HUB TECH IA

# AI and IAGEN Application Use Case

## Distribution Optimization in Vaca Muerta: Process Design Data-Driven

### Executive Summary – IAGEN Application for Distribution Optimization in Vaca Muerta

This executive summary presents a strategic application of artificial intelligence (AI) and generative artificial intelligence (IAGEN) in the energy sector, specifically aimed at optimizing the distribution of resources in the Vaca Muerta training. It represents a key opportunity to improve efficiency. logistics in one of the most important energy production centers in the country.

Use case classification

The report classifies this application based on the following axes:

1. By main resource: oil, gas, water and energy (comprehensive approach).
2. By activity: information management and decision-making.
3. By AI technology used: generative models, machine learning, natural language processing, computer vision, Big Data integration, intelligent agents.
4. By strategic impact: strategic decision-making and data analysis.

1. Opportunities for using AI and IAGEN in the sector

The application of these technologies makes it possible to address complex logistical challenges. Vaca Muerta's own, such as the distribution of oil, gas, water and sand in

adverse geographical conditions. Opportunities are identified such as transport route optimization, bottleneck prediction, real-time monitoring of operations, and the integration of multi-source data for dynamic and strategic decisions.

## 2. Expected benefits

The implementation of these solutions allows:

- Improve operational efficiency and decision-making throughout the supply chain supply.
- Reduce transportation times and costs in logistically demanding environments demanding.
- Minimize risks associated with weather, routes, and type of cargo transported.
- Increase operational sustainability through emissions reduction and better planning.

## 3. Application of AI

The approach proposes a workflow that integrates data capture, analysis operational, route generation and validation, logistics execution and learning continuous. AI is used for both predictive analysis and automation of operational tasks through integration with systems such as TMS, ERP, and IoT, ensuring adaptive, real-time logistics.

## 4. Proposed AI Agent

The report proposes a system composed of multiple intelligent agents. Among Among them, the Generative Route Agent stands out, based on LLMs such as GPT-4 Turbo with RAG. Its main function is to simulate optimal routes that contemplate real restrictions, such as weather conditions, road safety, type of load, energy consumption and logistics costs. Its main benefit is the ability to anticipate, plan and adjust routes dynamically and efficiently, contributing to

resilient, secure logistics aligned with the strategic objectives of production.

## 5. Conclusion

The incorporation of AI and IAGEN into Vaca Muerta's distribution logistics represents a paradigm shift in the operation of non-oilfields conventional. These technologies allow us to overcome structural limitations through intelligent, adaptive, data-driven decisions.

The digital transformation of logistics not only boosts Vaca's competitiveness Dead, but promotes a more sustainable, efficient and management model oriented to the country's energy future.