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March 19, 2014

Chairman John D. Keenan
Joint Committee on Telecommunications, Utilities and Energy
State House, Room 473B
Boston, MA 02133

Chairman Benjamin B. Downing
Joint Committee on Telecommunications, Utilities and Energy
State House, Room 413F
Boston, MA 02133

Re: S.2019 and H.3901, An Act relative to credit for thermal energy generated with renewable fuels

Dear Chairman Downing, Chairman Keenan, and Honorable Members of the Committee.

Thank you for the opportunity to provide our comments on S.2019 and H.3901, An Act relative to credit for thermal energy generated with renewable fuels. The Sierra Club fully supports S.2019 and H.3901.

The Sierra Club is the oldest and largest non-profit and non-partisan environmental organization in the country, with a national membership of 1.4 million. Its Massachusetts chapter has over 22,000 members throughout the state and a history of protecting the environment that spans more than forty years. We work to create healthy, vibrant communities through support of lower cost and cleaner energy, clean air and water; recycling and waste-elimination; and the preservation of the Commonwealth's most treasured forests, parks and open spaces.

The Sierra Club's testimony at the hearing had three principal thrusts for which we want to provide you important source information. Our other concerns and points were raised by others and will not be repeated here.

1. Solar is a hedge against overdependence on natural gas and the inevitable increase in cost of that energy source.
2. Grid design must take into account renewables such as solar and the growing distributed energy systems.
3. Solar is one way to stem the increased use of natural gas and methane leakage into our atmosphere.

Solar as a hedge:

Every kilowatt hour we generate with solar means that we do not have to use natural gas to generate that kilowatt hour. So Solar is a hedge against expanding our dependence on natural gas that is accelerating to 65%. That disturbing trend is well documented. Right now Massachusetts relies on natural gas for about 55% of its energy needs and that is projected to rise to 65% in a few years. That is simply too high a number.

Solar is a hedge against the inevitable increased cost of natural gas, which we have seen the price go from \$2, to \$4 and most recently to \$6 per mBTU. When we start to export into the global Liquid Natural Gas – LNG - market, we will be competing with gas prices of \$14 to \$20 per mBTU for 65% of our energy. When that gas pipeline splits into two branches, one to the LNG export terminal and one to Massachusetts, the branch to Massachusetts will be “the road not taken” at \$4 to \$6 per mBTU.

Even without the advent of exporting LNG from the United States, the price of gas is volatile and always will be, even in areas that have abundant gas, for reasons out of our control. See <http://www.eia.gov/forecasts/steo/uncertainty/> *Released: January 7, 2014* 1 and **Short-Term Energy Outlook - Natural Gas Section** *Released: January 7, 2014* Short-term forecasts of natural gas supply, demand, and price projections. 2

Massachusetts is at the end of every fossil fuel pipeline, barge, tank truck route, and tank car line. Every dollar we spend on fossil fuel is exported out of state; the money does not stay here. Clean energy investments in solar are investments at home, with local jobs and local technology development.

Each dollar increase in natural gas cost for us in Massachusetts is now a 20 to 25% increase in the energy costs for those businesses and home owners who depend on natural gas, which will be 65 % of our energy supply. Solar energy’s cost is fixed as a capital cost amortized over an expected life of the system of least 20 years. A fixed price of energy over the long term permits good and effective business planning. Normal payback periods are 5 to 7 years.

The grid must be designed to accommodate solar and other renewables:

Grid design must take into account the inevitable growth in the role of renewables and distributed energy sources. The more that last mile of electricity distribution is assumed by distributed energy sources, the lower the line loss and the more efficient the use of transmitted electricity.

Solar stems the growth in greenhouse gases

Solar power generation does not contribute to greenhouse gases. In contrast, up to 25% of each additional cubic foot of natural gas (essentially methane) that we use leaks into the atmosphere somewhere between wellhead and combustion chamber.

Natural gas distribution system leakage (from well head to combustion chamber) has been measured at anywhere between 7% to 25% of gas transmitted. See “In a Utah gas field, potent quantities of a greenhouse gas rise into the atmosphere – study” *Scientific American*, Stephanie Paige Ogburn and *Climate Wire*, August 7, 2013, showing leakage at 6.2% to 11.7% of production. “Into Thin Air: Natural Gas Leaks in Massachusetts”, estimates gas leakage from distribution systems in Massachusetts contributes about 4% to the state’s total greenhouse gas inventory.³ The Markey report has Massachusetts utility leakage figures (see pp. 5 and 24) and national system figures (see p. 6).⁴ See also Washington, D.C. leak

study.⁵ Also see “Is natural gas more climate-friendly? Researchers map thousands of leaks in Washington, D.C.” Scientific American, by [Stephanie Paige Ogburn](#) and [ClimateWire](#).⁶ The details of the greenhouse gas effect of natural gas, which is essentially methane, are important to understand. ⁷ According to even an outdated study by the Environmental Protection Agency. “Overview of Green House Gases,” one molecule of methane is at least as potent as 21 molecules of carbon dioxide.⁸ More recent reputable scientific studies estimate that global warming potential as at least 70 times greater than carbon dioxide.⁹ “Methane leaks could undo the climate change benefits of America’s natural gas boom, [a new report](#) said on Tuesday.”¹⁰ Another way to look at gas leaks is to recognize that we use a lot of our land for dumps to store our visible waste. We need to stop letting the gas industry use our atmosphere cost free as a dump for the profligate leakage of natural gas.

So increased solar is a hedge against increased greenhouse gases also.

The Sierra Club fully supports S.2019 and H.3901 and hopes that this bill receives a favorable review by the committee and the state legislature as a whole.¹¹ We strongly believe that it would have a significant positive impacts on the Commonwealth’s economy by continuing to stimulate job creation and technological innovation in support of cleaner energy and by keeping our dollars here rather than exporting them to buy fossil fuels and on the health of Massachusetts’s residents by stemming greenhouse gas production, and by fixing the cost of energy for those who adopt solar.

Respectfully,



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¹ <http://www.eia.gov/forecasts/steo/report/natgas.cfm>

² <http://www.eia.gov/forecasts/steo/report/natgas.cfm>

³ Published through CLF website. http://www.clf.org/static/natural-gas-leaks/WhitePaper_Final_lowres.pdf

⁴ <http://www.clf.org/wp-content/uploads/2013/08/Markey-Gas-Leaks-Report-2.pdf>

⁵ <http://www.usatoday.com/story/news/nation/2014/01/16/washington-dc-gas-pipeline-leaks/4497083/>

⁶ <http://www.scientificamerican.com/article.cfm?id=is-natural-gas-more-climate-friendly-washington-dc>

⁷ Natural gas is primarily methane and chemically is referred to as CH₄. Carbon dioxide is a heavier molecule and is chemically CO₂.

⁸ <http://epa.gov/climatechange/ghgemissions/gases/ch4.html>

⁹ <http://thinkprogress.org/climate/2013/09/19/2646881/study-fracked-wells-methane-emissions-super-emitters/> and <http://online.wsj.com/public/resources/documents/pnas20130916.pdf>

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¹¹ The benefits to Massachusetts of these bills fall within the scope of benefits to the Commonwealth envisaged by H.2935, An Act to Transition to a Clean Energy Commonwealth, which is also before your Committee.