Cepsa optimizes its chemical processes with artificial intelligence-based technology

- **The first digital transformation project for its Chemical Unit will increase production of phenol at one of its plants**

- **Using machine-learning techniques, the new system offers recommendations to control room operators to maximize production**

- **The Company continues to progress in process optimization and performance using industry 4.0 digital tools**

Cepsa has successfully completed its first digital transformation project in its Chemical Unit, applying specific industry 4.0 technologies and artificial intelligence, such as machine learning, big data and advanced analytics, to the production processes.

This first project was developed on phenol line 3 at the Palos Chemical Plant in Huelva, where it increased production by 2.5%, which will help to produce over 5,500 tons of phenol per year.

This initiative is part of the company's YET (Yield, Energy and Throughput) Optimization Project, which aims to improve energy efficiency, loading and performance of processes. This project is one of the fourteen cross-disciplinary lines of work on which Cepsa's digital transformation is structured, applied in this case to the Chemicals, Refining, and Exploration and Production Units.

Specifically, this first project consisted of developing and implementing two real-time optimizers in the phenol production process, which apply machine-learning techniques and predictive models allowing recommendations to be offered every 15 minutes to operators in the plant control rooms in order to maximize production.

This project led to the appearance of new profiles of professionals in the petrochemicals industry such as scientists and data engineers, and the evolution of the skills used by plant engineers towards industry 4.0.

To implement this project, it was necessary to mine and analyze over 3,000 process variables from different information sources (processes, climate conditions, lab data and more), build predictive behavior models based on the relationship of these variables, and to program the optimizers to offer the best recommendations regarding optimal operating values.

4.0 Industry at Cepsa

Cepsa is immersed in a far-reaching digital transformation process spanning all its divisions and businesses. This project makes new headway in optimizing production processes through the use of artificial intelligence, which helps to make better decisions along the value chain and in turn increase production and reduce energy costs.

Joaquín Abril-Martorell, Cepsa's Digital Transformation director, said: "Digital transformation is a reality at Cepsa. The world is going digital, and our Company has been swift to adapt; turning challenges into opportunities. Projects like this allow us to use advanced analytics in industry, which until now used more traditional techniques, making us more agile and efficient and offer higher value solutions."

Cepsa is a global energy company, which operates in an integrated manner at all stages of the hydrocarbon value chain. In addition to manufacturing products from plant-based raw materials, it also has a presence in the renewable energy sector. Mubadala Investment Company, one of the largest sovereign wealth funds in the world, is the only shareholder.

Cepsa's experience spans more than 85 years and its team, made up of close to 10,000 professionals, offer technical excellence and a capacity for adaptation. It is present on all five continents through its business areas of Exploration and Production, Refining, Chemicals, Marketing and Distribution, Gas and Electricity and Trading.

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