

28th June 2023

Promethean Particles' MOF-Based Carbon Capture Project Awarded DESNZ Funding

Promethean Particles (“Promethean” or the “Company”), the UK-based, leading global provider of industrial scale, cost-effective advanced materials, is pleased to announce that it has been awarded a £445,848.15 grant by the Department of Energy Security and Net Zero (DESNZ) for a ground-breaking carbon capture project. Project MONET (“MOF-based Negative Emissions Technology”) has been chosen by DESNZ as one of the successful applicants as part of Call 2 of its CCUS Innovation 2.0 competition (“the Competition”). The Competition aims to accelerate the development of next generation carbon capture, utilisation, and storage (“CCUS”) technology in the UK, such that it can be deployed at scale by 2030, as part of the Government’s Net Zero Innovation Portfolio (NZIP).

“We are extremely proud that project MONET has been chosen by DESNZ as one of the winners of this competition. We understand there were many strong applicants, all of which had extremely innovative projects,” said **James Stephenson, Chief Executive Officer of Promethean**. “Carbon removal is now a necessity in mitigating the devastating effects of climate change. Unfortunately, some existing carbon capture technologies have energy and space limitations that MOF-based carbon capture helps overcome, enabling broader adoption of this critical technology. Our continuous manufacturing process uniquely enables the production of these exciting materials at the scale and cost necessary to make them a viable industrial solution. We would like to congratulate the other successful project winners and look forward to updating all our stakeholders with our progress.”

Jason Shipstone, Chief Innovation Officer, Drax Group said, “Congratulations to all at Promethean Particles and project MONET on securing this award from DESNZ. We have a strong relationship with Promethean and we are pleased to support their work at our CCUS incubation site at Drax Power Station.”

“We are excited by the opportunities for MOF-based carbon capture and this new project will help us better understand the performance and future applications for the technology. MOFs have the potential to be deployed to help decarbonise Drax’s supply chain and contribute to our mission of enabling a zero carbon, lower cost, energy future.”

Project Highlights:

- Project MONET (the “Project”) involves carbon capture technology centred around an exciting class of materials called metal-organic frameworks (“MOFs”)

- Promethean’s proprietary manufacturing process unleashes the potential of these materials by uniquely enabling their cost-effective production at industrial scale
- The Project involves the design and fabrication of a fully-automated prototype carbon capture unit utilising MOFs as the novel solid sorbent
- The unit will be installed at Drax Group’s (“Drax”) CCUS Incubation Site in Selby, North Yorkshire, where it will be operated to demonstrate the effective separation of carbon dioxide (CO₂) from the flue gas generated from Drax’s biomass-based power generation
- Projects that have been successful in this second call of the Competition, will receive a share of £7.3 million in order to advance technology initiatives within the CCUS space
- Total available funding throughout the Competition, including Call 1 and 2, totals £20 million
- The CCUS Innovation 2.0 competition is part of the wider UK Government commitment to invest £100 million in the industrial decarbonisation and CCUS sectors
- The Competition has been run as part of the UK Government’s £1 billion Net Zero Innovation Portfolio (“NZIP”) to accelerate the commercialisation of innovative low-carbon technologies.

Following the installation of Promethean’s carbon capture at Drax’s site, the unit will initially target a minimum demonstrated capture rate of 0.5-1.0 tonnes CO₂ per day, although up to 3.0 tonnes per day is likely achievable. The use of MOFs offers a more energy-efficient carbon capture process than existing technologies. MOFs act as sieves or sponges, trapping the carbon dioxide when flue gas is flowed over them. When the carbon dioxide eventually needs to be released from the MOFs, it takes considerably less energy input and requires significantly less operating space than existing approaches. The successful demonstration of such a prototype unit will substantially de-risk the innovation and in turn, pave the way for adoption in a range of point source emitting processes and industries.

Supported by the University of Nottingham, a lifecycle assessment (“LCA”) and technoeconomic analysis (“TEA”) will also be conducted based on the data collected, and compared to alternative sorbent technologies where corresponding data is known or publicly available. This will further validate the feasibility and viability of MOF-based carbon capture supporting the case for commercialisation and exploitation beyond the Project’s timeframe.

For more information please contact:

Promethean Particles	James Stephenson / Selina Ambrose	
Camarco <i>Financial PR Adviser</i>	Gordon Poole / Emily Hall / Fergus Young	promethean@camarco.co.uk Office: +44 20 3757 4980
Website Twitter		prometheanparticles.co.uk/ @ProParticles

About Promethean

Promethean Particles is a UK-based, global pioneer, leading the industrial-scale manufacture of metal-organic frameworks (MOFs) and other specialty nanomaterials. The Company is primarily focused on developing the use of MOFs in the fight against climate change, particularly for carbon capture and storage (“CCS”) applications. When compared to existing technologies, MOF-based carbon capture has the potential to deliver significant advantages; increased energy-efficiency, lower process complexity, smaller operating footprint, and an improved EHS profile. Other applications for the Company’s materials include water harvesting, gas separation and storage, green hydrogen catalysis, and high-efficiency thermal fluid additives.

Promethean has developed a range of patented continuous-flow reactors, which dramatically improve throughput and cost whilst increasing process reliability and consistency. The company operates a 1,000 tonnes per year reactor at its site in Nottingham, UK – the world’s largest continuous multi-nanomaterial manufacturing plant.

Promethean is collaborating with several different organisations to test MOFs in real-world environments and measure carbon capture effectiveness. Results from completed studies have been exciting, demonstrating that MOFs can significantly increase the efficiency and cost-effectiveness of CCS and leading to further projects. Larger-scale MOF-based CCS demonstration units are now planned on the path to full-scale implementation.

About Department for Energy Security and Net Zero

The Department for Energy Security and Net Zero will provide dedicated leadership focused on delivering security of energy supply, ensuring properly functioning markets, greater energy efficiency and seizing the opportunities of net zero to lead the world in new green industries.

The funding from the CCUS Innovation 2.0 programme comes from the department’s £1 billion Net Zero Innovation Portfolio which provides funding for low-carbon technologies and systems and aims to decrease the costs of decarbonisation helping enable the UK to end its contribution to climate change.