


5.15 Colombian Air Force (FAC) and High Technology Corporation (CODALTEC)

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| <p>Partners</p> |  |
| <p>Objectives</p> | <p>Join efforts for research, data acquisition, development of algorithms and models for their interpretation, which allow satellite monitoring of GHG emissions, earth observation and the realization of additional studies in ECP and in the country, framed in the FACSAT-2 space mission.</p> |
| <p>Scopes</p> | <ul style="list-style-type: none"> • Generate knowledge and develop capacities in GHG satellite monitoring, strengthening the Science, Technology and Innovation System of FAC and ECOPETROL through the implementation of a second payload, included in the FACSAT-2 project of the FAC. • Generate Research and Development products such as algorithms and methodologies for interpretation of primary information of the installed sensor, which allow the study of GHG, from the acquisition of information of the main payload of FACSAT-2, on ECOPETROL facilities and areas of interest. • Establish a program of knowledge transfer at the national level in this type of technologies barely explored in the country and the interpretation of the data obtained with them, for this specific purpose, aimed at academia, research centers, government entities |
| <p>Geographical location</p> | <p>The monitoring project through the nanosatellite addresses the Colombian National Territory through which it makes the passes, focused on those territories where Ecopetrol maintains operations.</p> |
| <p>Social participation scenarios</p> | <p>Prepare to mitigate the causes and adapt to the effects of climate change, have an institutionality for the management of climate change in the country, which is strong and effective, which allows a shared and coordinated management of all sectors, in this order of ideas, this agreement would bring benefits for the Parties and for the country, for the knowledge generated in the field of GHG that allows greater management of emissions, as established by the national government, through CONPES 3983 of 2011.</p> |

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| | <p>Ecopetrol:</p> <ol style="list-style-type: none"> 1. Assimilate knowledge in space issues such as technologies that in the future deliver information for image analysis that allow regional monitoring of methane and CO2 emissions in Ecopetrol and the country. 2. Increase technical and scientific capacities 3. Reputational and corporate image benefit by participating in a project that generates knowledge and encourages research and development in the country. 4. Study state-of-the-art technological solutions that respond in the future to some of Ecopetrol's needs, especially in its Decarbonization strategy 5. Create capacities in the use of aerospace technologies for the study of GHG as a country. 6. Development of specific methodologies and algorithms for interpretation of country images and ECP facilities 7. Possible further joint FAC-CODALTEC-ECP developments with other space missions. <p>Colombian Air Force:</p> <ol style="list-style-type: none"> 1. Strengthen the processes of territorial integrity and contribute to the purposes of the state, and increase the capacities for the mastery of space projecting the FAC as an innovative entity and regional reference. 2. The FAC with the execution of the project seeks to acquire spectral signatures, for the study of greenhouse gases (GHG), as support to the missionality of governmental and private entities. 3. The FAC, through expert technical personnel, will acquire the capacity in integration and implementation of different payloads and through agreements with other entities will provide information for the GHG study. This capability is very important not only at the operational level but also at the scientific level. <p>CODALTEC:</p> <ol style="list-style-type: none"> 1. Through the development of the visualizer for this project CODALTEC will have the opportunity to put its technological capabilities in function of new applications such as the generation of information from satellite data. 2. Possibility of expanding potential markets, generating technological solutions in new areas of knowledge, such as data processing for the visualization of satellite information. |
| <p>Main results</p> | <ol style="list-style-type: none"> a. Data acquisition and processing to develop methodologies for interpretation of satellite information on GHG emissions on ECOPETROL facilities and areas of interest. b. Generate a knowledge network between the Research, Innovation and Technology Centers of FAC and ECOPETROL for the engineering design, integration and operation of the second payload on the satellite, which contributes to research, development and generation of satellite knowledge in the country. <p>These results will be measured based on the following criteria:</p> <ol style="list-style-type: none"> a. Data obtained from the sensor of the second payload and supplementary information of the primary load b. Development of methodologies for interpretation of satellite information. c. Scientific dissemination of information that is feasible to share |
| <p>Generation of new knowledge</p> | <ul style="list-style-type: none"> • International aeronautical and space fair – Colombia F-AIR Colombia 2023. Presentation of the technical advance associated with the FACSAT3-Chiribiquete nanosatellite. |

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| | <ul style="list-style-type: none"> • E+ Ecopetrol Talks – Technical progress of the specific science and technology agreement No. 3044283. <p>That within the ECP Decarbonization Plan it is key to establish the real inventory of emissions, to adjust the baselines, which today are estimated from emission factors or mass balances (theoretical estimates), so it is necessary to explore and use different technologies that allow the monitoring of gases at the country level and a broad view of all ECP facilities, to get real data.</p> |
| <p>Communication and knowledge dissemination pieces</p> | <ul style="list-style-type: none"> • International aeronautical and space fair – Colombia F-AIR Colombia 2023. Presentation of the technical advance associated with the FACSAT3-Chiribiquete nanosatellite. • E+ Ecopetrol Talks – Technical progress of the specific science and technology agreement No. 3044283. <p>Associated news:</p> <ul style="list-style-type: none"> • Ecopetrol Group and its support in the FACSAT-2 project |