

Workshop Agenda

The Technological, Economic and Environmental Potential of Natural Gas as a Sustainable Transportation Fuel in the United States

[UC Davis Conference Center](#), Ballroom B, University of California, Davis Campus

October 1, 2015

- 8:30 am Arrival and coffee
- 8:45 am **Welcome: Setting the Stage**
- *Amy Myers Jaffe*, Executive Director of Energy and Sustainability, University of California, Davis
- 9:00 am **Oil vs Natural Gas: Prices and US Economy Wide Factors**
- *Stephen P.A. Brown*, Professor, University of Nevada, Las Vegas and Fellow, Resources for the Future
- 9:15 am **Natural Gas in Trucking: Vehicle Technologies, Economics and Efficiency Trade Offs: Pros and Cons**
- Moderator: *Mike Kuby*, Professor, Arizona State University
- *Patric Ouellette*, Chief Technology Officer, Westport Innovations Inc.
 - *Emmanuel Varenne*, Alternative Fuel Program Manager, Volvo Trucks
 - *Jeffrey Reed*, Director, Business Strategy and Development, SDG&E & SoCalGas
- 10:45 am **Coffee Break**
- 11:00 am **Natural Gas as a Pathway to Alternative Low Carbon Fuels**
- Moderator: *Lew Fulton*, Director, STEPS Program, UC Davis Institute of Transportation Studies
- *Joan Ogden*, Professor, UC Davis -- Natural Gas as a Transition Fuel: Hythane and Hydrogen
 - *Nathan Parker*, Assistant Research Professor, Arizona State University -- Renewable Natural Gas potential
 - *Chuck White*, Government Affairs Consultant, Waste Management -- Barriers to RNG adoption
 - *Colin Carter*, Professor, UC Davis -- Infrastructure Issues and Barriers
- 12:30 pm **Lunch**

- 1:30 pm **Keynote: The EPA/NHTSA Phase 2 Proposal for Trucks – Opportunities and Challenges for Natural Gas Trucks**
Rich Kassel, Senior Vice President, Gladstein, Neandross & Associates
- 2:00 pm **Sustainability and Natural Gas as a Direct Fuel and Fuel Feedstock**
Moderator: Rosa Dominguez-Faus, UC Davis Environmental Lead, Natural Gas
- *Hao Cai*, Assistant Environmental Analyst, Argonne National Laboratory
 - *Arvind Thiruvengadam*, Research Assistant Professor, West Virginia University
 - *Andrew Burnham*, Assistant Environmental Scientist, Argonne National Laboratory
 - *Fan Tong*, PhD Candidate, Carnegie Mellon
- 3:15 pm **Concluding Discussions: Role of Policy**
Moderator: Amy Jaffe
- *Tim Frazier*, Director of Engineering, Cummins-Westport -- Role of policy in driving technology development and consumer adoption
 - *Tim Olson*, Energy Resource Manager, California Energy Commission -- Natural gas and low carbon fuel policy in California
 - *Ryan Schuchard*, Policy Director, CALSTART -- Role of policy in California
- 4:45 pm **Program Adjourns**
- 5:15 pm **Reception**
Our House Restaurant
808 2nd St; Davis, CA

Attendees

First Name	Last Name	Job Title	Company/ Organization
Evan	Michelson	Program Officer	Alfred P. Sloan Foundation
Andrew	Burnham	Assistant Environmental Scientist	Argonne National Laboratory
Hao	Cai	Assistant Environmental Analyst	Argonne National Laboratory
Scott	Kelley	Instructor	Arizona State University
Michael	Kuby	Professor	Arizona State University
Nathan	Parker	Assistant Research Professor	Arizona State University
Tim	Carmichael	President	CA NGV Coalition
Renee	Littaua	Staff Air Pollution Specialist	Air Resources Board
Ryan	McCarthy	Science and Technology Policy Advisor	California Air Resources Board
William	Robertson	Vehicle Program Specialist	California Air Resources Board
Reynaldo	Gonzalez	Transportation R&D Team Lead	California Energy Commission
Yu	Hou	Air Resources Engineer	California Energy Commission
Tim	Olson	Energy Resource Manager	California Energy Commission
Timothy	Hall	Environmental Scientist	CalRecycle
Brian	Helmowski	Environmental Scientist	CalRecycle
Ryan	Schuchard	Policy Director	CALSTART
Fan	Tong	PhD student	Carnegie Mellon University
Matt	Franklin	Planning Engineer	Chevron
Jeffrey	Jacobs	Vice President	Chevron
Sean Robledo	Edgar	Director	CleanFleets.net
Tim	Frazier	Director of Engineering	Cummins Westport
Richard	Kassel	Senior Vice President	Gladstein Neandross & Associates
Beth	Bourne	Assistant Program Manager	ITS-Davis
Andy	Burke	STEPS Researcher	ITS-Davis
Rosa	Dominguez-Faus	Postdoctoral fellow	ITS-Davis
Lew	Fulton	Director, STEPS Program	ITS-Davis
Paul	Gruber	Exec. Dir., STEPS Program	ITS-Davis
Dominique	Meroux	Graduate Student Researcher	ITS-Davis
Christopher	Yang	Research Scientist	ITS-Davis
Hengbing	Zhao	Researcher	ITS-Davis
Daniel	Cohn	Research Scientist	MIT Energy Initiative
Zhenhong	Lin	Senior R&D Staff	Oak Ridge National Lab
Jessica	Schlosser	Air Quality Specialist	San Joaquin Valley APCD

Jeffrey	Reed	Director, Business Strategy and Development	SDG&E & SoCalGas
Allison	Smith	Energy Policy Manager	SoCalGas
Henry	Hogo	Assistant Deputy Executive Officer	South Coast Air Quality Management District
Benjamin	Geller	Sr. Engineer	Toyota Technical Center
David	Bunch	Professor	UC Davis
Colin	Carter	Professor	UC Davis
Amy	Jaffe	Executive Director, Energy and Sustainability	UC Davis
Miguel	Jaller	Assistant Professor	UC Davis
Joan	Ogden	Professor	UC Davis
Daniel	Scheitrum	PhD Candidate	UC Davis
Adam	Schultz	Manager	UC Davis Energy Institute
Jacques	Franco	Science & Policy Fellow	UC Davis Policy Institute
David	Reichmuth	Senior Engineer	Union of Concerned Scientists
Stephen	Brown	Professor	University of Nevada, Las Vegas
Emmanuel	Varenne	Alt Fuel Program Manager	Volvo
Charles	White	Government Affairs Consultant	Waste Management
Arvind	Thiruvengadam	Research Assistant Professor	West Virginia University
Patric	Ouellette	CTO	Westport

Sustainable Transportation Energy Pathways Program (STEPS) www.steps.ucdavis.edu

STEPS is the major multidisciplinary research consortium within the Institute of Transportation Studies at the University of California, Davis. The consortium is comprised of 40+ PhD-level faculty and researchers and graduate students from UC Davis, 20+ industry and governmental partners, and 20+ outside expert organizations. Our mission encompasses research, outreach, and education:

- generate new insights and tools to understand the transitions to a sustainable transportation energy future for California, the US and the world,
- disseminate valued knowledge and tools to industry, government, the environmental NGO community, and the general public to enhance societal, investment, and policy decision making,
- train the next generation of transportation and energy leaders and experts.

The STEPS 2015-2018 program is generously supported by these sponsors:

- Auto: BMW, Daimler, Fiat Chrysler, Ford, GM, Honda, Hyundai-Kia, Renault, Toyota, Volkswagen
- Trucks: Cummins, Westport
- Energy: Aramco, Chevron, Centre for High Technology (India), Shell, San Diego Gas & Electric/SoCalGas, Sinopec
- Government: California Air Resources Board, Caltrans, South Coast AQMD, U.S. DOE, U.S. DOT, U.S. EPA
- NGO: FIA Foundation

STEPS has initiated a 2015-2018 research program. The main program areas and overarching research questions are:

- **Initiating Transitions 2015-2030:** What is required for early alternative fuel/vehicle transitions to succeed?
- **The Future of the Fuels and the Oil & Gas Industry:** How will changing geopolitical landscapes and disruptive technology in the oil and gas and clean technology industry impact future business models and the competition of fuels?
- **Global Urban Sustainable Transport (GUSTo):** How will a rapidly urbanizing world affect demand for transport and energy? How can we transition to sustainable transportation in a rapidly urbanizing world with ever-growing need for mobility?
- **Modeling Analysis, Verification, Regulatory and International Comparisons (MAVRIC):** What do improved and cross-compared economic/environmental/ transportation/energy models tell us about the future of sustainable transportation?

Contact: Paul Gruber, STEPS Executive Director, pwgruber@ucdavis.edu, (530) 752-1934

Notes:

Workshop Evaluation and Participant Survey**The Technological, Economic and Environmental Potential of Natural Gas as a Sustainable
Transportation Fuel in the United States**

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October 1, 2015

Participant's name (optional):

What was the perceived quality of the sessions that you attended at today's workshop on a scale of 1 (poor) to 5 (excellent)? Workshop sessions:

- | | | | | | | |
|--|---|---|---|---|---|----|
| • Natural Gas in Trucking: Vehicle Technologies, Economics and Efficiency Trade Offs: Pros and Cons | 1 | 2 | 3 | 4 | 5 | NA |
| • Natural Gas as a Pathway to Alternative Low Carbon Fuels | 1 | 2 | 3 | 4 | 5 | NA |
| • Keynote: The EPA/NHTSA Phase 2 Proposal for Trucks – Opportunities and Challenges for Natural Gas Trucks | 1 | 2 | 3 | 4 | 5 | NA |
| • Sustainability and Natural Gas as a Direct Fuel and Fuel Feedstock | 1 | 2 | 3 | 4 | 5 | NA |
| • Concluding Discussions: The Role of Policy | 1 | 2 | 3 | 4 | 5 | NA |

What did you think was most valuable about the workshop?

Where is there room for improvement?

How would you say this workshop compares to similar workshops/conferences that you have attended?

Do you believe the workshop achieved its overarching goals?