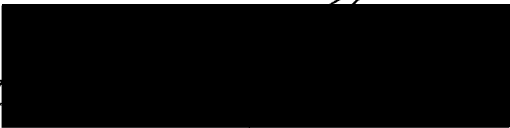


**Committee on Energy and Commerce**  
**U.S. House of Representatives**  
Witness Disclosure Requirement - "Truth in Testimony"  
Required by House Rule XI, Clause 2(g)(5)

<b>1. Your Name: John Farrell</b>		
<b>2. Your Title: Laboratory Program Manager, Vehicle Technologies</b>		
<b>3. The Entity(ies) You are Representing: National Renewable Energy Laboratory</b>		
<b>4. Are you testifying on behalf of the Federal, or a State or local government entity?</b>	<b>Yes</b>	<b>No</b> <b>X</b>
<b>5. Please list any Federal grants or contracts, or contracts or payments originating with a foreign government, that you or the entity(ies) you represent have received on or after January 1, 2015. Only grants, contracts, or payments related to the subject matter of the hearing must be listed. NREL operates under Prime Contract No. DE-AC36-08GO28308 with the U.S. Dept. of Energy. The dollar amount of the contract is variable; details per a specific period are available from NREL, or the Department.</b>		
<b>6. Please attach your curriculum vitae to your completed disclosure form.</b>		

Signature: 

Date: March 5, 2018

John Farrell



## Professional Experience

### National Renewable Energy Laboratory

Laboratory Program Manager - Vehicle Technologies 2013 – present

### ExxonMobil Corporate Research Laboratory

Section Head – Separations and Process Chemistry 2013

Planning Advisor to Vice President of R&D 2010 – 2013

Section Head – Emerging Energy Sciences 2008 – 2010

Section Head – Engineering and Process Chemistry 2006 – 2008

Program Leader, Combustion Fundamentals 2001 – 2006

Member of the Technical Staff, Flame Laboratory 1998 – 2001

### Sandia National Laboratories

Postdoctoral Research Associate, Combustion Research Facility 1996 – 1998

### Ethyl Corporation

Senior R&D Chemist, industrial/gear lubricant development 1996 – 1998

## Education

### Purdue University, West Lafayette IN

B.S. Chemistry 1990

### JILA/University of Colorado, Boulder CO

Ph.D. Physical Chemistry 1995

## Professional Activities

Technical lead, Department of Energy Co-Optimization of Fuels & Engines (Co-Optima) initiative 2014 – present

International Advisory Board, Combustion Energy Frontier Research Center 2009 – 2013

International Advisory Board, DOD Jet Fuel Multi-University Research Initiative 2007 – 2010

Peer Reviewer - numerous journal reviews, DOE proposal and merit reviews 1998 – present

Invited panel member for DOE Basic Research Needs activities 2006

PhD Thesis Committee

Chiung-Ju Chen, New Jersey Institute of Technology 2004

Kai He, Rutgers University 2008

Nagore Sabio Arteaga, Universitat Rovira i Virgili 2016

## Honors, Awards, Activities

ExxonMobil CEO Incentive Award	
Harry L. Horning Award From The Society of Automotive Engineers	2003
National Science Foundation Graduate Fellowship in Atmospheric Chemistry	1993
Graduate Teaching Award, University of Colorado	1991
New Jersey Chemistry Olympics	2001 – 2012
Campus Recruiter, Purdue University (PhD chemistry students)	2007 – 2012
High Bridge Environmental Committee (Chairman), High Bridge Green Team (Chairman), High Bridge Tree Board (Chairman)	2008 – 2013
Wild Bear Mountain Ecology Center (Vice President, Board of Directors and Chair, Building Development Committee)	2014 – 2017

## Select Invited Presentations, Panels, Congressional Briefings

1. Colorado School of Mines Chemical Engineering Departmental Seminar	2000
2. University of Wisconsin Mechanical Engineering Departmental Seminar	2004
3. University of Southern California Mechanical Engineering Departmental Seminar	2005
4. New Jersey Institute Chemistry Department Seminar	2007
5. Princeton University Mechanical Engineering Departmental Seminar	2009
6. Rutgers University Biomedical Engineering Departmental Seminar	2009
7. DU Law School, "Sustainable Transportation Overview: Challenges, Issues and Opportunities"	2014
8. Columbia University Mechanical Engineering Departmental Seminar	2014
9. DU Law School, "Sustainable Transportation: Technology, Economics, and Policy"	2015
10. SAE World Congress & Exhibition, Fuel/Engine Expert Panel	2015
11. BioEnergy 2015 Panel Discussion, Fuel-Engine Co-Optimization	2015
12. SAE High Efficiency Engine Symposium	2015
13. Congressional Briefing, Fuels-Engine Co-Optimization Program Overview	2016
14. DOE Sustainable Transportation Summit	2016
15. BioEnergy 2016 Panel Discussion, Fuel-Engine Co-Optimization	2016
16. National Council of State Legislators, Agriculture Task Force - Future of Fuels Panel Discussion	2016
17. IEA HEV Symposium, "Technology Opportunities for Electrified Medium- and Heavy-Duty Vehicles"	2016
18. Austrian Association for Advanced Propulsion Systems, Fuel-Engine Co- Optimization	2016
19. Health Effects Institute Workshop, "Effect of Fuel Composition on Particulate Matter"	2016
20. CRC Mobile Source Air Toxics Workshop, "Co-Optima Overview and Emissions Control Projects"	2017
21. Princeton University Mechanical Engineering Departmental Seminar, "Co- Optimization of Fuels and Engines (Co-Optima) Overview"	2017

22. University of Wisconsin Engine Research Center Symposium, "Co-Optimization of Fuels & Engines (Co-Optima) Initiative: Recent Progress on Light-Duty Boosted Spark-Ignition Fuels/Engines" 2017
23. Israeli Innovation Authority (IIA) Renewable Energy-Systems Integration & Safety Workshop, "Energy Storage for Efficient and High-Performance Transportation" 2017
24. Bioeconomy 2017, "Creating a Win-Win-Win with the Next Generation of Fuels and Vehicles: The Early-Stage Research Perspective" 2017
25. SAE 13<sup>th</sup> International Conference on Engines & Vehicles – Capri, Italy, "Overview of Co-Optimization of Fuels & Engines (Co-Optima) Initiative" 2017
26. SAE 2017 Range-Extenders for Electric Vehicles Symposium, "NREL/Industry Range-Extended EV for Package Delivery" 2017
27. Transportation Research Board 2018 Annual Meeting, "Opportunities for High-Value Bioblendstocks to Enable Advanced Light- and Heavy-Duty Engines: Insights from the Co-Optima Project" 2018

## Publications

1. J. Farrell, J. Holladay, and R. Wagner, "Fuel Blendstocks with the Potential to Optimize Future Gasoline Engine Performance: Identification of Five Chemical Families for Detailed Evaluation." Technical Report. U.S. Department of Energy, Washington, DC. 2018. DOE/GO-102018-4970
2. N. Sabio, C. Pozo, G. Guillén-Gosálbez, L. Jiménez, R. Karuppiah, V. Vasudevan, N. Sawaya, and J.T. Farrell, "Multi-objective Optimization of the Economic and Life Cycle Environmental Performance of Industrial Processes," *AIChE Journal*. (2014) 60(6), 2098-2121
3. L. Liang, J.G. Stevens, and J.T. Farrell, "A Dynamic Multi-Zone Partitioning Scheme for Solving Detailed Chemical Kinetics in Reactive Flow Computations," *Comb. Sci. Tech.*, (2009) 181:1345-71
4. L. Liang, J.G. Stevens, S. Raman, and J.T. Farrell, "The Use of Dynamic Adaptive Chemistry in Combustion Simulation of Gasoline Surrogate Fuels," *Comb. Flame* (2009) 156(7), 1493-1502.
5. L. Liang, J.G. Stevens, and J.T. Farrell, "A Dynamic Adaptive Chemistry Scheme for Reactive Flow Computations, *Proc. Comb. Inst.* 32 (2009), 527–534
6. G. Da Silva, L. Liang, J.W. Bozzelli, and J.T. Farrell, "Ethanol Oxidation: Kinetics of the  $\alpha$ -Hydroxyethyl Radical + O<sub>2</sub> Reaction," *J. Phys. Chem. A*, (2009), 113 (31), 8923–8933
7. K. Akihama, H. Kosaka, Y. Hotta, K. Inagaki, T. Fuyuto, Y. Iwashita, J.T. Farrell, and W. Weissman, "An Investigation of High Load (Compression Ignition) Operation of the "Naphtha Engine" – a Combustion Strategy for Low Well-to-Wheel CO<sub>2</sub> Emissions," SAE Paper 2008-01-1599 (2008)
8. J.T. Farrell, N.P. Cernansky, F.L. Dryer, D. Friend, C. Hergart, C.K. Law, R. McDavid, C.J. Mueller, and H. Pitsch, "Development of an Experimental Database and Kinetic Models For Surrogate Diesel Fuels," SAE Paper 2007-01-0201 (2007)

9. W. J. Pitz, N.P. Cernansky, F.L. Dryer, F. Egolfopoulos, J.T. Farrell, D. Friend, and H. Pitsch, "Development of an Experimental Database and Kinetic Models For Surrogate Gasoline Fuels," SAE Paper 2007-01-0175 (2007)
10. J.T. Farrell and B.G. Bunting, "Fuel Composition Effects at Constant RON and MON in a Recompression HCCI Engine," SAE Paper 2006-01-3275 (2006)
11. T.J. Wallington, E.W. Kaiser, and J.T. Farrell, "Automotive Fuels and Internal Combustion Engines: A Chemical Perspective", Chem.Soc. Rev., (2006) 35, 1-14
12. J.T. Farrell, J.G. Stevens, and W. Weissman "A Second Law Analysis of High Efficiency, Low Emissions Gasoline Engine Concepts," SAE Paper 2006-01-0491 (2006)
13. I.P. Androulakis, M.D. Weisel, C.S. Hsu, K. Qian, L.A. Green, J.T. Farrell, and K. Nakakita "An Integrated Approach for Creating Model Diesel Fuels," Energy Fuels, (2005) 19(1) 111–119
14. J.T. Farrell, R.J. Johnston, and I.P. Androulakis, "Molecular Structure Effects On Laminar Burning Velocities At Elevated Temperature And Pressure", SAE Paper 2004-01-2936 (2004)
15. C.-C. Chen, J.W. Bozzelli, and J.T. Farrell, "Thermochemical Properties, Pathway, and Kinetic Analysis on the Reactions of Benzene with OH: An Elementary Reaction Mechanism," J. Phys. Chem. A, (2004) 108(21), 4632–4652
16. K. Akihama, M. Taki, S. Takasu, T. Ueda, Y. Iwashita, J.T. Farrell, and W. Weissman, "Fuel Octane and Composition Effects on Efficiency and Emissions in a High Compression Ratio SIDI Engine," SAE Paper 2004-01-1950 (2004)
17. J.T. Farrell, W. Weissman, R.J. Johnston, J. Nishimura, T. Ueda, and Y. Iwashita, "Fuel Effects on SIDI Efficiency and Emissions), SAE Paper 2003-01-3186, (2003)
18. K. Nakakita, H. Ban, S. Takasu, Y. Hotta, K. Inagaki, W. Weissman and J.T. Farrell, "Effect Of Hydrocarbon Molecular Structure In Diesel Fuel On In-Cylinder Soot Formation And Exhaust Emissions", SAE Paper 2003-01-1914 (recipient of 2003 SAE Horning Award for best paper of year)
19. E.P. Clifford, J.T. Farrell, J.D. DeSain, and C.A. Taatjes, "Infrared Frequency-Modulation Probing of Product Formation in Alkyl + O<sub>2</sub> Reactions: I. The Reaction of C<sub>2</sub>H<sub>5</sub> with O<sub>2</sub> between 295 and 698 K". J. Phys. Chem. A., (2000) 104(49), 11549-11560.
20. J.T. Farrell and C.A. Taatjes, "Infrared Frequency-Modulation Probing of Cl + C<sub>3</sub>H<sub>4</sub> (Allene, Propyne) Reactions: Kinetics of HCl Production from 292 to 850 K". J. Phys. Chem. A., (1998) 102(25), 4846-4856.
21. J.T. Farrell, Jr. and D.J. Nesbitt, "Probing three-body intermolecular forces: near-infrared spectroscopy of Ar<sub>2</sub>HF and Ar<sub>2</sub>DF van der Waals modes". J. Chem. Phys. (1996), 105(21), 9421-9440.
22. J.T. Farrell, Jr., M.A. Suhm, and D.J. Nesbitt, "Breaking symmetry with hydrogen bonds: Vibrational predissociation and isomerization dynamics in HF-DF and DF-HF isotopomers". J. Chem. Phys. (1996), 104(23), 9313-9331.
23. S. Davis, D.T. Anderson, J.T. Farrell, Jr., and D.J. Nesbitt, "Isotopic substitution of a hydrogen bond: A near infrared study on intramolecular vibrations in (DF)<sub>2</sub>", J. Chem. Phys. (1996), 104(21), 8197-8209.
24. S. Davis, J.T. Farrell, Jr., D.T. Anderson, and D.J. Nesbitt, "10<sup>4</sup>-Fold isotope effect: vibrational predissociation in ArDF". Chem. Phys. Lett. (1995), 246(1,2), 157-62
25. J.T. Farrell, Jr., S. Davis, and D.J. Nesbitt, "Pairwise and nonpairwise additive forces in weakly bound complexes: high resolution infrared spectroscopy of Ar<sub>n</sub>DF (n = 1,2,3)", J. Chem. Phys. (1995), 103(7), 2395-11

26. D.J. Nesbitt, T.G. Lindeman, J.T. Farrell, Jr., and C.M. Lovejoy, "Slit jet infrared spectroscopy of hydrogen bonded N<sub>2</sub>HF isotopomers: rotational Rydberg-Klein-Rees analysis and H/D dependent vibrational predissociation rates", *J. Chem. Phys.* (1994), 100(2), 775-85.
27. E. Riedle, S.H. Ashworth, J.T. Farrell, Jr., and D.J. Nesbitt, "Stabilization and Precise Calibration of a cw difference frequency spectrometer by use of a simple transfer cavity", *Rev. Sci. Instrum.* (1994) 65:42-48
28. J.T. Farrell, Jr.; O. Sneh, and D.J. Nesbitt, "High-Resolution Infrared Overtone Spectroscopy of N<sub>2</sub>-HF: Vibrational Red Shifts and Predissociation Rate as a Function of HF Stretching Quanta", *J. Phys. Chem.* (1994), 98(24), 6068-74.
29. K.M. Stirk, P. Lin, T.D. Ranatunga, L.C. Zeller, J.T. Farrell, Jr., and H.I. Kenttamaa, "Comparison of energy-resolved low-energy CAD of stable and isomerizing ions in an FT-ICR and in other tandem mass spectrometers", *Int. J. Mass Spec. Ion Proc.* (1994), 130(3), 187-205.
30. L.C. Zeller, J.T. Farrell, Jr., H.I. Kenttamaa, and T. Kuivalainen, "Multiple-stage mass spectrometry in structural characterization of organophosphorus compounds", *J. Am. Soc. Mass Spec.* (1993), 4(2), 125-34.
31. M.A. Suhm, J.T. Farrell, Jr., S.H. Ashworth, and D.J. Nesbitt, "High-resolution infrared spectroscopy of the deuterium fluoride trimer: a cyclic, ground-state structure, and deuterium fluoride-stretch-induced intramolecular vibrational coupling", *J. Chem. Phys.* (1993), 98(7), 5985-9.
32. J.T. Farrell, Jr. O. Sneh, A. McIlroy, A.E.W. Knight, and D.J. Nesbitt, "High-resolution infrared overtone spectroscopy of argon-hydrogen fluoride (ArHF) via neodymium:YAG/dye laser difference frequency generation", *J. Chem. Phys.* (1992), 97(11), 7967-78.
33. M.A. Suhm, J.T. Farrell, Jr., A. McIlroy, and D.J. Nesbitt, "High-resolution, 1.3-mm overtone spectroscopy of the hydrogen fluoride dimer in a slit jet:  $K_a = 0 \leftarrow 0$  and  $K_a = 1 \leftarrow 0$  subbands of  $\nu_{\text{acc}} = 2 \leftarrow 0$ ", *J. Chem. Phys.* (1992), 97(8), 5341.
34. L. Zeller, J.T. Farrell, Jr., H.I. Kenttamaa, and P. Vainiotalo, "Long-lived radical cations of simple organophosphates isomerize spontaneously to distonic structures in the gas phase", *J Am. Chem. Soc.* (1992), 114(4), 1205-14.
35. J.T. Farrell, Jr.; P. Lin, and H.I. Kenttamaa, "Simple method for ion isolation in Fourier transform ion cyclotron resonance mass spectrometry: combined notch excitation and selective ion partitioning in a dual cell", *Anal. Chim. Acta* (1991), 246(1), 227-32 (1991) 227.