ENERGY TRANSITION RESEARCH CENTER

Contact details

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Acronym	**EnTReC**
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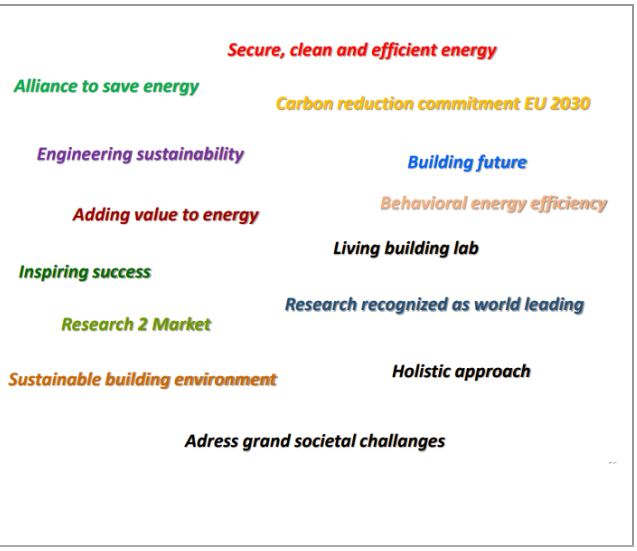

Areas of expertise

The EnTReC expertise was gained through active participation in interdisciplinary research consortiums within scientific projects or international scientific cooperation within European projects: Energy Efficiency in Buildings & Industry; Energy Analytics & Numerical Tools; Energy Sustainability Engineering; Energy Consumption/Generation Profiling and Forecasting; Big Data Analytics; IOT and Blockchain technology; Energy Optimisation at Building and Local Communities Level; Cognitive and Artificial Intelligence; Energy Islands & Energy Cooperation; Sustainability and Climate Changes; Energy Culture and Consumer Behavior; Renewable Energy Sources Integration; nZEB adoption; Waste to Energy; Smart Grid; Energy Storage; Electric mobility; Electromagnetic Fields; Electromagnetic Compatibility; Long life learning Programs for Energy Professionals.

Team

Energy Transition Group: Prof. Dan D. MICU, Dr. Denisa ȘTEȚ, Prof. Laura DARABANT, Dr. Mihaela CRETU, Dr. Andrei CECLAN, Dr. Levente CZUMBIL, Dr. Stefan CIRSTEA, Dr. Dacian JURJ, Dr. Alexandru MURESAN, Prof. Radu A. Munteanu, Dr. Bogdan BARGAUAN, Dr. Bogan TEBREAN, Dr. Dan IUDEAN, Dr. Calin MURESAN, Dr. Florin DRAGAN, Dr. Silviu STEFANESCU, Dr. Horia BELEIU, Dr. Antoniu TURCU, Dr. Aurel BOTEZAN, Dr. Anca IANCU, Dr. Stefan UNGUREANU, Drd. Timea FARKAS, Drd. Claudia MURESAN, Drd. Alexandru BERCIU, Drd. Mircea LANCRANJAN, Drd. Ahmed AHMED, Drd. Radu COVACI, Drd. Stefan BRAICU, Drd. Denisa BARAR
Distributed System Research Group: Prof. Tudor CIOARĂ, Prof. Ionut ANGHEL
Termotechnics Group: Prof. Mugur BĂLAN, Dr. Paula UNGURESAN, Dr. Ancuta MAGUREAN
Lighting Electrical Laboratory Group: Dr. Dorin BEU, Prof. Domnita FLORIN, Dr. Pop Octavian
Process and Energy Systems Engineering Group: Prof. Eva DULF, Prof. Vlad MURESAN, Dr. Valentin SITA
Civil Engineering Group: Dr. Ligia MOGA, Dr. Nicoleta COBARZAN, Dr. Iulia PRODAN
Renewable Energies Research Group: Prof. Dorin PETREUȘ, Prof. Ovidiu POP, Dr. Toma PATARAU, Dr. Radu ETZ,
Electric Mobility Applied Research Group: Prof. Bogdan VARGA, Dr. Dan MOLDOVANU, Prof. Florin MARIASIU
Environmental Engineering Group: Prof. dr.ing. Horatiu VERMEȘAN, Timea GABOR
Applied Informatics Group: Prof. Mihai MUNTEANU, Dr. Simona VLAD, Dr. Anca NICU, Dr. Angela LUNGU
Mathematics Group: Prof. Radu PETER, Prof. Dorian POPA, Dr. Adrian HOLHOS

Representative projects

Ongoing European Projects 2023-2026

1. Renewable ENergy-based Positive Homes - RENplusHOMES, HORIZON-CL5-2022-D4-01-02, 2023-2026, UTCN-463.188 EUR, Dr. Mihaela Crețu
2. Data-driven Residential Energy Carrier-agostic Demand Response Tools and Multi-value Services – DEDALUS, 2023-2026, HORIZON-CL5-2022-D4-01, 332.700 EUR, Prof. Tudor Cioară
3. Smart Grid-Efficient Interactive Buildings – EVELIXIA, HORIZON-CL5-2022-D4-02, 2023-2027, UTCN-360.438 EUR, Prof. Dan Micu
4. Holistic Green Airports - OLGA, 2021-2026, H2020-LC-GD-5-1-2020, UTCN- 765.897 EUR, Prof. Dan Micu
5. Blueprint for Net Zero Apartment-block Neighbourhoods, EIT, 2023-2025, UTCN – 353.875 EUR, Prof. Bogdan Varga
6. Energy Transition Audits towards Decarbonization – EnTRAINER, LIFE21-CET-AUDITS, 2022-2025, UTCN – 283.179 EUR, Dr. Denisa Șteț
7. Fostering the implementation of shallow geothermal hybrid heating and cooling systems in the Danube Region - Danube GeoHeCo, 2024-2026, Interreg Danube Region Programme, UTCN – 334.734 EUR, Prof. Radu Munteanu
8. Building Local Partnership for reducing the fossil energy demand of district heating systems in Eastern Danube Region – REHEATEAST, 2024-2026, Interreg Danube Programme, UTCN – 163.193 EUR, Dr. Paula Ungureșan
9. Centrul Național de Competențe și Soluții pentru dezvoltarea orașelor inteligente neutre climatic – NetZeRoCities, Planul Național de Redresare și Reziliență, 2023-2025, UTCN – 500.000 EUR, Dr. Andrei Ceclan

Finished European Projects 2015-2023

10. Renewable Cogeneration and Storage Technologies Integration for energy Autonomous Buildings, 2019-2022, 815301-RE-COGNITION, www.re-cognition-project.eu, Prof. Dan D. Micu
11. Sun coupled innovative Heat pumps, SUNHorizon, 2021-2023, https://sunhorizon-project.eu/, Dr. Levente Czumbil
12. Design and development of an Energy Efficiency Management and Control System with cost-effective solutions for residential and educational buildings - 332783/2021-2022– DOITSMARTER, EEA and Norway Funds, Dr. A. Ceclan
13. Empowering energy efficiency awareness through a holistic educational approach – 2022-2023/346660 ENERGEIA, EEA and Norway Funds, Dr. Denisa Stet
14. Supportin Increased Knowledge on Renewable Energy and energy efficiency – 2022-2023/346649 – GREENER, EEA and Norway Funds, Dr. Mihaela Cretu
15. A holistic framework for Empowering SME's capacity to increase their energy efficiency, 2019-2022, 847132-SMEmPower Efficiency, www.smempower.com, Prof. Dan D. Micu
16. Generate Energy Efficient Acting and Results at Small & Medium Enterprises - 894356 - GEAR at SME, 2020-2023, https://gearatsme.eu, Prof. Dan D. Micu
17. Enabling new Demand REsponse Advanced, Market oriented and Secure technologies, solutions and business models, - eDREAM H2020, 2018 – 2021, Director: Prof. T. Cioara
18. Finding the best KPIs for city energy and climate management and conversion tables- CoME EAsy 2018-2021 H2020, Prof. D. Beu
19. Flexible medium voltage DC electric railway systems, MVDC-ERS H2020-S2RJU-OC, 2018-2021, Prof. D. Petreus
20. Demand Response in Blocks of Buildings-DR-BOB, 2016-2019,https://cordis.europa.eu/project/id/696114,Prof. D. Micu
21. Meeting the Energy Professionals Skills, MENS, 2015-2017, https://cordis.europa.eu/project/id/649773, Prof. D. Micu

Significant results

The most representative publications of the past 5 years

1. A.G Berciu, E.H Dulf, Dan D. Micu, Improving the Efficiency of Electricity Consumption by Applying Real-Time Fuzzy and Fractional Control, *Mathematics*, vol.10, Issue 20, Oct **2022**, DOI10.3390/math10203807, **WoS Q1**
2. Hiris,P.D, Pop,O.G., Balan,M.C. - Analytical modeling and validation of the thermal behavior of seasonal storage tanks for solar district heating, *Energy Reports* 8 (**2022**) 741-755, ISSN: 2352-4847 (IF: 4.937 / 2021) https://doi.org/10.1016/j.egyr.2022.07.113 **WoS Q1**
3. H. Albu, D. Beu, C. Ciugudeanu, Study on the Power Quality of LED Street Luminaires, August **2022** *Sustainability* 14(15):9671 DOI: 10.3390/su14159671 **WoS Q2**
4. Cristea C., Cristea, M., Dan D. Micu, A. Ceclan,Tirnovan R.A.,Serban F.M., Tridimensional Sustainability and Feasibility Assessment of Grid-Connected Solar Photovoltaic Systems Applied for the Technical University of Cluj-Napoca, *Sustainability,* vol. 14, Issue 17, sep.**2022**, DOI10.3390/su141710892, **WoS Q2**
5. M. Antal, V. Mihailescu, T. Cioara, I. Anghel, Blockchain-Based Distributed Federated Learning in Smart Grid. *Mathematics* **2022**, 10, 4499, **WoS Q1**
6. Dacian I. Jurj, Levente Czumbil, Bogdan Bârgăuan, Andrei Ceclan, Alexis Polycarpou, Dan D. Micu, „Custom Outlier Detection for Electrical Energy Consumption Data Applied in Case of Demand Response in Block of Buildings", *Sensors* **2021**, 21(9), 2946; https://doi.org/10.3390/s21092946, **WoS Q1**
7. M. Cretu, L. Czumbil, B. Bargauan, A. Ceclan, A. Berciu, A. Polycarpou, R. Rizzo, Dan D. Micu, "Modelling and evaluation of the Baseline Energy Consumption and the Key Performance Indicators in Technical University of Cluj-Napoca buildings within a Demand Response programme: a case study", *IET Renewable Power Generation*, Vol. 14, Issue 15, pp 2864-2875, **2020**, DOI: 10.1049/iet-rpg.2020.0096, **WoS Q1**
8. C. Darab, A. Turcu, H. Beleiu, S. Pavel, I. Birou, Dan D. Micu, S. Ungureanu, S. Cirstea, „Hybrid load forecasting using gaussian process regression and novel residual prediction", *Applied Sciences*, Vol. 10, Issue 13, Art.no. 4588, **2020**, DOI: 10.3390/app10134588, **WoS Q2**

Awards

1. Best European Energy Service Project, awarded by EU Commission, Brussels, 2019.
2. Eastern & Central Europe Region Institutional Energy Management Award, awarded by Association of Energy Engineers, New York, USA, 2018.
3. Romanian Energy Award – Special Jury Award, awarded by Energynomics, Bucharest, 2015.

The offer addressed to the economic environment

Design and implementation of energy analytic tools for sustainable energy use; Applied energy services; Numerical modelling techniques of electrical/electronic engineering applications; Electromagnetic field numerical analysis and synthesis; Long life learning programmes for energy professionals (www.decidfr.utcluj.ro)

The education and training of energy professional is a statutory objective of the EnTReC.

Create knowledge: Studies on increasing energy efficiency, integration of renewable energies and forward-looking technologies are our fundamental contribution to a sustainable transformation of the energy system.

Last update on January 2024