



# LEO-GEO for Greenhouse Gases LEO-GEO4GHG

## Executive Summary Study

*Cognitive Cloud Computing*

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### Activity summary:

LEO-GEO4GHG studies the feasibility of new frontiers of Cloud Computing in Space and artificial intelligence (AI) combining multiple sources of data such as SATLANTIS GEI-SAT constellation and other external meteorological and atmospheric data with the final aim of providing near real time methane detection and quantification.

Methane emissions from the fossil fuel industry represent a key opportunity for mitigation the impact of methane on climate change. Within the framework of methane detection from space, Space-based Earth Observation (EO) is rapidly evolving and adapting to the needs of end users which demand increasingly more efficient and effective Space-based EO systems, however, end-users are still experiencing the inefficiencies related to traditional mission operational. LEO-GEO for Greenhouse gases (LEO-GEO4GHG) project studies new frontiers of Artificial Intelligence and Cloud Computing in Space combining multiple sources of data, such as the SATLANTIS's GEI-SAT constellation imagery, to provide near real time methane detection and measurement aiming at improving the responsiveness, reactivity and latency of the space value chain.

The analysis and studies carried out within the framework of LEO-GEO4GHG project show how a Cognitive Cloud computing in Space (C3S) infrastructure could allow maximum performance of methane detection and quantification to finally ensure compliance with end user requirements. This C3S constellation is envisioned to provide support to other EO constellation in LEO by providing a set of platforms with superior computation, storage and telecommunications capabilities. C3S platform could also provide exceptional capabilities for the parallel processing of other data sources to feed the detection algorithms with additional information that will ultimately result in an increase of sensitivity and accuracy of the full Image Processing workflow.

Therefore, the availability of a Cognitive Cloud Computing interface in Space could provide exceptional capabilities for the image processing related to the methane detection and quantification allowing future systems to break down the limitations that currently systems experience.