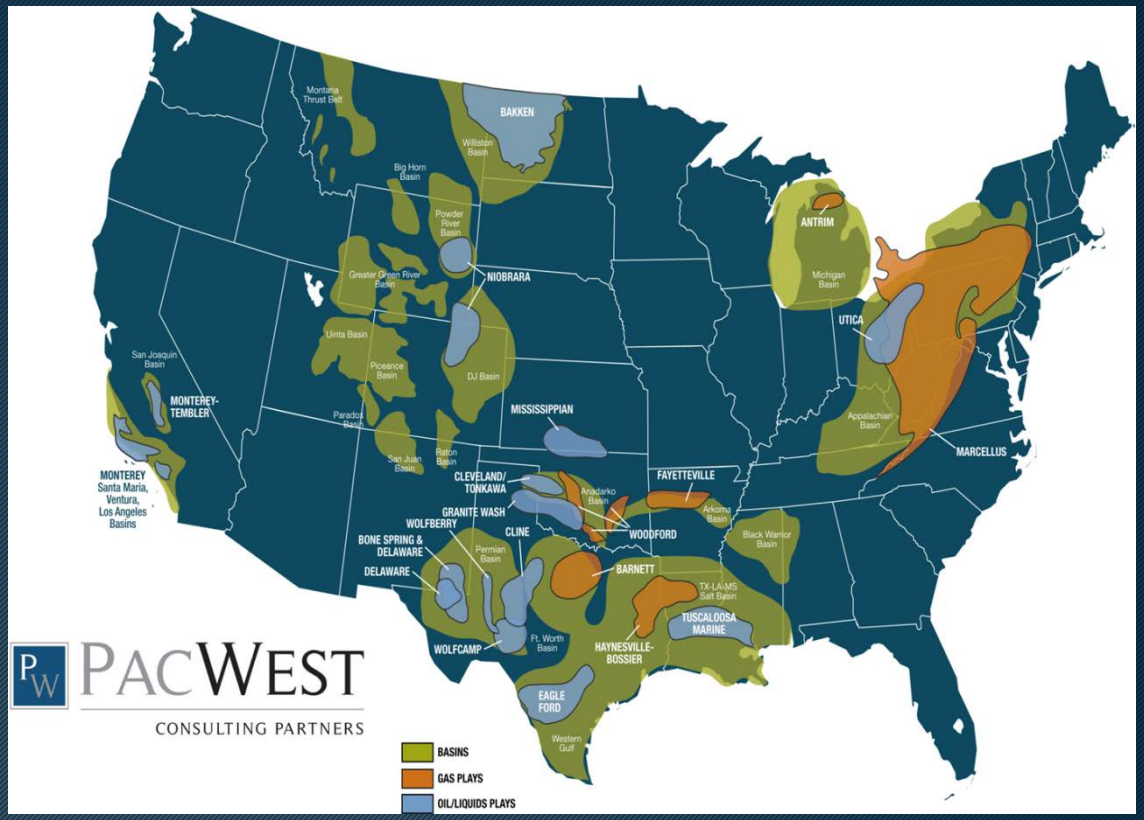
State of the Oil & Gas Industry

Dynamic Challenges Facing Marginal Well Producers

Edward Cross, P.G., M.B.A.
President
Kansas Independent Oil & Gas Association

2016 IOGCC Annual Business Meeting
Energy Research, Resources & Technology Committee
Denver Marriott City Center
Denver, Colorado
May 15, 2016

American Energy Renaissance



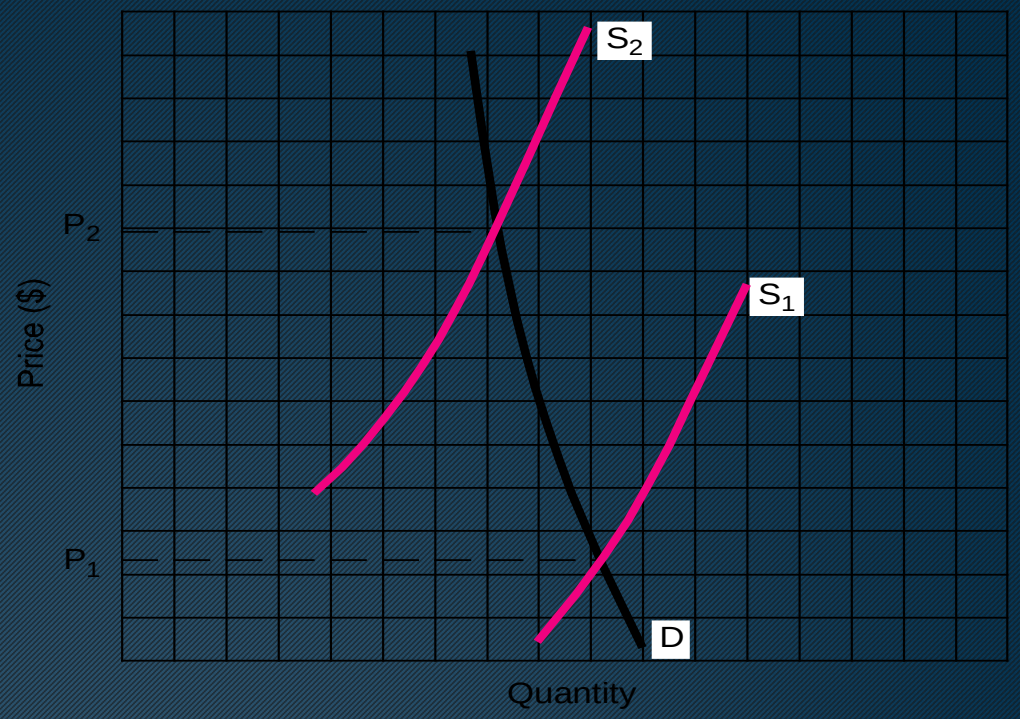
What happened to crude oil markets over the last year?

- Oversupply
  - U.S. oil production
  - OPEC dump low-cost oil on market
- Deceleration of demand growth
- Strong U.S. Dollar
- Oil Demand remains inelastic
- World oil supply becoming increasingly inelastic

Crude Oil Market Structure

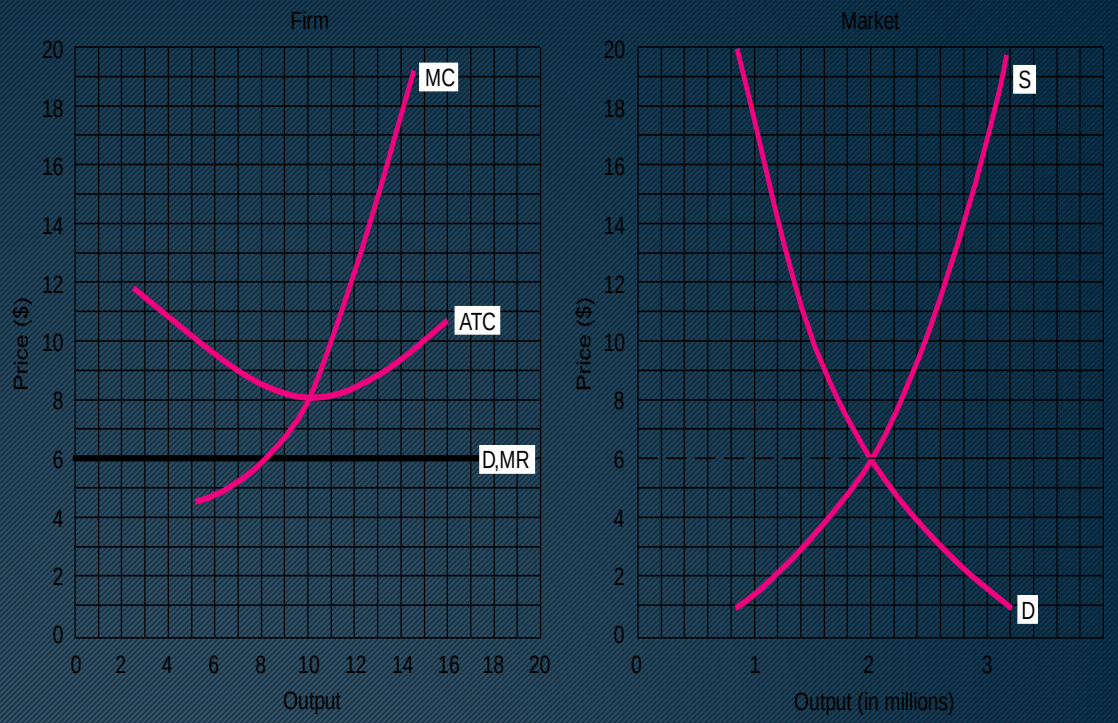
- Oligopoly
  - OPEC cartel collude to influence market price
- U.S. Producers are Perfect Competitors
  - Price-takers not price makers
- Cost structure optimization determines profit

Oil Market Dynamics



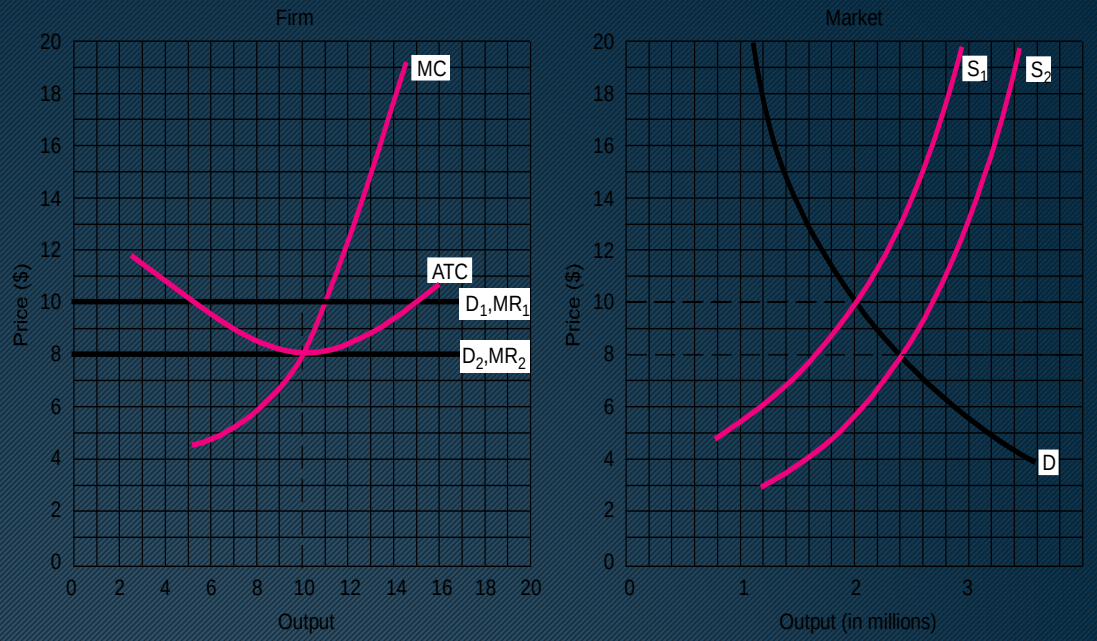
When supply increases from S_2 to S_1, price falls from P_2 to P_1

The Perfect Competitor



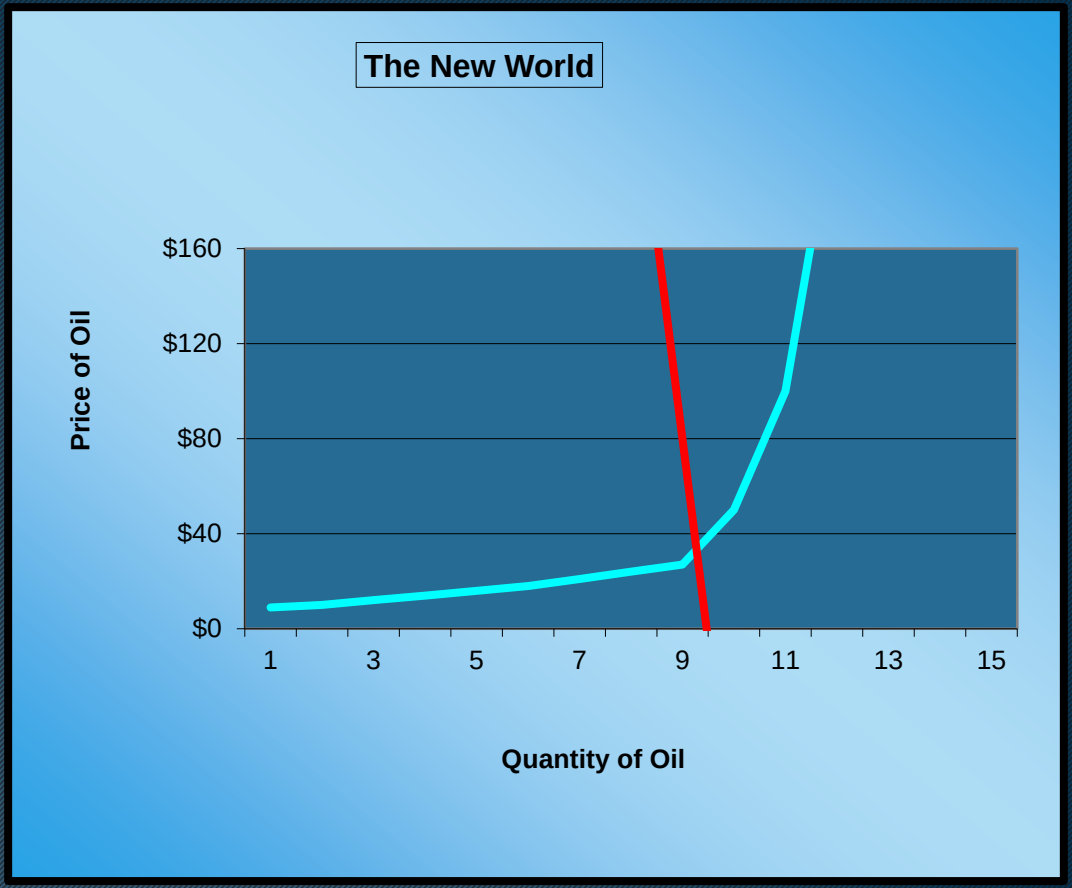
Internal Cost Structures Determine Profitability

Effects of Oversupply on Perfect Competitor



Kansas Oil & Gas Producers Strive to Improve Operating Efficiencies

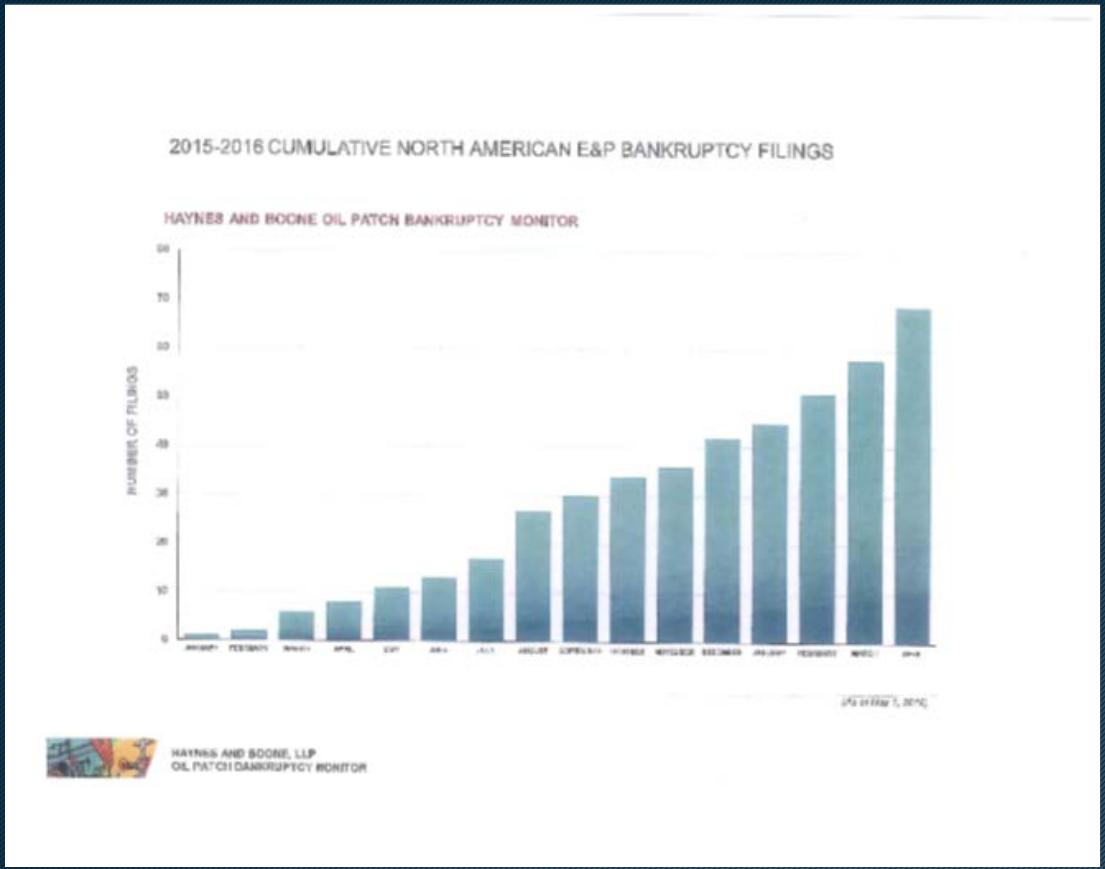
Supply Leverage Diminishing



Impact of Oil Price Collapse on Oil Industry Nationally

- Capex cuts
  - $61.2 billion in 2015
- Layoffs
  - 240,000 direct industry layoffs
  - 924,000 indirect industry layoffs
- Rapid Decline of Domestic Rig Count
  - Declined by 62% in 2015 (1,192 rigs)

Impact of Oil Price Collapse on Oil Industry Nationally



Bankruptcies

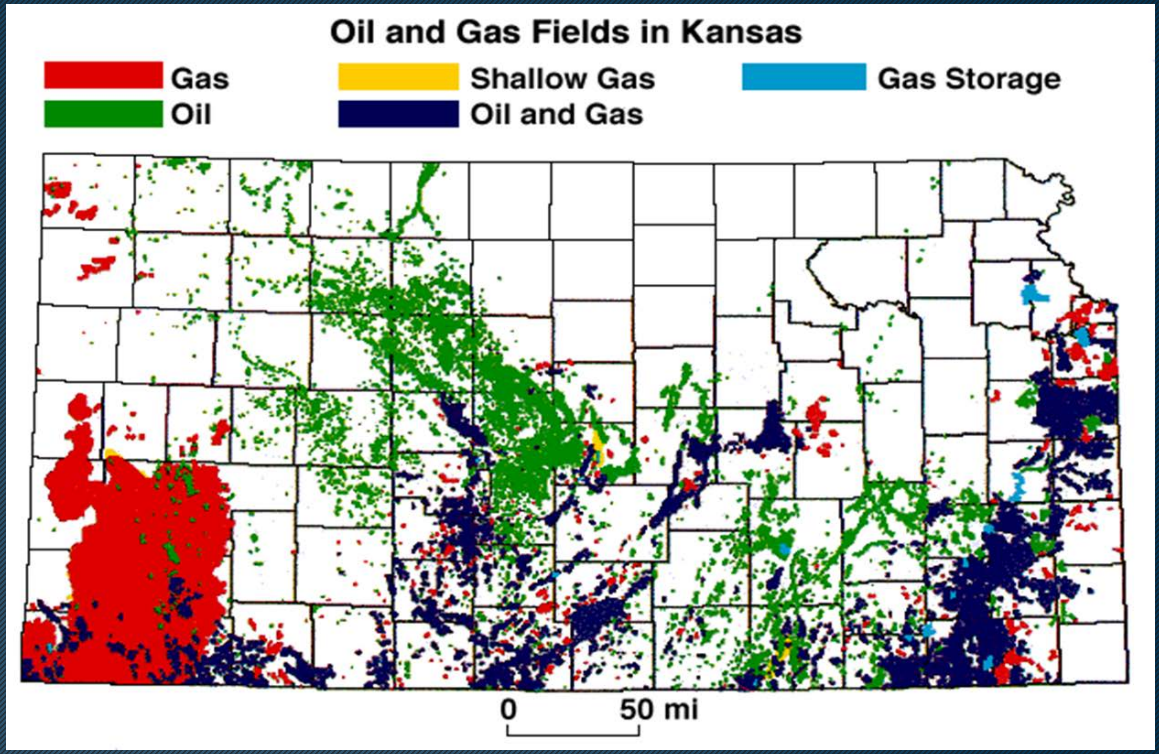
Impacts of Oil Price Collapse on Kansas Oil Industry

- Cut capex by 75% - 80% in 2015
  - $300 million in 2015 ($1.3 billion in 2014)
- Deferred well completions and high-cost wells temporarily shut-in
  - Royalty payments dropped by ~ $400 million in 2015
- Layoffs
  - 20% - 30% in production sector
  - Up to 50% in service sector
  - Loss of ~ $341 million in family income
- Reduced Activity
  - 68% drop in permits
  - 70% drop in rig count

Who are Independents?

- Small Businesses
- Drill & produce crude oil and natural gas
- Not integrated
  - Sell crude oil and natural gas to purchasers
  - Do not generate and market end-products

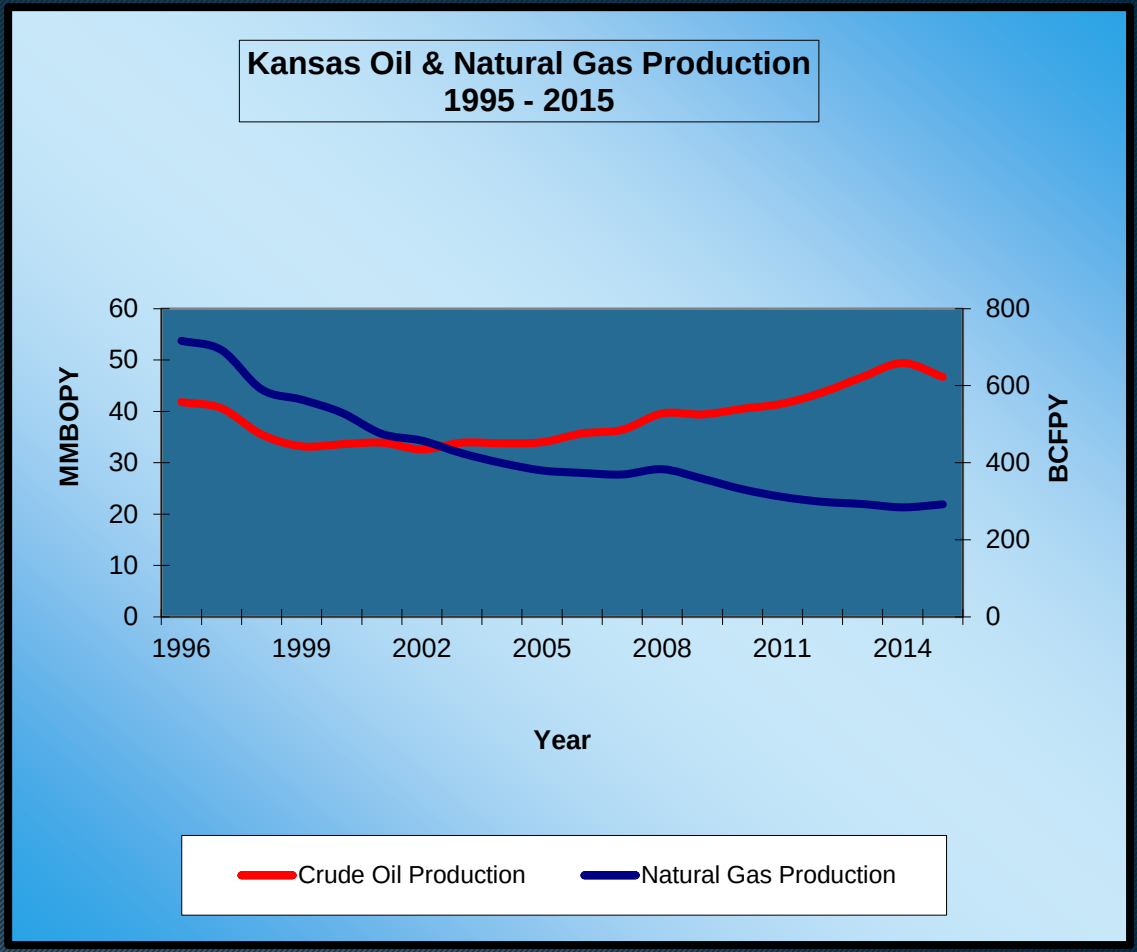
Kansas Oil & Natural Gas Production



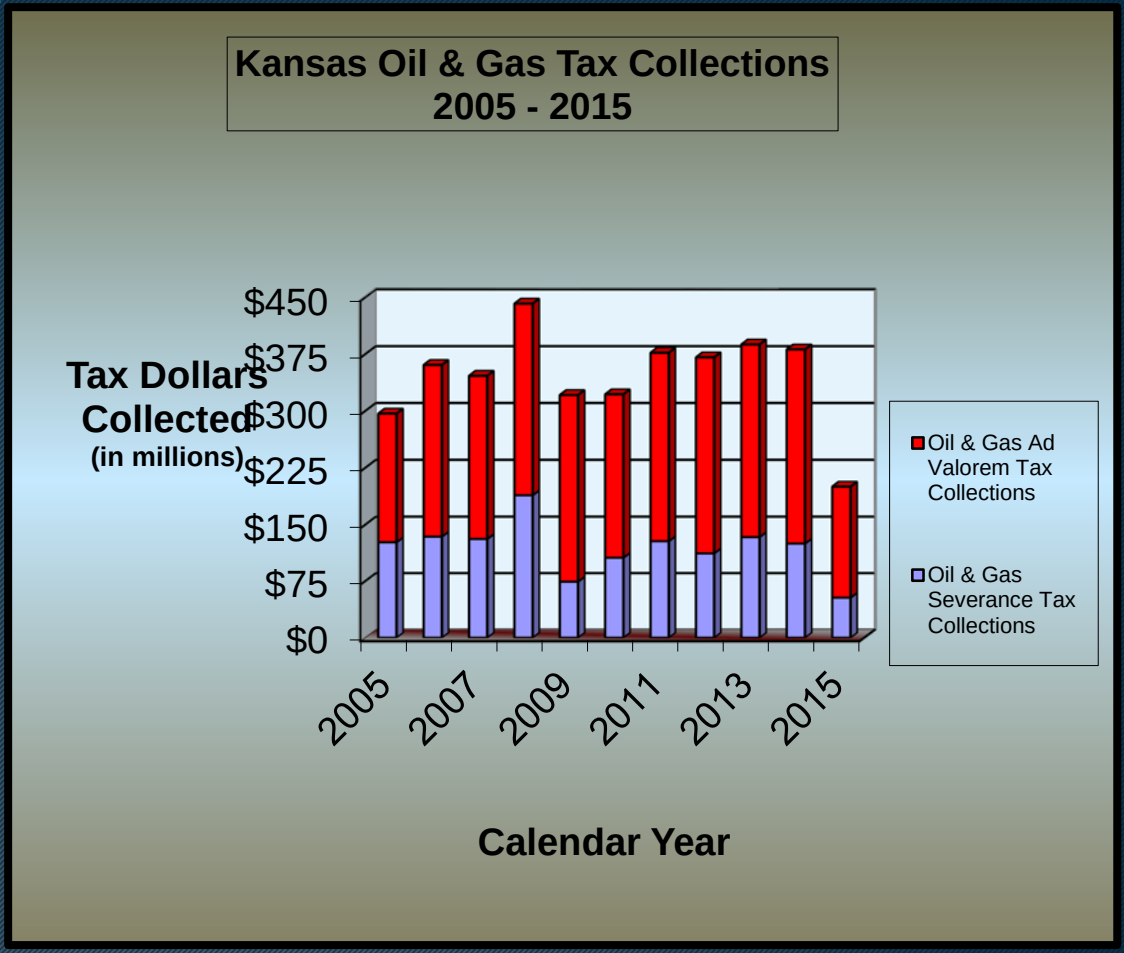
Kansas Oil & Natural Gas Dynamics

- Average Daily Oil Well Production = 3.2 BOPD
  - 72% of Kansas crude oil production from marginal wells
  - 94% of total Kansas oil wells are classified as marginal wells
- Average Daily Natural Gas Production = 41 McF
  - 74% of Kansas natural gas production from marginal wells
  - 81% of Kansas natural gas wells are classified as marginal wells
- Supports 118,000 Kansas jobs and $3 billion in family income

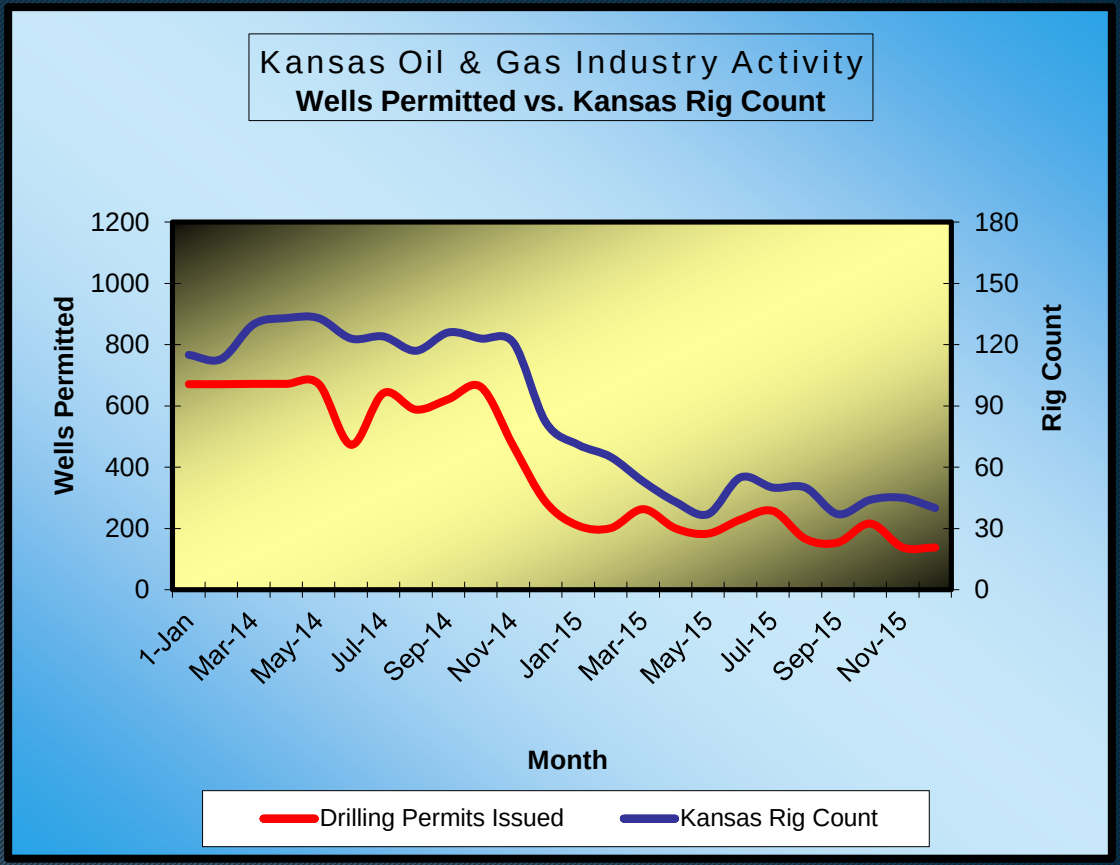
Kansas Oil & Natural Gas Production



Kansas Oil & Natural Gas Tax Collections



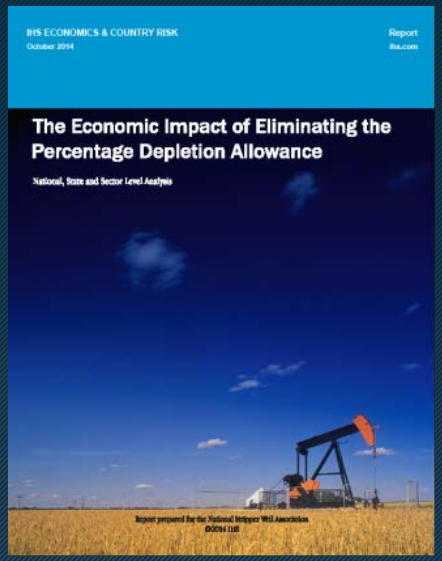
Impacts of Oil Price Collapse on Kansas Oil Industry

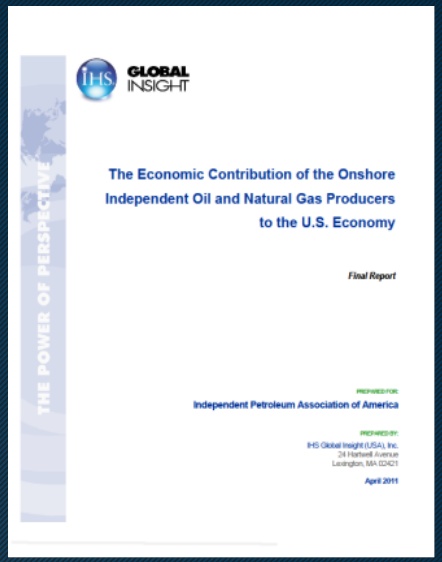


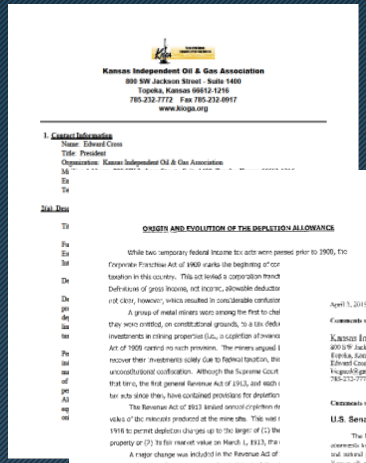
What are Marginal Wells?

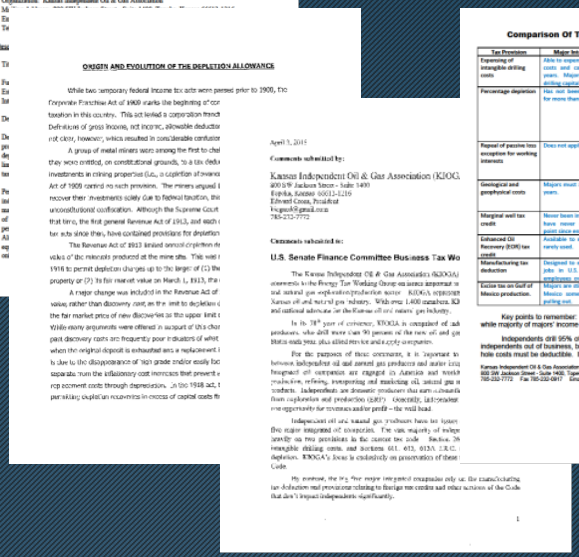
- IOGCC Defines Marginal Wells as:
  - Oil well producing 10 barrels of oil per day or less
  - Natural gas well producing 60 Mcf of natural gas per day or less

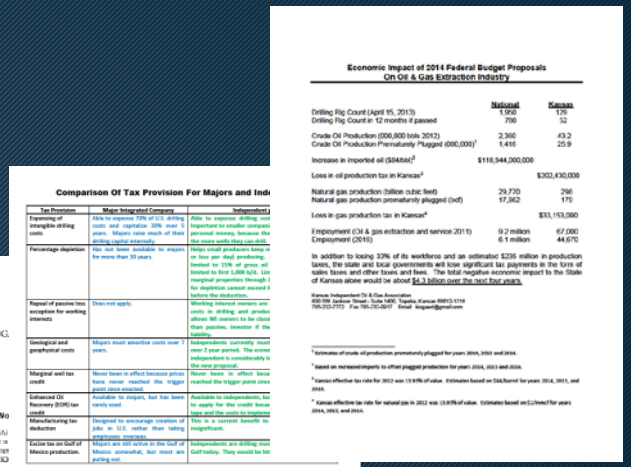
Marginal Well Economic Impact Reference Material



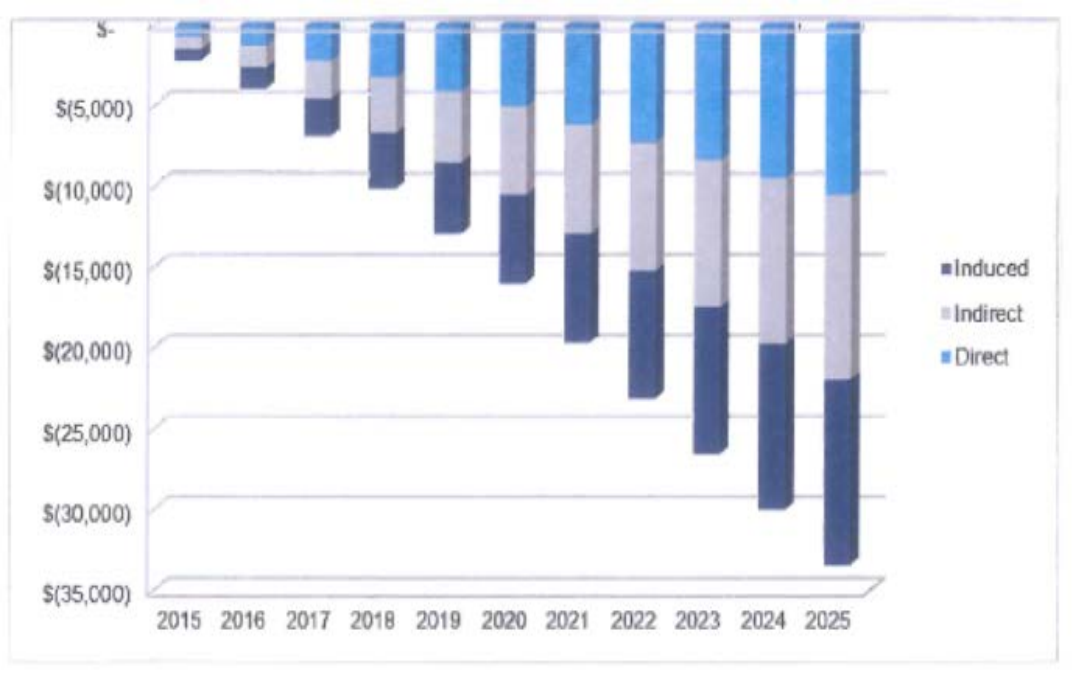






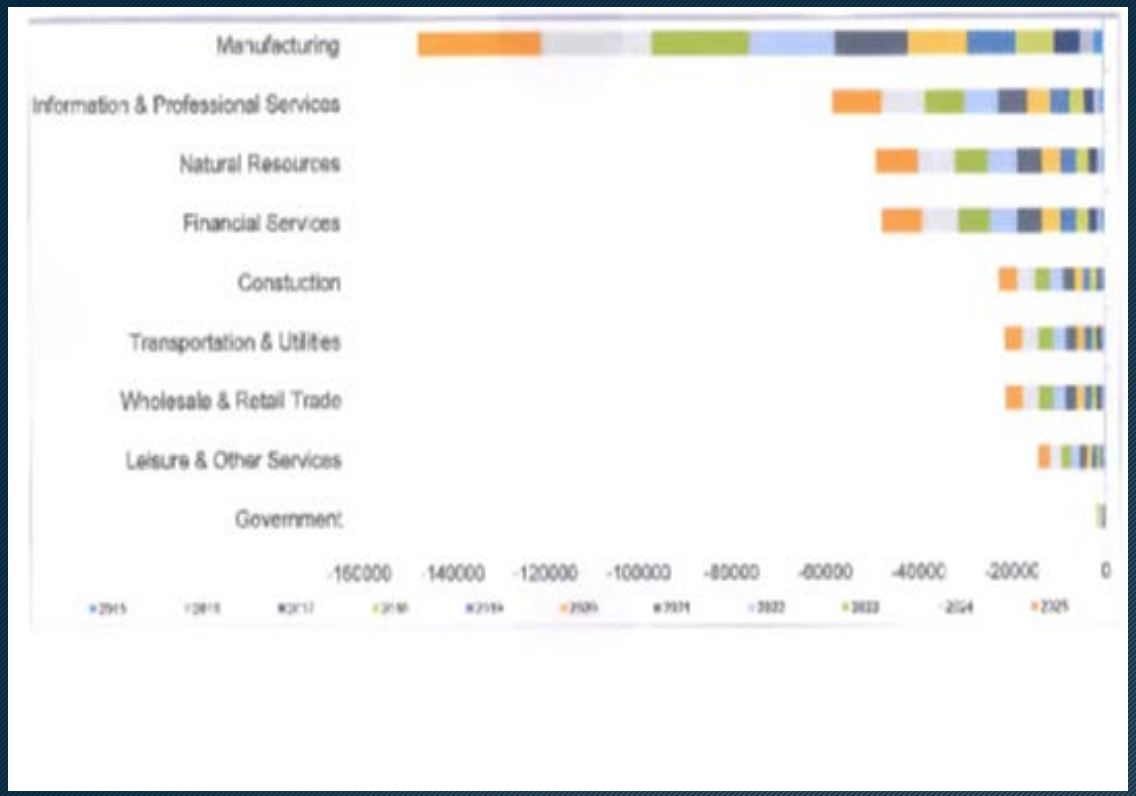


Impact of Losing Marginal Wells



Economic Cost to U.S. Economy

Impact of Losing Marginal Wells



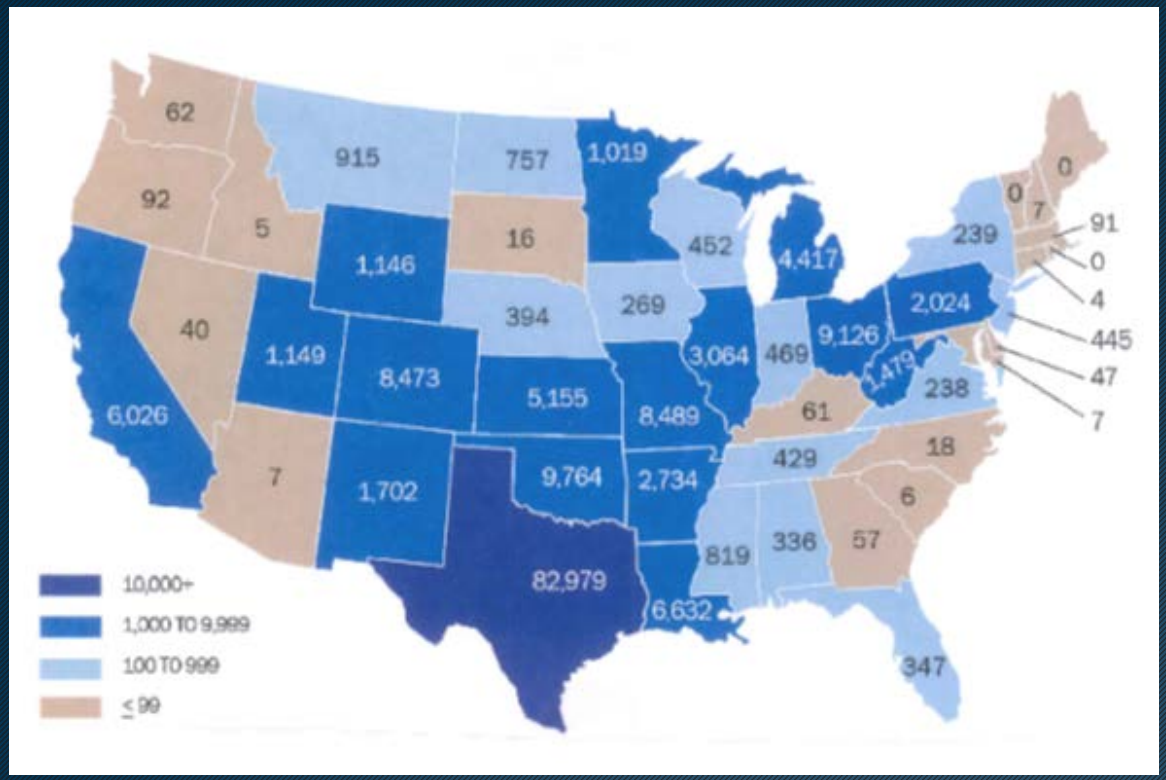
Impacts on Major U.S. Industry Output

Impact of Losing Marginal Wells

	2015	2020	2025	Average
Information & Professional Services	5,857	40,006	83,469	42,027
Manufacturing	4,827	27,636	57,119	29,002
Leisure & Other Services	2,567	18,253	36,098	19,167
Natural Resources	1,541	17,892	37,983	18,816
Wholesale & Retail Trade	2,149	15,180	29,856	15,774
Financial Services	1,900	14,278	29,767	14,982
Construction	1,845	12,053	25,046	12,659
Transportation & Utilities	919	8,072	17,076	8,495
Government	117	863	1,804	906
Total	21,722	154,233	326,238	161,829

Effect on Jobs by Industry Sector

Impact of Losing Marginal Wells



Average Direct Jobs Lost per Year Per State

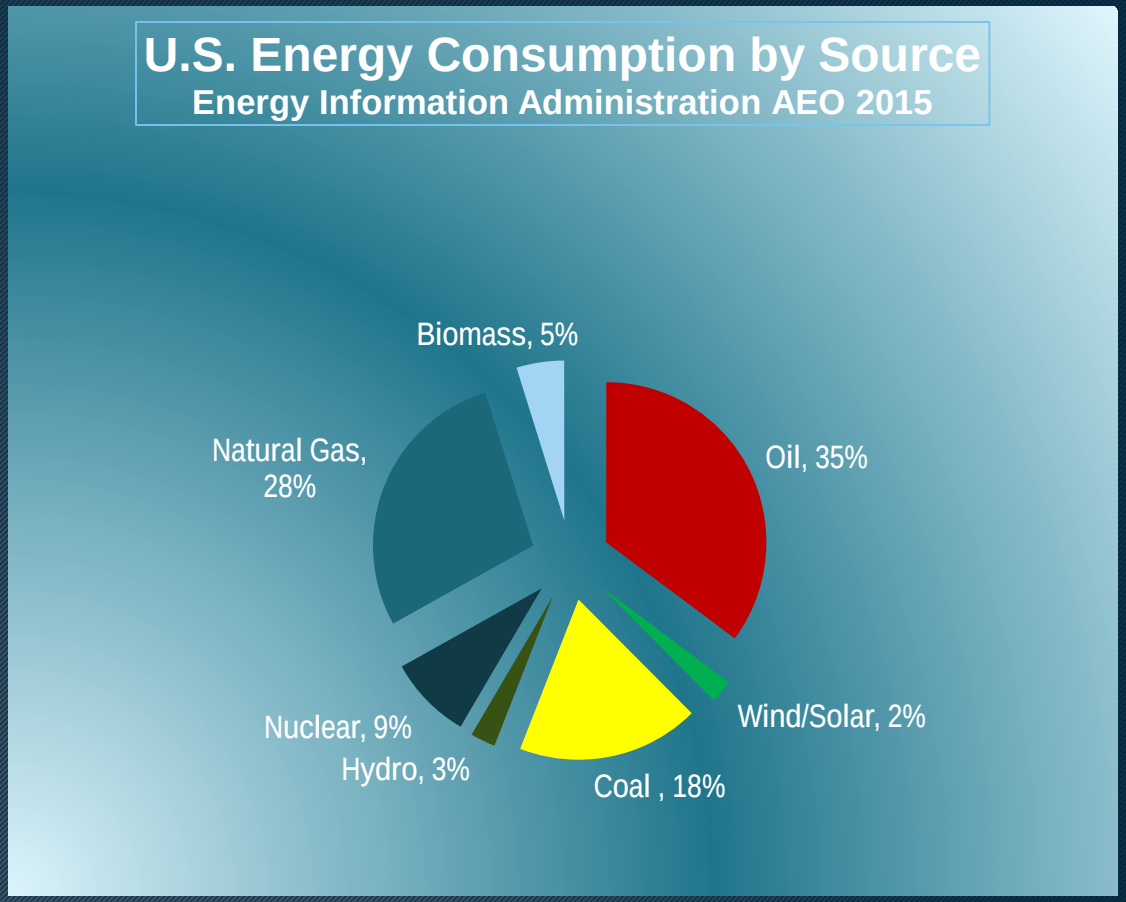
What are Companies doing?

- Supply Chain Optimization
- Operational Improvements
- Reduce and Refocus Capex
- Acquisition/Divestiture
- Talent Acquisitions

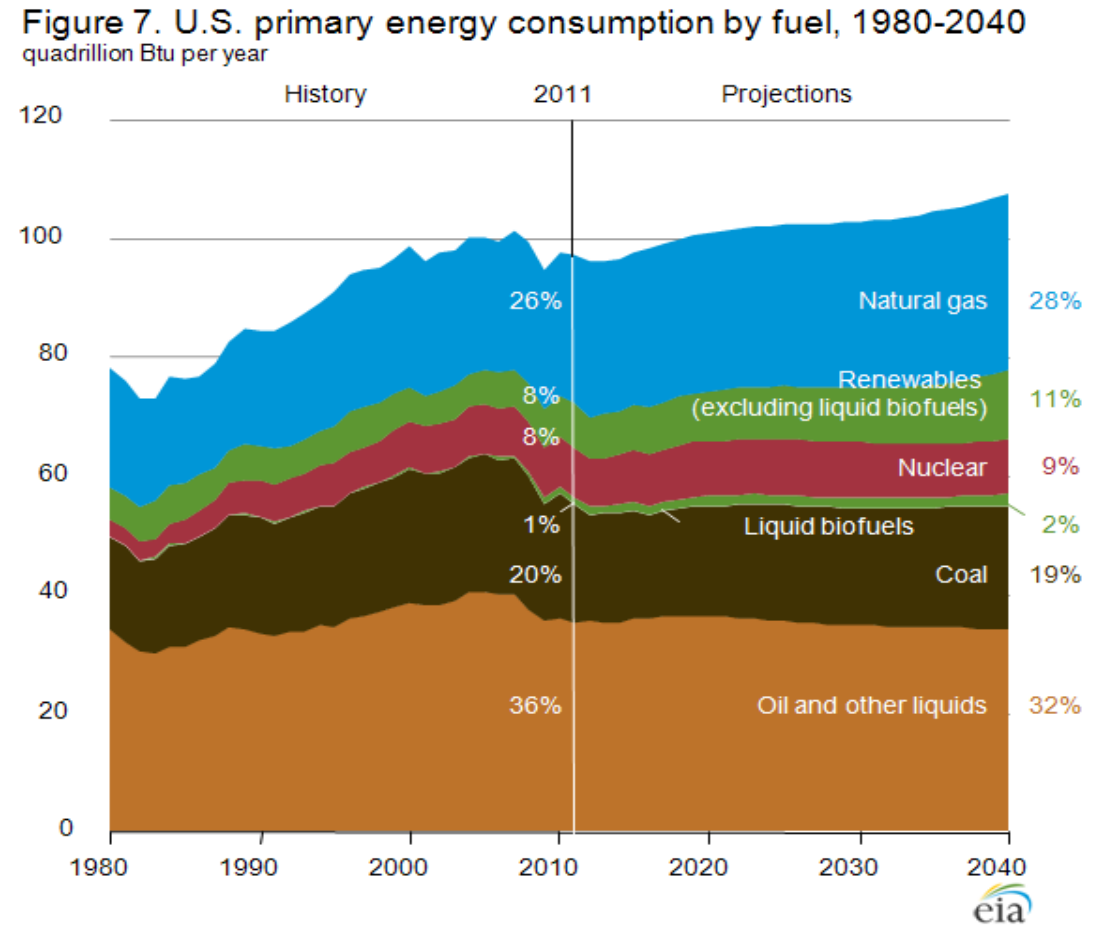
Key Challenges Facing Marginal Well Producers

- Crude Oil Prices
  - Do not compensate for loss of capex in U.S. economy
- Supply will fall as production rollover could be sooner and more severe than anticipated
- Exiting “Survival Phase” and entering “Inflection Phase” followed by “Regeneration Phase”
- Low crude oil prices are not the long-term story or trend

Low Crude Oil Prices Not Long-Term Story or Trend



What will power the U.S. in the future?



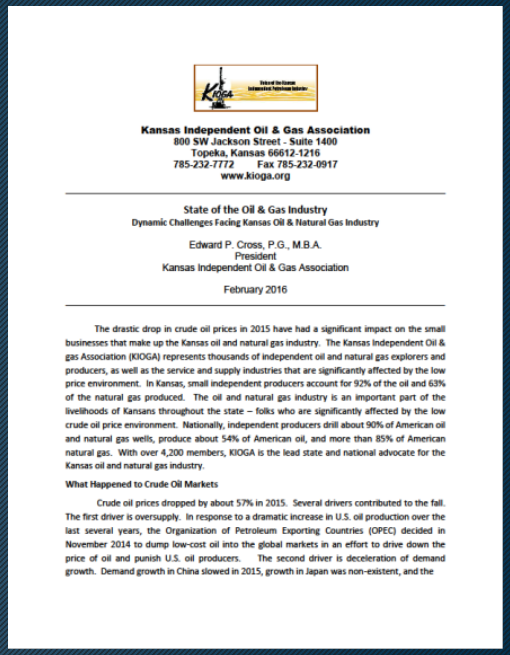
Key Challenges Facing the Kansas Oil & Gas Industry

Federal Legislative Challenges

President Obama's FY 2017 Budget

Federal Energy Policy & Tax Reform

Impact of Low Oil Prices



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www.kioga.org

State of the Oil & Gas Industry
Dynamic Challenges Facing Kansas Oil & Natural Gas Industry

Edward P. Cross, P.G., M.B.A.
President
Kansas Independent Oil & Gas Association

February 2016

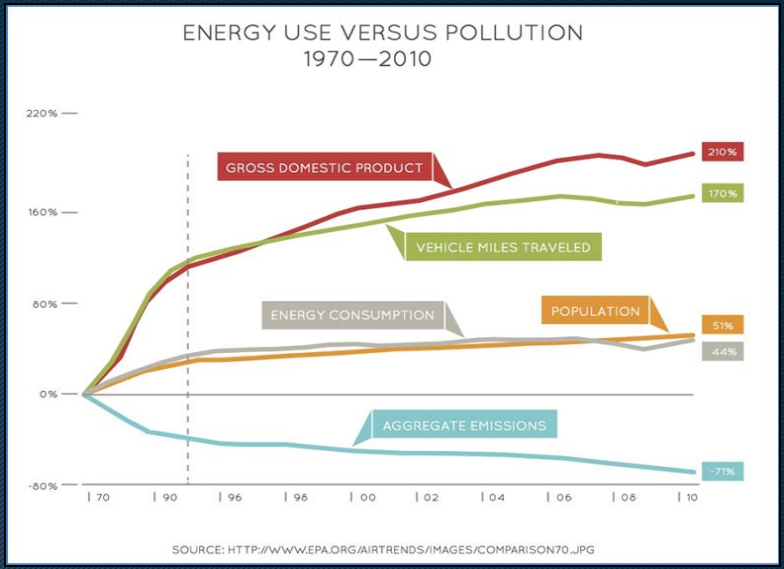
The drastic drop in crude oil prices in 2015 have had a significant impact on the small businesses that make up the Kansas oil and natural gas industry. The Kansas Independent Oil & gas Association (KIOGA) represents thousands of independent oil and natural gas explorers and producers, as well as the service and supply industries that are significantly affected by the low price environment. In Kansas, small independent producers account for 92% of the oil and 63% of the natural gas produced. The oil and natural gas industry is an important part of the livelihoods of Kansans throughout the state – folks who are significantly affected by the low crude oil price environment. Nationally, independent producers drill about 90% of American oil and natural gas wells, produce about 54% of American oil, and more than 85% of American natural gas. With over 4,200 members, KIOGA is the lead state and national advocate for the Kansas oil and natural gas industry.

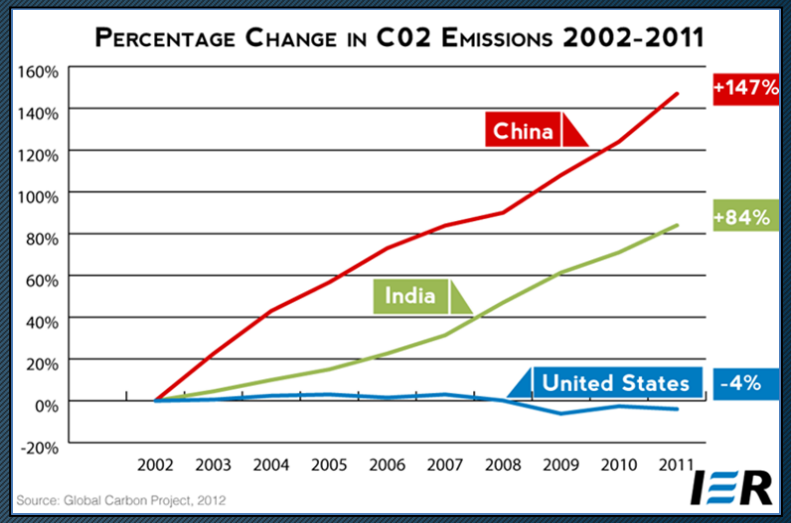
What Happened to Crude Oil Markets

Crude oil prices dropped by about 57% in 2015. Several drivers contributed to the fall. The first driver is oversupply. In response to a dramatic increase in U.S. oil production over the last several years, the Organization of Petroleum Exporting Countries (OPEC) decided in November 2014 to dump low-cost oil into the global markets in an effort to drive down the price of oil and punish U.S. oil producers. The second driver is deceleration of demand growth. Demand growth in China slowed in 2015, growth in Japan was non-existent, and the

Federal Regulatory Challenges

Emissions


ENERGY USE VERSUS POLLUTION
1970—2010
220%
160%
80%
0%
-80%
GROSS DOMESTIC PRODUCT
VEHICLE MILES TRAVELED
ENERGY CONSUMPTION
POPULATION
AGGREGATE EMISSIONS
210%
170%
51%
44%
-71%
'70
'90
'96
'98
'00
'02
'04
'06
'08
'10
SOURCE: HTTP://WWW.EPA.ORG/AIRTRENDS/IMAGES/COMPARISON70.JPG


PERCENTAGE CHANGE IN C02 EMISSIONS 2002-2011
160%
140%
120%
100%
80%
60%
40%
20%
0%
-20%
China
India
United States
+147%
+84%
-4%
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
Source: Global Carbon Project, 2012
IER

Obama Administration Wants to Show Climate Change Leadership

COP 21 Climate Change Conference

Federal Regulatory Onslaught

- PHMSA
- Tank Gauging
- RCRA
- TRI
- TSCA
- NEPA
- Induced Seismicity
- ESA
- PSM
- Silica Exposure
- And more

Big Issues

- No shortage of issues
- Fear of Unknown
  - Hydraulic Fracturing
  - Emissions
  - Climate Change
  - And more
- Environmental Activists Pander to Fear
- No shortage of Public Angst

Federal Regulatory Advocacy

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September 17, 2015

ATTN: Regulatory Affairs
U.S. Department of Interior
Bureau of Land Management
Mail Stop 2134 LM
1849 C Street NW
Washington, D.C. 20240

Re: Comments on the U.S. Bureau of Land Management Proposed Rule to Replace Onshore Oil and Gas Order No. 3.

Kansas Independent Oil & Gas Association
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December 11, 2015

Gina McCarthy
Administrator
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, D.C. 20460

Dear Administrator McCarthy:

This letter is being sent on behalf of the Kansas Independent Oil & Gas Association (KIOGA). KIOGA represents over 4,200 independent oil and natural gas producers, as well as service and supply companies that

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August 12, 2015

The Honorable Janet McCabe
Acting Assistant Administrator
Office of Air and Radiation
U.S. Environmental Protection Agency
William Jefferson Clinton Building
1200 Pennsylvania Avenue, NW
Washington, DC 2460

Dear Ms. McCabe:

Kansas Independent Oil & Gas Association
800 SW Jackson Street – Suite 1400
Topeka, Kansas 66612-1216
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March 12, 2015

The Honorable Gina McCarthy
Administrator
U.S. Environmental Protection Agency
EPA Docket Center
ATTN: Docket ID No. EPA-HQ-OAR-2008-0699
Mailcode 28221T
1200 Pennsylvania Avenue, NW
Washington, DC 20460

RE: Docket No. EPA-HQ-OAR-2008-0699.

Dear Administrator McCarthy:

The following comments are submitted on behalf of the Kansas Independent Oil & Gas

Kansas Independent Oil & Gas Association
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September 4, 2015

Members of the U.S. Senate Committee on Homeland Security & Governmental Affairs
340 Dirksen Senate Office Building
Washington, DC 20510

Ladies & Gentlemen:

The Kansas Independent Oil & Gas Association (KIOGA) applaud the introduction of S. 2006, the "Regulatory Accountability Act of 2015," and the leadership of this bill's original co-sponsors—Senators Rob Portman, Susan Collins, Angus King, Ron Johnson, Kelly Ayotte, John Cornyn, and David Perdue. This critical bipartisan bill would bring into the 21st century the process federal agencies use when they write the regulations that most significantly affect the lives of all Americans.

KIOGA represents over 4,200 small businesses and we believe that federal regulations must be narrowly tailored, supported by strong and credible data and evidence, and impose the least burden possible while still implementing Congressional intent. Unfortunately, however, we are now confronted with a growing number of massive, costly, and complex rules that breed uncertainty and stifle hiring and investment. These growing regulatory burdens and the uncertainty caused by badly-written regulations are a fundamental concern to us.

S. 2006 would improve the process by which federal agencies promulgate regulations to improve accountability and the integrity of the rulemaking process. This bill would not prevent federal agencies from issuing regulations or accomplishing needed regulatory objectives. It would, however, make the regulatory process more transparent, agencies more accountable, and regulations more carefully designed.

KIOGA applauds the introduction of this important bill and encourage the Committee to support this bill.

Sincerely,

Edward P. Cross

Edward P. Cross, President
Kansas Independent Oil & Gas Association

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January 7, 2016

TO THE MEMBERS OF THE U.S. HOUSE OF REPRESENTATIVES:

The Kansas Independent Oil & Gas Association (KIOGA) strongly support efforts by the House of Representatives to make federal agencies more accountable to the American public and improve the transparency of agency actions. The federal rulemaking process was founded on principles of open government and public participation.

We are pleased, therefore, that the House is voting on a comprehensive regulatory reform bill, H.R. 712, the "Sunshine for Regulatory Decrees and Settlements Act," which would take important steps to stop the abusive practice known as "sue and settle" and give the public and affected parties a greater ability to know about potential rulemakings and to participate. H.R. 712 embodies several major principles of accountability, transparency, and fairness, drawn directly from three regulatory reform bills:

- Title I – the "Sunshine for Regulatory Decrees and Settlements Act." Behind closed doors, organizations and agencies enter into consent decrees or settlement agreements compelling the agencies to issue rules on an expedited timeframe. The states and the public are not given notice of the lawsuits, nor do they have a meaningful voice in the process, despite the adverse impact that rushed, sloppy regulations have on them. This title would improve the "sue and settle" process by requiring agencies to give early notice and take public comment on proposed settlement agreements obligating agencies to initiate a rulemaking or take other action on a specified timetable. These settlement agreements allow interest groups to commandeer an agency's agenda and regulatory priorities. The bill would allow affected parties to get notice of draft settlements and provide some opportunity to participate.
- Title II – the "All Economic Rules are Transparent (ALERT) Act." This title would require agencies to disclose rulemakings the agency plans to propose or finalize to OMB's Office of Information and Regulatory Affairs (OIRA). OIRA would disseminate information about these planned rules to the public, including their estimated costs and benefits.

U.S. Supreme Court

Open U.S. Supreme Court Seat

Good News

- EPA Report Finds No Evidence that Hydraulic Fracturing has any systemic groundwater impacts
- U.S. Supreme Court Grants Stay of EPA Clean Power Plan
- Nationwide Stay Issue Against EPA's "Waters of the U.S." Rule
- LPC Listing Vacated
- Injunction Issued Against BLM Hydraulic Fracturing Regulation

State Legislative Challenges

State Advocacy

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The Whole Fracking Story
Regulatory & Policy Considerations

Edward P. Cross, President
Kansas Independent Oil & Gas Association

January 2010

America is truly in the midst of an oil and natural gas renaissance. New and evolving technologies like 3D seismic, horizontal drilling, and hydraulic fracturing have allowed oil and gas companies to access reserves of previously-unrecoverable oil and natural gas. America's energy renaissance has changed the global energy landscape. The U.S. has surpassed expectations and achieved a level of domestic energy production that was unthinkable even five years ago. Today, the U.S. is the world's number one producer of oil and natural gas. America's largest source of oil is America itself. Instead of importing liquefied natural gas (LNG) to supply our ever-power needs, we are now moving to support our allies overseas as an exporter of LNG. But the oil and natural gas from these rightly-praised rocks can be extracted only by using hydraulic fracturing.

For more than 60 years, America's energy producers have relied on an innovative technique known as hydraulic fracturing (HF) to enhance the production of oil and natural gas. While the first commercial "frac job" - as it is referred to within the industry - was conducted in 1947, the technique quickly became the most commonly used method of stimulating oil and natural gas wells. The technology has been deployed more than 1.2 million times over the course of more than 60 years.

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Energy Intelligence

Affordable, reliable energy is essential to the economy because energy powers everything that makes modern life possible. It heats our homes, fuels our transportation, and powers our machines. Put simply, energy makes our lives better.

Affordable energy makes the economy more efficient, lowers the cost of goods, and saves us money. More importantly, affordable energy allows us to spend more time with our families and friends and less time merely working to survive. Moreover, by making transportation less costly, affordable energy gives us greater freedom to live, work, and play how and where we want.

Affordable and abundant energy is a crucial component of a strong economy. Low domestic energy prices help keep jobs at home by lowering the cost of producing goods and services in the United States.

There are, however, a number of challenges to maintaining a sufficient supply of affordable energy. Seemingly every year there is a new energy bill in Congress that alleges to fix our energy problems. The premise of these bills is often totally flawed resulting in the cry for a new national energy policy practically every year.

Energy policy would be greatly improved if policymakers took into account the actual energy landscape. Far too often, energy bills are based on incorrect assumptions, such as the notion that new, revolutionary technologies, such as affordable cellulosic ethanol, are just around the corner if only the federal government provides the energy industry sufficient mandates and subsidies. Time after time, experience has shown that the government cannot force new technologies to market.

Policymakers should take time to understand the facts about energy and the obstacles to making it affordable and reliable given its critical role in our lives and our economy. America is home to vast natural resources, but many of our energy policies are built on the notion that energy is scarce and becoming more scarce. The reality is that we have more combined oil, coal, and natural gas resources than any other country on the planet. We have enough energy resources to provide reliable and affordable energy for decades, even centuries to come. The

Kansas Oil & Gas Industry Strategic Analysis

Prepared by: January 2016

Kansas Independent Oil & Gas Association
Edward P. Cross, President

Introduction

Special points of interest:

- Oil and gas industry is a vital part of Kansas economy.
- Fundamental challenges face policymakers.
- Oil and gas producers need policies that enhance access to capital.
- Kansas oil and gas industry supports $3 billion in family income annually.

Inside this Report:

Challenges Face 1
Oil & Gas Industry Situation analysis 2
Kansas Energy Outlook 5
Key Energy Issues 6

Oil and natural gas resources continue to play an important part in the livelihoods of Kansans throughout the state. The Kansas oil and natural gas industry is nearly a $1.8 billion industry that puts tens of thousands of people all across Kansas to work each day and pumps hundreds of millions of dollars into the state's economy each year, money that helps support families, fund schools, and build roads. Over the past decade, the oil and natural gas industry in Kansas supported an average annual estimated 110,000 jobs, over $3 billion in family income, and over $1.4 billion in state and local tax revenue. The oil and natural gas industry is a dependable and stable element of the Kansas economy today and will be a critical part of the economy going forward.

Nationally, Kansas ranks 9th among the 31 oil producing states and 12th among the 32 natural gas producing states. Over 2,100 licensed oil and gas operators produce nearly 47 million barrels of oil and over 290 billion cubic feet of natural gas annually.

Kansas Oil & Natural Gas Energy for the Future!

Oil and gas are an integral part of our society. Much of our high standard of living can be traced to the use of petroleum with over 6,000 products produced from petroleum. The Kansas oil and gas industry fuels America, helps the Kansas economy and makes significant positive contributions to our way of life!

Challenges Face Policymakers and the Kansas Oil & Gas Industry

Affordable reliable energy is essential to the economy because energy powers everything that makes modern life possible. Put simply, energy makes our lives better.

Policymakers should take the time to understand the facts about energy and the obstacles to making it affordable and reliable. We need policymakers to advocate smart energy policies that promote our nation's position as a leader in energy production. We need federal regulatory reforms that establish a common-sense regulatory structure that bases rulemakings on sound science, legitimate cost/benefit analyses, and economic impact. We must also abandon the state mindset of last century's thinking that increased oil and natural gas production and achieving climate goals are not compatible. And we must abandon policies driven by a zero-sum game philosophy for energy that says we must have less oil and gas so that we can have more of something else.

If our nation is to achieve energy independence, and very importantly, maintain competitiveness and not let our standard of living slip, we need a well-reasoned, fact-based comprehensive energy strategy. We need real energy solutions!

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Hydraulic Fracturing and Drinking Water Contamination

January 2016

The question of underground drinking water contamination from hydraulic fracturing is a settled issue; hydraulic fracturing has not caused underground drinking water contamination. However, professional environmental organizations – notably the Natural Resources Defense Council (NRDC) and the Sierra Club – continue to allege that fracturing not only poses a serious risk of contamination, but that the process has been linked to such contamination on numerous occasions. This is not based on scientific evidence (as the following examples will attest), but rather as one particular tool in a broader agenda to reduce or eliminate the development and use of oil and natural gas.

Fracturing is a temporary part of oil and natural gas development that has been effectively controlled by state-based well construction and completion regulations for decades. The following are just a handful of comments from a variety of experts, regulators, and analyses of hydraulic fracturing that speak directly to the question of whether the process contaminates drinking water aquifers:

- U.S. Environmental Protection Agency (June 2010): EPA release report, after three years of study, that found no evidence that hydraulic fracturing could contaminate drinking water. The EPA report found no evidence that hydraulic fracturing has any systemic groundwater impacts. The EPA concluded, "we did not find evidence that these mechanisms have led to widespread, systemic impacts on drinking water sources."
- Drollette et al., Proceedings of the National Academy of Sciences (2015): This study found no indication of contamination from the fracking process itself. In the

What Others are Saying

"In Kansas, there's no evidence that the earthquakes are being caused by fracking." –Rex Buchanan, Kansas Geological Survey Interim Director

"It is important for the public to recognize that the risks posed by injection of wastewater are extremely low. In addition, the risks can be minimized further through proper study and planning prior to injection, careful monitoring in areas where there is a possibility that seismicity might be triggered, and operators and regulators taking a pro-active response if triggered seismicity was to occur." Mark D. Zoback, Professor of Geophysics at Stanford University

"Injection for disposal of wastewater derived from energy technologies into the subsurface does pose some risk for induced seismicity. Not very few events have been documented over the past several decades relative to the large number of disposal wells in operation." – National Research Council's Committee on the Induced Seismicity Potential in Energy Technologies

"... there is not a one-and-one correlation between barrels of oil equivalent produced or injection wells to earthquakes." – Lynn Watney, Senior Scientific Fellow, Kansas Geological Survey

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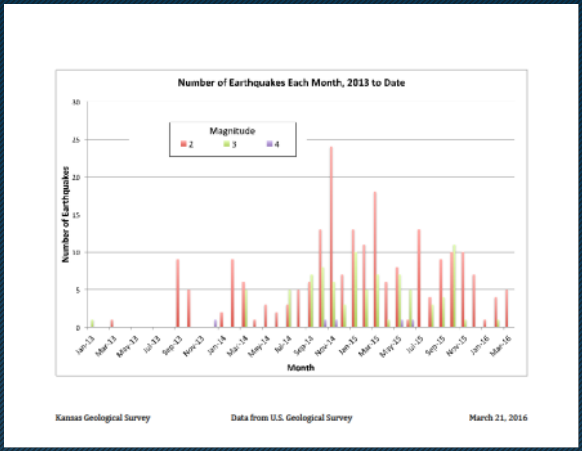
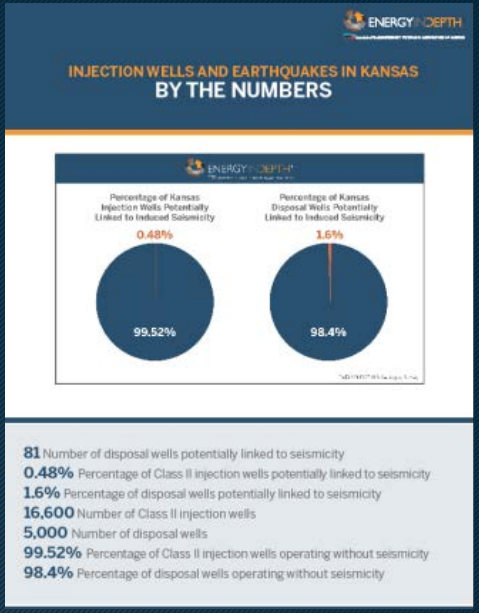
Seismic Activity in Kansas

Kansas Seismicity Overview and Context

State Regulatory Challenges





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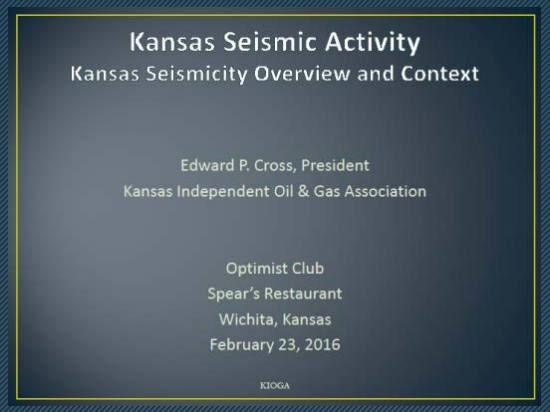

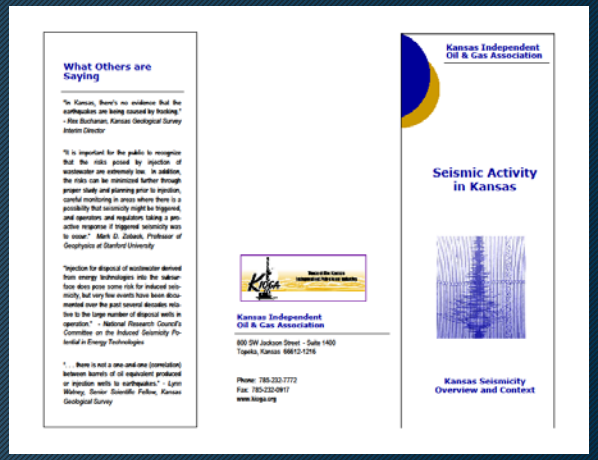

Going Forward into 2016 and Beyond

Form Strategic Coalitions

Council for a Secure America (CSA)

Multidimensional Public Information Campaigns

Editorials

Expanding the Message of Oil & Natural Gas

THE AMERICAN OIL & GAS REPORTER

KANSAS INDEPENDENT OIL & GAS ASSOCIATION

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THE HAYS DAILY NEWS

Importance of energy policy perspectives for 2016

CAPITAL-JOURNAL

Letter: Election season not complete without addressing energy

Sunday, August 16, 2015

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ALL ABOUT THAT FRACK

COLORADO'S FRACKING WARS AND THE CONTROVERSY ACROSS THE NATION

TO THE RESCUE

DOPE STUFF

The Wichita Eagle

BUSINESS PERSPECTIVES

Don't give into fear tactics; get the facts about fracking

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Classroom Energy Education Presentations

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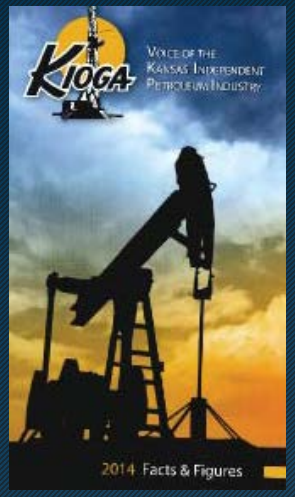
Information Services



Keep Industry and Public Informed

Thank You

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Kansas Independent Oil & Gas Association

Edward Cross, President