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News

Training and Careers

Climate, environment and circular economy | CO2 capture, utilization and storage

The CarMa “Carbon management and negative CO2 emission technologies: towards a low-carbon future” Chair, led by IFP School in partnership with Total, is hosting a new PD thesis supervised by the CNRS. This thesis will be dedicated to the social and spatial challenges associated with the roll-out of BioEnergy technologies with CO2 Capture and Storage. Via the CarMa Chair, IFP School, IFP Energies nouvelles (IFPEN) and Total aim to contribute to the solutions designed to limit atmospheric CO2 concentrations to a level compatible with the targets set out in the Paris Agreement.

Evaluating different carbon management options

Created in July 2019 for a period of 5 years, the CarMa Chair is supported by Total and sponsored by the Tuck Foundation. Its objective is to study and assess various approaches to reducing the CO2 present in the atmosphere in order to achieve carbon neutrality, in line with societal, environmental and economic expectations. The solutions studied include Direct Air Capture with Carbon Storage, (DACCS), and Bio-Energy with Carbon Capture and Storage (BECCS). Initially, the Chair will focus more specifically on BECCS.

The CarMa Chair has been given three missions: training in and through research; education of future ecological transition players and public awareness-raising with a view to informing public debate; knowledge sharing with the international scientific community. The CarMa Chair's research results will therefore be public and widely disseminated.

> "IFP School aims to create a genuine center of excellence on the themes of carbon management and negative CO2 emissions. Over the years, we will host up to 7 PhD students and 5 post-doctoral students within the framework of the Chair", comments Jean-Pierre Deflandre, Chair co-holder and lecturer-researcher at IFP School.

Launched in 2019, a first thesis relates to the economics of BECCS technologies. Two post-doctoral projects are also under way focusing on negative CO2 emission technologies and their treatment on the carbon markets, as well as assessment of their environmental impact.

Bioenergy with CO2 capture and storage

The new PhD thesis that has just been launched with the CNRS, in partnership with the University of Pau and Pays de l'Adour (UPPA), is dedicated to the social and spatial challenges associated with the roll-out of BECCS technologies. These technologies combine energy production from biomass – using atmospheric CO2 in the photosynthesis process – with capture of the CO2 emitted during biomass combustion and its geological storage. The French National Low-Carbon Strategy (SNCB), committing France to carbon neutrality by 2050, identifies BECCS as an essential tool for meeting these objectives.

While some BECCS technologies are mature, their roll-out may run into sociopolitical and economic difficulties, associated, in particular, with their inherent constraints. The new CarMa thesis sets out to study the interactions between the characteristics of the technologies, their associated social challenges as well as those that are more political in nature, linked to the support for and position of these technologies in transition policies.

> "This Chair supports IFPEN's research and innovation program on CO2 capture, utilization and storage (CCUS) and negative CO2 emissions. It represents one of the components of the strategic R&D partnership agreement signed in 2019 with Total on CCUS and the reduction of atmospheric CO2", asserts Florence Delprat-Jannaud, Chair co-holder and CCS program manager at IFPEN.

An international scientific board

In order to give an international perspective to the Chair's research activities, CarMa's scientific board brings together leading researchers from around the world. Under the chairmanship of Roger Aines, Energy Program Chief Scientist at California's Lawrence Livermore National Laboratory, CarMa's scientific board draws on the expertise of Jennifer Wilcox*, "James H. Manning, Chaired Professor" of Chemical Engineering at Worcester Polytechnic Institute in Massachusetts, Sabine Fuss, Economist, Professor at Berlin's Humbold University, Volker Sick, Professor and Director of the Global CO2 Initiative at Michigan University, and Jean-François Soussana, Agronomic Engineer and Vice-President responsible for International Affairs at INRAE.

** Jennifer Wilcox was recently appointed to the post of Deputy Assistant Secretary for the Office of Fossil Energy under the Biden administration*

More information : https://www.carma-chair.com

Press Contacts
Anne-Laure de Marignan, IFPEN - +33 1 47 52 62 07 – presse@ifpen.fr
Pia Manière, Agence Epoka – +33 1 86 90 42 61 – pmaniere@epoka.fr

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