PROVIDENCE Journal

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By Jerry Elmer

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Jerry Elmer: R.I. plant a step in wrong direction

The Providence Journal's Jan. 22 editorial ("A win-win") about the proposal to build a huge new fossil fuel plant in Burrillville correctly notes that Conservation Law Foundation is litigating before the Energy Facility Siting Board to oppose the plant. The editorial also notes, correctly, that "burning fossil fuel is not the direction we want to be going." Nevertheless, this newspaper supports the proposed plant, arguing that it would be good for the state's economy and that there is no better alternative. These arguments are both shortsighted and flawed.

In 2014, the Rhode Island General Assembly passed the Resilient Rhode Island Act. This important law set short-, medium-, and long-range carbon emission reduction goals for Rhode Island: 10 percent below 1990 levels by 2020, 45 percent by 2035, and 80 percent by 2040. By passing this law, the General Assembly was setting the public policy of the state, and the legislature empowered all state agencies, boards, and commissions to implement the law.

At the upcoming EFSB hearing, CLF will present evidence and testimony that it would be impossible to ever meet the carbon-emission-reduction goals of the Resilient Rhode Island Act if the Invenergy plant is built. In fact, Invenergy itself acknowledges that its plant could be in operation for as long as 40 years (from its starting date of 2019) — until 2059!

On this last point, Invenergy is absolutely correct. Natural gas infrastructure is extremely long-lived. Building this plant now would lock Rhode Island into a fossil fuel future for literally decades to come. Building this plant now would make it impossible for the state ever to meet the carbon emission reduction goals set by the General Assembly just two years ago. And building this plant now would preclude countless opportunities to invest in clean, local, non-carbon-emitting renewable energy sources that will create more jobs for a much longer period.

Of course, the Journal correctly points out that spending $700 million on a new fossil fuel plant will create a modest number of short-term construction jobs; it would be nearly impossible to spend that sum of money without creating some economic benefit. The

hundreds of millions of dollars and obviate the need for a new fossil fuel plant.

In fact, the very law that created the EFSB obligates the board to carefully consider just this issue: "Before approving the construction, operation, and/or alteration of major energy facilities, the board shall determine whether cost effective energy efficiency and conservation opportunities provide an appropriate alternative to the proposed facility."

CLF is confident that, if the EFSB properly considers energy efficiency and conservation alternatives, it will not approve Invenergy's permit request.

Last month in Paris, representatives of 180 nations came together and announced a historic and unprecedented agreement to take action on climate change by limiting carbon emissions. Building a massive, new, long-lived, carbon-emitting fossil fuel plant now would be a big step in the wrong direction.

Jerry Elmer is a senior lawyer in the Conservation Law Foundation's Rhode Island Advocacy Center.

Some commonly asked questions:

Aren't carbon dioxide emissions less for natural gas than for coal? Yes, substantially so. But methane emissions are far greater from natural gas, particularly from shale gas. When methane is included, total greenhouse gas emissions are greater from natural gas than from coal, particularly when analyzed on a 20-year period following emission.

I've heard that methane is 21-times more powerful as a greenhouse gas than is carbon dioxide. Is that true? No, that is based on a 20-year old report of the Intergovernmental Panel on Climate Change (IPCC) in 1995. The IPCC now states that methane is more than 100-times more powerful for the first decade after emission, 86-times over a 20-year period, and 34-times over 100 years. The shorter time periods are the most appropriate to use, given the urgency of slowing global warming over the coming 10 to 20 years, and when considering the idea of a "bridge fuel."

Why are the EPA methane estimates so low? The EPA states that methane is 25-fold more powerful than carbon dioxide, considering only the 100-year time scale and using information from an older IPCC report from 2007 rather than the most recent 2013 one. Further, their estimates of methane emission rates are much too low and are not supported by the most recent peer-reviewed science.

Can regulation reduce methane emissions to an acceptable level? Methane emissions come from many sources, from the well site to delivery through pipelines to final customers. Many of these remain poorly characterized. Reducing emissions is expensive, particularly from pipelines and storage tanks that are frequently 50 to 100 years old, and enforcement of regulations is difficult. Society is better off investing in renewable energy infrastructure.

If natural gas is not a bridge fuel, should we burn coal instead? No. The high levels of carbon dioxide emitted from using coal have a lasting influence on the atmosphere and climate for many centuries. It is past time to move away from all fossil fuels, and embrace the renewable energy technologies of the 21st Century.

Aren't cows more important as a source of methane than the natural gas industry? Globally, animal agriculture and the natural gas industry are comparable sources of methane. In the US, the natural gas industry is the far greater source, but both sources should be reduced.

For more information see:
http://www.eeb.cornell.edu/howarth/energy_and_environment.php

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Cornell University

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A bridge to nowhere: methane emissions and the greenhouse gas footprint of natural gas

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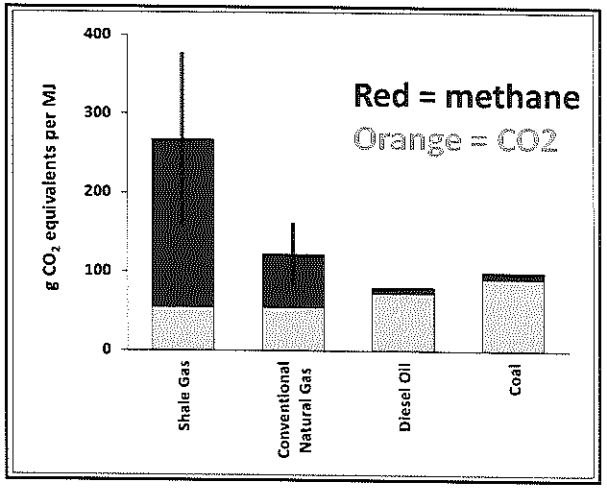
Abstract
In April 2011, we published the first peer-reviewed analysis of the greenhouse gas footprint (GHG) of shale gas, concluding that the climate impact of shale

Natural gas is widely promoted as a "bridge fuel" that allows continued use of fossil fuels while reducing greenhouse gas emissions compared to oil or coal. Increasingly since 2009, natural gas has come from shale gas, as conventional sources of gas have been depleted. Today, over 40% of US natural gas comes from shale. Is shale gas really a bridge fuel?

In the first comprehensive study of greenhouse gas emissions from shale gas, Howarth, Santoro, and Ingraffea concluded that due to methane shale gas has a larger climate impact than either coal or oil (April 2011 in *Climatic Change Letters*). They also called for new measurements to better assess these methane emissions. An explosion of new information has been published since then, reviewed by Howarth in 2014 in *Energy Science & Engineering* and again in 2015 in *Energy & Emission Control Technologies*. This flyer summarizes those updates.

The most recent research supports the 2011 analysis, and indicates greenhouse gas emissions from shale – dominated by methane -- are large and will have disastrous consequences for the Earth's climate.

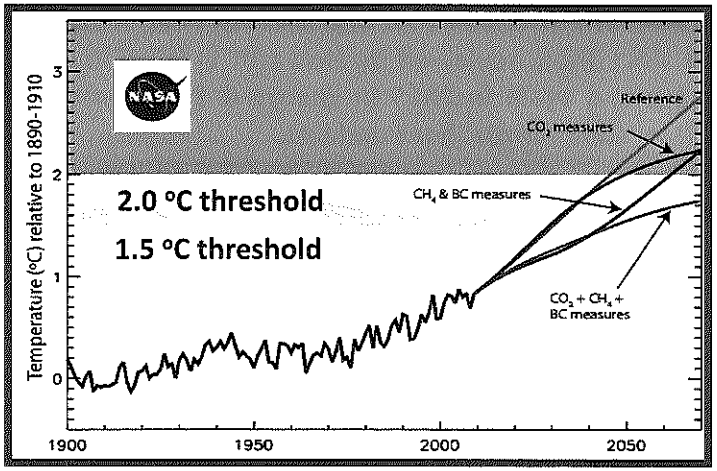


Source: Howarth (2015) *Energy & Emission Control Technologies*

Methane compared to carbon dioxide over a 20-year time period following emission to the atmosphere. Both direct emissions of carbon dioxide and methane emissions expressed as carbon dioxide equivalents are shown. For each fuel, the best estimate for methane emission is used. The vertical bars illustrate the the most probable range of values for shale gas and conventional natural gas.

Carbon dioxide vs. methane:

- **Methane is greater than 100 times more powerful as an agent of global warming, while both gases are in the atmosphere.**
- **The atmosphere contains more carbon dioxide than methane, making it the larger driver behind global warming, but methane is also important: 1.66 watts per square meter for carbon dioxide vs. 1.0 for methane.**
- **The effective residence times of the two gases in the atmosphere are very different: a little over a decade for methane and hundreds of years for carbon dioxide.**
- **Because of its long residence time, reductions in carbon dioxide emissions can only slowly change the atmospheric concentration, leading to a lag of many decades before global warming is slowed.**
- **With methane's short residence time, emissions reductions lead to almost immediate reductions in atmospheric concentrations; thus, reducing methane emissions now will significantly slow the rate of global warming almost immediately.**



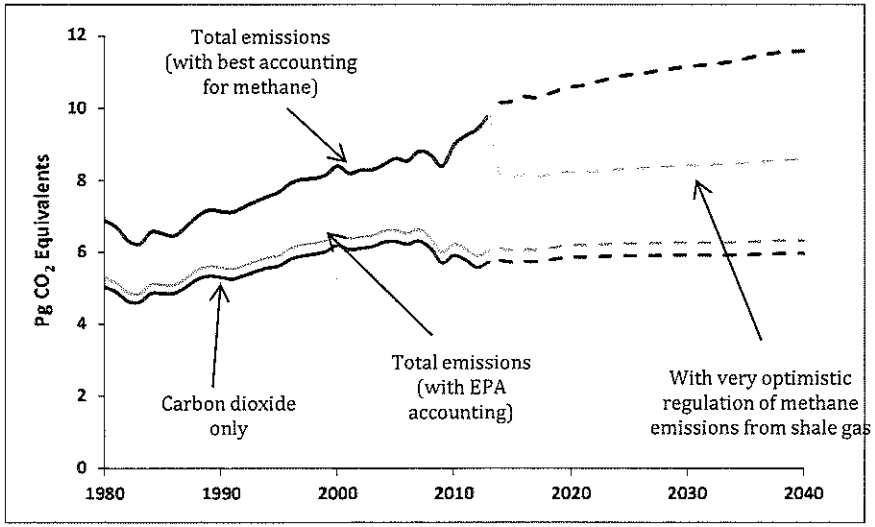
Source: Shindell and others (2012). *Science* 335: 183-189.

Within the next 15 years, the Earth will warm to very dangerous levels, doubling the total increase in the average temperature that has occurred since the start of the industrial revolution to now. Tipping points in the climate system may kick in and lead to runaway global warming. Only by reducing methane emissions and emissions of soot (black carbon, or BC) can society slow the rate of warming and buy precious time while moving aggressively toward a renewable energy economy. The natural gas industry is by far the largest source of methane emissions in the United States.

How much methane does the natural gas industry emit?

Methane emissions are better known now than in 2011, but estimates remain uncertain. The best current estimate of emissions from conventional natural gas comes from an analysis of over 12,000 monitoring observations taken before large-scale shale gas development began (Miller et al., 2003, *Proceedings of the National Academy of Sciences*). The best estimate of emissions from shale gas comes from satellite observations of increases in methane in the atmosphere before and after shale gas development began (Schneising et al., 2014, *Earth's Future*). Most other observations are for short periods of time, making it difficult to relate to gas production over the lifetime of a well. The lowest estimates -- part of a study promoted by the Environmental Defense Fund in coordination with industry -- have been called into question because of sensor failures with the instrumentation used (Howard, 2015, *Energy Science & Engineering*).

Carbon dioxide emissions from fossil fuels in the US have fallen since 2007 due largely to economic recession but also to switching from coal to shale gas. However, when methane emissions are properly included, total fossil-fuel greenhouse gas emissions have increased rapidly in recent years. In 2013, methane emissions contributed 40% of all fossil-fuel emissions in the US. The EPA accounting approach hugely underestimates the importance of methane emissions.



Total greenhouse gas emissions from fossil fuel use in the US through 2013 and predicted future trends based on US Dept. of Energy predictions for energy use. Grey line is for just carbon dioxide emissions. Red line includes methane. Green line shows total emissions as estimated by the US EPA, which greatly underestimates methane emissions and their importance. Blue line indicates a possible future scenario of reducing methane emissions from shale gas, with very optimistic assumptions on the ability of regulations to cut emissions. Source: Howarth (2015) *Energy and Emission Control Technologies.*

ISO Auction Shows That Invenergy's Proposed Plant Is Not Needed

Feb 12, 2016 Jerry Elmer

Readers will recall that the two major arguments used by Invenergy in support of its plan to build a gigantic (900 MW to 1,000 MW) fossil-fuel power plant in Burrillville, Rhode Island, are that the plant is needed for the reliability of the electricity grid and in order to save ratepayers money. Both of these arguments are predicated on the supposed shortage of existing electricity generation capacity in the geographical part of New England's electricity grid that includes Rhode Island.

On Monday, February 8, 2016, ISO-NE, the entity that runs the New England electricity grid, conducted its tenth annual Forward Capacity Auction (called FCA-10) to procure electricity generation capacity for the zone that includes Rhode Island. As a result of the auction, we learned something very important: both of Invenergy's primary arguments are wrong.

The ISO's figures don't lie; they tell a very simple, straightforward story:

- The Invenergy plant's power is not needed in Rhode Island; we actually have a surplus of power without Invenergy.
- The Invenergy plant, if built, would have a negligible effect on the price that ratepayers pay for electricity.

Let's look at the actual figures from the just-concluded auction.

Invenergy tried to sell all 900 to 1,000 MW of its proposed new plant in the auction, but the ISO only took 485 MW of that amount. Invenergy ended up with a Capacity Supply Obligation (CSO) of only 485 MW!

Overall, the ISO was trying to obtain 34,151 MW of generation capacity for the six New England states. This is the ISO's Installed Capacity Requirement (ICR), the amount of electricity needed to meet peak demand in New England and still keep the lights safely on. In fact, the ISO actually procured 35,567 MW in the auction, that is, 1,416 MW more than was required.

The results here in the Southeastern New England (SENE) zone were similar. For the SENE zone, the ISO had a so-called Local Sourcing Requirement (LSR) of 10,028 MW. That means that 10,028 MW (of the 34,151 MW total) had to come from generation plants located here in Southeastern New England.

That is the key figure: 10,028 MW of generation had to come from generation plants located here in Southeastern New England.

In the auction conducted on February 8, the ISO actually procured 11,384 MW here in Southeastern New England – that is, fully 1,356 MW more than the LSR of 10,028 MW that was needed!

What would happen if you removed all of Invenergy's CSO of 485 MW from the 11,384 MW that cleared the auction in the SENE zone? You would be left with 10,863 MW in the zone – still significantly more than the LSR of 10,028 MW needed locally.

The bottom line is very, very simple: the Invenergy plant is just not needed for system reliability. It is not needed to keep the lights on. Rhode Island, Southeastern New England (SENE), and all of New England have a surplus of generation capacity without Invenergy's proposed plant.

Nor are there ratepayer savings from the Invenergy plant. Invenergy's (incorrect) argument about ratepayer savings is predicated on the idea that the price for capacity here in the SENE zone would be much higher than in the rest of New England (called "Rest of Pool" by the ISO). (In fairness to Invenergy, that was true in the prior two capacity auctions run by ISO: FCA-8, which was held two years ago; and FCA-9, held one year ago.) But it was absolutely not true in FCA-10, conducted on February 8 this year.

In FCA-10, the SENE zone cleared the auction at $7.03/KW-month, and Rest of Pool cleared the auction at $7.03/KW-month – the exact same clearing price. This stands to reason. There was no shortage of generation capacity here in the SENE zone. That's why there was no "price separation" between the SENE zone and the Rest of Pool.

And that's why the presence or absence of the Invenergy plant will have no material impact on ratepayers. Again, this stands to reason: if the presence Invenergy plant's power was going to help save money for ratepayers, then the ISO would have taken all of Invenergy's 900-1,000 MW. The reason that the ISO wasn't even interested in buying all of Invenergy's generation capacity is that Invenergy's capacity just wasn't going to bring down the capacity clearing price. The capacity price was already as low as it could go.

I acknowledge that these figures can be confusing and these acronyms can cause a normal person's eyes to glaze over. But the bottom line remains simple. The electricity from the Invenergy plant is not needed; and the presence or absence of the plant will not materially affect the price of electricity.

This blog was taken from the website of Conservation Law Foundation, clf.org.