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

Organization UM6P	
Date of Request:	19/11/2024
Company name:	University Mohammed 6 Polytechnic
Contact person and title/ designation:	ZAARI Nadia/Head Scientist
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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, to this document.)*	
Sector	Research and development
Entity mission or core functions	Higher education, Research and development
Date of establishment	2015
Ownership (if public and traded, add stock exchange and ticker symbol)	OCP
Total number of employees	>2000
Number of employees in R&D	~500
Key products sold or services provided	
Entity core technical competencies	MULTIDISCIPLINARY
Key R&D programs and activities	www.um6p.ma
Examples of accomplishments	www.um6p.ma
Company strategic orientation	www.um6p.ma

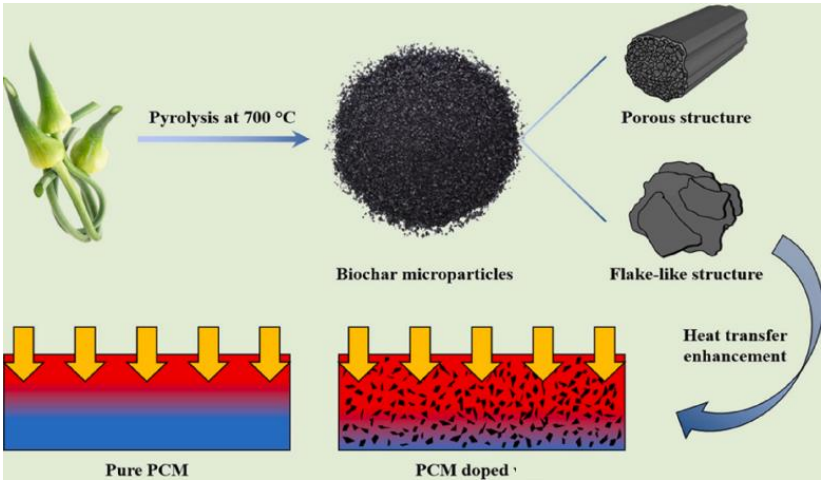
SECTION 2: Spanish Company Profile *(Please provide a summary of the prospective partner company or organization. This summary may address some or all of the points below)*	
Profile of ideal technology partner	A company engaged in the renewable energy sector working on a solution to enhance the flexibility of the electricity system by storing surplus energy produced.
Core technological competencies and expertise	Renewable energy, Thermal Energy Storage,
Other essential qualifications (e.g.: ownership, track records, etc.)	
If you have a list of companies with whom you are in contact or interested in contacting, please provide contact details.	
If you are interested in collaboration: please specify details and other important information you want to share with a potential company.	This project aims to develop a storage system using composite materials derived from activated carbon and PCMs to promote a circular economy for energy-consuming industries. A technical demonstration of this system will be conducted at the pilot industrial level under the guidance of the industrial project partner.
Interested areas of collaboration	
Specific R&D contribution you are seeking/offering	

Signature

Name: ZARI Nadia
Date: 19/11/2024

Project summary

The issue of energy shortages is becoming increasingly critical due to the rapid development of both the economy and society. Consequently, advancements in thermal energy conversion and storage (TES) are essential to accommodate this growth. Latent heat storage has emerged as one of the most promising storage technologies. Phase change materials (PCMs) have been extensively studied in recent years because of their chemical stability, high storage density, and ability to store and release thermal energy at nearly constant temperatures. However, challenges such as liquid leakage during phase transitions and poor heat transfer performance (characterized by low thermal conductivity) hinder their further development. In this context, solid-liquid PCM composites are viewed as effective solutions to the leakage problem, as these materials can be encapsulated in either an inorganic or organic matrix. Various supporting materials have been explored for use with PCMs, including carbon nanotubes, montmorillonite nanosheets, and graphene. Recently, activated carbon has gained considerable attention due to its abundance, low cost, porous structure, high specific surface area, and improved thermal conductivity.



This project aims to tackle the challenges associated with energy storage by developing and implementing a new composite material made of phase change material (PCM) encapsulated in activated carbon. We will characterize the properties of this composite and compare them to those of a typical PCM. An extensive study will be conducted on the fundamental aspects of heat transfer during both the charging and discharging processes, as well as the parameters that influence the properties of the composite. This will be approached through both numerical simulations and experimental testing. Once the properties are thoroughly evaluated, we will utilize this new material in a thermal storage system to assess its effectiveness and test its viability as a cost-effective energy storage solution for energy-intensive industries.

Recovering heat and reinjecting it into the process or repurposing it for other applications can have significant economic and environmental benefits. Finally, the Project Technical Feasibility Plan will provide a clear overview of the proposed technology, evaluate its viability based on laboratory testing results, and confirm its final applications.