

The Citizens Energy Task Force, created on January 3, 2008, would like to submit the following comments into the public record of the Department of Commerce Environmental Review Proceeding in the case of the CapX Large Transmission Line Application to the Public Utilities Commission.

Comment: The ER should address the health dangers from large transmission lines caused by the electromagnetic fields they create and the studies that link these fields to human disease. In MINNESOTA STATUTE 216C.05 FINDINGS AND PURPOSE, the statute that underlies the Certificate of Need process for the CapX project, the legislature specifically lists "environmental protection and the protection of citizens". The following studies, along with other important information are found at <http://www.powerlinefacts.com>. Choose EMF.

A major new study found that children whose birth address was within 200 meters of an overhead power line had a 70% increased risk of leukemia. Children living 200 to 600 meters away from power lines had a 20% increased risk. This indicates the danger from power lines is appreciably further from the lines than had been identified in previous studies. The study, which was partially funded by the power-line industry, mapped how far each child lived from a high voltage overhead power line. It compared the children who had cancer with a control group of 29,000 children without cancer, but who lived in comparable districts. Appearing in the June 2005 British Medical Journal, the study concludes there is a statistical link between EMF from power lines and leukemia. The study, a collaboration between the Childhood Cancer Research Group at the University of Oxford and National Grid owners, Transco looked at cancer data on children aged up to 15 years old in England and Wales between 1962 and 1995.

A Connecticut law requires the Connecticut Siting Council to include health and fair market value issues when deciding on the application to expand and build 345-kilovolt lines. Here is the rationale for the law. As a follow-up, the Council study shows that burying long lines is feasible.

Based on experiments involving rats and ozone, scientists at the Pacific Northwest National Laboratory have identified a chemical reaction that may explain higher rates of illness observed among some people exposed to strong electromagnetic fields such as those produced by high-voltage power lines.

A California Department of Health Sciences Evaluation concludes EMFs "can cause some degree of increased risk of childhood leukemia, adult brain cancer, Lou Gehrig's Disease, and miscarriage" [emphasis added]. The Evaluation, which is the culmination of a 9 year, \$7 million research effort, further concludes that magnetic fields may cause suicide and adult leukemia. The Final Evaluation is dated June 2002, but was only released about October 13, 2002. The Final Evaluation uses as a standard causation, which is a more rigorous test than the more common standard that seeks to demonstrate an association between EMF and many of these diseases. In addition, the California Health Department also produced a relatively short analysis of the policy options implied by the Evaluation. The Department discusses the policy implications of its analysis in a separate report. Even though the incidence of all these diseases (except miscarriages) is low, the California Department concludes EMF represents a significant health risk. "[I]f EMFs do contribute to the cause of these conditions, even the low fractions of attributable cases and the size of accumulated lifetime risk of highly-exposed individuals could be of concern to regulators. Indeed, when deemed a real cause, estimated lifetime risks smaller than these...have triggered regulatory evaluation and, sometimes, actual regulation."

As a direct result of the California Report, parents in Edmonton, Canada, were able to temporarily delay construction on a new school that they feared was too near a transmission power line. However,

ultimately, the school board decided to proceed.

During the week of March 31, 2002, the Minnesota Department of Health posted an evaluation of the massive report of the California Health Department that found that magnetic fields probably cause a number of deadly diseases. The evaluation, whose authorship is not stated, was produced in secret utilizing a process that was completely closed. Perhaps as a result, it contains numerous factual errors. Nothing is known about the people or process through which reached its conclusions, nor the standards it used. Additionally, in Minnesota, a so-called Interagency Working Group on EMF issues issued a report dated September 2002, but likely also published last week. It also contains numerous errors. Again, no authors were identified, and the process through which this report was produced was completely closed. It is clearly not a serious report but rather a reiteration of the utility industry's position.

A California Administration Law Judge recently agreed, concluding that power lines represent a health risk.

The Japanese news service reports that new Japanese study finds that EMF is linked to children's brain cancer. This is part of a three-year research effort into the impact of EMF being conducted by the former Japanese Science and Technology Agency, now part of the education ministry. Nevertheless, the Minnesota Department of Health continues to cite this study as not finding such a link.

A new UK study similarly finds a link between power line EMF and childhood leukemia. (Also reported by the BBC on October 30, 2004.) It is now asserted UK authorities suppressed this information for 3 years.

A three-fold increase in overall spontaneous abortions and a six-fold increase in spontaneous abortions occurring before the 10th week of pregnancy is associated with even momentary exposure to magnetic fields greater than 16 mG. This is the conclusion of new research by Dr. De-Kun Li reported in the January 2002 issue of *Epidemiology*. Similar results were found in a separate paper on spontaneous abortions prepared for the project by G. M. Lee which is printed in the same issue.

According to a news report in *New Scientist* of January 10, 2002, Li's results caused a California Health Services department scientist, Raymond Neutra, to reexamine his 1991 study of 727 women. Originally, his group's study had measured average magnetic field exposures and with inconclusive results. However, when Neutra recently reanalyzed the data from his earlier study, he discovered the results were similar to Li's. Women exposed to peak magnetic field levels greater than 14 mg doubled their risk of miscarriage over those who had no such exposure.

The results of nine major studies on EMF are reversed in a major analysis found at: <http://www.powerlinefacts.com/British%20Journal%20of%20Cancer%20Abstract%20of%20Meta-Analysis%20of%20Cancer.htm>. Most of these studies originally had failed to find a link between electromagnetic fields (EMF) and cancer. The new review concludes that, upon re-analysis, the data used in the earlier studies do identify an association between cancer and EMF. The authors of the new analysis are the same researchers who headed the earlier studies that had failed to find an association. (See also the appraisal of this study in the industry journal, *Microwave News*.) The authors now conclude, "The level of [statistical] significance that we see for the excess risk at high [EMF] exposure makes chance an unlikely explanation."

A dose-responsive relationship between magnetic fields from power lines and asthma and combined chronic illnesses is identified in an August 2001 Australian study. The study concludes, "The results

are consistent with a possible adverse effect of environmental magnetic field exposure on immune-related and other illnesses."

Dr. Paul Vailleneuve of the University of Ottawa finds in study published in February 2002 that those who were exposed to a moderate 6mG of magnetic fields increased by a factor of 12 their odds of developing an aggressive brain tumor known as glioblastoma multiforme.

The Japanese National Institute for Environmental Studies and the National Cancer Center, in midterm analysis of a joint three-year survey project, have concluded children who are often exposed to such electromagnetic waves, emitted from high-voltage power lines and some household appliances, are on average more than twice as likely to get leukemia than those who are not exposed to EMF.

In a significant July 2002 study sponsored by, among others, the National Institute of Environmental Health and the Department of Energy, Reba Goodman and Martin Blank (who testified for the PLTF) note "It is now well established that low frequency (<300 Hz) electromagnetic (EM) fields induce biological changes that include effects ranging from increased enzyme reaction rates to increased transcript levels for specific genes... Despite cell and tissue differences (e.g., mammalian, dipteran, yeast, bacteria), approximately the same EM field exposure, 60 Hz, 80 mG for 20 min, (Goodman and Blank, 1998) induces hsp70 synthesis in all systems studied... DNA is known to conduct electrons, and studies on ATPase, cytochrome oxidase, and the BZ reaction, show that EM fields accelerate electron transfer rates. We have suggested that EM fields activate DNA by generating repulsive forces when accelerating electrons within the DNA double helix (Blank and Goodman, 1997, 1999, 2001)."

ALTERNATIVES 7849.0200

CERTIFICATE OF NEED FOR LARGE ENERGY FACILITY

Minnesota Statute 216B.243, Subdivision 3.6 states: Showing required for construction. No proposed large energy facility shall be certified for construction unless the applicant can show that demand for electricity cannot be met more cost effectively through energy conservation and load-management measures and unless the applicant has otherwise justified its need. In assessing need, the commission shall evaluate:

(6) possible alternatives for satisfying the energy demand or transmission needs including but not limited to potential for increased efficiency and upgrading of existing energy generation and transmission facilities, load-management programs, and distributed generation.

DISTRIBUTED GENERATION

Comment: The CapX Application to the PUC for Certificates of Need responds to the statute's distributed generation alternative (specifically, C-BED) requirement, from 7.3.4 to 7.3.4.3 C-Bed Study. They conclude that C-Bed is not sufficient to handle future demand. However, the index for the application's Appendix does not show the study from which this conclusion is made. How is the commission going to "evaluate" the claims? The Citizens Energy Task Force believes the studies for a C-Bed alternative should be included in the Certificate of Need Process. To this point, one study "West Central C-Bed Study" has been done and its results produced very promising information about distributed generation as an alternative to central station energy supplies.

COMBINED HEAT AND POWER

Comment: Alternatives to the proposal should include the thorough Development of Community Based CoGeneration/Combined Heat and Power. Although there are safe emission issues that require improvements to this alternative, with these issues resolved it could be part of a solution to non fossil fuel energy distribution. The system of Central Station Thermal plants runs at a low thermal efficiency. Fossil fuel conservation on the Generation side of the electrical system can be directly achieved by locating most generation where the lower levels of heat after electric generation can be used to heat and cool districts of urban buildings as in the St. Paul District Energy, Mayo Clinic, Minnesota paper plants.

Comment: 2007 Minnesota statute 216C.05 subd. 2 on Energy Policy Goals states that: (1) the per capita use of fossil fuel as an energy input be reduced by 15 percent by the year 2015, through increased reliance on energy efficiency and renewable energy alternatives; Energy efficient Combined Heat/Cooling and Power is likely the most direct way the PUC can direct electric Utilities to conserve per capita fossil fuel that otherwise will be used by customers to heat buildings and operate industrial process.

Comment: Minnesota statute supports a future of Plug Hybrid cars which in a way can be a Distributed Energy Storage system. These may be available in mass production before these HV lines are built. How would 100,000 Plug Hybrids a year added to the regional mix change the needs for electric infrastructure? The applicants may need to provide smart meters to homes and businesses having CHP systems and Plug Hybrids capable of generating when electric energy prices are high.

Comment: The South East Transmission Zone may be able to accommodate around 2500MW of wind from existing Transmission and is the closest Wind resource to Metro loads. This should be the most economic Transmission path to pursue.

Comment: Concentrating Solar Power with Thermal Storage (CSP/TS) is rapidly entering utility scale use. Minnesota has good summer solar resources that match summer peak loads. CSP/TS systems could be located near most Minnesota communities and each contribute 10MW and above capacity to the system in the next few years. Solar One has been operating at that capacity since the early 80's. They can also contribute to thermal loads, even in the winter. Wind is light in summer but when complimented by CSP/TS can be balanced without fossil fuel.

UNDERGROUND LINES

Comment: CETF notes that costs are an important part of the rationale in the CapX application for dismissing underground lines as an alternative (7.6). However, on this site's list of EMF consequences (human costs) of large transmission lines (<http://www.powerlinefacts.com/EMF.htm>), the following is found:

A Connecticut law requires the Connecticut Siting Council to include health and fair market value issues when deciding on the application to expand and build 345-kilovolt lines. As a followup, the Council study shows that burying long lines is feasible.

The site further states: One of the issue confronting policymakers is the value of a human life. Does it make sense to spend \$4 million to bury a line if the reduction in EMF will save one life? An article in the on-line magazine Slate suggests a human life is worth between \$4 million and \$8 million.

In addition, CETF believes security, safety, and reliability issues are exacerbated on long vulnerable overhead transmission lines.

EFFICIENCY and CONSERVATION EXEMPTIONS

216C.05 STATES: "that the state has a vital interest in providing for: increased efficiency in energy consumption, the development and use of renewable energy resources wherever possible, and the creation of an effective energy forecasting, planning, and education program." EFFICIENCY has been exempted in the CapX application- 7849.0260 C, "for facility and for each alternative discuss": #6 "Efficiency" EXEMPT

Also: Rule 7849.0290 states:

7849.0290 CONSERVATION PROGRAMS, APPLICATION.

An application must include:

- A. the name of the committee, department, or individual responsible for the applicant's energy conservation and efficiency programs, including load management;
- B. a list of the applicant's energy conservation and efficiency goals and objectives;
- C. a description of the specific energy conservation and efficiency programs the applicant has considered, a list of those that have been implemented, and the reasons why the other programs have not been implemented;
- D. a description of the major accomplishments that have been made by the applicant with respect to energy conservation and efficiency;
- E. a description of the applicant's future plans through the forecast years with respect to energy conservation

and efficiency; and

F. a quantification of the manner by which these programs affect or help determine the forecast provided in response to part 7849.0270, subpart 2, a list of their total costs by program, and a discussion of their expected effects in reducing the need for new generation and transmission facilities.

STAT AUTH: MS s 216A.05; 216B.08; 216B.2421; 216B.243; 216C.10

Comment: THIS RULE HAS ALSO BEEN EXEMPTED IN THE CAPX APPLICATION
Comment: REGARDLESS OF THE UTILITY OR THE COMMISSIONS RATIONALE FOR THE EXEMPTION OF EFFICIENCY AND CONSERVATION PROGRAMS, CETF believes the efficiency and conservations issues are very important to public interest, public health, public environmental implications; and the intentions of statute and public policy to make efficiency/conservation a priority strategy for reducing dependency on fossil fuels is clear. The 2007 legislature has made efficiency a priority and has mandated actual energy savings of 1-1.5% per year for all utilities. For these reasons and because conservation was a topic of main concern at the DOC's ER scoping meeting in Cannon Falls on December 18, and probably at other meetings not attended by this group, the CETF believes this information should be included in the environmental review and, consequently, in the CON proceedings.

LINE LOSSES

Exemption # 5 of the PUC's ruling on application exemptions state: "Applicants are exempt from the obligation arising under Minnesota Rules, part 7849.0260, subparts A(3) and C(6), to state in the Certificate of Need application "the expected losses ... in the length of the transmission line and at the terminals or substations." Applicants shall estimate line losses throughout the system instead."

Comment: At the Avon Hills Initiative meeting, Community based distributed generation advocates shared findings that as you develop distributed and disbursed alternatives, you make it easier to balance line load. If the commission is to evaluate distributed generation alternatives compared to large transmission lines, it seems this exemption reduces their ability to do a part of that evaluation.

OPEN SPACE, FARMLAND OPERATIONS AND PROPERTY VALUES

Comment: Many townships in southern Minnesota have "Right to Farm" ordinances and counties such as Dakota County have expressed the importance of open space and farmland through their planning initiatives to 2030 and through such programs as Dakota County's "Farmland and Natural Areas Program". The viability of continued farming is considered to be an integral part of economic and social and aesthetic benefit to this area.

Comment: At the Cannon Falls scoping meeting, a farmer told of the existence of large transmission lines across their property which kept them from being able to run the equipment needed to irrigate their crops. In countering CapX representatives comments that underground lines are more costly, this farmer observed that the same rationale was given in the 70's when lines were put overhead instead of

underground and since that time they (the farm family) have had to bear the costs instead.

Comment: CETF believes the existence of these lines will also create a reduction in property values in areas close to urban areas and hub cities as these properties are considered for needed residential expansion and as more information surfaces about the health effects on humans.

Comment: The existence of these lines near greenways and preserved nature areas will also affect not only the flora and fauna of these areas, but also reduce the aesthetic appeal of these areas considered important to citizens for recreational enjoyment. The following is an example of a concern as expressed by a township supervisor from Bridgewater Township in Rice County: "The most northern section of Bridgewater Township is in the path of the Brookings line. Heath Creek, identified by the city of Northfield as a greenway for wildlife and walking and biking trail system is in this area. Siting the transmission line in this area is inconsistent with that use. This is the position of the Bridgewater township board."

Comment: CETF believes that non-proliferation of transmission lines, as established in the famous PEER decision which states that power lines have 'significant environmental impacts', is an important consideration in the ER and as it relates to open space. The task force believes this points to, at the minimum, no new transmission line corridors.