

The ability to reuse manually created data will be important, as will the ability incorporate automation where appropriate.

In addition to annotated map based products, users will need to create other forms of content, such as graphs, tables, and other formats.

The ability to brand manual products is important.

3k – Reuse of previously created products

Users need to be able to reuse previously created products in the creation of other products. A key aspect of this will be the efficient management and version control of products and their component content.

3l – Production Automation

The Met Office is very interested in utilising automation where appropriate, in order to ensure quality, consistency and timeliness in the product creation process.

There will be a need to monitor automated processes and to ensure that they are delivering the quality expected.

3m – Interoperability and Standards

The Met Office visualisation and production environment requires that many systems and services interact with each other to pull data together to create outputs. In order to maximise reuse between disparate systems, as well as the ability to extend this capability to downstream consumers outside the organisation, it is key that we ensure that all produced output are standards based, using either OGC or other relevant industry standards, to maximise interoperability opportunities.

3n – Visualisation rendering and generation

While maintaining a principle of 'just in time' access to data, an interoperable solution is needed which meets the expected performance characteristics for users.

A considered system design is expected; generating visualisations as appropriate:

- Centrally - pushing rendered outcome to a client (e.g. WMS layer).
  and/or
- Client side - pushing data cube to the client for rendering (e.g.. Complex interactive analysis).
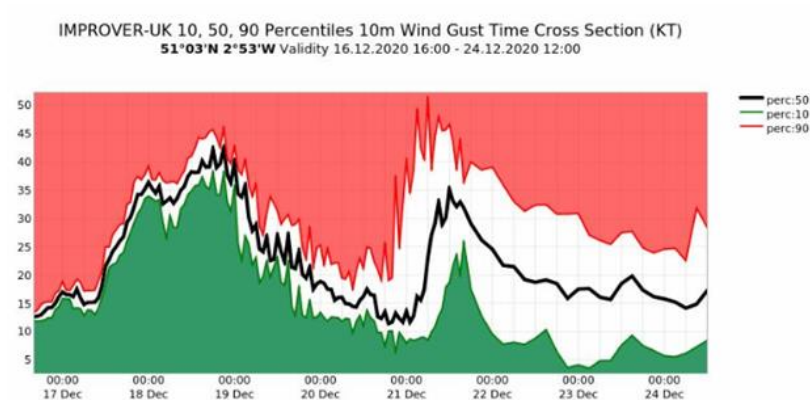
Fig 6. Example of complex data displayed as a line graph

A solution is sought to allow for a bandwidth restricted user and an intermittently offline user to access some visualisations at remote locations and at sea.

3o – Data sources
The visualisation system is to consume from a common data platform of standard based APIs in line with Met Office strategy.

Careful consideration and justification would be needed for visualisation capabilities which require data to be ingested into the visualisation platform **in advance** of user requests.

3p – Deployment
Met Office welcomes proposals for infrastructure and deployment options. However, the following may be relevant to any approach;
- Any solution will also need to take account of the fact that the data that underpins the visualisation will be hosted on public cloud and therefore data transfer costs will be a factor.
- On premises deployment of infrastructure at the Met Office is unlikely to be an option

3q – Support model
The supplier will be expected to be able to provide 24/7/365 support for at least 3rd and 4th line, for any solution.

3r – Capture metadata/usage analytics
Met Office would like to understand ongoing usage through solution provided analysis recording, tracking common journeys, time spent on tools/tasks.
Future planning will be supported by the kinds of expected Insights:
- Highlight under/over used features and data (for removal or promotion).
- Identify users impacted by change.

Section 4: COSTS

Estimated costs to help the Met Office validate internal estimates for Business Case and budgeting.

Based on the information provided in Section 3 and the supplier's capability self-assessment, please provide an estimate of the costs to develop, implement and support the solution over an 8-year period

Please note, cost estimates requested are for the purpose of budgeting and validation of estimates for the project's Business Case.   Estimates provided as part of this early market engagement will not be considered during any further procurement activities.

Section 5: ADDITIONAL INFORMATION

Respondents are invited to provide any further detail or information which may be relevant to demonstrating the capabilities of delivering the above requirements. Please where possible reference the appropriate topic heading to which this information refers.

B: Templated Production

Met Office expects that any supplier will be capable of developing and life-cycling any solution to the highest standard. At a minimum this will mean that we expect the solution to be secure, supportable and resilient. We expect that to ensure this, any supplier will need to be capable of demonstrating the following and should consider them within their response:

- A clear release/deployment process that minimises or eliminates user or service impact
- Enabling frequent/regular releases that ensure rapid introduction of new or modified capability
- A testing strategy that minimises human input (and any associated delay to deployment)
- A modular approach to architecture that allows for independent component lifecycles and focused resilience for key capabilities
- A comprehensive approach to user experience design that ensures that workflows are optimised, consistent across solutions and automated where appropriate in order to minimise human effort in both analysis of data and the construction of outputs.[3]
- A robust approach to security, maintained both in the solution and back through the supply chain to ensure that vulnerabilities are avoided where possible, and quickly identified and addressed where necessary. [4]
- A comprehensive support capability that can meet the needs of a 24/7/365 global user community

Section 1: SUPPLIER DETAILS

Business Name and Address
Contact Name and Details

Section 2: BUSINESS OVERVIEW

2a - An overview of your Business, its scale, products, services and customers.

2b - Use-cases to describe how your products are typically used (with specific reference to the Visualisation)

2c - An indication if you have worked with UK Government and/or MOD/NATO before.

2d – An indication if you have worked with other national meteorological services.

2e –The Met Office is seeking to procure supercomputing capability and associated services via the delivery of a fully integrated service from 2022 through to 2032. This early market engagement will not discuss any aspect of that procurement. If you are involved in any activity related to that procurement, please will you disclose this here as part of your return.

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[3] Requirements around WCAG AA alignment will be part of any formal procurement
[4] Requirements for security compliance at an organisational and delivery level will form part of any formal procurement

Section 3: CAPABILITIES

The objective is to deliver a tool which enables the creation of product templates and ongoing population of those products using meteorological data, imagery and text. The products are used by internal and external customers for situational awareness and operational decision making. The tool should include functionality to enable automation in varying forms to improve quality, efficiency and timeliness of product creation.

Many Met Office products must have a consistent content, format, and branding. Some of these products must be created at defined intervals, however some will be ad hoc and created on demand.

3a – Product templates and formatting
The Met Office provides many products that are identical in format and content type. In order to achieve consistent quality, there is a need to be able to define the format and data parameters for specific products. Templates will need to be managed through a lifecycle, such that they can be created, amended, and retired as needed. Version control is seen as important to template management and use.

Products could either be manually created (meteorologist enters the relevant data), partially automated, or fully automated based on product templates.

3b – Data pre-population and automation
Where possible products will be pre-populated with weather data. In the case of partially automated products, this will then be followed by the meteorologist amending or entering data to complete the product.

Automation will be employed to pre-populate data, determine if meteorologist intervention is required, and validate data entered by the meteorologist.

Where appropriate, fully automated products will be produced. These are those products that require no manual intervention.

3c – Reuse of previously created products
Efficiencies are introduced where products reuse content from earlier products, in part or entirely. Both manual and automated processes will require simple access to versioned content. The content to be reused will either be a final product, or content designed to be reused in one or more end products.

3d – Collaboration
The Met Office is interested in possibilities presented by collaboration tools, specifically where meteorologists could collaborate in analysis and production of meteorological products. This includes collaboration between internal Met Office meteorologists and collaboration between Met Office meteorologists and external meteorologists.

Meteorologists should be able to transparently work with other meteorologists to create graphical and text products.

3e – Verification
The templated production toolset's capabilities should include the means to verify the accuracy of forecast products when compared to weather observations.

3f – Product Metrics
Service managers will need to be able to monitor production metrics, such as the who was involved in a product's creation and when it was produced.
Additionally, being able to access the product in the form that it was created will be needed.

3g – Capture metadata/usage analytics
Met Office would like to understand ongoing usage tracking common journeys, time spent on tools and tasks.
Future planning will be supported by the kinds of expected Insights:
- Highlight under/over used features and data (for removal or promotion).
- Identify users impacted by change.

Section 4: COSTS

4a - estimated costs to help the Met Office to understand acquisition and on-going costs.

This should include:
- an outline of the full pricing structure for software,
- implementation,
- delivery,
- support and services (e.g. training),
- details of any other commercial/legal considerations of which the Met Office should be aware of in relation to the product/solution.

4b - Where services would be provided as a part of the overall solution delivery, detail a breakdown of available/recommended services and rate cards for these.

4c - Detail any services which may be required to deliver the Met Office use case, that would not available from your company.

Please note, cost estimates requested are for budgeting purposes only.

Section 5: ADDITIONAL INFORMATION

Respondents are invited to provide any further detail or information which may be relevant to demonstrating the capabilities of delivering the above requirements. Please where possible reference the appropriate topic heading to which this information refers.

C: Product Distribution

Section 1: INTRODUCTION

Business Name and Address
Contact Name and Details

Section 2: BUSINESS OVERVIEW

2a - An overview of your Business, its scale, products, service and customers

2b - Use-cases to describe how your products are typically used.

2c - An indication if you have worked with UK Government and/or MOD/NATO before.

2d – An indication if you have worked with other national meteorological services.

2e –The Met Office is seeking to procure supercomputing capability and associated services via the delivery of a fully integrated service from 2022 through to 2032. This early market engagement will not discuss any aspect of that procurement. If you are involved in any activity related to that procurement, please will you disclose this here as part of your return.

Section 3: CAPABILITIES

Objective is to deliver a solution responsible for the distribution of the products (created through capability 'B') to their intended recipients – both internal and external. This solution will include automated monitoring and alerting, and will replace the legacy system built, developed and supported internally by the Met Office.

3a – Push Distribution
Met Office products are distributed by a number of channels. Although email is an important channel currently, other channels to push deliver products could become important in the future, and the distribution system should be flexible to cater for different channels.
Met Office products are available in a number of different formats and will likely change in the future, depending on customer needs.

3b – Pull Distribution
Some Met Office products will be delivered on demand to customer users. The use of pull distribution is likely to increase in the future. Pull distribution would need to ensure that products are only delivered to authorised customer users.
Also of interest is the ability to enable customers to sign-up and pay to receive products and services.

3c – Distribution management

Recipient details will need to be securely maintained, with appropriate user able to amend details as required. Where product delivery is delayed, or fails, there should be notification to support staff. Service managers will need to be able to access records of product delivery for service support and audit reasons.

3d – System integration

The Met Office has several tools for alerting support teams and recording customer behaviour these include a CRM, Alerting dashboard, incident recording tooling and centralised logging and reporting systems. The tooling will be expected to be able to interface with all these capabilities with the priority being the monitoring of outbound deliveries.

3e – Customer self service

The tooling will need to be capable of supporting self-service. This may be via an integration with the Met Office ServiceNow implementation.

Section 4: COSTS

4a - estimated costs to help the Met Office to understand acquisition and on-going costs.

This should include:
- an outline of the full pricing structure for software,
- implementation,
- delivery,
- support and services (e.g. training),
- details of any other commercial/legal considerations of which the Met Office should be aware of in relation to the product/solution.

4b - Where services would be provided as a part of the overall solution delivery, detail a breakdown of available/recommended services and rate cards for these.

4c - Detail any services which may be required to deliver the Met Office use case, that would not available from your company.

Please note, cost estimates requested are for budgeting purposes only.

Section 5: ADDITIONAL INFORMATION

Respondents are invited to provide any further detail or information which may be relevant to demonstrating the capabilities of delivering the above requirements. Please where possible reference the appropriate topic heading to which this information refers.

D: Workflow Automation

Section 1: INTRODUCTION

Business Name and Address
Contact Name and Details

Section 2: BUSINESS OVERVIEW

2a - An overview of your Business, its scale, products, service and customers

2b - Use-cases to describe how your products are typically used.

2c - An indication if you have worked with UK Government and/or MOD/NATO before.

2d – An indication if you have worked with other national meteorological services.

2e –The Met Office is seeking to procure supercomputing capability and associated services via the delivery of a fully integrated service from 2022 through to 2032. This early market engagement will not discuss any aspect of that procurement. If you are involved in any activity related to that procurement, please will you disclose this here as part of your return.

Section 3: CAPABILITIES

The Workflow Automation solution will manage allocation of work to Operational Meteorologists - balancing workload across available resource. It will improve user experience and efficiency by choreographing processes and launching the necessary tools for the task to be performed. This system will automate prioritisation and (re)allocation and provide management dashboards and monitoring. Automated monitoring and alerting will be provided as a part of workflow automation.

This space may be suitable for a COTS based solution and the Met Office would be interested to hear of ideas on that front, with a potential supplier taking on an implementation and configuration role.

3a – Workflow Creation and Editing
In order to use workflow, the processes will need to be defined by the meteorologists and service managers.
The defined processes will need to comprise of activities and decision points that could be either manual or automatic. Process steps will need to be able to incorporate business rules based on meteorological data in addition to other factors, such as time, skills, or completion of dependent processes.
The people that are responsible for workflow management will need to be able to create, edit, and remove workflow processes.

3b – Work Scheduling

Operational meteorologists have many tasks and activities to undertake, some being time critical. Work that an operational meteorologist should be doing should be presented appropriately, based on time, skills, availability, weather conditions, and relative priority. The operational meteorologist should be able to select the task to complete from the prioritised tasks presented to them.

Meteorologists should be unable to select tasks that have been assigned to/by others, in order not to duplicate work.

Workflow automation should be able to schedule tasks to facilitate collaboration between meteorologists.

The workflow automation system should be capable of automatically applying business rules to changing meteorological data and alerting meteorologists, or re-prioritising tasks and processes based on those rules. For example, changing processes from fully automatic to manually intervened based on changes in visibility in a specified area.

3c – Metrics and monitoring

Managers require oversight of work undertaken by meteorologists. They will need to monitor completed work, work in progress, and scheduled work.

Managers should be able to reschedule, or re-prioritise, processes and activities on an ad hoc basis, in order to cater for unforeseen resources or conditions.

Managers should be able to view details and products of activities and processes as part of an audit capability.

3d – Application Integration

Operational Meteorologists need the right application accessible, with the right data, at the right time in order to complete tasks and activities. For example, the visualisation application should be presented to the user with the relevant weather model/parameters available/displayed, for the relevant part of the world, together with the relevant tools for manual production tasks.

Section 4: COSTS

4a - estimated costs to help the Met Office to understand acquisition and on-going costs.

This should include:
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- implementation,
- delivery,
- support and services (e.g. training),
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available from your company.

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Section 5: ADDITIONAL INFORMATION

Respondents are invited to provide any further detail or information which may be relevant to demonstrating the capabilities of delivering the above requirements. Please where possible reference the appropriate topic heading to which this information refers.