

Search for a Spanish Partner for a Bilateral R&D Project

Organization	
Date of Request:	22-08-2025
Company name:	Egyptian petroleum research institute, Cairo, Egypt
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SECTION 1: Entity launching the partner search

(Please give brief / to the point explanations. For more explanation on any point below, you may add a short paragraph as an annexure, with this document.)

Sector	Governmental Public Research Sector
Entity mission or core functions	National petroleum industry with studies, scientific research work, consultations, analytical and technical services, individually or together with other parties
Date of establishment	1974
Ownership (if public and traded, add stock exchange and ticker symbol)	Governmental
Total number of employees	4000
Number of employees in R&D	2500
Key products sold or services provided	Scientific and technical advising and development, chemicals for petroleum sector
Entity core technical competences	Development in scientific and petroleum sectors (oil and gas)
Key R&D programs and activities	Development in scientific and petroleum sectors (oil and gas)
Examples of accomplishments	Consultant in petroleum sector, chemicals production for petroleum sector
Company strategic orientation	Governmental

SECTION 2: Spanish Company Profile

(Please provide a brief summary of the prospective partner company or organization. This summary may address some or all of the points below)

Profile of ideal technology partner	Consultant for construction and implementation of the proposed petroleum wastewater treatment reactor
Core technological competencies and expertise	Expertise in the field of petroleum wastewater treatment, wastewater treatment reactors design and implementation, optimization of petroleum wastewater treatment specially produced water.
Other essential qualifications (e.g.: ownership, track records etc.)	Scientific and /or technical researchers
If you have a list of companies with whom you are in contact or interested in contacting, please provide contact details	I don't have any.
If you are interested in collaboration: please specify details and other important information you want to share with a potential company	Produced water in the petroleum sector is an issue but if it is ideally treated it could be reused as a reinjection water to enhance oil recovery.
Interested areas of collaboration	Produced water treatment via different treatment techniques. Construction of a reactor for the treatment for integrated systems.
Specific R&D contribution you are seeking/offering	Scientific and technical partnership in the present call of cooperation.

Produced water treatment using Egyptian prototype

English Abstract

The treatment of organic petroleum wastewater involves the removal of organic pollutants and microorganisms. Various treatment methods, such as biological, physical, and chemical treatments, can be used to achieve this goal. Biological treatment methods involve using different microorganisms to degrade the pollutants, while physical and chemical methods involve using physical or chemical processes to remove the contaminants. The treatment method chosen depends on the wastewater's characteristics and the desired effluent quality. The main problems in the petroleum wastewater are the residual of oil or condensate, biological oxygen demand (BOD), chemical oxygen demand (COD), total dissolved solids (TDS) and others. Therefore, the aim of the present study was directed to eliminate the residual of crude oil and or condensate (oil content) from the petroleum wastewater. This can be achieved via a pretreatment step, in which passing the petroleum wastewater through gravels, sand and activated carbon. Afterwards, the contaminated petroleum wastewater goes via different sorbents in the form of sheets, membranes, granules, beads and other (different biomasses in nanoforms that embedded with desirable polymers) in order to receive the water relatively free from hydrocarbons. Afterwards, the predicted next step will be a batch reactor of an activated sludge for the established microbial communities, that already present in the contaminated wastewater in order to reduce COD. Then the contaminated wastewater will be treated chemically in order to reduce COD and BOD, this can attempt via application of novel nanocomposites. Nanocomposites can be used as an effective treatment option for the organic petroleum wastewater, as they have a high surface area and can absorb organic pollutants. Nanocomposites such as Mg doped cobalt-supported diatomite and or Mn doped cobalt supported bentonite can degrade the organic pollutants to CO₂ and water to reduce the chemical oxygen demand (COD). Furthermore, fabrication of polyacrylonitrile (PAN) ultrafiltration (UF) membranes will be used for separation of salty wastewater in order to reduce the salinity of the petroleum wastewater. All of these processes will be accomplished via reactor's steps that will be provided at the end as a prototype. After the initial prototype is completed, an artificial intelligence (AI) simulation will be conducted to create a model for all Egyptian companies based on the characteristics of the produced water. The results will then be presented to an oil and gas company to develop an industrial model for marketing to petroleum companies, under the supervision of the Petroleum Research Institute and the sponsorship of the Ministry of Petroleum and Mineral Resources and the Ministry of Higher Education and Scientific Research. This project can be funded via STDF - Science and Technology Development Fund.

Mona Mansour

Signature

Name: Mona S. M. Mansour, Assoc. Prof. Dr.

Date: 22-08-2025