Dr.-Ing. Dimitris MANOLAKOS
Associate Professor on Energy Efficiency in the Agricultural Sector, Department of Natural Resources & Agricultural Engineering, Agricultural University of Athens
Iera odos 75, 11855 Athens, Greece
dman@aua.gr | http://renewables.aua.gr/

OBJECTIVE

His objective in the Agricultural University of Athens is to investigate, develop and integrate Energy Efficiency technologies and measures in the primary and secondary agricultural sector. RTD work is mostly focused on low grade heat recovery and upgrading and heat to power conversion technologies, emphasising on ORC, either for electricity generation or CHP. Solar thermal systems, biomass and waste heat are considered as candidate heat sources. Another field of expertise is the heat pumps with emphasis on livestock buildings applications and industrial, high temperature ones. Water treatment of brackish or sea water with desalination powered by renewables is also a field of investigation. In general, the research work assumes the optimal utilisation of energy resources for the benefit of the economy and development of the agricultural sector.

EDUCATION

National Technical University of Athens (NTUA), Diploma of Mechanical Engineering (1994)

Agricultural University of Athens (AUA), PhD on Solar-ORC (2006)

PROFESSIONAL POSITIONS

2020-present	Co-founder	Thermodraft IKE, spin-off company of AUA
2020-present	Associate professor	Dept. Of Natural Resources Management & Agricultural Engineering Athens, AUA
2015-2020	Assistant professor	Dept. Of Natural Resources Management & Agricultural Engineering Athens, AUA
2013-2015	Lecturer	Dept. Of Natural Resources Management & Agricultural Engineering, AUA
2008-2013	Research Associate	School of Mechanical Engineering, Lab. of Hydraulic Turbomachines, NTUA
1994-2013	Research Associate	Dept. Of Natural Resources Management & Agricultural Engineering, AUA

ACADEMIC ACTIVITIES

PhD Thesis

Directly supervision of PhD Students (ongoing PhDs)
1. "Techno-economic Evaluation of CHP systems, Ongoing PhD since 2015.
2. "Use of Residual Biomass for Energy Generation", Ongoing PhD since 2018.
3. "Computational Study of Two-Phase flow in Trilateral Flash Cycle", Ongoing PhD since 2020.
4. "Climate Control of Energy Neutral Livestock Buildings", Ongoing PhD since 2021.

Diploma Thesis

Supervisor of more than 20 Diploma theses on energy efficiency in the primary and secondary sector

TEACHING

Thermodynamics, Internal combustion engines, Renewable energy technologies, Heat and mass transfer.

PROFESSIONAL ACTIVITIES

Peer Reviewer for International Journals

Energy, Solar Energy, Applied Thermal Engineering, Energy Conversion and Management, Journal of Energy Engineering, International Journal of Green Energy, Sustainable Energy reviews, Desalination, Desalination and Water Treatment, Sustainable Energy and Technologies Assessment

Latest recognitions as reviewer

Certified with outstanding contribution in reviewing: Energy 2018, Energy Conversion and Management 2018

Certified as recognized reviewer: Applied Energy 2016, Sustainable Energy and Technologies Assessment 2017, Applied Thermal Engineering 2017, Renewable Energy 2018, Energy Conversion and Management 2018

RTD projects' evaluator

REA-Horizon 2020. Secure, clean and efficient energy: new technologies for utilization of heat recovery in large industrial systems, considering the whole energy cycle from heat production to transformation, delivery and end use

General Secretariat of Research and Technology. SYNERGASIA 2011, EDK 2018

Editor in International Journals

Invited guest editor on the Special Issue

"Organic Rankine Cycle Systems for Waste-Heat Recovery", Applied Sciences (ISSN 2076-3417). This special issue belongs to the section "Energy"

Organisation of international conferences

Member of scientific committees

-The 5th International Seminar on ORC Power Systems, Athens 9-11 September 2019

-10th National Conference of Agricultural Enginnering (HelAgEng), Athens 28-29 September 2017

-9th National Conference of Agricultural Enginnering (HelAgEng), Thessaloniki 8-9 October 2015

-Keynote speaker at the XX CIGR World Congress Dec. 5-10, Kyoto-Japan

WRITING & RESEARCH

PhD Thesis

Design and Experimental Assessment of a Stand-alone, low Temperature Solar Organic Cycle System for Reverse Osmosis Desalination, Agricultural University of Athens, 181 pages

Recent Articles in Peer-Review International Journals (5 years)

Twenty-five articles, with a total number of 1341 SCOPUS citations (July 2022, excluding self-citations), h-index=19. Recent articles are presented next:

- ***Paris, Bas; Vandorou, Foteini; Balafoutis, Athanasios T.; Vaiopoulos, Konstantinos; Kyriakarakos, George; Manolakos, Dimitris; Papadakis, George.*** Energy Use in

Greenhouses in the EU: A Review Recommending Energy Efficiency Measures and Renewable Energy Sources Adoption. *Applied Sciences (Switzerland)Open AccessVolume 12, Issue 10May-2 2022 Article number 5150*

- ***Gkountas, Apostolos; Bakalis, Panteleimon; Ntavou, Erika; Skiadopoulos, Anastasios; Manolakos, Dimitris.*** Modelling and Parametric Analysis of a Brine Treatment Unit Using a High-Temperature Heat Pump and a Vacuum Evaporator. *Applied Sciences (Switzerland)Open AccessVolume 12, Issue 9May-1 2022 Article number 4542*
- ***Paris, Bas; Vandorou, Foteini; Balafoutis, Athanasios T.; Vaiopoulos, Konstantinos; Kyriakarakos, George; Manolakos, Dimitris; Papadakis, George***. Energy use in open-field agriculture in the EU: A critical review recommending energy efficiency measures and renewable energy sources adoption. *Renewable and Sustainable Energy ReviewsOpen AccessVolume 158April 2022 Article number 112098*
- ***Bas Paris, Foteini Vandorou, Dimitrios Tyris, Athanasios T. Balafoutis, Konstantinos Vaiopoulos, George Kyriakarakos, Dimitris Manolakos and George Papadakis***. Energy Use in the EU Livestock Sector: A Review Recommending Energy Efficiency Measures and Renewable Energy Sources Adoption *Applied Sciences (Switzerland) Open Access Volume 12, Issue 4February-2 2022 Article number 2142.*
- ***Soulis K.X., Manolakos D., Ntavou E., Kosmadakis G.*** A geospatial analysis approach for the operational assessment of solar ORC systems. Case study: Performance evaluation of a two-stage solar ORC engine in Greece (January 2022), *Renewable Energy* Volume 181, Pages 116 – 128
- ***Panagakis P, Manolakos D, Axaopoulos P***. Optimal financial insulation thickness of a broiler house, *Agricultural Engineering International: CIGR Journal*Volume 23, Issue 2, Pages 99 – 110, 2021
- ***Golonis C., Skiadopoulos A., Manolakos D., Kosmadakis G.*** Assessment of the performance of a low-temperature Organic Rankine Cycle engine coupled with a concentrating PV-Thermal system (December 2021) *Renewable Energy* Volume 179, Pages 1085 - 1097
- ***Manolakos, D., Kosmadakis, G., Ntavou, E., Tchanche, B.*** Test results for characterizing two in-series scroll expanders within a low-temperature ORC unit under partial heat load (2019) Applied Thermal Engineering, 163, art. no. 114389
- ***Manolakos, D., Panagakis, P., Bartzanas, T., Bouzianas, K.*** Use of heat pumps in HVAC systems for precise environment control in broiler houses: System's modeling and calculation of the basic design parameters (2019) Computers and Electronics in Agriculture, 163, art. no. 104876,
- ***Ntavou, E., Kosmadakis, G., Manolakos, D., Papadakis, G., Papantonis, D.*** Experimental testing of a small-scale two stage Organic Rankine Cycle engine operating at low temperature, (2017) Energy, 141, pp. 869-879.
- ***Lazova, M.; Kaya, A.; Billiet, M.; Lecompte, S.; Manolakos, D.; De Paepe, M.*** Experimental Assessment of a Helical Coil Heat Exchanger Operating at Subcritical and Supercritical Conditions in a Small-Scale Solar Organic Rankine Cycle. (2017) Energies, 10(5), 619;
- ***Kosmadakis, G., Mousmoulis, G., Manolakos, D., Anagnostopoulos, I., Papadakis, G., Papantonis, D.*** Development of Open-Drive Scroll Expander for an Organic Rankine Cycle(ORC) Engine and First Test Results,(2017) Energy Procedia, 129, pp. 371-378.
- ***Kosmadakis, G., Landelle, A., Lazova, M., Manolakos, D., Kaya, A., Huisseune, H., Karavas, C.-S., Tauveron, N., Revellin, R., Haberschill, P., De Paepe, M., Papadakis, G.*** Experimental testing of a low-temperature organic Rankine cycle (ORC) engine coupled with

concentrating PV/thermal collectors: Laboratory and field tests (2016) Energy, 117, pp. 222-236.

- ***Ntavou, E., Kosmadakis, G., Manolakos, D., Papadakis, G., Papantonis, D.*** Experimental evaluation of a multi-skid reverse osmosis unit operating at fluctuating power input. (2016) Desalination, Volume 398, 15 November 2016, Pages 77-8
- ***Kosmadakis, G., Manolakos, D., Papadakis, G.*** Experimental investigation of a low temperature organic Rankine cycle (ORC) engine under variable heat input operating at both subcritical and supercritical conditions (2016) Applied Thermal Engineering, Volume 92, 5 January 2016, Pages 1-7

Books Chapters

Seawater Desalination Conventional and Renewable Energy Processes, Springer Chapter 10: Operating RE/Desalination units

ONGOING & RECENT PROJECT (Last 5 Years)

- ***2016*** Experimental Evaluation of Organic Rankine Cycle. Financed by the Commissariat à l' énergie atomique et aux énergies alternatives (CEA). Project coordinator. Project budget 2,500 €
- ***2020-2023.*** Innovative heat-to-power engine for very low temperature heat recovery applications, Proposal number: 778821, I-EE. Area SME Inst-09-2016-2017. Financing within the action Seal of Excellence of GSRT, Total budget: 1,198,250 €. AUA acts as RTD developer and expertise provider with a budget of 150,000 €.
- ***2017-2022***. Demonstration of dry fermentation and optimization of biogas technology for rural communities in the MENA region. ERANETMED project. Total budget 1,350,000 €. Project partner. Budget for AUA 100,000 €.
- **2020-2024:** Energy Smart Livestock Farming towards Zero Fossil Fuel Consumption. Horizon 2020 project. Project coordinator. Total budget 6,000,000 €. AUA budget 516,000 €.
- **2020-2023:** Strategies and Technologies to Achieve a European Fossil-Energy free agriculture. Horizon 2020 project. Project partner. Total budget 2,000,000 €. AUA budget 175,000 €.
- **2020-2023:** Organic Trilateral Flash Cycle for Efficient Conversion of Solar Heat to Power. HFRI project. Principal investigator. Total budget 164,000 €.
- **2020-2023:** Development of a Heat Engine Based on the Trilateral Flash Cycle (TFC) for Maximisation of Heat to Power Conversion Efficiency of ow Temperature Waste Heat. GSRT-EDK project. Project partner. Total budget 885,000 €. AUA budget 244,300 €
- **2020-2023:** Organic Rankine Cycle fueled with biomass for sustainable heat and power cogeneration in greenhouses. GSRT-EDK project. Project partner. Total budget 286,000 €. AUA budget 80,000 €
- **2020-2023:** Development of optimized ORC technology for waste heat recovery in ships. GSRT-EDK project. Project partner. Total budget 599,515 €. AUA budget 40,000 €.
- **2022-2024:** Installation of green desalination plant at Kimolos island incorporating innovative technology of brine treatment. Project coordinator. Total budget 1,084,256.88 €. AUA budget 1,084,256,88 €.