WORKSHOP ON
GREEN ENERGY

Faculty of Technology
Renewable Energies and Materials Laboratory
University of Medea, Algeria
On 11 December 2025

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Plenary 1 : Shallow Geothermal Energy Source for Efficient Air Cooling/Heating in Buildings

Geothermal energy is one of the renewable energies that presents an interesting alternative energy source for the conventional energy sources. The proposed talk will be started by general introduction related to the environmental and economic contexts; GHG gas emission and the increasing of the electrical energy cost. The geothermal energy is proposed as one of the solutions to the previous issues. Information about the different forms of geothermal energy sources and their advantages and disadvantages will be presented. However, more focus will be on the shallow geothermal energy source which is based on the ground of the soil and has the advantage that is available everywhere. During the next sections, different technologies used to extract/release heat from/into the earth for air cooling/heating in buildings will be outlined. Special attention will be given to the ground source heat pump and earth to air heat exchanger (Canadian well). Some results related to research works will be presented.

Key words: *Shallow Geothermal, Ground Source Heat Pump, Canadian Well, Earth to Air Heat Exchanger.*

Plenary 2 : IoT et IA au service de l'agriculture : un modèle national d'économie de l'énergie et de l'eau.

Résumé : L'intégration de l'Internet des Objets (IoT) et de l'Intelligence Artificielle (IA) constitue aujourd'hui un levier stratégique pour transformer durablement le secteur agricole, particulièrement dans les régions confrontées à des contraintes énergétiques et hydriques croissantes. Cette conférence plénière présente un modèle national innovant visant l'optimisation de la consommation d'énergie et la gestion rationnelle de l'eau à travers des solutions technologiques avancées appliquées aux exploitations agricoles. Le modèle proposé repose sur un réseau de capteurs intelligents pour le suivi en temps réel des paramètres agro-climatiques, la gestion automatisée de l'irrigation, la prévision des besoins hydriques des cultures, ainsi que le contrôle des systèmes énergétiques basés sur les micro-réseaux à énergies renouvelables. L'IA joue un rôle central dans l'analyse prédictive, la modélisation des scénarios, la détection des anomalies et l'aide à la décision, permettant une utilisation plus efficace des ressources disponibles. Cette approche intégrée contribue à réduire les pertes d'eau jusqu'à 40 %, améliore l'efficacité énergétique, augmente la productivité et renforce la résilience climatique des exploitations. Elle constitue un cadre national reproductible et évolutif, capable de soutenir les stratégies de durabilité, de moderniser les pratiques agricoles et d'accompagner la transition vers une agriculture intelligente, autonome et écologiquement responsable.

PLENARY 1

Dr. Mohamed Ouzzane

Recently, he joined the Department of Architecture at the University of Blida (Algiers). From 2016 till 2022, Dr. Mohamed Ouzzane was a Professor in the mechanical department at the Islamic University of Madinah (K.S.A.). He received his PhD from University of Sherbrooke (Quebec, Canada), his Magister from Haut Commissariat a la Recherche (Algiers) and his Bachelor (Engineer) from (Ecole Nationale Polytechnique d'Alger). During 2000-2016 he was a research scientist at CanmetEnergy-Varennes (Natural Resources Canada) and Associate Professor at the University of Sherbrooke and Ecole Superieure de Technologie de Montreal (ETS). During 1986-1996 he was an Assistant Researcher at CDER (Center of Renewable Energy Development), Algiers. His research interests include both experimental and numerical activities. His areas are related to thermo-fluid sciences and renewable energy systems. He was a leader of the research program of the development of new technologies and advanced practices for refrigeration and ground source heat pumps. He is an author and co-author of more than 100 scientific papers, 2 patents, one book and book chapter, supervisor of more than 25 students in Master, PhD and Postdoctoral degrees. He was a member of an editorial board of the Islamic University Journal of Applied Sciences and reviewers of many international scientific journals.

PLENARY 2

Dr. Hocine Belmili

Has been a Research Director since 2019. He received the State Engineer degree in Electronic Engineering from Constantine University in 2001, a Magister degree from Sétif University in 2004, and a PhD in Electronic Engineering from the National Polytechnic School of Algiers in 2012, completed in collaboration with ENPG-France. His research interests encompass renewable energy systems, hybrid photovoltaic–wind configurations, intelligent microgrids, and advanced control strategies for energy conversion and management. Throughout his career, Dr. Belmili has coordinated several national and international research projects, contributing significantly to the development of sustainable energy technologies. He has authored and co-authored more than 60 journal articles, 04 chapters in peer-reviewed international books, 86 conference papers, and has served as editor and contributor to a Springer proceedings book.
From 2020 to 2025, he served as Director of the Renewable Energy Research Division at the Unit of Development of Solar Equipment (UDES-CDER, Algeria), where he led major initiatives in solar energy integration, distributed energy systems, and innovative applications of smart technologies for agriculture and rural electrification.

Timing and Program

08 :45	Opening ceremony
09 :00	Plenary 1 **Chairs:** Prof. Chiba & Prof. Alliche
10 :00	Plenary 2 **Chairs:** Prof. Tlemçani & Prof. Henini
11 :00	Round table **Chairs:** Prof. Triki, Dr. Rebhi, Dr. Kherkhar, Prof. Zirari, Prof. Gacemi
12 :00	Closing ceremony

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