HUB TECH IA

AI and IAGEN Application Use Case

Site Assessment, Feasibility Analysis and Project Evaluation Exploitation with Generative Artificial Intelligence (IAGEN) in Vaca Muerta, Neuquén

Executive Summary – IAGEN Application for Site and Feasibility Assessment of Exploitation Projects in Vaca Muerta.

This executive summary presents an application of Generative Artificial Intelligence (IAGEN) in the energy sector, specifically in site assessment, analysis of feasibility and evaluation of hydrocarbon exploitation projects conventional in Vaca Muerta, one of the main oil and gas formations of the world. This is a strategic opportunity to optimize exploration and production in the Neuquén basin through the advanced use of artificial intelligence.

The report classifies this use case according to four key axes:

1) Main resource: oil as the main resource and gas as a secondary resource.
2) Activity in Vaca Muerta: information management and decision making for site evaluation and feasibility analysis of exploitation projects.
3) Type of technology used: generative artificial intelligence (IAGEN), machine learning and deep neural network models.
4) Strategic impact: improvement in strategic decision-making and optimization of data analysis to reduce risks, times and costs in the

exploration and production.

1. Specific opportunities for the use of AI and IAGEN in the sector

Various concrete opportunities for applying Artificial Intelligence are identified.
Generative (IAGEN) in the sector, such as automated model generation
three-dimensional geological with high precision, the identification of optimal areas for drilling, predicting well productivity from data analysis
historical, the optimization of well location considering both the impact
environmental, such as available infrastructure, and the prediction of future oil and gas demand, enabling more efficient operational and commercial planning.

2. Benefits

Among the notable benefits of using IAGEN are:

- Reduction in time spent on site assessment and decision-making.
- Greater accuracy in predictive and geological models.
- Reduction of operating costs thanks to automation.
- Mitigation of geological and operational risks.
- Improved environmental sustainability through more efficient operations.

3. Application of AI

IAGEN is applied throughout the site assessment chain through a workflow
automated work that includes data collection, preprocessing,
Model training and validation, generation of results, and their subsequent interpretation for decision-making. Technologies such as GANs and models are used.
of transformers, digital twins and deep learning techniques for
process and interpret geological and production data.

4. Proposed AI agent and its main function

The report proposes the design of a set of specialized intelligent agents,
Among which the Results Interpretation Agent stands out, whose function
The main objective is to translate the outputs of the IAGEN models into clear and useful information for geoscience experts, thus facilitating more informed decision-making, collaborative and efficient. This agent acts as a bridge between the algorithms and the human users, maximizing the practical value of the data generated.

5. Conclusion

The integration of IAGEN into the hydrocarbon industry represents a transformative leap for Vaca Muerta, with the potential to improve efficiency, reduce
costs, minimize risks and increase the sustainability of the sector. This technology enables a smarter, more agile and competitive operating model, positioning Vaca Dead as a benchmark for innovation in the exploitation of non-resources conventional.