

ECMWF Copernicus Procurement

Invitation to Tender



Copernicus Climate Change Service Volume II

CDS Interface to Climate-ADAPT

ITT Ref: C3S_434
ISSUED BY: ECMWF Administration Department Procurement Section
Date: 5 June 2019
Version: Final



Funded by the European Union

Implemented by



Table of Contents

1	Introduction	3
2	Technical requirements	3
2.1	Scope of Service	3
2.2	Service Target Requirements	6
2.3	Specification of Work.....	7
2.4	Contract Schedule	8
3	General requirements.....	9
3.1	Implementation Schedule	9
3.2	Meetings	9
3.3	Deliverables.....	9
3.3.1	Documents and reports	9
3.3.2	Data sets.....	9
3.3.3	User support	11
3.4	Key Performance Indicators.....	11
4	Tender format and content	11
4.1	Page limits	11
4.2	Specific additional instructions for the Tenderer's response	12
4.2.1	Executive summary	12
4.2.2	Track record	12
4.2.3	Quality of resources to be deployed.....	12
4.2.4	Technical solution proposed	12
4.2.5	Management and implementation plan	13
4.3	Price and payment specifications	14

1 Introduction

ECMWF, as the Entrusted Entity for the Copernicus Climate Change Service (C3S), invites tenders for services related to operational service provision.

The C3S combines observations of the climate system with the latest science to develop authoritative, quality-assured information about the past, current and future states of the climate and the environmental impacts in Europe and worldwide. The C3S builds upon and complements capabilities existing at national level and being developed through many climate-change research initiatives.

The C3S aims to provide information to support the development of a climate resilient society. Through the Sectoral Information System (SIS), C3S has already procured 7 Proof of Concept elements (POCs), addressing the needs of sectoral users in water, energy, insurance, agriculture and urban-management sectors in Europe. In addition, in 2017 ECMWF built upon the experience gained from the POC contracts, and supported a further 7 operational activities. The existing SIS contracts are developing datasets and tools based on the Climate Data Store (CDS) infrastructure. Outputs include Global, European and regional Climate Impact Indicators (CIIs), Essential Climate Variables (ECVs), tools, and Python scripts built using the CDS python libraries that run on the CDS Toolbox, to develop user-driven, sector-specific services.

The European Environment Agency (EEA) is the agency of the European Union (EU) which provides independent information on the environment. Its goal is to help those involved in developing, implementing and evaluating environmental policy, and to inform the general public.

The European Climate Adaptation Platform Climate-ADAPT is a partnership between the European Commission and EEA. Climate-ADAPT is maintained by the EEA with the support of the European Topic Centre on Climate Change Impacts, Vulnerability and Adaptation (ETC/CCA). Climate-ADAPT aims to support Europe in adapting to climate change by helping users to access and share data and information about the present and future climate of Europe. The platform includes a database that contains quality-checked information that can be easily searched. The platform is based on the Plone¹ content management system.

This Invitation to Tender (ITT) focuses on developing a suitable interface between the Climate Data Store and the Climate-Adapt platform to ensure the latter can take full advantage of the operational nature of the C3S infrastructure.

2 Technical requirements

2.1 Scope of Service

The service shall deliver a set of climate indicators (essential climate variables, indices and impact indicators) (see Table 1 for details) suited for the Climate-ADAPT platform and make them available, via the CDS, on the Climate-ADAPT site as a set of dynamical maps and graphs.

Although the primary goal is to make suitable indicators available on the Climate-ADAPT site, the primary deliverable of the contract shall be a series of workflows (python scripts to run on the CDS-toolbox platform) able to generate the above-mentioned indicators, visualise them and make the visualised data available for download. Depending on the computational expense of the code, the user

¹ See <https://plone.org/>

demand and the storage requirement, the workflows can in some cases be the sole deliverable of the contract as the data can, in some cases, be regenerated on demand each time the user requires it.

Table 1: Indicators needed for the Climate-ADAPT platform, temporal and time aggregations

Essential Climate Variables and Climate Indices	Sectoral indicators	Temporal aggregation	Spatial aggregation for the pan-European domain
Surface Temperature <ul style="list-style-type: none">- average- max- min- percentile 5 of the min- percentile 95 of the max- number of days with tmin > 20°C- number of days with tmin < 0°C- number of frost-free days- number of warm nights- number of warm days- number and length of heat waves	Agriculture, Forestry, Soil <ul style="list-style-type: none">- Soil moisture- Growing Degree Days- Index for Chill units- Frost-free season length- Date of last occurrence of 0°C in spring- Date of first occurrence of 0°C in autumn- Leaf area index (LAI)- FAPAR- Potential evapotranspiration- Index for wildfire danger (e.g. Fire Weather Index)- Index for aridity/drought	Past data: Temporal aggregation: <ul style="list-style-type: none">- daily timeseries- monthly timeseries- annual time series Trend data: <ul style="list-style-type: none">- calculated trends over pre-defined periods-layer adding level of statistical significance of the trend value Long term averages: <ul style="list-style-type: none">-annual mean-seasonal means	Countries NUTS-2, NUTS-3 EU transnational regions Nature 2000 sites Hydrological basins European regional seas Ad hoc polygons
Precipitation (pcp) <ul style="list-style-type: none">- total number of days with pcp > 1mm- number of days with pcp < 1mm- number of consecutive days with pcp < 1mm- max annual 5-day consecutive pcp- pcpmax 24h- percentile 95 of pcp- seasonal distribution of pcp	Energy <ul style="list-style-type: none">- Heating Degree Days (HDD)- Cooling Degree Days (CDD)	Climate Projections -Mid term projections (2041-2070) Long term projections (2071-2100) -different scenarios available - ensemble mean - ensemble spread - ensemble members	
Surface radiation budget <ul style="list-style-type: none">- solar incoming radiation	Hydrology <ul style="list-style-type: none">- River discharge		

- solar reflected radiation (albedo)			
Surface Wind - wind speed - Index for extreme wind speed - direction	Tourism - Climatic index relevant for tourism (e.g. Tourist Comfort Index)		
- surface relative humidity			
Cryosphere - snow - Icesheets - glaciers			
Ocean - Sea surface temperature - sea level			

Table 1 lists the variables needed for the Climate ADAPT platform that could be provided via the CDS. The temporal and spatial aggregations listed are intended to hold for all ECVs, Climate and Sectoral Indices, apart from where it is not possible due to their definition. The detailed list to be provided by the contractor, including the precise definition of the sectoral indices will be part of a deliverable due at the beginning of the project.

A single contract will be issued to develop and deliver:

- 1) A suitable visualisation of all essential climate variables, indices and sectoral indicators for at least two sectors (as presented in Table 1), with a particular focus on the display of time series.
- 2) A set of CDS applications to calculate trends and their significance and whenever appropriate statistical summaries of ensemble variables (e.g. mean and spread).

The contract will run for a period of maximum 12 months and must be delivered by 31 October 2020 at the latest. It is expected that an operational production activity will be conducted afterwards, either by ECMWF staff or by a contractor, and ECMWF reserve the right to negotiate directly with the successful Tenderer to this ITT in the event that they decide to contract this work at that time.

All data delivered should be compliant with the common international standards in the field (e.g. GCOS ECVs) and follow CF conventions, and should be as close as possible to the Common Data Model (<https://confluence.ecmwf.int/pages/viewpage.action?pageId=88254658>) of the Climate Data Store in order to simplify its integration into the public catalogue.

A number of independent C3S activities, which are not part of this ITT, have been or are being implemented to complement the scope of this tendered service. In particular:

- An Evaluation and Quality Control (EQC) function, which will assess the quality and suitability (fitness-for-purpose) of C3S products and services from a user perspective;

- A Climate Data Store (CDS) to provide access to ECV products, including those delivered by this service, as well as climate model output, reanalysis products;
- A CDS toolbox, providing tools operating on the data in the CDS catalogue;
- Outreach and dissemination activities to promote uptake of C3S data by various user communities.
- A user learning platform to provide targeted training for the users of the C3S infrastructure.

The Tenderer shall put in place all necessary mechanisms to ensure the outputs of this contract will be fully compliant with the activities above as well as make use of present development for this tender to the extent possible - particularly regarding data and tools.

The Tenderer is expected to bring together a sufficient pool of experts with competences in the following fields:

- Content Management Systems, especially the one used by the Climate-ADAPT platform (Plone);
- spatial data management and processing, solutions based on Web technologies;
- data visualisation with a particular emphasis on time-series display
- climate data analysis (calculation of trends and significance, uncertainty, homogenisation,...);
- climate change impacts modelling
- climate change adaptation.

The Tenderer shall:

- work closely together with the C3S team at ECMWF;
- liaise with EEA and in particular with the Climate-ADAPT team and learn about the processes for including the spatial and temporal datasets;
- meet with relevant EEA teams at least twice during the duration of the contract;
- liaise with EEA regarding the IT specifications of the Climate-ADAPT portal;
- define with EEA the exact spatial aggregation needed for the data and, whenever required, acquire the relevant shape-files;
- define with EEA the ways to present temporal aggregation of the presented climate variables, indices and indicators;
- define and document the productions protocols and standards, dataset formats, metadata information, quality assurance methods and licencing agreement to ensure compliance with the EQC framework developed by C3S;
- define a delivering mechanism to allow Climate-ADAPT to display the indicators and provide access to the data in a clean and professional manner;
- In close interaction with the EQC function develop a method to quantify the uncertainty/ attribute data quality flags to all the indicators generated;
- Define quality flags and KPIs indicating possible breaks in the acquisition process;
- Ensure that all indicators are ready to be made available in the C3S Climate Data Store (e.g. manifest file, compliance with C3S Common Data Model, ...) by the end of the contract;
- Prepare a road-map to operations summarising the key steps necessary for a smooth transition to an unsupervised routine production of the indicators;
- Document the procedure followed and develop appropriate training and supporting material.

2.2 Service Target Requirements

The successful tenderer will be expected to establish and continuously refine the following Target Requirements (TRs). The TRs described in Table 2 are expected to *evolve* during the lifetime of the service to adjust to new sensors (e.g. upcoming Copernicus missions), new capabilities (e.g.

algorithms, cloud-based platforms), emerging needs of C3S and feedback from the EQC. As such the service shall be supported by an *agile* production system, which shall continuously evolve to rapidly take account of these new needs.

Table 2: Target Requirements

TR1	Set-up a flexible, agile, scalable, and iterative production system capitalizing on existing e-infrastructures and enabling new software and new data streams to be integrated easily and incrementally. In particular, if a production chain already exists for other purposes, the successful tenderer shall look to upgrade the existing chains (rather than re-inventing another system) to meet the necessary climate quality requirements.
TR2	Develop and implement a system to monitor routinely the performance of the system through a series of benchmarking metrics, covering both the <i>quality</i> of the data (e.g. validation), the <i>performance</i> of the system, and the quality of the service. In particular, for the C3S, the successful tenderer shall take account of the feedback of the EQC to improve iteratively its products and processing chain

2.3 Specification of Work

Work package 0: Management and coordination activities (Months 1-12)

This work package will focus on contract management, including internal controls and coordination of subcontractors, risk management and tracking of the key performance indicators.

Deliverables expected:

Deliverables covering the contractual and financial reporting obligations towards ECMWF in line with the Terms and Conditions of the Framework Agreement shall be covered under WP0:

- Quarterly Implementation Reports, due 15 days after the end of each calendar quarter;
- Annual Implementation Reports, due annually on 28 February;
- Preliminary financial information, due annually on 15 January;
- Draft and final Implementation Plans for the year N+1, due respectively in February and October of the year N;
- Letter from the auditors referred to in Clause 2.3.1.4 of the Framework Agreement;
- Final report, due 60 days after the end of the Framework Agreement.

Work package 1: Scoping study (Month 1)

The successful bidder shall analyse the capability of both C3S and Climate Data Store and devise a strategy for delivering the prescribed set of indicators efficiently and reliably. The activity shall also consider what has already been generated by the ECV and SIS contracts and whenever possible capitalise on such development.

Deliverables expected:

- A summary report of the output of a workshop, to be arranged and run by the successful bidder, with the technical teams of both C3S and EEA to understand the technical constraints to the implementation at the start of the project.
- A summary report of the output of a second workshop, to be arranged and run by the successful bidder, a few months after the start of the contract to check the progress and make necessary adjustments.
- A report detailing the full list of variables and indicators, their precise definitions, time and spatial aggregations (based on Table 1) that will be delivered at the end of the project. In case the

contractor will not be able to deliver all variables listed in Table 1 such report should include an explanation of the reasons why this will not be possible.

- A document describing the setup (algorithms, workflows, and output data streams) that will be used during the operational implementation (month 2).
- A document describing the way in which the indicators will be delivered and displayed on the Climate-ADAPT portal and an associated a mock-up.

Work package 2: Prototyping (Months 2-8)

WP2 will take care of developing the prototype production.

Deliverables expected:

- A fully working prototype. This can initially be linked to a single indicator but should eventually extend to the full list.
- A summary report of the output of a workshop, to be arranged and run by the successful Tenderer, presenting the draft interface to the representatives of both C3S and EEA;
- A sample dataset –inclusive quality assurance information- generated through the prototype;
- A set of files (called pseudo-manifest files in the C3S jargon) describing in detail the characteristic of the data (including naming convention, directory structure, metadata structure, etc. ...) to facilitate the integration of the data onto the CDS;
- Full documentation and user manual for the prototype.

Work package 3: Data production (Months 9-12)

This WP will be devoted to the operational production of the workflows and associated datasets of ECVs and indicators (according to the final list defined in WP1 based on Table 1).

Deliverables expected:

- At the end of the period a final version of the workflows and whenever applicable the associated datasets.
- A mechanism to make the variables and indicators available on Climate-ADAPT.

Work package 4: Support and help development (Months 1-12)

This WP focuses on the preparation for the future operational transition.

Deliverables expected:

- Regular monthly meetings with the EEA and C3S teams.
- A document summarising the key steps towards the integration of the methodology into operation.
- Knowledge-based documents for C3S User Support purposes.
- Suitable training material that can be used by the Copernicus Learning Service in their training activities to users.

2.4 Contract Schedule

The contract will be implemented in two phases: Phase 1 will be completed within 3 months, and will define the scope and the overall approach. Phase-2 will be of no more than 9 months in duration, and will implement and demonstrate the prototype service.

The timeframe for the completion of the proposed service is expected to be no more than 12 months. The Tenderer shall provide in their bid a contract schedule with the duration of each activity and their

interactions, as well as all contractual milestones and deliverables, which will be refined during contract negotiations.

Activities shall be performed in the context of one service contract covering the whole duration.

3 General requirements

3.1 Implementation Schedule

The successful Tenderer is expected to provide a detailed time plan and schedule as part of the tender response. The proposed time plan and schedule shall address the main tasks, inputs, outputs, intermediate review steps, milestones, deliverables and dates. Regular progress meetings will be held with ECMWF during the contract to assess project status, risks and actions.

ECMWF has to prepare annual Implementation Plans, which must be approved by the European Commission before they can enter into force. The implementation plans will take full stock of service reviews, performed thoroughly on an annual basis, as well as of the continuously evolving user requirements and corresponding service specifications. The successful Tenderer shall therefore provide each year for ECMWF approval an updated detailed plan of proposed activities including Deliverables and Milestones, using the Work Package table template in Volume IIIB, which will form part of this Implementation Plan. The successful Tenderer has to report on a quarterly and annual basis (for more details please see Volume V Framework Agreement for this ITT).

3.2 Meetings

ECMWF will organise annual meetings to bring together all C3S service providers. The successful Tenderer is expected to attend these meetings. The successful Tenderer is also expected to attend monthly teleconference meetings to discuss C3S service provision, service evolution and other topics that cut across different aspects of C3S. The cost of attending these meetings shall be covered by the successful Tenderer and shall be included in the tendered price. The cost of organising and attending any additional meetings specific to the service provision shall also be covered by the successful Tenderer and shall be included in the tendered price.

3.3 Deliverables

Expected top level deliverables are outlined in section 2.2. These can be in the form of documents or reports, data sets or databases, services and user support. Requirements for each type are described in the following subsections.

3.3.1 Documents and reports

All project reports shall be produced 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 (PDF/Microsoft Word/Microsoft Excel or compatible).

3.3.2 Data sets

It is expected that data sets (including databases) generated or acquired by the successful Tenderer will be delivered via the Climate Data Store. The section below indicates generic requirements for

these datasets in terms of standards and conformity.

Provision of data and products: Suppliers will make the output of their work available to C3S users via the CDS, by one of two methods:

- a) uploading their data and products to a designated server,
- b) providing them via web services.

In the case of (a), suppliers will have to agree with ECMWF on the data formats to be used. ECMWF will only accept data in formats that follow internationally recognised standards. Such standards must be open (i.e. non-proprietary), managed by a recognised international standardisation body (e.g. ISO, WMO, OGC, etc.), or any de-facto standard. Open source software should also exist that can read and write files of these standards. Serialisation formats (e.g. NetCDF, XML, JSON) should be supported by standard schemas and conventions. All text-based formats should be encoded in UTF-8. ECMWF will implement tools to check the compliance of the provided data and products to the agreed standards before they are added to the CDS.

Examples of case (a) are data uploaded to the CDS in WMO GRIB edition 1 and 2, NetCDF files conforming to CF-1.6, or greater.

In the case of (b), suppliers will have to agree with ECMWF on the protocols to be used to invoke the web services. ECMWF will only accept protocols that follow internationally recognised standards. Such standards must be open (i.e. non-proprietary), managed by a recognised international standardisation process (e.g. ISO, WMO, OGC, etc), or be a de-facto standard such as OpenDAP. ECMWF will consider using bespoke web-based APIs to access the data and products if they implement very simple protocols (e.g. REST), as long as the results returned by these APIs are compatible with (a). It should be noted that requests for these web services will mostly originate from the Climate Data Store itself, as part of a workflow run on behalf of an end-user; ECMWF will therefore need to have the necessary credentials to invoke these services. ECMWF will not provide information on the end user's identity when invoking the web services. ECMWF will nevertheless collect usage statistics for all aspects of C3S.

Examples of case (b) are OGC standards (WMS, WCF, WFS, etc), OpenDAP, etc. Other protocols could be considered as the system evolves.

Every dataset and/or service provided shall be documented using the appropriate metadata standards (e.g. ISO 19115).

Provision of processing capabilities: Suppliers will (when appropriate) implement specific web-service-based data manipulation facilities. These will make it possible to run some agreed reduction and/or analysis algorithms directly on the data and products located on the suppliers' systems, and to return the results of said algorithms.

As for data retrievals, invocation of these web services will originate from the Climate Data Store itself as part of a workflow run on behalf of an end user, and ECMWF will need to have the necessary end-user credentials to invoke these services. ECMWF will not provide information on the end user's identity when invoking the web services. ECMWF will nevertheless collect usage statistics.

ECMWF will ensure that these services are invoked in a controlled fashion, to prevent any misuse of the system. This web services will be implemented with OGC's WPS standards or will be based on simple web-based REST API or equivalent. The results returned by these services will have to be in formats compatible with options (a) or (b) described above.

Data and IPR: It is a condition of EU funding for C3S that ownership of any datasets developed with

C3S funding passes from the suppliers to the EC, via ECMWF. Ownership will pass on delivery of the datasets. In return, the suppliers will be granted a non-exclusive licence to use the datasets which they have provided to C3S for any purpose except one which conflicts with the aims of C3S.

All software and products used by the successful Tenderer to produce the C3S datasets will remain the property of the successful Tenderer, except for those components which are acquired or created specifically for C3S purposes, with C3S funding, and which are separable and useable in isolation from the rest of the successful Tenderers' production system. The identity and ownership of such exceptional components will be passed to the EC via ECMWF annually, but in return the successful Tenderer will be granted a non-exclusive licence to use them for any purpose except one which conflicts with the aims of C3S.

3.3.3 User support

ECMWF has established a centralised Service Desk to provide multi-tiered technical support to all users of C3S data, products, tools and services. The C3S Service Desk is used for ticketing user requests and distributing these requests to specialists as needed. Dedicated staff at ECMWF provide basic support in the form of self-help facilities (FAQs, knowledge bases, tutorials etc.) as well as individualised support on technical queries related to the CDS, data formats, data access etc. In addition, ECMWF staff will provide specialised scientific support to address questions related to its industrial contributions to C3S, e.g. in the areas of global reanalysis and seasonal forecasting.

The tenderer is expected to provide enough documentation regarding the produced dataset and associated methodology that could be used during the operationalisation phase by the user support service.

3.4 Key Performance Indicators

As part of the bid, the Tenderer shall specify a proposed set of Key Performance Indicators (KPIs) appropriate for the service. The KPIs shall be designed to quantify different aspects of quality of service against the requirements described in this document. These initial specifications shall be refined together with ECMWF during the first 3 months of the contract. Contractors shall report to ECMWF on a set of KPIs suitable for monitoring various aspect of service performance, including (but not limited to):

- Data quality
- Service delivery
- Contract management
- User support

The KPIs will be reported in the Quarterly and Annual reports. At the end of each year, a service readiness review shall take place that will include assessment of performance against the set of KPIs.

4 Tender format and content

General guidelines for the tender are described in Volume IIIB. Specific requirements to prepare the bid for this particular tender are described in the next sub-sections.

4.1 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.

Table 3: Page limits

<i>Section</i>	<i>Page Limit</i>
<i>Executive Summary</i>	2
<i>Track Record</i>	2 (for general) and 2 (per entity)
<i>Quality of resources to be Deployed</i>	2 (excluding Table 1 in Volume IIIB and CVs with a maximum length of 2 pages each)
<i>Technical Solution Proposed</i>	20 (Table 2 in Volume IIIB, the section on references, publications, patents and any pre-existing IPR are excluded from the page limit and have no page limit)
<i>Management and Implementation</i>	5 (excluding Table 4 and Table 5 in Volume IIIB) + 2 per each Work package description (Table 3 in Volume IIIB)
<i>Pricing Table</i>	No limitation

4.2 Specific additional instructions for the Tenderer's response

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.

4.2.1 Executive summary

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

4.2.2 Track record

The Tenderer shall demonstrate for itself and for any proposed subcontractors that they have experience with relevant projects in the public or private sector at national or international level. ECMWF may ask for evidence of performance in the form of certificates issued or countersigned by the competent authority.

4.2.3 Quality of resources to be deployed

The Tenderer shall propose a team providing the skills required for providing operational services that meet the technical requirements set out in section 2. The team shall include a Service Manager with at least 5 years of experience in management of large-scale projects. The Tenderer shall describe the experience of the Service Manager and the technical project team in performing activities related to the various aspects of this tender.

4.2.4 Technical solution proposed

The Tenderer shall describe in detail the mechanisms that have been adopted to ensure the user requirements are fully accounted for in the implementation of the service.

The Tenderer shall give a short background to the proposed solution to demonstrate understanding of that solution and of the C3S context. This section shall also include information on any other third-party suppliers that are used as part of the technical solution, and a statement of compliance for each requirement formulated throughout this document, describing how the proposed solution maps to

the requirements.

4.2.5 Management and implementation plan

The Tenderer shall provide a detailed implementation plan of proposed activities for the duration of the framework agreement. Deliverables should be consistent with the technical requirements specified in section 2.2.

The Tenderer is requested to include management and implementation activities within a dedicated work package (WP 0). The number of milestones is not restricted, but they 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.

As part of the general project management description the Tenderer shall consider the following elements (this is not an exhaustive list):

- Quarterly, annual and final reports shall be provided in accordance with the Framework Agreement Article 2.3.
- An implementation plan for the year N+1 shall be provided in February of the year N for ECMWF approval.
- Monthly teleconferences with ECMWF and a bid for involvement of ECMWF in major project reviews shall be provided as part of the management plan.
- A proposed payment plan shall be provided as part of the bid. The payment plan shall be based on quarterly payments for routine services work packages and shall be based on milestones completion and associated deliverables for development related activities.
- If relevant, a list of sub-contractors and details of their contribution, key personnel, legal names and addresses shall be provided. The Tenderer shall describe how the Framework Agreement, in particular Clause 2.9, has been communicated down to all their sub-contractors.

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

Deliverables for this work package shall include the following reports:

WP0 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>	Annually

4.3 Price and payment specifications

The tendered price shall not exceed the price as indicated in Contract Notice and shall include the personal costs, travel expenses and other costs for all work, tasks and deliverables proposed in your response.

Payments shall be conducted on a cost-reimbursement basis. Payment milestones shall be aligned with the implementation milestones as proposed in the implementation plan.