Seminar

CCS-CCU technology for carbon footprint reduction using bio-adsorbents

14 – 16 September 2022, Częstochowa, Poland

The seminar promotes the best practices and innovative solutions in the field of reduction of the carbon footprint by utilizing carbon dioxide, coming from the energy and cement sector as well as the waste biomass and the production of useful products by using renewable energy.
The seminar is organized by Department of Advanced Energy Technologies of Faculty of Infrastructure and Environment of Czestochowa University of Technology from Poland which established international academic partnership with the following universities and research institutes:

- Instituto de Ciencia y Tecnología del Carbono of Consejo Superior de Investigaciones Científicas from Spain,
- Istituto di Tecnologie Avanzate per l'Energia "Nicola Giordano" of Consiglio Nazionale delle Ricerche from Italy,
- Instituto Superior Técnico of Universidade de Lisboa from Portugal,
- Department of Engineering of Università Campus Bio-Medico di Roma from Italy.

The areas of the seminar are:

- CCU and CCS technology
- bio-adsorbents
- CO_2 utilization in liquid fuels (dimethyl ether, methanol)
- CO_2 storage in concrete
- gas fuels from bioresources (biomethane, biogas, hydrogen)
- green concrete
- carbon footprint analysis
- life cycle assessment
- numerical simulation of the processes

The attendants have a great opportunity to discuss with the speakers during the three workshops planned after the sessions.

Registration

by conference website: https://wis.pcz.pl/konferencje

Scientific Committee

Dr. Dariusz Wawrzyńczak, Czestochowa University of Technology, Poland – Chairman
Dr. Marcin Panowski, Czestochowa University of Technology, Poland – Vice Chairman
Prof. Izabela Majchrzak-Kucęba, Czestochowa University of Technology, Poland
Prof. Marcello De Falco, Università Campus Bio-Medico di Roma, Italy
Prof. Mauro Capocelli, Università Campus Bio-Medico di Roma, Italy
Dr. Covadonga Pevida, Consejo Superior de Investigaciones Científicas, Spain
Dr. Maria Victoria Gil, Consejo Superior de Investigaciones Científicas, Spain
Dr. Nausika Querejeta, Consejo Superior de Investigaciones Científicas, Spain
Dr. Giuseppe Bonura, Consiglio Nazionale delle Ricerche, Italy
Dr. Francesco Frusteri, Consiglio Nazionale delle Ricerche, Italy
Dr. Catia Cannilla, Consiglio Nazionale delle Ricerche, Italy
Dr. Rita Nogueira, Universidade de Lisboa, Portugal
Dr. Jose Alexandre Bogas, Universidade de Lisboa, Portugal
Dr. Vitor Sousa, Universidade de Lisboa, Portugal

Organizing Committee

Dr. Dariusz Wawrzyńczak – Chairman, dariusz.wawrzynczak@pcz.pl
Dr. Marcin Panowski – Vice Chairman, marcin.panowski@pcz.pl
Prof. Izabela Majchrzak-Kucęba
MSc Marcelina Sołtysik
MSc Paulina Popielak
MSc Marta Niedzielska

Department of Advanced Energy Technologies
Faculty of Infrastructure and Environment
Czestochowa University of Technology
Dąbrowskiego 73 Street
42-201 Częstochowa
Poland

This material has been supported by the Polish National Agency for Academic Exchange

under Grant No. PPI/APM/2019/1/00042/U/00001

Session 4 Seminar "CCS-CCU technology for carbon footprint reduction using bio-adsorbents"	
14.09.2022 (Wednesday)	
9.00-10.00	Registration
10.00-12.00	Opening of the conference, plenary lectures *(common event for all sessions)*
12.00-13.00	Lunch
13.00-15.00	**Session 1: Possibilities of reduction carbon footprint based on BIOCO2 project results** *(Eastern room B)* *(Chairman: Dr. Dariusz Wawrzyńczak, CUT)* 1.1. BIOCO2 project overview – Prof. Izabela Majchrzak-Kucęba, CUT 1.2. CCU-CCS technology analysis (Task 1) – Dr. Dariusz Wawrzyńczak, CUT 1.3. Bio-adsorbents engineering (Task 2) – Dr. Covadonga Pevida, CSIC 1.4. Utilization of CO_2 – DME production (Task 3) – Dr. Giuseppe Bonura, CNR 1.5. Utilization of CO_2 – concrete production (Task 4) – Dr. Rita Nogueira, UL 1.6. Carbon footprint analysis (Task 5) – Prof. Marcello De Falco, UCBM 1.7. Differences in bioadsorbent activation processes – MSc Marcelina Sołtysik, CUT 1.8. Carbon footprint reduction - fly ash recovery in road construction sector – MSc Marta Niedzielska, CUT 1.9. Numerical simulations of CO_2 capture for its direct utilization in EOR – Dr. Marcin Panowski, CUT 1.10. Life Cycle Assessment analysis for power plant with CCU case study – MSc Paulina Popielak, CUT
17.00-0.00	Gala dinner
15.09.2022 (Thursday)	
9.00-10.20	**Session 2: Gas energy carriers** *(Eastern room B)* *(Chairwoman: Dr. Nausika Querejeta, CSIC)* 2.1. Bio-methane production from catalytic conversion of wet biomass under supercritical water gasification – Dr. Giuseppe Bonura, CNR 2.2. Biogas upgrading based on biomass-based adsorbents – Dr. Covadonga Pevida, CSIC 2.3. Renewable H_2 production from bioresources – Dr. Victoria Gil, CSIC 2.4. Hydrogen storage technology – Prof. Marcello De Falco, UCBM
10.20-11.00	**Workshop 1** *(Eastern room B)* *(Chairwoman: Dr. Covadonga Pevida, CSIC)*
11.00-11.30	Coffee break

11.30-12.30	**Session 3: Liquide energy carriers** *(Eastern room B)* *(Chairman: Dr. Giuseppe Bonura, CNR)* 2.5. Liquid Organic Hydrogen Carriers (LOHCs), like methanol and dimethyl ether: catalytic and technological aspects – Dr. Francesco Frusteri, CNR 2.6. Catalytic valorization of raw glycerol into oxygenated biofuels – Dr. Catia Cannilla, CNR 2.7. Exergy analysis of CO_2-H_2 utilization: example of DME production – MSc Leone Mazzeo, UCBM
12.30-13.10	**Workshop 2** *(Eastern room B)* *(Chairman: Prof. Marcello De Falco, UCBM)*
13.10-14.00	Lunch
14:00-16:00	Trip – visiting Jasna Góra Monastery in Częstochowa
19.00-21.00	Dinner
16.09.2022 (Friday)	
9.00-10:40	**Session 4: CO_2 capture and utilization** *(Eastern room B)* *(Chairman: Dr. Jose Alexandre Bogas, UL)* 3.1. The role of water vapor on CO_2 capture by adsorption – Dr. Nausika Querejeta, CSIC 3.2. Penalties, Barriers and Innovations of Carbon Capture & Storage – Prof. Mauro Capocelli, UCBM 3.3. Carbon capture and utilization technologies for cement-based materials – Dr. Rita Nogueira, UL 3.4. Towards full-recycled net zero high sustainable green concrete – Dr. Jose Alexandre Bogas, UL 3.5. Stochastic modeling of the carbon balance for storing carbon in concrete – Dr. Vitor Sousa, UL
10.40-11.20	Coffee break
11:20:12:00	**Workshop 3** *(Eastern room B)* *(Chairwoman: Dr. Rita Nogueira, UL)*
12.00-13.00	BIOCO2 closure project meeting (closed session)
13.15-14.30	Lunch