December 14, 2012

Debra Morrell
DEEP
Bureau of Energy and Technology Policy
Ten Franklin Square
New Britain, CT 06051.
Via e-mail to debra.morrell@ct.gov

Comments Re: Draft Comprehensive Energy Strategy for the State of Connecticut – resiliency of the electric distribution grid

We write on behalf of the Garden Club of New Haven (GCNH)[1] and the New Haven Urban Resources Initiative (URI) [2] out of concern that the Comprehensive Energy Strategy (CES) does not set forth a long range plan for placing electric distribution wires underground to the maximum extent possible in order to achieve maximum electric power reliability. With a stated planning horizon out to 2050, the CES should provide for gradual conversion of overhead wires to underground wires where geographically feasible and in order of cost effective impact on power reliability. Conversion of the primarily overhead electric distribution system to a primarily underground system would increasingly reduce and eventually eliminate the large economic losses to businesses and residents of the state caused by power outages from major storms, as well as the disruptive impacts on daily life and health. It would also protect the roadside forest, which provides significant environmental, social, health and economic benefits, by making potentially harmful and unattractive pruning of healthy trees unnecessary and allowing a wider range of tree species to grow along the roads.

The draft CES states, at p. 98:

> DEEP has explored this issue, and concluded that while undergrounding would make sense in some circumstances, it cannot be adopted as a statewide policy because such a commitment would entail an expense that would not be justified by the benefits that would accrue. The cost of putting power lines underground averages about $11 million/mile. Depending on how

[1] Promoting the preservation of natural resources is one of the primary missions of the Garden Club of New Haven ("GCNH") and of the organizations with which it is affiliated, the Garden Club of America ("GCA") and the Federated Garden Clubs of Connecticut, Inc. ("Federated"). GCNH has over one hundred members in the greater New Haven area. In 2011, members of Connecticut GCA clubs totaled 1,565 and Federated members totaled 8,143.

[2] The New Haven Urban Resources Initiative (URI) is a not-for-profit organization whose mission is to foster community-based land stewardship, promote environmental education and advance the practice of urban forestry.

> many miles of power lines have been undergrounded already, this could easily increase retail electricity rates in excess of 200%. Further, undergrounding is not always the best option for ensuring reliability. Whereas outages may occur less frequently with an underground line, outages can last much longer when an underground line must be repaired. Additionally, some studies show that overhead lines are more reliable than underground lines at later stages in their life cycle.

We assume that the $11 million cost per mile of undergrounding is a typographical error, since $1 million is often cited as an average cost. A 2009 study[3] by the Edison Electric Institute, an association of shareholder-owned electric companies, reports that the cost of converting overhead lines to underground lines ranges from $80,000 per mile in rural areas to $2,130,000 per mile in urban areas.

This summary of DEEP's conclusion, for which no supporting analytical document appears to be publicly available, seems to be based primarily on the impact on rates, but presumably uses existing rates as its base. Rates will most certainly rise in the near future to reflect the more aggressive tree pruning and removal proposed by the utilities, and already undertaken between the last 2011 major storm and Tropical Storm Sandy in 2012[4], as well as the hardening of poles and wires, especially by CL&P. Tree trimming and removal, including Enhanced Tree Trimming (ETT), are recurring expenditures. As undergrounding proceeded, those costs would be reduced.

Converting overhead lines to underground lines is a long-term process. Since costs would occur over a long period of time, it is not at all clear that rates would rise as much as stated, nor is it certain that rate payers would object to paying a surcharge to support undergrounding in order to get much more reliable power. It is also not clear that the costs of undergrounding need to be entirely funded through rates. Given the benefits of a reliable electrical power supply, and the negative economic, social and health consequences of power failure, other mechanisms for financing should be explored.

The only additional factors noted to support the conclusion are that underground wires take longer to repair if they fail and that they *may* become less reliable over an extended period of time. It is unclear whether these statements consider technological improvements since the underground lines studied were installed. More important, the question isn't whether underground lines are problem free and perfect. Overhead lines certainly aren't. The question is which type of system is most resilient and reliable in a

---

[3] "Out of Sight, Out of Mind Revisited; An Updated Study on the Undergrounding of Overhead Power Lines," available at www.eei.org.

[4] At page 97, the CES states: "CL&P indicates that it has allocated an additional $7.3 million in 2012 to support additional maintenance tree trimming and an additional $20 million to support additional enhanced tree trimming."

major storm. If there is doubt that underground wires are significantly more reliable than overhead wires, a careful study of underground installations in Connecticut as compared to overhead installations (factoring out loss of power to underground wires because of their connection to and reliance on overhead wires) for resiliency during the three recent major storms should be done.

Although we cannot predict exactly when Connecticut will be subjected again to a major storm such as the three storms that occurred in 2011 and 2012, we do know that there is a high probability that such major storms will occur more frequently than in the past as a result of climate change, and that the frequency and severity are likely to increase as the years go on. Tornados and hurricanes are probable. At the same time, we are far more dependent on electricity and the communications technology that it supports in the 21st century than at any other time in our history. The more frequent severe storms are, the more frequent significant power outages will be under the existing primarily overhead electric distribution system, even with more aggressive tree trimming and improved poles and wires. The pilot program for microgrids appears to recognize this.

In the short term, we have no choice but to rely on properly conducted tree trimming and removal as recommended in the State Vegetation Management Task Force (SVMTF) Final Report to reduce power outages. But this approach is unlikely to achieve the level of reliability that our modern economy and way of life require. It is worth noting that, even though the utilities engaged in far more aggressive tree trimming than in the past between the October 2011 Nor-easter and the October 2012 Tropical Storm Sandy, the State experienced significant long-term outages from Sandy that were unrelated to the flooding. In fact, CL&P only claims that its aggressive pruning and tree removal known as Enhanced Tree Trimming (ETT) reduces power outages by 35% (Testimony of Dana L. Louth, July 9, 2012 in Docket No. 12-07-06, p. 29) to 40% (PURA decision in Docket No. 12-06-09, p. 11) in major storms, as compared to normal tree trimming. Anecdotal evidence suggests that from 50 to 70% of the power outages were caused by trees falling from outside the right-of-ways in which the utilities do tree trimming and removal. Managing trees not within the right-of-way raises significant legal issues and will impose additional costs that are not considered at all in the DEEP statement.

In addition to the tree trimming and removal costs, plus pole and wire maintenance and strengthening, the costs of restoring poles and wires after a major storm must also be considered, as compared to the costs of repair, if any, to underground lines after a major storm.

It is not, however, sufficient to only consider the direct costs to the utilities. In the three storms of 2011-2012, both businesses and individual citizens incurred substantial monetary and other costs related to the disruption of normal life, such as lost business income, lost wages, damage to homes from failure of sump pumps, lost food, and harm to personal health. Not all of these have been quantified, but the two 2011 storms are estimated to have created $3 billion in economic losses. (SVMTF Final Report, p. 5)

If the costs of maintaining the overhead electric system are combined with just the economic costs of reliance on that system due to the impact of major storms, it seems to us highly probable that conversion to a more reliable, resilient underground distribution system is more cost effective than the current overhead distribution system. Moreover, given the probability that major storms are likely to increase, the cost effectiveness of maximum eventual conversion to a primarily underground system increases as well.

These considerations alone justify planning for maximum conversion to an underground electrical distribution system in a long-range plan. The positive impact of an underground system on protecting the aesthetic, environmental, economic, social and health benefits of the roadside forest is also highly significant. We do not repeat the benefits of the roadside here, since they are all detailed in the SVMTF report at pp. 13-15

Although we have focused on conversion of the existing overhead electric distribution system to an underground electric distribution system to the maximum extent possible, we also urge the State to require that all new business and residential development have underground electric wires, unless geographically impossible. Many states have this requirement, and it is a first and important step to take.

Thank you for your consideration of our comments.

Respectfully submitted,

Susan Ehrenkranz
President
The Garden Club of New Haven
P.O. Box 6197
Hamden, CT O6517

Anna Bartow
President
New Haven Urban Resources Initiative
195 Prospect Street
New Haven, CT 06511

Mary-Michelle (Mikey) Hirschoff
GCNH Spokesman on Trees and
Power

Colleen Murphy-Dunning
Director
URI