

EuroGEOsec – CS#10: Innovation Pre-Commercial Procurement in Earth Observation

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List of Acronyms

| Acronym | Description |
|-------------------|-------------------------------------------------------------------------|
| CS | Case Study |
| EAFIP | European Assistance for Innovation Procurement |
| EO | Earth Observation |
| EU | European Union |
| EuroGEO | Europe’s regional contribution to the Group on Earth Observations |
| EuroGEOsec | Project supporting the establishment of a permanent EuroGEO Secretariat |
| GEO | Group on Earth Observations |
| Marine-EO | Earlier EO-related pre-commercial procurement project |
| OP | Operational Pipeline |
| PCP | Pre-Commercial Procurement |
| PCP WISE | PCP initiative addressing water resilience and climate adaptation |
| PPI | Public Procurement of Innovative Solutions |
| PROTECT | Coordination and Support Action on innovation procurement in EO |
| R&D | Research and Development |
| R&I | Research and Innovation |

| | |
|---------------------|-----------------------------------------------------|
| SPACE4Cities | PCP initiative on EO-enabled urban space management |
| TRL | Technology Readiness Level |

1. Executive Summary

This case study (CS#10) examines the role and effectiveness of **pre-commercial procurement (PCP)** as an innovation and funding instrument for **Earth Observation (EO)** research and innovation (R&I) across Europe. Positioned within the EuroGEOsec Operational Pipeline (OP) on Funding and finance, the study explores how PCP can support the **development, validation, and eventual uptake** of EO-based solutions by public authorities, while reducing risk for both procurers and suppliers.

The analysis focuses on three European PCP initiatives active in EO-related domains – **SPACE4Cities, PCP WISE, and PROTECT** – complemented by an attempted engagement with the earlier Marine-EO project. The latter, while not successfully engaged due to difficulties in accessing active contact points, provided an early indication of a recurrent challenge in the PCP landscape: the limited **traceability** and institutional memory of concluded projects, which can hinder knowledge transfer and reuse.

Drawing on a **mixed methodology** combining desk research, project documentation review, and semi-structured interviews with procurers, support organisations, and project coordinators, the case study provides a panoramic view of how PCP is currently applied in EO across Europe. It identifies common design features, success factors, and structural barriers, with particular attention to organisational capacity, procurement readiness, and post-PCP continuity.

Overall, the findings confirm PCP as a powerful but demanding instrument. When well-designed and adequately supported, PCP can stimulate **EO innovation**, strengthen user–supplier collaboration, and accelerate the maturation of EO services. However, its impact remains uneven due to persistent capacity gaps, fragmented funding pathways, and limited mechanisms to transition from R&D to deployment. The conclusions highlight concrete opportunities for the EuroGEO community and the future EuroGEO Secretariat to strengthen institutional capacity, improve coherence across funding instruments, and enhance the **long-term impact** of PCP in EO service development.

2. Purpose

The purpose of CS#10 is to assess how **pre-commercial procurement** is used in practice to support EO-related innovation in Europe, and to evaluate its effectiveness as a **funding and finance mechanism** within the broader EO innovation ecosystem.

Despite sustained European investment in EO infrastructures and R&I programmes, many EO solutions struggle to progress from development to **operational uptake**. PCP has been promoted by the European Commission as a strategic tool to address this gap by enabling public authorities to procure R&D services tailored to unmet public needs, while **sharing risks and benefits** with the supply side. In EO, where solutions often sit at **intermediate Technology Readiness Levels (TRLs)** and require close interaction with users, PCP is **particularly relevant**.

Within the EuroGEOsec framework, this case study contributes to the Funding and finance OP by:

- analysing how **PCP schemes** are structured and implemented in EO contexts;
- identifying recurring **enablers and barriers** from both demand and supply perspectives; and
- distilling lessons that can inform more coherent, scalable **funding strategies** for EO innovation.

The ultimate aim is to support the **EuroGEO community** in better leveraging PCP as part of an integrated funding landscape that links R&I, procurement, and **market uptake**.

3. Contextual Framework

EuroGEO, Europe's regional contribution to the Group on Earth Observations (GEO), operates at the interface of research, policy, and markets. Through its community of public authorities, research organisations, and private companies, EuroGEO seeks to increase the **uptake and impact of EO-based information** in support of European and global policy objectives.

The EuroGEOsec project, launched in December 2023, aims to establish a permanent EuroGEO **Secretariat** capable of providing structured innovation and market development support to this community. As part of Work Package 3, a set of ten case studies has been designed to explore concrete support needs along the EO value chain, structured through five Operational Pipelines.

CS#10 falls under the OP Funding and finance, which addresses the complexity and fragmentation of the European funding landscape for EO innovation. In this context, PCP is examined not as a standalone procurement tool, but as a mechanism that can bridge collaborative R&I funding and **downstream deployment**, provided that it is embedded within a coherent support framework.

Innovation procurement, and PCP in particular, has been actively promoted at EU level as a way to stimulate **demand-driven innovation**, create early markets, and improve the effectiveness of public spending. In EO, PCP has increasingly been applied to domains such as climate adaptation, urban management, water resilience, and civil security, making it a relevant lens through which to analyse current practices and future opportunities.

4. Methodology

The case study follows a qualitative, multi-source methodology designed to capture both project-level experience and cross-cutting patterns.

Selection of initiatives

Three PCP initiatives were selected as primary reference cases: **SPACE4Cities, PCP WISE, and PROTECT**. Together, they cover a range of application domains (urban environments, water management, climate resilience, civil protection), organisational settings, and maturity stages. An initial attempt was made to involve the earlier Marine-EO project; however, despite outreach efforts, no active contact points could be identified, limiting direct engagement.

Data collection

The analysis is based on:

- desk **review** of publicly available project documentation and websites;
- in-depth review of policy briefs and analytical outputs produced under the PROTECT project;
- review of European Commission and EAFIP guidance on innovation procurement and PCP; and
- semi-structured **interviews** with representatives of support organisations, project coordinators, and stakeholders involved in the selected PCPs.

Interview questions focused on procurement design, stakeholder roles, organisational capacity, perceived benefits, and implementation challenges.

Analytical approach

Findings were synthesised across sources to identify **recurring themes** rather than project-specific performance metrics. Particular attention was paid to aspects relevant to funding and finance, including risk-sharing, continuity beyond PCP, and the interaction between PCP and other funding instruments.

5. Results

The analysis of SPACE4Cities, PCP WISE, and PROTECT reveals a set of consistent patterns in how PCP is currently applied within EO-related innovation activities across Europe. While each initiative addresses distinct thematic domains and operates within different organisational contexts, their implementation models and observed outcomes show a high degree of convergence.

5.1. Role of PCP in structuring EO innovation

Across all three initiatives, PCP was primarily used to address **public-sector challenges** for which EO-based solutions were not yet sufficiently mature or operationally validated to be procured through conventional means. PCP allowed public authorities to articulate functional needs rather than predefined technical specifications, allowing EO suppliers to propose diverse solution pathways.

In practice, PCP functioned as a **structuring mechanism for innovation**. The **phased competitive process** obliged both buyers and suppliers to progressively refine requirements, validate assumptions, and converge towards technically and operationally credible solutions. This structure was repeatedly highlighted as a key benefit compared to traditional R&I projects, where requirements often remain fluid and user engagement uneven.

5.2. Demand-side outcomes

From the perspective of **public buyers**, PCP delivered several tangible outcomes. First, it provided a **controlled environment** to explore EO capabilities without committing to full-scale deployment or long-term contractual obligations. This **de-risking effect** was particularly valued by authorities with limited prior experience in EO or innovation procurement.

Second, PCP processes supported **internal learning** within public organisations. Participation exposed procurement teams and operational departments to EO data, service integration challenges, and the practical implications of **TRL progression**. In several cases, PCP acted as a catalyst for improved **internal coordination** between innovation, procurement, and operational units – although this effect depended strongly on organisational maturity and leadership support.

However, the results also indicate that PCP outcomes on the demand side often remained confined to the project timeframe. While prototypes and pilot services were delivered, systematic plans **for follow-on procurement or scaling** were not always in place at project end.

5.3. Supply-side outcomes

For **EO solution providers**, particularly **SMEs**, PCP offered early access to **real public-sector needs** and direct interaction with end users. This was consistently identified as a major advantage compared to conventional grant-funded R&I projects, as it helped suppliers align development efforts with concrete operational constraints and decision-making contexts.

PCP funding facilitates suppliers to advance solutions to **higher TRLs**, often reaching demonstrator or pilot stages that would have been difficult to finance otherwise. Nonetheless, suppliers also highlighted uncertainty regarding post-PCP market opportunities. While PCP improved technical maturity and user relevance, it did not automatically translate into sustained commercial demand.

5.4. Role of support organisations

A critical result across all initiatives was the central role played by support organisations and intermediaries. These actors were instrumental in translating policy objectives and public-sector needs into **procurement-ready challenge definitions**, conducting state-of-the-art analyses, and supporting both buyers and suppliers throughout the PCP lifecycle.

Where such support was strong and continuous, PCP processes were perceived as significantly more **effective and manageable**. Conversely, limited access to dedicated support increased the burden on public buyers and reduced the likelihood of **successful outcomes**.

6. Analysis

The cross-case findings highlight PCP as a powerful but demanding instrument within the EO innovation ecosystem. Its effectiveness depends less on the formal procurement framework itself and more on the surrounding institutional, organisational, and funding context.

6.1. PCP as a de-risking and learning instrument

PCP's primary contribution in EO is not the immediate creation of **market-ready services**, but the **reduction of uncertainty** for all actors involved. For public buyers, PCP lowers the risk associated with experimenting with emerging EO solutions. For suppliers, it reduces uncertainty regarding user needs and operational feasibility. This mutual de-risking function positions PCP as a critical **learning instrument** within the innovation pipeline.

However, this learning value is maximised only when PCP is explicitly recognised as part of a **longer innovation trajectory**. When PCP is treated as an isolated funding opportunity rather than as a step towards deployment or procurement, its impact remains limited.

6.2. Organisational capacity as a decisive factor

A recurring insight across the analysed initiatives is the decisive role of organisational capacity on the buyer side. Authorities with prior experience in innovation procurement, access to **EO expertise**, or **dedicated innovation units** were better able to exploit PCP outcomes and consider follow-on actions.

In contrast, **capacity constraints** – legal, technical, or organisational – often limited ambition and continuity. In such contexts, PCP risked becoming a one-off experimentation exercise rather than a strategic tool for service development. This highlights that PCP effectiveness is closely tied to investment in skills, processes, and internal coordination within public organisations.

6.3. Funding continuity and the PCP–PPI gap

From a funding and finance perspective, one of the most significant structural issues identified is the **discontinuity** between PCP and subsequent deployment mechanisms, such as Public Procurement of Innovative Solutions (PPI) or traditional procurement. While PCP is well-suited to R&D and prototyping, clear pathways and budgets for **scaling and adoption** are often missing.

This gap creates frustration on both sides: suppliers reach **technically viable solutions** without clear routes to market, while buyers struggle to justify further investment without additional validation or funding support. Addressing this gap requires not only better alignment of funding instruments, but also early consideration of deployment strategies during PCP design.

6.4. Fragmentation and limited reuse of experience

At a **European level**, the analysis points to persistent **fragmentation** in how PCP experience is **captured and reused**. Knowledge generated through individual PCPs is rarely consolidated or transferred beyond project boundaries. The difficulty encountered in engaging with the Marine-EO project illustrates the risk of losing **institutional memory** once projects conclude.

This fragmentation reduces opportunities for **replication, learning, and scaling** across regions and sectors. It also increases transaction costs for new PCP initiatives, as similar challenges are repeatedly addressed from scratch.

6.5. Implications for EO-specific innovation pathways

EO adds specific complexity to PCP implementation, including **data integration challenges, validation requirements**, and dependencies on complementary **datasets and infrastructures**. PCP can effectively address these issues, but only when sufficient **technical support** and realistic expectations are built into the process.

Overall, the analysis confirms that PCP is most effective in EO when embedded within a broader support ecosystem that combines technical assistance, capacity building, and coherent funding pathways. In this configuration, PCP can act as a cornerstone of innovation-driven procurement rather than as a standalone experiment.

The cross-case analysis reveals several recurring success factors. First, the **quality of problem definition** and needs articulation emerged as a decisive element. PCPs that invested heavily in early **co-design and state-of-the-art** analysis were better able to attract relevant suppliers and produce usable outputs.

Secondly, **institutional capacity** on the buyer side proved critical. Public authorities with prior experience in innovation procurement or access to dedicated support were better positioned to manage the complexity of PCP processes and to engage meaningfully with suppliers.

At the same time, persistent barriers were observed. PCP remains **resource-intensive**, requiring legal, technical, and organisational capabilities that many public authorities lack. In addition, the separation between R&D procurement (PCP) and deployment procurement (PPI or traditional procurement) often creates a discontinuity that limits long-term impact.

From a funding and finance perspective, PCP functions effectively as a **de-risking mechanism**, but not as a complete solution. Its value lies in its integration with other instruments, including collaborative R&I funding, regional or national deployment funding, and capacity-building actions.

At a **European level**, the analysis suggests that PCP in EO is progressing, but remains **fragmented**. Knowledge and experience are often retained within individual projects or regions, reducing opportunities for replication and scaling.

7. Conclusions and Next Steps

CS#10 confirms that pre-commercial procurement is a strategically important instrument for advancing **EO innovation** in Europe, particularly in domains where **public-sector needs** are complex and market solutions immature. When supported by strong **intermediaries** and embedded within a coherent funding landscape, PCP can accelerate EO uptake and foster meaningful collaboration between public buyers and suppliers.

However, PCP alone cannot address all **funding and market challenges**. To maximise its impact, greater emphasis is needed on institutional capacity building, knowledge reuse, and continuity between PCP, PPI, and market deployment.

For the EuroGEO community and the future EuroGEO Secretariat, this points to several concrete avenues for action: facilitating exchange of PCP experience across sectors and regions; supporting buyers in **needs definition** and **procurement readiness**; and promoting more integrated funding pathways that link R&I, innovation procurement, and operational uptake.

By addressing these **systemic issues**, EuroGEO can help ensure that PCP becomes not just a successful project instrument, but a **scalable basis** of EO service development across Europe.

8. Annex – Sources and Stakeholder Engagement

8.1 Interviewed stakeholders (roles)

The qualitative insights informing this case study were gathered through semi-structured interviews with representatives involved in the design, coordination, and support of PCP initiatives. Interviewees were engaged in a personal capacity and are listed below by role rather than by organisation name.

- PCP project coordination and management (urban and environmental application domains)
- Innovation procurement support organisations assisting public buyers
- Technical and operational support organisations bridging EO suppliers and procurers
- PCP programme and community-building representatives active across multiple initiatives

These interviews focused on procurement design choices, stakeholder capacity, implementation challenges, and perceptions of PCP outcomes from both demand- and supply-side perspectives.

8.2 Reviewed projects and initiatives

The desk-based analysis and interviews were complemented by a review of documentation related to the following initiatives:

- SPACE4Cities (Pre-Commercial Procurement on EO-enabled urban space management)
- PCP WISE (Pre-Commercial Procurement addressing water resilience and climate adaptation)
- PROTECT (Coordination and Support Action on innovation procurement in EO)

8.3 Key documents reviewed

To support the cross-case and panoramic analysis, the following categories of documents were reviewed:

- Project websites and publicly available deliverables from SPACE4Cities, PCP WISE, and PROTECT
- PROTECT policy briefs addressing PCP, PPI, TRL assessment, and EO-based climate services
- European Commission guidance on innovation procurement and PCP
- EAFIP (European Assistance for Innovation Procurement) toolkit and reference materials