Dr P. A. Davies – Aston University – Birmingham – UK

School of Engineering and Applied Science

Coordinator, Sustainable Environment Research Group
http://www1.aston.ac.uk/eas/research/groups/serg/
Associate Dean – Research
p.a.davies@aston.ac.uk
+44 121 204 3724

Publications

Peer reviewed journals

Corresponding author underlined

1. M. Tandon, P. Vasudevan, S. N. Naik and P. A. Davies: Oil-bearing seasonal crops: energy and phytoremediation potential, *International Journal of Energy Sector Management,* in press
2. J. D. Nixon, P. K. Dey and P. A. Davies: An interdisciplinary approach to designing and evaluating a hybrid solar-biomass power plant for India, *International Journal of Energy Sector Management,* in press
3. P. Vasudevan, P. K. Sen, S. N. Singh, P. A. Davies, P. K. Dey and R. F. Berry: Trigeneration using biomass energy for sustainable development, *International Journal of Energy Sector Management,* in press
4. J.D. Nixon, D.G. Wright, P.K. Dey, S.K. Ghosh and P.A. Davies, A comparative assessment of waste incinerators in the UK, *Waste Management,* in press, http://dx.doi.org/10.1016/j.wasman.2013.08.001
5. J.D. Nixon, P.K. Dey, S.K. Ghosh and P.A. Davies: Evaluation of options for energy recovery from municipal solid waste in India using the hierarchical analytical network process, *Energy*, 59, 215-223 (2013).
6. J.D. Nixon, P.K. Dey and P.A. Davies: Design of a novel solar thermal collector using a multi-criteria decision-making methodology, *Journal of Cleaner Production*, 15, 150-159 (2013).
7. O. N. Igobo and P. A. Davies: A high-efficiency solar Rankine engine with isothermal expansion, *International Journal of Low-Carbon Technologies,* 8, 27-33 (2013).
8. A. K. Hossain and P. A. Davies: Pyrolysis liquids and gases as alternative fuels in internal combustion engines - a review, *Renewable & Sustainable Energy Reviews,* 21, 165-189 (2013).
9. T. Y. Qiu, O. N. Igobo and P. A. Davies: DesaLink: solar-powered desalination of brackish groundwater giving high output and high recovery, *Desalination and Water Treatment,* 51, 1279-1289 (2013).
10. A. K. Hossain, R. Thorpe, P. Vasudevan, P. K. Sen, R. E. Critoph and P.A. Davies: Omnigen: Providing electricity, food preparation, cold storage and pure water using a variety of local fuels, *Renewable Energy*, 49, 197-202 (2013).
11. T. Y. Qiu and P. A. Davies: Comparison of configurations for high-recovery inland desalination systems, *Water*, 4, 690-706 (2012).

12. A. K. Hossain and P. A. Davies: Performance, emission and combustion characteristics of an indirect injection (IDI) multi-cylinder compression ignition (CI) engine operating on neat jatropha and karanj oils preheated by jacket water, *Biomass and Bioenergy*, 46, 223-342 (2012).
13. J. D. Nixon, P. K. Dey and P. A. Davies: The feasibility of hybrid solar-biomass power plants in India, *Energy*, 46, 541-554 (2012).
14. G. Lychnos, R. Amdouni and P. A. Davies: Concentrated seawater brines for use in solar-powered desiccant cooling cycles, *RSC Advances*, 2, 7978-7982 (2012).
15. A. K. Hossain, M. Oaudi, S. Siddiqui, Y. Yang, J. Brammer, A. Hornung, M. Kay and P. A. Davies: Experimental investigation of performance, emission and combustion characteristics of an indirect injection multi-cylinder CI engine fuelled by blends of de-inking sludge pyrolysis oil with biodiesel, *Fuel*, 105, 135-142 (2012).
16. G. Lychnos and P. A. Davies: Modelling and experimental verification of a solar-powered liquid desiccant cooling system for greenhouse food production in hot climates, *Energy*, 40, 116-130 (2012).
17. T. Y. Qiu and P. A. Davies: Longitudinal dispersion in spiral wound RO modules and its effect on the performance of batch mode RO operations, *Desalination,* 288, 1-7 (2012).
18. J. D. Nixon and P. A. Davies: Cost-exergy optimization of linear Fresnel reflectors, *Solar Energy,* 86, 147-156 (2012).
19. R.H. Morris, M.I. Newton, P.R. Knowles, M. Bencsik, P. A. Davies, P. Griffin and G. McHale, Analysis of clogging in constructed wetlands using magnetic resonance, *Analyst* 136, 2283-2286 (2011).
20. T. Y. Qiu and P. A. Davies: The scope to improve the efficiency of solar-powered desalination, *Desalination and Water Treatment,* 35, 14-32 (2011).
21. O. P. Toky, D. Riddell-Black, P. J. C. Harris, P. Vasudevan, P. J. C. Harris, P. Vasudevan and P. A. Davies: Biomass production short rotation effluent-irrigated plantations in North-West India, *Journal of Scientific and Industrial Research*, 70, 601-608 (2011).
22. P. A. Davies, R. Srivastava, B. Kaphaliya, A. K. Hossain, O. Ngoye Igobo, and G. Garantziotis: A greenhouse integrating desalination, water saving and rainwater harvesting for use in salt-affected inland regions, *Journal of Scientific and Industrial Research*, 70, 628-633 (2011).
23. P. Vasudevan, A. Thapliyal, P. K. Sen, M. G. Dastidar and P. A. Davies: Buried clay pot irrigation for efficient and controller water delivery, *Journal of Scientific and Industrial Research*, 70, 645-652 (2011).
24. P. K. Sen, P. Vasudevan, S. N. Singh and P. A. Davies: Sustainable rural micro-enterprises through co- and tri-generation: Review of Concepts, *Journal of Scientific and Industrial Research*, 70, 683-687 (2011).
25. A. K. Hossain, R.Thorpe, R. E. Critoph and P. A. Davies: Development of a small-scale trigeneration plant based on a CI engine fuelled by neat non-edible plant oils, *Journal of Scientific and Industrial Research*, 70, 688-693 (2011).
26. P.K. Sen, P. Vasudevan, A. Mudgal, S.N. Singh, S.K. Vyas, P. A. Davies: A small scale Multi-effect Distillation (MED) unit for rural micro enterprises: Part I—design and fabrication, *Desalination*, 279, 15-26 (2011).
27. P. A. Davies: A solar-powered reverse osmosis system for high recovery of freshwater from saline groundwater, *Desalination*, 271, 72-79 (2011).

28. J. D. Nixon, P. K. Dey and P. A. Davies: Which is the best solar thermal collection technology for electricity generation in north-west India? Evaluation of options using the analytical hierarchy process, *Energy,* 35, 5230-5240 (2010).
29. P. A. Davies and A. K. Hossain, Development of an integrated reverse osmosis-greenhouse system driven by solar photovoltaic generators, *Desalination and Water Treatment*, 22, 1-13 (2010).
30. P. Vasudevan, A. Thapliyal, R. K. Srivasta, A. Pandey, M. G. Dastidar and P. A. Davies, Fertigation potential of domestic wastewater for tree plantations, *Journal of Scientific and Industrial Research*, 69, 146-150 (2010).
31. G. Lychnos, J. Fletcher and P. A. Davies, Properties of seawater bitterns with regard to liquid-desiccant cooling, *Desalination,* 250, 172-178 (2010).
32. P. R. Knowles, P. Griffin and P. A. Davies, Complementary methods to investigate the development of clogging within a horizontal sub-surface flow tertiary treatment wetland, *Water Research*, 44, 320-330 (2010).
33. A. K. Hossain and P. A. Davies, Plant oils as fuels for compression ignition engines: a technical review and life-cycle analysis, *Renewable Energy,* 35, 1-13 (2010).
34. P. R. Knowles and P. A. Davies, A method for the in-situ determination of the hydraulic conductivity of gravels as used in constructed wetlands for wastewater treatment, *Desalination and Water Treatment*, 5, 257-266 (2009).
35. P. A. Davies, A. K. Hossain and P. Vasudevan, Stand-alone groundwater desalination system using reverse osmosis combined with a cooled greenhouse for use in arid and semi-arid zones of India, *Desalination and Water Treatment*, 5, 223-234 (2009).
36. A. K. Hossain and P. A. Davies: Small-scale brackish water desalting system combined with greenhouse application for use in remote arid communities, *Desalination and Water Treatment,* 3, 229-235 (2009).
37. P. A. Davies and P. R. Knowles, Seawater bitterns as a source of liquid desiccant for use in solar-cooled greenhouses, *Desalination*, 196(1-3), 266-276 (2006).
38. P. A. Davies and C. Paton, The Seawater Greenhouse: background, theory and current status, *Int. J. Low Carbon Technology*, 1, 173-190 (2006).
39. P. A. Davies, Wave-powered desalination: resource assessment and technology review, *Desalination*, 186(1-3), 97-109 (2005).
40. P. A. Davies, A solar cooling system for greenhouse food production in hot climates, *Solar Energy*, 79(6), 661-668 (2005).
41. P. A. Davies and C. Paton: The Seawater Greenhouse in the United Arab Emirates: thermal modeling and evaluation of design options, *Desalination* 173, 2, 103–111 (2005).
42. P. A. Davies and C. Paton: The Seawater Greenhouse: a case study based on Morocco, *Sustainable Development International*, 2nd Edition, 99-103 (2000). ICG Publishing Ltd.
43. P. A. Davies and A. Luque: Solar thermophotovoltaics: brief review and a new look, *Sol.Energy Mat.Sol.Cells* 33, 11–22 (1994).
44. P. A. Davies: The edge-ray principle of nonimaging optics, *J.Opt.Soc.Am.A.* 11, 1256–1259 (1994).
45. P. A. Davies: Tracking mechanism using equatorial and ecliptic axes, *Solar Energy,* 50, 487–489 (1993).
46. P. A. Davies: Design of single-surface spherical lenses as secondary concentrators for photovoltaic cells, *Pure Appl.Opt.,* 2, 315–324 (1993).

47. P. A. Davies: Methods of choosing sample rays in ray-tracing computations, *Applied Optics,* 31, 7277–7282 (1992).
48. P. A. Davies: Light-trapping lenses for solar cells, *Applied Optics,* 31, 6021–6026 (1992).
49. P. A. Davies, J. C. Miñano, A. Luque, F. López and J. M. Ruiz: Calculations of efficiencies achievable using gallium arsenide and silicon cells mounted in cavities illuminated by single-stage concentration, *Sol.Energy Mat.Sol.Cells,* 26**,** 203–215 (1992).
50. P. A. Davies: Model of removal of immunoglobulins from plasma by extracorporeal immunoadsorption with Sepharose-Protein A, *Int.J.Artificial Organs,* 13, 837–845 (1990).
51. M. Unarska, P. A. Davies , M. P. Esnouf and B. J. Bellhouse: Comparative study of reaction kinetics in membrane and agarose bead affinity systems, *J.Chromatography,* 519, 53–67 (1990).
52. P. A. Davies: Determination of diffusion coefficients of proteins in beaded agarose by gel filtration, *J.Chromatography,* 483, 221–237 (1989).
53. P. A. Davies and B. J. Bellhouse: Permeability of beds of agarose-based particles, *Chemical Engineering Science,* 44, 452–455 (1989).

Conference Papers

1. P. A. Davies: Solar-powered desalination of brackish ground water, 1st Solar Thermal Energy Symposium, Islamabad (Feb. 2013).
2. P. K. Sen, K. Ashutosh, K. Bhuwanesh, Z. Engineer, S. Hegde, P.V. Sen and P. A. Davies: Linear Fresnel Mirror Solar Concentrator with Tracking, 5th BSME International Conference on Thermal Engineering, Dhaka (Dec. 2012).
3. A. K. Hossain and P. A. Davies**:** Combustion and emission characteristics of a typical biodiesel engine operated on waste cooking oil derived biodiesel, SAE 2012 Powertrains, Fuels and Lubricants Meeting, Malmo (Sept 2012).
4. O. N. Igobo and P. A. Davies: A high-efficiency solar Rankine engine with isothermal expansion for use in desalination, Heat Powered Cycles Conference, Alkmaar (Sept 2012).
5. T. Y. Qiu, O. N. Igobo and P. A. Davies: DesaLink: Solar powered desalination of brackish water giving high output and high recovery, Desalination for the Environment: Clean Energy and Water, Barcelona (April 2012).
6. T. Y. Qiu, O. N. Igobo and P. A. Davies: DesaLink – a novel solar thermal RO brackish water desalination system, 1st Int. Conf. on Desalination and Environment: A Water Summit, Abu Dhabi (Oct 2011, poster).
7. T. Y. Qiu and P. A. Davies: Solar-powered reverse osmosis: how efficient can it be? 3rd Oxford Water and Membranes Research Event (September 2010).
8. J. D. Nixon, Z. Engineer, A. K. Hossain and P. A. Davies: A hybrid solar-biomass power plant for India, WREC XI, Abu Dhabi (September 2010).
9. A. K. Hossain, R. Thorpe, P. Vasudevan, P. K. Sen, R. E. Critoph and P. A. Davies: Omnigen: providing electricity, food preparation, cold storage and pure water using a variety of local fuels, WREC XI, Abu Dhabi (September 2010).
10. G. Lychnos, A. K. Hossain and P. A. Davies: A solar-powered liquid desiccant cooling system to adapt crop production to climate change, WREC XI, Abu Dhabi (September 2010).

11. R.H. Morris, M.I. Newton, M. Bencsik, P.R. Knowles, P. A. Davies and P. Griffin, Long term monitoring of constructed wetlands using an NMR sensor, IEEE Sensors Conference, Christchurch (October 2009).
12. A. K. Hossain, P. Vasudevan and P. A. Davies: Small-scale brackish water desalting system combined with greenhouse application for use in remote arid communities, EUROMED 2008, Desalination for Clean Energy and Water, Dead Sea, Jordan (November 2008).
13. P. A. Davies, A. K. Hossain, G. Lychnos and C. Paton: Energy saving and solar electricity in fan-ventilated greenhouses, ISHS International Workshop on Greenhouse Environmental Control. and Crop Production in Semi-Arid Regions, Tucson (October 2008), *Acta Horticulturae,* 797, 95-101 (2008).
14. G. Lychnos and P. A. Davies: A Solar Powered Liquid-Desiccant Cooling System for Greenhouses, ISHS International Workshop on Greenhouse Environmental Control. and Crop Production in Semi-Arid Regions, Tucson (October 2008), *Acta Horticulturae*, 797, 339-346 (2008).
15. J. P. Fletcher, J. A. Drahun, P. A. Davies and P. R. Knowles: The Teaching of Sustainable Development at Aston University, *Engineering Education 2008,* Loughborough (June 2008).
16. P. R. Knowles and P. A. Davies: A method for the in-situ determination of the hydraulic conductivity of gravels, as used in constructed wetlands for wastewater treatment, *2nd Conf. on Small and Decentralized Water and Wastewater Treatment Plants*, Skiathos Island, Greece (May 2008).
17. P. Vasudevan, P. K. Sen and P. A. Davies: Trigeneration for Sustainable Rural Industrialisation, *Proc. Int. Conf. Mechanical Engineering,* December, Dhaka (2007).
18. P. A. Davies, Solar Thermal Cycles Based on Seawater for Large-scale Cooling and Food Production (**Invited presentation**), *World Renewable Energy Congress IX*, 19-25 August, Florence (2006).
19. P. A. Davies, I. Harris and P. R. Knowles, Cooling of Greenhouses using Seawater: a solar-driven liquid-desiccant cycle for greenhouse cooling in hot climates, *International Symposium on Greenhouse Cooling*, April, Almeria (2006).
20. P. A. Davies and P. R. Knowles, Seawater bitterns as a source of liquid desiccant for use in solar-cooled greenhouses, *NATO Advanced Workshop on Solar Desalination for the 21st Century*, February, Hammamet, NATO (2006).
21. P. A. Davies and C. Paton: The Seawater Greenhouse and the Watermaker Condenser, *3rd Int. Heat Powered Cycles Conference, Larnaca, Cyprus* (Oct 2004).
22. P. A. Davies, K. Turner and C. Paton: Potential of the Seawater Greenhouse in Middle Eastern climates, *International Engineering Conference Mutah 2004, Mutah, Jordan*, 523–540 (2004).
23. C. Paton and P. A. Davies: The Seawater Greenhouse for Arid Lands, *Mediterranean Conference on Renewable Energy Sources for Water Production, Santorini,* 163–166 (1996).
24. C. Algora, A. Martí, J. C. Maroto, G. L. Araújo, P. A. Davies, C. Flores and L. Mayet: GaAs concentrator cell for operation inside light-confining cavity, *11th European PV Solar Energy Conf., Montreux* (1992).
25. A. Luque, P. A. Davies, *et al.*: The photovoltaic eye: present status and perspectives, *11th European PV Solar Energy Conf., Montreux ,* 627–631 (1992).
26. P. A. Davies and J. C. Miñano: Combined optics for concentration and light trapping in photovoltaics, *Opt. Mat. Tech. for Energy Efficiency and Solar Energy Conversion XI***,** Edts. Goff, Granqvist and Lampert, 287–298 (1992).

27. A. Luque, J. C. Miñano, P. A. Davies M. J. Terrón, I. Tobías, G. Sala and J. Alonso: Angle-limited cavities for silicon solar cells, *22nd. IEEE PV specialists' conference, Las Vegas,* 99–104 (1991).
28. Luque, G. Sala, J. C. Miñano, P. A. Davies, I. Tobías, J. Alonso, C. Algora, G. L. Araújo, J. M. Ruiz, A. Cuevas, J. Oliván, P. Dunn, G. Rice. J. Knobloch, B. Voss and C. Flores: The photovoltaic eye: a high efficiency converter based on light trapping and spectrum splitting, *10th European PV Solar Energy Conf., Lisbon,* 627–630 (1991).

Patents filed or granted

1. UK Patent Application 1010394.3, *Desalination System* (filed 2010).
2. WO 2011/031822 A1, Controlled discharge ostomy appliance and shield therefor, Inventors Y. Nguyen-DeMary, J. B. Cline, J. Blum, G. Stacey, P. A. Davies, T. Beckett (published 2011).
3. US6723079 and EP-A-1348412: *Ostomy Appliance*, Inventors A. M. Lovatt, P. A. Davies, P. A. Johnson, G. Stacey, I. Ansell, Y. Nguyen-DeMary, J. B. Cline (filed 2003).
4. US6555983*, Positioning apparatus and method,* Inventor P. A. Davies (granted 2003).
5. DE 69924659, Positioniermechanismus, Inventor P. A. Davies (granted 2006).*
6. EP0937961, *Positioning mechanism,* Inventor P. A. Davies (granted 2005).*
7. GB2334593*, Positioning mechanism with flexible members,* Inventor P. A. Davies (granted 2002).*
8. GB2365991*, Optical workstation with aperture for an optical breadboard.* Inventors P. A. Davies, A. Patel, M. Sargeant, B. Watson and T. Wills (granted 2002).
9. US6193226*, Positioning Mechanism,* Inventor P. A. Davies (granted 2001).*
10. GB2345154*, Positioning controller for relative alignment of waveguides for maximum coupling efficiency,* Inventor P. Davies (granted 2000).

* known to be in exploitation

Book chapters

1. P. A. Davies: Designing for Life Cycles, chapter in *Design and Designing: the skills and knowledge of creation,* edts. S. Garner and C. Evans, Berg, 2012.
2. P. R. Knowles and P. A. Davies: A Finite Element Approach to Modelling the Hydrological Regime in Horizontal Subsurface Flow Constructed Wetlands for Wastewater Treatment, chapter of *Water and Nutrient Management in Natural and Constructed Wetlands,* edt. J. Vymazal, Springer, 2010.
3. P. A. Davies and J. C. Miñano: Photovoltaics under concentrated sunlight, chapter of *Solar Electricity* edt. T. Markvart (2nd edition), J. Wiley & Sons, 2000.

Book Translation

1. E. Lorenzo: Solar Electricity, Progensa, 1994. Translated from Spanish to English.

updated June 2013