AI and IAGEN Application Use Case

Design, Planning and Coordination - Maps, profiles, logistics and Communication in the Oil, Gas and Energy Industry in Vaca Muerta, Neuquén, Argentina

Executive Summary – Application of IAGEN in Design, Planning and Coordination in Dead Cow.

This executive summary presents a strategic application of generative artificial intelligence (IAGEN) in the energy sector, specifically targeting the design, planning, and operational coordination in the oil, gas, and energy industry in Vaca
Muerta, Neuquén, Argentina. This is a concrete opportunity to enhance the development of the AI Technology Hub in the region, optimizing key processes in a of the country's main unconventional reserves.

Use case classification

The report classifies this IAGEN application based on four dimensions:

1. By main resource: oil and gas (priority), with secondary mention to water and energy.
2. By activity: information management and decision-making.
3. By technology: generative AI models, machine learning algorithms and data integration and Big Data platforms.
4. By strategic impact: strategic decision-making and data analysis.

1. Opportunities for using AI and IAGEN in the sector

The document highlights multiple opportunities to apply AI and IAGEN in operations key, such as automatic generation of maps and schedules, logistics planning, predictive maintenance, reservoir simulation, field exploration, Demand and price prediction, regulatory compliance, automation administrative and comprehensive management of the supply chain. These technologies allow a more precise, safe, efficient and sustainable operation.

2. Expected benefits

The implementation of generative AI allows:

- Optimize resource distribution and operational planning.
- Improve safety through early detection of faults and events.
- Reduce human errors and logistics costs.
- Increase administrative efficiency and responsiveness.
- Contribute to a smaller environmental footprint in operations.

3. Application of AI

AI is implemented through a workflow that includes operational diagnostics, development of generative models, integration with existing systems (GIS, ERP, IoT), and continuous evaluation using key indicators. The solution adapts in real time to new operating conditions, providing active support to decision-making and permanently optimizing processes.

4. Proposed AI Agent

The report proposes a system composed of three intelligent agents: the Intelligent Agent Planning, which generates operational maps and adaptive schedules; the Agent Logistics, which optimizes the allocation of resources and equipment in real time; and the Agent Communications, which centralizes information and facilitates coordination between areas through conversational interfaces.

Integrated into systems such as GIS, ERP and IoT sensors, these agents operate in a

autonomous, reducing errors, anticipating contingencies and improving efficiency operational. Its main benefit is to enable agile and precise decision-making, scalable and accessible for non-technical users.

5. Conclusion

The incorporation of generative AI-based solutions in the design, planning and Coordination of energy operations in Vaca Muerta represents an evolution strategic for the sector. It strengthens the safety, efficiency, and sustainability of the industry, positioning Neuquén as a national and international benchmark in Innovation applied to energy. This digital transformation boosts competitiveness of the energy cluster, generating concrete benefits for regional development and the responsible use of resources.