

EXECUTIVE SUMMARY

WHERE SENSING MAKES SENSE

Opportunities for Advancing Europe's Priorities through Earth Observation



Earth Observation systems are increasingly central to achieving a host of public policy objectives. **Efforts to scale and consolidate the impact of Earth Observation solutions in relevant policy areas** should be guided by a sound identification and assessment of existing gaps and opportunities.

This study has been developed to provide evidence on the current level of contribution of Earth Observation solutions to priority policy domains across European countries. It aims to support space actors and policymakers in taking decisions on the use and tailoring of current solutions, as well as the development of new programmes and initiatives to serve policy priorities in Europe.

Over 300 policy documents and 600 downstream projects leveraging Earth Observation data were analysed across six domains: Energy, Agriculture & Food, Digital Transition, Peace & Security, Climate Resilience & Emergency Management, and Insurance. These were defined and selected according to current high-level and short-term policy **priorities of European countries**.

The policy analysis enabled the identification of approximately thirty concrete use cases per domain, followed by an assessment of their prioritisation in national policies and complemented by a separate overview of the insurance market. The collected projects are distributed unevenly across the selected domains and use cases. Specifically, Earth Observation solutions are yet to systematically address objectives in Energy and Digital Transition, where the current number and diversification of solutions remain limited. **Opportunity vectors arise in each of the analysed domains** and are accompanied by several **case studies on selected public administrations, highlighting the tangible benefits of using Earth Observation** in their activities. Benefits include significant cost and time savings in agricultural field inspections and maritime safety and security activities, increased coverage and information reliability for forestry and other land-monitoring actions, and enhanced

policy implementation and compliance with EU and national laws.

Two major clusters of policy objectives deserve further investigation: **Diplomatic Action & International Affairs** and **Natural Resource Management**. While most use cases in both areas show **high prioritisation in national policies**, the former community would benefit from a more significant availability of targeted Earth Observation projects, while the latter requires further understanding of the **strategic value and potential for scale** of available solutions.

Additionally, the explicit prevalence of Earth Observation terminology in non-space policies has been analysed, serving as an indicator of the level of awareness regarding the role of Earth Observation among policymakers and as an entry point for space actors to foster uptake and budget allocation to relevant solutions.

The Climate and Agriculture domains stand out in this context, boasting a high number of references to specific Earth Observation programmes such as Copernicus. In contrast, significantly more limited integration of actionable references to Earth Observation is observed in Energy and Security policies and related implementation plans.

Overall, research shows **significant alignment between the number of Earth Observation projects addressing the use cases in a given domain and the number of references to Earth Observation solutions in respective national policies**. The Energy, Climate and Agriculture domains are particularly representative of this correlation.

Going a step beyond, this report outlines **potential opportunities for increasing the use and benefits of Earth Observation in specific policy areas, as well as highlighting some overarching features of Earth Observation uptake in each of the selected domains.**

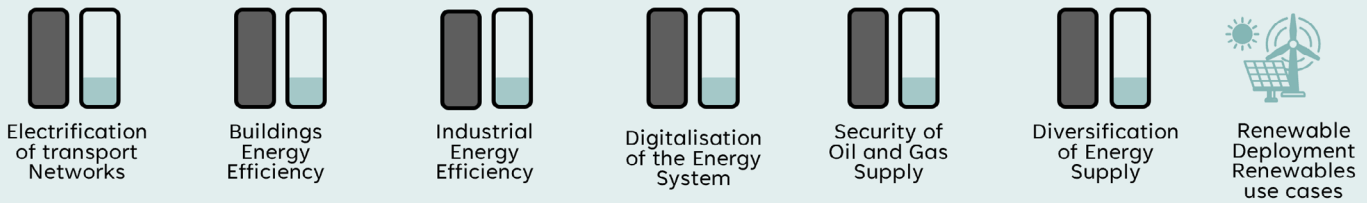




POLICY-DRIVEN OPPORTUNITIES FOR EARTH OBSERVATION

Main opportunities emerging across selected domains from a comparison between policy priorities and the number of Earth Observation projects currently addressing them

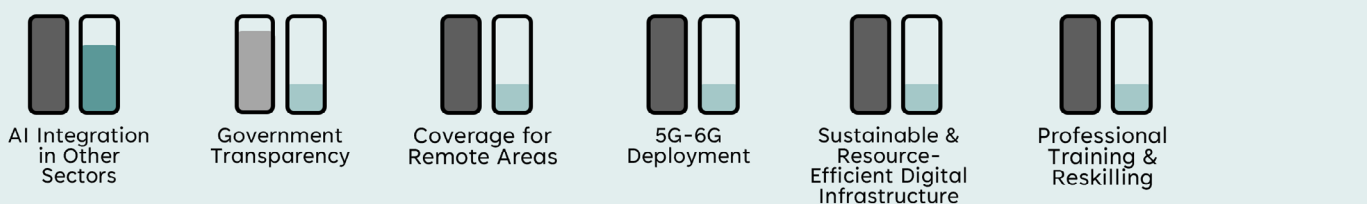
ENERGY



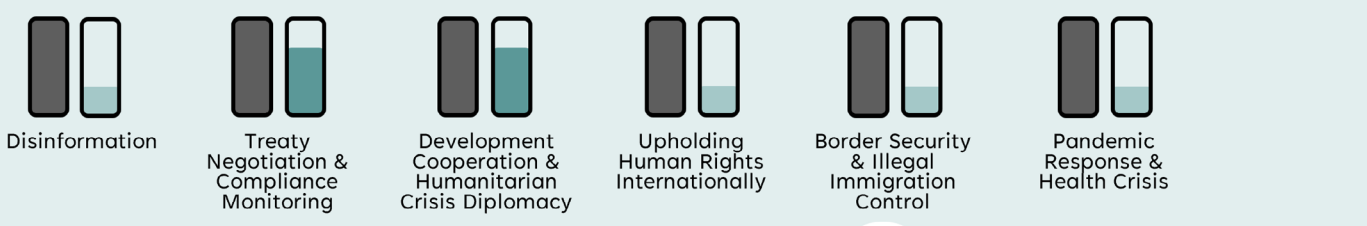
AGRICULTURE



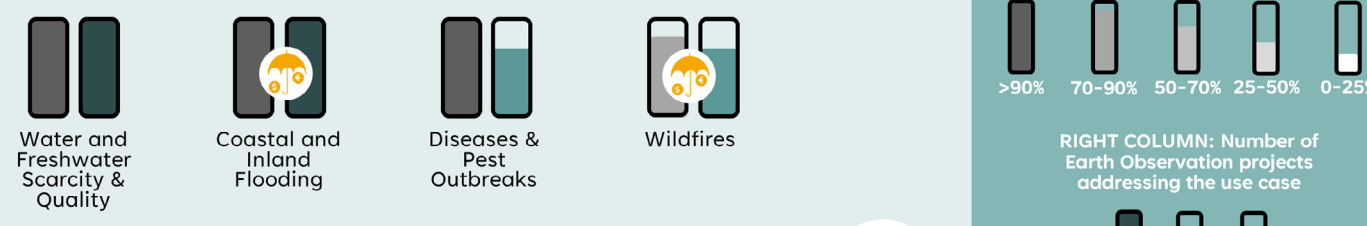
DIGITAL TRANSITION



PEACE & SECURITY (excluding defence-related use cases)



CLIMATE RESILIENCE



INSURANCE (across other selected domains)



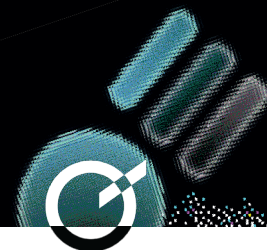
LEFT COLUMN: Percentage of 26 countries prioritising the use case

RIGHT COLUMN: Number of Earth Observation projects addressing the use case

Additional priority within the insurance market



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In **ENERGY**, low alignment between the level of policy ambition and the current contribution of Earth Observation to energy-related objectives is observed. Similarly, explicit references to Earth Observation in energy policies remain very limited. **Opportunities** lie in the use of EO for the electrification of transport networks, the increase of energy efficiency of buildings & industrial processes, and the deployment of renewables.

In **AGRICULTURE AND FOOD**, Earth Observation solutions are increasingly positioned as enablers of efficient and resilient agricultural practices, while also contributing to sustainable rural development. In this context, services that can be tailored to local realities and scaled by replicability of modular solutions appear to have the highest potential. These could be designed within and beyond broad data platforms, also favouring the integration of in situ data. **Opportunities** for the use of EO beyond established applications are observed for water quality assurance, management & security of the food value chain, and biodiversity protection & extension.

In **DIGITAL**, Earth Observation increasingly functions as a source of trusted data underpinning the development of applications driving a trusted digital transition. This includes decades of continuous Earth Observation datasets in the public domain that can be integrated into platforms and AI tools, contributing to maximising their impact for industry and public administrations across other sectors and domains. These tools include digital twins, currently mainly focused on urban contexts but with the potential to also boost rural planning and resilience. Specific **opportunities** can arise from leveraging Earth Observation for enhanced AI applications serving priorities in other domains and sectors, 5G-6G deployment & digital coverage increase for remote areas, and the digitalisation of public administrations & improvement of government transparency.

In **PEACE AND SECURITY**, while the growing climate-induced crises highlight the need to sustain and increase the use of Earth Observation for disaster management and environmental protection, other pressing policy priorities are increasingly addressed by applications based on Earth Observation data, from defence and conflict prevention to post-crisis reconstruction & recovery. Countering disinformation with trusted Earth Observation data also emerges as a priority, in parallel to continuous treaty verification. Other **opportunities** include using Earth Observation for development & humanitarian crisis cooperation, pandemic and health crisis response, and diplomatic negotiations.

In **CLIMATE RESILIENCE**, a systematic and comprehensive role of Earth Observation is manifested through the significant level and uniform distribution of projects across the identified use cases. This aligns with a broad integration of Earth Observation in climate policies and its ability to structurally address both the causes and effects of climate risks. Despite the wide distribution of solutions, **opportunities** are observed with regard to reducing species & habitat stress and addressing diseases & pest outbreaks. Water-related issues particularly stand out, from water scarcity to sea water intrusion. In a context of shifting policy priorities, there is also an opportunity to further leverage established applications for civil security purposes and as enablers and main drivers of bilateral and regional development cooperation efforts.

In the **INSURANCE** sector, considerable alignment is observed between risks covered and available Earth Observation applications, signalling a growing opportunity to more systematically leverage Earth Observation to support operational risk reduction, especially in areas within the climate resilience and security domains. **Opportunities** include severe weather events, coastal and inland flooding, terrain instability, wildfires, protection of critical infrastructure and disaster response.

Against this background, ESPI's next steps include **deep dives** into priority policy areas and sectors, starting from **Water, Energy and Diplomacy**. These will go beyond raising awareness and building capacity of policy and industry stakeholders, but also attempting to identify and unlock enablers of the identified opportunities, in terms of public funding streams, commercial market drivers, and public private partnerships.