Testimony
Committee on Natural Resources
Energy Independence: Domestic Opportunities to Reverse California's Growing Dependence on Foreign Oil
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David Quast, California Director, Energy in Depth
Representing the Independent Petroleum Association of America and the California Independent Petroleum Association

Thank you, Mr. Chairman, for the opportunity to address the Subcommittee on this important topic.

Many people don't realize the significant role that oil and natural gas have played in California's history, or the incredible opportunities that increased in-state production would afford us. These opportunities include high-paying jobs in our most economically troubled region, increased investment and tax revenue, environmental protection, and, of course, energy security.

California's oil and natural gas industry has been part of the backbone of our state's economy for more than 150 years. We have abundant energy resources – particularly in Kern and Los Angeles counties -- and our laws and regulations reflect the high priority we place on environmental stewardship. Californians of all political persuasions know that economic development and environmental protection are not mutually exclusive – on the contrary, this has been our tradition for more than a century.

As the President frequently and proudly points out, for the first time in 20 years the United States produces more oil at home than we buy from the rest of the world. Unfortunately, in California we still import half of our oil from overseas.

But it doesn't have to be this way.

California is the third largest oil producing state, and Governor Brown has said that he intends for this energy leadership to continue.

But this requires making a choice – we can generate more of our energy at home, as the rest of the country has been doing in recent years, or we can import it, often from politically fraught regions with all of the geopolitical risk that this entails -- not to mention the environmental disadvantages.

Happily, we have what appear to be the ingredients for success right under our feet, not only in California's established oil fields but also in the Monterey Shale.

As the Subcommittee is no doubt aware, the U.S. Energy Information Administration estimates that the Monterey Shale may contain as much at 15 billion barrels of recoverable oil, which would account for two-thirds of the U.S. resource and may very

well be the largest such reserve in the world. For perspective, this is approximately five times the size of the Eagle Ford shale in Texas.

Currently, in California, the petroleum industry supports approximately 95,000 direct jobs and more than a quarter of a million indirect jobs. And there is good reason to believe that this is only scratching the surface of our potential, as producers discover new ways to access our reserves.

According to a recent study by California State University, Fresno – which used relatively conservative production forecasts -- if technical challenges can be surmounted and depending on the pace of innovation and deployment -- the development of the Monterey Shale could lead to as many as 195,000 new jobs in the San Joaquin Valley and boost personal income there by $22 billion, all by the year 2030. This could be the beginning of an economic renaissance in a region suffering from crippling, double-digit unemployment.

It's worth remembering that the history of energy development is really the history of technology development. North Dakota's economic miracle didn't happen overnight. It took decades of work – including trial and error -- until the techniques that we now consider routine were perfected. But that reality should not hide the fact that technological innovation is itself a powerful job creator, all the better when it comes from private investment.

Unfortunately, in California, there is a small but vocal group of radical anti-industry activists with the goal of shutting down domestic oil and natural gas development, starting in California. They have tried to cloak this goal in a misguided and ill-informed attack on hydraulic fracturing.

The good news is that, despite the activists' repeated claims otherwise, the scientific consensus – that fracking technology is fundamentally safe and has manageable risks -- has prevailed in California. Last year the state's overwhelmingly Democratic legislature soundly defeated a bill to put a moratorium on the practice. The legislature instead passed the nation's most sweeping regulations on well stimulation, which we in the industry thought were overreaching, but which nevertheless mean the companies can continue to responsibly and safely produce oil and gas -- albeit in an even more heavily regulated environment.

Not to be deterred, the most radical of the activists continue to hold rallies and chant demonstrably untrue slogans, like "climate leaders don't frack." But the fact is that the United States leads the world in carbon emissions reductions thanks to the increased use of low-cost natural gas in the nation's power plants – something not possible without shale and hydraulic fracturing.

And, just as importantly, even though overall demand for oil is down, California remains the third largest consumer on the planet of gas and diesel – behind only the United States and China. In fact, 96 percent of our state's transportation is petroleum-based,

and the EIA estimates that by 2040, 80 percent of our energy will still be fossil-fuel based. Meanwhile, every barrel of oil we produce in California is a barrel that we don't import from countries with significantly fewer environmental protections.

Californians tend to be proud of our state's environmental leadership, and it is, frankly, bizarre that political activists would suggest that their elected leaders follow blind, anti-scientific talking points rather than sound science. Whether we are talking about oil or natural gas, increased domestic production is good for both the economy and the environment. This is something environmentalists should celebrate, not oppose as a matter of ideology.

In any case, the groundwork has been laid for the next chapter in California's long history of oil production, a history that should include many more jobs for Californians, more state revenue, more economic activity, lower global carbon emissions and, yes, less reliance on imported oil.

Thank you.

APPENDIX I: 50 Recent Studies on Hydraulic Fracturing

The production of oil and natural gas from deep shale formations and other "tight" reservoirs, and the use of hydraulic fracturing, have been closely regulated and extensively studied for many years. The ongoing effort to closely monitor these activities has yielded many studies and reports, including:

Impact of Shale Gas Development on Regional Water Quality
Department of Civil and Environmental Engineering, University of Pittsburgh & the Earth and Environmental Systems Institute and Department of Geosciences, Pennsylvania State University (May 2013)

Review of the Potential Public Health Impacts of Exposures to Chemical and Radioactive Pollutants as a Result of Shale Gas Extraction
Public Health England (October 2013)

The Petroleum Industry and the Monterey Shale: Current Economic Impact and the Economic Future of the San Joaquin Valley
Craig School of Business, California State University, Fresno (August 2013)

Induced Seismicity and Hydraulic Fracturing for the Recovery of Hydrocarbons
Durham Energy Institute, Department of Earth Sciences, Durham University (April 2013)

Evaluation of impact of shale gas operations in the Barnett Shale region on volatile organic compounds in air and potential human health risks
ToxStrategies, Austin (September 2013)

U-M technical reports examine hydraulic fracturing in Michigan
University of Michigan (September 2013)

Measurements of methane emissions at natural gas production sites in the United States
David T. Allena, Center for Energy and Environmental Resources, University of Texas, Austin, Vincent M. Torresa URS Corporation, et al. (September 2013)

America's New Energy Future: The Unconventional Oil & Gas Revolution and the US Economy
IHS CERA (September 2013)

Constraints on Upward Migration of Hydraulic Fracturing Fluid and Brine
Gradient (July 2013)

Game changers: Five opportunities for US growth and renewal
McKinsey & Company (July 2013)

Baseline Groundwater Quality from 20 Domestic Wells in Sullivan County, Pennsylvania, 2012
U.S. Geological Survey (June 2013)

National Human Health Risk Evaluation for Hydraulic Fracturing Fluid Additives
Gradient (May 2013)

The Next Frontier in United States Unconventional Shale Gas and Tight Oil Extraction: Strategic Reduction of Environmental Impact
Belfer Center (March 2013)

Shallow Groundwater Quality and Geochemistry in the Fayetteville Shale Gas-Production Area, North-Central Arkansas, 2011
U.S. Geological Survey (January 2013)

Modern Shale Gas Development in the United States: A Primer
U.S. Department of Energy and Ground Water Protection Council (April 2009)

State Oil and Natural Gas Regulations Designed to Protect Water Resources
U.S. Department of Energy and Ground Water Protection Council (May 2009)

Response of the U.S. Environmental Protection Agency to Petition for Promulgation of Rule Withdrawing Approval of Alabama's Underground Injection Control Program
U.S. Environmental Protection Agency (May 1995)

Evaluation of Impacts to Underground Sources of Drinking Water by Hydraulic Fracturing of Coalbed Methane Reservoirs Study
U.S. Environmental Protection Agency (June 2004)

Study of the Potential Impacts of Hydraulic Fracturing on Drinking Water Resources: Progress Report
U.S. Environmental Protection Agency (December 2012)

Hydraulic Fracturing Study: PXP Inglewood Oil Field
Cardno ENTRIX (October 2012)

Induced Seismicity Potential in Energy Technologies
National Research Council (June 2012)

Shallow Groundwater Quality and Geochemistry in the Fayetteville Shale Gas-Production Area, North-Central Arkansas, 2011
U.S. Geological Survey (January 2013)

Water Consumption of Energy Resource Extraction, Processing, and Conversion
Belfer Center for Science and International Affairs, Harvard University (October 2010)

The Impact of Marcellus Gas Drilling on Rural Drinking Water Supplies
Center for Rural Pennsylvania (November 2011)

Revised Draft Supplemental Generic Environmental Impact Statement: Well Permit Issuance for Horizontal Drilling and High-Volume Hydraulic Fracturing to Develop the Marcellus Shale and Other Low-Permeability Gas Reservoirs
New York Department of Environmental Conservation (September 2011)

The Future of Natural Gas
Massachusetts Institute of Technology Energy Initiative (June 2011)

A Commitment to Air Quality in the Barnett Shale
Texas Commission on Environmental Quality (2010)

Northeastern Pennsylvania Marcellus Shale Short-Term Ambient Air Sampling Report
Pennsylvania Department of Environmental Protection (January 2011)

Southwestern Pennsylvania Marcellus Shale Short-Term Ambient Air Sampling Report
Pennsylvania Department of Environmental Protection (November 2010)

Data Show Public Health Impacts from Natural Gas Production Overstated
***Sue Mickley, M.P.H., and Uni Blake, M.S., Toxicology* (October 2011)**

Shale Gas Production: Potential Versus Actual Greenhouse Gas Emissions
Massachusetts Institute of Technology (November 2012)
Shale Gas Production Subcommittee Second Ninety Day Report
U.S. Secretary of Energy Advisory Board (November 2011)

Estimated Use of Water in the United States in 2005
U.S. Geological Survey (October 2009)

Water Sources and Demand for the Hydraulic Fracturing of Oil and Gas Wells in Colorado from 2010 through 2015
Colorado Division of Water Resources, the Colorado Water Conservation Board, Colorado Oil and Gas Conservation Commission (January 2012)

Life Cycle Analysis of Water Use and Intensity of Oil and Gas Recovery In Wattenberg Field, Colo.
Colorado State University, Noble Energy Inc. (May, 2012)

Natural Gas and the Transformation of the U.S. Energy Sector: Electricity
U.S. National Renewable Energy Laboratory (November, 2012)

Life Cycle Greenhouse Gas Emissions of Marcellus Shale Gas
Carnegie Mellon University (August, 2011)

Characterizing Pivotal Sources of Methane Emissions from Natural Gas Production
URS Corp., LEVON Group, American Petroleum Institute, America's Natural Gas Alliance (September, 2012)

Comment on "Hydrocarbon Emissions Characterization in the Colorado Front Range – A Pilot Study"
Council on Foreign Relations (October, 2012)

Climate Impact of Potential Shale Gas Production in the EU
European Commission (July, 2012)

Life Cycle Greenhouse Gas Inventory of Natural Gas Extraction, Delivery and Electricity Production
U.S. National Energy Technology Laboratory (October, 2011)

The Greenhouse Impact of Unconventional Gas for Electricity Generation
University of Maryland (October, 2011)

Assessing the Greenhouse Impact of Natural Gas
Cornell University (June, 2012)

Mismeasuring Methane: Estimating Greenhouse Gas Emissions from Upstream Natural Gas Development
IHS CERA (August, 2011)

Trace Elements and Radon in Groundwater Across the United States, 1992-2003
U.S. Geological Survey (August, 2011)

City of Fort Worth Natural Gas Air Quality Study
Eastern Research Group, Sage Environmental Consulting

Shale Gas
U.K. House of Commons, Energy and Climate Change Committee (May, 2011)

State Oil and Gas Agency Groundwater Investigations
Ground Water Protection Council (August, 2011)

Evaluating the Environmental Implications of Hydraulic Fracturing in Shale Gas Reservoirs
ALL Consulting (2008)

A Comparative Study of the Mississippian Barnett Shale, Fort Worth Basin, and Devonian Marcellus Shale, Appalachian Basin
U.S. National Energy Technology Laboratory (April 2011)

APPENDIX II: Executive Summary Monterey Shale Study
California State University, Fresno

The Petroleum Industry and the Monterey Shale: Current Economic Impact and the Economic Future of the San Joaquin Valley

August 31, 2013

Presented to the Western States Petroleum Association

By

University Business Center
Craig School of Business
California State University, Fresno

Antonio Avalos, Ph.D.
California State University, Fresno
Department of Economics
Craig School of Business
aavalos@csufresno.edu

David Vera, Ph.D.
California State University, Fresno
Department of Economics
Craig School of Business
dvera@csufresno.edu

EXECUTIVE SUMMARY

The petroleum industry has played a significant economic role in the San Joaquin Valley (SJV) for more than a century. Yet, both oil and gas production has steadily declined at the State and the SJV region levels since 1985 when production peaked. The Monterey Shale Formation in terms of energy generation as oil and gas production could significantly increase again.

The purpose of this report is twofold. First: to assess the current annual economic contribution of the petroleum industry in the SJV. Second: to assess the potential future economic impact of oil production from the MSF in the SJV. The forecasting methodology employed in this study makes use of historical data and relationships in order to make an educated guess about the likelihood of future events. However, predicting the future with the highest precision is not possible. Multiple unforeseeable events can change the historical relationships among variables and thus the forecast. Therefore, the results of the investigation should be taken with caution.

This report exclusively responds to the need to advance our understanding of the economic contribution of the petroleum industry in the SJV both current and future. As such, the study does not quantify the potential environmental and economic costs of oil and gas production associated with neither current levels nor future levels derived from the MSF. By the same token, this report does not take any position and does not make policy recommendations based on the findings. The findings, interpretations, and conclusions are the authors' own responsibility and do not necessarily represent any position of the University Business Center or California State University, Fresno.

The main findings can be summarized as follows:

- Oil reached a maximum production level in both California and in the SJV in 1985. Current levels of State and SJV oil production are less than half the production level reached in 1985.

- Oil produced by SJV counties currently represents over 75% of the total oil production in California while gas currently represents over 65% of the total gas production in California.

- With over 95% of the total oil and gas produced in the region, Kern is the largest producing county in the SJV and in the State as well. Kern's petroleum industry contributes almost 20% to the county's gross domestic product (GDP) and more than 5% to total employment.

- The petroleum industry along with the industries linked to it supports 52,271 jobs in the SJV (3.1% of total employment in the region), paying a total of $4.08 billion in annual labor income.

- The petroleum industry generates a total of $23.6 billion in sales for businesses located within the SJV, representing close to 10% of total sales in the region.

- In terms of the fiscal impact, the petroleum industry annually generates $364,991,480 in sales taxes and $386,058,743 in property taxes.

- The impact of the MSF oil production under the alternative scenarios in the SJV economy implies job gains between 2,151 and 34,485 under the high resource scenario; and between 2,151 and 195,683 under the high resource-oil boom scenario.

- Personal Income can grow by $201 million to $4 billion under the high resource scenario; and by $201 million to $22 billion under the high resource scenario-oil boom scenario.

- Taxable sales can grow by $74 million to $1.2 billion under the high resource scenario; and by $74 million to $6.7 billion under the high resource scenario-oil boom scenario.

- SJV's nominal GDP per capita can grow by $44 to $701 under the high resource scenario; and by $44 to $3,980 under the high resource scenario-oil boom scenario.

- At the county level, the job gains vary, being most substantial for Fresno and Kern Counties. For Fresno County the results suggest job gains between 519 and 8,327 under the high resource scenario; and between 519 and 47,251 under the high resource-oil boom scenario.

- Taxable sales are forecasted to grow for all counties in the SJV. However, just as in the case of employment, Fresno and Kern Counties taxable sales show the biggest gains. For Kern County the results suggest taxable sale gains between $20 million and $325 million under the high resource scenario; and between $20 million and $1.8 billion under the high resource-oil boom scenario

Complete study:
http://www.wspa.org/sites/default/files/uploads/The%20Petroleum%20Industry%20and%20the%20Monterey%20Shale%20-%20Fresno%20State%20Study.pdf

APPENDIX III: Overview: Monterey Shale Study
University of Southern California and The Communications Institute

Powering California:
The Monterey Shale & California's Economic Future

USC Global Energy Network
A Joint Initiative of USC Price School of Public Policy & USC Viterbi School of Engineering
In association with The Communications Institute

Overview

The Monterey Shale Formation in California contains vast reserves of oil. This study presents a preliminary examination of one important aspect of developing the resource – the economic impact on the state's economy. Working from a model created by economists from the University of Southern California (USC) Price School of Public Policy and informed by and applied to a development scenario formulated by the USC Viterbi School of Engineering, the study concluded: "the prudent development of the Monterey Shale could add hundreds of thousands of new jobs to California over the next decade while stimulating economic growth and generating significant new state and local tax revenues."

Reaching the oil locked within the shale requires advanced oil-extraction technologies, including advanced geophysical monitoring technologies, horizontal drilling and hydraulic fracturing, the latter of which may pose as yet undefined environmental risks. Moreover, development will place large demands on local physical and social infrastructure.

The study was funded in part by a grant from the Western States Petroleum Association but was conducted by an independent USC research team. The study also drew upon USC resources for on-going research of various aspects of shale-oil development.

Complete study: http://wms.communicationsinstitute.org/energy/powering-california-project/powering-california-the-monterey-shale-californias-economic-future/