RESEARCHERS TO PRODUCE AVIATION FUEL FROM CO2, WASTE BIOMASS

News / Airlines

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Heriot-Watt University is to lead a £2 million ($2.98 million) project to develop low carbon aviation fuels from captured CO2 and waste biomass.

The multi-disciplinary project, funded by the Engineering and Physical Sciences Research Council will be led by Heriot-Watt engineers and scientists in conjunction with teams from Aston and Oxford Universities and the University of Edinburgh.

Not only does the research offer a lifeline to an aviation industry by offering the potential to deliver a 24 percent reduction in CO2 emissions by 2050, but it also offers a solution based on recycling waste biomass along with carbon captured from other CO2 producing industries.

Energy security is of particular concern for the aviation sector which is currently dependent on fossil fuel but at the same time is faced with demands from the Air Transport Action Group to reduce its carbon emissions by 50 percent by 2050. In contrast to ground transportation, there are no alternative fuel sources with sufficient energy density to fly a plane and in contrast to other transportation sectors emissions from the aviation sectors are currently increasing by 6 percent per year.

The project will use new combinations of existing cutting-edge science and technologies to create a fuel which could offer a 24 percent cut in carbon emissions by 2050, and to do it using undesirable waste products.

The strength of the project team is its natural, multi-disciplinary nature, bringing together specialists from the fields of engineering, chemistry, materials science and economics in a unified approach which involves parallel gasification and co-electrolysis with other process engineering technologies to offer a step change in bio jet fuel production.

Novel mix of expertise

The use of waste materials to produce a much needed fuel alternative almost sounds like magic. Instead, insists project leader Professor Mercedes Maroto-Valer, director of the Energy Academy at Heriot-Watt University, it’s more a matter of breaking down traditional academic barriers to bring together novel mixes of scientific and engineering expertise.

“Our project aims to produce low carbon synthetic aviation jet fuel using renewable energy from agricultural waste and forestry biomass and captured CO2.

“By combining knowledge and expertise from a range of normally separate specialisms we can break through barriers which have previously seemed intractable to develop a novel scientific and engineering process.

“Clearly, we won’t suddenly be producing enough fuel to fly fleets of jets, but believe we can demonstrate a prototype process, based on existing technologies, which will produce a new, greener fuel and which can then be scaled up for commercial production.”

Professor Philip Nelson, EPSRC chief executive, said, “If we are to meet the targets set in the new international agreement brokered in Paris we have to devise new ways of thinking, both in how we make and use energy and how we address technological challenges. This new EPSRC-funded research can be part of our response to the challenge of climate change.”

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