



AI and IAGEN Application Use Case

Water and Energy Optimization in Fracturing using IAGEN in Vaca Muerta, Neuquén

Classification of report deliverable 11: "Optimization of Water and Energy in Fracturing using IAGEN in Vaca Muerta, Neuquén":

Classification 1: By Main Resource

- Selected option: Water + energy (main), Oil and Gas (secondary).
- Justification:

The report's main focus is on optimizing water use and energy in the hydraulic fracturing processes in Vaca Muerta. While oil and gas are the ultimate objectives of the operation, the core of the document is the efficiency and sustainability of operational resources (water and energy), making explicit their priority role in technological optimization and operational.

Classification 2: By Activity within Vaca Muerta

- Selected option: Energy Efficiency and Sustainability
- Justification:

The report is clearly aimed at improving the efficiency in the use of key resources such as water and energy during hydraulic fracturing, which directly impacts operational sustainability. It is highlighted that strategic importance of reducing the water and energy footprint through application of advanced technologies (IAGEN), also addressing the environmental regulatory compliance.

Classification 3: Type of AI Technology Used

- Main selected option:

1. Generative AI Models,
2. Machine Learning Algorithms, 6. AI
Platforms for Data Integration and Big Data.

- Justification:

The document specifically mentions the implementation of models generative (IAGEN) for the simulation of multiple operating scenarios, advanced predictive models such as deep neural networks, Gradient Boosting (GBMs), decision trees, and various advanced architectures machine learning. In addition, it emphasizes the relevance of platforms Robust Big Data and IoT data integration to optimize resources during fracturing.

Classification 4: By Strategic Impact on the Industry

- Selected option: AI for Sustainability and Impact Reduction

Environmental

- Justification:

The most notable strategic impact in the report lies in significantly reducing water (15-20%) and energy (10-15%) consumption, which has direct positive implications for the environment. In addition, this Optimization facilitates environmental regulatory compliance, improves the operational sustainability and reduces the carbon footprint associated with hydraulic fracturing operations.