

Nora Clean Energy Committee Report on Wind/Solar/Geo-Thermal Energy Final Draft- Approved for distribution 1/22/2010

Background: At the 2009 annual meeting, church members passed a motion asking the social justice committee to return with a recommendation concerning alternative energy source. The social justice committee then directed Darrell Hinsman, Mark Wiger, (various other committee members also attended some of the meetings) to collect information from professionals in the Wind, Solar and Geo-Thermal areas.

Recommendation: The Nora church site is judged to be a high quality location for either a wind turbine or a solar photovoltaic installation. Between these two choices, **the committee is recommending a wind turbine. Solar photovoltaic would be the second choice only if zoning and setback issues are not resolvable.** Geo-thermal is not practical because it would require a great deal of digging and retrofitting of the heating system. Additionally, the cost of operating the blower motors negatively affects cost efficiency.

Wind Turbine

Energy Concepts- the consultant group commissioned to review the options, has carefully studied the Nora Church site and identified two superior locations for a potential wind turbine and tower. "Both sites on the property's south west corner, would present well to prevailing wind directions, allow easy access for heavy equipment, would preserve the site integrity of the church property, and be within 400' of the electrical panel on the north side of the Meeting Hall."

Besides meeting Nora's electrical needs, additional income from selling left over production can be used to off-set propane heating costs. This is because of "Net Metering" which requires that any excess electrical production that passes onto the grid must be fairly compensated by Alliant Energy at the current retail rate. A special electric meter would be installed with the turbine that literally can spin in two directions--and the "net" difference between usage and production would be charged, or credited, to the Church account.

The recommended Turbine is a Jacobs 20kW. The estimated installed cost is \$85,000. But with various successfully applied grant incentives, the cost could drop to somewhere between \$68,000 and \$39,000. The annual production is conservatively estimated at 29,804 kWh, which is 155% of current consumption. "For a variety of reasons-- overall production, maintenance, return-on-investment --Energy Concepts has determined that a minimum tower height at the Nora Church site is 100'."

Quoting from the consultants report, *"It must be noted however, that there are legal hurdles to sitting a wind turbine at this location because the tower height exceeds the setback distance to the neighboring property, even if just a corn field. Depending on the neighboring landowner, and current town and county ordinances in regard to wind turbine sitting, there may be months of meetings ahead before a tower permit can be issued.*

Solar

“Putting a solar array on top of a pole mount near the southern property boundary would be a solid, safe and effective way of producing renewable power”, states the report.

Finding a qualified and experienced solar installer in the Hanska area may be problematic and add cost to installation numbers, which are valid within 100 miles of Hudson, Wisconsin. The trenching distance, almost 400’ to the electrical service, could also result in an increased cost as well. The Simple Payback Period is quite a bit longer than wind.

Geo Thermal

Various contractors looked at the site and provided alternatives for equipment and installation. All agreed that because there are four furnaces and an assortment of buildings, tying everything together into one system would be costly and not practical. It was also hard for the committee to justify replacing furnaces that have remaining useful life. The committee believes that if geothermal were to be used; the only option worth considering would be equipping the parsonage, but not the church.

Conclusion

The consultants state that Nora Church is a superior location for harvesting wind and production numbers bear that out. Energy Concepts states, *Wind is clearly the best renewable energy application for this property, with average wind speeds of 13.5 mph at the recommended 100’ hub height sitting above the prairie floor on a little knoll.*”

The report goes on to say, *both wind and solar technologies work well and produce electricity reliably over many years making an investment in them safe, predictable and an overall asset to the property. The future cost of electricity, systemic risk from global climate change, and possible benefits from “carbon credits” in new Federal energy legislation -- all could affect current economic projections for renewable energy in the coming decades.*

The best reasons to invest in wind or solar are the ones that you can count on now and in the future: it’s the right thing to do for the local economy and the planet, it increases the value of your property, it contributes to a climate solution, it will save money over the long term (though how much is not fair to predict). The experience at Energy Concepts is that clients are extremely happy to have forged ahead with renewable energy despite long time horizons or uncertainty about future energy costs or legislative action. The power of energy independence, investing in a local green economy, electricity cost certainty, and contributing to a responsible energy/climate future are all significant and meaningful reasons to invest in clean energy today.”