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## Digital acceleration boosts the efficiency and safety of the O&G sector and can also be put at the service of society.



**Developed in partnership with SENAI CIMATEC, AIRIS, one of the biggest supercomputers in Brazil, integrates the investments of more than R\$ 150 million in Research, Development and Innovation (RD&I) made by Repsol Sinopec in the country and recently contributed researches to fight to new coronavirus.**

The reach of the permanent technological development of the oil and natural gas industry goes beyond increasing safety in operations and reducing operating costs. The digital acceleration of the sector, with increasing investments in artificial intelligence (AI), machine learning, robotics and augmented reality (AR), can also be placed at the service of society's demands not related to energy supply.

One example of this is the AIRIS – Artificial Intelligence RSB Integrated System. The supercomputer was developed by Repsol Sinopec Brasil (RSB), in partnership with the Supercomputing Center for Industrial Innovation (CS2I) of SENAI CIMATEC, in Salvador (BA), in an investment of R\$ 27 million. Intended to improve the processing of big data, the use of complex algorithms, high-performance processing, high-fidelity simulations, the AIRIS is reserved primarily for the oil and gas sector, but can also benefit segments that require high processing capacity.

As an example of this, we made part of the processing capacity of the AIRIS Supercomputer available to the scientific community to assist in research with the use of Artificial Intelligence on the coronavirus. The initiative, which was selected in a national call for



action to combat covid-19 from SENAI Nacional, included a line of research to facilitate the diagnosis of Covid-19 in imaging exams using artificial intelligence and streamlining the treatment of large data to predict possible future scenarios, and a second line of action aimed at assisting decision making by analyzing geographic and hospital data to predict the development of the disease allowing for a more efficient management of health, safety and social support resources.

AIRIS supports various Research, Development and Innovation (RD&I) projects in the areas of seismic processing, reservoir engineer and abandonment technologies, which Repsol Sinopec develops in the country, in partnership with startups, universities, research institutes and other private companies. Over the past four years, RSB has invested more than R\$ 150 million in its R&D projects of different thematic lines.



*We operate from basic research to the construction of prototypes, in order to develop local technical capabilities and at the same time maximize the value generation of our projects. We have focused on disruptive and digital technologies to increase the automation of processes, developing algorithms and advanced data analysis, making activities more efficient and safer. We are currently testing the effectiveness of artificial intelligence algorithms to improve decision making in the area of predictive maintenance, with the PredictMain4.0 project.*

**Research and Development manager at RSB,  
Támara García**

Among the dozens of solutions under study, we can also highlight the ARIEL – Autonomous Robot for Identification of Emulsified Liquids. Developed in partnership with TideWise, LEAD Coppe/UFRJ, GSCAR – Coppe/UFRJ and Farol Serviços, ARIEL is an autonomous system that can be used for tasks such as submarine positioning, data survey and environmental monitoring. Operating in remote mode, the system is able to identify, for example, the location and size of a possible oil leak.

Another highlight is the TWIn – Tuned Water Injection. The project studies the mechanisms of advanced oil recovery from water injection, using a virtual reality simulator, with interactive visualization at the atomic level. It is developed in partnership with Unicamp and USP.

On the other hand, the GOLD project, in partnership with Geowellex, is giving its first results when it comes to providing underground information during drilling campaigns.

And in search of solutions for the protection of biodiversity, Repsol Sinopec Brasil, Bio Bureau Biotecnologia and SENAI CETIQT signed a partnership to carry out the genetic sequencing of Orange Cup Coral, an invasive species that has been affecting the biodiversity of some regions.



*The sequencing of the Orange Cup Coral genome will increase the knowledge of this species, helping us to obtain biotechnological solutions to decrease its dissemination and mitigate its impacts.*

**Explains Támara García**

## **About Repsol Sinopec Brasil**

Pioneer in the opening of the market and exploration in the Brazilian pre-salt, Repsol Sinopec Brasil (RSB) is currently the fourth largest producer of oil and gas in the country. The company occupies a strategic position in the areas of greatest potential in the Brazilian pre-salt, with activities in the Santos and Campos Basins. The asset portfolio includes three production fields – Albacora Leste, Sapinhoá and Lapa– and exploratory blocks of great potential, such as the BM-C-33 and Sagitário.

A member of the Repsol Group, from Spain, the company started its activities in Brazil in 1997, importing, selling and directly distributing basic oils and petrochemical products. In 2010, it restructured its asset portfolio, focusing on upstream. In the same year, it was the private foreign company that most invested in Exploration in the country.

Also in 2010, there was a capital increase in partnership with the Chinese Sinopec, thus creating Repsol Sinopec Brasil. Spanish Repsol maintained a 60% stake in the company, and Chinese Sinopec holds the remaining 40%.