



Dr. George Papadakis
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Education and academic career

Prof. George Papadakis was born in Chania, Crete, Greece in 1958. He has obtained his Diploma on Agricultural Engineering from the Agricultural University of Athens (AUA) in 1983. He then continued his studies as PhD candidate at AUA in 1984 and he received from AUA his doctoral degree (PhD) on agricultural engineering in 1989. In the following two years (1991-1992) he worked as researcher at the Centre for Renewable Energy Sources in Athens, Greece. Then, from 1993 to 1996, he continued his work as researcher at the Agricultural University of Athens mainly involved in renewable energy projects.

In September 1996 he applied for a University staff position opened at the Dept. of Natural Resources and Agricultural Engineering of the Agricultural University of Athens and after review he was appointed as Assistant Professor (tenure track). Since 2009 he is Full Professor at the same Dept. of AUA on the field of expertise "Renewable Energy Technologies".

Research and publications

Major fields of his research include: Implementation of photovoltaic and hybrid renewable energy systems (and micro-grids) to supply electricity and services to rural and remote areas. Desalination powered by renewable energy technologies. Also he has been investigating experimentally and theoretically organic Rankine thermodynamic cycles for exploiting low grade heat for power production. Other areas of research are biomass for energy such as investigation of energy production technologies utilizing liquid and solid biofuels.

He has published more than 160 papers, (67 papers in refereed journals and books, more than 95 papers in international and national conference proceedings and many other publications such as workshops, reports etc.). His journal papers have received more than **2220 citations** while his *h* (Hirsh) index is **29**, (data from www.scopus.com 1-Nov-2015). See more on publications in Appendix I.

He is member of the Editorial Boards of the following Journals

- Journal of Power and Energy Engineering (www.scirp.org/journal/jpee).
- Journal of Fundamentals of Renewable Energy and Applications, (<http://www.ashdin.com/journals/ifrea/ifrea.aspx>).
- British Journal of Renewable Energy, (<http://measpublishing.co.uk/journals/bjre/>).
- Journal of Agricultural Engineering (JAE), the official journal of the Italian Society of Agricultural Engineering, (<http://www.agroengineering.org/jae/index>).

He has been collaborating with many public and private institutions from more than 35 countries from Europe and internationally in projects funded by the European Union and other international and national organizations. Since 1997 he has been scientific coordinator of more than 28 projects of which 15 international multi partners' research projects that were funded by the European Commission (all competitive projects). The overall projects' budget managed by himself with the AUA as beneficiary has exceeded 5.5 million EURO while the overall budget of the multi partners' projects he has been coordinating has exceeded 17.5 million EURO. See more on projects in Appendix II.

International distinctions

- Awarded the title "CIGR Fellow" at the ASAE annual international meeting/CIGR XVth world congress, 28-31 July 2002, Chicago, Illinois USA, (ASAE: American Society of agricultural Engineers, CIGR: Committee International on Agricultural Engineering).
- Founding fellow of the International Academy of Agricultural and Biological Engineering.

Teaching and Theses supervision

He is teaching courses on, Renewable Energy Technologies, Heat and Mass transport processes, Agricultural Machines, and Hydraulic Machines.

He has supervised 4 PhDs and is currently supervising 3 PhD students. He coordinates a research group at AUA (www.renewables.aua.gr), which includes: 2 faculty members, 5 post-doc researchers, 3 Ph.D. students and 2 other engineers.

University administration experience

He was Vice Rector (Vice President) of AUA responsible for the economic affairs, research and development of the university (a 4 year term, September 2010 - August 2014). Major responsibilities included, management of the yearly budget of the university (as set by the Greek Ministry of Education – about 3.5 million EURO per year), management of the research funding of any source, finding new funds for the university. Major accomplishments include a) the setting up of a project for development appropriate structures for the exploitation of research results of the university, such as the foundation of a tech transfer office (funded by 860 thousands EURO by the municipality of Athens with a duration of two and a half years). Such structures never existed before at AUA; b) negotiation and securing the funding of new educational and research equipment for the university, (with an approved budget of 8.5 million EURO by the prefecture of Attica); c) development of a lifelong training centre and agricultural extension service and the establishment of an innovation and entrepreneurship centre (project financed by the Stavros Niarchos foundation - first phase budget 200000 USD).

Innovation and entrepreneurship

He has recently submitted two disclosure forms for commercial exploitation of two technologies developed by his research group while he is among the founders of a start-up company for the commercial exploitation of the organic Rankine technology.

Appendix I. List of selected publications (since 2005) in refereed journals and books

1. Essam Sh. Mohamed, G. Papadakis, E. Mathioulakis, V. Belessiotis. **The effect of hydraulic energy recovery in a small sea water reverse osmosis desalination system, an experimental and economic evaluation.** Desalination, 184, **2005** : 241-246.
2. D. Manolakos, G. Papadakis, Essam Sh. Mohamed, S. Kyritsis, K. Bouzianas. **Design of an autonomous low-temperature solar Rankine cycle system for reverse osmosis desalination.** Desalination 183, **2005** : 73–80.
3. Essam Sh. Mohamed, G. Papadakis, E. Mathioulakis and V. Belessiotis. **An experimental comparative study of the technical and economic performance of a small reverse osmosis desalination system equipped with a hydraulic energy recovery unit.** Desalination 194, **2006** : 239-250.
4. Manolakos D, Papadakis G, Kyritsis S, Bouzianas K. **Experimental evaluation of an autonomous low temperature solar Rankine cycle system for reverse osmosis desalination.** Desalination 203, **2007** : 366-374.
5. Voulgaraki S.I. and Papadakis G. **Simulation of a greenhouse solar heating system with seasonal storage in Greece.** ACTA HORTICULTURAE **2008**, 801, 757-764.
6. Essam Sh. Mohamed, G. Papadakis, E. Mathioulakis, V. Belessiotis. **A direct coupled photovoltaic seawater reverse osmosis desalination system toward battery based systems—a technical and economical experimental comparative study.** Desalination, Volume 221, Issues 1-3, 1 March **2008**, p. 17-22.
7. D. Manolakos, Essam Sh. Mohamed, I. Karagiannis, G. Papadakis. **Technical and economic comparison between PV-RO system and RO-Solar Rankine system. Case study: Thirasia Island.** Desalination Volume 221, Issues 1-3, 1 March **2008**, p. 37-46.
8. Ioannis Vallios, Theocharis Tsoutsos, George Papadakis. **Design of biomass district heating systems.** Biomass & Bioenergy, Volume 33, Issue 4, April **2009**, Pages 659-678.
9. Manolakos, G. Kosmadakis, S. Kyritsis, G. Papadakis. **On site experimental evaluation of a low temperature solar organic Rankine cycle for RO desalination.** Solar Energy, Volume 83, Issue 5, May **2009**, Pages 646-656.
10. G. Kosmadakis, D. Manolakos, S. Kyritsis, G. Papadakis. **Economic assessment of a two-stage solar organic Rankine cycle for reverse osmosis desalination.** Renewable Energy, Volume 34, Issue 6, June **2009**, Pages 1579-1586.
11. G. Kosmadakis, D. Manolakos, S. Kyritsis, G. Papadakis. **Comparative thermodynamic study of refrigerants for a two stages organic Rankine cycle for RO desalination.** Desalination, 243, **2009** p. 74–94.
12. G. Kosmadakis, D. Manolakos, S. Kyritsis, G. Papadakis. **Simulation of an autonomous, two stages solar organic Rankine cycle system for reverse osmosis desalination.** Desalination and Water Treatment 1 (**2009**) 114–127.
13. Michael Papapetrou, Essam Sh. Mohamed, Dimitris Manolakos, George Papadakis, Vicente J. Subiela, and Baltasar Peñate. **Operating Renewable Energy/Desalination Units,** (Chapter 10 pp 247-272). In, **Seawater Desalination. Conventional and Renewable Energy Processes.** Series: Green Energy and Technology. Cipollina, Andrea; Micale, Giorgio; Rizzuti, Lucio (Eds.). **2009**, XIV, 306 p. 135 illus., Hardcover, ISBN: 978-3-642-01149-8.
14. D. Manolakos, G. Kosmadakis, S. Kyritsis, G. Papadakis. **Identification of Behaviour and Evaluation of Performance of Small Scale, Low Temperature Organic Rankine Cycle Process coupled with RO Desalination Unit.** Energy, Volume 34, Issue 6, June **2009**, Pages 767-774.
15. Tchanche Fankam Bertrand, George Papadakis, Gregory Lambrinos and Antonios Frangoudakis. **Fluid selection for a low-temperature solar organic rankine cycle.** Applied Thermal Engineering, Volume 29, Issues 11-12, August **2009**, Pages 2468-2476.

16. G. Kosmadakis, D. Manolakas, S. Kyritsis, G. Papadakis. **Design of a two stage Organic Rankine Cycle system for reverse osmosis desalination supplied from a steady thermal source.** *Desalination*, Volume 250, Issue 1, 1 January **2010**, Pages 323-328.
17. B.F. Tchanche, Gr. Lambrinos, A. Frangoudakis and G. Papadakis. **Exergy analysis of micro-organic Rankine power cycles for a small scale solar driven reverse osmosis desalination system.** *Applied Energy* 87 (4) (**2010**), pp. 1295–1306.
18. G. Kosmadakis, D. Manolakas, G. Papadakis. **Parametric theoretical study of a two-stage solar organic Rankine cycle for RO desalination.** *Renewable Energy*, Volume 35, Issue 5, May **2010**, Pages 989-996.
19. G. Kosmadakis, D. Manolakas, G. Papadakis. **Simulation and economic analysis of a CPV/Thermal system coupled with an organic Rankine cycle for increased power generation.** *Solar Energy*, Volume 85, Issue 2, February **2011**, Pages 308-324.
20. George Kyriakarakos, Anastasios Dounis, Stelios Rozakis, Konstantinos G. Arvanitis, George Papadakis. **Polygeneration microgrids: A viable solution in remote areas for supplying power, potable water and hydrogen as transportation fuel.** *Applied Energy*, Vol. 88, Issue 12, December **2011**: 4517 - 4526.
21. B.F. Tchanche, Gr. Lambrinos, A. Frangoudakis, G. Papadakis. **Low-grade heat conversion into power using organic Rankine cycles – A review of various applications.** *Renewable & Sustainable Energy Reviews* 15 (**2011**) 3963– 3979.
- A. Balafoutis, S. Fountas, A. Natsis, and G. Papadakis. **Performance and emissions of sunflower, rapeseed and cotton seed oils as fuels in an agricultural tractor engine.** *ISRN Renewable Energy*, Volume 2011 (**2011**), Article ID 531510, 12 pages, doi:10.5402/2011/531510.
22. Kyriakarakos, G., Dounis, A.I., Arvanitis, K.G., Papadakis, G. **A fuzzy logic energy management system for polygeneration microgrids.** *Renewable Energy*, 41, **2012** : 315-327.
23. G. Kyriakarakos, A. Dounis, K.G. Arvanitis, G. Papadakis. **A Fuzzy Cognitive Maps – Petri Nets Energy Management System for Autonomous Polygeneration Microgrids.** *Applied Soft Computing Journal*, **2012**, 12 (12) , pp. 3785-3797.
24. G. Kyriakarakos, D.D. Piromalis, A.I. Dounis, K.G. Arvanitis, G. Papadakis. **Intelligent demand side energy management system for autonomous polygeneration microgrids.** *Applied Energy* **2013**, 103, pp. 39-51.
25. C. Li, G. Kosmadakis, D. Manolakas, E. Stefanakos, G. Papadakis and Y. Goswami. **Performance investigation of concentrating solar collectors coupled with a transcritical organic Rankine cycle for power and seawater desalination co-generation.** *Desalination* **2013**, 318, pp. 107-117.
26. A.T. Balafoutis, E. Papageorgiou, Z. Dikopoulou, S. Fountas, G. Papadakis. **Sunflower oil fuel for diesel engines: Experimental investigation and optimum engine setting evaluation using Multi-Criteria Decision Making approach.** *International Journal of Green Energy* **2014**, 11 (6), pp. 642-673
27. Ioannis Vallios, Theocharis Tsoutsos, George Papadakis. **An applied methodology for assessment of the sustainability of biomass district heating systems.** *International Journal of Sustainable Energy* **2014** forthcoming
28. George Kosmadakis, Dimitris Manolakas, Erika Ntavou, George Papadakis. **Multiple Reverse Osmosis sub-units supplied by unsteady power sources for seawater desalination.** *Desalination and Water Treatment*, **2014** forthcoming
29. Bertrand F. Tchanche, M. Pétrissans, G. Papadakis. **Heat resources and organic Rankine cycle machines.** *Renewable and Sustainable Energy Reviews*. Volume 39, November **2014**, pp. 1185–1199
30. G. Kosmadakis, D. Manolakas, G. Papadakis. **An investigation of design concepts and control strategies of a double-stage expansion solar organic Rankine cycle.** *International Journal of Sustainable Energy* **2015**, 34, (7), pp. 446-467.
31. Evangelos Dimitriou, Essam Sh. Mohamed, George Kyriakarakos, George Papadakis. **Experimental investigation of the performance of a reverse osmosis desalination unit under full and part load operation.** *Desalination and Water Treatment*, **2015**, 53 (12), pp. 3170-3178.
32. Essam Sh. Mohamed, George Papadakis. **Advances of renewable energy powered desalination.** In, *Handbook of Clean Energy Systems*, Jinyue Yan (Editor). **2015**. John Wiley & Sons, 2015, forthcoming
33. George Kyriakarakos, George Papadakis. **Polygeneration microgrids for residential applications.** In, *Handbook of Clean Energy Systems*, Jinyue Yan (Editor). **2015**. John Wiley & Sons, **2015**, forthcoming
34. Anastasios I. Dounis, P. Kofinas, G. Papadakis, C. Alafodimos. **A Direct Adaptive Neural Control for Maximum Power Point Tracking of Photovoltaic System.** *Solar Energy*, **2015**, 115, pp. 145-165.
35. P. Kofinas, A. I. Dounis, G. Papadakis, M.N. Assimakopoulos. **An Intelligent MPPT Controller based on Direct Neural Control for Partially Shaded PV System.** *Energy and Buildings*, **2015**, 90, pp. 51-64.
36. G. Kyriakarakos, D. D. Piromalis, K. G. Arvanitis, A. I. Dounis, G. Papadakis. **On Battery-Less Autonomous Polygeneration Microgrids: Investigation of the Combined Hybrid Capacitors / Hydrogen Alternative.** *Energy Conversion and Management*, **2015**, 91, pp. 405-415
37. Karavas, C.-S., Kyriakarakos, G., Arvanitis, K.G., Papadakis, G. **A multi-agent decentralized energy management system based on distributed intelligence for the design and control of autonomous polygeneration microgrids.** *Energy Conversion and Management*, 2015, 103, pp. 166-179

38. George Kosmadakis, Dimitris Manolakos, George Papadakis. **Experimental investigation of a low-temperature organic Rankine cycle (ORC) engine under variable heat input operating at both subcritical and supercritical conditions.** Applied Thermal Engineering, In Press, Accepted Manuscript, Available online 3 October 2015

Appendix II: Projects and funding

1. 1997-2000. Scientific coordinator of the project funded by the European Commission: **Development and application of a water pumping system for remote areas consisted of photovoltaic modules with inverters integrated onto the modules and a new type of an asynchronous pump motor.** DG XII - DG XVII, INCO-COPERNICUS. Partners from France, Romania, Czech Republic, Bulgaria. European Commission contribution 1450000 EURO, AUA budget 385000 EURO.
2. 1999-2001. Scientific coordinator of the project funded by the European Commission: **Development of an autonomous solar thermally driven distillation system.** DG XII, CRAFT. Partners from United Kingdom, Austria, Germany. European Commission contribution 1000000 EURO, AUA budget 500000 EURO.
3. 2003-2006. Scientific partner in the project funded by the EC: **Photovoltaics Enlargement.** FP5 project; Directorate General for Energy and Transport. Partners from Germany (coordinator), Austria, Bulgaria, Czech Republic, Hungary, Italy, Poland, Portugal, Romania. European Commission contribution 2170000 EURO, AUA budget 188000 EURO.
4. 2003-2007. Scientific partner in the project funded by the European Commission, Directorate Research: **Alternative fuels for industrial gas turbines.** Partners from France (coordinator), Portugal, Spain, Italy, UK, Sweden. European Commission contribution 3500000 EURO, AUA budget 145500 EURO.
5. 2003-2008. Scientific coordinator of the project funded by the European Commission: **Autonomous desalination system concepts for sea water and brackish water in rural areas with renewable energies, (ADIRA).** EU-MEDA-WATER program. Partners from Germany, Egypt, Morocco, Spain, Jordan, Turkey. European Commission contribution 3412000 EURO, AUA budget 450000 EURO.
6. 2004-2006. Scientific coordinator of the project funded by the European Commission: **Development of an autonomous low-temperature solar rankine cycle system for reverse osmosis desalination (RO-SOLAR-RANKINE).** FP6 project, Cooperative research SMEs. Partners from Germany, UK, Spain, Greece. European Commission contribution 1137500 EURO, AUA budget 415000 EURO.
7. 2004-2007. Scientific coordinator of the project funded by the Greek Ministry of Education: **Experimental investigation of the use of non-esterified (crude) vegetable oils in internal combustion engines.** Project budget 80000 EURO, AUA budget 80000 EURO.
8. 2006-2010. Scientific coordinator of the project funded by the European Commission: **Hybrid renewable energy systems for supplying services in rural settlements of Mediterranean partner countries, (HYRESS).** Programme FP6-INCO, Directorate Research. Partners from Germany, Spain, Egypt, Morocco, Tunisia. European Commission contribution 1250000 EURO, AUA budget 390000 EURO.
9. 2007-2008. Scientific partner in the project funded by the Greek Ministry of Development: **Development of a renewable energy polygeneration system to produce electricity, drinkable water and hydrogen.** Project realised with the Greek company Tropical S.A. Project budget 270000 €, AUA budget 107000 €.
10. 2010-2013. Scientific partner in the project funded by the European Commission: **Regional networks for the development of a sustainable market for bioenergy in Europe - Bioregions.** Program ALTENER-Intelligent Energy. Partners from Germany (coordinator), Austria, Bulgaria, Italy, Hungary, Poland, Holland, Denmark. European Commission contribution 1118538 EURO, AUA budget 60492 EURO.
11. 2010-2014. Scientific coordinator of the project funded by the Greek General Secretary of Research and Development (GSRT): **Development and experimental evaluation of an autonomous two-stage solar organic Rankine cycle for reverse osmosis desalination of seawater (Two-stage RO-Rankine).** GSRT contribution 585000 EURO, AUA budget 250000 EURO.
12. 2013-2014. Scientific coordinator of the project funded by the European Commission, (FP7 SMEs): **Improving the Performance of Concentrating PV by Exploiting the Excess Heat through a Low Temperature Supercritical Organic Rankine Cycle.** Partners from Greece, Belgium, Spain, Sweden. European Commission contribution 950000 EURO, AUA budget 340000 EURO.
13. 2012-2015. Scientific coordinator of the project funded by the Greek General Secretary of Research and Development (GSRT): **Direct driven (battery-less) photovoltaic/wind turbine reverse osmosis desalination employing computational intelligence techniques (Smart Desalination).** AUA budget 448898 EURO.
14. Ongoing 2012-2016. Scientific partner in the project funded by the European Commission (TEMPUS): **Solar energy system design using advanced learning aids.** Partners from Spain (co-ordinator), UK, Germany, Italy, Greece, Egypt. European Commission contribution 1090000 EURO, AUA budget 78000 EURO.
15. 2013-2015. Scientific partner of the project funded by the Greek General Secretary of Research and Development (GSRT): **Development of a small-scale low-temperature Supercritical Organic Rankine Cycle engine with optimised scroll expander and evaporator.** GSRT contribution 636896 EURO, AUA budget 222000 EURO.
16. 2015-2016. Scientific coordinator of the project funded through the Centre of Renewable Energy Sources and the European Economic Area – EEA, (3 countries of the European Free Trade Association - Iceland, Liechtenstein and Norway): **Incorporation of Green Technologies in AUA campus.** AUA budget 821072 EURO.

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