#### America's Oil and Natural Gas Industry



Energizing America: Facts for Addressing Energy Policy

ltem	Amount	Percent of U.S. Total
Operational Impact		
Employment*	7,978,636	4.6%
Labor Income (\$ millions)**	\$466,869	5.3%
Value Added (\$ millions)	\$966,324	6.8%
Capital Investment Impact		
Employment*	1,181,930	0.7%
Labor Income (\$ millions)**	\$66,679	0.8%
Value Added (\$ millions)	\$115,377	0.8%
Total Impacts		
Employment*	9,160,566	5.3%
Labor Income (\$ millions)**	\$533,548	6.0%
Value Added (\$ millions)	\$1,081,701	7.7%

### Table E-1.Total Impacts of the Oil and Natural Gas Industry's Operations<br/>and Capital Investments on the U.S. Economy, 2009

Source: PwC calculations using the IMPLAN modeling system (2009 database). Details may not add to totals due to rounding.

\* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

\*\* Labor income is defined as wages and salaries and benefits as well as proprietors' income.



#### Gasoline, Diesel and Crude Oil Prices



Source: NYMEX (WTI crude oil) and AAA (gasoline and diesel).









#### Click anywhere on map for state-by state list of average fuel prices.





#### AMERICAN PETROLEUM INSTITUTE

#### GASOLINE TAXES

COMBINED LOCAL, STATE AND FEDERAL (CENTS PER GALLON) JANUARY 2013



Disclaimer: This report is posted for informational purposes only and should not be relied upon or used for compliance purposes.

#### **U.S. Gasoline Requirements**





#### **Oil prices relate to many uncertain factors**





#### World Oil Demand - IEA



#### US Petroleum Demand – year to date 2012





Quantity





Source: U.S. Energy Information Administration based on data from various published studies. Canada and Mexico plays from ARI. Updated: May 9, 2011



#### Gentlemen, we can rebuild him. We have the technology.



## Table 1. INTEK estimates of undeveloped technically recoverable shale gas and shale oil resourcesremaining in discovered shale plays as of January 1, 2009

			Shale oil
Onshore Lower-48 Oil		Shale gas	resources
and Gas Supply		resources (trillion	(billion
Submodule region	Shale play	cubic feet)	barrels)
Northeast	Marcellus	410	
	Antrim	20	
	Dovonion I our Thormal Maturity	4.4	
	Devonian Low Thermai Maturity	14	
	New Albany	11	
	Greater Sittstone	8	
	Big Sandy	7	
	Cincinnati Arch*	1	
Subtotal		472	
Percent of total		63%	
	Haynesville	75	
	Eagle Ford	21	3
	Flovd-Neal & Conasauga	4	
Subtotal		100	3
Percent of total		13%	14%
Mid-Continent	Fayetteville	32	
	Woodford	22	
	Cana Woodford	6	
Subtotal		60	
Percent of total		8%	

## Table 1. INTEK estimates of undeveloped technically recoverable shale gas and shale oil resources remaining in discovered shale plays as of January 1, 2009

Southwest	Barnett	43	
	Barnett-Woodford	32	
	Avalon & Bone Springs		2
Subtotal		76	2
Percent of total		10%	7%
Rocky Mountain	Mancos	21	
	Lewis	12	
	Williston-Shallow Niobraran*	7	
	Hilliard-Baxter-Mancos	4	
	Bakken		4
Subtotal		43	4
Percent of total		6%	15%
West Coast	Monterey/Santos		15
Subtotal			15
Percent of total			64%

Total	onshore	Lower-48	
State	S		



#### **Marcellus Shale Gas Play Appalachian Basin**

#### Wells Producing from Marcellus Shale

- Marcellus Shale Only
- Marcellus + Other Formation Commingled

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• In 2012, unconventional oil and natural gas activity will contribute nearly \$62 billion in federal, state and local tax receipts. By 2020, total government revenues will grow to just over \$111 billion. On a cumulative basis, unconventional oil and natural gas activity will generate more than \$2.5 trillion in tax revenues between 2012 and 2035.









#### Proper well construction provides groundwater protection.



Typically, steel pipe known as surface cusing is consented into place at the uppermost portion of a well for the explicit purpose of protecting the groundwater. The depth of the surface cusing is generally determined based on groundwater protection, among other factors. As the well is deiled deeper, additional cusing is installed to isolate the formation(s) from which oil or natural gas is to be produced, which facther protects groundwater from the producing formations in the well.

Casing and consenting are critical parts of the well construction that not only protect any water zones but are also important to successful oil or natural gas production from hydrocurbon bearing zones.

Industry well design practices protect sources of deinking water from the other geologic zone of an oil and natural gas well with multiple layers of impervious cocks<sup>6</sup>

4. Industry has developed equipment/appears: and operating practices for users means an expection acts deel, examples, volume any science production to example of a series productions: coning equipment(a, P) as series productions: production comment(a, P) as series productions: production equipment(a, P) as series productions: production

#### Typical Chemical Additives Used in Frac Water

Compound	Purpose	Common application	
Acids	Helps dissolve minerals and initiate fissure in rock (pre-fracture)	Swimming pool deaner	
Sodium Chloride	Allows a delayed breakdown of the gel polymer chains	Table salt	
Polyacrylamide	Minimizes the friction between fluid and pipe	Water treatment, soil conditioner	2
Ethylene Glycol	Prevents scale deposits in the pipe	Automotive anti-freeze, deicing agent, household cleaners	ř
Borate Salts	Maintains fluid viscosity as temperature increases	Laundry detergent, hand soap, cosmetics	
Sodium/Potassium Carbonate	Maintains effectiveness of other components, such as crosslinkers	Washing soda, detergent, soap, water softener, glass, ceramics	
Glutaraldehyde	Eliminates bacteria in the water	Disinfectant, sterilization of medical and dental equipment	1
Guar Gum	Thickens the water to suspend the sand	Thickener in cosmetics, baked goods, ice cream, toothpaste, sauces	
Citric Acid	Prevents precipitation of metal oxides	Food additive; food and beverages; lemon juice	
Isopropanol	Used to increase the viscosity of the fracture fluid	Glass cleaner, antiperspirant, hair coloring	

Source: DOE, GWPC: Modern Gas Shale Development in the United States: A Primer (2009).

## Hydraulic Fracturing is Well Regulated

Hydraulic fracturing is **well regulated** by multiple federal, state and local authorities addressing environmental protection during natural gas operations, covering such items as well permitting, well materials and construction, **safe disposition of** used hydraulic fracturing **fluids**, **water testing**, **and chemical recordkeeping and reporting**. These rules and industry practices **effectively protect underground sources of drinking water**.



#### FEDERAL STATUTES REGULATE EVERY STEP OF THE HYDRAULIC FRACTURING PROCESS



CWA: Clean Water Act • OSHA: Occupational Safety and Health Administration • SDWA: Safe Drinking Water Act • EPRCA: Community "Right to Know" Act

#### **Government Oversight**

#### **Regulated by states and under the following federal laws:**

- Clean Water Act surface water discharge, storm water runoff
- Clean Air Act air emissions associated with processing equipment and engines
- Safe Drinking Water Act –underground injection disposal/reuse of produced waste and flowback fluids
- Federal Land Policy and Management Act permitting for federal onshore resources
- National Environmental Policy Act permits and environmental impact statements
- Occupational Safety and Health Act requires information about chemicals used at every site
- Emergency Planning and Community Right-to-Know Act annual reporting to emergency responders of chemicals stored and used above certain quantities
- Extensive State Oversight implement federal laws and regulate drilling fluids and produced water management
  - Detailed state regulatory information available at www.STRONGERInc.org

# To make it all happen, industry is committed to good stewardship

- Listening to and addressing community concerns
- Use of stringent industry and government standards on land reclamation, well construction, water management and pipeline safety
- Responsible hydraulic fracturing practices
- Minimizing surface effects on land and infrastructure
- Practice safe operations and pollution prevention

\*\*\*

Produce the energy we need. Protect the environment we value.

#### Overview of Industry Guidance/Best Practices on Hydraulic Fracturing (HF)

#### HF1 – Hydraulic Fracturing Operations – Well Construction and Integrity Guidelines, 1st Edition, October 2009, (API)

- Highlights industry practices for well construction and integrity for wells that will be hydraulically fractured.
- The guidance identifies actions to protect shallow groundwater aquifers, while also enabling economically viable development of oil and natural gas resources.

#### HF2 – Water Management Associated with Hydraulic Fracturing, 1st Edition, June 2010, (API)

- Identifies best practices used to minimize environmental and societal impacts associated with the acquisition, use, management, treatment, and disposal of water and other fluids associated with the process of hydraulic fracturing.
- Focuses primarily on issues associated with hydraulic fracturing pursued in deep shale gas development, but also describes the important distinctions related to hydraulic fracturing in other applications.

#### HF3 – Practices for Mitigating Surface Impacts Associated with Hydraulic Fracturing, 1st Edition, February 2011, (API)

- Identifies the best practices for minimizing surface environmental impacts associated with hydraulic fracturing operations.
- Focused on protecting surface water, soils, wildlife, other surface ecosystems, and nearby communities.
- Includes API's policy on chemical disclosure:
  - API supports transparency regarding the disclosure of the chemical ingredients;
  - States are the proper authority to determine reporting requirements and formatting of reporting and public disclosure;
  - Proprietary information should be protected; and
  - Hydraulic fracturing is effectively regulated by numerous federal, state and local requirements. Hydraulic fracturing should not be placed exclusively under the purview of the Safe Drinking Water Act (SDWA) or any other federal statute.

#### Overview of Industry Guidance/Best Practices on Hydraulic Fracturing (HF)

#### Std 65 Part 2 – *Isolating Potential Flow Zones During Well Construction,* 2nd Edition, December 2010, (API)

- Identifies best practices used to minimize environmental and societal impacts associated with the acquisition, use, management, treatment, and disposal of water and other fluids associated with the process of hydraulic fracturing.
- Focuses primarily on issues associated with hydraulic fracturing pursued in deep shale gas development, but also describes the important distinctions related to hydraulic fracturing in other applications.

#### RP 51R – Environmental Protection for Onshore Oil and Gas Production Operations and Leases, 1st Edition, July 2009, (API)

- Provides environmentally sound practices for domestic onshore oil and gas production operations, including fracturing. Applies to all production facilities, including produced water handling facilities. Operational coverage begins with the design and construction of access roads and well locations, and includes reclamation, abandonment, and restoration operations.
- Annex A provides guidance for a company to consider as a "Good Neighbor."





- Taxes Access Regulation
- Hydraulic fracturing
- Exports
- Oil sands/Keystone XL
- RFS, E15, Other fuels issues
- Idle leases
- Investments/Buybacks/Dividends/Debt
- Financial regulations
- SPR
- NOPEC
- Idle leases
- ULS Heating Oil

#### Income Tax Expenses as Share of Net Income Before Income Taxes (2011)



Source: Compustat North America Database (April 2012 update).

Where Funds Will Go for U.S. Projects	2012 million \$	Change 2012- 2011	2011 million \$	Change 2011- 2010	2010 million \$
Exploration-production Drilling-exploration Production OCS lease bonus Subtotal	230,695 43,832 1,300 \$275,827	4.0 4.0 284.6 4.3 %	221,846 42,151 338 \$264,335	13.1 13.1 -63.3 12.8%	196,091 37,257 920 \$234,268
Other Refining Petrochemicals Marketing Crude & products PL Natural gas pipelines Other transportation Mining, other energy Miscellaneous Subtotal	9,000 300 3,000 3,948 3,721 1,000 1,100 4,200 \$26,268	-2.2  3.4 185.9 -52.0 -9.1 10.0 5.0 -4.9%	9,200 300 2,900 1,381 7,744 1,100 1,000 4,000 \$27,625	73.6  6.2 -83.9 152.9 15.8  6.6%	5,300 300 2,730 8,563 3,062 950 1,000 4,000 \$25,905
TOTAL	\$302,095	3.5%	\$291,960	12.2%	\$260,173

Carbon Mitigation Investment by Investor Group (2000-2011)



Source: T<sup>2</sup> & Associates, "Key Investments in Greenhouse Gas Mitigation Technologies from 2000 Through 2010 by Energy Firms, Other Industry and the Federal Government," October 2011.



#### **Administration actions**

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#### Expanding Alternative Fuels for Transportation: Current Laws



Source: EIA and Energy Independence Security Act of 2007.

# America's choice





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Thank You

# For more information visit

www.api.org

www.energytomorrow.org

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US Lower 48 Employment Contribution							
(Number of workers)							
	2012	2020	2035				
Unconventional Oil Activity*	845,929	1,345,987	1,390,197				
Unconventional Gas Activity**	902,675	1,639,181	2,108,481				
Total Unconventional Activity	1,748,604	2,985,168	3,498,678				

NOTES: Numbers may not sum due to rounding.

\*Unconventional oil activity represents the production of oil and condensate and associated gas recovered from tight oil plays.

\*\*Unconventional gas activity represents the production of gas and liquids recovered from shale gas and tight gas plays. Source: IHS Global Insight

#### \$172 Billion Annual Capital Expenditures By 2020

US Lower 48 Capital Expenditures: Total Unconventional Activity*							
(Current \$M)							
	2012	2020	2035	2012-2035**			
Drilling Capital Expenditure	28,027	57,680	122,430	1,761,012			
Completion Capital Expenditure	46,873	92,322	188,284	2,737,444			
Facilities Capital Expenditure	6,701	12,620	24,479	370,727			
Gathering System Capital Expenditure	5,701	9,919	17,883	279,326			
TOTAL UPSTREAM CAPITAL EXPENDITURE	87,301	172,542	353,076	5,148,509			

NOTES: \*Total unconventional activity represents the sum of unconventional oil and unconventional gas activity.

\*\*2012-2035 represents the total for all years including those years not reported.

Source: IHS Global Insight

US Lower 48 Estimated Government Revenue: Total Unconventional Activity*							
(2012 \$M)							
	2012	2020	2035	2012-2035**			
Federal Taxes	28,936	50,229	57,846	1,137,602			
State and Local Taxes	30,931	57,731	64,967	1,317,506			
Federal Royalty Payments	1,964	3,204	1,593	62,141			
Total Government Revenue	61,832	111,164	124,406	2,517,248			
Lease Payments to Private Landowners	504	913	1,232	23,599			
NOTES: *Total unconventional activity represent	s the sum of unconv	entional oil and unc	onventional gas ac	tivity.			
**2012-2035 represents the total for all years inc	cluding those years n	ot reported.					

Source: IHS Global Insight