

ECMWF Copernicus Procurement

Invitation to Tender



Copernicus Climate Change Service

Volume II

C3S Use Cases

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1 Introduction to the Contract

Some of the biggest challenges our society faces are related to climate change and the impact this will have on the environment and on our own activities. The increasing concentration of the greenhouse gases is a prominent driver of a changing climate, but the extent of their impacts is sector dependent and generally more difficult to characterise. In order to build a climate proof society, we need to improve the way in which climate datasets are processed and used to inform decisions in different businesses and societal sectors.

The Copernicus Climate Change Service (C3S) has been developed to meet these needs, aiming at supporting policymakers, businesses and citizens through the provision of high-quality usable information.

The Service consolidates many years of preparatory research and development and delivers through the Climate Data Store a long list of quality-controlled and operationally-produced climate relevant datasets including (or in the process of including):

- a) Reanalyses (ERA5) providing consistent multi-annual global datasets of atmospheric, ocean and land surfaces variables with a frozen model/assimilation system and provided with a short delay (~1 week).
- b) Hi-resolution (5km) regional reanalysis for Europe (in development).
- c) Global land reanalysis based on ERA5 at 9km resolution.
- d) Monthly production of global multi-model seasonal forecasts (month 1-7).
- e) Global (CMIP5 subset) and regional climate projections (EURO-CORDEX).
- f) Gridded observations for Europe.
- g) Historical climate data records for 22 of the Essential Climate Variables (ECVs) as defined by GCOS.
- h) Products to support users in the environmental and climate policy sector, adding value to “raw” data in order to deliver information products in a form adapted to policy applications and policy-relevant work.

All the products can be found on the C3S website at <http://cds.climate.copernicus.eu> using the catalogue search tool. This ITT is about setting up and demonstrating downstream applications, known as “Use Cases”, using one or more of the C3S products as inputs.

This is an open call for C3S “Use Cases” and aims at selecting cases to bring about success stories of the uptake of C3S products to spin-up sustainable applications and businesses. The proposals will be evaluated every three months on the basis of the proposals that have been received at that point.

1.1 Definitions

General definitions can be found in Volume I. Definitions specific for this ITT are defined below.

C3S products: All the products available in the C3S catalogue: <https://cds.climate.copernicus.eu/#!/home>

Application: an information product, software or service (including consultancy) which makes use of one or more C3S as an input.

2 The Climate Data Store and Toolbox

The purpose of this section is to clarify the context of this tender and to briefly describe the relevant outcomes of current activities to implement the Climate Data Store (CDS) and Toolbox initiated by C3S. Specific technical requirements for the additional work to be carried out under this tender are described in Section 4 of this document.

The backbone of the C3S is a cloud-based Climate Data Store (CDS) that provides users with a single point of access to quality-assured data on climate. The datasets may be physically located at various data centres around the world, or they may be distributed in the cloud, but this will be transparent to users of the CDS. All data procured by Copernicus will be open and free, and can be used by anyone for any purpose. Copernicus will also provide access to third party data with different data license. To facilitate the transformation of data into tailored information products, the CDS features a toolbox for creating workflows and applications on-line. All CDS data and tools will be accessible from the C3S website as well as via open Application Programming Interfaces (APIs). The CDS was publicly released on 14 June 2018.

The SIS (Sectoral Information System) is the part of the programme devoted to development of sectoral applications which illustrate how the CDS and the toolbox could be used to address specific users' needs.

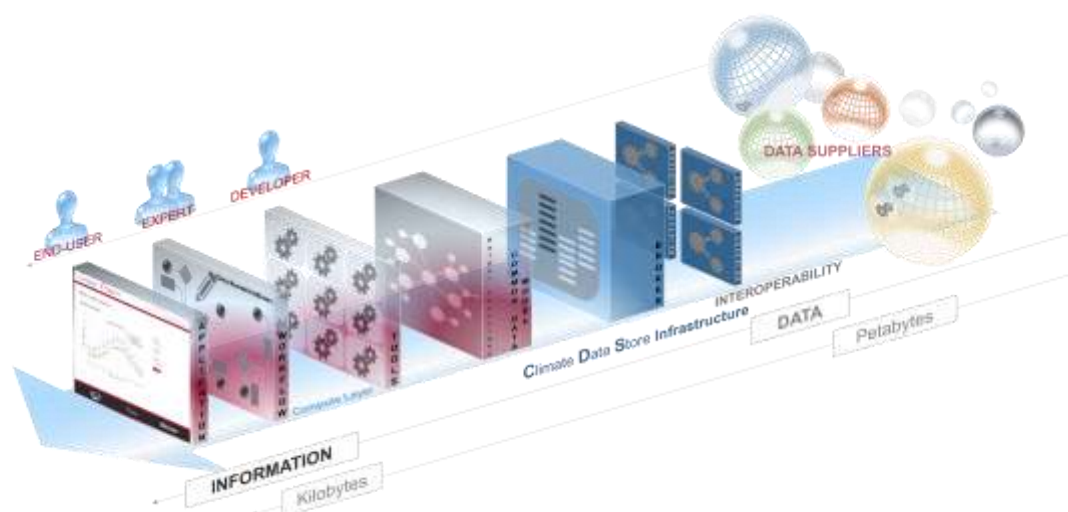


Figure 1. Conceptual overview of the Climate Data Store (CDS) / Toolbox environment. The CDS facilitates access to climate data from multiple providers via one unified access point. The CDS toolbox is an applications environment providing C3S expert users (which includes SIS developers) access to a suite of tools to explore, postprocess climate data and, potentially, develop user relevant applications. The CDS environment permits the processing next to the data to increase computational efficiencies and uses 'orchestrated python workflows', making use of library of tools whilst the JavaScript framework facilitates the SIS contractors to implement customized applications.

CDS DATA CATALOGUE. The CDS provides access to climate datasets via a searchable catalogue. Categories of data include: Climate Data Records (CDRs) and Interim Climate Data Records (ICDRs), quality-controlled archives of in-situ climate observations, reprocessed satellite data records, data from climate reanalyses, seasonal forecast data, output from climate model simulations, and a variety

of derived climate impact indicators. Multiple datasets will be available in each category, e.g. for 22 of the GCOS Essential Climate Variables (ECVs), on global or regional domains, with varying spatial resolutions and temporal coverage, from different data providers, based on different methodologies, etc.

EQC EVALUATION AND QUALITY CONTROL. All datasets available on the CDS will be quality controlled by an independent activity. Such a step serves two main purposes. Firstly the activity has been designed to ensure that each and every record on the catalogue is of a sufficient quality to be used for applications. Secondly the EQC function will ensure that all entry will be supported by a sufficient number of EQC attribute to allow any user who would want to do so to define their own quality control metrics.

CDS TOOLBOX. The CDS Toolbox provides users with the ability to create interactive web applications tailored to their needs using CDS datasets. The Toolbox contains a variety of software tools for combining CDS datasets and performing basic operations on the data, including functions for interpolation and re-gridding, simple statistical calculations, visualisation, text manipulation, etc. The Toolbox is designed to be extendable. The Toolbox uses a Common Data Model to represent different types of datasets available in the CDS catalogue. This allows data and tools to be combined into workflows that can be executed on-line. An Application Editor is available to parametrise workflows using widgets to create interactive web applications on the CDS. The Toolbox includes a mechanism for tracking the provenance of information products created in workflows and applications.

URDB USER REQUIREMENTS DATA BASE. Users play a central role in the implementation of the programme. All user-facing contracts are asked to contribute to a systematic collection of user requirements. These are organised in a database whose analysis (also known as URAD User Requirement Analysis Document) will be one of the key instruments to inform the service evolutions.

3 Contract Summary

This ITT is for “Use Case” contracts that, based on market analysis, will develop and demonstrate end-to-end Applications based on C3S products and the tools provided by the CDS infrastructure. The objective of such contracts is to stimulate innovative ideas and support the development of downstream applications based on C3S data and associated infrastructure.

The criteria for selection will be the innovative use of one or more C3S products, the sustainability of the Application business plan, the potential for increasing the use of C3S services and reaching out to wider communities, and the quality and value for money of the proposals.

ECMWF expects that individual bids in the range between 100 000 and 250 000 euros will be adequate to achieve the objectives of this call, depending on the scope of the proposed use case. Nevertheless, ECMWF may consider bids outside of that range if duly justified by the bidder.

The Invitation to Tender is open to use cases addressing all societal and industrial sectors relevant to climate change.

Within this ITT, ECMWF aims to select use-cases addressing a representative set of C3S products and targeting a wide range of societal sectors. Notwithstanding the above, bids addressing the needs for cultural heritage and forestry sector would be welcome in a first instance. Such an encouragement should be considered active until suitable use cases in these areas have been awarded (C3S website will provide updated information on this).

4 Technical Specification

The ITT targets contractors who are aiming at developing public or commercial Applications using C3S products. While each successful bid will have a single prime contractor, bids may involve other subcontracted entities to deliver the activities. Each “Use Case” shall focus on a single Application.

4.1 General Requirements

The proposed technical solution shall contain a technical description of the Application, a business plan, as well as a description of the activities foreseen for the two phases of the project:

- design and development (duration between 3 and 6 months);
- market trial (duration around 12 months).

In order to be eligible:

- the proposal must cover a single Application (tenderers may submit other separate proposals covering other Applications);
- the Application must make use of one or more C3S products and the CDS infrastructure.

There is no preferred geographical target for the Application, which could apply anywhere in the world. Applications making use of the C3S global line of products (re-analyses, seasonal forecasts, climate projections, climate data records and earth observation based ECV products) are especially encouraged, as well as those that benefit from significant communication outreach potential in new areas.

4.2 Technical Description

The proposal must provide a technical description of the “Use Case”. The description shall cover, as a minimum, the following aspects:

- Overall purpose of the Application
- C3S product(s) used and use of CDS infrastructure
- Other input data (if applicable)
- Target geographical area
- Outline technical design including information flow
- Publicity and communication method(s)

4.3 Business Case

A business case must be presented for the proposed “Use Case”. It is recommended to cover at least the following aspects:

- Target audience(s) for the Application; need assessment and market research; expression(s) of interest from potential users/stakeholders (optional, to be put in annex);
- Existing market (if applicable), customer base (new customers or additional services to existing customers), business drivers, service provision concept;
- Marketing and commercial strategies, competitive assessment and differentiators, time to market analysis;
- Economic model, financial metrics, expected economic return on investment and commercial sustainability of the Application beyond the duration of the contract;

- Risks assessment;
- Potential for expansion or replication of the Application (e.g. over other geographical areas).

Tenderers shall describe their background (customer base, products) in end-users and/or downstream applications development and exploitation, as well as within environmental services provision.

Tenderers shall also mention any other past or ongoing developments for the same or similar Application. In that case, evidence should be provided as an attachment to your response. Other funding solicited (or potential future funding) but not secured at the time of writing of the proposal need NOT be mentioned as part of the tender, but the tenderer must note and comply with Clause 2.1.1.1.xi of the terms and conditions in Volume V of this ITT. Such “non-secured” funding shall not be taken into account as an element in the financial business case.

4.4 Work package 1: Design and development phase

The Tenderer will describe the tasks foreseen in the design and technical development phase. This phase must have a total duration between 3 and 6 months. The tasks will be organised into a single work package, with tasks, milestones, deliverables and a Gantt chart.

Deliverables can be either “public” or “restricted” (accessed by ECMWF, EC/DG-GROW and auditors for the purpose of contract monitoring), but at least one of the deliverables must be a “public” final report for the phase. A “communication and user uptake strategy” document must form part of the deliverables (it can be “restricted”).

The table below provides a template to be used by the contractor to describe the complete list of deliverables and delivery schedules for this work package. All deliverables shall be numbered as indicated in the table. All document deliverables shall be periodically updated and versioned as described in the table. Tenderers shall provide a preliminary version of the completed table as part of their bid.

WP1 Deliverables Template			
#	Type	Title	Due
D1.1.1	Report	Application Architecture	
D1.1.2	Report	
D1.2.1	Report	
D1.2.1		Communication and user uptake strategy	
D1.2.1		
...		
D1.2.2	Report	
D1.2.2		Design and development report	
D1.2.2-v...		
...		

4.5 Work package 2: Market trial phase

The Tenderer will describe the tasks foreseen in the market trial phase. This phase must have a total duration around 12 months. The tasks will be organised into a single work package, with tasks, milestones, deliverables and a Gantt chart. Deliverables can be either “public” or “restricted” (accessed by ECMWF, EC/DG-GROW and auditors for the purpose of contract monitoring).

Deliverables must include:

- A 2-page document about the Application, its users and how C3S input is used for publication (print and web);
- A quarterly report about the use and user uptake of the Application, as well as the business case outcomes compared to planned;
- Participation to and presentation of the “Use Case” at two C3S events (user day, general assembly...) as required by ECMWF. Venue will be in Europe and participation is expected for one day in each case;
- A final report assessing status at the end of the contract and providing an outlook on continued operation of the Application (can be “restricted”).

The table below provides a template to be used by the contractor to describe the complete list of deliverables and delivery schedules for this work package. All deliverables shall be numbered as indicated in the table. All document deliverables shall be periodically updated and versioned as described in the table. Tenderers shall provide a preliminary version of the completed table as part of their bid.

WP2 Deliverables Template			
#	Type	Title	Due
D2.1.1-v1	Report	Quarterly report about the use and user uptake of the Application and the business case outcomes	
D2.1.1-v2		2-page document about the Application, its users and how C3S input is used for publication (print and web);	
D2.1.1-v3		Presentation of the application at C3S events.	
D2.1.1-v...			
D2.1.2		Final Report	
D2.1.2-v2			
D2.1.2-v...		...	
...	Report		

4.6 WP0: Management and Implementation

The Tenderer shall provide a detailed implementation plan of proposed activities for the duration of the framework contract. Deliverables should be consistent with the technical requirements specified in Section 3.8.2

Milestones should be designed as markers of demonstrable progress in service development and/or quality of service delivery.

Adjustments to the proposed implementation plan can be made on an annual basis depending on needs for service evolution, changed user requirements, or other requirements as agreed between the European Commission and ECMWF.

The following management aspects shall be described in the proposal: quality assurance and control, communication management (ECMWF, stakeholders, internal communication), conflict resolution, subcontractor management, personal data management.

A list of subcontractors describing their contribution and key personnel, legal name and address shall be provided. The Tenderer shall describe how the Framework Agreement, in particular Clause 2.9, has been flowed down to all their subcontractors.

As part of the general project management description, the Tenderer shall include the following elements:

- Contractual obligations as described in the Framework Agreement Clauses 2.1, 2.3 and 2.4.
- Monthly teleconferences with ECMWF and a proposal for involvement of ECMWF in major project reviews.
- Proposal for payment milestones (linked to major project reviews/milestones).

Milestones will include two meetings: one in the middle and one at the end of this phase. The meetings will take place at ECMWF's premises (Reading, UK).

WPO Contractual Obligations Template				
#	Responsible	Nature	Title	Due
D0.y.z-YYYYQQ	Tenderer	Report	Quarterly Implementation Report QQ YYYY <i>QQ YYYY being the previous quarter</i>	Quarterly on 15/01, 15/04, 15/07 and 15/10
D0.y.z-YYYY	Tenderer	Report	Annual Implementation Report YYYY <i>YYYY being the Year n-1</i>	Annually on 28/02
D0.y.z	Tenderer	Report	Final report	60 days after end of contract
D0.y.z-YYYY	Tenderer	Other	Preliminary financial information YYYY <i>YYYY being the Year n-1</i>	Annually on 15/01
D0.y.z-YYYY	Tenderer	Report	Draft Implementation plan YYYY <i>YYYY being the Year n+1</i>	Annually on 28/02
D0.y.z-YYYY	Tenderer	Report	Finalised Implementation plan YYYY <i>YYYY being the Year n+1</i>	Annually on 31/10
D0.y.z-YYYY	Tenderer	Other	Copy of prime contractor's general financial statements and audit report YYYY <i>YYYY being the Year n-1</i>	Annually
D0.y.z-YYYY	Tenderer	Other	Letter from auditor specific to C3S contract YYYY <i>YYYY being the Year n-1</i>	End of the contract
D0.y.z-YYYY	Tenderer	Other	Risk Analysis and Contingency Plan

WPO Milestones Template				
#	Responsible	Title	Means of verification	Due
M0.y.z	Tenderer	Kick-Off meeting	Minutes of meeting	Month 1
M0.y.z	Tenderer	Progress review meetings with ECMWF / Payment milestones	Minutes of meeting	~ Every 6 months

4.7 Specific Requirements

4.7.1 Publicity and communications

The fact that the Application uses Copernicus data must be clearly acknowledged for all publication/dissemination channels. Communications guidelines will be provided by ECMWF to the Successful Tenderer at the start of the contract.

4.7.2 User feedback and user support

As a user of C3S products, the successful tenderer will be required to provide feedback on the use of C3S data and on its evolving needs and requirements.

As for all C3S users, the successful tenderer will have access to the C3S Service Desk, providing technical support on all the products provided by C3S. However, C3S Service Desk cannot be used to support the users of the Application; the Application will not form part of the C3S “core service” portfolio.

4.8 Performance Requirements

4.8.1 Schedule/timetable

The execution of tasks detailed in Work packages 1 and 2 will follow the implementation plan outlined in your bid. Please complete the work package table template in Volume IIIB for this purpose.

This contract spans a total period of 15 to 18 months and the Tenderer is expected to provide an implementation plan of the proposed activities for the full duration of the contract.

4.8.2 Deliverables

Based on the Work Package 1 and 2 descriptions of this ITT the Tenderer shall define a set of Deliverables and Milestones for each work package. Each Deliverable shall have an associated resource allocation. The total of these allocated resources shall amount to the entire requested budget.

During the contract duration, the Successful Tenderer will be required to provide input to the quarterly and annual reporting to the European Commission. These reports shall be defined as Deliverables as part of an overall management work package (Work Package 0). Each quarterly report shall provide information on the performed activities for the previous period, list the achieved Deliverables and Milestones, and provide reasons for deviation from the implementation plan, where relevant.

All reports in this project shall be in English. The quality of reports and Deliverables shall be equivalent to the standard of peer-reviewed publications and practice. Unless otherwise specified in the specific contract Deliverables shall be made available to ECMWF in electronic format using the Microsoft Word template provided at the start of the contract.

ECMWF will organise a monthly follow-up meeting (by teleconference, except for one “physical” meeting at the end of the design and development phase). The Project Manager appointed by the Successful Tenderer (see 4.2.2) will represent the Successful Tenderer in such meetings.

4.8.3 Data delivery and IPR requirements

It is a condition of EU funding for C3S that ownership of the contract outputs, in this case the Deliverables must pass from the Contractor (the Tenderer who wins the contract) to the European Commission, via ECMWF. In return, the Contractor is granted a licence to use the Deliverables, for any purpose except one which conflicts with the aims of C3S.

In this case, and in order for Work Package 2 (Market Trial Phase) to be successful, the Contractor's licence to use the Deliverables will be an exclusive licence for the corresponding duration of 12 to 24 months. During that same period, all revenue generated by the Application may be kept entirely by the Contractor (and associated entities, if applicable). After the end of the exclusive licence period (and of the contract), ECMWF, on behalf of the European Commission will release the Application, under a permissive open source licence and the Contractor may choose whether, or not, to continue to develop and/or exploit the Application.

All pre-existing technology, **used by the Contractor or its sub-contractors** to deliver the Application will remain owned by them, but has to be fully licensed to ECMWF and the European Commission to the extent necessary to make unbridled use of the Deliverables. The identity and ownership of those components which are acquired or created specifically for the purpose of this contract, with C3S funding and which are separable and useable in isolation from the rest of the Contractor/Sub-contractor's production system will be passed to the European Commission, via ECMWF annually. In return, the Contractor will be granted a non-exclusive licence to use them for any purpose except one which conflicts with the aims of C3S. The Contractor may grant a sub-licence to the relevant Sub-contractor.

Detailed contractual terms, including terms to give effect to the arrangements described above are set out in Volume V of this ITT.

4.8.4 Key Performance Indicators and Performance Targets

The Tenderer shall provide a set of Key Performance Indicators (KPI) and Performance Targets for the activities covered by this ITT and taking the requirements described above into account.

5 Tender Format

General guidelines and templates for the Tender are described in Volume IIIB. Specific requirements for this ITT are described in the next few sub-sections.

5.1 Page limits

As a guideline, it is expected that individual sections of the Tenderer's response do not exceed the page limits listed below. These are advisory limits and should be followed wherever possible, to avoid excessive or wordy responses.

<i>Section</i>	<i>Page Limit</i>
<i>Technical Description (4.2)</i>	4
<i>Business Case (4.3)</i>	6
<i>Resources Applied</i>	1 (excl. CVs with a maximum length of 2 pages each)
<i>WPO – Management and Implementation (4.6)</i>	3
<i>WP1 – Design and Development Phase (4.4)</i>	3

<i>WP2 – Market Trial Phase (4.5)</i>	3
<i>Annexes (Letters, commitments, expression of user needs...)</i>	No limitation
<i>Pricing Table (Volume IIIA)</i>	No limitation

Table 1: Page limits

5.2 Specific additional instructions for the Tender

The following is a guide to the minimum content expected to be included in each section, additional to the content described in the general guidelines of Volume IIIB. This is not an exhaustive description and additional information may be necessary depending on the Tenderer's response.

5.2.1 Executive Summary

The Tenderer shall provide an executive summary of the proposal, describing the objectives, team and service level.

5.2.2 Quality of Resources Applied

The Tenderer shall propose a project team and appoint a Project Manager with more than 2 years' experience in managing activities of the same nature as the ones proposed. A CV, in the standard 'europass' format, must be provided for all personnel involved (<http://europass.cedefop.europa.eu/>).

The Project Manager will be its primary contact for contractual delivery and performance aspects.

5.2.3 Management and Implementation

The Tenderer shall provide a detailed implementation plan of proposed activities using the activity table in Volume IIIB as a template. The Tenderer shall provide a table for each work package describing the main objectives, the respective proposed activities and a set of Deliverables and Milestones. The number of Deliverables and Milestones shall be restricted to less than ten per work package. While financial information can be omitted from this table, a specification of the required staff resources is required. Adjustments to the proposed implementation plan can be made during the course of the contract subject to approval by ECMWF.

6 Schedule

This is a rolling Invitation to Tender, whereby bids will be evaluated on a quarterly basis, with closing dates every three months (14 September 2018, 14 December 2018, 14 March 2019, 14 June 2019), when bids submitted during the previous calendar quarter will be evaluated. Bidders will be informed about the outcome of the evaluation within six weeks following each closing date.

Reminders on the evaluation dates will be posted on the C3S website (<https://climate.copernicus.eu/>) at regular points in time.

As an outcome of each quarterly evaluation, bids will be either selected for negotiations in that round, rejected, or included in a reserve list for future consideration.

Six weeks upon each evaluation date, ECMWF will update the C3S website with an overview of the sectors and C3S products for which a use-case has been selected.