7. **What are the related cost and benefits (re affordability, reliability, and the environment) of a range of possible energy efficiency standards (including maintaining our current standard, and increasing it to various levels?**

Environmental Benefits:

Michigan's Energy Optimization efficiency standard helps avoid a lot of pollution that would have otherwise been emitted by power plants. According to the MPSC 2012 Report on PA 295 Energy Optimization (http://www.michigan.gov/documents/mpsc/2012_EO_Report_404891_7.pdf), the 1% 2012 statewide energy savings goal is equivalent to almost exactly 1 million MWh. One million MWh of electricity savings in Michigan would produce the following annual emission reductions, for each year the efficiency measures stay in place[1]:

NOX:	1,800,948	lbs
SO2:	6,161,665	lbs
CO2:	851,919	short tons
Ozone Season NOX	740,129	lbs

The American Council for an Energy-Efficient Economy (ACEEE) incorporated the EPA emissions calculator and developed for its web site a user-friendly *Energy Efficiency and Pollution Control Calculator* (http://www.aceee.org/research-report/e134) Using those calculation tools, ACEEE has calculated what the emissions reduction effects would be from maintaining a 1% annual Energy Optimization savings standard in Michigan through 2025. The cumulative effect of that energy efficiency with an average life of measures of 13 years, would produce the following benefits to Michigan (expressed as the average annual emission reduction, and the corresponding cost in pollution control equipment that it would take to produce that size of an annual emission reduction from installing pollution control technology on electric generating plants)[2]:

- *Nitrogen Oxides (NO_x)* – An average of over 6,000 tons of this smog forming pollutant would be reduced annually by maintaining the Energy Optimization annual 1% energy savings target through 2025. Without these Energy Optimization savings, nearly $400 million in investments would be required to get the same NO_x reductions from pollution control equipment.

- *Sulfur Dioxide (SO_2)* – Maintaining that Energy Optimization 1% annual energy savings requirement through 2025 would reduce over 20,000 tons of this lung irritant annually. Without the efficiency standard Michigan would have to invest over $500 million in pollution controls to achieve that level of SO_2 emissions.

- *Mercury* – Maintaining Michigan's Energy Optimization 1% annual savings target through 2025 will annually prevent over 347 pounds of mercury emissions, a pollutant that causes birth defects in

[1] These calculations are made using the U.S. EPA Power plant Emissions Calculator (http://www.epa.gov/airquality/eere/download.html), which uses actual power plant level information from each FERC subregion.

[2] These data are summarized in a fact sheet on the ACEEE web site (http://www.aceee.org/files/pdf/fact-sheet/123-michigan.pdf), with links to the emissions calculator and associated references.

children. Utilities would have to invest over $280 million in plant upgrades to get these same emissions reductions.

In summary, by maintaining the Energy Optimization 1% per year savings standard through 2025, an average of over 6,000 tons of nitrogen oxide, over 20,000 tons of sulfur dioxide, and over 347 pounds of mercury are avoided annually over that time period. Installation of pollution controls on a power plant can be very expensive. In fact, to get the same emissions reductions as the efficiency standard, Michiganders would have to invest over $1 billion in pollution control equipment.

In addition to those regulated pollutants, that 1% annual Energy Optimization requirement would also produce an average annual reduction over that time period of nearly 6 million tons of CO2. While there is not a current cost attached to CO2 emissions, many experts believe that there will be such a requirement within the timeframe of this modeling (i.e., through 2025). If that does happen, these CO2 reductions from Energy Optimization would provide significant further economic benefits to Michigan.

[Note: Increasing the Energy Optimization 1% annual savings requirement would increase the various emissions reductions described above roughly proportionally (e.g., doubling the standard to 2% per year would roughly double the emissions reduction benefits).]

Finally, it should be noted that all of the above environmental emissions benefits described in the response above are *in addition to* the Energy Optimization program benefits described in the MPSC 2012 Energy Optimization Programs report. The MPSC did not attempt to quantify any environmental emissions benefits in that report.