From: Lusardi, Meg (ENE)
To: Aminpour, Farhad (ENE)
Cc: McBrien, Joanne (ENE)
Subject: Fw:
Date: Sunday, December 21, 2014 10:31:14 PM

Sent from my Verizon 4G LTE Smartphone

------ Original message ------
From: bill monahan
Date: Sun, Dec 21, 2014 8:07 PM
To: lowdemandstudy@state.ma.edu;
Cc: eastanton@synapse-energy.com;eastanton@synapse-energy.com;Lusardi, Meg (ENE);Lusardi, Meg (ENE);Sylvia, Mark (ENV);Sylvia, Mark (ENV);
Subject:

December 21, 2014

Mr. Mark Sylvia
Undersecretary for Energy
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Dear Mr. Sylvia:

My name is William Monahan. We live in an area that would be affected by one of the proposed new pipeline projects. The proposed pipeline would run in a field behind our home where we have lived for 34 years. This field is a site that Historical artifacts from Wampanoag indian campsites have been discovered .The Ipswich River is in the path of this proposed pipeline and that is a source of our town drinking water. There are electric lines that run in this area behind our home. We are extremely alarmed that anybody would propose a 1400 psi pipeline within 200 feet from where we lay our heads on our pillows at night . There must be a better alternative than allowing a big business to come to our little community and effect our quality of life, our personal safety as well as our property values.

My understanding is that the DOER has drafted a natural gas demand study that does not take into account the ability of existing pipelines to deliver more gas to the region. It is important that the DOER and its consultant, Synapse, not publish reports or spreadsheets which contain statements like "This Scenario Requires a Pipeline" when the opportunities to increase flow on the existing Portland Natural Gas and Iroquois pipelines have not been considered.

It is my understanding that at the recent Consumer Advisory Group meeting of ISO New England, held on December 4, it was announced that Portland Natural Gas secured approval from Canada's National Energy Board (see: http://goo.gl/rvHVqb) that will enable the company to deliver 200 million cubic feet per day of additional natural gas into Dracut, MA (see: www.nescoe.com, letter of May 30, 2014).
,
It is also my understanding that in May, the Iroquois Gas Transmission System told NESCOE that an additional 350 million cubic feet of natural gas was available to be sent eastward into New England on its major pipeline (see: http://goo.gl/UoSuln), again without any pipeline construction.

Considering all that your office has done to reduce and reverse the growth in energy demand through many energy efficiency programs, we would be shocked if you were to approve a report which relies on data from a single pipeline company, and ignores less expensive options that do far less environmental harm.

Please ensure that this erroneous Synapse report is corrected before it is released.

Thank you,
William Monahan
1 Damon street
North Reading ma.

From:	David Tuohey
To:	Lowdemandstudy, (ENE)
Subject:	MMWEC comments
Date:	Thursday, December 18, 2014 4:43:19 PM
Attachments:	MMWEC Comments to DOER Low Demand Analysis 11.14.pdf

---

I am resending these MMWEC comments because the previous submission was out-of-time and I want to make sure they are included in the package of comments. Please contact me if you have any questions.

Dave Tuohey
MMWEC
(413) 308-1392

November 14, 2014

Ms. Meg Lusardi
Acting Commissioner
Massachusetts Department of Energy Resources (DOER)
100 Cambridge Street, Suite 1020
Boston, MA 0214

Subject: Comments of the Massachusetts Municipal Wholesale Electric Company (MMWEC) Regarding DOER's Low Demand Analysis

Submitted via email to: meg.lusardi@state.ma.us and lowdemandstudy@state.ma.us

Dear Acting Commissioner Lusardi,

MMWEC appreciates the opportunity to participate in the stakeholder process for development of the model to be used in conducting this analysis of the need for additional natural gas pipeline capacity in New England. In this letter we provide a few observations and a specific recommendation regarding the analysis.

We also appreciate the enormity of the task at hand, given the tight schedule and diversity of interests represented by stakeholders. Fortunately, this same question has been the subject of numerous, recent studies, and we hope that Synapse will incorporate the results of these completed studies into its own analysis.

In reviewing stakeholder comments and otherwise participating in this process, it is clear that analysis inputs can be skewed to support a foregone conclusion, depending upon energy efficiency expectations, natural gas price projections, electric load forecasts and any number of other technical, economic, operational or political variables applied in the analysis. It appears the largest task facing DOER and Synapse is to produce an objective study that balances the various and competing stakeholder interests, based upon real experience and defensible facts. This is essential if the end product is to be a credible source of information and useful in resolving the energy issues facing Massachusetts and New England.

As to the root question of whether there is a need for additional natural gas pipeline capacity to provide New England with a reliable and economically competitive supply of electricity, MMWEC believes this question has been answered in the affirmative by almost any measure of experience during the past two winters alone. We are unsure of the amount of new pipeline capacity required, but the Synapse analysis must accurately reflect 1) the historic and projected growth in demand for natural gas for both heating and electric generation, and 2) the benefits or avoided costs for consumers of eliminating constraints on the region's natural gas infrastructure.

MMWEC's specific recommendation has to do with the calculation of costs for construction of new pipeline capacity, which we understand will form the basis for costs to be avoided in the Synapse analysis. First, as stated above, any such calculation must include the benefits of adequate pipeline capacity, estimated by most to be between $2 billion and $3 billion, which is the cost to consumers of pipeline constraints during last winter alone. This regional economic burden, reflected in the 30% - 40% electric rate increases recently announced by the region's investor-owned utilities, will continue until natural gas pipeline constraints are resolved.

More importantly, MMWEC's Consumer Model for construction of new pipeline capacity should be modeled in any analysis of pipeline costs. The attached letter from MMWEC to NESCOE explains the Consumer Model and its benefits in greater detail, but use of the Consumer Model can reduce pipeline costs by billions of dollars over the life of a project.

These lower costs result from public, non-profit ownership of the pipeline and the use of tax-exempt financing to the greatest extent possible. The bulk of the avoided costs result from the non-profit status of the pipeline owner, which eliminates the need for the estimated 14% profit or "Return on Equity" earned by traditional pipeline owners. MMWEC has estimated that for every $1 billion of pipeline costs, the avoided costs or savings for consumers under the Consumer Model would be approximately $4.38 billion over the life of the pipeline.

More generally, MMWEC is aligned with the comments submitted in this stakeholder process by NESCOE, as well as others advocating for a thorough and objective analysis of an issue that is resulting in serious electric reliability issues and economic disparities for New England consumers.

Thank you for the opportunity to comment on this matter. Please contact me if you would like to discuss the content of this correspondence.

Sincerely,

David Tuohey
Director of Communications & External Affairs
Massachusetts Municipal Wholesale Electric Company (MMWEC)
(413) 308-1392
dtuohey@mmwec.org

cc: Farhad Aminpour, DOER

From:	Shop_Angel
To:	Lowdemandstudy, (ENE)
Subject:	"States, NEPOOL: ISO-NE Overestimating Capacity Needs"
Date:	Wednesday, December 10, 2014 8:47:52 AM

To Liz Stanton, et. al.:

This seems to a layperson to be "breaking news", as the article is dated Dec. 9, but I hope your team has been aware of it all along and this perspective is incorporated into the low-demand study:

http://www.rtoinsider.com/iso-ne-nescoe-nepool-icr-11400/
"**States, NEPOOL: ISO-NE Overestimating Capacity Needs**"

Thank you and best wishes~
Ariel Elan
Montague MA

From:	Hiel Lindquist
To:	Lowdemandstudy, (ENE)
Subject:	LNG
Date:	Saturday, December 20, 2014 7:15:12 PM

I read in earlier slides that this study was to consider all alternatives, including Liquefied Natural Gas (LNG).

Then, in the December slides (Slide 50) i see that "No additional LNG facilities were considered". Then on slide 65 "This study assumes that no additional LNG storage facilities will be sited in Massachusetts during the study period. This is based on expected challenges related to permitting, siting, financing and potential public opposition."

I have to question why a pipeline is any more "challenging" than additional LNG facilities. I believe the public should decide whether a pipeline is more advantageous than LNG.

By not evaluating all alternatives I believe it throws the entire study into question.

--
Hiel Lindquist
Fitzwilliam, NH

From:	Rosemary Wessel
To:	Lowdemandstudy, (ENE); Lusardi, Meg (ENE)
Cc:	ValleyBartlett, Maeve (EEA); Elizabeth_Warren@warren.senate.gov; Sylvia, Mark (ENV); stan.rosenberg@masenate.gov
Subject:	Study Comments from No Fracked Gas in Mass
Date:	Saturday, December 20, 2014 8:23:48 PM
Attachments:	NFGiM-FinalLDS-response.pdf ATT00001.htm

Dear Low Demand Study staff:

Attached, please find comments in response to the final stakeholder meeting for the Low Demand Study from No Fracked Gas in Mass.

Thank you,

Rosemary Wessel
Founder, www.nofrackedgasinmass.org
90 Trow Road
Cummington, MA
413-634-5726 (o)
413-320-5643 (c)

nofracked gasinmass.org
Protect Our Common Wealth

Rosemary Wessel, Founder
nofrackegasinmass@gmail.com • 90 Trow Road, Cummington, MA 01026 • 413-634-5726

December 20, 2014

To the Acting Commissioner, Dept. of Energy Reources, Meg Lusardi
and members of the Low Demand Study Team:

The current Low Demand Study, commissioned by the Department of Energy Resources (DOER) originated when a group of five of us representing various citizen's groups met with Governor Patrick on July 30, 2014 about pipeline proposals and energy needs for the New England region.

Citing an earlier study by Black & Veatch for the New England States Council on Energy (NESCOE) that stated that no new pipeline would be necessary if the region were to continue to lower its energy demand with policies that were already producing notable results, we were told by the Governor and the Secretary of Energy and Environmental Affairs that the study was flawed. When the Governor agreed to our suggestion of a new study, the DOER invited a large group of stakeholders to be involved in the process, including many conservation groups, environmental justice groups, and clean energy advocates, as well as energy industry and regulatory representatives. This inclusive approach was very much in line with our request for an open and transparent process - something that had been missing from the decision making process that led to NESCOE, ISO New England and the six New England Governors' request for more pipeline capacity.[1]

The original request for proposals drafted by the DOER to hire a consulting firm included these study goals:

— ***To determine, given updated supply and demand assumptions, whether or not new gas infrastructure is required***
— ***If so, how to optimize for environmental, reliability, and cost considerations.***
— ***When considering all energy resources, which resources offer the greatest net benefits when assessing for reliability needs, cost savings and reducing environmental effects including lower GHG emissions.***
— ***In combination, how far can these alternative resources go in replacing retiring generation capacity***

The meetings hosted by DOER for stakeholders to hear the progress of the study and offer feedback have been inclusive, open to the public by way of attendance or conference calling. Each meeting was followed by a brief comment period, during which stakeholders were encouraged to provide further specific feedback into the study. Although it was stated at the outset that this was not a consensus-building process, the initial proposal for the study and some of the issues addressed by stakeholders seemed to be taken into account as the process moved forward.

Then the third and final stakeholder meeting was postponed — ***not once but twice*** — pushing the final meeting back until just four days before the deadline for the study's release. What was ultimately presented at the December 18 meeting did not take the shape of the study that stakeholders had seen taking form during the development of the request for proposals and the previous stakeholder sessions. As one of the five who originally met with the Governor to request this study, the differences were stark and disappointing.

The final models used for the study, which were refined during the period of time when public participation was postponed, have many assumptions that are simply not rooted in the real world. Collectively, they render the study useless to anyone looking to this report for energy policy development and useless to the people of Massachusetts.

The following are just some of the most outstanding deficiencies in the Low Demand Study's modeling assumptions:

— None of the models are GWSA (Global Warming Solutions Act) compliant. This not only ignores state law, it ignores one of the key pieces of the RFP - how to meet our energy needs WHILE lowering ghg emissions.

— Building more pipeline would pull us further out of compliance with the GWSA, shifting the burden to meet GWSA compliance out of the electric generation sector to more expensive sectors of the economy.

— Offshore wind is discounted as not feasible, yet there are currently multiple projects moving ahead. This will be part of our energy system in the near future, yet it is not considered.

— Solar is dismissed as not being available during peak hours (the only times considered in the model). At the same time, peak storage systems using pumped or battery storage are also discounted as not feasible. Including both can provide peak demand relief.

— The study does not take into account the drastic drop in oil and LNG prices, making the study's results already obsolete.

— It does not appear to take into consideration emissions of methane released through normal operations of transmission pipelines (at compressor, pigging and valve stations).[2] Methane is currently rated by the IPCC to have 34 times the climate change impact of CO_2 over their first 100 years in the atmosphere; 86 times more over their first 20 years.[3]

— It does not include expansions of current energy efficiency programs or further incentives for distributed generation development, both of which are currently keeping electric demand flat in the state.

— The study uses ISO-New England's energy forecasts as base model numbers. These forecasts have recently been criticized by NESCOE for not including current distributed generation (rooftop solar, etc), and utility scale wind and solar that are slated to come on line in the next few years, as well as energy efficiency incentives that are holding electric demand flat.[4]

— The study assumes optimal pipeline use (80% full and serving only domestic uses) which would not be the case if all or even most of the currently proposed pipelines are built. If they are built, and the market is flooded with excess capacity during the 325-350 days a year when demand is below peak, this would create a glut of gas capacity with nowhere to go but export to foreign markets. The significantly higher prices that natural gas captures overseas would raise prices here in New England.

— The study only marginally considers increasing the storage and/or importation of liquified natural gas (LNG) to meet the infrequent peak demands for natural gas in the current system. There are currently under-utilized facilities for storage in New England that could be used to store natural gas during the vast majority of the year when peak demand is not an issue. Also, our main importer in the region, Distrigas, has estimated that the peak constraints can be addressed by their company with no more impact than 2-1/2 to 3 extra tankers per year arriving at their facility. This is a solution that could bridge the current constraints while renewable capacity is boosted to address electric generation needs over the next few years. Unlike a pipeline, both of these solutions are immediately available and don't require ANY new infrastructure to be built.

By recalibrating the study to such tight and unrealistic parameters, the study has been bent into a shape in which the only question to be answered was not "is more pipeline necessary", but "how much pipeline is necessary". The spirit of the study requested during our meeting with Governor Patrick was to determine if, and by what mea-

sures, peak demands could be met by means other than new pipelines. Given the unrealistic nature of so many of the assumptions in this study, its usefulness seems limited to showing how much distortion of study parameters it takes to show that more pipeline is indeed needed.

It's my hope that the deficiencies in this study can help the incoming Administration understand how to achieve the original goals put forth by our citizen's groups to determine what our actual energy needs are, and how far we can go toward meeting them using non-fossil-fuel means, before even considering resorting to adding to our already considerable over-reliance on natural gas. A study keeping in line with the original RFP seems crucial to moving forward in accurately re-defining our state's energy policies in a way that will keep both our economy and our climate impact reduction goals on track.

It's also my hope that in the brief time before he leaves office, Governor Patrick will require regulations to be put in place as mandated by the GWSA[5], "establishing a desired level of declining annual aggregate emission limits for sources or categories of sources that emit greenhouse gases." These regulations were due in 2012 and have still not been put in place. They would go a long way to helping the state achieve its goals, and are essential in establishing any future energy policy, since these regulations are mandated to be the law of the Commonwealth.

Sincerely,

Rosemary Wessel

Cc: Governor Deval Patrick
EEA Secretary Maeve Vallely-Bartlett
Undersecretary for Energy, Mark Silvia
Governor-Elect Charlie Baker
EEA Secretary-Elect Matthew Beaton
Attorney General Elect Maura Healey
Senator Elizabeth Warren
Senator Edward Markey
MA Senator Stanley Rosenberg

1- http://www.ct.gov/deep/lib/deep/press_releases/2013/New_England_Governors_Statement-Energy_12-5-13_final.pdf
2- http://www.epa.gov/gasstar/documents/redesignblowdownsystems.pdf
3- http://www.climatechange2013.org/report/full-report/
4- http://www.nescoe.com/uploads/ICR_Statement_October_2014.pdf
5- http://www.clf.org/blog/clean-energy-climate-change/global-warming-solutions-act/

From:	Jay R Mason
To:	Lowdemandstudy, (ENE)
Cc:	Sylvia, Mark (ENV); Lusardi, Meg (ENE); eastanton@synapse-energy.com; "Rich Cowan"; Christina Rohrbacher; John Noto; Kevin Dillon; Derek Pelotte; Robert Slezak; Billy Webster; Kathleen Laliberte
Subject:	"gas pipeline needs study"
Date:	Sunday, December 21, 2014 12:48:32 AM

Dear Sir/Madam;
I'm writing to provide comments on the proposed pipeline, please note:

* developing new fossil fuel infrastructure that lasts 50 years when state policy calls for rapid phase-out of gas usage by 2040 is not practical or efficient. It ignores the science regarding climate change and is therefore nothing less than insane.
* the Kinder Morgan proposal alone would add 43 Million Megatons of CO2 emissions to the atmosphere at full annual capacity, with over half of that likely to be via LNG exports, further worsening climate damage. Those numbers do not even take into account fugitive "methane emissions" associated with compressor stations, drilling operations, and distribution systems.
* the latest information on monthly actual power demand from ISO New England show a reduction of 1-2% in 2014 compared to 2013. This trend is likely to continue due to lighting upgrades and building code upgrades not taken into account by ISO in their energy forecast.
*given current trends, it is apparent that the region will have a surplus of electricity even if a nuclear plant and three large coal plants are shut down.
* conservation is affordable and the related conservation and alternative energy programs which support conservation and generate jobs would be endangered with a too-heavy reliance on gas expansion.

Regards,

Jay Mason

Jay R. Mason
Cell: 978-239-7897
77 Tyler Park, Lowell, MA 01851
Ph: 978.459.2004 | Fax: 775.254.5097

From:	Lusardi, Meg (ENE)
To:	wsrw@verizon.net; Lowdemandstudy, (ENE); Lusardi, Meg (ENE)
Cc:	VallelyBartlett, Maeve (EEA); Elizabeth_Warren@warren.senate.gov; Sylvia, Mark (ENV); stan.rosenberg@masenate.gov
Subject:	Re: Study Comments from No Fracked Gas in Mass
Date:	Sunday, December 21, 2014 8:23:09 AM

Confiriming receipt. Thanks Rosemary.

Sent from my Verizon 4G LTE Smartphone

------ Original message------
From: Rosemary Wessel
Date: Sat, Dec 20, 2014 8:23 PM
To: Lowdemandstudy, (ENE);Lusardi, Meg (ENE);
Cc: VallelyBartlett, Maeve (EEA);Elizabeth_Warren@warren.senate.gov;Sylvia, Mark (ENV);stan.rosenberg@masenate.gov;
Subject: Study Comments from No Fracked Gas in Mass

Dear Low Demand Study staff:

Attached, please find comments in response to the final stakeholder meeting for the Low Demand Study from No Fracked Gas in Mass.

Thank you,

Rosemary Wessel
Founder, www.nofrackedgasinmass.org
90 Trow Road
Cummington, MA
413-634-5726 (o)
413-320-5643 (c)

From:	Tribal Scribal
To:	Lowdemandstudy, (ENE)
Subject:	Comments
Date:	Sunday, December 21, 2014 9:18:36 AM

The Massachusetts Department of Energy Resources should have required that all scenarios in the Low Demand Study meet the statutory requirements of the Massachusetts Global Warming Solutions Act. Without that consideration the entire process is not valid and needs to be revisited.

Don Ogden, producer/co-host
The Enviro Show
WXOJ & WMCB
Western Massachusetts

****

Checkout The Enviro Show on WXOJ-LP, 103.3fm. Northampton, MA, Tuesdays, 6pm
[Webstreaming at:
http://www.valleyfreeradio.org/listen/web-stream-listening-help/]
Also on WMCB, Greenfield; 107.9, Mondays at 9pm. Streaming at
http://wmcb.net/Listen.html
[Blog w/links and YOUR comments at: http://enviroshow.wordpress.com/]
https://www.facebook.com/enviro.show
****

From: Lisa Chappell
To: Lowdemandstudy, (ENE)
Subject: Fw: Synapse report - resident response
Date: Sunday, December 21, 2014 10:40:41 AM

December 21, 2014
Mr. Mark Sylvia
Undersecretary for Energy
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Dear Mr. Sylvia:
My name is Lisa Chappell and I live in East Dracut in an area that would be affected by one of the proposed new pipeline projects. I have just moved to Dracut and was extremely saddened and outraged to hear of the proposed pipeline. This pipeline would sit immediately behind my neighbors homes and also run through some of the areas farmlands. I understand as well that the Lynnfield line would need to cross the Merrimack river, which also causes me great concern. I moved to Dracut to return to a more tranquil lifestyle and we boat on the Merrimack through the summer. My kids have been swimming in that river for the last 5 years - and although some wonder, the clean-up has been remarkable. Disturbing the river seems extremely dangerous and irresponsible. That river supplies drinking water to many communities in the area – such as Methuen and Andover. Also, while East Dracut seems like a non-settled area to some, there are many residents here that would be dangerously close to the pipeline. My neighborhood is full of young children and babies who play outside together safely, like when we were younger. I am only sharing my personal view, but I also question the reason we need to do this. I do not think the assessment of need has gone deep enough. I do not think, when further inspected, that Kinder Morgan cannot find other ways to meet this supposed demand they talk about. Also, the idea of a compressor station that needs 20 to 50 acres to exist, is outrageous. Even more outrageous located here in our growing community.

My understanding is that the DOER has drafted a natural gas demand study that does not take into account the ability of existing pipelines to deliver more gas to the region. It is important that the DOER and its consultant, Synapse, not publish reports or spreadsheets which contain statements like "This Scenario Requires a Pipeline" when the opportunities to increase flow on the existing Portland Natural Gas and Iroquois pipelines have not been considered.

It is also my understanding that at the recent Consumer Advisory Group meeting of ISO New

England, held on December 4, it was announced that Portland Natural Gas secured approval from Canada's National Energy Board (see: http://goo.gl/rvHVqb) that will enable the company to deliver 200 million cubic feet per day of additional natural gas into Dracut, MA (see: www.nescoe.com, letter of May 30, 2014). It is also my understanding that in May, the Iroquois Gas Transmission System told NESCOE that an additional 350 million cubic feet of natural gas was available to be sent eastward into New England on its major pipeline (see: http://goo.gl/UoSuln), again without any pipeline construction.

Considering all that your office has done to reduce and reverse the growth in energy demand through many energy efficiency programs, we would be shocked if you were to approve a report which relies on data from a single pipeline company, and ignores less expensive options that do far less environmental harm. The report also ignores the opportunity to roll out more mandates for efficient lighting as these devices continue to reduce power demand.

Please ensure that this erroneous Synapse report is corrected before it is released.

Thank you,
Lisa Chappell
4 Farm Gate Road, Dracut MA 01826

From:	Katy Eiseman
To:	Lowdemandstudy, (ENE)
Subject:	Regarding DOER"s "Low Demand" Study
Date:	Sunday, December 21, 2014 9:20:02 AM
Attachments:	Letter re DOER Study 12-21-14.pdf

Pleased see attached.

--
Kathryn R. Eiseman, Director
Massachusetts PipeLine Awareness Network
MassPLAN.org
(413) 320-0747

MASSACHUSETTS PIPELINE AWARENESS NETWORK
www.MassPLAN.org

Kathryn R. Eiseman, Director

December 21, 2014

To the DOER Low Demand Study Team:

As some of you know, I was one of five people who participated in a meeting with Governor Patrick and EEA Secretary Bartlett on July 30th concerning the direction of the Commonwealth's energy policies and initiatives. In a summary of our meeting I sent out later that day, I wrote:

> Importantly, [the Governor] committed to having his administration re-visit the numbers in NESCOE's Black & Veatch study, which the administration believes is flawed, and to update at least the Massachusetts portion. I asked for his confirmation that this meant a commitment to a study of the low demand scenario, and the "clean energy future" study, and he said, "Yes, absolutely."

After some back and forth with stakeholders, DOER issued an RFP, hired Synapse Energy Economics, and held three meetings for stakeholder input. Please note that the RFP for this study stated:

> The goal of DOER's study is to determine, given updated supply and demand assumptions, **whether or not new infrastructure is required, and if so, how to optimize for environmental, reliability, and cost considerations.** Key questions for consideration include:
>
> 1) When considering all energy resources, which resources offer the greatest net benefits when assessing for reliability needs, cost savings and **reducing environmental effects including lower GHG emissions.**
>
> **2) In combination, how far can these alternative resources go in replacing retiring generation capacity?**

Despite the stated goal of "optimizing" for environmental, reliability and cost considerations, one of the caveats in last week's presentation states, regarding the study's limitations, that ***the study does not consider "avoided cost of GWSA compliance" or <u>any</u> "non-energy benefits."***

Specific items for study as spelled out in the RFP also included determining:

> - How existing infrastructure (e.g. LNG, CHP, etc.) can be maximized to meet short-term peak demand.
> - The extent to which the demand for natural gas in Massachusetts can be reduced by replacing or repairing leak-prone gas distribution system facilities.
> - The extent to which any short-term supply gaps can be filled through extension of ISO-NE's Winter Reliability program.

The RFP also contemplated a study that would:

> - Identify market rule changes that can aid in increasing levels of alternative resources and demand response.
> - Identify considerations to meet the GWSA [Global Warming Solutions Act] Climate Plan for the next 15-30 years.

I understand that Synapse and DOER were under considerable time constraints, and I appreciate this administration's willingness to begin this process. However, the study as unveiled last week is missing many of the elements of the RFP outlined above. While assumptions built into the model obviously impact the results, of particular note is the fact that GWSA compliance has been relegated to being a modeling *output*, rather than having compliance be a *requirement* for any of the scenarios considered. And, in fact, **none of the scenarios evaluated result in GWSA compliance.**

The main conclusion I draw from this undertaking with Synapse is that the Baker administration will need to double down on reducing fossil fuel use if the Commonwealth is to be compliant with its own commitments. We must establish an energy plan that charts an accelerated path to the "clean energy future." Perhaps uncompleted elements of the study such as those outlined above, and the numerous caveats to be included in the report, can be addressed in the coming months to help establish a meaningful roadmap. I note that the carbon tax study DOER just released[1] indicates one possible step on this path.

Massachusetts can set an example in fighting climate change, and in some ways it has. Governor Patrick still has time to set the stage by ***requiring regulations to be put in place as mandated by the GWSA,*** "establishing a desired level of declining annual aggregate emission limits for sources or categories of sources that emit greenhouse gases." These regulations are long overdue.

Sincerely,

cc:

Governor-Elect Charlie Baker
EEA Secretary-Elect Matthew Beaton
Attorney General Elect Maura Healey
Senator Stanley Rosenberg

1 "Analysis of a Carbon Fee or Tax as a Mechanism to Reduce GHG Emissions in Massachusetts," December 2014 (http://www.mass.gov/eea/docs/doer/fuels/mass-carbon-tax-study.pdf).

From:	Frank Gullotto
To:	Lowdemandstudy, (ENE)
Subject:	Energy Demand Study
Date:	Sunday, December 21, 2014 10:48:56 AM

Mr. Mark Sylvia

Undersecretary for Energy

Executive Office of Energy and Environmental Affairs

100 Cambridge Street, Suite 900

Boston, MA 02114

Dear Mr. Sylvia:

My name is Frank Gullotto and I live in Wilmington in an area that would be affected by one of the proposed new pipeline projects. The portion of the pipeline that runs through North Wilmington will be very close to the town water supply as well as an active quarry. When there is blasting at the quarry, all house in the area shake, so I have serious concerns about the safety of this project. The route also crosses through neighborhoods and conservation land.

My understanding is that the DOER has drafted a natural gas demand study that does not take into account the ability of existing pipelines to deliver more gas to the region. It is important that the DOER and its consultant, Synapse, not publish reports or spreadsheets which contain statements like "This Scenario Requires a Pipeline" when the opportunities to increase flow on the existing Portland Natural Gas and Iroquois pipelines have not been considered.

It is my understanding that at the recent Consumer Advisory Group meeting of ISO New England, held on December 4, it was announced that Portland Natural Gas secured approval from Canada's National Energy Board (see: http://goo.gl/rvHVqb) that will enable the company to deliver 200 million cubic feet per day of additional natural gas into Dracut, MA (see: www.nescoe.com, letter of May 30, 2014).
,
It is also my understanding that in May, the Iroquois Gas Transmission System told NESCOE that an additional 350 million cubic feet of natural gas was available to be sent eastward into New England on its major pipeline (see: http://goo.gl/UoSuln), again without any pipeline construction.

Considering all that your office has done to reduce and reverse the growth in energy demand through many energy efficiency programs, we would be shocked if you were to approve a report which relies on data from a single pipeline company, and ignores less expensive options that do far less environmental harm. The report also ignores the opportunity to roll out more mandates for efficient lighting as these devices continue to reduce power demand.

Please ensure that this erroneous Synapse report is corrected before it is released.

Thank you,

Frank Gullotto

12 Draper Drive, Wilmington

From:	Joseph Cigna
To:	Lowdemandstudy, (ENE)
Cc:	Sylvia, Mark (ENV); Lusardi, Meg (ENE); eastanton@synapse-energy.com
Subject:	Natural Gas Pipeline Needs Study/Resident Comment
Date:	Sunday, December 21, 2014 11:09:46 AM

December 21, 2014

Mr. Mark Sylvia
Undersecretary for Energy
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Dear Mr. Sylvia:

My name is Joseph Cigna and I live in Wilmington, MA in an area that would be affected by one of the proposed new pipeline projects. From my porch window I can see surveyors' stakes marking a path for the proposed Lynnfield Lateral through the protected conservation wetlands that supply our town wells and water supply and adjacent active quarries where daily blasting occurs. On many levels I do not want this pipeline constructed through Wilmington and the surrounding towns.

My understanding is that the DOER has drafted a natural gas demand study that does not take into account the ability of existing pipelines to deliver more gas to the region. It is important that the DOER and its consultant, Synapse, not publish reports or spreadsheets which contain statements like "This Scenario Requires a Pipeline" when the opportunities to increase flow on the existing Portland Natural Gas and Iroquois pipelines have not been considered.

It is my understanding that at the recent Consumer Advisory Group meeting of ISO New England, held on December 4, it was announced that Portland Natural Gas secured approval from Canada's National Energy Board (see: http://goo.gl/rvHVqb) that will enable the company to deliver 200 million cubic feet per day of additional natural gas into Dracut, MA (see: www.nescoe.com, letter of May 30, 2014).

It is also my understanding that in May, the Iroquois Gas Transmission System told NESCOE that an additional 350 million cubic feet of natural gas was available to be sent eastward into New England on its major pipeline (see: http://goo.gl/UoSuln), again without any pipeline construction.

Considering all that your office has done to reduce and reverse the growth in energy demand through many energy efficiency programs, we would be shocked if you were to approve a report which relies on data from a single pipeline company, and ignores less expensive options that do far less environmental harm. The report also ignores the opportunity to roll out more mandates for efficient lighting as these devices continue to reduce power demand.

Please ensure that this erroneous Synapse report is corrected before it is released.

Thank you,

Joseph Cigna
48 Hathaway Rd.
Wilmington, MA 01887

From:	Patty Woodbury
To:	Lowdemandstudy, (ENE); Sylvia, Mark (ENV); Lusardi, Meg (ENE); eastanton@synapse-energy.com
Subject:	Pipeline Opposition
Date:	Sunday, December 21, 2014 12:19:52 PM

Dear Mr. Sylvia:

My name is Patty Woodbury and i live in North Reading in an area that would be affected by one of the proposed new pipeline projects. This line would cross a vernal pool, wetlands area, an area where Wampanoag artificacts were found and the Ipswich River which supplies drinking water to over 300,000 homes, and disrupt an entire neighborhood with the threat of an explosion.

My understanding is that the DOER has drafted a natural gas demand study that does not take into account the ability of existing pipelines to deliver more gas to the region. It is important that the DOER and its consultant, Synapse, not publish reports or spreadsheets which contain statements like "This Scenario Requires a Pipeline" when the opportunities to increase flow on the existing Portland Natural Gas and Iroquois pipelines have not been considered.

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Please ensure that this erroneous Synapse report is corrected before it is released.

Thank you,

Patty Woodbury
North Reading, MA

From:	Steve Woodbury
To:	Lowdemandstudy, (ENE); Sylvia, Mark (ENV); Lusardi, Meg (ENE); eastanton@synapse-energy.com
Subject:	Pipeline Opposition
Date:	Sunday, December 21, 2014 12:22:36 PM

Dear Mr. Sylvia:

My name is Steve Woodbury and i live in North Reading in an area that would be affected by one of the proposed new pipeline projects. This line would cross a vernal pool, wetlands area, an area where Wampanoag artificacts were found and the Ipswich River which supplies drinking water to over 300,000 homes, and disrupt an entire neighborhood with the threat of an explosion. If you “Google” Kinder Morgan you will be shocked at the felonies, explosions and business practices of said company.

My understanding is that the DOER has drafted a natural gas demand study that does not take into account the ability of existing pipelines to deliver more gas to the region. It is important that the DOER and its consultant, Synapse, not publish reports or spreadsheets which contain statements like "This Scenario Requires a Pipeline" when the opportunities to increase flow on the existing Portland Natural Gas and Iroquois pipelines have not been considered.

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Considering all that your office has done to reduce and reverse the growth in energy demand through many energy efficiency programs, we would be shocked if you were to approve a report which relies on data from a single pipeline company, and ignores less expensive options that do far less environmental harm.

Please ensure that this erroneous Synapse report is corrected before it is released.

Thank you,

Steve Woodbury
North Reading, MA

From:	Christopher Kilfoyle
To:	Lowdemandstudy, (ENE)
Subject:	Low Demand Study comments from BPVS
Date:	Sunday, December 21, 2014 1:35:17 PM

Dear Commissioner Lusardi and members of the Low Demand Study team-

Thank you for the opportunity to submit these brief comments on the issues before this study group and the initial report from the DOER consultant, Synapse Energy Economics.

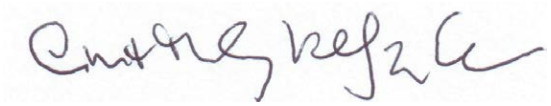
The Patrick Administration should advise the public and the Baker administration, that the case for expanded and new gas pipelines in the Commonwealth has been exaggerated by the utility and pipeline industries and their allies. The perceived peak shortages for the electricity sector last winter were due in large part to the procurement decisions by the electricity generation sector itself. The general argument that there will be growing natural gas shortages, only new and expanded pipelines can mitigate, is proven debatable. In fact this simple dubious perspective has deliberately created a false emergency among the public that should be carefully corrected by political leaders. There is no urgency for the state to signal to FERC that pipeline monopoly franchises be conferred and construction begun.

The draft Sypapse Studies revealed at the December 18th stakeholder meeting, omits notice of energy market forces already in play and significantly limits alternative considerations on the most appropriate and incremental improvements to obviate the need for new gas transmission infrastructure. The study albeit with the fair excuse of being rushed is already flawed.

The nature of public comments thus far and the intelligence of the stakeholders involved in this issue will devastatingly criticize any conclusion of this study that suggests increased natural gas use requiring expanded and new pipelines is the only solution.

On behalf of my firm and our many customers contributing to the clean energy transformation of our economy please promote energy policies that better reflect our environmental healing aspirations and reject short term corporate opportunism in promoting expanded fossil fuel combustion.

Sincerely



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Christopher Derby Kilfoyle

BPVS Berkshire Photovoltaic Services
46 Howland Avenue
Adams,MA 01220
Tel: 413-743-0152
Fax: 413-743-4827
www.bpvs.com

From:	Kitsy Durkin
To:	Lowdemandstudy, (ENE)
Subject:	FW: Natural Gas Pipeline Study
Date:	Sunday, December 21, 2014 5:00:53 PM

From: Kitsy Durkin [mailto:kitsydurkin@gmail.com]
Sent: Sunday, December 21, 2014 12:21 PM
To: 'lowdemandstudy@state.ma.edu'
Subject: FW: Natural Gas Pipeline Study

From: Kitsy Durkin [mailto:kitsydurkin@gmail.com]
Sent: Sunday, December 21, 2014 12:16 PM
To: 'lowdemandstudy@state.ma.edu'
Cc: 'Mark.Sylvia@state.ma.us'; 'meg.lusardi@state.ma.us'; 'eastanton@synapse-energy.com'
Subject: Natural Gas Pipeline Study

Mr. Mark Sylvia
Undersecretary for Energy
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Dear Mr. Sylvia:

My name is Thomas J. Durkin Sr. and I live at 216 Troutbrook RD in Dracut, MA in an area that would be affected by one of the proposed new pipeline projects. I am vehemently opposed to this project. As one of the abutters to the location, this proposal is planned on going through my residential property, where I have lived with my family and have been paying taxes on the land in question for the past 33 years. I further understand that the compressor station will be located approximately 200 yards from my property line which studies say may cause major safety, health, environmental and noise concerns. In addition, I live within one mile of Brox's Quarry and have significant concerns as to the potential impact due to the nature of an active quarry.

My understanding is that the DOER has drafted a natural gas demand study that does not take into account the ability of existing pipelines to deliver more gas to the region. It is important that the DOER and its consultant, Synapse, not publish reports or spreadsheets which contain statements like "This Scenario Requires a Pipeline" when the opportunities to increase flow on the existing Portland Natural Gas and Iroquois pipelines have not been considered.

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Considering all that your office has done to reduce and reverse the growth in energy demand through many energy efficiency programs, we would be shocked if you were to approve a report which relies on data from a single pipeline company, and ignores less expensive options that do far less environmental harm. The report also ignores the opportunity to roll out more mandates for efficient lighting as these devices continue to reduce power demand.

Please ensure that this erroneous Synapse report is corrected before it is released.

Thank you

Thomas J. Durkin Sr.

From:	Tipper Durkin
To:	Lowdemandstudy, (ENE)
Subject:	FW: Natural Gas Pipeline Study for Dracut, MA
Date:	Sunday, December 21, 2014 5:02:40 PM

From: Tipper [mailto:tipperdurkin@gmail.com]
Sent: Sunday, December 21, 2014 12:07 PM
To: lowdemandstudy@state.ma.edu
Cc: Mark.Sylvia@state.ma.us; meg.lusardi@state.ma.us; eastanton@synapse-energy.com; tipperdurkin@gmail.com
Subject: Natural Gas Pipeline Study for Dracut, MA

Mr. Mark Sylvia
Undersecretary for Energy
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Dear Mr. Sylvia:

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Please ensure that this erroneous Synapse report is corrected before it is released.

Thank you

Thomas J. Durkin Sr

From:	C&H Rose
To:	Lowdemandstudy, (ENE)
Subject:	The Synapse study is seriously flawed
Date:	Sunday, December 21, 2014 8:51:40 PM

To The MA DOER,

We find the low demand study seriously flawed for the following reasons:

It did not take into consideration MA H.4164 (legislation on gas leaks).

It did not consider the impact on gas prices once the gas is exported.

It did not include the predicted decline in methane supplies.

It did not comprehensively consider alternative energy resources.

It did not consider the negative environmental impacts of pipeline construction, gas extraction, or leaks.

It did not consider the diversion of financial resources away from renewables and conservation measures.

There was no accounting for the increase in solar energy generation of which MA is capable.

The possibility of electric rate reform was not considered.

There was no consideration of how additional storage of Liquified Natural Gas might help mitigate spikes in energy costs during certain very cold days.

In summary, there were so many caveats, this study seems invalid.

Our state make a commitment to decrease our use of fossil fuel in the form of the Global Warming Solutions Act. It is time to implement it to the full extent. Any study that does not include activities consistent with the GWSA suggests that you do not plan to implement it.

Respectfully,

Henry Rose, MD
Cheryl Rose

Dalton, MA

From:	Derek Pelotte
To:	Lowdemandstudy, (ENE)
Cc:	Sylvia, Mark (ENV); Lusardi, Meg (ENE); eastanton@synapse-energy.com; Rich Cowan; Christina Rohrbacher; John Noto; Kevin Dillon; Derek Pelotte; Robert Slezak; Billy Webster; Kathleen Laliberte
Subject:	Comments for Gas Pipeline Needs Study
Date:	Sunday, December 21, 2014 9:03:47 PM

Dear Sir/Madam,

I would like to add my comments regarding the proposed pipeline.

After looking at the needs study released this past week, I have serious doubts this report took into consideration all of the relevant facts about the necessity for this pipeline. For example,

ISO New England's latest information on power demand shows a 1-2% decrease in 2014 from 2013. With a variety of efficiency programs in place and planned across the region, this trend is likely to continue but for was not taken into account in the ISO energy forecasts.

The efficiency programs are true job creators. A pipeline expansion only encourages waste and negligence since the losses can simply be "made up" by increasing supply. A pipeline expansion is estimated to add 43 million Megatons of CO2 emissions, which doesn't include methane emission at transfer stations and drilling sites, all of which will only exacerbate
the problem of climate change.

Also not considered is that state policy calls for the phasing out of gas usage by 2040. What use is a pipeline expansion that is said will last 50 years when in 35 it will be useless?

Regards,

Derek Pelotte

From:	Alan Rosenthal
To:	Lowdemandstudy, (ENE)
Cc:	Sylvia, Mark (ENV); Lusardi, Meg (ENE); eastanton@synapse-energy.com
Subject:	Proposed Pipeline Concerns
Date:	Sunday, December 21, 2014 10:00:12 PM

Dear Sir/Madam,

I would like to add my comments regarding the proposed pipeline.

After looking at the needs study released this past week, I have serious doubts this report took into consideration all of the relevant facts about the necessity for this pipeline. For example,

ISO New England's latest information on power demand shows a 1-2% decrease in 2014 from 2013. With a variety of efficiency programs in place and planned across the region, this trend is likely to continue but for was not taken into account in the ISO energy forecasts.

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the problem of climate change.

Also not considered is that state policy calls for the phasing out of gas usage by 2040. What use is a pipeline expansion that is said will last 50 years when in 35 it will be useless?

And finally, given that there were 2 cancelled public meetings regarding this meeting less than a month before the release of this study, 2 meetings that would have provided valuable public comment, it seems that this study was rushed with little concern for those who will be immediately effected by this pipeline project.

Regards,
Alan Rosenthal

From:	ReyesBlanco, Jesus M
To:	Lowdemandstudy, (ENE); Sylvia, Mark (ENV); Lusardi, Meg (ENE); eastanton@synapse-energy.com
Subject:	Comments regarding the Pipeline Study
Date:	Sunday, December 21, 2014 10:06:33 PM

Dear Sir/Madam,

I would like to add my comments regarding the proposed pipeline.

After looking at the needs study released this past week, I have serious doubts this report took into consideration all of the relevant facts about the necessity for this pipeline. For example,

ISO New England's latest information on power demand shows a 1-2% decrease in 2014 from 2013. With a variety of efficiency programs in place and planned across the region, this trend is likely to continue but for was not taken into account in the ISO energy forecasts.

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Regards,
Jesus M. Reyes-Blanco
UMass Lowell student

From:	Michael Pelotte
To:	Lowdemandstudy, (ENE)
Cc:	Lusardi, Meg (ENE); Sylvia, Mark (ENV); eastanton@synapse-energy.com
Subject:	Comments For the Pipeline Study
Date:	Sunday, December 21, 2014 10:11:51 PM

Dear Sir/Madam,

I would like to add my comments regarding the proposed pipeline.

After looking at the needs study released this past week, I have serious doubts this report took into consideration all of the relevant facts about the necessity for this pipeline. For example,

ISO New England's latest information on power demand shows a 1-2% decrease in 2014 from 2013. With a variety of efficiency programs in place and planned across the region, this trend is likely to continue but for was not taken into account in the ISO energy forecasts.

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And finally, given that there were 2 cancelled public meetings regarding this meeting less than a month before the release of this study, 2 meetings that would have provided valuable public comment, it seems that this study was rushed with little concern for those who will be immediately effected by this pipeline project.

Regards,
Michael C. Pelotte

From:	Michael Frenette
To:	Lowdemandstudy, (ENE)
Cc:	"MassSolar@googlegroups.com"
Subject:	Massachusetts Low Demand Analysis Comments
Date:	Sunday, December 21, 2014 11:52:52 PM

Synapse was given a scope by the Massachusetts Department of Energy Resources, and executed that scope with great detail and care. There are a number of comments made by other stakeholders in regards to deficiencies of the report that I support wholly, however my comments are limited to the form of the report. There was a great deal of controversy in response to the "Caveats" of the study, and I believe the Caveats should be all published in bold print, in one-two pages at the beginning of the report. An example of a Caveat used in this report is ignoring the impact of gas exports with respect to the natural gas pricing assumption. When the request was made at the 3rd Stakeholder meeting to include the Caveats in one page at the beginning of the report, Synapse mentioned the Caveats would be interspersed throughout the report, referencing the corresponding scenarios. I commend DOER/Synapse on this approach, however in the spirit of transparency, all Caveats should be included at the beginning of the report. A study of this magnitude is ultimately the basis of major energy/environmental policies going forward, and it would be imprudent to sprinkle major limitations of the study by design throughout the body of such a lengthy report.

Sincerely,

Michael Frenette | CFO
No Fossil Fuel, LLC

From:	cathy buckley
To:	Lowdemandstudy, (ENE)
Subject:	Comments on DOER Low Demand Study
Date:	Monday, December 22, 2014 4:58:18 AM

As I stated at the December 18 meeting, I was dismayed to see that none of the eight analyzed scenarios were consistent with the MA Global Warming Solutions Act (GWSA). I could understand how "business as usual" scenarios would not comply with the law. But I do not understand how the Commonwealth could commission a study that completely ignores the law. (Is that legal?)

The term "low demand" suggests a new way of approaching our energy usage. Through efficiency, changed attitudes, and demand management, we could use much less energy. The analogy has been made with our transportation system - that providing all the capacity we need for peak periods would require 12 lanes in each direction on the Southeast Expressway, four lanes in each direction on Massachusetts Avenue, etc. I had expected a study that would really contemplate how we could lower demand, not - to use the transportation analogy - shave a few inches off the breakdown lane.

Does the Department of Energy Resources understand the climate crisis we are facing? If so, why are taxpayers funding studies - in 2014 - that ignore that crisis? I appreciate that a good deal of work was done in a short period of time. Unfortunately, the heart of the matter was left out.

I urge you to withhold this study until it is consistent with the law (GWSA). And I urge you to lift your thinking beyond 'what you have always done and are supposed to do' to what you (and all of us) must do in order to continue to enjoy our hospitable habitat here on Earth. Allow yourself to imagine how you will feel - ten or fifteen years from now - if we fail.

Cathy Ann Buckley
Volunteer with Sierra Club, Environmental Defense Fund, 350MA.
Member, Westwood Environmental Action Committee

From:	Arnold Piacentini
To:	Lowdemandstudy, (ENE)
Subject:	Commentary of Arnold Piacentini & 350MA-Berkshires on MA DOER Stakeholder Meeting and Report on Dec 18, 2014
Date:	Monday, December 22, 2014 5:46:35 AM
Attachments:	MA DOER Low Demand Study Commentary Dec 22"14.doc

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To: Meg Lusardi, Liz Stanton & Jonathan Raab

See the Attachment for my input and, also, on behalf of 350MA-Berkshires.

Very disappointed in all of you.

Arnold Piacentini
December 22, 2014

Arnold Piacentini

♦ ♦ ♦

PO Box 454 ♦ Richmond, MA 01254

Tel 413-698-2057 ♦ Email arnoldpiacentini@gmail.com

December 22, 2014

To: lowdemandstudy@state.ma.us

Re: Stakeholder Meeting & Report December 18, 2014 at Atlantic Wharf

OVERVIEW SUMMARY

The undersigned conclude that the referenced report is not a study, but that it is a political statement. It is a betrayal to all stakeholders with the exception of the electric and gas utility companies, the gas pipeline companies and the gas industry lobbyists.

CONCLUSION AND RECOMMENDATION

The undersigned conclude that the study is ridden with flaws, false assumptions, errors and omissions. That, it was designed to give an outcome consistent with the supply-push scenario for fracked gas, i.e. to justify additional pipeline infrastructure. The undersigned recommends in the strongest terms possible that the so-called "study results" not be released on December 23, 2014, as presently intended.

MAIN FLAWS

The fracked gas model determines the relative economic attractiveness of the various sources of energy. This model is fatally flawed. It has omitted very significant costs of using toxic radioactive fracked gas (1, 4). There is a total lack of social cost considerations. These are the costs that are transferred to society for the environmental and environmental public health consequences, e.g. increased health impacts and the health care and lost wages costs tied to them; the loss of an average 10-30% of property value (according to Forensics Appraisal Group) of impacted properties, and the loss of tax income from that; the loss of tourist dollars to impacted recreational and scenic properties, etc.

These losses may be hard to forecast, but these impacts are very real. Areas of industrial development see all those costs, and to the areas in MA where this is being proposed, tourism, agriculture and conservation are the basis of much of the economy. It would decimate the economic basis of the whole region.

- **By understating the real cost of fracked gas transmission and distribution results are biased from the outset towards the use of more fracked gas, correspondingly reducing the incentives to build renewables' infrastructure.**

… 1/7

The fracked gas model does not recognize the very large emissions of fracked gas to the atmosphere (1). The fracked gas model does not recognize the much higher global warming power of methane in comparison to carbon dioxide. By these omissions results are biased from the outset to overstate the degree of compliance with the GWSA (Global Warming Solutions Act) (2).

The fracked gas model assumes that a fracked gas pipeline can be built in increments of inches of diameter. This flies in the face of reality, as the pipeline companies will build a much larger diameter pipe, thus increasing the real cost of the use of fracked gas (3).

- **The inclusion of the Spectra AIM (Algonquin Incremental Market Expansion) project in the base case and throughout is totally inappropriate. This project has not been permitted by FERC and the grassroots opposition to this project is fierce in New York, Rhode Island, Connecticut and Massachusetts (4). The ultimate disposition of this project is problematical. Further, and troublesome is that it understates the amount of energy to be supplied in all cases via alternative means.**

- **The export of fracked gas that could be transmitted to the Maritimes should some of the proposed pipelines be built has been omitted (3). There are several consequences by such omissions.**

  The actual size of the pipelines and associated infrastructure is much larger than that needed by MA, which realistically is zero additional pipeline capacity. Thus, the cost of the environmental and environmental public health consequences and destruction of property values is incurred by MA stakeholders while any export profits are accrued to the pipeline and gas industry companies.

  The export of fracked gas would result in higher netbacks to the gas companies. They would demand domestic markets to pay this higher price. In addition, exports tighten the supply-demand balance. So, while claiming to the utility companies that pipelines, through some perverse logic, would decrease fracked gas price, in fact the reverse would occur. Even ISO New England concurs with this.

  Higher transmission of fracked gas through MA for export significantly increases the emissions of fracked gas to the atmosphere. This further reduces the actual compliance with the GWSA.

- **There is no consideration of who would pay for these gargantuan fracked gas pipelines. Recall that NESCOE has recommended that these costs be paid by an already over-burdened consumer through a "tariff". This proposal has been tabled, not withdrawn. It is not clear at all for how many of the four fracked gas pipelines currently being proposed and what fraction, thereof, that this inane proposal by NESCOE will be applied. Governor Patrick has not stated categorically that he does not support this proposal nor that he opposes these pipeline proposals.**

… 2/7

- **There is no recognition of the reality facing the fracked gas mania which clearly casts doubt on the reliability of such a source. Public opposition is growing exponentially as the environmental and environmental public health consequences are recognized. Communities and states are starting to legally ban the practice, prominently the NY announcement on December 17th. Citizens are being given the right to deny fracking on their property.**

  And, the costs of fracking are increasing, as the life of wells decreases. The credit worthiness of pipeline companies and smaller fracking companies is clearly at risk. Lenders and bond holders are becoming skittish as they see Athabasca tar-sands and certain Bakken and other shale-oil wells go into the red with the decrease in crude oil prices.

- **The lack of compliance with GWSA would increase the cost of (i) the consequences of even further future damage from climate change, and (ii) the need to make even greater investments to get back into compliance. These costs have not been reflected in the study.**

- **The actual demand in the "Low Demand" scenario was not updated to reflect current projections, including by ISO New England that MA demand is likely to continue to decrease due to continual energy efficiency (5). Nor was the legislation to fix gas leaks reflected.**

- **To further increase the bias towards the use of more fracked gas the study was based on meeting a "peak demand" that was far greater than the actual experience over recent years. During the past 3 years, actual peak demand has occurred for between 10 and 28 days per year, 4 hours per day (6, 7).**

- **To additionally increase the bias towards the use of fracked gas the study did not use all of the existing LNG import, storage and distribution capacity. LNG suppliers have indicated their ability and willingness to satisfy these peak demands (7). Should there be potential bottlenecks in some parts of the distribution systems, these can and should be removed. Any such bottlenecks are no reason to build gargantuan transmission pipelines.**

- **The study did not include the likelihood of investments in renewables such as offshore wind and investments in transmission from Maine to carry wind backed by hydro from Labrador which would be more cost effective than using the Quebec power system (8). The latter, nevertheless, is a viable alternative to buy time to build the renewables infrastructure in MA.**

- **The study did not consider the major changes that have taken place due to the 50% decline in crude oil prices. Given that LNG prices are linked to same, the cost of the use of LNG to meet peak demands has been lowered. Also, the cost benefits of converting from heating oils to fracked gas according to the conventional method of calculating same has diminished. Thus, future fracked gas demand has been further lowered.**

- **The study has an incredible ethical and legal flaw in that it does not recognize the reality of global climate change. We the majority of stakeholders in MA expect better from our State and from the brain trust that it contains.**

… 3/7

Instead of ignoring this reality, the study should have been oriented towards meeting or even exceeding the GWSA targets. The study looked back towards the dinosaurs instead of forward towards efficiency and renewables. A study by the Frontier Group shows that MA has the potential to meet 100% of its energy needs by a factor of 16! MA has the potential to become 100% reliant on renewables and to become an exporter of energy to the grid! The factor for New England is greater, primarily due to the vast potential in Maine. (9) Imagine the potential for commerce and clean ethical jobs.

One of the DOER representatives suggested that alternative energy was irrelevant because of its intermittency. The argument that the sun does not shine at 6:00 PM in the winter is specious and small-minded to omit solar. The wind blows, especially offshore, and there is great potential for further uses of and advances in storage.

FUTURE WORK NEEDED

As previously stated, the undersigned believe that this study is not at all ready to be issued. If Governor Patrick and Governor-Elect Baker are serious about serving the future needs of the majority of stakeholders in MA, then much more work is needed. The deficiencies enumerated herein and by others in the third stakeholder sub-group must be addressed.

The orientation must be changed towards a bias of meeting MA and indeed New England needs with no new fossil fuel infrastructure through the most economic means. The decrease in crude oil prices has bought us some valuable time. Let's not fritter it away haggling.

The undersigned do not believe that MA DOER, Synapse and Raab Associates are capable of doing this in isolation. This result demonstrates this conclusion. Instead, such deficiencies can only be repaired by including a critical mass of stakeholders in defining realistic bases and methodology for moving forward.

PERSONAL NOTE BY ARNOLD PIACENTINI

My parents, Boston Latin School, Tufts University, Lehigh University and Exxon Chemical Company have taught me not to make decisions on faulty bases.

The Undersigned support the foregoing commentary:

The Undersigned request that this commentary be included in the body of any report which may be issued, contrary to the recommendations contained herein.

Signed: *Arnold Piacentini*
Arnold Piacentini, PhD in ChE
350MA-Berkshires, Richmond

Signed: *Cheryl D. Rose*
Cheryl D. Rose, 350MA-Berkshires, Dalton

Signed: *Henry J. Rose*
Henry J. Rose, MD, 350MA-Berkshires, Dalton

Signed: *Judy Gitelson*
Judy Gitelson, 350MA-Berkshires, Pittsfield

Signed: *Judy Eddy*
Judy Eddy, 350MA-Berkshires, West Stockbridge

Signed: *Andrew Bloom*
Andrew Bloom, 350MA-Berkshires, West Stockbridge

Signed: *Bob & Marnie Meyers*
Bob & Marnie Meyers, 350MA-Berkshires, Windsor

Signed: *Patty Crane*
Patty Crane, 350MA-Berkshires, Windsor

Signed: *Kathy Kessler*
Kathy Kessler, 350MA-Berkshires, Great Barrington

Signed: *Michael Feldstein*
Michael Feldstein, 350MA-Berkshires, Great Barrington

Signed: *Stephanie Blumenthal*
Stephanie Blumenthal, 350MA-Berkshires, Sheffield

Signed: *June Stewart*
June Stewart, 350MA-Berkshires, Pittsfield

Signed: *Anne O'Connor*
Anne O'Connor, 350MA-berkshires, Williamstown

Signed: *Frank & Louise Farkas*
Frank & Louise Farkas, 350MA-Berkshires, Pittsfield

NOTE: After two postponements for unstated reasons, MA DOER scheduled the 3rd Stakeholder meeting just 4 days before their arbitrary deadline of 2:00 PM on December 22nd. Additional signatories are expected and will be subsequently transmitted.

Cc: Governor Deval Patrick
EEA Secretary Maeve Vallely-Bartlett
Undersecretary for Energy, Mark Silvia

… 5/7

Acting Commissioner MA DOER, Meg Lusardi
Governor-Elect Charlie Baker
EEA Secretary-Elect Matthew Beaton
Attorney General- Elect Maura Healey
Deputy Chief, Assistant Attorney General, Sandra E. Merrick
Senator Elizabeth Warren; Senator Edward Markey
MA Senator Stanley Rosenberg; MA Senator Benjamin Downing
MA Representatives: William "Smitty" Pignatelli, Gail Cariddi, Paul Mark, Tricia Farley-Bouvier
US Representatives: Richard Neal; James McGovern
ISO-NE CEO, Gordon van Welie
NESCOE President, Ann Berwick
MA Legislative Committees: Global Warming and Climate Change; Joint Committees on Telecommunications, Utilities, and Energy and Economic Development and Emerging Technologies

EXPLANATORY AND REFERENCED NOTES:

(1) Judy Eddy and Arnold Piacentini Letter to 1Berkshire Strategic Alliance, 350MA-Berkshires, December 5, 2014

(2) A Bridge Too Far, The Climate Case Against Natural Gas in Massachusetts, Lead Author, Joshua Jackson et al, Better Futures Project, 350MA, June 2014

(3) Currently, 4 major fracked gas pipeline projects have been announced that would impact NY, MA and New England. These are, as follows:

- **Northeast Direct (NED) by Kinder Morgan, 30" to 36" diameter at 1,450 psi with a maximum design capacity of 2.2 billion cubic feet per day (bcf/day). This proposed project would extend from PA, through NY, MA, NH to Dracut, MA with the clear intention of linking to the Maritime Pipeline.**

  -An illegal segment off of this has been called the Connecticut Expansion Project which adds 3 loops in NY, MA and CT with added capacity of 0.07 bcf/day.

- **Algonquin Incremental Market Expansion (AIM) by Spectra which is replacing 24" diameter pipe with 42" diameter high pressure pipe and increasing compression capacity by 0.34 bcf/day in densely populated areas. This proposed project extends from PA, through NY, CT, RI to Boston. Additionally, it is highly controversial as it passes close-by the Indian Point Nuclear Plant, which in the base case has a myriad of other high risk situations.**

- **Atlantic Bridge by Spectra, owned by Maritimes and Northeast, appears to be an added expansion of Algonquin following much the same route with a design capacity of up to 0.6 bcf/day to Boston with the clear intention of connecting to the Maritime.**

- **Access Northeast, a proposed joint venture between Spectra and Northeast Utilities, not well defined at this time. Could just be incremental capacity for either/both AIM and Bridge.**

… 6/7

The three proposed Spectra projects may well be a prima facie case of illegal segmentation.

(4) Stop the Algonquin Pipeline, www.sape2016.org.

(5) ISO New England Annual Power System Plan, Nov 6, 2014

(6) Verbal communication Bruce Winn, Berkshire Environmental Action Team with Distrigas, June 2016

(7) Francis J. Katulak, CEO GDF Suez Gas NA LLC to Heather Hunt, Executive Director, NESCOE, Feb 10, 2014

(8) Peter Shattuck, Acadia Center, Dec 18, 2014

(9) Clean Energy Potential in New England, Tony Dutzik, Frontier Group, www.frontiergroup.org, Nov 9, 2014

From:	Phillip Graves
To:	Lowdemandstudy, (ENE); Sylvia, Mark (ENV); Lusardi, Meg (ENE); eastanton@synapse-energy.com
Subject:	Pipeline
Date:	Monday, December 22, 2014 7:29:00 AM

Dear Sir/Madam,

I would like to add my comments regarding the proposed pipeline.

After looking at the needs study released this past week, I have serious doubts this report took into consideration all of the relevant facts about the necessity for this pipeline. For example,

ISO New England's latest information on power demand shows a 1-2% decrease in 2014 from 2013. With a variety of efficiency programs in place and planned across the region, this trend is likely to continue but for was not taken into account in the ISO energy forecasts.

The efficiency programs are true job creators. A pipeline expansion only encourages waste and negligence since the losses can simply be "made up" by increasing supply. A pipeline expansion is estimated to add 43 million Megatons of CO2 emissions, which doesn't include methane emission at transfer stations and drilling sites, all of which will only exacerbate
the problem of climate change.

Also not considered is that state policy calls for the phasing out of gas usage by 2040. What use is a pipeline expansion that is said will last 50 years when in 35 it will be useless?

Regards,

--
Phillip Graves

From:	Kelly Contois
To:	Lowdemandstudy, (ENE)
Cc:	Sylvia, Mark (ENV); Lusardi, Meg (ENE); eastanton@synapse-energy.com
Subject:	Comments for Pipeline Study
Date:	Monday, December 22, 2014 8:51:30 AM

Dear Sir/Madam,

I would like to add my comments regarding the proposed pipeline.

After looking at the needs study released this past week, I have serious doubts this report took into consideration all of the relevant facts about the necessity for this pipeline. For example,

ISO New England's latest information on power demand shows a 1-2% decrease in 2014 from 2013. With a variety of efficiency programs in place and planned across the region, this trend is likely to continue but for was not taken into account in the ISO energy forecasts.

The efficiency programs are true job creators. A pipeline expansion only encourages waste and negligence since the losses can simply be "made up" by increasing supply. A pipeline expansion is estimated to add 43 million Megatons of CO2 emissions, which doesn't include methane emission at transfer stations and drilling sites, all of which will only exacerbate
the problem of climate change.

Also not considered is that state policy calls for the phasing out of gas usage by 2040. What use is a pipeline expansion that is said will last 50 years when in 35 it will be useless?

And finally, given that there were 2 cancelled public meetings regarding this meeting less than a month before the release of this study, 2 meetings that would have provided valuable public comment, it seems that this study was rushed with little concern for those who will be immediately effected by this pipeline project.

Regards,
Kelly Contois

From: Haskell Werlin
To: Lowdemandstudy, (ENE)
Cc: haskellwerlin@gmail.com
Subject: Low Demand Gas Study Comments
Date: Monday, December 22, 2014 9:05:34 AM

To the DOER and Synapse regarding the low demand gas study:

Thank you for the opportunity to respond to the December 18th stakeholder meeting to review the results of the low demand study modelling efforts. Given the limited time available for providing comments, my responses are limited to my personal opinions rather than organizations that I belong to such as MassSolar or E2 (Environmental Entrepreneurs). Three and a half days (including a weekend during the holiday season) do not allow for a full group review and group authored response.

Nevertheless, this study is too important to ignore and to not point out the flaws in the study would be folly for the Commonwealth to adopt its recommendations without fully appreciating the caveats that completely invalidate the study's conclusions.

The study is a good start of the conversation but by no means should be the basis for any decisions regarding gas pipeline capacity expansion or adding new electric transmission lines from Canada.

1) First and foremost of the eight scenarios modeled, none of the eight even met the Global Warming Solutions Act targets for either 2020 or extrapolated out for 2030. Even the most optimistic scenario came in at 2% deficit and that assumes that the other sectors (buildings/transportation) meet or beat their target reductions as well which is more challenging and expensive than the electricity sector. Whatever the eventual plan is, it must conform to Massachusetts law and meet the goals of the GWSA as a starting point, not as a consequence of that plan. Global warming must be the driver, not an afterthought, as the inputs in this modelling effort.

2) Demand response must be considered as a factor in shaving peaks and reducing the supply constraints in the worst cold snaps when supply is most severely constrained.

3) Price impacts of gas exports must be factored in as the domestic price of gas will eventually be influenced by the world price once export facilities come on line. Whether they are in Maryland, Massachusetts or the Gulf is immaterial. The global price will then dictate the domestic gas prices and that will make many of the "economically infeasible" technologies listed in the red section of the first slide now economically viable options.

4) Price suppression effects of wind and solar in the wholesale markets must be considered

as it lowers ratepayers costs now that the ISO-NE is for the first time allowing renewables to bid into the wholesale auction and is accepting negative hourly prices.

5) Cost of additional natural gas storage facilities to meet the shortfall for the 12 day peak winter cold snap was not shown as a viable option.

6) Study is state specific, not regional, yet the solution is regional by nature and needs to run as a regional model to make any sense in the real world.

7) Solar PV is currently severely constrained by net metering caps and managed growth allocations in Massachusetts. Together with offshore wind this could conceivably be required to add over 4000 MW of capacity by 2030 to offset some of the retiring generation assets with out adding to emissions.

8) LNG pricing is directly related to oil costs which have dropped dramatically over recent months and LNG storage facilities should be considered for improving reliability and avoiding the forecasted winter price spikes of natural gas from the constrained pipelines in the short years of 2020-2022.

Respectfully,

Haskell Werlin

Director of Business Development
solar design associates
280 Ayer Road
Harvard, Massachusetts 01451

617.519.1024 mobile
978.456.6855 x 22

hwerlin@solardesign.com
www.solardesign.com

From: Jonathan Mark
To: Lowdemandstudy, (ENE)
Subject: one more voice for low demand
Date: Monday, December 22, 2014 9:22:15 AM

December 22, 2014

Ms. Meg Lusardi
Acting Commissioner
Massachusetts Department of Energy Resources
100 Cambridge Street, Suite 1020
Boston, MA 02114
Re: DOER's Low-Demand Gas Study

Dear Acting Commissioner Lusardi:

Unless we seriously limit carbon greenhouse gas emissions, our world will be at greater risk for climate change, ocean and storm surges, pollution and geoengineering that causes global dimming that can effect food supplies and water security. Just the fact that a company wants to transport dirty fracked gas throughout the country shows the insane direction of profit-driven use of short supplies, speculation and over production of fuels that has harmed our environment.

The key for sustaining life in the 21st Century is in our quickly transitioning to conservation-integrity with most all our citizens involved, and the use of cleaner distributed power systems using renewable fuels. Politics often get infused with geopolitical circumstances and corruption. A low demand study with integrity must seek uncompromising solutions to the crisis to our environment that exists today. It is not to pave the way for more carbon saturated fuels to be ignited into our atmosphere for short term gains in economy. That is shortsighted. Policies in this Century so far have maintained a destructive turn of events by the controlling influences of Wall Street investment, a military industrial complex choice of fuels and actions in imperialism to control energy resources and media around the world.

My web site has a link chronicling **Energy Pollution's Impact On Environment** **since we launched our web site in 1000. Please realize that our world must make a stronger commitment to clean energy and conservation. Following such principles innovation and solutions can come about from such a new direction.**

Sincerely yours,

Jonathan Mark
(western mass)
December 22, 2014

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environment, human rights, justice, and nonviolence,
since the launch of NASA's Cassini space probe in 1997.

News Fit to Transmit in the Post Cassini Flyby Era

= = = **www.FlybyNews.com** = = =

From:	Laurie Albano
To:	Lowdemandstudy, (ENE)
Cc:	albano1415@yahoo.com; Sylvia, Mark (ENV); Lusardi, Meg (ENE); eastanton@synapse-energy.com
Subject:	Pipeline Report Comments
Date:	Monday, December 22, 2014 9:42:15 AM

December 22, 2014

Mr. Mark Sylvia
Undersecretary for Energy
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Dear Mr. Sylvia:

My name is Andrew Albano and I live in Dracut, Massachusetts, in an area that would be affected by one of the proposed new pipeline projects. This land in which the pipeline is now encroaching is a very large residential neighborhood. My main concern with this ongoing project is the environmental impact to which this proposed pipeline would cause for many families and children within our residential neighborhood. The new proposed pipeline has a pumping station situated very close to our development. There is little doubt that this pumping station and proposed pipeline project will cause irreparable harm to our way of life and neighborhood. Between noise pollution and actual pollutions/toxins there is no excuse to place this station and pipeline so close to our neighborhood.

My understanding is that the DOER has drafted a natural gas demand study that does not take into account the ability of existing pipelines to deliver more gas to the region. It is important that the DOER and its consultant, Synapse, not publish reports or spreadsheets which contain statements like "This Scenario Requires a Pipeline" when the opportunities to increase flow on the existing Portland Natural Gas and Iroquois pipelines have not been considered.

It is my understanding that at the recent Consumer Advisory Group meeting of ISO New England, held on December 4, it was announced that Portland Natural Gas secured approval from Canada's National Energy Board (see: http://goo.gl/rvHVqb) that will enable the company to deliver 200 million cubic feet per day of additional natural gas into Dracut, MA (see: www.nescoe.com, letter of May 30, 2014).

It is also my understanding that in May, the Iroquois Gas Transmission System told NESCOE that an additional 350 million cubic feet of natural gas was available to be sent eastward into New England on its major pipeline (see: http://goo.gl/UoSuln), again without any pipeline construction.

Considering all that your office has done to reduce and reverse the growth in energy demand through many energy efficiency programs, we would be shocked and disappointed if you were to approve a report which relies on data from a single pipeline company, and ignores less expensive options that do far less environmental harm. The report also ignores the opportunity to roll out more mandates for efficient lighting as these devices continue to reduce power demand.

Please ensure that this erroneous Synapse report is corrected before it is released.

Thank you,

Andrew & Laurie Albano

From:	jean063@aol.com
To:	Lowdemandstudy, (ENE)
Cc:	"to Mark.Sylvia"@state.ma.us; Lusardi, Meg (ENE); eastanton@synapse-energy.com
Subject:	Pipeline Low demand study
Date:	Monday, December 22, 2014 9:43:55 AM

December 21, 2014

Mr. Mark Sylvia
Undersecretary for Energy
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Dear Mr. Sylvia:

My name is Jean Theberge and I live in Metheun in an area that would be affected by one of the proposed new pipeline projects. The pipeline is proposed to pass closely to a quarry (with active blasting) and conservation lands.

My understanding is that the DOER has drafted a natural gas demand study that does not take into account the ability of existing pipelines to deliver more gas to the region. It is important that the DOER and its consultant, Synapse, not publish reports or spreadsheets which contain statements like "This Scenario Requires a Pipeline" when the opportunities to increase flow on the existing Portland Natural Gas and Iroquois pipelines have not been considered.

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,
It is also my understanding that in May, the Iroquois Gas Transmission System told NESCOE that an additional 350 million cubic feet of natural gas was available to be sent eastward into New England on its major pipeline (see: http://goo.gl/UoSuln), again without any pipeline construction.

Considering all that your office has done to reduce and reverse the growth in energy demand through many energy efficiency programs, we would be shocked if you were to approve a report which relies on data from a single pipeline company, and ignores less expensive options that do far less environmental harm. The report also ignores the opportunity to roll out more mandates for efficient lighting as these devices continue to reduce power demand.

Please ensure that this erroneous Synapse report is corrected before it is released.

Thank you,

Jean Theberge

From:	Anne O"Connor
To:	Lowdemandstudy, (ENE)
Subject:	Re: Stakeholder Meeting & Report December 18, 2014 at Atlantic Wharf
Date:	Monday, December 22, 2014 9:44:29 AM

Re: Stakeholder Meeting & Report, December 18, 2014, at Atlantic Wharf

I am writing to express my outrage and consternation over the deeply inadequate Low-Demand Study that has been prepared by MA DOER, Synapse and Raab Associates. In light of the report's serious flaws, I ask that the report not be issued on December 23 as announced, but instead taken back into study so that input from a wider array of stakeholders and expertise be included.

The report utterly neglects the reality of climate change. The whole point of considering a low-demand scenario is the crushing urgency we all face in attenuating the consequences of our past habits in energy consumption. Every serious scientific body worldwide has acknowledged the need to drastically scale back our usage of fossil fuels in order to ensure a livable planet for future generations.

The report utterly neglects the nefarious impacts of fracking and fracked gas at every stage of its cycle, from extraction to transportation to consumption. While so-called natural gas may burn somewhat "cleaner" than oil or coal, its primary component, methane, is a far more potent greenhouse gas even than carbon dioxide. Overwhelming evidence indicates that huge amounts of methane are leaked into the atmosphere during the extraction and transportation process involved in fracking, and that is not counting the egregious instances of accidents, pipeline ruptures and explosions. It must be remembered that the corporations contracting to extract and transport fracked gas are not bound to serve the public good, but rather to make a profit. Their profit-driven model puts all of us at great risk. That fracking is dangerous and brutally destructive for the public and environmental health has been underscored by Governor Cuomo's recent ban on fracking in the State of New York. If only Massachusetts could be equally as forward-thinking and progressive as our neighbor!

Please return the low-demand scenario study to the drawing boards and show the incredible capacity of our state to be a leader in renewable energy development. We simply do not need the grotesquely inflated capacity of high-pressure gas pipelines and additional fossil-fuel infrastructure in our state. Should we go this route at our own expense, both financially and environmentally, we will see our gas prices rise as we find ourselves competing for supply in a rabid export market.

The many omissions, failures and flaws of this report make it clear that it is being used as merely another political pawn in a process intended to shove further fossil-fuel development upon a region that does not need it, with the sole goal of enhancing the bottom line of a handful of powerful corporations and their political cronies. As a proud resident of the Commonwealth of Massachusetts, I am ashamed and appalled.

I request that my comment be included in the body of any report released without the above-mentioned issues addressed.

Sincerely,

Anne O'Connor
201 Cole Avenue, Apt. 103
Williamstown, MA 01267

From: Lusardi, Meg (ENE)
To: Aminpour, Farhad (ENE); McBrien, Joanne (ENE)
Subject: Fw: MASS Dept of Energy resources on Natural Gas Pipeline Needs Study
Date: Monday, December 22, 2014 10:34:56 AM

Sent from my Verizon 4G LTE Smartphone

------ Original message------
From: Eleni Xifaras
Date: Mon, Dec 22, 2014 10:32 AM
To: lowdemandstudy@state.ma.edu;
Cc: Sylvia, Mark (ENV);Lusardi, Meg (ENE);eastanton@synapse-energy.com;
Subject:MASS Dept of Energy resources on Natural Gas Pipeline Needs Study

December 21, 2014

Mr. Mark Sylvia

Undersecretary for Energy

Executive Office of Energy and Environmental Affairs

100 Cambridge Street, Suite 900

Boston, MA 02114

Dear Mr. Sylvia:

My name is Eleni Xifaras and I live in Andover, MA near anarea that would be affected by one of the proposed new pipeline projects. The Tennessee Gas Pipeline NED LynnfieldLateral Project is slated to run underneath the Merrimack River from Dracutinto Andover with a path on or along private residential properties with the risk of explosion, and the risk of contamination of the watersupply to countless area residents due to this project and how it is contemplated, with no upside to thecommunity.

My understanding is that the DOER has drafted a natural gasdemand study that does not take into account the ability of existing pipelinesto deliver more gas to the region. It isimportant that the DOER and its consultant, Synapse, not publish reports orspreadsheets which contain statements like "This Scenario Requires aPipeline" when the opportunities to increase flow on the existing PortlandNatural Gas and Iroquois pipelines have not been considered.

It is my understanding that at the recent Consumer AdvisoryGroup meeting of ISO New England, held on December 4, it was announced thatPortland Natural Gas secured approval from Canada's National Energy Board(see: http://goo.gl/rvHVqb) that willenable the company to deliver 200 million cubic feet per day of additionalnatural gas into Dracut, MA (see: www.nescoe.com, letter of May 30, 2014).

It is also my understanding that in May, the Iroquois GasTransmission System told NESCOE that an additional 350 million cubic feet ofnatural gas was available to be sent eastward into New England on its majorpipeline (see: http://goo.gl/UoSuln), again without any pipeline construction.

Considering all that your office has done to reduce andreverse the growth in energy demand through many energy efficiency programs, Iwould be shocked if you were to approve a report which relies on data from asingle pipeline company, and ignores less expensive options that do far lessenvironmental harm. The report also ignores the opportunity to roll out moremandates for efficient lighting as these devices continue to reduce powerdemand.

Please ensure that this erroneous Synapse report iscorrected before it is released.

Thank you,

Eleni Xifaras

From:	esocha@riseup.net
To:	Lowdemandstudy, (ENE)
Subject:	Low Demand Study
Date:	Monday, December 22, 2014 10:27:30 AM

Hello,

I am concerned with the recent results of the study on Low Demand in relation to environmental and climate policies in our state Massachussetts.

Did the Governor know that the study scenarios would ALL violate state law? Shouldn't a requirement of the study have been to comply with state law i.e. the Global Warming Solutions Act?
Please require the numbers to be re-run with the condition that the results MUST meet the statutory goals of the GWSA.

Thank you.

--
The original 'I' is the 'unchanging' witness of the three states of waking, dream and sleep. Yet these three states are exclusive of each other. A thing that exists at one time and does not exist at another cannot be real in the absolute sense. Therefore, we are to look beyond these three states for Reality.
-The basis of Advaita Vedanta

From:	Woll, Jr., Edward
To:	Lowdemandstudy, (ENE)
Cc:	Lusardi, Meg (ENE); "ewoll@sierraclubmass.org"
Subject:	Massachusetts Sierra Club Comment #3 on Low Demand Study
Date:	Monday, December 22, 2014 10:19:53 AM
Attachments:	image002.png Sierra Club Cmte LAC DOER Low Demand Analysis Mass Sierra Club Submitted comments regarding low demand study FINAL 2014-12-22 (B1803657).PDF

Please find attached Comment #3 of the Massachusetts Sierra Club following the December 18, 2014 Stakeholder meeting on the Low Demand Study.

Edward Woll, Jr.,
Massachusetts Sierra Club
Vice Chair, Chair Energy Committee

T 617 338 2859
F 617 338 2880
ewoll@sandw.com
www.sandw.com
LinkedIn Profile

Massachusetts Sierra Club
10 Milk Street, Suite 417
Boston MA 02103-4600

www.sierraclubmass.org
office@sierraclubmass.org
(617) 423-5775

Massachusetts Sierra Club Comments #3
Massachusetts Low Demand Analysis

December 22, 2014

The Massachusetts Sierra Club is grateful for the opportunity to participate with many other stakeholders in the meeting on December 18, 2014 and to submit additional comments beyond the 18 points raised in its two earlier submissions: Comment #1 dated October 20, 2014 and Comment #2 dated November 4, 2014. The comments below focus primarily on the limitations or caveats to be listed in the final report. We recognize that the time frame for developing the report was quite short and therefore many issues were either not able to be addressed, were not selected for consideration or were discarded because of time constraints. Therefore it is very important to be aware of what the report has not covered.

While reading the report, one must also keep in mind that it is not a recommendation. Nor is it driven by any goal except to attempt to provide a snapshot of the future based on the status quo of already passed legislation and existing government department studies and programs. Some of these studies are dated, and some of those programs are outdated. That suggests understandably that the report is somewhat outdated and overestimates the energy needed, i.e., the "shortfall."

It is necessary to repeat that the Massachusetts Sierra Club goals are the same as the Commonwealth's, i.e., to have a clean energy economy in the near future by avoiding policies that perpetuate and increase the excessive dependence on natural gas, by developing a vibrant economy with clean energy jobs and by meeting the Global Warming Solutions Act's goal of reducing green house gases. In that regard, the report must concede that to the extent it advocates an increase in natural gas infrastructure, it also implicitly advocates not meeting the Commonwealth's greenhouse gas emission goals. But the report was not driven by those goals.

The proper lens with which to view the report is its limitations and caveats. The other focus should be on peak shaving. A road map can be developed using these lenses to create new clean sources of energy and jobs and to eliminate any perceived shortfall.

Point 19. The Report Does Not Consider and Account for New Legislation, Rulemaking and Regulations or the Likelihood of Passage of Pending Legislation. We request that the report identify as a limitation that it does not take into account currently developing policies reflected in new legislation as well as the likelihood of passage of pending legislation that will hasten the transition to a clean energy economy. These include the impact of passage of a pending net metering bill, the powerful movement to pass a carbon fee or tax, the gas leaks bill

passed in 2014, a jobs bill to retrain fossil fuel industry workers, and some utilities' progress to develop their own solar energy fields, among others.

Point 20: **The Report Is Not Based on Any Goal of a Clean Energy Future for the Commonwealth.** We request that the report identify as a limitation that it adheres to no clean energy goal. In its proper perspective, the report is justly viewed as at most a stepping stone from which the Commonwealth can continue to develop policies and programs for its economy, public health and environment to benefit from a 100% clean energy future. The goal of a clean energy future will drive how energy policy and infrastructure are to be developed and built.

Point 21: **The Report Fails to Include the Impact of the Financial Incentives to be Provided by New Thermal Renewable Energy Credit Regulations.** We request that the report identify as a limitation that it has not fully considered that DOER is conducting stakeholder meetings in its rule making process to implement the Alternative Energy Credits (AEC) allowed in 2014 by "An Act relative to credit for thermal energy generated with renewable fuels." The thermal renewable energy systems include Biomass (BIO), air source heat pumps (ccAHSP), ground source heat pumps (GSHP), solar combination systems (Solar-Combi) and solar hot water (Solar DHW). DOER's final design of the regulations is at DOER's website and covers small and large systems. The final design includes, for example, the following:

Example Residential Installation			*Illustrative example, including multiplier, actual calculation will depend on final regulations*		
Building characteristics					
Heat Load	MMBtu/y	100			
Cool Load	MMBtu/y	5			
Domestic Hot Water Load	MMBtu/y	15			

	BIO	**ccASHP**	**GSHP**	**Solar Combi**	**Solar DHW**
Efficiency/COP	0.85	3	4	1	1
Load served %	100%	80%	100%	40%	60%
AEC/year	34	4	34	27	13
Pre-minted AEC value $[1]	$5,056	$633	$5,078	$4,045	$1,978

Using the example of residential installations (not large scale systems), the above table suggests that each 100,000 residences[2] that employ a qualifying BIO or GSHP system will displace 10,000,000 MMBtus per year of thermal natural gas. That is equivalent to almost 34,000,000 MWh per year using the DOER formula that 1 MWh is equivalent to 3.412 MMBtu. That is roughly 0.3 billion cubic feet of natural gas per day that would shave peak energy demand. [3]

[1] The calculation assumes 10 years pre-minted AECs are sold at $15/AEC, and is based on the formula that 1 Alternative Energy Credit = 1 MWh = 3.412 MMBtu.

[2] That is less than 4 % of the 2,813,536 Massachusetts housing units, 1,640,291 of which are single-family homes per the United States Census Bureau. http://quickfacts.census.gov/qfd/states/25000.html.

[3] For conversion factors see thttp://www.neb-one.gc.ca/clf-nsi/rnrgynfmtn/sttstc/nrgycnvrsntbl/nrgycnvrsntbl-eng.html#s1ss2 (0.95 million Btu = 0.95 thousand cubic feet of natural gas at 1000 Btu/cf = 0.28 megawatt hour of electricity).

Point 22: **The Report Masks the Potential Impact of Using Technologies That Are Above the Levelized Cost Line, i.e., the Red Technologies, to Shave the Costly Energy Peaks.** We request that the report identify as a limitation that it does not address clearly and specifically the benefits of applying the "red" technologies to shave the peak energy demand, which is the driver for natural gas infrastructure that is far greater than is needed. Correlatively, the report fails to take into account the overall cost of new natural gas infrastructure that will be passed directly on to or imposed through taxes and tariffs on the taxpayers. Instead it uses as the primary economic tool, i.e., the levelized cost, i.e., to create an impenetrable Maginot line between the red and blue energy sources. Its narrow economic lens focuses instead on the cost of the natural gas itself.

Point 23: **Although the Report Takes into Account the Cost of Natural Gas in Assessing Demand, It Does not Credit the Adverse Impact on Investment in Clean and Renewable Energy of a Policy that Relies on and Promotes Additional Natural Gas Infrastructure.** We request that the report disclose that it implicitly creates an uneven playing field in favor of natural gas by ignoring the adverse impact on clean and renewable technology development of a policy to invest in natural gas infrastructure.

Point 24: **It Is not Clear Whether the Synapse Scenarios Envision Additional Gas Fired Electricity Generating Capacity and Incorporate the Cost to Build That Capacity**.

Point 25: **The Report Does Not Scrutinize the Amount of the Projected Needs of the Local Distribution Companies That Include the Expansion of Natural Gas Markets**. We request that the report identify as a limitation that it does not dissect the projected needs of the Local Distribution Companies to determine how much of that future demand includes new customers and expanded markets beyond the existing local distribution gas pipeline network or whether the report assumes that there is no geographical expansion of that existing gas pipeline network.

Feasible objectives are two-fold. First: to implement existing clean and renewable energy resources and to develop and deploy sufficient peak shaving clean and renewable energy resources and policies that incent alternatives to natural gas over the time it will take to permit, construct and commence operating additional natural gas pipeline capacity. That will assure and confirm that additional pipeline infrastructure is unnecessary. Second: to deploy those resources in a manner that paves the way for energy and grid management programs and economic and technological improvement that will reduce over the long term the overall demand for energy sourced with natural gas.

We appreciate your considering these requests.

Respectfully

Edward Woll, Jr., Massachusetts Sierra Club
Vice-Chair, Chapter Energy Chair
ewoll@sierraclubmass.org
617-338-2859

From:	Rema Loeb
To:	Lowdemandstudy, (ENE)
Subject:	The Study
Date:	Monday, December 22, 2014 10:31:31 AM

Your study reeks of collusion with the gas industry. We had that problem in New York State for a long while until citizens drew upon scientific studies to lay bare the hypocrisy. Natural gas is methane, released into the atmosphere at several points during drilling and transportation.This is more harmful to climate than even carbon. I cannot appeal to your collective consciences. I am not convinced that you have any. Instead of using renewable energy (sun, wind, tidal),you allow the wreckage of other American citizens' homes to feed your shortsighted interests. Start a real study, no words from the fossil fuel industry. It might surprise you. You are part of an ugly past that will dictate your own future. In a moment of beautiful honesty, the Commissioner of Health in New York stated that he would not want his child living in a community where there is drilling. Or compressor stations. Or pipelines. When you commit to moving your own families to such areas, then I will believe your sincerity.

From: claire
To: Lowdemandstudy, (ENE)
Subject: Fw: Low Demand Gas Study Comments
Date: Monday, December 22, 2014 10:58:24 AM

Please accept adding Claire Chang and John Ward to this letter commenting on the low demand study.

Thank you for your consideration,

Claire Chang
Solar Store of Greenfield
2 Fiske Ave
Greenfield, MA
413 772 3122
claire@solarstoreofgreenfield.com

-------- Original message --------
Subject:Fw: Low Demand Gas Study Comments
From:Haskell Werlin <hwerlin@solardesign.com>
To:arnoldpiacentini@gmail.com
Cc:John Carlton-Foss <jcfrss@gmail.com>,Claire Chang <claire@solarstoreofgreenfield.com>,Emily Rochon <ERochon@bostoncommunitycapital.org>,Mark Sandeen <mark.sandeen@sustainablelexington.org>,scottjnielsen@gmail.com,John Ward <John@solarstoreofgreenfield.com>

FYI

Haskell Werlin

Director of Business Development
solar design associates
280 Ayer Road
Harvard, Massachusetts 01451

617.519.1024 mobile
978.456.6855 x 22

hwerlin@solardesign.com
www.solardesign.com

From: Haskell Werlin
Sent: Monday, December 22, 2014 9:05 AM
To: lowdemandstudy@state.ma.us

Cc: haskellwerlin@gmail.com
Subject: Low Demand Gas Study Comments

To the DOER and Synapse regarding the low demand gas study:

Thank you for the opportunity to respond to the December 18th stakeholder meeting to review the results of the low demand study modelling efforts. Given the limited time available for providing comments, my responses are limited to my personal opinions rather than organizations that I belong to such as MassSolar or E2 (Environmental Entrepreneurs). Three and a half days (including a weekend during the holiday season) do not allow for a full group review and group authored response.

Nevertheless, this study is too important to ignore and to not point out the flaws in the study would be folly for the Commonwealth to adopt its recommendations without fully appreciating the caveats that completely invalidate the study's conclusions.

The study is a good start of the conversation but by no means should be the basis for any decisions regarding gas pipeline capacity expansion or adding new electric transmission lines from Canada.

1) First and foremost of the eight scenarios modeled, none of the eight even met the Global Warming Solutions Act targets for either 2020 or extrapolated out for 2030. Even the most optimistic scenario came in at 2% deficit and that assumes that the other sectors (buildings/transportation) meet or beat their target reductions as well which is more challenging and expensive than the electricity sector. Whatever the eventual plan is, it must conform to Massachusetts law and meet the goals of the GWSA as a starting point, not as a consequence of that plan. Global warming must be the driver, not an afterthought, as the inputs in this modelling effort.

2) Demand response must be considered as a factor in shaving peaks and reducing the supply constraints in the worst cold snaps when supply is most severely constrained.

3) Price impacts of gas exports must be factored in as the domestic price of gas will eventually be influenced by the world price once export facilities come on line. Whether they are in Maryland, Massachusetts or the Gulf is immaterial. The global price will then dictate the domestic gas prices and that will make many of the "economically infeasible" technologies listed in the red section of the first slide now economically viable options.

4) Price suppression effects of wind and solar in the wholesale markets must be considered as it lowers ratepayers costs now that the ISO-NE is for the first time allowing renewables to bid into the wholesale auction and is accepting negative hourly prices.

5) Cost of additional natural gas storage facilities to meet the shortfall for the 12 day peak winter cold snap was not shown as a viable option.

6) Study is state specific, not regional, yet the solution is regional by nature and needs to run as a regional model to make any sense in the real world.

7) Solar PV is currently severely constrained by net metering caps and managed growth allocations in Massachusetts. Together with offshore wind this could conceivably be required to add over 4000 MW of capacity by 2030 to offset some of the retiring generation assets with out adding to emissions.

8) LNG pricing is directly related to oil costs which have dropped dramatically over recent months and LNG storage facilities should be considered for improving reliability and avoiding the forecasted winter price spikes of natural gas from the constrained pipelines in the short years of 2020-2022.

Respectfully,

Haskell Werlin

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From:	Joel Wool
To:	Lowdemandstudy, (ENE)
Subject:	Low Demand Gas Study Comments
Date:	Monday, December 22, 2014 11:07:32 AM

To whom it may concern:

Clean Water Action is grateful for the opportunity to provide brief comment on the low demand gas study.

From the beginning, we have questioned the framing of this study as one designed to necessitate some quantity of pipeline rather than establishing a pathway forward toward a clean energy future that is compliant with the state's energy, environmental and public health goals, including the the Global Warming Solutions Act. Nevertheless, we are truly grateful for the effort by Synapse and by DOER to study and struggle with local responses to a regional problem in an accelerated, and incredibly difficult, time frame.

Given the imminent release of the report, we

- Adoption of ISO-NE's projections for distributed generation is inadvisable as nearly every other stakeholder, including NESCOE and NEPOOL, have contested these projections and they are currently being appealed at FERC.
- Solar distributed generation and other renewable technologies should be interpreted to the extent they do coincide with peak load, i.e. by determining a peak load match factor and valuing how much - even if minimally - this "shaves" or otherwise reduces peak demand. Likewise, we would suggest price suppression from renewable energy should have been taken into account in this study.
- We are unclear whether the consultant has adequately modeled the use of LNG and fuel storage as an interim step for maintaining electric reliability and stable prices while other large-scale and long-term energy options come online.
- The reconsideration rendering offshore wind essentially unviable is unsettling for several reasons. In order to level the playing field, one might note that potential pipeline expansion is also years off, uncertain and could be subject to delay, changing markets and investor confidence, or shifts in policy
- Failure to account for fugitive emissions or potential of gas exports is a serious study flaw which may have major economic and environment consequences for residents, ratepayers, and policymakers of the Commonwealth.
- Meeting the requirements of the Global Warming Solutions Act is a mandate, not an option. It would seem that Synapse and DOER should recommend further investigation or inquiry so that the state can find policy solutions to comply with its legal mandates and sustainability goals.

Thank you for the opportunity to provide these comments. Happy holidays.

Kind Regards,

Joel Wool
Advocate: Energy & Environment
Clean Water Action
www.cleanwateraction.org/ma/

88 Broad St, Lower Level, Boston, MA 02110
Tel: 617-338-8131 x205
Fax: 617-338-6449

From: Janet Bradley
To: Lowdemandstudy, (ENE)
Subject: comments on a flawed Low Demand Study
Date: Monday, December 22, 2014 11:08:59 AM

To the Acting Commissioner, December 21, 2014

Dept. of Energy Resources, Meg Lusardi

and members of the Low Demand Study Team:

I am writing to express my comments on the current Low Demand Study that was commissioned by the Department of Energy Resources (DOER) on July 30, 2014.

I understand that the original request for proposals included the following goals:

-To determine whether or not a new gas infrastructure is necessary.

-To determine which resources offer the greatest net benefits when considering reliability needs, cost savings and reducing environmental effects including lower GHG emissions.

-and to determine how far can these alternative resources can go in replacing retiring plants.

I feel that the results of this study are flawed because they in no way address the initial study goals. The following are a few of the major disappointments in the Low Demand Study's assumptions:

-Regarding pipeline proposals and energy needs for the New England region: None of the models are GWSA (Global Warming Solutions Act) compliant. This not only ignores state law; it ignores how to meet our energy needs WHILE lowering greenhouse gas emissions.

- Building more pipeline would pull us further out of compliance with the Global Warming Solutions Act GWSA.

- Building more pipeline irresponsibly ignores the currently leaking, aged infrastructure of gas piping, much of which dates back to 1950's. Fixing existing leaks would also reduce greenhouse gas emissions and increase the amount of gas available for energy. And, more importantly, it would reduce accidents such as what occurred this past March in the devastating Harlem explosion in NYC when two buildings were demolished in an explosion that killed eight people. (The gas leak was found adjacent to 1646 Park Ave.)

-Offshore wind is discounted as not realistic yet there are currently a number of projects moving ahead. This will obviously be part of our energy system in the near future, yet it is not considered in this study.

-Solar is also dismissed because it is deemed as not available during peak hours and peak hours were the only times considered in the model. At the same time, peak storage systems using pumped or battery storage are also discounted as not feasible. Including both could provide peak demand relief.

- It appears Synapse relied on ISO data for predicted electricity generation needs. At a minimum, Synapse should release where it obtained data on predicted electricity demand, because the ISO New England predictions have not been close to actual usage and the amount of error has been increasing in recent years. In 2011 the ISO prediction was 4.7% higher than actual and in 2014 the ISO prediction is almost 10% higher than actual electric demand. Electricity demand for the 12 months from Jan-Dec 2014 is running 1.5% below electricity demand for the same 12 month period last year.

-There is no consideration of the pipeline emissions of methane released through normal operations of transmission pipelines (at compressor, pigging and valve stations). Methane has 34 times the climate change impact of CO2 over the first 100 years in the atmosphere. Furthermore, there was no consideration of the slew of other toxic chemicals carried with the methane; benzene and toluene are known carcinogens that will contaminate the air and very likely contaminate ground water because the history pipeline accidents cannot be ignored.

The east coast is the recipient of all the pollution coming from west. To compound this with what compressor and meter and pigging stations will emit is unconscionable.

-The study does not consider the expansion of current energy efficiency programs.

-I feel that all of these factors were intentionally ignored to restructure the study so that it no longer answered the question “is more pipeline necessary” but rather, the obviously biased report focuses on “ how much pipeline is needed.”

The incoming Administration needs to understand how to achieve the initially stated goals put forth by our citizen’s group to determine what our actual energy needs are, and how far we can go toward meeting them using non-fossil-fuel means.

We must establish an energy plan that follows an accelerated path to the clean, renewable energy future that Massachusetts residents want and expect.

Sincerely,

Mrs. J. Bradley and Mr. Douglas McNally

From:	Elisa Grammer
To:	Lowdemandstudy, (ENE)
Cc:	Lusardi, Meg (ENE); Aminpour, Farhad (ENE); susan@raabassociates.org; raab@raabassociates.org; eastanton@synapse-energy.com
Subject:	Low Gas Demand Analysis Comments of 47 Coffin Street Ratepayer Advocates
Date:	Monday, December 22, 2014 12:52:09 PM
Attachments:	12_22_14-47Coffin.pdf

Ladies and Gentlemen:

Many thanks to all of you for your commitment, insights, and hard work on the Massachusetts Low Gas Demand Analysis.

47 Coffin Street Ratepayer Advocates (those of us living at 47 Coffin St., West Newbury, MA in National Grid's NEMA/Boston load zone) very much appreciates the opportunity to submit the attached comments, which request that the final report include a prominent disclaimer describing the extent to which the Analysis, which apparently gives electric demand response less credit than do skeptics such as the New England Power Generators Association, rests on an assumption that the Commonwealth is uniquely incapable or unwilling, over the next 15 years, to deploy proven DR used successfully to reduce peak by hundreds and thousands of MW in states of comparable size and situation.

Elisa J. Grammer
703-855-5406

47 Coffin Street Ratepayer Advocates
47 Coffin Street
West Newbury, Massachusetts 01985
December 22, 2014

Ms. Meg Lusardi
Acting Commissioner
Massachusetts Department
of Energy Resources
By email

Dr. Elizabeth Stanton
Senior Economist
Synapse Energy Economics, Inc.

Re: Massachusetts DOER Low Gas Demand Analysis (RFR-ENE-2015-012)

Dear Acting Commissioner Lusardi, Dr. Stanton, *et al.,*

47 Coffin Street Ratepayer Advocates (47 Coffin)[1] recognizes the difficulty of this endeavor, and commends the efforts of the Department of Energy Resources (DOER) and Synapse Energy Economics in engaging in the Low Gas Demand Analysis (Analysis), and appreciates the opportunity to comment on the materials posted on Synapse's website in the past hours.

Briefly, 47 Coffin is deeply concerned that the "Low Demand" Analysis fails, notwithstanding substantial evidence (attached for convenience and incorporated herein as Appendix A), to consider readily available and/or inevitable growth in demand response (DR) to reduce winter peak electric demand by hundreds to thousands of MW. Logic dictates that DR proven viable around the nation and the world would be key to "Low Demand" in the first place. The materials shared with stakeholders as of this writing do not explain this omission, providing no rational basis for the outcomes reached. The Analysis' failure to consider an obvious, low-cost solution used successfully in many jurisdictions cannot be reconciled with its "purpose . . . to consider various gas demand scenarios and to evaluate a range of solutions to meet Massachusetts' short and long-term resource needs, considering greenhouse gas reductions, economic costs and benefits, and system reliability."[2]

Accordingly, 47 Coffin respectfully requests that the Analysis' final report contain a *prominent, first page disclaimer stating the extent to which it assumes the Commonwealth's unique and unexplained inability or unwillingness, over the next 15 years, to deploy proven DR used successfully to reduce peak by hundreds and thousands of MW in states of comparable size and situation.* Such a disclaimer will 1) enable the Analysis' readers to give it proper weight and credibility and 2) inform future rate regulators assigning stranded cost responsibility to utility shareholders

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[1] 47 Coffin comprises senior citizen, mostly retired, retail National Grid zone NEMA/Boston electric ratepayers residing at 47 Coffin Street, West Newbury, MA.
[2] Synapse Energy Economics, *Massachusetts Low Demand Analysis,* (visited Dec. 20, 2014), *available at* http://www.synapse-energy.com/project/massachusetts-low-demand-analysis.

in the event of un- or under-utilized gas pipeline and/or distribution plant if, contrary to the Analysis, increased DR and energy efficiency do occur.

According to the slides released for the December 18 conference, DR was removed from the feasibility study and supply curve.[3] This itself should be a prominent caveat. While capacity from *wholesale* DR is problematic in many respects, even the New England Power Generators Association (NEPGA) credits *retail* DR as potential capacity in ISO-New England's Forward Capacity Markets (FCM). It is more than passing curious that in Analysis, DOER and Synapse largely dismiss DR, while other interests, known for skepticism regarding demand-side solutions, are stating, "Consistent with the jurisdictional line recognized in the *EPSA* decision [finding wholesale DR beyond FERC's jurisdiction], NEPGA recognizes that *States will presumably move forward with their own retail demand response programs and that to the extent that these programs result in legitimate load reductions, such reductions may be reflected in FCM*."[4]

Now the Analysis apparently considers DR only as a balancing or peak shaving tool. The slides subsequently credit DR with a 0.1 Billion NG BTU/hour contribution to peak hour balancing in 2015 and zero in all years thereafter.[5] The slides make no further reference to DR, except to dismiss existing Massachusetts policies such as time-sensitive ratemaking[6] and even simple consumer education initiatives such as Connecticut's "Wait til 8" program that, as noted, have been proven in other jurisdictions to shave many hundreds if not thousands of MW.[7] Without explanation, large and successful existing programs are

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[3] Synapse Energy Economics, *Massachusetts Low Demand Analysis December 18 Meeting Slides* at 12 (visited Dec. 20, 2014), available at http://www.synapse-energy.com/sites/default/files/Slides%20for%20Third%20Stakeholder%20Meeting.pdf [hereinafter "Dec. 18 Slides"].

[4] *New England Power Generators Assn v. ISO-New England,* FERC Docket No. EL15-21, Complaint at 14, n.52 (Nov. 4, 2014), *available at* http://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13685626. Emphasis added.

[5] Dec. 18 Slides at 27.

[6] *Investigation by the Department of Public Utilities upon its own Motion into Time Varying Rates,* Mass. D.P.U. Docket No. 14-04, Order Adopting Policy Framework for Time Varying Rates (Nov. 5, 2014), *available at* http://web1.env.state.ma.us/DPU/FileRoomAPI/api/Attachments/Get/?path=14-04%2fOrder_1404C.pdf, *reh'g denied,* (Dec. 16, 2014), *available at* http://web1.env.state.ma.us/DPU/FileRoomAPI/api/Attachments/Get/?path=14-04%2forder_motion_recon_121614.pdf.

[7] *E.g.,* Energy Upgrade California, *See the Impact of Flex Alert* (visited Dec. 20, 2014), *available at* https://www.energyupgradeca.org/en/save-energy/home/see-the-impact/see-the-impact-of-flex-alert ("History has shown that Californians respond when called to action and often generate savings of 1,000 megawatts — enough electricity to power 1 million households. In fact, July 1st and 2nd, 2013, a Flex Alert was called and many businesses, residents, local governments and organizations responded quickly, dropping their energy demand by thousands of megawatts.")

apparently assumed, for purposes of this report, to be "not reasonably available" in the period approaching 2030 or "of limited potential capability."[8]

Incremental Balancing Measures: Base Case

	Increment	Total winter peak hour availability	Total annual availability	Winter peak hour availability	Annual availability
2015 Balancing Measures		*MMBtu*	*MMBtu*	*MMBtu*	*MMBtu*
Pipeline (long- and short-haul	Minimum	0	n/a	n/a	n/a
Winter Reliability Program	Minimum	29,434	29,434	1	150
Demand Response	Minimum	190	5,040	0.76	20
Pumped Storage	Minimum	0	n/a	n/a	n/a
Battery Storage	Minimum	289	52,560	289	52,560
2020 Balancing Measures					
Pipeline (long- and short-haul	Minimum	undetermined	undetermined	4,167	36,500,000
Winter Reliability Program	Minimum	0	n/a	n/a	n/a
Demand Response	Minimum	190	5,040	0.76	20
Pumped Storage	Minimum	4,043	367,920	2,022	183,960
Battery Storage	Minimum	1,444	52,560	289	10,512
2030 Balancing Measures					
Pipeline (long- and short-haul	Minimum	undetermined	undetermined	4,167	36,500,000
Winter Reliability Program	Minimum	0	n/a	n/a	n/a
Demand Response	Minimum	190	5,040	0.76	20
Pumped Storage	Minimum	4,043	367,920	2,022	183,960
Battery Storage	Minimum	8,664	52,560	289	1,752

Incremental Balancing Measures: Low Demand Case

	Increment	Total winter peak hour availability	Total annual availability	Winter peak hour availability	Annual availability
2015 Balancing Measures		*MMBtu*	*MMBtu*	*MMBtu*	*MMBtu*
Pipeline (long- and short-haul	Minimum	0	n/a	n/a	n/a
Winter Reliability Program	Minimum	29,434	29,434	1	150
Demand Response	Minimum	760	20,160	0.76	20
Pumped Storage	Minimum	0	n/a	n/a	n/a
Battery Storage	Minimum	289	52,560	289	52,560
2020 Balancing Measures					
Pipeline (long- and short-haul	Minimum	undetermined	undetermined	4,167	36,500,000
Winter Reliability Program	Minimum	0	n/a	n/a	n/a
Demand Response	Minimum	760	20,160	0.76	20
Pumped Storage	Minimum	4,043	367,920	2,022	183,960
Battery Storage	Minimum	1,444	52,560	289	10,512
2030 Balancing Measures					
Pipeline (long- and short-haul	Minimum	undetermined	undetermined	4,167	36,500,000
Winter Reliability Program	Minimum	0	n/a	n/a	n/a
Demand Response	Minimum	760	20,160	0.76	20
Pumped Storage	Minimum	4,043	367,920	2,022	183,960
Battery Storage	Minimum	8,664	52,560	289	1,752

47 Coffin found only one reference (at left) to DR in the explanatory spreadsheets provided after the December 18 meeting.[9] These data show DR virtually nonexistent in the base case and minimally increased in the low demand scenario—*with no growth in DR between 2015 and 2030.* 47 Coffin has seen no intelligible explanation of DR energy values and costs assumed for 2015, much less in outlying years.

Overall, the Analysis appears to be an energy supply analysis, relying primarily on suppliers' demand projections (apparently including their view of or their own activities concerning energy efficiency reductions), with some review of alternative supply sources beyond natural gas. This ostensible "Low Demand"

[8] Dec. 18 Slides at 64.

[9] Synapse Energy Economics, *Supply Curve Reference Gas,* sheet Balancing Measures, *available at* http://www.synapse-energy.com/sites/default/files/Supply%20Curve%20-%20Ref%20Gas.xlsm. This also appears in the Balancing Measures spreadsheet of the Gas Model, *available at* http://www.synapse-energy.com/sites/default/files/Gas%20Model.xlsx. Values for DR are simply plugged to spreadsheet cells, with no information as to their basis in fact or underlying assumptions.

Analysis contains little or no consideration of what consumers may prefer, intend, or realize in terms of their own demand reductions and load shaping through energy efficiency and demand response.

The treatment of DR in the data provided to stakeholders is confounding, particularly in view of the statement at the December 18 meeting, "We do include Winter Reliability Program; we include demand response; we've included all those considerations."[10] Similarly, the caveats dismissing aspects of DR appear in the context of the feasibility study and supply curve,[11] even though DR supposedly was, in this most recent iteration, removed from the feasibility study and supply curve and relocated to the capacity and demand balance assessment.[12]

Nothing in the materials released to date explains why, in the context of a low demand study, Massachusetts would support the premise that over the next decade and a half the Commonwealth—notwithstanding its impressive commitment to energy efficiency and recent adoption of demand response rate design policies—is unwilling or unable to use the same proven DR and demand side management tools that so many other jurisdictions and indeed, National Grid, have used with operational and economic success. This premise further assumes the failure of Massachusetts start-ups seeing significant potential for electric peak shaving.[13] 47 Coffin remains hopeful that this will become more clear in the final report to be issued in the upcoming days, and respectfully requests that the final report contain the first-page disclaimer identifying the extent to which it relies on a critical *assumption that the Commonwealth of Massachusetts is incapable or unwilling to deploy proven DR used successfully to reduce peak by hundreds and thousands of MW in states of comparable size and situation*.

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[10] John Carlton-Foss, Green Energy & Climate Change, *Video of 3rd Mass Gas Pipeline Meeting Released* (posted Dec. 19, 2014) at hour 1:53:23, *available at* https://www.youtube.com/watch?feature=player_embedded&v=3hU3N23kfcE#t=6803.
[11] Dec. 18 Slides at 64.
[12] Dec. 18 Slides at 27.
[13] *E.g.,* eCURV, *There is a better way* (accessed Dec. 20, 2014), *available at* http://www.ecurv.com/ (describing a digital network that seamlessly applies patented queuing algorithms to optimize the runtime of commercial/industrial appliances like HVAC systems, pumps, motors, battery chargers, heating and refrigeration equipment—and so avoid coincident peak usage).

47 Coffin thanks DOER and Synapse for their hard work, appreciates the opportunity to provide these comments, and concurs with other stakeholders who stress the need for clear caveats expressing the Analysis' limitations.

Respectfully submitted,

Elisa J. Grammer

47 Coffin Street Ratepayer Advocates
47 Coffin Street
West Newbury, MA 01985
703-855-5406
Email: Elisa.Grammer@PerennialMotion.com

APPENDIX A:
November 4, 2014 Comments of 47 Coffin Street Ratepayer Advisors

47 Coffin Street Ratepayer Advocates
47 Coffin Street
West Newbury, Massachusetts 01985
November 4, 2014

Ms. Meg Lusardi
Acting Commissioner
Massachusetts Department
of Energy Resources
By email

Dr. Elizabeth Stanton
Senior Economist
Synapse Energy Economics, Inc.

Re: Massachusetts DOER Low Gas Demand Analysis (RFR-ENE-2015-012)

Dear Acting Commissioner Lusardi, Dr. Stanton, *et al.,*

47 Coffin Street Ratepayer Advocates (47 Coffin)[1] commends the Department of Energy Resources (DOER) for engaging in the Low Gas Demand Analysis (Analysis), appreciates the work of Synapse Energy Economics in making this analysis happen in a very short time frame, and thanks them both for this opportunity to submit the following comments.

Briefly, 47 Coffin is concerned that the analysis to date fails to capture readily available and/or inevitable demand response (DR) opportunities to reduce winter peak electric demand. Specifically, the October 31 Feasibility Study relies on New England Independent System Operator (ISO-NE) forecasts to determine winter peak, and predicts only a potential DR capacity addition of 400 MW by 2015, with no further growth whatsoever through 2030, all at an annualized levelized cost of $500/MWh and net avoided cost of $373/MWh.[2] As discussed below, this analysis apparently disregards the proven potential for thousands of MW in capacity additions and peak shaving available through

> 1) **retail direct load control** in response to automatic utility dispatch (reported to have a potential as high as 2,620 MW in Florida alone[3] and **currently in use by National Grid in the UK for the express purpose of meeting this winter's peak power demands**[4]);

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[1] 47 Coffin comprises senior citizen, mostly retired, retail National Grid zone NEMA/Boston electric ratepayers residing at 47 Coffin Street, West Newbury, MA, which at the moment is .5 miles from the Merrimack River, about 10 miles from the Atlantic, and roughly 50 feet above sea level.

[2] Synapse Energy Economics, Inc., *Feasibility Study for Low Gas Demand* at 5, 21-22 (Oct. 31, 2014), *available at* http://synapse-energy.com/sites/default/files/Feasibility%20Study%20for%20Low%20Gas%20Demand%20Analysis.pdf [hereinafter Feasibility Study].

[3] Federal Energy Regulatory Comm'n (FERC) Staff, *2012 Assessment of Demand Response and Advanced Metering* at 28 (Dec. 2012), *available at* http://www.ferc.gov/legal/staff-reports/12-20-12-demand-response.pdf [hereinafter 2012 DR Assessment].

[4] Flexicitricity News Release, *Companies win contracts for reducing power demand: National Grid has contracted 319 MW of Demand Side Balancing Reserve (DSBR) across 431 individual sites, to be available this winter* (Sept. 23, 2014), *available at* http://www.flexitricity.com/news.php?section=10&newsid=126 ("Demand Side Balancing Reserve will enable large

Footnote continued

2) **voluntary load reduction** (used successfully in California to **shave some 700 MW in Southern California alone during cold weather winter electric peaks when natural gas supply constraints impacted power generation**[5]); and

3) **self-directed demand destruction and peak shaving** attributable to soaring power prices in the face of flat or falling overall demand. [6]

With respect, 47 Coffin disputes the Feasibility Study's assertion that DR is best assessed through the lens of wholesale centralized forward capacity markets (FCM) as opposed to retail demand side management (DSM),[7] voluntary load reduction and self-directed DR. New England's wholesale DR "markets" would be problematic even if they were not under continuous legal attack from energy suppliers,[8] if major wholesale demand-side players like Enernoc had not quit,[9] if the command-and-control FCM were not overtly non-competitive,[10] and if the critical DR "baseline"[11] were not an invitation to

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energy users to reduce their demand or run other sources of generation during peak periods in return for a payment. The service will be available for short periods between 1600hrs and 2000hrs on weekday evenings between November and February.")

[5] Caroline Aoyagi-Stom, Southern California Edison Co., *SCE Customers Help Save Almost 700 MW During Recent Flex Alert and Warning Triggered by CAISO* (Feb. 14, 2014), available at http://newsroom.edison.com/stories/sce-customers-help-save-almost-700-mw-during-recent-flex-alert-and-warning-triggered-by-caiso ("The Flex Alert and subsequent warning on Feb. 6 were called because of extreme cold weather in much of the United States and Canada impacting fuel supplies to power plants in Southern California, resulting in a reduction of electricity generation. As a result, SCE immediately asked all interruptible power use be suspended (mostly business customers, who have signed up for programs designed to temporarily suspend some of their electricity use).")

[6] *See, e.g.,* eCURV, *There is a better way* (accessed Nov. 1, 2014), *available at* http://www.ecurv.com/ (novel digital network that avoids coincident peak usage via patented queuing algorithms to optimize the runtime of commercial/industrial appliances like HVAC systems, pumps, motors, battery chargers, heating and refrigeration equipment).

[7] *Cf.* Synapse Energy Economics Inc., *Modeling Demand Response and Air Emissions in New England* at 6 (rev. Sept. 4, 2003) http://www.synapse-energy.com/sites/default/files/SynapseReport.2003-09.US-EPA.NE-DR-and-AE-Modeling.03-01.pdf ("We modeled . . . an economic DR program, one in which DR resources bid into the day-ahead [wholesale] energy market along with other supply-side resources and are dispatched based on their bids, just like supply-side resources. . . . . Under a reliability-based DR program, DR resources are dispatched based on a measure of system reliability or available reserves. . . . We chose to investigate . . . economic DR rather than emergency DR, because the impacts of economic DR are much more controversial and potentially much larger than those of emergency DR.")

[8] *Electric Power Supply Ass'n v. FERC*, 753 F.3d 216 (D.C. Cir. 2014), *mandate stayed,* No. 11-1486 (D.C. Cir. Oct. 20, 2014) (per curiam); *FirstEnergy Service Co. v. PJM,* FERC Docket No. EL14-55, Formal Complaint of FirstEnergy (May 23, 2014), *available at* http://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13554068, *amended,* Amended Complaint (Sept. 22, 2014), *available at* http://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13641870.

[9] Andrew Price, Competitive Energy Services Sr. VP, CES Energy Blog, *Enernoc Exits ISO New England Demand Response Program* (Mar. 29, 2013), *available at* http://www.competitive-energy.com/blog/energy-strategy/enernoc-exits-iso-new-england-demand-response-program

[10] *ISO New England Inc.,* FERC Docket No. ER14-1409, Explanatory Statement of FERC Chairman LeFleur (Sept. 16, 2014), *available at* http://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13638080 ("FCA 8 results in the NEMA/Boston capacity zone were 'non-competitive,' indicating that the level of participation in the auction was inadequate to satisfy the Installed Capacity Requirement….")

overconsume and thus depict a false demand reduction.[12] Centralized markets are by definition one-size-fits-all, generation-oriented constructs that preclude highly valuable, environmentally benign, low cost and readily available individualized DR services.[13] In California alone, a single user's 2,000+ MW of dispatchable synchronous water pumping loads—which prior to electric restructuring could contractually provide such sophisticated grid services as load following through complementary morning and evening ramping, voltage support, underfrequency load shedding and a Remedial Action System to address contingencies such forced outages of nuclear generation or major transmission—have no ISO "market."[14]

The Analysis' use of ISO-NE's CELT forecast[15] to determine winter peak electric demand, as well as its view of future DR potential, disregard or understate significant non-market, retail DR. 47 Coffin cannot follow the Feasibility Study's explanation, "There are many MW of demand response that occur outside of the markets that is triggered by expected monthly peak load hours which act as triggers for large cost allocations such as transmission costs and demand charges." [16] It is confident that whatever this refers to fails to include projected MW of DSM capacity. Reported DSM is currently virtually non-existent in New England[17] and thus would not have been, per the Feasibility Study, "already occurring on its own"

Footnote continued

[11] Synapse Energy Economics Inc., *Demand Response as a Power System Resource Program Designs, Performance, and Lessons Learned in the United States*, at 8 (May 2013) http://www.synapse-energy.com/sites/default/files/SynapseReport.2013-03.RAP_.US-Demand-Response.12-080.pdf ("Without feasible, trustworthy baselines, demand response will not succeed.")

[12] *E.g., Competitive Energy Services LLC,* 144 FERC ¶ 61,163 at Para. 3 (Aug. 2013) (imposing civil penalties relating to "a fraudulent scheme in connection with [ISO-New England's DR program], so that CES and Rumford would artificially inflate Rumford's customer baseline to enable Rumford and CES to receive compensation for demand response without Rumford intending to provide the service or actually having to reduce load.")

[13] *E.g., Cal. Indep. Sys. Operator Corp.*, 94 F.E.R.C. ¶ 61,266, at 61,926-27 (2001) ("DWR protests for the fourth time the ISO's continued failure to establish permanent rules that recognize that large dispatchable loads, such as DWR's, cannot be turned on and off every ten minutes. . . . DWR's continued request . . . is . . . a collateral attack on the Commission's previous order. . . .").

[14] *E.g., Cal. Indep. Sys. Operator Corp.*, FERC Docket No. ER02-1656, Comments and Protest of the California Department of Water Resources State Water Project (Nov. 12, 2002), *available at* http://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=9591689.

[15] Time constraints proscribe a detailed discussion of CELT methodology here. Suffice it to say that ISO-NE stakeholders who understandably welcome transmission expansion as a means of increasing rate base, may be expected to question or discount the value of customer action to reduce peak usage, *E.g.,* ICF International on behalf of Northeast Utilities, *Comments on ISONE's Draft Final Energy Efficiency Forecasts of Peak Demand Savings* (March 2012) *available at* http://www.iso-ne.com/committees/comm_wkgrps/othr/enrgy_effncy_frcst/mtrls/nu_icf_comments_ee_forecast.pdf

[16] Feasibility Study at 22.

[17] 2012 DR Assessment at 32, 99-101. National Grid's version of demand management in Massachusetts evidently focuses on non-dispatchable load control by the customer. *E.g.,* Metering International, *US utility National Grid has*

Footnote continued

and accordingly "captured in the current forecast of winter peak demand."[18] It would be a serious mistake for the Analysis to dismiss this kind of DR as a quaint artifact of the days of vertically integrated utilities.[19]

1) Tried and true, verifiable retail DSM DR should be included in the Analysis.

Retail DSM programs, in which an end-user receives a reduced rate in exchange for permitting its utility to remotely dispatch load adjustments by, for instance, cycling hot water heaters, electric heating and/or air conditioning,[20] provides substantial, proven advantages while avoiding all of the problems noted above with DR in wholesale markets. They can be integrated into ISO systems by, among other things, including them in the responsible utility's Demand Bids and load forecasting. Indeed, Connecticut Light & Power has recently proven it possible to implement such a DSM program with Walgreen's Distribution Center, representing over 1.7 MW within the confines of the ISO-NE system.[21] In 2013, this program was recognized for its operational success.[22]

Footnote continued

deployed a CEIVA Energy home energy management system (HEMs) as part of its Smart Energy Solutions Programme (Aug. 13, 2014), *available at* http://www.metering.com/national-grid-rolls-out-ceiva-solution-for-home-energy-management/ *See also* National Grid, *EMS- Existing Facility/Retrofit* (visited Nov. 1, 2014) *available at* https://www1.nationalgridus.com/MAEMSExisting ("Systems can be programmed to reflect occupancy levels, shift schedules, type of work performed, and other variables that affect the need for heating and cooling. EMS technology can be used to relax temperature set points when a building is unoccupied by alternating use of heating and air conditioning rather than turning the systems off completely.")

[18] Feasibility Study at 22.

[19] Synapse Energy Economics, *Demand Response as a Power System Resource Program Designs, Performance, and Lessons Learned in the United States*, at 9 (May 2013), *available at* http://www.synapse-energy.com/sites/default/files/SynapseReport.2013-03.RAP_.US-Demand-Response.12-080.pdf (describing DSM load control programs as "popular during the 1980s and 1990s," but rarely called upon, poorly dispatched and superseded by restructured wholesale markets).

[20] An example of Baltimore Gas & Electric's retail tariff for this dispatched load interruption may be found at https://www.bge.com/myaccount/billsrates/ratestariffs/electricservice/electric%20services%20rates%20and%20tariffs/rdr_15.pdf. *See also* FERC Staff, Demand Response and Advanced Metering at 25 (Oct. 2013), *available at* http://www.ferc.gov/legal/staff-reports/2013/oct-demand-response.pdf ("Utilities in Maryland have a goal of delivering 200 MW of demand response from dynamic pricing programs, in addition to approximately 700 MW from direct load control programs.")

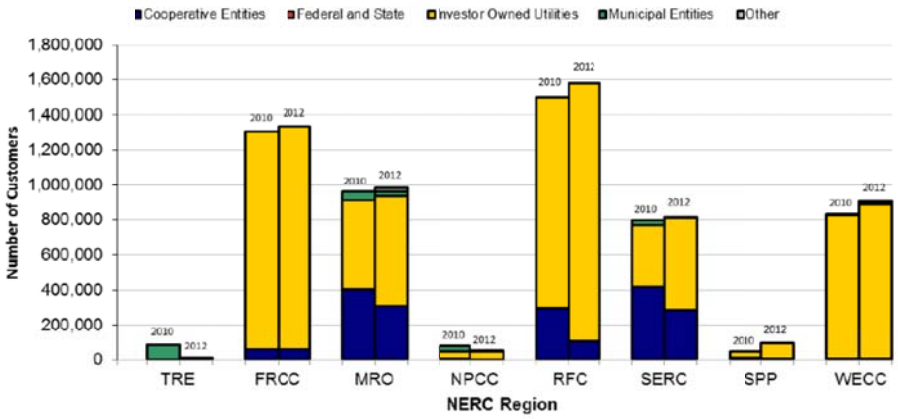
[21] Energize Connecticut, *Automated Demand Response Energy Efficiency Case Study: Walgreens Distribution Center, Windsor, CT*, *available at* http://www.cl-p.com/downloads/Walgreens.pdf?id=4294989252&dl=t ("Working with the Burton Energy Group and Conservation Resource Solutions (CRS), one of the ISO New England permitted data collection vendors . . . , CL&P program administrators developed the Automated Demand Response pilot for the largest per square foot building in Connecticut. . . . When ISO New England calls an event, a signal is sent to the Walgreens Distribution Center by CRS through the interface. Energy use at the Walgreens facility is monitored and heating, cooling, lighting systems and more are adjusted according to preprogrammed settings. When the event ends, a second signal is sent restoring the pre-event settings.")

[22] Christina Griffin, Windsor, CT, Patch, *Walgreens Distribution Center Wins Award for Energy Efficiency* (May 6, 2013), *available at* http://patch.com/connecticut/windsor/walgreens-distribution-center-wins-award-for-energy-efficiency.

a) New England should be able to quickly develop DSM participation levels at least comparable to Maryland (822 MW) or Minnesota (994 MW).

Across the country, DSM, also known as direct load control or DLC, is by far the most favored new demand response program planned by those responding to the Federal Energy Regulatory Commission's 2012 DR survey.[23] Florida alone reported over 2,500 MW of direct load potential peak reduction.[24] As early as 2004, Florida Power & Light's load management system used over 816,000 load-control transponders connecting more than 712,000 users, permitting sophisticated load shaping/peak management *and* providing a cost-effective alternative to additional gas-fired generation.[25] **In 2012, all New England states together reported 0 MW of DLC.**[26] New England—which with northeastern Canada is in the NPCC reliability region saved from last place only by Texas—has abundant room for growth in capturing this emission-free, low cost, peak shaving and load shaping.[27]

Figure 3-11. Reported number of customers enrolled in direct load control programs by region and type of entity in 2010 and 2012



	TRE	FRCC	MRO	NPCC	RFC	SERC	SPP	WECC	Other
Percent of total estimated customers in the region in a direct load control program	0.11%	14.54%	12.15%	0.25%	4.39%	2.28%	1.43%	3.09%	4.59%

If Massachusetts were to pursue DSM with the zeal that made the Commonwealth first in the nation in energy efficiency, the Analysis would need to include over 2,500 MW of this form of DR. More conservatively, it would appear reasonable for the Analysis to project that New England could within a

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[23] 2012 DR Assessment at 32.
[24] 2012 DR Assessment at at 28.
[25] Michael Andreolas, FPL, Transmission & Distribution World, Mega Load Management System Pays Dividends (Feb. 1, 2004), *available at* http://tdworld.com/distribution-management-systems/mega-load-management-system-pays-dividends ("From the operational point of view, FPL's load-management experience has been positive. The load-management program is an effective and reliable tool to reduce peak demand.")
[26] 2012 DR Assessment at 32, 99-101.
[27] *Id.* at 34.

short timeframe achieve at least comparable direct control DSM as that reported in 2012 by Maryland (822 MW) or Minnesota (994 MW).[28]

b) With appropriate mandates and guidance from the Commonwealth, National Grid should be able to draw on its experience in the UK to put into place a vibrant and highly effective DSM program.

Without question, consumer-owned municipal and cooperative utilities, whose interests in cost savings, peak shaving, and efficiency align directly with those of their customers, have shown leadership in DSM programs.[29] In Massachusetts, National Grid presents a more complex picture, simultaneously urging customers to take advantage of its incentive to switch to natural gas heating ("It's not often that you have the opportunity to improve productivity, while saving money. But clean, efficient natural gas does just that, and more!")[30] while blaming this winter's electric rate increase on natural gas insufficiencies ("[W]ith about half of New England's electricity generation now fueled by natural gas, electric commodity prices have risen due to continued constraints on the natural gas pipelines serving the region.")[31] In such circumstances, mandates and /or guidance from retail regulatory bodies and policy makers may be required to help align interests in cost savings, peak shaving, and overall energy efficiency.

With guidance from the Commonwealth placing emphasis on selling DSM in addition to natural gas heating, National Grid should be readily able to import its enthusiasm and expertise in DSM from England to New England. National Grid has also long used UK behind the meter standby generation and DSM as grid management resources.[32] In September in the UK, National Grid was quoted as "keen to promote and stimulate demand side services and will continue to talk to the industry to make the [winter peak shaving Demand

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[28] *Id.* at 28.
[29] A cursory collection of electric cooperative DSM programs can be found at:
http://www.piercepepin.com/content/load-management-0;
http://www.greatriverenergy.com/savingelectricity/loadmanagement/loadmanagementprograms.html ;
http://www.wildriceelectric.com/msp-load.html ;
http://central.coopwebbuilder2.com/sites/centralcentral/files/images/load-managment-programupdated-6-2013.pdf ;
http://www.riverlandenergy.com/content/load-management-program.
[30] National Grid US/MA, *Convert to Natural Gas: Boost Your Bottom Line with Natural Gas* (visited Nov. 1, 2014), *available at* https://www1.nationalgridus.com/ConvertToNaturalGas ("Our generous incentives make it easy to switch to natural gas heating.")
[31] National Grid US/MA, *Update on Winter Electric Supply Rates* (pop-up viewed Nov. 1, 21014), *available at* https://www1.nationalgridus.com/BilsAndPayments.
[32] David Andrews, Senior Technical Consultant, Biwater Energy, *National Grid's use of Emergency Diesel Standby Generator's in Dealing with Grid Intermittency and Variability Potential Contribution in Assisting Renewables* at 7-8 (Jan. 24, 2006), *available at* http://www.claverton-energy.com/wordpress/wp-content/files/ou-idgte-talk-load-managment-diesels.pdf

Side Balancing Reserve] DSBR product mutually beneficial."[33] Within the past week or so, National Grid described a DR program to meet winter peak demands notwithstanding serious contingency events concerning forced outages of key generators in the UK.[34]

c) Costs of retail DSM have been below costs for new generation capacity and have recently been estimated at between $51-$164/kW-year.

Costs, controversies, and delays associated with developing a Smart Grid have not impeded successful DSM programs throughout the nation. Florida Power & Light, a leader in this area with efforts beginning in the 1980s, determined that "that the economic costs of building and operating [new base-load power-generating equipment, such as combined cycle units] are at least 20% to 30% higher than the cost of installing and operating the DMS program."[35] This is not rocket science. The municipal power system in the Town of Apex, NC, provides load management switches on all new and remodeled home construction of $10,000 or more. It explains, "Load management switch devices allow the Town, via radio control, to temporarily turn off water heaters, electric heat strips, and air conditioning compressors on an intermittent basis. In doing so, the Town reduces the peak demand all across its service area. The more switches the Town has in place, the greater the impact of this peak-shaving program."[36]

While 47 Coffin is not in a position to price DSM in New England, such a program is likely to compare favorably with ISO-NE's FCM outcomes. Additional information about costs of direct load control is available from the many utilities and utility commissions throughout the nation and the world that have adopted it. Further, PacifiCorp, whose DMS penetration and experience is extensive (potentially increasing marginal costs of DSM additions), recently commissioned a detailed integrated resource study looking forward to 2032, which estimated DSM costs as follows:

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[33] Flexicitricity News Release, *Companies win contracts for reducing power demand: National Grid has contracted 319 MW of Demand Side Balancing Reserve (DSBR) across 431 individual sites, to be available this winter* (Sept. 23, 2014), *available at* http://www.flexitricity.com/news.php?section=10&newsid=126 (quoting National Grid's Peter Bingham).
[34] Nena Chestney, Reuters, *Fire closes UK power generation unit, squeezing electricity supply* (Oct. 20, 2014), *available at* http://uk.reuters.com/article/2014/10/20/uk-britain-fire-idUKKCN0I80VH20141020 ("Grid operator National Grid has announced precautionary measures to keep the lights on, including a scheme to encourage utilities to make idle capacity available and paying offices and factories for reducing electricity use to ensure supply to households.")
[35] Michael Andreolas, FPL, Transmission & Distribution World, Mega Load Management System Pays Dividends (Feb. 1, 2004), *available at* http://tdworld.com/distribution-management-systems/mega-load-management-system-pays-dividends.
[36] Town of Apex, NC, Load Management Program: *Want to save money on your Electric bill? Try Load Management!* (accessed Nov. 1, 2014), *available at* http://www.apexnc.org/services/public-works/electric-utilities-division/load-management-program.

> The irrigation DLC program is expected to be the least expensive program option, with levelized costs ranging from $51/kW-year to $64/kW-year. Per-unit resource costs for the nonresidential load curtailment program are estimated at $69/kW-year for both service territories (as events are assumed to be called on a system-wide basis). The residential DLC AC program exhibits levelized costs ranging from $72/kW-year in Utah to $164/kW-year in Idaho. The assumed per-switch kW impact drives this variation in cost, with these impacts highest in Utah (1 kW) and the lowest in Idaho (0.43 kW).[37]

2) Voluntary demand response of the sort California has achieved with the FlexAlert program should be included in the Analysis.

Another significant source of potential additional DR is a range of retail voluntary load curtailment programs currently in place throughout the country, but weakly represented, if at all, in New England. 47 Coffin cannot determine from the Feasibility Study whether ISO-NE's Operating Procedure No. 4 has been factored into the winter peak at the publicly noted 200-300 MW demand reduction in response to an ISO-NE Power Warning, or whether other values or additional non-market DR resources have been considered.[38] Opportunities for MW growth in the OP 4 program, which provides no public service announcements and "almost no outreach to increase awareness of these conservation appeals outside of the appeals themselves"[39] may be significant.

A model to consider is California's FlexAlert program. FlexAlert has been proven, in the nearly decade and a half since its inception during the Energy Crisis, to be a highly effective means of managing extreme peak demands, often providing 1,000 MW of peak shaving and at times more.[40] California's utilities, in coordination with the ISO and state agencies, operate FlexAlert, casting wide public awareness

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[37] The Cadmus Group, *Assessment of Long-Term, System-Wide Potential for Demand-Side and Other Supplemental Resources, 2013-2032* at 31(Mar. 2013) http://www.pacificorp.com/content/dam/pacificorp/doc/Energy_Sources/Demand_Side_Management/DSM_Potential_Study/PacifiCorp_DSMPotential_FINAL_Vol%20I.pdf .

[38] Research into Action, *Final Report: Process Evaluation of the 2013 Statewide Flex Alert Program* at 49 (May 2, 2014), *available at* http://www3.sce.com/sscc/law/dis/dbattach5e.nsf/0/74BA2E806FE19D4788257CED005C010C/$FILE/A1208007%20et%20al%20Statewide%20MEO%20Apps%20-%20SCE%20Flex%20Alert%20Final%20Report.pdf [hereinafter 2013 FlexAlert Evaluation].

[39] *Id.*

[40] Energy Upgrade California, *See the Impact of Flex Alert* (visited Nov. 1, 2014), *available at* https://www.energyupgradeca.org/en/save-energy/home/see-the-impact/see-the-impact-of-flex-alert ("History has shown that Californians respond when called to action and often generate savings of 1,000 megawatts — enough electricity to power 1 million households. In fact, July 1st and 2nd, 2013, a Flex Alert was called and many businesses, residents, local governments and organizations responded quickly, dropping their energy demand by thousands of megawatts.")

campaigns.[41] FlexAlert has mitigated not only summer peaks, but also peaking associated with cold weather winter demand when natural gas becomes constrained, adversely impacting gas-fired generation. In the Southern California Edison service area alone, FlexAlert provided nearly 700 MW in February, 2014.[42] Many industrial and commercial users are enthusiastic participants in FlexAlert, including Kinder Morgan Energy Partners, which was quoted as follows:

> "The incentives are very significant in managing electrical costs at Kinder Morgan, which also ultimately benefits all customers of refined petroleum products," says Joel Hvidsten, energy forecaster at the energy transport company.
>
> Kinder Morgan, like many other demand response participants, also takes pride in helping California avoid a repeat of the devastating energy crisis of 2000-2001. "Kinder Morgan understands it could not effectively operate its pipelines without reliable electrical power," Hvidsten observes. "Additionally, since many Kinder Morgan employees are residents of California, the power grid's reliability impacts both business and personal life."[43]

Indeed, National Grid already has implemented a voluntary, incentive-based load drop program for commercial/industrial entities with behind the meter generation in New York. This program is "used when the NYISO declares a system emergency. Companies enrolled in this program will receive a financial incentive if they can curtail at least 100 kW of electricity one hour after notification. Incentive payments will only be made to program participants if power use is actually curtailed."[44]

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[41] *See generally* 2013 FlexAlert Evaluation.

[42] Caroline Aoyagi-Stom, Southern California Edison Co., *SCE Customers Help Save Almost 700 MW During Recent Flex Alert and Warning Triggered by CAISO* (Feb. 14, 2014), available at http://newsroom.edison.com/stories/sce-customers-help-save-almost-700-mw-during-recent-flex-alert-and-warning-triggered-by-caiso ("Something happened recently that we don't normally see in Southern California during the colder, winter months: the California Independent System Operator issued a statewide Flex Alert asking consumers to immediately start conserving energy. . . . The warning . . . during the afternoon of Feb. 6, triggered Southern California Edison (SCE)'s demand response programs and enrolled customers to respond immediately. Their response made a critical contribution, helping to reduce energy usage by almost 700 megawatts, enough power to provide electricity to more than 35,000 homes.")

[43] Jonathan Marshall, Pacific Gas & Electric Co. Currents, *PG&E Customers Heed the Call to Conserve* (Aug. 17, 2012), *available at* http://www.pgecurrents.com/2012/08/17/pge-customers-heed-the-call-to-conserve/ ("Some 4,100 large business customers also cut back that day, chopping peak demand by 475 MW, equal to the output of a major natural gas-fired generator. One such customer is Kinder Morgan Energy Partners, which transports refined petroleum products over pipelines throughout California. It alone shed more than 10 MW of load on both August 9 and 10, by turning off large electric motors used to drive centrifugal pumps.")

[44] National Grid, *Energy Demand* (visited Nov. 1, 2014), *available at* http://www.nationalgridus.com/niagaramohawk/business/programs/4_emergency.asp.

Expansion of these programs into New England should be incorporated in the Analysis. Although recent research indicates even greater potential for this kind of voluntary demand response,[45] the Analysis can and should conservatively develop MW and cost projections from existing successful programs, including FlexAlert and other voluntary DR programs.

3) The Analysis should examine peak shaving and demand destruction attributable to steadily skyrocketing power costs.

Among the indisputable benefits of wholesale power market restructuring is the new-found opportunity to examine electric demand price elasticity in the face of relentless rate shock. Long term decreasing cost trends vexed such inquiries,[46] but ISO-NE wholesale markets are rapidly rectifying this problem. As of September 2014, National Grid residential rates, driven by wholesale market outcomes, had increased by almost 12% as compared to the same 2013 time period.[47] On November 1, 2014, residential rates increased 37% as compared to the same 2013 time period—and other customer classes are experiencing significantly higher increases.[48] Customers can count on continued price escalation in years ahead. ISO-NE's non-competitive FCM has produced capacity costs for 2017-18 that will almost *triple* 2013 levels, increasing to $3.05 billion.[49] According to consumer interests, New England customers look forward to an additional $180 million costs in the capacity commitment period beginning in June 2017,

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[45] Robert Walton, Utility Dive, *If you want customers to decrease energy consumption, just ask* (Oct. 27, 2014) *available at* http://www.utilitydive.com/news/if-you-want-customers-to-decrease-energy-consumption-just-ask/325736/.

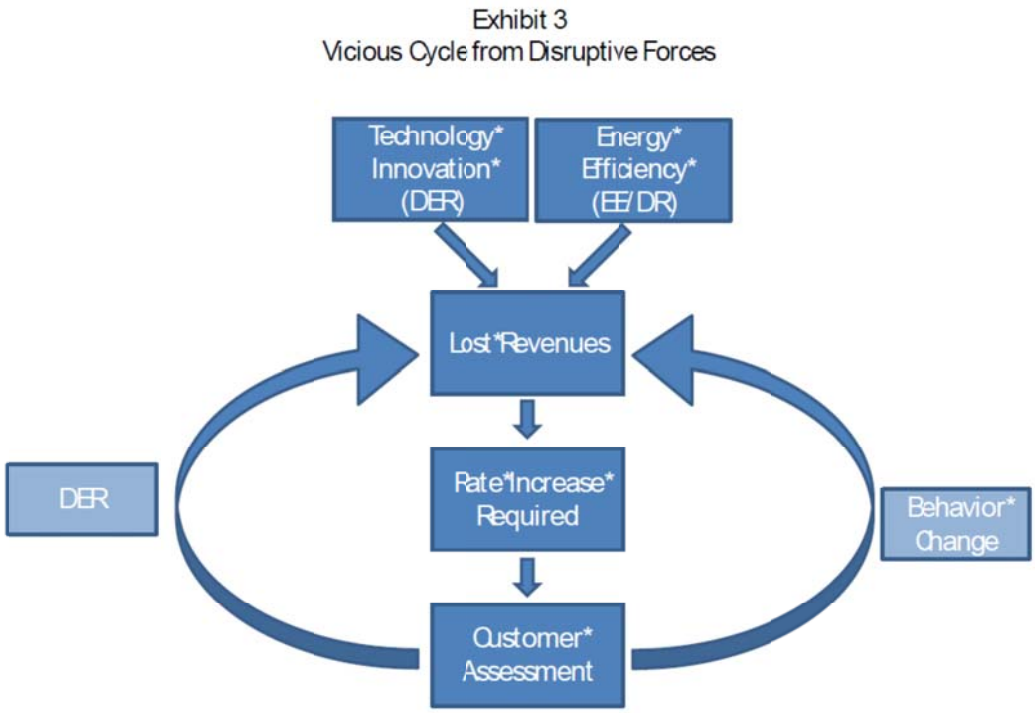
[46] *E.g.,* Mark A. Bernstein, James Griffin, Rand Infrastructure, Safety and Environment, *Regional Differences in the Price-Elasticity of Demand for Energy* (2005), *available at* http://www.rand.org/content/dam/rand/pubs/technical_reports/2005/RAND_TR292.pdf (Findings for prior periods showing price inelasticity "might imply that there are few options available to the consumer in response to changes in the price of energy, and that price does not respond much to changes in demand. On the other hand, because prices were declining in real terms over most of the period we studied, the inelasticity of demand may be more of an artifact of the lack of price increases.")

[47] US Dept of Energy, Energy Information Agency, *Residential Electricity Prices Are Rising* (Sept. 2, 2014), *available at* http://www.eia.gov/todayinenergy/detail.cfm?id=17791. ("The primary driver of the recent increase in New England retail rates was the sharp rise in wholesale power prices. For the first six months of 2014, the day-ahead wholesale power price in the ISO-New England control area averaged $93 per megawatthour, 45% higher than the average wholesale price during the same period last year. The increased cost of producing electricity in New England is evident in the 21% increase in the energy-only component of restructured retail suppliers' rates.")

[48] Robert Walton, Utility Dive, *National Grid customers to see 37% higher rates this winter* (Sept. 29, 2014), *available at* http://www.utilitydive.com/news/national-grid-customers-to-see-37-higher-rates-this-winter/314414/

[49] ISO New England Press Release, *Finalized Auction Results Confirm Slight Power System Resource Shortfall in 2017–2018* at 2 (Feb. 28, 2014), *available at* http://www.iso-ne.com/nwsiss/pr/2014/fca8_final_results_final_02282014.pdf.

with customers in the Northeastern MA/Boston zone bearing the greatest burden.[50] In a short time, New England power markets have produced incomparable motivation for high levels of self-help DR.[51]



Importantly, the Edison Electric Institute (EEI) posits that electric demand is remarkably price-sensitive. Expressed in terms of culprits comprising DR, DSM, and distributed energy resources (DER) the conclusion (diagrammed left) of a recent EEI-commissioned report is that demand reduction increases per unit rates as costs are shifted to fewer remaining customers, which then provokes spiraling demand reduction, spurring a "vicious cycle" (aka death spiral) of increasing demand destruction and ultimately stranded utility costs. [52] The same reasoning must logically apply when the rate increase triggering EEI's "Customer Assessment" that results in more DER or its DSM/DR "Behavior Change" is the utility industry's own kamikaze electric price increases in the face of flat or falling demand. 47 Coffin has found no evidence that this phenomenon has been included in ISO-NE's CELT forecasts, however.

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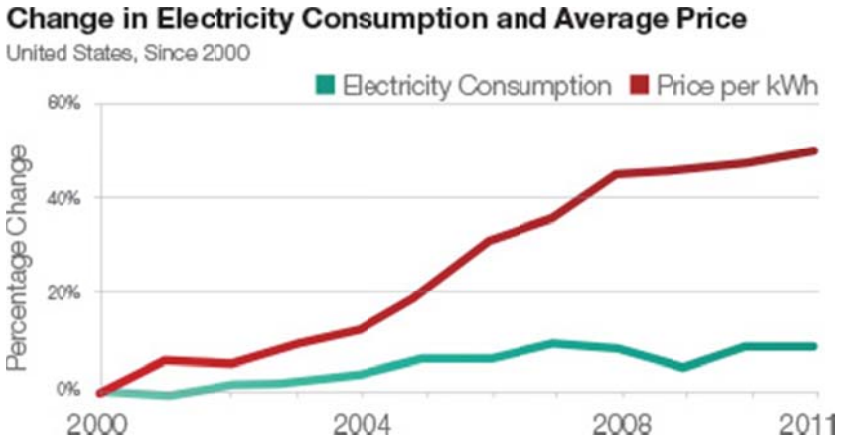
[50] *ISO New England Inc.,* FERC Docket No. ER14-1409, Joint Motion to Intervene, Motion Requesting Waiver, and Objection of Massachusetts Electric Co. *et al.* at 10 (Apr. 14, 2014), *available at* http://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13514034.

[51] By comparison, California's 2000-01 price fly up was unanticipated and contemporaneously paid for not by electric ratepayers but rather with state funds recouped through a $11.2 billion bond, whose repayment has been spread out in electric bills over many years. *See* Oscar Hidalgo, Cal. Dept. Water Res., DWR News, *DWR Keeps Power Flowing* (2006), *available at* http://www.cers.water.ca.gov/pdf_files/about_us/cers_history.pdf.

[52] Peter Kind, Energy Infrastructure Advocates, *Disruptive Challenges: Financial Implications and Strategic Responses to a Changing Retail Electric Business* (Jan. 2013), *available at* http://www.eei.org/ourissues/finance/documents/disruptivechallenges.pdf.

Commercial and industrial end users who do not relocate must be expected to undertake increasingly cost-effective self-help measures to mitigate ever-escalating New England rate hikes. SolarCity, for example, uses the chart at left to advertise its DemandLogic program. DemandLogic supplements solar installations with battery resources that enable a commercial/ industrial user to avoid consumption in evening peak periods. As of 2014, this program became available in the Connecticut Power & Light and NStar service areas.[53] eCURV, a Boston start-up, offers sophisticated network systems computing to provide self-driven load control that reduces demand charges by avoiding coincident peak usage.[54]



Over and above current ratepayer-funded energy efficiency and stretch building codes that appear to form the basis of the Feasibility Study's energy efficiency analysis,[55] New England's spectacular electric rate increases, known to continue through at least 2018 *even without the additional burden of natural gas pipeline costs*, are highly likely to promote load shifting, demand reduction, and ultimately the demand destruction cycle EEI describes. Spiraling load reduction and particularly load shifting in response to stunning, ongoing price spikes in New England electricity costs should also be considered in the Analysis. This kind of peak shaving may be "invisible" insofar as it may be neither utility- nor government-sponsored but rather self-driven and involve no subsidies. But it has very significant potential and can occur quite swiftly as power rates go up…and up. The Analysis could estimate MW potential and costs simply through calls to providers such as eCURV and SolarCity.

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[53] SolarCity, DemandLogic, *Start saving right away* (accessed Nov. 1. 2014), *available at* http://www.solarcity.com/commercial/demandlogic.

[54] eCURV, *There is a better way* (accessed Nov. 1, 2014), *available at* http://www.ecurv.com/ (describing a digital network that seamlessly applies patented queuing algorithms to optimize the runtime of commercial/industrial appliances like HVAC systems, pumps, motors, battery chargers, heating and refrigeration equipment).

[55] Feasibility Study at 22. It would also appear that expansion of the innovations in peak shaving only recently offered by eCURV and SolarCity also cannot be "already occurring on its own" and thus "captured in the current forecast of winter peak demand." *Id.*

In summary, a review of established, successful electric DR outside of New England—and outside of centralized ISO wholesale markets—reveals thousands of MW of untapped retail DR potential that should be taken into account in the Low Gas Demand Analysis. 47 Coffin thanks DOER and Synapse for their work, appreciates the opportunity to provide these comments, and would be happy to answer questions or provide additional information.

Respectfully submitted,

Elisa J. Grammer

47 Coffin Street Ratepayer Advocates
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Email: Elisa.Grammer@PerennialMotion.com

From: deb
To: Lowdemandstudy, (ENE)
Subject: Low Demand Gas Study Comments
Date: Monday, December 22, 2014 11:21:16 AM

To the DOER and Synapse,

Re: Low demand gas study:

Thank you for the opportunity to respond to the December 18th stakeholder meeting to review the results of the low demand study modelling efforts.

The study is a good start of the conversation but by no means should be the basis for any decisions regarding gas pipeline capacity expansion or adding new electric transmission lines from Canada.

1) First and foremost of the eight scenarios modeled, none of the eight even met the Global Warming Solutions Act targets for either 2020 or extrapolated out for 2030. Even the most optimistic scenario came in at 2% deficit and that assumes that the other sectors (buildings/transportation) meet or beat their target reductions as well which is more challenging and expensive than the electricity sector. Whatever the eventual plan is, it must conform to Massachusetts law and meet the goals of the GWSA as a starting point, not as a consequence of that plan. Global warming must be the driver, not an afterthought, as the inputs in this modelling effort.

2) Demand response must be considered as a factor in shaving peaks and reducing the supply constraints in the worst cold snaps when supply is most severely constrained.

3) Price impacts of gas exports must be factored in as the domestic price of gas will eventually be influenced by the world price once export facilities come on line. Whether they are in Maryland, Massachusetts or the Gulf is immaterial. The global price will then dictate the domestic gas prices and that will make many of the "economically infeasible" technologies listed in the red section of the first slide now economically viable options.

4) Price suppression effects of wind and solar in the wholesale markets must be considered as it lowers ratepayers costs now that the ISO-NE is for the first time allowing renewables to bid into the wholesale auction and is accepting negative hourly prices.

5) Cost of additional natural gas storage facilities to meet the shortfall for the 12 day peak winter cold snap was not shown as a viable option.

6) Study is state specific, not regional, yet the solution is regional by nature and needs to run as a regional model to make any sense in the real world.

7) Solar PV is currently severely constrained by net metering caps and managed growth allocations in Massachusetts. Together with offshore wind this could conceivably be required to add over 4000 MW of capacity by 2030 to offset some of the retiring generation assets with out adding to emissions.

8) LNG pricing is directly related to oil costs which have dropped dramatically over recent months and LNG storage facilities should be considered for improving reliability and avoiding the forecasted winter price spikes of natural gas from the constrained pipelines in the short years of 2020-2022.

Sincerely,

Deborah Katz
Executive Director
Citizens Awareness Network
P.O. Box 83
Shelburne Falls, MA 01370
413-339-5781
deb@nukebusters.org

From:	Pat Larson
To:	Lowdemandstudy, (ENE); Lusardi, Meg (ENE)
Subject:	Comments on Low Demand Scenario Study
Date:	Monday, December 22, 2014 11:20:11 AM

To: Meg Lusardi – Department of Energy Resources and Members of Low Demand Study Team

Although I have not studied all the information from the Low Demand Study that was presented to stakeholders on December 18, 2014, I do have a few general comments.
First in the opening slide and on the Synapse website the purpose of the study is stated to be the following: "Consider various solutions to address Massachusetts' short and long-term energy needs, taking into account greenhouse gas reductions, economic costs and benefits, and system reliability."

But in later parts of the December 18th presentation by Synapse they state that they do not assume various models will be in compliance with the Global Warming Solutions Act. Thus it is my feeling that many things are left out of this study which could show that we do not need the amount of natural gas in Massachusetts that is suggested by the study. For example new energy efficiency programs which include moving to LED lighting, providing incentives for weatherization, more energy efficient machines and determining the role that renewables play in a low-demand scenario could show that we need less natural gas.
Also listening to people who attended the stakeholder meetings it appears that Synapse relied on ISO data for predicted electricity generation needs. Many people feel that Synapse should release where it obtained data on predicted electricity demand, because the ISO New England predictions have not been close to actual usage and the amount of error has been increasing in recent years. In 2011 the ISO prediction was 4.7% higher than actual and in 2014 the ISO prediction is almost 10% higher than actual electric demand.
I understand that Synapse had a very short period of time for completing the study, but we need a study that makes sure that we do not head in the wrong direction with an over-reliance on natural gas to generate electricity in this state and back track on the forward progress we have made in this state in terms of energy efficiency. We need to work to be in compliance with the Global Warming Solutions Act and decrease our carbon footprint now. Thank you.
Patricia Larson - plarson24@hotmail.com
173 Athol Road, Orange, MA 01364

From:	Carolyn Britt
To:	Lowdemandstudy, (ENE)
Subject:	Comments on LDS
Date:	Monday, December 22, 2014 11:33:17 AM

In addition to the comments already provided by others involved with the Stakeholder interests in the Low Demand Study, I offer the following two points:

Economics of Investment in Energy Systems:

The presenter of the study at the Stakeholder meetings often used the term "cost to Massachusetts" when discussing the cost table showing the pipeline costs as the zero point, with some potential options either costing more or costing less. The energy technologies were arrayed as if they were in a store on a shelf, and that "Massachusetts" would walk into the store and purchase one option. My issue is that the "cost to Massachusetts" are actually costs vs. revenue or returns, ie investment decisions, that are made by a wide variety of actors. These actors include home-owners, owners of commercial buildings, municipal utilities, developers, investor-owned utilities, etc. While these Massachusetts actors take into consideration some of the cost of installation identified in the study (including incentives), they also factor in their own particular situation and what investment makes sense to them. These individual situations can make certain investments make economic sense when the study has identified that they don't. MA residents/taxpayers don't make an individual decision to buy a pipeline or some of the other industrial scale options. Other commenters have noted clearly that in addition to underestimating investment choices in renewables, the study has left out significant costs of some of the industrial options, most specifically a pipeline carrying fracked gas and all the huge costs associated with that.

Least Cost Option:

Missing from the shelf at the energy technology store noted above, was a program to educate and incentivize users of electricity powered by gas and direct users of gas to vary their time of use to flatten the peak so that Massachusetts need not buy the pipeline or any other energy technology to meet the peak winter demand. I can not imagine why this was not included as it makes so much sense.

Thank you for your consideration.
Carolyn Britt

--
Carolyn Britt, AICP
Community Investment Associates
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(978) 317-2145 (cell)
(978) 356-9881

From:	Stanzione, James
To:	Lowdemandstudy, (ENE)
Cc:	Stanzione, James; Vaughn, John V.; Holodak Jr, James G.; Arangio, Elizabeth C. (Marketing); Brennan, Timothy J.; Blazewicz, Stanley J.; LaRusso, Anthony; Paravalos, Mary Ellen (US); Martin, Tim (US); Allocca, John E. (Marketing); Leippert, Mark J. (Marketing); Mc Cauley, Stephen A. (Marketing)
Subject:	National Grid Comments -- Synapse Economics DOER low demand analysis
Date:	Monday, December 22, 2014 12:06:48 PM

December 22, 2014

Mr. Farhad Aminpour
Director, Energy Markets Division
Massachusetts Department of Energy Resources
100 Cambridge Street, Suite 1020
Boston, MA 02114

DOER low demand study

National Grid (Ngrid) appreciates the opportunity to participate and provide comments on the Synapse low demand study modeling results prepared for the Massachusetts Department of Energy Resource's (DOER's) .

The modeling results as presented by Synapse on December 18, 2014 in Boston, indicate that the economic chose in serving gas and electric customers through 2030 in Massachusetts requires increased gas pipeline capacity as reflected in the base case and in all scenario cases. These results are consistent with other studies which have been done modeling the infrastructure constraints in the New England Region and its impact on reliability and customer energy costs. By not eliminating the infrastructure constraints in the New England Region consumers will face billions of dollars of increased energy costs and reliability concerns into the future.

As noted the low demand analysis has only modeled the Massachusetts gas and electric demand which results in the need for 0.6 billion cubic feet per day (Bcf/d) to
1.1 Bcf/d of new pipeline capacity in Massachusetts only. This does not reflect the New England Region need for added pipeline capacity which is far greater. It should be noted Massachusetts equals approximately 50% of the total annual natural gas consumption in New England, and 43% of total regional gas consumption in the power generation sector, therefore the total regional natural gas pipeline capacity demand would be far greater than the needed incremental pipeline capacity as identified by Synapse modeling in the low demand study.

In addition, It is our understanding that the potential for significant system contingency occurrences in the winter peak hour, such as a forced outage of an existing nuclear unit or a sudden loss of energy imports over a tie with neighboring control area , were not modeled in this analysis. As a result, the analysis may be severely underestimating the potential natural gas supply/demand imbalance during the winter peak hour and the associated reliability risks and potential economic harm to the region.

Also Ngrid will note that the analysis reflects a heavy dependence on LNG world cargo deliveries which may be a concern in meeting future New England energy needs.
Thank you and please let me know if you have any questions.

Sincerely,

James A. Stanzione

James A. Stanzione
U.S. Regulation and Pricing
Director of Federal Gas Regulatory Policy
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Tel: 929 324 4597
Cell: 646 660 2290
Fax: 718 596 7802
Email: james.stanzione@us.ngrid.com

From:	Stephen Leahy
To:	Lowdemandstudy, (ENE)
Subject:	NGA comments on low demand analysis modeling results
Date:	Monday, December 22, 2014 12:07:47 PM
Attachments:	NGA letter to MA DOER on low demand study modeling, 12-22-14.pdf

Dear Farhad:

Attached please find the comments of the Northeast Gas Association (NGA) regarding the modeling results associated with the Department's "low demand analysis" as presented by Synapse Energy Economics on December 18 to the stakeholder group meeting in Boston.

Thank you and best wishes for the holidays and new year.

Regards,
Steve

Stephen Leahy
Northeast Gas Association (NGA)
Tel. 781-455-6800, x. 111
leahy@northeastgas.org

Northeast GAS ASSOCIATION

December 22, 2014

Mr. Farhad Aminpour
Director, Energy Markets Division
Massachusetts Department of Energy Resources
100 Cambridge Street, Suite 1020
Boston, MA 02114

Re: DOER's Low-Demand Gas Study

Dear Mr. Aminpour:

The Northeast Gas Association (NGA) appreciates the opportunity to provide comments on the modeling results prepared by Synapse Energy Economics, Inc. for the Massachusetts Department of Energy Resource's (DOER's) low demand analysis.

The modeling results as presented by Synapse in its presentation to the stakeholder group in Boston on December 18 indicate that the Commonwealth requires increases in gas pipeline capacity in the base case and in all scenario cases. These results are consistent with the natural gas industry experiences in recent years, as the pipelines into Massachusetts continue to encounter consistent capacity constraints and as the Commonwealth's natural gas utilities experience growing demand. In addition, by not having additional capacity, Massachusetts consumers will face billions of dollars of costs under some of the more likely scenarios.

Our comments on the Synapse presentation of the December 18 modeling results follow.

Confirmation of Need for Gas Pipeline Capacity in Massachusetts under All Scenarios:
The information displayed on pages 27 and 28 of the December 18 presentation identifies preliminary peak hour natural gas shortages in the Commonwealth for both 2020 and 2030, under all scenarios analyzed by Synapse. The capacity need as identified by Synapse ranges from 0.6 billion cubic feet per day (Bcf/d) to 1.1 Bcf/d. It should be noted that these requirements apply to Massachusetts alone. Massachusetts currently equals 50% of the total annual natural gas consumption in New England, and 43% of total regional gas consumption in the power generation sector, so the total regional natural gas capacity demand would be even greater than the needed incremental pipeline capacity as identified by Synapse.

LDC Growth Rates:
In earlier comments in this process, we noted that the larger Massachusetts local natural gas distribution companies (LDCs) were updating their growth forecasts following the very cold winter of 2013-14, to reflect growing peak and system demand. The LDCs are experiencing higher conversion numbers and also incorporating some capacity exempt customers under the guidance of the MA Department of Public Utilities (DPU).

The LDC gas demand numbers should reflect these new market conditions, and the three largest utilities in the Commonwealth – Columbia Gas of MA, National Grid, and NSTAR/NU – did submit updated growth forecasts to MA DOER for this study. It is our understanding that the updated utility forecasts have been utilized by Synapse in this modeling, but we are still uncertain as to the definition of the design day number beyond five years, and would welcome clarification on that point.

Reliability Analysis and Contingencies:
System reliability is one of the key criteria to be addressed in this study, along with greenhouse gas reductions and economic costs and benefits. In the modeling analysis, we are unclear as to whether alternative energy options were fully tested for reliability, such as the loss of a large generator under peak day conditions. Some of the options identified as alternatives to natural gas would likely not be fully available on a peak winter day, such as some renewables. It would be useful to test the reliability criteria for all options for design winter conditions.

Positive Impact of Natural Gas on Emissions:
The emissions charts associated with various fuels are helpful in terms of understanding rates of compliance with the state's Global Warming Solutions Act. One issue not reflected, we feel, is the positive impact of natural gas on air emissions in terms of displacing what otherwise "might have been" had gas not displaced such fossil fuels as coal and oil on the regional power system.

NGA thanks DOER for consideration of our comments and for the opportunity to participate in the stakeholder sessions.

Sincerely,

Stephen Leahy
Vice President, Policy

From: Claire Chang
To: Lowdemandstudy, (ENE)
Subject: Low Demand Gas Study Comments
Date: Monday, December 22, 2014 12:12:47 PM

To whom it may concern:

We would like to repeat the concerns and issues raised in this letter commenting on the Low Demand Study.

Thank you for your time and consideration.

Claire Chang
John Ward

Solar Store of Greenfield
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413-772-3122
claire@solarstoreofgreenfield.com
john@solarstoreofgreenfield.com
<!--[if !supportEmptyParas]-->

To the DOER and Synapse regarding the low demand gas study:

Thank you for the opportunity to respond to the December 18th stakeholder meeting to review the results of the low demand study modeling efforts. Given the limited time available for providing comments, my responses are limited to my personal opinions rather than organizations that I belong to such as MassSolar or E2 (Environmental Entrepreneurs). Three and a half days (including a weekend during the holiday season) do not allow for a full group review and group authored response.

Nevertheless, this study is too important to ignore and to not point out the flaws in the study would be folly for the Commonwealth to adopt its recommendations without fully appreciating the caveats that completely invalidate the study's conclusions.

The study is a good start of the conversation but by no means should be the basis for any decisions regarding gas pipeline capacity expansion or adding new electric transmission lines from Canada.

1) First and foremost of the eight scenarios modeled, none of the eight even met the Global Warming Solutions Act targets for either 2020 or extrapolated out for 2030. Even the most optimistic scenario came in at 2% deficit and that assumes that the other sectors (buildings/transportation) meet or beat their target reductions as well which is more challenging and expensive than the electricity sector. Whatever the eventual plan is, it must conform to Massachusetts law and meet the goals of the GWSA as a starting point, not as a

consequence of that plan. Global warming must be the driver, not an afterthought, as the inputs in this modeling effort.

2) Demand response must be considered as a factor in shaving peaks and reducing the supply constraints in the worst cold snaps when supply is most severely constrained.

3) Price impacts of gas exports must be factored in as the domestic price of gas will eventually be influenced by the world price once export facilities come on line. Whether they are in Maryland, Massachusetts or the Gulf is immaterial. The global price will then dictate the domestic gas prices and that will make many of the "economically infeasible" technologies listed in the red section of the first slide now economically viable options.

4) Price suppression effects of wind and solar in the wholesale markets must be considered as it lowers ratepayers costs now that the ISO-NE is for the first time allowing renewables to bid into the wholesale auction and is accepting negative hourly prices.

5) Cost of additional natural gas storage facilities to meet the shortfall for the 12 day peak winter cold snap was not shown as a viable option.

6) Study is state specific, not regional, yet the solution is regional by nature and needs to run as a regional model to make any sense in the real world.

7) Solar PV is currently severely constrained by net metering caps and managed growth allocations in Massachusetts. Together with offshore wind this could conceivably be required to add over 4000 MW of capacity by 2030 to offset some of the retiring generation assets with out adding to emissions.

8) LNG pricing is directly related to oil costs which have dropped dramatically over recent months and LNG storage facilities should be considered for improving reliability and avoiding the forecasted winter price spikes of natural gas from the constrained pipelines in the short years of 2020-2022.

Respectfully,

Haskell Werlin

Director of Business Development
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From:	Polly Ryan
To:	Lowdemandstudy, (ENE)
Subject:	Polly Ryan"s comments to December 18th Low-Demand Study meeting
Date:	Monday, December 22, 2014 12:13:49 PM
Attachments:	DOER comment_Polly Ryan.docx

Dear members of the Low Demand Study Team;

Attached, please find comments I'd like filed and posted to your December 18th meeting.

Thank you,
Polly Ryan

December 22, 2014

To the Acting Commissioner, Dept. of Energy Resources, Meg Lusardi and members of the Low Demand Study Team:

As a resident of Massachusetts and a citizen of the United States I am a direct stakeholder in this study in that I paid for it. I am also a stakeholder in the sense that the proposed New England Energy Direct project will impact my life directly as the NED pipeline is proposed to go through my property and a compressor station may be my neighbor.

I am sorely disappointed in the Synapse Study. It is so full of caveats' it does not do justice to what can be "real case" practical and technically accurate scenarios! I do not feel I got my money's worth given that the major proposals put forth for the intent of this study were caveated ***as italicized and BOLDED below;***

- To determine, ***GIVEN UPDATED SUPPLY DEMAND ASSUMPTIONS,*** whether or not new gas infrastructure is required.
- If so, ***how to OPTIMIZE for ENVIRONMENTAL, RELIABILITY, and COST considerations.***
- Considering ***ALL*** energy resources, which resources offer the greatest net benefit when assessing for reliability needs, cost savings and ***REDUCING ENVIRONMETAL EFFECTS INCLUDING LOWER GHG EMISSIONS!***
- In combination, how far can ***(ALL)*** these ***ALTERNATIVE RESOURCES*** go in replacing retiring generation capacity

I am not an energy expert, but I did listen to the December 18th meeting on YouTube and have heard and read submitted comments. I strongly agree with the comments submitted by nofrackedgasinmass.org (aka Rose Wessel) as indicated below;

- You missed the boat in terms the intent for the study by excluding (caveating) ***ALL energy resource*** considerations like solar and wind power generation that would have rendered your models to be **more compliant with the Global Warming Solutions Act**.
- The study does not consider ***UPDATED SUPPLY DEMAND ASSUMPTIONS*** in that it hasn't taken into account the recent drop in oil and LNG prices.
- Methane ***IS*** rated by the IPCC to have 34 times the climate change impact of CO_2 over their first 100 years in the atmosphere and 86 times more over their first 20 years. Why even waste any of my tax dollars if your intent is to promote energy policies that will accelerate us to the ***tipping point of global warming (the point of no return)*** and result in eventual and inevitable annihilation of our species???
- Assuming optimal pipeline use only during peak demand, 80% full capacity and, that the gas is for domestic use only is hugely erroneous. FERC has already permitted 2 export stations and has dockets in place for 18 more export stations wanting to be permitted along the East coast so they can handle excess gas ***NOT needed for our New England States*** and transport it overseas resulting in our ***New England Prices being raised!*** REALLY??? That's cost savings? Whose might I ask?

There are ***"real case" practical and technically accurate scenarios*** that are not even considered in this study, like Distrigas resolving peak demand constraints simply by importing 2 ½ to 3 extra tankers of gas per year or, considering the storage of more LNG and, factoring in ***ALL*** renewable resources that aren't just subsidized or part of energy programs!

I agree with Rose Wessel's statement that your study is skewed toward answering the question of ***"How much more pipeline is needed?"*** because all the factors that could have reflected on the question ***"Is the pipeline needed"*** were caveated!

I also would like Governor Patrick to put regulations in place mandating the GWSA (intended to be in place in 2012) that will establish desired levels of declining annual aggregate emission limits for sources that emit greenhouse gases.

I am a single parent who built her own house on a "***technically"*** borderline poverty level income. I have lived in my home, sanctuary, for over 25 years. My real concern is for my children and grandchildren, who all live with me. Our home will be situated a football field away from the NED pipeline. Should an accident occur, we will all be instantly annihilated. Our small town does not have resources to deal with such an accident. If this "scenario" is caveated, then we may instead endure a slower and more painful death from breathing the toxic fumes from an 80,000 horse power compressor station a mile away which will "off gas" endocrine disrupting, carcinogenic and neurotoxic volatile chemicals all of which are documented to be found in fracked gas. Your study's intent is not purposed to evaluate these considerations but it is why stakeholders who drafted its' original intent asked you to conduct this study!

I am being asked to sacrifice my home through eminent domain for the "greater good". Just what is that greater good and exactly whom does it benefit I wonder? I personally would pay a higher utility rate for the few days the market demands than put the lives of my children and grandchildren in danger. How about that scenario? New York just banned any drilling of fracked of gas in their state. That decision was based on real research and scientific facts in a study conducted over years not months. Perhaps the DOER might benefit from their example and their holistic approach. Consider the type of report you'd like to have conducted if it impacted your children or grandchildren directly.

Sincerely,

Polly Ryan
11 Windsor Avenue
Plainfield, MA 01070

From:	Fred Unger
To:	Lowdemandstudy, (ENE)
Subject:	Low Demand Gas Study
Date:	Monday, December 22, 2014 12:24:20 PM
Attachments:	CLF Comments on NESCOE IGER Proposal 5 30 14.pdf

Dear Commissioner Lusardi,

I would like to suggest that facts and suggestions offered in the attached May letter provided to New England States Committee on Electricity by the Conservation Law Foundation be considered by your the Low Demand Study effort regarding natural gas supplies.

It is disturbing that solutions being discussed by governmental agencies across New England seem focussed on solutions that would effectively subsidize natural gas pipelines and generators and thus distort the market based mechanisms that the New England wholesale electricity markets are designed to operate under. It appears that the primary constraints on the gas supply could be fully met by rule changes currently being considered at FERC to better coordinate the rules and timing of the day ahead wholesale electricity market in New England with the markets for gas supplies which that market depends on. It seems that that between the steps that FERC is currently undertaking and opportunities to better utilize existing gas pipeline and storage capacity, we should be able to meet the demands of the market until renewables, conservation and demand response eliminate the need for new natural gas capacity altogether.

According to the CLF letter:

“Several studies have confirmed that these basis spikes are not the result of fully subscribed pipelines, but instead, begin to occur at roughly 75% of subscribed pipeline capacity. One of the reasons for the spikes that occur on the system beginning at this level is the fact that “most natural gas –fired power generation capacity in New England is not supported by firm transportation contracts on natural gas pipelines.” Although the pipelines are fully subscribed, they are not actually being fully utilized even at time of peak demands. As described more fully below, CLF and others have proposed market refinements and new services that would create more opportunities for intra-day and short term releases, greater liquidity and transparency, and incremental expansion of existing pipelines (which is already occurring, largely due to the market signals created by the basis differential). Such options, further described below, would resolve the basis differential without saddling ratepayers with billions in debt and without building continued over-reliance on natural gas into the system.”

“The issue of natural gas deliverability is not new, but the region’s increased reliance on natural gas for electric generation is a relatively new wrinkle. For the past two years, CLF has been advocating for market refinements and new services that would address the natural gas deliverability issues facing New England without requiring significant, new greenfield projects to be put in place. In March, the Federal Energy Regulatory Commission (“FERC”) issued a Notice of Proposed Rulemaking to address the coordination of the scheduling process of interstate natural gas pipelines and public utilities. FERC also issued an order opening an investigation into better coordination of the electric day ahead market and the gas day to facilitate more transparency regarding fuel availability. In addition, FERC opened an investigation into requiring interstate pipelines to revise their tariffs to provide for posting of offers to purchase released (unscheduled) capacity which would increase liquidity. CLF is also pursuing market reforms through proceedings at the North American Energy Standards Board (“NAESB”) to further increase liquidity and transparency in natural gas markets. Unfortunately, none of the states has been as actively engaged in seeking and expediting market solutions to the basis problem.”

“These market reforms, when coupled with the impacts that the Algonquin Incremental Market (“AIM”) project is already having on basis would provide New England with the time that it needs to continue retiring outdated oil and coal capacity while building new, clean resources and ramping up energy efficiency and storage to achieve the climate mandates that each state has embraced as necessary to preserving New England and protecting its residents. Such a set of solutions may include reliance upon LNG supplies and the buildout of incremental projects such as the AIM project and the Iroquois Constitution project, but these solutions could be implemented without abandoning the market principles

that have guided New England since the early 2000s, and they could be done in a far more cost effective manner. For example, ICF estimated that additional LNG spot supplies could be purchased for $14.50-15.50/MMBtu as compared to a cost of $16-20/MMBtu for a greenfield pipeline."

"The key calculation to be made, before determining the proper course of action, is that of anticipated need – that calculation must reflect the unfolding and expandable impact of efficiency efforts by the states – and the potential that market reforms being developed by FERC and at NAESB will lead to greater liquidity and gas availability"

I am hopeful that both the current and new administrations will favor market based solutions to addressing the issues impacting gas supplies. I appreciate your consideration of these thoughts and suggest that you confer with the folks at CLF who prepared the attached letter.

Thank you very much,

Fred Unger

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clf
conservation law foundation

For a thriving New England

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May 30, 2014

Via Electronic Mail
Heather Hunt
Executive Director
New England States Committee on Electricity
655 Longmeadow Street
Longmeadow, MA 01106
RegionalInfrastructure@nescoe.com

Re: Comments on Governors' Infrastructure Initiative in New England – Incremental Gas for Electric Reliability ("IGER") Concept and Electric Distribution Companies Proposal ("EDC") for Management of Pipeline Capacity

Dear Ms. Hunt:

Conservation Law Foundation ("CLF") appreciates this opportunity to provide comments on the Governor's Infrastructure Initiative as outlined in recent documents presented to the New England Power Pool ("NEPOOL"). CLF has long advocated for developing transparent, well-coordinated, and effective market structures to ensure a reliable energy system that recognizes the need for accurate price formation and facilitates the transformation of the system as necessary to retire outdated, uneconomic sources and to develop new resources that are compatible with the clean energy and climate policies and programs established by each of the states in the New England region. Experience has proven what CLF and others accurately predicted: that the most cost-effective resource that we can invest in is energy efficiency.[1] Over time, the electric energy efficiency programs that were pioneered in the era of restructuring the electric markets have been embraced by ISO-NE, and integrated into wholesale markets, as a reliable, quantifiable resource that has resulted in millions of dollars worth of savings in deferred transmission investments alone,[2] in addition to the significant direct benefits to ratepayers in the form of reduced bills and reduced pollution.[3] Such investments have shown themselves to be

[1]Conservation Law Foundation, Conservation Services Group and New England Energy Policy Council, *Power to Spare: A Plan for Increasing New England's Competitiveness through Energy Efficiency* (1987); Dep't of Energy Resources, *Energy Efficiency in Massachusetts: Our First Fuel*, available at http://www.mass.gov/eea/docs/doer/energy-efficiency/ee-story-booklet-web.pdf; ISO-NE, *2013 Regional Energy Outlook*, at 27 (approximating that energy efficiency resulted in a savings of $260 million by deferring the need for transmission upgrades) available at http://www.iso-ne.com/aboutiso/fin/annl_reports/2000/2013_reo.pdf.
[2]ISO-NE, 2013 *Regional Energy Outlook*, at 27.
[3]A detailed analysis of the "avoided energy costs" attributable to energy efficiency programs in New England is available in the *Avoided Energy Supply Costs in New England: 2013 Report*, prepared by Synapse Energy Economics, available at http://www.synapse-energy.com/Downloads/SynapseReport.2013-07.AESC.AESC-2013.13-029-Report.pdf. In Massachusetts, for example, the Energy Efficiency Advisory Report to the legislature estimated over $5 billion in benefits to Massachusetts business and residents from the energy efficiency programs. *Staying on Top: Energy Efficiency Continues to Deliver Benefits to Massachusetts Residents and Businesses*, The

From:	EBroadbent
To:	Lowdemandstudy, (ENE)
Cc:	james.eldridge@masenate.gov; Jennifer Benson; Capone, Lisa (ENE)
Subject:	Comments on the Synapse Low Demand Study
Date:	Monday, December 22, 2014 12:44:30 PM

Dear Commissioner Lusardi,

as one of the representatives of the town of Harvard that has participated in the Green Communities Program, I have continuously been impressed with the forward thinking policy-making aspects of the program and of other DOER-sponsored programs on behalf of the Clean Energy Center, such as Solarize Mass, the Residential Solar Loan Program, and support for Community Shared Solar.

These programs all reflect a willingness at the policy level to *"transform the market"*, language used directly in published program materials. Indeed, market transformations are going to be required if we are to both meet our energy demands and meet the legal obligations mandated in the Global Warming Solutions Act, which is a fundamental and formal recognition that energy and climate are inextricably linked and solutions for either one must involve solutions for the other - i.e. they are the same solutions.

Given all the past and present policy and program developments from your offices and those of other state agencies, it is with considerable dismay that I observed a departurre from this kind of thinking embodied in the revisions to the Synapse Low-Demand Study that were made during the postponement interim periods this month. *What happened*?

In several key areas, the scope of the study was narrowed from what was requested in the RFP and presented at previous stakeholder meetings. What remained constant throughout the revision was the suggested economics and feasibllity of the pipeline, in spite of considerable price instability, potential for cost overruns, and major environmental consequences. It is narrow-minded — and in my view, only does service to the pipeline case, to remove the mitigating effects of continual advances in building codes, energy efficiency measures, LNG imports, increased adoption of solar and wind beyond current program goals, and finally, to acknowledge that none of the scenarios studied meet the GWSA requirements.

These scope revisions were posed as a result of your office's judgement of what is "*practically and technically feasible*" given current programs. That is an attitude and approach that was not taken in Green Community programs and policies under your tenure, which I have wholeheartedly supported and stand in admiration of. Again I must ask: *what happened during this postponement interim to alter and limit the approach*?

As a Green Community, the town and residents of Harvard have benefitted from DOER programs in many ways, as have many others across the state. Recently, the Harvard Solar Gardens completed phase II of a total of 524kW of locally-sourced renewably generated electricity, serving roughly 100 residents and businesses in Harvard and across our WCMA load zone. As you know, this project would not have happened if it were not for DOER programs and continued forward-thinking policy decisions. This was not an easy project, but the idea of community-shared solar is compelling enough to push the project to completion through many major

difficulties. As you are also aware, the future potential of community-shared solar in MA is huge and can completely change the 'balance of power' in our state such that distributed generation can becomes a major contributor to our state's energy requirements, but only if forward-thinking policies are put in place; most notably the dispatching of distributed storage and AMI solutions such as time-of-use metering. These are some of the keys to the future of clean energy and decreased reliance on fossil fuels, with further benefits of increased investment in Massachussets' economy, expanded infrastructure jobs, lower energy prices, and lower GHG emissions.

In one of two articles published in Commonwealth Magazine (*references noted below*), Gordon Van Welie of ISO-NE makes the case that our increasing reliance on natural gas has left the state and the region vulnerable to the capacity and cost constraints of a single resource:

"*It's evident that generating electricity with natural gas has its benefits. But becoming heavily reliant on just one fuel poses challenges to the long-term stability of the power system.*" (from *http://www.commonwealthmagazine.org/Voices/Perspective/2012/Summer/001-Natural-gas-Good-news-and-bad-news.aspx*)

This heavy reliance on natural gas coupled with inevitiable price spikes from the spot-market demand bidding system - have resulted in a major policy and public relations push to advance the case for new natural gas pipelines, and has brought us NESCOE and its B&V Low-Demand Scenario, and strong advocacy for the pipeline on behalf of the business community (AIM, PowerOptions, etc.), mostly based on constrained assumptions about the economics of cheaper natural gas. Nowhere is there an acknowledgement that much of the planned capacity is destined for export where it will fetch much higher prices than New England customers are accustomed to, and will ultimately be subject to as a new floor is established. Also absent from these arguments is the recogniition of the environmental and climate effects of the sources of this fuel: hydraulic fracturing, and the attendant methane leaks. Any studies or recommendations on new energy infrastructure must take these into account, and yet the studies undertaken to provide us with comparative economics put no price on these long-term effects, and either discount or ignore the positve environmental impacts of renewable energy generation.

In an earlier article, Mr. Van Welie makes reference to a previous study that indicated our current gas system will suffer "*no shortfall*" in meeting our needs through 2017, and then goes on to address meeting future demand by investing in alternative measures:

"*NEW ENGLAND HAS tremendous potential to develop native wind power. In addition, opportunities abound to import clean energy from hydro, wind, and even potential nuclear sources in Canada. But the region will need to undertake an extensive expansion of the power grid to ensure these new resources can be fully deployed. This will require a large, upfront investment in resources, infrastructure, and technology—investment to build the wind farms that will produce the power, investment to expand the transmission system that will deliver it to consumers, and investment in new technologies to foster implementation of a smart grid so that system operators can integrate renewable energy reliably while giving consumers greater control over their electricity use.*" (from *http://www.commonwealthmagazine.org/Voices/Perspective/2010/Energy-environment/Catching-the-wind.aspx*)

Finally, Mr. Welie posed an all-important queestion:

"*Are New England consumers willing to pay more in the short-to-medium run for potential longer-term economic and environmental benefits?*"

This last question gets to the core issue we have before us, and NESCOE - with DOER's guidance, has provided us with the alternative scenario:

"*... or are we instead willing to pay more in the short-to medium run for a natural gas pipeline and more dependence on fossil fuel?*"

This second part of the question regarding the pipeline appears to be the only choice before us now, and that is a fatal flaw in the current process. Instead, all stakeholders must ask and answer the larger question:

"*Are New England consumers willing to invest in new renewable energy infrastructure incorporating multiple sources that can meet our electricity demands as well as decreasing use of fossil fuel and consequent GHG emissions, or are they instead willing to invest in new fossil fuel infrastruture that increases our reliance on a single source?*"

The answer to *this* question must determine our next investments in energy infrastructure, instead of a narrowly drawn study that excludes many of the most important potential solutions to our energy and climate problems, as the current Synapse Low Demand Study has become. Instead, with the questions and answers limted to what is "**practical and feasible**" given current programs, the essential question has been swept aside, doing a disservice to all in the Commonwealth.

After many years of participating in the public discussion on many levels about energy, it is my firm belief that if the broader question is posed to all stakeholders, the results would be overwhelmingly in favor of clean energy investment. Withour such a discussion, the DOER and other decison-making bodies are advancing a dangerous and short-sighted process that will reach a pre-determined result that locks us in to many more years of reliance on a hazardous fuel source, at great expense to all and immense profits to a select few.

Respectfully yours - and with great admiration and appreciation for your past work as head of the Green Communities Division,

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Lisa Capone - Acting Director - DOER Green Communities Division

particularly effective in reducing peak demands on the system that would otherwise necessitate new electric transmission infrastructure.[4]

Yet, now, in the face of natural gas deliverability constraints on the system, the New England Governors, acting through NESCOE, appear to have largely overlooked the role for energy efficiency and market reforms as more well-tailored and cost-effective tools for dealing with incremental capacity issues. These solutions are especially effective in dealing with a capacity issue that is as limited in time and scope as the "basis differential" problem that primarily presents itself in needle peaks during the winter heating season. Nonetheless, the NESCOE proposal has focused on securing additional firm pipeline capacity in an amount of 1000 mmcf/day above 2013 levels as the primary solution with very little attention to the implications of such additional capacity on the climate mandates and policies of the states in addition to the resolutions between the New England Governors and the Canadian provinces.[5] Therefore, CLF's comments focus on the need to examine other solutions such as market reforms and energy efficiency, the potential market distortions that may already have been caused by NESCOE's and Maine's proposed out-of-market solutions, and to the extent that NESCOE determines to move forward with such a proposal despite its drawbacks, the need to limit and mitigate the economic and environmental impacts of any effort to socialize the costs of new fossil fuel infrastructure on the backs of electric customers.[6]

The Problem

CLF agrees that the increased reliance on natural gas for power generation in the past few years has contributed to episodic basis spikes during periods of peak demand on the system in recent winters. CLF also recognizes that the shift to natural gas for power generation has, in some

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2012 Report of the Massachusetts Energy Efficiency Advisory Council (November 2013) available at http://www.mass.gov/eea/docs/doer/energy-efficiency/ma-advisory-council-2012-report.pdf.

[4]ISO-NE, *2013 Regional Energy Outlook*, *supra* note 2.

[5]Massachusetts established mandates to reduce greenhouse gas emissions by 25% below 1990 levels by 2020 and at least 80% below 1990 levels by 2050 through the Global Warming Solutions Act, St. 2008, c. 298, codified in part as M.G.L. c. 21N; Connecticut established greenhouse gas reduction mandates of at least 10% below 1990 levels by 2020 and at least 80% below 2001 levels by 2050 in Conn. Gen. Stat. § 22a-200a; Maine established greenhouse gas reduction goals of 10% below 1990 levels by 2020 and long term reductions of 75% to 80% below 2003 levels at 38 Maine Rev. Stat. § 576; Vermont established greenhouse gas reduction goals of 25% below 1990 levels by 2012, 50% below 1990 levels by 2028, and 75% below 1990 levels by 2050. 10 Vt. Stat. § 578; New Hampshire's Climate Action Plan recommended goals of 20% below 1990 levels by 2025 and 80% below 1990 levels by 2050, available at http://des.nh.gov/organization/divisions/air/tsb/tps/climate/action_plan/documents/nhcap_xsum.pdf; The New England Governors and Eastern Canadian Premiers ("NEG/ECP") established a Climate Action Plan in 2001 that recommended a long-term greenhouse gas reduction goal of 75% to 85% below 2001 levels. New England Governors/Eastern Canadian Premiers, Climate Action Plan 2001 (August 2001) available at http://negc.org/uploads/file/Reports/ClimateChangeAP%5B1%5D.pdf; The NEG/ECP reaffirmed their commitment to reducing greenhouse gas emissions in Resolution 36-3, available at http://negc.org/uploads/file/NEG-ECP%20Resolutions/NEG-ECP%20Rresolution%2036-3.pdf.

[6] Although NESCOE asserts that it has been "open" to receiving stakeholder comments throughout the development of its proposal to increase natural gas and electric transmission infrastructure, the fact is that NESCOE and its managers have focused their "outreach" primarily on industry stakeholders (such as natural gas pipeline owners, marketers, local distribution companies, or large industrial customers who stand to benefit most from spreading the costs of such infrastructure) in closed-door meetings rather than an open public process to inform and engage the vast majority of residential customers who will actually bear the largest proportion of the costs of this proposal.

measure, facilitated the retirement of aging, out-dated, and uneconomic coal and oil units. This reduced reliance on coal and oil has had significant, positive impacts on air quality in the region by resulting in substantially lower emissions of sulfur dioxide and particulate matter.[7] In addition, to the extent that natural gas has displaced coal and oil units, it has also resulted in reduced carbon dioxide emissions from the stack.[8] However, the solutions proposed by NESCOE as represented in the Black & Veatch study, fail to acknowledge (1) that the basis problem is not solely the result of physical constraints on the pipeline system; (2) that a set of market reforms, increased natural gas energy efficiency, and more efficient utilization of existing supply would lay the groundwork for far more cost-effective solutions; and (3) that passing the costs of a massive new greenfield pipeline on to customers is likely to result in overbuilding long-lived fossil fuel infrastructure that is incompatible with the climate policies of the New England states and ultimately results in stranded costs.

The Basis Problem is Limited in Scope and Duration such that a Cross-Regional Pipeline is Unlikely to Be the Most Cost-Effective Solution

Depending on the study and the particular scenario, episodic basis spikes are expected to occur between 18-60 days a year.[9] Over the past three years, price spikes have been limited to a period of between 10 to 27 days a year.[10] However, the duration of these spikes is extremely short, and results in "needle spikes" early in the morning hours and in the evening hours when demands for gas-fired space heating compete with demands for electric generation. While these spikes may extend through the day on extremely cold days, for the most part, it is the simultaneous pull of supply during these two peaks that drives the basis differential. That means that the need for additional capacity is limited to very specific portions of the day and to a limited number of days of the year. While additional pipeline capacity is one means to meet the demand created by such peaks, it is unlikely to be either the cost effective or compatible with the greenhouse gas reduction requirements that most New England states agree are necessary to mitigate climate change. For example, the Black & Veatch report indicated an extremely low transportation rate for a new cross-regional pipeline with a capacity of 1.2 Bcf/day, but that rate assumes that 100% of the capacity is contracted,[11] an assumption that is extremely unlikely given that the existing needle peaks on the system only occur for portions of up to 27 days or a few full days of the

[7]Sulfur dioxide emissions have fallen 92% from 2001-2012. *See* ISO-NE, *2012 ISO-NE Electric Generator Air Emissions Report* at 20 (January 2014) available at http://www.iso-ne.com/committees/comm_wkgrps/prtcpnts_comm/eag/mtrls/2014/mar52014/2012_emissions_report.pdf.

[8]Carbon dioxide rates have only fallen by 21% in the same time frame. *Id*. However, the overall impact of fuel switching from coal and oil to natural gas is largely dependent upon how much methane is lost from wellhead to burner tip. Recent peer reviewed studies have indicated that unless the total leakage rate is less than 3%, natural gas may actually have a higher greenhouse gas emissions footprint than coal. Alvarez, R.A., et al., *Greater focus needed on methane leakage from natural gas infrastructure*. Proc. Natl. Acad. Sci. USA 109:6435-6440. (2012) doi: 10.1073/pnas.1202407109; Howarth, et al., *A bridge to nowhere: methane emissions and the greenhouse gas footprint of natural gas*. Energy Sci. Eng. (May 21, 2014) doi: 10.1002/ese3.35.

[9] ICF, *Assessment of New England's Natural Gas Pipeline Capacity to Satisfy Short and Near- Term Electric Generation Needs: Phase II, Draft Report*, submitted to ISO-NE, at 39 (December 16, 2013); Black & Veatch, *New England Natural Gas Infrastructure and Electric Generation: Constraints and Solutions, Phase II*, prepared for NESCOE, at 1, April 16, 2013 [hereinafter Phase II]. ICF, *Options for Serving New England Natural Gas Demand*, prepared for GDF Suez, 4 (October 22, 2013).

[10] Black & Veatch, *Phase II* at 6.

[11] Black & Veatch, *Phase III* at 11.

year. Even with such rosy assumptions about the transportation rate, the Black & Veatch study concluded that an investment in such a pipeline would incur economic losses from the capital investments during the first six years of the pipeline's operation and admitted that the costs could easily turn out to be more than double the estimate.[12]

Moreover, several studies have confirmed that these basis spikes are not the result of fully subscribed pipelines, but instead, begin to occur at roughly 75% of subscribed pipeline capacity.[13] One of the reasons for the spikes that occur on the system beginning at this level is the fact that "most natural gas –fired power generation capacity in New England is not supported by firm transportation contracts on natural gas pipelines."[14] Although the pipelines are fully subscribed, they are not actually being fully utilized even at time of peak demands. As described more fully below, CLF and others have proposed market refinements and new services that would create more opportunities for intra-day and short term releases, greater liquidity and transparency, and incremental expansion of existing pipelines (which is already occurring, largely due to the market signals created by the basis differential). Such options, further described below, would resolve the basis differential without saddling ratepayers with billions in debt and without building continued over-reliance on natural gas into the system.[15]

Tailored, Blended Solutions are More Cost Effective

The Black & Veatch study explained that "solutions must be tailored, and when appropriate blended, to solve the type of constraints expected to occur," and yet, the study called for a solution that is clearly not tailored to address the needle spikes that New England has experienced but rather appears to be designed to ensure continued and expanded use of natural gas for decades more. The proposal by NESCOE ignores more targeted, cost-effective and available solutions to the crisis that New England faces, and it does so at the peril of the economic and public health interests of its residents.

The issue of natural gas deliverability is not new, but the region's increased reliance on natural gas for electric generation is a relatively new wrinkle. For the past two years, CLF has been advocating for market refinements and new services that would address the natural gas deliverability issues facing New England without requiring significant, new greenfield projects to be put in place. In March, the Federal Energy Regulatory Commission ("FERC") issued a Notice of Proposed Rulemaking to address the coordination of the scheduling process of

[12]Black & Veatch explained that "it must be noted that the transportation rates offered by this pipeline could greatly exceed this estimate. Even if construction cost overruns are not experienced, lower-than-anticipated capacity subscription could lead to significant increased in the per-unit rate. For example, the per-unit rate would double if the pipeline capacity is only 50% subscribed." *Phase III* at 34.
[13]Black & Veatch, *Phase II* at 1.
[14]Black & Veatch, *Phase III* at 8.
[15]Similar risks may attend the companion large-scale infrastructure proposal that NESCOE is pursuing—its forthcoming solicitation for gigawatts of north-south transmission capacity. According to Black & Veatch, large-scale transmission projects for hydropower imports would result in economic losses to New England customers through the 2022 timeframe in much the same way as a cross-regional pipeline project. Black & Veatch, Phase III at 45. Moreover, given recent winter experiences of constrained imports over existing ties during Canadian winter peak periods, which coincide with New England needle peak constraints, such transmission projects will not meaningfully address winter basis differentials unless such projects facilitate import of firm power products, which would likely come at a premium to average market rates.

interstate natural gas pipelines and public utilities. FERC also issued an order opening an investigation into better coordination of the electric day ahead market and the gas day to facilitate more transparency regarding fuel availability. In addition, FERC opened an investigation into requiring interstate pipelines to revise their tariffs to provide for posting of offers to purchase released (unscheduled) capacity which would increase liquidity. CLF is also pursuing market reforms through proceedings at the North American Energy Standards Board ("NAESB") to further increase liquidity and transparency in natural gas markets.[16] Unfortunately, none of the states has been as actively engaged in seeking and expediting market solutions to the basis problem. In addition to these market refinements, CLF also proposed a winter reliability solution for the 2013-2014 winter that would have allowed LNG supplies to compete with oil capacity.[17] Such a solution would have reduced air pollution and cost less than the solution that was ultimate adopted by ISO-NE, but ISO-NE and others in the market have expressed an interest in maintaining the price volatility of natural gas in order to support the construction of new pipelines.[18]

These market reforms, when coupled with the impacts that the Algonquin Incremental Market ("AIM") project is already having on basis would provide New England with the time that it needs to continue retiring outdated oil and coal capacity while building new, clean resources and ramping up energy efficiency and storage to achieve the climate mandates that each state has embraced as necessary to preserving New England and protecting its residents. Such a set of solutions may include reliance upon LNG supplies and the buildout of incremental projects such as the AIM project and the Iroquois Constitution project, but these solutions could be implemented without abandoning the market principles that have guided New England since the early 2000s, and they could be done in a far more cost effective manner. For example, ICF estimated that additional LNG spot supplies could be purchased for $14.50-15.50/MMBtu as compared to a cost of $16-20/MMBtu for a greenfield pipeline.[19]

The key calculation to be made, before determining the proper course of action, is that of anticipated need–that calculation must reflect the unfolding and expandable impact of efficiency efforts by the states–and the potential that market reforms being developed by FERC and at NAESB will lead to greater liquidity and gas availability, among other factors. Instead, NESCOE did not even consider the potential impacts of these pending market reforms,[20] nor did the Black & Veatch study provide any analysis of the potential for natural gas energy efficiency or other

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[16] For a more detailed description of these proposed market refinements see http://www.naesb.org/pdf4/geh042214clf_skipping_stone.pdf.

[17] CLF's proposal is available on the ISO-NE website at http://www.iso-ne.com/key_projects/win_relblty_sol/mc_mtrls/ and is entitled *A2.2 CLF Winter 2013/2014 Reliability Solution Proposal.*

[18] As one gas pipeline owner astutely explained in its comments on the ISO-NE proposed 2013-2014 winter reliability solution, ISO-NE explicitly chose to rely solely on oil, knowing that it would result in higher electricity costs because it was concerned that:

> an ISO solution [that] reduced the opportunity costs priced into the gas market during a time of high gas demand, . . . would lower gas prices and send the wrong signal about the relative scarcity of natural gas. These lower prices would also be reflected in the electricity market.

FERC docket ER13-1851, Motion to Intervene and Comments of Algonquin Gas Transmission, LLC and Maritimes and Northeast Pipeline, L.L.C., 3 (quoting ISO-NE filing at 7) (July 19, 2013).

[19] ICF, *Options for Serving New England Natural Gas Demand* at 20.

[20] *Phase II* at 25.

methods to reduce the demand for natural gas supplies.[21] Instead, Black & Veatch simply acknowledged that under the "Low Demand" scenario, no new infrastructure would be needed.[22] For some reason, NESCOE did not ask Black & Veatch to consider whether implementing measures to achieve the "Low Demand Scenario" would be cost effective or how it would compare to the other solutions from a cost-benefit standpoint.[23]

The IGER Proposal is far more risky than NESCOE has Indicated

NESCOE has understated the significant risks that electric customers will be exposed to if an Integrated Gas for Electric Reliability ("IGER") proposal moves forward. In its analysis, Black & Veatch was extremely careful to explain that its conclusions were highly dependent upon the assumptions that it made:

> While Black & Veatch believes that such assumptions and methodologies as summarized in this report are reasonable and appropriate for the purpose for which they are used; depending upon conditions, events and circumstances that actually occur but are unknown at this time, actual results may materially differ from those projected.

Phase III at 7. Among the many assumptions that Black & Veatch relied upon, several are likely to be proven wrong. For example, several pipeline owners have already noted that the costs of a proposed greenfield pipeline was significantly understated, the study assumed no additional regulations on hydraulic fracturing (including the use of water and disposal of wastewater) even though multiple states are moving forward with regulation,[24] and the study's estimation of potential benefits from subsidizing a cross-regional pipeline did not reflect the real possibility that domestic and global natural gas prices will converge,[25] leading to increased LNG imports (using existing terminals) especially during the peak period of concern during the winter.

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[21] Notably, the benefit-cost ratio established by Black & Veatch for the cross-regional pipeline is 1.67. This benefit-cost ratio is far lower than some of the benefit-cost ratios for natural gas energy efficiency programs in Massachusetts. *See* Statewide Cost-Effectiveness Tables, Gas, Cost-Effectiveness by Initiative (showing benefit-cost ratios ranging from 1.61 to 6.46) available at http://www.ma-eeac.org/Three%20Year%20Plans.html. Moreover, though ICF concluded that demand-side management could not play a significant role in reducing natural gas demand in New England, that study only considered the savings from existing electric energy efficiency programs and did not review recent analyses of potential for natural gas energy efficiency in the region. In 2012, the consultants to the Massachusetts Energy Efficiency Advisory Council estimated that there was the potential for natural gas energy efficiency measures to reduce load by 1.4%-6.4% annually even though the current programs only target a little over 1%. Preliminary Assessment of Potential, Massachusetts EEAC Consultant Team, at 3 (April 13, 2012).

[22] *Phase III* at 62.

[23] Ben D'Antonio, NESCOE staff, NECA Presentation re Gas-Electric Study Phase III, at 33 (September 26, 2013) noting that "No long-term infrastructure solutions are necessary under the Low Demand Scenario; The costs of measures that could bring about the Low Demand Scenario, an additional alternative, would require study."

[24] Jennifer Oldham, Bloomberg, Colorado First State to Clamp Down on Fracking Methane Pollution (February 23, 2014) available at http://www.bloomberg.com/news/2014-02-24/colorado-first-state-to-clamp-down-on-fracking-methane-pollution.html; Ryan Koronowski, Climate Progress, Breaking Down the New Proposed Fracking Rules Released in Illinois and California (November 16, 2013) available at http://thinkprogress.org/climate/2013/11/16/2956011/proposed-fracking-rules-illinois-california/.

[25] Platts Energy, *Interview: US, Australia LNG Exports to promote price convergence:Moniz*, available at http://www.platts.com/latest-news/natural-gas/rome/interview-us-australia-lng-exports-to-promote-26784758

A critical flaw with the IGER model is its failure to provide for efficient price formation so that generators and/or other consumers of gas supplied by a pipeline expansion reflect the true gas supply and infrastructure costs, including the transportation rate imposed to fund the construction of new pipeline capacity. In effect, IGER would allocate the costs in the first instance upon New England Retail Electric Customers without accurately passing those costs on to generators and secondary market consumers that would be using and benefitting from the additional natural gas supplies to generate power. In other words, IGER would essentially subsidize the use of natural gas by electric generators thereby altering the generators' marginal costs and reference pricing. Such an outcome is the embodiment of market manipulation by intentionally upsetting, if not discarding altogether, the price signals upon which the wholesale electric market design relies upon to function efficiently. As a result, IGER will violate the underpinnings of standard market design which is constructed upon a foundation of sending accurate price signals and allocation of cost through cost causation principles. This creates a real question of whether such a proposal could meet the legal standards for a FERC-approved tariff.

Further, the cost-effectiveness of the construction of such a pipeline depends upon a vision of the future of the region as becoming even more dependent on natural gas even though for decades the states and ISO-NE have emphasized the importance of fuel diversity to reliability.[26] As we face additional retirements of our aging infrastructure, the choices that we make now will shape the energy landscape for the next 40 years. Now is the time for New England to invest in a new kind of fuel diversity that relies less and less on centralized fossil fuel plants and more and more on renewable generation, efficiency, energy storage, and limited natural gas where necessary for firming. The IGER will not only lock us in to decades more of fossil fuel dependence, but it will do so at substantial economic risk to customers.

Finally, from a climate perspective, it is clear that the IGER proposal will do nothing to advance the greenhouse gas reduction mandates and policies of the New England states. None of the studies conducted for NESCOE by Black & Veatch nor the studies conducted by ICF for ISO-NE even attempted to quantify the potential greenhouse gas emissions impacts of the construction of a massive new greenfield natural gas pipeline on the policies and mandates that have been adopted by virtually every New England state. This is especially concerning given the recent scholarship relating to the methane emissions from natural gas on a life cycle basis. A robust greenhouse gas emissions analysis should have been conducted for each of the proposed alternatives.

Conclusion

Based upon the data and the analysis of the current causes of natural gas deliverability issues in New England, CLF recommends that NESCOE abandon the IGER approach and prioritize compensation and incentives for increased use of existing infrastructure first and incremental expansion of gas import capacity second and explain how such steps have been fully exhausted before turning to expensive and long-lived infrastructure. NESCOE should also engage a consultant to conduct region wide analyses of natural gas energy efficiency potential to

[26] *See* ISO-NE, *Strategic Planning Problem Statement* (February 2011) available at http://www.iso-ne.com/committees/comm_wkgrps/strategic_planning_discussion/materials/problem_statement.pdf.

determine whether the same types of programs that have so successfully deferred the need for new electric transmission could be deployed to defer the need for new natural gas transmission while delivering local benefits and local jobs.

NESCOE's decision to send signals to the market indicating that a state subsidized solution was at hand may have already resulted in negative impacts on incremental projects that have been proposed, and NESCOE should be mindful of the potential for the existence and progress of IGER and the Governors statements about seeking out-of-market solutions to send a signal that squelch market solutions from meeting the need that does exist.

If NESCOE determines to move forward with a scheme like IGER despite its substantial risks and the significant greenhouse gas impacts associated with new natural gas infrastructure, then the utilities or the entity that is charged with implementing the IGER must explain what mechanisms are being put in place to ensure that the projects that are being funded will actually help the New England to meet its short- and long-term greenhouse gas reduction policies. In the context of existing dockets, CLF has proposed that any new natural gas infrastructure should be subject to a "system transformation charge," similar to a "system benefit charge" on the electric side, that would be directed into a fund to advance natural gas energy efficiency measures targeted to address peak demand and to support renewable energy including renewable thermal space heating.[27] Without such measures to mitigate the impacts of additional fossil fuel infrastructure, natural gas will not serve as a bridge, but will instead create a barrier to building the clean energy infrastructure that is needed to meet the challenges of climate change.

Respectfully submitted,

Shanna Cleveland
Senior Attorney

N. Jonathan Peress
Vice President and Director

[27] *See* Massachusetts D.P.U. 13-157, 13-158, and 13-159 (2013) documents available at www.mass.gov/dpu.

From:	Judy Eddy
To:	Lowdemandstudy, (ENE)
Subject:	Low Demand Study comments from Judy Eddy
Date:	Monday, December 22, 2014 12:30:24 PM

Dear Commissioner Lusardi and members of the Low Demand Study team,

Thank you for the opportunity to submit these comments on the initial report from the DOER consultant, Synapse Energy Economics.

I appreciate the efforts of the Patrick Administration to address the need for our Commonwealth, and our region, to understand the complex variables affecting energy policy and regulation decision-making. By commissioning this study, we are taking steps towards this end.

I am concerned that the study does not emphasize the need for Massachusetts, our nation, and the world, to take seriously the shattering implications of global warming and the reality of our climate crisis. By not considering, up front and as a backdrop to all measures, the requirement of the Massachusetts Global Warming Solutions Act (GWSA), the study does a disservice to its very purpose - which is to ascertain the true cost and implications of each case and each choice before us with regard to where and how we will source our energy going forward.

I urge you to prioritize clean, renewable energy, and DE-priortize fossil fuels and their related infrastructure.

We are, as a nation, still not in agreement about the adverse affects of tracking on our climate. It is clear already, however, from studies recently completed, that methane is under-measured, and therefore its affects are under measured. The fact that the Low Demand Study is weighted through its various caveats and assumptions to put disproportionate emphasis and dependence on mining, transporting, distributing, and burning tracked gas to produce electricity in addition to heating homes and businesses, is a major problem that must be addressed. The fact that all energy efficiency and renewable energy measures NOW AVAILABLE TO US were not equally compared and considered against building pipelines and other tracked gas infrastructure, is a huge problem of this study, in my opinion.

I would ask that the comments and input received by the deeply concerned, informed, and involved stakeholders integral to our Commonwealth's healthy and prosperous future are incorporated into a subsequent study, and that NO action is taken or endorsement is made related to any fossil-fuel based solution to energy demand issues until a subsequent study is completed.

Thank you to all parties for all the effort put forth in commissioning and conducting this detailed study. I do, however, hope that a wider net is cast in relation to sustainable energy solutions in future studies.

We MUST transform our thinking, our economy, our culture, our institutions, and our government towards choices that immediately adopt CLEAN, RENEWABLE ENERGY SOLUTIONS and no longer consider fossil fuel-based solutions.

Judy Eddy
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Co-Chair, Towards a Fossil Fuel Free Future Action Group, 350MA-Berkshires

From:	Jane Winn
To:	Lowdemandstudy, (ENE)
Cc:	Lusardi, Meg (ENE)
Subject:	comments from the Berkshire Environmental Action Team (BEAT)
Date:	Monday, December 22, 2014 12:45:50 PM
Attachments:	2014-12-22-BEATcomments.pdf

Please find attached, comments from the Berkshire Environmental Action Team (BEAT). These comments are also being sent to Governor Patrick.
--

Jane
--
Jane Winn, Executive Director
jane@thebeatnews.org, 413-230-7321
BERKSHIRE ENVIRONMENTAL ACTION TEAM (BEAT)
BEAT, 29 Highland Ave, Pittsfield, MA 01201-2413 www.thebeatnews.org
Working with you to protect the environment for wildlife
You make our work possible **- Please donate now!**

Berkshire Environmental Action Team

Protecting the Environment for Wildlife

December 22, 2014

Synapse Energy Economics
485 Massachusetts Avenue, Suite 2
Cambridge, MA 02139

Re: Massachusetts Low Demand Study

Dear Synapse,

Please accept the following comments from Berkshire Environmental Action Team, Inc. (BEAT). Our mission is to work with you to protect the environment for wildlife in support of the natural world that supports us all.

As one of the groups that met with Governor Patrick and Secretary Bartlett when they agreed to commission this study, we are very disappointed.

Does the Governor know that the study did not require compliance with state law? Specifically, that NONE of the scenarios that were run in the way that the Massachusetts Department of Energy Resources has chosen, meet the statutory goals set forth in the Global Warming Solutions Act.

We second MassPLAN's detailed comments on how the current iteration of the study does not meet the goals of the study.

For the final version of this study, please re-run with compliance with the Global Warming Solutions Act as one of the un-bendable criteria. This study must show scenarios that comply with Massachusetts state laws.

Thank you for considering our comments.

Sincerely,

Jane Winn, Executive Director

BEAT, 29 Highland Ave., Pittsfield, MA 01201-2413 www.thebeatnews.org 413-230-7321 jane@thebeatnews.org

From:	Joshua Jackson
To:	Lowdemandstudy, (ENE)
Cc:	Lusardi, Meg (ENE)
Subject:	comments re: low demand study
Date:	Monday, December 22, 2014 12:54:57 PM
Attachments:	MAGWSACarbonBudgetAnalysis11.15.14.pdf

I am writing to thank DOER and Synapse for conducting the "low demand" study, an important contribution to the energy policy and regulation debate in the Commonwealth and the region.

I only have one comment: I am unsurprised to see that none of the four low demand scenarios achieved compliance with even a simply linearly extrapolated GWSA 2030 mitigation target. This reinforces an analysis I have already made of the GWSA mitigation targets in the proper context of the global carbon budget (attached), which found that compliance with a "fair share" allocation of emissions allowances to the state under a 2C temperature stabilization global emissions pathway would require a stabilization of the state's gas consumption even under the most unrealistic optimistic "gas bridge" energy policy assumptions. I eagerly await the inevitable outcomes of both the pending suit against the state regarding the GWSA's 2012-2020 annual cap mandate, and the target-setting process for 2030 and 2040, which will necessarily show the radical irreconcilability of prevailing gas consumption trends and a scientifically-grounded 2C GHG mitigation policy.

Sincerely,

Joshua Jackson
112 Belmont St.
Somerville, MA 02143
857-998-1391
joshujackson@gmail.com

Dangerously Off-track and Out-of-line:

Massachusetts Greenhouse Gas Mitigation Targets, the Global Carbon Budget, and the "350" Challenge

By Joshua Jackson, 350 Massachusetts volunteer
(Excel spreadsheets available upon request: joshujackson@gmail.com)

"The evidence shows that ignoring climate change will eventually damage economic growth. **Our actions over the coming few decades could create risks of major disruption to economic and social activity**, later in this century and in the next, **on a scale similar to those associated with the great wars and the economic depression of the first half of the 20th century**. And it will be difficult or impossible to reverse these changes."

From the Executive Summary of the 2006 *Stern Review: Economics of Climate Change*, an independent study commissioned by UK Chancellor of the Exchequer, reported to Prime Minister and Chancellor, authored by Sir Nicholas Stern, then Head of the Government Economic Service in UK, former World Bank Chief Economist

"**Looking back, I underestimated the risks.** The planet and the atmosphere seem to be absorbing less carbon than we expected, and emissions are rising pretty strongly. Some of the effects are coming through more quickly than we thought then . . . I think I would have been a bit more blunt. I would have been much more strong about the risks of a four- or five-degree rise . . . This is potentially so dangerous that we have to act strongly. **Do we want to play Russian roulette with two bullets or one? These risks for many people are existential.**"

-

Lord Nicholas Stern (*Observer*, January, 2013)

Summary: *The GWSA mandates CO_2e emission reductions of 25% and 80-100% below 1990 levels by the year 2020 and 2050, respectively. While EOEEA is confident that the 2020 target will be met, the GWSP Scorecard suggests the state will fall short without additional effort, but both avoid the more fundamental question of the GWSA's alignment with science-based global mitigation pathways. As a problem of cumulative emissions, "dangerous" climate change can only be averted if global GHG emissions do not exceed a rapidly diminishing global carbon "budget." To comply with this budget and stay below the 21st century maximum 2°C temperature rise ceiling, major emitter economies must cooperatively reduce their GHG emissions through a global mitigation pathway that fairly distributes remaining emissions "allowances." The GWSA targets are implicitly premised on a global 2°C pathway, which now requires demanding emissions cuts from developed economies, the Commonwealth included. The state's "fair share" of the global mitigation effort is calculated, and the resulting "implicit" 2012-2050 budget requires that GHG emissions in Massachusetts fall by at least around 3% per year (from base 2011 levels) from 2012 to 2020 under a "fair share" pathway. State energy policy is premised on a "gas bridge" platform, but even if methane leakage is entirely reduced and the building and electric sectors completely convert from oil and coal to gas by 2020, the 3% per year mitigation pathway would constrain gas consumption from 2012 to 2020 at roughly 2012 levels - and below those levels by 2020. Additional pipeline and gas electric generation capacity - only needed if gas consumption significantly increases and persists - is thus not only unnecessary but runs counter to the constraints of the GWSA's implicit carbon budget. Finally, a fair share budget aligned with a 1°C /350 ppm global mitigation pathway would already be exhausted, implying a radical mitigation policy paired with payments for emissions "credits" through international emissions trading mechanisms.*

The Great Task Before Us

A wise philosopher once remarked that "men and women make history, but not under historical conditions of their own choosing." This is a timeless human truth, but it takes on a special and unsettling significance in a time of global ecological crisis. Our generation does not simply inherit conditions that no other has ever faced – this is the fate of every age. Our moment is unprecedented because the decisions we make today will determine the ecological legacy not just for our children or grandchildren, but potentially for thousands of human generations to come.

Whereas humanity was once merely a passive participant in the cycles of nature, in the "Anthropocene," the latest and perhaps last act of our long evolutionary drama, we now act *on* - and not merely *upon* – our seemingly solid and stable geological stage. Yet though we have begun to affect the play's setting, we have by no means gained mastery over the script. We can improvise in our action and dialogue, but we cannot refuse our roles outright. And now, in a tragic twist, the very fuels that powered the industrial revolution and ushered human civilization into the modern era are eating away at the ecological foundations upon which civilization *as such* necessarily rests. After one hundred centuries of agriculture and forty centuries of urbanization, only a century of mostly unwitting folly has brought us to a potentially fatal climax. History, as it were, has chosen *us* - we are left to decide only whether we will make history or be unmade by it. There are no curtains, and no exits.

True, humanity has always wrestled with nature, and wrestled with ourselves in the process. "By acting on the external world and changing it," wrote our philosopher, "humanity at the same time changes its own nature." We have always somehow affected our ecological conditions, only to be affected by them in turn. Yet no preceding generation simultaneously had the power to fundamentally - and effectively permanently - alter the earth's climate, the knowledge of this awful capacity and its dangerous implications, *and* the opportunity to use the very wealth, knowledge, and technology of the fossil fuel age to move beyond it. It could not be otherwise, for as our thinker observed, "humanity inevitably sets itself only such tasks as it is able to solve, since closer examination will always show that the problem itself arises only when the material conditions for its solution are already present."

Fortunately, the material conditions for the solutions to the climate crisis are indeed already present, and many are already under development. Unfortunately, however, global warming forms only the most

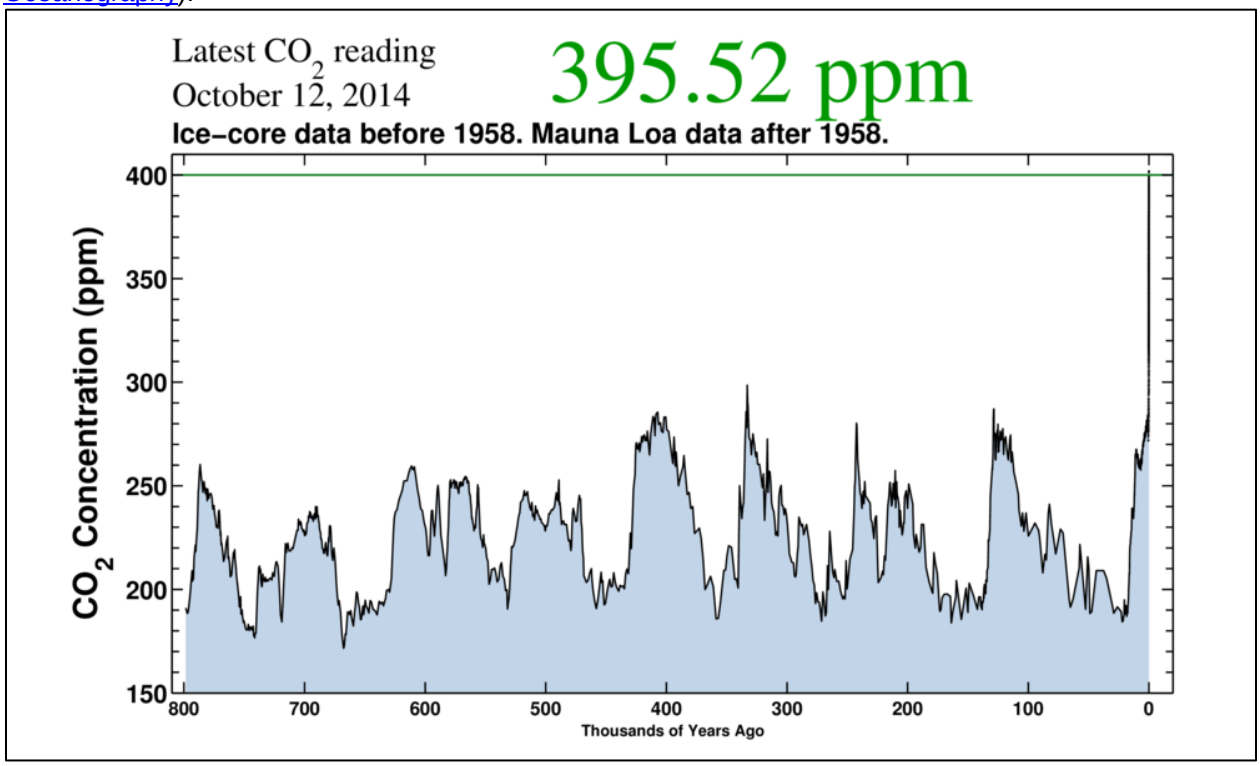
urgent front in a broader assault upon the ecosphere, and humanity – at once both attacker *and* defender - has not yet won the balance of forces needed to slow and stall our own perilous advance. Those who lead the attack enjoy the advantage of inertia, and selfishly press ahead at the cost of our collective self-destruction. Those who fight in defense of our common and only home, however, fight for us all, knowing that the next few years of struggle will determine the terms of the peace for millennia. Before shouldering such a heavy responsibility, we should grasp its true dimensions, measure its full weight, and test the strength of our arms and legs, lest we falter and fall under the load, and fail to fulfil our grave charge.

A Global Experiment

We should first recognize the real and full significance of the geophysical "experiment" in which we all now participate.

On May 10, 2013, news media reported a grim symbolic milestone: daily average atmospheric carbon dioxide (CO_2) concentrations had reached 400 parts per million (ppm) for the first time in recorded history. Scientist Ralph Keeling, who monitors CO_2 concentrations, sounded a note of alarm: "It takes a long time to melt ice, but we're doing it," he warned. "It's scary."

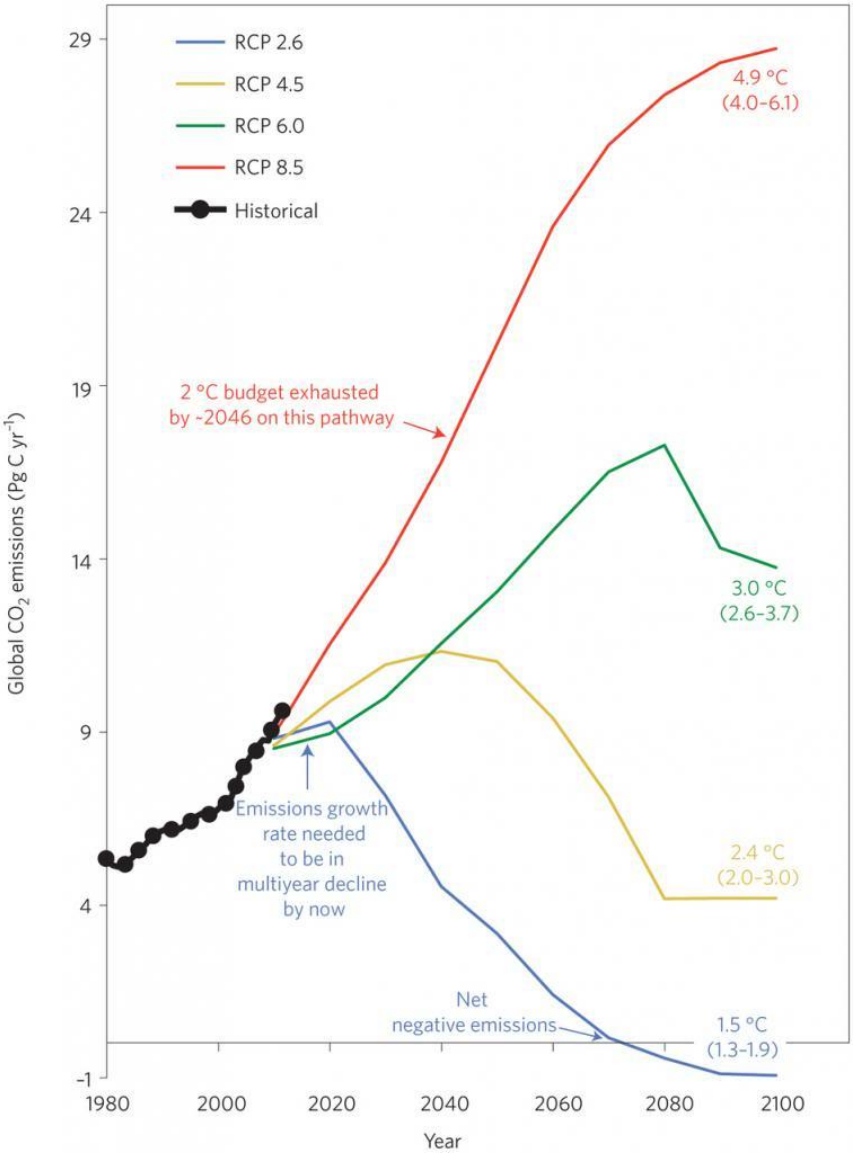
Chart 1: Atmospheric CO_2 concentrations over preceding 800,000 years (Scripps Inst. of Oceanography).



Scientists have recently extended the reach of ice core sampling to create an accurate record of atmospheric CO_2 over the past 800,000 years, during which concentrations vacillated between 170 ppm to 300 ppm through glacial and interglacial periods. Around 200 years ago, in the present interglacial period, pre-industrial CO_2 levels were around 275 ppm. Thus within the space of just two centuries, human activity alone has achieved a scale of change in atmospheric chemistry hitherto only produced by massive natural geophysical processes operating over much longer time-scales. In fact, the present rate of change in atmospheric CO_2 concentrations appears to be *unprecedented* in the same record (note the

vertical line of ascent in **Chart 1** above).[1] To place this in a more anthropocentric perspective, anatomically modern man appeared on the evolutionary stage roughly 200,000 years ago, and agriculture developed roughly 10,000 years ago, within the relatively warm – and now closing – period known as the Holocene.

Chart 2: "Observed and projected trends in global CO_2 emissions under four RCP scenarios" (Sanford, et al, 2014).



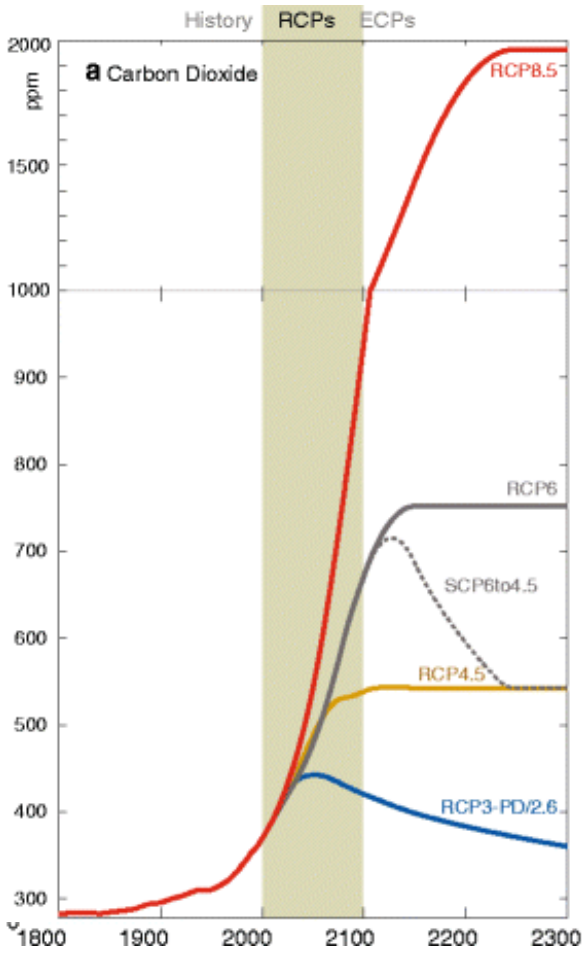
This record alone, however, fails to convey the full gravity of the climate crisis. If we project our current emissions trajectory along a so-called "business-as-usual" pathway out to 2100, we must in turn reach much further into the geological past to find comparable conditions. As shown above in **Chart 2**, global

[1] Significant global climate change events have in some cases apparently occurred incredibly rapidly. A recently published analysis of sedimentary data suggests that the Paleocene-Eocene thermal maximum - a very rapid warming event around 55 million years ago - was caused by a sudden doubling of CO_2 (possibly a result of a comet impact), which acidified the surface of the oceans within months or perhaps even weeks, and raised global average temperatures by 5°C in just 13 years; see Wright and Schaller, "Evidence for a rapid release of carbon at the Paleocene Eocene thermal maximum," *PNAS*, 110.40, 15908-15913.

CO_2 emissions are tracking *above* the "high" emissions scenario (RCP 8.5) presented in the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC).

Scientists have warned that this trajectory will lead to CO_2 concentrations of 900-1100 ppm by the end of the 21st century, accompanied by a global average temperature rise of at least 5°C (9°F) (see **Chart 3** below). Indirect paleoclimate evidence suggests that CO_2 concentrations haven't approached such heights for at least 30-35 million years, when global surface temperatures were around 16°C (29°F) higher than preindustrial levels. Even if CO_2 concentrations were to stabilize within this high range by 2100, temperatures would continue to climb after 2100 to markedly higher levels until the earth's energy balance is restored. A prominent climate blogger has explained that "the scientific community has spent little time modeling the impacts of a tripling (~830 ppm) or quadrupling (~1100 ppm) of carbon dioxide concentrations from preindustrial levels," partly "because they never believed humanity would be so self-destructive."

Chart 3: CO_2 concentrations in four Representative Concentration Pathways (Meinshausen, et. al.)



As an "even worse than the worst-case" scenario unfolds, the thinly-veiled private despair of the scientific community has begun to give way to public candor. "Climatologists, like other scientists, tend to be a stolid group," writes cryo-scientist Lonnie Thompson of Ohio State University:

> "We are not given to theatrical rantings about falling skies. Most of us are far more comfortable in our laboratories or gathering data in the field than we are giving interviews to journalists or speaking before Congressional committees. Why then are climatologists speaking out about the

> dangers of global warming? The answer is that virtually all of us are now convinced that global warming poses a clear and present danger to civilization."

With this proper "historical" context in mind, we can proceed to a discussion of the state's greenhouse gas mitigation targets and evaluate whether they in fact fulfil the state's responsibility to the coming generations.

The Global Warming Solutions Act and 2020 Plan Mitigation Targets

The Massachusetts Global Warming Solutions Act of 2008 established legally binding decadal greenhouse gas (GHG) mitigation targets: a long-term target of 80-100% below 1990 levels by the year 2050, and a short-term discretionary target of 10-25% below 1990 levels by the year 2020. The Act also requires the establishment of 2030 and 2040 targets, which remain undetermined. As the coordinating agency, the Executive Office of Energy and Environmental Affairs (EOEEA) in 2010 decided upon a 25% target for 2020, and reviewed current policies and trends to project that measures in its 2010-2020 mitigation plan (the "2020 Plan") would achieve emissions cuts of between 18-33% (with a central estimate of 27%) by the end of the decade.

The 2020 Plan also projected a roughly proportionate distribution of these cuts across emissions sectors (see **Supplementary Table 1**). Thus far, the buildings sector is on track, with ⅔ of its annual reduction target already achieved, while the electric sector is actually far ahead of schedule, prematurely reaching 150% of its 2020 sector target by 2011. For both, fuel switching from coal and oil to natural gas partially accounts for their mitigation gains to date. Transportation and non-energy emissions (agriculture, industrial processes, waste, etc.) have grown slightly to account for significantly higher portions of the total amount.

At first sight, the state has made considerable mitigation progress, and the 2020 target appears to be reasonably within reach: at 80 million metric tons (MMT), CO_2e emissions (or all GHGs on a carbon dioxide equivalent basis) in 2011 were a full 15% below 1990 levels, with 8 more years to go until the end of the decade. Independent assessments, however, warn that the current policy suite and prevailing mitigation trajectory will be insufficient. A GWSA Scorecard report released earlier this year by the Global Warming Solutions Project, a GWSA watchdog coalition, warned that the state will actually fall short at only around a 20% annual reduction by 2020. EOEEA's 5-year GWSA progress report acknowledged that "the Commonwealth's leadership recognizes that more can and must be done," and suggested a range of supplementary policy strategies and enhancements to keep mitigation efforts on track.

The Global Carbon Budget Constraint

While genuine, justified, and welcome, concern over the state's commitment to the GWSA targets elides the more fundamental question of the scientific validity of the targets themselves. As *climate* policy targets, their efficacy depends entirely on their correspondence with larger global climate policy mitigation goals.

Climate scientists are highly confident that global mean surface temperatures are tightly and nearly-linearly linked over time to atmospheric concentrations of GHGs, especially - but not exclusively - carbon dioxide. While GHGs chemically persist in the atmosphere for shorter or longer time periods, CO_2 is by far the most prevalent greenhouse gas and can reside in the air for thousands of years. The earth's natural carbon cycle continuously releases and removes CO_2 from the air, with natural sources such as biotic decay and volcanism releasing CO_2 into the atmosphere, and biotic growth and oceanic dissolution removing it. These natural "sinks," however, operate on very different timescales. The ocean, the earth's major carbon sink, normally absorbs between 65-80% of released CO_2 over the course of 20-200 years, but other natural sinks, such as chemical weathering, work very slowly over geological timescales of hundreds of thousands of years. Since roughly 1/5 to 1/4 of all emitted CO_2 will effectively reside in the

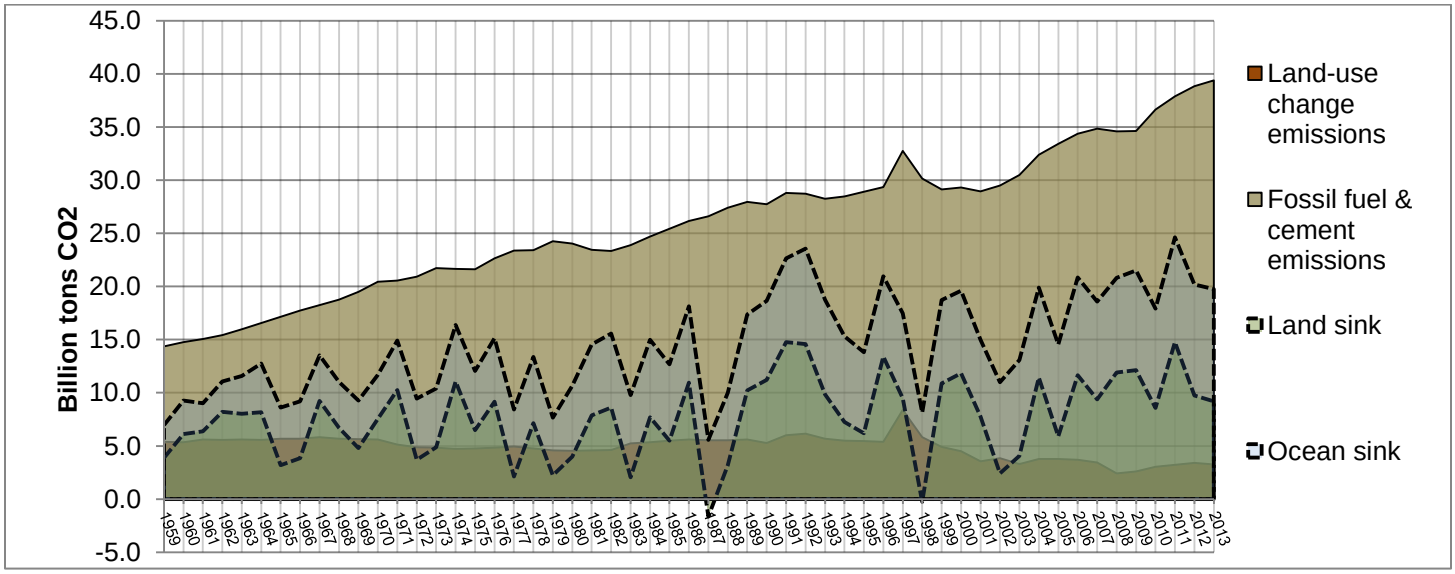
atmosphere for millennia, sustained emissions above levels normally absorbed by natural and faster-acting carbon sinks will result in increasing atmospheric concentrations (as shown below in **Chart 4**).[2]

Thus, in order to limit global average temperature rise to a supposedly "manageable" and "adaptable" maximum, CO_2 concentrations must ultimately stabilize at "safe" levels. In turn, for CO_2 concentrations to stabilize at safe levels, manmade carbon emissions must be radically reduced and must not cumulatively exceed a "carbon budget" limit. In its AR5 Working Group 1 Summary for Policymakers:, the IPCC calculates the global carbon budget for a 21st century 2°C temperature rise ceiling target:

> "Limiting the warming caused by anthropogenic CO_2 emissions alone with a probability of >33%, >50%, and >66% to less than 2°C since the period 1861–1880 will require cumulative CO_2 emissions from all anthropogenic sources to stay between 0 and about 1570 GtC (5760 GtCO2), 0 and about 1210 GtC (4440 GtCO2), and 0 and about 1000 GtC (3670 GtCO2) since that period, respectively. These upper amounts are reduced to about 900 GtC (3300 GtCO2), 820 GtC (3010 GtCO2), and 790 GtC (2900 GtCO2), respectively, when accounting for non-CO2 forcings as in RCP2.6. An amount of 515 [[445 to 585] GtC (1890 [1630 to 2150] GtCO2), was already emitted by 2011. A lower warming target, or a higher likelihood of remaining below a specific warming target, will require lower cumulative CO_2 emissions. Accounting for warming effects of increases in non-CO_2 greenhouse gases, reductions in aerosols, or the release of greenhouse gases from permafrost will also lower the cumulative CO_2 emissions for a specific warming target."[3]

As expressed in the IPCC's RCP 2.6 pathway scenario, a 66% chance of limiting the end-of-century global mean surface temperature rise to no higher than 2°C (3.6°F) above pre-industrial levels requires stabilization of atmospheric CO_2 concentrations at around 400-450 ppm by mid-century, which further requires limiting 2011-2050 global cumulative CO_2 emissions to a "carbon budget" of 1010 gigatons CO_2.

Chart 4: Global carbon sources and sinks, 1959-2013 (Global Carbon Project, 2014).



Emissions have continued to grow since 2011. According to the Global Carbon Project's most recent analysis (shown in **Chart 4** above), global annual CO_2 emissions from fossil fuels and cement production increased by 2.3% from 2012 to raise total annual CO_2 emissions in 2013 to 36 $GtCO_2$ - fully 61% *above* 1990 levels. Emissions are projected to increase by a further 2.5% in 2014. In 2013, ocean and land carbon sinks respectively removed just 27% and 23% of total CO_2, leaving 50% of emissions in the atmosphere and bringing total cumulative emissions from 1870 to 2013 to around 535 GtC (1963.5 $GtCO_2$) from fossil fuels, cement, and land use change. The IPCC's 2900 $GtCO_2$ global budget for a 66%

[2] Many scientists fear that some natural sinks may soon become saturated and ultimately act as net sources of carbon.
[3] One ton of carbon equals = 3.67 tons of carbon dioxide (CO_2).

of staying below the 2°C threshold thus leaves just 936.5 Gt of "allowable" CO_2 emissions, an amount that would be consumed entirely by 2040 at 2013 emissions rates, or by 2034 at the 2013 rate of increase.

Clearly, cumulative global GHG emissions can only be effectively checked and constrained by collective adherence to a global budget, likely requiring an internationally coordinated mitigation effort, with leading roles played by the largest emitters - namely, China, the US, the EU, India, Russia, and Japan, accounting for roughly 70% of total GHG emissions in 2012. International negotiations commenced in 1990 and led in 1992 to the United Nations Framework Convention on Climate Change (UNFCCC), a "framework" treaty that articulated several guiding principles of the global mitigation effort in general, and on the basis of which legally binding UNFCCC mitigation "protocols" are established by the parties.

As stated in Article 2, the "ultimate objective" of the Convention is to achieve "*stabilization* of greenhouse gas concentrations in the atmosphere at a level that would prevent *dangerous anthropogenic interferenc*e with the climate system." Over the past twenty years, the climate policies of developed nations have cohered around a 2°C global average temperature rise above pre-industrial temperatures as the threshold marker for "dangerous anthropogenic interference." Article 3 of the Convention established several guiding principles for subsequent negotiations and legal instruments ("the Parties should protect the climate system for the benefit of present and future generations of humankind, on the basis of *equity* and in accordance with their *common but differentiated responsibilities* and respective *capabilities*"), and states that "the *developed country Parties should take the lead* in combating climate change and the adverse effects thereof" (emphasis added). Since 2007, various agreements and accords reached through the UNFCCC process have acknowledged that developing countries will "peak" their emissions later, since - in the words of the 2009 Copenhagen Accord - "social and economic development and poverty eradication are the first and overriding priorities of developing countries."

The Kyoto Protocol of 1997 came into effect in 2005 and obligates industrialized economy parties (classified as "Annex 1") to set mitigation targets for the first (2008-2012) and second (2013-2020) commitment periods. Second commitment period targets remain undetermined and are scheduled to be finalized in 2015. In lieu of a final global protocol agreement for the 2013-2020 commitment period, many nations, including the United States and United Kingdom, have independently and voluntarily pledged to meet self-determined and "unconditional" national emissions targets (i.e., unconditional on the pledges of other parties).

It is possible that independent and unconditional country pledges could together achieve the 2°C global mitigation pathway without a legally binding international agreement for 2020 mitigation targets. Unsurprisingly, however, and as documented by successive "emissions gap" reports, the sum of these unconditional pledges continues to fall short of the global mitigation pathway needed to stay below the 2°C ceiling. Governments - and even the United Nations, itself a creature of national governments - have resisted the carbon budget concept, for obvious reasons. As so many observers have noted, the climate crisis and global mitigation challenge poses a classic "collective action" or "tragedy of the commons" problem.

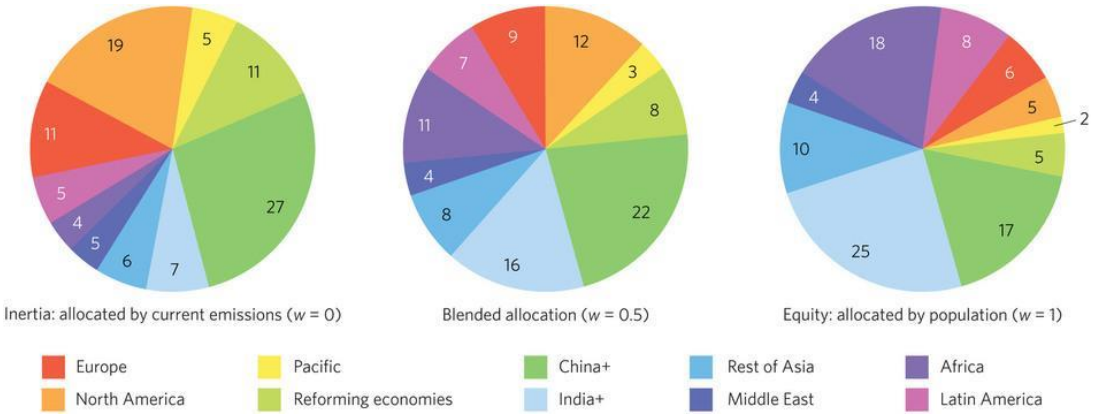
Nonetheless, the implications of a global carbon budget constraint remain inescapable. First, adherence to a global carbon budget requires that global GHG emissions as a whole "peak" at some definite point, and do so sooner rather than later, for the necessary rate at which emissions must fall - and thus the cost and sheer technical difficulty - only increases as time passes and the peaking point is delayed. All else being equal, under a fixed, finite, and time-limited cumulative budget, *higher* emissions *earlier* necessarily require *lower* emissions *later*. Second, the global carbon budget must be formally or informally distributed as "emissions allowances" to individual nations, each of which must also peak their emissions at some point and decline at least by some average annual rate over time to fall below the overarching global budget ceiling. Logically, nations that exceed their given distributed share of global budget emissions - however determined - can only "balance their account" by either reducing future domestic emissions by an equivalent amount, or by purchasing the emissions allowances of disproportionately lower-emitting nations through an international financial mechanism.

There are multiple ways that the total global amount of allowances could be quantified and allocated to derive underlying national carbon budgets and mitigation pathways. Numerous schemes have been proposed, with widely varying assumptions and outcomes, and mainly differing by their budgetary elements (e.g., CO_2 alone, CO_2 plus non-CO_2 GHGs and other radiative forces, land-use change emissions, emissions embodied in trade); their interpretation, inclusion, and integration of the basic UNFCCC Article 3 principles (*capability*, *responsibility*, and *equality*); and their particular distribution method, e.g., by "least cost" mitigation opportunities, equal cumulative CO_2 per capita, or capability defined as equal mitigation costs by GDP. The two global mitigation "burden-sharing" schemes reviewed below, recently released to coincide with the recent September, 2014 UNFCCC negotiations in New York City, illustrate the likely form of a finalized global mitigation agreement.

"Sharing a quota on cumulative emissions"

The first scheme proposes a "carbon-quota" resource-sharing approach using two generic metrics: "inertia," which reflects the present distribution of emissions (and is broadly associated with historical responsibility and capacity), and "equity," which reflects the present distribution of population. An emissions allowance distribution using these metrics can address "responsibility" by setting an *earlier or later* emissions reference date in the past, thus accounting for historical emissions by subtracting the given cumulative historical amount from the allotted distribution, and/or by setting a *later* population reference date in the future, thus accounting for projected future population growth. A global budgetary distribution skewed towards either of these metrics will result in reduced emission leeway for either developing or for already developed nations: heavily weighting "inertia" favors high-emitting nations, and conversely, heavily weighting "equity" favors high-population nations.[4] A "sharing index" weighted towards either of these metric "poles," however, can "blend" sharing principles and help to establish compromise positions between nations (**Chart 5** below shows regional allowance distributions using such an index).

Chart 5: "Sharing the carbon quota pie" (Raupach, et al.).



Although a "blended" sharing approach is most likely to satisfy all parties and secure a global climate treaty, even this balanced index (index value of 0.5) would entail very high global average mitigation rates once emissions "persistence" (i.e., policy and infrastructure lag) is taken into account. Under such an

[4] Sharing simply by present emissions (inertia) - for example, distributing 20% of the 2014-2050 emissions allowance budget to a nation with 20% of 2014 global emissions but only 10% of the global population - leaves developing nations (high population/low emissions) with less CO_2 emissions leeway (since their allotments will be disproportionately lower than the global average allotment), and developed nations (low population/high emissions) with greater CO_2 emissions leeway (since their allotments will be disproportionately higher than the global average allotment); on the other hand, sharing simply by population (equity) - for example, distributing 20% of the 2014-2050 emissions allowance budget to a nation with 20% of the population but only 10% of present global emissions - will leave developed nations with less CO_2 emissions leeway (since their allotments will be disproportionately lower than the global average allotment), and developing nations with greater CO_2 emissions leeway (since their allotments will be disproportionately higher than the global average allotment).

approach, a 66% chance of remaining below the 2°C threshold entails a post-2012 fossil fuel CO_2 emissions global budget of 1,100 $GtCO_2$, necessitating a very difficult 7% exponential rate of decline for global fossil fuel CO_2 emissions as a whole, and a roughly equivalent rate for the United States (potentially moderated somewhat in implementation by an international emissions allowance trading regime).

Climate Fairshares

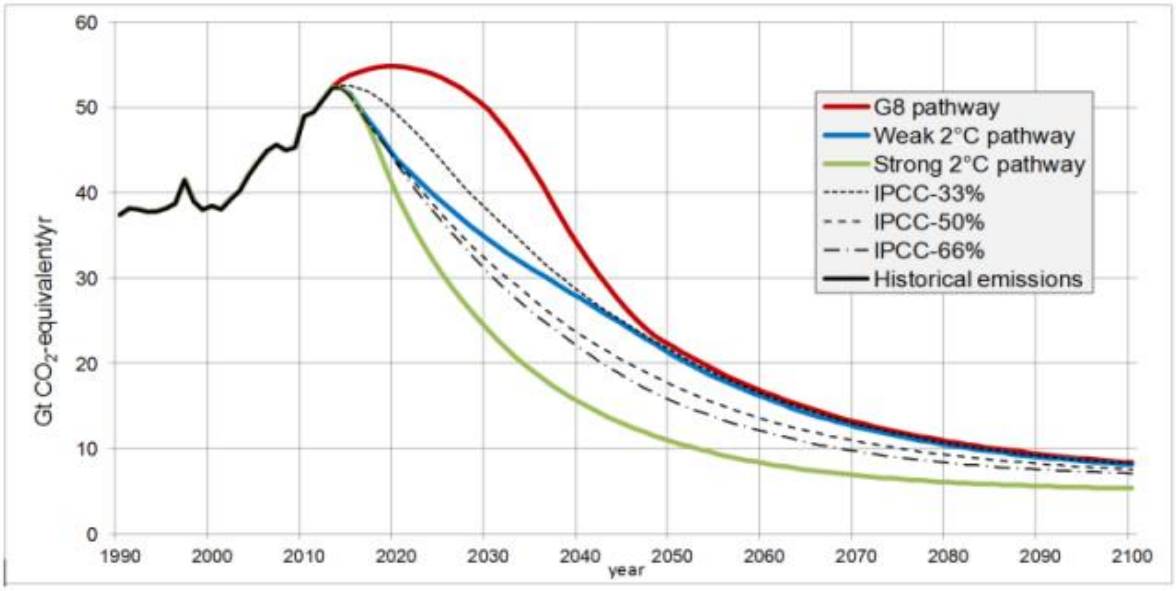
Based on the "Greenhouse Development Rights" framework of the Stockholm Environmental Institute and EcoEquity, and presented in their January, 2014 paper, the second approach compares the IPCC AR5 2°C probability budgets referenced above to three global emissions pathways representative of the policy and science literature (shown in **Chart 6** below), and interprets the UNFCCC's responsibility and capacity principles to derive composite "fair share" national budgets. The representative "Strong" 2°C pathway ("an extremely ambitious mitigation pathway that can still be defended as being techno-economically achievable"), "Weak" 2°C pathway ("fashioned after well-known and often-cited emissions pathways" for a 66% or higher chance), and G-8 pathway ("a marker of the high-level political consensus in developed countries") are shown in **Table 1** below.

Table 1: Tabular comparison of IPCC carbon budgets and representative mitigation pathways (Greenhouse Development Rights, 2014).

Key data for the three pathways (and the IPCC carbon budgets against which to compare them)			
	Strong 2ºC pathway	Weak 2ºC pathway	G8 pathway
Peak Year	2014	2014	2020
2020 emissions (GtCO2eq)	40	44	55
2030 emissions (GtCO2eq)	24	35	50
Peak Rate of Decline (fossil CO2 / all GHGs)	-6.0% / -6.1%	-4.4% / -3.3%	-6.0% / -4.9%
Year Peak Decline Rate Reached	2019 / 2019	2050 / 2020	2038 / 2038
% reduction by 2050 vs 1990	-71%	-44%	-41%
Budget (2000-2011) (GtCO2/GtCO2eq)	390 / 520	390 / 520	390 / 520
Budget (2012-2050) (GtCO2/GtCO2eq)	715 / 1050	1000 / 1375	1315 / 1685
Budget (2012-2100) (GtCO2/GtCO2eq)	780 / 1390	1270 / 1985	1610 / 2325
IPCC carbon budgets	**>66%**	**>50%**	**>33%**
Budget (2012 forward) (GtCO2)	1010	1120	1410

If we accept the IPCC's post-2011 global budget of 936.5 $GtCO_2$, we find that only the Strong 2°C pathway begins to approach a viable 2°C global mitigation effort, particularly since global emissions have not yet peaked. According to Climate Fairshares, the Strong 2°C pathway would entail a peak global mitigation rate of 6.1% (6% for fossil fuel CO_2 emissions alone). The United States would be required to cut domestic emissions 55-65% below 1990 levels by 2025 and 71%-81% below 1990 levels by 2030, as well as provide $634 billion in emissions trading finance.

Chart 6: IPCC and representative global emissions pathways (Greenhouse Development Rights, 2014).



The Implicit Carbon Budget of the Global Warming Solutions Act

To reiterate, global warming can only be effectively checked by limiting cumulative global GHG emissions, an absolute limit that inescapably implies the establishment of a global carbon budget and composite regional or national carbon budgets. Surprisingly, however, this overriding constraint passes unmentioned in all publicly available and online EOEEA or DEP planning and policy documents. In Section 4(c) of Chapter 21N, the GWSA directs the Secretary of EOEEA to "consider all relevant information pertaining to greenhouse gas emissions reduction goals and programs in other states and nations." By the end of 2006, at least two carbon budget papers had been released in the United Kingdom: "Living within a carbon budget", by scientists associated with the UK's Tyndall Centre, a prominent climate science research and policy institute, and "Developing a carbon budget for the UK," by Ecofys, a leading European energy consultancy. Moreover, the UK's 2008 Climate Change Act, which codified the UK's mitigation targets and 5-year interim carbon budgets, was preceded by numerous draft bills and reports that explicitly proposed and discussed carbon budget policy options. It is possible that these leading policy developments in the closest peer of the United States passed unnoticed.

Nonetheless, in lieu of correspondence and clarification, we can proceed by articulating the implicit conditions and unstated assumptions of the GWSA and 2020 Climate Plan.

The GWSA imposes legally binding mitigation mandates in the form of declining decadal CO_2e emissions limits (or mitigation "targets"): a *minimal* reduction of 80% below 1990 levels by the year 2050 (from 94 MMT to no higher than 19 MMT), a 25% reduction below 1990 levels by the year 2020 (from 94 MMT to no higher than 71 MMT), and the undetermined 2030 and 2040 annual emissions targets. Without access to documentation, it is impossible to evaluate their origin and rationale. Nevertheless, if they are *scientifically grounded* targets, such that emissions in target year "X" are "Y"% lower than emissions in base year "Z", they must be associated with a reference carbon budget and pathway.[5] Furthermore, the

[5] Admittedly, climate policy goals are "politically" guided; the proper threshold of "dangerous anthropogenic interference," in the words of the UNFCCC, is determined by social and economic considerations. Thus the poorer and more vulnerable island nations and "least developed countries" have instead advocated for a 1.5°C stabilization target, rather than the 2°C ceiling favored by developed nations. In the final analysis, however, the viability and credibility of climate policy targets depend entirely on the extent to which they are grounded in the climate science.

5-year GWSA review asserts that "the GWSA created a regulatory framework for actions to reduce global warming emissions to levels which scientific evidence indicates are needed to avoid the most damaging impacts of climate change." This language suggests that the GWSA was intended to align state climate policy with the global mitigation pathway needed to stay below the consensus 2°C temperature threshold target (at the very least).

Prior to passage of the GWSA in August, 2008, the most notable reference to developed nation mitigation targets appears in the IPCC's 2007 Fourth Assessment Report (AR4) Working Group III report, which reviewed the literature to find that staying below a 2°C or 450 ppm CO_2e stabilization threshold would require that developed nations cut their CO_2e emissions between 25-40% by 2020 and 80-95% by 2050 from 1990 levels (without associated budgets and probabilities identified). Also, in June, 2005, Executive Order S-03-05 issued by Governor Schwarzenegger of California established an 80%/2050 target but also failed to articulate a corresponding temperature/concentration stabilization threshold and global carbon budget. Several other US states now have 80%/2050 policy targets in place.

Perhaps the most relevant instance of an 80%/2050 target is codified in the UK's Climate Change Act passed in December, 2008. Like the GWSA, it established short and long-term mitigation targets (2022 and 2050), but it additionally requires adherence to intermediate 5-year carbon budgets recommended by an official "Committee on Climate Change" (CCC). Without access to internal DEP and EOEEA records or the GWSA's legislative history, we can assume that the CCC's advisory report, "Building a low-carbon economy: the UK's contribution to tackling climate change," likely closely parallels the GWSA's underlying but unavailable analysis.

The report begins by reviewing the latest climate science developments and advises that global and UK mitigation policy must limit central estimates of 21st century temperature rise to below the "global danger zone" of 2°C. The CCC then considers several global mitigation scenarios differing by peaking date, decline rate, and emissions floor parameters, and concludes that global emissions should peak before 2019 (and temporarily push GHG concentrations above 450 ppm), decline at a minimum per annum rate of 3%, and fall between 34-46% below 1990 CO_2e levels to reach a global emissions total of 20-24 $GtCO_2e$ by 2050. Finally, the report reviews several global "burden-sharing" methodologies and argues that a global climate treaty will very likely be conditioned on the global "convergence" of national per capita GHG emissions rates by 2050 - roughly 2.1-2.6 $GtCO_2e$ per capita for the projected 2050 global population. The CCC concludes that UK annual emissions would have to fall 78-82% (80%) below 1990 levels by 2050 for UK per capita emissions to reach this fair global per capita range.[6]

Altogether, it seems reasonable to conclude that the GWSA targets are premised upon a 2°C global carbon budget. If this is indeed the case, the implications for Massachusetts climate and energy policy are significant.

Implications of a "Fair Share" Budget for Massachusetts Energy Policy

To quantify the state's contribution to a 2°C global mitigation effort, we can first determine a 2009-2050 global carbon budget by adding 2009 and 2010 global CO_2 emissions to the IPCC's 2°C global budget above, for a total of 1075 $GtCO_2$ (for a 66% chance of staying below 2°C). Second, the state's "fair share" of the global mitigation effort can be calculated by distributing global emission allowances in 2009 (the first year after passage of the GWSA), and directly allocating allowances to the state using the weighted index approach above. With only 0.0001% of global population and 0.0002% of global CO_2 emissions in 2009, allocations weighted entirely in favor of either "inertia" or "equity" amount to post-2008

[6] In 2011, Tyndall Centre scientists noted that the CCC's models are premised on a global carbon budget that assumes a 63% chance of *exceeding* the 2°C threshold. Their article highlights the considerable discrepancy between the CCC's global budget and numerous high-level UK government statements that even under a "highly conservative" interpretation suggest no more than a 5-33% chance of exceeding a 2°C threshold.

CO_2 budgets of 2,150 or 1,075 MMT, respectively, whereas an evenly "blended" or equally weighted distribution leaves a budget of 1612.5 MMT.[7] If we assume that global mitigation cooperation will most likely be secured by an evenly weighted distribution, deduction of 2009-2011 emissions from the total leaves the Commonwealth a post-2011 budget of roughly 1380 MMT CO_2.

To represent the 2020 Plan's projected average annual rates of mitigation, **Chart 7** below shows an average 0.9% annual rate of decline from 2011, the last year of full GHG data, to the 2020 25% target, and a 1.7% rate from 2020 to the 2050 80% target; the shaded light-blue area below this line represents roughly 1981.5 MMT CO_2e. In contrast, **Chart 7** also shows a budget-constrained "fair share pathway" framed by two extremely impractical and unlikely "upper-limit" budget-constrained mitigation pathways: first, a "slow and stop" pathway representing the least demanding mitigation effort out to 2050, and second, a "high-low" pathway representing a delayed and dramatic period of decarbonization. The "fair share pathway" shows average linear rates of decline to a 25% by 2020, 2030, 2040, and 100% by 2050 mitigation targets. By definition, these three budget-constrained pathways lead to a 100% mitigation target for 2050.

The two hypothetical "upper-limit" budgets, neither of which is practically tenable, reflect the inescapable implication of a fixed and finite carbon budget: emissions that exceed the pathway's "budget limit" in any given year must be compensated by lower emissions later. This "compensation effect" is most clearly demonstrated by the "high-low" pathway, which shows that 2011 CO_2 levels could only persist until around 2025, when emissions would have to begin falling from 90% to 10% of 2011 levels in just ten years (2025-2035), at an incredible average year-over-year rate of roughly 18.5%, before reaching near-zero levels by around 2040. Conceivably, it illustrates a delayed and deliberate transition effort, but the decline simply defies credulity – such a rate is historically without precedent, and implies either an economic collapse or extremely painful emergency economic contraction. The "slow and stop" pathway would be equally untenable: a lower but still historically high 2012-2030 average annual mitigation rate of 5% (of 2011 emissions) would simply delay compensation until 2050, when emissions would have to make a full stop and drop vertically to zero.

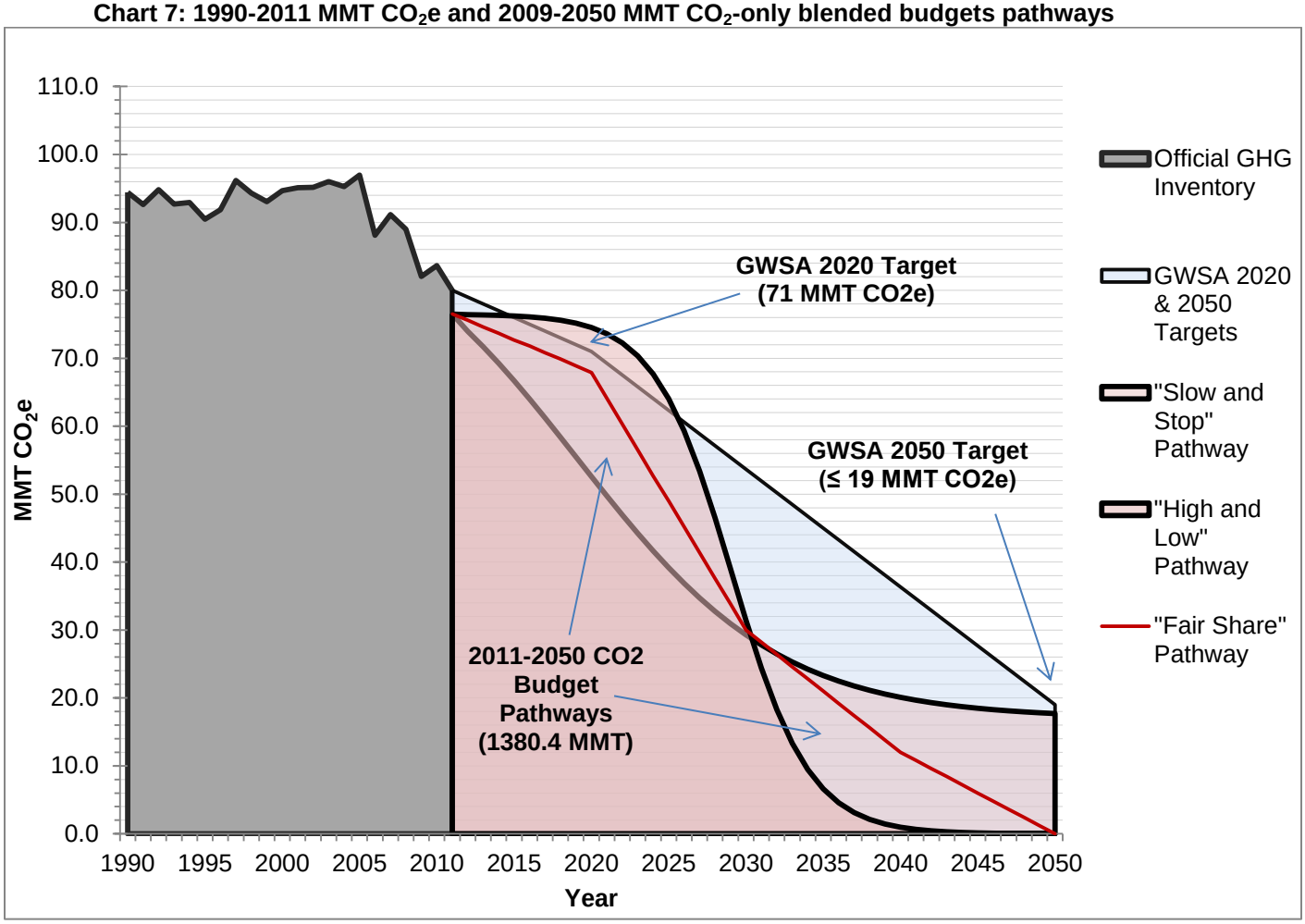
Running between these two illustrative extremes, the "fair share pathway" indicates a still challenging but much more realistic mitigation scenario in which CO_2 emissions maintain their 2011 share of overall CO_2e emissions (96.6%) while declining to 11% below 2011 levels by 2020, and 61%, 84%, and 100% below 2011 levels by 2030, 2040, and 2050, respectively (corresponding to CO_2e declines of 25%, 67%, and 87% below 1990 levels by 2020, 2030, and 2040, respectively). This scenario assumes average annual mitigation rates of 1.2% (2011-2020), 5% (2021-2030), 2.4% (2031-2040), and 1.6% (2041-2050), relative to 2011 levels. Although the fair share carbon budget is too low to allow for a simple linear rate of decline from 2011 to 2050, the technical difficulty and economic impact of the higher 2021-2030 rate can be lessened to the extent that emissions from 2011-2020 fall faster than their average 1.2% rate. Averaged together, CO_2 emissions from 2011-2030 fall at a 3.2% annual rate under this pathway.

To be clear, the "fair share" pathway is as much of a "total" budget scenario as the so-called "upper-limit" pathways; in other words, each pathway shows a fully "spent" budget that unfolds along an averaged projected line. There are a number of very compelling reasons, however, why mitigation policy should instead aim for a pathway that lies well *below* the fair share pathway below:

1) First, since actual annual emissions fluctuate mostly on the basis of economic activity and weather, unexpectedly high emissions early on - e.g., perhaps due to economic growth and long and harsh winters that compel older and more carbon-intensive power plants to stay online - necessitate a steeper mitigation path later.

[7] 2009 world pop.: 6.8 billion, 2009 MA pop.: 6.6 million; 2009 global CO_2 emissions: 34620 MMT CO_2, 2009 MA CO_2 emissions: 75 MMT.

Chart 7: 1990-2011 MMT CO_2e and 2009-2050 MMT CO_2-only blended budgets pathways

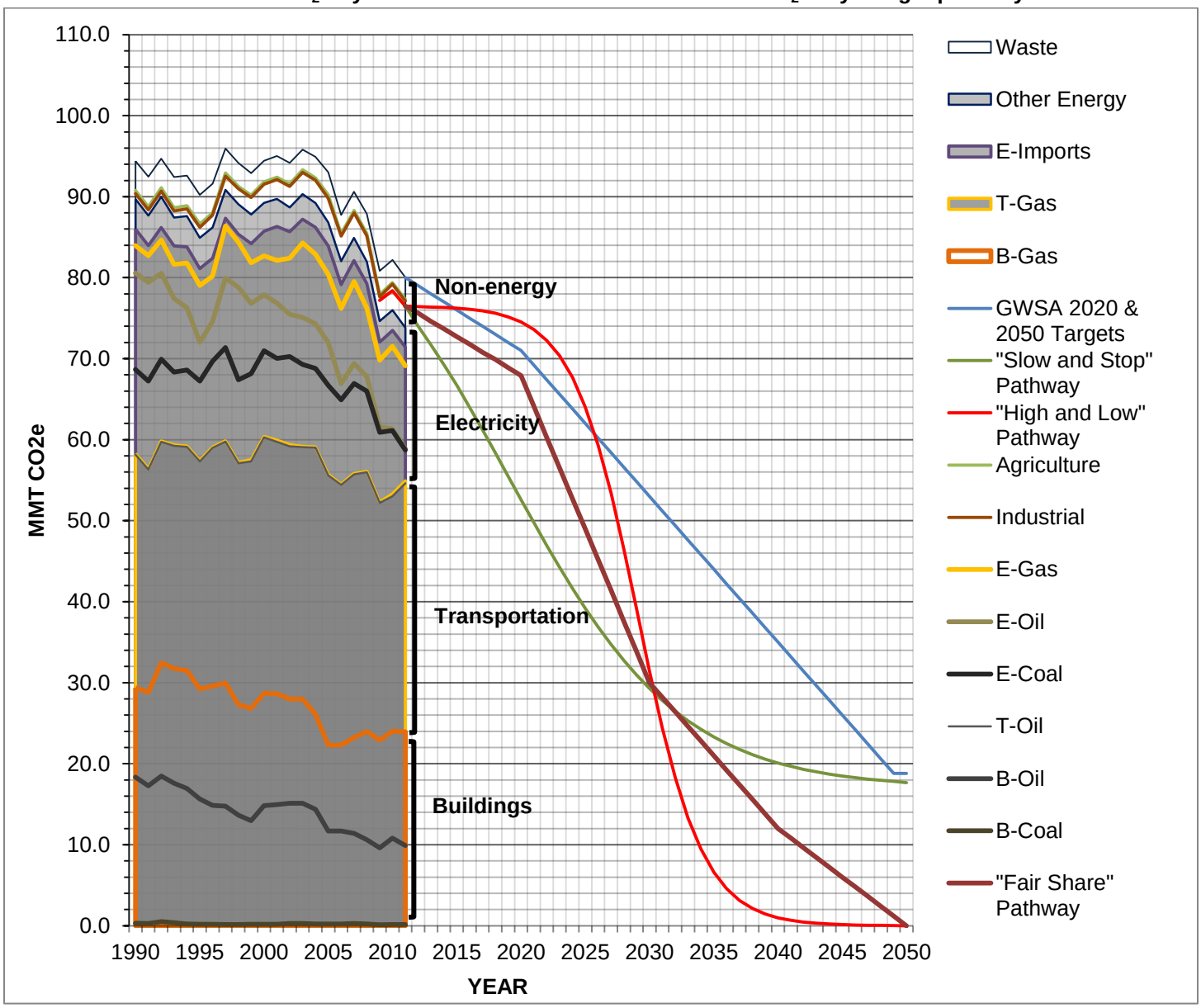


2) Second, the IPCC global budget from which the state's "fair share" budget is derived assumes a 33% chance of *exceeding* the 2°C threshold, and does not account for the warming effects of increases in non-CO_2 GHGs, reductions in aerosols, and GHG releases from rapidly thawing permafrost, whereas a prudent mitigation policy would aim for an extremely low (e.g., 1-5%) chance of exceeding the threshold and take the above factors into account.
3) Third, and as noted below, given that several critical climate impacts such as Arctic sea ice melt are occurring *faster* than climate models have predicted, it is possible and even likely that many climate models are underestimating the climate system's "sensitivity" to radiative forcing.
4) Fourth, since the United States is alone responsible for 26% of all cumulative carbon emissions from 1751-2012, and still ranks as one of the highest large advanced industrial per capita emitters (only surpassed by Canada and Australia in 2011), arguments for an evenly weighted emissions allowance distribution to the US – and to the state, by extension - would likely be met with little sympathy from developing countries and the most vulnerable poor and least developed nations.
5) Finally, and as explained in an earlier report, the state very likely *underestimates* current and historical methane (CH_4) emissions, persists in using outdated warming metrics for methane, and ignores methane's radically potent short-term (10-20 year) warming impact.

Once these and other factors are considered, a roughly 3% mitigation rate from 2012-2030 should arguably lie at the very *low* end of a scientifically-grounded and cautious mitigation pathway. This "low-end" fair share mitigation rate stands in contrast to the 2020 Plan's projected 0.9% rate from 2010-2020 and 1.7% rate from 2020-2050 for an 80% end target.

Chart 8 below shows the same historical emissions totals and mitigation pathways as **Chart 7**, but distinguishes between emission sector and by fossil fuel for the building, transportation, and electric emissions sectors in particular ("B" for buildings, "T" for transportation, "E" for electric, with buildings as the bottom and most opaque sector, followed by the transportation and electric sectors, etc).

Chart 8: Historical CO_2e by sector and fossil fuel with 2012-2050 CO_2-only budget pathways

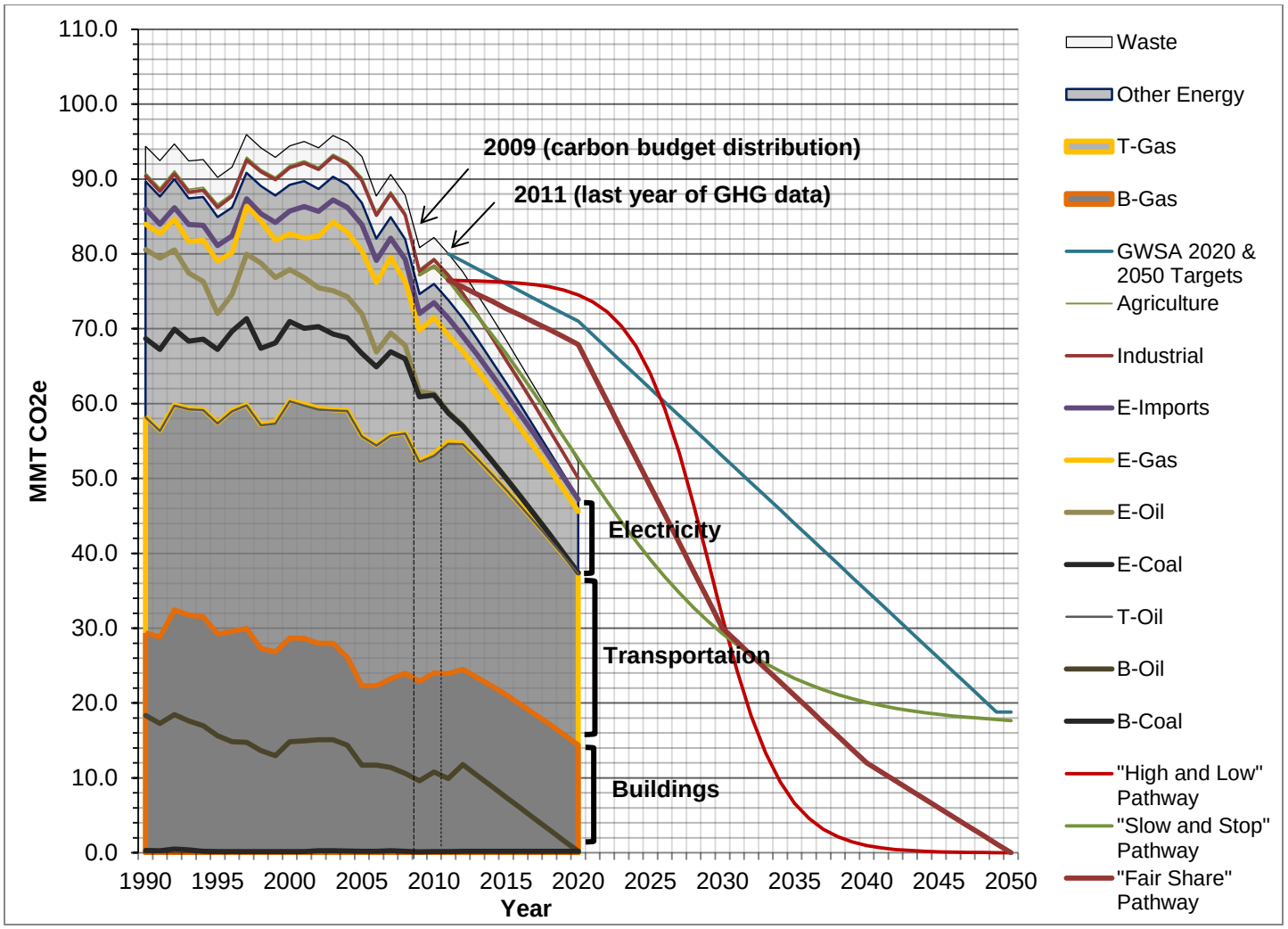


Finally, **Chart 9** below attempts to "explicitly account for the GHG implications of an increased role for natural gas," as called for in the recent 5-year GWSA progress report. It depicts a purely hypothetical and arguably aggressive and optimistic 2012-2020 "gas bridge" emissions scenario under the fair share budget in which:

- oil and coal CO_2 emissions in the building and electric sectors decline at an average 12.5% annual rate to *zero* by 2020 as oil and coal-fired power plants and oil-heated buildings convert to gas;

- CO_2 emissions in the building, transportation, and electric sectors decline at an average 3% annual rate (as % of 2011 emissions), *even as* the building and electricity sectors convert from oil and coal to gas;
- in-state natural gas system CH_4 (methane) leakage also steadily falls to zero by 2020;
- and CO_2e emissions from electric imports, other energy, and non-energy sectors also decline at an average annual 3% rate.

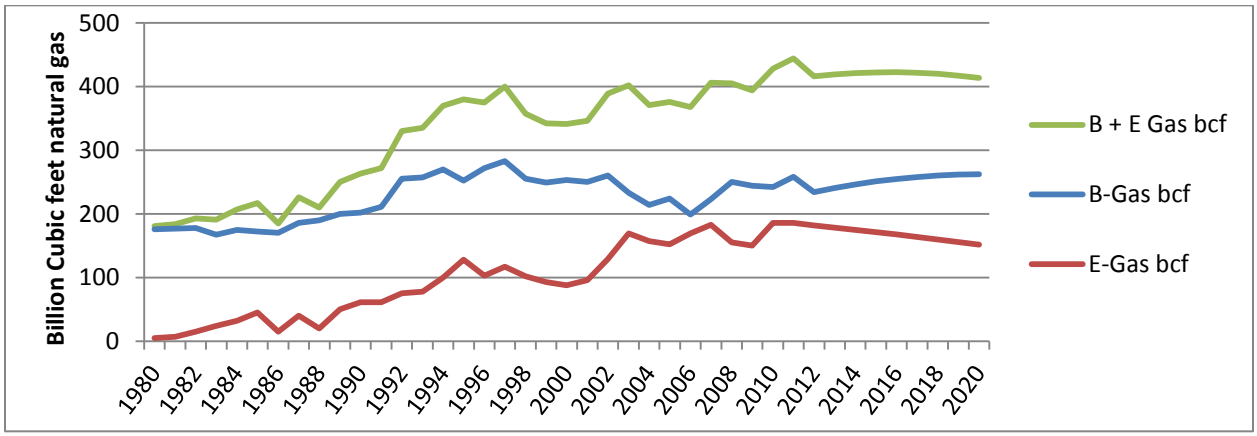
Chart 9: 2012-2020 "gas bridge" scenario with 3% per annum CO_2e decline



Well above the 2020 Plan's "very aggressive" 1.7% rate, the more ambitious but arguably *minimally* necessary 3%/year average annual mitigation rate in **Chart 9** would actually see gas CO_2 emissions *stabilize* between 22.5 to 23 MMT per year, roughly *only slightly above* 2007-2011 average levels. Gas consumption in the building and electric sectors would accordingly slightly rise by only 1.5% (roughly only an additional 6.5 bcf per year) before falling to *below* 2012 levels by 2020, *even as they convert to gas* (as shown in **Chart 10** below). Conversion in this case would be accompanied ostensibly by robust energy efficiency and conservation programs and a *reversal* of the historical growth trend in transportation emissions. As with any budget-constrained scenario, the building and electricity sectors would have to make additional cuts to the extent that emissions from other sectors fail to decline at the 3% average annual rate. Lastly, an "extension" of the gas bridge from 2020 to 2030 – i.e., stabilization at 2020 gas emissions levels as renewables capacity grows – could only be purchased through elimination

of all non-energy emissions and an approximately 75% reduction in transportation oil CO_2 emissions, implying a dramatic transformation of the state's transportation systems and land-use patterns.

Chart 11: Building and electric sector gas consumption under gas bridge scenario



Together, these "budget-constrained" mitigation pathways present state planners with a difficult choice: the state can only carry out a short-term 10-15 year "gas bridge" policy by either (A) preparing for an implausibly steep decline in GHG emissions through some combination of efficiency, conservation and rapid transition to renewables, or (B) constraining gas consumption while dramatically reducing transportation and non-energy GHG emissions.

As discussed in a previous report, the last decade and a half witnessed a significant transformation of the state's fossil fuel mix, with natural gas consumption rising by roughly 30% from 2000-2011 to recently provide around ⅔ of the fuel for both the building and electricity energy sectors. Driven by remarkable increases in domestic shale gas production and resulting low gas prices relative to other fuels, rising gas demand has contributed to pipeline capacity constraints when the gas supply must be divided between the heating and electric sectors, particularly during winter cold-weather extremes. This in turn has led to high wholesale and retail electricity prices and recently proposed wintertime rate increases. After a decade of cautionary warnings regarding the region's increasing dependence on gas, two gas transportation companies have proposed new pipelines and upgrades supposedly to relieve regional capacity constraints, and a new gas-fired power plant proposal has been fully permitted by state regulators.

An expansion of gas transportation capacity and increased gas power generation will presumably lead to increased gas consumption, at least in the short-term. However, if the above mitigation scenario analysis is correct, gas consumption will either have to be stabilized and constrained or begin a precipitous decline by the end of the decade, just after or as these gas infrastructure projects would begin operation. Metaphorically speaking, "widening" the "gas bridge" by adding capacity and facilitating increased demand and consumption can only have the effect of "shortening" its length at the same time. Fortunately, several environmental organizations have advanced alternative proposals for addressing the capacity problem, and the state has at least temporarily withdrawn from a regional tariff proposal to await the results of a "low-demand" scenario study commissioned to explore the cost-effectiveness of foregoing extra gas capacity.[8]

[8] For examples, see the comments of Conservation Law Foundation recently submitted to the New England States Committee on Electricity, and an alternatives assessment by ENE.

The "350" Stabilization Challenge

While the state's GHG mitigation targets are implicitly premised upon the developed world's consensus stabilization target, the 2°C ceiling is neither universally accepted by the international community nor unreservedly endorsed by climate scientists. Island nations and the least developed countries facing the greatest and most immediate adaptation challenges have rallied around a 1.5°C stabilization target, while many of the world's leading climate scientists, including the chairman of the IPCC, have strongly cautioned that temperatures should ultimately not stabilize above the 1°C threshold.

"Humanity and nature, the modern world as we know it," a 2013 paper cautions, "is adapted to the Holocene climate that has existed more than 10,000 years. Warming of 1°C relative to 1880–1920 keeps global temperature close to the Holocene range, but warming of 2°C, to at least the Eemian level, could cause major dislocations for civilization," and would eventually lead to warming likely above 3°C. The 2°C target is "far more dangerous" and even "foolhardy" primarily because slow climate system feedbacks (reduction of ice sheet coverage, permafrost thaw) are much more likely to be induced by temperature increases outside the Holocene range (i.e., above 1°C), but also because it necessarily implies extraction of unconventional and more carbon-intensive fossil fuels, and is much more likely to lead to increases in non-anthropogenic emissions as warming takes hold. Average surface temperatures have already risen approximately 0.85°C above preindustrial levels, and "inertia" in the climate system attributable to ice sheet and ocean response times holds at least another 1°C of (hopefully "peaking") warming in the pipeline.

In an earlier and related paper (2008), scientists advise that "a CO2 amount of order 450 ppm or larger, if long maintained, would push Earth toward the ice-free state" and would "likely would cause the passing of climate tipping points and initiate dynamic responses that could be out of humanity's control." While they concede that "climate models have many deficiencies in their abilities to simulate climate change," they point out that "model uncertainties cut both ways: it is at least as likely that models underestimate effects of human-made GHGs as overestimate them." The authors carefully note that "model deficiencies in evaluating tipping points, the possibility that rapid changes can occur without additional climate forcing, are of special concern," particularly given that "loss of Arctic sea ice, for example, has proceeded more rapidly than predicted." Indeed, "there are reasons to expect that other nonlinear problems, such as ice sheet disintegration and extinction of interdependent species and ecosystems, also have the potential for rapid change."

After reviewing climate models and weighing the paleoclimate record against observed changes, the authors "suggest an initial objective of reducing atmospheric CO2 to 350 ppm, with the target to be adjusted as scientific understanding and empirical evidence of climate effects accumulate." Although they recognize that "a case already could be made that the eventual target probably needs to be lower, the 350 ppm target is sufficient to qualitatively change the discussion and drive fundamental changes in energy policy."

As might be expected, the global carbon budget and global mitigation pathway associated with a 350 ppm CO_2 climate stabilization target are extremely demanding - but still feasible. The 2013 paper calculates that a 6%/year decrease of fossil fuel emissions beginning in 2013, paired with 100 GtC of reforestation, achieves a CO_2 decline to 350 ppm near the end of the 21st century. This pathway limits the 2013-2050 global budget of fossil fuel CO_2 to a total of 473 billion tons. If the global peaking date is delayed until 2020 while fossil fuel emissions grow at a 2%/year rate, stabilization at 350 ppm would be pushed back 200 years to 2300; if the global peaking date isn't reached between 2030 and 2050, CO_2 would remain above 350 ppm or 400 ppm, respectively, until well after 2500.

The implication for Massachusetts mitigation policy is troubling: responsible for 0.0002% of global emissions, a global distribution of the "350" budget weighted entirely to "inertia" - and thus in the state's favor - would leave the state with a 2013-2050 CO_2 budget of just 94.7 MMT - in other words, our fossil fuel CO_2 emissions would have to drop to *zero* by the end of 2014. Clearly, this scenario lies well beyond the limits of immediate possibility. To participate in a global 350 ppm stabilization effort, the state would

have to aggressively decarbonize *and* make large purchases of global emissions allowances through an international emissions trading system. If GHG emissions must be reduced *as rapidly and aggressively as is technically possible,* mitigation targets under such a pathway become strictly a question of capacity.

For the climate movement, the implication is equally clear and no less daunting. Those committed to placing Massachusetts on a 350 ppm stabilization pathway are compelled to conclude, along with the authors of a 350 ppm pathway analysis, that "the radical emission cuts we need can only come by way of a wholesale economic transformation – a fair, global effort that not only accommodates but actually prioritizes the aspirations of the poor and the disenfranchised – and can only correspond to a societal mobilization with few if any peacetime precedents." It is to be expected that "all adequately ambitious responses" will be "dismissed as being outside the bounds of so-called 'political realism,' " but at the same time, "failure to mount an adequately ambitious response – one scaled to the actual threat – would force us to endure irreversible harms, and accept catastrophic risks, and suffer a future in which continued prosperity itself comes to be outside the bounds of realism."

In short, all political barriers to achieving the quickest possible drop to of the state's GHG emissions to "net zero" must be swept aside. It falls to the people of Massachusetts to begin and carry out this urgent project, but the leadership that only public authority can provide is needed if we are to succeed.

"A Leadership of Frankness and Vigor"

In 1933, during the depths of the Great Depression, President Franklin D. Roosevelt used his inaugural speech to gird and stir the American people:

> "This is preeminently the time to speak the truth, the whole truth, frankly and boldly. Nor need we shrink from honestly facing conditions in our country today. This great Nation will endure as it has endured, will revive and will prosper. So, first of all, let me assert my firm belief that the only thing we have to fear is fear itself—nameless, unreasoning, unjustified terror which paralyzes needed efforts to convert retreat into advance. In every dark hour of our national life a leadership of frankness and vigor has met with that understanding and support of the people themselves which is essential to victory."

The financial and economic crisis that followed only a month after the GWSA's passage certainly could have pressured the Patrick administration to halt its advancements in climate policy. Instead, under the administration's guidance, and in cooperation with the legislature and civil society, state government has pushed forward to achieve notable results in both renewable energy deployment and greenhouse gas mitigation. Yet despite significant legislation, executive measures, and administrative reforms, the politics of energy in Massachusetts remain relatively independent from the unforgiving imperatives of a science-based mitigation pathway. As we have seen, even under the most aggressive and optimistic assumptions, an "increased role for natural gas" quickly runs up against the mitigation constraints imposed by a fair share of the GWSA's implicit 2°C global carbon budget, much less the justifiably cautious and far more stringent 350 ppm budget. Energy and environmental policy may now rest under the same administrative roof, but closer inspection reveals a house divided against itself.

In a rapidly warming world, every *energy* decision is at one and the same time a *climate* decision. At this late hour, the energy and climate policies of the Commonwealth will remain unaligned only at the expense of the "safety, prosperity, and happiness" of the very citizens by and for whom it is constituted. A leadership of frankness and vigor will be difficult, and certainly not immediately welcomed by all, but it will become increasingly untenable to shrink from honestly facing the climate crisis as impacts accelerate and accumulate both at home and abroad. We can be confident that the people of Massachusetts will meet candid assessments and strong action with the understanding and support that our circumstances warrant. If, however, our elected officials fail to boldly wield the power that the sovereign people properly entrusts in *their hands*, and *their hands alone*, we can be equally sure that the citizens of the Commonwealth will act in the spirit of its founders, and take matters directly into their own.

Supplementary Materials

Table 1: 1990 and 2011 MMT CO_2e Emissions by Sectors, and 2020 Plan and GWSP Projections for 2020

	Buildings[1]	Transportation[1]	Electricity	Non-energy	TOTAL
1990 MMT level	31.2	30.7	27.8	4.7	94.4
As % of 1990 total	33%	32%	29%	5%	-
2020 Plan projected reduction MMT by 2020	9.2	7.1	7.2	1.9	25.4
As % of 1990 MMT total	9.8%	7.6%	7.7%	2%	27%
As % of 1990-2020 Plan mitigation total	36%	28%	28%	0.75%	-
2020 Plan projected sector MMT totals	22.3	23.6	20.6	2.8	69.4
As % of 2020 total	32%	34%	30%	4%	-
2011 sector MMT totals	25.1	32.2	16.5	6.2	80
As % of 2011 total	31%	40%	21%	8%	-
Reduction from 1990 MMT total to 2011 MMT total	6.1	-1.5	11.3	-1.5	14.4
GWSP Projected % reduction by 2020	87%	63%	88%	74%	81%[2]

[1] "Other energy" emissions as categorized in the Massachusetts GHG Inventory are here artificially evenly divided between the buildings and transportation sectors.
[2] The GWSP projected 2020 reduction of only 81% of the 2020 Plan target total is weighted and combined.

From:	Info StopNED
To:	Lowdemandstudy, (ENE)
Cc:	P Terrasi; Rob Rand; Cathy Kristofferson
Subject:	Low Demand Study comments from the StopNED coalition
Date:	Monday, December 22, 2014 12:59:44 PM
Attachments:	StopNED_LowDemandStudy_Comments_12222014.pdf

Please find attached our comments regarding the Low Demand Study following Thursday's Third Stakeholder Meeting.

Thank you for allowing us the opportunity to participate. We hope someday to participate in a study that truly seeks "solutions for meeting Massachusetts' energy needs while striking a balance between reliability, cost, and the environment." We feel a study that does not take GHG emissions nor compliance with the Global Warming Solutions Act as input doesn't actually balance the environment with reliability and cost at all.

Respectfully,

The StopNED coalition

STOP THE PIPELINE stopned.org

StopNED – Stop Northeast Energy Direct

StopNED is a coalition of community leaders campaigning to stop the Kinder Morgan Tennessee Gas Pipeline Northeast Energy Direct fracked gas pipeline project.

Our mission:
A gas pipeline is being forced upon us that will take our property by eminent domain, tax us to pay for its construction, destroy our protected & treasured open spaces, increase the risk to our personal safety, and jeopardize our State's ability to meet its carbon emission commitments. We envision stopping the unnecessary pipeline, and meeting our needs by reducing our reliance on fossil fuels, increasing efficiency, expanding renewable technologies, and mandating repairs of existing infrastructure.

StopNED - Stop the Northeast Energy Direct

StopNED.org

December 21, 2014

To the Acting Commissioner, Dept. of Energy Resources, Meg Lusardi
and members of the Low Demand Study Team:

We at StopNED are participating as stakeholders in this study as members of communities threatened by massive fossil fuel infrastructure construction. We are conservation commissioners, land trust members, affected landowners, and concerned citizens worried about our communities, the Commonwealth and the effects of continued fossil fuel use globally. We had great hope reading the RFR for the study since members of our coalition were among the group who met with Governor Patrick to inspire this Low Demand Study. Clearly we are gravely disappointed in the direction the study headed while meetings were postponed.

Initially we understood the study as defined by stakeholders and the Administration:

> The goal of DOER's study is to determine, given updated supply and demand assumptions, whether or not new infrastructure is required, and if so, how to optimize for environmental, reliability, and cost considerations. Key questions for consideration include:
>
> 1) When considering all energy resources, which resources offer the greatest net benefits when assessing for reliability needs, cost savings and reducing environmental effects including lower GHG emissions.
>
> 2) In combination, how far can these alternative resources go in replacing retiring generation capacity?[1]

At Thursday's stakeholder meeting we were stunned to see the outcome did not address the original intent of what was agreed to be the charge of the study.

How do you execute a study of energy capacity and generation with no regard for compliance with the Global Warming Solutions Act (GWSA)? Especially when you are dealing with a fossil fuel, methane, known to be 34X more harmful to the environment without even considering all of the effects from fugitive emissions that occur during extraction, blowing off, and leaking. How do you use study results that leave the Commonwealth further out of compliance with its own law?

[1] DOER Agency Document Number: RFR-ENE-2015-012

Synapse recently submitted testimony[2] regarding the avoided costs of GWSA compliance for a study commissioned by the Massachusetts Departments of Energy Resources and Environmental Protection, why didn't you take this knowledge into account in this Low Demand study? Why in this study are there no financial considerations for non-compliance? The City of Boston, ranked 8th most at risk coastal city in the world, is fully aware of the economic impact of impending climate change having just released their updated 2014 Climate Action Plan. As one commenter said last Thursday, how do you complete an energy study as if climate change is not one of the most pressing issues facing mankind today?

We understand that environmental destruction, loss of ecosystem capital, decreased property values, risk to our drinking water supplies, disruption of our way of life, all have no part in your study as they do not have a tangible price tag you can "model." These are high costs for all of us, especially those directly affected. We are labeled "low collateral" because our homes, our businesses, our low population rural lives would be a small price to pay should something go awry while natural gas capacity and presumably consumption are increased. We are likely to be paying these high intangible costs for the obvious profit from natural gas exportation, not for simply fulfilling a New England need, when you consider that 4.5bcf/d are currently proposed where your study finds a shortage of only 0.6 - 1.1bcf/d.

We are questioning the justification for removing winter reliability, demand response, and storage options for no annual savings as stated by your “Key Changes to Feasibility Study and Supply Curves” slide #12. The reason given to bring in more gas is not annual but to meet peak demand requirements of a couple of hours on a few days? We question the measure used to determine “feasible and practical” when discounting renewable energy options for the study. Given the growth of home and small business solar in Massachusetts in recent years, and despite the ending of SREC I and II this growth is likely to continue. This growth also likely will include storage that would certainly be "feasible and practical" if providing electricity during the hours of early evening.

In addition to our own comments, we would like to reassert the points that were made during Thursday’s breakout session among the “enviro groups”:

1. Report limited to MA. The analysis is limited to Massachusetts, while the challenge and solutions are regional. Additional analysis is now needed at the regional level to determine the optimal resource mix. For example, we know that NH and ME have a lot more efficiency potential, yet this potential is not captured in the MA-focused study.

2. Report’s obsolescence based on unforeseen/unanticipated market developments. Recent developments in energy markets – particularly the drop in oil and LNG prices – makes many of the assumptions outdated already. For example, it may be much more attractive to rely more on LNG and new gas storage on the system.

3. Misleading assumptions about economics of pipeline capacity. Assuming optimal economics for additional pipeline capacity (i.e. 80% annual utilization rate) skews the results to portray new capacity in a favorable light, whereas in reality pipelines are often oversized, which could lead to lower utilization and worse economics.

[2] http://synapse-energy.com/project/avoided-costs-global-warming-solutions-act-compliance-0

4. NO GWSA Compliance. All scenarios are out of compliance with the GWSA, and additional pipeline pulls us further out of compliance, potentially requiring more expensive emissions reductions outside of the electric sector.

5. Limited consideration of alternatives. The study is limited in its consideration of alternatives, specifically:
    - Importing cheaper LNG through existing infrastructure and storing more LNG in the system
    - Doing more on energy efficiency
    - Incorporating offshore wind, which politically is a likelihood
    - Including transmission from Maine to carry wind backed by hydro from Labrador, which would have a higher annual capacity factor and greater benefits than Quebec system power.

6. ALL caveats should be clearly stated/summarized up front. This is in addition to being restated at the beginning of each section which is what Acting Commissioner Lusardi indicated DOER plans to do.

Hopefully, the new Baker administration can use the identified shortcomings of this study to commission a new one whose results will move the Commonwealth forward to a scenario of energy efficiency, sustainable energy generation and compliance with a fully regulated GWSA. The Patrick administration has let the non-industry stakeholders down with the derailment of this study.

Respectfully,
The members of the StopNED coalition
Represented at the Low Demand Study by Paula Terrasi, Rob Rand, and Cathy Kristofferson
Contact info: info@stopned.org

CC: Governor Deval Patrick
Governor-Elect Charlie Baker
EOEEA Secretary Maeve Vallely-Bartlett
EOEEA Secretary-Elect Matthew Beaton
Attorney General-Elect Maura Healey
US Senator Elizabeth Warren
US Senator Edward Markey
US Representative Niki Tsongas
MA State Senator Eileen Donoghue
MA State Senator Jennifer Flanagan
MA State Senator-Elect Anne Gobi
MA State Representative Sheila Harrington

From:	SCWorg
To:	Lowdemandstudy, (ENE)
Subject:	DOER and Synapse regarding the low demand gas study:
Date:	Monday, December 22, 2014 1:02:02 PM

Friends:
Thank you for the opportunity to respond to the December 18th stakeholder meeting to review the results of the low demand study modelling efforts. Given the limited time available for providing comments, my responses are limited to my personal opinions rather than organizations that I belong to such as MassSolar or E2 (Environmental Entrepreneurs). Three and a half days (including a weekend during the holiday season) do not allow for a full group review and group authored response.

Nevertheless, this study is too important to ignore and to not point out the flaws in the study would be folly for the Commonwealth to adopt its recommendations without fully appreciating the caveats that completely invalidate the study's conclusions.

The study is a good start of the conversation but by no means should be the basis for any decisions regarding gas pipeline capacity expansion or adding new electric transmission lines from Canada.

1) First and foremost of the eight scenarios modeled, none of the eight even met the Global Warming Solutions Act targets for either 2020 or extrapolated out for 2030. Even the most optimistic scenario came in at 2% deficit and that assumes that the other sectors (buildings/transportation) meet or beat their target reductions as well which is more challenging and expensive than the electricity sector. Whatever the eventual plan is, it must conform to Massachusetts law and meet the goals of the GWSA as a starting point, not as a consequence of that plan. Global warming must be the driver, not an afterthought, as the inputs in this modelling effort.

2) Demand response must be considered as a factor in shaving peaks and reducing the supply constraints in the worst cold snaps when supply is most severely constrained.

3) Price impacts of gas exports must be factored in as the domestic price of gas will eventually be influenced by the world price once export facilities come on line. Whether they are in Maryland, Massachusetts or the Gulf is immaterial. The global price will then dictate the domestic gas prices and that will make many of the "economically infeasible" technologies listed in the red section of the first slide now economically viable options.

4) Price suppression effects of wind and solar in the wholesale markets must be considered as it lowers ratepayers costs now that the ISO-NE is for the first time allowing renewables to bid into the wholesale auction and is accepting negative hourly prices.

5) Cost of additional natural gas storage facilities to meet the shortfall for the 12 day peak winter cold snap was not shown as a viable option.

6) Study is state specific, not regional, yet the solution is regional by nature and needs to run as a regional model to make any sense in the real world.

7) Solar PV is currently severely constrained by net metering caps and managed growth allocations in Massachusetts. Together with offshore wind this could conceivably be required to add over 4000 MW of capacity by 2030 to offset some of the retiring generation assets with out adding to emissions.

8) LNG pricing is directly related to oil costs which have dropped dramatically over recent months and LNG storage facilities should be considered for improving reliability and avoiding the forecasted winter price spikes of natural gas from the constrained pipelines in the short years of 2020-2022.

Sincerely,

Susan Worgaftik
45 Forest Avenue
Greenfield, MA 01301

From:	Eugenia Gibbons
To:	Lowdemandstudy, (ENE)
Cc:	Larry Chretien
Subject:	LDS Analysis Stakeholder Comments - Re: December 18th Meeting
Date:	Monday, December 22, 2014 1:11:42 PM
Attachments:	LDS Stakeholder Comments from MassEnergy et al 122214.pdf
Importance:	High

Please find attached comments submitted on behalf of Mass Energy Consumers Alliance, Acadia Center, Environmental League of Massachusetts, Environment Massachusetts, Mothers Out Front, and Clean Water Action.

Thank you and best regards,
Eugenia

Eugenia T. Gibbons, Clean Energy Program Director
Energy Consumers Alliance of New England (ECANE)
(dba Mass Energy Consumers Alliance in MA and People's Power & Light in RI)
284 Amory Street
Boston, MA 02130
617-524-3950 x 141
eugenia@massenergy.org

www.massenergy.org and www.ripower.org

December 22, 2014

Massachusetts Department of Energy Resources (DOER)
Submitted electronically to lowdemandstudy@state.ma.us

Re: Massachusetts Low Demand Analysis – Comments from Mass Energy Consumers Alliance

Dear Acting Commissioner Lusardi:

Thank you for the opportunity to offer feedback in response to the Low Demand Scenario Analysis presentation given by Synapse on December 18, 2014. The undersigned represent consumer advocacy, environment, and grassroots citizen groups. We are deeply committed to achieving 80% GHG emission reductions by 2050 and believe energy solutions that move us away from our current over-reliance on natural gas are integral to meeting these goals. As we are seeing play out at the time of this study, this over-reliance leaves ratepayers exposed and vulnerable to energy price volatility, particularly during extreme peak periods – which further underscores the need for a thorough exploration of alternative solutions.

From the outset, we commended the Administration for undertaking a low demand analysis. We remained optimistic that the analysis would truly explore alternative resources capable of meeting the Commonwealth's heating and electricity demand in a sustainable way. And so although we applaud this exercise as an important step in identifying enduring solutions to Massachusetts' energy needs, it is far from complete. The study is constrained by the assumptions underlying it and DOER-imposed limitations on various components, especially energy efficiency. It does not reflect recent changes in the marketplace of great significance. But perhaps most important is the fact that compliance with Massachusetts law – the Global Warming Solutions Act (GWSA) – was neither an input nor was it achieved as an output.

The challenge of how to sustainably meet our energy demand is regional, as are some of the more comprehensive solutions. For example, we know that New Hampshire and Maine have significantly more efficiency potential, yet this potential and the true impact of new pipeline outside of the Commonwealth is not captured in this study. A pipeline would not only dampen the growth of clean energy in Massachusetts, but in other New England states as well.

Given the December 23rd date slated for release of the report, we recognize that it is unlikely that any of our recommendations will be reflected in the final work product. However, in submitting to the record the following limitations and deficiencies, it is our hope that this administration or the incoming administration will address the study's deficiencies and the larger question of GWSA compliance before proposing or implementing any policy that would commit the Commonwealth to new, publically-funded natural gas infrastructure over the long term.

Consider the Option Value

The RFP[1] issued by DOER in September 2014 was for a feasibility study "of achievable levels of alternative resource penetration in Massachusetts over next five-15 years." This was to be done to assess the extent to which new pipeline infrastructure is required to meet demand during peak periods. Although the LDS assesses the addition of incremental pipeline to the system, in reality a pipeline is not constructed in this way. A pipeline is either built or not. The LDS study compares a very large natural gas pipeline expansion to a number of alternative resources. Each of the alternatives is relatively small compared to the pipeline in terms of meeting our energy needs. However, with all of the alternatives, we can envision a wide range of possibilities (i.e. with off-shore wind and energy efficiency, we could procure any number of MW).

In this context, we urge policy makers to consider the option value of first adopting several examples of alternative resources before locking Massachusetts ratepayers in to an enormous long-term commitment to natural gas.

Recommended Improvements

The report provides interesting information that could be helpful in determining a set of solutions to meet our energy needs, but at a minimum, the following concerns must be addressed.

1. **GWSA COMPLIANCE.** Compliance with GWSA is fundamental. We recognize the challenge of exploring solutions that meet energy demand while balancing reliability, cost, and environment, but the Commonwealth's emissions reductions targets (25% below 1990 by 2020, 80% by 2050) are **mandated** by the Global Warming Solutions Act (GWSA). A path to compliance should have been a goal of the study, yet Synapse was directed by DOER to make GWSA compliance an output rather than an input. The result is that NONE of the eight (8) scenarios presented in this study would bring us into compliance with the law.

   All eight scenarios would cause additional costs to the citizens of the Commonwealth and would have to be achieved outside of the Electricity and Building Sectors. Costs incurred by citizens would be include the abatement costs associated with the increased quantity of greenhouse gases emitted from the transport and combustion of natural gas through the new pipelines. Such costs could have easily been estimated by Synapse and tacked onto the cost of the pipeline. Instead, Synapse was directed by DOER to neglect such a fundamental consideration.

2. **LIMITED CONSIDERATION OF ALTERNATIVES.** Additional pipeline will undermine the progress MA has already made toward meeting the GWSA, while deferring more expensive emission reductions to be achieved outside of the electric sector. EEA's own analysis[2] indicates that the strategies currently underway and most likely to achieve the required reductions by 2020 nearly all come from buildings (demand) and electricity (supply). Attempting to meet demand with additional pipeline, especially while

[1] See RFP for Consulting Services for Low Demand Scenario: RFR ENE-2015-012/COMMSBUYS Bid# BD-15-1041-ENE01-ENE01-00000001461, Section 3.1.1, 1c-f

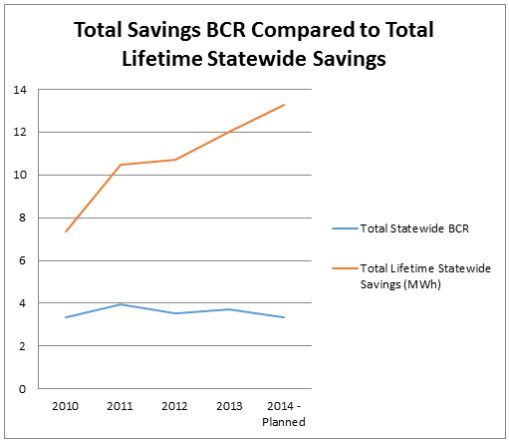
[2] "**GHG Reductions Likely by 2020:** This block of GHG reductions represents strategies which are underway or in the late stages of planning, and in EEA's judgment are highly likely to be realized at or near their full potential by 2020.These include (1) energy efficiency and tree-planting, totaling 5.5 MMTCO2e (2) clean energy imports, power plant closures, solar thermal, and expanded RPS, totaling 6.4 MMTCO2e, (3) Federal efficiency standards for light– and medium/heavy duty vehicles, totaling 2.0 MMTCO2e , and (4) Non-energy emissions, totaling 1.0 MMTCO2e." See Commonwealth of Massachusetts Global Warming Solutions Act 5-Year Report, page 12.

failing to fully consider demand side resources and supply side renewable alternatives, will only pull Massachusetts further away from compliance.

This study is specifically limited in its consideration of the following alternatives:

- ENERGY EFFICIENCY. Synapse's examination of the full impact of energy efficiency as a least cost resource with proven benefits was arbitrarily constrained by DOER who imposed a limit on the amount of efficiency to be considered. The limits imposed by DOER beyond 2015 correspond to the Clean Energy & Climate Plan, but they reflect energy savings that would be only slightly higher than the amount of energy savings now being achieved. Neither the Energy Efficiency Advisory Council nor Department of Public Utilities have approved such limited energy savings.

  Given that Massachusetts energy efficiency programs have greatly expanded since 2009 without causing per unit costs to rise or BCRs to fall, we see the current amount of efficiency in the supply curve to be far too low. Synapse has shown us how well efficiency compares to EVERY other possible energy resource, inclusive of the pipeline and alternative resources. We also know that empirical data about the cost-effectiveness of energy efficiency provides us with greater certainty about efficiency than any other resource.

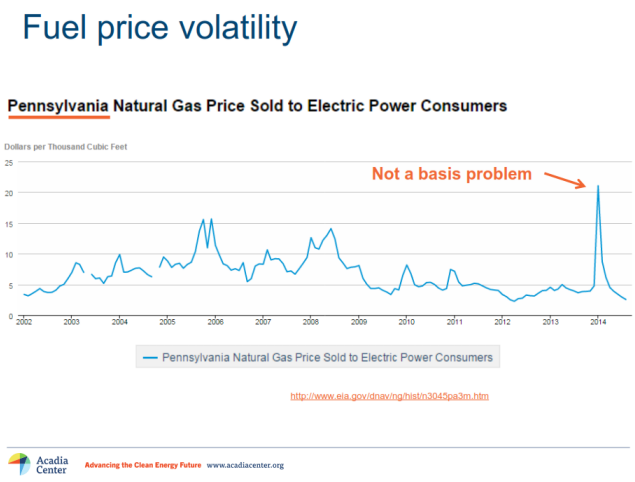


- LIQUID NATURAL GAS AND OIL. We understand the reticence of some to rely on LNG and petroleum for meeting winter peak demand, based solely upon the Polar Vortex experienced last year. But circumstances have changed greatly. Oil prices have plummeted, greatly reducing the cost to generators in New England for both oil and LNG, which is priced off the world-wide price of oil. As such, the economics of the Winter Reliability Program have been greatly improved. In October, we asked that Synapse consider possible expansions of the program, but we do not see evidence that they did. We believe that consuming additional quantities of LNG and oil during a few winter peak hours for the next few years is preferable both economically and environmentally to buying a long-term commitment of methane-leaking natural gas.

- RENEWABLE RESOURCES. Based on the criteria used to screen measures, the study suggests that off-shore wind has great potential in terms of quantity, but at a cost that was considered non-economic relative to gas pipelines. We would have preferred to see the analysis consider blending a more modest amount of off-shore wind with greater energy savings and other renewables. Furthermore, in the calculations of benefits of low-emission supply-side resources, Synapse should have used the

same value for carbon abatement that is applied to energy efficiency here. (The value has been proposed to apply to energy efficiency in DPU docket 14-86.) A value for the cost of carbon abatement could and should be applied to hydro and Class 1 renewables, as well. Failing to do so quite obviously hides an important cost factor with natural gas. Additionally, the consideration of Canadian imports seemed superficial insofar as it looked at two generic transmission lines capturing system power. We would have liked to have seen a more robust consideration of hydro and wind sourced from different Canadian provinces, which may have a higher capacity factor and greater benefits than what was modeled.

- NATURAL GAS PRICES. At the December 18 stakeholder session we learned that the study assumes gas heating demand to be inelastic for the entire study period. Over such a long period of time (five-15 years), high gas prices would cause reduced gas consumption, either through conservation, efficiency, or the adoption of renewable thermal technologies. In addition, the scenarios studied assume that there would be no winter price spikes in years 2015-2020. Again, price spikes would cause greater adoption of alternatives. It should also be noted that additional pipeline does not inoculate against price volatility – as was experienced in Pennsylvania last winter.[3]



Finally, it is unclear the extent to which DOER and Synapse have calculated the economic threshold considering the potential run-up in cost that could result from a substantial amount of natural gas exports. Each of these examples further illustrates the study's inadequacies.

3. **MISLEADING ASSUMPTIONS ABOUT ECONOMICS OF PIPELINE CAPACITY.** Assuming optimal economics for additional pipeline capacity (i.e. 80% annual utilization rate) skews the results to portray new capacity in a favorable light. In reality pipelines are often oversized, which could lead to lower utilization and worse economics. Furthermore, we note that two of the leading proposals being considered in Massachusetts far exceed what this study recommends (e.g., Kinder Morgan NED proposed 2.2Bcf/d, Spectra proposed 1.0Bcf/d).

4. **FAILURE TO ACCOUNT FOR METHANE EMISSIONS.** In the comments submitted on 10/20/14, we stated our concerns that DOER had instructed Synapse not to account for methane leakage because of limited time to analyze this question properly given the wide range of possibilities. That concern remains

[3] See slides 6, 7 in presentation given by Acadia Center at Restructuring Roundtable, November 2014. Available online at http://www.raabassociates.org/Articles/Shattuck% 20Presentation%20Final%2011.21.14.pdf.

unchanged, especially in the wake of the Administration's release of a Carbon Tax Study. As supporters of the Global Warming Solutions Act, we do not understand why the Commonwealth would carefully analyze its many energy options and the effects of putting a price on C02 up the stack without also putting a price on CH4 sent into the air, which is inconsistent.

At a minimum we suggest a simplified approach that would be similar to approaches used in other parts of this Low Demand Analysis. That would be to utilize a conservative percent leakage as recently published in a report for US DOE.[4] In that report, the authors estimate a 1.2-1.6 percent methane leakage rate, for Marcellus shale gas. (Please note this is a conservative estimate. We suggest a more appropriate rate would be 3-6%, but recognize that even higher estimates may be considered, too.[5]) It would seem reasonable to multiply the middle of that range, or 1.4% times the amount of natural gas that would be piped into Massachusetts to determine the quantity of leaked methane. Then multiply that number by 86[6] to derive a number that would be the number of tons of carbon dioxide equivalent.

As the transition in the Commonwealth's leadership gets underway, we hope that these comments and those of our colleagues will be taken into consideration as decisions about energy planning are made. The challenge of how to sustainably meet our energy demand is regional, as are some of the more comprehensive solutions. This report is an important step forward and we strongly urge policy-makers to address the study's deficiencies raised above and the larger question of GWSA compliance before proposing or implementing any policy that would commit the Commonwealth to new natural gas infrastructure over the long term. As actively engaged stakeholders committed to advocating for consumers and the environment, we look forward to continuing the dialogue and to participating in this process. We make ourselves available to you for ongoing collaboration.

For questions or additional information please contact Eugenia Gibbons: eugenia@massenergy.org, 617-524-3950 x 141.

Sincerely,

Eugenia Gibbons, Mass Energy Consumers Alliance
Peter Shattuck, Acadia Center
Vanessa Rule, Mothers Out Front
Joel Wool, Clean Water Action
Josh Craft, Environmental League of Massachusetts
Ben Hellerstein, Environment Massachusetts

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[4] http://energy.gov/sites/prod/files/2014/05/f16/Life%20Cycle%20GHG%20Perspective%20Report.pdf.
[5] See "A Bridge Too Far" page 7 for citations of rates between 1-9% including Harvard/NOAA. http://www.betterfutureproject.org/wp-content/uploads/2014/06/A-Bridge-Too-Far-Final.compressed.pdf
[6] IPCC, 2013: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 1535 pp.

From: Lusardi, Meg (ENE)
To: Aminpour, Farhad (ENE)
Cc: McBrien, Joanne (ENE)
Subject: Fw: Citizen comments: Andrea Doremus - West Roxbury, MA DOER/LowDemand
Date: Monday, December 22, 2014 2:02:08 PM
Attachments: Letter to Meg L.doc
DOERgas use projection.jpg

Sent from my Verizon 4G LTE Smartphone

------ Original message------
From: Andrea Doremus Cuetara
Date: Mon, Dec 22, 2014 1:49 PM
To: Lusardi, Meg (ENE);
Subject: Citizen comments: Andrea Doremus - West Roxbury, MA DOER/LowDemand

Dear Ms. Lisardi - My concerns about the draft DOER/Synapse report:

Don't all the people involved in this draft report, including the Governor, realize that the proposal as it stands actually violates Mass State Law under the Global Warming Solutions Act? How is that even possible?!!

--[if !supportLists]-->2) <!--[endif]-->Why is there STILL not enough "taking into account" the rapidly developing renewable, sustainable energy grid? And why isn't there enough investment to policies that aggressively promote education and subsidies for truly effective consumer and commercial conservation measures, ie, high efficiency heaters and appliances (I heard on KPFA radio yesterday that the US produces more carbon from backyard BBQs on one day -4th of July- than some African countries in a whole year).

--[if !supportLists]-->3) <!--[endif]-->Of course this whole plan was made BEFORE this huge drop in all prices changes everything and also speaks to the instability and volatility of markets and the future of fossil fuels (also considering increasing extreme weather events as forecast).

--[if !supportLists]-->4) <!--[endif]-->The whole assumption of the report that price spikes

will exist then vanish, fails to consider WHY they exist. “It appears that in the eastern NY area there is a lot of gas trading (north-south) going on and this speculative activity could persist even with the installation of more pipeline. If north-south speculative gas trading is pulling gas down to long island or to Maryland or to Ontario, it could be a source of congestion. It appears that regulations may be needed so that some of the companies that serve residential gas heating in the winter do not charge the power generators too much money for the gas they "release into the market." No guarantee that just physical pipeline additions will erase the issue, though they probably will help.”

--[if !supportLists]-->5) <!--[endif]-->“Synapse only considered short term pipeline capacity
additions from Spectra Energy, and ignored the two projects which have the ability to add gas, without the addition of any new pipeline whatsoever. These are the Iroquois + PNGTS solution which would mean 550 million cubic feet a day of new capacity without a pipeline, compared to the AIM solution which is 342 million cubic feet a day with a pipeline. Synapse did not reveal the fact that AIM was "baked into the analysis" until just a few days ago, despite the fact they promised to reveal their assumptions much earlier... AND THEN cancelled those meetings. The Iroquois & PNGTS proposals were posted at NESCOE.com back
in May 2014.

--[if !supportLists]-->6) <!--[endif]-->the state should have insisted on a model run that
procured enough weatherization or storage to avoid a pipeline. They are leaving it up to us to make our own model runs that show the alternatives, which is silly because they spent $250,000 on this, and easily could have insisted on it -- with the proper direction from those in charge in the Governor's office.

Thank you for your tremendous efforts on behalf of the Massachusetts public and environment.

Andrea Doremus - (mom and hs teacher)

48 Linden Road

West Roxbury, MA 02132

2 blocks from Spectra proposed M & R station
(750psi high-pressure pipeline) across from an actively blasting stone quarry
(WR Crushed Stone)

My concerns about the draft DOER/Synapse report:

1) Don't all the people involved in this draft report, including the Governor, realize that the proposal as it stands actually violates Mass State Law under the Global Warming Solutions Act? How is that even possible?!!

2) Why is there STILL not enough "taking into account" the rapidly developing renewable, sustainable energy grid? And why isn't there enough investment to policies that aggressively promote education and subsidies for truly effective consumer and commercial conservation measures, ie, high efficiency heaters and appliances (I heard on KPFA radio yesterday that the US produces more carbon from backyard BBQs on one day -4th of July- than some African countries in a whole year).

3) Of course this whole plan was made BEFORE this huge drop in all prices changes everything and also speaks to the instability and volatility of markets and the future of fossil fuels (also considering increasing extreme weather events as forecast).

4) The whole assumption of the report that price spikes will exist then vanish, fails to consider WHY they exist. "It appears that in the eastern NY area there is a lot of gas trading (north-south) going on and this speculative activity could persist even with the installation of more pipeline. If north-south speculative gas trading is pulling gas down to long island or to Maryland or to Ontario, it could be a source of congestion. It appears that regulations may be needed so that some of the companies that serve residential gas heating in the winter do not charge the power generators too much money for the gas they "release into the market." No guarantee that just physical pipeline additions will erase the issue, though they probably will help."

5) "Synapse only considered short term pipeline capacity additions from Spectra Energy, and ignored the two projects which have the ability to add gas, without the addition of any new pipeline whatsoever. These are the Iroquois + PNGTS solution which would mean 550 million cubic feet a day of new capacity <u>without a pipeline</u>, compared to the AIM solution which is 342 million cubic feet a day <u>with a pipeline</u>. Synapse did not reveal the fact that AIM was "baked into the analysis" until just a few days ago, despite the fact they promised to reveal their assumptions much earlier... AND THEN cancelled those meetings. The Iroquois & PNGTS proposals were posted at NESCOE.com back in May 2014.

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Andrea Doremus - (mom and hs teacher)
48 Linden Road
West Roxbury, MA 02132
2 blocks from Spectra proposed M & R station (750psi high-pressure pipeline) across from an actively blasting stone quarry (WR Crushed Stone)

	Base Case - Ref Gas - No Hydro		
	MA NG	**MA CO2**	**MA Costs**
	Annual MMBtu	*metric tons*	*2013 $*
2015	181,311,320	18,248,599	2,181
2016	184,972,290	18,283,063	2,300
2017	200,451,170	17,843,295	2,239
2018	199,119,990	17,105,871	2,290
2019	205,017,020	17,407,430	2,272
2020	255,783,870	17,236,344	2,089
2021	246,834,540	17,096,854	2,127
2022	233,395,600	16,798,716	2,204
2023	235,948,780	16,906,576	2,287
2024	248,222,830	16,711,820	2,334
2025	254,287,850	16,948,035	2,403
2026	254,776,890	16,806,740	2,484
2027	253,741,460	16,845,593	2,546
2028	269,966,790	16,960,055	2,653
2029	274,440,680	17,298,721	2,773
2030	260,960,520	16,974,073	2,855

From:	Doug Pope
To:	Lowdemandstudy, (ENE)
Subject:	Pope Energy - Low Demand Study
Date:	Monday, December 22, 2014 1:36:21 PM
Attachments:	Pope Energy Comment Letter 12-22-2014.pdf ATT00001.txt PastedGraphic-3.tiff ATT00002.txt

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Commissioner Lusardi,

Please find our comment letter for the Low Demand Analysis.

Best Regards,

Doug

Pope Energy

December 22, 2014 1:35 PM

Meg Lusardi
Acting Commissioner
Department of Energy Resources
100 Cambridge Street, Suite 1020
Boston, MA 02114

lowdemandstudy@state.ma.us

Re: Comment Letter Synapse Energy Economics
Low Demand Study, Meeting December 18, 2014

Dear Ms. Lusardi:

At the meeting on December 18, 2014, Synapse stated that the study only dealt with existing legislative and regulatory conditions, Massachusetts's sited retirement of generation assets that had been announced and existing generation technologies.

With Massachusetts being the largest consumer of electricity in New England[1], the concept of isolating the study to considering only announced retirements of coal and oil assets within the Commonwealth is flawed. ISO-NE continues to project the retirement of 8,300 MW of coal and oil generation assets and 5,100 MW of those new replacement resources are needed at the "HUB" which is located in central Massachusetts.[2] In order for the Massachusetts Low Demand Analysis to have value, the Synapse report must address the anticipated retirement of not only the retirement (and refueling?) of Salem Harbor (749 MW), Brayton Point (1,535 MW) but Vermont Yankee (604 MW) and the balance of projected 5,400 MW of retiring coal and oil generation assets.

If the Low Demand Analysis considers province-owned hydroelectric generation as a realistic generation scheme to consider, then in-state development of solar PV and wind should be considered. With Managed Growth of solar constraints removed, the solar and wind industry could consume most of the capacity of retiring coal and oil generation assets. By giving notice to the market that the Commonwealth intends to replace retiring capacity with solar and wind resources, this will also direct the new investment in fast-start balancing resources. The fuel sources for these fast-start resources needs to be modeled as well.

The North American Ice Storm of 1998, that collapsed over 1,000 transmission towers leaving 4 million people without electricity for over one month[3] serves as a reminder that natural forces are capable of disabling these significant province-owned, hydroelectric generation assets. Fuel for reliability needs to be modeled for such an event. Decentralized solar and wind generation assets are less prone to catastrophic system failure and represents a strategic investment for the Commonwealth in infrastructure security.

[1] US Energy Information Administration, Table F21 Electricity Consumption, 2013
[2] ISO-NE Strategic Transmission Analysis, Stephen Rourke, VP, System Planning, June 14, 2013
[3] http://en.wikipedia.org/wiki/North_American_Ice_Storm_of_1998

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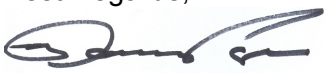
Pope Energy

More than 340 city and town officials are asking Governor-Elect Baker to support the report by Environment Massachusetts that calls for 20% installed capacity of solar by 2025.[4] As a default methodology, the Low Demand Analysis should model this scenario in a straight line 10-year fashion to calculate the low-demand metrics as well as the environmental attributes.

Thank you for your consideration.

Best Regards,



Doug Pope
President

[4] http://environmentmassachusetts.org/news/mae/more-340-city-and-town-officials-ask-governor-elect-baker-support-solar

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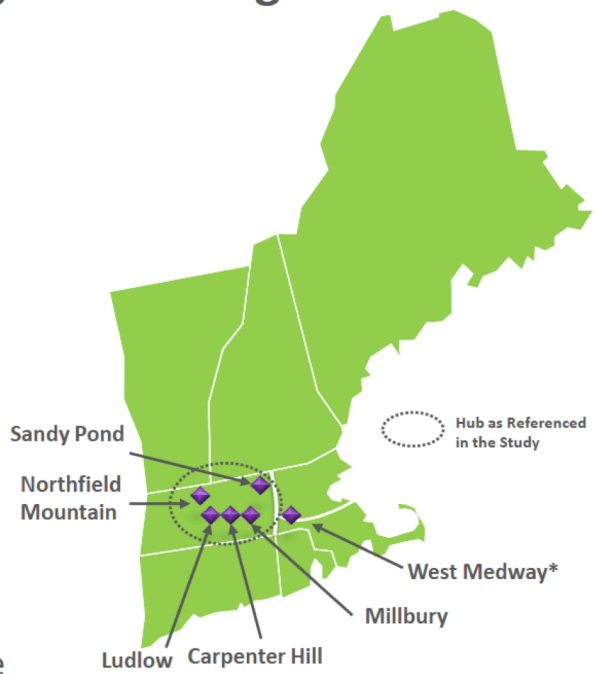
Capacity Resources Assumed to be at Risk of Retirement (from 2010 Economic Study)

Unit	Unit Type	MW Maximum Assumed	In-service Date	Age in 2020
BRAYTON POINT 1	Coal	261	01-Aug-63	57
BRAYTON POINT 2	Coal	258	01-Jul-64	56
BRAYTON POINT 3	Coal	643	01-Jul-69	51
BRAYTON POINT 4	Oil	458	01-Dec-74	46
BRIDGEPORT HBR 2	Oil	190	01-Aug-61	59
BRIDGEPORT HBR 3	Coal	401	01-Aug-68	52
CANAL 1	Oil	597	01-Jul-68	52
CANAL 2	Oil	599	01-Feb-76	44
MERRIMACK 1	Coal	121	01-Dec-60	60
MERRIMACK 2	Coal	343	30-Apr-68	52
MIDDLETOWN 2	Oil	123	01-Jan-58	62
MIDDLETOWN 3	Oil	248	01-Jan-64	56
MIDDLETOWN 4	Oil	415	01-Jun-73	47
MONTVILLE 5	Oil	85	01-Jan-54	66
MONTVILLE 6	Oil	418	01-Jul-71	49
MOUNT TOM 1	Coal	159	01-Jun-60	60
MYSTIC 7 GT	Oil	615	01-Jun-75	45
NEW HAVEN HBR	Oil	483	01-Aug-75	45
NEWINGTON 1	Oil	424	01-Jun-74	46
NORWALK HBR 1	Oil	173	01-Jan-60	60
NORWALK HBR 2	Oil	179	01-Jan-63	57
SCHILLER 4	Coal	51	01-Apr-52	68
SCHILLER 6	Coal	51	01-Jul-57	63
W. SPRINGFIELD 3	Oil	111	01-Jan-57	63
YARMOUTH 1	Oil	56	01-Jan-57	63
YARMOUTH 2	Oil	56	01-Jan-58	62
YARMOUTH 3	Oil	122	01-Jul-65	55
YARMOUTH 4	Oil	632	01-Dec-78	42
TOTAL 8,281 MW				

Application of New England Trading "Hub"

- New England Trading Hub (Hub) is a central trading location in energy market where no significant energy congestion is expected
  - 32 electrical buses/nodes in West-Central Massachusetts make up the Hub
  - Interconnection of new proxy generation at the Hub was represented by six 345 kV buses/nodes*
- Replacement resources needed were envisioned to be integrated at the Hub



** W. Medway 345 kV is electrically close to, but not in the defined Trading Hub*

From:	John Carlton-Foss
To:	Lowdemandstudy, (ENE)
Subject:	Comments
Date:	Monday, December 22, 2014 1:50:33 PM

Thank you for your considerable effort to provide a quantitative report and evaluation of the matter at hand. Mathematical treatments of matters are important because the substance and biases become clearer and more actionable.

Others have made excellent comments in other domains. I particularly wish to endorse the Sierra Club comments, Amber Hewett's comments, Haskell Werlin's comments, as well as those of Elisa Grammer. Rather than repeat parts of those comments, I will focus on the narrow issue of the levelization algorithm, which I found useful but inadequate by itself. I have not had time to read the draft report or review the spreadsheets this weekend, so my comments are based on the presentation.

I would start by noting that the levelized cost results are contradictory with the results presented several years ago for power generation by a major Midwestern electric company. I made a picture of their slide with results but do not have time to find it in my archives.

A more complete metric might include consideration of the number of good jobs created by each technological choice.

The levelized cost calculation appears to be one of many possible algorithms to provide a metric to evaluate different options. One obvious additional metric would be installed MW of electricity produced as corrected by capacity factor. The differing results for different metrics should be analyzed and understood as they relate to totals and subtotals.

This is particularly important because the levelized algorithm has its biases. The use of time value of money gives advantage to long lasting projects with expenses that can be put off as late as possible, or that come at the end of the project. This would, for example, place a nuclear electric facility in unreasonably favorable light just at a time when it is apparent to many citizens that decommissioning and dealing with toxic and radioactive wastes represents a major burden that stands considerable risk of being socialized.

Let me say this in a different and more challenging way. Net present value calculations may work for money, and then may work for material such as carbon when there is substantially an infinite supply and an unlimited sink. It does not work as a way of characterizing costs when the supply is finite OR the capacity of the atmosphere to serve as a sink has already been exceeded.

The study also is looking at the levelized cost of various options for making sure we have as much electricity and gas as we may want. I use the word "want" instead of "need" as code to indicate our profligacy in consumption of energy and use of the environment as a dump site. Although most of us recognize that excess, and many of us try to do something about it in our own lives, it has not been properly addressed in the study. What has been addressed is the levelized costs and benefits assuming unlimited supplies and unlimited willingness to use them. Here we find that the study has ignored the costs of dumping carbon dioxide, methane, and other carbon equivalents into the atmosphere. Clear signals are emerging that we are near to well past the sustainable limit. This needs to be translated into a yearly cost quantity that can be entered into the spreadsheets. It would be deceptive and incorrect to adjust successive terms with a net present value calculation, as these pollutants become ever more a critical factor as the atmosphere is more and more filled with carbon dioxide equivalents. Carbon pricing would provide for this, but current political thinking would set the price too low. How about using the net worth of our seaboard civilization divided by the number of metric tonnes of carbon emissions over the next ten years? This would provide a means to amortize the cost over a period of ten years.

--
John Carlton-Foss, S.M., Ph.D.
Co-Vice Chair, Environmental Officer, and Secretary, Weston DTC
Climate Action Citizens
(https://www.facebook.com/pages/Climate-Action-Citizens-US/552228361510739)
Videography Outlets: Falmouth CTV, Weston Media, YouTube

From:	Ken Berthiaume
To:	Lowdemandstudy. (ENE); Lusardi. Meg (ENE)
Cc:	matthew.beaton@mahouse.gov
Subject:	Follow-up Comments - December 18th Meeting on the Low Gas Demand Study
Date:	Monday, December 22, 2014 1:51:19 PM

Acting Commissioner Lusardi and Members of the Low Demand Study Team, I offer the following comments:

1. The New England grid capacity is stated at 32, 247 MW's as referenced by ISO New England in their 2013-2014 Regional profile [1]. The grid has been running consistently **well below** capacity, ranging from 53% to 60% over the past several months. Of the total electricity generation, hydro has been supplying on average 11% with renewables (as defined by ISO N.E.) an additional 7 % of actual output **during peak hours** – as observed daily from the ISO New England website "real-time data" [2]. The remainder has been NG, Nuclear, Coal and occasionally Oil generation. As the use of renewable energy generation continues to increase, the aforementioned fossil fuels and nuclear will continue to be displaced by clean energy that is NOT subjected to world-price volatility of fossil fuels nor weather forecasts – example cited below:

a) The price of Natural Gas as of **November 5th** was at $4.06 / MMBTU's and the nation's gas reserves at 3,571 Bcf [3].

b) Note the price volatility of Natural Gas simply based on the weather forecast.
"Prices/Demand/Supply:
Prices rise on colder weather. Natural gas prices rose at most market locations this week, as New England and some Southern states experienced early winter weather. The Henry Hub spot price rose 24 cents from $3.56/MMBtu last Wednesday to $3.80/MMBtu yesterday. The Algonquin Citygate, which serves Boston, began the week at $4.03/MMBtu and rose to $6.64/MMBtu on Friday on forecasts for a cold, snowy weekend in New England. The price dropped back to $4.06/MMBtu at the end of the report week as temperatures moderated."

2. With the existing New England states Renewable Portfolio Standards set to account for approximately 8,000 MW's of wind and solar energy to come on-line between now and 2020 [4,5,6,7,8,9], the low gas demand study appears to have by-passed or discounted this fact, or is not distinctly discernable within the four spreadsheets provided.

3. Demand Response, pumped storage, and battery storage were "removed" from the study, as "None of these resources have annual MMBtu savings" as stated in the Synapse December 18th slides (slide 12). The purpose of this low-demand study was to determine the extent of the potential "issue" during Winter Peak-Demand hours. Removing these resources, which could readily (i.e. today) contribute to the reduction of this peak demand increases the possibility of unwarranted infrastructure, costs that would ultimately be borne by rate-payers.

4. In addition to the cost of the transmission pipeline, the cost of LDC's additional gas lines to new consumers (including street to homes/buildings) needs to be factored into the overall cost of NG. This was commented previously and appears to not have been factored in to this study, or it is not discernable based on the less than 72 hours of review time available before the comments deadline.

5. While it may have been discussed briefly, 'Repairing gas distribution leaks' was not mentioned in the October 31st Memorandum.
   - It was mentioned in the October 15, 2014 First Stakeholder Meeting on slide 27 titled Feasibility

Analysis.

- The amount cited by CLF[10] is between 8Bcf and 12Bcf annually. Based on U.S. EIA 2009 information[11] , this equates to savings equal to the amount of annual gas consumption for an additional 93,000 to 140,000 homes.
- Per caveats listed in the December 18th slides (slide 48, 68), the "Study does not take into consideration…. legislation on gas leaks", nor the accompanying benefits and basic savings, but does recommend "that this information be considered in future studies".

6. The study is based primarily on ISO New England's CELT forecast which has proven to be highly optimistic over the past 3 years.

   In year 2011, the CELT forecast was 4.7% higher than actual
   Net Energy forecast for 2011: 135,455 (2011 CELT report)
   actual for 2011: 129,153 GWH (2012 CELT report)

   In year 2012, the CELT forecast was 6.2% higher than actual
   Net Energy forecasts for 2012: 137,955; 138,195 -- (2011, 2012 CELT reports)
   actual for 2012: 128,047 GWH (2013 CELT report)

   In year 2013, the CELT forecast was 6.1% higher than actual
   Net Energy forecasts for 2013: 139,230; 138,875; 137,045 -- (2011, 2012, 2013 CELT reports)
   actual for 2013: 129,367 GWH (2014 CELT report)

   In 2014 the CELT forecast is approximately 9.7% higher than what is actually occurring
   Net Energy forecasts for 2014: 140,830; 140,520; 138,910; 138,390 -- (2011, 2012, 2013, 2014 CELT reports)
   actual for 2014 through November from the net energy and peak load report jan-nov: 116,154; assuming 11,000 GWH in December would yield 127,154 GWH

7. As noted and discussed in the December 18th meeting (slide 34), not one of the scenarios modeled in this low-gas demand study complied with GWSA targets. It is apparent that additional work is in order if Massachusetts is to not only stabilize its energy infrastructure by reducing its over-reliance on fossil fuels but to also align with GWSA policies.

Thank you for considering these comments.

Regards,

Kenneth W. Berthiaume
Orange, MA
North Quabbin Pipeline Action

Cc: EEA Secretary-Elect Matthew Beaton

References:

[1] http://www.iso-ne.com/nwsiss/grid_mkts/key_facts/final_regional_profile_2014.pdf
[2] http://www.iso-ne.com/
[3] http://www.eia.gov/naturalgas/weekly/archive/2014/11_06/index.cfm
[4]

http://www.iso-ne.com/nwsiss/grid_mkts/key_facts/final_ma_profile_2013-14.pdf

[5] http://www.iso-ne.com/nwsiss/grid_mkts/key_facts/final_vt_profile_2014.pdf

[6] http://www.iso-ne.com/nwsiss/grid_mkts/key_facts/final_me_profile_2014.pdf

[7] http://www.iso-ne.com/nwsiss/grid_mkts/key_facts/final_ct_profile_2013-14.pdf

[8] http://www.iso-ne.com/nwsiss/grid_mkts/key_facts/final_nh_profile_2014.pdf

[9] http://www.iso-ne.com/nwsiss/grid_mkts/key_facts/final_ri_profile_2014.pdf

[10] The Boston University Study's findings regarding the number of leaks in Boston are in line with reporting to the Department of Transportation and the Massachusetts Department of Public Utilities. *See* D.P.U. 12-38, Petition of Boston Gas Company and Colonial Gas Company d/b/a National Grid for Review and Approval of its Targeted Infrastructure Replacement Factor for 2011, NG-WFF-6 at 3 (Reporting 4,285 leaks on leakprone pipelines in 2011), available at http://www.env.state.ma.us/dpu/docs/gas/12-38/5112ngcmpex2.pdf; National Grid reported 3,772 leaks on its Boston Gas Company mains to the Department of Transportation. Gas Distribution Annual Form 2011, PHMSA, Form F 7100.1-1.

[11] http://www.eia.gov/pub/oil_gas/natural_gas/feature_articles/2010/ngtrendsresidcon/ngtrendsresidcon.pdf

From: Rich Cowan
To: Lowdemandstudy, (ENE)
Cc: Sylvia, Mark (ENV); eastanton@synapse-energy.com
Subject: Comments on Synapse Low Demand Analysis, 12/22/2014
Date: Monday, December 22, 2014 1:55:28 PM

To the "Low Demand" Analysis Group:

I appreciate the opportunity to comment on the latest Synapse study. Though I was unable to attend the meeting held last week after it was twice rescheduled, I have followed the process remotely and reviewed the results you posted. I hold bachelors and masters degrees in Electrical Engineering and Computer Science from MIT and have been attending industry meetings (ISO Regional System Plan, iSO CAG, NE Environmental Business Council) and much of the information I am presenting was learned from those interactions. My comments also represent the group Dracut Stop the Pipeline which has over 50 members concerned about the hazards of new pipeline construction in an area close to two active quarries, five active farms, and many newly constructed residential neighborhoods.

I will focus strictly on the numbers in your draft report and some of its overall assumptions.

1) The study should mention the possibility of expanding flows on existing pipelines.

There are already significant expansions planned (and approved) that are likely to be in place well before the construction of the AIM pipeline. Specifically, the PNGTS Continent to Coast expansion does not require "a new pipeline." The chief regulatory obstacle to that expansion has been cleared in a November 28 decision of Canada's National Energy Board. Not only does this pipeline project offer an additional capacity of 200,000 Dth/day during peak hours, but it may be joined by an additional expansion of New England bound gas on the Iroquois pipeline, in the amount of 350,000 Dth/day. Iroquois documents state the pipeline could theoretically add compression to further increase flow. The combined addition of 550,000 Dth/day should resolve all short term supply problems -- if the natural gas and electricity forecasts relied on are not overly "bullish" in terms of the expected increase in demand. The details on the Iroquois expansion are provided here: http://www.nescoe.com/uploads/IGTSletteronIGER_23May2014.pdf

Thus, we recommend that the estimate of natural gas supply without new pipeline construction -- the 550 Dth/day cited above -- be included in the study, along with any AIM capacity that could also be added. It should be noted that AIM has recently been delayed and its construction by 2016 may now be less likely than expansion of flow on existing pipes, as the result of a more informed electorate. Failing that, a caveat needs to be added to the final draft that "new pipeline" really means "new pipeline capacity" -- whether that flow is achieved on the two existing underutized pipelines, or shiny new greenfield pipelines pressurized at 1460psi that cross conservation lands, watersheds, and back yards.

2) The GWSA compliance analysis paired with new pipeline

recommendations may raise eyebrows.

The addition of any significant pipeline would obviously result in increased LNG exports especially during off peak months. A study concluding that additional pipelines sized to feed new proposed export terminals (such as Canaport, NB, Downeast Maine, and Goldboro, NS) would offer global warming benefits may easily be discredited by those on all sides of the debate.

A pipeline sized at 1 BCF/day is able to carry enough gas to generate 19.5 million metric tons of CO2 per year -- whether that CO2 is generated here or abroad. The energy used in compression for transmission (about 4% for the proposed market segment of the NED pipeline and in liquefaction/transport (up to 30%) must also be accounted for. And yes, there are leaks of methane.

3) The use of ISO CELT data for Electric Demand must be disclosed and gas forecasts from LDCs need to be double-checked

It appears that industry data was supplied for gas forecasts, and ISO CELT data was used for electricity demand forecasts. Dr. Stanton stated that ISO data was used mainly for demand forecasts when I asked this question at the October 30 meeting. CELT reports are publicly available at http://iso-ne.com/system-planning/system-plans-studies/celt

Recent analysis of these reports show that ISO's energy predictions are consistently wrong. In 2011 the ISO prediction for net energy use was 4.7% higher than actual and in 2014 the ISO prediction is almost 10% higher than actual electric demand. 140,830 Gwh of net energy use was predicted in this year's CELT but assuming normal December demand of 11,000 Gigwatt hours, only 127,154 Gwh of net energy will be used in the northeast in all of 2014. This is 1.7% below electricity demand for the same 12 month period last year according to the ISO, and at a time when the unemployment rate is falling. There **decrease** in electricity demand from 2011 to 2014, based on this extrapolation of actual 2014 "net energy" statistics, as shown here:
http://www.iso-ne.com/static-assets/documents/2014/09/enepk_report.xls

It appears that the numbers reflected in the latest Synapse model include the electricity needed to run many more incandescent bulbs during the winter than actually exist. It is also likely that these numbers include gas demand figures that show a temporary spike due to the loss of waste energy from these same incandescent bulbs, which have been replaced by CFLs and LEDs.

Could Synapse please disclose the source of the "Market Analytics" data that was used to calculate net power demand?
Could Synapse please disclose whether the natural gas demand figures supplied by the LDCs were audited (many of those forecasts are now up to 2 years old) before they were included in the recent report?

Below are the numbers I pulled from the ISO CELT report showing lower than expected electricity use.

Thank you for considering these comments.

Sincerely,

Rich Cowan
(617) 642 3379

ISO Forecasted Demand, vs Actual Demand (Gwh)

sources: http://iso-ne.com/system-planning/system-plans-studies/celt
http://www.iso-ne.com/static-assets/documents/2014/09/enepk_report.xls
[compiled by R. Cowan, 12/22/2014]

Net Energy forecast for 2011: 135,455 (2011 CELT report)
actual for 2011: 129,153 (2012 CELT report)

Net Energy forecasts for 2012:
137,955 138,195 -- (2011, 2012 CELT reports)
actual for 2012: 128,047 (2013 CELT report)

Net Energy forecasts for 2013:
139,230 138,875 137,045 -- (2011, 2012, 2013 CELT reports)
actual for 2013: 129,367 (2014 CELT report)

Net Energy forecasts for 2014:
140,830 140,520 138,910 138,390 -- (2011, 2012, 2013, 2014 CELT reports)
actual for 2014: 127,154 (Based on Net Energy spreadsheet with 11,000 Gwh assumed in December) *

*Note: the final figure could be slightly higher or lower, but would a small change would have an insubstantial effect on annual totals.

From: Ariel
To: Lowdemandstudy, (ENE)
Subject: COMMENTS
Date: Monday, December 22, 2014 1:55:31 PM

December 22, 2014

To Governor Patrick, the Massachusetts Department of Energy Resources, and the team from Synapse Energy Economics that prepared the Low Demand Study as presented at the final stalkeholders meeting held on December 18:

I join in and support every word in the comments submitted by Rosemary Wessel on behalf of NoFrackedGasinMass, Katy Eiseman on behalf of MassPLAN, and solar developers Haskell Werlin and Christopher D. Kilfoyle.

This study as presented December 18 is a complete betrayal of the intention and the commitment that Governor Patrick made to the citizens of the Commonwealth on July 30, as represented by a group of five citizens who met with him that day.

That meeting was hard won. It culminated six months of intensive public education and organizing in response to Kinder Morgan's proposal to install a massive natural-gas pipeline that would bulldoze through our land, aquifers, rivers and streams, wildlife habitat, prized natural areas, and our farmers' fields.

Governor Patrick agreed to this meeting after hundreds of people had turned their lives upside-down to educate ourselves on the energy policies and planning that had brought this project to our doorsteps; to learn what the alternatives might be; and to bring this information to their neighbors, legislators, and government bodies at every level. A number of individuals essentially took on second or third full-time jobs, without pay, because the many consequences and risks of adding pipeline infrastructure to our state and adding more natural gas to our energy supply were too great for their families and our communities at large to bear. These individuals did so, and continue to do so, at great cost to their personal and family lives, in the service of a greater good. Thousands of others have squeezed time they could not spare, out of already overburdened lives, to support this effort as well.

By the time Governor Patrick agreed to meet with five citizens on July 30 concerning the pipeline and its alternatives, he had received many thousands of calls, emails, and hand-addressed letters on his desk. Hundreds of people had combined their efforts, relay style, to walk the entire length of the pipeline route across the state, attracting robust news coverage along the way. On July 30, this culminated in a rally at the statehouse. By then a number of legislators had been supportive of our cause for a long time.

All of this effort to achieve one hour for 5 citizens in the company of our Governor.

What is wrong with this picture?

Though I'm not a risk-taker, I would bet far more money than I have that a representative of Kinder Morgan, or any other pipeline company, would not need

massive and explicit public support to achieve a meeting with our Governor. I'll bet that a pipeline-company representative can pick up the phone and arrange such a meeting--even without being a citizen or voter in this state.

And this pipeline-company representative would not be cramming his mission into an underpaid and overworked life; he or she would be making a very nice salary to enjoy meeting with our elected officials about his or her company's proposals and concerns.

The barriers to active participation by "the average citizen" in creating the policies and laws that shape every aspect of our daily lives are immense, as illustrated by this example of a major industrial project arriving unannounced on our doorsteps, and the monumental effort it took to get an audience of one hour with the Governor of our state to discuss the matter.

Need I mention that we "average citizens" pay the cost of these barriers to our participation, and that we pay the cost of the salaries and machinery of government that operates behind them? Even businesses that pay into the tax base must,, of course, recover that expense in the prices we consumers pay.

The context I have laid out is to convey the heightened importance of the July 30 meeting between Governor Patrick and five concerned citizens representing thousands of others. It was not a ceremonial meet-and-greet. It was not "Sure, let's do lunch."

Riding on the outcome of that meeting were many, many futures--from those of individuals whose homes or businesses would be disrupted or put at grave risk along the pipeline path, to the citizens of the entire planet, in light of the methane emissions from natural-gas extraction and transport, which have 86 times the climate-disrupting impact of CO-2 over a 20-year period in the atmosphere.

The participants in that meeting were well-prepared. They had done homework in depth on the policy-making processes behind the surprise arrival of a proposed pipeline on our doorsteps. They had discovered that most energy policy "on the ground" is not proposed nor planned by our elected representatives, but is in fact researched and decided by two organizations that are barely known or accessible to the public at large. These are NESCOE--a not-for-profit corporation started by the Governor's Council of New England, whose $2.5 million budget is paid by all electric customers through a tariff on our electric bills; and ISO-New England, the organization that operates New England's power grid and manages its energy markets. ISO-NE is also funded by electric ratepayers through a tariff on our bills. Through ISO-NE, the Federal Energy Regulatory Commission [FERC] also has a large hand in our energy policy.

Most citizens/ratepayers/taxpayers/voters have no idea that these bodies are largely deciding our energy and climate future, every day. Interestingly, a dive into some of the many documents NESCOE and ISO make available to the public on their websites reveal differences of opinion and some vigorous debate on what that energy future should be. The NESCOE study itself, that had formed the basis for New England's six governors issuing a joint policy letter in December 2013, was so riddled with internal dispute and deficiencies that the pages of caveats by the committee and addendum comments by individual participants run as long as the study's central findings.

Governor Patrick in that July 30 meeting agreed that the research basis for his concurring recommendation that new gas pipelines be invited into Massachusetts was "flawed"; that new gas infrastructure would not satisfy the Global Warming Solutions Act (GWSA) and overall climate goals as well as fossil-free renewables would do those jobs, and that he would authorize and fund a Low Demand Scenario study to address these deficiencies in previous planning.

While this promise ended up being executed from the beginning with many inherent flaws, including a 3-month timeline given to Synapse to accomplish work that sensibly should have taken a year, it seemed that in some form the study would produce data showing the technical availability and associated costs for a number of combinations of energy efficiency, fossil-free renewable energy sources, conservation, and other strategies that provide alternatives to more natural gas for our state and by extension, New England.

At the very least, legislators, interested stakeholders, and all citizens would have some reliable numbers from which to discuss and craft policies, with greater pubic participation than had been available before, that would influence our energy future.

Others who I named at the beginning of this comment have detailed clearly how these modest expectations came crashing to the ground when we saw the 180-degree turn that the Synapse study, its assuptions, and parameters, had taken in the month between the second and third stakeholder meetings.

The big picture here is that millions of dollars come out of our pockets every year to fund policies and practices that are virtually inaccessible to our examination, discussion, and input from most citizens who are impacted by these policies and practices. The decision-makers "on the ground" have no accountabiity to any participant except those businesses and institutions that have vested interests in making no changes in their daily assumptions and operations--is unnacceptable.

One small study conducted in what was promised to be the bright light of citizen participation and well-grounded public concerns was never going to change these deep and long-entrenched problems with our democracy.

Even this one hopeful flame, however, was snuffed out at the last minute by one or more decision-makers. Several of us asked acting DOER director Meg Lusardi, directly, who was responsible for the change in course, away from the study Governor Patrick had promised, modeling not one scenario that would comply with the GWSA, and failing to fulfill the core definitions of this study as stated in the RFP.

Ms. Lusardi's refusal to answer any question of responsibility and decision-making, and her framing of every response in passive voice--as if what we were witnessing at the stakeholder meeting had just occurred, out of thin air, on its own, was chilling to experience.

I hold Governor Patrick and DOER officials who were involved fully responsible for betraying the promises the Governor made in the July 30 meeting.

Who else would have the power to say no?

With sincere hopes for a better and more democratic future~

Ariel Elan
P.O. Box 351
Montague, Massachusetts

From:	Brian Hebeisen
To:	Lowdemandstudy, (ENE)
Subject:	Comments on the Synapse Low Demand Study
Date:	Monday, December 22, 2014 1:56:37 PM

Dear Commissioner Lusardi,

Thank you for the opportunity to comment on the Synapse Low Demand Study. Due to the incredibly short time for feedback (3 days!) I will give a short summary of my concerns.

As a long-time member of the Watertown Energy Committee and from my other work in the clean energy industry I have been very impressed with Massachusetts leadership in addressing the crisis of global warming and in particular its policies on energy efficiency and renewable energy. However, I am very concerned about the slant of this report. It will be difficult to reach our green house gas reduction targets and we need to prioritize those goals if we hope to meet them. This report seems to be focused on the narrow concern of infrequent gas shortages without seriously addressing the global warming impacts of investing large amounts of capital on this proposed gas line. I believe this capital would be much better invested in the proven returns from energy efficiency rather than a risky and destructive pipeline project.

I strongly urge that this process be revisited with a focus on environmental concerns and especially meeting our global warming gas reduction goals. I also urge that more public input be solicited through town hall meetings, and other active outreach. I am a very well informed citizen on environmental and energy issues but was largely unaware of this process. How could the average citizen be expected to be involved?

Again, thank you for your consideration.

Sincerely,

Brian Hebeisen
170 Worcester St.
Watertown, MA 02472

From:	HOWARD M SORETT
To:	Lowdemandstudy, (ENE)
Cc:	Lusardi, Meg (ENE)
Subject:	Synapse/DOER Low Demand Natural Gas Study Commemts
Date:	Monday, December 22, 2014 1:57:46 PM

Shouldn't a requirement of the study have been to comply with state law i.e. the Global Warming Solutions Act? Please require the numbers to be re-run with the condition that the results MUST meet the statutory goals of the GWSA. Did the Governor know that the study scenarios would ALL violate state law?

Best regards,
Howard Sorett

Best regards,
Howard Sorett

From:	Nancy E Caisse
To:	Lowdemandstudy, (ENE)
Subject:	Report
Date:	Monday, December 22, 2014 1:59:07 PM

I am disappointed ----I had great faith in the people developing the new energy report not only that they would delve into the real details but also that they would allow us to examine it to the extent of seeing it's sources.
The whole picture is missing---ISO NE is a source?? We know that has flaws--
What about Iroquois and PNGTS possible solutions??
Mostly where is the transparency?
Sincerely,
Nancy Caisse
Bolton,MA 01740
Monday,Dec, 22, 2014

Sent from my iPhone

From:	Amber Hewett
To:	Lowdemandstudy, (ENE)
Subject:	Low Demand Study comments
Date:	Monday, December 22, 2014 1:59:27 PM
Attachments:	LDS Comments - offshore wind.pdf

Dear Synapse Low Demand Study Team,

Please find joint comments attached.

Thank you for your consideration,

Amber Hewett

Amber Hewett
Northeast Climate Program Assistant
National Wildlife Federation
(802)552-4310
hewetta@nwf.org
Learn about our new and growing initiative, Sailors for Wind Power!

December 22, 2014

Massachusetts Department of Energy Resources (DOER)
Submitted electronically to lowdemandstudy@state.ma.us
Re: Low Demand Analysis Stakeholder Comments

Dear DOER and Synapse:

On behalf of the undersigned organizations and our thousands of members and supporters throughout Massachusetts, we thank you for the opportunity to contribute to the Low Demand Study process. Recognizing the limitations on the current and final comment period, we wish to submit the following concerns surrounding the study's presentation of offshore wind power, which we find to be immensely undervalued. We urge consideration of the following when interpreting the results of the Low Demand Study:

- **The scale of offshore wind development that the study projects falls short of what can technically and practically be connected to the grid by both 2020 and 2030.**
  Cape Wind's 468 MW capacity is scheduled to be grid-connected by 2016, and the combined 8,000 MW potential of the two federally designated Wind Energy Areas off the coast of Massachusetts puts significantly more power within reach for 2020 and 2030 than the study projects.[1] Most notably, the approaching auction of the 5,000 MW Massachusetts Wind Energy Area makes the study's projected 2,000 MW by 2030 unreasonably conservative.
- **The Annual Net Levelized Costs assigned to offshore wind for both 2020 and 2030 are higher than can be substantiated by the current or the projected market.**
  The study's projected 2020 price of $1,173/MMBtu is nearly double the current initial price of the Cape Wind contract. The market in Europe, where offshore wind power has been online for more than twenty years and the price has been declining rapidly, points to a conservative estimate of $569/MMBtu in 2020.[2] The 2030 price of $627/MMBtu contrasts dramatically with the price US developers project for the same timeframe.

[1] Musial, W., et al. *Assessment of Offshore Wind Energy Leasing Areas for the BOEM Massachusetts Wind Energy Area.* National Renewable Energy Laboratory Technical Report TP-5000-60942. December 2013. http://www.nrel.gov/docs/fy14osti/60942.pdf; Musial, W., et al. *Assessment of Offshore Wind Energy Leasing Areas for the BOEM Rhode Island-Massachusetts Wind Energy Area.* National Renewable Energy Laboratory Technical Report TP-5000-58091. April 2013. http://www.nrel.gov/docs/fy13osti/58091.pdf
[2] *Offshore Wind Cost Reduction Pathways* Study. The Crown Estate.* June 2012. http://www.thecrownestate.co.uk/media/5493/ei-offshore-wind-cost-reduction-pathways-study.pdf

- **Offshore wind power carries unique value in its coincidence with peak demand.** Considering that our capacity challenges are the most urgent during winter evenings, the study ought to reflect which alternative resources offer the most value at those moments. The price of offshore wind should be considered in relation to peak costs of our existing supply, to fully capture the price suppression benefits of a source that will be producing an abundance of power (with zero fuel cost) at the moments we need it most.[3]

We are committed to helping realize the smartest and most resilient energy solutions for the Commonwealth, and to ensuring that offshore wind power receives careful and accurate consideration throughout the process. As our largest home-grown clean energy opportunity, it is time to collectively recognize the immense economic and environmental benefits that responsibly developed offshore wind power have to offer.

Sincerely,

Catherine Bowes, National Wildlife Federation
149 State Street
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bowes@nwf.org

Josh Craft, Environmental League of Massachusetts
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Boston, MA 02108
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294 Washington Street, Suite 500
Boston, MA 02108
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Joel Wool, Clean Water Action
88 Broad Street, Lower Level
Boston, MA 02110
(617)338-8131 x205
jwool@cleanwater.org

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*The Crown Estate is an independent commercial business created by an Act of Parliament, investing in and managing some of the United Kingdom's most important assets, ensuring they are sustainably worked, developed and enjoyed to deliver the best value over the long term (http://www.thecrownestate.co.uk/).

[3] Tabors, R., et al. *Price Suppression and Emissions Reductions with Offshore Wind: An Analysis of the Impact of Increased Capacity in New England.* Tabors Caramanis Rudkevich and Newton Energy Group: Cambridge, MA. June 2014. http://www.newton-energy.com/docs/default-source/publications/price-suppression-and-emissions-reductions-with-offshore-wind-an-analysis-of-the-impact-of-increased-capacity-in-new-england.pdf?sfvrsn=0

Rosemary Wessel, No Fracked Gas in Mass
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wsrw@verizon.net

John Carlton-Foss, Climate Action Citizens
Box 263, Wayland, MA 01778
(339)368-6820
jcfrss@gmail.com

Nashoba Conservation Trust
PO Box 188
Pepperell MA 01463

Nashoba Conservation Trust Comments on Massachusetts Low Demand Analysis

December 22, 2014

Nashoba Conservation Trust, Inc. (NCT) appreciates the opportunity to submit comments to the study. NCT is a Pepperell based land trust that stewards over 400 acres of land and natural resources. NCT's ability to preserve these open spaces for the benefit of wildlife and the recreational enjoyment of current and future generations is influenced by a range of factors, not the least of which is climate change, which the 2009 New England Governors Blue Ribbon Commission on Land Conservation cited "as the great environmental challenge of our time". The Commission's report further noted that "conservation of our region's wildlife resources is an economic as well as a biological necessity", and promoted sustainable development and energy independence amongst a number of measures to mitigate the effects of climate change and ensure this outcome. The findings and recommendations of this report brought an encouraging regional dimension to climate change mitigation to complement Massachusetts' 2008 Global Warming Solutions Act.

The subsequent measures adopted and implemented in Massachusetts have been encouraging, although much work remains especially as regards meeting GWSA targets. Therefore, it was with great disappointment that Governor Patrick, along with the other New England governors issued a statement[1] on December 5, 2013 advocating for the development of new natural gas pipeline infrastructure. The statement unleashed a chain of events leading to new natural gas pipeline proposals that, in aggregate, could result in several billions of cubic feet in additional gas to the region, the destruction of thousands of acres of land and the taking of private property by eminent domain.

The importance of meeting the GWSA targets and building a clean energy future was, therefore, a major premise for the meeting NCT and other stakeholders held with Governor Patrick and Secretary Bartlett on July 30, 2014. In that meeting the Governor agreed to a new study to determine whether or not new gas infrastructure is required. In consultation with stakeholder participation in the process, the Administration agreed to the following key considerations:

1) When considering all energy resources, which resources offer the greatest net benefits when assessing for reliability needs, cost savings and reducing environmental effects including lower GHG emissions.

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[1] NEW ENGLAND GOVERNORS' COMMITMENT TO REGIONAL COOPERATION ON ENERGY INFRASTRUCTURE ISSUES

2) In combination, how far can these alternative resources go in replacing retiring generation capacity?

The study's scope was to include all of New England and incorporate a feasibility study of achievable levels of alternative resource penetration, including energy efficiency, by identifying the "cost, technology and deployment constraints along with possible solutions". The study was also to "Identify considerations to meet the GWSA [Global Warming Solutions Act] Climate Plan for the next 15-30 years" along with "emissions reductions achieved from each resource identified".

Clearly, the spirit, if not the letter, of the study is to understand the means by which BOTH future energy needs and GWSA targets can be met. Yet the study, as constructed, separates the two as if it were a choice to meet one without the other. Other than the conclusion that the addition of any gas infrastructure will fail to meet GWSA targets, this study at best can be construed as a basis for yet more analysis to achieve the purpose for which it was intended. However, to achieve that many shortcomings need to be addressed notably

- A more practical interpretation of the scale, cost and benefits of renewable resources, including offshore wind
- The inclusion of consumer solar penetration in the study's impact assessment
- The benefits of complying with current energy efficiency targets, as well as the potential benefits accruing from additional investment
- The inclusion of non-Massachusetts based LNG resources, as well as LNG storage, to meet peak period demands
- The impacts of pending legislation and rulemaking that will advance clean energy goals

Massachusetts can and should regain its rightful position at the forefront of fighting climate change. We encourage the current and future Administrations to proceed with haste toward achieving an energy portfolio that reflects this goal.

Sincerely,

Ken Hartlage
President, Nashoba Conservation Trust

From: Dennis Eklof
To: Lowdemandstudy, (ENE)
Subject: Low Demand Study - a fundamental calculation error?
Date: Monday, December 22, 2014 2:01:30 PM

Comments on December 18 Analysis
By Dr. W. Dennis Eklof

I have been looking at the study workbooks released on your website following the December 18 meeting (which I was unfortunately unable to attend). They seem to include what I believe to be a fundamental error in your calculations of net levalized costs per mmbtu of natural gas displaced by alternatives.

The clearest way to explain issue I see is by a brief specific example.

In the reference case gas supply curve workbook (Supply Curve – Ref Gas.xlsm, attached) on tab SC2015 in Cell Q9 there is an estimated levalized cost of $656 per MWh for small wind. This is converted to $/MMBtu NG by multiplying $656 by an annual marginal heat rate of 8.4 mmbtu/Mwh (41% efficiency rate), to get an annualized cost per mmbtu NG of $5,508 per mmbtu.

If I were to make the same calculation, my login would be as follows:

If I spend $656, I get 1 MWh of electricity from small wind generation. On the other hand I would save generating 1 MWh from natural gas. The 1 MWh of gas fired power would consume 8.4 mmbtu of natural gas, i.e. the 1 MWh of wind energy would save me 8.4 mmbtu of natural gas. Thus the cost of saving that gas per mmbtu is $656/8.4, or $78.10 per mmbtu of gas saved, not $656*8.4 or $5,508 per mmbtu of NG.

No matter how hard I try, I cannot understand the Synapse logic. What am I missing?

If I am correct, it seems to me that most the conclusions of the study would be drastically altered as the table below demonstrates (from SC_2020 in Supply Curve Ref Gas.xlsm)

Technology	Annual Net Levelized Cost *$/MWh*	Annual Net Levelized Cost *$/MMBtu NG*	Revised Annual Net Levelized Cost *$/MMBtu NG*
Wind (<10 kW)	$558	$4,688	$66
Wind (<100 kW)	$69	$584	$8
Large Wind C5	$45	$378	$5
Large Wind C4			

Offshore Wind	$140	$1,173	$17
Utility-Scale PV	$83	$698	$10
Commercial PV	$77	$643	$9
Residential PV	$91	$768	$11
Large CHP	-$60	-$504	-$7
Small CHP	-$11	-$93	-$1
Landfill Gas	-$39	-$327	-$5
Anaerobic Digestion	-$66	-$555	-$8
Biomass Power C1	$34	$285	$4
Biomass Power C2	$51	$431	$6
Biomass Power C3	$138	$1,156	$16
Biomass Power C4	$182	$1,532	$22
Converted Hydro	-$30	-$254	-$4
Res. Electric EE	-$108	-$905	-$13
LI Electric EE	-$13	-$107	-$2
CI Electric EE	-$86	-$724	-$10
Appliance Standards	-$390	-$3,277	-$46

Again, if I am correct in interpreting your workbooks, I am also concerned that many people have spent a huge amount of time on stakeholder input to your work and it seems not to have been heeded. Quoting my comments submitted following the October 30 meeting:

"Calculation of Net Levalized Cost per MMBtu of NG

I am afraid I cannot reconcile this calculation. Taking again the Wind: Offshore example, the
net levelized cost for 2020 is $133 per MWh. If the assumed heat rate used is based on peak
generation, i.e. 12,000 btu/kwh as stated in the meeting, the $0.133 ($133/MWh) spent on a kwh
of offshore wind energy would displace a total of 12,000 btu or 0.012 MMBtu. That seems to me
to be a lot closer to $11 per MMBtu displaced than $1,591 per MMBtu. What am I missing?"

Dennis Eklof
31 Ames Road

Groton, MA 01450-1963
508-878-9510

From: Ariel
To: Lowdemandstudy, (ENE)
Subject: TYPOS corrected in my previous COMMENTS
Date: Monday, December 22, 2014 2:02:12 PM

On 12/22/2014 1:55 PM, Ariel wrote:

December 22, 2014

To Governor Patrick, the Massachusetts Department of Energy Resources, and the team from Synapse Energy Economics that prepared the Low Demand Study as presented at the final stalkeholders meeting held on December 18:

I join in and support every word in the comments submitted by Rosemary Wessel on behalf of NoFrackedGasinMass, Katy Eiseman on behalf of MassPLAN, and solar developers Haskell Werlin and Christopher D. Kilfoyle.

This study as presented December 18 is a complete betrayal of the intention and the commitment that Governor Patrick made to the citizens of the Commonwealth on July 30, as represented by a group of five citizens who met with him that day.

That meeting was hard won. It culminated six months of intensive public education and organizing in response to Kinder Morgan's proposal to install a massive natural-gas pipeline that would bulldoze through our land, aquifers, rivers and streams, wildlife habitat, prized natural areas, and our farmers' fields.

Governor Patrick agreed to this meeting after hundreds of people had turned their lives upside-down to educate ourselves on the energy policies and planning that had brought this project to our doorsteps; to learn what the alternatives might be; and to bring this information to their neighbors, legislators, and government bodies at every level. A number of individuals essentially took on second or third full-time jobs, without pay, because the many consequences and risks of adding pipeline infrastructure to our state and adding more natural gas to our energy supply were too great for their families and our communities at large to bear. These individuals did so, and continue to do so, at great cost to their personal and family lives, in the service of a greater good. Thousands of others have squeezed time they could not spare, out of already overburdened lives, to support this effort as well.

By the time Governor Patrick agreed to meet with five citizens on July 30 concerning the pipeline and its alternatives, he had received many thousands of calls, emails, and hand-addressed letters on his desk. Hundreds of people had combined their efforts, relay style, to walk the entire length of the pipeline route across the state, attracting robust news coverage along the way. On July 30, this culminated in a rally at the statehouse. By then a number of legislators had been supportive of

our cause for a long time.

All of this effort to achieve one hour for 5 citizens in the company of our Governor.

What is wrong with this picture?

Though I'm not a risk-taker, I would bet far more money than I have that a representative of Kinder Morgan, or any other pipeline company, would not need massive and explicit public support to achieve a meeting with our Governor. I'll bet that a pipeline-company representative can pick up the phone and arrange such a meeting--even without being a citizen or voter in this state.

And this pipeline-company representative would not be cramming his mission into an underpaid and overworked life; he or she would be making a very nice salary to enjoy meeting with our elected officials about his or her company's proposals and concerns.

The barriers to active participation by "the average citizen" in creating the policies and laws that shape every aspect of our daily lives are immense, as illustrated by this example of a major industrial project arriving unannounced on our doorsteps, and the monumental effort it took to get an audience of one hour with the Governor of our state to discuss the matter.

Need I mention that we "average citizens" pay the cost of these barriers to our participation, and that we pay the cost of the salaries and machinery of government that operates behind them? Even businesses that pay into the tax base must, of course, recover that expense in the prices we consumers pay.

The context I have laid out is to convey the heightened importance of the July 30 meeting between Governor Patrick and five concerned citizens representing thousands of others. It was not a ceremonial meet-and-greet. It was not "Sure, let's do lunch."

Riding on the outcome of that meeting were many, many futures--from those of individuals whose homes or businesses would be disrupted or put at grave risk along the pipeline path, to the citizens of the entire planet, in light of the methane emissions from natural-gas extraction and transport, which have 86 times the climate-disrupting impact of CO-2 over a 20-year period in the atmosphere.

The participants in that meeting were well-prepared. They had done homework in depth on the policy-making processes behind the surprise arrival of a proposed pipeline on our doorsteps. They had discovered that most energy policy "on the ground" is not proposed nor planned by our elected representatives, but is in fact researched and decided by two organizations that are barely known or accessible to the public at large. These are NESCOE--a not-for-profit corporation started by the Governor's Council of New England, whose $2.5 million budget is paid by all electric customers through a tariff on our electric bills; and ISO-New England,

the organization that operates New England's power grid and manages its energy markets. ISO-NE is also funded by electric ratepayers through a tariff on our bills. Through ISO-NE, the Federal Energy Regulatory Commission [FERC] also has a large hand in our energy policy.

Most citizens/ratepayers/taxpayers/voters have no idea that these bodies are largely deciding our energy and climate future, every day. Interestingly, a dive into some of the many documents NESCOE and ISO make available to the public on their websites reveal differences of opinion and some vigorous debate on what that energy future should be. The NESCOE study itself, that had formed the basis for New England's six governors issuing a joint policy letter in December 2013, was so riddled with internal dispute and deficiencies that the pages of caveats by the committee and addendum comments by individual participants run as long as the study's central findings.

Governor Patrick in that July 30 meeting agreed that the research basis for his concurring recommendation that new gas pipelines be invited into Massachusetts was "flawed"; that new gas infrastructure would not satisfy the Global Warming Solutions Act (GWSA) and overall climate goals as well as fossil-free renewables would do those jobs, and that he would authorize and fund a Low Demand Scenario study to address these deficiencies in previous planning.

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Others who I named at the beginning of this comment have detailed clearly how these modest expectations came crashing to the ground when we saw the 180-degree turn that the Synapse study, its assumptions, and parameters, had taken in the month between the second and third stakeholder meetings.

The big picture here is that millions of dollars come out of our pockets every year to fund policies and practices that are virtually inaccessible to our examination, discussion, and input from most citizens who are impacted by these policies and practices. The decision-makers "on the ground" have no accountabiity to any participant except those businesses and institutions that have vested interests in making no changes in their daily assumptions and operations. This is unnacceptable.

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citizen participation and well-grounded public concerns was never going to change these deep and long-entrenched problems with our democracy.

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Ms. Lusardi's refusal to answer any question of responsibility and decision-making, and her framing of every response in passive voice--as if what we were witnessing at the stakeholder meeting had just occurred, out of thin air, on its own, was chilling to experience.

I hold Governor Patrick and DOER officials who were involved fully responsible for betraying the promises the Governor made in the July 30 meeting.

Who else would have the power to say no?

With sincere hopes for a better and more democratic future~
Ariel Elan
P.O. Box 351
Montague, Massachusetts

From: Sally Pick
To: Lowdemandstudy, (ENE)
Subject: Comments on Low Demand Analysis
Date: Monday, December 22, 2014 2:04:02 PM
Attachments: Comments on Low Demand Analysis.pdf

Dear DOER,

Please see my attached comments on the Massachusetts Low Gas Demand Modeling Analysis.

Sincerely,

~~~~~~
Sally Pick
SJP Environmental Consulting, LLC
PO Box 303
Montague, MA 01351
413.559.7257 cell

http://sjpconsulting.biz
LinkedIn.com
Facebook.com/SJP.LLC

Building Performance Institute (BPI©) Certified Professional Building Analyst
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Empowering homeowners with the information and resources they need to: explore and prioritize energy saving and renewable energy options; reduce wasted energy; make their homes less drafty, more cozy, and healthier; lower their carbon emissions; and find incentives, financing and qualified energy contractors to bring their energy projects to fruition.

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"Energy efficiency is an investment...The cheapest kilowatt is one you don't have to buy."
~Paul Scheckel, The Home Energy Diet
~~~~~~

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PO Box 303, Montague, MA 01351 | 413-559-7257 | SJP@crocker.com | SJPconsulting.biz

December 22, 2014

Meg Lusardi, Acting Commissioner
Department of Energy Resources

Dear Commissioner Lusardi:

Thank you for the opportunity to submit comments on the Massachusetts Low Gas Demand Modeling Analysis. I am pleased that DOER has committed to exploring a low demand model in examining our state's needs for energy generation.

I submit the following questions and concerns related to the study and the future of energy generation in Massachusetts:

- I am concerned that the analysis used ISO-New England's energy demand projections, since ISO-NE's power projections for 2018-2019 did not include a "conservative forecast of hundreds of MWs of solar PV projected to come on line in the next three years," according to NESCOE. As you know, adoption of renewables is increasing rapidly, especially as prices continue to drop, the state programs drive their expanded adoption, and they reach grid parity.

- Does the economic threshold in this study include the likelihood of increased costs to customers of building pipelines, as seen with the 40% increases in costs to build the Vermont Gas pipeline to Middlebury, Vermont? Also, the study excludes risks associated with natural gas volatility, including the potential for more stringent regulations on hydraulic fracturing and increased costs of natural gas from new pipelines that could potentially be used for export rather than to meet local demand.

- I share the Conservation Law Foundation's view that, "Abundant gas entrenches us more deeply in a high-emissions, climate-compromised future, unless accompanied by robust, additional policies ensuring greater efficiency and a swift transition to low-carbon energy." If we truly need additional natural gas as a transition to more efficiency and renewables, Massachusetts should commit to pipelines that must be phased out as demand in Massachusetts declines with the expansion of energy efficiency, renewables, and other means of addressing short and long-term energy demands. The Footprint natural gas power plant in Salem, Massachusetts, models just such a phase out, as developers agreed to limit emissions and to a shutdown date to comply with the Global Warming Solutions Act's mandated emission reductions.

- The study excludes demand response and additional Liquefied Natural Gas supplies, essential tools for addressing any short-term price spikes in evaluating the "need" for new gas pipelines.

- Given that none of the modeled scenarios meets the GWSA-mandated targets, the study clarifies the necessity, by law, that Massachusetts expand its efforts to drive the adoption of energy efficiency and renewables as quickly as possible and find other short-term means for addressing winter price spikes, without installing new pipelines to be paid for by ratepayers—pipelines with no clear long-term financial or environmental benefit and much risk.

Thank you for making this study participatory and transparent and for considering these comments.

Sincerely,

Sally Pick

From:	Jerrold Oppenheim
To:	Lowdemandstudy, (ENE)
Cc:	Elliott Jacobson; Rita Carvalho; John Wells; Charlie Harak; John Howat
Subject:	Low Income comments re:gas study
Date:	Monday, December 22, 2014 2:10:23 PM
Attachments:	Gas Low Demand Study Com 122214 FNL.doc

Attached are the comments on the Low Demand Gas Study of the Low Income Weatherization and Fuel Assistance Network.

Thank you for this opportunity and please contact the undersigned with any questions.

Jerrold Oppenheim, Democracy And Regulation
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+1-978-335-6748 (US call, rings worldwide)
while travelling: +1-610-844-0682 (US call),
+(49-0) 151-110-48444 (Germany)
Pilgersberggasse 5, 55276 Oppenheim, Germany

LOW GAS DEMAND STUDY - COMMENT OF LOW INCOME WEATHERIZATION AND FUEL ASSISTANCE NETWORK

This is the Comment of the Low Income Weatherization and Fuel Assistance Network (The Network), at the invitation of the Department of Energy Resources (DOER), concerning the study of low gas demand resource options (the Study) conducted by Synapse Energy Economics (Synapse) under the direction of DOER. (The latest draft of the Study is published at synapse-energy.com/project/massachusetts-low-demand-analysis.)

The Network is very appreciative of he opportunity to file tehse comments and of the hard work and thought that Synapse and DOER have put into this study. The Network is also cognizant of the difficult circumstances under which the study was conducted. Both demand and resource supplies are highly uncertain, as are resource costs and, to an important extent, existing resources. Further, there are strong economic and environmental arguments on just about every side of this complex discussion. Under these circumstances, it is commendable that the Study has provided relevant data points and, more important, caveats that amount to a useful research agenda.

The Network shares the environmental concerns, including regarding Global Warming Solutions Act (GWSA) compliance, that virtually all stakeholders express. At the same time, the Network is highly concerned about the ability of low-income energy consumers to afford the energy they need to heat their homes and provide other basic needs. The recent 51% increase in National Grid low-income winter electricity rates dramatizes the difficulties facing low-income families, especially in light of the fact that federal fuel asistance (LIHEAP) is more than a third less than it was five years ago. Analysis from March, 2014 demonstrates that, even after assistance, 23% of U.S. low-income households reported foregoing food to pay for high home energy bills. (B. Tonn, E. Rose, "The Health Benefits of Weatherization, *Home Energy*, March 2014 at 38, T.1, http://www.homeenergy.org/show/article/nav/casestudies/id/1946; *see* C. Lidell, C. Morris, S. L. Page., "Kirklees Warm Zone," University of Ulster, Feb. 2011, www.kirklees.gov.uk/community/environment/energyconservation/warmzone/ulsterreport.pdf.)

It is well established that poor households reduce their caloric intake when energy bills rise due to weather extremes, to the detriment of their health. (J. Bhattacharya *et al.*, "Heat or Eat? Cold Weather Shocks and Nutrition in Poor American Families," National Bureau of Economic Research, June 2002, www.nber.org/papers/w9004; J. L. Brown, *et al.*, "The Economic Cost of Domestic Hunger," Sodexo Foundation, June 5, 2007, c. 4: "Illness: The Costs of Mental Health and Medical Care", http://www.sodexofoundation.org/hunger_us/Images/Cost%20of%20Domestic%20Hunger%20Report%20_tcm150-155150.pdf; J. B. Cullen, Friedberg L. Wolfram C., "Do Households Smooth Small Consumption Shocks? Evidence from Anticipated and Unanticipated Variation in Home Energy Costs, Center for the Study of Energy Markets (CSEM), Report: CSEM WP 14: 2005 at 1-33; D. A. Frank, Neault NB, Skalicky A, Cook JT, Wilson JD, Levenson S, Meyers AF, Heeren T, Cutts DB, Casey PH, Black MM, Zaldivar N, Berkowitz C, and C-SNAP Study Group. "Heat or Eat: The Low Income Home Energy Assistance Program and Nutritional and Health Risks Among Children Less Than 3 Years of Age," Pediatrics. 2006;118:1293-1302, Nov. 1, 2006, http://pediatrics.aappublications.org/content/118/5/e1293;

M. Nord and Kantor LS. Seasonal Variation in Food Insecurity Is Associated with Heating and Cooling Costs among Low-Income Elderly Americans. *J. Nutr*. 136: 2939-2944, 2006.) Thus medical researchers have found that reductions in food expenditures in order to pay for cold weather energy bills led to a high incidence of pediatric emergency cases with age-weighted weights below the fifth percentile in the period following the coldest month. (D. A. Frank DA, et al. Seasonal Variation in Weight-for-Age in a Pediatric Emergency Room. Public Health Reports, July/August 1996, 111:366-371.)

The Commonwealth's nation-leading low-income energy efficiency programs are a great help in ameliorating this impact, as is the federal Low Income Home Energy Assistance Program (LIHEAP). But, by definition, those at the economic bottom lack the resources to meet their basic human needs -- U.S. Labor Department data show that, for the lowest income quintile, food and housing expenses alone outstrip after-tax income by 25%. (2013 Bureau of Labor Statistics (BLS) Consumer Expenditure Survey (CES) Table 1101 BLS.gov/cex/#tables)

Projections for electricity prices in support of electric capacity and environmental requirements start in the neighborhood of 35% increases in real terms by 2024 (Connecticut Department of Energy and Environmental Protection, Draft 2014 Integrated Resource Plan, at iv, ; http://www.ct.gov/deep/cwp/view.asp?a=4405&q=486946&deepNav_GID=2121%20; Synapse projects energy prices -- about half a typical residential bill -- rising from about $45/mWh to about $75/mWh in 2030, a commodity cost increase of about 67 per cent little changed among capacity expansion scenarios. R. Hornby et al., "Incremental Benefits and Costs of Large-Scale Hydroelectric Energy Imports," Synapse Energy Economics, Nov. 1., 2013, at 25, Fig. 11, Exh. DPU 1-21, Exh. 1 in D.P.U. 14-86). Other projections are much higher for some scenarios (C. Courchesne, "Three Ugly Numbers Behind the Governor's Push for Candaian Hydropower" (Conservation Law Foundation, 2014); clf.org/blog/clean-energy-climate-change/three-ugly-numbers-behind-governors-push-canandian-hydropower.). This is simply not sustainable for low-income families.

The Network is the organization of agencies that make up the low-income weatherization and fuel assistance program network that is appointed by statute to implement low-income energy efficiency programs in the Commonwealth (G.L. c. 25, sec. 19(c); Green Communities Act, St. 2008, c. 169, sec. 11). Network agencies also implement the federal Fuel Assistance and Weatherization Assistance Programs administered by the Department of Housing and Community Development. Members of the Network agencies counsel utility customers about rates and payment options, and arrange rate payment assistance, including Fuel Assistance, arrearage management, and other forms of assistance for low-income utility customers.

The Study sets out many factors, topics, and potential scenarios that there was not time to study (caveats), but which are necessary to examine before making high stakes policy decisions. This

amounts to a research agenda that should be made explicit as such.

From the low-income consumer point of view, bill impacts of the alternative approaches (and combinations thereof) to capacity and environmental (GWSA) compliance are an essential topic for study. Others include, but are not limited to:

* Environmental benefits of natural gas expansion and consequent reduction in use of heating oil as a result of fuel-switching to gas.
* Winter-peak availability of Quebec power, e.g., in light of HydroQuebec's complete lack of availability on December 4. (J. Chesto, "Bright lights, big party," Boston Globe at C3, Dec. 18, 2014.)
* Dual-fuel generator use of LNG when gas is not available, including expansion of storage facilities.
* Dual-fuel generator use of oil when gas is not available, including expansion of storage facilities.
* Results if gas prices are and remain high, at various levels, for example as a result of expanded LNG export.
* Environmental and bill impacts of a carbon tax.
* Environmental and bill impacts of alternative measures such as biomass thermal, ground source and air sourwce heat pumps, solar hot water, wind, photovoltaics.
* Retirement scenarios for existing generating plant.
* Reduced gas leaks as a result of H.4164.
* Non-energy and enviromental impacts of alternative resources, Quebec supply, and gas pipeline supply; including health and economic development benefits.
* Variations in gas and electric loads.
* Interactions among above and other factors.

Respectfully submitted,
LOW INCOME WEATHERIZATION AND FUEL ASSISTANCE PROGRAM NETWORK,
by its attorney

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From:	O"Reilly, Jim
To:	Lowdemandstudy, (ENE)
Subject:	NEEP comments on Low Demand Scenario Analysis third stakeholder meeting
Date:	Monday, December 22, 2014 2:08:15 PM
Attachments:	LDS Comments from NEEP 12 22 14.docx

Please accept the attached comments from Northeast Energy Efficiency Partnerships (NEEP) in response to the most recent set of modeling assumptions and analysis performed by Synapse Energy Economics as part of the state's Low Demand Scenario Stakeholder Process and as presented on December 18, 2014 in a public stakeholder session in Boston.

Please don't hesitate to contact me with any questions related to the attached.

Best regards,

Jim O'Reilly
Director of Public Policy

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Comments of Northeast Energy Efficiency Partnerships (NEEP) To the Massachusetts Department of Energy Resources Re: Massachusetts Low Demand Scenario Analysis

Submitted via email to: lowdemandstudy@state.ma.us
December 22, 2014

Thank you for the opportunity to comment on the information presented at the third stakeholder meeting for the Massachusetts Low Demand Analysis. [1] NEEP is a regional non-profit organization whose mission is to serve the Northeast and Mid-Atlantic areas of the U.S. to accelerate energy efficiency in the building sector through public policy, program strategies and education. We are one of six Regional Energy Efficiency Organizations (REEOs) as designated by the U.S. Department of Energy to work collaboratively with it in linking states in our respective regions to DOE guidance and resources.

While we, and the other clean energy stakeholders participating in this exercise, were very much appreciative of the Department's efforts to create an open process for reviewing alternatives to increased natural gas pipeline capacity into Massachusetts and New England, the stakeholder meeting of December 18, 2014 has left us very frustrated by what seems to be the Department's unwillingness to acknowledge a set of deeper and broader benefits that are attributable to clean energy, and, specifically, energy efficiency.

In hearing the presentation of Dr. Elizabeth Stanton of Synapse Energy Economics — the firm chosen by DOER to conduct the low demand scenario analysis — it became very apparent that Synapse was operating under a set of restrictive parameters placed upon it by DOER which have had the effect of disqualifying large amounts of energy efficiency potential which are generally acknowledged to be the cleanest, quickest and least expensive of energy resources available to meet the Commonwealth's and the region's energy needs.

In addition, certain assumptions directed to Synapse by DOER in relation to building energy codes have had the effect of creating an unrealistic baseline assumption of which energy efficiency measures may be modeled to be cost-effective, thus also changing the amount of those resources that should be acknowledged as available. Given the significant limitations of time imposed on stakeholders to provide comments, we limit these comments to largely focus on the energy efficiency modeling results as released by Synapse on Dec. 18.

Energy efficiency potential underestimated

During the initial stakeholder meeting to explain the Low Demand Scenario modeling plans, Dr. Stanton indicated that the standard to be used by Synapse for screening alternative resources is "to the greatest extent that is determined to be simultaneously technically and

[1] These comments are offered by NEEP staff and do not necessarily represent the view of the NEEP Board of Directors, sponsors, funders or partners.

economically feasible." During the stakeholder meeting of Dec. 18, however, she revealed that DOER had placed upon Synapse an alternative screening parameter that she described as "practical and feasible." When questions about exactly what that requirement would equate to in practice, she acknowledged that such language is not what analysts would normally apply to energy efficiency potential study analysis, but that it was what DOER had directed be included in the Low Demand Scenario Analysis.

Upon further questioning, Acting Commissioner Meg Lusardi of DOER acknowledged that the figure for energy efficiency potential was derived from conversations among DOER staff which simply took the 2.6 percent annual electric savings currently planned for in the next three-year energy efficiency plans as administered by the state's investor owned utilities and the Cape Light Compact and added 0.3 percent to what they considered "achievable" under the parameters of "feasible and practical."

As energy efficiency potential studies have been conducted for many years in all parts of the U.S. and the world — including many that have guided energy efficiency program goals for Massachusetts and New England — using what are seemingly an unaccepted set of parameters to model the energy efficiency potential for the purposes of this analysis would seem ill-advised, considering how energy efficiency can be most quickly and economically deployed, and also be in compliance with the Global Warming Solutions Act.

As an alternative, we would suggest that DOER may instead direct Synapse to the energy efficiency potential study performed by Optimal Energy for NEEP in 2010.[1] While DOER analysis appears to vastly underestimate the annual energy efficiency savings potential in Massachusetts in 2020 with a value of roughly 24 trillion BTUs, the Optimal analysis performed for NEEP showed that Massachusetts has the potential to save 51 trillion BTUs of energy (more than *twice* the DOER analysis) and New England has the potential to save 108 trillion BTUs from 2010 to 2018. Although the study period of NEEP's most recent analysis and DOER's low demand analysis are different, it at least illustrates the point that DOER appears to have vastly underestimated the annual energy efficiency savings potential in Massachusetts.

Moreover, NEEP would strongly suggest also that energy efficiency potential for the entire New England region be modeled as part of this exercise, for reasons explained in greater detail below. This potential, according to our same 2010 analysis, showed an opportunity to capture108 trillion BTUs in energy efficiency across the six-state region by 2018.

In addition, Acting Commissioner Lusardi noted during the Dec. 18 stakeholder meeting that the Synapse analysis assumed the adoption of an "advanced" building energy code, or stretch code, going forward, because such an assumption is included as part of the state's Clean

[1] See: From Potential to Action - An Analysis of the Region's Economically Achievable Electric Efficiency Potential, Oct. 2010, at: http://www.neep.org/potential-action-analysis-regions-economically-achievable-electric-efficiency-potential-oct-2010

Energy and Climate Plan as developed in response to the Global Warming Solutions Act of 2008. However, despite the fact that the state has had the next iteration of the stretch building energy code for over two-and-a-half years but has failed to act on it, any assumptions of an advanced energy code being adopted now appear to be unrealistic. And, insomuch as the adoption of a new building code would alter the baseline of the state's energy use, any new energy efficiency measures included as part of the Synapse analysis would be less-cost effective than they will be in reality without a new advanced building code being adopted.

At the very least, we believe that DOER should have instructed Synapse to model with different baselines assuming a new advanced building code and no new advanced building code, to be sure that the differing baseline assumptions would not dramatically alter the potential cost-effective savings available from new energy efficiency measures.

Regional vs. state-only energy efficiency potential

The Synapse analysis of energy efficiency potential continues to only model results for energy efficiency measures in Massachusetts. This was an issue identified by NEEP after the first stakeholder meeting as one that significantly limits the ability to most accurately capture alternative resource solutions. As we noted at the time, such a limited interpretation of alternative energy resources would mean that, for example, the energy efficiency resource that a state such as New Hampshire could contribute to the demand reductions will only be modeled based on current efficiency savings levels.

NEEP, again, reiterates that a wealth of detailed analysis has been performed to ascertain the technical and economic potential for energy efficiency savings for a state such as New Hampshire,[2] and, rather than suggesting policy changes for that state cannot be included, the analysis should capture in the aggregate all energy efficiency potential that has been identified as both economically and technically attainable for all New England states.

The reasoning behind request such a change in modeling parameters is found in the fact that current market rules allow for all costs associated with supply-side infrastructure enhancements — poles, wires, pipelines, etc. — to be "socialized" among the ISO-New England states, and, as such, all demand-side resources, such as energy efficiency, should be counted on a regional basis as well. And, as gas pipeline capacity increases are being modeled based on certain "policy" commitments of New England states other than Massachusetts — i.e., state siting decisions, environmental impact decisions, etc. — so, too should the demand resources being models, such as energy efficiency. As we have previously pointed out, to not

[2] See:"Increasing Energy Efficiency In New Hampshire," prepared for the Office of Energy and Planning, November, 2013. http://www.nh.gov/oep/resource-library/energy/documents/nh_eers_study2013-11-13.pdf

do so is inconsistent with the New England governors' stated intent of sharing investments in and commitments to regional energy solutions, including energy efficiency. [3]

Price assumptions for natural gas pipeline

Any assessment of energy efficiency potential has been put up against a price point for new natural gas pipeline capacity that Synapse has included in its modeling results. However, there are two significant flaws that DOER's parameters placed upon Synapse modeling that also need to be called out:

The first is the fact that between the first stakeholder meeting and the third, the price for new natural gas pipeline capacity has evolved from an assumption of 20 percent pipeline usage during winter peak periods to 80 percent usage. The reason for this change was not fully explained by Synapse during the Dec. 18 meeting, with the only reason being that, again, a directive from DOER resulted in this change of parameter and assumption. Certainly, DOER has to acknowledge that such a major shift of assumption needs to have greater clarification if this process is to earn the trust of the public, especially since it is widely understood that winter peak price spikes have occurred in New England on only a very few hours of a very few days, and those occurring during one of the coldest winters on record for the region.

The second flaw in modeling involves price assumptions for natural gas supply. When this exercise began nearly three months ago, Synapse began its modeling for price based upon what were the prices for natural gas, oil and liquefied natural gas (LNG) at the time. However, as we all are aware, the market has changed significantly since then, with oil prices having fallen precipitously. And, since LNG tracks the price of oil, its commodity price has dropped dramatically as well. Since LNG can play a significant role as an alternative fuel to fire gas generated power plants during periods of high winter peak demand, new economic modeling should have been performed to account for these new prices.

Lastly, Synapse continues to use U.S. Energy Information Administration (EIA) data to reflect prices from natural gas derived from hydraulic fracturing, or fracking, processes, this despite the fact that several policy decisions in states around the country are likely to cause increases in the costs of fracked gas, including the recent decision by New York to ban fracking entirely in that state.

In addition, new analysis done by researchers at the University of Texas casts significant doubt as to the credibility of the price of future fracked gas as ascertained by the EIA.[2]

[3] See: http://www.governor.ct.gov/malloy/lib/malloy/2013.12.05_new_england_governors_statement-energy.pdf

[2] See article in the journal Nature, December 3, 2014, entitled: *Natural Gas: The Fracking Fallacy*, at http://www.nature.com/news/natural-gas-the-fracking-fallacy-1.16430

This doubt involves the fact that the assumptions behind the EIA findings may be overly optimistic because of the methods EIA uses to calculate predictions of gas extractions from Marcellus shale formations. New methods, such as those employed by the UT researchers, are being applied in a far greater level of detail, and result in much more conservative forecasts of the ease of extraction of large amounts of Marcellus shale gas, which would, of course, drive up the costs of those extractions, and, thus, the cost attributed by Synapse of the cost of winter pipeline usage. Of course, the greater the cost of that gas supply, the more cost-effective the alternative resources that could meet winter capacity need of the region.

Summary

While we appreciate that DOER agreed to conduct a Low Demand Scenario Analysis, what began as a process to be transparent and inclusive in making an appropriate assessment of alternatives to a new natural gas pipeline into Massachusetts has, unfortunately, resulted in a process that seems quite flawed in its assumptions of one of the key alternative resources that can be utilized by the Commonwealth, and particularly with the need to simultaneously meet the requirements of the Global Warming Solutions Act. Since energy efficiency is seemingly so undervalued in the Low Demand Scenario Analysis, it is hard to imagine that the public trust has been gained by this process, which appears to have been one of the goals of the Patrick Administration.

Therefore, we would recommend that the next gubernatorial administration commit to a more thorough analysis of alternative resources, and one which uses generally accepted methods of modeling resources such as energy efficiency, as opposed to the assumptions placed upon Synapse by DOER. Further, new analysis should take into account the dramatic shifts in fossil fuel prices that have occurred since the Low Demand Scenario Process began. Lastly, it should also be done on a New England-wide basis as the proposed supply options have also been assessed based on regional energy need.

Submitted by:

Jim O'Reilly
Director of Public Policy
Northeast Energy Efficiency Partnerships (NEEP)
91 Hartwell Avenue
Lexington, MA 02421

From:	Ken Hartlage
To:	Lowdemandstudy, (ENE)
Subject:	Comments of LDS study - revised
Date:	Monday, December 22, 2014 2:18:27 PM
Attachments:	DOER_LDSStudyComments21Dec2014.pdf ATT00001.htm

Please accept my apologies for having sent an outdated version of my comments. Attached is the correct version.
Thank you
Ken

Nashoba Conservation Trust
PO Box 188
Pepperell MA 01463

Nashoba Conservation Trust Comments on Massachusetts Low Demand Analysis

December 22, 2014

Nashoba Conservation Trust, Inc. (NCT) appreciates the opportunity to submit comments to the study. NCT is a Pepperell based land trust that stewards over 400 acres of land and natural resources. NCT's ability to preserve these open spaces for the benefit of wildlife and the recreational enjoyment of current and future generations is influenced by a range of factors, not the least of which is climate change, which the 2009 New England Governors Blue Ribbon Commission on Land Conservation cited "as the great environmental challenge of our time". The Commission's report further noted that "conservation of our region's wildlife resources is an economic as well as a biological necessity", and promoted sustainable development and energy independence amongst a number of measures to mitigate the effects of climate change and ensure this outcome. The findings and recommendations of this report brought an encouraging regional dimension to climate change mitigation to complement Massachusetts' 2008 Global Warming Solutions Act.

The subsequent measures adopted and implemented in Massachusetts have been encouraging, although much work remains especially as regards meeting GWSA targets. Therefore, it was with great disappointment that Governor Patrick, along with the other New England governors issued a statement[1] on December 5, 2013 advocating for the development of new natural gas pipeline infrastructure. The statement unleashed a chain of events leading to new natural gas pipeline proposals that, in aggregate, could result in several billions of cubic feet in additional gas to the region, the destruction of thousands of acres of land and the taking of private property by eminent domain.

The importance of meeting the GWSA targets was, therefore, a major premise for the meeting NCT and other stakeholders held with Governor Patrick and Secretary Bartlett on July 30, 2014. In that meeting the Governor agreed to a new study to determine whether or not new gas infrastructure is required, especially in consideration of a low demand scenario to achieve a clean energy future. In consultation with stakeholder participation in the process, the Administration agreed to the following key considerations:

1) When considering all energy resources, which resources offer the greatest net benefits when assessing for reliability needs, cost savings and reducing environmental effects including lower GHG emissions.

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[1] NEW ENGLAND GOVERNORS' COMMITMENT TO REGIONAL COOPERATION ON ENERGY INFRASTRUCTURE ISSUES

2) In combination, how far can these alternative resources go in replacing retiring generation capacity?

The study's scope was to include all of New England and incorporate a feasibility study of achievable levels of alternative resource penetration, including energy efficiency, by identifying the "cost, technology and deployment constraints along with possible solutions". The study was also to "Identify considerations to meet the GWSA [Global Warming Solutions Act] Climate Plan for the next 15-30 years" along with "emissions reductions achieved from each resource identified".

Clearly, the spirit, if not the letter, of the study is to understand the means by which BOTH future energy needs and GWSA targets can be met. Yet the study, as constructed, separates the two as if it were a choice to meet one without the other. Other than the conclusion that the addition of any gas infrastructure will fail to meet GWSA targets, this study at best can be construed as a basis for yet more analysis to achieve the purpose for which it was intended. However, to achieve that many shortcomings need to be addressed notably

- A more practical interpretation of the scale, cost and benefits of renewable resources, including offshore wind
- The inclusion of consumer solar penetration in the study's impact assessment
- The benefits of complying with current energy efficiency targets, as well as the potential benefits accruing from additional investment
- The inclusion of non-Massachusetts based LNG resources, as well as LNG storage, to meet peak period demands
- The impacts of pending legislation and rulemaking that will advance clean energy goals

Massachusetts can and should regain its rightful position at the forefront of fighting climate change. We encourage the current and future Administrations to proceed with haste toward achieving an energy portfolio that reflects this goal.

Sincerely,

Ken Hartlage
President, Nashoba Conservation Trust

From: Karin Theodoros
To: Lowdemandstudy, (ENE)
Subject: Meeting 12-18-2014 comments
Date: Monday, December 22, 2014 2:38:07 PM

Dear Sirs and Madam-

Please be advised that as a taxpayer, I am deeply disturbed by what I have seen unfolding in connection with your study over the past few weeks. I share the concerns of Rose Wessel, especially with respect to the fact that the final meeting was postponed until only shortly before the planned release date. I ask that the release date itself be postponed in all fairness to the public. This is only right, especially given this time of year. The materials were not posted until the Friday of the week-end before Christmas and the middle of Hanukkah, as well as other Holiday celebrations. To claim public participation, then expecting the public to comb through your final Drafts and provide comments in such short time frame is disingenuous. In addition to that, I also note that you had serious problems with the Teleconferencing and people who were trying to participate were denied that opportunity to hear your explanation for almost the first two hours. Dissipate those issues, you never incorporated any link on your site to the videos that you knew a lay person was making so that people could educate themselves. I was trying to follow this for the past several weeks and found it extremely difficult to find any meaningful educational information for lay people who could not attend the meetings on your site. In this day and age, for you not to have held video conferencing and then posted the videos yourselves is not acceptable.

I wish you to be aware that the lack of questioning by the Electric and Gas sections during the last meeting, while there was obviously substantial concern by the Green and Renewable Energy Sections, combined with the understanding that the models changed substantially between the second to last and the last meeting , as a result of which you failed to incorporate renewables and the path Massachusetts has taken in developing renewables, has left me with the perception that you had conversations with fossil fuel interests in private, and tailored these final models to meet their desired outcome.

Massachusetts is the 4th leading state in the Country in renewables. I direct your attention to the recognition given to the Commonwealth of Massachusetts by the EPA, which can be found at this link:

http://yosemite.epa.gov/opa/admpress.nsf/0/068329A572EFD5F685257DA1005367B6

Your study gave no shrift to the individuals who, on their own, are converting. Solar Farms are also major players that your study ignored. For your study to tell us we have a fuel shortage without thoroughly vetting all the options is rip off of the tax payers.

You have ignored the important potential that Renewables have proven to play in our development of sources of energy production.

Your calculations of the degree by which your specific options fail to meet GWSA standards is also defective, because you failed to incorporate the pollutants and gases produced in the Fracking and transport processes, as one attendee adeptly pointed out.

I ask therefore, that you extend the release date and allow further revision of your models to address these deficiencies.

Here are Rose Wessell's concerns and I set them forth again and I share them all:.

— None of the models are GWSA (Global Warming Solutions Act) compliant. This ignores state law.

— Building more pipeline pulls us further out of compliance with the GWSA, shifting the burden to meet GWSA compliance out of the electric generation sector to more expensive sectors of the economy.

— Offshore wind is discounted as not feasible, yet there are currently multiple projects moving ahead. This will be part of our energy system in the near future, yet it is not considered.

— Solar is dismissed as not being available during peak hours. At the same time, peak storage systems using pumped or battery storage are also discounted. Including both can provide peak demand relief.

— The study does not take into account the recent, drastic drop in oil and LNG prices, making the study's results already obsolete.

— It does not include expansions of current energy efficiency programs or clean energy utility intertie incentives, all of which are currently keeping electric demand flat in the state.

— They've used ISO-New England's energy forecasts as base model numbers. These forecasts have recently been criticized by NESCOE for not including current distributed generation (rooftop solar, etc), utility scale wind and solar that are slated to come on line in the next few years, and energy efficiency incentives that are holding electric demand flat.

— They assume optimal pipeline use (80% full and serving only domestic uses) which would not be the case if all or even most current proposals are built. If they are built, and the market is flooded with excess capacity during the 325-350 days a year when demand is below peak, this creates a glut of capacity with nowhere to go, but export to foreign markets. The significantly higher prices that natural gas captures overseas raises prices here in New England.

— They only marginally address imported LNG or LNG storage to meet these infrequent peak demands for natural gas in the current system. There are currently under-utilized facilities for storage in New England that could be used to store natural gas during the vast majority of the year when peak demand is not an issue. Also, our main importer in the region, Distrigas, has estimated that the peak

constraints can be addressed by their company with no more impact than 2-1/2 to 3 extra tankers a year arriving at their facility. This is a solution that could bridge the current constraints while renewable capacity is boosted to address electric generation needs over the next few years. Unlike a pipeline, both of these solutions are immediately available and don't require ANY new infrastructure to be built.

By recalibrating the study to such tight and unrealistic parameters, the study has been bent into a shape in which the only question to be answered was not "is more pipeline necessary", but "how much pipeline is necessary". The spirit of the study requested during our meeting with Governor Patrick was to determine if peak demands couldn't be met by other means, and if not entirely, then how little would it truly take. The usefulness of this newly completed study is limited to showing how much distortion of data it takes to show that more pipeline is needed.

Please note that I am forward gin a copy of my concerns to my Elected officials.

Thank you.

Karin Theodoros,

Tewksbury, MA 01876

From:	Smith Sam
To:	Lowdemandstudy, (ENE)
Subject:	Fwd: [350MA-Berkshires] Low Demand Study comments from BPVS
Date:	Monday, December 22, 2014 2:47:39 PM

Begin forwarded message:

From: Smith Sam <sam@caretakerfarm.org>
Subject: Re: [350MA-Berkshires] Fwd: Low Demand Study comments from BPVS
Date: December 22, 2014 at 2:33:06 PM EST
To: Kilfoyle Chris <cdk@bpvs.com>
Cc: "MassSolar@googlegroups.com" <MassSolar@googlegroups.com>, 350ma-berkshires@googlegroups.com

Dear Commissioner Lusardi and members of the Low Demand Study team,

My wife, Elizabeth, and i wish to add our names to Christopher Kilfoyle's letter below:

Sincerely,

Samuel & Elizabeth Smith
1216 Hancock Rd
Williamstown, MA 01267
413-458-4309
On Dec 22, 2014, at 10:03 AM, Christopher Kilfoyle <cdk@bpvs.com> wrote:

-------- Original Message --------
Subject: Low Demand Study comments from BPVS
Date: Sun, 21 Dec 2014 13:35:10 -0500
From: Christopher Kilfoyle <cdk@bpvs.com>
Reply-To: cdk@bpvs.com
Organization: BPVS
To: lowdemandstudy@state.ma.us

Dear Commissioner Lusardi and members of the Low Demand Study team-

Thank you for the opportunity to submit these brief comments on the issues before this study group and the initial report from the DOER consultant, Synapse Energy Economics.

The Patrick Administration should advise the public and the Baker administration, that the case for expanded and new gas pipelines in the Commonwealth has been exaggerated by the utility and pipeline industries and their allies. The perceived peak shortages for the electricity sector last winter were due in large part to the procurement decisions by the electricity generation sector itself. The general argument that there will be growing natural gas shortages, only new and expanded pipelines can mitigate, is proven debatable. In fact this simple dubious perspective has deliberately created a false emergency among the public that should be carefully corrected by political leaders. There is no urgency for the state to signal to FERC that pipeline monopoly franchises be conferred and construction begun.

The draft Sypapse Studies revealed at the December 18th stakeholder meeting, omits notice of energy market forces already in play and significantly limits alternative considerations on the most appropriate and incremental improvements to obviate the need for new gas transmission infrastructure. The study albeit with the fair excuse of being rushed is already flawed.

The nature of public comments thus far and the intelligence of the stakeholders involved in this issue will devastatingly criticize any conclusion of this study that suggests increased natural gas use requiring expanded and new pipelines is the only solution.

On behalf of my firm and our many customers contributing to the clean energy transformation of our economy please promote energy policies that better reflect our environmental healing aspirations and reject short term corporate opportunism in promoting expanded fossil fuel combustion.

Sincerely

<Mail Attachment.jpeg>

--
Christopher Derby Kilfoyle

BPVS Berkshire Photovoltaic Services
46 Howland Avenue
Adams,MA 01220
Tel: 413-743-0152
Fax: 413-743-4827
www.bpvs.com

Website: http://350ma-berkshires.org/
Facebook: https://www.facebook.com/BerkshireNode350MA

From: Lusardi, Meg (ENE)
To: Aminpour, Farhad (ENE)
Cc: McBrien, Joanne (ENE)
Subject: Fw: Comment on LDS
Date: Monday, December 22, 2014 5:42:40 PM

Sent from my Verizon 4G LTE Smartphone

------ Original message------
From: jodi macdonald
Date: Mon, Dec 22, 2014 5:06 PM
To: lowdemandstudy@state.ma.edu;Sylvia, Mark (ENV);Lusardi, Meg (ENE);eastanton@synapse-energy.com;
Subject: Comment on LDS

I want to convey my concerns about the future of energy generation in Massachusetts and the flaws in the recent Low Demand Study. I personally have switched my home electricity supplier to a green source: New England Greenstart through National Grid. We need to break our dependence on fossil fuels and work diligently to meet the goals set in the GWSA.

As a resident of Andover, I am greatly concerned about the proposed Kinder Morgan pipeline. I was happy to see MA government undertaking the Low Demand Study to determine whether we need the energy that this natural gas will enable. However, I am extremely disappointed in how the study has been carried out. I am adding my name and support to the attached letter from Mothers Out Front and other stakeholders who outline the many shortcomings of the study.
Jodi MacDonald

From: Lusardi, Meg (ENE)
To: Aminpour, Farhad (ENE); McBrien, Joanne (ENE)
Subject: Fw: Caveats bias study
Date: Monday, December 22, 2014 6:14:27 PM

Sent from my Verizon 4G LTE Smartphone

------ Original message------
From: Pete
Date: Mon, Dec 22, 2014 6:13 PM
To: lowdemandstudy@state.ma.edu;
Cc: Lusardi, Meg (ENE);Sylvia, Mark (ENV);eastanton@synapse-energy.com;
Subject: Caveats bias study

December 22, 2014

Mr. Mark Sylvia
Undersecretary for Energy
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Dear Mr. Sylvia:

My name is Peter J. Clark and I live at 135 Heather Rd, Dracut, MA. My neighborhood and in particular, my yard is an area that would be affected by one of the proposed new pipeline projects. I am completely opposed to this project. My family's home where we have lived for over 30 years is less than 100 feet from a new high-pressure natural gas line that is being proposed. I am also less than 300 yards from a very large compressor station. Other compressor stations around the country have been the source of major safety, health, environmental and noise concerns.

As I understand it, the DOER has funded a natural gas demand study that does not take into account the ability of existing pipelines to deliver more gas to the region nor does it consider additional LNG storage to deal with peak loads. Considering that the entire conclusion of the report is based on peak hour demand, this appears to be a serious oversight. It is important that the DOER and its consultant, Synapse, not publish reports or spreadsheets which contain statements like "This Scenario Requires a Pipeline" when the opportunities to increase flow on the existing Portland Natural Gas and Iroquois pipelines have not been considered.

It is my understanding that at the recent Consumer Advisory Group meeting of ISO New England, held on December 4, it was announced that Portland Natural Gas secured approval from Canada's National Energy Board (see: http://goo.gl/rvHVqb) that will enable the company to deliver 200 million cubic feet per day (8.4 Billion Btu/hr) of additional natural gas into Dracut, MA (see: www.nescoe.com, letter of May 30, 2014).

It is also my understanding that in May, the Iroquois Gas Transmission System told

NESCOE that an additional 350 million cubic feet per day (14.7 billion Btu/hr) of natural gas was available to be sent eastward into New England on its major pipeline (see: http://goo.gl/UoSuln), again without any pipeline construction.

Considering all that your office has done to reduce and reverse the growth in energy demand through many energy efficiency programs, we would be shocked if you were to approve a report which relies on data from a single pipeline company, and ignores less expensive options that do far less environmental harm. The report also ignores the opportunity to roll out more mandates for efficient lighting as these devices continue to reduce power demand.

Please ensure that this erroneous Synapse report is corrected before it is released.

Sincerely,

Peter J. Clark

From:	Karin Theodoros
To:	Lowdemandstudy, (ENE)
Cc:	james.lyons@mahouse.gov; paul.gangi@mahouse.gov; eileen.donoghue@masenate.gov; Barry Finegold; Alexander Vispoli; Campaignmanager@teambarbara.com; Constituent Services (GOV)
Subject:	FW: Meeting 12-18-2014 comments
Date:	Monday, December 22, 2014 3:02:27 PM

From: Karin Theodoros [mailto:attyktheo@gmail.com]
Sent: Monday, December 22, 2014 2:38 PM
To: 'lowdemandstudy@state.ma.us'
Subject: Meeting 12-18-2014 comments

Dear Sirs and Madam-

Please be advised that as a taxpayer, I am deeply disturbed by what I have seen unfolding in connection with your study over the past few weeks. I share the concerns of Rose Wessell, especially with respect to the fact that the final meeting was postponed until only shortly before the planned release date. I ask that the release date itself be postponed in all fairness to the public. This is only right, especially given this time of year. The materials were not posted until the Friday of the week-end before Christmas and the middle of Hanukkah, as well as other Holiday celebrations. To claim public participation, then expecting the public to comb through your final Drafts and provide comments in such short time frame is disingenuous. In addition to that, I also note that you had serious problems with the Teleconferencing and people who were trying to participate were denied that opportunity to hear your explanation for almost the first two hours. Despite those issues, you never incorporated any link on your site to the videos that you knew a lay person was making so that people could educate themselves. I was trying to follow this for the past several weeks and found it extremely difficult to find any meaningful educational information for lay people who could not attend the meetings on your site. In this day and age, for you not to have held video conferencing and then posted the videos yourselves is not acceptable.

I wish you to be aware that the lack of questioning by the Electric and Gas sections during the last meeting, while there was obviously substantial concern by the Green and Renewable Energy Sections, combined with the understanding that the models changed substantially between the second to last and the last meeting , as a result of which you failed to incorporate renewables and the path Massachusetts has taken in developing renewables, has left me with the perception that you had conversations with fossil fuel interests in private, and tailored these final models to meet their desired outcome.

Massachusetts is the 4th leading state in the Country in renewables. I direct your attention to the recognition given to the Commonwealth of Massachusetts by the EPA, which can be found at this link:

http://yosemite.epa.gov/opa/admpress.nsf/0/068329A572EFD5F685257DA1005367B6

Your study gave no shrift to the individuals who, on their own, are converting. Solar Farms are also major players that your study ignored. For your study to tell us we have a fuel shortage without thoroughly vetting all the options is rip off of the tax payers.

You have ignored the important potential that Renewables have proven to play in our development of sources of energy production.

Your calculations of the degree by which your specific options fail to meet GWSA standards is also defective, because you failed to incorporate the pollutants and gases produced in the Fracking and transport processes, as one attendee adeptly pointed out.

I ask therefore, that you extend the release date and allow further revision of your models to address these deficiencies.

Here are Rose Wessell's concerns and I set them forth again and I share them all:.

— None of the models are GWSA (Global Warming Solutions Act) compliant. This ignores state law.

— Building more pipeline pulls us further out of compliance with the GWSA, shifting the burden to meet GWSA compliance out of the electric generation sector to more expensive sectors of the economy.

— Offshore wind is discounted as not feasible, yet there are currently multiple projects moving ahead. This will be part of our energy system in the near future, yet it is not considered.

— Solar is dismissed as not being available during peak hours. At the same time, peak storage systems using pumped or battery storage are also discounted. Including both can provide peak demand relief.

— The study does not take into account the recent, drastic drop in oil and LNG prices, making the study's results already obsolete.

— It does not include expansions of current energy efficiency programs or clean energy utility intertie incentives, all of which are currently keeping electric demand flat in the state.

— They've used ISO-New England's energy forecasts as base model numbers. These forecasts have recently been criticized by NESCOE for not including current distributed generation (rooftop solar, etc), utility scale wind and solar that are slated to come on line in the next few years, and energy efficiency incentives that are holding electric demand flat.

— They assume optimal pipeline use (80% full and serving only domestic uses) which would not be the case if all or even most current proposals are built. If they are built, and the market is flooded with excess capacity during the 325-350 days a year when demand is below peak, this creates a glut of capacity with nowhere to go, but export to foreign markets. The significantly higher prices that natural gas

captures overseas raises prices here in New England.

— They only marginally address imported LNG or LNG storage to meet these infrequent peak demands for natural gas in the current system. There are currently under-utilized facilities for storage in New England that could be used to store natural gas during the vast majority of the year when peak demand is not an issue. Also, our main importer in the region, Distrigas, has estimated that the peak constraints can be addressed by their company with no more impact than 2-1/2 to 3 extra tankers a year arriving at their facility. This is a solution that could bridge the current constraints while renewable capacity is boosted to address electric generation needs over the next few years. Unlike a pipeline, both of these solutions are immediately available and don't require ANY new infrastructure to be built.

By recalibrating the study to such tight and unrealistic parameters, the study has been bent into a shape in which the only question to be answered was not "is more pipeline necessary", but "how much pipeline is necessary". The spirit of the study requested during our meeting with Governor Patrick was to determine if peak demands couldn't be met by other means, and if not entirely, then how little would it truly take. The usefulness of this newly completed study is limited to showing how much distortion of data it takes to show that more pipeline is needed.

Please note that I am forwarding a copy of my concerns to my Elected officials.

Thank you.

Karin Theodoros,

Tewksbury, MA 01876

From:	Karl Meyer
To:	Lowdemandstudy, (ENE)
Subject:	Comments: low demand gas study
Date:	Monday, December 22, 2014 2:57:10 PM

Karl Meyer, MS Environmental Science
85 School Street, # 3
Greenfield, MA 01301
413-773-0006
karlmeyer1809@verizon.net

Dear DOER and Synapse regarding the low demand gas study:

I include below these, the comments of Haskell Werllin of Solar Design Associates. Please accept them as my own input into the results generated by the modeling study. I fully support those comments and specific points made regarding costs, price supports, generation and transmission. Any responsible study in this era of climate warming must have Climate Change as the chief factor in making public policy decisions.

Further, the only way to create a responsive energy policy is to look at regional needs, rather than using a piecemeal, state by state patchwork to justify higher demand predictions.

Lastly, the future "potential" for 12 peak-demand days should not be the excuse or driving force in loading up on the planets energy reserves. Energy efficiency and weatherization work could erase those peaks and create a more-livable region for future generations--if they were simply implemented before we plunder more climate warming resources.

That's what creating responsible energy policy demands. Thank you.

Sincerely, Karl Meyer, Greenfield, MA (**comments continue below**)

Low Demand Gas Study Comments

To the DOER and Synapse regarding the low demand gas study:

Thank you for the opportunity to respond to the December 18th stakeholder meeting to review the results of the low demand study modelling efforts. Given the limited time available for providing comments, my responses are limited to my personal opinions rather than organizations that I belong to such as MassSolar or E2 (Environmental Entrepreneurs). Three and a half days (including a weekend during the holiday season) do not allow for a full group review and group authored response.

Nevertheless, this study is too important to ignore and to not point out the flaws in the study would be folly for the Commonwealth to adopt its recommendations without fully appreciating the caveats that completely invalidate the study's conclusions.

The study is a good start of the conversation but by no means should be the basis for any decisions

regarding gas pipeline capacity expansion or adding new electric transmission lines from Canada.

1) First and foremost of the eight scenarios modeled, none of the eight even met the Global Warming Solutions Act targets for either 2020 or extrapolated out for 2030. Even the most optimistic scenario came in at 2% deficit and that assumes that the other sectors (buildings/transportation) meet or beat their target reductions as well which is more challenging and expensive than the electricity sector. Whatever the eventual plan is, it must conform to Massachusetts law and meet the goals of the GWSA as a starting point, not as a consequence of that plan. Global warming must be the driver, not an afterthought, as the inputs in this modelling effort.

2) Demand response must be considered as a factor in shaving peaks and reducing the supply constraints in the worst cold snaps when supply is most severely constrained.

3) Price impacts of gas exports must be factored in as the domestic price of gas will eventually be influenced by the world price once export facilities come on line. Whether they are in Maryland, Massachusetts or the Gulf is immaterial. The global price will then dictate the domestic gas prices and that will make many of the "economically infeasible" technologies listed in the red section of the first slide now economically viable options.

4) Price suppression effects of wind and solar in the wholesale markets must be considered as it lowers ratepayers costs now that the ISO-NE is for the first time allowing renewables to bid into the wholesale auction and is accepting negative hourly prices.

5) Cost of additional natural gas storage facilities to meet the shortfall for the 12 day peak winter cold snap was not shown as a viable option.

6) Study is state specific, not regional, yet the solution is regional by nature and needs to run as a regional model to make any sense in the real world.

7) Solar PV is currently severely constrained by net metering caps and managed growth allocations in Massachusetts. Together with offshore wind this could conceivably be required to add over 4000 MW of capacity by 2030 to offset some of the retiring generation assets with out adding to emissions.

8) LNG pricing is directly related to oil costs which have dropped dramatically over recent months and LNG storage facilities should be considered for improving reliability and avoiding the forecasted winter price spikes of natural gas from the constrained pipelines in the short years of 2020-2022.

Respectfully,

Haskell Werlin

Director of Business Development
solar design associates
280 Ayer Road

Harvard, Massachusetts 01451

** Please update your records to my new E-mail Address:*

karlmeyer1809@verizon.net

From:	pdowns881@comcast.net
To:	Lowdemandstudy, (ENE)
Subject:	Synapse report
Date:	Monday, December 22, 2014 3:05:23 PM

Mr. Mark Sylvia
Undersecretary for Energy
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Dear Mr. Sylvia:

My name is Pamela Downs and I have lived in Wilmington my entire life. The portion of the pipeline that runs through North Wilmington will be very close to the town water supply as well as an active quarry. I have serious concerns about the safety of this project. The route also crosses through neighborhoods and conservation land.

My understanding is that the DOER has drafted a natural gas demand study that does not take into account the ability of existing pipelines to deliver more gas to the region. It is important that the DOER and its consultant, Synapse, not publish reports or spreadsheets which contain statements like "This Scenario Requires a Pipeline" when the opportunities to increase flow on the existing Portland Natural Gas and Iroquois pipelines have not been considered.

It is my understanding that at the recent Consumer Advisory Group meeting of ISO New England, held on December 4, it was announced that Portland Natural Gas secured approval from Canada's National Energy Board (see: http://goo.gl/rvHVqb) that will enable the company to deliver 200 million cubic feet per day of additional natural gas into Dracut, MA (see: www.nescoe.com, letter of May 30, 2014).

It is also my understanding that in May, the Iroquois Gas Transmission System told NESCOE that an additional 350 million cubic feet of natural gas was available to be sent eastward into New England on its major pipeline (see: http://goo.gl/UoSuln), again without any pipeline construction.

Considering all that your office has done to reduce and reverse the growth in energy demand through many energy efficiency programs, we would be shocked if you were to approve a report which relies on data from a single pipeline company, and ignores less expensive options that do far less environmental harm. The report also ignores the opportunity to roll out more mandates for efficient lighting as these devices continue to reduce power demand.

Please ensure that this erroneous Synapse report is corrected before it is released.

Thank you in advance,

Pamela Downs
Competitive Edge Real Estate Services
1120 Main Street
Tewksbury, MA 01876
Office 978-851-5580
Fax 978-851-5568
Cell 978-944-1558
E-Mail pdowns@compedgeres.com

attachments is confidential and is intended only for the use of the individual or entity named above and others who have been specifically authorized to receive it. If you are not the intended recipient, you are hereby notified that any use, unauthorized dissemination, distribution, or copying of this communication is strictly prohibited. If you have received this communication in error, please delete immediately or if any problems occur with transmission, please notify me immediately by telephone. Thank you.

From:	Robyn Sartell
To:	Lowdemandstudy, (ENE)
Cc:	Sylvia, Mark (ENV); Lusardi, Meg (ENE); eastanton@synapse-energy.com; Robyn Sartell
Subject:	MASS Dept of Energy resources on Natural Gas Pipeline Needs Study
Date:	Monday, December 22, 2014 3:58:16 PM
Importance:	High

December 22, 2014

Mr. Mark Sylvia
Undersecretary for Energy
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Dear Mr. Sylvia:

My name is Robyn Sartell and I live in Dracut in an area that would be affected by one of the proposed new pipeline projects. The proposed route for the pipeline will run through 3 active farms, a footbridge (built by volunteers) located at our local church, natural preservation among other areas. The proposed pipeline will also surround my house with 36" and 30" pipelines as well as a massive compression station that is proposed to be located on a road adjacent to mine. I am very concerned with the safety of my family and those of my friends as well as the compromise to my well water, agriculture and natural preservation. Dracut is a beautiful town with a tremendous effort towards conservation. The town already houses pipelines for natural gas and has a compression station close to where my children attend elementary school. This town has certainly done its part assisting with the transportation of natural gas and to continue to expose Dracut to the dangers of adding additional pipelines and compression stations for an unnecessary need is disheartening. I would hope that you would reconsider your findings and potentially help to support Dracut from further exposure to potential harm and continue to review the capacity of existing pipelines.

My understanding is that the DOER has drafted a natural gas demand study that does not take into account the ability of existing pipelines to deliver more gas to the region. It is important that the DOER and its consultant, Synapse, not publish reports or spreadsheets which contain statements like "This Scenario Requires a Pipeline" when the opportunities to increase flow on the existing Portland Natural Gas and Iroquois pipelines have not been considered.

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Considering all that your office has done to reduce and reverse the growth in energy demand through many energy efficiency programs, we would be shocked if you were to approve a report which relies on data from a single pipeline company, and ignores less expensive options that do far less environmental harm. The report also ignores the opportunity to roll out more mandates for efficient lighting as these devices continue to reduce power demand.

Please ensure that this erroneous Synapse report is corrected before it is released.

Thank you,

Robyn Sartell

From: Sheann@verizon.net
To: Lowdemandstudy, (ENE)
Subject: Concern regarding new pipeline
Date: Monday, December 22, 2014 4:05:13 PM

Mr. Mark Sylvia

Undersecretary for Energy

Executive Office of Energy and Environmental Affairs

100 Cambridge Street, Suite 900

Boston, MA 02114

Dear Mr. Sylvia:

My name is Sheila Robichaud and I live in Wilmington in an area that would be affected by one of the proposed new pipeline projects. The portion of the pipeline that runs through North Wilmington will be very close to the town water supply as well as an active quarry. When there is blasting at the quarry, all house in the area shake, so I have serious concerns about the safety of this project. The route also crosses through neighborhoods and conservation land.

My understanding is that the DOER has drafted a natural gas demand study that does not take into account the ability of existing pipelines to deliver more gas to the region. It is important that the DOER and its consultant, Synapse, not publish reports or spreadsheets which contain statements like "This Scenario Requires a Pipeline" when the opportunities to increase flow on the existing Portland Natural Gas and Iroquois pipelines have not been considered.

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Considering all that your office has done to reduce and reverse the growth in energy

demand through many energy efficiency programs, we would be shocked if you were to approve a report which relies on data from a single pipeline company, and ignores less expensive options that do far less environmental harm. The report also ignores the opportunity to roll out more mandates for efficient lighting as these devices continue to reduce power demand.

Please ensure that this erroneous Synapse report is corrected before it is released.

Thank you,

Sheila Robichaud

Sent from my iPad

From: Sheann@verizon.net
To: Lowdemandstudy, (ENE)
Subject: Proposed pipeline in Wilmington, MA
Date: Monday, December 22, 2014 4:07:28 PM

Mr. Mark Sylvia

Undersecretary for Energy

Executive Office of Energy and Environmental Affairs

100 Cambridge Street, Suite 900

Boston, MA 02114

Dear Mr. Sylvia:

My name is Scott Robichaud and I live in Wilmington in an area that would be affected by one of the proposed new pipeline projects. The portion of the pipeline that runs through North Wilmington will be very close to the town water supply as well as an active quarry. When there is blasting at the quarry, all house in the area shake, so I have serious concerns about the safety of this project. The route also crosses through neighborhoods and conservation land.

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Please ensure that this erroneous Synapse report is corrected before it is released.

Thank you,

SCOTT ROBICHAUD

Sent from my iPad

From:	Wrick, Doreen F
To:	Lowdemandstudy, (ENE)
Cc:	Paglia, Richard; Mike Ausere (michael.ausere@nu.com); Kruse, Richard J
Subject:	MA DOER Low Demand Analysis - Comments of Spectra Energy and NU
Date:	Monday, December 22, 2014 4:28:01 PM
Attachments:	image003.png SPECTRA NU LETTER_FINAL.pdf ATT00001.txt

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Attached please find the joint comments of Spectra Energy and Northeast Utilities.

Doreen

DOREEN WRICK
DIRECTOR, MARKETING | SPECTRA ENERGY
o. 617.560.1536 | c. 617.686.0321 | dfwrick@SpectraEnergy.com

890 Winter Street, Suite 300
Waltham, MA 02451

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December 22, 2014

Mr. Farhad Aminpour
Director, Energy Markets Division
Massachusetts Department of Energy Resources
100 Cambridge Street, Suite 1020
Boston, MA 02114

Via Electronic Mail

Dear Mr. Aminpour:

Spectra Energy and Northeast Utilities ("NU") appreciate the opportunity to provide comments on the modeling results prepared by Synapse Economics, Inc., for the Massachusetts Department of Energy Resource's ("DOER") Low Demand Analysis. It is our understanding that the modeling results in the Synapse presentation to the stakeholder group in Boston on December 18, 2014, indicate that the Commonwealth requires increases in peak natural gas capacity in the base case, and in all scenario cases.

Spectra Energy and NU, two of the largest energy providers in New England, agree with this conclusion. The lack of sufficient energy infrastructure is driving New England's energy prices higher, limiting economic competitiveness and growth, and straining energy systems. In order to provide a solution, the two companies are working together to develop the Access Northeast Project, an expansion of existing gas infrastructure in New England to specifically improve fuel deliveries to electric power generation. Spectra Energy's pipelines are already directly connected to over 60% of the gas fired power plants that serve New England. Further, the Spectra Energy pipelines serve twice the number of efficient gas-fired power plants than the other pipelines combined. Access Northeast, along with interconnecting pipelines such as Iroquois Gas Transmission System, LP (as announced December 8, 2014) and regional storage assets will provide firm services to gas-fueled electricity generating plants when they need it most … on cold winter days.

Although the region has expanded pipeline infrastructure as demand for gas heating has grown, there has been no equivalent investment to ensure that gas is available for power plants. Meanwhile, the region's reliance on gas-fired generation for electricity has grown from 15% in 2000 to 50% in 2014. During the coldest days last winter, 70% of New England's gas generation fleet sat idle because of lack of access to fuel. As a consequence, the region was forced to rely substantially on older and more expensive oil and coal plants. The result of our deficient energy infrastructure is skyrocketing electric prices. The energy prices paid by residential electric customers will increase by as much as 60% starting in January. This surge in energy prices impacts not only residential customers, but industrial and commercial customers as well.

In its final report, we recommend that the DOER further clarify its conclusions related to peak hour natural gas demand and capacity requirements. Access Northeast is being designed specifically to balance our region's need for infrastructure on both an annual and peak basis. It is our opinion that the optimal solution, based on our understanding of these preliminary results, is the Access Northeast Project, which utilizes a combination of existing natural gas and interconnecting pipelines and regional storage assets.

Spectra Energy and NU look forward to working with State of Massachusetts to meet the energy needs of the Commonwealth and the New England Region.

From:	Dan Comcast
To:	"lowdemandstudy@state.ma.us"@bos-mailsec-002.state.ma.us
Subject:	Caveats bias study
Date:	Monday, December 22, 2014 4:46:49 PM
Attachments:	December 21 DOER.docx ATT00001.htm

Sent from my iPad

December 21, 2014

Mr. Mark Sylvia
Undersecretary for Energy
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Dear Mr. Sylvia:

My name is Daniel L, Mooney and I live at 71 Heather Rd, in Dracut, MA in an area that would be affected by one of the proposed new pipeline projects. My home may be less than 200 feet from a 24 in gas line operating at 1400 psi. I am also less than a ¼ mile from a large compressor station.

My understanding is that the DOER has funded a natural gas demand study that does not take into account the ability of existing pipelines to deliver more gas to the region nor does it consider additional LNG storage to deal with peak loads. Considering that the entire conclusion of the report is based on peak hour demand, this appears to be a serious oversight. It is important that the DOER and its consultant, Synapse, not publish reports or spreadsheets which contain statements like "This Scenario Requires a Pipeline" when the opportunities to increase flow on the existing Portland Natural Gas and Iroquois pipelines have not been considered.

It is my understanding that at the recent Consumer Advisory Group meeting of ISO New England, held on December 4, it was announced that Portland Natural Gas secured approval from Canada's National Energy Board (see: http://goo.gl/rvHVqb) that will enable the company to deliver 200 million cubic feet per day (8.4 Billion Btu/hr) of additional natural gas into Dracut, MA (see: www.nescoe.com, letter of May 30, 2014).

It is also my understanding that in May, the Iroquois Gas Transmission System told NESCOE that an additional 350 million cubic feet per day (14.7 billion Btu/hr) of natural gas was available to be sent eastward into New England on its major pipeline (see: http://goo.gl/UoSuln), again without any pipeline construction.

Considering all that your office has done to reduce and reverse the growth in energy demand through many energy efficiency programs, we would be shocked if you were to approve a report which relies on data from a single pipeline company, and ignores less expensive options that do far less environmental harm. The report also ignores the opportunity to roll out more mandates for efficient lighting as these devices continue to reduce power demand.

Please ensure that this erroneous Synapse report is corrected before it is released.

Thank you,

Daniel L. Mooney

From:	jodi macdonald
To:	Lowdemandstudy, (ENE); Sylvia, Mark (ENV); Lusardi, Meg (ENE); eastanton@synapse-energy.com
Subject:	FW: Comment on LDS with attachment
Date:	Monday, December 22, 2014 5:11:59 PM
Attachments:	LDS Stakeholder Comments from MassEnergy et al 122214.pdf

I want to convey my concerns about the future of energy generation in Massachusetts and the flaws in the recent Low Demand Study. I personally have switched my home electricity supplier to a green source: New England Greenstart through National Grid. We need to break our dependence on fossil fuels and work diligently to meet the goals set in the GWSA.

As a resident of Andover, I am greatly concerned about the proposed Kinder Morgan pipeline. I was happy to see MA government undertaking the Low Demand Study to determine whether we need the energy that this natural gas will enable. However, I am extremely disappointed in how the study has been carried out. I am adding my name and support to the attached letter from Mothers Out Front and other stakeholders who outline the many shortcomings of the study.
Jodi MacDonald

December 22, 2014

Massachusetts Department of Energy Resources (DOER)
Submitted electronically to lowdemandstudy@state.ma.us

Re: Massachusetts Low Demand Analysis – Comments from Mass Energy Consumers Alliance

Dear Acting Commissioner Lusardi:

Thank you for the opportunity to offer feedback in response to the Low Demand Scenario Analysis presentation given by Synapse on December 18, 2014. The undersigned represent consumer advocacy, environment, and grassroots citizen groups. We are deeply committed to achieving 80% GHG emission reductions by 2050 and believe energy solutions that move us away from our current over-reliance on natural gas are integral to meeting these goals. As we are seeing play out at the time of this study, this over-reliance leaves ratepayers exposed and vulnerable to energy price volatility, particularly during extreme peak periods – which further underscores the need for a thorough exploration of alternative solutions.

From the outset, we commended the Administration for undertaking a low demand analysis. We remained optimistic that the analysis would truly explore alternative resources capable of meeting the Commonwealth's heating and electricity demand in a sustainable way. And so although we applaud this exercise as an important step in identifying enduring solutions to Massachusetts' energy needs, it is far from complete. The study is constrained by the assumptions underlying it and DOER-imposed limitations on various components, especially energy efficiency. It does not reflect recent changes in the marketplace of great significance. But perhaps most important is the fact that compliance with Massachusetts law – the Global Warming Solutions Act (GWSA) – was neither an input nor was it achieved as an output.

The challenge of how to sustainably meet our energy demand is regional, as are some of the more comprehensive solutions. For example, we know that New Hampshire and Maine have significantly more efficiency potential, yet this potential and the true impact of new pipeline outside of the Commonwealth is not captured in this study. A pipeline would not only dampen the growth of clean energy in Massachusetts, but in other New England states as well.

Given the December 23rd date slated for release of the report, we recognize that it is unlikely that any of our recommendations will be reflected in the final work product. However, in submitting to the record the following limitations and deficiencies, it is our hope that this administration or the incoming administration will address the study's deficiencies and the larger question of GWSA compliance before proposing or implementing any policy that would commit the Commonwealth to new, publically-funded natural gas infrastructure over the long term.

Consider the Option Value

The RFP[1] issued by DOER in September 2014 was for a feasibility study "of achievable levels of alternative resource penetration in Massachusetts over next five-15 years." This was to be done to assess the extent to which new pipeline infrastructure is required to meet demand during peak periods. Although the LDS assesses the addition of incremental pipeline to the system, in reality a pipeline is not constructed in this way. A pipeline is either built or not. The LDS study compares a very large natural gas pipeline expansion to a number of alternative resources. Each of the alternatives is relatively small compared to the pipeline in terms of meeting our energy needs. However, with all of the alternatives, we can envision a wide range of possibilities (i.e. with off-shore wind and energy efficiency, we could procure any number of MW).

In this context, we urge policy makers to consider the option value of first adopting several examples of alternative resources before locking Massachusetts ratepayers in to an enormous long-term commitment to natural gas.

Recommended Improvements

The report provides interesting information that could be helpful in determining a set of solutions to meet our energy needs, but at a minimum, the following concerns must be addressed.

1. **GWSA COMPLIANCE.** Compliance with GWSA is fundamental. We recognize the challenge of exploring solutions that meet energy demand while balancing reliability, cost, and environment, but the Commonwealth's emissions reductions targets (25% below 1990 by 2020, 80% by 2050) are **mandated** by the Global Warming Solutions Act (GWSA). A path to compliance should have been a goal of the study, yet Synapse was directed by DOER to make GWSA compliance an output rather than an input. The result is that NONE of the eight (8) scenarios presented in this study would bring us into compliance with the law.

   All eight scenarios would cause additional costs to the citizens of the Commonwealth and would have to be achieved outside of the Electricity and Building Sectors. Costs incurred by citizens would be include the abatement costs associated with the increased quantity of greenhouse gases emitted from the transport and combustion of natural gas through the new pipelines. Such costs could have easily been estimated by Synapse and tacked onto the cost of the pipeline. Instead, Synapse was directed by DOER to neglect such a fundamental consideration.

2. **LIMITED CONSIDERATION OF ALTERNATIVES.** Additional pipeline will undermine the progress MA has already made toward meeting the GWSA, while deferring more expensive emission reductions to be achieved outside of the electric sector. EEA's own analysis[2] indicates that the strategies currently underway and most likely to achieve the required reductions by 2020 nearly all come from buildings (demand) and electricity (supply). Attempting to meet demand with additional pipeline, especially while

[1] See RFP for Consulting Services for Low Demand Scenario: RFR ENE-2015-012/COMMSBUYS Bid# BD-15-1041-ENE01-ENE01-00000001461, Section 3.1.1, 1c-f

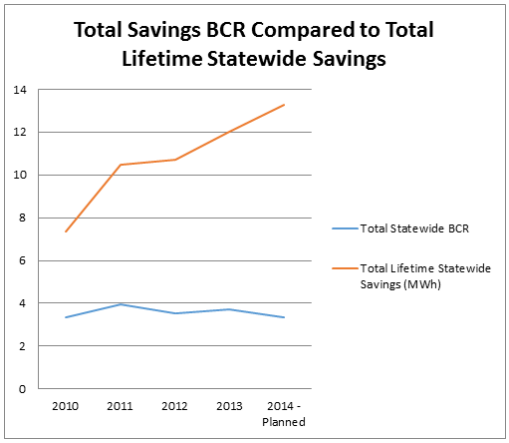
[2] "**GHG Reductions Likely by 2020:** This block of GHG reductions represents strategies which are underway or in the late stages of planning, and in EEA's judgment are highly likely to be realized at or near their full potential by 2020.These include (1) energy efficiency and tree-planting, totaling 5.5 MMTCO2e (2) clean energy imports, power plant closures, solar thermal, and expanded RPS, totaling 6.4 MMTCO2e, (3) Federal efficiency standards for light– and medium/heavy duty vehicles, totaling 2.0 MMTCO2e , and (4) Non-energy emissions, totaling 1.0 MMTCO2e." See Commonwealth of Massachusetts Global Warming Solutions Act 5-Year Report, page 12.

failing to fully consider demand side resources and supply side renewable alternatives, will only pull Massachusetts further away from compliance.

This study is specifically limited in its consideration of the following alternatives:

- ENERGY EFFICIENCY. Synapse's examination of the full impact of energy efficiency as a least cost resource with proven benefits was arbitrarily constrained by DOER who imposed a limit on the amount of efficiency to be considered. The limits imposed by DOER beyond 2015 correspond to the Clean Energy & Climate Plan, but they reflect energy savings that would be only slightly higher than the amount of energy savings now being achieved. Neither the Energy Efficiency Advisory Council nor Department of Public Utilities have approved such limited energy savings.

  Given that Massachusetts energy efficiency programs have greatly expanded since 2009 without causing per unit costs to rise or BCRs to fall, we see the current amount of efficiency in the supply curve to be far too low. Synapse has shown us how well efficiency compares to EVERY other possible energy resource, inclusive of the pipeline and alternative resources. We also know that empirical data about the cost-effectiveness of energy efficiency provides us with greater certainty about efficiency than any other resource.

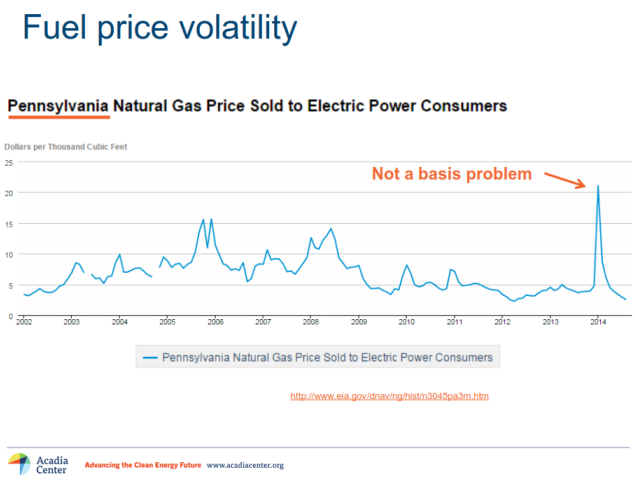


- LIQUID NATURAL GAS AND OIL. We understand the reticence of some to rely on LNG and petroleum for meeting winter peak demand, based solely upon the Polar Vortex experienced last year. But circumstances have changed greatly. Oil prices have plummeted, greatly reducing the cost to generators in New England for both oil and LNG, which is priced off the world-wide price of oil. As such, the economics of the Winter Reliability Program have been greatly improved. In October, we asked that Synapse consider possible expansions of the program, but we do not see evidence that they did. We believe that consuming additional quantities of LNG and oil during a few winter peak hours for the next few years is preferable both economically and environmentally to buying a long-term commitment of methane-leaking natural gas.

- RENEWABLE RESOURCES. Based on the criteria used to screen measures, the study suggests that off-shore wind has great potential in terms of quantity, but at a cost that was considered non-economic relative to gas pipelines. We would have preferred to see the analysis consider blending a more modest amount of off-shore wind with greater energy savings and other renewables. Furthermore, in the calculations of benefits of low-emission supply-side resources, Synapse should have used the

same value for carbon abatement that is applied to energy efficiency here. (The value has been proposed to apply to energy efficiency in DPU docket 14-86.) A value for the cost of carbon abatement could and should be applied to hydro and Class 1 renewables, as well. Failing to do so quite obviously hides an important cost factor with natural gas. Additionally, the consideration of Canadian imports seemed superficial insofar as it looked at two generic transmission lines capturing system power. We would have liked to have seen a more robust consideration of hydro and wind sourced from different Canadian provinces, which may have a higher capacity factor and greater benefits than what was modeled.

- NATURAL GAS PRICES. At the December 18 stakeholder session we learned that the study assumes gas heating demand to be inelastic for the entire study period. Over such a long period of time (five-15 years), high gas prices would cause reduced gas consumption, either through conservation, efficiency, or the adoption of renewable thermal technologies. In addition, the scenarios studied assume that there would be no winter price spikes in years 2015-2020. Again, price spikes would cause greater adoption of alternatives. It should also be noted that additional pipeline does not inoculate against price volatility – as was experienced in Pennsylvania last winter.[3]



Finally, it is unclear the extent to which DOER and Synapse have calculated the economic threshold considering the potential run-up in cost that could result from a substantial amount of natural gas exports. Each of these examples further illustrates the study's inadequacies.

3. **MISLEADING ASSUMPTIONS ABOUT ECONOMICS OF PIPELINE CAPACITY.** Assuming optimal economics for additional pipeline capacity (i.e. 80% annual utilization rate) skews the results to portray new capacity in a favorable light. In reality pipelines are often oversized, which could lead to lower utilization and worse economics. Furthermore, we note that two of the leading proposals being considered in Massachusetts far exceed what this study recommends (e.g., Kinder Morgan NED proposed 2.2Bcf/d, Spectra proposed 1.0Bcf/d).

4. **FAILURE TO ACCOUNT FOR METHANE EMISSIONS.** In the comments submitted on 10/20/14, we stated our concerns that DOER had instructed Synapse not to account for methane leakage because of limited time to analyze this question properly given the wide range of possibilities. That concern remains

[3] See slides 6, 7 in presentation given by Acadia Center at Restructuring Roundtable, November 2014. Available online at http://www.raabassociates.org/Articles/Shattuck% 20Presentation%20Final%2011.21.14.pdf.

unchanged, especially in the wake of the Administration's release of a Carbon Tax Study. As supporters of the Global Warming Solutions Act, we do not understand why the Commonwealth would carefully analyze its many energy options and the effects of putting a price on C02 up the stack without also putting a price on CH4 sent into the air, which is inconsistent.

At a minimum we suggest a simplified approach that would be similar to approaches used in other parts of this Low Demand Analysis. That would be to utilize a conservative percent leakage as recently published in a report for US DOE.[4] In that report, the authors estimate a 1.2-1.6 percent methane leakage rate, for Marcellus shale gas. (Please note this is a conservative estimate. We suggest a more appropriate rate would be 3-6%, but recognize that even higher estimates may be considered, too.[5]) It would seem reasonable to multiply the middle of that range, or 1.4% times the amount of natural gas that would be piped into Massachusetts to determine the quantity of leaked methane. Then multiply that number by 86[6] to derive a number that would be the number of tons of carbon dioxide equivalent.

As the transition in the Commonwealth's leadership gets underway, we hope that these comments and those of our colleagues will be taken into consideration as decisions about energy planning are made. The challenge of how to sustainably meet our energy demand is regional, as are some of the more comprehensive solutions. This report is an important step forward and we strongly urge policy-makers to address the study's deficiencies raised above and the larger question of GWSA compliance before proposing or implementing any policy that would commit the Commonwealth to new natural gas infrastructure over the long term. As actively engaged stakeholders committed to advocating for consumers and the environment, we look forward to continuing the dialogue and to participating in this process. We make ourselves available to you for ongoing collaboration.

For questions or additional information please contact Eugenia Gibbons: eugenia@massenergy.org, 617-524-3950 x 141.

Sincerely,

Eugenia Gibbons, Mass Energy Consumers Alliance
Peter Shattuck, Acadia Center
Vanessa Rule, Mothers Out Front
Joel Wool, Clean Water Action
Josh Craft, Environmental League of Massachusetts
Ben Hellerstein, Environment Massachusetts

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[4] http://energy.gov/sites/prod/files/2014/05/f16/Life%20Cycle%20GHG%20Perspective%20Report.pdf.
[5] See "A Bridge Too Far" page 7 for citations of rates between 1-9% including Harvard/NOAA. http://www.betterfutureproject.org/wp-content/uploads/2014/06/A-Bridge-Too-Far-Final.compressed.pdf
[6] IPCC, 2013: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 1535 pp.

From: Larry Aller
To: Lowdemandstudy, (ENE)
Subject: Comments on low demand study
Date: Monday, December 22, 2014 5:13:33 PM

Many thanks to the DOER and Synapse teams for the effort and work on this so far. It is vital to have good information to inform policy options and actions to reduce winter rates and provide a stable and sustainable energy supply for the Commonwealth.

In reviewing the materials recently posted for the Low Demand study, as well as other sources of market data, a few questions have emerged that I'd like to submit for consideration:

- The feasibility study references natural gas price scenarios based on Henry Hub prices, with a range generally below $5/mmBTU through 2020
    - o Figure 2 (p.7): http://synapse-energy.com/sites/default/files/Feasibility%20Study%20for%20Low%20Gas%20Demand%20Analysis.pdf

- Gas prices used in the Gas Model analysis range up to a high of $10.76 in 2019
    - o *Table 10 (Rows 182-204), RefTables sheet, Gas Model Excel workbook*

- However, recent data released by FERC in their Winter 2014-2015 Energy Market Assessment shows that 2014-2015 gas future prices at the Algonquin natural gas hub in New England, which is used by FERC as their reference for regional natural gas prices, are over 400% higher than the Henry Hub gas future price for this same period.
    - o In dollar terms, the 2014-2015 Algonquin gas future price is $21.45/mmBTU, compared to $4.08/mmBTU for the Henry Hub during the same period
    - o Slide 11: https://www.ferc.gov/market-oversight/reports-analyses/mkt-views/2014/10-16-14-A-3.pdf

I have not had time to review the full detail of the materials made available since the meeting last Thursday and there is a good chance I'm missing something. While future prices are not actual prices, this is an extremely large difference in futures price. Is this something that materially influences the results of these analyses? Is the Henry Hub price or the Algonquin price the appropriate reference price for natural gas for Massachusetts? If Algonquin is the correct reference, what is the appropriate gas price for this analysis? How could this affect the measures identified as cost effective in the feasibility study, or the net benefits of investing in alternatives to natural gas to serve or reduce demand?

Thank you again for the diligent work on this, and please contact me if I can provide any clarification or assistance.

Best regards,

Larry Aller

Next Step Living

www.nextstepliving.com

NextStepLiving.com
Home Energy Solutions.

From:	Skipworth, Norman D (Dodson)
To:	Lowdemandstudy, (ENE)
Subject:	Comments of Tennessee Gas Pipeline Co., LLC 12/22/2014
Date:	Monday, December 22, 2014 5:47:57 PM
Attachments:	DOER Comments 12.22.2014.pdf

Please see attached the comments of Tennessee Gas Pipeline Co., LLC to the Massachusetts Low Demand Study results discussed December 18, 2014. Thank you for the opportunity to provide input. Feel free to contact me by email or at the phone number below with any questions.

Sincerely,
Dodson Skipworth
Tennessee Gas Pipeline Co., LLC
713-823-7590

Tennessee Gas Pipeline
Company, L.L.C.
a Kinder Morgan company

December 22, 2014

Ms. Meg Lusardi
Acting Commissioner
Massachusetts Department of Energy Resources
100 Cambridge Street, Suite 1020
Boston, MA 02114

Submitted via email: lowdemandstudy@state.ma.us

RE: Comments of Tennessee Gas Pipeline Company L.L.C.
Regarding DOER's Low Demand Analysis Project

Dear Acting Commissioner Lusardi:

Tennessee Gas Pipeline Company, L.L.C. ("TGP") appreciates the opportunity to comment on the Massachusetts Low Demand Scenario Analysis modeling results produced by Synapse Economics, Inc. ("Synapse") on behalf of the Massachusetts Department of Energy Resources ("DOER") and presented at the December 18, 2014 stakeholder meeting. TGP applauds Synapse for its efforts under severe time constraints and commends the DOER for its efforts demonstrating —once and for all— that even in a low demand scenario with all other resources factored in, Massachusetts requires significant incremental gas pipeline capacity to meet peak day needs.

The critical takeaway of the modeling exercise is that Massachusetts alone, under all eight modelling scenarios, is projected to suffer from a pipeline capacity deficit of 0.6 to 1.1 Bcf/d during a "winter peak event.[1]" This deficit is specific to Massachusetts, a state relatively well-positioned with respect to natural gas pipeline access. It is worth noting that for other New England states, such as Maine, the relative economic effects are far worse.

Starting with the premise of a low demand scenario that is not conducive to promoting economic development and addressing the increasingly high energy costs in Massachusetts and the burden that these costs impose on residents and businesses, the Synapse study confirmed that, even under the most

[1] Synapse originally announced 1.1 Bcf as the high end of this range, but in revised slides posted a day after the modeling results were announced and one business day before these comments are due, the high end of the range was changed to 0.9 Bcf. In the absence of any explanation for such a last minute revision, TGP cannot comment on that change here.

favorable assumptions regarding the contributions of renewable resources, Massachusetts needs more pipeline capacity. Fortunately, pipeline projects, like TGP's Northeast Energy Direct ("NED") Project, are moving forward and are expected to be ready to meet incremental demand in the winter of 2018.

The results of the Synapse modeling validate signals from the New England markets – in the form of commitments to pipeline expansion projects – that the region needs more gas pipeline capacity. Unfortunately for Massachusetts and New England overall, if the region only adds 0.8 Bcf of pipeline capacity for example, all of this capacity will be soaked up by local distribution companies and Massachusetts and New England will have delayed the opportunity to add the gas pipeline capacity that is needed to reduce overall energy costs and enhance electric reliability. A recent study of New England's need for additional pipeline capacity by Competitive Energy Services ("CES") concluded that the region needs up to 2.4 Bcf of capacity to reduce the high basis differentials that are driving high electricity costs in Massachusetts. Furthermore, the CES analysis did not include any additional growing LDC demand caused by increasing conversions to natural gas, primarily from oil. It is clear that more than 0.8 Bcf of incremental capacity is needed to reduce basis differentials, lower overall energy costs, and enhance electric reliability in Massachusetts and New England.

Suggestions:

1. TGP's recognizes Massachusetts' commitment to the development of renewable resources and demand side management to support the electric grid. At the same time, it is important to recognize the critical role that gas pipeline capacity plays in firming up the reliability of the electric grid when intermittent resources like wind and solar are not available. Pipeline capacity is vitally important to electric and gas reliability. To this end, any alternative resource used to potentially fill the deficit of pipeline capacity in Massachusetts should offer comparable system reliability benefits to pipeline capacity. For example, solar and wind do not offer the same amount of reliability as subscribed pipeline capacity. Based on the study's definition of a "winter peak event"—design day demand at 6 p.m. during a 12-day "cold snap"—the sun would never be shining and there is no guarantee that the wind would be blowing. Therefore, for purposes of system reliability, solar resources should provide little benefit and wind resources should provide a substantially reduced benefit. It is unclear how the inherently less reliable nature of these resources was factored into the modelling. TGP respectfully requests that Synapse explain how reliability costs and benefits were applied to all resources. If sufficient natural gas pipeline capacity is not available to support intermittent renewable resources, the New England electric grid will be forced to increasingly rely on coal and oil for fuel, as we have seen with increasingly regularity over the past two winters.

   Moreover, it is unclear how the model deals with the legal requirement for LDCs to not only plan for the "design day" and account for a "cold snap," but also plan to reliability meet their firm demand on a design day within a "design season."

2. A comprehensive reliability analysis should account for contingencies. For example, a recent ICF study considered the effect of losing the Seabrook nuclear generating station: "Assuming winter 2013/14 weather conditions, most oil-fired units in-merit, and Seabrook included in the dispatch, gas supplies available to generators are barely adequate through 2017/18, and then in deficit by about 100 MMcf/d (~400 MW). With Seabrook offline, gas

supplies are in deficit throughout the forecast by as much as 300 MMcf/d (1,250 MW)."[2] TGP urges Synapse to consider the impact on Massachusetts demand for natural gas of similar contingencies, for example the loss of the Pilgrim nuclear generating station or a major transmission constraint limiting the ability to transmit electricity to the Boston area. Such contingencies would certainly affect Massachusetts' natural gas demand, and thus the magnitude of pipeline capacity deficit.

TGP thanks DOER for consideration of its comments, and looks forward to working with all Massachusetts stakeholders to help enhance the reliability of energy delivery and lower costs throughout the Commonwealth.

Sincerely,

Sital Mody
Vice President, Marketing & Business Development

[2] http://www.iso-ne.com/committees/comm_wkgrps/prtcpnts_comm/pac/mtrls/2014/apr292014/a3_icf_benchmarking_study.pdf.

From:	dorianswilliams@gmail.com on behalf of Dorian Williams
To:	Lowdemandstudy, (ENE)
Subject:	Better Future Project Comment Submission
Date:	Monday, December 22, 2014 9:16:58 PM
Attachments:	DOER Gas Demand Comment.docx

Please find BFP's comment to the low demand analysis attached. Apologies for the late submission, the tight timeline has been tough on all of us.

Happy Holidays!

Thank you,
Dorian

--

Dorian Williams
Climate Legacy Coordinator
Better Future Project
C: 773-289-2240
E: dorian@betterfutureproject.org

Climate Summer and 350 Massachusetts are programs of Better Future Project.

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December 22, 2014
Comment on DOER, Synapse Low Demand Analysis

Dear Department of Energy Resources,

Thank you for hearing citizen concerns to explore the implications how of a low gas demand scenario would affect the perceived need for increased gas capacity. While we commend the administration for undertaking this study, we find the parameters under which it was set to have seriously compromised the results.

What answer you receive is always dependent on what question you ask. Therefore, how the DOER framed Synapse's low gas demand analysis ensured an outcome that only perpetuates existing cycles of over-reliance on gas and climate change. In line with the caveats mentioned in the study, we see several key framing limitations that yielded Synapse's results.

Key Frame Limitations:

1. GWSA Non-Compliance
   - For the Global Warming Solutions Act to fulfill its original design and purpose, it must be taken into consideration up front, as criteria to evaluate the viability of projects. Waiting until the end to apply the criteria led to non-compliance across every scenario, keeping us from meeting the GWSA targets without relying on more expensive reductions in other sectors.
   - The Global Warming Solutions Act was enacted as law. To model scenarios without mandating GWSA compliance is enabling breaking the law. To do so knowingly, blatantly disregards one of the few climate safeguards we have.

2. What Impacts Gas Prices
   - The study shows a significant difference in the outcomes of high-price or low-price scenarios but has left out key factors in what causes gas prices to rise or fall.
   - Omitting the potential for the incoming gas to be exported through existing and proposed LNG terminals in the region is a major oversight given this likely possibility would substantially increase gas prices by bringing them closer to more expensive foreign markets.
   - While constrained supply was addressed, our dependency on gas was not. Gas prices are high in part because we are so reliant on gas for heating and the electric sector. Diversifying our electricity grid was not adequately considered as a means of protecting us from future gas price volatility.
   - Additional gas pipelines may therefore *increase* the price of gas, causing the biggest costs to consumers. Because the study did not look at gas price inputs, only outputs, it has missed the opportunity to have a real understanding of what would be most cost-effective for Massachusetts ratepayers.

3. Who Pays, Who Benefits?
   - There was no distinction made between costs to consumers and costs to corporations thereby prioritizing corporate profits at the expense of ratepayers.
   - Energy companies make profit off of large, centralized fossil fuel projects but it is the public who pays the externalized costs of spills, falling property values, health effects, and climate change - to name a few.
   - Decentralized municipal or community-owned renewable energy projects would bring economic development to the Commonwealth and keep the profits public while protecting a livable future for generations to come. However, without making such a distinction, publically favorable solutions are lost.

4. Price vs. Values
   - While important to be mindful of consumer costs, setting an economic threshold that leaves out our ability to employ renewable energy / alternative economic solutions is a commitment to short-sided investments that will be more costly for consumers in the long term through over-dependence on gas and climate catastrophe.
   - If we want our energy system to match our values, we must lead with principles, not price alone.
   - Better mechanisms to protect vulnerable ratepayers such as consumer programs would be a more welcome avenue for exploring cost issues than simply discounting renewable energy options.

5. Undervaluing Alternative Energy Solutions
   - Energy efficiency was undervalued even though further gains could be made in this area. ISO-New England projected in their last report that demand could flat-line if energy efficiency was fully utilized.
   - Storage technologies, offshore wind, solar and other energy alternatives were also undervalued or dismissed in the study, despite Cape Wind being set to bring over 400MW of online by 2016 with new projects on the horizon.

- Additionally, the study models' use ISO-NE projections, which have been criticized for undercounting current distributed renewable energy generation, particularly solar, and projected utility-scale projects that will come online in the coming years.

6. Planning for the Worst Case Without Planning for its Likelihood
    - The sample winter peak hour was artificially constructed without modeling its likelihood of occurring.
    - To base the entire study and therefore our energy future in MA on an unknown, rare occurrence commits us to energy infrastructure that will be vastly oversupplied the majority of the time, making it literally overkill.
    - Not modeling solutions based on real need puts solutions dramatically out of scale with the perceived problem.
    - If we addressed climate change with this same urgency by assuming the worst-case scenario instead of arguing about its likelihood, we would already be on our way to a renewable energy economy. Such favoritism to the gas industry only illuminates why we are still so dependent on it.

The study has asked the question backwards. We need to ask what kind of energy system do we, the people of Massachusetts, want and how do we get there? Not, what is the most profitable way for energy corporations to sell us more gas. By confining the study frame within the existing paradigm of relying on "cheap" gas to meet our energy needs, it guarantees the study will perpetuate that paradigm, at the expense of the Massachusetts' residents.

Additional Problematic Assumptions:

- Massachusetts' energy system acts at a regional level but the study limited energy generation to Massachusetts only, except for the added scenarios potential transmission from Canada.
- Utilization of pipelines was assumed to be 80%, which is unrealistic given previous utilization of pipes and potential for over capacity during non-peak hours driving vendors to find other outlets abroad.
- Without accounting for a full life-cycle analysis of methane emissions and hydraulic fracturing, the full effects of gas infrastructure are greatly under appreciated, with costs to our water supply, climate and health care system being completely disregarded.
- The use of existing gas infrastructure as potential solutions such as LNG storage and additional tankers were excluded.
- The proposed Footprint Salem Harbor Gas Plant was an assumed source of gas demand despite this projects' rocky footing based on ongoing legal appeals, lack of financing and failure to meet ISO deadlines for operation. To include this gas plant while leaving out Cape Wind, which is set to come online in 2016 (the deadline Footprint missed) demonstrates a clear political bias towards fossil fuels over renewable energy.

When taken in combination, these caveats, false assumptions and backwards framing make the study's results problematic out of context. Therefore, such limitations must be acknowledged at the front of the published study. We appreciate some of these oversights may be the result of limiting time constraints. However, it is these same oversights and rushed planning that are happening at a systemic level and driving our climate off the cliff.

Massachusetts prides itself on its climate and environmental record based on being 2nd in the country on energy efficiency and passing of the landmark Global Warming Solutions Act, but it has failed to live up to those mandates by choosing to ignore them.

Student groups helped pass the Global Warming Solutions Act in 2008 to protect those of us who will live to see a 2050 world. Disregarding that legislation disregards every young person who wishes to see a livable climate through old age. Based on the priorities of this administration as outlined in this study, younger generations have little to hope for. We have only a matter of years to transition to a renewable energy economy without massive casualties and our institutions are failing due to lack of leadership.

We hope to see the Department of Energy Resources take greater leadership in the future and protect the Global Warming Solutions Act by holding energy projects to its standards and implementing stringent 2030 and 2040 targets.

Sincerely,

Dorian Sosnick Williams
Energy Organizer, Better Future Project
20 Bow St. Cambridge MA
dorian@betterfutureproject.org

From: sandsdalby@verizon.net
To: Lowdemandstudy, (ENE)
Subject: Proposed Kinder Morgan Pipeline
Date: Tuesday, December 23, 2014 10:24:35 AM

Mark Sylvia
Undersecretary Energy
Office Energy and Environmental Affairs
Boston, Ma

Mr Sylvia,
My name is Spencer Dalby and my wife and I live on Damon Street in North Reading directly adjacent to the proposed Kinder Morgan gas pipeline. I believe DOER company has submitted for your review a natural gas study and it states "this scenario requires a pipeline". I also believe that just about anyone can fund a study that will boolster their point of view. For decades the cigarette companies paid scientists and doctors to produce studies that concluded cigarettes were not harmful to your health. And why should the general public doubt such learned men? We are now aware of the impared life and mortal effects.
I firmly believe Kinder Morgan is attempting to 'create' a need and demand for their product in order to increase bottom line profits. The Consumer Advisory Group of ISO New England had a meeting on Dec 4th and we learned the Portland Natural Gas has approval from Canada's National Energy Board to obtain an additional 200 million cubic feet per day of natural gas into Dracut. (www.nescoe.com letter May 30 2014) Also, the Iroquois Gas Transmission System told NESCOE that an additional 350 million cubic feet of natural gas was available into New England on its major pipeline. All of this can be achieved using existing pipelines already in place without disrupting the environment and the lives of thousands.
One of the prime objectives of your office is to promote energy efficiency. Construction of a major pipeline when existing facilites are already in place is contrary to that objective. We are praying that common sense will prevail and you will not approve or accept a report funded by one gas company for its own benefit that will cause significant harm to the environment and its inhabitants.

The consultant Synapse report is biased and slanted toward the viewpoint of those who paid for it. This report should be corrected and only

accepted within that framework. Thank you for your help and consideration in this matter.

Spencer & Susan Dalby
15 Damon Street
North Reading, Ma 01864

From:	Lowdemandstudy, (ENE)
To:	Aminpour, Farhad (ENE)
Subject:	FW: NESCOE Comments on Low Demand Study Dec 18 Presentation
Date:	Tuesday, January 06, 2015 4:20:00 PM
Attachments:	NESCOEComments_23Dec2014.pdf ATT00001.htm

From: Ben D'Antonio [mailto:bendantonio@nescoe.com]
Sent: Tuesday, December 23, 2014 3:08 PM
To: Lowdemandstudy, (ENE)
Cc: Ben D'Antonio; Heather Hunt
Subject: NESCOE Comments on Low Demand Study Dec 18 Presentation

Good Afternoon,

Please find attached the New England States Committee on Electricity's comments on the December 18 stakeholder presentation. If you have any questions regarding the attached, please feel free to contact me.

Thanks,
Ben

New England States
Committee on Electricity

To: **Massachusetts DOER & Synapse Energy Economics, Inc.**
From: **NESCOE**
Date: **December 23, 2014**
Subject: **Comments on December 18 Low Demand Analysis presentation**

NESCOE appreciates the opportunity to provide comments in connection with the Low Demand Analysis (the Study) modeling results discussed at the December 18, 2014 stakeholder session. In this context, NESCOE's views do not reflect the views of officials from the Commonwealth of Massachusetts.

NESCOE appreciates that DOER considered stakeholder comments and took additional time to complete the modeling and verify the accuracy of the results. Notably, the revised marginal heat rate assumption, which the Study uses to estimate potential gas demand reduction associated with electric sector alternative measures, is reasonable. NESCOE appreciates the Study's caveats. They are comprehensive, clearly presented, and provide important context as stakeholders consider the results alongside the results of the many other studies on New England's natural gas needs.

Primary Observation: the Study Confirms the Need for Additional Infrastructure

According to the Study's statement of work, the "goal of DOER's study is to determine, given updated supply and demand assumptions, whether or not new infrastructure is required, and if so, how to optimize for environmental, reliability, and cost considerations."[1] The Study achieved this goal. Under all eight scenarios Massachusetts studied, Massachusetts-based electric sector natural gas demand exceeded the capability of existing infrastructure.

In order to balance supply and demand for natural gas in Massachusetts in 2020, the Study showed hypothetical natural gas "pipeline additions [that] range from 25 billion Btu per peak hour to 33 billion Btu per peak hour (0.6 Bcf per day to 0.8 Bcf per day)."[2] This primary Study result - the need for additional natural gas pipeline to satisfy Massachusetts' energy needs - includes the effects of 1) Massachusetts building two hypothetical additional transmission lines filled with imported hydro energy plus 2) Massachusetts implements *all* of the alternative

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[1] DOER Request for Response, Consulting Services for Low Demand Scenario (September 5, 2014), at Statement of Work requirements on page 5.

[2] Massachusetts Low Demand Analysis, Third Stakeholder Meeting Presentation (updated on December 19) ("December 18 Presentation") at slide 28, available at http://synapse-energy.com/project/massachusetts-low-demand-analysis .

resources deemed technically and economically feasible and practically achievable. Thus, the Study, even using these very conservative assumptions about hypothetical investments, confirms the need for additional infrastructure.[3] The Study's findings are directionally consistent with myriad other studies that evaluated natural gas demand in New England.

Moreover, the Study indicates that alternative resources that will continue to be important to the region's power system, cannot, on their own, fully address Massachusetts-based electric sector demand for gas.

Based on information provided on December 19, 2014 in the supply curve analysis workbooks, the table below shows the estimated peak hour gas savings associated with both: (1) just the economically feasible alternative resources and (2) all alternative resources.

Year	Alternative Resources	Peak Hour Gas Savings (MMBtu / hour)	Peak Day Gas Savings (Bcf / day)
2015	Economically Feasible	27	0.001
	All Alternatives	54	0.001
2020	Economically Feasible	2,963	0.07
	All Alternatives	7,493	0.18
2030	Economically Feasible	6,394 – 12,105	0.15 – 0.29
	All Alternatives	26,590	0.65

Compared with the pipeline amounts that the Study added to balance supply and demand mentioned above, which range from 0.6 to 0.9 Bcf /d in 2030, the alternative resources, even including the resources the Study assumed would not be economically feasible, does not eliminate Massachusetts-based electric sector resources' need for additional infrastructure.[4]

Secondary Observation: the Study Provides Useful Information on Alternative Resources

The Study results presented on December 18, 2014 are directionally consistent with the analytical work others have undertaken on the subject. Similar to the findings of ICF International, Black & Veatch, and Levitan & Associates, the Study finds that when compared to the significant and growing electric sector demand for natural gas, gas infrastructure and available supply are inadequate during the winter season.

While not endorsing all of the assumptions in the economic analysis, the Study may provide useful information about the technically and economically feasible and practically achievable alternative resources available in the immediate, near-term, and long-term timeframes. The

[3] For example, the Study "assumes LNG availability from Distrigas for import in the peak hour." December 18 Presentation at slide 66. In contrast, the November 2014 Federal Energy Regulatory Commission Office of Enforcement Energy Market Snapshot for the East Region, at 32, indicates that daily LNG sendout from this same facility have been much lower than its maximum capability, the amount assumed available in the balancing analysis.

[4] Much of the scalable alternative resource gas savings potential, especially in 2030, comes from offshore wind. However, the Study found this resource not to be feasible. For example, offshore wind, estimated to have a *net* levelized cost of $117 / MWh (or approximately $984 / MMBtu) in 2020 is more expensive than other balancing measures like pipeline investments at a *gross* levelized cost of $ 4 – 4.48 / MMBtu.

Study also provides electric sector costs and emissions-related information that may be useful in considering emissions reduction targets. With these qualifications, in addition to the imported-hydro scenarios, the Study identifies relatively lower cost alternative resources capable of displacing significant amounts of gas demand. As the New England states have a strong interest in maximizing resources such as energy efficiency and have, in broad terms, common interest in increasing the relative amount of no- and/or low-carbon resources in the region's generation mix, information about alternative resources and their relative economic feasibility is useful.

From: Lowdemandstudy, (ENE)
To: Aminpour, Farhad (ENE)
Subject: FW: Low Demand Study, Gas Pipeline Infrastructure, KInder Morgan Track Record
Date: Monday, December 29, 2014 1:13:58 PM
Attachments: MA DOER Low Demand Study Commentary Dec 22"14.doc
350MA Letter to 1Berkshire_FINAL.docx

This too

From: Arnold Piacentini [mailto:symptrad@nycap.rr.com]
Sent: Thursday, December 25, 2014 12:56 PM
To: Lowdemandstudy, (ENE); Lusardi, Meg (ENE); VallelyBartlett, Maeve (EEA); Elizabeth_Warren@warren.senate.gov; Sylvia, Mark (ENV); stan.rosenberg@masenate.gov; natalie.blais@mail.house.gov; info@charliebaker2014.com; deborah@maurahealey.com
Cc: benjamin.downing@masenate.gov; james.eldridge@masenate.gov; leonard.mirra@mahouse.gov; 'Stephen - Rep. (HOU) Kulik'; james.lyons@mahouse.gov; gailanne.cariddi@mahouse.gov; rep.pignatelli@mahouse.gov; marc.pacheco@masenate.gov; gale.candaras@masenate.gov; ken.gordon@mahouse.gov; wayne.matewsky@mahouse.gov; denise.provost@mahouse.gov; marc.lombardo@mahouse.gov; mike.rush@masenate.gov; brian.joyce@masenate.gov; chris.walsh@mahouse.gov; frank.smizik@mahouse.gov; james.miceli@mahouse.gov; evandro.carvalho@mahouse.gov; jeff.roy@mahouse.gov; joseph.wagner@mahouse.gov; richard.ross@masenate.gov; tricia.farley-bouvier@mahouse.gov; thomas.mcgee@masenate.gov; robert.hedlund@masenate.gov; carole.fiola@mahouse.gov; robert.koczera@mahouse.gov; stephen.dinatale@mahouse.gov; claire.cronin@mahouse.gov; marcos.devers@mahouse.gov; danielle.gregoire@mahouse.gov; aaron.vega@mahouse.gov; kevin.kuros@mahouse.gov; thomas.calter@mahouse.gov; daniel.donahue@mahouse.gov; susan.gifford@mahouse.gov; mark.cusack@mahouse.gov; donald.humason@masenate.gov; john.rogers@mahouse.gov; walter.timilty@mahouse.gov; john.mahoney@mahouse.gov; jennifer.benson@mahouse.gov; randy.hunt@mahouse.gov; thomas.golden@mahouse.gov; tackey.chan@mahouse.gov
Subject: Low Demand Study, Gas Pipeline Infrastructure, KInder Morgan Track Record

To: The Addressees:

Attached please find the response and comments made by Arnold Piacentini on behalf of himself, 350MA-Berkshire Node and other signatories to the results of the Low Demand Study that was presented to Stakeholders on December 18, 2014 in Boston. Additional signatories are anticipated.

Also attached is a letter written by Judy Eddy & Arnold Piacentini on behalf of the 350MA-Berkshire Node to the 1Berkshire Strategic Alliance. This letter gives additional and pertinent information on the destructive nature of enormous gas pipeline infrastructures, as well as on Kinder Morgan's track record.

Thank you for your attention to this most important matter.

Arnold Piacentini

413-698-2057

Arnold Piacentini
♦ ♦ ♦
PO Box 454 ♦ Richmond, MA 01254
Tel 413-698-2057 ♦ Email arnoldpiacentini@gmail.com

December 22, 2014

To: lowdemandstudy@state.ma.us

Re: Stakeholder Meeting & Report December 18, 2014 at Atlantic Wharf

OVERVIEW SUMMARY

The undersigned conclude that the referenced report is not a study, but that it is a political statement. It is a betrayal to all stakeholders with the exception of the electric and gas utility companies, the gas pipeline companies and the gas industry lobbyists.

CONCLUSION AND RECOMMENDATION

The undersigned conclude that the study is ridden with flaws, false assumptions, errors and omissions. That, it was designed to give an outcome consistent with the supply-push scenario for fracked gas, i.e. to justify additional pipeline infrastructure. The undersigned recommends in the strongest terms possible that the so-called "study results" not be released on December 23, 2014, as presently intended.

MAIN FLAWS

The fracked gas model determines the relative economic attractiveness of the various sources of energy. This model is fatally flawed. It has omitted very significant costs of using toxic radioactive fracked gas (1, 4). There is a total lack of social cost considerations. These are the costs that are transferred to society for the environmental and environmental public health consequences, e.g. increased health impacts and the health care and lost wages costs tied to them; the loss of an average 10-30% of property value (according to Forensics Appraisal Group) of impacted properties, and the loss of tax income from that; the loss of tourist dollars to impacted recreational and scenic properties, etc.

These losses may be hard to forecast, but these impacts are very real. Areas of industrial development see all those costs, and to the areas in MA where this is being proposed, tourism, agriculture and conservation are the basis of much of the economy. It would decimate the economic basis of the whole region.

- **By understating the real cost of fracked gas transmission and distribution results are biased from the outset towards the use of more fracked gas, correspondingly reducing the incentives to build renewables' infrastructure.**

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The fracked gas model does not recognize the very large emissions of fracked gas to the atmosphere (1). The fracked gas model does not recognize the much higher global warming power of methane in comparison to carbon dioxide. By these omissions results are biased from the outset to overstate the degree of compliance with the GWSA (Global Warming Solutions Act) (2).

The fracked gas model assumes that a fracked gas pipeline can be built in increments of inches of diameter. This flies in the face of reality, as the pipeline companies will build a much larger diameter pipe, thus increasing the real cost of the use of fracked gas (3).

- **The inclusion of the Spectra AIM (Algonquin Incremental Market Expansion) project in the base case and throughout is totally inappropriate. This project has not been permitted by FERC and the grassroots opposition to this project is fierce in New York, Rhode Island, Connecticut and Massachusetts (4). The ultimate disposition of this project is problematical. Further, and troublesome is that it understates the amount of energy to be supplied in all cases via alternative means.**

- **The export of fracked gas that could be transmitted to the Maritimes should some of the proposed pipelines be built has been omitted (3). There are several consequences by such omissions.**

  The actual size of the pipelines and associated infrastructure is much larger than that needed by MA, which realistically is zero additional pipeline capacity. Thus, the cost of the environmental and environmental public health consequences and destruction of property values is incurred by MA stakeholders while any export profits are accrued to the pipeline and gas industry companies.

  The export of fracked gas would result in higher netbacks to the gas companies. They would demand domestic markets to pay this higher price. In addition, exports tighten the supply-demand balance. So, while claiming to the utility companies that pipelines, through some perverse logic, would decrease fracked gas price, in fact the reverse would occur. Even ISO New England concurs with this.

  Higher transmission of fracked gas through MA for export significantly increases the emissions of fracked gas to the atmosphere. This further reduces the actual compliance with the GWSA.

- **There is no consideration of who would pay for these gargantuan fracked gas pipelines. Recall that NESCOE has recommended that these costs be paid by an already over-burdened consumer through a "tariff". This proposal has been tabled, not withdrawn. It is not clear at all for how many of the four fracked gas pipelines currently being proposed and what fraction, thereof, that this inane proposal by NESCOE will be applied. Governor Patrick has not stated categorically that he does not support this proposal nor that he opposes these pipeline proposals.**

- **There is no recognition of the reality facing the fracked gas mania which clearly casts doubt on the reliability of such a source. Public opposition is growing exponentially as the environmental and environmental public health consequences are recognized. Communities and states are starting to legally ban the practice, prominently the NY announcement on December 17th. Citizens are being given the right to deny fracking on their property.**

  And, the costs of fracking are increasing, as the life of wells decreases. The credit worthiness of pipeline companies and smaller fracking companies is clearly at risk. Lenders and bond holders are becoming skittish as they see Athabasca tar-sands and certain Bakken and other shale-oil wells go into the red with the decrease in crude oil prices.

- **The lack of compliance with GWSA would increase the cost of (i) the consequences of even further future damage from climate change, and (ii) the need to make even greater investments to get back into compliance. These costs have not been reflected in the study.**

- **The actual demand in the "Low Demand" scenario was not updated to reflect current projections, including by ISO New England that MA demand is likely to continue to decrease due to continual energy efficiency (5). Nor was the legislation to fix gas leaks reflected.**

- **To further increase the bias towards the use of more fracked gas the study was based on meeting a "peak demand" that was far greater than the actual experience over recent years. During the past 3 years, actual peak demand has occurred for between 10 and 28 days per year, 4 hours per day (6, 7).**

- **To additionally increase the bias towards the use of fracked gas the study did not use all of the existing LNG import, storage and distribution capacity. LNG suppliers have indicated their ability and willingness to satisfy these peak demands (7). Should there be potential bottlenecks in some parts of the distribution systems, these can and should be removed. Any such bottlenecks are no reason to build gargantuan transmission pipelines.**

- **The study did not include the likelihood of investments in renewables such as offshore wind and investments in transmission from Maine to carry wind backed by hydro from Labrador which would be more cost effective than using the Quebec power system (8). The latter, nevertheless, is a viable alternative to buy time to build the renewables infrastructure in MA.**

- **The study did not consider the major changes that have taken place due to the 50% decline in crude oil prices. Given that LNG prices are linked to same, the cost of the use of LNG to meet peak demands has been lowered. Also, the cost benefits of converting from heating oils to fracked gas according to the conventional method of calculating same has diminished. Thus, future fracked gas demand has been further lowered.**

- **The study has an incredible ethical and legal flaw in that it does not recognize the reality of global climate change. We the majority of stakeholders in MA expect better from our State and from the brain trust that it contains.**

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Instead of ignoring this reality, the study should have been oriented towards meeting or even exceeding the GWSA targets. The study looked back towards the dinosaurs instead of forward towards efficiency and renewables. A study by the Frontier Group shows that MA has the potential to meet 100% of its energy needs by a factor of 16! MA has the potential to become 100% reliant on renewables and to become an exporter of energy to the grid! The factor for New England is greater, primarily due to the vast potential in Maine. (9) Imagine the potential for commerce and clean ethical jobs.

One of the DOER representatives suggested that alternative energy was irrelevant because of its intermittency. The argument that the sun does not shine at 6:00 PM in the winter is specious and small-minded to omit solar. The wind blows, especially offshore, and there is great potential for further uses of and advances in storage.

FUTURE WORK NEEDED

As previously stated, the undersigned believe that this study is not at all ready to be issued. If Governor Patrick and Governor-Elect Baker are serious about serving the future needs of the majority of stakeholders in MA, then much more work is needed. The deficiencies enumerated herein and by others in the third stakeholder sub-group must be addressed.

The orientation must be changed towards a bias of meeting MA and indeed New England needs with no new fossil fuel infrastructure through the most economic means. The decrease in crude oil prices has bought us some valuable time. Let's not fritter it away haggling.

The undersigned do not believe that MA DOER, Synapse and Raab Associates are capable of doing this in isolation. This result demonstrates this conclusion. Instead, such deficiencies can only be repaired by including a critical mass of stakeholders in defining realistic bases and methodology for moving forward.

PERSONAL NOTE BY ARNOLD PIACENTINI

My parents, Boston Latin School, Tufts University, Lehigh University and Exxon Chemical Company have taught me not to make decisions on faulty bases.

The Undersigned support the foregoing commentary:

The Undersigned request that this commentary be included in the body of any report which may be issued, contrary to the recommendations contained herein.

Signed: *Arnold Piacentini*
Arnold Piacentini, PhD in ChE
350MA-Berkshires, Richmond

Signed: *Cheryl D. Rose*
Cheryl D. Rose, 350MA-Berkshires, Dalton

Signed: *Henry J. Rose*
Henry J. Rose, MD, 350MA-Berkshires, Dalton

Signed: *Judy Gitelson*
Judy Gitelson, 350MA-Berkshires, Pittsfield

Signed: *Judy Eddy*
Judy Eddy, 350MA-Berkshires, West Stockbridge

Signed: *Andrew Bloom*
Andrew Bloom, 350MA-Berkshires, West Stockbridge

Signed: *Bob & Marnie Meyers*
Bob & Marnie Meyers, 350MA-Berkshires, Windsor

Signed: *Patty Crane*
Patty Crane, 350MA-Berkshires, Windsor

Signed: *Kathy Kessler*
Kathy Kessler, 350MA-Berkshires, Great Barrington

Signed: *Michael Feldstein*
Michael Feldstein, 350MA-Berkshires, Great Barrington

Signed: *Stephanie Blumenthal*
Stephanie Blumenthal, 350MA-Berkshires, Sheffield

Signed: *June Stewart*
June Stewart, 350MA-Berkshires, Pittsfield

Signed: *Anne O'Connor*
Anne O'Connor, 350MA-berkshires, Williamstown

Signed: *Frank & Louise Farkas*
Frank & Louise Farkas, 350MA-Berkshires, Pittsfield

NOTE: After two postponements for unstated reasons, MA DOER scheduled the 3rd Stakeholder meeting just 4 days before their arbitrary deadline of 2:00 PM on December 22nd. Additional signatories are expected and will be subsequently transmitted.

Cc: Governor Deval Patrick
EEA Secretary Maeve Vallely-Bartlett
Undersecretary for Energy, Mark Silvia

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Acting Commissioner MA DOER, Meg Lusardi
Governor-Elect Charlie Baker
EEA Secretary-Elect Matthew Beaton
Attorney General- Elect Maura Healey
Deputy Chief, Assistant Attorney General, Sandra E. Merrick
Senator Elizabeth Warren; Senator Edward Markey
MA Senator Stanley Rosenberg; MA Senator Benjamin Downing
MA Representatives: William "Smitty" Pignatelli, Gail Cariddi, Paul Mark, Tricia Farley-Bouvier
US Representatives: Richard Neal; James McGovern
ISO-NE CEO, Gordon van Welie
NESCOE President, Ann Berwick
MA Legislative Committees: Global Warming and Climate Change; Joint Committees on Telecommunications, Utilities, and Energy and Economic Development and Emerging Technologies

EXPLANATORY AND REFERENCED NOTES:

(1) Judy Eddy and Arnold Piacentini Letter to 1Berkshire Strategic Alliance, 350MA-Berkshires, December 5, 2014

(2) A Bridge Too Far, The Climate Case Against Natural Gas in Massachusetts, Lead Author, Joshua Jackson et al, Better Futures Project, 350MA, June 2014

(3) Currently, 4 major fracked gas pipeline projects have been announced that would impact NY, MA and New England. These are, as follows:

- **Northeast Direct (NED) by Kinder Morgan, 30" to 36" diameter at 1,450 psi with a maximum design capacity of 2.2 billion cubic feet per day (bcf/day). This proposed project would extend from PA, through NY, MA, NH to Dracut, MA with the clear intention of linking to the Maritime Pipeline.**

  -An illegal segment off of this has been called the Connecticut Expansion Project which adds 3 loops in NY, MA and CT with added capacity of 0.07 bcf/day.

- **Algonquin Incremental Market Expansion (AIM) by Spectra which is replacing 24" diameter pipe with 42" diameter high pressure pipe and increasing compression capacity by 0.34 bcf/day in densely populated areas. This proposed project extends from PA, through NY, CT, RI to Boston. Additionally, it is highly controversial as it passes close-by the Indian Point Nuclear Plant, which in the base case has a myriad of other high risk situations.**

- **Atlantic Bridge by Spectra, owned by Maritimes and Northeast, appears to be an added expansion of Algonquin following much the same route with a design capacity of up to 0.6 bcf/day to Boston with the clear intention of connecting to the Maritime.**

- **Access Northeast, a proposed joint venture between Spectra and Northeast Utilities, not well defined at this time. Could just be incremental capacity for either/both AIM and Bridge.**

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The three proposed Spectra projects may well be a prima facie case of illegal segmentation.

(4) Stop the Algonquin Pipeline, www.sape2016.org.

(5) ISO New England Annual Power System Plan, Nov 6, 2014

(6) Verbal communication Bruce Winn, Berkshire Environmental Action Team with Distrigas, June 2014

(7) Francis J. Katulak, CEO GDF Suez Gas NA LLC to Heather Hunt, Executive Director, NESCOE, Feb 10, 2014

(8) Peter Shattuck, Acadia Center, Dec 18, 2014

(9) Clean Energy Potential in New England, Tony Dutzik, Frontier Group, www.frontiergroup.org, Nov 9, 2014

Additional Signatories, as of December 25, 2014

Signed: *Rosemary Wessel*
Rosemary Wessel, Founder-No Fracked Gas in MA, Cummington

Signed: *Marcia Powdermaker*
Marcia Powdermaker, 350MA-Berkshires, Tyringham

Signed: *Walter & Susan Cudnohufsy*
Walter & Susan Cudnohufsy, Hill Town Community Rights, Ashfield

Signed: *Adeline Ellis*
Adeline Ellis, Richmond Core Committee, Richmond

Signed: *Stu Besnoff*
Stu Besnoff, Alpine Solar Heat & Hot Water, Windsor

Signed: *Alvin Blake*
Alvin Blake, 350MA-Berkshires, Becket

Signed: *Clare Donohue*
Clare Donohue, Sane Energy, NY, NY

Signed: *Sam & Elizabeth Smith*
Sam & Elizabeth Smith, 350MA-Berkshires, Williamstown

Signed: *Shira Wohlberg*
Shira Wohlberg, 350MA-Berkshires, Williamstown

Addendum for Additional Signatories to December 22nd Letter to lowdemandstudy@state.ma.us:

Signed: *Terry Wise*
Terry Wise, 350MA-Berkshires, Stockbridge

Signed: *Richard & Nina Evans*
Richard & Nina Evans, 350MA-Berkshires, Great Barrington

December 5, 2014

Michael P. Daly, Vice Chair
Van Shields, Vice Chair
Peter Stasiowski, Vice Chair
1Berkshire Strategic Alliance Inc.
66 Allen Street
Pittsfield, MA 01201

Jonathan Butler, President and CEO
Central Berkshire Chamber of Commerce
66 Allen Street
Pittsfield, MA 01201

Laurie Klefos, President and CEO
Berkshire Visitors Bureau
66 Allen Street
Pittsfield, MA 01201

Julia Dixon, Managing Director
Berkshire Creative
66 Allen Street
Pittsfield, MA 01201

Dear 1Berkshire Leaders,

We are writing to express our concern over the fact that Kinder Morgan (KM) has been accepted as a partner in 1Berkshire and as a leadership investor. Kinder Morgan has established an office in Pittsfield for one reason: to enable them to establish a presence in the Berkshires for the purpose of building support for the dangerous, high-pressure, fracked gas pipeline they propose building through the Berkshires. This pipeline threatens not only the health and safety of Berkshire residents, but also the tourism industry which is dependent upon natural areas in the Berkshires, and upon which so many of our residents depend for their living.

Your stated mission is: "The work of 1Berkshire is retaining and attracting jobs, tourism and creativity for the benefit of everyone in the Berkshires." We understand that your focus and main priority is acting as an economic development engine here in the Berkshires. But we believe that economic development must not come at the cost of the priceless assets we hold dear here in the Berkshires, and which, in fact, feed that economic engine more than anything else: the first being the natural beauty of the area that draws tens of thousands of people from the cities and suburbs to the Berkshires to enjoy our fresh air, beautiful landscapes, unique farming communities, quaint villages, restful second homes and lodgings, and diverse cultural activities. One of the people featured in your introductory video says it well:

> "You come to a community like this and it just fills you with a sense of peace and a sense of tranquility." *1Berkshire - Free to Grow* video

The actual process of constructing and maintaining a large pipeline and it's associated infrastructure – let alone living with the threats presented by a pipeline that could lay within yards of one's home, business, or hiking trail – is about as far from peace and tranquility as you can get. But there are *many* reasons why 350MA-Berkshires is opposed to the pipelines proposed by Kinder Morgan/Tennessee Gas Pipeline that will negatively impact the Berkshires. And we are not alone: as of this date, 40 municipalities have passed resolutions to ban the pipeline.

The proposed Northeast Energy Direct and CT Expansion pipeline projects are designed to transport fracked gas at high pressure (1,450 psi) through conservation lands, wildlife reserves, state parks, farmland, towns and even crossing over or under the Connecticut River – as well as through our friends' and neighbors' personal property. The construction will cut a 150-foot swatch across the landscape, disturbing many sensitive landscapes and ecological areas, including Kennedy Park, Spectacle Pond in Sandisfield (a vernal pool, which is a breeding pool of forest-dwelling rare amphibians and invertebrates), October Mountain State Park, and the Richmond, Lenox, Pittsfield and other watersheds. It will then travel on its way across our great Commonwealth, crossing myriad private properties and Article 97 lands

that have been conserved by the Constitution of Massachusetts in perpetuity. This is not the type of corporation we wish to welcome to the Berkshires.

> "We've actually found that, with the kind of innovative knowledge worker that we're looking to attract, that they really value this kind of community and this kind of beauty…and they tend to come and they tend to stay for a lifetime." *1Berkshire - Free to Grow* video

350MA-Berkshires is the Berkshire County arm of 350MA, an all-volunteer climate action network working to turn the tide on fossil fuels by banning coal, fracking and tar sands, stopping the development of new fossil fuel infrastructure, expanding the use of renewables, and setting a price on carbon pollution. As such, we work to address existing and potential activities that will increase greenhouse gas emissions in the Berkshires. Protecting Berkshire County's natural assets and opposing the build-out of new fossil fuel infrastructure as a means of addressing climate change is of paramount importance to the 400+ members of 350MA-Berkshires.

According to the Massachusetts Office of Travel and Tourism, in 2012, $355 million in travel expenditures in the Berkshires supported $86 million in payroll, 3,390 jobs, $17 million in state tax receipts, and $10 million in local tax receipts.[1] The travel expenditures represent a 2.7% increase over 2011 and the highest level of expenditures in the past 5 years.

The beauty of this area is what draws people here to enjoy our fantastic restaurants, theater, dance, music, other cultural attractions, and rich variety of outdoor recreation opportunities.

> "If you love the things that make the Berkshires beautiful, then you need to love 1Berkshire, because it's job is to protect, and grow, and nourish, all these wonderful assets that we have."

Here at 350MA-Berkshires, our concern is for the same natural beauty and precious assets, human and environmental health, sense of safety and well being, and overall unique quality of life that you celebrate at 1Berkshire.

On the 1Berkshire Investors page, Kinder Morgan states, "In Massachusetts, Kinder Morgan operates 600 miles of the Tennessee Gas Pipeline natural gas system throughout eight counties, and has safely provided natural gas to the region for over 50 years."

In fact, Kinder Morgan's safety record is far from stellar, both in our region and elsewhere. Residents of Sandisfield experienced a terrifying incident in 1981 when a boulder dislodged by blasting ruptured an existing pipeline, leading to a major gas leak and evacuation of hundreds of residents. As one Sandisfield resident wrote in the April 2014 *Sandisfield Times*:

> "During blasting… a huge boulder flew into the air and landed on the operating first line, which was ruptured! At 760 PSI, a volcano of natural gas shot into the atmosphere. A crewmember told a reporter that if that gas had ignited, "it would have been like an atomic bomb."… Families in north Sandisfield, Tolland, and Otis were evacuated. We were told to run for our lives leaving behind everything, including farm animals. Later, probably in the 1990s, TGP approached us to ask permission to install a "cathodic protection unit"… We were told that this measure was necessary because errors in the installation of the initial pipeline caused frost-heaving rocks to rub against the pipe."

The pipelines proposed by KM will transport fracked gas at *1,450 psi*, and therefore ruptures and explosions of these high-pressure pipelines would result in accidents of significantly higher magnitude.

One would be naïve to expect an accident never to happen. However, leaks, ruptures or explosions are all scenarios that happen *regularly* on similar high-pressure pipelines throughout the country.[2] According to reports from the U.S. Dept. of Transportation's Pipelines and Hazardous Materials Safety Administration (PHMSA) compiled on Wikipedia's Kinder Morgan page[3], throughout the U.S. since 2003, Kinder Morgan and its subsidiaries' pipelines have been responsible for at least 180 spills, evacuations,

[1] 2012 Domestic Travel Impact on Massachusetts: Table A: Alphabetical by County, Preliminary 2012
[2] No Fracked Gas in Mass website: www.nofrackedgasinmass.org
[3] Kinder Morgan. http://en.wikipedia.org/wiki/Kinder_Morgan#cite_note-20. Retrieved December 1, 2014.

explosions, fires, and fatalities in 24 states.[4] The details of these events are horrific, and are certainly not scenarios we wish to see reenacted in the Berkshires.

In 2009, Kinder Morgan was cited by the PHMSA for violating safety standards regarding the distance between a natural gas pipeline and a "high consequence area" such as a school or hospital; the pipeline was too close for safe operation in case of a leak.[5]

In 2011, PHMSA cited Kinder Morgan for the following safety violations:

- Failing to maintain update maps showing pipeline locations,
- Failing to test pipeline safety devices,
- Failing to maintain proper firefighting equipment,
- Failing to inspect its pipelines as required, and
- Failing to adequately monitor pipes' corrosion levels.[6]

In 2013, the headline *"Wall Street Worries About Kinder Morgan's Safety Record: BC pipeline operator slashes and defers maintenance spending"* (referring to KM operations in British Columbia) was a concern to anyone who lived or worked near a Kinder Morgan pipeline.[7]

The Wall Street Journal asked, *"Is Kinder Morgan Scrimping on its Pipelines?"* after an investment analyst charged the company with starving its pipelines of routine maintenance spending in order to return more cash to investors.[8] Deferred maintenance may account for the high number of Kinder Morgan pipeline accidents in the last decade.

Close examination of PHMSA's incident reports for Kinder Morgan's onshore gas transmission pipelines shows that faulty infrastructure causes 45% of onshore gas transmission pipeline significant leaks. Failure of the pipe, a cracked weld, and faulty pipeline equipment together account for 28.3% of pipeline leaks, and corrosion of the pipe causes 16.8%.[9]

In addition to the types of incidents outlined above, the toxic gases contained in the fracked gas transported through the proposed pipeline would be continuously distributed over our landscape and into our population centers and homes in Pittsfield, North County and beyond all along the route into the Greater Boston area. Air, water, drinking water and food quality are all adversely affected. A serious environmental public health threat would be created.

There are many sources of emissions[10]. At compressor stations routine pipeline and compressor operations require "blow outs"; disruptions in operations actuate pressure relief valves; valves and gaskets weaken from corrosion and thermal stress. Pigging operations add to the emissions. Compressors are driven by burning the fracked gas, which results in a continuous emission of unburned methane, and the products of combustion, including carbon dioxide, carbon monoxide, sulfuric oxide, nitrous oxides and a mix of volatile organic compounds. A typical compressor station emits 46.2 tons of nitrous oxide per year[11]. Nitrous oxide and volatile organic compounds interact to produce ground-level ozone. Ozone can inhibit crop growth by up to 30%. The fracked gas being transported from Marcellus is not "your grandparents' natural gas"; in addition to containing trace amounts of dozens of fracking chemicals, it also contains radioactive Radon. Radon is precipitated as radioactive polonium and its progeny is lead.

The pipeline distribution systems in our population centers are old; for the most part they have been neglected and, hence, leak. Leaks, of course, spread the toxic chemicals and Radon, and lead to explosions. Explosions in urban areas are common. More insidious is that the fracked gas is introduced

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[4] PHMSA Pipeline Safety State Pages at http://primis.phmsa.dot.gov/comm/States.htm?nocache=3971.
[5] PHMSA letter to Richard Kinder, September 1, 2009, http://primis.phmsa.dot.gov/comm/reports/enforce/documents/520071008/520071008_FinalOrder_09012009_text.pdf.
[6] Pipeline and Hazardous Materials Safety Administration (PHMSA) letter to Hugh Harden, Kinder Morgan, Feb. 28, 2011, http://primis.phmsa.dot.gov/comm/reports/enforce/documents/520115005/520115005_NOPV%20PCO_02282011_text.pdf.
[7] Eric de Place, "Wall Street Worries About Kinder Morgan's Safety Record: BC pipeline operator slashes and defers maintenance spending", September 19, 2013, http://daily.sightline.org/2013/09/19/wall-street-worries-about-kinder-morgans-safety-record/.
[8] Tom Fowler and Ben Lefebvre, "Is Kinder Morgan Scrimping on its Pipelines?" Wall Street Journal, Sep 27, 2013, http://blogs.wsj.com/corporate-intelligence/2013/09/27/is-kinder-morgan-scrimping-on-its-pipelines-the-market-shrugs/.
[9] Leak data from http://primis.phmsa.dot.gov/comm/reports/safety/AllPSIDet_1994_2013_US.html?nocache=1724#_ngtranson
[10] More Than A Pipeline, It's a Toxic Industrial Infrastructure by Mina Hamilton, October, 2014
[11] FERC application for the Compressor Station at Reed, PA.

into the homes at the burner tip in the kitchen and/or the heater in the basement. Children, the infirm and the elderly are at high risk[12]. Public health in general is adversely affected.

There have been many media reports of electricity and natural gas rate increases projected for the upcoming winter. There are many myths inherent in these reports, and a great deal of misreporting. The fact is, the increase in electricity and natural gas rates is not directly tied to a lack of natural gas infrastructure, and in fact there are a great many alternatives to building a pipeline that would immediately address any spikes in demand that we may face this winter and in subsequent winters. We have developed a Fact Sheet on the subject, and it is attached.

While we employ viable alternatives to meet energy demands in the short-term that eliminate the need to build a new pipeline, we propose that we continue to build-out our renewable sources of energy. New England has the potential to supply all of its energy needs via renewable sources within a few short decades with currently available technology and at reasonable cost. Massachusetts could become an energy exporter to the national grid. The potential for commerce and clean, ethical jobs is huge.

Although we don't fully understand why Kinder Morgan apparently has the right to join and support 1Berkshire and the Berkshire Chamber of Commerce – since they are not so much "doing business" here in the Berkshires but using our land as the means to an end far from the Berkshires – we do understand that 1Berkshire will benefit from accepting their financial contributions and therefore will extend them the same membership privileges enjoyed by other members. **We firmly believe that this is wrong and that Kinder Morgan's membership should be revoked and their fees returned to them.**

We regret that this multibillion dollar company has come to the Berkshires, and we dread and oppose what they intend to do to our beautiful environs. By embracing Kinder Morgan and enabling them to become embedded in our community, 1Berkshire is supporting and legitimizing their agenda, and we know that their agenda will bring irreversible harm and degradation to the Berkshires in direct contradiction to your stated mission. And for this we deeply oppose in the strongest sense their membership in your organizations.

We appreciate your consideration of our position in this matter, and welcome your response. We invite 1Berkshire representatives to meet with us to further discuss these and other critical, related issues.

Thank you.

On behalf of 350MA-Berkshires / Pipeline and Fracking Opposition and Pro-Renewables Working Group:

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Cc: Governor Deval Patrick; Governor-Elect Charlie Baker; Mayor Daniel L. Bianchi, Pittsfield; U.S. Senator Elizabeth Warren; U.S. Senator Edward Markey; U.S. Congressman Richard E. Neal; MA Senator Ben Downing; MA Representative William "Smitty" Pignatelli; MA Representatives Gail Cariddi; MA Representative Paul Mark; MA Representatives Tricia Farley-Bouvier; Mayor Richard J. Alcombright, North Adams; Betsy Andrus, Executive Director, Southern Berkshire Chamber of Commerce; Steve Fogle, Berkshire Enterprises/Small Business; Pittsfield Kiwanis; Rotary Club of Pittsfield; Rotary Club of Great Barrington, Chambers of Commerce along the pipeline route and in the Greater Boston area.

[12] Ellen Weininger, "Fracking Impact Closing in on Connecticut. Spectra Algonquin Project in Development", January 2014. Grassroots Environmental Education. http://www.enaturalawakenings.com/FAIR/January-2014/Fracking-Impact-Closing-in-on-Connecticut/

Is this what we want for the Berkshires?

Swath cut through wetlands in Wawayanda State Park in northern New Jersey during the "300 Line Project" pipeline built by Kinder Morgan/ Tennessee Gas Pipeline Co.

Compressor Stations will be required for proposed Northeast Energy Direct pipeline:

- 10 ft. diameter exhaust fans that run 24/7 along with substantial lighting at night;
- Noise levels usually range from 50-90 decibels;
- See discussion above regarding continuous emissions of toxic chemicals.

Sparkling new compressors stations look innocent enough…

The toxic reality: Methane, volatile organic chemical (VOC) emissions as seen through an infrared camera — invisible to the naked eye.

Samples of toxic substances leaking into a wetland disturbed by pipeline route in Wawayanda State Park in northern New Jersey tested positive for petroleum hydrocarbons ("TPH") and volatile organic compounds ("VOCS") (toluene).

From ***Sustainable Berkshires*** Vision Statements:

Conservation & Recreation Vision

The Berkshires offer a connected system of open lands to support diverse habitat and recreational needs. Residents and visitors have, at the ready, a number of guides to what the region has to offer in the activity of their choice. Schools and businesses are able to benefit from the outdoors through equipping and facilitating tours and outings. This supports stewardship and active lifestyles now and in the future. An overarching ethic of natural resource conservation is embraced by the region, which understands and appreciates the many important values represented in the natural landscape. Conservation and development activities work to retain the integrity of the most critically important areas to biodiversity, recreation, and scenery. This is reflected in activities and practices not only in the rural areas, but also in how nature is incorporated and protected within a highly developed context, such as neighborhoods and downtowns, to ensure accessibility and stewardship are present in some way in all areas, not just parks and reserves.

Land Use Vision

Berkshire County residents, businesses, cultural institutions and municipalities enjoy and actively work to maintain the rich landscapes and settlement forms of the county. The distinction between the rural and urbanized areas is maintained and reinforced. Rural towns maintain large blocks of undeveloped areas for resource and tourist-based economic development and environmental enhancement. Villages and town centers remain vibrant activity centers where residents and visitors meet basic needs and enjoy strong social engagement. Town centers and the region's cities are activity hubs offering a robust blend of economic and social opportunities that serve existing residents and businesses and attract new ones to the region. Investments made previously to the built environment are maintained and expanded through an extensive program of targeted reinvestment and revitalization. The region's leaders work together to develop, coordinate and implement methods to attract new development to the region which capitalizes on and enhances the region's aesthetic attributes, maintains important natural resources while allowing economic growth.

Historic Preservation Vision

Berkshire County residents, businesses, municipalities, and preservationists enjoy and actively work to protect the rich history of the region – its iconic landmarks, historic buildings, and heritage landscapes. Vibrant Main Street districts with active village greens are bordered by walkable historic neighborhoods with mature street trees. Rural landscapes uphold the heritage of the region, its agriculture, westward expansion links, and Native American beginnings. New balances with old in compelling ways as historic buildings take on different uses and existing neighborhoods add green features and new buildings while upholding the integrity, character, and aesthetics of the built environment. History is embedded in the pride, recreation, education, economy, and daily activities of the region and its people in tangible ways that are ever-evolving.