

## HASAN OZCAN (ASSOCIATE PROFESSOR)

Yildirim Beyazit University, Engineering Faculty  
Dept of ME, Etlik 06220 Ankara Turkey

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**Profile** : Engineering Scientist with a Ph.D degree and strong quantitative and engineering background  
**Area of Interest** : Sustainable Energy Systems, Integrated energy systems, Thermal systems modeling, Hydrogen production, thermochemical water splitting, Hydrogen economy, Non-electric applications of Nuclear Energy, Turbomachines.

### EDUCATION

**University of Ontario Institute of Technology (UOIT)** – Oshawa, ON

Ph.D, Mechanical Engineering, *Dec 2015*

- Thesis: Experimental and Theoretical Investigations of Magnesium-Chlorine Cycle and its Integrated Systems
- Awarded by Education Ministry of Turkey for Graduate Studies, Ontario Centres of Excellence and Connect Canada

**Karabuk University** – Karabuk, Turkey

M.S., Mechanical Engineering, *July 2011*

- Thesis: Performance Determination of Alternative Refrigerants by Using Exergy Method
- Completed a joint study in two universities in Turkey

**Erciyes University** – Kayseri, Turkey

B.S., Mechanical Engineering, *June 2009*

- Thesis: Efficiency Analysis of a Solar – Driven Ammonia – Water Absorption Cooling System
- Listed in honors students in 3<sup>rd</sup> and 4<sup>th</sup> years.
- Awarded governmental and private scholarships throughout undergrad studies.

**Debrecen University** – Debrecen, Hungary

EU Erasmus Program, *Fall 2007*

- Attended the fall term of the undergraduate studies at the corresponding year.

### EXPERIENCE

**Associate Professor**

**Yildirim Beyazit University**

**from Jan 2019**

Ankara, Turkey

- Supervise undergraduate and graduate courses
- Supervise doctoral and masters students
- Conduct national and international projects
- Advisor for Nuclear Energy Department non-electric applications department at IAEA

**Assistant Professor**

**Karabuk University**

**Jan 2016 – Dec 2018**

Karabuk, Turkey

- Supervise undergraduate and graduate courses
- Supervise doctoral and Masters students
- Conduct national and international projects
- University director of Ministry of National Education Overseas Graduate Scholarships
- Vice director of the Iron and Steel institute

- Courses taught are:
  - Thermodynamics (Undergraduate)
  - Heat Transfer (Undergraduate)
  - Turbomachinery (Undergraduate)
  - Heat Conduction (Graduate)
  - Applied Energy Systems (Graduate)

**Teaching Assistant**

**University of Ontario Institute of Technology**

**Sept 2012 – Dec 2015**

Ontario, Canada

- Prepare course materials and present subject matter to students
- Tutor and assist students in order to reinforce learning concepts
- Prepare and grade assignments, quizzes and exams
- Courses taught as TA are:
  - Introduction to Engineering (ENGR 1015U)
  - Introduction to Programming (ENGR 1200U)
  - Introduction to Energy Systems (ENGR 3260U)
  - Thermodynamics (ENGR 2320U)
  - Fluid Power Systems (MECE 3320U)
  - Quality Control (MANE 4045U)
  - Energy Efficiency, Management & Simulation (ENGR 4540U)

**Graduate Intern, Connect Canada, Ontario Centre of Excellence**

**Mar 2014- Jan 2015**

Ontario, Canada

- Modeling of advanced systems
- Performance assessment and optimization
- System improvement and configuration development
- Conceptual design and final prototyping

**Research Assistant**

**Karabuk University Mechanical Engineering Department**

**Sept. 2009 – April 2012**

Karabuk, Turkey

- Conduct investigation and assessment of Kardemir Iron and Steel Facility's energy deficiencies
- Investigation of Natural Refrigerant mixtures as a substitute for ozone depleting refrigerants

**Design Technician**

**Somcelik Shelf Industries - Research and Development Department**

**June 2008 – July 2009**

Kayseri, Turkey

- Mold design of a fully automatic shelf cutting machine
- Simulation of designed molds to verify their feasibility
- Production of designed and simulated molds

**Visual Designer**

**Somcelik Shelf Industries - Architectural Design Department**

**June. 2006 – Jan 2007**

Kayseri, Turkey

- Design of more flexible products for customer satisfaction
- Preparation of Technical Data Handbook for small scale products of the company
- Technical drawing of customer requested products for laser cutting processes

**SKILLS**

- MATLAB, EES (Engineering Equation Solver), Aspen Plus, RefPROP, Gambit-Fluent
- AutoCAD, Solid Works
- MS Office (Excel, Word, PowerPoint, Visio, Access, Outlook), Windows XP / Vista
- Photoshop, Corel Draw
- Bilingual: English (Fluent) – Turkish (Native)

## PROJECTS

### **Turkish Science and Technology Research Council priority research project (1003), 2019 - 2022**

- Experimental investigations of hydrogen from industrial waste – under review, Role: Researcher (400000 EUR)

### **International Atomic Energy Agency, Coordinated Research Project, 2018-2021**

- Assessing Technical and Economic Aspects of Nuclear Hydrogen Production for Near-Term deployment Role: Researcher (80000 EUR)

### **HydroBase Energy Inc, Ontario Centre of Excellence, Connect Canada, March 2014-September 2014**

- Development of Novel Power generation by Organic Hydro Cycle Using Low Grade Heat. Role: Researcher (30,000\$)

### **Karabuk University Scientific Research Projects, 2011, 2017**

- Experimental Investigations of various propane/isobutene/n-butane mixtures in a water cooled heat pump unit as substitute for R12, R22 and R134a refrigerants. Role: Researcher (\$2,000)
- Thermo-economic Analysis of solar based refrigeration systems for emergency areas, Role: Supervisor (\$2,000)

### **Somcelik Shelf Industries, TUBITAK-SME Development Project, 2008-2009**

- Project member of Mold Design and Production of a fully automated shelf cutting machine. Role: Intern Engineer (\$30,000)

## PUBLICATIONS

### **Peer Reviewed Journal Papers (SCI, SCIE and ESCI)**

1. El-Emam RS, Ozcan H. Comprehensive Review on the Techno-Economics of Sustainable Large-Scale Clean Hydrogen Production. Journal of Cleaner Production. 2019 Feb 10. In press, corrected proof, 2019
2. S. Yosaf, H. Ozcan, Thermo-economic assessment of a solar based ejector absorption cooling system with thermal energy storage: A case study for Al-Jofra city in Libya , Int. J. Exergy, In press, 2019.
3. Yosaf S, Ozcan H. Effect of Ejector Location in Absorption Refrigeration Cycles Using Different Binary Working Fluids. International Journal of Air-Conditioning and Refrigeration. In press, corrected proof, 2019.
4. S. Yosaf, H. Ozcan. Exergoeconomic investigation of flue gas driven ejector absorption power system integrated with PEM electrolyser for hydrogen generation. Energy, Vol 163, pp 88-99, 2018.
5. H. Ozcan, I. Dincer 'Experimental investigation of an improved version of the four-step Magnesium-chlorine cycle', International Journal of Hydrogen Energy, Vol 43, pp. 5808-5819, 2018.
6. H. Ozcan, S. Yosaf, Energy and Exergy Analysis of Advanced Absorption Power Cycles using Salt-Water Mixtures as Working Fluids, Int. J. Exergy, Vol 25, pp. 187-202, 2018.
7. H. Ozcan, I. Dincer 'Energy and exergy analyses of a solar based hydrogen production and compression system', International Journal of Hydrogen Energy, Vol 42, pp. 21414-21428, 2017.
8. H. Ozcan, U.D. Akyavuz 'Thermodynamic and economic assessment of off-grid portable cooling systems with energy storage for emergency areas', Applied Thermal Engineering, Vol 119, pp. 108-118, 2017.
9. H. Ozcan, C. Zamfirescu, I. Dincer, S. Hariri, A.A. Hariri. 'Transient modeling of a gas-liquid piston-cylinder mechanism for low temperature energy conversion applications', International Journal of Thermal Sciences, Vol 111, pp. 525-532, 2017.
10. H. Ozcan, I. Dincer. Exergoeconomic optimization of four-step Magnesium-Chlorine cycle . Int. J Hydrogen Energy, Vol. 42, pp. 2435-2445, 2017.
11. H. Ozcan, I. Dincer. Thermodynamic modeling of a nuclear based integrated system for hydrogen production and liquefaction. Computers & Chemical Engineering, Vol. 90, pp. 234-246, 2016.
12. H. Ozcan, I. Dincer. Modeling of a new four-step magnesium-chlorine cycle with dry HCl capture for more efficient hydrogen production. Int. J Hydrogen Energy, Vol 41; pp 7792-7801, 2016.

13. H. Ozcan, I. Dincer. Comparative performance assessment of three configurations of magnesium-chlorine cycle, *Int. J Hydrogen Energy*, Vol. 41, pp. 845-856, 2016.
14. R.S. El-Emam, H. Ozcan, I. Dincer. Comparative cost evaluation of nuclear hydrogen production methods with the Hydrogen Economy Evaluation Program (HEEP), *Int. J Hydrogen Energy*, Vol 40, pp. 11168-11177, 2015.
15. H. Ozcan, I. Dincer. Thermodynamic and environmental impact assessment of steam methane reforming and magnesium-chlorine cycle based multigeneration systems, *Int. J Energy Research*, Vol. 39(13), pp. 1778-1789, 2015.
16. H. Ozcan, I. Dincer. Performance evaluation of an SOFC based trigeneration system using various gaseous fuels from biomass gasification, *Int. J Hydrogen Energy*, Vol 40, pp. 7798-7807, 2015
17. H. Ozcan, I. Dincer. Energy and exergy analysis of a solar driven Mg-Cl hybrid thermochemical cycle for cogeneration of hydrogen and electricity, *Int. J Hydrogen Energy*, Vol 39, pp. 15330-15341, 2014.
18. H. Ozcan, I. Dincer. Thermodynamic analysis of a combined chemical looping-based trigeneration system. *Energy Conversion and Management*, Vol 85, pp. 477-487, 2014.
19. H. Ozcan, I. Dincer. Performance investigation of magnesium-chloride hybrid thermochemical cycle for hydrogen production, *Int. J. Hydrogen Energy*, Vol 39, pp. 76-85, 2014.
20. T. Menlik, H. Ozcan, E. Arcaklioglu. Second law analysis of an environmentally friendly R290/R600/R600a mixture in a water-cooled heat pump unit, *J. of Thermal Science and Technology*, Vol 34, pp. 19-28, 2014.
21. H. Ozcan, I. Dincer. Thermodynamic analysis of an integrated SOFC, solar ORC and absorption chiller for tri-generation applications. *Fuel Cells*, Vol 13, pp. 781-793, 2013.
22. H. Ozcan, K. Ozdemir, H. Ciloglu. Optimum cost of an air cooling system by using differential evolution and particle swarm algorithms. *Energy and Buildings*, Vol 65, pp. 93-100, 2013
23. R. Polat, H. Ozcan, C. Uysal. Present status of energy use in Karabuk industry (Turkey) and energy conversion potential in its steel production sector. *Scientific Research and Essays*, Vol 6(5), pp. 1028-1033, 2011.

#### Peer Reviewed Journal Papers (National)

24. Özcan H. Thermodynamic analysis of an ice slurry thermal energy storage system for decreased size and cost of HVAC systems. *Pamukkale University Journal of Engineering Sciences*. 2018 Jan 1;24(1).
25. Özcan H. Comparison of particle swarm and differential evolution optimization algorithms considering various benchmark functions. *Politeknik Dergisi*. 2017 Dec 1;20(4):899-905.
26. Ozcan H, Seyitoglu SS. Comparative thermodynamic assessment of various super-and trans-critical working fluids for low temperature power generation applications. *Politeknik Dergisi*. 2017 Dec 1;20(4):915-21.

#### Books/Book Chapters

27. Ozcan H. and Dincer I., Geothermal Energy, in I. Dincer (eds.), *Comprehensive Energy Systems*, Elsevier, Vol. 1, Part B, pp. 702-732, 2018.
28. Ozcan H. and Dincer I., Energetic and Exergetic Performance Comparisons of Various Flow Sheet Options of Magnesium-Chlorine Cycle, in F. Aloui, I. Dincer (eds.), *Exergy for A Better Environment and Improved Sustainability*, Volume 1, - Fundamentals, Springer Nature, pp. 1191-1206, 2018.
29. H. Ozcan, I. Dincer. Thermodynamic Analysis of a Solar Driven Tri-Generation System For Building Applications, *Progress in Exergy, Energy, and the Environment* (Eds Dincer et al.), pp. 169-180, Springer, Switzerland, 2014
30. H. Ozcan, R.S. El-Emam, I. Dincer. Comparative Assessment of Nuclear Based Hybrid Sulfur Cycle and High Temperature Steam Electrolysis Systems using HEEP, *Progress in Sustainable Energy Technologies-Volume I* (Eds Dincer et al.), pp. 165-181, Springer, India 2014.
31. Ozcan H. and Dincer I., Exergy Analysis and Environmental Impact Assessment of Solar-Driven Heat Pump Drying Systems, in *Causes, Impacts and Solutions to Global Warming* (Eds. Dincer et al.), pp. 839-858, Springer, New York, 2013.

#### International Conference Papers and Presentations

32. S. Yosaf, H. Ozcan. Thermo-economic assessment of a solar based ejector absorption cooling system with thermal energy storage: a case study for al-jofra city in Libya. Global Conference on Global Warming, Izmir, Turkey, 2018.
33. U.D. Akyavuz, H. Ozcan, Alternative Energy and Fossil Fuel Energy in Off-grid Mobile Cooling Systems Int. Conf. on Energy Systems Engineering, Karabuk, Turkey, Nov 2017
34. R.S. El-Emam, H. Ozcan, Life Cycle Assessment of Municipal Solid Waste in Dakahlia – Egypt, Int. Conf. on Energy Systems Engineering, Karabuk, Turkey, Nov 2017.
35. S. Yosaf, H. Ozcan, Energy and Exergy Analysis of Novel Ejector-Absorption Refrigeration Cycle Int. Conf. on Energy Systems Engineering, Karabuk, Turkey, Nov 2017.
36. L.S. Coelho, H. Ozcan, M.K. Ozdemir, Thermo-economic optimization of an air-cooling plant using various evolutionary algorithms, Int. Conf. on Energy Systems Engineering, Karabuk, Turkey, Nov 2017.
37. A. Ibrahim, H. Ozcan, Thermodynamic analysis of geothermal based trigeneration system, 6th Int. Adv. Tech. Symposium, Elazig, Turkey, Oct. 2017, pp 1862-69.
38. C. Uysal, H. Ozcan, H. Caliskan, H.-Y. Kwak, H. Kurt, H. Hong, The Effect of Evaporator Effectiveness on Unit Exergy Cost of Electricity Generated by an Organic Rankine Cycle, 2017 SAREK Annual Conference, Seoul, Republic of Korea, 21-23 June 2017.
39. H. Ozcan, I. Dincer. Experimental investigation of MgOHCl hydrochlorination for decreased power consumption of the four-step Magnesium-Chlorine Cycle. 9th International Exergy Energy and Environment Symposium (IEEES9), Split- Croatia, May 14-17, 2017.
40. H. Özcan, M. Tekir, Thermodynamic Analyses and Comparison of Various Geothermal Power Plant Configurations, 3rd International Conference on Engineering and Natural Sciences, Budapest, Hungary, 3-7 May 2017.
41. H. Ozcan, U.D. Akyavuz, "Comparative analysis of two mobile cooling systems with solar source and energy storage in off-grid areas" 2nd International Hydrogen Technologies Congress, 15-18 March 2017, Adana, Turkey.
42. H. Ozcan, U.D. Akyavuz, "Thermodynamic Assessment of an Off-Grid Portable Cooling System for Emergency Regions" 2nd International Conference on Energy Systems (ICES16), pp.31-36, 21-23 December 2016, Istanbul, Turkey.
43. H. Ozcan, I. Dincer. Energy and Exergy Analyses of a Solar Based Hydrogen Production and Compression System, 8th International Exergy, Energy and Environment Symposium, pp. 465-477, 1-4 May 2016, Antalya, Turkey.
44. H. Ozcan, I. Dincer. The four-step Magnesium Chlorine cycle with dry HCl capture for decreased electrical work consumption, 6th International Conference on Hydrogen Production, pp. 913-921, 3-6 May 2015, Oshawa, Canada.
45. H. Ozcan, I. Dincer. Energetic and Exergetic Performance Comparisons of Various Flowsheet Options of Magnesium-Chlorine Cycle, 7th International Energy, Exergy, and Environment Symposium, 27-30 April 2015, Valenciennes, France.
46. R.S. El-Emam, H. Ozcan, I. Dincer. Cost assessment of nuclear hydrogen production systems using HEEP. 7th International Ege Energy Symposium & Exhibition, 18-20 June 2014, pp. 363-379, Usak, Turkey.
47. H. Ozcan, I. Dincer. Efficiency comparison of an internal reforming SOFC based trigeneration system using various gaseous fuel types, International Conference on Clean Energy, pp.614-624 8-12 July 2014. Istanbul, Turkey.
48. H. Ozcan, I. Dincer. Comparative exergy based environmental impact assessment of two integrated renewable energy based systems for multigeneration, Global Conference on Global Warming, pp. 25-29, 25-29 May 2014. Beijing, China.
49. H. Ozcan. Experimental and theoretical investigations of magnesium-chloride cycle and its integrated systems. Global conference on Global Warming, Young scholar session, 28 May 2014, Beijing, China.
50. H. Ozcan, I. Dincer. Performance assessment of a solar driven Mg-Cl hybrid thermochemical cycle for co-production of power and hydrogen, 5th International Conference on Hydrogen Production, pp.65-67, 2-5 February 2014, pp. 65. Fukuoka, Japan.
51. H. Ozcan, I. Dincer. Thermodynamic Analysis of a Solar Driven Tri-Generation System For Building Applications, 6th International Energy, Exergy, and Environment Symposium, pp. 225-236, 1-4 July 2013, Rize, Turkey.
52. H. Ozcan, E. Arcaklioglu. Utilization of Hydrocarbons as Alternative Environmentally Friendly Refrigerants. 6th International Advanced Technologies Symposium, pp. 66-71. 16-18 May 2011, Elazig, Turkey. In Turkish.

### Invited Talks/Speeches

- H. Ozcan. Environmental and Economic Aspects of Large Scale Clean Hydrogen Production. Technical Meeting on the Deployment of Non-Electric Applications Using Nuclear Energy for Climate Change Mitigation, IAEA Vienna, Austria 16-18 April 2018
- Hasan Ozcan, Feasibility of nuclear hydrogen transportation via blue stream pipeline in Turkey, IAEA's Technical Meeting to Examine the Role of Nuclear Hydrogen Production in the Context of the Hydrogen Economy, 17-19 July, 2017, International Atomic energy Agency, Vienna, Austria.
- Hasan Ozcan, A Nuclear Energy Based Hydrogen and Power Production Plant with Hydrogen Storage, IAEA's Technical Meeting on The Socio-Economic Aspects of Nuclear Cogeneration, 21-23 Nov, 2016, Vienna, Austria.
- Hasan Ozcan, Dusuk sicaklikli enerji kaynaklarini kullanarak elektrik ureten yeni bir gaz-sivi enerji donusum sistemi, I. Ulusal Yenilenebilir Enerji ve Ekserji Calistayi, Gaziantep Universitesi, 2 Haziran 2016.
- H. Ozcan. Experimental and theoretical investigations of magnesium-chloride cycle and its integrated systems. Global conference on Global Warming, Young scholar session, 28 May 2014, Beijing, China.

### Editorial Board / Committee Member

- International Conference on Energy Systems Engineering (ICESE18), 2018 Karabuk, Turkey
- 10th International Conference on Numerical Analysis in Engineering, 2017 Banda Aceh, Indonesia
- International Conference on Hydrogen Production (ICH2P15), 2015 Oshawa, Canada

### Referee/ Reviewer

- Biofuels
- Energy Conversion and Management
- Energy
- Entropy
- Applied Energy
- Journal of Power Sources
- Heat Transfer – Asian Research
- International Journal of Energy Research
- International Journal of Exergy
- International Journal of Green Energy
- International Journal of Hydrogen Energy
- Renewable Energy

## SUPERVISED GRADUATE STUDIES

### MSc

**Ümit Deniz Akyavuz.** Thermo-economic Analysis of Solar-based Portable cooling systems for Emergency Regions, January 2017. YOKTEZ Thesis #: 459297

**Thesis accomplishments:** A university project is completed. 1 SCI and 3 Conference papers are published.

**Funda Ates.** Prediction and assessment of Turkey's industrial waste heat-to-power potential and power conversion technologies. In progress.

**Betül Genç.** Exergoeconomic analysis of hybrid solar-geothermal power production systems with thermal energy storage. In progress.

### PhD

**Salem Abdulsalam Yosaf.** Development Modeling and Thermodynamic Optimization of Renewable Energy Based Absorption Refrigeration and Power Systems, July 2018. YOKTEZ Thesis #: [519592](#)

**Thesis accomplishments:** 3 SCI, 1 national and 2 Conference papers are published.

**Hamoda Gnaifaid.** Development and thermodynamic analyses of Integrated renewable energy based fresh water production systems via reverse osmosis desalination. In progress.

**Ümit Deniz Akyavuz.** Feasibility and experimental investigation of renewable based heating assistance for residential buildings. In progress.