# INTEGRATING SCIENCE COMMUNICATION INTO SPAIN'S ATMOSPHERIC PRODUCTS:
# INSIGHTS FROM RESPIRE AND CAMS NCP

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## INTRODUCTION

Effective science communication is a central component of two major atmospheric initiatives in Spain:

The high-Resolution air Emissions Systems to suPport modellIng and monitoRing Efforts (RESPIRE) project aims to improve emission estimates for air quality modeling and greenhouse gas (GHG) monitoring in Spain.

The Copernicus Atmosphere Monitoring Service – National Collaboration Programme (CAMS NCP) in Spain stimulates the uptake and adaptation of CAMS products for feeding official national environmental information systems and services and supporting the official mandates of Spain related to air quality management and emission reductions.

**Both initiatives are led collaboratively by the Barcelona Supercomputing Center - Centro Nacional de Supercomputación (BSC-CNS) and the Spanish Meteorological Agency (AEMET).**

## METHODOLOGY - COMMUNICATION AS A STRATEGIC PILLAR

### RESPIRE Approach

Communication is embedded across all project phases:

- Stakeholder workshops and co-creation activities
- Digital communication: website updates, newsletters, social media
- User-centric web application visualizing $CO_2$ and $CH_4$ fluxes

**Impact**

Translates complex modelling outputs into actionable knowledge for:

- Public administrations
- Scientists
- Private sector
- Citizens

By integrating advanced modeling systems with a user-centric digital tool and strategic communication , RESPIRE-CLIMATE enhances Spain's ability to monitor and reduce greenhouse gas emissions. This project exemplifies cutting-edge innovation in climate policy and emissions management.

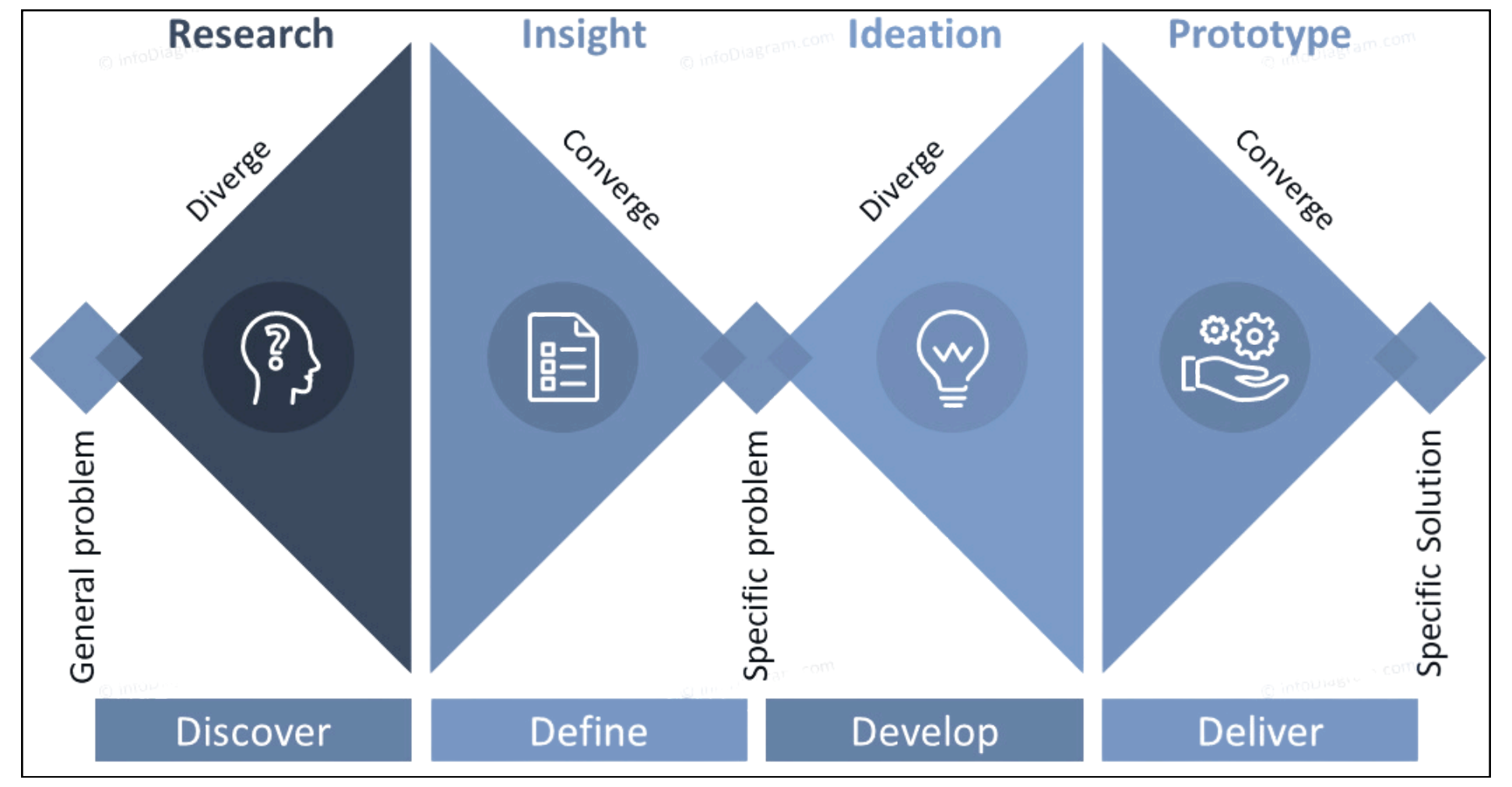
Research
Insight
Ideation
Prototype
Diverge
Converge
Diverge
Converge
General problem
Specific problem
Specific Solution
Discover
Define
Develop
Deliver

Figure 1: Design methodology that follows the Double Diamond innovation model developed by Design Council

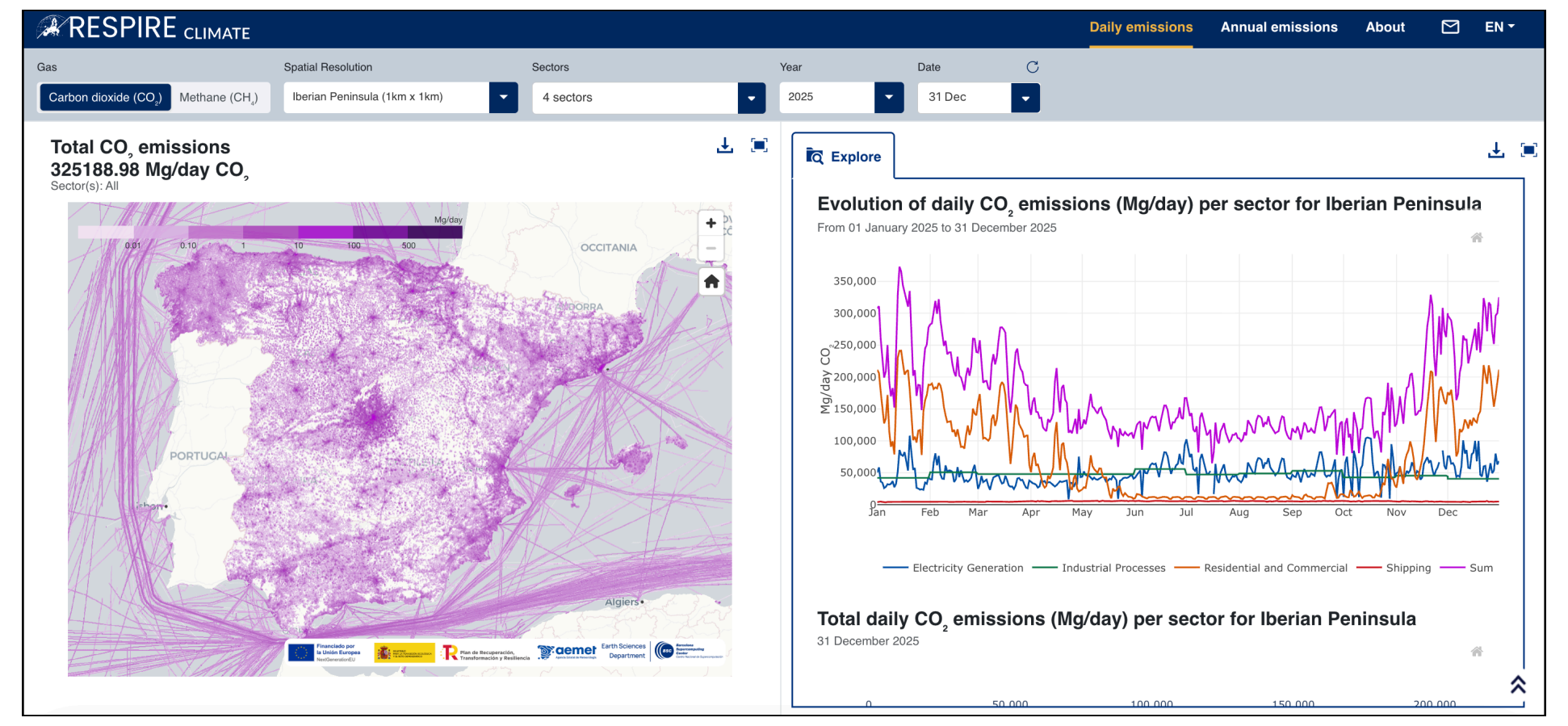
RESPIRE CLIMATE
Daily emissions
Annual emissions
About
EN
Gas
Carbon dioxide (CO₂)
Methane (CH₄)
Spatial Resolution
Iberian Peninsula (1km x 1km)
Sectors
4 sectors
Year
2025
Date
31 Dec
Total CO₂ emissions
325188.98 Mg/day CO₂
Sector(s): All
Explore
Evolution of daily CO₂ emissions (Mg/day) per sector for Iberian Peninsula
From 01 January 2025 to 31 December 2025
Mg/day CO₂
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Electricity Generation
Industrial Processes
Residential and Commercial
Shipping
Sum
Total daily CO₂ emissions (Mg/day) per sector for Iberian Peninsula
31 December 2025

Figure 2:Daily emissions

### CAMS NCP Strategy

Focused on visibility, uptake, and user engagement:

- Communication & User Outreach Plan
- Website content updates
- News articles, press releases and social media campaigns
- Annual use case publication
- Workshops, events and surveys

**Impact**

Fostering a strong connection between the European CAMS services and national users, experts and stakeholders.

Increased awareness and uptake of CAMS products and results derived from this CAMS NCP among policy makers and modelling groups improving air quality decisions across Spain.

CAMS NATIONAL COLLABORATION PROGRAMME
Spain
Summary
National needs and approach
The modules in which Spain is involved:
See what other countries are doing:

Figure 3: CAMS NCP webpage

## SHARED CHALLENGES

- Communicating technically complex atmospheric data
- Managing expectations about product capabilities
- Maintaining visibility among multiple initiatives

## KEY LESSONS LEARNED

- Co-creation increases uptake:

Iterative engagement ensures tools meet real user needs

- Transparency builds trust:

Communicating uncertainty strengthens credibility

- Tailored communication is essential:

Adapt messaging to different contexts (policy, science, society)

## ACHIEVEMENTS

- RESPIRE recognized internationally by IG3IS (WMO initiative)
- CAMS NCP expanding its national user community and strengthened integration between national and European services

## CONCLUSIONS

Integrating communication into environmental science projects:

- Enhances societal impact
- Improves user uptake and engagement
- Supports evidence-based decision-making

**Combining advanced modelling with user-focused communication contributes to a more informed society and strengthens Spain's response to climate change and air quality challenges.**

## ACKNOWLEDGEMENTS

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