

GEORGE MAKRIDES

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FOSS Research Centre for Sustainable Energy
Head of Renewables and Grid integration group
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Personal information

Date of birth 7 October 1979
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Education

2006-2012 **University of Cyprus**
PhD in Electrical and Computer Engineering
University of Cyprus, Department of Electrical and Computer Engineering
FOSS Research Centre for Sustainable Energy

2003-2004 **University of Cambridge**
MPhil in Engineering (Awarded Cambridge University scholarship)
Research Group - Electrical Power & Energy Conversion (EPEC)
First Class Honours

2000-2003 **University of London, Queen Mary**
BEng (Hons) in Electrical & Electronic Engineering
First Class Honours (82% overall mark – top departmental mark)

1991-1998 **Grammar School, Nicosia Cyprus**
School Leaving Certificate (91% average mark)

Academic Honors / Scholarships / Awards

2015 Awarded scholarship for outstanding research profile by the Shacolas Group at the University of Cyprus

2015 Best paper award 42nd IEEE PVSC Conference, USA

2014 Best poster award 29th EU-PVSEC Conference, Netherlands

2009 Best paper award Staffelnstein Conference, Germany

2004 Awarded scholarship for academic excellence by the Cambridge Commonwealth Trust

2003 Award for academic excellence at Queen Mary University of London (top mark)

2003 Award for academic excellence at Queen Mary University of London (top mark)

Employment

- 2005 - to date** **University of Cyprus**
- Head of Renewable and Grid integration group – FOSS Research Centre for Sustainable Energy
 - Research Fellow at the University of Cyprus – FOSS Research Centre for Sustainable Energy
 - Quality manager of the PV Technology Laboratory
- 2004 – 2005** **MTN Cyprus**
- Network administrator & BSS engineer – Responsible for the supervision, development and operation of the Base Station Subsystem and the UTRAN 3G Department of Areeba Cyprus
- Summer internship** **J+A Philippou**
- Electrical engineer – Design of electrical circuits for residences
- Summer internship** **EL+D Christou Electromechanical Services**
- Electrical engineer – Design lighting control systems for residences
- Summer internship** **ITS Networking Ltd**
- Telecommunication engineer – Design of telecommunication cabinets and structured cabling networks

Memberships / Professional License

- Member of International Energy Agency (IEA) Photovoltaic Power Systems (PVPS) Taskforce 13
- Member of the European Commission Energy Smart Grid Work Group 4
- Member of the International Council on Large Electric Systems (CIGRE)
- Member of the European Distributed Energy Resources Laboratories (DERLab)
- Member of the Institution of Engineering and Technology (IET)
- Member of the Cypriot Scientific and Technical Chamber (electrical and electronic engineering)
- Member of Electromechanical Chamber of Cyprus (electrical engineering consultancy and installation, unlimited KVA license)
- Fellow Member of Wolfson College Cambridge University.

Professional Training

- 2017** ACTA Greece, Greece – Measurements of EMF at radio frequencies
- 2014** TUV Cyprus, Cyprus - PV system performance certification according to IEC 62446
- 2012** Conicon Ltd, Cyprus - ISO 9001 and Internal Auditor
- 2007** Thales, France - Spectrum monitoring
- 2005** Alcatel, France - Professional training on UMTS, UTRAN and 3G telephony
- 2005** Alcatel, France - Professional training on 2G GSM networks

Research Interests

My research interests are in the areas renewable energy source (RES) power systems (focal point photovoltaics), grid integration of variable renewable sources, smart grids, machine learning and data-driven analytics.

Research Projects / Grants

Coordination, participation and authoring over 30 research projects funded from research bodies, academic institutions and industry.

The outcome of my independent research activities (projects I have entirely authored and coordinated) is at the moment >€1,500,000 funding for FOSS.

Some of the projects which I have either coordinated, participated and authored are summarised below:

- 2018** ERIGENEIA, “Enabling rising penetration and added value of photovoltaic generation by implementation of advanced storage systems”, funded by the European Regional Development Fund through the Solar Eranet, *UCY Funding - €150,000*; Partners: University of Cyprus, Austrian Institute of Technology, Cybrotech Ltd, Fronius Ltd.
- 2017** AT-SGIREs, “Advanced Teaching and training on Smart grid and Grid Integration of Renewable Energy Systems”, funded by the European Regional Development Fund through the Erasmus+, *UCY Funding - €80,000*; Partners: University of Newcastle, University of Cyprus, Hamburg University of Technology, German Jordanian University, Damascus University, Al-Baath University, Tafila Technical University.
- 2016** INFORPV, “Innovative Forecasting PV Energy Yield Solution for Sustainable Large Scale Deployment”, funded by the European Regional Development Fund through the Solar Eranet, *UCY Funding - €114,000*; Partners: University of Cyprus, Department of Meteorology, Electricity Authority of Cyprus, Decision Makers Ltd, M.G. Lightning Ltd.
- 2016** StoRES, “Promotion of higher penetration of distributed PV through storage for all”, funded by Interreg Mediterranean, *UCY Funding - €1,990,000*; Partners: Aristotle University of Thessaloniki, University of Cyprus, Regional Energy and Environment Agency of Algarve, Municipality of Ussaramanna.
- 2016** GOFLEX, “Generalized Operational FLEXibility for Integrating Renewables in the Distribution Grid”, funded by Horizon 2020- LCE-02-2016 Demonstration of smart grid, *UCY Funding - €1,112,000*; Partners: IBM Research Ireland, Aalborg University, Technische Universitaet Dresden, University of Cyprus, Electricity Authority of Cyprus (EAC), University of Applied Sciences Western Switzerland, L'Energie Sion Région SA. SWW Wunsiedel GmbH.
- 2016** InteGRIDy, “Integrated Smart GRID Cross-Functional Solutions for Optimized Synergetic Energy Distribution, Utilization & Storage Technologies”, funded by Horizon 2020-LCE-02-2016 Demonstration of smart grid, *UCY Funding - €564,000*; Partners: Siemens UK (SIEMENS), Centre for Research & Technology Hellas, University of Cyprus, University of Teesside, Isle of Wight Council, University of Newcastle upon Tyne, “Sapienza” University of Rome, Electricity Authority of Cyprus, Universidade Católica Portuguesa.
- 2015** TwinPV, “Stimulating scientific excellence through twinning in the quest for sustainable energy”, funded by Horizon 2020, *UCY Funding - €1,100,000*; Partners: AIT Austrian Institute of Technology GmbH, Denmark Technical University, University of Cyprus.
- 2015** MEoS, “Meeting of Energy Professional Needs”, funded by Horizon 2020, *UCY Funding - €99,000*; Partners: EnerGia-Da Ltd, Knowledge Transfer Network Ltd, Aristotle University of Thessaloniki, Brunel University, University of Cyprus, Technical University of Cluj-Napoca, Dublin Institute of Technology.
- 2015** IPERMON, “Innovative Performance Monitoring System for Improved Reliability and Optimized Levelized Cost of Electricity”, funded by the European Regional

- Development Fund through the Solar Eranet, *UCY Funding - €100,000*; Partners: University of Cyprus, Gantner Instruments Test & Measurement GmbH.
- 2015** ECO-RED, “European quality COurse system for Renewable Energy Development”, funded by the European Regional Development Fund through the Erasmus+, *UCY Funding - €114,000*; Partners: Hanoi University of Science and Technology, Ho Chi Minh University of Technology, Cantho University, Sapienza University of Rome, University of Cyprus and Jagiellonian University.
- 2015** DIEGO, “Development of quality system through EnerGy Efficiency Courses”, funded by the European Regional Development Fund through the Erasmus+, *UCY Funding - €100,000*; Partners: Sapienza University of Rome, University of Cadiz Spain, Universidad San Carlos de Guatemala Guatemala, Universidad Rafael Landívar de Guatemala Guatemala, Universidad de la República Uruguay, Universidad Nacional De Chilecito Argentina Universidad Nacional Del Sur Argentina, Universidad Nacional De San Luis.
- 2015** SEM SEM, “Smart control systems for energy management”, funded by the European Regional Development Fund through the Erasmus+, *UCY Funding - €90,000*; Partners: Staffordhisre University, University of Oviedo, University of Cyprus, Ain Shams University, Nile university, Helwan University, University of Jordan.
- 2015** PV-EXPERT, “Early and reliable detection of degradation in photovoltaics”, funded by the European Regional Development Fund through the Research Promotion Foundation, *UCY Funding - €100,000*; Partners: University of Cyprus, M.G. Lightning Ltd, Gesolar Cyprus.
- 2015** Grid30, “Analysis of the present and future power system in Cyprus – JRC/PTT/2015/F.3/0019/NC”, funded by the Joint Research Centre (JRC), *UCY Funding - €42,000*; Partners: University of Cyprus, Ministry of Energy, Commerce, Industry and Tourism Cyprus.
- 2015** DESIRE, “Development of higher education teaching modules on the socio-economic impacts of the renewable energy implementation”, funded by the European Regional Development Fund through the Erasmus+, *UCY Funding - €90,000*; Partners: German Jordanian University, University of Jordan, University of Cyprus, Cairo University, Aswan University, Sapienza University, Wuppertal Institute, Technical University of Dresden, Damascus University, Tishreen University.
- 2015** DEM4BIPV, “Development of innovative educational material for building integrated photovoltaics”, funded by the European Regional Development Fund through the Erasmus+, *UCY Funding - €60,000*; Partners: University of Utrecht, University of Cyprus, Deloitte Cyprus, Fachhochschule Technikum Wien, Wirtschaft und Infrastruktur GmbH and Co.
- 2013** SmartPV, “Smart net metering for promotion and cost-efficient grid-integration of PV technology in Cyprus”, funded by the European Regional Development Fund through the Life+, *UCY Funding - €400,000*; Partners: University of Cyprus, Electricity Authority of Cyprus, Cyprus Energy Regulatory Agency, Department of Environment, Deloitte.
- 2013** PV-Degradation, “Reliable assessment of degradation in new thin-film photovoltaic technologies”, funded by the European Regional Development Fund through the Research Promotion Foundation, *UCY Funding - €175,000*; Partners: University of Cyprus, Austrian Institute of Technology, Institut für Photovoltaik, University of Stuttgart, University of Barcelona and Cyprus Energy Regulatory.
- 2013** PV-NET, “Promotion of PV energy through net metering optimization”, funded by the European Regional Development Fund through the cross-border cooperation programme MED, European Commission, *UCY Funding - €1,200,000*; Partners: Andalusian Institute of Technology, Aristotle University of Thessaloniki, University of Maribor, Algarve Regional Energy and Environment Agency, Cyprus Energy Agency, Rhonalpenergie-Environment, University of Cyprus.
- 2013** “Modelling of the degradation and electrical characteristics of novel PV technologies”, funded by the Cyprus Research Promotion Foundation, *UCY Funding - €160,000*; Partners: Institute for Photovoltaics, University of Stuttgart, Centre for Renewable

- Energy Sources (CRES), Conergy (Cyprus) Ltd, Cyprus Energy Agency, University of Cyprus.
- 2013** Q Cells, “Performance evaluation of new PV modules in outdoor conditions”, funded by Hanwha Q Cells, *UCY Funding - €200,000*.
- 2012** Honeywell International, “Evaluation of novel PV technologies based on innovative backsheet materials”, funded by Honeywell Corporation, Specialty Materials, *UCY Funding - €100,000*.
- 2012** MURREE, TEMPUS Project, European Commission “Modernizing undergraduate renewable energy education: EU experience for Jordan”, funded by EC, *UCY Funding - €300,000*.
- 2010** Circadian Solar, “Performance evaluation of CPV modules”, funded by Circadian Solar, *UCY Funding - €50,000*.
- 2009** “Advanced Photovoltaic Research for Improved Technologies”, funded by the Research Promotion Foundation, *UCY Funding - €395,000*; Partners: Institute for Physical Electronics, University of Stuttgart, Germany; Austrian Institute of technology, Austria; Centre for Renewable Energy System Technologies, UK; CRES, Greece, University of Cyprus.
- 2009** “Design, implementation and characterisation of optimised CPV systems for future uptake in regions of high solar irradiance”, funded by Research Promotion Foundation, *UCY Funding - €160,000*; Partners: Inst. for Physical Electronics, University of Stuttgart, Germany; CRES, Greece; Whitfield Solar, UK; Conergy, Cyprus, University of Cyprus.
- 2008** APOLLON, “Multi approach for high efficiency integrated and intelligent concentrating PV modules (systems)”, funded by the EC under the FP7 Large Scale Integrated Project (IP), *UCY Funding - €300,000*; Partners: 15 partners.
- 2008** ORION, “Optimisation of Si solar cells, plastic materials and technologies for the development of more efficient concentration Photovoltaic Systems”, funded by FP7-Research for SMEs, *UCY Funding - €220,000*; Partners: 6 partners.
- 2006** “Characterisation of novel PV systems of improved performance”, funded by the Research Promotion Foundation, *UCY Funding - €218,000*; Partners: Institute for Physical Electronics, University of Stuttgart, University of Cambridge, Cyprus Energy Regulatory Authority; Department of Energy, Electricity Authority of Cyprus; University of Cyprus.
- 2006** “Novel PV modules and systems for improved efficiencies”, funded by INTERREG II3, *UCY Funding - €290,000*, Partners: 5 partners.
- 2005** “Annual energy yield of different PV technologies at three different locations in Europe and Africa”, funded by the German Federal Ministry for the environment and energy; *UCY Funding - €155,000*; Partners: Institute for Physical Electronics, University of Stuttgart, German University of Egypt, University of Cyprus

Course Development and Teaching

Academic courses

- 2016** Smart Grids for Energy Savings (Development of course through the Erasmus+ SEM SEM project)
- 2016** Grid integration of renewables (Development of course through the Erasmus+ SEM SEM project)
- 2016** Mechatronics I (University of Cyprus: MMK226: Μηχατρονική Ι) – Development and instruction of course
- 2014 - 2018** Electronic Circuits I (University of Cyprus: HMMY205: Ηλεκτρονικά Κυκλώματα Ι) – Development and instruction of course
- 2015 - 2018** Building Integrated Photovoltaics – Towards Nearly Zero Energy Buildings (University of Cyprus: HMMY687: Φωτοβολταϊκά Ενσωματωμένα στα Κτίρια – Κτίρια με Σχεδόν Μηδενική Ενεργειακή Κατανάλωση) – Development and instruction of course
- 2014 - 2018** Electronic devices principles and circuit modelling (University of Cyprus: HMMY202: Αρχές Ηλεκτρονικών Στοιχείων και Μοντελοποίηση Κυκλωμάτων) – Instruction of course
- 2013 - 2015** Renewable Energy Sources: Photovoltaics (University of Cyprus: HMMY447: Ανανεώσιμες Πηγές Ενέργειας: Φωτοβολταϊκά) – Development and instruction of course

Laboratories developed and instructed

- PV system design (University of Cyprus)
- Grid-connected PV system installation (University of Cyprus)
- Stand-alone PV system installation (University of Cyprus)
- Steady and quasi-dynamic load flow simulation using Digsilent (University of Cyprus)
- Design of smart grid Home Energy Management System (University of Cyprus)
- Interoperability in smart grids using IoT devices and platforms (University of Cyprus)
- Design and simulation of Nearly Zero Energy Buildings (University of Cyprus)
- Digital System Design (Queen Mary University of London)
- Control Systems (Queen Mary University of London)
- Digital System Design (Cambridge University)

Vocational training courses

Head of the RES Vocational Training and Examination Centre of the University of Cyprus (developed the centre and all process for its approval by the Ministry of Energy and the Human Resources and Development Department of Cyprus).

Vocational Courses

- 2013 - 2019** PV system designer and installer – Development and instruction of course which is certified by the Ministry of Energy and the Human Resource and Development Department
- 2013 - 2018** Verification and inspection of grid connected PV systems according to EN 62446 – Development and instruction of course
- 2015 - 2015** Fundamentals of building integrated PV – Development and instruction of course
- 2015 - 2015** Fundamentals of nearly zero energy buildings – Development and instruction of course

Certified trainer at the Cyprus Productivity Centre:

2013 - 2014 PVTRIN training course for PV installers

2013 - 2019 Certified vocational trainer by the Human Resources and Development Department of Cyprus

Supervision (Graduate and Undergraduate level)

Graduate PhD students

- 2018** Andreas Livera (University of Cyprus)
Research theme: Innovative failure prognosis and diagnosis in PV systems through predictive O&M approaches.
- 2018** Spyros Theocharides (University of Cyprus)
Research theme: Active grid management through accurate day- and hour-ahead renewable production forecasting.
- 2015** Michael Florides (University of Cyprus)
Research theme: Innovative failure detection and modelling in Photovoltaic systems.
- 2015** Venizelos Venizelou (University of Cyprus)
Research theme: Grid integration analysis of increased renewable technologies and electric vehicles in future distribution grids.
- 2015** Nikolas Philippou (University of Cyprus)
Research theme: Smart-grid demand side management modelling
- 2015** Ioannis Koumparou (University of Cyprus)
Research theme: Accurate spatio-temporal forecasting of photovoltaic power production.
- 2013** Mhnas Patsalides (University of Cyprus) [Graduated 2017]
Research theme: Power quality behaviour of the Distribution Network in the presence of Photovoltaic systems.
- 2013** Alexander Phinikarides (University of Cyprus) [Graduated 2017]
Research theme: Novel degradation rate analysis algorithms of different grid-connected PV systems.

Graduate MSc students

- 2018** Marios Kynigos (University of Cyprus)
Research theme: Accurate day- and hour-ahead PV system production forecasting.
- 2016** Spyros Theocharides (University of Cyprus) [Graduated 2016]
Research theme: Development of novel machine learning algorithms for accurate PV production forecasting.
- 2013** Marios Tomazou (University of Cyprus) [Graduated 2013]
Research theme: Novel PV reverse osmosis desalination unit for remote locations.

Undergraduate students

- 2018** Vivian Nikolaou (University of Cyprus)
Final year project: Modelling the University of Cyprus micro grid.
- 2018** Kyriakos Andreou (University of Cyprus)
Final year project: Virtual laboratory environment of a home energy management system in future smart grids.
- 2018** George Konstantinides (University of Cyprus)
Final year project: Optimizing intra-hour-ahead PV production forecasting with extreme machine learning techniques.
- 2016** Michalis Machalekides (University of Cyprus) [Graduated 2016]
Final year project: Hardware photovoltaic (PV) system power production simulation tool.
- 2016** Michaella Masoura (University of Cyprus) [Graduated 2016]
Final year project: Design and optimization of buildings to Nearly Zero Energy Buildings.
- 2016** Nicos Neophytou (University of Cyprus) [Graduated 2016]
Final year project: Development of advanced PV system production forecasting tool.
- 2016** Ioakim Christodoulou (University of Cyprus) [Graduated 2016]
Final year project: Modelling the performance of PV systems.
- 2015** Andreas Livera (University of Cyprus) [Graduated 2015]
Final year project: Electromagnetic field estimation for base station units in Cyprus.
- 2015** Christiana Shimitra (University of Cyprus) [Graduated 2015]

- Final year project: Novel failure detection algorithms for PV monitoring systems.
2015 Kyriakos Pantziaros (University of Cyprus) [Graduated 2015]
- Final year project: Design issues in PV system performance modelling.
2015 George Tsagarides (University of Cyprus) [Graduated 2015]
- Final year project: Failure detection imaging techniques for PV modules.
2014 George Kangas (University of Cyprus) [Graduated 2014]
- Final year project: Design and development of advanced electroluminescence imaging technique.
2014 George Panagi (University of Cyprus) [Graduated 2014]
- Final year project: Feasibility study and potential of PV in Cyprus.
2013 Marios Hrodotou (University of Cyprus) [Graduated 2013]
- Final year project: Feasibility study and design optimization of stand-alone PV systems.
2010 Alexander Phinikarides (University of Cyprus) [Graduated 2010]
- Final year project: The design and implementation of a PV system with data-logging and remote monitoring.

Invited Talks

Over **60 invited talks at research seminars, conferences and workshops**. Some of the main invited talks are listed below:

- 2018 *PV performance measurements and analytical techniques*, Oral Session – Pearl-PV Workshop
- 2018 *PV production forecasting model based on artificial neural networks*, Plenary Session – 33rd European Photovoltaic Solar Energy Conference
- 2017 *Energy performance improvement and thermal operation of crystalline silicon photovoltaic modules designed with innovative packaging components*, Oral Session – 32nd European Photovoltaic Solar Energy Conference
- 2015 *Analysis of the present and future power distribution system in Cyprus*, Invited talk – Ministry of Energy and Joint Research Centre Institute for Energy
- 2007 *Temperature behaviour of different photovoltaic systems installed in Cyprus and German*, Oral Session – 17th Photovoltaic Solar Energy Conference

Organisation of Scientific Meetings

- 2017 Organisation Assistance ETIP SNET /JRC - Smart Grids Energy week / Cyprus
- 2017 Organisation Assistance Energy Day Workshop of the SmartPV project / Cyprus
- 2017 Coordinator SOLARERANET/1215/02 - INFORPV Project / Cyprus
Project meeting / 9 participants / Cyprus
- 2017 Coordinator SOLARERANET3-147 - IPERMON Project / Switzerland
Project meeting / 2 participants / Switzerland
- 2016 PI Framework programme for research, technological development and innovation 2009-2010 of the Research Promotion Foundation - PV-EXPERT Project / Cyprus
Project meeting / 7 participants / Cyprus
- 2016 Organisation Assistance 24th Steering Committee of the European Energy Research Alliance (EERA) Joint Programme (JP) on Smart Grids / Cyprus

Major Collaborations

- Prof. Juergen Werner, PV systems, University of Stuttgart / Institute of Photovoltaics / Germany
- Prof. Wilfried Van Sark, Energy, Utrecht University / Institute of Sustainable Development / Netherlands
- Prof. Grigorios Papagiannis, PV systems, Engineering / Department of Electrical & Computer Engineering / Aristotle University of Thessaloniki / Greece
- Prof. Hubert Fechner, Grid integration, Department Renewable Energy / FH Technikum Wien / Austria
- Dr Joshua Stein, PV performance, Sandia National Laboratories / USA
- Dr Christopher Mayer, Grid integration, Austrian Institute of Technology / Austria
- Dr. Eduardo Fernandez, PV production forecasting, Centre for Advanced Studies in Energy and Environment / Universidad de Jaén / Spain
- Dr. Katuscia Cipri, PV technology, Department of Mechanical Engineering / Sapienza University/ Italy
- Dr Eyal Brill, RES production forecasting, Technology Management / Holon Institute of Technology/ Israel
- Dr Juergen Sutterluti, PV monitoring, Gantner Instruments GmbH / R&D Department / Austria
- Dr Matthias Strobel, PV performance, Hanwha Q Cells GmbH / R&D Department / Germany
- Dr Jeff Bratt, PV performance, Honeywell International / R&D Department / USA

Research Infrastructure design, implementation and operation

2017	Implementation and operation of UCY micro-grid. Setup of equipment and control algorithms at the UCY pilot site
2016	Implementation and operation of residential and commercial storage pilot site at the UCY – PV Technology Laboratory and a prosumer pilot (10 prosumers at a residential feeder)
2014	Implementation and operation of Cypriot prosumer pilot (300 prosumers at 10 feeders) to verify grid integration of PV issues and smart grid functionalities
2010	Implementation and operation of meteorological stations for the Distribution System Operator (DSO) Cyprus (17 stations at different distribution substations)
2006	Implementation of outdoor and indoor testing facility at the UCY – PV Technology Laboratory. Setup of equipment, testing procedures and research test-sets. Official test-site manager for largest PV manufactures (Q Cells, Honeywell, Conergy, etc.)

Reviewer

Journals

- IEEE Journal of Photovoltaics
- Solar Energy
- Renewable Energy
- Progress in Photovoltaics
- Applied Energy
- Sustainable Energy Reviews
- Solar Energy Materials & Solar Cells

Conference

- European Photovoltaics Specialists Conference (EU-PVSEC)
- IEEE Photovoltaic Specialists Conference (PVSC)

Chair Sessions

Chairing Conference Sessions

- European Photovoltaics Specialists Conference (EU-PVSEC)
- IEEE Photovoltaic Specialists Conference (PVSC)

Citation Indices

Google Scholar – 10/2/2019 Total Citations: 1002, h-index: 16, i10-index: 23
Scopus – 10/2/2019 Total Citations: 498, h-index: 11

Research Awards

- [1] A. Livera, M. Theristis, **G. Makrides** and G. E. Georghiou, “On-line failure diagnosis of grid-connected PV systems”, in *NREL PV Reliability Workshop*, 2018.
- [2] A. Phinikarides, **G. Makrides** and G. E. Georghiou, “Estimation of annual performance loss rates of grid-connected photovoltaic systems using time series analysis and validation through indoor testing at standard test conditions”, in *42nd IEEE Photovoltaic Specialists Conference*, 2015, pp 1 - 6.
- [3] A. Kyprianou, A. Phinikarides, **G. Makrides** and G. E. Georghiou, “Robust principal component analysis for computing the degradation rates of different photovoltaic systems”, in *29th European Photovoltaic Solar Energy Conference*, 2014, pp 2939-2942.
- [4] B. Zinßer, M. Ibrahim, **G. Makrides**, H. El-Sherif, E. Hamouda, G. E. Georghiou, M. Schubert, and J. H. Werner, “Mehrertrag durch Nachführung in Deutschland, Zypern und Ägypten”, in *24th Symposium Photovoltaische Solarenergie*, 2009, pp. 1-6.

List of Publications

Publications - Total 97

- Thesis: 3
- Books: 2 (under review)
- Book chapters: 2
- Journals: 18 (1 under review),
- Conferences: 74

Thesis

- [T1] **G. Makrides**, “Performance assessment of different grid-connected PV technologies utilising real outdoor measurements”, University of Cyprus, 2012.
- [T2] **G. Makrides**, “Design and construction of a hardware platform for driving and controlling a brushless doubly fed machine”, Cambridge University, 2004.
- [T3] **G. Makrides**, “Design of a high-speed asynchronous transfer mode switch”, Queen Mary University of London, 2003.

Books

- [B1] **G. Makrides**, A. Phinikarides, M. Hadjipanayi, G. Georghiou “Photovoltaic system technology: An introduction to theory, operation and integration”, Springer (2016). (under review).
- [B2] A. Phinikarides, **G. Makrides**, G. Georghiou “Photovoltaic degradation mechanisms, reliability issues and failure detection monitoring principles”, IET (2016) (under review).

Book Chapters

- [BC1] M. Theristis, **G. Makrides**, G. Georghiou “Energy Yield in PV Systems”, PV Systems Elsevier (2017); pp. 1-32.
- [BC2] **G. Makrides**, B. Zinsser, M. Norton, M. Schubert, G. Georghiou “Important Performance Factors Determining the Assessment of Photovoltaic Technologies”, INTECH (2012), Third Generation Photovoltaics; pp. 201-232.

Journal publications

- [J1] V. Venizelou, **G. Makrides**, M. Patsalides, V. Efthymiou, “Distribution Grid Impacts of Smart Electric Vehicle Charging and Photovoltaic Penetration” *IEEE Transactions on Smart Grid*, (under review).
- [J2] A. Livera, **G. Makrides**, M. Theristis, G. E. Georghiou, “Recent advances in failure diagnosis techniques based on performance data analysis for grid-connected photovoltaic systems” *Renewable Energy*, vol. 133, pp. 126-133, Apr 2019.
- [J3] **G. Makrides**, M. Theristis, J. Bratcher, J. Pratt, G. E. Georghiou, “Five-year performance and reliability analysis of monocrystalline photovoltaic modules with different backsheet materials” *Solar Energy*, vol. 171, pp. 491-499, Sep 2018.
- [J4] V. Venizelou, N. Philippou, **G. Makrides**, M. Hadjipanayi, V. Efthymiou, G. E. Georghiou, “Development of a Dynamic Time-of-Use Tariff Algorithm for Optimized Price-Based Demand Side Management” *Energy*, vol. 142, pp 633–646, Jan 2018.
- [J5] E. Pieri, A. Kyprianou, A. Phinikarides, **G. Makrides**, G. E. Georghiou, “Forecasting degradation rates of different photovoltaic systems using robust principal component analysis and ARIMA” *IET Renewable Power Generation*, pp. 1752-1424, May 2017.
- [J6] M. Hadjipanayi, I. Koumparou, N. Philippou, V. Paraskeva, A. Phinikarides, **G. Makrides**, V. Efthymiou, G. E. Georghiou, “Prospects of Photovoltaics in Southern European regions,” *Renewable Energy*, vol. 92, pp. 58-74, Jul 2016.
- [J7] A. Nikolaidis, I. Koumparou, **G. Makrides**, V. Efthimiou, G.E. Georghiou, C.A. Charalambous, “Reliable integration of a concentrating solar power plant in a small isolated system through an appropriately-sized battery energy storage system,” *IET Renewable Power Generation*, 2015 doi: 10.1049/iet-rpg.2015.0337.
- [J8] A. Kyprianou, A. Phinikarides, **G. Makrides**, G. E. Georghiou, “Definition and computation of the degradation rates of photovoltaic systems of different technologies with robust principal component analysis,” *Journal of Photovoltaics IEEE*, vol. 5, pp. 1698-1705, Nov 2015.
- [J9] A. Phinikarides, **G. Makrides**, M. Schubert, G. E. Georghiou, “Analysis of photovoltaic system performance time series: seasonality and performance loss” *Renewable Energy*, vol. 43, pp. 143-152, Dec 2014.
- [J10] A. Phinikarides, **G. Makrides**, M. Schubert, G. E. Georghiou, “Review of photovoltaic degradation rate methodologies,” *Renewable and Sustainable Energy Reviews*, vol. 43, pp. 143-152, Dec 2014.
- [J11] **G. Makrides**, B. Zinsser, M. Schubert, G. E. Georghiou, “Performance loss rates of different photovoltaic technologies,” *Solar Energy*, vol. 100, pp. 28-42, May 2014.
- [J12] A. Phinikarides, N. Kindyni, **G. Makrides**, G. E. Georghiou, “Review of photovoltaic degradation rates: methodologies and results” *International Journal of Photoenergy*, 2013.
- [J13] **G. Makrides**, B. Zinsser, M. Schubert, G. E. Georghiou, “Energy yield prediction errors and uncertainties of different photovoltaic models,” *Progress in Photovoltaics: Research and Applications*, vol. 21, pp. 500-516, Jun 2013.
- [J14] **G. Makrides**, B. Zinsser, M. Schubert, G. E. Georghiou, “Seasonal Performance Comparison of Different Photovoltaic Technologies Installed in Cyprus and Germany,” *International Journal of Sustainable Energy*, 2012.
- [J15] **G. Makrides**, B. Zinsser, A. Phinikarides, M. Schubert, G. E. Georghiou, “Temperature and thermal annealing effects on different photovoltaic technologies,” *Renewable Energy*, vol. 43, pp. 407-417, Jul 2012.
- [J16] **G. Makrides**, B. Zinsser, M. Norton, G. Georghiou, M. Schubert, J. Werner, “Outdoor Performance Evaluation of Grid-Connected PV technologies in Cyprus,” *Journal of Energy & Power Engineering*, vol. 4, no. 2, pp. 52 – 57, Feb. 2010.
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Academic/Testing Service Laboratory (Certification)

2013-9 Quality Manager of renewable technology research laboratory at the University of Cyprus. Design and implementation of records and procedures according to ISO 17025 for the PV Technology Laboratory Quality Management System.

Consultancy services include: Maximum power characterisation, environmental testing, Electroluminescent imaging and other standardised tests of PV technologies (IEC 61215). Feasibility studies and techno-economic analysis. Power quality measurements.

Technical Reports

Below is a list of selected technical reports I have implemented for both national and international enterprises:

- 1 **G. Makrides**, G. Georghiou “ISO/IEC 17025 Accreditation steps and requirements for the Department of Electronic Communications”, Final Consulting Report submitted to the Department of Electronic Communications, October 2016.
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