Svetlana A. Ikonnikova

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Center for Energy Economics
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Education

2003 – 2007 **Ph.D. in Economics and Management Science**, Humboldt University of Berlin, Germany.

Ph.D. dissertation title: "Strategic Investment, Multilateral Bargaining and Coalition Formation Games: Analysis of the Eurasian Gas Supply Network".

2001 – 2003 **M.S. in Applied Physics and Mathematics**, Moscow Institute of Physics and Technology, Moscow, Russia.

M.S. thesis title: "Application of Neural Networks for Inflation Rates Forecasting in Russia".

1997 – 2001 **B.S. in Applied Physics and Mathematics**, Moscow Institute of Physics and Technology, Moscow, Russia.

Areas of Expertise

Economics: Industrial economics, game theory, supply chain economics, contract theory, network economics, international energy trade, energy finance, investment decisions under uncertainty.

Energy: Energy transition strategies, economics of hydrogen, supply capabilities of unconventional energy resources, renewable (geothermal, wind, solar) energy hydrogen, energy policy, geopolitics, international energy (especially LNG) markets.

Environment: CO2 regulations, the nexus of environmental and energy policies.

Technology: Economics of technological change, statistical analysis of productivity changes, technology choices and industry dynamics.

Professional Experience

2019 – Pres. ***Associate Professor***, Chair for Resource Economics, Center for Energy Markets, TUM School of Management, The Technical University of Munich.

Responsible for: analysis of international energy (incl. hydrogen) trade, study of energy supply under energy transition, analysis of methane-based hydrogen production technologies, teaching international trade, network economics, and advanced seminar on energy technologies

2019 – Pres. ***Research Scientist***, Senior Energy Research Advisor for the Tight Oil Resource Assessment (TORA) research group *and* Center for Energy Economics, Bureau of Economic Geology, The University of Texas at Austin.

Responsible for: defining analysis of geologic and technological drivers of unconventional wells performance, production and drilling pace projections for the major unconventional plays (incl. Permian basin, Eagle Ford, Williston, Haynesville, Marcellus).

2016 – 2020 ***Research Scientist***, Senior Energy Economist, Principle Investigator (PI), *head of TORA team* (incl. economists, statisticians, engineers, and geoscientists), Bureau of Economic Geology, The University of Texas at Austin

Responsible for: setting research goals and timeline, assignment and coordination of technical research tasks, statistical analysis focusing on geo-engineering drivers of unconventional well productivity, modeling the major unconventional plays development pace and production outlook (oil, natural gas, water).

2014 ***Adjunct Professor***, Graduate Program in Operations Research and Industrial Engineering, Department of Mechanical Engineering, The University of Texas at Austin.

Responsible for: teaching Fundamentals of project financing, analysis of oil and gas drilling decision-making under uncertainty

2011 – 2016 ***Research Associate***, Center for Energy Economics, Bureau of Economic Geology, The University of Texas at Austin.

2008 – 2011 ***Postdoctoral Fellow***, Center for Energy Economics, Bureau of Economic Geology, The University of Texas at Austin.

2007 – 2008 ***Postdoctoral Fellow***, Department of Business and Economics, Catholic University of Leuven, Belgium.

2007 – 2008 ***Postdoctoral Fellow*** and ***Teaching Assistant***, Department of Economics and Management, Humboldt University of Berlin, Germany.

2003 – 2007 ***Research Assistant***, Department of Economics and Management, Humboldt University of Berlin, Germany.

2002 ***Visiting Research Assistant***, School of Computer Engineering, Nanyang Technological University, Singapore.

2001 – 2003 ***Research Assistant***, Higher School of Economics, Moscow, Russia

Grants and Projects

in progress with the HEC Paris, the industrial partners funded research & teaching consortium "Collaborative Alliance for Research and Education on Climate (CARE-Climate)".

2019 – 2020 with the Stadtwerke München research project "Evaluation of Methods to Produce CO2-free Hydrogen and Methane".

2016 – Pres. with the Industrial Consortium "Tight Oil Resource Assessment (TORA)".

2018 – 2019 with the Total E&P Company sponsored research project “Study of Near Wellbore Facies and Horizontal Wells Productivity: Permian and Eagle Ford play analysis”.

2017 – 2018 with the Exxon Mobil sponsored research project “Clay rich unconventional shales, Haynesville case study”.

2016 – 2018 with the U.S. Department of Energy grant “Update and Enhancement of Shale Gas Outlooks”.

2016 – 2017 with in the Alfred P. Sloan Foundation grant “Technology and its Environmental Implications: Evolution of Shale Oil and Gas Industry”.

2015 – 2016 with the Alfred P. Sloan Foundation project “Water Demand for Five Major U.S. Unconventional Reservoirs Relative to Water Supplies”.

2014 – 2016 with in the Alfred P. Sloan Foundation grant “The Role of Shale Oil in Future U.S. Energy Supply - III”.

2014 – 2015 with in the Alfred P. Sloan Foundation grant “Marcellus Shale Play Resource Assessment and Production Outlook”.

2011 – 2013 with the Alfred P. Sloan Foundation grant “The Role of Shale Gas in the U.S. Energy Transition: Recoverable Resources, Production Rates, and Implications”.

2010 – 2011 with the Alfred P. Sloan Foundation grant “Taking Natural Gas Seriously”.

2009 – 2010 with the U.S. Department of Energy grant “20 Percent Wind Energy in 2030: Overcoming the Challenges, Techno-economic modeling of the integration of 20% wind and large-scale storage in ERCOT by 2030".

2008 – 2009 with the U.S. Department of Energy grant “Developing a comprehensive risk assessment framework for geological storage of CO_2”.

Awards

Top breakout speaker at the U.S. *Energy Information Administration Energy Conference*, Washington DC, June, 2015.

2011 and 2015 Bureau of Economic Geology Career Development Publication Awards.

Research paper award, the Association of International Petroleum Negotiators, 2009.

Programm zur Förderung der Chancengleichheit für Frauen Post-Doc-Stipendium (Equal Opportunities for Women in Research Scholarship), 2007 - 2008.

Marie Curie Fellowship for the Infrastructure Modeling and Policy Workgroup, 2006.

Best Student Paper Award at the 26th United States Association for Energy Economics North American Conference, 2006.

German Academic Exchange Service (DAAD) scholarship, 2005.

Economic Society of Humboldt University of Berlin scholarship, 2003 – 2005.

Publications

Ikonnikova, S., Lin, N., Berdysheva, S., 2020, The Effect of CO2 prices on the Hydrogen Global Trade Potential, (*in prep*)

Ikonnikova, S., Berdysheva, S., del Carpio Neyra, V., 2020, Energy Transition Strategies and the Elasticity of Supply: The Role of Energy Project Characteristics, (*in revision*.)

Scanlon, B., Reedy, R., Xu, P., Engle, M., Nicot, J.P., Yoxtheimer, D., Yang, Q., **Ikonnikova, S**., 2020, Can we Beneficially Reuse Produced Water from Oil and Gas Extraction in the U.S.? Science of The Total Environment, Vol. 717 (137085), http://doi.org/10.1016/j.scitotenv.2020.137085

Scanlon, B., **Ikonnikova, S.,** Yang, Q., Reedy, R., Will Water Issues Constrain Oil and Gas Production in the U.S.? Environmental Science & Technology,https://doi.org/10.1021/acs.est.9b06390

Scanlon, B., **Ikonnikova, S.,** Weingarten, M., Murray, K., Reedy, R., and Hamlin S. *resubmitted***.** Managing Basin-Scale Fluid Budgets to Reduce Injection-Induced Seismicity from the Recent U.S. Shale Oil Revolution, ***Proc. of the National Academy of Sciences,*** *revised and resubmitted.*

Liu, W., **Ikonnikova, S.A.,** Pyrcz, M., Hamlin, S., Sivila, L., 2019, Spatial Sampling Bias in Decision Tree Machine Learning Method for Unconventional Resources, ***Proc. of 2019 AAPG Annual Convention and Exhibition,San Antonio, Texas***

Ikonnikova, S., Reedy, R. C., Hamlin, H. S., Lemons, C. R., and Scanlon, B. R., 2018, Evaluating cumulative water risks from shale oil production: Permian Basin case study, ***Proc. of AGU Fall meeting 2018***, Washington, DC, H21I-1754

Ikonnikova, S., Smye, K., Browning, J., Dommisse, R., Gülen, G., Hamlin, S., Tinker, S. W., Male, F., McDaid, G., Vankov, E., 2018, Report on Update and Enhancement of Shale Gas Outlooks, DOE Technical Report, http://doi.org/10.2172/1479289

Wolaver, B.D., Pierre J.P., **Ikonnikova, S.A.,** Andrews, J.R., McDaid, G., Ryberg, W.A., Hibbitts, T.J., Duran, C.M., Labay, B.J., LaDuc, T.J., 2018, An Improved Approach for Forecasting Ecological Impacts from Future Drilling in Unconventional Shale Oil and Gas Plays, ***Environmental Management,*** vol. 62(2), pp. 323-333. http://doi.org/10.1007/s00267-018-1042-5

Ikonnikova, S.A., Male, F., Reedy, R. 2017**.** Projecting Water Footprint under Different Price Scenarios: Case study of the Eagle Ford Shale, ***Environmental Science and Technology,*** vol. 51 (24), pp. 14453–14461. http://doi.org/10.1021/acs.est.7b03150

Gherabati, S.A., Browning, J., Male, F., **Ikonnikova, S.A.**, and McDaid, G. 2016. The impact of pressure and fluid property variation on well performance of liquid-rich Eagle Ford shale. ***Journal of Natural Gas Science and Engineering,*** vol. 33, pp. 1056-1068. http://doi.org/10.1016/j.jngse.2016.06.019

Ikonnikova, S., Gülen, G., Browning, J. 2016. Impacts of Price Differentials, Taxation, and Costs on Shale Gas Drilling: A Marcellus Case Study, ***Proc. of SPE/IAEE Hydrocarbon Economics and Evaluation Symposium,*** paper no. SPE-179985-MS, pp. 1-10. http://doi.org/10.2118/179985-MS

Ikonnikova, S., Vankov, E., Gülen, G., Browning, J. 2016.Understanding Shale Resource Production: What are the Key Variables? ***Proc. of SPE/IAEE Hydrocarbon Economics and Evaluation Symposium,*** paper no. SPE-179984-MS, pp. 1-13. http://doi.org/10.2118/179984-MS

Hammes, U., Eastwood, R., McDaid, G., Vankov, E., Gherabati, S.A., Shultz, A., Smye, K., Shultz, J., Potter, E., **Ikonnikova, S.,** Tinker, S. 2016. Regional Assessment of the Eagle Ford group of South Texas, USA: Insights from lithology, pore volume, water saturation, organic richness and productivity correlations. ***Interpretation, SEG Journal,*** vol. 4(1), pp. SC125-SC150. http://doi.org/10.1190/INT-2015-0099.1

Ikonnikova, **S.** and Gülen, G. 2015. Impact of low prices on shale gas production strategies. ***The Energy Journal***, vol. 36, pp. 43-62. http://doi.org/10.5547/01956574.36.SI1.siko

Gülen, G., **Ikonnikova, S.,** Browning, J., Smye, K., Tinker, S.W. 2015. Production scenarios for the Haynesville shale play. ***SPE Economics & Management***, vol. 7(4), pp. 138-147. http://doi.org/10.2118/176022-PA

Male, F., Islam, A.W., Patzek, T.W., **Ikonnikova, S.,** Browning, J., Marder, M.P. 2015. Analysis of gas production from hydraulically fractured wells in the Haynesville shale using scaling methods. ***Proc. of the SPE Unconventional Resources Conference,*** paper no. 168993-MS, pp. 1-9. http://doi.org/10.2118/168993-MS

Tinker, S.W. and **Ikonnikova, S**. 2015. Shale gas: Hardly a fallacy. ***Nature,*** vol. 517, p. 553. http://doi.org/10.1038/517553c

Ikonnikova, S., Gulen, G., Browning, J., Tinker, S. 2015. Profitability of shale gas drilling: A case study of the Fayetteville shale play. ***Energy***, vol. 81, pp. 382-393. https://doi.org/10.1016/j.energy.2014.12.051

Ikonnikova, S., Browning, J., Gülen, G., Smye K., and Tinker, S. 2015. Factors influencing shale gas production forecasting: Empirical studies of Barnett, Fayetteville, Haynesville, and Marcellus Shale. ***Energy Economics and Environmental Policy***, vol. 4 (1), pp. 19-35. http://doi.org/10.5547/2160-5890.4.1.siko

Fu, Q., Horvath, S., Potter, E., Tinker, S., Roberts, F., **Ikonnikova**, S., Fisher, W. and Yan, J. 2015. Log-derived thickness and porosity of the Barnett Shale, Fort Worth basin, Texas: Implications for assessment of gas shale resources. ***AAPG Bulletin***, vol. 99(1), pp. 119-141. http://dx.doi.org/10.1306/07171413018

Gulen, G., **Ikonnikova**, S., Browning, J., and Tinker, S. 2014. Fayetteville shale production outlook. ***SPE Economics & Management***, vol. 7(2), pp. 19-35. http://dx.doi.org/10.1306/07171413018

Ikonnikova, S. and Zwart, G. 2014. Trade quotas and buyer power with an application to the EU natural gas market. ***Journal of the European Economic Association***, vol. 12(1), pp. 177-199. http://dx.doi.org/10.1111/jeea.12064

Ikonnikova, S., Browning, J., Horvath, S., and Tinker, S. 2014. Well recovery, drainage area, and future drill-well inventory: Empirical study of the Barnett shale gas play. ***SPE Reservoir Evaluation***, vol. 17(4), pp. 484-496. http://dx.doi.org/10.2118/171552-PA

Browning, J., **Ikonnikova**, S., Gülen, G., and Tinker, S. 2013. Barnett shale production outlook. **SPE *Economics & Management***, vol. 5(3), pp. 89-104. https://doi.org/10.2118/165585-PA

Gülen, G., **Ikonnikova**, S., Browning, J., and Tinker, S. 2013. Well economics across ten tiers in low and high Btu (British thermal unit) areas, Barnett Shale, Texas. ***Energy***, vol. 60(1), pp. 302-315. http://dx.doi.org/10.1016/j.energy.2013.07.041

Browning, J., Tinker S. W., **Ikonnikova**, S., Gülen, G., et al. 2013. Barnett shale model - 1: Study develops decline analysis, geologic parameters for reserves, production forecast. ***Oil & Gas Journal***, vol. 111 (8), pp. 62-73.

Browning, J., Tinker S. W., **Ikonnikova**, S., Gülen, G., et al. 2013. Barnett shale model - 2 (Conclusion): Barnett study determines full-field reserves, production forecast. ***Oil & Gas Journal***, vol. 111 (9), pp. 88-95.

Hubert, F. and **Ikonnikova**, S. 2011. Investment options and bargaining power: the Eurasian supply chain for natural gas. ***The Journal of Industrial Economics***, vol. 59(1), pp. 85-116. http://doi.org/10.1111/j.1467-6451.2011.00447.x

Ikonnikova, S. and Tinker, S. 2010. Technology, entry, and uncertainties: Analysis of the U.S. shale gas industry development. ***Proceedings of the 34th IAEE International Conference International Association for Energy Economics*****,** pp. 1-2.

Ikonnikova, S., Volkov, D., Gulen, G., and Makaryan, R. 2009. Strategic model of LNG arbitrage: Analysis of LNG trade in Atlantic Basin. ***Proceedings of the AIChE Spring National Meeting and 5th Global Congress on Process Safety,*** p.1***.***

Ikonnikova, S. 2007. Games in the Eurasian gas supply network: Multinational bargaining, strategic investment, and hold-up. ***MPRA Paper*** 17852.

Hubert, F., and **Ikonnikova,** S. 2004. Cross subsidies in Russian electric power tariffs, in Trends in infrastructure regulation and financing: international experience and case studies from Germany, edit. by von Hirschhausen, C., Beckers, T., and Mitusch, K., **Edward Elgar Publishing**, Ltd.

Contract Reports

Ikonnikova, S., del Carpio Neyra, V., and Gulen, G., 2019, Drilling and investing across the Permian Basin analysis: modeling needs and capabilities (ext. abs.): Tight Oil Resource Assessment (TORA) Research Consortium Annual Meeting, p. 81-85

Ikonnikova, S., Hamlin, H. S., Yang, Q., del Carpio Neyra, V., Gulen, G., and Fairhurst, B., 2018, Individual well productivity and profitability of Midland Wolfcamp A and B wells (ext. abs.): Tight Oil Resource Assessment (TORA) Research Consortium Annual Meeting, p. 89-95."

Ikonnikova, S., Yang, Q., del Carpio Neyra, V., and Gulen, G., 2018, Update on the Bakken and Three Forks production outlook (ext. abs.): Tight Oil Resource Assessment (TORA) Research Consortium Annual Meeting, p. 47-51

del Carpio Neyra, V., **Ikonnikova, S**., 2019, Well economics to development strategies (ext. abs.): Tight Oil Resource Assessment (TORA) Research Consortium Annual Meeting, p. 87-91

Ikonnikova, S., Gülen, G., Lemons, C., Male, F., McDaid, G., Smye, K., Vankov, E. 2018. Update and Enhancement of U.S. Shale Gas Outlooks. *Report to the Department of Energy*, 99p.

LaDuc, T. J., Wolaver, B. D., Pierre, J. P., Duran, C. M., Labay, B. J., Ryberg, W. A., Hibbitts, T. J., Roelke, C. E., Fujita, M. K., Wright, I. M., Surya, G. S., Shank, C. J., Andrews, J. R., **Ikonnikova, S.,** and McDaid, G., 2018, Final Report: Collaborative Research on the Natural History of the

Enigmatic Spot-Tailed Earless Lizard (Holbrookia lacerata) in Texas: The University of Texas at Austin (http://dx.doi.org/10.18738/T8/C1C7X7), contract report prepared for Texas Comptroller of Public Accounts, under contract no. 14-000769, 259 p.

Ikonnikova, S., Gülen, G., Lemons, C., Male, F., McDaid, G., Smye, K., Vankov, E. 2018. Update and Enhancement of U.S. Shale Gas Outlooks. *Report to the Department of Energy*, 99p.

Ikonnikova, S., Browning, J., Scanlon, B., Gülen, G., Lemons, C., Vankov, E., McDaid, G., Smye, K.. 2018. Evolution of Shale Oil and Gas Drilling Technology and its Environmental Implications. *Report to to the Alfred P. Sloan Foundation*, 25p.

Ikonnikova, S., Tinker, S., Browning, J., Dommisse, R., Gherabati, A., Gülen, G., Hammes, H., Hamlin, S., Idzior, R., Lemons, C., Male, F., McDaid, G., Marder, M., Medlock, K., Potter, E., Reedy, R., Scanlon, B., Smye, K., Vankov, E., Walsh, M. 2016. Role of Shale Oil in the U.S. Energy Transition: Recoverable Resources, Production Rates, and Implications. *Final Report to the Alfred P. Sloan Foundation*, 197p.

Ikonnikova, S., Smye, K., Browning, J., Gulen, G., Male, F., McDaid, G., Potter, E., Tinker, S., Vankov, E. 2015. Marcellus Shale: Enhanced Reserves and Production Forecast, *Final Report to the Alfred P. Sloan Foundation,* 26p.

Tinker, S., **Ikonnikova, S**., Hammes, U., Gherabati, A., Smye, K., Browning, J., Gülen, G., McDaid, G., Male, F., Medlock, K., Patzek, T., Potter, E., Shultz, J., Idzior, R., Hwang, A., Vankov, E. 2014. The Role of Shale Oil in Future U.S. Energy Supply: Recoverable Resources, Production Rates, and Implications, *Midterm Report to the Alfred P. Sloan Foundation*, 31 p.

Tinker, S., **Ikonnikova, S.,** Browning, J., Ettehad, A., Fisher, W., Fu, Q., Grote, C., Gülen, G., Horvath, S., Male, F., Medlock, K., Patzek, T., Potter, E., Roberts, F., Seitlheko, L., Smye. K. 2014. Recoverable Resources, Production Rates, and Implications, *Final Report to the Alfred P. Sloan Foundation* on Role of Shale Gas in the U.S. Energy Transition*,* 108 p.

Tinker, S., **Ikonnikova, S**., Browning, J., Fisher, W., Fu, Q., Gülen, G., Horvath, S., Male, F., Medlock, K., Patzek, T., Potter, E., Roberts, F. 2012. Recoverable Resources, Production Rates, and Implications: Barnett Shale. *Midterm Report to the Alfred Sloan Foundation*, 71 p.

Tinker, S., **Ikonnikova, S**., Browning, J., Fisher, W., Fu, Q., Gülen, G., Horvath, S., Male, F., Medlock, K., Patzek, T., Potter, Seitlheko, L., June 2012, Mid-Term Report, Role of Shale Gas in the U.S. Energy Transition: Recoverable Resources, Production Rates, and Implications: Fayetteville Shale Play: Arkoma Basin, Arkansas and Haynesville Shale Play: East Texas and West Louisiana. *Midterm Report to the Alfred P. Sloan Foundation*, 230 pages.

Ikonnikova, S., Bryce, Robert and Tinker, S. 2010. Driving forces of Natural Gas Demand, White paper on The Natural Gas Demand Workshop, *Report to the Alfred P. Sloan Foundation*.

Tinker, S., **Ikonnikova, S**., Fisher, W. L., and Bryce, R., 2010, Taking Natural Gas Seriously, White paper on The Natural Gas Supply Workshop, *Report to the Alfred P. Sloan Foundation*.

Presentations

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Towards Carbon Neutrality in Energy and Transportation: The Role of Hydrogen, *2020*, MIT CEEPR Workshop, Webinar Series

Enhanced Methodology to Understand Well Productivity and Production Outlook: The Analysis of the Marcellus Play, *TORA Meeting 2020,* Austin, TX

What may Europe expect from developments in the major U.S. shale gas and oil plays? *FLAME 2019*, Amsterdam, Netherlands

The Latest on Unconventional Resources and Their Development*, OTC Norwegian Delegation Breakfast*, 2019, Houston, Texas

Energy and Geopolitics: The Role of the U.S. Unconventional Resources, *Energy Week*, 2019, the University of Texas at Austin

Where New Technologies Will Lead: A look at the Permian and other plays, *American Business Conference*, 2019, Houston, Texas

The U.S. Unconventional Resource: Production Capabilities and Outlook*, JOGMEC Meeting*, 2019, Austin, Texas

Evaluating Cumulative Water Risks from Shale Oil Production: Permian Basin Case Study, *American Geophysical Union*, 2018 Fall Meeting

The Effect of Technology on Importance of Geologic Parameters for Shale Well Productivity: Cross-Play Analysis, invited talk at *INFORMS Conference*, 2018, Phoenix, Arizona.

The Price Elasticity of Shale Gas Supply: Financing Constraints and Resource Endowment, invited talk at *the U.S. Association of Energy Economists* Conference, Washington DC, 2018.

What changed in the U.S. shale in five years: Geology, Technology, and Economics, invited talk at *Energy Information Administration's Energy Forecasting Forum*, Washington DC, 2018.

Water – Energy Nexus: Production Outlook for Water and Natural Resources Production from the Major U.S. Shale Plays, invited talk at *National Council for Science and the Environment Conference*, Washington DC*,* 2018.

The Categorization and Assessment of Hydrocarbon Resource Potential in Clay-rich Unconventional Shales and Analysis of The Effect of Ductility on Shale Productivity, project talk at *Exxon Mobil*, Houston, TX*,* 2018.

Production Outlook for the U.S. Shale Gas Production: Implications for the World LNG Trade, invited lecture at *Oxford Institute for Energy Studies*, Oxford*,* UK, October 2017.

Assessment of Shale Resources: Learnings and Insights from the Study of Six Major Shale Plays in the U.S., invited lecture at *China University of Petroleum*, Qingdao*,* China, September 2017.

The Future of the U.S. Unconventional Resource: Geology, Technology, Markets, panel talk at *National Royalty Owners Association meeting*, Dallas, TX, September, 2017.

Well Economics and Production Outlook for Bakken and Three Forks, *Unconventional Resource and Technology Conference,* Austin, TX, August, 2017.

The U.S. Shale Gas Resource: Outlook for the Industry Reshaping Global Energy, keynote lecture at *Conference on the Economics of Natural Gas*, Paris, France*,* June, 2017.

Water Demand and Supply in Shale Oil and Gas Production, keynote lecture at *Water-Energy Nexus Experts Meeting*, Department of Energy, Washington DC, June, 2017.

From Shale Geology to Production Outlook: Integrated Approach to Analyze Shale Resources, invited guess lecture at *Society of Petroleum Engineers*, Austin Section, TX, May, 2017.

Resource and Productivity Assessment of the Bakken and Three Forks Play, keynote lecture at *DUG Conference,* Denver, CO, March, 2017.

From Geology to Reserves to Production Outlook: Integrated Approach to Analyze Shale Resources, *Lawrence Livermore National Laboratory,* Livermore, CA, February, 2017.

From Geology to Reserves to Production Outlook: Integrated Approach to Analyze Shale Resources, *Lawrence Livermore National Laboratory,* Livermore, CA, February, 2017.

Geology, Economics, and Environment: Integrated Approach to Analyze Shale Resources, *Lawrence Berkeley National Laboratory,* Berkeley, CA, February, 2017.

Rigorous Unconventional Resource Assessment: Implications for Long-term Planning and Governance, *National Academy of Sciences*, December, 2016

Shale Plays: An Integrated Look, *National Association of Royalty Owners 2016,* Dallas, TX, October, 2016.

Integrated Analysis of Six Major U.S. Shale Gas and Oil Basins: Reserve and Produciton Scenarios, *AAPG 2016,* Cancun, Mexico, September, 2016.

Well Economics and Production Outlook of the Eagle Ford Shale play, *Unconventional Resource and Technology Conference,* San Antonio, TX, August, 2016.

Impacts of Price Differentials, Taxation, and Costs on Shale Gas Drilling: A Marcellus Case Study, *SPE/IAEE Conference,* Houston, TX, May, 2016.

Integrated Analysis of Six Major U.S. Shale Gas and Shale Oil Basins, *UNECE Expert Group on Resource Classification,* Geneva, Switzerland, April, 2016.

Shale Gas and Shale Oil: The U.S. Experience and its Global Implications, presented at the *Ministry of Natural Resources,* Beijing, China, March, 2016.

The U.S. Shale Gas Production Outlook: An Integrated Approach, *Southern Gas Association*, November, 2015

Resource Evaluation and Development: Interdisciplinary Approach, *Pennsylvania State University*, State College, PA, October, 2015.

Fracking education: Interdisciplinary approach, Panel Discussion, *Natural Gas Forum*, Washington, DC, October, 2015.

Shale production outlook models: Important enhancements, *EIA Energy Conference*, Washington, DC, June, 2015.

Shale Plays in North America: Lessons Learned and Global Implications, *International Association for Energy Economics Conference*, May, 2015.

Shale gas production elasticity: How past shapes the future, *Oxford Institute for Energy Studies*, UK, April, 2015.

Shale gas development: Lessons for the future, *Texas Electricity Cooperatives: 14th Annual Directors Conference*, Austin, TX, 2015.

Shale gas development: The role of uncertainties, *the U.S. Energy Information Administration*, Washington, DC, 2014.

Shale gas outlook: Present and future, *the U.S. Office of Fossil Energy*, Washington, DC, 2014.

Marcellus shale gas: Analysis of uncertainties, *Strategic Department*, Range Resource, Austin, TX, 2014.

Shale gas: Well economics and production outlook, *Center for Energy Studies*, Rice University's Baker Institute for Public Policy, Houston, TX, 2014.

Shale gas economics and production outlook, *World Petroleum Congress*, Moscow, Russia, 2014.

Reserve and production forecasts for shale gas systems, *Committee on Resource Estimation*, AAPG Conference, Houston, TX, 2014.

Shale gas production in Texas: Present and future, *ERCOT Scenario Analysis Workshop*, Austin, TX, 2014.

Reserve and production forecast for the Barnett, Fayetteville and Haynesville Shale plays, *lecture to East Texas Geological Society*, Tyler, TX, 2014.

Shale gas future: *Briefing to Assistant Secretary for Fossil Energy*, Chris Smith, and staff, Washington DC, 2014.

Shale gas future, the *Alfred P. Sloan Foundation meeting*, New York, NY, 2014.

Shale gas resource and resource estimation and production outlook, *SIPES/DGS Symposium*, Dallas, TX, 2013.

Production outlook for Barnett shale play, the *U.S. Energy Information Administration*, Washington, DC, 2013.

Barnett shale reserves and production, *Potential Gas Committee Meeting*, Marco Island, FL, 2013.

Inferred refracturing study on the Barnett play: Exploring the future impact, the *United States Association for Energy Economics*, Austin, TX, 2012.

Barnett Shale Production Model and Economics, Gulf Coast Association of Geological Societies, Austin, TX, 2012.

Technology, entry, and uncertainties: Analysis of the U.S. shale gas industry development, *International Association for Energy Economics*, Stockholm, Sweden, 2011.

Strategic investment and contract choice: Analysis of the global LNG market, the 7th *International Industrial Organization Conference*, Boston, MA, 2009.

Improving the buyer power on the EU gas market Coordination, Restrictions, or Diversification? The 39th *European Association for Research in Industrial Economics Conference*, Ljubljana, Slovenia, 2009.

Strategic model of LNG arbitrage: analysis of LNG trade in Atlantic Basin: presented at International Association for Energy Economics Conference, San Francisco, CA, 2009.

Competition and countervailing power in the European gas market: Pitfalls of the liberalization, the 6th *International Industrial Organization Conference*, Arlington, VA, 2008.

Challenges of the liberalization of the European gas market: is GasPEC real? *European Gas Seminar*, Moscow, Russia, 2007.

Global emission game: formation of international environmental coalitions and emission reductions, the 5th *International Industrial Organization Conference*, Savannah, GA, 2007.

Issues of strategic Investments and multilateral bargaining in the European gas industry, *CPB Netherlands Bureau for Economic Policy Analysis*, The Hague, Netherlands, 2007.

Games the parties of Eurasian gas supply network play: analysis of strategic investment, hold-up, and multinational bargaining, the 26th *United States Association for Energy Economics*, Ann Arbor, Michigan, 2006.

Games the parties of Eurasian gas supply network play: analysis of strategic investment, hold-up, and multinational bargaining, the 33rd *European Association for Research in Industrial Economics Conference*, Amsterdam, Netherlands, 2006.

Games the parties of Eurasian gas supply network play: analysis of strategic investment, hold-up, and multinational bargaining, the 5th *International Industrial Organization Conference*, Boston, Massachusetts, 2006.

Games the parties of Eurasian gas supply network play: analysis of strategic investment, hold-up, and multinational bargaining, the 3rd *World Congress of the Game Theory Society*, Evanston, Illinois, 2006.

Strategic value of investments in international gas transportation systems: analysis of the Eurasian gas supply network, the 16th *International Trade and Logistics*: Corporate Strategies and Global Economy Conference, Le Havre, France, 2005.

Hold-up, multilateral bargaining, and strategic investment: the Eurasian supply chain for natural gas, the 31st *European Association for Research in Industrial Economics Conference*, Berlin, Germany, 2004.

Hold-up, multilateral bargaining, and strategic investment: the Eurasian supply chain for natural gas: presented at *Strategic Planning Department*, *Wintershall AG*, Kassel, Germany, 2004.

Hold-up, multilateral bargaining, and strategic investment: the Eurasian supply chain for natural gas: presented at American Economic Association Conference, San Diego, California, 2004.

Strategic investment and bargaining power in supply chains: a Shapley value analysis of the Eurasian gas market: presented at 18th *European Economic Association Conference*, Stockholm, Sweden, 2003.

Strategic investment and bargaining power in supply chains: a Shapley value analysis of the Eurasian gas market: presented at 30th *European Association for Research in Industrial Economics* Conference, Helsinki, Finland, 2003.

Teaching experience

International Trade II, 2019/2020, MS-level class (in English), TUM School of Management

Network Economics II, 2019/2020, MS-level class (in English), TUM School of Management

International Trade I, 2019/2020, MS-level class (in English), TUM School of Management

Network Economics I, 2019/2020, MS-level class (in English), TUM School of Management

Evaluation of Unconventional Resources: An Integrated Approach, 2017

Executive Professional-Development Training, The University of Texas at Austin

Natural Resource Evaluation and Development Strategy, Spring 2016, Spring 2017, Spring 2018

MS level class (in English), The New Economic School, Moscow, Russia

Engineering Finance (ME 353), Fall 2014

BS&MS level class, Department of Mechanical Engineering, The University of Texas at Austin

Competitive strategy, 2007/2008, BS&MS level class (in English, German), *teaching assistant* at Humboldt University of Berlin.

Energy economics, 2007, MS-level class (in English), *teaching assistant* at Catholic University of Leuven, Leuven.

Power games in energy markets, 2006/2007, Advanced Seminar MS/PhD class (in English), *teaching assistant* at Humboldt University of Berlin.

Applied Infrastructure Research and Policy Training, 2005&2006, PhD-level School, *contributing participant*, Technical University of Berlin.

Business Intelligence System in Oracle, 2003, Client training group, *assistant* in a Sterling R. Group, Department of Enterprise Management.

Students Supervised

J. Simanjuntak, 2019. Challenges and Opportunities of Shale Resources Development in Indonesia, MS in Energy and Earth Resources, McCombs School of Management & Jackson School of Geosciences, University of Texas at Austin

R. Safiulin, 2019. The Role of Information, Uncertainty, and Capital in Technology Development: Analysis of the Shale Gas Industry Productivity, MS in Energy Economics, New Economic School, Russia

S. Siddique, 2018. Strategic motives for time and cost overruns in infrastructure projects, MS in Energy and Earth Resources, Mechanical Engineering Department & Jackson School of Geosciences, University of Texas at Austin

S. Berdyasheva, 2018. Financial Constraints and Elasticity of Natural Resource Supply, Masters in Energy Economics, MS in Energy Economics, New Economic School, Russia

W. Jang, 2017. Firm-level Trade-offs and Play-wide Implications of Different Shale Resource Development Options, MS in Energy and Earth Resources, Jackson School of Geosciences

D. Sierra, 2016. Developing a Vaca Muerta Shale Play: An Economic Assessment Approach, MS in Energy and Earth Resources, Jackson School of Geosciences

A. Hwang, 2015. The Impact of Cluster Drilling Technology on Well Productivity and Profitability: A Case Study of the Fayetteville Shale Play, MS in Energy and Earth Resources, Jackson School of Geosciences

Z. Petrou, 2015. Water-Energy Nexus: The case study of Marcellus shale gas play, MS in Energy and Earth Resources, Jackson School of Geosciences

C. Grote, 2014. Industry Evolution: Applications to the U.S. Shale Gas Industry, MS in Energy and Earth Resources, Jackson School of Geosciences

G. Kupper, 2008. What is the strategic value of investments in alternative local energy supply? PhD at Catholic University of Leuven, Belgium

Service at the University of Texas at Austin

2015 – Pres. **Graduate Study Committee**, Energy and Earth Resources Graduate Program, Jackson School of Geosciences, The University of Texas at Austin

2010 - 2016 **Endowment Committee** of the Jackson School of Geosciences;

The Chair of the Committee since 2015