

## Prof. Dr. DEREK KEITH BAKER

### Kişisel Bilgiler

İş Telefonu: [+90 312 210 5217](tel:+903122105217)

E-posta: [dbaker@metu.edu.tr](mailto:dbaker@metu.edu.tr)

Web: <https://avesis.metu.edu.tr/dbaker>

### Uluslararası Araştırmacı ID'leri

ScholarID: 3ClkZYIAAAAJ

ORCID: 0000-0003-4163-1821

Publons / Web Of Science ResearcherID: H-2021-2015

ScopusID: 16041579400

Yoksis Araştırmacı ID: 216431

### Eğitim Bilgileri

Doktora, The University of Texas at Austin, Mechanical Engineering, Amerika Birleşik Devletleri 1996 - 2000

Yüksek Lisans, The University of Texas at Austin, Mechanical Engineering, Amerika Birleşik Devletleri 1994 - 1996

Lisans, Virginia Polytechnic Institute and State University, Mechanical Engineering, Amerika Birleşik Devletleri 1987 - 1992

### Yaptığı Tezler

Doktora, An investigation of calcium carbonate scaling rates based on experiments and modeling, The University of Texas At Austin, Mechanical Engineering, 2000

Yüksek Lisans, Software to predict scaling problems in solar hot water systems, The University Of Texas At Austin, Mechanical Engineering, 1996

### Araştırma Alanları

Makina Mühendisliği, Enerji, Güneş Enerjisi, Mühendislik ve Teknoloji

### Akademik Unvanlar / Görevler

Prof. Dr., Orta Doğu Teknik Üniversitesi, Mühendislik Fakültesi, Makina Mühendisliği Bölümü, 2015 - Devam Ediyor

Doç. Dr., Orta Doğu Teknik Üniversitesi, Mühendislik Fakültesi, Makina Mühendisliği Bölümü, 2014 - 2015

Doç. Dr., Orta Doğu Teknik Üniversitesi, Mühendislik Fakültesi, Makina Mühendisliği Bölümü, 2011 - 2012

Yrd. Doç. Dr., Orta Doğu Teknik Üniversitesi, Mühendislik Fakültesi, Makina Mühendisliği Bölümü, 2003 - 2010

Yrd. Doç. Dr., Humboldt State University, Natural Sciences, Environmental Systems Engineering, 2000 - 2003

### Yönetilen Tezler

BAKER D. K., Investigation of Nanostructured Surfaces for Thermophotovoltaic Applications, Yüksek Lisans, E.ENİS(Öğrenci), 2021

BAKER D. K., Investigation of mechanical and thermal properties of sintered bauxite and sand particles as heat transfer and storage media, Yüksek Lisans, Z.UYKUN(Öğrenci), 2021

KAZANÇ ÖZERİNÇ F., BAKER D. K., Tek basınç kademeli jeotermal enerji santralinin biyokütle kaynaklı sco<sub>2</sub> çevrimi ile hibridizasyonu, Yüksek Lisans, B.Mutlu(Öğrenci), 2020

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BAKER D. K., Modelling and transient analysis of a hybrid liquid Desiccant cooling system, Yüksek Lisans, A.KARSHENASS(Öğrenci), 2014

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GÜVENÇ YAZICIOĞLU A., BAKER D. K., Isıl enerji depolamalı parabolik oluklu kolektörlerin modellenmesi, zamana bağlı benzetimi ve parametrik çalışması, Yüksek Lisans, T.Akba(Öğrenci), 2014

BAKER D. K., GÜVENÇ YAZICIOĞLU A., Modelling, transient simulations and parametric studies of parabolic trough collectors with thermal energy storage, Yüksek Lisans, T.AKBA(Öğrenci), 2014

BAKER D. K., Methodology to size large scale solar PV installations for institutions with unidirectional metering, Yüksek Lisans, M.ARSALAN(Öğrenci), 2014

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## SCI, SSCI ve AHCI İndekslerine Giren Dergilerde Yayınlanan Makaleler

- I. **Opportunities and challenges of geothermal energy in Turkey**  
Korucan A., DERİN GÜRE P., Celebi B., BAKER D. K., Vander Velde M.  
Energy for Sustainable Development, cilt.79, 2024 (SCI-Expanded)
- II. **Coupling PCM wallboard utilization with night Ventilation: Energy efficiency and overheating risk in office buildings under climate change impact**  
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ENERGY AND BUILDINGS, cilt.298, 2023 (SCI-Expanded)
- III. **Geometric design of micro scale volumetric receiver using system-level inputs: An application of surrogate-based approach**  
Akba T., BAKER D. K., Mengüç M. P.

- Solar Energy, cilt.262, 2023 (SCI-Expanded)
- IV. **Off-design performance of micro-scale solar Brayton cycle**  
Akba T., BAKER D. K., Mengüç M. P.  
Energy Conversion and Management, cilt.289, 2023 (SCI-Expanded)
- V. **Gradient-based optimization of micro-scale pressurized volumetric receiver geometry and flow rate**  
Akba T., BAKER D. K., Mengüç M. P.  
Renewable Energy, cilt.203, ss.741-752, 2023 (SCI-Expanded)
- VI. **Modeling heat exchangers with an open source DEM-based code for granular flows**  
Johnson E. F., TARI İ., BAKER D. K.  
SOLAR ENERGY, cilt.228, ss.374-386, 2021 (SCI-Expanded)
- VII. **Development and analysis of the novel hybridization of a single-flash geothermal power plant with biomass driven sco<sub>2</sub>-steam rankine combined cycle**  
Mutlu B., BAKER D. K., KAZANÇ ÖZERİNÇ F.  
Entropy, cilt.23, sa.6, 2021 (SCI-Expanded)
- VIII. **Radiative heat transfer in the discrete element method using distance based approximations**  
Johnson E. F., TARI İ., BAKER D. K.  
POWDER TECHNOLOGY, cilt.380, ss.164-182, 2021 (SCI-Expanded)
- IX. **Solar-thermal driven drying technologies for large-scale industrial applications: State of the art, gaps, and opportunities**  
Kamfa I., Fluch J., Bartali R., Baker D.  
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- X. **A Monte Carlo method to solve for radiative effective thermal conductivity for particle beds of various solid fractions and emissivities**  
Johnson E., Tari İ., Baker D.  
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- XI. **Modeling, transient simulations and parametric studies of parabolic trough collectors with thermal energy storage**  
Akba T., Baker D., GÜVENÇ YAZICIOĞLU A.  
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- XII. **An investigation of optimum PV and wind energy system capacities for alternate short and long-term energy storage sizing methodologies**  
Al-Ghussain L., Taylan O., BAKER D. K.  
INTERNATIONAL JOURNAL OF ENERGY RESEARCH, cilt.43, sa.1, ss.204-218, 2019 (SCI-Expanded)
- XIII. **Sizing of Photovoltaic-Wind-Battery Hybrid System for a Mediterranean Island Community Based on Estimated and Measured Meteorological Data**  
Sadati S. M. S., Jahani E., Taylan O., BAKER D. K.  
JOURNAL OF SOLAR ENERGY ENGINEERING-TRANSACTIONS OF THE ASME, cilt.140, sa.1, 2018 (SCI-Expanded)
- XIV. **Technoeconomic and exergy analysis of a solar geothermal hybrid electric power plant using a novel combined cycle**  
Bonyadi N., Johnson E., BAKER D. K.  
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- XV. **Numerical Analysis of Phase Change Material Characteristics Used in a Thermal Energy Storage Device**  
Bonyadi N., Somek S. K., Ozalevli C. C., Baker D., TARI İ.  
HEAT TRANSFER ENGINEERING, cilt.39, sa.3, ss.268-276, 2018 (SCI-Expanded)
- XVI. **Solar energy potentials in strategically located cities in Nigeria: Review, resource assessment and PV system design**  
Okoye C. O., Taylan O., Baker D. K.  
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- XVII. **A study to incorporate renewable energy technologies into the power portfolio of Karachi, Pakistan**  
Ali S. M. H., Zuberi M. J. S., Tariq M. A., BAKER D. K., Mohiuddin A.

- RENEWABLE & SUSTAINABLE ENERGY REVIEWS, cilt.47, ss.14-22, 2015 (SCI-Expanded)
- XVIII. **Energetic and economic performance analyses of photovoltaic, parabolic trough collector and wind energy systems for Multan, Pakistan**  
Sadati S. M. S., Qureshi F. U., BAKER D. K.  
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- XIX. **Modeling and simulations of a micro solar power system**  
Pehlivanurk C., Ozkan O., BAKER D. K.  
INTERNATIONAL JOURNAL OF ENERGY RESEARCH, cilt.38, sa.9, ss.1129-1144, 2014 (SCI-Expanded)
- XX. **Two dimensional transient coupled analysis of a finned tube adsorbent bed for a thermal wave cycle**  
ÇAĞLAR A., Yamali C., BAKER D. K.  
INTERNATIONAL JOURNAL OF THERMAL SCIENCES, cilt.73, ss.58-68, 2013 (SCI-Expanded)
- XXI. **MEASUREMENT OF SOLAR RADIATION IN ANKARA, TURKEY**  
Caglar A., Yamali C., BAKER D. K., KAFTANOĞLU B.  
ISI BILIMI VE TEKNIGI DERGISI-JOURNAL OF THERMAL SCIENCE AND TECHNOLOGY, cilt.33, sa.2, ss.135-142, 2013 (SCI-Expanded)
- XXII. **Solar repowering of Soma-A thermal power plant**  
YILMAZOĞLU M. Z., DURMAZ A., BAKER D. K.  
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- XXIII. **A two-energy equation model for dynamic heat and mass transfer in an adsorbent bed using silica gel/water pair**  
Solmus I., Rees D. A. S., Yamali C., Baker D.  
INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, cilt.55, ss.5275-5288, 2012 (SCI-Expanded)
- XXIV. **COP trends for ideal thermal wave adsorption cooling cycles with enhancements**  
Taylan O., Baker D. K., Kaftanoğlu B.  
INTERNATIONAL JOURNAL OF REFRIGERATION-REVUE INTERNATIONALE DU FROID, cilt.35, sa.3, ss.562-570, 2012 (SCI-Expanded)
- XXV. **Numerical investigation of coupled heat and mass transfer inside the adsorbent bed of an adsorption cooling unit**  
Solmus I., Rees D. A. S., Yamali C., Baker D., KAFTANOĞLU B.  
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- XXVI. **Experimental investigation of a natural zeolite-water adsorption cooling unit**  
Solmus I., KAFTANOĞLU B., Yamali C., Baker D.  
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- XXVII. **MODELING OF BIPOLAR PLATES FOR PROTON EXCHANGE MEMBRANE FUEL CELLS**  
Ekiz A., Camci T., Turkmen I., SANKIR M., USLU S., BAKER D. K., Agar E.  
JOURNAL OF THE FACULTY OF ENGINEERING AND ARCHITECTURE OF GAZI UNIVERSITY, cilt.26, sa.3, ss.591-605, 2011 (SCI-Expanded)
- XXVIII. **International Summer Engineering Program on fuel cells for undergraduate engineering students**  
BAKER D. K., Agar E.  
INTERNATIONAL JOURNAL OF HYDROGEN ENERGY, cilt.36, sa.5, ss.3712-3725, 2011 (SCI-Expanded)
- XXIX. **Adsorption properties of a natural zeolite-water pair for use in adsorption cooling cycles**  
Solmus I., Yamali C., KAFTANOĞLU B., Baker D., Caglar A.  
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- XXX. **Thermodynamic limits to thermal regeneration in adsorption cooling cycles**  
BAKER D. K.  
INTERNATIONAL JOURNAL OF REFRIGERATION-REVUE INTERNATIONALE DU FROID, cilt.31, sa.1, ss.55-64, 2008 (SCI-Expanded)
- XXXI. **Predicted impact of collector and zeolite choice on the thermodynamic and economic performance of a solar-powered adsorption cooling system**  
Baker D. K., Kaftanoglu B.

EXPERIMENTAL HEAT TRANSFER, cilt.20, sa.2, ss.103-122, 2007 (SCI-Expanded)

**XXXII. Identifying and reducing scaling problems in solar hot water systems**

Baker D. K., Vliet G.

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**XXXIII. Designing solar hot water systems for scaling environments**

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JOURNAL OF SOLAR ENERGY ENGINEERING-TRANSACTIONS OF THE ASME, cilt.123, sa.1, ss.43-47, 2001 (SCI-Expanded)

## **Diğer Dergilerde Yayınlanan Makaleler**

**I. Normalized Thermodynamic Model for Intermittent Energy Systems and Application to Solar-Powered Adsorption Cooling Systems**

Taylan O., Baker D. K., Kaftanoglu B.

INTERNATIONAL JOURNAL OF THERMODYNAMICS, cilt.14, sa.3, ss.107-115, 2011 (ESCI)

## **Kitap & Kitap Bölümleri**

**I. Technical Study of a Hybrid Solar-Geothermal Power Plant and its Application to a Thermal Design Course**

BAKER D. K., Özalevli C., Sömek K.

Progress in Clean Energy Volume 2 Novel Systems and Applications, Dincer, I., Colpan, C.O., Kizilkan, O., Ezan, M.A., Editör, Springer, Cham, ss.887-910, 2015

**II. Modeling and Transient Simulations of 30 MW Solar Thermal Electric Power Plants in the Northeast Mediterranean Region**

BİLYAZ S., Singh R., KARSHENASS A., BAKER D. K.

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**III. Technical Analysis of Hybrid Desiccant Cooling in a Mediterranean Climate**

KARSHENASS A., BAKER D. K., YAMALI C., Singh R.

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**IV. Thermodynamics An Integrated Learning System**

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John Wiley & Sons, 2006

## **Hakemli Kongre / Sempozyum Bildiri Kitaplarında Yer Alan Yayınlar**

**I. \_The Investigation of Mechanical and Thermal Properties of Sintered Bauxite and Sand Particles as Heat Transfer and Storage Media**

Uykun Z., TARI İ., BAKER D. K.

27th International Conference on Concentrating Solar Power and Chemical Energy Systems: Solar Power and Chemical Energy Systems, SolarPACES 2021, Virtual, Online, 27 Eylül - 01 Ekim 2021, cilt.2815

**II. A Simulation Tool for Renewable Energy Supported Buildings**

Kuru M., Gökçül F., Ölmez B. B., Eicker U., BAKER D. K., Güğül G. N., Geçer K., Güleç S.

5th International Conference on Building Energy and Environment, COBEE 2022, Montreal, Kanada, 25 - 29 Temmuz 2022, ss.1041-1050

- III. **DESIGN METHODOLOGY OF A CONCENTRATING SOLAR VOLUMETRIC RECEIVER**  
Akba T., BAKER D. K., Mengüç M. P.  
ASME 2023 17th International Conference on Energy Sustainability, ES 2023, Washington, Amerika Birleşik Devletleri, 10 - 12 Temmuz 2023
- IV. **Water Sludge Drying: Modelling of a Solar Thermal Plant for a Solar Vacuum Dryer**  
Bartali R., BAYER Ö., Pınarlı D., Erdoğan S., Bolognese M., BAKER D. K., Praticò L., Crema L.  
EuroSun 2020, 01 Eylül 2020
- V. **Hybridization of a geothermal power plant with biomass driven sCO<sub>2</sub> cycle**  
Mutlu B., BAKER D. K., KAZANÇ ÖZERİNÇ F.  
Eight European Conference on Renewable Energy Systems (ECRES2020), 24 - 25 Ağustos 2020
- VI. **Development of View Factor Correlations for Modeling Thermal Radiation in Solid Particle Solar Receivers Using CFD-DEM**  
johnson e., BAKER D. K., TARI İ.  
SolarPACES2018: Solar Power and Chemical Energy Systems, Morocco, Fas, 2 - 05 Ekim 2018
- VII. **Concentrating Solar Thermal: Global Trends and Opportunities in Turkey**  
BAKER D. K.  
TÜBA-TOBB ETÜ one day Energy Conference, Ankara, Türkiye, 11 Eylül 2017
- VIII. **NUMERICAL COMPARISON AND SIZING OF SENSIBLE AND LATENT THERMAL ENERGY STORAGE FOR COMPRESSED AIR ENERGY STORAGE SYSTEMS**  
Kaya M., TARI İ., BAKER D. K.  
ASME International Mechanical Engineering Congress and Exposition (IMECE2016), Arizona, Amerika Birleşik Devletleri, 11 - 17 Kasım 2016
- IX. **TECHNICAL FEASIBILITY STUDY OF A SOLAR GEOTHERMAL HYBRID ELECTRIC POWER PLANT USING A COMBINED CYCLE**  
bonyadi n., johnson e., BAKER D. K.  
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- X. **Proposal of a Novel Gravity-Fed, Particle-Filled Solar Receiver**  
JOHNSON E., Baker D., TARI İ.  
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- XI. **Study Case of Solar Thermal and Photovoltaic Heat Pump System for Different Cities in Turkey**  
Moia-Pol A., Pujol-Nadal R., Martinez-Moll V., Bonyadi N., Baker D.  
11th ISES EuroSun Conference, Palma, İspanya, 11 - 14 Ekim 2016, ss.762-766
- XII. **Solar Thermal Electricity Overview Activities in Turkey and New METU GÜNAM Laboratory ODAK**  
BAKER D. K.  
INTERNATIONAL WORKSHOP ON SPECIAL TOPICS ON POLYMERIC COMPOSITES, 24 - 26 Şubat 2016
- XIII. **Experimental analysis of energy storage device using phase change material integrated with a milk storage system**  
NIMA B., SOMEK S. K., C CIHAN O., BAKER D. K., TARI İ.  
1st Thermal and Fluid Engineering Summer Conference, TFESC, New-York, Amerika Birleşik Devletleri, 9 - 12 Ağustos 2015
- XIV. **A methodology for designing tonpiz type transducers**  
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- XV. **Numerical Analysis of Phase Change Material Characteristics in a Thermal Energy Storage Heat Exchanger**  
NIMA B., SOMEK S. K., OZALEVLI C. C., BAKER D. K., TARI İ.  
ASME-ATI-UIT 2015 Conference on Thermal Energy Systems: Production, Storage, Utilization and the Environment, Napoli, İtalya, 17 - 20 Mayıs 2015
- XVI. **Modeling of the rectifier of a mini absorption cooling device using ceramic hollow fiber membranes**  
OZKAN O., GÜVENÇ YAZICIOĞLU A., BAKER D. K.

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- XVII. **Numerical analysis of phase change material characteristics used in a thermal energy storage device**  
Bonyadi N., Kazım S., Özalevli C., BAKER D. K., TARI İ.  
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- XVIII. **EXPERIMENTAL INVESTIGATION OF SINGLE-PHASE LIQUID FLOW AND HEAT TRANSFER IN MULTIPORT MINICHANNELS**  
Altinoz M., GÜVENÇ YAZICIOĞLU A., Baker D.  
12th International Conference on Nanochannels, Microchannels and Minichannels (ICNMM), Illinois, Amerika Birleşik Devletleri, 3 - 07 Ağustos 2014
- XIX. **Adsorbent Refrigerant Comparison for a Solar Powered Adsorption Cooling System using Seasonal Simulations**  
TAYLAN O., BAKER D. K., Kaftanoglu B.  
10th REHVA (the Federation of European Heating and Air Conditioning Associations) World Congress (Clima 2010), Antalya, Türkiye, 9 - 12 Mayıs 2010
- XX. **Energy and exergy analysis for the electricity sector of Turkey**  
Guray B. S., BAKER D. K.  
23rd International Conference on Efficiency, Cost, Optimization, Simulation, and Environmental Impact of Energy Systems, ECOS 2010, Lausanne, İsviçre, 14 - 17 Haziran 2010, cilt.3, ss.331-338
- XXI. **Parametric Study and Seasonal Simulations of a Solar Powered Adsorption Cooling System**  
TAYLAN O., BAKER D. K., Kaftanoglu B.  
22nd International Conference on Efficiency, Cost, Optimization, Simulation and Environmental Impact of Energy Systems (ECOS 2009), Foz do Iguaçu, Brezilya, 30 Ağustos - 03 Eylül 2009, ss.833-842
- XXII. **TRENDS IN COP FOR ADSORPTION COOLING CYCLES WITH THERMAL REGENERATION AND FINITE NUMBER OF BEDS**  
BAKER D. K., Kaftanoglu B.  
2nd International Conference on Energy Sustainability, Florida, Amerika Birleşik Devletleri, 10 - 14 Ağustos 2008, ss.601-608
- XXIII. **ThermoNet: Part of an integrated website-textbook system**  
Baker D., Canlidinc A.  
International Conference on Education and Information Systems - Technologies and Application, Florida, Amerika Birleşik Devletleri, 21 - 25 Temmuz 2004, ss.199-204

## Desteklenen Projeler

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Yerci S., Baker D. K., Derin Güre P., UFUK AVRUPA Projesi, A Greek-Turkish Solar Energy Excellence Hub to Advance the European Green Deal, 2023 - 2026

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Baker D. K., Tari I., Okutucu Özyurt H. T., Akata Kurç B., Çulfaz Emecen P. Z., Kurt Z., Erden Topal Y., TAYLAN O., UFUK 2020 Projesi, SolarTwins: Solar Twinning to Create Solar Research Twins, 2020 - 2023

Baker D. K., Kale N., Kazanç Özerinç F., UFUK 2020 Projesi, GEOSMART, 2019 - 2023

Baker D. K., Bial M., Erden Topal Y., Erdil E., Pamukcu M. T., Akçomak I. S., Aydinoğlu A. U., UFUK 2020 Projesi, HORIZON-STE: Implementation of the Initiative for Global Leadership in Solar Thermal Electricity, 2019 - 2022

Baker D. K., Sanchez R., Tari I., UFUK 2020 Projesi, Solar Facilities for the European Research Area - Third Phase, 2019 -

2022

Baker D. K., Bayer Ö., Tarı I., Nitz P., UFUK 2020 Projesi, INSHIP: Integrating National Research Agendas on Solar Heat for Industrial Processes, 2017 - 2021

Turan R., Baker D. K., Okutucu Özyurt H. T., Tarı İ., Güvenç Yazıcıoğlu A., CB Strateji ve Bütçe Başkanlığı (Kalkınma Bakanlığı) Projesi, 2015K121200 - GÜNAM 2. Aşama Global Mükemmeliyet ve Sanayi AraYüzü Oluşturulması, 2015 - 2020

Turan R., Baker D. K., Okutucu Özyurt H. T., AB Çerçeve Programları Destekli Proje, EU-Solaris, The European Solar Research Infrastructure for Concentrated Solar Power, 2012 - 2016

## **Metrikler**

Yayın: 65

Atıf (WoS): 617

Atıf (Scopus): 701

H-İndeks (WoS): 15

H-İndeks (Scopus): 15