

## POC1: Aircraft Emission Measurement and Monitoring

**Subcontractor tendering for the following task: UX design, UI development and user adoption support**

### Context of the project

According to the World Health Organization, 99% of the global population breathes air that exceeds the guideline limits. This leads to bad air quality being the largest environmental health risk in Europe, leading to cardiovascular diseases, heart diseases, strokes, lung disease and lung cancer. The pollutants that cause these and other illnesses are monitored in great detail with the proposed solution. This innovative air quality monitoring service harnesses the power of a range of Copernicus products to provide comprehensive, frequent air quality insights. The service focusses on the pollution from the aviation industry, with two specific customer segments identified: environmental inspection agencies and airport operators.

As part of the EUSPA Copernicus Demonstrators project, S[&]T will develop a proof of concept (POC1) that will generate air quality maps for SO<sub>2</sub>, NO<sub>2</sub>, O<sub>3</sub>, PM<sub>2.5</sub>, PM<sub>10</sub> at a spatial resolution of approximately 100x100m and a temporal resolution of 1 hour, with coverage extending to each commercial airport in Europe. This is done by merging data from Copernicus products CAMS, CLMS, and ERA5, and other data sources such as sensor readings from the European Environment Agency, OpenStreetMap, and flight radar. Advanced data fusion algorithms will be employed for this purpose. The resulting air quality maps will be easily accessible via a web based front-end catered to specific industry needs.

The implementation of our air quality monitoring service yields numerous benefits for users. Enhanced decision-making through access to precise, frequent data supports better decision-making in policy development, inspection efforts, business operations, and personal health. Regulatory compliance is facilitated as businesses can easily monitor their compliance with environmental regulations, avoiding penalties and enhancing their sustainability efforts. Public health improvement is achieved by providing critical air quality information, which helps to mitigate the health impacts of pollution, contributing to overall public well-being.

The proposed air quality monitoring service represents a significant advancement in environmental monitoring technology. By leveraging Copernicus data, it provides a comprehensive, accurate, and user-friendly solution that meets the diverse needs of our customers. This innovative approach not only addresses critical pain points but also delivers substantial gains, empowering users to make informed decisions and take proactive steps towards a healthier, more sustainable future.



## **Company background**

At S[&]T, we are committed to creating a safer life on Earth by transforming space data into valuable and actionable insights. We manage data throughout the entire process, from instrument to application. We apply our expertise within our software frameworks, information products, and consultancy.

Our society relies on space and scientific instruments for crucial services that we all use in our daily lives like climate change monitoring, navigation, defence and national security. These instruments generate a vast amount of complex data, and our mission is to unlock its value.

With over two decades of expertise in instrument calibration, data quality monitoring tools, real-time data processing frameworks, and the development of application-specific algorithms, we empower organisations, governments, and industries to strengthen their information position and enhance decision-making.

## **Description of the Tenderer's task**

### **Overall objectives**

The primary objectives of this ITT are to redesign the UX and UI of the air quality monitoring application developed by S&T for the Copernicus Demonstrators project. The goal is to establish a robust online presence for the air quality monitoring, ensuring our solution reaches and resonates with the target audience for POC1. In this process, the wishes from the proposed users should be centrally placed, focusing on easy and intuitive operational use.

To achieve this, the task is split up in 4 activities:

1. Consultation of stakeholders to finalize user requirements
2. UX/UI design based on user requirements
3. Co-development of UI together with POC1 development team.
4. Creation of marketing materials to support user adoption

### **Consultation of stakeholders to finalize user requirements**

Several specific UX requirements should guide the design and development process. The system should:

#### **Usability**

- Ensure the tool is intuitive and easy to use for non-technical users.
- Simplify complex data visualizations for quick understanding.

#### **Accessibility**

- Adhere to web accessibility standards (e.g., WCAG 2.1) to ensure the tool is usable by people with disabilities.
- Include features like keyboard navigation, screen reader compatibility, and color contrast adjustments.



- Support for various web browsers and operating systems.
- Ensure compatibility with existing systems and platforms used by the stakeholders.

### **Responsiveness**

- Ensure the tool is fully responsive and works seamlessly across various devices (e.g., desktops, tablets, smartphones).
- Optimize for different screen sizes and resolutions.

### **Performance**

- Load quickly and handle large datasets efficiently.
- Minimize latency in data updates and visual rendering.

### **User Feedback Mechanism**

- Provide a way for users to submit feedback and report issues directly through the tool.
- Implement an iterative design process, incorporating user feedback to improve the tool over time.

## **UX/UI design based on user requirements**

The new interface needs to be designed and is expected to include the following functionalities (to be verified with end-users):

### **Dashboard Interface**

- User registration and login.
- A user-friendly dashboard that presents key air quality metrics (e.g., AQI, particulate matter levels, pollutant concentrations).
- Visualization of air quality map.
- Account section (user information, account settings, subscription status, etc).

### **Interactive Maps**

- Intuitive map interface displaying air quality data overlaid on geographic locations.
- Ability to zoom, pan, and select different layers of data (e.g., specific pollutants, historical data).
- Search options to find specific locations or hotspot of pollutants.

### **Data Analysis Tools**

- Tools for users to analyze trends, patterns, and anomalies in air quality data.
- Customizable data filters and visualization options (e.g., graphs, charts).

### **Alerts and Notifications**

- Configurable alerts for specific air quality thresholds.
- Optional notifications through multiple channels (e.g., email, SMS, in-app).

### **Reporting and Exporting**

- Options for users to generate and export reports based on selected data and time periods.
- Option to integrate local reporting standards in place. This can include, but is not limited to, the different threshold values per pollutant in an area.
- Support for various formats (e.g., PDF, Excel).

### **Co-development of UI**

The new UI will be developed together with the POC1 backend and frontend development team. We chose this co-development strategy in order to ensure that the new UI integrates well into the system and to guarantee maintainability after the end of the project.

### **Technical Requirements**

- Development must be based on open-source components and standards (OGC). Use of technological components that require licenses is strongly discouraged.
- Frontend will be based on Angular and TypeScript.
- Full stack development experience is preferred.
- Experience with security and user management is preferred.

### **Creation of marketing materials to support user adoption roadmap**

It is important to communicate the unique benefits and differentiators of our air quality monitoring tool and ensure the value proposition towards customers is aligned with the UX redesign. As such, another key deliverable is the creation of high-quality, cohesive marketing materials that effectively communicate our solution to the proposed users. These promotional materials must at least include a product presentation, leaflets (one pager), and an informational homepage to access the tooling.

The envisioned website needs to be user-friendly and visually appealing, and to reflect the new UX design. It must be optimized for search engines (SEO) and have a responsive design for all devices. Sections such as product features, benefits, user testimonials, case studies, real-time data visualizations, and contact information need to be included.

Besides a website, other creative digital ads can include, but are not limited to, high-quality images, infographics, and compelling illustrations that highlight the value proposition. Creative approaches are especially appreciated, as long as the design is consistent with the overall branding and UX design. These digital ad creatives should be suitable for various platforms (e.g., Google Ads, social media) that capture attention and drive engagement.

Next to the delivery of these materials, suggestions on how to most effectively utilize them need to be bundled in an advice to support user adoption.

## Other topics of interest

### Security and Privacy

To ensure user data is protected, sufficient security and privacy requirements need to be met. This includes the following:

- Implementing robust security measures to protect data from unauthorized access and breaches.
- Ensuring data is encrypted both in transit and at rest.
- Adhering to relevant data privacy regulations (GDPR).
- Including clear privacy policies and obtain user consent where necessary.

### Tenderer Background and Experience

- Provide information about the company's background and relevant experience in UX design, especially for geospatial and data-intensive applications.
- Include case studies of similar projects and references from past clients.
- Detail the proposed team structure and qualifications of key team members.
- Outline the proposed approach to the UX design process, including key phases and deliverables.
- Any additional information that the bidder believes is relevant to the project.

## Deliverables

The following deliverables for this Statement of Work are identified. These deliverables relate directly to Task 5, 6 and 7 of the main Contract, Copernicus Demonstrators-Lot1:

Task 5: D1, D2, D3

Task 6: D4a

Task 7: D4b

### **D1 - List of requirements from proposed users**

Delivery: December 2024

Format: PDF

Expected effort: 13% of the total budget for the subcontracting Task

### **D2 - A redesigned user interface for monitoring air quality around airports**

Delivery: December 2024

Format: TBD

Expected effort: 10% of the total budget for the subcontracting Task

### **D3 - Operational user interface**

Delivery: December 2024

Format: source code

Expected effort: 50% of the total budget for the subcontracting Task

**D4 – Marketing materials and advice to support user adoption roadmap****a) Marketing materials**

Delivery: March 2025

Format: TBD

Expected effort: 15% of the total budget for the subcontracting Task

**b) Advice on marketing strategy to support user adoption**

Delivery: March 2025

Format: PDF

Expected effort: 12% of the total budget for the subcontracting Task

<b>Deliverable</b>	<b>Draft</b>	<b>Final revision</b>
<b>D1</b>	Nov 2024	Dec 2024
<b>D2</b>	Nov 2024	Dec 2024
<b>D3</b>	Nov 2024	Dec 2024
<b>D4a</b>	Feb 2025	Mar 2025
<b>D4b</b>	Feb 2025	Mar 2025

**Budget and payment plan**

The total budget for this subcontracting task is 116,600.00 EUR. The payment plan will be defined in accordance with the tender specifications.