

# Marcellus and Utica Shale: The Promise and the Reality

# The promise (by the industry)

## **Energy independence for the United States.**

Increased job growth in Pennsylvania and other gas producing states.

Decreased pollution (from vehicles and electricity generating plants).

Slow down the greenhouse effect and environmental warming.

Land owners with mineral rights will financially profit.

There will be no bad health effects for people or animals.

Aquifers will not be contaminated.

Local surface and community environmental disruption will be short lived.

The finished well sites will be barely noticeable.

Dominion spokesman Dan Donovan said the company expects its Cove Point, Md., terminal facility to become an import export facility as early as 2015 if the Marcellus shale is developed, America has excess natural gas and its gas drillers demand it.

# The following have joint ventures with financiers and companies in China, South Korea, India, Japan, & UK

Gastar Exploration Ltd. 21.43%, South Korea

Exco Resources, Inc. ??%, United Kingdom

Chesapeake Energy Corporation 33%, China

Chesapeake Energy Corporation 20% China; \$200 million, S. Korea

Anadarko Petroleum Corporation 32.5%, Japan

Atlas Energy Resources (now purchased by Chevron) 45%, India

Carrizo Oil & Gas ??%, India

Chevron (see Atlas Energy above)

Pioneer Natural Resources 45%, India

East Resources Management, Inc., LLC is wholly owned by Royal Dutch Shell. Their operations are largely in Tioga County and north western Butler County.

Baron Group, Inc., is a member of PIOGA (Pennsylvania Independent Oil and Gas Association). Baron Group is based in Hong Kong with offices in Beijing, Vancouver, and Macau.

XTO Energy Inc. and Exxon Mobil Corporation have formed a new organization to manage global development of unconventional resources. Over the coming decades, natural gas is expected to play an increasingly important role in fueling the world's economic growth. ExxonMobil sells approximately 11 billion cubic feet of gas per day and is active across the gas value chain in most major markets.

In January 1996, NGC and Chevron announced plans to merge Chevron's natural gas and natural gas liquids business with NGC. On May 23, 1996, the companies reached an agreement in principle to merge their business. Under the agreement, Chevron transferred its natural gas gathering, operating and marketing operation to NGC in exchange for a roughly 25 percent equity stake in NGC. On August 30, shareholders approved the deal creating North America's largest natural gas and gas liquids wholesaler. In 1998, NGC Corporation was renamed Dynegy.

Shell (=Royal Dutch Shell) ~90% gas developed in NW Butler County will be shipped overseas, according to a Shell representative.

Speaker: David S. Fitzsimmons (of BP)

Speech date: 13 March 2001

Venue: 4th Doha Gas Conference on Natural Gas, Qatar

Title: Group Vice President, Gas & Power, BP p.l.c.

“We have combined four great energy companies - Amoco, Arco and Castrol and BP - in the space of just two years

The old BP was really an oil company with 17% gas production. The new BP is a gas company with 40% gas production. Last year we produced 8 bcf/d and sold 12 bcf/d - putting us in the top 3 of international gas companies. Note we sold 50% more than we produced.

But let me put that in perspective - the world has 5000 trillion cubic feet of proven stranded gas reserves seeking markets and customers.

So the challenge today is to be a world class marketer of gas.”

# LNG BATTLE TAKES SHAPE

## PROPOSED AND EXISTING LIQUEFIED NATURAL GAS PLANTS

- EXISTING
- APPROVED - UNDER CONSTRUCTION
- PROPOSED
- APPROVED - NOT UNDER CONSTRUCTION
- U.S. - MARAD / COAST GUARD\*



\*Maritime Administration/Coast Guard jurisdiction

SOURCE: FEDERAL ENERGY REGULATORY COMMISSION

AVERY PAGE / NATIONAL POST

## LNG TERMINAL LOCATION

Cameron, LA  
Cove Point, MD  
Elba Island, GA  
Everett, MA  
Freeport, TX  
Kenai, AK  
Lake Charles, LA  
Peñuelas, PR  
Sabine, LA  
Sabine Pass, TX



Nearly 14 percent of America's daily natural gas production could be sold overseas if all the other firms that have applied or publicly expressed interest in exporting are approved by the U.S. Department of Energy, the Tribune Review reported in the first part of this investigation published on Sunday. The exact amount depends on demand, production and necessary approvals. **But prices for gas in Europe are nearly three times those in the United States.**

Exports from just the Sabine terminal at the projected rate will drive up natural gas prices in the United States by at least 11.6 percent in 2015, the DOE said. That doesn't consider approval of any other export terminal.

Industry & politicians are touting:

a change to vehicles using natural gas

electricity generating plants switching to natural gas

energy independence for the next 40 to 50 years

Realistically, is this all possible with the amounts being exported?

No comprehensive analysis has been done.

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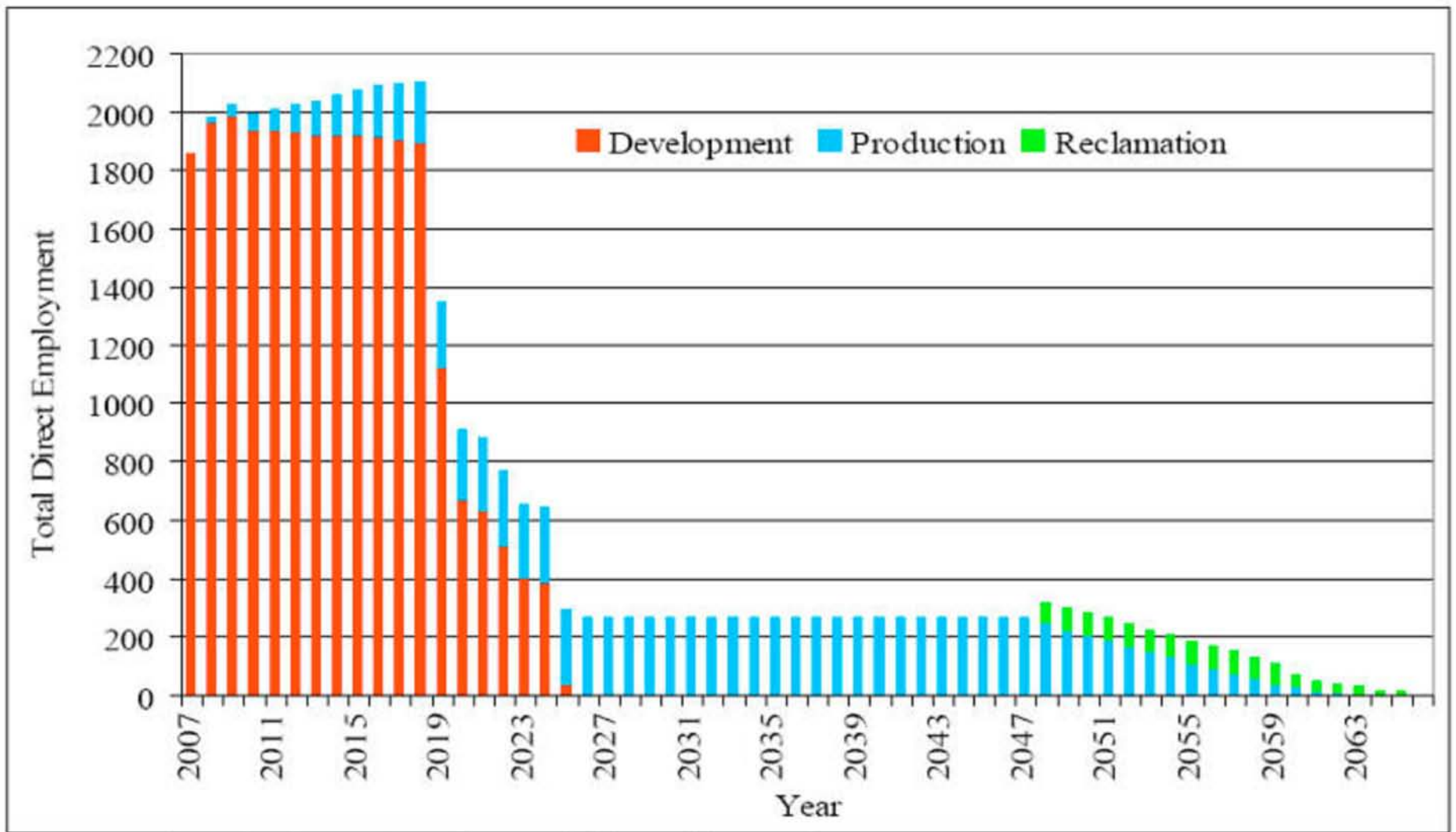
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A May 29 article in The Patriot News reported that natural gas drilling in the Marcellus Shale has created 48,000 jobs.

The 48,000 figure refers to “New Hires” — additions to employment in the state. New hires are not the same as jobs created because many new hires replace workers who have quit, been fired, retired, enticed to leave other jobs, or come from other states.

Since the fourth quarter of 2009, Marcellus “Core” and “Ancillary” industries — as defined by the Center for Workforce Information and Analysis (CWIA) of the Pennsylvania Department of Labor and Industry — created 1.7% of all new hires in Pennsylvania, one out of every 59.

CWIA finds that Marcellus Core industries in Pennsylvania created 9,288 jobs between the fourth quarter of 2007 and the fourth quarter of 2010. Marcellus Ancillary industries actually lost 3,619 jobs in this period so that, taken together, Marcellus Core and Ancillary industries created 5,669 new hires (=11.8% of the 48,000 figure).



Graph: Ecosystem Research Group/Jacquet

Source: *Economic Challenges and Opportunities of Marcellus Shale* by Timothy W. Kelsey, Ph.D., Penn State University

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Methane (CH<sub>4</sub>) is one of several greenhouse gases that contribute to global climate change.

CH<sub>4</sub> traps 20 times more infrared heat than carbon dioxide (CO<sub>2</sub>)

Has an average atmospheric life of 8 to 9 years. It breaks down into CO<sub>2</sub> and H<sub>2</sub>O.

**Human influenced sources include landfills, natural gas and petroleum systems production and distribution, agriculture, coal mining, wastewater treatment, combustion, and certain industrial processes.**

Natural sources include wetlands, termites, oceans, ruminant animals, and gas hydrates.

Over the last 150 years, methane concentrations in the atmosphere have more than doubled.

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Lessors receive a one time bonus up front per acre.

Lessors will receive royalties after the gas is actually produced and production costs are recouped by the industry.

For example, based on a 12.5% royalty, a lessor with 100 acres in a drilling unit of 640 acres (the usual size) would receive a payment of 1.95% of the net profit.

If, on the other hand, you have only ten acres to lease, then you would receive only 0.195% of the net profit.

Non-lessors with forced pooling pay a penalty of double the normal share of the production costs (for the Utica under present law).

A proposed law stipulates a four-fold production cost penalty for the Marcellus.

Why the penalty for those who do not lease to the gas company?

Leases, as presently written, make the lessor and the gas company equally liable for problems that may occur, such as:

- 1- pollution from drilling mud ponds that get covered over;
- 2- contaminated dust & soil;
- 3- possible accident liability issues of injuries to gas workers;
- 4- use of access roads by off-road wheelers & hunters;
- 5- lawsuits from downstream municipalities;
- 6- problems with abandoned equipment;
- 7- pollution, fire or explosion damage caused by vandalism; &
- 8- any lawsuit that arises and is related to the lessors land because of the gas production.

Those who are involved in the drilling unit by forced integration share no liability as do those who lease.

# Property and liability concerns

## Municipal properties

**roads:** One Denton, Texas, study determined that for all three phases of a gas well -- drilling, fracing, and maintenance -- approximately 592 one-way truck trips were required per well. Some individual trucks weighed as much as 80,000 to 100,000 lbs when fully loaded.

# Property and liability concerns

Municipal properties

**water supplies:** Wells

Rivers

State environmental investigators are trying to determine the source of a chemical that Carnegie Mellon University researchers say is responsible for **carcinogens in drinking water from the Monongahela River**.

Department of Environmental Protection workers are investigating whether coal, power and oil- and gas-drilling industries are to blame for unsafe levels of bromide in the river, said Ron Schwartz, assistant director of DEP's southwest region, at a daylong symposium Thursday at CMU. **It could take weeks or months to determine who is at fault**, he said.

"There's very little, if anything, the (water) utilities can do to remove that from their water," Schwartz said. "The key is to remove it from the source points."

If bromide is in the river water when the water is chlorinated, bromine combines with the chlorine to create a disinfectant byproduct, VanBriesen said. Those byproducts can cause cancer.

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**Industry promise:** The drilling, fracking, producing, and transporting aspects of the industry are perfectly safe.

As of June, 2010, 14.2% of all wells drilled in Pennsylvania had violations, with an average of 2.7 violations per well. 43.7% of these violations actually caused land, surface water, ground water, and/or air pollution (source, DEP); these violations have often caused serious health problems for people and death of livestock.

**What does it mean for the industry to have a violation?**

Possibly,

1- temporary cessation of work, and/or

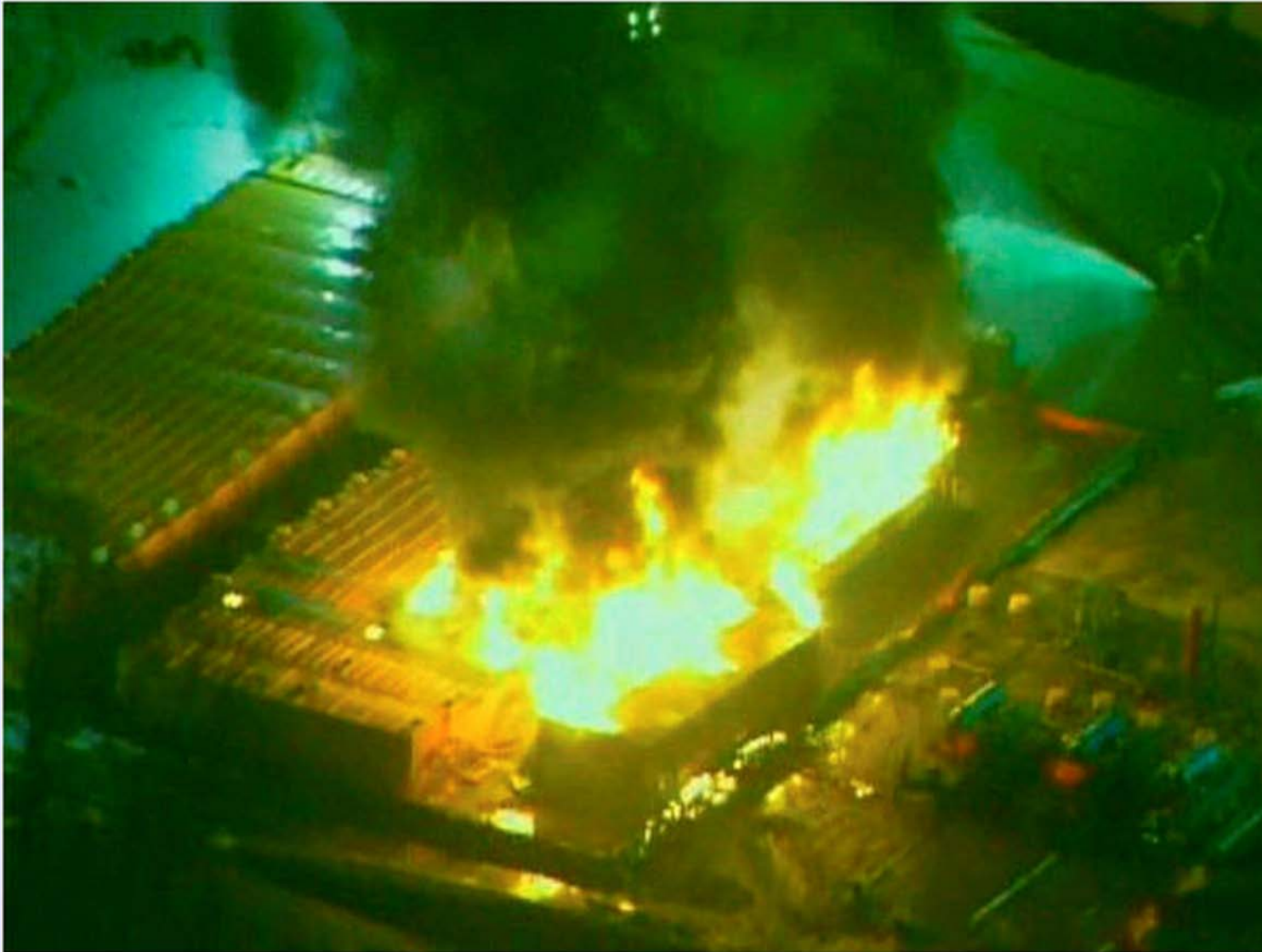
2- a fine, and/or

3- clean-up if possible, and/or

4- provide a temporary, and eventually permanent, water supply

**What does it mean to be perfectly safe?**

**What does it mean to be perfectly safe?**



Avella, PA, February 2011

Gas processing and transportation are all potential sources of air pollution that impair health.

gas separation plants

gas compressor →

pipelines



PA PUC determination and eminent domain

gas dehydraters

LNG facilities

**Gas dehydraters:** Regeneration of the glycol solutions used for dehydrating natural gas can release significant quantities of benzene, toluene, ethylbenzene, and xylene, as well as a wide range of less toxic organics.

**Gas sweeteners:** Natural gas is considered "sour" if hydrogen sulfide ( $H_2S$ ) is present in amounts greater than 5.7 milligrams per normal cubic meters. The  $H_2S$  must be removed (called "sweetening" the gas) before the gas can be utilized. Sulfur dioxide is the emission product.

The major emission sources in the natural gas processing industry are compressor engines, acid gas wastes, fugitive emissions from leaking process equipment and if present, glycol dehydrator vent streams.

**Gas compressors** are used in pipeline transport of purified natural gas to move the gas from the production site to the consumer. Often, the compressor in this application is driven by a gas turbine which is fueled by gas bled from the pipeline. Thus, no external power source is necessary.

Natural gas processing plants are used for compressing intermediate and end product gases.

# Chemicals at every stage

- **Condensate tanks** – Hydrocarbons, Benzene, Toluene, Ethylbenzene, Xylene
- **Construction Activity** – Dust and particulates which are precursors to Ozone formation
- **Dehydraters** – significant quantities of VOC's, Benzene and Toluene
- **Engines** – diesel or gas/petrol release CO, NO<sub>x</sub>, PAH's, heavy metals, formaldehyde, BTEX and can contribute to Ozone/smog
- **Flaring** – benzene, formaldehyde, polycyclic aromatic hydrocarbons (PAHs, including naphthalene), acetaldehyde, acrolein, propylene, toluene, xylenes, ethyl benzene and hexane. Researchers in Canada have measured more than 60 air pollutants downwind of natural gas flares.

*Ref -The Endocrine Disruption Exchange*

- **Fugitive emissions** – unintentional releases of gases. Methane, VOCs and hydrogen sulphide
- **Pits** - acids, biocides, surfactants, solvents, lubricants, plus VOC's, benzene, toluene and hydrogen sulphide
- **Vehicle** -NO<sub>x</sub>, carbon monoxide, and sulfur dioxide, as well as particulate matter. These compounds combine with VOCs to form ground-level ozone (smog).
- **Venting** – massive release of VOC's and hazardous chems (if flaring is not used)

*Ref -The Endocrine Disruption Exchange*





Jonah gas  
field,  
Wyoming

Gas field produced ozone has created a serious air pollution problem similar to that found in large urban areas, and can spread up to 200 miles beyond the immediate region where gas is being produced.

*Ref -The Endocrine Disruption Exchange*

# Health Effects of Air Emissions – Ozone

## Range of health effects

- Mortality
- Reduced lung function in healthy adults and children
- Exacerbation of asthma
- Increases in respiratory symptoms
- Increased airway responsiveness
- Airway inflammation

No evidence for threshold for effect.

*Ref -The Endocrine Disruption Exchange*

# Benzene

- Known human carcinogen
- Long-term exposure associated with increased incidence of bone marrow depression and leukaemia (acute myeloid leukaemia)
- Recent meta-analyses found association with increased incidence of Non-Hodgkins' Lymphoma (2008)
- International air quality standards currently stand at 1.5 ppb as annual average. Adopted by EU and UK air quality strategy.
- No known threshold for carcinogenic effects.

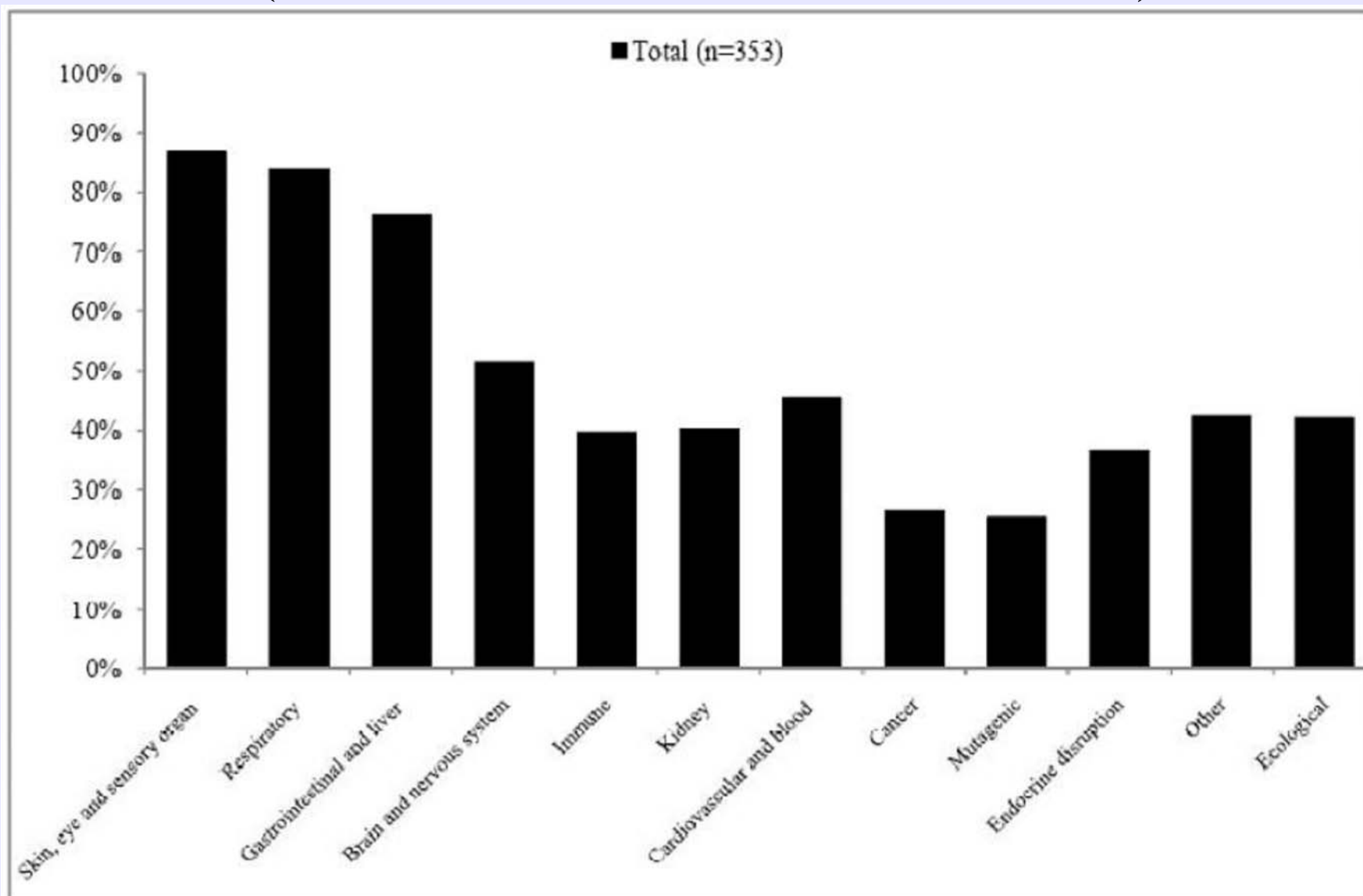
*Ref -The Endocrine Disruption Exchange*

# Nano-particles

- Particles that measure less than 100 nanometres = 100, 000<sup>th</sup> of a one metre.
- DNA strand = 2.5 nanometres
- Pass directly through human membranes into the blood and organs.
- Inhaled nanoparticles can pass the blood brain barrier.
- Nanopollution is more toxic than standard pollution.
- Nanoparticles can travel long distances intact.

*Ref -The Endocrine Disruption Exchange*

LNG facilities: 632 chemicals used, 353 with CAS numbers (Chemical Abstracts Service numbers)



# Health and Environmental concerns

## **Anecdotal evidence versus Scientific validation \***

Children

Pam Judy

Dish, Texas

Terry Greenwood

Ron Gulla

This is an example of anecdotal evidence of noise and general health problems related to noise.

“The house next door” to the flaring, Vera says, “just got sold two weeks ago. An elderly couple owned it. They were from Long Island, now they’re back in Long Island. **They couldn’t take it anymore.** They’d been here about 15 years, and the months of drilling, fracking, all the noise, vibration, dust, traffic, they could hardly sleep. She would go to other places to sleep. **She would go and sleep in the parking lot of the high school in Montrose.** So they had to sell their home, which they hated to do. They loved this place, but it has now become an industrial zone.”

Scientific evidence is based on probabilities of random studies, usually of large populations of data; the results can never be 100%. That is why anecdotal evidence is frequently a better indicator of a problem.

# Health and Environmental concerns

Anecdotal evidence versus Scientific validation

## **Children**

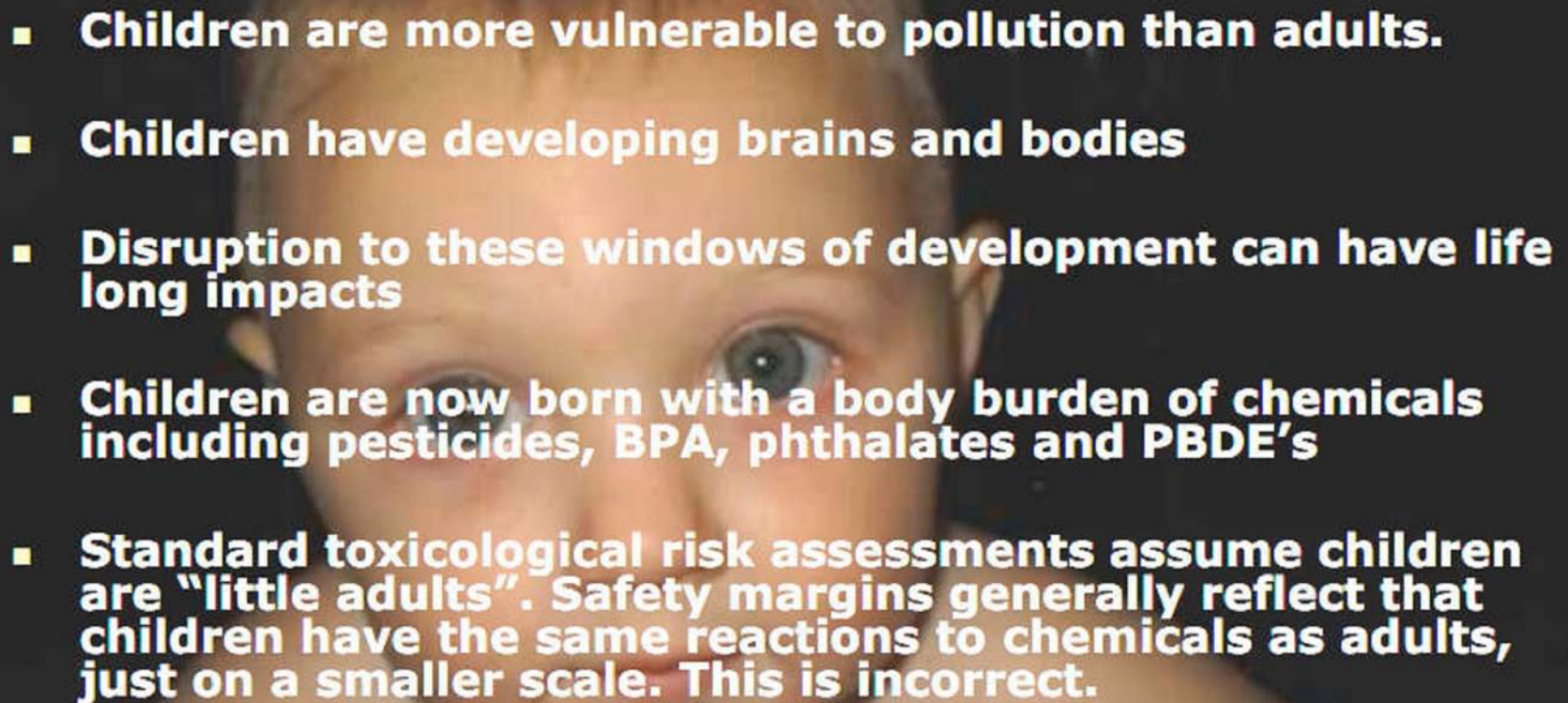
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- 
- **Children are more vulnerable to pollution than adults.**
  - **Children have developing brains and bodies**
  - **Disruption to these windows of development can have life long impacts**
  - **Children are now born with a body burden of chemicals including pesticides, BPA, phthalates and PBDE's**
  - **Standard toxicological risk assessments assume children are "little adults". Safety margins generally reflect that children have the same reactions to chemicals as adults, just on a smaller scale. This is incorrect.**

PBDE - Polybrominated diphenyl ethers

BPA - Bisphenol A

*Ref -The Endocrine Disruption Exchange*

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Anecdotal evidence versus Scientific validation

Children

**Pam Judy** google: “Pam Judy” gas Pennsylvania

Dish, Texas

Terry Greenwood

Ron Gulla

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Pam Judy

**Dish, Texas**

Terry Greenwood

Ron Gulla

**5/3/2011 -**

The people of Dish, Texas are fed up with natural gas drilling in the Barnett shale, and what it's done to their community. The small Denton County town, home to 200 residents and 60 natural gas wells, has filed suit against six natural gas or pipeline companies, claiming compressor stations associated with hydraulic fracturing operations in the area are ruining the town's air.

Just last month, Dish Mayor Calvin Tillman announced he was leaving his government job and the town itself over concerns that fracking in the Barnett shale was ruining his family's health.

**61%**

Health effects reported  
by the DISH community  
were associated with  
toxics measured in excess  
of TCEQ screening levels

Abnormal EEG  
Brain disorders  
Bronchitis  
Chronic Eye Irritation  
Decreased Motor Skills  
Depression  
Dizziness  
Eyes Burning  
Falling, Staggering  
Frequent Irritation  
Frequent Nausea  
Increased Fatigue  
Irregular/Rapid Heart Beat  
Muscle Aches & Pains  
Nasal Irritation  
Pre-Cancerous Lesions  
Severe Anxiety  
Severe Headaches  
Sinus Problems  
Throat Irritation  
Tired  
Weakness  
Allergies  
Difficulty in Concentrating  
Easy Bruising  
Nervous System Impacts  
Difficulty in Breathing

**Texas Commission on  
Environmental Quality**

# TCEQ study of Dish, Texas, residents



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gas wells

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Natural gas smell

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REPORTED EFFECTS

headaches  
nausea  
sinus problems  
asthma



---

natural gas  
pipelines

---

Odorized natural gas

---

REPORTED EFFECTS

headaches  
nausea  
sinus problems  
asthma



---

compressor stations

---

Sulfur smell  
Odorized natural gas  
Ozone  
Burnt butter

---

REPORTED EFFECTS

burning eyes  
nausea  
headaches  
running nose  
sore throat  
asthma  
sinus problems



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gas processing plants /  
metering stations

---

Sulfur smell  
Odorized natural gas  
Burnt wire  
Strong chemical like smell  
Ether

---

REPORTED EFFECTS

burning eyes  
nausea  
headaches  
running nose  
sore throat  
asthma  
sinus problems  
bronchitis

**Texas Commission on  
Environmental Quality**

The Associated Press has reported that other Dish residents have complained of nosebleeds, pain, and poor circulation since the first compressor station was built in their town in 2005. The air around Dish was found to contain high levels of the cancer-causing chemical benzene. While no one has been able to prove a direct connection, Tillman and others in Dish believe natural gas drilling is to blame.

All of the lawsuits claim the plaintiffs are entitled to collect monetary damages from the gas companies because of diminished property values. None of the lawsuits claim any personal injuries.

. “It is just horrible how little private property rights we have in Texas, where we’re supposed to have private property rights.”

# Health and Environmental concerns

Anecdotal evidence versus Scientific validation

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Pam Judy

Dish, Texas

**Terry Greenwood**    Google: "terry greenwood" gas



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Anecdotal evidence versus Scientific validation

Children

Pam Judy

Dish, Texas

Terry Greenwood

**Ron Gulla** <http://www.marcellus-shale.us/Ron-Gulla.htm>

or, Google: “ron gulla” gas drilling

and open: Ron Gulla - Marcellus Shale gas drilling

# Health and Environmental concerns

Abraham Lustgarten:

"I hear [stories] thousands of miles apart, in various states, and to me — to an untrained medical professional — they sound alarmingly similar," he says. "But when we go to federal or state health officials, or drilling officials, or any officials, and ask how common these are ... nobody really knows. Nobody has systemically tracked how many health complaints there are, whether the complaints are similar, whether they can be tied to any specific chemical exposure or any environmental cause. It makes it very difficult beyond an anecdotal answer to get a handle on how widespread a problem this might be."

## Why doesn't anyone know?

\*Abraham Lustgarten is a former staff writer and contributor for Fortune, and has written for Salon, Esquire, the Washington Post and the New York Times.

Part of the problem, writes Lustgarten, is that "the drilling companies have complicated efforts to gather pollution data and to understand the root of health complaints."

"The Clean Air Act requires reporting of emissions so that the government can collect the [toxic emissions] data **from facilities of a certain size**," he says.

"The oil and gas facilities often fall under that threshold and an exemption (in the federal 2005 Oil and Gas Act) allows them not to be aggregated or counted together. Because these facilities are small, there is no obligation to report to federal authorities what pollutants might be emitted from those facilities ... which means there's no information to paint a bigger picture of what communities are dealing with."

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Pipeline problems came under increasing scrutiny during the past year.

In September, a 44 year old gas transmission line ruptured in a crowded San Francisco suburb, killing eight people, injuring dozens and ruining 55 homes. Investigators blamed flawed welds on the pipe.

A gas pipeline explosion in Allentown on Feb. 9 killed five people and destroyed a block of row houses.

Extensive numbers of pipelines may exacerbate these kind of problems.

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# Dimock, PA

One owners water well blew up from gas exploding.

Dimock well water after fracking.



# Colorado



Residents in Colorado were able to light their tap water on fire.



In Colorado, three households that reported gas in their well water were studied by Colorado Oil and Gas Conservation Commission (COGCC). The COGCC is the Colorado equivalent of the PA DEP.

It was determined that the gas in two of the wells was biogenic gas, and the third well contained thermogenic gas.

Biogenic gas can originate in coal seams, swamps, and other surface or near surface sources.

Thermogenic gas comes from deeper sources, such as the areas being tapped by the drilling and hydrofracking of the gas industry.

These tests confirmed that the water at one site was severely contaminated with natural gas and other chemicals probably due to a nearby gas drilling operation.

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Well site preparation takes a few weeks

Each well drilled and fracked takes 6 to 8 weeks

Each completion could take a few more days

Each well pad can have up to 10 Marcellus wells

Each well pad can have up to 10 Utica wells

Pipelines have to be laid to carry the gas to:

Dehydraters (need to be in the same general vicinity & along pipelines)

Compressors (need to be in the same general vicinity)

Separaters

LNG facilities

Distribution lines to customers

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# Marcellus wells





**Dryer Compressor Station March 2011  
Expanded to 3 compressors**



Condensate tanks

# Legal and legislative status

Dillon's rule and preemptive law:

The "Dillon Rule," states that municipal governments only have the powers that are expressly granted to them by the state legislature, those that are necessarily implied from that grant of power, and those that are essential and indispensable to the municipality's existence and functioning. Any ambiguities in the legislative grant of power should be resolved against the municipality so that its powers are narrowly construed.

Municipalities are children of the state.

Most state laws are preemptive, essentially forbidding municipalities from enacting ordinances in any area that they have not been given the state mandate to enact, or that further restrict any area that state laws or regulations cover.



# Legal and legislative status

## **Federal 2005 Oil and Gas Act**

The oil and gas industry enjoys sweeping exemptions from provisions in the major federal environmental statutes intended to protect human health and the environment. These statutes include the:

- Comprehensive Environmental Response, Compensation, and Liability Act (known as the Superfund Act)
- Resource Conservation and Recovery Act (waste handling)
- Safe Drinking Water Act
- Clean Water Act (stormwater discharges)
- Clean Air Act
- National Environmental Policy Act
- Toxic Release Inventory under the Emergency Planning and Community Right-to-Know Act

# PA Oil and Gas Act - Marcellus, Onondaga, Utica

DEVONIAN		West Falls	Nunda	Sh, ss	365 - 125	Oil, Gas
			Rhinestreet	Sh		
		Sonyea	Middlesex	Sh	0 - 400	Gas
		Genesee	Genesee	Sh	0 - 450	Gas
	?		Tully	Ls	0 - 50	Gas
	MIDDLE	Hamilton	Moscow	Sh	200 - 600	Gas
			Ludlowville	Sh		
			Skaneateles	Sh		
			Marcellus	Sh		
			Onondaga	Ls	30 - 235	Gas, Oil
LOWER	Tristates	Oriskany	Ss	0 - 40	Gas	
	Helderberg	Manlius	Ls	0 - 10		
		Rondout	Dol			
SILURIAN	UPPER		Akron	Dol	0 - 15	Gas
		Salina	Camillus	Sh, gyp	450 - 1850	
			Syracuse	Dol, sh, silt		
			Vernon	Sh		
		Lockport	Lockport	Dol	150 - 250	Gas
	LOWER	Clinton	Rochester	Sh	125	Gas
			Irondequoit	Ls		
			Sodus	Sh		
			Reynales	Ls	75	Gas
			Thorold	Ss		
Medina	Grimsby	Sh, ss	75 - 150	Gas		
OVICIAN	UPPER		Whirlpool	Ss	0 - 25	Gas
			Queenston	Sh	1100 - 1500	Gas
			Oswego	Ss		
			Lorraine	Sh		
		Utica	Sh	900 - 1000		
	MIDDLE	Trenton-Black	Trenton	Ls	425 - 625	Gas

# Legal and legislative status

## ALEC

### **It's True. Corporate lobbyists really are writing PA laws**

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**Sent:** Friday, August 05, 2011 10:52 AM

**To:** [Hinds, Robert](#)

Seriously. Corporations are writing PA's laws.

This is not just hyperbole. At this very moment, in New Orleans, there is a group of corporate lobbyists writing what they call "model bills." Their plan is to get your state senator and representative to introduce and pass these bills.

So they have invited hundreds of state legislators to this secretive confab to play golf and be wined and dined. It's possible your legislator is with them right now.

Who is this shadowy organization? They are called the American Legislative Research Council (ALEC); and they write legislation for corporate lobbyists - much of it introduced here in Pennsylvania. Most disturbingly, it is often introduced word for word. ([See our report on ALEC's influence on PA here](#)).

ALEC is behind the efforts in Pennsylvania to pass bills that strip away union rights, scale back child labor laws, attack the regulation power of environmental agencies, suppress voter rights with strict identification requirements, eliminate the social safety net, and privatize public services. This model of spoon feeding legislators is a corruption of representative, open government and is an abrogation of duty on the part of our elected legislators.

# Beneficiaries of Gas Wealth

Gas companies and supporting industries

Drilling crews and support personnel

Many local businesses

Gas associations

Land owners

Lawyers

Politicians

# Losers

Many residents who live near gas wells and other gas production facilities, because:

- lose of property value

- lose of house insurance

- lose of healthy air, water, and soil

- inability of prospective buyers to obtain FHA backed mortgage

Animals, including livestock, deer, other mammals, birds and fish if the air, water, and soil are contaminated.