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Our Shared Responsibility to Help Build a Sustainable, Just World

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Thank you for the invitation to be with you this afternoon. It's always nice to get away from Harrisburg.

Thanks also for the work that you're doing - individually, and collectively. PERC's mission - to share knowledge about a sustainable future – and more importantly, in my view, to take action towards building it and generating momentum for societal action, has never been more important.

I'd like to share a fairly deep dive with you today on why I think that's so, especially in Pennsylvania, and what it means, with a focus on the threat of climate change.

The poet Ralph Waldo Emerson wrote that “God offers to every mind its choice between truth and repose.”

We face that choice today - on many fronts. Between the necessary truth of finding a just and sustainable path forward – and speaking that truth to power- or – at our peril - the repose of the status quo. The societal choices we make between truth and repose have become existential ones.

Unfortunately, the term “sustainability” is used more today in an aspirational context than a descriptive one. Present company excepted, of course. Businesses and governments talk a lot about sustainability – more about all that talk in a minute - but are they – and we - really walking the talk?

No. Let me explain why.

Atmospheric concentrations of carbon dioxide are at levels last seen 3 million years ago and rising fast. World energy-related CO₂ emissions hit a record high last year, with emissions from coal-fired power plants making up the largest portion.¹ You know the impacts – melting ice caps and glaciers, rising seas, wildfires, weather disasters, dying coral reefs, and mass extinctions happening right now on a global scale. The poorest and people living in least developed countries are already bearing an unjust, disproportionate burden, and that burden will only grow as humanity continues to perform history's largest uncontrolled chemistry experiment –

¹ https://www.washingtonpost.com/climate-environment/2019/03/26/blow-climate-coal-plants-emitted-more-than-ever/?utm_term=.dc061e35930c

changing the chemical composition of our atmosphere by using it as a dumping ground for industrial pollution, when we damn well know better.

Closer to home, Pennsylvania remains the nation's 3rd largest emitter of carbon pollution, and emits 1 percent of the world's greenhouse gas pollution. According to an analysis done here at Penn State in 2015, Pennsylvania is warming 1 degree per decade, and by the middle of the 21st century, our state will be about 5.4 degrees F warmer than it was at the end of the 20th.² A recent paper³ found that by 2080, State College will feel like Henderson, Kentucky - 7.6°F warmer than today.⁴ Pennsylvanians are already dying from tropical diseases; the old, the sick, and the poor already suffer from summer heat waves and ozone pollution and smog. Our weather is increasingly extreme, storm and flood losses mount, and whole industries, including our biggest - agriculture - are threatened.

But wait. The 5 largest oil and gas companies are projected to spend close to \$4 billion on low-carbon investments such as biofuels and renewables in 2019,⁵ and even a few million on carbon removal technology.⁶ In 2014, members of the Oil and Gas Climate Initiative pledged to spend \$1 billion on methane reduction. And to considerable fanfare, some oil majors have even announced their support for federal efforts to regulate methane.⁷ That's all great, right?

Not so fast. Every year, the world's five largest publicly owned oil and gas companies spend about \$200 million on lobbying designed to control, delay or block binding climate-motivated policy, including controlling methane emissions.⁸ That's over \$1 billion on public relations and lobbying since the Paris Agreement.⁹ And those same companies putting a combined \$110 billion in new fossil-fuel production just this year alone.¹⁰

Actions speak louder than words.

Twelve Pennsylvania cities - including State College – and 23 Pennsylvania colleges and universities - including Penn State and many of your schools - have signed onto the “We Are Still In Movement – committing to stand by the Paris Climate Agreement. We thank them all for their leadership. But the Commonwealth of Pennsylvania is not in.¹¹

2

<http://www.depgreenport.state.pa.us/elibrary/GetDocument?docId=5002&DocName=2015%20PENNSYLVANIA%20CLIMATE%20IMPACTS%20ASSESSMENT%20UPDATE.PDF%20>

³ <https://www.nature.com/articles/s41467-019-08540-3>

⁴ <https://fitzlab.shinyapps.io/cityapp/>

⁵ <https://www.eenews.net/energywire/stories/1060127133/>

⁶ <https://www.nytimes.com/2019/04/07/business/energy-environment/climate-change-carbon-engineering.html>

⁷ <https://www.eenews.net/energywire/stories/1060127133/>

⁸ <https://www.forbes.com/sites/niallmccarthy/2019/03/25/oil-and-gas-giants-spend-millions-lobbying-to-block-climate-change-policies-infographic/#2c813cba7c4f>

⁹ https://www.huffpost.com/entry/oil-industry-climate_n_5c940962e4b0a6329e144e6c

¹⁰ https://www.huffpost.com/entry/oil-industry-climate_n_5c940962e4b0a6329e144e6c

¹¹ <https://www.wearestillin.com/>

John Quigley

Twenty three governors have joined the United States Climate Alliance. Pennsylvania's is not among them.¹²

“But wait a minute”, you might be thinking. There's a January 2019 Executive Order¹³ calling for Pennsylvania to reduce its “net greenhouse gas emissions” by 26 percent by 2025 from 2005 levels, and 80 percent by 2050 – in line with the Paris Agreement. What about that?

Let's take a closer look, because facts matter.

According to data from the US Energy Information Administration¹⁴, Pennsylvania's CO₂ emissions in 2016 were already almost 23% below 2005 levels, driven primarily by the switch from coal to natural gas for power generation. In other words, we were almost 90% of the way to a 26% reduction three years ago. And the plans to convert the Brunner Island coal-fired power plant in York County to gas and the scheduled closing of the Bruce Mansfield plant in Beaver County in 2021 will get us the rest of the way there without lifting a policy finger.¹⁵

So how ambitious is that 26% reduction goal in reality when business as usual will get us there?

The only caveat to that is a big one. Pennsylvania's nuclear fleet accounts for 39% of Pennsylvania's electricity generation¹⁶ and 95% of Pennsylvania's carbon-free electricity. All that carbon-free power is at risk in the next few years. If Pennsylvania's nukes cease operation, you can kiss 26% by 2025 goodbye. The nukes will be replaced by natural gas-fired power, and Pennsylvania's CO₂ emissions will soar. At the current annual rate of increase of renewable energy in Pennsylvania, just looking at the two plants most at risk of closure, it would take Pennsylvania almost 13 years to replace the lost carbon free electricity from TMI, and an additional 28 years to replace Beaver Valley.¹⁷

And then there's the subject of methane emissions – pretty important for the nation's #2 natural gas producing state, where production is still climbing. It's especially so considering that methane is 36 times more potent than CO₂ as a climate forcer over a 100-year timeframe.

Now, Federal data show declines in methane emissions from the oil and gas sector. But that data is based on industry self-reported numbers that are generated from engineering calculations, not actual measurements. And those numbers, according to independent research, are questionable, and could be substantially understated. I said and explained as

¹² <https://www.usclimatealliance.org/governors-1>

¹³ <https://www.governor.pa.gov/executive-order-2019-01-commonwealth-leadership-in-addressing-climate-change-and-promoting-energy-conservation-and-sustainable-governance/>

¹⁴ <https://www.eia.gov/environment/emissions/state/>

¹⁵ <https://www.pennlive.com/opinion/2019/02/gut-checking-pennsylvanias-climate-moment-opinion.html>

¹⁶ <https://drive.google.com/file/d/1NrGasDFJM3QN-F-Dg9R1GteNTjvoGWX4/view>

¹⁷ Ibid.

John Quigley

much when I announced in January 2016 that DEP would directly regulate methane emissions from all sources as part of its methane strategy.¹⁸

Now, however, Pennsylvania has decided to not directly regulate methane emissions at all from all existing oil and gas facilities in the state.¹⁹ Instead, the plan is to address methane emissions from tens of thousands of existing unconventional wells, and from pipelines, compressor stations and processing equipment *indirectly* through regulatory limits on emissions of volatile organic compounds - VOCs. Now, methane and VOCs are correlated. But the Marcellus in Pennsylvania is mostly what's called a dry gas play. That is, produced Marcellus gas tends to have little to no VOCs associated with it. So, an attempt to control methane by regulating VOCs misses the target.

Further, a regulatory regime that doesn't target methane directly won't be able to take advantage of the latest, cost effective technologies and approaches to leak detection. We're researching these technologies and their application at Harrisburg University in partnership with Colorado State University and governments in Colorado, California, Montana, and Alberta Canada. So, public policy in the nation's #2 natural gas producing state will continue to parrot highly questionable industry self-generated data. We'll claim success in limiting methane emissions where the reality – and its impact on climate – could well be far different.

The 2019 Executive Order also set a 40 percent renewable electricity procurement goal for state government. Great, right? Well, on February 26, the Department of General Services reported that the goal has already been achieved by purchasing nationally certified renewable energy credits²⁰ - credits that were not generated in Pennsylvania. So, this purchase had zero effect on Pennsylvania's actual emissions, and did nothing to spur Pennsylvania renewable energy development. But another box was checked.

Folks, details matter. We're not really walking the talk. We're not doing enough.

Pennsylvania recently issued a report calling for 10 percent of PA's electricity to come from in-state solar by 2030.²¹ Current state law requires 0.5% of the state's electricity sales to come from solar by 2020, and solar is currently only 0.2% of sales. So, aspiring to 500% growth in solar deployment over the next eleven years is a good thing, right?

Yes, but.

¹⁸ <http://files.dep.state.pa.us/Air/AirQuality/AQPortalFiles/Methane/DEP%20Webinar%20on%20Methane-20160120%201631-1.mp4>

¹⁹

http://files.dep.state.pa.us/Air/AirQuality/AQPortalFiles/Advisory%20Committees/Air%20Quality%20Technical%20Advisory%20Committee/2019/4-11-19/ONG_PRN_Annex_A_AQTAC_4-11-2019.pdf

²⁰ <http://www.paenvironmentdigest.com/newsletter/default.asp?NewsletterArticleID=45936&SubjectID=8>

²¹ <https://www.dep.pa.gov/Business/Energy/OfficeofPollutionPrevention/SolarFuture/Pages/Pennsylvania's-Solar-Future-Plan.aspx>

John Quigley

BloombergNEF reports that the levelized cost of energy for Solar PV has fallen 84% since 2010. The cost of battery storage has fallen 76% since 2012.²² Neither trend shows any sign of slowing. And according to a recent report from Navigant Research,²³ power purchase agreements for combined solar and battery storage are already less expensive than the levelized cost of energy for combined cycle natural gas and coal-fired power in the United States.

What does all this mean? Business as usual and market forces alone could get us well beyond 10% solar even in Pennsylvania in the next 11 years.

Just imagine what real action equal to the urgency of the threat and the magnitude of the opportunity could achieve.

We need to do more.

Our neighbors have been more aggressive on renewable energy. Last year, Maryland increased its renewables generation target to 25% by 2020.²⁴ And just yesterday, both houses of the Maryland General Assembly passed – by vetoproof margins – a bill that requires 50% renewable energy - including 14.5 percent solar energy - by 2030, and 100% clean power by 2040.^{25,26}

A 2018 New Jersey law requires 35% renewable electricity by 2025 and 50% by 2030, including a 5.1% solar requirement by 2021.²⁷ New York has committed to 50% renewables by 2030, and last December, Governor Cuomo pledged the state to 100% carbon-free electricity by 2040.²⁸

Here in Pennsylvania, we continue to leave money on the table. Our Alternative Energy Portfolio Standard (AEPS) has not been amended since Governor Rendell signed it into law fifteen years ago. A 2017 report found that Pennsylvania has a clean energy market potential of between \$16 and \$20 billion. About \$9 billion of that total is in distributed energy technologies such as rooftop solar panels and building efficiency just waiting to be developed.²⁹ Yet, there's little private sector activity in these markets beyond the minimum needed to meet weak AEPS targets.³⁰

And so today, renewables comprise just four percent of the electricity consumed in Pennsylvania.

²² <https://www.utilitydive.com/news/solar-storage-projects-to-drive-utility-scale-deployment-of-batteries-na/551724/>

²³ <https://www.navigantresearch.com/reports/how-utilities-can-look-beyond-natural-gas-with-cost-effective-solar-plus-storage-strategies>

²⁴ <https://www.eia.gov/todayinenergy/detail.php?id=30492>

²⁵ <https://ccanactionfund.org/maryland-general-assembly-passes-clean-energy-jobs-act/>

²⁶ <https://legiscan.com/MD/text/SB516/2019>

²⁷ <https://www.njleg.state.nj.us/bills/BillView.asp?BillNumber=A3723>

²⁸ <https://www.utilitydive.com/news/new-york-gov-cuomo-pledges-100-carbon-free-electricity-by-2040/544587/>

²⁹ <http://coalitionforgreencapital.com/wp-content/uploads/2017/08/PA-Clean-Energy-Market-Report-8.15.17.pdf>

³⁰ <https://www.pennaeps.com/>

John Quigley

Here are two reasons why. Gerrymandering and unlimited campaign contributions in Pennsylvania help keep officials in power like the majority party chair of the House Environmental Resources and Energy Committee who, just two weeks ago, invited a representative of the Heartland Institute to testify before the committee to “debunk” the “myth” of climate change.

Where do we go from here?

In his book *Profiles in Courage*, John F. Kennedy wrote:

“...in a democracy, every citizen, regardless of his interest in politics, 'holds office'; every one of us is in a position of responsibility; and, in the final analysis, the kind of government we get depends upon how we fulfill those responsibilities. We, the people, are the boss, and we will get the kind of political leadership, be it good or bad, that we demand and deserve.”

I emphasize the “deserve.”

In the most recent mid-term elections, 58 percent of registered Pennsylvania voters cast ballots.³¹ That’s actually a pretty big number, comparable to a presidential election year. Pennsylvania has 8.6 million registered voters. So, just over 5 million voters went to the polls last November. But 3.6 million voters stayed home.

The urgent, existentially important work that’s needed in Washington and in Harrisburg has to start with each of us, as citizens. The policy void in Pennsylvania must be filled with bottom up action. Action in more businesses, more schools, and more communities. That can create the conditions for better top-down policy action.

That’s where PERC schools come in. Doing more of what you’re already doing is critically needed, now.

Your work is exemplary. Millersville’s zero energy Welcome Center. Pitt’s award-winning food recovery efforts. Penn State’s Solar Power Purchase Agreement. Penn State, Bucknell, and Dickinson all working collaboratively with communities. The work you’re doing on your campuses and in your communities is important, and essential. But more is required. Your work must scale.

³¹ <https://www.pennlive.com/news/2018/11/midterm-voter-turnout-in-pa-keeps-up-with-historic-national-levels.html>

John Quigley

The promising work we're doing at Harrisburg University on methane emissions, and to apply information technology and data science to sustainability is a talk for another day. But more is required. For starters, we're working with PERC to develop a web-based platform to give Pennsylvania's communities the tools to perform greenhouse gas inventories and develop emission reduction plans. We look forward to working with all of you to get that effort to scale.

Bottom up action at scale can create the conditions for better top down policies.

My mom taught me a lot of things – or at least tried to. One lesson that has stayed with me comes from the gospel according to Luke: “To whom much has been given, much will be required.”

We all have been given much.

We live in an advanced – if perilously shaky – society. We know where our next meal is coming from. We have a roof over our heads, a steady paycheck (hopefully), access even to too-expensive healthcare. We have the right to vote, and the means to be active citizens. But beyond that, we're privileged to work in the arena of ideas, to advance knowledge, and to educate the next generation. Your teaching, your research, and your ability to convene government, civil society, academia and business to learn and collaborate and act all are powerful tools. How are we using them? How can we do more when more is what's required?

It's critically important for each of us to ask ourselves that question. To answer it, President Theodore Roosevelt, a conservationist of the first order who would not recognize his political party today, famously said “Do what you can, with what you have, where you are.”

I strongly recommend, if you haven't already, that you watch Greta Thunberg's November 2018 TED Talk³². She said, "The climate crisis has already been solved. We already have all the facts and solutions...All we have to do is to wake up and change." She went on, “we do need hope...(b)ut the one thing we need more than hope is action. Once we start to act, hope is everywhere.”

If a 16-year-old Swedish student can inspire students around the world to strike for climate action, maybe we can all do a little more.

Once we start to act, hope is everywhere.

Thank you very much.

³² https://www.ted.com/talks/greta_thunberg_the_disarming_case_to_act_right_now_on_climate