

KEMAL SARICA

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EDUCATION

2004- 2010 **Ph.D.** Boğaziçi University, Dept. of Industrial Eng., Istanbul, Turkey.
'Modeling and Analysis of a Decentralized Electricity Market: Integrated Simulation / Optimization'
Advisor/Co-Advisor: Prof. Gürkan Kumbaroğlu, Prof. İlhan Or

2001-2004 **M.Sc.** Boğaziçi University, Dept. of Industrial Eng., Istanbul, Turkey.
'Efficiency Assessment of Turkish Power Plants using Data Envelopment Analysis'
Advisor: Prof. İlhan Or

1997-2001 **B.Sc.** Boğaziçi University, Dept. of Mechanical Eng., Istanbul, Turkey.

EMPLOYMENT RECORD

2022 - Assoc. Prof. at the Industrial Eng. Dept, Gebze Technical University, Gebze/Kocaeli, Turkey

2019-2022 Assoc. Prof. at the Industrial Eng. Dept, Işık University, Istanbul, Turkey.

10/2013-2019 Assist. Prof. at the Industrial Eng. Dept, Işık University, Istanbul, Turkey.

04/2010 -09/2013 Post-Doctoral Research Associate at the Department of Agricultural Economics, Purdue University, West Lafayette, IN, USA
Mentor: James & Lois Ackerman Prof. Wallace E. Tyner

- Designed ways of linking GTAP-BIO and US EPA MARKAL models
- Modeled land use in MARKAL in conjunction with first and second generation biofuels.
- GTAP-BIO is used as a resource for producing land supply curves.
- Modeled ethanol fuels (E10, E85) in detail to capture blend wall effect
- Carrying on research on current US climate policy (CAFE, CES and RFS) in conjunction with hybrid modeling techniques.

07/2003-03/2010 Research & Teaching Assistant at the Industrial Engineering Department, Boğaziçi University, Istanbul, Turkey

PROFESSIONAL ACTIVITIES

Since 02/2005 Founding Member of the Turkish Energy Economics Association (www.traee.org), Affiliated to the International Association for Energy Economics (IAEE)

- 06/2008 Organization Committee Member, *31st IAEE International Conference, Bridging Energy Supply and Demand: Logistics, Competition and Environment* (www.iaee08ist.org), June 18-20, 2008, Istanbul.
- 02/2005 Organization Committee Member, International Workshop on Business Opportunities for Clean Development (www.cdm-tr.net), February 16-18, 2005, Istanbul
- 07/2003 Technical Support, *EURO/INFORMS Joint International Meeting*, Istanbul, July 6-10, 2003.
- 09/2002 Organization Committee Assistant, Euro-Med Energy Policy Training Network, Energy Decision Makers' Workshop, September 23-27, 2002, Istanbul

SUPPORTED ONGOING RESEARCH

Turkish Transportation Sector Under Deep Decarbonization Targets: Modal Shift and Financial Impacts from A Bottom-Up Modelling Perspective, Scientific Research Council of Turkey (TUBİTAK), Project No: 221M437, 2022-.

SUPPORTED RESEARCH

Assessment of Turkish Electricity System under Renewable Electricity Expansion Policies, Isik University Scientific Research Council (BAP), Project No: 20A202, 2020-2022.

Technical Assistance for Developed Analytical Basis for Formulating Strategies and Action towards Low Carbon Development, European Commission Instrument for Pre-Accession Assistance, EuropeAid /136032/IH/SER/TR, Contract Nr. TR2013/0327.05.01-01/001, 2018-2020, Lead Author and Lead Modeling Expert

Partnership for Market Readiness Project (PMR Project), Phase II, Grant No. P- 168730, Identification of the emission cap and Development of the National Allocation Plan, Ministry Of Environment and Urbanization, Reference No: PMR-TRII-C2-CS1, 2019-2020 , Senior Modelling Expert

Partnership for Market Readiness Project (PMR Project), Grant No. TF- 015591, Synthesis Report: Implementation of Carbon Pricing in Turkey, Ministry Of Environment and Urbanization, Reference No: DoMBI(s)-5, 2017-2018, Senior Expert

Partnership for Market Readiness Project: Modeling Fiscal, Economic and Sectoral Impacts of Carbon Pricing in Turkey, Ministry Of Environment And Urbanization, Grant No. TF- 015591, Contract No:DoMBI(s)-4. 2017-2018, Senior Modeling Expert.

Partnership for Market Readiness Turkey: Development of Sectoral Marginal Abatement Cost Curves for Turkey, The World Bank, Contract No: 7181724, 01/2017-2018, Senior Expert.

Integrated Modeling of Turkish Electricity Sector, Isik University Scientific Research Council (BAP), Project No: 16A201, 2016-2017.

Boğaziçi Üniversitesi Enerji Modelleme Sisteminin (Büems) Geliştirilmesi Ve Sera Gazı Salım Kısıtlamalarının Türkiye'ye Etkilerinin Araştırılmasına Yönelik Olarak Büems/Türkiye Modelinin Kurulması Ve Senaryo Analizleri, TUBİTAK , Project No: 114M348, Researcher .

UNFCCC Preparation of National Communications on Climate Change: Greenhouse Gas Emissions Projections and Sectoral Analysis, The Scientific and Technological Research Council of Turkey-Marmara Research Center (TUBITAK-MAM), Environment and Cleaner Production Institute, 11/2013-02/2016

Support for the Preparation of the Turkey's First Biennial Report (FBR) to UNFCCC, National Consultant on Climate Change Mitigation Actions and Projections, PIMS 5266, 09/2015-03/2016

Computable General Equilibrium Analysis of Energy Sector Reforms in Bangladesh, Worldbank, 08/2014-07/2015, Lead Modeling Expert.

Analysis of Policies Aimed at Increasing Use of Natural Gas in the Transportation System, Nextrans Center / USDOT, Project No: DTRT12-G-UTC05, 2013, Modeling Expert

Analysis of the Global Impacts of Second Generation Biofuels in the Context of Other Energy Technologies and Alternative Economic and Climate Change Policy Options, National Institute of Food and Agriculture - USDA, Project No. IND010576G1, 9/2009-2/2014.

An Integrated Simulation/Optimization Approach to the Modeling and Analysis of the Decentralized Turkish Electricity Market, Scientific Research Council (BAP), Project No: 07A301D, 2007-2010.

Analysis of Possible Effects on Turkish Energy Industry due to Emission Restrictions parallel to KYOTO Protocol using MARKAL Model, Scientific Research Council (BAP), Project No: 09A303P, 2009.

Environmental Consultancy for Privatization of Electricity Generation Co. Inc. and Subsidiaries, Republic Of Turkey, Prime Ministry, Privatization Administration (ÖİB) (Green House Gases Working Group, Expert), 2009.

Determination of Sectoral Costs in the Fight against Climate Change, State Planning Organization (DPT), 12/2008-12/2009 (in close collaboration with AEA Technologies, www.aeat.co.uk).

Sustainable Clean Development Options for Turkey: Assessment of Prospects for the Diffusion Potential of Renewable Energy Technologies, and Development of Projects to Utilize International Funds and Flexibility Mechanisms, Scientific and Technical Research Council of Turkey, Project No: 104M291, 04/2005-04/2007. (Project Member).

Petroleum Products Demand Forecasting, Petrol Ofisi Co., 2007. (Project Member).

Bottom-Up Electricity Demand Forecasting for Turkey, Fraunhofer Institute for System and Innovation Research, 2007 (Project Member).

Business Opportunities for CDM Project Development in the Mediterranean, the European Commission, Project Synergy No: 4.1041/D/02-003, 10/2003-04/2005. (Project Member).

TECHNICAL SKILLS

Optimization	GAMS, Cplex (via API), Knitro (via Java api), Conopt (via LINDO Api)
Programming	Java, Matlab, Fortran, Visual Basic, Maple

Simulation	Stella, Powersim, Anylogic
Packet Programs	SPSS (Including macro programming), Microsoft Office (Highly Advanced with VBA)
Operating Systems	Windows/Windows Server Family, Active Directory and Group Policy (Advanced level domain planning)
Other	ANSWER - VEDA (ETSAP Family), DEA Solver Pro (Saitech inc.), FRONTIER 4.1 (SFA software by Coelli 1996a) , GemPack, RunGTAP

CERTIFICATES

August 7-13, 2010	18 th Annual Short Course in Global Trade Analysis, Center for Global Trade Analysis, Purdue University
October 8-13, 2010	Short Course in Dynamic Global Trade Analysis, Center for Global Trade Analysis, Purdue University

REFEREEING

- *Applied Energy*, Elsevier Science, Amsterdam
- *Energy Policy*, Elsevier Science, Amsterdam
- *Energy Journal*, IAEE, Cleveland, OH
- *Energy*, Elsevier Science, Amsterdam
- *European Journal of Operational Research*, Elsevier Science, Amsterdam
- *System Dynamics Conferences*, System Dynamics Society, USA
- *IAEE Conferences*
- *Journal of Cleaner Production*, Elsevier Science, Amsterdam

COURSES TAUGHT

IE301 *Operations Research-I*
 IE321 *Industrial Production Systems*
 IE443 *Engineering Investment Analysis*
 IE486 *Energy Policy, Planning and Markets*
 IE583 *Multi Criteria Optimization and Performance Assessment*

AWARDS

Best Paper Award, "Commitment for sustainable development" for Outstanding Contribution during 2006/2007, June 12, Florence, 2007

AFFILIATIONS

Turkish Association for Energy Economics (Founding Member)
 International Association for Energy Economics (Member)
 INFORMS (Member)

LIST OF PUBLICATIONS

Journal Articles

- Isik, M., **Sarica, K.** and Ari, I., Driving forces of Turkey's transportation sector CO2 emissions: An LMDI approach. *Transport Policy*, 97, pp.210-219, 2020.
- Küçük, M., Kumbaroğlu, G., and **Sarica, K.**, "Substitution Elasticities in an Energy-Augmented CES Production Function: An Empirical Analysis for Turkey", *Journal of Economics and Political Economy*, 5(2), 234-249, 2018.
- **Sarica, Kemal**, "Parametrik Ve Parametrik Olmayan Verimlilik Degerlendirmesi ve Karsilastirilmesi: Türkiye Elektrik Santralleri Örneği", *Uludag Üniversitesi Mühendislik Fakültesi Dergisi*, 22(3), 21-42, 2017.
- **Sarica, K.**, and Tyner, W. E., "Economic Impacts of Increased U.S. Exports of Natural Gas: An Energy System Perspective", *Energies*, 9(6), 401, 2016.
- G. O'Rear, E., **Sarica, K.**, and Tyner, W. E., "Analysis of Impacts of Alternative Policies Aimed at Increasing US Energy Independence and Reducing GHG Emissions", *Transport Policy*, 37, 121-133, 2015.
- Yang, L., Tyner, W. E., and **Sarica, K.**, "Evaluation of the Economics of Conversion to Compressed Natural Gas for a Municipal Bus Fleet", *Energy Science & Engineering*, 1(3), 118-127, 2013.
- **Sarica, K.** and Tyner, W. E., "Alternative Policy Impacts on US GHG Emissions and Energy Security: A Hybrid Modeling Approach", *Energy Economics*, 40, 40-50, 2013.
- **Sarica, K.** and Tyner, W. E., "Analysis of US Renewable Fuels Policies Using a Modified MARKAL Model", *Renewable Energy*, 50, 701-709, 2013.
- **Sarica, K.**, Kumbaroğlu G., and Or, I., "Modeling and Analysis of a Decentralized Electricity Market: An Integrated Simulation/Optimization Approach", *Energy*, 44(1), 830-852, 2012.
- **Sarica, K.** and Or, I., "Efficiency Assessment of Turkish Power Plants using Data Envelopment Analysis", *Energy*, 32(8), 1484-1499, 2007.

Book Chapters

- İklim Değişikliği ve Kalkınma , Chapter Name "İklim Değişikliği ile Mücadelede Türkiye: Enerji Kullanımı ve Emisyon Azaltımı Maliyetleri", **Kemal Sarica**, *T.C. Cumhurbaşkanlığı Strateji ve Bütçe Başkanlığı*, Editör: Dr. İzzet Arı, p239, ISBN:978-605-2270-19-6, (2018).
- Fracking, Chapter Name "Shale Gas Boom, Trade and Environmental Policies: Global Economic and Environmental Analyses in a Multidisciplinary Modeling Framework", Taheripour F., Tyner, W. E., **Sarica, K.**, *The Royal Society of Chemistry*, Editor: Hester R.E., Harrison R.M., p246, ISBN:978-1-84973-920-7, (2015).

Conference Proceedings (refereed)

- Kumbaroğlu, G., Or, İ., Alizadeh, S. F., Yucel, G., **Sarica, K.**, and Arıkan, Y., “Energy-Economy Modeling Under Emission Constraints Using TIMES-MACRO: The Case of Turkey”, *2nd IAEE Eurasian Conference*, Zagreb, Croatia, October 12-14, 2017.
- Tetik, E., and **Sarica, K.**, “Long-term Bottom-up Modeling of Turkish Electricity Sector”, *15th IAEE European Conference*, Vienna, Austria, September 3-6, 2017.
- O’Rear, E., **Sarica, K.**, and Tyner, W. E., “VMT Taxes: The Impacts of Switching from a Volumetric Fuel Tax to a Mileage Tax”, *38th IAEE International Conference*, Antalya, Turkey, May 25-27, 2015.
- Tetik, E., and **Sarica, K.**, “Turkish Electricity Sector: A Bottom-up Approach”, *38th IAEE International Conference*, Antalya, Turkey, May 25-27, 2015.
- **Sarica, K.** and Tyner, W. E., “Analysis Of Policies Aimed At Increasing Use Of Natural Gas In The Transportation System”, *37th IAEE International Conference*, New York City, NY, USA, June 15-18, 2014.
- Taheripour, F., **Sarica, K.**, and Tyner, W. E., “Shale Gas Trade and Environmental Policies: Global Economic and Environmental Analyses in a Hybrid Modeling Framework”, *32nd USAEE/IAEE North American Conference*, Anchorage, AK, USA, July 28-31, 2013.
- **Sarica, K.**, and Tyner, W. E., “Economic and Environmental Impacts of Increased U.S. Exports of Natural Gas”, *32nd USAEE/IAEE North American Conference*, Anchorage, AK, USA, July 28-31, 2013.
- **Sarica, K.**, and Tyner W. E., “Alternative Policy Impacts on US GHG Emissions and Energy Security: A Hybrid Modeling Approach”, *31th USAEE/IAEE North American Conference*, Austin, November 4-7, 2012.
- **Sarica, K.**, and Tyner, W. E., “Comparison of Current and Proposed U.S. Energy Policies with an Equivalent Carbon Tax”, *INFORMS Annual Meeting*, Phoenix , October 14-17, 2012.
- O’Rear, E., **Sarica, K.**, Paarlberg, P. L., and Tyner, W. E., “The Impacts of the Rebound Effect on U.S. CAFE Standards for Light-Duty Vehicles”, *INFORMS Annual Meeting*, Phoenix , October 14-17, 2012.
- **Sarica, K.**, Chen, Y., and Liu, A., “Long-run Analyses of Combining Climate Policies in the United States using MARKAL”, *INFORMS Annual Meeting*, Charlotte , November 13-16, 2011.
- **Sarica, K.**, and Tyner, W. E., “Analysis of U.S. Renewable Fuels Policies Using Modified Markal and Gtap-Bio Models”, *30th USAEE/IAEE North American Conference*, Washington D.C., October 9-12, 2011.
- **Sarica, K.**, and Tyner, W. E., “Analysis of US Renewable Fuels Policies Using a Modified MARKAL Model”, *34th IAEE International Conference*, Stockholm, Sweden, June 19-23, 2011.
- **Sarica, K.**, and Tyner, W. E., “Analysis of US Renewable Fuels Policies Using a Modified MARKAL Model”, *14th Annual Conference on Global Economic Analysis*, Venice, Italy, ISSN: 2160-2115, June 16-18, 2011.
- **Sarica, K.**, and Tyner, W. E., “Analysis of US Renewable Fuels Policies Using a Modified MARKAL Model”, *Biofuels LUC Workshop*, Chicago, March 25, 2011.

- Or, I., **Sarica, K.**, and Kumbaroğlu, G., “Integrated Simulation/Optimization Modeling and Analysis of a Decentralized Electricity Market”, *33rd IAEE International Conference, International Society for Energy Economics*, Rio de Janeiro, 6-9 June, 2010.
- **Sarica, K.**, Or, I., and Kumbaroğlu, G., “Modeling and Analysis of A Decentralized Electricity Market: Integrated Simulation/Optimization”, *10th IAEE European Conference*, Vienna, Austria, September 7-10, 2009.
- **Sarica, K.**, Or, I., and Kumbaroğlu, G., “An Integrated Simulation/Optimization Approach to the Modeling and Analysis of the Decentralized Turkish Market”, *32nd IAEE International Conference*, San Francisco, USA, June 21-24, 2009.
- **Sarica, K.**, and Karali, N., “Modeling of the Interactions between Sectoral Co2 Missions and Energy Efficiency Under CO₂ Emission Restriction Policies”, *26th International Conference of the System Dynamics Society*, ISBN 978-1-935056-01-0, Athens, Greece, July 20 – 24, 2008.
- **Sarica, K.**, and Karali, N., “Diffusion Potential of New Energy Efficient Technologies under an Uncertain Environment”, *International Conference on Policy Modeling- EcoMod2008*, Berlin, Germany, July 2-4, 2008.
- **Sarica, K.**, and Karali, N., “Modeling of the Interactions between Sectoral CO₂ Emissions and Energy Efficiency under Emission Restriction Policies”, *31st IAEE International Conference, Bridging Energy Supply and Demand: Logistics, Competition and Environment*, Istanbul-Turkey, June 18-20, 2008.
- **Sarica, K.**, and Karali, N., “Cost Based Sectoral Analysis of CER/ERU Emission Certificate Trading”, *22nd European Conference on Operational Research*, University of Economics Prague, Prague-Czech Republic, July 8-11, 2007.
- **Sarica, K.**, and Kumbaroğlu, G., “Power Plant Efficiency Assessment: Case of Turkey”, *9th IAEE European Energy Conference, Energy Markets and Sustainability in a Larger Europe*, Florence-Italy, June 10-13, 2007.
- **Sarica, K.**, and Kumbaroğlu, G., “Efficiency Assessment of Turkish Power Plants Using DEA”, *19th Mini EURO Conference on Operational Research Models and Methods in the Energy Sector (ORMMES’06)*, University of Coimbra, Portugal, 6-8 September 2006.
- **Sarica, K.**, and Barlas, Y., “Verifying System Dynamics Simulation Results by Analytical Phase Plane Tools”, *the 24th International Conference of the System Dynamics Society*, Nijmegen, The Netherlands, July 23-27, 2006.

Paper Presentations at National Conferences

- Tetik, E. and **Sarica, K.**, “Türkiye’nin Elektrik Sektörü’ne Temel Yaklaşım”, *35th YAEM National Operations Research and Industrial Engineering Congress*, Middle East Technical University, Ankara-Turkey, 09-11 Eylül, 2015.
- **Sarica, K.**, Or, I., and Kumbaroğlu, G., “Elektrik Üretim Tesislerinin Çok Yönlü Karşılaştırılmalı Değerlendirilmesi”, *Uluslararası Doğal Gaz Kongresi ve Sergisi, TMMOB Makina Mühendisleri Odası*, Ankara-Türkiye, 3-5 Mayıs, 2007.

- **Sarıca, K.**, and Or, I., “Efficiency Assessment of Electrical Energy Generation Plants Using Data Envelopment Analysis”, Yöneylem Araştırması/Endüstri Mühendisliği 24. Ulusal Kongresi- YA/EM’ 2004, Adana-Türkiye, 15-18 Haziran, 2004.

Technical Reports

- **Sarıca, K.**, and Barlas, Y., “Analytical & Numerical Tools for Phase Plane Analysis of System Dynamics Models”, Working Paper No: FBE-IE-09/2005-14, Boğaziçi University, 2005.
- **Sarıca, K.**, and I. Or, “Efficiency Analysis of Power Generation Plants in Turkey Using Data Envelopment Analysis”, Working Paper No: FBE-IE-09/2004-12, Boğaziçi University, 2004.
- **Sarıca, K.**, and I. Or, “Türkiye’deki Elektrik Üretim Tesislerinin Veri Zarflama Analizi ile Verimlilik İncelemesi”, Working Paper No: FBE-IE-12/2004-17, Boğaziçi University, 2004.