



GREEN DEAL



OVERVIEW

Focuses on establishing a smart, integrated air quality monitoring and notification system that informs citizens and institutions about elevated levels of Particulate Matter (PM) 10 particles and other pollutants.

Air pollution—driven primarily by traffic, energy use, agriculture, and household heating—remains a critical concern for urban environments, yet traditional monitoring approaches are limited by infrequent, aggregated data collection. This use case addresses that gap by introducing a dynamic, real-time data ecosystem powered by sensors, digital tools, and artificial intelligence (AI).

PURPOSE

The Green Deal use case is focused on real-time air quality monitoring and citizen awareness through the deployment of environmental sensors, integration of diverse data sources (including public, private, and agricultural datasets), and utilization of AI tools for enhanced data analysis.

The service informs citizens and stakeholders about dangerous air pollution levels, especially PM10, through timely alerts. It integrates cross-sectoral data to uncover pollution patterns and guide preventative actions by institutions. High-resolution insights support targeted policies and raise awareness of pollution linked to daily activities.

CHALLENGE

Overcoming outdated, infrequent air pollution monitoring that limits timely public response.



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OFFERED SERVICES

Green Deal provides real-time air quality monitoring and public alerts, helping citizens and institutions respond to pollution events. It supports public health, environmental awareness, and policymaking by integrating data from multiple urban and agricultural sectors.

Developed as well as a web platform and alert system by the Municipality of Murska Sobota and ITC, the service uses AI from the University of Maribor for analytics. Key data products include PM10 sensor data, traffic, waste, weather, and agricultural datasets shared via the two dataspace existing in the use case the DIH Agrifood data space (DADS) and the CITY data space.

DATASPACE

Key data products include PM10 sensor data, traffic, waste, weather, and agricultural datasets shared via the two dataspace existing in the use case: the DIH Agrifood data space (DADS) and the CITY data space. AI-driven tools generate pollution forecasts and visualizations, informed by diverse cross-sector inputs.

The CITY Dataspace (operated by the Municipality of Murska Sobota) and DADS (operated by ITC) provide secure, federated data infrastructure.

NON-FUNCTIONAL PROPERTIES

- Capable of expanding to include more sensors or data types in the future.
- Continuous and accurate data collection with minimal downtime.
- Robust alert system with fail-safes for critical communications.
- Secure handling of sensitive data from institutions and third-party sources.
- Compliance with GDPR and other relevant data protection regulations.
- Compatibility with external datasets (e.g., statistical office, satellite data).
- Standardized APIs for data exchange with other platforms.
- Easy access and understanding of data by non-expert users.
- Intuitive visualizations and clearly worded notifications.
- Open communication of data sources, methodologies, and system logic.

FUNCTIONAL PROPERTIES

- Installation, calibration, and management of air quality sensors.
 - Real-time collection of PM10 and potentially other pollutants (e.g. NO2, CO2).
 - Automated alerts to the public and institutions via email or digital platforms.
 - Threshold-based warnings for elevated PM10 levels.
 - Data enhancement, anomaly detection, and prediction modeling.
 - Generation of detailed air quality heatmaps and dashboards.
 - Public-facing online platform to display current air quality data.
- Educational content to inform about sources and health effects of pollution.



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MODULES USED IN THIS USE CASE



DS2 Security

Added Value: City cybersecurity expert relies on SEC to protect sensitive air quality and IoT data through encryption and continuous threat monitoring.



DS2 Multicloud

Added Value: Data analyst benefits from faster access to large datasets stored across different cloud providers, enabling smoother analytics.



DS2 Data Marketplace

Added Value: Enables CITY Dataspace and DADS to provide secure data as discoverable products for authorized users, AI and services under defined terms.



DS2 Data Share Controller

Added Value: Municipal official monitors and controls ongoing data exchanges in real time to ensure proper use.



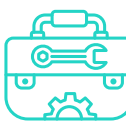
DS2 Portal

Added Value: Environmental officer browses the portal to find and activate relevant monitoring and analytics modules in one place.



DS2 Containerisation

Added Value: Municipal technician quickly deploys new air quality apps without manual setup, saving time and reducing technical complexity.



DS2 IDT
Integrated Broker,
Modules & Toolkit

Added Value: City IT manager uses IDT to deploy all environmental monitoring tools in a secure and scalable environment, ensuring seamless operation across municipal systems.



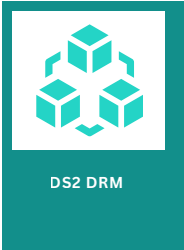
DS2 Data Retrieval

Added Value: Application developer automates API queries through RET, simplifying cross-sector data integration.



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MODULES USED IN THIS USE CASE



DS2 DRM

Added Value: Auditor tracks all data transactions on an immutable blockchain ledger for transparency and accountability.



DS2 Curation

Added Value: Policy advisor uses CUR's natural language interface to easily access integrated environmental and agricultural datasets.



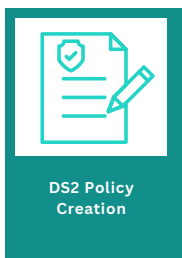
DS2 Data
Detection and
Transformation

Added Value: Data scientist trusts DDT to automatically clean, validate, and standardize sensor data for reliable analysis.



DS2 Edge-to-
Cloud Connection

Added Value: Use for ELT, to transfer data from sensors to cloud.



DS2 Policy
Creation

Added Value: Data sharing manager defines standardized data sharing policies between municipal and agricultural actors.



DS2 Policy
Agreement &
Enforcement

Added Value: Compliance officer relies on automated enforcement of these policies to prevent unauthorized data use.



DS2 Sovereignty
Decision Support

Added Value: Actors could assess data risks before entering new partnerships for data sharing.



DS2 Data
Visualization

Added Value: Environmental analyst views dynamic dashboards showing pollution trends and their relation to traffic or agriculture.



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MODULES USED IN THIS USE CASE



DS2 Catalog

Added Value: A researcher from the University explores the catalogue to discover relevant environmental datasets from multiple sectors.



DS2 DARC

Added Value: Public administrator chats with the AI assistant to quickly find pollution or traffic data without technical knowledge.



DS2 Data Inspection

Added Value: User friendly tool for designing and executing data pipelines; for correcting errors in data streams.



DS2 Culture and Language

Added Value: Regional policymaker accesses multilingual dataset descriptions, breaking language barriers in cross-border cooperation.



DS2 Identity

Added Value: Only verified organisations will be able to access and share data within Green Deal use case.



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COMPLEX DATA LIFECYCLE AND REGULATORY COMPLIANCE TESTING

Green Deal involves multi-stakeholder environmental data with varying ownership models across.

BEFORE & AFTER DS2

Before DS2: Urban air pollution monitoring relied on outdated, infrequent data collection, preventing citizens and institutions from mounting a timely response to elevated pollutant levels.

After DS2: A smart, real-time ecosystem integrates cross-sectoral data, sensors, and AI to deliver dynamic alerts and predictive insights, empowering the community to proactively monitor and mitigate air pollution.

USE CASE PARTICIPANTS



ITC

INOVACIJSKO TEHNOLOŠKI GROZD
INNOVATION TECHNOLOGY CLUSTER



www.dataspace2.eu/green-deal