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Center for Solar Energy Res. & App'ls (GÜNAM)

GÜNAM Management Board
ODAK: Conc. Solar Thermal Research Laboratory
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General Background

Degrees

| | | | |
|--------------|------------------------|--|--------------|
| Assoc. Prof. | Mechanical Engineering | Republic of Turkey's Interuniversity Council | January 2010 |
| Ph.D. | Mechanical Engineering | The University of Texas – Austin | August 2000 |
| M.S. | Mechanical Engineering | The University of Texas – Austin | May 1996 |
| B.S. | Mechanical Engineering | Virginia Tech | May 1992 |

Academic Positions

2015-Present, Professor, Mechanical Engineering, Middle East Technical University (ODTÜ/METU)
2014-2015, Associate Professor, Mechanical Engineering, ODTÜ
2012-2014, Visiting Associate Professor, Mechanical Engineering, METU Northern Cyprus Campus
2011-2012, Associate Professor, Mechanical Engineering, ODTÜ
2003-2010, Assistant Professor, Mechanical Engineering, ODTÜ
2000-2002, Assistant Professor, Environmental Resources Engr, Humboldt State U., California
1994-2000, Teaching and Research Assistant, Mechanical Engineering, The University of Texas-Austin.

Industry Positions

Xenergy, Burlington, MA (1993-1994). Consultant to New England Electric System. Developed demonstration programs for emerging residential heating and cooling technologies. Evaluated residential and industrial Demand Side Management (DSM) programs.

Siv. Ing. Gaute Flatheim, Stavanger, Norway (2 Months, 1992). Exchange Engineering Position. Thermal modeling of solar heated house.

ABB: Gas Turbine Manufacturing, Chester, VA (3 Months, 1992). Summer Engineering Position. Gas turbine manufacturing support

Duke Power Company, Mt. Holly, NC, (1988-1990). Co-op Engineer. Support for fossil fuel power plant maintenance.

Research and Consulting

INSHIP (Jan. 2017-Dec. 2020): Integrating National Research Agendas on Solar Heat for Industrial Processes. This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 731287. The objectives are to 1) create a European Common Research and Innovation Agenda (ECRIA); and 2) coordinating Research and Development (R&D) at Technology Readiness Levels (TRLs) 2-5. GÜNAM-ODAK is leading Tasks on high temperature technologies for metallurgical processes and lime production using solid particle receivers, and contributing to Tasks on low temperature solar technologies and their application to drying processes, and thermal energy storage and heat distribution networks for hybridization and system integration. The project team consists of 11 core partners and 17 research partners across 12 different countries. Total Budget: €2,498,661; GÜNAM-ODAK's Budget: €199,987. *GÜNAM-ODAK PI: Derek BAKER; Researchers: İlker TARI, Özgür BAYER.*

www.inship.eu

GÜNAM-2 (Jul. 2015-Dec. 2017): GÜNAM 2nd Phase – Formation of Global Excellence Center and Interface with Industry. Turkish Ministry of Development Grant 2015K121200. The overall objective is to expand GÜNAM's photovoltaic (PV) research infrastructure and establish Turkey's first dedicated Concentrating Solar Thermal (CST) research laboratory *ODAK* (Odaklanmış Isıl Güneş Enerjisi Araştırma Laboratuvarı). I am contributing to the establishment of *ODAK*, which has a mandate to support Research, Technology Development and Innovation (RTDI) in Solar Thermal Electricity (STE), also called Concentrating Solar Power (CSP) and Solar Heat for Industrial Processes (SHIP). Total Budget: 19,000,000 TL; *ODAK* Budget 4,000,000 TL. *ODAK Implementers: Derek BAKER, Tuba OKUTUCU ÖZYURT, İlker TARI, Almıla YAZICIOĞLU. GÜNAM Director: Raşit TURAN.*

gunam.metu.edu.tr

EU-Expert for the Evaluation of Horizon 2020 Proposals (2014-Continuing): I serve as both an Independent Expert for the evaluation of proposals and as a Rapporteur. As a Rapporteur, I work with Independent Experts to arrive at a consensus for the evaluation of proposals, and then write the Evaluation Summary Reports. Typical project budgets are on the order of 4-5 M€.

ec.europa.eu/programmes/horizon2020

EU-SOLARIS (2012-2016): The European Research Infrastructure for Concentrated Solar Power (CSP); European Union FP7 Grant 312833, CP-CSA_FP7-INFRASTRUCTURES-2012-1. The Objective is to create the legal, financial and management structure for the transnational European Concentrating Solar Thermal (CST) research entity Solaris. The project team consists of 13 research, 1 non-profit industrial association, and 1 government ministry across 9 different countries. Total Budget: €4,448,000; GÜNAM's Budget: €153,220. *GÜNAM PI: Raşit TURAN; Researchers: Derek BAKER, Tuba OKUTUCU ÖZYURT.*

eusolaris.eu

Solar Geothermal Hybrid (SGH) Power Plants (2013-2014): TÜBİTAK (Scientific and Technological Research Council of Turkey) TEYDEP Grant 7120763. The Objective is to install and monitor the performance of parabolic trough collectors at a geothermal power plant in Turkey, and develop software for feasibility and design studies of solar-geothermal hybrid power plants. Total Budget: 650,000 TL; METU's Budget: 25,000 TL. *Consultant: Derek Baker.*

Si Tabanlı Nano-Malzemelerin Geliştirilerek Güneş Gözesi ve Optoelektronik Aygıtlara Uygulanması (2013-2014): TÜBİTAK ARDEB Grant 113F217. The Objective is to seed collaboration between METU GÜNAM and The University of Texas-Austin on photovoltaic research. The project is co-funded by the TÜBİTAK and the US National Science Foundation (NSF). The NSF project is EAGER: Energy Harvesting and Storage for Sustainable and Energy Efficient Buildings of the Future. METU's Budget: 130,000 TL. *METU PI: Raşit Turan; Researchers: Derek Baker; Mehmet Parlak; Husnu Emrah Unalan.*

EU-SFERA User at CIEMAT-PSA (Centro de Investigaciones Energéticas Medioambientales y Tecnológicas-Plataforma Solar de Almería): 9-13 September 2013. The Objective was to visit PSA's Heat Transfer Fluid (HTF) testing facility for Parabolic Trough Collector's (PTC) to support the installation and testing of PTC's for the Solar Geothermal Hybrid Power Plant project listed above and to support the development of a central CST research facility for Turkey. Total Budget: €3,360,000; METU's Budget: €5,000. *PI: Derek Baker; Supported students: Cemil Cihan Özalevli (METU MSc); Süleyman Kazım Sömek (METU BSc); Hakan Kocaman (METU BSc).*

sfera.sollab.eu

Development of Zeolite Based Solar Thermal Powered Adsorption Heat Pump: SAN-TEZ Grant105M244, 2006-2009). Theoretical and experimental investigations into thermal powered adsorption heat pumps. Established outdoor solar thermal collector test facility and performed long-term collector tests. Established solar radiation monitoring station and collected long term data. Budget: 292,106 TL. *PI: Bilgin Kaftanoğlu. Researchers: Derek Baker; Cemil Yamalı. Supported Students: Ahmet Çağlar (PhD), İsmail Solmuş (PhD).*

Completed Graduate Students

19. Loiy Al-Ghussain (MSc 2017, METU NCC SEES). Effects of short and long term storage systems on size determination of renewable energy systems in micro-grids. *Adviser: Onur Taylan; Co-Adviser: Derek Baker.*
18. Evan JOHNSON (MSc 2017, METU ME). Conceptual design and heat transfer investigation of a dense granular flow solar receiver. *Adviser: Derek Baker; Co-Adviser: İlker Tari.*
17. Rahul SINGH (MSc 2017, METU ME). Modelling and Performance Analysis of Linear Fresnel Collector for Process Heat Generation for Ice Cream Factory in Konya. *Adviser: Derek Baker; Co-Adviser: İlker Tari.*
16. Mine KAYA (MSc 2015, METU ME). Numerical comparison and sizing of sensible and latent thermal energy storage for compressed air energy storage. *Adviser: İlker Tari; Co-Adviser: Derek Baker.*
15. Onur ÖZKAN (MSc 2015, METU ME). Design and modeling of a novel rectifier with ceramic hollow fiber membrane contactor for miniaturized absorption cooling devices. *Adviser: Almıla Yazıcıoğlu; Co-Adviser: Derek Baker.*
14. Muhammad Arsalan TARIQ (MSc 2014, METU NCC SEES). Methodology to Size Large Scale Solar PV Installations for Institutions with Unidirectional Metering. *Adviser: Derek Baker.*
13. Tufan AKBA (MSc 2014, METU ME). Demand Based Optimized Sizing of Thermal Storage for Concentrating Solar Power Systems. *Adviser: Almıla Yazıcıoğlu; Co-Adviser: Derek Baker.*
12. Arash KARSHENASS (MSc 2014, METU ME). Modeling and Simulations of Desiccant Cooling Cycles. *Adviser: Cemil Yamalı; Co-adviser: Derek Baker.*
11. Nima BONYADİ (MSc 2014, METU ME). Experimental and Numerical Investigation of Adsorption on Zeolite. *Adviser: Cemil Yamalı; Co-adviser: Derek Baker.*
10. Koray TAŞTANKAYA (MSc 2014, METU ME). Feasibility of Advanced Adiabatic Compressed Air Energy Storage Systems for Wind Energy in Turkey. *Adviser: İlker Tari; Co-Adviser: Derek Baker.*
9. Mesru ALTINOZ (MSc 2013, METU ME). Experimental Investigation of Heat Transfer Characteristics in Micro-Channels. *Adviser: Almıla Yazıcıoğlu; Co-Adviser: Derek Baker.*
8. Can UÇKUN (MSc 2013, METU ME). Modeling and Simulations of Direct Steam Generation in Concentrating Solar Power Plants using Parabolic Trough Collectors. *Adviser: Derek Baker.*
7. Erdem Emre PINAR (MSc 2013, METU ME). Energy Optimal Path Planning of an Unmanned Solar Powered Aircraft. *Adviser: Derek Baker; Co-adviser: Eray Uzgören, METU NCC.*
6. Ahmet CAĞLAR, (PhD 2012, METU ME).. Design and Construction of the Adsorbent Bed of a Thermal Wave Adsorption Cooling Cycle. *Adviser: Cemil Yamalı; Co-adviser: Derek Baker.*
5. Kerim ÇEPNİ (MSc 2011, METU ME).. A Methodology for Designing Tonpiliz-Type Transducers. *Adviser: Derek Baker; Co-Adviser: Mehmet Çalışkan.*
4. Yasemin USTA (MSc 2010, METU ME). Simulations of a Large Scale Solar Thermal Power Plant in Turkey using Concentrating Parabolic Trough Collectors. *Adviser: Derek Baker; Co-Adviser: Bilgin Kaftanoğlu.*
3. Onur TAYLAN (MSc 2010, METU ME). Numerical Modeling and Performance Analysis of Solar-Powered Ideal Adsorption Cooling Systems. *Adviser: Derek Baker; Co-Adviser: Bilgin Kaftanoğlu.*
2. Ertan AĞAR (MSc 2010, METU ME). 2-D Modeling of a Proton Exchange Membrane Fuel Cell. *Adviser: Derek Baker; Co-Adviser: Mehmet Sankır, TOBB ETÜ.*
1. Derviş Emre DEMİROCAK (MSc 2008, METU ME).. Thermodynamic and Economic Analysis of a Solar Thermal Powered Adsorption Cooling System. *Adviser: Derek Baker; Co-Adviser: Bilgin Kaftanoğlu.*

Educational Activities

International Summer/Solar Engineering Program (ISEP): Creator and coordinator. Annually from 2009-2013. A 7-week summer program at METU for upper level undergraduate engineering students from Turkey and the The University of Texas-Austin (UT) focused on emerging clean energy technologies such as fuel cells and concentrating solar power. In total approximately 130 METU and 24 UT students have participated in the program. The program has not only brought many UT students to METU but also enabled several METU ME students to study as exchange students at UT and laid the foundation for the EAGER project with METU and UT described above.

Courses Taught at METU and METU NCC

METU ME Graduate

- ME 514: Advanced Solar Energy Utilization
- ME 537: Advanced Engineering Thermodynamics I
- ME 538: Advanced Engineering Thermodynamics II

METU NCC Sustainable Environment and Energy Systems (SEES) Graduate

- SEES 510: Renewable Energy and Climate Change
- BUS 535: Energy Management

4th Year Technical Elective at METU (ME 4xx) and METU NCC (MECH 4xx)

- ME/MECH 405: Energy Conversion Systems
- ME/MECH 415: Utilization of Geothermal Energy
- ME 476: Second Law Analysis of Engineering Systems
- ME/MECH 478: Introduction to Solar Energy Utilization
- ME 492: Fuel Cell Fundamentals
- ME 496: Design of Renewable Energy Systems

2nd and 3rd Year Core Courses at METU (ME xxx) and METU NCC (MECH xxx, CHME xxx)

- ME/MECH 203: Thermodynamics I
- ME 204: Thermodynamics II
- ME/MECH 311: Heat Transfer
- ME/MECH 312: Thermal Engineering
- CHME 325: Heat Transfer
- ME 351: Thermodynamics of Heat Power

Service Activities

GÜNAM Committees:

2018-2023 Strategic Plan Committee, 2017-Present
Management Board, 2017-Present

Department Committees:

METU ME Erasmus Committee Coordinator, 2014-Present;
METU ME Undergraduate Committee Member, 2003-2012.

University Committees:

METU English Education Committee Member, 2012.

Research Proposal Review:

Network of the European Union, Latin America and the Caribbean Countries on Joint Innovation and Research Activities (ERANet-LAC). eranet-lac.eu
- Scientific Evaluation Committee (2015): Consolidation of evaluation results.
- Evaluator (2015): Initial evaluation of proposals.

Professional and Service Positions:

Publishing Editor, *The International Journal of Thermodynamics* (2012-2014);
Associate Editor-in-Chief, *The International Journal of Thermodynamics* (2008-2011);

Journal Refereeing (Only 2013-2017 Listed):

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| Applied Energy (2016) | International Journal of Sustainable Energy (2014) |
| Energy (2015-2017) | Journal of Energy Engineering (2014, 2016, 2017) |
| Env. Progress & Sustainable Energy (2017) | Journal of Quantitative Spectroscopy and Radiative Transfer (2013 -2014) |
| Experimental Thermal Fluid Science (2014-2015) | Journal of Thermal Science and Technology (2017) |
| Int'l Journal of Energy Research (2014-2017) | Solar Energy (2014, 2017) |
| Int'l Journal of Refrigeration (2013) | Turkish J. of Elec. Engr. & Computer Sci. (2017) |
| Int'l Journal of Renewable Energy Tech. (2015) | |

Awards

Middle East Technical University Performance Award: Awarded based on overall academic performance (research, education and service).

2016: Ranked 3rd out of approximately 48 faculty members in Mechanical Engineering and in the top 10% of all faculty members in the Faculty of Engineering.

Turkish Council of Higher Education (YÖK) Research Performance Award: Awarded based on research performance.

2016: Ranked 5th out of approximately 48 faculty members in Mechanical Engineering
2015: Ranked 4th out of approximately 47 faculty members in Mechanical Engineering

Education

METU Outstanding Educator, 2011-12 (METU's highest and terminal teaching award);
METU Educator of the Year, 2003-4, 2005-6.

Publications

Online Publication Profiles:

- Google Scholar (GS) Profile: [Derek Baker \(METU\)](#) (Most Comprehensive)
ORCID: [0000-0003-4163-1821](#) (Semi selective)
ResearcherID: [H-2021-2015](#) (Most selective: Only SCI-E Journal Articles)

SCI-E Journal Publications (all METU A-Type Journals)

18. Sadati, S.M.S., E. Jahani, O. Taylan, D.K. Baker (In-Press. Accepted 13 Sept. 2017). *Sizing of PV-Wind-Battery Hybrid System for a Mediterranean Island Community Based on Estimated and Measured Meteorological Data*. Journal of Solar Energy Engineering.
17. Bonyadi, N., S. K. Sömek, C. C. Özalevli, D. Baker, I. Tarı (2017). *Numerical analysis of phase change material characteristics used in a thermal energy storage device*. 39(3). Heat Transfer Engineering. doi: [10.1080/01457632.2017.1295741](#)
16. Okoye, C. O., O. Taylan, D. Baker (2016). *Solar energy potentials in strategically located cities in Nigeria: Review, resource assessment and PV system design*. Renewable & Sustainable Energy Reviews. 55C. 550-566. doi: [10.1016/j.rser.2015.10.154](#).
15. Sadati, S. M. S., F. U. Qureshi, D. Baker, (2015). *Energetic and Economic Performance Analyses of Photovoltaic, Parabolic Trough Collector and Wind Energy Systems for Multan, Pakistan*. Renewable & Sustainable Energy Reviews. 47. 844-855. doi: [10.1016/j.rser.2015.03.084](#)
14. Ali, S. M. H., M. J. S. Zuberi, M. A. Tariq, D. Baker, A. Mohiuddin (2015). *A Study to Incorporate Renewable Energy Technologies into the Power Portfolio of Karachi, Pakistan*. Renewable and Sustainable Energy Reviews. 47. 14-22. doi: [10.1016/j.rser.2015.03.009](#)
13. Pehlivanurk, C., Ozkan, O., Baker, D. K. (2014). *Modeling and Simulations of a Micro Solar Power System*. International Journal of Energy Research. 38. 1129-1144. doi: [10.1002/er.3119](#)
12. Caglar, A., Yamali, C., & Baker, D. K. (2013). *Two dimensional transient coupled analysis of a finned tube adsorbent bed for a thermal wave cycle*. International Journal of Thermal Sciences. 73. 58-68. doi: [10.1016/j.ijthermalsci.2013.06.009](#)
11. Yılmazoğlu, M. Z., Durmaz, A., Baker, D. (2012). *Solar Repowering of Soma-A Thermal Power Plant*. Energy Conversion and Management. 64. 232-237. doi: [10.1016/j.enconman.2012.04.019](#)
10. Solmuş, İ, Rees, D. A. S., Yamalı, C, Baker, D. (2012). *A Two-Energy Equation Model for Dynamic Heat and Mass Transfer in an Adsorbent Bed Using Silica Gel/Water Pair*. International Journal of Heat and Mass Transfer. 55. 5275-5288. doi: [10.1016/j.ijheatmasstransfer.2012.05.036](#)
9. Solmuş, İ, Rees, D. A. S., Yamalı, C, Baker, D., Kaftanoğlu, B. (2012). *Numerical Investigation of Coupled Heat and Mass Transfer Inside the Adsorbent Bed of an Adsorption Cooling Unit*. International Journal of Refrigeration. 35. 652-662. doi: [10.1016/j.ijrefrig.2011.12.006](#)
8. Taylan, O, Baker, D., Kaftanoğlu, B. (2012). *COP Trends for Ideal Thermal Wave Adsorption Cooling Cycles with Enhancements*. International Journal of Refrigeration. 35(3) 562-570. doi: [10.1016/j.ijrefrig.2010.07.008](#)
7. Solmuş, İ, Kaftanoğlu, B., Yamalı, C., Baker, D. (2011). *Experimental Investigation of a Natural Zeolite-Water Adsorption Cooling Unit*. Applied Energy. 88(11) 4206-4213. doi: [10.1016/j.apenergy.2011.04.057](#)
6. Baker, D, Açar, E. (2011). *International Summer Engineering Program on Fuel Cells for Undergraduate Engineering Students*. International Journal of Hydrogen Energy. 36(5) 3712-3725. doi: [10.1016/j.ijhydene.2010.12.106](#)
5. Solmuş, İ, Yamalı, C., Kaftanoğlu, B., Baker, D., Çağlar A. (2010). *Adsorption Properties of a Natural Zeolite-Water Pair for use in Adsorption Cooling Cycles*. Applied Energy. 87, 2062-2067. doi: [10.1016/j.apenergy.2009.11.027](#)
4. Baker, D. K. (2008). *Thermodynamic Limits to Thermal Regeneration in Adsorption Cooling Cycles*. International Journal of Refrigeration. 31(1) 55-64. doi: [10.1016/j.ijrefrig.2007.09.001](#)
3. Baker, D. K., Kaftanoğlu, B. (2007) *Predicted Impact of Collector and Zeolite Choice on the Thermodynamic and Economic Performance of a Solar Powered Adsorption Cooling System*. Experimental Heat Transfer journal, 20(2) 103-122. doi: [10.1080/08916150601091407](#)

2. Baker, D. K., Vliet, G. C. (2003) *Identifying and Reducing Scaling Problems in Solar Hot Water Systems*. Journal of Solar Energy Engineering, 125(1) 61-66. doi: [10.1115/1.1528924](https://doi.org/10.1115/1.1528924)
1. Baker, D. K., Vliet, G. C. (2001). *Designing Solar Hot Water Systems for Scaling Environments*, Journal of Solar Energy Engineering. 123(1) 43-47. doi: [10.1115/1.1350564](https://doi.org/10.1115/1.1350564)

Book Chapters (METU A-Type Publishers)

4. Baker, D., Özalevli, C. C., Sömek, S. K. (2015). “Technical Study of a Hybrid Solar-Geothermal Power Plant and its Application to a Thermal Design Course,” *Progress in Clean Energy - Volume 2 Novel Systems and Applications*. Dincer, I., Colpan, C.O., Kizilkan, O., Ezan, M.A. (Eds.). Springer. pp. 887-910. doi: [10.1007/978-3-319-17031-2_58](https://doi.org/10.1007/978-3-319-17031-2_58)
3. Karshenass, A., Baker, D., Yamali, C., Singh, R. (2015). “Technical Analysis of Hybrid Desiccant Cooling in a Mediterranean Climate,” *Progress in Clean Energy - Volume 2 Novel Systems and Applications*. Dincer, I., Colpan, C.O., Kizilkan, O., Ezan, M.A. (Eds.). Springer. pp. 911-928. doi: [10.1007/978-3-319-17031-2_59](https://doi.org/10.1007/978-3-319-17031-2_59)
2. Bilyaz, S., Singh, R., Karshenass, A., D. Baker (2015). “Modeling and Transient Simulations of 30 MW Solar Thermal Electric Power Plants in the Northeast Mediterranean Region,” *Progress in Clean Energy - Volume 2 Novel Systems and Applications*. Dincer, I., Colpan, C.O., Kizilkan, O., Ezan, M.A. (Eds.). Springer. pp. 1099-1114. doi: [10.1007/978-3-319-17031-2_74](https://doi.org/10.1007/978-3-319-17031-2_74)
1. Sankir, M., Semiz, L., Serin, R. B., Sankir, N. D., Baker, D. (2015) “Hydrogen Generation from Chemical Hydrides” *Advanced Materials Book Series: Advanced Catalytic Materials*. Eds: A. Tiwari and S. Titinchi. Wiley-Scrivener Publishing, USA. pp. 145-192. doi: [10.1002/9781118998939.ch5](https://doi.org/10.1002/9781118998939.ch5)

Textbook and Textbook Supplements (METU A-Type Publisher)

3. 김동섭, 김무근, 김영일, 서정세, 신지영 공역 (Schmidt, Ezekoye, Howell, Baker), 2008, 열역학 (Thermodynamics: An Integrated Learning System). Translated and Published by Sigma Publishers, Seoul, Korea; Under Agreement with Wiley, New York.
2. Schmidt, P. S., Ezekoye, O. A., Howell, J. H., and Baker, D. K. (2006). "Thermodynamics: An Integrated Learning System", 512 page textbook. John Wiley, New York.
1. Schmidt, P. S., O. A. Ezekoye, J. Howell, D. K. Baker, 2001, "ThermoNet V1 ", Wiley, New York. 11 chapter online supplement to the following textbooks: Fundamentals of Engineering Thermodynamics, M. Moran and H. Shapiro; Fundamentals of Thermodynamics, R. Sonntag, C. Borgnakke, and G. Van Wylen; Introduction to Engineering Thermodynamics, R. Sonntag and C. Borgnakke.

Other Journal Publications

2. Ekiz, A., Camci, T., Türkmen, I., Sankir, M., Uslu, S., Baker, D. K., Ağar, E. (2011). *Pem Tipi Yakıt Pilleri İçin Çift Kutuplu Akiş*. J. Fac. Eng. Arch. Gazi Univ. 26(3) 591-605.
1. Taylan, O, Baker, D., Kaftanoğlu, B. (2011). *Normalized Thermodynamic Model for Intermittent Energy Systems and Application to Solar-Powered Adsorption Cooling Systems*. International Journal of Thermodynamics. 14(3) 107-115. doi: [10.5541/ijot.289](https://doi.org/10.5541/ijot.289).

Select Refereed Conference Publications

21. Kaya, M., İ. Tarı, D. Baker (2016). “Numerical Comparison And Sizing Of Sensible And Latent Thermal Energy Storage For Compressed Air Energy Storage Systems,” Proceedings of the ASME 2016 International Mechanical Engineering Congress and Exposition (IMECE2016), Nov. 11-17, Phoenix, Arizona, USA
20. Johnson, E., D. Baker, İ. Tarı (2016). “Proposal of a Novel Gravity-Fed, Particle-Filled Solar Receiver,” SolarPACES 2016 (Solar Power and Chemical Energy Systems), Oct. 11-14, Abu Dhabi, United Arab Emirates.
19. Bonyadi, N., S. K. Sömek, C. C. Özalevli, D. Baker, I. Tarı (2015). “Experimental analysis of energy storage device using phase change material integrated with a milk storage system.” Proceedings of 1st Thermal and Fluid Engineering Summer Conference, TFESC, August 9-12, 2015, New York City, USA.
18. Çepni, K., D. K. Baker, M. Çalışkan (2015). “A methodology for designing tonpiliz-type transducers.” Proceedings of 3rd International Conference and Exhibition on Underwater Acoustics (UACE2015), June 21-26, Crete, Greece.

17. Bonyadi, N., S. K. Sömek, C. C. Özalevli, D. Baker, I. Tari (2015). "Numerical analysis of phase change material characteristics used in a thermal energy storage device." Proceedings of ASME-ATI-UIT 2015 Conference on Thermal Energy Systems: Production, Storage, Utilization and the Environment, 17-20 May 2015, Napoli, Italy. ISBN: 978-88-98273-17-1.
16. Özkan, O., A. Yazıcıoğlu, D. Baker (2015). "Modeling of the Rectifier of a Mini Absorption Cooling Device Using Ceramic Hollow Fiber Membranes." Proceedings of ASME-ATI-UIT 2015 Conference on Thermal Energy Systems: Production, Storage, Utilization and the Environment, 17-20 May 2015, Napoli, Italy. ISBN: 978-88-98273-17-1.
15. Kuyumcu, Ö. Ç., O. Serin, C. C. Özalevli, D. K. Baker, S. K. Sömek (2014). "Design and Implementation of the Gümüşköy Hybrid Geothermal and Solar Thermal Power System," 38th GRC (Geothermal Research Council) Annual Meeting & GEA (Geothermal Energy Association) Geothermal Energy Expo, Sept. 28-Oct. 1, 2014, Portland, Oregon, USA.
14. Altinoz , M., A. Guvenc Yazicioglu, D. Baker (2014). "Experimental Investigation of Single-Phase Liquid Flow and Heat Transfer in Multiport Minichannels," ASME 2014 4th Joint US-European Fluids Engineering Division Summer Meeting and 11th International Conference on Nanochannels, Microchannels, and Minichannels, FEDSM2014, August 3-7, 2014, Chicago, Illinois, USA.
13. Usta, Y., Baker, D., Kaftanoğlu, B., (2011). "Modeling and Simulations of a 30 MW_e Solar Electric Generating System Using Parabolic Trough Collectors In Turkey," Proceedings of International Green Energy Conference VI (IGEC VI), Eskisehir, Turkey.
12. Taylan O., D. K Baker, B. Kaftanoğlu (2010). "Adsorbent–Refrigerant Comparison for a Solar Powered Adsorption Cooling System using Seasonal Simulations," Proceedings of Clima 2010, 10th REHVA World Congress, Antalya, Turkey.
11. Güray B. S., D. Baker (2010). "Energy and Exergy Analysis for the Electricity Sector of Turkey," Proceedings of 23rd International Conference on Efficiency, Cost, Optimization, Simulation and Environmental Impact of Energy Systems (ECOS 2010), Lausanne, Switzerland, 2010.
10. Çağlar A., C. Yamalı, D. Baker and B. Kaftanoğlu (2010). "Testing the Thermal Performance of Solar Collectors," Proceedings of 7th International Conference on Heat Transfer, Fluid Mechanics and Thermodynamics (HEFAT 2010), Antalya, Turkey.
9. Taylan O., D. K. Baker, B. Kaftanoğlu (2009). "Parametric Study and Seasonal Simulations of a Solar Powered Adsorption Cooling System," Proceedings of 22nd International Conference on Efficiency, Cost, Optimization, Simulation and Environmental Impact of Energy Systems (ECOS), Parana, Brazil.
8. Baker, D. K. and B. Kaftanoğlu (2008). "Trends In COP for Adsorption Cooling Cycles with Thermal Regeneration and Finite Number Of Beds," Proceedings of ASME Energy Sustainability 2008, Jacksonville, Florida, 10-14 August.
7. Baker, D. K. and B. Kaftanoğlu (2005). "Comparing the Performance of Natural and Synthetic Zeolites in a Solar-Powered Adsorption Cooling System", Proceedings of 4th International Conference on Heat Transfer, Fluid Mechanics, and Thermodynamics (HEFAT05) Cairo, Egypt.
6. Baker, D. K. and G. C. Vliet (2002). "Identifying and Reducing Scaling Problems in Solar Hot Water Systems", Solar 2002 Proceedings, ASME, Reno, Nevada, USA.
5. Baker, D. K., O. A. Ezekoye, P. S. Schmidt, C. M. Jones and Min Liu (2000). "ThermoNet: A Web-Based Learning Resource for Engineering Thermodynamics", Proceedings of American Society for Engineering Education Annual Meeting, St. Louis, Missouri, USA.
4. Baker, D. K., G. C. Vliet and D. F. Lawler (1999). "Comparison of Calcium Carbonate Scaling Rate Models", Proceedings of 1999 National Heat Transfer Conference, ASME, Albuquerque, New Mexico, USA.
3. Baker, D. K., G. C. Vliet and D. F. Lawler (1999). "Experimental Apparatus to Investigate Calcium Carbonate Scale Growth Rates", Proceedings of Mitigation of Heat Exchanger Fouling and Its Economic and Environmental Implications, United Engineering Foundation, Banff, Canada.
2. Vliet, G. C. and D. K. Baker (1998). "Designing Solar Hot Water Systems for Scaling Environments", Proceedings of American Solar Energy Society Annual Conference, Albuquerque, New Mexico, USA.
1. Baker, D. K., G. C. Vliet and D. F. Lawler (1996). "SOLSCALE: Software to Predict Scaling in Solar Domestic Hot Water Systems", Proceedings of American Solar Energy Society Annual Conference, Asheville, North Carolina, USA.

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