

Mitigation Projects at the UUFM

The Unitarian Universalist Fellowship of Mankato (UUFM) is in the process of accomplishing or is planning to accomplish several major mitigation projects that will potentially reduce our contribution to the cause of greenhouse warming-the burning of fossil fuels.

We moved into our current A-frame building in 2005. One side of the A-frame roof is directed almost due south making it perfect to host a solar array. After much discussion a solar array was installed in June 2019.



UUFM Building with Solar Array

Financially this was a complex process. We contracted with a company that got tax credits and gets 80% of the monetary value of the energy we produce for 13 years. The UUFM gets the monetary value of 20% of the energy generated by the array and after 13 years we will own the array and all its energy output. We did not pay anything for the hardware or installation of the array. Recent work on the array has increased its energy output. The energy generated varies depending on weather but should be more than 15 mega-watt-hours per year. That is

enough energy to power the Fellowship building at full occupancy with energy to spare. Our 20% share makes a substantial contribution to our electric bill. Disregarding money, our array produces energy that replaced energy generated by fossil fuel. Another way of assessing the energy produced is to calculate the carbon dioxide (CO₂) that would have been generated if the energy was generated by the burning of coal. For the entire history of our array we have kept about 36,000 pounds of CO₂ from being generated. (For every kilowatt-hour of energy produced by burning coal, 1.5 pounds of CO₂ are produced.) Put another way, the array has done the work of about 300 trees taking CO₂ out of the atmosphere. (A mature tree removes about 48 pounds of CO₂ from the atmosphere per year.) The website designed to monitor the array is monitoring.solaredge.com/solaredge-web/p/login ,username uumankato@gmail.com and password SE89mk*(p . At the website you can monitor the operation of the array in realtime.

Another mitigation project recently undertaken was the retrofitting of the lighting of UUFM building. Incandescent , fluorescent, and compact fluorescent lights were replaced by LED lights. The initial cost for this conversion, about \$11,000, was large but it will be paid back in savings in about 14 years. More importantly lighting energy use was cut to one-third of what we were consuming with a corresponding effective reduction in CO₂ generated. Some lighting still needs to be retrofitted.



LED Lighting in Sanctuary UUFM



LED Lighting in Lower Level UUFM

Finally, another mitigation project in the planning stages is the replacement of the heating system. Currently we have a hot water system with radiators and a boiler powered by natural gas. This is an old unit and the Buildings and Grounds committee is investigating alternative systems. The system could be replaced as is or with a more efficient boiler for considerably more money. A geothermal system seems to be impractical since bedrock is just below the surface at the UUFM site. Heat pump systems or other innovative systems might also be possible. Preliminary discussions are underway.



Old Boiler at UUFM