Elected Official Name: Elizabeh Law-Evans

Date of Travel or Training: April 18 & 19, 2018

Description of Travel or Training: attendance at Energy and Environment Symposium, Rifle, Colorado

Total Amount Expended: $409.36
(include airfare, hotel, registration, and all other reimbursements)

How this Travel or Training Benefited the Citizens of Broomfield:

I attended presentations by industry representatives (e.g., COGA’s legal counsel, representatives from Liberty Oilfield Services, and others), industry analysts, researchers (e.g. Dr. Jeffrey Collett of CSU Atmospheric Science Department), local government officials (e.g., Greg Becker of Greeley Fire Department), nonpartisan observers (e.g., Daniel Raimi of Resources for the Future), and state regulators (Dr. Larry Wolk of CDPHE).

My notes will be posted on the city’s website (most likely under Councilmember reports?)
Wednesday, April 17, 2018

Arrived 11:40am after getting home last night at 12:30am from the council study session.
Tail end of session on “Western State Rural Natural Gas Initiative.”
Jordan Cove project to pipe natural gas from Western Colorado to a distribution point in Oregon.
Western Colorado considers this crucial for their economy; they don’t have a lot of diversification in their economy.
Lunch Keynote Address: “Public views on energy and climate issues in the United States and around the world.”
Brian Kennedy, Pew Research Center

Protecting environment worth the economic cost?
Widening partisan divide
2007 gap was just 9%, last summer 77%D say worth the cost, 36%
Republicans believe stricter environmental regulations are worth the cost.

State level public opinion 2014
Highest: Hawaii & Vermont
Lowest: Wyoming, Montana, West Virginia
Why: Politics, AND economy, role of extractive industry has SOME influence.
Here in Colorado mirrored the country as a whole (57/37% worth the cost), but here in CO partisan division even wider than the nation as a whole.

Possible or not possible to protect air and water quality while cutting back on environmental regulations: basically split. Partisan gap is large.

In daily life, people ____ about helping the environment:
particularly concerned: 75%
but only 25% say live all the time helping the environment

Earth is getting warmer due to human activity: 53% yes, slight uptick in trend—but huge partisan divide.

Partisan divide persists even among those with “high” science knowledge.

Many Americans expect harms from global climate change
Liberal Democrats are more likely to believe harms will occur due to climate change.
36% of Americans say they care a great deal about the issue of global climate change — wide political differences.
About half of Americans say power plant restrictions, international emissions agreement can make a big difference for climate change. Most liberal Democrats see wide range of actions as able to make a big difference to address climate change.

Americans most likely to trust information from climate scientists about causes of climate change. Trust much lower in news media, energy industry leaders, and elected officials. 

**Trust in information from climate scientists varies by politics—but NO ONE TRUSTS news media, energy industry leaders, or elected officials.**

Most Americans say climate scientists should have a major role in climate policy (this was more bipartisan). Less likely: elected officials and leaders from other nations.

Intensity of climate change concern varies globally (2015)
High: Brazil, India, Peru,
Low: China, Poland, Russia
Latin Americans, Sub-Saharan Africans more troubled by climate change than people in other regions. US slightly below median.

**Public Opinion about Energy**
Most in US give priority to developing alternative energy over fossil fuels. 65/27% in favor of alternative sources.
2012 narrowing (47/39): paying more at the gas station than we are now. Divide between Republicans and Democrats over energy priorities. Alternative energy: 81/45 partisan. Republican party divide by ideology—conservative Rs more likely to say focus on expanding fossil fuels.

Partisans agree on the importance of energy sector jobs, divided on prioritizing environmental effects of energy sources.

Political and age divides over whether the free market alone can increase
use of renewable energy sources.
Balance of opinion in favor of government regulations; Ds more likely to say need regulations. 
Difference by age, even after controlling for party: younger adults say need more regulations.

Strong public support of US for expanding wind, solar power, not so much for offshore drilling, nuclear, fracking, etc. This support is bipartisan. 
Wide political divides over expanding fossil fuel energy sources. 

Strong bipartisan support for expanding solar & wind, wide political divides of expanding fossil fuels, fracking, nuclear. 

US Political differences on expanding fracking (59/28%) 
Ds with high science knowledge are much less likely to fear expansion of fracking. Most Rs favor expansion of fracking. Similar pattern for coal mining.

Republicans with high science knowledge much more likely to favor more nuclear power plants, Ds pretty split and stable across all science knowledge categories 
bkennedy@pewresearch.org
@briantkennedy on Twitter

Q&A: 
Q on slave labor involved in cobalt production in the Congo. Why isn’t that coming out? Cognitive Dissonance? 
A: Good question, we don’t provide opinion on things. A lot of these issues are not top of the head issues experience every day, people form judgements in many different ways on them, local issues more immediate as to where they draw their opinion from.

Q re stricter now versus stricter regulations all the time? 
A: When show a question like that, we’ve asked the same question over time so haven’t defined “stricter.” Your idea that the context of the
question has changed is most likely correct and can account for some of the trend line changes.

Q: Demographics as to how many heat their homes with electricity versus gas, how far drive, drive with fossil fuels, etc.

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Last bipartisan note: when they measure science knowledge, they don’t see much difference between Rs & Ds.

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World and U.S. oil and gas production and price outlook: To infinity (or at least 2050) and beyond!

Troy Cook, Senior Global Upstream Analyst, Energy Information Administration

Projection, not forecast.
Future oil prices are uncertain. (Hah!)

US production:
Tight oil production remains the leading source of U.S. crude oil production from 2017-2050. World market was upset when these “resource plays” came online in 2012 and thereabouts.
Technology not quite what people think it is — everything gets faster, cheaper.
The relationship between oil and gas production and Western Colorado employment
Dr. Nathan Perry, Associate Professor of Economics, Colorado Mesa University

The Employment Impact of Rig Count in the Piceance Basin

Econometric study relating the changes in employment to change sin rig counts, gas prices, well counts, etc. (By end of year he will have comprehensive economic study done, this is part 1)

strong relationship between Piceance employment and # rigs up to 2014 or 2015, then diversified.
controlled for seasonal factors
regression Autoregressive Distributed Lag Model (follows Brown’s methodology)

Not just the direct jobs that the rigs employ, but “trickle down” effect of support jobs

8/08 to 5/16 rigs went from 80 to 2, loss of jobs

Western CO more reliant on O&G than other areas studied. When you add high paying jobs in rural communities the multiplier effect is huge.

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Oil and gas and the impact on humanity
Heidi Gill to introduce speaker:  
Chris Wright CEO, Liberty Oilfield Services

Need more candid and spirited discussions

Big picture history, history of humanity and history of energy closely tied.

He works a lot in the Bakken, many of the surface owners own their mineral rights, makes for great partnerships

UK nationalized their minerals in the Great Depression.  Not the same working with the government.  Birthplace of the industrial revolution, not doing well.  1 in 3 households in Northern England do not have an employed wage-earner in the house.  Not the birthplace of the shale revolution.

Dramatic reduction of oil and natural gas prices a result of technology and development, celebrate.  Free market solution this is the winners.  Means that low-income people have better, longer life, so hard to top that as something to cheer for.

Grew up in Colorado, high school in the early 1980s.  Lots of discussion about resource depletion.  Running out of everything.  Predictions of mass starvation by 1980.  Gloom and doom, civilization as we know it will be imperiled.

Through all of human history there are things that majorities believe that never come to pass.

In HS as a kid he sort of bought in to all of that.  Now they are mountain climbers, not possible without oil and gas, no big mountains in the world were climbed without oil and gas.  Only way to get water on mountains is to take white gas, melt snow.

Lucky to be born in the 20th century.  Very lucky, crazy dreamy life.  Incredibly lucky life.  HIs passion is why isn’t everyone else so
lucky. Born 200 years ago, born in the wrong country, wrong zip code don’t get the same opportunities. Energy massively important:

3 things matter:
food
housing
energy

Look at the history of humanity in a funny cartoon way. Space farer here 200k years ago: semi-hairless apes, scrounging and fighting for food. Same thing up to very recently, human condition did not meaningfully change until quite recently, like 10k years ago. World-changing energy revolution: Cultivate seeds on stable plot of land. Invention of agriculture. Written language, first cities, culture . . . all the kernels of what we think of in society today did not exist 10k years ago.

Hunter gatherers live the way our ancestors did
Hobbes: life was nasty, brutish, and short

Invention of agriculture started to change a lot of things, but didn’t really change the condition of the AVERAGE person.

Life expectancy didn’t change until very recently, about 170 years ago (when first oil and gas well drilled), about 30 years. Median wealth of people didn’t change until recently.

World bank: people living in extreme poverty, $1.40 per day. 700 million today under extreme poverty, about 10% of world population. Go back to 1840 what % then lived in extreme poverty: 90%. Calorie-deficient, didn’t get enough protein to grow, just don’t have enough food to eat.

90% of ancestors through out all of human history lived in extreme poverty. Life of average person was tough.

2 things happened that created modern world:
1: LIBERTY, human liberty (long and beautiful story; meaningful political liberty 1689 Glorious Revolution in England, king forced to cede sovereignty
to governing body). John Locke wrote the ideas that crystallized this, Federalist Papers. Inspired to take next step. Role of government is to enable us to live better lives. Of course, it was still for a select group of people, but instead of .001%, now 10%. Liberty marched forward slowly. Adam Smith 1840s Wealth of Nations: shouldn’t have government saying what to do, etc., Ideas really came in to play in 1840s. Registration Act in UK: all you have to do to start a business is file paperwork rather than get an act of Parliament! Human income and life expectancy took off . . . more businesses, more wealth, etc.

2: ENERGY: Needed more energy sources, first well drilled 1859. Coal arrived too late to save the forests of UK, but did save forests of Europe. Eastern US pretty deforested. Oil and gas large energy density. Before O&G/Coal, all fuel came from top 6’ of earth, now 16ksf. Came from same place the sun, etc. Extract energy from a place people don’t live (i.e., below ground). Shrink our footprint, air and water now MEANINGFULLY CLEANER. Shrink the human footprint and grown our lives.

Life expectancy worldwide 71 years. No country on Earth with life expectancy below 45.

Environment cleaner massively important. History of that pretty tremendous. London’s air today much cleaner, worst was 1750s. People say coal is dirty, he says compared to what? Not compared to burning wood inside hut where indoor air quality is horrible. Coal cleaner than wood, oil cleaner than coal, gas cleaner than oil.

Availability of energy enables everything we do in our society. A billion people don’t have access to energy. Lots of future in energy. Energy revolution in O&G (he studied and worked in fusion, solar, geothermal)

81% of global energy from OGC. Projected 2040 % of world energy from OGC: just under 80%. 50 years ago it was about 83%.

He’s bullish on fusion, nuclear, wind, solar: virtually zero prospect that the world will run out of oil and gas. Better ways of extracting, etc. Reserves <> how much we have.
Other technologies rise, there will be a gradual transformation to other energy sources. Changes of sources of energy happen very slowly.

Q&A

Q: Where do you see biofuels in the future?
A: Maybe 2-3% of world energy. Play a significant role, but suffer from significant limitations: solar energy that’s hitting the earth TODAY. There’s a maximum amount of energy we can produce on a given plot of land. Unlikely they will reach 10%.

Q: Wind?
A: We map winds of world, pretty known. 1W/m² an average, so in a little more context, uses a lot of land. To produce the increased energy consumption from 2017 to 2018 would take a wind farm the size of Germany (about 20% bigger than the state of Colorado). Not enough acres in the US to make it the dominant source of world energy. Electricity is most refined source of energy.

Q: Climate change
A: Scientifically, super interesting. Concept is true, increased CO2 in atmosphere by 40%. That means the warming effect. Simple math, doubling of CO2 in atmosphere in 150 years that should cause 1 degree C of warming. We’ve had about 2/3 of that before. Are we changing? Yes, absolutely. Is it the top environmental issue today? I think the case for that is weak and getting weaker. The belief is that there’s positive feedback of increased in water vapor. Is there positive feedback or not? Data to date doesn’t support meaningful positive feedback. IPCC lowered their lower bound estate to 1.5C with some positive feedback. Warmer and wetter world, Sahel is greening up. More abundant life. It’s a real issue, still dominantly a political issue. Absolutely the climate is changing and absolutely we’re contributing to it, but media and politicians running away with it. Real things, but lots of exaggerations.

Q: Private property rights. Best way to protect property rights?
A: Tough balance, tough problem in towns in Colorado in the oilfield. Can’t
move the oil, but now have people who don’t have mineral rights so they don’t get any benefit from it. Sticky tradeoff issue. Respective property rights, fundamental rights to have property rights. when we impact other people that’s a problem too. Not black and white, takes the sticky discussions and take offs. Small cadre of people who hate oil and gas are a small minority, rest of the issue is communities and neighborhoods. Be open and honest and find right balance of trade-offs. “Thou shalt not” is significant taking. We all consume oil and gas. Saying we won’t produce it in our county doesn’t do anything to not consume it . . .

Q: China and India?
A: Biggest demand growth in the world in China and India, they started way behind and are largest population centers. Massive growth in consumption. Both are huge coal producers, but poor cool burning technologies and so have huge problem pollution, quality of health. Meaningful problem. Both investing massively in LNG import infrastructure, that will keep happening. Kyoto was nonbinding international treaty, China said aspire to have peak CO2 emissions in 2030s. Moving from coal to natural gas drives down CO2 emissions. US CO2 emissions 2017 lower than any time since he was born. Will continue with or without government regulations.

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CSU studies of air quality impacts of oil and gas development from local and regional scales
Dr. Jeffrey Collett

NG cleaner burning, lower CO2 than coal
Potential air quality impacts: climate, especially if CH4 released to atmosphere (very “potent” greenhouse gas)
Criteria Pollutants: ozone produced by VOCs and NOx; fine particles a concern also
Air toxics: VOCs / BTEX, etc.

Fine particle formation and haze
any kind of combustion process produces NOx; reactions can eventually produce very small particles of ammonium nitrate and form haze. At high enough concentrations a potential human health concern. Bakken has high concentrations. They went to Bakken area to observe. Most of the country (including CO) has had improvement in nitrate particulates, but not the Bakken area.
NPS concerned about visibility in Teddy Roosevelt, etc.
Hypothesis: rapid increase in O&G caused increased haze

Spatial patterns of methane and ethane
Map of Methane: Sources: O&G, cattle, livestock, wetlands
Map of Ethane: elevated in oil patch but not in other biogenic sources—helps to “discriminate” that cause is oil patch

Bakken Haze episodes
Didn’t see high ozone episodes
Did see fine particle episodes
When the wind stops blowing you get the formation of the ammonium nitrate particles. Form over a period of several hours during stagnation periods. Key ingredients are NOx and ammonia (maybe coming from agriculture)

Colorado O&G
Studies in Garfield County and Front Range
Objectives: quantify emissions, characterize dispersion downwind
Looked at fracking, flowback, longer term emissions

Why measure emissions: If simply measure concentrations then that doesn’t give you predictive value. By measuring emissions, can combine with methodology to predict.

Findings: Highlights:
Methane for front range:
Highest emissions of methane from flowback and liquids load out process (large separators and removal to tanks)
Compare to Garfield county: story is basically the same, highest emissions from flowback.
Longer term production emissions: front range 0.4% methane lost during production; “This is a pretty good number.” “This is a relatively small but still significant loss.”

VOC emissions, Front Range re toxics
Measured 48 different VOC
Focus primarily on BTEX re potential health impacts
Bottom line: biggest emissions during flowback
Garfield County versus front range: Garfield county blowback emissions similar, but slightly lower
Fracking GC higher than FR

Translating emissions to concentrations
Modeled benzene concentration maps for a Front Range site
look at variability of emissions over a year using a dispersion model with constant emissions
concentrations fall off quickly as move from the source
four season dispersion models similar. concentrations highest near facility, drop off quickly as you move away. 500’ or beyond concentrations .1ppb
Comparison: FC city measurements, “background” between .1 and .4ppb

**Much more sophisticated simulation going on with CDPHE, they are advising. Will come out later this year.**

Importance of thinking short term as well.
Increase in long term concentrations drop off very quickly. If have unfortunate meteorological concentration can get much higher concentrations for short period of time. Thinking about potential exposure concerns, think not just about long term exposures but also shorter term acute effects.

New study here in Garfield: determine source contributions to ambient VOCs. Goal to be able to take data and do source apportionment of ambient concentrations. Try to recognize patterns of different sources of VOCs.

**Concluding thoughts**  
CSU has examined O&G impacts on air quality at local to regional scales.  
**At neighborhood scales, hourly air toxics exposure evaluation highest priority**  
methane climate change is a global scale issue

**Q&A:**

I asked about the criticisms of his study; I can’t summarize all he said but it was good . . . (sorry)

Q: plants manufacturing renewables that release pollutants should also be studied such as the Lithium Carbonate plant Tesla has between Reno and Las Vegas  
A: we should look at all emissions sources, make informed decisions. Objective basis, useful information to people and policy makers to make informed decisions.

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Colorado energy impacts: production, jobs, revenue and price forecasts
Chris Akers, Economist, State Demography Office, Colorado Department of Local Affairs
Overview:
2017 record oil production
2017 NG production stable
2017 employment changes a rollercoaster
price & production forecasts (presentation yesterday)
state revenue projections (presentation yesterday?)

Oil
CO 4.3% of US oil production (used to be 1%)—US and CO both increased
2017 CO record oil production, Weld County 91% of CO

Natural Gas
US production increased substantially, CO 2000-2012 was biggest increase

Employment in CO
It really is a rollercoaster. 9/17 22,343. Lost 13k jobs in 2015 and early 2016 (almost half of jobs). Much more severe than in great recession.

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Thursday, April 18

Local Government Case Studies (Part 1)

Moderator: Brad Schol, Special Programs Manager, City of Longmont
O&G operations in urban interface

Greeley well site inspection program, Greg Becker, Greeley Fire
Overview:
Why develop inspection program?
• Address citizen concerns re O&G in urban areas
• Address concerns re existing O&G in urban areas
• become familiar with O&G locations in response jurisdiction.
• preplan response to locations in case of emergency
• advocate for the community — extra set of eyes in addition to state inspectors

483 wells currently in city limits, another couple hundred in city limits in near future

Steps to develop (nothing like it in the country)
Developed and implemented inspection program
COGCC & CDPHE

Established and developed principled relationships with our local operators in the O&G community

How does the International Fire Code pertain to O&G? Authority . . . 2015 IFC

How do we prioritize inspections? See COGCC prioritization, but they developed their=>
Target Hazard Assessment form
• Pop density and urbanization
• history of violations at location
• size of the location
• time since last inspection
• overall impression
• (scoring system, assessment score)
Every well within 3 year time period, high priority more often

Also: Complaint-Based Inspections from citizens or other city departments (planning, etc.)

submit reports

Identified results and benefits
now in 2nd full year
• improved knowledge of facilities in community, better preparation
• Principled Relationships with operators and state regulatory agencies
• significant decrease in fire code violations

...
New Mexico case study: Eddy County, NM, “A county on the rise”
Rick Rudometkin, County Manager, Eddy County, NM

Permian and Delaware Basin, Carlsbad
Carlsbad NM: Permian Basin: Massive El Capitan carbonate fore-reef facies
(Guadeloupe National Park)

70-80k permanent residents, but 100k/day come in to county to work
Industry: Potash mines, WIPP nuclear waste depository / salt mine, Oil & Gas industries, Agriculture and Tourism
One of the top revenue producers for the State of New Mexico
80% federal land in the county

WIPP: an amazing deal, take a tour with DOE.

Huge stress on roads re loading the trucks, want to get one a minute out 24/7 (is this for gas? unclear)

No zoning, no junkyard ordinance, no business license ordinance. Community doesn’t want any type of zoning.

County roads not made for heavy truck traffic.

Main issues
• unprecedented influx of people almost overnight
• work force camps and RV parks popping up everywhere (now an ordinance for 25’ setback)
• infrastructure needs and challenges — compounded (roads, roads, roads; state won’t give $$ back from taxes)
• housing issues and needs (6000-8000k units short right now per housing assessment; rents really high, $350/night for hotel rooms; some companies rent entire floor of hotel for a year; can’t get people to Carlsbad Caverns)
• county employee recruitment and retainment (can’t get road people to stay; main drug trafficking corridor from Juarez)
• public safety issues and concerns
• industry needs and locations
Photos of the traffic, crazy! Really insane on US285, 2 lane without acceleration lanes or turnout lanes. 

**Average a traffic fatality PER MONTH right now!**

Wear and tear on the roads because of production traffic, but can’t get the state to give them $$ back to fix.

Tank battery fires: have a lot of these all the time, lightning started Volunteer fire department, plus city fire in Carlsbad & Artesia training producers put materials on sites to fight: water and FOAM (scary photos)

Resolutions and Success

• Eddy county has strong relationships / partnerships with industries
• incentives are available: IRBs (Industrial Revenue Bond to help mitigate taxes), state service industry programs, reimbursement snd partnerships
• Public Safety training available through county for all industriels
• Industry, esp O&G, vital for our well-being
• embrace and support all things “industry” in Eddy County
• Our industries value us for being good neighbor and solid partner

Production: they anticipate being the next “Midland Odessa” of the Permian Basin.

Town hall meetings

(Makes me want to go visit Carlsbad! But stay somewhere else!)

. . . .
Weld County oil and gas location assessment
Troy Swain, O&G Liaison, Weld County

Panel Q&A

Q: Specific items to inspect? A: basically same as COGCC
Q: Most violations categories, remediated? A: main violation is siting and contact info updates. need right contact to inform and coordinate.

.... break ....
Local Government Case Studies (Part 2, City and County of Broomfield)

Comprehensive Plan, Citizen’s Committee, and oil and gas operations MOU
Tami Yellico, Director of Strategic Initiatives, City and County of Broomfield

. . . This is really a story about more O&G moving closer to people . . .

(Note: this is an excellent overview and for me, a very helpful review. When this is posted on the symposium website it would be good to have a link to it and suggest that everyone review the history and process.)

Local government authority to protect air quality through regulations and operator agreements
Elizabeth Paranhos, Attorney, Energy Innovation Partners

(Note: This is all really, really complicated, but Elizabeth is doing a great job explaining it.)

. . . .
Overview of COGCC’s Local Government Designee Program
Marc Morton, Local Government Liaison, Colorado Oil and Gas Conservation Commission

COGCC’s LGD Program
The Fracking Battle in Colorado
Mark J. Mathews, Shareholder, Brownstein Hyatt Farber Schreck (represents COGA)

What we will cover
• The law of operational preemption — what can local governments legally regulate?
• Potential legislation — what can we expect regarding local control and setbacks?
• Litigation: the Martinez decision and the Amendment 71 decision
• Ballot Measures for 2018

What is operational preemption?
It’s really an issue of who decides how O&G is regulated
What is the state’s role and what is the local gov’s role
The state regulates O&G through O&G Conservation Act and has hundreds of pages of regulations covering virtually every aspect of O&G
Who gets to decide?

What do Longmont and Fort Collins decisions mean?
Some groups say these are narrow.
He says: operational conflict test

Operational Conflict Test
“We will analyze an operational conflict by considering whether the effectuation of a local interest would materially impede or destroy a state interest, recognizing that a local ordinance that authorizes what state law forbids or that forbids what state law authorizes will necessarily satisfy this standard.”

- Local government law can be conflicted in two ways: Is there a conflict (forbid/authorize test) and, even if there is a conflict, does the local government law materially impede the state interest?
How is this test applied?

- Court held that industry was right: “[i]n virtually all cases,” the operational conflict test “will involve a facial evaluation of the respective statutory and regulatory schemes, not a factual inquiry as to the effect of those schemes ‘on the ground.’”

How is this test applied (part 2)

- Huge impact. Operational conflict cases should be resolved on summary judgment within a year of the filing of a complaint, rather than after years of discovery and hearings.
- Should be no need for long trials or discovery.
- Issues raised by Longmont – alternatives to fracking activity in area, safety of fracking – are irrelevant.

We will get confirmation from Adams County Court soon re Thornton
Facial conflict, issues should be resolved in a matter of months not years.

Thornton regulated a lot of stuff, under court challenge (Adams County)

Local government regulations cannot facially conflict with COGCC (his interpretation)

Not talking about air (Paranhos) or MOUs (Yellico)

Performance Based Standards
Seeing more sophisticated regulations from local governments that don’t have a facial number, seeing “maximum extent practicable,” etc. Do those facially conflict? Next wave of preemption litigation will come from when they apply for permit and government denies => “as applied” conflict

Rights-based regulations (see photo) such as Lafayette’s Climate Bill of Rights
This right is now being advocated as a means to ban O&G without getting in to preemption. Not much case law. Generally rejected, but this legal theory not going away.
Lafayette

- “All residents and ecosystems in Lafayette possess the right to be free from all activities . . . including the extraction of coal, oil or gas . . . which threaten human physical and neurological systems.”

Moratoria
Court punt on length of moratoria.
One year probably too long but will end up arguing.

Proposed Legislation
2018 mid-term state senate very important
Every year see local control and setback proposals

Legislation on the Horizon?

- Local Control Legislation? Operational preemption is created by state statute. If state law changes, so does the preemption test.
- Setback Legislation? Foote bill: location at least 1,000 feet from school property line and other high occupancy buildings.
The Martinez Decision
COGCC refused to hold that hearing, which they felt it would have elevated environmental concerns above other concerns. Balancing of multiple factors.
Court of Appeals rejected historical balancing test. Limited decision but huge implications. We’ve all heard Martinez quoted.

The Martinez Decision
• Now before the Colorado Supreme Court.
• The decision arose from a petition for rulemaking seeking a rule precluding the COGCC from issuing any drilling permits until “the best available science demonstrates . . . that drilling can occur in a manner that does not” impair the environment.
• The COGCC denied the petition because, among other reasons, it required consideration of environmental impacts alone rather than a balancing of multiple factors.

Martinez Decision (cont.)
• The Court of Appeals reversed, rejecting the historical balancing test and concluding that the Act required that all development and production should be accomplished with the focus on environmental impacts.
• Limited decision: court did not mandate that a rulemaking occur and certainly didn’t suggest the outcome of any rulemaking.
• But it has huge implications if not reversed. Could be interpreted as mandating that the COGCC may not approve any rulemaking or permit that impairs the environment to any degree.
What will supreme court do?
Grounds for Reversal
He admits bias . . . probably will be reversed

Martinez Decision—Grounds for Reversal
- Ignores multiple goals of Act.
- Ignores statutory language that environmental mitigation must be balanced with technical feasibility and cost effectiveness.
- Courts rarely second-guess agencies’ interpretation of their enabling statute or the process by which agencies make complex decisions. Majority here did both.
Amendment 71 Decision
Legal challenge to “Raise the Bar”
Since he prepared the slide, 10th circuit reversed part of decision for 2018 midterm elections

Amendment 71 Decision

- In Semple v. Williams, court held that Amendment 71 (“Raise the Bar”) violated the Fourteenth Amendment by violating the “one person, one vote” principal.

- Court found that the 2% signature requirements from each of the State’s 35 senate districts was unconstitutional because voter population varies widely between state senate districts.

- Court issued an injunction striking the 2% requirement in the November 2018 election.

- State has filed an emergency appeal with the Tenth Circuit.
Ballot Measures

• Important dates: April 6 (filing deadline), April 18 (last Title Board meeting), August 6 (all signed initiative petitions must be filed), Sept. 10 (Secretary must certify ballot), Nov. 6 (general election).

• Initiative #97: Seeks to create buffer zones whereby new oil and gas production not on federal land must be 2,500 feet from homes, schools, water bodies. In litigation.

Ballot Measures (cont.)

• Takings Initiatives #108-113: property can’t be reduced in fair market value by government (at all or by more than 10 percent), or damaged by restricting uses without just compensation.

• Local Government Control Initiatives #178-181: affirms that local governments can regulate certain surface aspects of oil and gas development so long as the regulation does not conflict with state law and does not otherwise impose conditions that are not technically feasible or economically practicable.
Climate Bill Litigation filed earlier this week
Very long and thoughtful document, filed by Boulder, etc. against Suncor and Exxon.
Similar to tobacco lawsuits
Summary: that they knew damages, covered up, lies and deceptions so they could continue earning top dollar
Unlike any other case filed, this is only one filed in an inland jurisdiction (sea level rise). Increased wildfire, drought conditions, damage to infrastructure as a result of increasing heat
Will be attempted to move to federal court—state nuisance and trespass (?)
Federal common law different from state common law
If goes forward, repercussions. Any person can sue any O&G operator, anyone who emits greenhouse gases. Will go on for decades. He thinks it will get dismissed under preemption and Clean Air Act. International treaties under executive branch. But it is a serious complaint and needs to be taken seriously.
Conclusion

Questions:

Q: Banned drilling/fracking in NY. Case law in other states that are a taking? A: I know that there are cases. No published case in NY. Takings hard cases to win: have to show that property interest is eliminated or substantial diminution such as 90%. Years of discovery and lots of experts. NY going to be in a world of hurt if those cases are successful.

Q: 2018 midterm election. Changing landscape of legislature or legal wrangling in courts — which change industry faster. A: A17 and Martinez case excepted, of course it’s the changing legislature. Climate change bill if not thrown out of court is a game-changer. Legislature change will be huge. local control, pooling, severance taxes, will impact every topic we’ve talked about and a lot we haven’t.

Q: Does Martinez case affect only issuance of permits, or will it also affect operations? A: great question, if not overturned it will move in to permitting and more stringent standards on environmental access, will certainly seep in to what local governments allow. Will have far-ranging
applications. That rule-making will be a doozy. There are other grounds for COGCC to reject Martinez. (?)

Q: Boulder: lawsuit, what are thoughts on ability of Boulder to borrow money with that lawsuit? They will have to disclose that in their future bond prospectus, will have to pay a higher interest rate. They have to disclose in their prospectus. A: above my pay grade

Q: SOS website at title-setting boards potential ballot initiatives: #94, change in severance tax? A: COGA guys, speak to severance tax issue? Above my pay grade . . . changes the distribution formula. Increases severance taxes, creates two separate funds for distribution for severance taxes. Part to local governments, part to all-day kindergarten (?). Huge financial hit to local governments.

Q: potential for groups or towns to sue local governments for their impact on environment — not just O&G? A: Interesting scenario! Rural community resentful of someone else. Martinez will fill any space, can be used by anyone for anything re anyone producing (autos, local govs, housing authorities). Will expand like Ideal Gas Law!

Q: Endangerment finding: CO2 can be regulated by EPA as pollutant, Massachusetts case. Overturned? A: He doesn’t see any scenario where it will be overturned.

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Keynote Speaker raime@rff.org

The Fracking Debate: The Risks, Benefits, and Uncertainties of the Shale Revolution
Daniel Raimi
nonpartisan, non advocacy research ==> go where the data takes us

Headline from The Onion: Scientists Working to Harness Energy Produced by Intense Fracking Debates (!)

Polarized topic, complex realities that cut both ways. Issues not going to go away any time soon. Hope is that everyone has access to good information . . . see his book.

The Fracking Debate: see the list of chapters in the book

He has traveled extensively around the US where
Structured interviews with 250 government officials
16 different states
2 peer-reviewed studies published

Book tries to combine stories with overview of academic research

shale revolution has increased US gas production enormously

Marcellus Shale, Pennsylvania
Beautiful country, couldn't find many traces of the industry at first; not a dystopia that some have portrayed. There are impacts of the industry, and some of them are negative.
Carter Road, Dimock Township, Susquehanna County: most famous site in fracking “landscape”
well drilled, fracked, residents began complaining about contaminated well water—contaminated with “stray” methane
People along that road felt that impact
Not fracking chemicals in the water, but there were real impacts — a shed exploded because of accumulation of methane
high profile case of water contamination
He wanted to know: how common? Most states don’t have great data on water supply impacts, but PA does. 302 cases where O&G activities in PA where affected water supply. Some can be fixed relatively easily. In PA case, operator bought all properties at 2x property value.
Timeline: overtime # stray gas cases from shale wells has decreased over time. 2010 less than 1% of new shale wells had stray gas. 2015, most recent, NO CASES. Environmental regulation substantially reduced incidence.
Cumulative impact is far above zero nationwide, these are truly individuals who are impacted.
When he spoke with local government officials in Dimock township, even though Carter Road people mad, people in the rest of township wanted drilling for the royalties: complex viewpoints
Shale development in PA has provided a lot of money in royalties.

Permian Basin, Texas
producing for a long time, tens of thousands of wells
Not hard to find oil wells in this landscape!
All kinds of new development in Permian Basin: oil, gas, wind, solar . . .
People in the Permian used to living around the oil industry. Lots of wells literally in people’s back yards.
For many people, this is normal
Drive a few hours south, to Balmorhea State Park. Photo of cool spring-fed pool. Really wonderful place!
In the Permian Basin, but never been a lot of O&G development in this particular spot—until very recently.
People had a different response, even those who work in the oil industry. Many see this place a special, even those who work in the industry.
Many people really concerned about impacts to this area, sensitive environmental habitat. Even though the risk is very low, they are worried about water contamination. Perspective: people can support the industry and yet be concerned about it==>nuanced view that isn’t seen much in the fracking debate. Really important view in his opinion.
Research on this topic, this duality:
Peer-reviewed literature on this: closer you are to oil-producing areas, the more nuanced your views become (EXCEPTION: Front Range). The farther out from those areas you get the more partisan polarization you have. B/W view not seen a lot in the regions where people live and work in the industry.
Public perception in a Colorado context

The Front Range ain’t West Texas: In West Texas, people expecting to live/near the industry.
Colorado is perhaps the state with the most contentious debate over “fracking” (also NY state)
Dense population in close proximity to production
There have been several focusing events: local bans, Firestone, and others;
focusing events really matter
Many residents here come for the natural amenities: living near production may be unexpected
The economy is healthy and diverse, especially along the front range
People may ask do we “need” O&G production to support the economy
Key Concerns

- Quality of life impacts
  - Noise, light, traffic
- Environmental impacts
  - Climate change is at the forefront
- Local health impacts
  - Research in this area continues to develop
  - Regardless, local concerns are likely to persist

Quality of life impacts: noise, light, traffic . . .
Environmental impacts: climate change is at the forefront (these may be rare, but that doesn’t mean they are zero)
Local Health Impacts
research in this area continues to develop (inconclusive; but more research needed)
regardless, local concerns are likely to persist
What next?

From his perspective, on the outside:
Colorado already a leader on stakeholder engagement
But disputes over development are not going to go away, especially along the Front Range
There are two models that operators and regulators could follow:
1: head down model (see photo): historic model. See a lot of this in rural regions
2: heads up model (see photo): will become more common (engage)

The “heads up” model
- Engaging with a broader range of stakeholders can be frustrating and time-intensive
- Two-way communication is difficult, but essential

- Gather feedback on execution
- Identify technical task
- Gather stakeholder feedback
- Develop options
- Execute task
- Gather feedback on options
Q&A:

Q: Gasland vs Frack Nation: Dimock case, jury awarded $4.2m for contamination, but judge threw it out because some evidence of natural biogenic methane coming in to the wells BEFORE drilling. Response? A: Not a geochemist or petroleum engineer. Has spoken with PA environmental protection, they think both biogenic and thermogenic—some of it was cause by stray gas coming in to those wells. Operator bought out most homeowners, rest of them sued and eventually settled out of court.

Q: Moffat County: communication important especially on fracking fluid chemicals.

Q: Boulder County: have you watched from heads down to heads up, what does it take? A: haven’t seen that shift in too many places. Colorado: governor’s task force, community liaisons, operators reaching out==> type of activity that you want to see?

Q: documented cases of fracking contaminating an aquifer? A: not completely resolved/clear. Two cases he talks about in the book: Wyoming (under debate) & NE PA (very low level contamination documented, only plausible source of chemical was fracking fluid). “Not near top of concerns in my analysis.”

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Larry Wolk

Air, health, water, waste

Air Quality Activities: lots of good news (see photos)

Monitoring data at locations in Garfield and Weld Counties show significant reductions in ambient air levels of oil and gas related hydrocarbons

- Approximately 50% to 65% reduction in non-methane organic compounds (NMOC) from 2008-2016 at various Garfield County monitoring locations
- Approximately 25% NMOC reduction from 2012-2016 at Weld County monitoring location (approximately 250% increase in oil production during that period)

Update on Recent Air Quality Activities

- 2017 regulatory revisions to reduce volatile organic compound emissions from oil and gas operations in the Front Range ozone non-attainment area
- Completion of technical guidelines for best practices in designing, operating and maintaining oil storage tanks
- State-wide hydrocarbon emission reduction task force
Oil and Gas Health Information and Response Activities

To date: we have not found any elevated short or long-term health risks from the substances measured.

Difference between health related impact and something that’s a nuisance such as truck traffic, noxious smell, loud noise.

Update on O&G Risk Assessment in Northern Front Range and Garfield County (Dr. Collett, etc.)

ongoing study

potential health risk: need to control for other factors, such as if people smoke more who are near rigs, etc.
Update on Oil and Gas Risk Assessment in Northern Front Range and Garfield County

- Using emission data from CSU studies (North Front Range and Garfield County)
- Dispersion model-based exposures
- Calculate potential health risk
  - By distance
  - By phase of operation
  - Directly attributable to oil and gas activities
- Findings will be submitted for peer-reviewed publication
Water Quality Control Division

Pollution Prevention (Clean Water Act) Activities:
- WQCD issues permits and requires spill notifications for unpermitted discharges for all surface water discharges, and groundwater discharges when they are outside of the authority of COGCC including construction stormwater, hydrostatic testing for pipeline operations, and produced water discharges to surface water (if applicable).

- In 2017, the division began implementing a new compliance assistance and assurance strategy for the construction sector, including oil and gas construction sites, and increased total inspections by about 400%. The new strategy increases compliance assistance and decreases the percent of inspections resulting in formal enforcement.

Water Quality Control Division

Safe Drinking Water Protection Activities:
- The WQCD in coordination with COGCC works collaboratively to implement Rule 317B. This rule has effectively managed oil and gas operations in drinking water source water supply areas.

- COGCC Rule 306 allows the Local Government Designees (LGD) to request consultation with CDPHE for oil and gas operations that create concerns regarding public health, safety, welfare or the environment. CDPHE staff has participated in many consultations in coordination with COGCC staff to address local concerns and implement creative best management approaches.
Hazardous Materials and Waste Management Division

Management and Disposal of TENORM wastes
Challenge - Solid Waste Act prohibits disposal of radioactive materials in landfills unless they are specifically designated for that purpose. Radiation Control Act prohibits development of regulations for disposal of TENORM until US EPA does, and possession of radioactive materials requires a license from the department.

- November 7, 2017 - a notice was sent to landfills, O&G operators, and other stakeholders prohibiting disposal of E&P wastes with the potential for high concentrations of TENORM in landfills not specifically approved to take them until the waste is characterized and found to contain TENORM at less than levels of concern.

Hazardous Materials and Waste Management Division

- The wastes of concern are those that may accumulate higher concentrations of TENORM such as tank bottoms, filter socks and sludges. We are focusing on TENORM, not NORM - therefore drill cuttings are a lower priority.

- There is a bill currently under consideration by the legislature (HB 18-1215) that could give CDPHE the authority to develop regulations for the disposal of TENORM waste. While CDPHE does not have a position on the proposed legislation, we are monitoring it, and participating in the legislative process.
Liz’s Questions
Q: Nosebleeds in Erie? Vibrations? Yes to both. We recognize that there are acute health related problems from O&G relations, so vibration is not specific to O&G, but shouldn’t ignore. Some people sensitive to noxious smells and have symptoms. But again, not specifically to oil and gas, occupational symptoms that get addressed. People more concerned about long term health effects. Educate folks with regards to birth defects ro cancer. If i’ve lived in proximity for how long what is my risk for chronic conditions, etc. Nuisance AND heal the symptoms, no evidence to long term issues.

Q: Lisa McKenzie’s latest study?
Used used exact same dataset from CDPHE, they modeled the way we modeled. CDPHE concerned about 500’ and beyond. That 500’ setback important because that’s the public policy, their focus was on 500’ or less. Get closer to well, benzenes higher, lead to higher potential risks. their conclusions were based on the under 500’ setback, and maybe over 500’ out there were issues. They used california EPA standard, more stringent than national. Other states have developed other standards, Texas, EPA standard in the middle thats’ what CDPHE uses. **CDPHE concluded that there was no risk over 500’ with THE SAME DATA.**

Mr. Raimi’s aside to me: not necessarily a mechanism identified (?); some indication that stress itself is the source of the health effects.