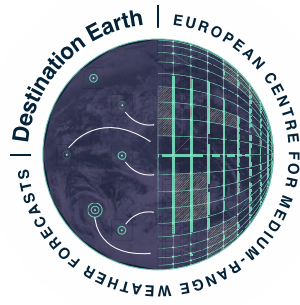




Invitation to Tender

Destination Earth Initiative

Demonstrator for European Central Bank Climate
Risk Quantification in Agriculture

Volume II: Specification of Requirements

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1 Introduction

Destination Earth (DestinE) is an initiative of the European Commission under the European Union (EU) Digital Europe programme [RD1]. By pushing the limits of computing, weather and climate sciences, DestinE is a cornerstone of the European Commission's efforts to boost Europe's digital capabilities and the Green Deal actions on climate change and to prevent environmental degradation. It aims at supporting climate change adaptation policies and decision-making for reducing the impacts of climate change and extreme events.

DestinE is deploying several highly accurate thematic digital replicas (digital twins) of the Earth system to simulate natural and human activities as well as their interactions, to develop and test scenarios that would enable more sustainable developments and support European policy making. DestinE is intended to unlock the potential of both physics-based and data-driven models and the capacity of leading European supercomputers of the EuroHPC Joint Undertaking to achieve a breakthrough in the resolution and realism of the simulation of Earth-system components.

The European Centre for Medium-Range Weather Forecast (ECMWF) implements two high-priority digital twins for DestinE – one on climate change adaptation and one on weather-induced extremes. These are developing enhanced simulation systems, informed by observations, based on a new generation of Earth system models. These enhanced systems aim at representing the Earth system more realistically and will also produce information at precisely those scales where many of the impact of climate change and extremes are felt and where key processes are observed. This allows users from impact-sectors to access and exploit such information for their specific application.

Rooted in both the European Commission's Green Deal and the Digital Strategies, DestinE will contribute to solving a range of societal challenges in Europe and globally. Timely and spatially detailed weather and climate data and information produced by DestinE have the potential to be instrumental in economic and financial risk assessment. Examples include supply chain related risks, sectoral productivity assessment, and renewable energy demand and supply. This makes DestinE data also suitable to assess the risks posed by climate change to economic and financial sector developments, integrating the physical risks to assets from extreme weather events and long-term climate shifts.

This Invitation to Tender (ITT) seeks to leverage DestinE's capabilities for financial and economic impact assessments by developing a demonstrator to support the European Central Bank (ECB) in addressing climate-related risks relevant to its mandate. Specifically, DestinE will be integrated with existing data sources to generate insights on climate change and extreme weather events, including their simulated probability, intensity, and climate impacts at both global and regional levels—focusing on the agriculture sector. These insights will help model the effects of climate hazards on agricultural productivity and food prices, serving as a proof of concept for potential future service developments tailored to central banking needs across multiple sectors and applications.

This effort also aims to support the advancement of the Network of Central Banks and Supervisors for Greening the Financial System (NGFS) physical risk assessment capacities, by showcasing how high-resolution, sector-specific climate impact indicators and simulations can enhance the understanding of physical risks such as those stemming from floods, heatwaves, droughts, and wildfires. Leveraging granular data produced by DestinE will strengthen NGFS members' ability to refine climate stress testing frameworks, improve physical risk assessments, and support more robust financial system resilience planning.

1.1 Definitions

General definitions can be found in Volume I. Definitions specific for this Invitation to Tender (ITT) are given below. For a general DestinE glossary please refer to the Destination Earth Glossary [RD2].

Climate risk scenarios: Quantitative storylines that combine plausible physical climate futures with socio-economic assumptions to assess how climate change could affect inflation, growth, and macroeconomic stability. These scenarios typically include extreme weather and slow-onset events as well as their sectoral and regional economic impacts over different time horizons.

Compound events: Multiple climate-related hazards that occur simultaneously or in close succession, thereby amplifying their overall impact on the economy. These may include: co-occurring extremes (e.g., heatwaves and droughts), sequential events (e.g., a flood followed by a storm), or cascading effects (e.g., crop failure due to both heat stress and water scarcity).

Demonstrator: An explorative implementation of an Application to test and/or showcase its viability for future further development or implementation.

Teleconnected impacts: Climate-driven economic effects that originate in one region but propagate through global systems to affect distant regions. In the context of agriculture sector and central banking, this might involve a climate shock (e.g., drought) in a major agricultural region leading to global food price volatility.

2 Background

2.1 DestinE structure and implementation

DestinE is funded by the European Commission under the EU Digital Europe programme and is implemented by ECMWF, the European Space Agency (ESA), and the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT) under the lead of the European Commission Directorate-General for Communications Networks, Content and Technology (DG CNECT). The objective of this initiative is to develop a highly accurate digital replica of the Earth to enhance the abilities to respond and adapt to the environmental challenges posed by climate change and extreme events.

The main building blocks of the infrastructure of the DestinE System are:

- The DestinE core Service Platform (DESP; responsibility ESA) A platform that provides a large number of users with tools, applications and services, based on an open, flexible, scalable and evolvable secure cloud-based architecture. DESP federates access to users' platforms, European cloud and HPC infrastructures and integrates access to Digital Twins. It allows users to customise the platform, integrate their own data and develop their own applications.
- The DestinE Data Lake (DEDL; responsibility EUMETSAT) provides discovery, access, and big data processing services to the DestinE data portfolio [RD3], including required data storage. It provides seamless access to datasets via GUIs or APIs to data in accordance with the DestinE Data Portfolio, regardless of data type and location. DEDL big data processing allows near-data processing and by this conceptually supports ML/AI applications executed on the DEDL. The DEDL federates with existing data holdings as well as complementary data from diverse sources like in-situ, socio-economic, or data-space data.
- The Digital Twin Engine (DTE; responsibility ECMWF) is a software-defined environment to operate DestinE's DTs and manage their corresponding control and data flows across distributed high-performance computers (HPC) and cloud computing resources. Moreover, it creates a framework for the fusion of observations with Earth-system simulations and the integration of applications targeting specific impact-sectors via selected use cases. The engine enables the porting and optimization of codes, developing and managing the digital twin workflows, and provides the data handling and

model interaction and interactivity capabilities that run on diverse HPC and cloud infrastructures including the Data Warehouse hosted on the data bridges.

- The two high-priority Digital Twins (DTs; responsibility ECMWF) for generating high-quality simulations and combining simulations and observations of the Earth system at unprecedented accuracy to serve the EU's Green Deal policy priorities:
 - Weather-induced extremes DT ("Extremes DT") for providing capabilities for the assessment and prediction of environmental extremes at very high spatial resolution and close to real-time decision-making support at continental, country, coastline, catchment and city scales in response to meteorological, hydrological and air quality extremes.
 - Climate change adaptation DT ("Climate DT") for providing capabilities to support climate adaptation policy and scenario testing at multi-decadal timescales aiming at a real breakthrough at the level of reliability at regional and national levels.

A number of use cases, pilot services and demonstrators have been showcasing how DestinE may be used for different applications [RD4]. Examples include applications in hydrology, renewable energy production and energy system modelling, air quality and urban heat extremes, among others.

From now on and in future phases of DestinE, developments will continue to evolve to enhance capabilities, adding further thematic foci, ingest the latest scientific developments and observational information, and make use of the emerging digital infrastructure ecosystem supported by the Digital Europe programme in Europe.

2.2 DestinE DT capabilities

ECMWF and its contractors have built the two high-priority DTs, on weather-induced extremes ("Extremes DT") and on climate change adaptation ("Climate DT") and demonstrated their capabilities at scale.

Climate DT¹ supports adaptation activities by providing innovative climate information on multi-decadal timescales, globally, at scales at which many impacts of climate change are observed. It delivers a substantial evolution of existing climate projection capabilities at multi-decadal timescales. The main breakthroughs lie in the operationalisation and the regular production of high-quality climate information, in the streaming of this information to applications from important impact-sectors like forestry, urban environments, hydrology, hydrometeorology, and energy, and in developing further interactivity elements in particular in support of performing "what-if" scenarios. The Climate DT combines cutting-edge global Earth-system models, impact-sector applications and observations into a unified framework to provide global climate projections and impact-sector information on multi-decadal timescales (1990 to ~2050), at very high spatial resolutions (5 to 10 km).

The Climate DT provides selected model output variables characterising the evolution of the different Earth-system components. For selected time slices, the Climate DT can also generate storyline simulations to assess extremes weather events, such as heatwaves, floods, and droughts, under different climate conditions, including past, present, and future scenarios². These simulations enable researchers and policymakers to explore "what if" questions, assessing how specific extreme events might unfold in a warmer climate, thereby enhancing understanding of potential future risks and informing adaptation strategies.

¹ <https://destine.ecmwf.int/climate-change-adaptation-digital-twin-climate-dt/#What-is-the-Climate-DT>

² <https://destine.ecmwf.int/news/replaying-extreme-weather-how-storyline-simulations-help-us-prepare-for-climate-change/>

Both DT already include elements of co-design with component models from impact sectors. An evaluation and uncertainty quantification framework for the DT is being developed gradually throughout the DestinE phases.

Details on the Climate DT are available at the ECMWF Destination Earth webpages [RD6] and on the data portfolio of the Climate DT at [RD7]. Technical information on the interfaces provided by the Digital Twin Engine is available in the documentation for the Digital Twin Engine [RD8].

2.3 ECMWF capability to support financial and policy institutions

ECMWF is already supporting other institutions with climate information. Under a Memorandum of Understanding³ with the European Investment Bank (EIB), ECMWF pursues the enhanced use of Copernicus data, information and tools by the EIB, notably in EIB's Climate Risk Assessment system⁴. The work in this context includes the selection and implementation of climate indicators for EIB operating sectors based on a review of available data, models and concrete requirements. This work is currently identifying, via a co-designed approach with EIB engineers, sector-specific climate risk indicators of varying complexity, covering a range of climate hazards and economic sectors within the context of resilient finance. Those developments support the EIB commitment to increase substantially adaptation efforts and to ensure that all the operations the EIB supports are adapted to current weather variability and future climate change impacts, in line with the adaptation objectives of the Paris Agreement and the EU Taxonomy. These developments are considered relevant input to the work required under this ITT.

2.4 Physical risks of climate change for central banking and the ECB

The European Central Bank (ECB) is the central bank of the European Union countries that use the euro, with its main task being to maintain price stability. This is done through the ECB's monetary policy decisions, in turn supported (amongst others) by economic and financial analysis that investigates the drivers of price changes. The ECB also supervises major banks in the euro area, helps preserving financial stability, supports secure and efficient payment systems, and develops and issues euro area banknotes.

Climate change affects central banks' work, for example as it can pose risks to price stability. Threats to price stability arise, amongst others, through its effects on productivity across various sectors like agriculture, energy, and manufacturing. The agricultural sector deserves particular attention due to its direct and immediate links with food prices: Agricultural output is highly sensitive to climate conditions, including temperature extremes, droughts, floods, and shifting seasonal patterns. These disruptions can lead to significant volatility in food supply and pricing. There is a growing body of evidence showing how climate change affects food prices and the agricultural sector, making agriculture a critical entry point for central banks to understand and address climate-related inflation risks [RD9, RD10, RD11, RD12]. For example, one study found that Europe's extreme summer heat in 2022 increased food inflation by 0.43–0.93 percentage points, a figure expected to rise by 30–50% by 2035 [RD9]. This is relevant for overall inflation dynamics, as food prices are an important component of consumer price indices, and their fluctuations can quickly transmit climate shocks into broader inflationary pressures.

³ <https://www.eib.org/en/press/news/eib-and-ecmwf-agree-to-leverage-copernicus-for-smart-climate-adaptation>

⁴ <https://climate.copernicus.eu/c3s2431-climate-hazard-information-support-physical-climate-risk-assessments>

Additionally, extreme weather events, such as heatwaves, floods, and storms, often disrupt labour markets by reducing productivity, impairing workplace operations, and causing job losses in climate-sensitive industries like agriculture and manufacturing. Health-related impacts, including heat stress and respiratory issues from pollution, further compound productivity losses, creating broader economic implications.

Compounding climate risks are particularly relevant to the physical risk priorities of the ECB and the NGFS. Compounding risks, such as extreme heat combined with drought, can exacerbate vulnerabilities in interconnected global systems, posing challenges for price stability and supply chain resilience. These risks could also affect financial stability and threaten the steady resource flows to industries.

Economic responses to climate extremes can be nonlinear because small changes in climate variables (such as temperature or precipitation) can lead to disproportionately large impacts on economic systems once critical thresholds are exceeded. Many economic activities depend on climate variables being within specific ranges. For example, crop yields might increase slightly with modest warming, but beyond a threshold (e.g., 2-3°C rise), productivity can decline drastically due to heat stress or drought (e.g. [RD10], and references therein). Furthermore, the relationship between heat exposure and labour productivity is highly nonlinear: moderate heat may only marginally reduce productivity, but extreme heat (e.g., >40°C) can lead to significant reductions in work capacity, especially in outdoor labour-intensive sectors like agriculture and manufacturing.

Interconnected sectors can amplify economic impacts through various feedback mechanisms. For example, extreme weather events may reduce agricultural output, increasing food prices. This, in turn, raises costs for other sectors (e.g., retail, logistics), amplifying the overall economic impact. Similarly, reduced agricultural output due to climate extremes may lead to reduced labour productivity, further affecting income and demand, thus creating a compounding nonlinear economic response. These feedback loops are often exacerbated by market responses. For example, extreme weather events causing supply disruptions in key commodities (like coffee or grain) may lead to speculative activities in financial markets, driving prices further up in a non-proportional way.

The ECB increasingly integrates climate information into its economic assessment and modelling to assess how climate change and related policies impact the economic outlook. This includes for example the assessment of how climate risks influence inflation, economic growth, and financial stability. These analyses help policymakers evaluate the long-term macroeconomic effects of climate-related shocks, such as extreme weather events and energy transitions. By considering climate information in its analyses, the ECB aims to enhance its understanding of potential economic disruptions and ensure more robust, forward-looking policy decisions.

Being able to leverage high-resolution climate projections in different scenarios is crucial to understand how economic output and inflation will be affected by climate change. Moreover, high-resolution climate data is key to revealing the complex, non-linear impacts of climate extremes on economic performance. Given the relatively advanced understanding of climate risks in agriculture and their direct link to inflation, this sector offers a strategic starting point for integrating climate data into central banking models. This is where DestinE is expected to add substantial value.

2.5 Reference resources

[RD1] Destination Earth websites of the Commission and joint DestinE website

<https://digital-strategy.ec.europa.eu/en/policies/destination-earth>

<https://www.destination-earth.eu>

[RD2] ECMWF Destination Earth Glossary

<https://destine.ecmwf.int/glossary>

[RD3] DestinE Data Portfolio

<https://platform.destine.eu/destine-data-portfolio/>

[RD4] Overview of use case contracts implemented by ECMWF, ESA, and EUMETSAT

<https://destination-earth.eu/use-cases>

[RD5] Data Portfolio of the DT Extremes

<https://confluence.ecmwf.int/display/DDCZ/DestinE+ExtremesDT+Parameters>

[RD6] ECMWF Destination Earth webpages <https://destine.ecmwf.int>

Explanation of Destination Earth Digital Twin on Climate Change Adaptation

<https://destine.ecmwf.int/news/the-fast-development-of-destines-climate-change-adaptation-digital-twin>

[RD7] Data Portfolio of the DT Climate

<https://confluence.ecmwf.int/display/DDCZ/Climate+DT+Phase+1+data+catalogue>

[RD8] Documentation for Digital Twin Engine

<https://digital-twin-engine.readthedocs.io/en/latest/#documentation>

[RD9] Kotz, M., Kuik, F., Lis, E., Nickel, C., 2024. Global warming and heat extremes to enhance inflationary pressures. *Communications Earth and Environment*, 5, 116.

[RD10] Zampieri, M., Ceglar, A., Dentener, F., Toreti, A., 2017. Wheat yield loss attributable to heat waves, drought and water excess at the global, national and subnational scales. *Environmental Research Letters*, 12, 064008

[RD11] Ciccarelli, M., Kuik, F., Martínez Hernández, C., 2024. The asymmetric effects of temperature shocks on inflation in the largest euro area countries, *European Economic Review*, 168, 104805.

[RD12] Usman, S., Parker, M., Gonzalez-Torres, 2024. Going NUTS: how regional economies respond over the medium term to extreme climate events. *ECB Working Paper No. 2024/3002*.

[RD12] Gortan, M., Testa, L., Fagiolo, G., Lamperi, F., 2024. A unified dataset for pre-processed climate indicators weighted by gridded economic activity. *Scientific data*, 11, 533

[RD13] De Winne, J., Peersman, G., 2021. The adverse consequences of global harvest and weather disruptions on economic activity. *Nature Climate Change*, 11, 665–672.

[RD14] IPCC climatic impact drivers
https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_AnnexVI.pdf

3 Summary of contract to be placed

This ITT aims to placing a single contract for the definition and demonstration of climate risks indicators for agriculture and climate risk scenarios, to demonstrate the potential of DestinE, and especially the Climate DT, in providing the ECB with tailored, high-resolution climate risk data. The demonstrator will use existing

Climate DT data to evaluate risks related to the occurrence and intensity of compound extreme climatic events in future climate and their implications for agricultural systems and macroeconomic implications.

With this contract ECMWF aims to support the development of a DestinE demonstrator to support the ECB in its efforts to enhance its analysis and modelling capabilities by defining and testing selected climate indicators for the agriculture sector for future integration into ECB's analysis. This is expected to eventually enable a more precise assessment of how climate-related extremes including heatwaves, cold spells, droughts, floods as well as compounded extreme events, impact agricultural productivity and food prices. By examining the occurrence and intensity of future extreme events, the demonstrator will provide insights into how extreme climatic episodes, such as the 2003 summer heatwave, may affect agricultural production and food prices. Understanding these relationships will enable the ECB and other central banks to assess how climate-induced volatility in food prices can influence inflation dynamics, economic growth and financial stability. This information will support the integration of climate risk into macroeconomic modelling and help strengthen the ECB's capacity for resilient, forward-looking monetary policy and financial oversight.

The development of physical risk indicators and scenarios should be based on peer-reviewed methodologies [e.g., RD9, RD12, RD13] and build upon analyses conducted under ECMWF's contract with the EIB. The approach must address both hazard and vulnerability dimensions of climate risks, tailored to the ECB's needs for integrating physical climate risks into financial stability assessments and central banking risk management.

The proposed approach shall demonstrate the added value of the Climate DT's high-resolution – both spatially and temporally, global coverage, and dynamic consistency across multiple variables. This should be illustrated through at least two proposed climate risk scenarios focusing on compound risks and teleconnected impacts in a future climate.

Both the definition of climate risk scenarios and the implementation of related indicators may leverage results and data products developed under previous or ongoing DestinE Use Cases, Pilot Services, or Machine Learning demonstrators⁵. Agricultural climate indicators and climate risk scenarios should be co-developed with the ECB and ECMWF experts. Specifically, the indicators should be developed at different levels of aggregation (spatial and temporal) and tailored to the agricultural sector by using different relevant weighting schemes (e.g., land use and land cover).

The contractor is also expected to work collaboratively with other ECMWF and DestinE contractors, including those implementing the Climate DT, and to build on existing knowledge from the development of climate indicators using Copernicus Climate Change Service (C3S) data for the EIB.

One single contract is foreseen, led by a prime contractor, which may engage with one or more sub-contractors. ECMWF expects the contract to not exceed a maximum total price of €350,000 and a maximum duration of 18 months.

4 Technical Specification

This ITT addresses Tenderers with a proven track record in developing analytical tools and methodologies that integrate climate hazards with socio-economic data; sectoral experience on agricultural is also welcome. The selected Tenderer will be responsible for defining and demonstrating agriculture-specific climate risk

⁵ <https://destine.ecmwf.int/destine-uses/>

indicators and climate risk scenarios to support the ECB in assessing economic and financial risks linked to climate change impacts on agriculture.

The ECB aims to use high-resolution climate data to refine economic modelling and assessments. Integrating information from advanced systems such as DestinE into the ECB's economic analysis could significantly improve the evaluation of extreme events, regional disparities, and climate impacts on the agriculture sector. This integration would help the ECB assess cascading climate-related risks and their implication for food prices and inflation.

While DestinE is still being developed, the ECB plans to explore and demonstrate its potential to support this work. In particular, the Climate DT is expected to offer higher-resolution data that could lead to more realistic and policy-relevant modelling outcomes. The ECB is therefore seeking to develop suitable indicators as a key step toward making this modelling approach actionable.

Unlike general weather or climate indicators, the targeted climate risks indicators for the ECB shall focus on agriculture-specific vulnerabilities by integrating in addition to climate data regional sectoral data, remote sensing information, and socio-economic layers. An increasing body of literature provides early examples of how such approaches can be applied (e.g., Kotz et al., 2024; Gortan et al., 2024; Usman et al., 2024). In existing work, indicators are usually defined based on state-of-the-art meteorological data (e.g., from ERA5) and aggregated temporally (e.g., on daily and monthly time scales) and spatially (e.g., across regions and countries). Indicator definitions typically follow well-documented definitions in the literature, such as the climatic impact drivers defined by the IPCC [RD14]. Regional aggregation is done using remote sensing or socio-economic information, which is used as aggregation weights to tailor the indicators to specific applications. Further development will aim to better tailor these indicators specifically to the agricultural sector. ECMWF has also been developing climate indicators relevant to EIB under another contract, which shall be used as a starting point for the analysis required in this ITT.

Required deliverables of the work include:

1. A **technical report** detailing the methodological approach for deriving the indicators and selection of two climate risk scenarios. The report shall provide a comprehensive definition of climate risk indicators for agriculture (for use by the ECB). The selection of two scenarios should illustrate risks associated with climate events, including at least one compound case, and teleconnected impacts across the food supply chain.
2. The production of a **demonstrator dataset of climate risk indicators for agriculture** (baseline and future projection) derived using Climate DT data up to 2050. The format of the dataset will be agreed with ECMWF and ECB.
3. A **python code with documentation** to compute the indicators from raster climate data at various levels of aggregation relevant for the ECB. The level of aggregation will be agreed at the initial workshop with ECB stakeholders. The successful Tenderer will also assess with ECB and the entities contracted by ECMWF to implement the Climate DT how the indicator preparation could be integrated into Climate DT workflows.
4. Online inception workshop with stakeholders identified by ECB and ECMWF, including users and co-design partners to ensure co-design of the agricultural indicators and use case scenarios (**workshop summary report**).
5. In-person technical workshop with stakeholders identified by ECB and ECMWF, including users and co-design partners to ensure co-design of the agricultural indicators and climate risk scenarios (**workshop summary report**).

6. **Final report** including validation and feedback by ECB end-user of the indicators, as well as an **interactive demonstration** of the results to ECB, including all steps needed to reproduce the indicators (**report and visual demonstrator in the form of presentation slides**).
7. Contribution to ECMWF **communication and outreach activities**.

The following subsections detail the work required in support of these outputs.

4.1 Technical Report: Methodology for Indicators and Use Case Selection

The successful Tenderer shall provide a comprehensive technical report outlining a practical and step-by-step methodology for developing agriculture-specific physical climate risk indicators and defining selected use case scenarios. The approach should build on existing work conducted under the ECMWF-EIB contract and relevant peer-reviewed literature. The selection of indicators must be prioritized based on maturity, data availability, and relevance to ECB's needs, and validated through stakeholder engagement (e.g. bilateral exchanges, targeted workshops).

The report shall include the following components:

(i) Data Identification and Selection

Identify and document relevant climate and socio-economic datasets for the agriculture sector. This includes global and European land use data such as Earthstat⁶ (global harvest areas for 175 crops, year 2000) and Corine (European land cover, 1990–2018⁷). The Tenderer should focus on datasets that are readily accessible, open-access and suitable for integration with DestinE's Climate DT.

(ii) Definition of Climate Risk Indicators

Propose a set of climate risk indicators for the agricultural sector, that can help assess the impact of extreme weather conditions and gradual shifts in climatic conditions on agricultural production, with a particular focus on crops relevant to the Harmonised Index of Consumer Prices (HICP) food basket. The HICP is a key measure of inflation across EU Member States, and its food component is especially sensitive to climate variability.

Bidders are invited to structure their analysis around four main crop groups that reflect the composition and price sensitivity of the HICP food basket. These include staple crops, which play a central role in European diets and are extensively studied in climate-agriculture literature; oils and protein crops, which are important for both direct consumption and food processing; feed and industrial crops, which are essential inputs to livestock and sugar production and indirectly influence meat and processed food prices; and perishables, such as fruits, vegetables, and potatoes, which are highly sensitive to seasonal climate variability and often drive short-term price fluctuations.

For each of these crop groups, bidders should provide indicators that capture both average and extreme climate conditions during the relevant growing season⁸. At a minimum, this should include metrics related to temperature, precipitation, drought, and excessive wetness (Table 1). These

⁶ <http://www.earthstat.org/harvested-area-yield-175-crops/>

⁷ <https://land.copernicus.eu/en/products/corine-land-cover/>

⁸ Differentiation between spring and winter crops should be proposed for staple crops (e.g., spring and winter wheat)

indicators should reflect seasonal climate characteristics and be suitable for assessing crop performance and potential yield impacts and build upon the Copernicus Agroclimatic Indicator datasets⁹.

All indicators should be aggregated over relevant arable land types to ensure spatial relevance and comparability. The spatial resolution should be appropriate for integration with national and regional economic data, ideally down to the NUTS2/3 level or equivalent. Where available, bidders are encouraged to incorporate crop-specific indicators from the scientific literature, particularly for staple crops where such metrics are more commonly established.

Indicators must be co-developed with ECB and ECMWF experts to ensure relevance and usability.

Table 1 Crop Groups and Climate Indicators

Crop groups	Examples	Minimum indicators	Additional indicators (to be co-defined with ECB and ECMWF)
Staples	Wheat, maize, rice, barley	Temperature (mean/max/min), rainfall, drought, excessive wetness	e.g., heat stress at anthesis, growing degree days
Oils and protein crops	Soybean, sunflower, rapeseed, olives		e.g., crop-specific phenology, dry fruit weight and oil concentration
Feeds and industrial crops	Maize for feed, fodder crops, sugarcane, sugar beet		e.g., biomass accumulation, sugar yield
Perishables	Fruits, vegetables, potatoes		e.g., frost risk, chilling hours, phenology

(iii) Historical Baseline Construction

Develop a historical baseline using past climate data (ideally from the 1970s onward) to assess agricultural exposure and vulnerability. Use high-resolution datasets such as Copernicus ERA5 and Climate DT historical simulations. The Climate DT baseline will help contextualize recent anomalies and identify emerging risks. Indicators based on ERA5 would help calibrate economic assessments that rely on historical relationships, and both would be used (also in comparison) to assess the behaviour and impact of extreme events in the past.

(iv) Scenario Development and Use Cases

Select and describe two climate risk scenarios:

- Use Case 1: Assess macroeconomic risks to food prices from compound climate events (e.g. heatwaves and droughts).
- Use Case 2: Explore teleconnected impacts – cascading effects of climate events across global breadbasket regions.

Each scenario should be based on a plausible storyline, such as a recurrence of the 2022 European drought under a future warming scenario. Available simulations from the Climate DT should be leveraged to identify these events and quantify their impacts.

(v) Forward-Looking Risk Indicators

⁹ Nobakht, M., Beavis, P., O'Hara, S., Hutjes, R., Supit, I., (2019): Agroclimatic indicators from 1951 to 2099 derived from climate projections. Copernicus Climate Change Service (C3S) Climate Data Store (CDS). DOI: 10.24381/cds.dad6e055 (Accessed on 06-09-2025)

Develop future projections of selected indicators using available DestinE climate data (up to 2050) for each of the use cases. Focus on short term horizons and ensure consistency with historical baselines.

(vi) Uncertainty and Added Value Assessment

Quantify uncertainties and compare results with indicators derived from different models (e.g., CMIP6 ensemble or subset¹⁰). Highlight the added value of using Climate DT data in terms of granularity and accessibility.

The report shall specify spatial and temporal resolution of datasets, data coverage and unit consistency.

The indicators shall be tailored to capture the climate sensitivities unique to the agriculture sector. For example, the indicators shall include metrics related to temperature and precipitation extremes affecting crop yields.

Three versions of the report shall be delivered:

- Version 1 of the report shall include proposals for the indicators, data sources required, and storylines (i, ii, iv above).
- Version 2 shall include all elements indicated above to be agreed with ECMWF and ECB.
- Version 3 shall be the final version.

4.2 Demonstrator Dataset of Sectoral Climate Risk Indicators

The successful Tenderer shall develop a structured demonstrator dataset of climate risk indicators for agriculture for ECB use, covering baseline conditions and future projections based on Climate DT outputs up to 2050.

4.2.1 Preparation of Climate Risk Indicator files

The Successful Tenderer shall demonstrate the computation of the climate hazard, exposure and vulnerability indicators as defined in the Technical Report (see section 4.1) and deliver the corresponding set of files

These shall:

- Cover the four crop groups listed in section 4.1. (i.e., staple crops, oils and protein crops, feed and industrial crops, and perishable crops)
- Integrate high-resolution climate data from DestinE Climate DT with socio-economic and land use/cover data to reflect sectoral vulnerabilities.
- Apply economic proxies (e.g., cropland area, crop-specific land use types, or other relevant proxies such as data reflecting whether land is irrigated or not) to differentiate climate impacts across regions. Economic proxies shall ensure that climate impacts are not evenly applied across all regions but instead reflect regions relevant for agricultural productivity [RD12].

¹⁰ <https://cds.climate.copernicus.eu/datasets/projections-cmip6?tab=overview>

4.2.2 Socio-Economic Data Integration

The indicators shall be constructed by combining climate variables remote sensing datasets to assess climate impacts on agriculture. This shall involve:

- Weighting climate data based on land cover (specific crop types). The weighted climate data can then be aggregated to regional or national levels, aligning with administrative boundaries (e.g., countries or regions). This step allows for meaningful comparisons of climate impacts across different geographical scales.
- Data shall be aggregated at various temporal (daily, monthly, yearly) and spatial (country-level, regional-level - NUTS3) resolutions, allowing flexibility in how climate impacts are integrated in the economic models.

Tenderers may also propose other datasets to produce agro-climate indicators.

To the extent possible the computation of the indicators shall make optimal use of the capabilities available in the DestinE system components.

Tenderers shall provide an estimate of resource requirements (compute, data storage, license fees) in their Tender and identify how they propose to meet those. Any resource requirements for DestinE System components (DESP, DEDL, DTE, DT) shall be identified and, if necessary, budgeted for. For estimating the cost for hosting a web application on the DESP, please refer to <https://www.ovhcloud.com/en-ie/public-cloud/prices/>

For any software developed or used for this work open-source solutions should be favoured. If such is proposed in the Tender, the Tenderer shall be prepared to provide more information and details on the respective open-source software license, the benefit for EU and the DestinE from such an open-source license, as well as confirmation that there will be no substantial risks for DestinE. The Tenderer shall warrant that the Tenderer has the full capacity and authority for such an open-source licence to be granted. If open-source developments are agreed in the contract, they shall be managed as an open-source project on a public repository (e.g., on GitHub, GitLab, etc.) and hosted under a dedicated domain to be agreed with ECMWF. Where Tenderers propose proprietary software to be used, they shall identify the corresponding software in their Tender and include any license cost necessary for the Demonstrator in their Tender.

4.3 Python Code and Documentation

The successful Tenderer shall provide a Python code to process climate data and compute sectoral risk indicators at various levels of aggregation.

The Python codes should be developed to be compatible for the ECB infrastructure to enable seamless integration and analysis of large-scale historical weather datasets (e.g., ERA5) and high-resolution climate projections from Destination Earth and potentially other sources (e.g., the Copernicus Climate Change Service). This code shall be designed to handle different emission and adaptation scenarios, allowing for flexible and scalable analyses. The codes shall be designed to enable API Integration for Automated Data Flow. The codes shall be designed in a way that ECB staff can then independently apply them on the ECB system, for example to update time series based on latest data.

Successful tenderers shall also explore with ECMWF and the teams implementing the Climate DT how the computation could be integrated with the Climate DT workflows to compute the indicators on-the-fly.

4.4 Workshops and Stakeholder Engagement

To ensure alignment with ECB requirements, the Tenderer shall organize an **Inception Workshop** at the start of the project and a following **Technical Workshop** involving stakeholders identified by ECB and ECMWF. These workshops should be planned as an online event for the Inception Workshop and as an in-person event at the ECB's premise for the Technical Workshop. These workshops will be instrumental to refining the development of the climate risk indicators for agriculture, ensuring that definitions, metrics, and data sources are clearly established. Participants will also work together to define use case scenarios, reaching a consensus on the selection of compound climate events and cascading food supply chain risks to be analysed. Additionally, the workshop will be used to finalise technical requirements, including data formats and aggregation levels, ensuring consistency in dataset delivery. Following each workshop, the Contractor shall prepare a summary report capturing key discussions and agreements. These reports will document decisions made during the sessions. The inception workshop report will provide a clear roadmap for the next steps in developing the indicators, whilst the technical workshop will be instrumental to the validation of the approach and thus serve as the key input to the technical report (see 4.1).

4.5 Final Report and Interactive Demonstration

The Contractor shall produce a final report that validates the climate risk indicators for agriculture and includes an interactive demonstration of their computation and application. The validation process will involve ECB experts to ensure the indicator definitions meet operational needs. Additionally, the report will compare climate risk indicators against historical trends and observed anomalies, providing a robust assessment of uncertainties.

To complement the report, the Contractor shall provide a demonstration that walks through the entire computation process of the indicators. This demonstration will guide users through all necessary steps to reproduce the indicators using provided Python scripts and datasets, ensuring transparency and usability of the methodology. Corresponding deliverables shall include user-facing documentation, a training event (possibly online) and a training tutorial (video).

4.6 Communication, training, and user outreach

The successful Tenderer is expected to support ECMWF and the European Commission in overarching DestinE user engagement and communication activities. To this end, the successful Tenderer will be required to:

- Support workshops and other events organized by ECMWF, the Commission or other parties by presenting their work. At a minimum, bidders shall foresee participation in the regular DestinE User eXchange meetings (June 2026, Spring 2027) and ECMWF DestinE Annual Meetings (2026 and 2027). In addition, participation to events organised by NGFS and Eurosystem shall be foreseen.
- Present the service in relevant fora and communications (publications, websites, newsletters, social media, workshops, conferences, etc.) within the relevant community.
- Contribute to the ECMWF and European Commission communication work on DestinE as required as well as ECB's internal communication.

Specifically, the successful Tenderer shall deliver at a minimum:

- A description of the work suitable for presentation on the web to generalised audiences, including text and visuals (updated regularly);
- Presentation material on the service and the progress of implementation to be maintained up to date over the duration of the contract;

- Regular posts on/for relevant social media channels within the relevant community;
- One fact sheet aimed at general public/policy audiences outlining the work of the contract
- A short video (approximately 90 seconds) presentation of the service for inclusion on a DestinE web presence.
- Support to inter-contract communication

A plan for community engagement and communication activities carried out by the Tenderers shall be included in the bid. An initial version will be agreed with ECMWF during negotiation and will form part of the contract. The implementation of this plan and any subsequent updates will need to be agreed upon with ECMWF regularly during the contract implementation. This includes, but does not exhaustively cover, communication planning, contributions to DestinE media outreach, websites and social media activity, externally facing written and graphical contents and events.

4.7 Deliverables and milestones

At a minimum the successful Tenderer is expected to deliver:

Deliverable	Section reference	Format	Due
Technical report (v1)	4.1	Report	KO + 3 months
Technical report (v2)	4.1	Report	KO + 6 months
Technical report (v3)	4.1	Report	KO + 9 months
Dataset of sectoral climate risk indicators	4.2	To be agreed at workshop	KO + 15 months
Python code	4.3	Software	KO + 15 months
Inception workshop report	4.4	Report	KO + 1 months
Technical workshop report	4.4	Report	KO + 4 months
Final report	4.5	Report	End of contract
Tutorial & documentation	4.5	Video ppt or compatible	KO + 15 months
Communication material to support ECMWF communication: - Website content - Factsheet - Presentation - Social media content - Video	4.6	text and visuals ppt or compatible posts video	KO + 1 month (plus regular updates, as needed) As needed end of contract

Further deliverables should be defined by the Tenderer based on the requirements above, as needed. Each deliverable shall have an associated resource allocation (person-months and financial budget). The total of these allocated resources shall amount to the requested budget associated with payroll as detailed in Volume IIIA of this ITT.

Milestones should be designed as markers of demonstrable progress in capability development and/or quality of capability delivery, as applicable. They should not duplicate deliverables and should not have any cost associated to them.

5 General Requirements

5.1 Implementation schedule

ECMWF intends to award one contract for a duration of 18 months under this ITT. This contract is expected to commence in June 2026, indicatively, depending on good progress on negotiations with preferred Tenderers. For the purposes of preparing responses, Tenderers should consider 1 June 2026 as the indicative start date for the contract. The actual contract start date, as well as necessary adjustments, will be agreed with the preferred Tenderer during the negotiation phase.

The Tenderer is expected to provide a detailed schedule as part of the Tender. The proposed schedule shall address the main tasks, milestones and deliverables. Regular progress meetings will be held with ECMWF during the contract to assess contract status, risks and actions.

5.2 Meetings

5.2.1 Physical / face-to-face meetings

A kick-off (KO) meeting will be held (online) no later than one month after contract start date.

One physical meeting at ECMWF (Bonn) or ECB (Frankfurt) should be budgeted for in Tenders submitted.

Tenderers should also foresee active participation in at least three relevant physical events over the duration of the contract in the DestinE context. This must include participation in the DestinE User eXchange meetings, which should be assumed to take place in June 2026 (Brussels) and Q2/2027 (tbc, Europe), and one annual ECMWF DestinE meeting in Q3/26 in Bonn. Contributions to further meetings may be proposed to support user engagement and outreach objectives. Such meetings should be chosen to maximize impact and relevance in the specific impact sector communities.

5.2.2 Regular meetings by web-conference

The Successful Tenderers are expected to organize monthly progress meetings with ECMWF by videoconference, prepare corresponding summary minutes of these meetings and maintain a list of agreed actions and their status.

Successful Tenderers may also be requested by ECMWF to contribute to additional technical working groups on issues relating to the requirements and evolution of DestinE. These are expected to be held generally by web-conference.

5.3 Documents and reports

All project reports shall be produced in English. Unless otherwise specified in the specific contract, deliverables shall be made available to ECMWF in electronic format (Microsoft Word/PDF/Microsoft Excel or compatible), via the DestinE Deliverables Repository portal; the details will be agreed at the negotiation stage.

Please refer to Clause 2.3 and the Annex 5 of the Volume V Agreement for details on Reporting Obligations.

5.4 Graphical material and content for communication, user outreach and training activities

All content shall be produced in English, unless specifically agreed by ECMWF. The Successful Tenderers shall ensure that all material (text, visuals, videos, etc.) is duly licensed for use by ECMWF and the European Commission.

Outreach activities will be organised by ECMWF during the period of the contract. In such instances, the Successful Tenderers will be approached by ECMWF for support on developing and delivering contents.

Successful Tenderers shall not establish their own brand for the selected projects but rely on and use DestinE and ECMWF pre-defined wording and branding. A communications package (including guidelines, logos and templates) will be provided by ECMWF at the start of the contract.

5.5 Data and IPR

It is a condition of EU funding for DestinE that the ownership of any deliverable (as defined in Volume V Agreement) developed with DestinE funding passes from the Successful Tenderers to the European Union via ECMWF. Ownership will pass from the date of the creation of the deliverable.

All pre-existing materials (e.g. software and products) used by the Successful Tenderer to produce the DestinE deliverables and Pilot Service or ML Demonstrator will remain the property of the Successful Tenderer. The Successful Tenderers will have to provide a royalty-free, non-exclusive, worldwide, perpetual and irrevocable license to those pre-existing materials to the European Union and ECMWF.

Developments or modifications to pre-existing materials that constitute results and are acquired or created specifically for DestinE purposes will be owned by the European Union.

Upon request, the Successful Tenderer may be granted a non-exclusive licence, at the discretion of ECMWF and subject to the approval by the European Commission, to use the deliverables which they have provided to DestinE.

6 Tender Format and Content

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

6.1 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>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>	8 (Table 2 in Volume IIIB, the section on references, publications, patents and any pre-existing IPR is excluded from the page limit and has no page limit)
<i>Management and Implementation</i>	4 (excluding Table 4 and Table 5 in Volume IIIB) + 1 per each Work package description (Table 3 in Volume IIIB)
<i>Pricing Table</i>	No limitation

Table 2: Page limits

6.2 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.

6.2.1 Executive summary

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

6.2.2 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.

6.2.3 Quality of Resources to be Deployed

The Tenderer shall propose a team that meets at least the following requirements:

- A senior team member with more than 5 years of experience in managing activities related to this ITT (referred to as Service Manager). This person will be the point of contact on technical matters.
- A team member with experience of managing projects and contracts of this type and size (referred to as Contract Manager). This person will be the main point of contact for administrative matters.
- Team members with demonstrated experience in performing activities related to the various aspects of this ITT.

These team members shall be involved in the activities of this ITT at a minimum level of 10% of their total working time.

6.2.4 Technical Solution Proposed

The Tenderer is expected to provide a short background to the proposed technical solution to demonstrate understanding of the solution proposed, as well as an exhaustive and detailed description of the proposed technical solution and its organisation into work packages.

6.2.5 Management and implementation plan

The Tenderer shall provide a detailed implementation plan of proposed activities for the duration of the contract. Deliverables should be consistent with the technical requirements specified in Section 4.

The Tenderer is requested to include management and implementation activities within a dedicated work package (WPO). Additionally, the plan should include the following WPs: WP1: Indicator and use case definition; WP2: Implementation and production; WP3: Evaluation. The maximum number of milestones is not prescribed, but they should be designed as markers of demonstrable progress in capabilities development or quality of capability delivery to keep progress monitoring manageable.

Adjustments to the proposed implementation plan can be proposed by the successful Tenderer, depending on the needs for the evolution of the technical solution, changed user requirements, or other requirements, but must be agreed to by ECMWF.

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

- Annual work Plan and Semestrial, annual and final reports shall be provided in accordance with the Volume V Agreement Clause 2.3 and Annex 5.
- Monthly videoconferencing with ECMWF and a proposal for involvement of ECMWF in major project reviews shall be provided as part of the management plan. The Tenderer is responsible for the organisation of such meetings, including provision of minutes.
- If relevant, a list of sub-contractors and details of their contribution, key technical personnel involved in the contract, legal names and addresses shall be provided. The Tenderer shall describe how the Volume V Agreement, particularly Clause 2.9, has been communicated to all their sub-contractors.
- The Tenderer shall describe in the Proposal the management of personal data and how this meets the requirements of Clause 2.8 and Annex 6 of Volume V Agreement.

The table below provides the template to be used by the Tenderer 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:

WPO Contractual Obligations Template			
#	Nature	Title	Due
D0.y.z-YYYY	Report	Semestrial Implementation Report (Jan-June 202X). This includes a specific Financial Report	15/07/202X
D0.y.z-YYYY	Report	12-month Work Plan YYYY being the Year n+1	31/08/2026
D0.y.z-YYYY	Report	Annual Implementation Report 2026 YYYY being the Year n-1 This includes a specific Financial Report	15/01/2027
D0.y.z	Report	Final Implementation Report This includes a specific Financial Report	Contract end
...	...	...	...
D0.y.z-YYYY	Other	Copy of prime contractor's general financial statements and audit report YYYY (YYYY being the Year n-1)	Annually (no-cost associated)

6.2.6 Travel Costs

The travel costs shall be presented in accordance with the following provisions:

Travel costs should, in principle, be based on the [European Commission's calculator](#) [Table 3: Unit cost per distance band for air or combined air/rail travel, Commission Decision C(2024)5405], and consider a daily subsistence allowance not to exceed €300.

Travel costs must reflect **estimated actual costs and must not include any profit margin**.

If the proposed travel costs deviate from these reference values, the deviation shall be clearly indicated and duly justified.

The Tenderers are requested to provide a summary table as shown below as part of their bid.

Type of cost	Route/Destination	Estimated number of missions	Estimated unit price [€]
Travel/Subsidence			
Travel/Subsidence			

Table 3: Travel Costs summary

6.2.7 Key Performance Indicators

Contractors shall provide a set of Key Performance Indicators (KPIs) suitable for monitoring various aspect of service performance. The KPIs and performance targets, to be proposed by the Tenderer in the bid, will be agreed in contract negotiation and may be updated by mutual agreement, if necessary.

KPI shall be measurable indicators on the key outputs of the work. These shall include

KPI name	Means of verification	Target	reported
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Technical

Methodological design meets ECB requirements	Feedback from ECB stakeholders	Achieved	KO + 4 KO + 6
Number of minimum indicators identified	Technical report	6	KO + 4 KO + 6
Number of additional crop-specific indicators identified	Technical report	1-10	KO + 4 KO + 6
Demonstrator datasets delivered	Milestone report and feedback from ECB	Achieved	KO + 16
Python code applicable for ECB	Feedback from EIB on code and documentation	ECB confirms they can run the code	KO + 16
User satisfaction	ECB feedback collected	Positive feedback from users	End of the contract

User engagement

Number of external users engaged for demonstrator definition and validation	Summary minutes of exchanges	15 individuals from at least 3 institutions, including ECB, EIB.	Quarterly
Number of presentations at workshops, events	References	At least 5 at DestinE and other relevant events.	End of contract.

Communication

Number of social media posts, likes and shares	Analytics	To be proposed by Tenderer	Every 3 months
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Contract management

Timely implementation of the contract	Dates of milestones and timely submission of deliverables	100% on time	monthly
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Tenderers should propose additional KPI to fully cover the focus of their bid. These should cover aspects relevance, applicability, fitness-for-purpose, quality, user engagement and satisfaction.

6.2.8 Requirements compliance table

This table summarizes the requirements that the successful Tenderer shall meet. The successful Tenderer shall include in their Tender a Requirements Compliance Table, confirming for each of the requirements that their Tender fulfils. Any deviations shall be noted and justified.

Requirement	Description	Compliance (Y/N or “n/a” if not applicable to this Tender/Lot) Reference to Tender section and WP
Technical requirements		
Req-101	The bid fully describes the approach to identifying, analysing and agreeing the indicators with ECB.	
Req-102	The bid commits to defining and demonstrating indicators for high priority crops defined by ECB.	
Req-103	Maturity, quality, and fitness-for-purpose of the defined indicators, as well as availability of required data, can be ensured.	
Req-104	Agriculture risk indicators coupled to the Digital Twin models will be demonstrated and delivered.	
Req-105	Uncertainties in the indicators are assessed, including by evaluation vis-à-vis the use of alternative datasets, including climate projections.	
Req-106	Risk storylines will be developed to support the analysis.	
Integration with DestinE		
Req-201	Demonstrator exploits the novel data, Services and capabilities of the DestinE DT.	
Req-202	Demonstrator will be integrated with DestinE System Components, as relevant.	
Req-203	Successful Tenderers will assess with DT Climate teams if and how these codes could be integrated into Climate DT workflows to be automatically generated for future simulations.	
Req-204	An estimate of resource requirements (compute, data storage, licence fees) is provided in the bid, as well as how these are met. Any resource requirements for DestinE System components (DESP, DEDL, DTE, DT) are identified and budgeted.	
Req-205	New software developments favour open-source licences and are managed as an open-source project on a public repository (e.g., on GitHub, GitLab, etc.) and hosted under a dedicated domain to be identified by – or agreed with – ECMWF. (More information and details may be required from the	

	Tenderer. The Tenderer warrants that the Tenderer has the full capacity and authority for such an open-source licence to be granted).	
Req-206	Any proprietary software to be used is identified in the bid, including any licence cost necessary for the operation of the Demonstrator.	
Req-207	The bid references results obtained in previous EU-funded actions, notably including actions funded under the EU Digital Europe and Horizon Europe programmes that are exploited for the work proposed.	
Demonstrator fitness-for purpose		
Req-301	Python code developed for computing the indicators will be suitable to be run by ECB on their own infrastructure.	
Req-302	Documentation and training are foreseen to enable ECB will be able to work with the indicators and code delivered.	
Req-303	Indicators developed will be thoroughly analysed with respect to their feasibility (available data, maturity of methodology), relevance for ECB usage, and consistency with related activities.	
Interaction with ECB and other Stakeholders		
Req-401	ECB stakeholders will be involved from the start to co-define how the demonstrator will support them in their work.	
Req-402	The core user group (at the ECB) will test and validate the demonstrator.	
Management requirements, including engagement and communications		
Req-001	The Management Plan provided foresees monthly video-conferencing with ECMWF and involvement of ECMWF in major project meetings.	
Req-002	The bid includes the required contributions to the overall DestinE stakeholder engagement, including the dedicated User eXchanges.	
Req-003	The bid proposes adequate key performance indicators (KPI) covering all aspects of the work proposed, including those listed the KPI in section 6.2.6 above.	
Req-004	The bid includes contributions to DestinE communications activities, notably - Content for website - Factsheet - Presentations - Social media - Video	

	- Support to inter-contract communication	
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6.2.9 Diversity and inclusion

If multiple bidders present equally qualified proposals (discrepancy lower than 1%), ECMWF will take into consideration the diversity and gender balance of each bidder's organisation as a tiebreaker when making the final decision. We recognise that diversity and a collaborative environment are essential for advancing scientific discovery and innovation, and we are dedicated to creating a culture that encourages and supports the contributions of individuals from all backgrounds. As part of this commitment, we encourage bids from organisations who share our values and demonstrate a commitment to diversity and inclusion in their own organisations. We believe that working with suppliers who support our efforts to create a more inclusive and diverse community is key to achieving our goals and driving progress forward in all our areas of activities. Therefore, the Centre encourages all potential bidders to take these values into consideration when submitting proposals.