



Deliverable report 20

Generative Artificial Intelligence

Design and Planning of Projects and Operations in the Gas Industry, Oil and Water in Vaca Muerta, Neuquén

**Deliverable Classification 20: "Generative Artificial Intelligence in Design and
Project and Operations Planning in the Gas, Oil and Water Industry in
Dead Cow":**

Classification 1: By Main Resource

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

- Justification:

The report mainly addresses optimization in the design and planning of projects related to the extraction and production of hydrocarbons, specifically oil and gas. In addition, explicit mention is made of the importance of water in operations, particularly in contexts such as hydraulic fracturing, although in a complementary role with respect to the hydrocarbons.

Classification 2: By Activity within Vaca Muerta

- Selected option: Information Management and Decision Making
- Justification:

The main focus of the document lies in the use of Artificial Intelligence Generative to automatically generate optimized models of infrastructure, predictive simulations of operations and strategic project planning, significantly facilitating decision-making operational and strategic in Vaca Muerta.

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, 4) Computer
Vision Systems and Image Analysis (virtual simulations and
3D models).

- Justification:

The report details the extensive use of Generative Adversarial Networks (GANs), Advanced Language Models (LLMs like Transformers) and Digital Twins for create predictive models, advanced simulations of operational scenarios, and automated generation of technical and planning documentation. The Integration of geological, climatic and operational data also highlights the use of advanced Big Data platforms and visual simulation.

Classification 4: By Strategic Impact on the Industry

- Selected option: Strategic Decision Making and Data Analysis

- Justification:

The report clearly emphasizes IAGEN's strategic capability to reduce planning times (40-60%), decrease operating costs (up to 30%), increase efficiency (25%), and significantly reduce operational risks (50%) through detailed predictive analytics. These advantages substantially improve the quality and speed of strategic and business decision-making.
operational in the industry.

